APR 9 1980

Item 830-J-5

NAS 1.21:7043(24)

NASA

Energy
A Continuing Bibliography with Indexes

NASA SP-7043(24)
January 1980

J+635-050
cp 700

9099

contin

National Aeronautics and
Space Administration

y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

IAA (A-10000 Series)	A79-43833 – A79-54505
STAR (N-10000 Series)	N79-28118 – N79-34158

Previous publications announced in this series/subject category include:

DOCUMENT	*DATE*	*COVERAGE*
NASA SP-7042	April 1974	January 1968 – December 1973
NASA SP-7043(01)	May 1974	January 1, 1974 – March 31, 1974
NASA SP-7043(02)	November 1974	April 1, 1974 – June 30, 1974
NASA SP-7043(03)	February 1975	July 1, 1974 – September 30, 1974
NASA SP-7043(04)	May 1975	October 1, 1974 – December 31, 1974
NASA SP-7043(05)	August 1975	January 1, 1975 – March 31, 1975
NASA SP-7043(06)	October 1975	April 1, 1975 – June 30, 1975
NASA SP-7043(07)	December 1975	July 1, 1975 – September 30, 1975
NASA SP-7043(08)	February 1976	October 1, 1975 – December 31, 1975
NASA SP-7043(09)	April 1976	January 1, 1976 – March 31, 1976
NASA SP-7043(10)	July 1976	April 1, 1976 – June 30, 1976
NASA SP-7043(11)	October 1976	July 1, 1976 – September 30, 1976
NASA SP-7043(12)	January 1977	October 1, 1976 – December 31, 1976
NASA SP-7043(13)	April 1977	January 1, 1977 – March 31, 1977
NASA SP-7043(14)	July 1977	April 1, 1977 – June 30, 1977
NASA SP-7043(15)	October 1977	July 1, 1977 – September 30, 1977
NASA SP-7043(16)	January 1978	October 1, 1977 – December 31, 1977
NASA SP-7043(17)	April 1978	January 1, 1978 – March 31, 1978
NASA SP-7043(18)	August 1978	April 1, 1978 – June 30, 1978
NASA SP-7043(19)	October 1978	July 1, 1978 – September 30, 1978
NASA SP-7043(20)	January 1979	October 1, 1978 – December 31, 1978
NASA SP-7043(21)	April 1979	January 1, 1979 – March 31, 1979
NASA SP-7043(22)	July 1979	April 1, 1979 – June 30,1979
NASA SP-7043(23)	October 1979	July 1, 1979 – September 30, 1979

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

NASA SP-7043 (24)

ENERGY

A Continuing Bibliography

With Indexes

Issue 24

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced from October 1 through December 31, 1979 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

Scientific and Technical Information Branch 1980
National Aeronautics and Space Administration
Washington, DC

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price $15.00 domestic, $30.00 foreign.

INTRODUCTION

This issue of *Energy: A Continuing Bibliography with Indexes* (NASA SP-7043(24)) lists 1609 reports, journal articles, and other documents announced between October 1, 1979 and December 31, 1979 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of this continuing bibliography was published in May 1974 and succeeding issues are published quarterly.

The coverage includes regional, national and international energy systems; research and development on fuels and other sources of energy; energy conversion, transport, transmission, distribution and storage, with special emphasis on use of hydrogen and of solar energy. Also included are methods of locating or using new energy resources. Of special interest is energy for heating, lighting, for powering aircraft, surface vehicles, or other machinery.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries* in that order. The citation, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR* including the original accession numbers from the respective announcement journals. This procedure, which saves time and money accounts for the slight variation in citation appearances.

Five indexes -- subject, personal author, corporate source, contract number, and report number -- are included. The indexes are of the cumulating type throughout the year, with the fourth quarterly publication containing abstracts for the fourth quarter and index references for the four quarterly publications.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A79-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at $6.00 per document up to a maximum of 20 pages. The charge for each additional page is $0.25. Microfiche(1) of documents announced in *IAA* are available at the rate of $2.50 per microfiche on demand, and at the rate of $1.10 per microfiche for standing orders for all *IAA* microfiche. The price for the *IAA* microfiche by category is available at the rate of $1.25 per microfiche plus a $1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of $1.35 per microfiche.

Minimum air-mail postage to foreign countries is $1.00 and all foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

STAR ENTRIES (N79-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page viii.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard $3.50 price, for those documents identified by a # symbol.)

---

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.

Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.

Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)

Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.

Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the quarterly supplements is $50.00 domestic; $100.00 foreign. All questions relating to the subscriptions should be referred to NTIS, Attn: Subscriptions, 5285 Port Royal Road, Springfield, Virginia 22161.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and
Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

Department of Energy
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information
Facility
P.O. Box 8757
B. W. I. Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Branch (NST-41)
Washington, D.C. 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey
1033 General Services Administration
Building
Washington, D.C. 20242

U.S. Geological Survey
601 E. Cedar Avenue
Flagstaff, Arizona 86002

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U.S. Geological Survey
Bldg. 25, Denver Federal Center
Denver, Colorado 80225

Fachinformationszentrum Energie, Physik,
Mathematik GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1980)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 3.50	$ 5.25
A02	001-025	5.00	10.00
A03	026-050	6.00	12.00
A04	051-075	7.00	14.00
A05	076-100	8.00	16.00
A06	101-125	9.00	18.00
A07	126-150	10.00	20.00
A08	151-175	11.00	22.00
A09	176-200	12.00	24.00
A10	201-225	13.00	26.00
A11	226-250	14.00	28.00
A12	251-275	15.00	30.00
A13	276-300	16.00	32.00
A14	301-325	17.00	34.00
A15	326-350	18.00	36.00
A16	351-375	19.00	38.00
A17	376-400	20.00	40.00
A18	401-425	21.00	42.00
A19	426-450	22.00	44.00
A20	451-475	23.00	46.00
A21	476-500	24.00	48.00
A22	501-525	25.00	50.00
A23	526-550	26.00	52.00
A24	551-575	27.00	54.00
A25	576-600	28.00	56.00
A99	601-up		-- 2/

1/ Add $1.00 for each additional 25 page increment or portion thereof for 601 pages up

2/ Add $2.00 for each additional 25 page increment or portion thereof for 601 pages and more

Schedule E

EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

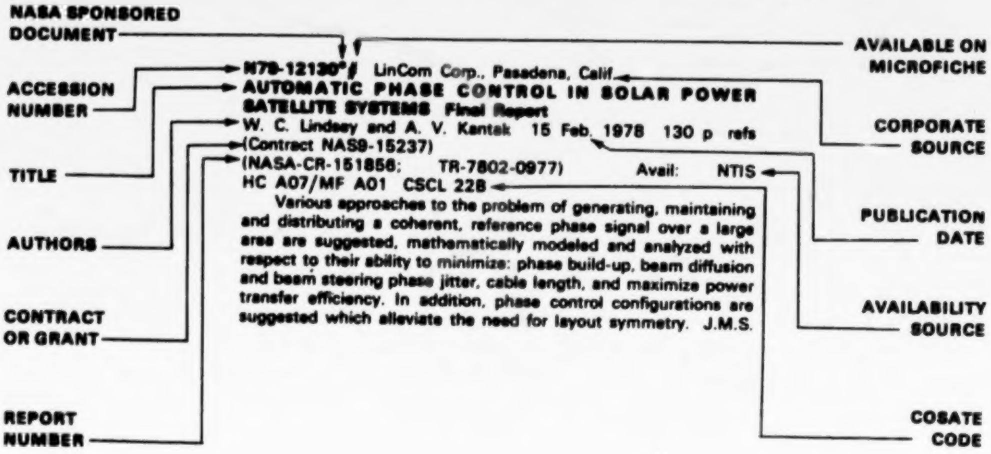
Price Code	North American Price	Foreign Price
E01	$ 5.50	$ 11.50
E02	6.50	13.50
E03	8.50	17.50
E04	10.50	21.50
E05	12.50	25.50
E06	14.50	29.50
E07	16.50	33.50
E08	18.50	37.50
E09	20.50	41.50
E10	22.50	45.50
E11	24.50	49.50
E12	27.50	55.50
E13	30.50	61.50
E14	33.50	67.50
E15	36.50	73.50
E16	39.50	79.50
E17	42.50	85.50
E18	45.50	91.50
E19	50.50	100.50
E20	60.50	121.50
E99 - Write for quote		
N01	28.00	40.00

TABLE OF CONTENTS

IAA Entries 601
STAR Entries 717

Subject Index A-1
Personal Author Index B-1
Corporate Source Index C-1
Contract Number Index D-1
Report/Accession Number Index E-1

TYPICAL CITATION AND ABSTRACT FROM *STAR*

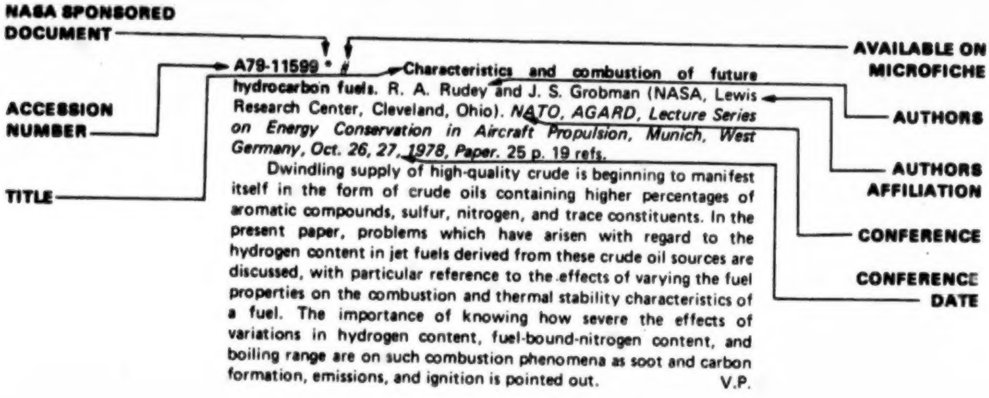


N79-12130*# LinCom Corp., Pasadena, Calif.
AUTOMATIC PHASE CONTROL IN SOLAR POWER SATELLITE SYSTEMS Final Report
W. C. Lindsey and A. V. Kantak 15 Feb. 1978 130 p refs
(Contract NAS9-15237)
(NASA-CR-151856; TR-7802-0977) Avail: NTIS
HC A07/MF A01 CSCL 22B

Various approaches to the problem of generating, maintaining and distributing a coherent, reference phase signal over a large area are suggested, mathematically modeled and analyzed with respect to their ability to minimize: phase build-up, beam diffusion and beam steering phase jitter, cable length, and maximize power transfer efficiency. In addition, phase control configurations are suggested which alleviate the need for layout symmetry. J.M.S.

NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
CONTRACT OR GRANT
REPORT NUMBER
AVAILABLE ON MICROFICHE
CORPORATE SOURCE
PUBLICATION DATE
AVAILABILITY SOURCE
COSATE CODE

TYPICAL CITATION AND ABSTRACT FROM *IAA*



A79-11599 * # Characteristics and combustion of future hydrocarbon fuels. R. A. Rudey and J. S. Grobman (NASA, Lewis Research Center, Cleveland, Ohio). *NATO, AGARD, Lecture Series on Energy Conservation in Aircraft Propulsion, Munich, West Germany, Oct. 26, 27, 1978, Paper.* 25 p. 19 refs.

Dwindling supply of high-quality crude is beginning to manifest itself in the form of crude oils containing higher percentages of aromatic compounds, sulfur, nitrogen, and trace constituents. In the present paper, problems which have arisen with regard to the hydrogen content in jet fuels derived from these crude oil sources are discussed, with particular reference to the effects of varying the fuel properties on the combustion and thermal stability characteristics of a fuel. The importance of knowing how severe the effects of variations in hydrogen content, fuel-bound-nitrogen content, and boiling range are on such combustion phenomena as soot and carbon formation, emissions, and ignition is pointed out. V.P.

NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AVAILABLE ON MICROFICHE
AUTHORS
AUTHORS AFFILIATION
CONFERENCE
CONFERENCE DATE

A Listing of Energy Bibliographies Contained In This Publication:

1. Bibliography of subsidence and related topics for in situ coal gasification p0733 N79-29373
2. A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining p0735 N79-29584
3. DOE/STOR bibliography for flywheel energy systems, 1977 p0742 N79-29665
4. Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224) --- bibliographies p0743 N79-29671
5. Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362) p0743 N79-29672
6. Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes p0743 N79-29673
7. Energy information data base. Serial titles, supplement 3 --- bibliographies p0745 N79-30088
8. Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts p0747 N79-30413
9. Energy conservation via heat transfer enhancement --- bibliographies p0758 N79-30819
10. Pollution and environmental aspects of fuel conservation. A bibliography with abstracts p0761 N79-30857
11. Hydrogen production, volume 1. A bibliography with abstracts p0765 N79-31406
12. Hydrogen production, volume 2. A bibliography with abstracts --- by electrolysis and coal gasification p0765 N79-31407
13. Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base p0767 N79-31433
14. Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base p0767 N79-31434
15. Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base p0767 N79-31435
16. Passive solar design: An extensive bibliography p0774 N79-31804
17. Wind power, volume 2. Citations from the NTIS data base --- bibliographies p0777 N79-31836

18. Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies p0777 N79-31837
19. Wind power, volume 2. Citations from the Engineering Index data base p0777 N79-31838
20. Transportation systems center bibliography of technical reports p0794 N79-33107
21. Alcohol fuels. Citations from the Engineering Index data base p0795 N79-33341
22. Alcohol fuels, volume 2. Citations from the NTIS data base p0795 N79-33342
23. Alcohol fuels, volume 1. Citations from the NTIS data base p0795 N79-33343
24. Hydrogen use as a fuel. Citations from the NTIS data base p0796 N79-33347
25. Fuel Cells, volume 3. Citations from the NTIS data base p0801 N79-33594
26. Hydrocarbon fuel cells. Citations from the American Petroleum Institute data base p0801 N79-33595
27. Energy supply and demand modeling. A bibliography with abstracts p0802 N79-33605
28. State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts p0802 N79-33608

ENERGY

A Continuing Bibliography (Issue 24)

JANUARY 1980

IAA ENTRIES

A79-43848 # **Development of thermoelectricity studies in the USSR (Razvitie issledovanii po termoelektrichestvu v SSSR).** A. A. Buriak. Kiev, Izdatel'stvo Naukova Dumka, 1978. 136 p. 307 refs. In Russian.

The historical background and current status of thermoelectric power generation in the USSR are reviewed. Consideration is given to the properties of the principal thermoelectric semiconductor materials as well as to methods for calculating the principal parameters of thermoelectric devices. The design and operation of specific types of thermoelectric generator systems, including solar thermoelectric generators, organic-fuel generators, and SNAP systems, are reviewed. B.J.

A79-44160 **Energy analysis of the Solar Power Satellite.** R. A. Herendeen, T. Kary, and J. Rebitzer (Illinois, University, Urbana, Ill.). *Science,* vol. 205, Aug. 3, 1979, p. 451-454. 25 refs.

The energy requirements to build and operate the proposed Solar Power Satellite are evaluated and compared with the energy it produces. Because the technology is so speculative, uncertainty is explicitly accounted for. For a proposed 10-gigawatt satellite system, the energy ratio, defined as the electrical energy produced divided by the primary nonrenewable energy required over the lifetime of the system, is of order 2, where a ratio of 1 indicates the energy breakeven point. This is significantly below the energy ratio of today's electricity technologies such as light-water nuclear or coal-fired electric plants. (Author)

A79-44225 * # **Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/.** G. D. Sagerman, G. J. Barna, and R. K. Burns (NASA, Lewis Research Center, Cleveland, Ohio). *American Institute of Aeronautics and Astronautics, Terrestrial Energy Systems Conference, Orlando, Fla., June 4-6, 1979, Paper 79-1000.* 20 p. Contract No. EC-77-A-31-1062.

The Cogeneration Technology Alternatives Study (CTAS), a program undertaken to identify the most attractive advanced energy conversion systems for industrial cogeneration applications in the 1985-2000 time period, is described, and preliminary results are presented. Two cogeneration options are included in the analysis: a topping application, in which fuel is input to the energy conversion system which generates electricity and waste heat from the conversion system is used to provide heat to the process, and a bottoming application, in which fuel is burned to provide high temperature process heat and waste heat from the process is used as thermal input to the energy conversion system which generates energy. Steam turbines, open and closed cycle gas turbines, combined cycles, diesel engines, Stirling engines, phosphoric acid and molten carbonate fuel cells and thermionics are examined. Expected plant level energy savings, annual energy cost savings, and other results of the economic analysis are given, and the sensitivity of these results to the assumptions concerning fuel prices, price of purchased electricity and the potential effects of regional energy use characteristics is discussed. C.K.D.

A79-44239 **Turning to the sun for power.** J. Hopkinson. *EPRI Journal,* vol. 4, June 1979, p. 18-21.

Problems of supply and collection in solar-thermal conversion are discussed. A solar thermal power plant concept is described which incorporates a closed Brayton-cycle (gas turbine) system. Advantages of the Brayton cycle are its reduced need for cooling water and higher efficiency due to recycling or not exhaust air back to the receiver. These factors increase siting flexibility and reduce land requirements, respectively. A 1-MW (th) solar receiver is described which uses air, heated from 1000 F to 1500 F, as the working fluid. Also studied is an open Brayton cycle central receiver concept which heats air to 2000 F to achieve higher thermal efficiency. Finally, a solar-fossil hybrid turbine is described, as a means of back-up generation to ensure a constant power supply. M.E.P.

A79-44241 # **Fusion - Its status and outlook.** W. B. Briggs (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: Energy: A close look at the energy business; Proceedings of the Second International Conference, Washington, D.C., November 30, December 1, 1978. Stamford, Conn., Business Communications Co., Inc., 1979, p. 133-155.

The potential of fusion is examined and realistic dates for its utilization are projected. Fusion fundamentals are discussed, noting that in fusion there are no noxious effluents and no fuel cycle that requires expensive control. Governmental and commercial fusion R&D are surveyed and attention is given to the major obstacles: (1) institutional - fusion central power plants must be compatible with the distribution system and economically attractive to displace known entities such as fossil fuel or nuclear fission plants, (2) financial - research money must come from national governments, and (3) technical, i.e., multidiscipline engineering must be applied to make an efficient subsystem and engineering at the limit of theoretical knowledge. Finally, world wide research project developments are surveyed and some aspects of fusion economics studied. M.E.P.

A79-44242 # **The future of methane supply.** C. G. Matthews (Brooklyn Union Gas, Brooklyn, N.Y.). In: Energy: A close look at the energy business; Proceedings of the Second International Conference, Washington, D.C., November 30, December 1, 1978. Stamford, Conn., Business Communications Co., Inc., 1979, p. 170-176.

Recent developments in the natural gas industry are surveyed. Advantages of methane are stressed, and include its ability to be utilized in many energy applications with minimal environmental impact, and that an effective distribution network already exists. Sources discussed include geopressure zones, tight formations, and biomass. A study is cited which concludes that for its existing systems, coal-based gas would provide a cheaper and more efficient energy form than coal-based electricity while another study found that coal gasification would be up to 50% more efficient than coal electrification and result in lower air pollution, lower solid waste generation, and lower water requirements. M.E.P.

A79-44255 **Study of photocell characteristics dependence on solar ray incidence angle and intensity.** M. M. Koltun, I. V. Karpenko, V. P. Matveev, Iu. N. Ksendzatskaia, I. S. Orshanskii, T.

A. Kozyreva, and G. D. Naumova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 5, 1978, p. 3-6.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 1-3. Translation.

The characteristics of silicon and thin-film Cu2S-CdS photocells are studied for various solar radiation incidence angles. It is found that for the silicon solar batteries with variable sunlight incidence angles creation of microrelief on the outer surface of the protective glasses by pregrinding of these surfaces is most effective. For the thin-film Cu2S-CdS heterosystem solar batteries of improved angular characteristics are obtained when using polycrystalline films with micrograin dimensions from 0.5 to 1.5 microns. The results obtained show that under low illumination and variable solar ray incidence angle conditions thin-film photocells may be more effective than silicon photocells.

(Author)

A79-44259 **Calculating the radiant field of concentrators with artificial sources.** S. A. Azimov, G. T. Adylov, Kh. M. Mallaeva, I. I. Pirmatov, and T. T. Riskiev (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 5, 1978, p. 27-31.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 19-22. 6 refs. Translation.

A general scheme for the analysis of concentrators with arbitrary radiation sources is proposed. The analysis takes into account reflector inaccuracies which are significant when the source angular dimensions are comparable with the mean-square deviations of the reflector surface normal from the ideal direction. As an example, consideration is given to the radiation field of the 'Uran' radiative heating unit.

B.J.

A79-44260 **Solar radiation concentrator for uniform irradiation of flat energy receivers and converters.** D. I. Tepliakov and R. R. Aparisi (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *(Geliotekhnika,* no. 5, 1978, p. 32-40.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 23-29. 9 refs. Translation.

A79-44261 **Accuracy and energy characteristics of paraboloidal heliostat system.** R. A. Zakhidov and A. A. Vainer (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *(Geliotekhnika,* no. 5, 1978, p. 41-44.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 30-32. Translation.

A general theory developed by Zakhidov et al. (1977) for multimirror concentrating systems is used to analyze a paraboloidal heliostat system. Consideration is given to both aperture/dimensional design and accuracy/energy design.

B.J.

A79-44262 **Composite paraboloidal radiant energy concentrators.** L. Ia. Paderin (Tsentral'nyi Aerogidrodinamicheskii Institut, Moscow, USSR). *(Geliotekhnika,* no. 5, 1978, p. 45-51.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 33-37. Translation.

Calculations are presented for an axisymmetric paraboloidal composite mirror-type concentrators exposed to solar flux parallel to the concentrator axis. The concentrators are sets of conical or spherical rings of equal width which intersect at their initial and final sections the generating surfaces. It is shown that the solar flux concentration efficiency of conical-ring paraboloids is low, while that of spherical-ring paraboloids is high.

B.J.

A79-44263 **Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate.** V. B. Kozlov and Iu. B. Rudiak (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *(Geliotekhnika,* no. 5, 1978, p. 52-57.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 38-42. Translation.

A79-44264 **Experimental study of mass exchange in glazed solar solution regenerator.** A. Kakabaev, O. Klyshchaeva, A. Khandurdyev, and O. Tuiliev (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *(Geliotekhnika,* no. 5, 1978, p. 58-61.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 43-45. Translation.

Some experimental results on heat transfer for a laboratory model of a solar regenerator are discussed. Mass transfer from the aqueous lithium chloride solution flowing over the regenerator surface to the air flowing through the slot formed by the glass and regenerator surface is studied as a function of surface heating intensity, regenerator inclination to the horizon, and degree of flooding of the surface by the solution. Empirical relations for determining the mass transfer coefficient are derived.

B.J.

A79-44265 **Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen.** Sh. D. Shakhbazov and P. F. Rzaev (Akademiia Nauk Azerbaidzhanskoi SSR, Sektor Radiatsionnykh Issledovanii, Azerbaidzhan SSR). *(Geliotekhnika,* no. 5, 1978, p. 72-74.) *Applied Solar Energy,* vol. 14, no. 5, 1978, p. 54-56. Translation.

A79-44273 # **Ocean thermal energy for the 80's.** G. L. Dugger (Johns Hopkins University, Baltimore, Md.). *AIAA Student Journal,* vol. 17, Summer 1979, p. 14-19. 13 refs.

The use of sea water as a means of producing energy, through a process of open-cycle or closed-cycle Ocean Thermal Energy Conversion (OTEC), is presented. The possibility of producing energy-intensive products, such as ammonia, liquid hydrogen or aluminum on plantships cruising the high seas seeking the highest change in temperature at all times was examined and it was determined that the costs for such plants in the Atlantic Ocean (several hundred miles east of Brazil) would range between $800 and $1,000 per kWe or 14-17 mills per kWh onboard electrical costs. A proposal to construct an ammonia producing plant in the South Atlantic, capable of providing up to 40 MW for Puerto Rico's power consumption during the next decade, is studied. Due to the expected rise in U.S. ammonia use in fertilization and chemical manufacture, OTEC plant sizes of 200-400 MWe are projected, emphasizing the need to modify existing shipyards and raise the necessary capital investment costs of $200-$600 million.

C.F.W.

A79-44275 # **A realistic alternative for practical fusion power.** R. W. Bussard. *AIAA Student Journal,* vol. 17, Summer 1979, p. 24-26, 48.

An alternative approach to practical fusion power that is less expensive and more solidly based on known technology and physics is presented. The RIGGATRON 'throwaway' tokamak is similar to all other tokamaks except that it is designed to operate at magnetic fields sufficiently high to allow attainment of fusion ignition directly by plasma ohmic heating alone, without exceeding the limits of plasma current and density for stable confinement. The small size of the RIGGATRON, ten times smaller than mainline tokamaks, results in a more than 1000-fold reduction in unit costs, leads to low-cost R&D and allows operation in a 'throwaway' or disposable/recyclable mode. It is also found that the lifetime cost of RIGGATRONs are between $1 and $3 million per kWe hr of net power delivered to user loads.

C.F.W.

A79-44276 # **Future energy alternatives.** J. Grey (Long Island University, Brookville; American Institute of Aeronautics and Astronautics, Inc., New York, N.Y.). *AIAA Student Journal,* vol. 17, Summer 1979, p. 28-31.

Future energy sources such as photovoltaic arrays, solar thermal electric systems, biomass energy, gasohol, wind energy, water power and geothermal energy are discussed. It is noted that the energy problems do not lie in federal R&D, but in the implementation of nationwide and worldwide systems and it is suggested that massive implementation of building and appliance efficiency standards, industrial and commercial cogeneration of electrical power and heat, and capital-intensive options such as district heating via power plant waste, be developed to reduce our expanding energy requirements.

C.F.W.

A79-44277 # **The solar power satellite concept.** P. E. Glaser (Arthur D. Little, Inc., Cambridge, Mass.). *AIAA Student Journal*, vol. 17, Summer 1979, p. 32-41. 25 refs.

A method to utilize solar energy through solar power satellites (SPS) is presented. The electricity produced by solar energy conversion will be fed to microwave generators forming part of a planar, phased-array transmitting antenna, which in turn is designed to direct a microwave beam to one or more receiving antennas. Variations in solar power output due to eclipses, equinox periods and other predictable interruptions, are expected to range from 1.309 kW/sq m to 1.399 kW/sq m. Technological options for solar energy conversion, including photovoltaic and thermal-electric processes are described. Attention is also given to the assembly and maintenance of SPS, economic and environmental implications, as well as microwave biological effects and other impacts, which include thermal pollution, land despoilment and resource consumption.

C.F.W.

A79-44294 **Transient plate temperature in flat plate solar collectors.** J. K. Nayak, I. C. Goyal, S. C. Kaushik (Indian Institute of Technology, New Delhi, India), and M. A. S. Malik (Kuwait Institute of Scientific Research, Kuwait). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, 1st Semester, 1979, p. 8-10.

An analysis of the rise in temperature of plate and insulation in a flat plate solar collector when the flow of fluid in the collector stops (which could happen accidentally) is presented. The equation of heat conduction in the insulation is solved, in accordance with the energy-balance conditions, to obtain a temperature distribution in insulation. As a special case this leads to the variation of the temperature of the top layer of the insulation (i.e., that of the plate). The results are shown to be in good agreement with those of a simulated experiment.

(Author)

A79-44295 **How a wall uses solar energy (Comment un mur utilise-t-il l'energie solaire).** F.-M. Camia (Ecole d'Architecture de Luminy, Marseille, France). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, 1st Semester, 1979, p. 11-17. 7 refs. In French.

The captation of solar energy by opaque walls is analyzed. A simple formulation of the transfer function for a wall is obtained on the basis of the assumption that the latter can be represented as the sum of a constant mean energy and a sinusoidal variation. These expressions are used to evaluate the coupled effects of conduction and convection. The elements of the intrinsic reaction of the wall are calculated and directly applied to time tables of the energy received. The analysis indicates that the energy transfer regime is strongly influenced by the value of the coefficient of external exchange. It also shows that convection is a serious obstacle to captation of solar energy by walls.

C.K.D.

A79-44296 **Regulation of the water steam cycle in a solar receiver.** G. Francia (CNR, Rome, Italy). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, 1st Semester, 1979, p. 18-26.

On the basis of heat and energy distribution calculations, a regulation system for the water-steam cycle of a solar boiler has been designed. The system is intended to maintain steam exiting from the boiler at a constant temperature and relatively constant volume. Water temperature is regulated at a given point during the preheating stage by comparing the temperature measured by a sensor with the theoretical value and making appropriate adjustments in the main flow rate. The steam titer in the evaporation zone is controlled by a second regulator on the basis of measurements transmitted from temperature and pressure sensors located in the superheater. A final stage of regulation is accomplished by an attemperator located in the end section of the superheater. The operation of the system when the energy input drops to zero is examined, together with the case in which energy input is abruptly resumed after several hours of interruption.

C.K.D.

A79-44298 **The use of solar energy to provide heat and hot water for the students' residence of the Ecole des Mines in Ales, France (Chauffage et production d'eau chaude par l'énergie solaire a la maison des Elèves de l'Ecole des Mines d'Alès).** J.-C. Vezilier. *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique*, 1st Semester, 1979, p. 33-38. In French.

A79-44365 **Solar concentrator flux distributions using backward ray tracing.** J. C. Daly (Rhode Island, University, Kingston, R.I.). *Applied Optics*, vol. 18, Aug. 1, 1979, p. 2696-2699. 7 refs.

Flux distributions produced by parabolic and circular cylinder solar concentrators subject to surface slope errors and defocusing are determined. The technique developed traces a set of rays from a point on the absorber back through the concentrator optics to the sun. The solar flux at the absorber point is the sum of the flux associated with each ray. Various models of the solar disk are introduced by weighting the flux associated with each ray as a function of where it strikes the solar disk.

(Author)

A79-44504 **Passive solar heating for buildings.** J. D. Balcomb (California, University, Los Alamos, N. Mex.). In: The passive collection of solar energy in buildings; Proceedings of the Conference, Royal Institution of Great Britain, London, England, April 24, 1979. Conference sponsored by the International Solar Energy Society. London, International Solar Energy Society, 1979, p. 75-85. 11 refs. Research sponsored by the U.S. Department of Energy and Office of the Assistant Secretary for Conservation and Solar Applications.

A survey of passive solar heating experience is presented. Design approaches reviewed include: (1) direct gain, (2) thermal storage wall, (3) attached sun space, (4) thermal storage loops, and (5) convective loop. Consideration is also given to generic categories: (a) direct, (b) indirect, and (c) isolated. Data is given showing that passive heating can be successful in regions such as Boston, Mass. and Seattle, Wash. Advantages cited include low cost, ease of natural operation, thermal comfort, few needs for certification, and esthetic appeal. The Los Alamos program of performance simulation and evaluation is described and a simplified method of performance estimation is outlined.

M.E.P.

A79-44525 **Electrostatic separation of coal macerals.** J. M. Anderson (Joy Manufacturing Co., Kitchener, Ontario, Canada), L. Parobek (Hi-Rel Laboratories, Monrovia, Calif.), M. A. Bergougnou, and I. I. Inculet (Western Ontario, University, London, Canada). *IEEE Transactions on Industry Applications*, vol. IA-15, May-June 1979, p. 291-293. 6 refs. Research supported by the Department of Energy, Mines, and Resources of Canada.

Present threats of energy shortages have placed an increasing importance on coal as a fossil fuel. Government restrictions on the maximum permissible SO2 content in coal burning plant effluents have necessitated sulphur reduction processes. By using an apparatus developed by the researchers at the University of Western Ontario, it has been demonstrated that constituent macerals of the coal may be successfully triboelectrified and then separated in electrostatic fields. The electrification and separation of the pyrite maceral from coal by means of dilute phase fluidization and electric fields is discussed. Some results are also presented on the separation of the vitrinite, fusinite, exinite, and micrinite macerals as well as of coal fractions with high ash content. The results show the effectiveness of the triboelectrification of the macerals in contact with one another and with the material used in the construction of the separator. (Author)

A79-44526 **Advances in cryogenic engineering. Volume 24 Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977.** Conference sponsored by the U.S. Navy. Edited by K. D. Timmerhaus (Colorado, University, Boulder, Colo.), R. P. Reed, and A. F. Clark (National Bureau of Standards, Institute for Basic

Standards, Boulder, Colo.). New York, Plenum Press, 1978. 597 p. $49.50.

Volume 24 of Advances in Cryogenic Engineering reflects the growing awareness that many materials have great potential for various low-temperature applications. The papers explore basic information on the behavior of low-temperature materials which is essential to all aspects of cryogenic research. Problem areas of interest include ferrous alloys, nonferrous alloys, physical properties of structural alloys, composites, stress effects of superconductors, pinning in superconductors, multifilamentary superconductors, film- and tape-type superconductors, special electrical materials, and U.S./USSR exchange program on LNG materials research. S.D.

A79-44527 **Large superconducting magnets for new energy technologies.** M. N. Wilson (MIT, Cambridge, Mass.). In: Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, Boulder, Colo., August 2-5, 1977. New York, Plenum Press, 1978, p. 1-16. 35 refs. ERDA-supported research.

The paper describes three energy conversion technologies which demand the use of superconducting magnets on a scale that is extremely large compared to anything attempted so far. They are MHD power generation, controlled thermonuclear fusion, and magnetic energy storage. Some general magnet design problems are discussed and their implications for each system considered. The problems selected are stability, stress, and safety. These are surely not the only problems involved, but they probably bear more strongly on the design of these magnets than any other. S.D.

A79-44537 **Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks.** K. Ikeda, Y. Miyagi, M. Aoki, and T. Shirakura (Kobe Steel, Ltd., Amagasaki, Japan). In: Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, Boulder, Colo., August 2-5, 1977. New York, Plenum Press, 1978, p. 166-174. 6 refs.

A79-44545 **Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors.** S. O. Hong, P. F. Michaelson, I. N. Sviatoslavsky, and W. C. Young (Wisconsin, University, Madison, Wis.). In: Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, Boulder, Colo., August 2-5, 1977. New York, Plenum Press, 1978, p. 341-349. 5 refs. ERDA-supported research.

An embedded conductor design concept for the UWMAK toroidal field magnets was developed and tested with results of fatigue tests performed on a prototype model reported, including epoxy-bond integrity, high voltage breakdown characteristics, and the change in the resistance of a copper stabilizer due to cyclic loading of the model at cryogenic temperatures. The three major advantages are outlined: (1) efficient utilization of structural material for both radial and lateral loads; (2) reduction of friction-generated heat by minimizing conductor movement; and (3) capability of testing each disk of a cryostat under simulated operating conditions prior to assembling it into a completed magnet. V.T.

A79-44546 **High-current Al-TiNb composite conductor for large energy storage magnets.** S. G. Ladkany (Wisconsin, University, Madison, Wis.). In: Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, Boulder, Colo., August 2-5, 1977. New York, Plenum Press, 1978, p. 374-382. 20 refs. Research supported by the Wisconsin Electric Utilities Research Foundation, Wisconsin Alumni Research Foundation, ERDA, and NSF.

The design of a circular cryogenically stable high-current Al-TiNb composite conductor is presented, such that the extremely soft but highly desirable high-purity aluminum is tightly and completely confined inside thin shells of high-strength aluminum. The conductor is also reinforced with high-strength webs, which provide axial, circumferential, and flexural strength. The conductor is torsionally stiff and structurally self-supporting; it accommodates discrete, instead of continuous, supports, allowing for cooling along its entire length. Such open surface cooling provides for high current density in the aluminum stabilizer. Criteria are given for the separation between adjacent windings in a magnet which would allow for adequate cooling. One 45-kA conductor model has been constructed, and its use for large energy storage magnets and poloidal field coils in fusion reactors is under investigation. (Author)

A79-44549 **Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy.** H. I. McHenry, S. E. Naranjo, D. T. Read, and R. P. Reed (National Bureau of Standards, Boulder, Colo.). In: Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, Boulder, Colo., August 2-5, 1977. New York, Plenum Press, 1978, p. 519-528. 10 refs.

A79-44550 **Fracture toughness of cryogenic alloys.** A. W. Pense, R. D. Stout, and B. R. Somers (Lehigh University, Bethlehem, Pa.). In: Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, Boulder, Colo., August 2-5, 1977. New York, Plenum Press, 1978, p. 548-559. 7 refs. Research sponsored by the Welding Research Council, Nippon Steel Corp., and NSF.

The paper explores the use of the newer cryogenic materials in the light of recent developments to ensure the strength and toughness appropriate for liquid natural gas (LNG) service. Included are data obtained from fracture tests on an austenitic manganese steel weldment and a special aluminum alloy. The materials studied are ASTM A553 Type I, ASTM A645, N-TUF CR-196, OX13AG19, AMg6, and 5083-O (4.4%-Mg Al alloy, ASTM B209). The fracture toughness specimens employed are compact tension and bend specimens, which are limited in thickness by the available plate. These plate thicknesses are near the maximum used or contemplated for use in LNG service. Summary tables are presented relative to chemical compositions of the materials, tensile and fracture toughness test results, and critical through-flaw stress in a 25-mm plate and critical through-flaw size at half yield stress. Several pertinent graphs are also included. S.D.

A79-44551 **Meteorology for solar energy applications; Proceedings of the Conference, Royal Institution of Great Britain, London, England, January 24, 1979.** London, International Solar Energy Society, 1979. 129 p. $13.60.

A series of articles on meteorological studies and modeling techniques which are applicable to the design or operation of solar energy systems is presented. Topics include: the radiance distribution of clear and overcast skies; measurements of inclined surface irradiance; studies of the spectral irradiance of direct radiation and global radiation in the UK; the effect of environmental parameters of the performance of flat plate solar collectors; a solar radiation data acquisition program; solar radiation measurements at the UK Meteorological Office; values of the turbidity coefficient for different classes of radiation day; and mathematical models for estimating the irradiance at an inclined surface under different conditions and predicting hourly temperature, wind speed and long wave radiation variations. C.K.D.

A79-44557 **The influence of environmental parameters on flat plate solar collector performance.** A. A. Green (University College, Cardiff, Wales). In: Meteorology for solar energy applications; Proceedings of the Conference, London, England, January 24, 1979. London, International Solar Energy Society, 1979, p. 95-107. 8 refs.

Results of computer modeling of single- and double-glazed flat plate solar collectors are presented, in the form of conventional collector performance characteristics, indicating the influence of wind speed, ambient air temperature and effective sky temperature on collector steady-state efficiency, for moderate values of other parameters. Variations in air temperature, and in wind speed for low wind speeds (less than 6 m/sec) are shown to have more significant effects than probable variations in effective sky temperature. The simplified computer models used in the investigation are described in an appendix. They are based on one-dimensional, steady-state heat transfer analyses of single- and double-glazed collectors and utilize recently published empirical results of convective heat transfer studies. The models take into account absorption of solar radiation by the transparent cover(s) and multiple reflection of solar radiation between the absorber plate and transparent cover(s) in a collector. (Author)

A79-44580 **Photosynthetic pathway and biomass energy production.** D. L. Marzola and D. P. Bartholomew (Hawaii, University, Honolulu, Hawaii). *Science,* vol. 205, Aug. 10, 1979, p. 555-559. 61 refs.

Three plant species are compared in their photosynthetic abilities to provide useful energy in the form of alcohol when grown in a tropical environment. An evaluation of growing requirements, photosynthetic productivity, water use efficiency, energy requirements for production and yields of fermentable substrates is presented for cassava, sugar cane and pineapple. Production records for sugar cane and pineapple grown under a high level of management in Hawaii and cassava grown experimentally in Costa Rica and Jamaica reveal that carbohydrate production per hectare per month decreases from pineapple to sugar cane to cassava. It is pointed out that pineapple is well adapted to the subhumid or semiarid tropics and thus the growing of pineapple for energy conversion is particularly well suited to the exploitation of large areas not currently under cultivation. A.L.W.

A79-44715 **Proton radiation effects on Cr-MIS single-crystal Si solar cells.** R. Ferraglio (Rutgers University, Piscataway; U.S. Navy, Naval Air Engineering Center, Lakehurst, N.J.) and W. A. Anderson (Rutgers University, Piscataway, N.J.). *Applied Physics Letters,* vol. 35, July 1, 1979, p. 18-20. 8 refs.

Cr-MIS solar cells on single-crystal Si, with a 2-sq-cm area and approximately 10% efficiency, have been subjected to 1.0- and 1.6-MeV proton radiation at total dosages of up to 3.3 times 10 to the 13th/sq cm. Photovoltaic studies reveal characteristic short-circuit current and open-circuit voltage degradation similar to proton-irradiated junction-type solar cells. Spectral response measurements reveal output decay primarily due to minority-carrier diffusion-length decreases of up to 96%. (Author)

A79-44721 **Photovoltaic effect in Cu/CuGaSe2 Schottky barriers.** J. Stankiewicz and W. Giriat (Instituto Venezolano de Investigaciones Científicas, Caracas, Venezuela). *Applied Physics Letters,* vol. 35, July 1, 1979, p. 70, 71. Research supported by the Consejo Nacional de Investigaciones Científicas y Tecnológicas.

Cu/CuGaSe2 Schottky barriers have been prepared by vacuum deposition of copper on p-type CuGaSe2 single crystals with a resistivity of 0.01 ohm-cm. The photovoltaic properties of such cells have been investigated. Under the AM1 condition these cells exhibit a solar-energy conversion efficiency of 3.5 percent. (Author)

A79-44790 # **Annular diffuser performance for an automotive gas turbine.** D. Japikse (Creare, Inc., Hanover, N.H.) and R. Pampreen (Chrysler Corp., Gas Turbine Engineering and Research Office, Detroit, Mich.). *(American Society of Mechanical Engineers, Gas Turbine Conference, London, England, Apr. 9-13, 1978, Paper 78-GT-147.) ASME, Transactions, Journal of Engineering for Power,* vol. 101, July 1979, p. 358-372. 17 refs.

A series of experimental tests and computational analyses are reported for two automotive gas turbine diffusers. The diffusers include an interstage and an exhaust diffuser plus collector. The diffuser models were tested at Reynolds numbers and inlet blockage levels characteristic of the engine operating conditions. A rig test of the interstage diffuser is also reported. Inlet swirl and Mach number were systematically varied in the model tests. Good recovery was found for each diffuser at zero swirl. Recovery degraded at high swirl for the interstage diffuser. The exhaust diffuser with a double discharge collector showed little sensitivity to inlet swirl. Flow visualization indicates that the interstage diffuser was separated at modest swirl levels, at least in the model test. Pressure recovery in the rig (with upstream rotor and downstream stator) was found to be greater than in the model test (using 'clean' inlet conditions). Comparisons between measured wall pressures and calculations provide further basic insights. (Author)

A79-44793 # **Design and development of a low emission combustor for a car gas turbine.** I. Holzapfel and F. J. Meyer (Daimler-Benz AG, Stuttgart, West Germany). *(American Society of Mechanical Engineers, Gas Turbine Conference, London, England, Apr. 9-13, 1978, Paper 78-GT-155.) ASME, Transactions, Journal of Engineering for Power,* vol. 101, July 1979, p. 422-430. 11 refs.

A79-44796 * **The engineering analysis of solar radiation.** M. S. Reid, C. L. Hamilton, and O. V. Hester (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *International Journal of Policy Analysis and Information Systems,* vol. 2, July 1978, p. 187-217. 12 refs. Contract No. NAS7-100.

A necessary precursor to construction of well-designed, efficient, and economically viable solar energy systems is the engineering analysis not only of the systems themselves but also of the solar radiation that will drive them. This paper presents the first steps in such an analysis to support the design of solar thermal power systems. A rationale for development of an integrated approach to this analysis is outlined, and elements of the approach are described. A dynamic computer simulation of a conceptual system was employed in an initial sensitivity analysis to explore how performance estimates might be affected by the precision and amount of detail in solar radiation data used as model input. A measurement program, including instrumentation, used to characterize precisely and in detail the solar resource at one location is described as is a probabilistic model derived from it, for predicting insolation as a function of time. (Author)

A79-44873 **Gas concentration cells for the conversion of ocean wave energy.** R. E. Salomon and S. M. Harding (Temple University, Philadelphia, Pa.). *Ocean Engineering,* vol. 6, no. 3, 1979, p. 317-327. 6 refs. Contract No. ET-78-S-05-5669.

The concept of using electrochemical gas concentration cells to convert the mechanical potential energy of ocean waves to electricity using a taut-moored buoy is analyzed. Several idealized embodiments are discussed and one of these is shown to have particular merit. Some results obtained in an experimental program aimed at developing such a system are described. In particular, an electrochemical cell employing the protonically conducting synthetic polymer Nafion, bounded by platinum electrodes, has been studied in a manner which simulates the operation of such a device within a taut-moored buoy subject to ocean waves. It is shown that with some modest engineering advances, this system is indeed capable of converting a significant fraction of ocean wave energy into electricity. (Author)

A79-44914 # **A new three-dimensional equivalent circuit of diagonal type MHD generator.** M. Yoshida, K. Komaya, and J. Umoto (Kyoto University, Kyoto, Japan). *Kyoto University, Faculty of Engineering, Memoirs,* vol. 41, Apr. 1979, p. 96-108. 8 refs.

For a large scale diagonal type generator with oil combustion gas plasma, a new three-dimensional equivalent circuit is proposed, in which are considered the leakage resistance of the duct insulator surface, the boundary layer, the ion slip, the effect of the finite electrode segmentation, etc. Next, through the relation between the Hall voltage per one electrode pitch region and the load current obtained by use of the equivalent circuit, a suitable size and number of the space elements per region are determined. Further, by comparing in detail the electrical performances of two types of the diagonal generators with diagonal conducting and insulating sidewalls, three-dimensional effects of the sidewalls are discussed. (Author)

A79-44915 # **A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma.** H.-T. Yip, H. Nishihara (Kyoto University, Kyoto, Japan), and S. Yano (Kobe University of Mercantile Marine, Kobe, Japan). *Kyoto University, Faculty of Engineering, Memoirs,* vol. 41, Apr. 1979, p. 159-167. 5 refs.

A theoretical basis of the neutral beam probe for measuring the local ion temperature of a plasma is given. The results of numerical calculations for some typical plasmas show that it is desirable to choose the beam energy in the region of 10 keV to 30 keV for plasmas of current and of next generation tokamaks. It is pointed out that the method of least squares can be applied to determine the local ion temperature from the measured data. (Author)

A79-44916 # **Construction of Lur'e type Lyapunov function with effect of magnetic flux decay.** N. Kakimoto, Y. Ohsawa, and M. Hayashi (Kyoto University, Kyoto, Japan). *Kyoto University, Faculty of Engineering, Memoirs,* vol. 41, Apr. 1979, p. 168-186. 11 refs.

In this paper a generalized stability criterion for a system with multi-argument nonlinearities is derived. The new criterion is based on Pai's work, and is proved along with Anderson's criterion. The new criterion makes it possible to construct a Lur'e type Liapunov function in a systematic way. The new criterion is applied to a multi-machine power system with magnetic flux decays of generators. A new Liapunov function is constructed in a well known manner established by Willems and other researchers. The new Liapunov function is similar to the one which has already been obtained for a system without the magnetic flux decays, except for a few points which will affect the transient stability of the system. (Author)

A79-44919 **Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells.** S. R. Dhariwal, N. Basu, and R. Gadre (Government College, Ajmer, India). *Electronics Letters,* vol. 15, July 19, 1979, p. 456-458. 5 refs. Research supported by the University Grants Commission of India.

A new method is suggested for measurement of lifetime of photoinjected carriers in the base layer of a p-n junction solar cell. The cell is switched from the open-circuit to the short-circuit mode of operation by using a negative voltage pulse. C.R.O. trace of the output voltage pulse provides a direct means for lifetime measurement. (Author)

A79-44957 **Coal usage (Kohlenverwendung).** H.-D. Schilling (Berbau-Forschung GmbH, Essen, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, Apr. 1979, p. 125-130. 144 refs. In German.

Different methods for processing coal with regard to efficiency and reduced pollution, are surveyed. Among these are new technologies for the production of coke. Attention is given to electricity and heat generation, noting that this represents two thirds of the primary energy usage. Fluidized bed reactors, with some seeing applications in the near future, are covered. The use of nuclear heat in the process of gasification is mentioned. Other topics discussed include coal liquefaction and new procedures on the basis of active charcoal from stone coal. M.E.P.

A79-44958 **Renewable energy sources (Regenerative Energiequellen).** M. Meliss (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, Apr. 1979, p. 147-154. 73 refs. In German.

A survey of renewable energy sources is presented with consideration given to the significance of such sources for West Germany. Discussion includes the use of low temperature collectors and heat pumps for household use, since over 80% of the energy used in this area is for heating and hot water production. Heat pumps powered by Volkswagen engines are also covered with data presented showing the number of such units in use and operating costs. Further attention is given to high temperature collectors and solar cells for general power supply, with solar farms and solar towers mentioned in particular. Other topics discussed include wind power and geothermal energy. Finally, research in other nations is examined, noting that the emphasis is also on solar energy. M.E.P.

A79-44959 **Energy storage (Energiespeicherung).** U. Kaier (Kraftanlagen AG, Heidelberg, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, Apr. 1979, p. 156-158. 53 refs. In German.

Various methods of energy storage are surveyed. Systems are described according to type of application and working medium. Attention is given to the three areas in which R&D is being undertaken: (1) energy storage in systems for electricity and power generation, (2) central heat storage for heating from remote sources, (3) decentralized small heat reservoirs in the household area. In addition, the operating economy of several systems of energy storage such as thermal oil, steam, hydrogen, and flywheel, are detailed. M.E.P.

A79-44979 # **Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks.** A. A. Mirin, M. G. McCoy, J. Killeen, M. E. Rensink, D. E. Shumaker (California, University, Livermore, Calif.), D. L. Jassby, and D. E. Post (Princeton University, Princeton, N.J.). In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 1. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 13-18. 16 refs. Research supported by the U.S. Department of Energy.

The properties of deuterium plasmas in experimental tokamaks heated and fueled by intense neutral-beam injection are evaluated with a Fokker-Planck/radial transport code coupled with a Monte Carlo neutrals treatment. Illustrative results are presented for the Poloidal Divertor Experiment at PPPL as a function of beam power and plasma recycling coefficient, Rc. When beam power equals 8 MW at beam energy of 60 keV, and Rc equals 0.2, then the hot-ion/electron density ratio is about 0.5, 2/3 the mean ion energy equals 22 keV or about 6 times the mean electron temperature, and the D-D neutron intensity is 10 to the 16th n/sec. (Author)

A79-45004 # **Tearing mode instabilities and their suppression by lower hybrid fields.** A. K. Sundaram (Physical Research Laboratory, Ahmedabad, India) and A. C. Das. In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 1. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 177-180. 7 refs.

The kinetic theory of tearing mode instabilities in the collisionless limit is reexamined incorporating properly the magnetic shear effects. An important feature of this analysis is the relaxation of constant A approximation usually invoked in the singular layers by earlier authors. It is found that the new effects drastically modify the growth rate characteristics. The stabilization of tearing modes by the localized lower hybrid fields which are present due to parametric heating schemes is also discussed briefly. (Author)

A79-45028 # **The theory of lower hybrid heating of tokamak plasmas.** M. Brambilla (EURATOM and Commissariat à l'Energie Atomique, Département de Physique du Plasma et de la Fusion Contrôlée, Grenoble, France). In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 2. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 251-263. 45 refs.

Aspects of the theory of lower hybrid resonance heating of tokamak plasmas which are important for the interpretation of recent experiments and for future applications in fusion research are discussed. Attention is given to the plasma model for the description of lower hybrid waves, a linear theory accounting for the 'Grill' (a waveguide array mounted on the liner), the electrostatic approach to resonance cones, and the hot plasma dispersion relation near the point where incoming cold plasma waves turn back along a warm plasma electrostatic branch. Implications of the theory for the design of heating antennas and waveguide arrays are considered. Theories of nonlinear effects arising during plasma heating, including self-induced scattering of lower hybrid resonance waves, anomalous absorption and anomalous thermalization brought about by wave decay are also discussed. A.L.W.

A79-45030 # **Lower hybrid heating experiments in JFT-2 tokamak.** T. Nagashima and N. Fujisawa (Japan Atomic Energy Research Institute, Tokai, Ibaraki, Japan). In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 2. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 281-292. 16 refs.

Preliminary results of lower-hybrid heating studies conducted with the JFT-2 tokamak using a hydrogen plasma are presented. A phased array of four waveguides was used for power coupling; experiments were carried out with RF power levels up to 135 kW applied for 20 seconds. A transmission efficiency of 90 percent was obtained. The coupling characteristic of the array was found to be well predicted by the Brambilla (1976) calculations. Parametric instability occurred in the vicinity of the plasma edge in front of the launcher. Effective ion heating of 50 to 60 percent has been obtained, but no indication of electron heating or production of superthermal electrons has been found. C.K.D.

A79-45033 # **Electron cyclotron heating in Bumpy Torus Program.** H. Ikegami (Nagoya University, Nagoya, Japan) and R. A. Dandl (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 2. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 321-337. 45 refs. ERDA-sponsored research.

Electron cyclotron heating is reviewed from the viewpoint of experiments on the Elmo Bumpy Torus. Consideration is given to some of the coupling processes of microwave power to plasmas and the generation of energetic electrons which is explained as a distinguishing feature of microwave discharge plasmas in the bumpy torus configuration. Some discussion is made on the technology for the successful application of high-power millimeter microwaves to the heating of fusion plasmas. In Appendix, experimental results are presented from the Elmo Bumpy Torus. (Author)

A79-45034 # **Gyrotrons for the electron-cyclotron plasma heating in large tokamaks.** V. V. Alikaev, V. A. Fliagin, V. I. Khizhniak, A. G. Luchinin, G. S. Nusinovich, V. G. Usov, and S. N. Vlasov (Akademiia Nauk SSSR, Institut Prikladnoi Fiziki, Gorki, USSR). In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 2. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 339-349. 7 refs.

Gyrotrons which use the electron-cyclotron resonance (ECR) to obtain high-frequency oscillations for plasma heating in large tokamaks are considered. These devices are cyclotron resonance masers (CRM) which use electron cyclotron emission, with particle bunching caused by the relativistic dependence of the cyclotron frequency of electrons on their energy. The characteristic feature of the gyrotron is its operation on the modes excited at the frequency close to the cut-off frequency in a part of the waveguide employed as a resonator. Generators for the electron cyclotron plasma heating and the output power of a gyrotron are discussed, noting that the beam current can be raised due to the increase in the current density and in the cross-section of the tube-shaped electron beam. The long pulse gyrotron with large resonator, collector, and output window is discussed, and the microwave complex requirements including the wave-vector angle, location of the focus, and the angle between the directions of tokamak magnetic field and microwave emission are described. A.T.

A79-45037 # **Heating of current-free stellarators.** J. L. Shohet (Wisconsin, University, Madison, Wis.). In: Heating in toroidal plasmas; Proceedings of the Joint Varenna-Grenoble International Symposium, Grenoble, France, July 3-7, 1978. Volume 2. Grenoble, France, EURATOM and Commissariat à l'Energie Atomique, 1978, p. 377-388. 13 refs. NSF Grant No. ENG-77-14820.

Recent results from large stellarator experiments have shown that current-free operation may be the optimum mode of operation for these devices. RF heating has provided good heating efficiency. Neutral beam heating may be effective provided enhanced transport due to helical ripples is not significant. (Author)

A79-45154 **An optical valve for flat-plate solar energy collectors.** K. S. Kohli, K. N. Chopra, and R. Hradaynath (Instruments Research and Development Establishment, Dehra Dun, India). *Journal of Optics*, vol. 10, July-Aug. 1979, p. 195, 196. 11 refs.

An optical valve for use in flat-plate solar energy collectors is described. A small optical wedge made of a high-transmission dielectric material is placed between the reflecting surfaces of adjacent triangular reflectors. The wedge is in the form of an isoceles triangle; part of its two equal sides is coated with a highly reflecting material. The wedge reflects the incident solar radiation falling on the coated portions of the large surfaces and transmits incident radiation falling on the short side. This design doubles the angle of acceptance of the optical valve, resulting in an increase in the effective active time of the flat plate collector. C.K.D.

A79-45201 * **Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978.** Conference sponsored by the University of Alabama, NASA, Alabama Solar Energy Association, et al. Edited by S. T. Wu, D. L. Christensen, and R. R. Head (Alabama, University, Huntsville, Ala.). Huntsville, Ala., UAH Press, 1978. 504 p. $25.

Demonstration projects, systems-subsystems simulation programs, applications (heating, cooling, agricultural, industrial), and climatic data testing (standards, economics, institutional) are the topics of the book. Economics of preheating water for commercial use and collecting, processing, and dissemination of data for the national demonstration program are discussed. Computer simulation of a solar energy system and graphical representation of solar collector performance are considered. Attention is given to solar driven heat pumps, solar cooling equipment, hybrid passive/active solar systems, and solar farm buildings. Evaluation of a thermographic scanning device for solar energy and conservation applications, use of meteorological data in system evaluation, and biomass conversion potential are presented. V.T.

A79-45202 **Overview of solar energy programs and activities in the Southeast.** D. L. Christensen (Alabama, University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 3-9.

Climatic factors, heating and cooling programs, test and research sites, and advanced solar energy technologies are discussed. Attention is given to costs, industrial factors, and industrial and commercialization factors. The longer-term and more sophisticated solar energy technologies, such as wind, ocean-thermal, solar-thermal, and photovoltaics are evaluated. One of the largest wind machines will be installed in the North Carolina mountains. Biomass conversion is another logical consideration for the Southeast as available sunshine and water are important factors for this type of energy resource. Such activities as broad use of solar energy for heating water; improved design concepts for building and solar equipment; mass production of modular and packaged heating and cooling units are considered as critical to the more widespread application of solar energy in the Southeast. V.T.

A79-45203 **Southern regional solar energy center planning.** G. B. Graves (Southern Solar Energy Planning Projects, Atlanta, Ga.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 11-22. Contract No. EM-78-L-01-4144.

The objective of the southern regional solar energy planning project is to provide both an organizational structure and a work program that can be effective in developing and transferring solar technologies to use in concert with overall national energy policies. The project identifies and develops an initial work program on the following activities: solar technology assessment and transfer; information dissemination; commercialization; development, application, and demonstration projects to suit regional situations; education and training programs; and coordination with national, state, and local elements. Cooling techniques, biomass conversion, energy requirements for crop drying, heat pump technologies, and ocean thermal energy conversion are the main issues of the planning project together with socioeconomic and institutional problems. V.T.

A79-45204 **Solar radiation data in the southeastern United States.** E. A. Carter and B. B. Williams (Alabama, University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 31-42. 9 refs.

Proper selection of sites, sensors, data collection equipment, and correct installation and maintenance of equipment are necessary for meaningful solar radiation measurements. Some of these factors in reference to global, direct, and diffuse radiation are discussed briefly, and the relation of these measurements to tilt measurements is illustrated. The availability of solar radiation measurements in the southeastern United States is presented. The location of solar radiation sites, the data bank locations and format of data storage are given. (Author)

A79-45205 * **A comprehensive solar energy system analysis data base in Huntsville, Alabama.** J. P. Goddard (Alabama, University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 43-52. 6 refs. Research supported by the U.S. Department of Energy; Contract No. NAS8-31293.

The history of a comprehensive solar energy system analysis data base developed by NASA/Marshall Space Flight Center and the University of Alabama is presented, along with its current status. The Marshall Information Retrieval and Data Storage (MIRADS) system was chosen for the data base, and feedback systems were arranged to cope with changes in the needs of the program management for the type of data gathered. The final structure of the data base consists of 22 files divided into 6 topical sections: summaries, climatological, utility rates, architectural, equipment, and economics. The data base offers help to the solar industry in two ways: it provides information and it serves as a model for users trying to establish the climatic and socioeconomic variables they should take into account when they examine a potential market for solar energy equipment. V.T.

A79-45206 **Economics of preheating water for commercial use.** G. T. White (Whiteline, Inc., Asheville, N.C.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 57-60.

Concentrating collector panels (440 square feet) are being used to preheat water for a community cafeteria. The system has been under operation 10 months as of March, 1978 resulting in a savings of 21,376 kWh or a projected savings of 25,605 kWh per year. The clearness factor during this period of operation averaged 50.2% according to U.S. Weather Bureau figures. Since the annual clearness factor in Asheville is 58%, a savings of 58/50 x 25.605 = 29,702 kWh have been projected for a normal year. With a nominal collection area of 440 square feet, this results in a savings of 67.3 kWh per square foot per year. The cost of installation was approximately $7,300.00. At $0.03 per kWh, the savings amounted to $888.00 per year or 12.2% on the cost of the investment without consideration of tax benefits. (Author)

A79-45207 **Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems.** R. D. Evans and R. D. Doering (Florida Technological University, Orlando, Fla.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 61-73. 7 refs. Research supported by the Florida State Department of Administration.

A79-45208 * **Collection, processing and dissemination of data for the national solar demonstration program.** R. E. Day, L. J. Murphy, and J. T. Smok (IBM Corp., Federal System Div., Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 75-83. Contracts No. NAS8-32036; No. EG-77-C-01-4049.

A national solar data system developed for the DOE by IBM provides for automatic gathering, conversion, transfer, and analysis of demonstration site data. NASA requirements for this system include providing solar site hardware, engineering, data collection, and analysis. The specific tasks include: (1) solar energy system design/integration; (2) developing a site data acquisition subsystem; (3) developing a central data processing system; (4) operating the test facility at Marshall Space Flight Center; (5) collecting and analyzing data. The systematic analysis and evaluation of the data from the National Solar Data System is reflected in a monthly performance report and a solar energy system performance evaluation report. V.T.

A79-45209 **Solar 'plus' - Huntsville, Alabama.** R. E. Somers (Remtech, Inc., Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 85-94. 8 refs.

The design, construction, and performance of a solar house built with standard equipment in Huntsville, Alabama, is described. The solar system was designed to provide domestic hot water and space heating for a family of five occupying the 2287 sq ft residence. The system uses ten high-temperature liquid, flat-plate collectors and a 500-gallon thermal storage tank to provide an estimated 63% of the annual load. The storage subsystem is in series with the collector array and the distribution subsystem so that the system is basically three independent flow loops. During construction the house was insulated to almost twice the R-values required by the local code and attention was given to caulking and weather-stripping windows and doors. V.T.

A79-45210 **Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex.** J. Greenstein and J. L. Lipeles (Aztec Solar Co., Maitland, Fla.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 95-107.

A79-45211 **A review of current R&D in thermal energy storage and heat exchange in solar applications.** A. I. Michaels (Argonne National Laboratory, Argonne, Ill.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 131-143. 31 refs. Research supported by the U.S. Department of Energy.

The paper reviews the state of advanced technology by presenting a survey of current research and development underway in all of the media and methods used for storing and transferring thermal energy. The thermal energy storage and heat transfer methods discussed are innovative heat exchange and transport, advanced concept sensible heat storage in water, rock, earth or a combination of these, for either short term or for annual storage periods, heat storage in the energy of phase change, and heat storage in the energy of reversible chemical reactions. The material presented is organized in terms of the above categories and subcategories, with the specific R&D projects listed. (Author)

A79-45212 * **Evaluation of Rankine cycle air conditioning system hardware by computer simulation.** H. M. Healey (Western Kentucky University, Bowling Green, Ky.) and D. Clark (NASA, Marshall Space Flight Center, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 145-163. 7 refs.

A computer program for simulating the performance of a variety of solar powered Rankine cycle air conditioning system components (RCACS) has been developed. The computer program models actual equipment by developing performance maps from manufacturers data and is capable of simulating off-design operation of the RCACS components. The program designed to be a subroutine of the Marshall Space Flight Center (MSFC) Solar Energy System Analysis Computer Program 'SOLRAD', is a complete package suitable for use by an occasional computer user in developing performance maps of heating, ventilation and air conditioning components. (Author)

A79-45213 **Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model.** S. M. Han and S. T. Wu (Alabama, University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 165-183. 12 refs. Contract No. EG-77-S-02-4479.

Existing models for the liquid solar energy storage system do not properly consider viscous entrainment effects of jet streams which cause turbulent mixing inside liquid storage tanks. Turbulent mixing reduces thermal stratification adjacent to jet streams and prevents jet streams from going further down to the bottom of the storage tank. To account for viscous entrainment effects, a set of partial differential equations is derived and an implicit finite difference method is employed for its solution. TRNSYS solar energy simulation with this viscous-entrainment liquid storage model is carried out for a hot water application. Simulation results show that the viscous entrainment model represents more realistic storage tank performance compared with other existing models. (Author)

A79-45214 **Three dimensional mathematical model of flow stratification in thermocline storage tanks.** W. T. Sha and E. I. H. Lin (Argonne National Laboratory, Argonne, Ill.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 185-202. 11 refs. Research sponsored by the U.S. Department of Energy.

A three-dimensional, transient, single-fluid, single-phase mathematical model, the COMMIX-SA computer program, is being developed to investigate the flow stratification phenomena that occur in thermocline storage tanks, and the effects of stratification on solar systems performance. The model solves the conservation equations of mass, momentum, and energy as an initial value problem in time and a boundary value problem in space. Details on the formulation of the model and the numerical techniques employed are described, and special features of the model are discussed. The model has been used to analyze several storage-tank stratification problems. The results indicate that the model is capable of predicting realistically the flow and temperature distributions in storage tanks. The predictions are in good qualitative agreement with experiments and show substantial improvement over those obtained by the TRNSYS one-dimensional model. Three-dimensional effects are evident, and some parametric studies are suggested. (Author)

A79-45215 **Heat storage in crushed limestone.** B. F. Parker, C. D. Arnold, G. M. White, and O. J. Loewer, Jr. (Kentucky, University, Lexington, Ky.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 203-212. 8 refs. Research sponsored by the U.S. Department of Energy and U.S. Department of Agriculture.

The problems and potentials for using crushed limestone as a thermal energy storage medium are discussed. Characteristics of a rock bed thermal storage unit, such as the heat transfer rate between air and the stone, the pressure required to force air through the bed, and a heat capacity, are considered together with flow and cleanliness problems which might be created by dust, lint, and moisture in the bed. To minimize the problem of lint and dust, the air entering the rock bed should be filtered in addition to protection from moisture with a gravity drain. A balance between the pressure drop and the rate of heat transfer between air and the stone is needed, therefore, the smallest stone size consistent with reasonable pumping efficiency should be selected. V.T.

A79-45216 **Graphical representation of solar collector performance.** H. G. Paul (Alabama, University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 233-240. 7 refs.

Determination of the thermal performance of solar collector modules by test according to ASHRAE Standard 93-77 involves a number of variables, such as incident solar radiation, ambient temperature, fluid inlet and exit temperatures and mass flow across the collector. A diagram arrangement is presented which elucidates the roles of these variables as to efficiency and useful energy output of the collector over an ample operational range. A blank quadrant is provided which allows incorporation of the straight-line or other thermal efficiency curve of collectors for comparison, extrapolation or analysis. The graphical method presented should greatly facilitate the interpretation of the ASHRAE Standard 93-77 recommended Hottel-Whillier-Bliss plot of the measured thermal performance of solar energy collector modules. (Author)

A79-45217 * **Protection of solar collector materials from UV.** J. G. Castle, Jr. (Alabama, University, Huntsville, Ala.), R. L. Gause, and A. Whitaker (NASA, Marshall Space Flight Center, Materials and Processes Laboratory, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 241-245.

Certain plastic films, such as KAPTON, are known to be stable with excellent long-term aging characteristics under intense uv radiation. Our recent measurements of the optical transmission spectra of KAPTON films show an absorption edge in the blue and are interpreted in terms of an electronic excitation mechanism. The application of this type of film as covering for solar collectors is discussed in regard to the protection this strong uv absorption offers to the materials underneath. (Author)

A79-45218 * **Early developments in solar cooling equipment.** J. M. Price (NASA, Marshall Space Flight Center, Solar Heating and Cooling Projects Office, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 249-252.

A brief description of a development program to design, fabricate and field test a series of solar operated or driven cooling devices, undertaken by the Marshall Space Flight Center in the context of the Solar Heating and Cooling Demonstration Act of

1974, is presented. Attention is given to two basic design concepts: the Rankine cycle principle and the use of a dessicant for cooling.
C.K.D.

A79-45219 * **Solar-powered Rankine heat pump for heating and cooling.** J. Rousseau (AiResearch Manufacturing Company of California, Torrance, Calif.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978 Huntsville, Ala., UAH Press, 1978, p. 253-267. Contract No. NAS8-32091.

The design, operation and performance of a family of solar heating and cooling systems are discussed. The systems feature a reversible heat pump operating with R-11 as the working fluid and using a motor-driven centrifugal compressor. In the cooling mode, solar energy provides the heat source for a Rankine power loop. The system is operational with heat source temperatures ranging from 155 to 220 F; the estimated coefficient of performance is 0.7. In the heating mode, the vapor-cycle heat pump processes solar energy collected at low temperatures (40 to 80 F). The speed of the compressor can be adjusted so that the heat pump capacity matches the load, allowing a seasonal coefficient of performance of about 8 to be attained.
C.K.D.

A79-45220 **Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas.** S. E. Scarborough (Honeywell, Inc., Minneapolis, Minn.), W. D. Batton (Barber-Nichols Engineering Co., Arvada, Colo.), and B. Dollars (Lennox Industries, Carrollton, Tex.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 269-288.

The status of a program undertaken to develop solar-powered Rankine engine/air conditioner systems is discussed. The program calls for the development of a residential heating system, a residential cooling/heating system, a 25-ton multi-family heating/cooling system, and commercial heating/cooling systems in 25-, 50-, and 75-ton versions. At present, one residential unit is operational, one under construction, and the remaining systems are at various stages of design. A description of the design and operation of the multi-family unit is provided.
C.K.D.

A79-45221 **Rankine cycle solar driven heat pump development.** J. C. Graf (General Electric Co., Philadelphia, Pa.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 289-298.

The characteristics of two Rankine cycle solar driven heat pumps currently under development for projected introduction in the mid-1980s are described. The systems, intended to provide central air conditioning for residential applications, are being developed in three- and ten-ton versions. A single-compressor, aircooled concept using a fluorocarbon working fluid has been adopted. A high-efficiency, vertically mounted two-stage expander is under development.
C.K.D.

A79-45222 **The HYCSOS solar energy driven heat pump.** I. Sheft, D. Gruen, and G. Lamich (Argonne National Laboratory, Argonne, Ill.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 299-308. 5 refs.

The HYCSOS solar energy driven chemical heat pump is described, and operational experience obtained with a demonstration test facility is discussed. The system, based on a two-hydride (CaNi5 and LaNi5) concept, can function in heating, cooling and energy conversion modes, and can significantly reduce the required area of solar collectors.
C.K.D.

A79-45223 **Instrumenting hybrid passive/active solar systems.** W. W. Youngblood and J. C. Gray (Northrop Services, Inc., Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 309-324. 9 refs.

A set of recommendations are provided for instrumenting and reporting the performance of hybrid passive/active solar heating systems. The discussion centers on the entire system/subsystem/site combination and attempts to remove some of the uncertainties in providing sufficient data for adequate performance evaluations of such systems. The major subject of this paper concerns solar heating systems utilizing massive thermal storage that is also a portion of the building structure and that is architecturally integrated into the building esthetically. The instrumentation recommended includes the conventional temperature sensors, flow meters, pressure sensors, radiation measurement devices, and relative humidity sensors, as well as some special instrumentation including mean radiation temperature sensors, passive wall thermal gradient sensors, and others. The use of these instruments will be discussed from the standpoint of what performance parameters they can aid in determining. (Author)

A79-45224 **Solar farm buildings collect energy for crop drying.** G. C. Shove (Illinois, University, Urbana, Ill.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 325-331.

A79-45225 **Use of meteorological data in system evaluation.** S. E. Taylor (Auburn University, Auburn, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 387-398. 9 refs.

The efficiency of a solar energy collection system is dependent on the solar energy absorbed and on the energy losses from the system primarily by radiation, convection, conduction. The method of estimating solar collector efficiency which has been suggested by the National Bureau of Standards is discussed. This method accounts for the meteorological parameters of insolation and air temperature; the detailed physical analysis also takes into account air speed and direction, evaporation or condensation of water on the collector surface, and thermal background radiation. A detailed physical analysis of the energy balance of a collector is presented and compared with the NBS's estimation method. Details on collection of meteorological data are given.
(Author)

A79-45226 **On solar energy heating and degree days during the winter months.** O. M. Essenwanger (U.S. Army, Missile Research and Development Command, Redstone Arsenal, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 399-417. 15 refs.

The performance of a solar heating system in a climatic region that has a series of consecutive cloudy days (in winter) is investigated. A method that associates the size of a collector area with the energy reserve capacity, based on climatological background that enables hardware factors to be added later, is described. The available solar energy and the corresponding heat requirements during two winters in Huntsville, Alabama, serve as a basis for developing the concept of computer modeling for the design of an optimum and nonfailing solar heating system. Attention is given to the design evaluation and the relationship between degree days and solar energy. It is concluded that a solar heating system based on an expectation of 140 Langleys per day and 11 days of storage capacity would have been sufficient to supply a home with the necessary heat, however an alternate system based on the average January solar radiation, would have required 27 days worth of an alternate heat source.
C.F.W.

A79-45227 **The economics of solar domestic hot water systems in state university and community college buildings.** R. D. Doering and R. D. Evans (Florida Technological University, Orlando, Fla.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., 1978, p. 427-437. 5 refs. Research supported by the Florida State Department of Administration.

A79-45228 **Low cost selective surface-carbon particle coating.** J. Lents (Energy Converters, Inc., Chattanooga, Tenn.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 439-443.

In measuring and comparing various coatings for metal absorber plates, it was observed that a coating of carbon microspheres produced higher solar collection rates than normal painted coatings. Test plates were coated with different densities of carbon microspheres and tests were made on these surfaces. These tests verified that carbon microspheres can be used to produce a moderately selective solar energy absorption surface. Absorption to relative emissivity ratios (a/e) of 2 to 3.2 could be produced with the carbon microspheres. When optimized for residential potable water heating an absorption of .99 with a consequent relative emissivity of .5 was found to be best. For summer air conditioning an absorption of .9 with a consequent relative emissivity of .3 was found to be optimum. Test results are shown along with the theory of operation to explain the selective properties of these surfaces. (Author)

A79-45229 **Evaluation of a thermographic scanning device for solar energy and conservation applications.** D. L. Christensen (Alabama, University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 445-464. 5 refs.

Electronic thermography is the term associated with a group of IR imaging systems that use some intermediate means of converting changes in IR radiation into a visual display. The paper is concerned with a thermal imaging system, the Magnavox An/PAS-7 Point Detector/scanning Mirror handheld viewer, which was used for a series of evaluation tests during June 1977. This real-time IR imaging system is designed to provide detection and recognition of any object having a temperature difference, however slight, between it and its surroundings. The system operates in the 3-5-micron band of the IR spectrum and utilizes a 48-element thermoelectrically cooled lead selenide detector array. The viewer has a 6 by 6 deg field of view and weighs 6.5 lb without the battery pack. Testing activities, survey results, and areas of concern are discussed. S.D.

A79-45230 * **Collector testing in the MSFC simulator.** W. S. Humphries (NASA, Marshall Space Flight Center, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 465-479.

The Marshall Space Flight Center (MSFC) Sun simulator and collector testing techniques are described herein. Details of simulator construction are given along with actual measured simulation performance characteristics. Initial comparative performance data from selected air and liquid collector tests are presented for both indoor simulator tests and outdoor tests. These data indicate exceptionally good collector efficiency correlations between the two tests. Comparisons prove sufficiently the validity of using the MSFC simulator for nonconcentration flat plate collector configuration performance evaluations. (Author)

A79-45231 **Biomass conversion potential in the Southeast.** H. Saha (Alabama A & M University, Huntsville, Ala.). In: Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978. Huntsville, Ala., UAH Press, 1978, p. 481-488. 8 refs.

The biomass production and conversion potential of the southeastern U.S., with its large forest land and wood residue, long coastal areas, abundance of water, large amounts of readily collectable agricultural, urban and industrial waste materials, longer rainfall and fertile soil, is examined. Various types of biomass production and conversion methods, including terrestrial and silvicultural biomass as well as herbaceous, aquatic and organic waste biomass, are evaluated. A result of a silvicultural biomass production found that its productivity under closed-space, short-rotation conditions could yield annual dry-ton-equivalents of 5 to 13 tons per acre. It was also determined that the most promising production of large quantities of biomass in the SE U.S. would be the establishment of intensively-managed energy farms, using woody and herbaceous species, including forest and crop residues, high-yield crops, and animal manure. Special attention is given to diagrams that describe biomass conversions, such as terrestrial biomass and domestic residue, and to a description of the basic steps in ethanol production from farm products. C.F.W.

A79-45328 # **An analysis of operational procedures and design modifications for aircraft fuel conservation.** R. Aggarwal, A. Dushman (Dynamics Research Corp., Wilmington, Mass.), and A. J. Calise (Drexel University, Philadelphia, Pa.). In: Atmospheric Flight Mechanics Conference for Future Space Systems, Boulder, Colo., August 6-8, 1979, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 232-242. 11 refs. (AIAA 79-1656)

This paper is taken from a two year study conducted to determine the effectiveness of fuel conservation measures as applied to Air Force bomber/transport type aircraft. The impact of various potential design and operational procedure improvements are quantified. A major contribution of this study is the approach taken to generate the effect of design changes on fuel consumption and direct operating cost (DOC). Sensitivity plots of fuel and DOC savings as a function of the design parameters are generated for each aircraft type. These plots are based on actual mission trajectory data as opposed to 'typical' mission trajectory profiles. (Author)

A79-45479 **Solid state electrodes for high energy batteries.** D. W. Murphy (Bell Telephone Laboratories, Inc., Murray Hill, N.J.) and P. A. Christian. *Science,* vol. 205, Aug. 17, 1979, p. 651-656. 60 refs.

Candidate cathode materials for rechargeable batteries based on topochemical reactions of lithium and transition metal compounds are discussed. The reactions involved in intercalation are outlined, and reactions which serve to model the intercalation (discharge) and deintercalation (charge) reactions of the cathode are considered. Among the cathode materials examined are van der Waals bonded structures, three-dimensionally bonded host lattices, and Perovskite-based structures. C.K.D.

A79-45500 **The exergy of fuels (Die Exergie der Brennstoffe).** H. D. Baehr (Hamburg, Hochschule der Bundeswehr, Hamburg, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, July 1979, p. 292-297. 7 refs. In German.

Calculations of fuel exergy, dependent upon the enthalpy of fuel combustion, and exergy calculations for oxygen, nitrogen, water, carbon dioxide, and sulfur dioxide are examined. The effects of various environments on fuel exergy and its numerical analysis are discussed, and a model is sought where the requirement of thermodynamic theory coincides with the estimated expectations. The calculations involving fuel exergy are performed for thermal and mechanical equilibrium states. Results show that the exergy of fluid fuels lies at about 2%, while that of gaseous fuels is 4 to 7% less than the gross heating value. Overall it was determined that fuel exergy and total net caloric power rarely differ and thus the chemical bond energy is actually the total exergy in its energy equivalent form. C.F.W.

A79-45531 **Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements.** P. V.

Hobbs, D. A. Hegg, M. W. Eltgroth, and L. F. Radke (Washington, University, Seattle, Wash.). *Atmospheric Environment,* vol. 13, no. 7, 1979, p. 935-951. 20 refs. Research supported by the Electric Power Research Institute.

A79-45532 Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements. M. W. Eltgroth and P. V. Hobbs (Washington, University, Seattle, Wash.). *Atmospheric Environment,* vol. 13, no. 7, 1979, p. 953-975. 45 refs. Research supported by the Electric Power Research Institute.

A79-45538 A study of long range air pollution problems related to coal development in the Northern Great Plains. D. R. Durran, M. J. Meldgin, M.-K. Liu (Systems Applications, Inc., San Rafael, Calif.), T. Thoem (U.S. Environmental Protection Agency, Denver, Colo.), and D. Henderson. *Atmospheric Environment,* vol. 13, no. 7, 1979, p. 1021-1037. 39 refs. U.S. Environmental Protection Agency Contract No. 68-01-3591.

A79-45576 Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Symposium sponsored by the Institute of Gas Technology. Chicago, Institute of Gas Technology, 1979. 682 p. $60.

The symposium focused on hydrogen as an energy carrier analogous to electricity, covering its status today in the captive and merchant hydrogen industry to future uses, such as hydrogen-fueled transportation systems. Specifically, papers covered hydrogen in the U.S. energy picture, international developments in hydrogen technologies, demand and supply as a chemical feedstock in U.S., modern ammonia synthesis use of hydrogen, economics of small user hydrogen, developmental hydrogen via coal gasification processes, alkaline electrolysis, water electrolysis using polymer electrolytes, hydrogen via thermochemical and other advanced water-splitting technologies, transmission of gaseous hydrogen, and liquid hydrogen fueled commercial aircraft. A.T.

A79-45577 * Hydrogen in the U.S. energy picture. J. H. Kelley and R. Manvi (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 9-26. 10 refs.

A study of hydrogen in the U.S. program performed by the Hydrogen Energy Systems Technology (HEST) investigation is reported. Historic production and use of hydrogen, hydrogen use projections, hydrogen supply, economics of hydrogen production and supply, and future research and development needs are discussed. The study found current U.S. hydrogen utilization to be dominated by chemical and petroleum industries, and to represent 3% of total energy consumption. Hydrogen uses are projected to grow by a factor of 5 to 20 during the remainder of this century, and new applications in synthetic fuel from coal manufacture and directly as energy storage or fuel are expected to develop. The study concluded that development of new methods of supplying hydrogen replacing natural gas and petroleum feedstocks with alternate sources such as coal and heavy oils, and electrolysis techniques is imperative. A.T.

A79-45578 Role of hydrogen in Eco Energy. W. Hausz (GE Center for Advanced Studies, Santa Barbara, Calif.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 27-39. 9 refs.

A retrospective of GE-TEMPO's Eco Energy project, started in 1971, is described to show how an early interest in hydrogen as a clean energy form for economic distribution by underground pipelines developed into a conviction that a multiple media energy system was required. The key components of the system, recognized as needing technological breakthroughs, and the approaches to these breakthroughs being explored, are described. It is concluded that hydrogen has a role in such a system, which may be minor or major depending on the technology and economics of the alternatives. (Author)

A79-45579 International developments in hydrogen technologies. G. E. Beghi (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 41-57.

International cooperation in the research for new hydrogen production methods is reported. Research areas in hydrogen production and utilization and the International Energy Agency programs on hydrogen production from thermal decomposition of sulfuric acid, thermal decomposition of metal sulfate, hydrolysis of $FeCl_2$, liquid separation of H_2SO_4/HI from solution, decomposition of HI, decomposition of $FeCl_3$, and production of hydrogen from water are discussed. Other joint programs include thermochemical and electrolytic production, and transportation and storage of hydrogen. It is expected that as a result of cooperative actions, it will be possible to conduct integrated experimental activities, exchange of researchers, and joint participation in pilot scale and demonstration projects. A.T.

A79-45580 * Demand and supply of hydrogen as chemical feedstock in USA. C. J. Huang (Houston, University, Houston, Tex.), K. Tang, J. H. Kelley (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.), and B. J. Berger (U.S. Department of Energy, Washington, D.C.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 69-84. 13 refs. Research supported by the U.S. Department of Energy.

Projections are made for the demand and supply of hydrogen as chemical feedstock in USA. Industrial sectors considered are petroleum refining, ammonia synthesis, methanol production, isocyanate manufacture, edible oil processing, coal liquefaction, fuel cell electricity generation, and direct iron reduction. Presently, almost all the hydrogen required is produced by reforming of natural gas or petroleum fractions. Specific needs and emphases are recommended for future research and development to produce hydrogen from other sources to meet the requirements of these industrial sectors. The data and the recommendations summarized in this paper are based on the Workshop 'Supply and Demand of Hydrogen as Chemical Feedstock' held at the University of Houston on December 12-14, 1977. (Author)

A79-45581 Modern ammonia synthesis use of hydrogen. T. A. Czuppon, A. E. Cover, and L. J. Buividas (Pullman Kellogg, Houston, Tex.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 111-137. 12 refs.

The sources of hydrogen for ammonia production, the energy requirement of a modern ammonia plant and how it relates to the U.S. energy demand, the economics of alternate feedstocks, and the implications of natural gas scarcity are considered. Raw materials for ammonia production, economics of raw materials, ammonia process hydrogen feed requirement, feed loss in steam reforming process, fuel requirement, and ammonia industry related to U.S. energy demand are discussed. Economics of alternate feedstocks, including natural gas, naptha, heavy oil feeds, and coal are described. It is concluded that if the cost of natural gas approaches $3.00/mm Btu other feedstocks, such as heavy oil and coal, may be given consideration. The outlook for the ammonia industry, their energy consumption, and future sources of synthesis gas are considered. A.T.

A79-45582 **Commodity hydrogen production and marketing.** J. E. Johnson (Union Carbide Corp., New York, N.Y.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 147-161.

The development of hydrogen technologies and their current status is presented. Today hydrogen is produced primarily for chemical synthesis and fuel uses are minor. On weight basis hydrogen production is less than one percent of liquid and gaseous fuels, and hydrogen delivered to users from central production facilities amounts to less than one percent of all hydrogen production. Location of liquid hydrogen supply and demand; industrial applications of hydrogen, including electronics, heat treatment, edible oil manufacture, and ammonia, methanol, and petroleum refining are discussed. It is concluded that new energy precursor large scale hydrogen processing technologies, not dependent on hydrocarbons, will be the next step toward energy applications for hydrogen. A.T.

A79-45583 **Economics of small user hydrogen.** H. G. Corneil, F. J. Heinzelmann, and E. W. S. Nicholson (Exxon Research and Engineering Co., Linden, N.J.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 163-174. 4 refs.

The future requirements for small user hydrogen and predicted costs of hydrogen during the 1980 to 2000 period are presented. Small user hydrogen includes small uses such as chemical synthesis, metallurgical processing, electronic manufacturing, and vegetable oil processing. Hydrogen requirements for this category totals 250 million SCFD and is expected to increase to 700 million SCFD by the year 2000. The key economic factor in obtaining hydrogen is the quantity needed. In the very small range of 1000 to 10,000 SCFD, the cost will vary from $100 to $35 per million Btu, depending on the users consumption rate, and delivery distance. For large quantities from 1 to 100 million SCFD on site manufacture is preferred with costs varying from $10 to $6 per MBtu. In the intermediate range of 100,000 to 1 million SCFD the user should compare on site manufacture by reforming, by electrolysis, and over the fence purchase from a nearby large producer. In this range hydrogen costs could vary from $35 to $10 per MBtu. A.T.

A79-45585 **Hydrogen/oxygen steam generation - An example of aerospace technology transfer.** D. E. Wright (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 193-223.

A three-part technical study was conducted whereby parametric technical and economic feasibility data were developed on several power conversion systems suitable for the generation of central station electric power through the combustion of hydrogen and the use of the resulting heat energy in turbogenerator equipment. The study assessed potential applications of hydrogen-fueled power conversion systems and identified the three most promising candidates: (1) Ericsson Cycle, (2) gas turbine, and (3) direct steam injection system for fossil fuel as well as nuclear powerplants. A technical and economic evaluation was performed on the three systems from which the direct injection system (fossil fuel only) was selected for a preliminary conceptual design of an integrated hydrogen-fired power conversion system. (Author)

A79-45586 **Hydrogen production via the K-T gas gasification process - Current economic and technological aspects.** H. J. Michaels (Koppers Co., Inc., Pittsburgh, Pa.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 225-238.

Technological and economic aspects of hydrogen production by the K-T gas gasification process are presented. The process converts carbonaceous feedstock into a raw gas containing principally carbon monoxide and hydrogen by partial oxidation, and it entails the reaction of a carbon containing feedstock with oxygen and steam at high temperatures in an entrained bed type of gasification system. The syngas produced can be used as a fuel gas or can be upgraded to hydrogen or synthetic natural gas. The process can handle a variety of feedstocks, including coal, char, and coke, and it produces no tars, phenols, or condensible hydrocarbons. The cost of producing 100 million SCFD of 97.4% pure hydrogen with less than 10 ppm carbon oxide is $4.50 to $7.00 per million Btu. The sensitivity of hydrogen costs to feedstock costs, plant site, and financing methods is discussed. A.T.

A79-45587 **Developmental hydrogen via coal gasification processes.** P. B. Tarman (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 239-252.

Commercially available and developmental technologies for producing hydrogen from coal are summarized. The Winkler process operates as a fluidized bed and uses noncaking coals, the Koppers-Totzek process operates as an entrained bed and can use any coal type, the Lurgi process uses a moving bed and noncaking coals, and the Wellman-Galusha process utilizes a fixed bed gasifier at near atmospheric pressure and temperatures of 1000 to 2000 F. The new technologies include the Texaco process using partial oxidation of coal with steam and oxygen at elevated pressure, the U-Gas process based on single stage, nonslagging, fluidized bed, the steam-iron process using air instead of oxygen and producing large amounts of electrical power in addition to high-purity hydrogen. It is concluded that as the demand for hydrogen increases a wide choice of processes for producing high purity hydrogen from coal will be available. A.T.

A79-45588 **Alkaline electrolysis - Past, present and future.** W. C. Kincaide and M. P. Saltzman (Teledyne, Inc., Timonium, Md.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 267-287. 7 refs.

Background of hydrogen production by water electrolysis, the current state of the art, and development of large plant sized units are presented. The alkaline electrolysis process is described, noting that its applications required high purity gas and had low cost electricity available. Alkaline technology including unipolar and bipolar cell construction and pressure requirements are discussed. Development of a plant sized electrolysis system capable of producing 1 to 2 ton per day of hydrogen is outlined, along with the description of the prototype version of the plant. An advanced materials development program is investigating plumbing corrosion, cell frame stability, and electrode separator stability in a gas generating system designed for cell voltage studies at current densities up to 2500 ma/sq cm, voltages up to 3.6 volt/cell, and temperatures up to 300 F in a five cell bipolar module. A.T.

A79-45589 **Water electrolysis using solid polymer electrolytes.** L. J. Nuttall (General Electric Co., Wilmington, Mass.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 289-305.

The Solid Polymer Electrolyte (SPE) electrochemical technology for hydrogen generation is presented. This water electrolysis method was originally developed for oxygen generation for manned spacecraft and submarine life support systems, and with the availability of new anode catalysts which provide more efficient oxygen evolution in conjunction with acidic electrolytes, the SPE has shown a breakthrough in efficiency and cost for water electrolysis systems. SPE technology including chemistry, cell construction, cell voltage, current density, and the advantages of the SPE cell over other types of cells, such as highest efficiency, electrolyte stability, and ability to withstand high differential pressures, are discussed. A development program to produce a large-scale SPE electrolysis design for bulk hydrogen generation which started with a design study of a 58 MW system, and is directed towards low-cost materials for separators and current collectors, use of lower cost catalyst and lower cost electrolyte, operation at higher temperature, and improved electrodes, is described. A 50 kW module was designed and is being fabricated, and its 12 cells have an active area of 2-1/2 sq ft, featuring pneumatically loaded end plates for uniform compression. A.T.

A79-45590 Hydrogen via thermochemical and other advanced water-splitting technologies. J. B. Pangborn (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 307-316. 17 refs.

Research on the production of hydrogen from water and nonfossil energy sources using thermophotochemical, biochemical, and hybrid processes is presented. Direct thermal splitting of water, multistep thermochemical cycles, hybrid cycles with the reaction steps driven by work inputs from an electrochemical or electrolysis step, and steam-iron processes continuously producing hydrogen from char are discussed. Future technology processes include nuclear radiolysis, digestion of biomass, photosynthetic and biochemical hydrogen production, and hydrogen production in a photochemical cell. It is concluded that thermochemical production is laboratory-proved in noncontinuous procedures, but most methods require solar or geothermal heat, or high-temperature, gas-cooled reactors if nuclear heat is the energy source. High-temperature heat is acknowledged as a requirement for efficient operation of thermochemical processes. A.T.

A79-45591 The Westinghouse Sulfur Cycle Hydrogen Production Process. G. H. Farbman (Westinghouse Electric Corp., Pittsburgh, Pa.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 317-337.

The Sulfur Cycle Hydrogen Production Process is a hybrid electrochemical/thermochemical process for decomposing water into hydrogen and oxygen. The development program is based on the desire to have a process development unit (PDU) operating at the pressures, temperatures, and performance levels desired for a commercial unit in service by 1983. The program required to meet the schedule and the results of the development activities performed to date are discussed. Evaluations of process performance and economics for both nuclear and nonnuclear energized process configurations continue to show overall thermal efficiencies of close to 50 percent and potential economics competitive with alternate methods of producing bulk hydrogen. (Author)

A79-45592 * Dedicated nuclear facilities for electrolytic hydrogen production. S. E. Foh, W. J. D. Escher, and T. D. Donakowski (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 339-359. 22 refs. NASA-supported research.

An advanced technology, fully dedicated nuclear-electrolytic hydrogen production facility is presented. This plant will produce hydrogen and oxygen only and no electrical power will be generated for off-plant use. The conceptual design was based on hydrogen production to fill a pipeline at 1000 psi and a 3000 MW nuclear base, and the base-line facility nuclear-to-shaftpower and shaftpower-to-electricity subsystems, the water treatment subsystem, electricity-to-hydrogen subsystem, hydrogen compression, efficiency, and hydrogen production cost are discussed. The final conceptual design integrates a 3000 MWth high-temperature gas-cooled reactor operating at 980 C helium reactor-out temperature, direct dc electricity generation via acyclic generators, and high-current density, high-pressure electrolyzers based on the solid polymer electrolyte approach. All subsystems are close-coupled and optimally interfaced and pipeline hydrogen is produced at 1000 psi. Hydrogen costs were about half of the conventional nuclear electrolysis process. A.T.

A79-45593 * Concepts for solar production of hydrogen. J. A. Hanson (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 361-392. 24 refs.

Some basic technical approaches to producing hydrogen from solar energy are surveyed. Solar energy forms are divided into: (1) direct solar radiation and (2) indirect forms such as wind and ocean thermal gradient. Technical approaches are separated into: (1) direct hydrogen production from the action of sunlight on some substrate, (2) hydrogen production from sunlight via an intermediate form of energy such as heat and electricity, and (3) hydrogen production from indirect solar energy via an intermediate energy form. It is concluded that while hydrogen from solar energy will be expensive by present standards, the depletion of fossil fuels will cause solar hydrogen to emerge as one of the few alternatives to a nuclear-electric or nuclear-electric-hydrogen energy system. M.E.P.

A79-45594 Hydrogen from falling water. J. Palumbo (Pennsylvania Gas and Water Co., Pa.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 393-398. 8 refs.

Over the past years, with ever rising energy costs, the United States has looked at the possibility of harnessing existing untapped dams for energy conversion purposes. However, integration of these facilities into the conventional electric utility systems has not occurred due to technical, economic, and institutional difficulties, the key issues being the seasonal unreliability of water flow, the regulatory status of small operators desiring to sell power, and the possibility of large investments with low rates of return. The present analysis indicates that, in spite of constituting a small fraction of the United States energy demand, this overall 'small hydro' energy resource base should be utilized to its fullest potential. V.P.

A79-45595 Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants. A. Talib, A. Konopka, N. Biederman, C. Blazek, and B. Yudow (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 399-423. 25 refs. NSF Grants No. NSF-C-1008; Grant No. AER-75-00033; Contract No. E(49-18)-2426.

In the present paper, a concise technical assessment and economic analysis are made of components associated with the conversion, storage, transportation, and shore-based receiving facilities for the conversion of OTEC mechanical energy to chemical energy and, in some cases, conversion of delivered chemical energy to electricity. Particular attention is given to the equipment, capital and operating costs, and efficiencies of converting the delivered hydrogen and ammonia into electricity. V.P.

A79-45597 Transmission of gaseous hydrogen - A preliminary technology evaluation. S. L. Robinson (Sandia Laboratories, Livermore, Calif.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 453-483. 34 refs. Contract No. HC-01-07-03.

Hydrogen embrittlement phenomena are discussed, and their implications for hydrogen transmission by pipeline are explored. Metallurgical trends in pipe steels are considered for their effect on hydrogen embrittlement. Burst testing of internally flawed A106-B pipe showed a 15% loss in hoop stress at failure when pressurized with 1000 psi hydrogen. Therefore, pressure derating of pipelines for hydrogen transmission compared to natural gas may be necessary for equivalent safety margins. Fracture toughness testing using J-integral techniques shows a 40% loss of toughness compared to the 15 to 17% loss predicted from burst tests. A satisfactory laboratory test to predict the effect of hydrogen in full scale tests does not yet exist, but would be valuable. (Author)

A79-45598 **Distribution of gaseous hydrogen - Technology evaluation.** W. J. Jasionowski, J. B. Pangborn, and D. G. Johnson (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 485-508. Contract No. FY-76-C-02-2907.

The present paper evaluates the feasibility of hydrogen delivery in natural gas distribution equipment. Attention is given to three operational model test loops: (1) a residential/commercial test loop with smaller sized components, (2) an industrial loop with larger sized components, and (3) a small safety test loop for special (created) leakage tests. Among the conclusions are, that the Joule-Thomson effect should not exceed 3 F for normal operations and that hydrogen leaks will not ignite spontaneously; hydrogen escaping from a leak expands adiabatically and then cools. M.E.P.

A79-45599 **Hydrogen storage technology for metal hydrides.** G. Strickland (Brookhaven National Laboratory, Upton, N.Y.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 509-539. 44 refs. Research supported by the U.S. Department of Energy.

Attention is given to the advantages of using hydrogen as a secondary energy carrier and factors pertinent to the technology of hydrogen storage via metal hydrides are briefly described. The technology is centered on iron-titanium hydride, TeTiHx, as the most practical choice for the safe and compact storage of hydrogen. The features of such hydride reservoirs are described, and performance data are given for two reservoirs constructed at BNL. In addition the results of tests on the long term behavior of TeTiHx are presented along with information on pressure drop in a hydride bed. Other topics covered include: container materials selection, safety testing of FeTiHx, hydride materials development, and the proposed Hydrogen-Halogen Energy Storage System. Finally, consideration is also given to current development needs. M.E.P.

A79-45600 **Liquid hydrogen fueled commercial aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, Calif.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 541-550.

This statement reviews the probable future fuel problem facing the commercial air transport industry and suggests an innovative course of action. The plan involves creation of an experimental airline equipped with four liquid hydrogen-fueled, wide-body aircraft flying commercial cargo on a regularly scheduled basis between the United States, Western Europe, and the Middle East. Development of facilities incorporating advanced technologies for production and liquefaction of hydrogen at each of four major air terminals is an integral part of the plan. (Author)

A79-45601 **Assessment of hydrogen-fueled intercity trucking and rail transportation.** R. W. Foster (Escher Technology Associates, St. Johns, Mich.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 551-567. 9 refs.

Hydrogen is generally acknowledged to be a 'long term' alternative fuel candidate which will begin to see significant use in the post 2000 time frame. The use of hydrogen as an alternative fuel in both the automotive industry and the rail industry is discussed. Attention is given to technological considerations such as engine conversion, fuel delivery system design, safety and reliability, as well as the effects on business operation practices and business economics. While it is concluded that there are significant problems to be overcome these problems do not preclude this fuel conversion. However, while the safety problems associated with fuel production, transmission and distribution appear acceptable based on past experience, no analysis of the risk management problems associated with the use of hydrogen in these transportation systems has been accomplished to date. M.E.P.

A79-45602 **Fuel uses of hydrogen in the residential/commercial/industrial sectors.** N. R. Baker (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 569-582. 10 refs.

In this paper, hydrogen as a fuel is discussed and its technical merits are examined. In anticipation of the time when natural gas can no longer satisfy the consumptive demand, hydrogen has been suggested as the obvious replacement. In order for hydrogen to play a major role as a residential, commercial, or industrial fuel, the effect of its substitution for natural gas in conventional combustion devices must be examined. This paper discusses several of hydrogen's combustion properties, principally in comparison with those of methane. The effect of converting existing burners to hydrogen use is discussed regarding energy input, operation, and emissions. Two differing hydrogen combustion techniques are reviewed, and their relative advantages discussed. In general, recent developments in hydrogen combustion devices have shown that such burners can be both cleaner and more efficient than their hydrocarbon counterparts. (Author)

A79-45603 **Thermodynamic considerations in the production of synthetic fuels from coal.** R. L. Woolley (Billings Energy Corp., Provo, Utah). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 603-612.

An attempt is made to determine, on the basis of thermodynamic considerations, which of the candidate fuel synthetics, methane or hydrogen, will have the lowest thermodynamic cost of coal conversion to synthetic fuels. It is proposed that a proper measure of the thermodynamic cost can be obtained in the classical manner as a comparative change in the energy availability of ideal processes. The considerations favor production of hydrogen over methane from coal. A sizeable loss in availability takes place when coal is gasified. The additional loss in availability to shift the stream to hydrogen is not large. It may be argued that the benefits that accrue from making this shift are well worth the thermodynamic price. In contrast, the thermodynamic penalty for making methane is sizeable, while the benefits are comparable to the benefits of hydrogen production. V.P.

A79-45604 **How safe is hydrogen.** J. Hord (National Bureau of Standards, National Engineering Laboratory, Boulder, Colo.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 613-643. 79 refs.

The fire characteristics of hydrogen, methane and gasoline are different but do not significantly favor any one of these fuels. However, the risks due to fuel-air explosions in confined spaces are greatest for hydrogen. Industry has proven that all three fuels can be safely and easily contained in both gaseous and liquid phases. Hydrogen fires are more difficult to detect than methane or gasoline fires, but modern detection equipment makes it possible to quickly and reliably detect the flames of all three fuels. For equivalent energy storage or for equivalent volume storage, hydrogen has the least theoretical explosive potential of the three fuels considered. Regulations, standards and guidelines already exist for storage and transport of hydrogen. S.D.

A79-45605 **DOE program on hydrogen energy systems.** J. H. Swisher (U.S. Department of Energy, Div. of Energy Storage Systems, Washington, D.C.). In: Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978. Chicago, Institute of Gas Technology, 1979, p. 645-671.

Currently, thirteen program divisions within the Department of Energy are supporting research and development work on hydrogen energy systems. The scope of the activities is subdivided into production, storage, transport, and conversion technologies, the principal effort being directed on the production of hydrogen using such energy sources as coal, electricity, nuclear process heat, and solar energy. The DOE hydrogen budget and hydrogen programs are discussed. V.P.

A79-45745 **Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis.** S. R. Das, A. Banerjee, and K. L. Chopra (Indian Institute of Technology, Delhi, India). *Solid-State Electronics,* vol. 22, June 1979, p. 533-539. 19 refs. Research supported by the Ministry of Industrial Development.

A79-45748 **The extent of catalytic SO2 reactions in smoke plumes (Das Ausmass von katalytischen SO2-Reaktionen in Rauchfahnen).** G. Haury. *Staub - Reinhaltung der Luft,* vol. 39, July 1979, p. 241-245. 20 refs. In German.

The chemical reactions of SO2 in the atmosphere are studied, with regard to the assessment of injurious effects of SO2 emissions from fossil fired combustion plants. Through laboratory experiments in a large environmental chamber and the use of a mathematical smoke plume model, it is determined what proportion of the overall reaction can be accounted for by catalytic reactions in the plume region. Finally, the results show that the catalytic reaction of the SO2 with flyash particles in the plume is limited by the reaction speed, and that the limited reaction capacity of the particles is exhausted to a minor extent only in the plume itself. M.E.P.

A79-45749 **Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures.** P. Van Acker and R. Dams (Gent, Rijksuniversiteit, Ghent, Belgium). *Staub - Reinhaltung der Luft,* vol. 39, July 1979, p. 245-252. 12 refs.

A79-45764 **The conceptual basis of the electric utility sub-model of Project Independence Evaluation System.** A. L. Soyster and R. T. Eynon (Virginia Polytechnic Institute and State University, Blacksburg, Va.). *Applied Mathematical Modelling,* vol. 3, Aug. 1979, p. 242-248. 21 refs.

A conceptual approach to integrating the supply and demand for electricity through an electric utilities submodel called Project Independence Evaluation System (PIES) is presented. The construction and approximation of nonlinear duration load curves within a linear framework is examined. The integration of supply with the demand oriented load curve into the process oriented supply function is discussed and attention is given to the difficulties associated with marginal cost pricing inherent in linear programming models. Lastly, a prototype example of the full-scale model is presented explaining the basic assumptions and methods that were employed. C.F.W.

A79-45776 **Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volumes 1 & 2.** Conference sponsored by the U.S. Department of Energy. Edited by G. L. Dugger. Laurel, Md., Johns Hopkins University, 1979. Vol. 1, 543 p.; vol. 2, 196 p.

This volume focuses on the latest OTEC research and development work, test results, component design information, system integration efforts, and application investigations. Specifically, papers are presented on the U.S., French, and Japanese OTEC developments, waves and salinity gradients as energy sources, analysis of OTEC commercialization, heat exchanger development, power systems design, design and costs of platforms and cold water pipe, biofouling and microfouling problems, legal and institutional aspects, ammonia as working fluid, studies of oceanic environmental parameters, and alternate power systems studies. A.T.

A79-45777 # **Eurocean OTEC project.** B. A. P. L. Lachmann (Association Européenne Océanique, Monaco). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 2A-1/1 to 2A-1/5.

The Eurocean ocean thermal energy conversion (OTEC) work and the proposal for a 10 MWe closed cycle pilot plant are reviewed. OTEC activities including cost estimates for 100 MW commercial size floating plants and combination with agriculture using the artificial upwelling or combination with biomass production for food, fertilizer, or fuel are discussed. The 10 MWe pilot plant will be built to test the OTEC system with full size modules, to verify the cost estimates for the commercial plant, and to examine possible use of less costly materials. Costs of OTEC electricity are compared with the costs of oil fueled power electricity. A feasibility study combining aquaculture/OTEC/desalination project is described. A.T.

A79-45778 # **French OTEC program.** P. Marchand (Centre National pour l'Exploitation des Océans, Paris, France). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 2A-2/1 to 2A-2/7. 8 refs.

The OTEC program which plans to build a pilot ocean thermal energy conversion (OTEC) plant in the 1 to 10 MWe range is reviewed. Past French experience in OTEC is discussed, and the feasibility study, testing of major components, and designing of the 1 to 10 MWe pilot plant are described. The shore based power plant concept is considered, noting the problem of laying cold water pipe. Open cycle OTEC schemes have several advantages over closed-cycle schemes using ammonia, and they produce desalinated water at nominal cost, although sea-water requires deaeration. The shore-based concept and the floating concept are being studied, and the use of offshore technology for the design of floating units is considered. It is concluded that the first small and middle-sized OTEC power plants will be located in equatorial islands. A.T.

A79-45779 # **An overview of the Japanese OTEC development.** T. Homma (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan) and H. Kamogawa (Toshiba Corp., Research and Development Center, Kawasaki, Japan). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 2A-3/1 to 2A-3/5. 11 refs.

Design of 100 MW OTEC power plants, experimental studies of the power cycle, and application and assessment of OTEC systems in Japan are reviewed. A dynamic analysis was made of the platform and platform structure for the 100 MW commercial plant to optimize the plant configuration and its anchoring system. Optimum conceptual design of 100 MW plants on board of ship type and submerged disk type platforms was carried out and the major specifications and costs are given. Heat exchanger development with several types of tubes and tube plates is discussed, noting that titanium tubes are the best to resist corrosion, erosion, and biofouling. Studies of uranium exploration by OTEC and the possibility of marine biological productivity enhancement are described. The long time engineering test in the ocean environment will use a 1 MWe power system on board a barge with ammonia as a working fluid, and will be equipped with test facilities to evaluate the environmental effects. A.T.

A79-45780 # **Waves, salinity gradients and ocean currents - Alternative energy sources.** M. E. McCormick (U.S. Naval Academy, Annapolis, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 2B-1/1 to 2B-1/6. 5 refs.

Ocean wave, salinity gradients, and ocean current energy conversion techniques are reviewed. Cavity resonator and wave focusing systems of ocean wave energy conversion are considered, emphasizing radiant wave interaction, Fresnel-type focusing, and conversion channeling. The salinity gradient system uses osmosis or electrodialysis for converting the energy of mixing of high saline and low saline waters. Osmotic pressure conversion has the greatest energy potential, but its technology requirements are not yet ready. The reverse electrodialytic technology is available, and unlike osmosis, this method is not site dependent. A 75 MW ducted turbine supported around the periphery by liquid bearings is used to study the environmental effects, hydroelastic stability of the rotor blades and the mooring and anchoring systems in ocean current energy conversion. A.T.

A79-45781 # **Regional-scale sea surface temperature determination from the geostationary environmental operational satellite.** G. A. Maul (NOAA, Atlantic Oceanographic and Meteorological Laboratories, Miami, Fla.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1.
Laurel, Md., Johns Hopkins University, 1979, p. 2C-2/1 to 2C-2/6. 12 refs.

Sea surface temperatures determined from the digital GOES data base require five steps for quantification: first, the data have to be remapped into a rectangular matrix. Second, using optional decision strategy, cloud-free pixels are identified from joint visible-infrared probability distributions. Third, atmospheric corrections for infrared radiative transfer are calculated from upper air soundings in the region of interest. Fourth, the corrected satellite data are least-squares adjusted to surface observations because the GOES data have no absolute blackbody reference calibration. Fifth, the data are composited and prepared for analysis of variability with application to OTEC thermal resource. Error analysis of this scheme suggests that the rms error for 10 km resolution surface temperature will be + or - 1 K or less. (Author)

A79-45782 # **Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC.** F. M. Vukovich (Research Triangle Institute, Research Triangle Park, N.C.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 2C-3/1 to 2C-3/4.

A large, narrow, cold tongue was detected in May 1978, extending southward from the northern boundary of the Loop Current. Similar tongues were detected in the spring of 1977 and 1975. The 1977 intrusion was described by Vukovich, et al (1978). These tongues penetrate as far as 400 km southward, and persisted for as long as 73 days. They originated as meanders on the northern boundary of the Loop Current. Limited in situ data (one case study) has indicated that there is greater cooling in the subsurface layers than in the surface layers in the cold tongues. This, in fact, produced an increase in the vertical temperature difference, or enhancement of the OTEC resource. Further study is needed to provide more substantial statistics. (Author)

A79-45783 # **OTEC ocean engineering progress report.** W. G. Sherwood (U.S. Department of Energy, Washington, D.C.) and J. P. Walsh (Value Engineering Co., Alexandria, Va.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 3A-1/1 to 3A-1/10. 8 refs.

The OTEC ocean engineering program to extract solar energy stored in the ocean surface water and to deliver it to the U.S. at a marketable price is reviewed. The thermodynamic system to extract the stored energy, the supporting equipment, and means of delivering it are considered as objectives of the OTEC program. The objective of the ocean engineering program is the design and construction of the resource delivery system. Platform subsystems, land-based plants, plant ship, and a spar platform for the 40 MWe plant are discussed. Design of the cold water pipe is considered, including bottom-mounted pipe, tensioned pipe, and pipe joints. It is concluded that a technical base of platform designs, cold water pipe designs, and moor designs has been provided for designing, building, and operating a 40 MWe OTEC plant. A.T.

A79-45784 # **OTEC goes to sea /A review of Mini-OTEC/.** L. C. Trimble and R. L. Potash (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 3A-2/1 to 3A-2/6. Research supported by the Lockheed Missiles and Space Co. and Dillingham Corp.

An overview of the Mini-OTEC project, including a description of the power plant, control system, instrumentation, cold water pipe (CWP) mooring system, and platform is presented. The Mini-OTEC is the first floating at-sea closed loop system using surface and deep seawater to generate 50 kW output, and it is installed on a moored barge incorporating CWP in the single anchor leg. Design data for heat exchangers, the turbine generator, fluid systems, control system, and instrumentation are presented. An engineering description of the moor, characteristics of the barge, specifications for the polyethylene CWP, and the crossover hose are provided. A static analysis was made to select a mooring leg configuration, component lengths, and anchor weight, and a dynamic analysis of the system response in a storm was performed to select line diameters, pipe and hose wall thickness, and buoy depth. A time-domain dynamic program was developed to simulate the seaway-induced motions and loads of the coupled mooring components. A.T.

A79-45785 # **Development of a Test Program for OTEC-1.** P. Archibold (Rockwell International Energy Technology Engineering Center, Canoga Park, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1.
Laurel, Md., Johns Hopkins University, 1979, p. 3A-4/1 to 3A-4/4.

The test program for the OTEC-1 ammonia power plant consisting of heat transfer experiments to validate the OTEC concept is reviewed. The program includes evaluation of shell and tube type heat exchangers, plate type heat exchangers, assessment of the impact of biofouling and corrosion, and monitoring of the performance of the cold water pipe. Selection of ammonia as the working fluid dictates that no copper bearing materials be used in the power system loop, and tests must be performed to evaluate biofouling and microfouling in absence of copper alloys. Shell and tube heat exchangers designed for 1 MWe duty with seawater flowing through titanium tubes are tested to demonstrate the system concept, and the resulting data will be compared with predicted data generated by the computer model. Pool boiling tests on an enhanced tube bundle and evaluation of the biofouling countermeasures involving Amertap and chlorination are considered. Instrumented tubes in each heat exchanger will be monitored during biofouling tests and provide data on the fouling resistance. A.T.

A79-45786 # **Analysis of prospects for OTEC commercialization for baseload power.** W. E. Jacobsen and R. N. Manley (Mitre Corp., Metrek Div., McLean, Va.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1.
Laurel, Md., Johns Hopkins University, 1979, p. 3B-5/1 to 3B-5/7. 8 refs. Contract No. ET-78-C-01-2854.

Requirements for stimulating commercialization of OTEC systems for offshore generation of baseload electric power are analyzed. Commercialization potential was determined in a model which projects competitive economics of regional power-producing systems and estimates market entry and rates of commercial buildup. It was concluded that: (1) OTEC could make a contribution to future baseload electric requirements in the southeast U.S. with 400 MWe plants, (2) OTEC performance could be improved by lower engineering costs and better system performance, (3) the establishment of 750 MWe precommercial capacity off Hawaii and Puerto Rico could serve as U.S. mainland market springboard, and (4) no fundamental technical obstacles in achieving OTEC commercialization were identified, and major remaining problems are in the design, integration, construction, and deployment of marine components which are larger than the present offshore structures. A.T.

A79-45787 # **Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC.** A. Thomas, J. J. Lorenz, D. L. Hillis, D. T. Yung, and N. F. Sather (Argonne National Laboratory, Argonne, Ill.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 3C-1/1 to 3C-1/10. 6 refs. Research sponsored by the U.S. Department of Energy.

Final test results are reported for the five 1 MWt shell-and-tube heat exchangers tested at Argonne National Laboratory. These five heat exchangers are the Union Carbide flooded-bundle evaporator, the Union Carbide sprayed-bundle evaporator, the Union Carbide enhanced-tube condenser, the Carnegie-Mellon vertical fluted-tube evaporator, and the Carnegie-Mellon vertical fluted-tube condenser. Performance parameters measured include the overall heat transfer coefficient (Mo), the water-side pressure drop, and the vapor quality. Also measured were operational characteristics of the heat exchangers such as repeatability of results and the dependence of Uo on heat duty, ammonia flow rate, and subcooling. Individual water-side and ammonia-side coefficients were deduced using the Wilson Plot method. (Author)

A79-45788 # **Core unit testing of the APL/JHU shell-less folded tube heat exchanger.** J. L. Keirsey, J. A. Funk, P. P. Pandolfini, and R. T. Cusick (Johns Hopkins University, Laurel, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 3C-2/1 to 3C-2/6. 13 refs. Research sponsored by the U.S. Department of Energy.

A heat exchanger that meets the minimum overall objective for ocean thermal energy conversion (OTEC) plant-ships may not necessarily have the highest heat transfer performance but should have low fabrication cost, cleanability, modularity and maintainability. The shell-less, folded-tube heat exchanger being investigated by APL/JHU appears to offer advantages in these areas compared with some alternative designs. A full-scale core unit is being tested at the Argonne National Laboratory. The objectives of this core test are as follows: (1) to obtain experimental data on this novel design and (2) to validate or to provide a basis for modification of the APL computer code that will be used to estimate performance of a full-scale operational unit. The core test unit is described and is compared with a full-scale, 2.5-MWe, operational heat exchanger module. Results of evaporator core tests which began in April 1979 are compared with performance predictions and with results of separate internal and external heat transfer tests carried out in 1976-77. (Author)

A79-45789 # **Compact heat exchanger design progress.** J. H. Anderson, Jr. (Sea Solar Power, Inc., York, Pa.) and P. B. Pribis (General Electric Co., Schenectady, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 3C-5/1 to 3C-5/8.

Development of compact plate type heat exchangers for OTEC plants is reviewed. The heat exchangers have horizontal, single pass water flow, vertical downflow condenser, and vertical upflow boiler passages. The design lends itself to many variations in type of water side configuration, and in boiling and condensing surface design. It makes high heat transfer coefficients possible, along with low pressure drops on the water and working fluid sides. Aluminum, cupro-nickel, titanium, steel, or combinations of different materials can be used in the clad form. The three test loops made it possible to measure an overall heat transfer coefficient in a typical OTEC evaporator and condenser, the film side coefficient for boiling and condensing, and the water side heat transfer coefficient. It is concluded that overall heat transfer coefficients in the range of 1200 BTU/hr per sq ft per deg F and greater can be achieved using R-22 working fluid, and that the heat exchanger described is a practical and a low cost solution for OTEC. A.T.

A79-45790 # **Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/.** J. J. Lorenz and D. Yung (Argonne National Laboratory, Argonne, Ill.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 3C-7/1 to 3C-7/6. 18 refs.

A79-45791 # **Preliminary designs of 10 MWe and 50 MWe power modules.** R. T. Miller, J. J. Gertz (Westinghouse Electric Corp., Steam Turbine-Generator Technical Operations Div., Pittsburgh, Pa.), and S. Cunninghis (Gibbs and Hill, Inc., New York, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4A-1/1 to 4A-1/10. Research supported by the U.S. Department of Energy.

The results of preliminary design studies of a closed cycle 10 MWe modular experiment power system and the related commercial size 50 MWe power system module are presented. The system design including valve arrangement, evaporator tube bundles and hotwell storage as well as the liquid ammonia, which consists of a mix of condensate from the condenser and recirculated liquid from the evaporator storage, is examined. The heat exchangers and rotating equipment used are scaled logically from 10 MWe modular experiment size to 50 MWe modules suitable for commercial plants in the 400 MWe range. Conclusions show that power system modules for an OTEC power plant can be designed and constructed using proven technology and at a cost that appears competitive with alternative energy plants. C.F.W.

A79-45792 # **TRW PSD-I power system design.** P. J. Bakstad and R. O. Pearson (TRW Defense and Space Systems Group, Redondo Beach, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4A-2/1 to 4A-2/9. 6 refs. Contract No. EG-77-C-03-1570.

TRW has developed preliminary designs of 10 MWe power systems for OTEC. The PSD-I power system employs vertical, falling film, shell-and-tube heat exchangers with titanium tubes. The heat exchangers are externally mounted, immersed in seawater. The containment hull is a ship type platform. The PSD-II power system employs shell-less, plate-type heat exchangers made of aluminum. The power system is contained within the APL Plantship per contractor direction. The purpose of this paper is to present the PSD-I power systems design. A 10 MWe power module was developed offering high performance heat exchangers in a compact arrangement which lends itself to integration within surface coupled and surface decoupled (e.g., spar) type hulls. No major technical problems were unsolved. The heat exchangers, and within these, the tubes, represent the major power system cost element; therefore, alternate materials and production techniques should be pursued. (Author)

A79-45793 # **Performance optimization of an OTEC turbine.** S. P. Vincent (TRW Defense and Space Systems Group, Redondo Beach, Calif.) and C. H. Kostors (Elliott Co., Jeanette, Pa.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4A-3/1 to 4A-3/6.

The need for an ammonia turbine with maximized efficiency over the expected range of operation was determined during OTEC 10 MWe net power system optimization studies. It was determined that for every extra KW produced it was worth expending $1,000 in plant cost. Specific application of state-of-the-art hardware designs were used to assure that the efficiencies determined were realizable. The turbine aerodynamic design considered axial flow and radial inflow turbines, single and double flow designs, and variations in the number of stages and base diameters. Consideration was given to the turbine-generator control scheme and specific areas of the turbine mechanical design such as the blades, seals and bearings. The optimum design is a four-stage axial flow double flow turbine directly connected to a four pole 60 hertz synchronous generator. The efficiency of the double-flow, four stage design is more than two percent higher than a one-stage, single flow design with diffuser. This is due to the latter's inherent very high exit velocity. Additional optimally designed stages can more efficiently recover this energy than a diffuser. Variable nozzles for the first stage are utilized for power maximization at off-nominal conditions. (Author)

A79-45794 # **Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid.** M. G. Olmsted, M. J. Mann, and C. S. Yang (General Electric Co., Schenectady, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4A-5/1 to 4A-5/6.

Basis for the selection of Refrigerant-22 and the basic logic and results of a power system design optimization and off design analysis program developed to support OTEC PSD 11 0.2 MWe heat exchanger and 10 MWe power module design and sensitivity analysis tasks are presented. The Freon properties program, 'heuristic direct search minimization' and 'Maxopt' Fortran programs incorporated into design optimization, and the optimization logic are described. The basic power system uses R-22 as the working fluid, plate type 'shell-less' cross flow heat exchangers, turbine driven seawater and condensate pumps and a single stage axial flow main turbine. A program to optimize the system capital costs using velocity, differential temperature, and saturation temperature was written for each heat exchanger, and block diagrams for the basic logic of this program and typical sensitivity analyses which resulted were presented. A.T.

A79-45795 # **Ocean Thermal Energy Conversion plant with Freon 22.** H. Uehara, H. Kusuda, M. Monde, T. Nakaoka (Saga University, Saga, Japan), and S. Miyazaki. In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4A-6/1 to 4A-6/8. 22 refs.

In this paper is treated the performance of an Ocean Thermal Energy Conversion plant using Freon 22 as the working fluid. The new plate-type heat exchanger is used as the evaporator and the condenser in this plant. The overall heat transfer coefficient of this plate-type evaporator is about 3000 kcal/sq m per h per C for Freon 22 for the case that the velocity of warm water is 1.2 m/s, and the inlet temperature of warm water is 28 C. The overall heat transfer coefficient of this plate type condenser is about 1500 kcal/sq m per h per C with Freon 22 for the case that the velocity of warm water is 1.0 m/s and the inlet temperature of cold water is 8.5 C. On the basis of these results, the design for a 25-MW OTEC plant module with Freon 22 is conducted and is compared with that of ammonia. (Author)

A79-45796 # **Conceptual designs and costs of OTEC 10/40 MW spar platforms.** R. J. Scott (Gibbs and Cox, Inc., Arlington, Va.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4B-1/1 to 4B-1/13.

This paper summarizes studies of conceptual designs of 10 and 40 MW Modular Application Platforms (MAP) of the spar configuration. The feasibility studies, which preceded these designs, evaluated trends in spar platform size and configuration as a function of alternative power system components and materials. These studies, summarized in this document, led to selection of a steel spar supporting external vertical heat exchangers as the lowest cost configuration. The conceptual designs of the 10 and 40 MW spar concepts selected during the early feasibility studies are described, including platform arrangements and modularity characteristics. The efforts required to integrate the dynamic response of the platform, cold water pipe and mooring system are described in detail. Concepts for construction and deployment are described, and estimates are presented for total system cost and schedule. (Author)

A79-45797 # **Design considerations on 100MWe commercial scale OTEC power plant and a IMWe class engineering test plant.** T. Homma, T. Kajikawa (Ocean Thermal Energy Conversion Committee; Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan), H. Kamogawa (Ocean Thermal Energy Conversion Committee; Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan), S. Nagasaki (Ocean Thermal Energy Conversion Committee; Tokai University, Tokyo, Japan), H. Uehara (Ocean Thermal Energy Conversion Committee, Tokyo; Saga University, Saga, Japan), and T. Teramoto (Ocean Thermal Energy Conversion Committee; Tokyo, University, Tokyo, Japan). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1.
Laurel, Md., Johns Hopkins University, 1979, p. 4B-2/1 to 4B-2/7. Research supported by the Ministry of International Trade and Industry.

The design of 100 MWe OTEC power plant with respect to sites, economics, engineering and environment and the proposed IMWe OTEC engineering test facility are examined. An analysis of the external force and dynamic properties is given for a surface ship type and a submerged cylindrical type platform installing the cold water pipe using the design criteria of Osumi and Toyama, Japan sites. Site selection and power system optimization for the 100 MWe plant are considered, and corrosion and biofouling of heat exchangers discussed, noting that titanium, copper-nickel, stainless steels, and hastelloy are being tested. The platform structure, the cold water pipe, and the environmental aspects are described. It is concluded that the OTEC power cost depends on oceanic and atmospheric conditions which determine the design temperature difference and capacity factor, with the cost at each site of 12.2-12.4 yen/kwh regardless of the length of the cold water pipe and capacity factor. The generating cost including cleaning was almost the same for the shell and tube and plate type heat exchangers. The anchoring system was estimated on the basis of the external force and dynamic properties for a surface ship and a submerged cylindrical type platform coupled with a cold water pipe. A.T.

A79-45798 # **A feasibility study of an OTEC guyed tower concept.** E. H. Pharr (J. Ray McDermott and Co., Inc., New Orleans, La.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4B-4/1 to 4B-4/8. 7 refs.

A bottom supported guyed tower structure as a platform to support OTEC operations was studied. The study assumes environmentally hostile Atlantic or Gulf of Mexico sites to supply power to the U.S., and it rejects prior concepts of moving off station or abandoning the cold water pipe under 100 year storm conditions. The cold water pipe and transmission line problems are solved, and the structural adequacy, life, and station keeping ability are examined. Results of the study indicate that an OTEC/guyed tower power plant can be built and installed, with the optimum generating capacity yet to be determined. From a structural support standpoint, the optimum size is in excess of 1000 MW. A.T.

A79-45799 # **Land-based OTEC plants - Cold water pipe.** J. H. Brewer (Deep Oil Technology, Inc., Irvine, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4B-5/1 to 4B-5/6.

The deep water portion of the cold water intake pipe presents the most significant engineering aspect of a land-based OTEC plant. This paper emphasizes the conceptual solutions to the problems of pipe materials, pipe design, and installation methods. Presented is the rational used for selecting two different pipe materials and two different installation methods for two different sets of specific ocean floor conditions. The selected pipe design and installation method are then presented. Finally potential risk is discussed and a test program to evaluate or reduce risk is outlined. (Author)

A79-45800 # **A single insulated sodium conductor for HVDC underwater power transmission.** R. M. Dunlap. In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4B-6/1 to 4B-6/3. 13 refs.

The minimum energy transmission cost cable configuration for HVDC underwater power transmission is considered. Cable material costs, energy losses, operating temperatures, bend radii, terminal voltages, currents, and resistances are determined. Electrode design, single vs two conductor transmission, splices, insulation, control of buoyancy, operating hazards, and the cost per unit of energy are analyzed. It is concluded that the use of a sodium conductor insulated with polyethylene for HVDC underwater power transmission is superior to copper conductor with the same insulation due to its reduced transmission cost, avoidance of strategic materials (copper), flexibility, near neutral buoyancy in water avoiding high stresses laying in deep water, lower received voltage, and lower operating temperature. A.T.

A79-45801 # **Load criteria for OTEC riser cable design.** J. C. Oliver and W. K. Jawish (Giannotti and Buck Associates, Inc., Annapolis, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4B-7/1 to 4B-7/10. 17 refs.

A method for determining fatigue loading of the OTEC electrical riser cable is presented. Sources of loading on the cable including steady loads such as cable weight and hydrostatic pressure, and unsteady loads - flow induced vibration, thermal stresses and internal waves - are discussed. Other factors which affect loading conditions, creep, corrosion, abrasion, and marine organisms are considered. Static tensions and long term distributions for each load source are determined and applications to design are considered, noting that two types of damage are of particular interest: (1) exceedance of the ultimate strength which initiates electrical or mechanical failure, and (2) failure from cyclic fatigue. It is concluded that techniques are now available for making calculations in probability terms of most of the loads on the riser cable, including static tension, platform motion induced, current drag, wave forces, and radial loads, such as hydrostatic pressure and thermal stresses. However, the input data for definition of station keeping system, the type of cable termination device, and the flow induced vibration problem are incomplete. A.T.

A79-45802 # **Tuned Sphere Stable OTEC Platform.** A. L. Simensen (Tuned Sphere International, Inc., Nashua, N.H.) and E. W. Farmer (Oceanic Development Co., Nashua, N.H.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4B-8/1 to 4B-8/5.

Analysis and wave tank testing have been conducted under grants from the Department of Energy to determine the seakeeping response and suitability of the Tuned Sphere Stable Platform as an OTEC platform. Seakeeping response analyses were performed parametric in size (100 to 1000 MWe, 150 KLT to 900 KLT), Cold Water Pipe (CWP) size, attachment rotational stiffness, sea state, and platform submergence (draft-to-diameter ratios of 0.6 to 0.8). Wave tank tests were conducted on several Tuned Sphere configurations to assess the response in the imposed wave environment and to acquire parametric test data required to optimize the function and stability required in the OTEC application. (Author)

A79-45803 # **Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978.** V. A. DePalma, D. W. Goupil, and C. K. Akers (Calspan Corp., Buffalo, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4C-3/1 to 4C-3/8. 13 refs. Research supported by Calspan Corp.

Field demonstrations of microfouling in model heat exchangers performed at the Stage 1 experimental platform of the Naval Coastal Systems Center, Panama City, Fla., are reported. Subsurface water was delivered through heat exchangers, and the volumetric exposure of seawater to heat exchanger surface area, the shear rates, and stresses were controlled to simulate conditions in full-scale OTEC units. The titanium and aluminum alloys, and corrosion resistant optical flats of germanium, for diagnosis of fouling films, were evaluated. Analyses by internal reflection infrared spectroscopy, ellipsometry, surface potential, wettability, and scanning electron microscopy show that fouling films are acquired by spontaneous adsorption of glyco-protenaceous matter within the first day of seawater exposure. The titanium and aluminum showed corrosion films in addition to biological slimes. A.T.

A79-45805 # **Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii.** W. Grantz, J. Belvedere (Parsons, Brinckerhoff, Quade, and Douglas, Inc., Honolulu, Hawaii), L. Hallanger, E. Noda (Hawaii, University, Research Corp., Honolulu, Hawaii), and H. White (Hawaii, Natural Energy Laboratory, Keahole Point, Hawaii). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4C-5/1 to 4C-5/8. 6 refs.

A comprehensive survey of the proposed OTEC Seacoast Test Facility to be located at Ke-ahole Point, Hawaii is presented. Attention is given to the advantages of a land-based facility over an off-shore facility. Discussion includes background, a site description, and design criteria. Some construction problems regarding the design, fabrication, and deployment of the cold water intake pipe which is to reach a depth of 2100 ft. are covered. Also considered are the pumping station, constant head tanks, and the onshore facilities. Finally, it is noted that many of the befouling and corrosion questions on the component level pertaining to the technical and economic viability of OTEC systems will be answered by the work done at the Seacoast Test Facility. M.E.P.

A79-45806 # **Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico.** D. S. Sasscer, T. R. Tosteson, K. B. Pedersen, F. Rosa, and F. L. Benitez (University of Puerto Rico, Mayaguez, P.R.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4C-6/1 to 4C-6/7. 15 refs.

A79-45807 # **Ultrasonic detection of microbial slime films.** G. Loeb and J. Jarzynski (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4C-8/1 to 4C-8/5.

The growth of microbial slime layers on heat exhanger surfaces exposed to seawater is a basic problem in the development of an OTEC plant. In this paper, measurements of the acoustic properties of the fouling layer material are made for laboratory-grown slime films grown from slime collected on a titanium sample in the Chesapeake Bay. Several ultrasonic methods for monitoring the layer thickness are described, and the performance of each method is predicted using the data on the relevant physical properties of the layer material. S.D.

A79-45808 # **Legal and institutional aspects.** V. P. Nanda (Denver, University, Denver, Colo.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4D-2/1 to 4D-2/10. 126 refs.

The paper deals with those legal and institutional aspects of the jurisdictional, regulatory, and environmental issues that will ostensibly have a significant bearing on the commercialization of OTEC. They are discussed in the context of both the current and the evolving law, with emphasis on the relationship between the coastal States and the Federal government, and the ongoing negotiations of the Third United Nations Conference on the Law of the Sea. The current state of the law is examined, and the existing ambiguities, gaps, and uncertainties are identified. The need for the development of an imaginative and effective legal and institutional framework is demonstrated, and specific recommendations are made. V.P.

A79-45809 # **Lead agency designation and proposed licensing procedures for ocean thermal energy conversion facilities.** E. J. Linky (New Jersey, Dept. of Energy, N.J.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 4D-4/1 to 4D-4/4. 10 refs.

The concept of a lead agency both at the federal and state levels is examined and an attempt is made to determine if such a concept will actually aid the licensing of an OTEC facility. Key features of a licensing procedure at the federal and state levels are discussed. It is noted that offshore siting of energy facilities is particularly susceptible to competing and often conflicting regulatory and planning programs of federal agencies. B.J.

A79-45810 # **A case study of OTEC financing for the Middle South Utilities.** B. J. Anderson (General Electric Co., Washington, D.C.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5A-3/1 to 5A-3/5. Contract No. ET-78-C-02-5092.

A79-45811 # **Cold water pipe verification test.** H. L. Donnelly, J. T. Stadter, R. O. Weiss (Johns Hopkins University, Laurel, Md.), and L. Pérez y Pérez (Deep Oil Technology, Inc., Irvine, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5B-2/1 to 5B-2/3.

Tests of a 5-ft-diam steel pipe, made up in 20-ft sections to total lengths up to 500 ft, were conducted off Santa Catalina Island, California during December 1978 and January 1979. The pipe was supported from a semisubmersible platform by a gimbal joint. The platform was moored with spring buoys in 1000 ft of water. The objectives were to evaluate the at-sea performance of various configurations and to use the test results to verify or improve the existing time domain and frequency domain analyses of cold-water pipes for Ocean Thermal Energy Conversion plants. The configurations tested were: platform alone; platform with 120-ft pipe, with 300-ft pipe, with 500-ft pipe, and with 384-ft pipe including a U-joint at 160 ft. (Author)

A79-45812 # **Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads.** R. A. Barr and V. E. Johnson, Jr. (Hydronautics, Inc., Laurel, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5B-3/1 to 5B-3/11. 22 refs.

Analytical and experimental methods for analyzing OTEC plant dynamics and cold water pipe (CWP) loads and structural design are presented. Histories of CWP theoretical analysis and laboratory model tests, description of CWP/platform configurations, tests of CWP sections and circular cylinders are discussed. The status of theoretical analysis methods, the NOAA/DOE methods, Paulling methods for the coupled, linear, frequency-domain response of CWP and platform designs to unidirection regular and irregular waves, and the TRW method based on marine riser analysis are described. It is concluded that theoretical methods for calculating the response of platform CWP to waves are in agreement, but validation is in most cases limited. Tests of the largest scale ratio (1 to 75) in laboratories are subject to scale effects and analysis of the lateral CWP response shows that undistorted and distorted models of CWP's tested at high frequencies should augment results from Froude models; large scale, at-sea tests are needed to validate laboratory and theoretical results. A.T.

A79-45813 # **A limiting mechanism for the heave induced Mathieu type instability of a cold water pipe.** A. E. Galef (TRW Defense and Space Systems Group, Redondo Beach, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5B-4/1 to 5B-4/4.

When the hull of an OTEC plant is subjected to heave motion, the acceleration causes oscillating tension in the cold water pipe. If the pipe has a natural bending period close to two times the period of heave motion, unstable vibrations may be initiated. For the 'small angle' approximation in general use for cold water pipe studies those vibrations are limited only by damping, and solutions may show excessive stresses before a limit cycle is reached. This paper shows that when the small angle approximation is refined to permit second order terms, an additional source of oscillating tension is recognized. The additional oscillating tension is out of phase with the heave induced component, and counteracts its destabilizing effects to make the limit cycle occur at, usually, moderate stress levels. (Author)

A79-45814 # **Practical schemes for reducing cold water pipe loads.** W. P. Deuchler, W. W. Rogalski (Gibbs and Cox, Inc., Arlington, Va.), and J. G. Giannotti (Giannotti and Buck Associates, Inc., Annapolis, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5B-5/1 to 5B-5/14. 23 refs.

Major environmental loads and results of studies conducted during the OTEC commercial plant study and the 10/40 MWe modular application platform are summarized. Attention is given to a variety of schemes for reducing the magnitude and/or frequency of the environmental loads so as to maintain the cold water pipe (CWP) stresses below the tolerable limits. The schemes are assessed in terms of their effectiveness in reducing the loads and stresses as well as the implementation cost. Platform motion stabilization and optimum CWP structural design are stressed. S.D.

A79-45816 # **Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants.** R. L. Molinari (NOAA, Atlantic Oceanographic and Meteorological Laboratories, Miami, Fla.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5C-5/1 to 5C-5/11. 7 refs.

A79-45817 # **Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico.** G. G. Goldman and D. Pesante (University of Puerto Rico, Mayaguez, P.R.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5C-6/1 to 5C-6/7. 12 refs.

A79-45818 # **Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment.** R. S. C. Munier (Tracor Marine, Inc., Port Everglades, Fla.), T. N. Lee, and S. Chiu (Miami, University, Miami, Fla.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5C-7/1 to 5C-7/7. 10 refs. Contract No. NOAA-3-7-022-35217.

A79-45819 # **Ammonia vaporization and condensation investigations related to OTEC heat exchangers.** C. M. Sabin and H. F. Poppendiek (Geoscience, Ltd., Solana Beach, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5D-3/1 to 5D-3/5. 5 refs. Contract No. EY-76-C-03-1094.

A79-45820 # **The modeling of thin film heat exchangers.** S.-C. Yao, A. W. Westerberg (Carnegie-Mellon University, Pittsburgh, Pa.), and N. H. Chao. In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. (A79-45776 20-44) Laurel, Md., Johns Hopkins University, 1979, p. 5D-4/1 to 5D-4/5. 14 refs. Contract No. EY-76-S-02-2641-A004.

The steady and dynamic behavior of thin film evaporators and condensers are simulated with a general thin film heat exchanger model. The dynamics of the gravity-controlled falling laminar film on horizontal or vertical tubes are studied in detail. For a first approach or for a slow transient a single-lumped model can be used. For a refined simulation or for a severe transient a grouped model is proposed. The grouped model preserves the unique feature of delay-time and wave-distortion of a transient, which was observed in a separate precise analysis. The thin film heat exchanger models are used in the dynamic simulation computer programs ODSP3 and OSCAR which were established at CMU for OTEC systems. Typical results are presented to demonstrate the capability of the model. (Author)

A79-45821 # **Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL.** T. Kajikawa, T. Agawa, H. Takazawa, M. Amano, K. Nishiyama, and T. Homma (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 5D-5/1 to 5D-5/8. 6 refs. Research supported by the Ministry of International Trade and Industry.

This paper describes experimental investigations on OTEC power system characteristics and the enhancement of the working fluid-side heat transfer surfaces at Electrotechnical Laboratory. The dynamic characteristics of the OTEC power system were investigated for the ETL-OTEC-II experimental facility. The responses to the change in the inlet conditions were detected. It was found that the time constants of the gas temperature at both the evaporator and the condenser were about 100 sec in spite of a small scale power system. According to an experiment on the noncondesible gas effect, the permissible noncondensible gas concentration ratio is suggested to be less than 0.05 wt % for the OTEC power plant. The fine metal fiber coated tubes at the evaporator and the double fluted tubes with drainage collars at the condenser were tested to demonstrate the enhancement of heat transfer performance obtained by using Fron 114 as a working fluid. A single tube heat exchanger test facility for ammonia and Fron 22 is introduced. (Author)

A79-45822 # **Ocean thermal and current velocity data requirements for design of an OTEC plant - An update.** R. L. Molinari (NOAA, Physical Oceanography Laboratory, Miami, Fla.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6A-2/1 to 6A-2/9.

A79-45823 # **Development of a lightweight concrete for OTEC cold water pipes.** A. Litvin and A. E. Fiorato (Portland Cement Association, Skokie, Ill.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6B-1/1 to 6B-1/8. 14 refs. Research supported by the U.S. Department of Energy.

A79-45824 # **Oscillations of and drift force acting on an OTEC-CWP structure.** S. Nagasaki (Tokai University, Shimizu, Japan), M. Nagatsuka, and H. Kobayashi (Tokai University, Shimizu; Shimizu Construction Co., Ltd., Japan). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6B-2/1 to 6B-2/6. 8 refs.

A model test dealing with the oscillations of and the drift force acting on the OTEC structure to investigate the effect of cold water pipe (CWP) and its attachment to the hull is outlined. Experimental details including model, wave basin, oscillation measurement, drift force measurement, and wave parameters are discussed. The CWP or rigid, semiflexible or flexible type is connected to a circular floating hull by rigid, universal joint or slide type attachment. Oscillation characteristics including heaving and pitching, surging, and drift force characteristics are described. It was found that the oscillations and drift force were larger with the universal joint and slide type attachment than with the rigid type, being the largest for the universal joint. The floating system with flexible CWP was subjected to oscillations and drift force smaller than those with rigid type. A.T.

A79-45825 # **Vortex excited oscillations of marine structures with application to the OTEC cold water pipe.** O. M. Griffin (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6B-4/1 to 6B-4/9. 24 refs. Research supported by the U.S. Department of Energy.

Vortex-excited oscillations of marine structures result in reduced fatigue life, amplified hydrodynamic forces, and sometimes lead to structural damage and to premature failure. The cold water pipe of an OTEC plant is nominally a bluff, flexible cylinder with a large aspect ratio (L/D = length/diameter), and is likely to be susceptible to resonant vortex-excited oscillations. The purpose of this paper is to survey recent results pertaining to the vortex-excited oscillations of structures in general and to consider the application of these results to the OTEC cold water pipe. These results are compared to design methods which have been developed for the dynamic analysis of marine structures and cable systems. (Author)

A79-45826 # **Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation.** C. F. Schrieber, W. D. Grimes, and W. F. McIlhenny (Dow Chemical Co., Freeport, Tex.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6C-1/1 to 6C-1/5.

A79-45827 # **Oxygen, temperature and pH effects on corrosion of aluminum in seawater.** S. C. Dexter (Delaware, University, Lewes, Del.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6C-2/1 to 6C-2/10. 31 refs. Contract No. EY-76-S-02-2957.

The effects of dissolved oxygen, pH and temperature on the rate of initiation and growth of pitting and crevice corrosion of aluminum alloy 5052 and pure aluminum have been determined. Variations in pH and temperature rather than dissolved oxygen are shown to account for increased corrosion rates of 5000 series aluminum alloys that have been reported for deep ocean exposures. A combination of on site hydrographic measurements and electrochemical laboratory testing will make it possible to identify the most corrosive depths at any candidate OTEC site. The impact of these results on the use of aluminum for OTEC heat exchanger tubing and on possible approaches to corrosion control are discussed, particularly in relation to location of cold and warm water intakes and conditions that may develop during shutdown periods. (Author)

A79-45828 # **Qualification of a duplex, clad material for OTEC.** M. J. Mann, F. B. Bailey, and J. F. Mocker (General Electric Co., Schenectady, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 6C-4/1 to 6C-4/6. 13 refs.

Selection of copper-nickel/low carbon steel (Cu-Ni/LCS) clad material for OTEC heat exchangers is discussed. Four materials considered, titanium, stainless steel, aluminum alloys, and copper-nickel alloys are examined, noting that a compromise approach is to utilize a duplex, clad metal to provide seawater resistance, compatibility with the working fluid, and wall strength. This material is produced with a cold, 100% metallurgical bonding technique. The heat exchanger requires material with good seawater corrosion and erosion resistance, good heat transfer characteristics, and anti-fouling resistance on the seawater side. On the working fluid side, the material must operate with freon or ammonia and supply most of wall strength. It is concluded that a CuNi/LUS clad material with 0.040 in. LCS and 0.010 in. Cu-Ni can meet these design criteria at low cost. The Cu-Ni provides corrosion resistance and anti-fouling characteristics, and LCS is compatible with freon and ammonia, provides strength, and is not susceptible to stress corrosion cracking. A.T.

A79-45829 # **The effects of biofouling and corrosion on heat transfer measurements.** B. E. Liebert, L. R. Berger, H. J. White, J. Moore, W. McCoy, J. A. Berger, and J. Larsen-Basse (Hawaii, University, Honolulu, Hawaii). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 7A-1/1 to 7A-1/10. 13 refs.

Four different metal heat exchanger tubes were deployed on a submerged buoy 40 ft below the surface 1000 ft from Keahole Pt., Hawaii. Nominal sea water velocity of 6 ft/sec was maintained on the internal surfaces of these tubes from Nov. 6, 1978 through March 9, 1979. Periodic samples from titanium, stainless steel, aluminum, and copper-nickel tubes were removed for biological and corrosion analyses. Weekly measurements of changes in heat transfer were made on each sample and attempts are made to correlate observed biofouling and corrosion data with changes in heat transfer. A discussion of predictive techniques for changes in heat transfer is also discussed. (Author)

A79-45831 # **OTEC 100-MWe alternate power systems study.** T. J. Rabas, J. M. Wittig (Westinghouse Electric Corp., Steam Turbine Generator Technical Operations Div., Lester, Pa.), and K. Finsterwalder (Dyckerhoff and Widmann, Inc., New York, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 7C-1/1 to 7C-1/13. 21 refs.

The results of cost studies for the open and hybrid OTEC cycles are summarized and cost comparison between these cycles and the previously analyzed closed cycle is presented. The major result of these studies is that the open cycle OTEC power systems are feasible and have a lower capital cost than the ammonia closed cycle system, and that the hybrid power system is not cost effective. The high steam turbine cost of the open cycle system was solved with fiberglass blades and a fabricated disk, and the removal of large quantities of dissolved gases in seawater was resolved by the use of high efficiency axial compressors and intermediate after-condensers. The open cycles have advantages of reduced biofouling and corrosion and the commercial potential of water production. Existing multistage flash evaporator saline water conversion technology is the basis for the open cycle flash chamber design, and the resulting power module designs are single vacuum housings containing all components. A.T.

A79-45832 # **Recent developments in the foam OTEC system.** C. Zener, A. Molini, T. Fort, Jr., J. Fetkovich, and M. Greenstein (Carnegie-Mellon University, Pittsburgh, Pa.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 7C-2/1 to 7C-2/7.

Analysis of the foam formation in the OTEC open cycle is presented. In this cycle warm water lifts itself several hundred feet, with a behavior which appeared to depend in a capricious manner on the temperature of the incoming water, the pressure of the spray condenser, and the foam mass flow rate. Foam making and foam breaking, the governing equations for the rise of a foam column, superheated incoming warm water, super pressurized incoming warm water, laminar vs turbulent flow, and surfactant concentration and slippage are discussed. An equation which governs the steady state rise of a foam column was derived by analysis and experiment, and it predicts the effects of controllable parameters, including the diameter and height of the column, on the foam behavior. It is shown that foam flows laminarly rather than turbulently, and has a well defined drag function. The drag function decreases as the inverse square of the column diameter. A.T.

A79-45833 # **Description and status report of a program to define sea water-surfactant interactions in relation to the foam system.** M. I. Kay (University of Puerto Rico, Mayaguez, P.R.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 7C-3/1 to 7C-3/4. 8 refs. Research supported by the U.S. Department of Energy.

The paper describes the scope of a project to investigate surfactant-sea water interactions with the objective of minimizing quantities of surface active materials. In addition, the second phase of the project is a determination of the surface tension variability of the upper layers of sea water. Topics discussed include: sea water variability experiments and sea water foam stability. Surface tension measurements are given which show some sample variability at the 10 meter level noting that this was encountered in two different types of measurements. Finally it has been determined that the solubility and diffusion requirements both seem to point to short groups but, C5 to C7 alcohols are, in high concentrations, antifoaming agents. M.E.P.

A79-45835 # **Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger.** P. P. Pandolfini, W. H. Avery, and F. K. Hill (Johns Hopkins University, Laurel, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8A-1/1 to 8A-1/5. 6 refs. Research supported by the U.S. Department of Commerce and U.S. Department of Energy.

A79-45837 # **Dynamic and off-design analysis of OTEC closed cycle power systems.** A. W. Westerberg, S. Yao (Carnegie-Mellon University, Pittsburgh, Pa.), S. J. Jennings, and W. H. Coleman (Westinghouse Electric Corp., Pittsburgh, Pa.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8B-1/1 to 8B-1/12. Contract No. EG-77-C-03-1569.

In the present study, power system analytical simulation programs were used to formulate and analyze an advanced OTEC Rankine cycle. Least cost optimization algorithms, involving pattern search techniques, were used to show that anhydrous ammonia is the most suitable working fluid. A unique power plant configuration was developed and shown to provide maximum power cycle efficiency. Dynamic and off-design conditions were simulated on the OTEC power plant, and the requirements for heat exchanger hotwell capacities, liquid ammonia pump characteristics, connecting pipe sizes, valve specifications, storage capacities, and condenser venting loops were identified. V.P.

A79-45838 # **Steady-state and dynamic performance of an OTEC plant.** M. Kayton (TRW Defense and Space Systems Group, Redondo Beach, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8B-2/1 to 8B-2/3.

The paper deals with a mathematical model that was used for performance analysis of the PSD-1 and PSD-2 plants and for designing the control systems. The steady-state model includes simulations of such major system elements as heat exchangers (heat transfer and flow losses), moisture separator, turbine, pumps, pipes, fittings, and valves. The model is organized into subroutines that can be individually modified. A relaxation algorithm determines the steady-state flows and temperatures, given the dimensions and other variables. The steady-state model achieves 1% accuracy in power, 0.3 psi accuracy in pressure, and 0.1 F accuracy in temperature. V.P.

A79-45839 # **Design of land-based, foam OTEC plants for bottoming cycles.** A. E. Molini, C. Zener, T. Fort, Jr. (Carnegie-Mellon University, Pittsburgh, Pa.), M. Santiago, A. Herrera, J. A. Lopez, and R. Martinez (University of Puerto Rico, Mayaguez, P.R.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8C-1/1 to 8C-1/6. 5 refs. Contract No. EG-77-78-S-02-4459-A000.

Open cycle OTEC technology suggests new concepts for the embodiment of commerically feasible bottoming processes to recover energy from hot industrial effluents and simultaneously minimize their environmental impact. The approach would make pollution abatement more economically attractive, yielding clean low-temperature flue gases while recovering a large portion of the thermal energy as electricity. The technology opens the use of lower quality fuels without fear of air pollution caused by their flue gases. A structural design for a unit 380 ft high, visualized as an inverted vertical reinforced concrete U tube 36 ft in diam and walls 11 in. thick is examined. V.P.

A79-45840 # **Multiple staging of the cold water in the open cycle OTEC Systems.** A. E. Molini, C. Zener, and T. Fort, Jr. (Carnegie-Mellon University, Pittsburgh, Pa.). In: Ocean thermal energy for the 30's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8C-2/1 to 8C-2/4. 5 refs. Contract No. EG-77-78-S-02-4459-A000.

Using the cooling water of the open cycle OTEC Systems in a multiple stage fashion results in its most effective utilization. Such use increases by 2-1/3 times the power production capability per unit mass of cold water, thus reducing the cost of the most expensive single item of an original installation. Later stages could utilize the effluent from previously installed stages. Also, the warmed effluent from the last stage could be utilized to enrich the nutrient value and CO2 absorption capacity of the ocean waters near to the surface. A form of the 'six-tenth factor rule' was used to estimate the cost of multiple stage installations using as a basis the cost of the initial unit. Results are presented relating the cost of the initial cold water supply system, number of stages, and power output per unit mass of original cold water at constant cost per unit of power. (Author)

A79-45841 # **The mist-transport cycle - Progress in economic and experimental studies.** A. F. Charwat (California, University, Los Angeles, Calif.), R. P. Hammond, and S. L. Ridgway (R & D Associates, Marina del Rey, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8C-3/1 to 8C-3/9. 5 refs. Contract No. W-7405.

A preliminary design and cost analysis of an OTEC power plant utilizing the mist transport cycle has been conducted. Arbitrary choices for the expected lift tube losses were made; other losses estimated from conservative engineering practice. The plant cost is lift efficiency insensitive, and is of the order of $1000/kW. An experimental facility has been constructed by UCLA for the purpose of studying the essential fluid dynamics of the mist generation and mist transport process - a 3 ft diameter 24 ft tall vertical flow two-phase tunnel with supplies of vacuum, warm and cold water. An orifice plate mist generator is at the bottom, and a vapor condenser is at the top. The equipment shakedown phase is nearing completion, and data collection is beginning. (Author)

A79-45842 # **Gravity opposed heat pipe.** G. P. Wachtell (Franklin Research Center, Philadelphia, Pa.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8D-1/1 to 8D-1/4. 9 refs.

A gravity opposed heat pipe is proposed for rejecting heat to the deep ocean water, thereby eliminating the pumping power needed to pump cold water up to the ocean surface. Heat pipe working fluid condensate is elevated to the vapor generator by entrainment in the vapor stream. The vapor, generated as a result of heat rejected by the OTEC power cycle, flows down to the entrainment point, up to a separator, and finally down to the condenser, where it rejects its latent heat to the ocean water. The gravity opposed heat pipe can be used in the power cycle itself, by placing a vapor turbine in the vapor stream. (Author)

A79-45843 # **Thermoelectric OTEC.** T. S. Jayadev, D. K. Benson, and M. S. Bohn (Solar Energy Research Institute, Golden, Colo.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8D-2/1 to 8D-2/8. 13 refs. Contract No. EG-77-C-01-4042.

A novel thermoelectric OTEC concept is proposed and compared with the ammonia closed-cycle designs. The thermoelectric OTEC is a much simpler system which uses no working fluid and therefore requires no pressure vessel, working fluid pumps nor turbogenerator. These components are replaced by power modules which are simply compact heat exchangers integrated with thermoelectric generators. The thermoelectric OTEC offers several potential advantages including: simpler and more easily mass-produced components; higher reliability system performance through the use of a high level of redundancy and long-lived, solid-state thermoelectric generators; greater safety for crew and environment by elimination of the pressurized working fluid; and the possibility of lower system costs. These comparisons are discussed and plans for future work are presented in the paper. (Author)

A79-45844 # **Hybrid OTEC cycle avoids indirect heat exchangers.** C. E. Jahnig. In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 1. Laurel, Md., Johns Hopkins University, 1979, p. 8D-3/1 to 8D-3/4. 5 refs.

A hybrid OTEC cycle which uses air as a working fluid is presented. Indirect heat exchangers are avoided and the air is alternately warmed and cooled by direct contact with water to produce useful work from the expansion and contraction. Methods are described to decrease the buoyancy and size of equipment, such as by increasing the compression beyond that caused by the temperature change alone. In addition no water pumps are used since pressure changes produce the desired flow, making the system well suited to combinations with industrial manufacturing and aquaculture. Finally, based on a conceptual design the hybrid system can produce electric power of 2.9 cents/kWh compared to 3.9 cents/kWh by conventional technology burning coal. M.E.P.

A79-45845 # **Use of satellite-derived sea surface temperatures by cruising OTEC plants.** F. K. Hill and G. L. Dugger (Johns Hopkins University, Laurel, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 2C-4/1 to 2C-4/6.

The collection and use of satellite data on sea surface temperatures by cruising OTEC plants is reviewed. A 360,000 sq nautical mile tropical area near the equator with temperature differences of 22 to 23.9 C between surface and 900 m deep water is of particular interest to early OTEC plantship deployment. To attain the highest temperature, a plantship must cruise continually to seek out the warmest spot each month, and must know what course to follow in terms of increasing relative sea surface temperature. This temperature gradient can be obtained less expensively from satellite observations than from surface vessels or aircraft. Data supplied by the NOAA from the NODC files are compared to sea surface temperature data provided by ITOS/NOAA polar orbiting satellites. Comparison of satellite measurements with surface measurements indicates that the view from space provides the aereal coverage and the necessary resolution with respect to sea surface temperature gradients to navigate OTEC plantships to stay in the warmest water. A.T.

A79-45846 # **An overview of the OTEC-1 design.** N. A. Svensen (Global Marine Development, Inc., Newport Beach, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 3A-3/1 to 3A-3/15. Contract No. ET-78-C-03-1785.

An overview of the OTEC-1 system design including the vessel, the cold water pipe and deep water discharge, the power loop, the mooring system, and the anchoring site selection are presented. Systems integration is described in terms of interface design and installation requirements, manufacturing and assembly constraints, and materials considerations. The site survey is included to show the basis for the novel anchor design. The T-2 tanker Chepachet used for the OTEC-1 experiment has the ammonia power cycle located in a compartment provided by converting three ships centerline cargo tanks. A.T.

A79-45847 # **System design considerations for a floating OTEC modular experiment platform.** J. F. George (Johns Hopkins University, Laurel, Md.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 3A-5/1 to 3A-5/5. 7 refs.

A baseline design of an OTEC modular experiment platform has been completed. This design addresses the grazing option of OTEC power utilization, whereby a self-propelled platform cruises a tropical ocean area and uses the OTEC power to synthesize an energy-intensive product (e.g., ammonia). The paper describes the system integration requirements and the resulting design of the hull structure, OTEC power system and cold water pipe. The cost for acquiring and deploying this platform outfitted with a 10 MWe (net) OTEC power system is presented. These data are available to DOE to serve as baseline information to industry in subsequent design and construction phases of the OTEC program. (Author)

A79-45848 # **Electric utility system planning studies for OTEC power integration.** F. Pérez Bracetti (Puerto Rico Water Resources Authority, San Juan, P.R.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 3B-2/1 to 3B-2/7. 8 refs.

The plan of generation expansion study assuming availability of commercial OTEC plants together with the coal, oil, and nuclear utilities is discussed. Generation system, electrical system, licensing, and environmental problems are considered, with generation expansion based on a system planning method using reliability criteria complemented with analyses of reserve requirements. Alternative generation expansion schemes, reliability evaluation, energy production costs, and OTEC break-even requirements are included in the plan, with determination of costs for various voltages, capacities, and maximum reliability cable configurations considered in the electrical portion of the plan. The licensing of a stationary sea floating facility and the role of regulatory agencies is discussed. The design of the environmental study is focused on the OTEC platform attraction for the pelagic organisms, and the nature and extent of this effect is an important factor in OTEC platform siting bearing potential effect on project feasibility. A.T.

A79-45849 **Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation.** L. J. Nuttall (General Electric Co., Wilmington, Mass.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 3B-3/1 to 3B-3/6.

The possible use of hydrogen as an energy vector is being considered for some of the possible OTEC scenarios. This requires an efficient means of producing the hydrogen from electrical power on board the OTEC platform, and also for converting it back to electrical energy at the other end of the distribution network. Under a program sponsored in part by DOE and some of the electric and gas utilities, General Electric is developing a new solid polymer electrolyte water electrolysis technology which offers a potential efficiency of 85-90% and capital costs in the range of $100/kW. This paper presents a brief description of the technology and discusses the current status of the program relative to a planned 5 MW demonstration plant which is expected to be completed in 1983. The solid polymer electrolyte technology has also been studied for use in a hydrogen/halogen regenerative fuel cell system for energy storage. A concept is presented for adapting this approach to a primary H2/O2 fuel cell by combining it with a catalytic process for converting HCl into H2 and H2O. For such a system, fuel cell efficiencies in the range of 70-80% may be feasible. (Author)

A79-45850 # **OTEC system response and control analysis.** W. L. Owens (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 4A-4/1 to 4A-4/7.

An analysis is presented for OTEC system response and control. Two basic operational modes are considered consisting of constant and variable flow seawater pumps. Variable flow seawater pumps allow optimization of the OTEC thermal cycle state points for maximization of net generated power. Constant flow pumps are cheaper and simpler, but do not permit direct control over the evaporator and condenser operating temperatures. A system of nonlinear differential equations representing the basic elements of a constant seawater flow OTEC plant has been formulated for computer solution. Typical response curves are presented for pressures, temperatures, mass flow rates, and generator speed for the Mini-OTEC plant scheduled for operation later this year. (Author)

A79-45851 # **Station keeping subsystem designs for modular experiment OTEC plants.** N. S. Basar, J. C. Daidola, and R. C. Sheffield (M. Rosenblatt and Son, Inc., New York, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 4B-3/1 to 4B-3/4.

Conceptual design of the station keeping subsystem (SKSS) for 40 MWe modular experiment OTEC platforms is discussed. Design approach consists of developing the matrix of SKSS concepts, investigation of site locations, the mooring system stress analyses, and a framework reliability, performance, and optimization analysis scheme. The SKSS matrix consists of tension leg and catenary systems, the stress analysis includes computation of wind, current, and wave forces and the first order seakeeping motions of the vessel, and performance, reliability, cost, deployment, and maintenance are considered in the optimization study. It is concluded that a multileg spread catenary using wire rope and chain for mooring lines, and a vertical tension leg type mooring are the best SKSS concepts for the SPAR platform, and the same catenary with a single buoy mooring concept are the best for the BARGE platform. A.T.

A79-45854 # **Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries.** J. D. Nyhart (MIT, Cambridge, Mass.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 4D-1/1 to 4D-1/9. 111 refs.

The legal issues of siting OTEC plants offshore in U.S. and foreign countries and on the high seas are presented. The legal questions for each specific site are presented in terms of international legal and political framework, international arrangements, regulatory law, criminal law, private and residual law, and financing. In comparing the OTEC sites in the three areas, it is found that the sea law will result in coastal state dominance of sites within 200 miles offshore, and the international arrangements will seek benefits for the U.S. and foreign countries, and more attractive investment by private sources, and will be defensive in nature in protecting U.S. interests. Recommendations regarding OTEC and the law of the sea conference include legislation regulating the deployment and operation of OTEC devices within 200 miles off its coast, and changes in criminal and private law for OTEC development and commercialization. A.T.

A79-45855 # **Potential for ocean thermal energy conversion electric power generation in the Southeast region.** P. L. Sutherland (Florida Power and Light Co., Miami, Fla.), F. G. Arey, Jr., and D. H. Guild (Stone and Webster Engineering Corp., Boston, Mass.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 5A-1/1 to 5A-1/6. 5 refs.

Evaluation of the operating characteristics and investment costs of an OTEC electric power plant in the Southeast U.S. is presented. Conceptual design of an OTEC plant is discussed with the capital cost estimate, and conventional coal fuel plant costs. A computer analysis is made of the life cycle costs of electric power generation with conventional generating plants, and an OTEC plant substituted for a coal plant of a capacity that provides equal system reliability. A present worth of revenue requirements cost analysis is then made of the revised system expansion plan that includes the OTEC plant. The comparative difference between the present worth life cycle costs of the two expansion plans determine the break-even capital investment that can be made in an OTEC plant. It is concluded that OTEC holds the greatest promise in comparison to other renewable energy sources available in the Southeast for central station power generation. A.T.

A79-45856 # **Results of a near field physical model study.** E. E. Adams, D. J. Fry, and D. H. Coxe (MIT, Cambridge, Mass.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 5C-1/1 to 5C-1/7. Contract No. ET-78-S-02-4683.

Experimental investigation of external fluid mechanics associated with OTEC plants is presented. Tests were conducted under stagnant and flowing conditions, using the mixed discharge (combined evaporator and condenser) and nonmixed discharge concepts. Measurements included temperature, dye concentration, mean velocity, and visual observations from still and motion pictures. Stagnant water tests showed no significant recirculation except where the discharge ports were oriented upward or where the largest plant (600 MWe) was tested. There was no significant difference in recirculation between the mixed and nonmixed discharge designs although differences in the equilibrium positions of the discharge plumes were noted. The flowing condition tests are still in progress. A.T.

A79-45857 # **Environmental impact assessment for OTEC-1.** L. Sinay-Friedman (TRW Defense and Space Systems Group, Redondo Beach, Calif.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 5C-2/1 to 5C-2/6. 9 refs.

Environmental impact assessment of 1 MWe set of heat exchangers aboard the OTEC-1 early ocean test platform is presented. The key environmental issues assessed were organism entrainment and impingement, ocean water mixing, platform attraction, chlorine releases, ammonia leakage, oil spills, atmospheric pollution, endangered species, and socioeconomics. The overall findings are that nearfield biological effects of OTEC-1 will be localized within a few hundred meters of the vessel, and their impact will be negligible in view of the broad distribution of pelagic organisms. Farfield effects on nearshore populations, whose habitats may be more restricted, will be insignificant. A.T.

A79-45858 # **Modeling the intermediate field of ocean thermal energy conversion discharges.** G. H. Jirka, J. M. Jones, and F. E. Sargent (Cornell University, Ithaca, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 5C-3/1 to 5C-3/7. 10 refs. Contract No. ET-78-S-02-4683.

The intermediate field of an OTEC plant is defined as that region in the surrounding stratified ocean where the plant effluents are distributed through the interaction of buoyancy driven currents and the ambient ocean current. The intermediate field determines the area over which physical, chemical and biological disturbances from the plant can be felt and measured. The governing equations of the intermediate field motion are derived and first order solutions are given. The results, including some experimental verification, document the significant horizontal (order 10 km) and vertical extent (order 10 m) of the intermediate field layer. Siting consequences for multiple OTEC plants and additional hydrodynamic drag effects are discussed. (Author)

A79-45859 # **Experimental and analytical OTEC studies at ORNL.** J. W. Michel (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 5D-1/1 to 5D-1/8. 10 refs. Contract No. W-7405-eng-26.

The results of ammonia heat transfer experiments and various analytical studies of OTEC heat exchangers are summarized. Work done since that reported at the Fifth OTEC Conference includes additional ammonia condensation tests on several vertical fluted tubes and on tubes inclined at 30 deg from vertical position. The main conclusions from these tests are that the high condensation coefficients previously reported for fluted tubes have been verified and they seem to be insensitive to tube length over the range tested. Also, tilting the tubes significantly improves the performance of smooth tubes and causes a slight decrease in the performance of fluted tubes. Testing of vertical tubes for ammonia evaporation is currently in progress with evaluation of both in-tube and outside tube evaporation experiments planned. Analytical studies include evaluating the cost effectiveness of various types of heat transfer enhancement and performing a survey of heat exchanger joinability. Also, several studies are in progress relative to alternate OTEC cycles and components for these cycles. (Author)

A79-45863 # **Dynamic analysis of pipeline system for thermal power generation facility.** T. Yokoyama, Y. Arai, and T. Katoh (Showa Denko, Tokyo, Japan). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2.

Laurel, Md., Johns Hopkins University, 1979, p. 6B-3/1 to 6B-3/4. Research sponsored by the Tokyo Electric Power Co.

A stability study of a fiber reinforced plastic (FRP) pipe is presented. The criteria for stability of the structural design are given. Mathematical models are constructed for cantilever and simple beams, and the approximated transfer functions are obtained through Laplace transform and Galerkin's 5th order polynomial fitting. Finally, design criteria are obtained in the form of stiffness, fluid velocity, material properties, and scale dimensions. M.E.P.

A79-45864 # **Use of the new stainless alloys for OTEC heat exchangers.** J. R. Maurer (Allegheny Ludlum Steel Corp., Brackenridge, Pa.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 6C-3/1 to 6C-3/8. 9 refs.

New stainless steel alloys resistant to seawater and other highly aggressive environments are presented. These alloys, which include AL-6X (20 Cr-24Ni-6Mo), were made possible by recent developments in steel melting and processing technology, and are considered viable alternatives for OTEC heat exchangers. Examples of test and operating experience in power plant condensers are given, including corrosion resistance, fouling, heat transfer, and other areas pertinent to OTEC applications. The new ferritic stainless steels are reviewed as candidates for thin wall heat exchangers, and details of condenser operating experiences in brackish and fresh water environments are included. Installation and fabrication of rolled and welded tube/tube sheet joints are covered, including rolling procedures and joint strengths for various material combinations. A.T.

A79-45870 # **Application of the Cathelco system for control of fouling in OTEC systems.** C. W. Smith (CV Associates, McLean, Va.), B. J. Kirk (Cathelco, Ltd., Chesterfield, Derby, England), and W. J. Blume (Blume Worldwide Services, Scarsdale, N.Y.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 8A-2/1 to 8A-2/3.

The development of the Cathelco system for control of fouling and its possible application to OTEC systems is outlined. The system employs two different anodes at a very low current: (1) marine growth anodes which release copper ions preventing the settlement of the primary forms of biofouling on surfaces within the system being protected, and (2) trap corrosion anodes which release aluminum serving as a conditioner to enhance deposition of the copper anti-foulant throughout the system, forming a protective coating and reducing corrosion. Systems have been designed for flows of 3000 to 17,000 gpm which operated successfully. OTEC problems of macrofouling, systems with long pipe runs, flow treatment, microfouling, and the ecological implications of using the Cathelco system are discussed. A.T.

A79-45871 # **Land-based application of an OTEC open-cycle power system.** F. C. Chen (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volume 2. Laurel, Md., Johns Hopkins University, 1979, p. 8C-4/1 to 8C-4/6. 9 refs. Contract No. W-7405-eng-26.

OTEC power system technology, although primarily developed for the utilization of renewable ocean thermal sources, could conceivably also be applied to other types of low-temperature heat sources. For utilizing rejected heat from large thermal power plants, application of open-cycle steam turbine technology to additional very low pressure turbine stages as an integral part of the thermal power plant appears to be more cost effective than a separate bottoming cycle system, where OTEC range cold water is economically available. For utilizing rejected heat for power generation from nuclear facilities, the open cycle has the advantage of not requiring isolation heat exchangers to avoid cross contamination of GDP cooling water. A conceptual thermal analysis of such open-cycle power systems is presented in the present paper. V.P.

A79-45923 **Electromagnetic interference to television reception caused by horizontal axis windmills.** D. L. Sengupta and T. B. A. Senior (Michigan, University, Ann Arbor, Mich.). *IEEE, Proceedings,* vol. 67, Aug. 1979, p. 1133-1142. 14 refs. Contract No. EY-76-S-02-2846.

Electromagnetic interference to television (TV) reception produced by horizontal axis wind turbine generators or windmills has been identified and quantified by comprehensive theoretical and experimental studies. It is found that the rotating blades of a windmill can produce pulse amplitude modulation (PAM) of the total signal received, and that for an antenna so located as to pick up the specular or forward scattering off the blades, this extraneous modulation can distort the video portion of a TV signal reproduction in the vicinity of the windmill. The distortion is worst at the higher frequencies, and therefore, poses more of a problem at UHF than VHF. Based on laboratory studies as well as on-site measurements, a modulation level has been established at which the video interference is judged 'acceptable,' and this threshold of interference is substantially independent of the ambient signal strength. A theory has been developed to compute the interference region about a windmill for any given TV transmitter, and the results are in good agreement with those obtained from on-site measurements with an operational windmill. (Author)

A79-45974 **Performance parameters for fusion-fission power systems.** D. J. Bender (California, University, Livermore, Calif.). *Nuclear Technology,* vol. 44, Aug. 1979, p. 381-389. 12 refs. Contract No. W-7405-eng-48.

A fusion-fission power system is considered in which fissile-producing hybrid (or fusion-fission) reactors supply the makeup fuel needs for fissile-consuming, or converter, reactors. As a result of the diverse nature of the hybrid reactor, a number of general performance parameters are proposed that will permit comparison of various hybrid reactor configurations. In addition, the relationships developed are used to show that scientific feasibility or 'breakeven' for the hybrid reactor is near at hand in the fusion program and that attractive commercial reactors can be based on near-term plasma physics. (Author)

A79-45979 **Thermal energy conversion - Tapping the sea depths.** J. H. Rumbaugh, T. F. Garrity, R. Cohen (U.S. Department of Energy, Washington, D.C.), and R. L. Sullivan (Florida, University, Gainesville, Fla.). *IEEE Spectrum,* vol. 16, Aug. 1979, p. 42-48. 17 refs.

Thermal energy conversion through electricity-to-shore schemes and manufacture at ocean installations of energy-intensive products such as ammonia, hydrogen and aluminum is discussed. Three phases of development are presented. The first phase uses a small scale OTEC heat exchanger with 1 MW thermal capacity; in the second, a T-2 tanker is refitted for providing data on biofouling, cold-water plume, fluid dynamics, cleaning and general environmental impact. The third phase, to be started in 1984, is a pilot plant of 10 MW electricity that will provide energy for the U.S. islands through ocean platforms. Special attention is given to open- and closed-cycle power plants, discussing their technical feasibility and subsequent costs as well as the design and deployment of submarine power cables enabling the conversion of thermal energy to electrical power. C.F.W.

A79-45991 **The effect of coal characteristics on the catalytic liquefaction of Utah coals.** G. T. Garr, J. M. Lytle, and R. E. Wood (Utah, University, Salt Lake City, Utah). *Fuel Processing Technology,* vol. 2, July 1979, p. 179-188. 15 refs. Research supported by the Mineral Leasing Fund.

A79-45992 **Selectivity improvement in the SRC process.** D. Garg, A. R. Tarrer, J. A. Guin, J. M. Lee, and C. W. Curtis (Auburn University, Auburn, Ala.). *Fuel Processing Technology,* vol. 2, July 1979, p. 189-208. 6 refs. Research supported by the U.S. Department of Energy.

The selectivity for hydrodesulfurization over hydrogenation was examined in a new short residence time catalytic two-stage solvent refined coal process, (SRC), with the potential of producing a low-sulfur solid SRC product to meet the proposed EPA new point source emission standards. Residence time and hydrogen consumption are minimized in the first stage by mineral catalyst (SRC residue ash) treated under a combustion environment to improve its selectivity for hydrosulfurization over hydrogenation. The second stage involves hydrotreating the filtered liquid product with a Co-Mo-Al catalyst, before splitting into a solid SRC and solvent recycle by distillation. The type of coal, catalyst, temperature, hydrogen partial pressure, and reaction time were examined to provide information on hydrogen consumption, product distribution, sulfur removal, SRC yield, and solvent quality. The results show that selectivity in two stage hydrodesulfurization of coal is improved by high reaction temperatures, short residence times, the SRC residue ash as a first stage catalyst, and Co-Mo-Al as a second stage catalyst, and that two stage catalytic SRC processing is more selective for hydrodesulfurization than catalytic or non-catalytic single stage SRC processing.
A.T.

A79-45993 **Changes within tin-containing catalysts under hydrorefining conditions.** J. F. Kriz, K. Belinko, B. N. Nandi, and D. S. Montgomery (Department of Energy, Mines and Resources, Energy Research Laboratories, Ottawa, Canada). *Fuel Processing Technology,* vol. 2, July 1979, p. 221-226. 5 refs.

Changes in tin-containing catalysts for bitumen upgrading under hydrorefining conditions are reported. Tests were performed in a bench-scale fixed-bed reactor, and compared with pure alumina, tin compounds supported on alumina showed only marginal improvements in liquid product quality in bitumen hydrorefining. Behavior of four catalysts is described, including alpha alumina monohydrate gelled with acidified water, and made into an extrudate impregnated with SnCl2. Microscopic examinations of the used extrudates revealed extensive sintering of the tin component into the cracks of alumina. The formation of SnS from SnCl2 and its sintering is discussed, and it is concluded that the original dispersion of tin compounds on the catalyst supports significantly decreased within a short period of time. Changes in the dispersion were observed when different methods of preparation were applied. An improved catalytic system would require a stronger bond between the tin compound and the support to hinder surface migration. A.T.

A79-45994 **A survey of methods of coal hydrogenation for the production of liquids.** J. M. Lytle, B. C. B. Hsieh, L. L. Anderson, and R. E. Wood (Utah, University, Salt Lake City, Utah). *Fuel Processing Technology,* vol. 2, July 1979, p. 235-251. 114 refs.

A79-45995 **Photochemical energy conversion studies in systems containing methylene blue.** A. S. N. Murthy and K. S. Reddy (Indian Institute of Technology, New Delhi, India). *International Journal of Energy Research,* vol. 3, July-Sept. 1979, p. 205-210. 20 refs.

The behavior of photogalvanic cells containing methylene blue with various reducing agents has been examined. Appreciable potentials and currents have been detected. The power conversion efficiency of an EDTA-methylene blue (EDTA - ethylene diamine tetra-acetic acid) photogalvanic cell has been estimated to be about 0.04%. The storage of light energy in iron-methylene blue and EDTA-methylene blue systems has been studied. (Author)

A79-45996 **Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability.** N. D. Brinkman (GM Research Laboratories, Warren, Mich.). *International Journal of Energy Research,* vol. 3, July-Sept. 1979, p. 243-274. 28 refs.

Methanol as an alternative fuel in vehicles with spark-ignited, internal combustion engines is evaluated. A methanol-fueled model car, equipped with electronic fuel injection was modified to provide proper air-fuel ratios for methanol. Exhaust emissions and fuel economy, using an average equivalence air-fuel ratio of 0.96 and spark-timing, designed for the production gasoline car, were compared. It was found that methanol fuelling with a 0.96 ratio using best-power rather than production spark timing increased fuel economy from 3 to 6% without significantly affecting emissions and driveability. Furthermore, with best-power spark-timing and a maximum economy air-fuel ratio of 0.83, driveability was acceptable and the CO and NO emissions met the 1977 standard. Although feasibility and benefits of operating vehicles with neat methanol were demonstrated, not all problems of methanol fuelling (i.e., cold starts) were solved and other alternatives such as obtaining hydrocarbon liquids from coal should be considered. C.F.W.

A79-46050 **Solar power for telecommunications.** M. R. Mack (Telecom Australia, Australia). *Telecommunication Journal of Australia,* vol. 29, no. 1, 1979, p. 20-44.

This article outlines the basic theory of solar photovoltaic power systems and the way in which Telecom Australia is applying these systems to provide relatively small quantities of power for communication systems in areas where mains power is not available. It includes methods used to dimension the solar array and battery and describes how the power generated by the solar array is controlled. Future trends and use of solar cells are also briefly discussed.
(Author)

A79-46065 **Numerical modeling of the thermal boundary layer near a synthetic crude oil plant.** A. Kumar (Syncrude Canada, Ltd., Edmonton, Alberta, Canada). *Air Pollution Control Association, Journal,* vol. 29, Aug. 1979, p. 827-832. 15 refs.

The paper presents a numerical model for the prediction of thermal boundary layer (TBL) height as a function of time of day based on the solution of appropriate conservation equations relating both the heat flux and the temperature jump across the inversion layer to the height of the TBL. The resulting equations are solved by the Runge-Kutta method. It is shown how the model is tested against the field data collected as part of a base-line data acquisition program. In addition, a comparison is also made of two different methods (kink method and conventional method) to calculate thermal boundary heights from the mini-sonde data. Problems in the use of the results of TBL heights using these two methods for predicting pollution potential near a tar sands plant are also discussed.
M.E.P.

A79-46152 **Efficient electron-beam-deposited ITO/n-Si solar cells.** T. Feng, A. K. Ghosh, and C. Fishman (Exxon Research and Engineering Co., Linden, N.J.). *Journal of Applied Physics,* vol. 50, July 1979, p. 4972-4974. 15 refs. Contract No. E(04-3)-1283.

Indium tin oxide/silicon heterojunction solar cells with power conversion efficiencies of 10% in the AM1 solar spectrum were fabricated. The indium tin oxide (ITO) films were deposited onto n-type silicon by electron-beam evaporation of a mixture of 90:10 molar% In2O3:SnO2 powder. As in SnO2/n-Si cells, the efficiencies of these cells depend upon the angle of incidence of the ITO vapor stream to silicon. The photovoltaic properties of these cells have been found to be very similar to those of SnO2/n-Si devices. (Author)

A79-46157 **Variation of photovoltaic effect in vertical n/p-junction solar cells.** Y.T. Yang (National Tsinghua University, Hsinchu, Nationalist China). *Journal of Applied Physics,* vol. 50, July 1979, p. 5047-5049. Research supported by the National Science Council and TDK Co.

It is shown experimentally that the power output of an ordinary vertical silicon single crystal solar cell varies with the local illumination. In the case where the illuminated areas are only a small portion of the surface area, the dark current was independent of the location of illumination. For a fully illuminated vertical solar cell, the dark current may increase or decrease, depending on whether the impurity concentration is inhomogeneous or homogeneous, whereas the short-circuit current increases in either case. V.P.

A79-46201 **Spray-deposited high-efficiency SnO2/n-Si solar cells.** T. Feng, A. K. Ghosh, and C. Fishman (Exxon Research and Engineering Co., Linden, N.J.). *Applied Physics Letters,* vol. 35, Aug. 1, 1979, p. 266-268. 8 refs. Contract No. E(04-3)-1283.

SnO2/n-Si solar cells (area = 1 and 4 sq cm) having AM1 efficiencies of 12.3% on single-crystal silicon and 10.1% on polycrystalline silicon have been fabricated. The tin oxide is deposited by spraying a SnCl4 mixture onto heated silicon substrates. Using this low-cost process, large-area (20-sq cm) single-crystal cells having 10% efficiency have also been made. The smaller diffusion length and higher resistivity in the polycrystalline silicon accounts for its lower efficiency as compared to single-crystal cells. (Author)

A79-46202 **Spectrally selective surfaces of Ni-pigmented anodic Al2O3.** C. G. Granqvist (Chalmers Tekniska Hogskola, Goteborg, Sweden), A. Andersson (Granges Aluminium, Finspang, Sweden), and O. Hunderi (Norges Tekniske Hogskole, Trondheim, Norway). *Applied Physics Letters,* vol. 35, Aug. 1, 1979, p. 268-270. 28 refs.

The spectral selectivity and technical properties of Ni-pigmented anodic Al2O3, a possible coating in photothermal solar energy conversion, are examined. Coatings are obtained by dc anodization in dilute phospheric acid, followed by blackening by ac electrolysis in a bath containing NiSO4. Accelerated tests at 300 C and severe humidity conditions produce no significant degradation of properties, indicating high durability. Scanning electron microscopy, Auger depth profiling and atomic absorption analysis lead to the formulation of a structural model of the coating, in which a thin layer comprising a mixture of Ni and Al2O3 is located near the bottom of the anodic film. Spectral reflectance experiments indicate a high degree of spectral selectivity, which is explained in terms of the model structure by the Bruggeman (1935) theory. A.L.W.

A79-46221 **Interannual and month-to-month variations of wind speed.** C. G. Justus, K. Mani, and A. S. Mikhail (Georgia Institute of Technology, Atlanta, Ga.). *Journal of Applied Meteorology,* vol. 18, July 1979, p. 913-920. 9 refs.

Spatial cross correlations and interannual and month-to-month variations of monthly mean wind speed are studied at 40 sites that span 21 states, including Alaska and Hawaii, plus one Pacific Ocean site (Wake Island). The sites are selected on the basis of availability of 10 or more years of data from a fixed location with constant anemometer level and having a climatic mean wind speed of 5 m/s or higher. Also discussed are time correlations and persistence probabilities. Probability distributions of monthly and annual mean speeds are found to be nearly Gaussian with respect to climatological monthly or annual mean. Conclusions are drawn on spatial cross correlations and wind speed variability. A persistence probability of about 63% is established. S.D.

A79-46228 **Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants.** M. H. Wang (New York State, Dept. of Environmental Conservation, Albany, N.Y.) and L. K. Wang (Stevens Institute of Technology, Hoboken, N.J.). *(University of Missouri-Rolla, Annual Conference on Energy, 4th, University of Missouri-Rolla, Rolla, Mo., Oct. 11-13, 1977.) Journal of Environmental Sciences,* vol. 22, July-Aug. 1979, p. 23-26. 5 refs. Research supported by New York State Dept. of Environmental Conservation and Stevens Institute of Technology.

Electrical energy consumption models are developed for the unit operations/processes of pumping, screening and comminution, grit removal, sedimentation, chlorination, gravity thickening, anaerobic digestion, vacuum filtration, incineration, and diffused air flotation. The mathematical models of total heating requirements of biological wastewater treatment plants are also derived and presented. (Author)

A79-46231 **Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators.** J. M. Ondov, R. C. Ragaini, and A. H. Biermann (California, University, Livermore, Calif.). *Environmental Science and Technology,* vol. 13, Aug. 1979, p. 946-953. 35 refs. Contract No. W-7405-eng-48.

A79-46236 **Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems.** M. R. Jonzen (General Atomic Co., Fusion Div., San Diego, Calif.). *Nuclear Technology,* vol. 45, Aug. 1979, p. 54-67. 21 refs.

Detailed mass and energy calculations have been used to study the fuel- and power-producing capabilities of a gas-cooled fast reactor and a non-optimized ignition tokamak fusion-fission hybrid reactor. Equivalent energy inputs and outputs are utilized to evaluate the performance of the reactors. The time to recover reactor inputs, system efficiencies, and lifetime net outputs are compared. Fuel production capabilities of the hybrid are contrasted with those of the gas centrifuge and gaseous diffusion uranium enrichment processes for various ore costs. Results show that fuel- and power-producing hybrid systems can compare favorably with fission breeders and isotope separation systems, particularly when utilized in U-233-fueled symbiotic systems. (Author)

A79-46249 **Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence.** A. Yoshikawa, O. Ishizaki, H. Kasai, and M. Nishimaki (Chiba University, Chiba, Japan). *Institute of Electronics and Communication Engineers of Japan, Transactions, Section E (English),* vol. E62, Apr. 1979, p. 224-228. 10 refs.

The paper presents a study of the junction properties of n-CdS/p-InP heterodiodes prepared as solar cells by a close-space technique. Results of an experiment using injection electroluminescence show that these diodes have a low interface state density in deep levels at room temperature. At liquid nitrogen temperature the luminescence spectra originating from both band-to-band and free-bound transitions are observed. The energy difference between the two emission peaks is found to be 67 meV, which corresponds to the activation energy of typical acceptors in InP. The internal electroluminescence quantum efficiency is 12.8% at 77 K. V.T.

A79-46254 # **Computer simulation of laser implosive compression of ADT target and analytic solutions on the shock waves and thermal waves.** W.-H. Tan (Academia Sinica, Optics and Fine

Mechanics Institute, Shanghai, Communist China). *Acta Physica Sinica,* vol. 28, May 1979, p. 364-376. 8 refs. In Chinese, with abstract in English.

A79-46301 **Midwest Energy Conference, Chicago, Ill., November 19-21, 1978, Proceedings.** Conference sponsored by the University of Illinois and U.S. Department of Energy. Edited by J. P. Hartnett (Illinois, University, Chicago, Ill.). *Energy* (UK), vol. 4, Apr. 1979. 239 p.

The conference focused on nuclear energy, energy storage and conservation, alternate energy sources, and coal. Specifically, papers were presented on the characteristics of the high power density tokamak reactor, advanced-fuel pellet approaches to inertial fusion, thermal storage efficiencies, effects of modifying heat transfer properties of indigenous sandstones, design of compressed air energy storage systems, superconductive magnetic energy storage, electronegative chemical reactors, biomass gasification, fuels and chemicals from biomass, study of a wave energy device, and a steam process for coal gasification. A.T.

A79-46302 **Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor.** S. K. Borowski and T. Kamn.ash (Michigan, University, Ann Arbor, Mich.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21. 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 147-155. 15 refs. Research supported by the Electric Power Research Institute and U.S. Department of Energy.

Most of the fusion Experimental Power Reactor (EPR) and commercial power reactor designs have been limited to low beta (ratio of plasma pressure to magnetic field pressure), low power density tokamak systems. In an effort to redesign a viable, economically attractive power reactor that could meet the electric utilities needs, the flux-conserving tokamak concept has emerged as a leading contender. In this paper, we examine the operating characteristics of an FCT reactor and show that such a system would be comparable in size to an EPR but produce more than five times the fusion power. It will be seen that the FCT concept could provide the utility industry with compact reactor systems of moderate electrical output (between 500 and 1000 MWe) without requiring large extrapolations in plasma size and technology beyond that of the Tokamak Fusion Test Reactor (TFTR) currently under construction. (Author)

A79-46303 **Advanced-fuel pellet approaches to inertial fusion.** C. K. Choi, T. E. Blue, and G. H. Miley (Illinois, University, Urbana, Ill.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 157-162. 9 refs. Research supported by the Electric Power Research Institute.

Inertial confinement fusion (ICF) concepts, as compared to magnetic confinement, provide an attractive approach to burning 'advanced-fusion fuels' to achieve fusion. A key advantage of the ICF approach is that the absence of externally imposed magnetic fields avoids large cyclotron radiation losses. An important advantage of advanced-fusion fuels is that advanced fuels provide 'cleanliness' due to less neutron production and tritium handling. Present studies focus on the A-FLINT (Advanced-Fuel Layered Ignitor/Pellet Nurturing Tritium) design which consists of a D-T fueled seed surrounded by a D-layer and appropriate tamper. A heavy-ion beam accelerator is proposed to provide adequate input-energy and efficiency. The pellet design minimizes input requirements through shock ignition of the small D-T core, providing a matchhead effect. The surrounding layers provide unburned tritium to fuel subsequent pellets, eliminating the need for a lithium blanket and simplifying the reaction vessel design. (Author)

A79-46304 **A possible route to small, flexible fusion units.** G. H. Miley and J. G. Gilligan (Illinois, University, Urbana, Ill.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 163-170. 25 refs.

Conceptual design studies of a small D-H-3 field-reversed mirror fusion plant are described. If achieved, the basic unit, termed SAFFIRE, would produce a few megawatts of power. By 'stacking' of units, however, plants could be built in the 10s of megawatt size. This would make relatively clean fusion power available for applications requiring small, decentralized, power plants. (Author)

A79-46305 **Energy exchange between earth-sheltered structures and the surrounding ground.** E. R. G. Eckert, T. P. Bligh, and E. Pfender (Minnesota, University, Minneapolis, Minn.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 171-181. 5 refs. NSF Grant No. AER-75-03481.

A program of measurements is underway at Williamson Hall, an earth-sheltered building on the campus of the University of Minnesota. The temperature and the moisture field in the ground adjacent to the building, as well as the heat flux through the building walls, are measured continuously and recorded on magnetic tape and are thus available for evaluation. The thermal conductivities of soil samples at various moisture contents were measured with a novel, unsteady method. Temperature fields in the soil adjacent to the building were also calculated on an electronic computer using the unsteady heat-conduction equation. The paper describes the present status of this study and presents samples of the results obtained to date. (Author)

A79-46306 **Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones.** R. M. Abdel-Wahed (Alexandria, University, Alexandria, Egypt), P. F. Emerson, P. L. Blackshear, Jr., and M. Riaz (Minnesota, University, Minneapolis, Minn.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 183-192. 11 refs. Contract No. EY-76-S-4009.

For conditions encountered in much of the Midwest, an extensive layer of dry sandstones protected by an impermeable limestone roof is accessible for long-term (six-month), high-temperature (T higher than 100 C) thermal energy storage. The performance of such storage beds is examined when the thermal properties of sandstones are modified so as to adjust the permeability toward an optimum in order to reduce pumping power. The thermal properties of consolidated St. Peter sandstone, dispersed St. Peter sand, and pelletized St. Peter sand are measured by several techniques. A nondimensional computer model for beds bounded by a constant temperature water table is employed to estimate the influence of thermal property manipulation of storage system performance. Disrupting the sandstone permits a substantial increase in the volume efficiency and first and second law efficiencies. Pelletizing sand into particles of approximately 1 mm diameter permits marginal further increases in performance. Disruption of the consolidated sandstone reduces the thermal diffusivity and increases the permeability. Both effects improve performance. (Author)

A79-46307 **Energy conservation via heat transfer enhancement.** A. E. Bergles, G. H. Junkan (Iowa State University of Science and Technology, Ames, Iowa), and R. L. Webb (Pennsylvania State University, University Park, Pa.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 193-200. 28 refs. Contract No. EG-78-S-02-4649.

This paper describes work on a program directed toward assessing the prospects for development of more efficient heat-exchanger equipment. Improved equipment leads to more efficient thermal systems and more effective waste-heat recovery. Heat-transfer enhancement is a vital part of this development effort. Sources of information on heat-transfer enhancement are briefly reviewed. Applications are discussed, with emphasis on those techniques which have made the transition from the laboratory to full-scale industrial equipment. Typical reports of the benefits of enhancement are cited. Factors affecting commercial development and use are also discussed. (Author)

A79-46308 **Design of optimum compressed air energy-storage systems.** A. Sharma, H. H. Chu (Illinois, University, Chicago, Ill.), F. W. Ahrens, R. K. Ahluwalia (Argonne National Laboratory, Argonne, Ill.), and K. M. Ragsdell (Purdue University, West Lafayette, Ind.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 201-216. 31 refs. Research supported by the U.S. Department of Energy.

Compressed air energy storage (CAES) power systems are being considered by electric utilities for load-leveling application. Their economic benefit and the extent of premium fuel conservation is dependent on their design. An optimum design approach for CAES is presented in this paper. It is based on decomposition of the overall CAES plant/utility grid system into three partially-decoupled subsystems. Technical and economic models of the subsystems are used in a constrained optimization procedure. The constraints are imposed by the physical characteristics of the subsystems, by interaction among the subsystems and by the interfacing requirements imposed by the utility. To illustrate the concepts, models for the system comprising the compressor train, piping, and an aquifer reservoir have been used in the optimization procedure. Results from these studies show that substantial reductions in capital cost and total operating cost can be achieved using optimization techniques. (Author)

A79-46309 **Superconductive magnetic energy storage.** R. W. Boom and S. W. Van Sciver (Wisconsin, University, Madison, Wis.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 217-223. 23 refs.

Technical and economic aspects of large scale superconductive magnetic energy storage are presented. The program consists of component development and detailed design leading to construction of a large superconducting magnet capable of storing 1000 to 10,000 MWh. The magnet is a single-layered segmented solenoid of about 100 m radius, and energy containment is achieved by burying the magnet underground in bedrock tunnels. Magnetic loads are transmitted from the conductor to bedrock through glass fiber reinforced composite struts, and the conductor is made of an aluminum and NbTi composite and designed for full cryogenic stability in 1.8 K superfluid helium. The Graetz bridge converts the d.c. superconducting current into a.c. current in the three-phase power system. Economic analysis shows that superconductive magnetic energy storage is competitive with alternative large scale storage schemes for units greater than 1000 MWh size. A.T.

A79-46310 **Electrogenerative chemical reactors.** S. H. Langer, S. J. Pietsch, and G. P. Sakellaropoulos (Wisconsin, University, Madison, Wis.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 225-233. 36 refs. Research supported by the University of Wisconsin, Atlantic Richfield Co., DuPont de Nemours and Co., and NSF.

Electrogenerative processes and the design and operation of electrogenerative reactors are reviewed. These processes are electrochemical in which the exothermic energy of chemical reaction is converted to direct electric current while the required chemical product is produced. Apart from energy recovery, it is also possible to reduce capital costs for cooling to remove heat. The electrogenerative reactor which uses free electrolyte, with reactants continuously supplied over the catalytic electrodes separated by the electrolyte barrier is described, noting that selectivity and rate may be controlled by varying electrode potential and electrocatalyst. Electrogenerative reactions and related thermodynamic calculations for hydrogenation, oxidation, halogenation, and hydrometallurgical reactions are discussed and the importance of electrocatalysis is illustrated. Possibilites for incorporating electrogenerative processes into existing chemical processing technology are discussed from the standpoint of conserving and recovering energy presently lost as heat. A.T.

A79-46311 **Small scale gasification of biomass - The case of corn cob gasifiers.** O. C. Doering, III, T. J. O'Hare, and R. M. Peart (Purdue University, West Lafayette, Ind.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 235-248. 7 refs.

A79-46312 **Farm-scale generation of bio-gas.** P. R. Goodrich, R. J. Gustafson, K. L. Hauer (Minnesota, University, St. Paul, Minn.), and V. Larson. *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 249-261.

A farm-scale research and demonstration digester has been constructed, operated and monitored on a private medium-sized swine farm. Materials handling problems have been studied. Bio-gas from the digester is used in a motor generator set to be integrated into the farmstead energy system. The digester has been monitored to determine operational characteristics, amount of energy produced and efficiency of energy production. (Author)

A79-46313 **Fuels and chemicals from biomass.** M. R. Ladisch, M. C. Flickinger, and G. T. Tsao (Purdue University, West Lafayette, Ind.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 263-275. 75 refs.

Techniques of converting cellulosic materials in biomass to sugars and alcohol are reviewed. Biomass is a cellulosic material composed of alpha- and hemicellulose and lignin, is renewable and abundant, and is a reservoir of solar energy stored through photosynthesis. The yield of sugars from cellulose has been increased to 90% or greater by the Purdue process in which cellulosic material is solvent-pretreated to facilitate hydrolysis to sugars by acid or enzyme. History of cellulose conversion technology by acids and enzymes is given, and the Purdue process is described, noting the solvents used for pretreatment which produce the increased sugar and consequent alcohol yield. It is concluded that this process may alleviate the future fossil-fuel dependency of the chemical industry and that the availability, quality, and cost of glucose from the solvent pretreatment process may compare favorably with glucose derived from starch. A.T.

A79-46314 **The distributed flow, below atmospheric pressure solar collector.** D. L. Spencer and T. F. Smith (Iowa, University, Iowa City, Iowa). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 287-297. 9 refs. Research supported by the Iowa Energy Policy Council.

The general concepts of the vacuum-flow, flat-plate solar energy collector are discussed and previous work reviewed. Results of recent performance and freeze-tolerance test of individual modules are presented. The problems of integrating modules of the vacuum-flow type into arrays and experience with working arrays are reported. Comments are included on the economic aspects of the use of the collector as versus conventional absorbers and on the methods of assembly of the collector. (Author)

A79-46315 **An investigative study of a wave-energy device.** D. A. Guenther, D. Jones, and D. G. Brown (Ohio State University, Columbus, Ohio). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 299-306. 16 refs.

The methodology and design of an offshore float device to capture power in waves is presented. Results show that a modification of a mechanical cycle can produce a significant energy increase, and a prototype device will be tested to illustrate that wave power can provide significant amounts of energy. The recovery concept presented increases the deliverable energy that can be captured from a buoyant float following the free passage of a wave, accomplished by sequential capture (preloading) and release of the flat at critical stages of wave passage. It is concluded that a simple modification of a mechanical cycle can lead to a significant increase in the developed energy, and specifically, preloading a float in the trough of a wave and releasing it to the surface near the wave crest results in a net increase in the energy which may be extracted from a wave. A.T.

A79-46316 **Polyelectrolyte electrets for electrical energy storage.** I. F. Miller (Illinois, University, Chicago, Ill.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978). Energy* (UK), vol. 4, Apr. 1979, p. 307-313. 17 refs. NSF Grant No. GK-43294; Grant No. NIH-GM-12013.

In the study described, membrane electrets composed of mixtures of polyelectrolyte salts and hydrogen bonding materials were investigated to determine, their electric charge and electrical energy-storage characteristics. It is found that membranes containing salts of polystyrene-sulfonic acid plus polyvinyl alcohol show excellent promise for electrical storage purposes. (Author)

A79-46317 **Combustion of coal particles in wall-burning swirl combustors.** P. M. Chung (Illinois, University, Chicago, Ill.) and R. S. Smith (Argonne National Laboratory, Argonne, Ill.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978). Energy* (UK), vol. 4, Apr. 1979, p. 315-327. 16 refs. Research supported by the University of Illinois and U.S. Department of Energy.

An approximate analysis is made of the performance of the wall-burning coal combustors. The results show that the swirl number plays a more important role than the char gasification chemical kinetics in determining the overall gasification rate. At high pressures, the wall-burning combustors may not be as efficient as the gas-stream combustors. The situation, on the other hand, may be reversed at the lower pressures. (Author)

A79-46318 **Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures.** C. K. Law, H. K. Law, and C. H. Lee (Northwestern University, Evanston, Ill.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 329-339. 7 refs. Contract No. EF-77-G-01-2741.

The utilization of coal/oil mixtures in furnaces and boilers appears to be a viable short-to-medium range solution to partially alleviate the demand on petroleum supply with minimum combustor modifications. The present investigation first demonstrates that the combustion characteristics of the coal/oil mixture droplets depend intimately on the intensity of internal circulation. Rapid internal motion favors batch-distillation-type vaporization which causes the coal particles to agglomerate. On the other hand, slow internal motion traps the volatile components in the inner core of the rapidly-heated droplet and may eventually lead to internal boiling and subsequently fragmentation of the droplet. Experimental results reveal a mixed behavior, although the degree of agglomeration is significant even at moderate levels of coal loading. It is subsequently shown that the addition of small quantities of water significantly enhances the potential and intensity of droplet explosion. Practical implications of the present results are also discussed. (Author)

A79-46319 **Combustion of single coal particles in a jet.** K. W. Ragland and C. A. Weiss (Wisconsin, University, Madison, Wis.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978.) Energy* (UK), vol. 4, Apr. 1979, p. 341-348. 13 refs.

Experimental data on the behavior and combustion rates of individual coal particles aerodynamically suspended in a heated jet to simulate fluidized bed conditions are presented. Tests of bituminous, sub-bituminous, and lignite coals from 2 to 12 mm in size were conducted at jet temperatures of 705 and 816 C in air and air diluted with equal amount of nitrogen. The ignition time delay varied from 2 to 44 sec, and the devolatilization time extended up to 80 sec and varied as the particle initial diameter to the 1.5th power. The total burn time extended to 740 sec, was independent of coal type and temperature, and varied as the square of the size and inversely with the oxygen concentration. The burning rate decreased with time and could not be explained by a square law relationship, and it was higher than literature values at lower convective velocities indicating the importance of oxygen diffusion. A.T.

A79-46320 **Heat transfer between a fluidized bed and an immersed vertical U-tube.** S. C. Saxena (Illinois, University, Chicago, Ill.) and A. Chatterjee (Illinois, University, Chicago, Ill.; Indian Institute of Technology, Bombay, India). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978). Energy* (UK), vol. 4, Apr. 1979, p. 349-356. 7 refs. NSF Grant No. ENG-77-08780.

The design details of a 0.254m stainless steel cylindrical fluidized bed pilot plant facility, whose fabrication, installation and testing have been recently completed, are described. It primarily consists of a fluidized-bed reactor, fluidizing air-supply system, solids feeder, off-gas cleaning and exhaust system, and cooling water-supply system for heat-transfer tubes provided in the bed in the freeboard sections. The plant is operated at ambient pressure in the temperature range 300-600 K, both in the batch and continuous modes for solids feed. Bed-pressure drop measurements as a function of fluidizing velocity for two different bed heights reveal that the quality of fluidization is good. Similar experiments have been conducted with the continuous solids feed. The heat-transfer coefficient between the bed and an immersed stainless steel U-tube is measured as a function of fluidizing air velocity at five different temperatures. The effects on bed-to-tube heat-transfer rate of solids feed rate, bed height, air-flow rate, and bed temperature are examined. All of these observed variations are interpreted in terms of the solids mixing and bubble mechanics in the bed. (Author)

A79-46321 **A steam process for coal gasification.** S. L. Soo and R. T. Gibbs (Illinois, University, Urbana, Ill.). *(University of Illinois and U.S. Department of Energy, Midwest Energy Conference, Chicago, Ill., Nov. 19-21, 1978). Energy* (UK), vol. 4, Apr. 1979, p. 357-364. 14 refs. Research supported by Pullman Kellogg.

The paper studies a gasification process which uses steam as a reactant as well as a heat source to generate hydrogen, carbon monoxide, and methane by using carbon in coal as a reducing agent. It is shown that economical operation can be maintained by using a large excess in steam at 1300 C level (more than 4 mole of H2O to 1 mole C). The steam is produced by burning a fraction of the product gas in a pebble-heater system. A high percentage of H2 can be produced in the product gas without the need for shift conversion. Other components are CO, CH4, with CO2 and H2S removed by absorption; with excess H2O removed by condensation, of varying percentages dependent on reactor temperature and pressure. Charcoal and Illinois No. 6 coal were gasified in the experimental facility at pressures up to 10 atm. It is noted that a steam temperature of 1300 C or higher can be achieved via a pebble bed heater with cored bricks or a silicon carbide tubular heat exchanger. (Author)

A79-46432 # **Volcanology.** T. Simkin (Smithsonian Institution, Washington, D.C.). *Reviews of Geophysics and Space Physics,* vol. 17, June 1979, p. 872-887. 405 refs.

Volcanology in the 1970s has expanded greatly both in size and in scope. The most striking volcanological advances in the 1970s have been in the investigation of deep sea volcanism. Additional recent expansion in 1970s volcanology has come with interdisciplinary approaches: the application of physics and chemistry to eruptive processes, the meteorological effects of explosive eruptions, the geophysical delineation of subsurface magma bodies, and the increasing interaction with archeological problems. The present review proceeds from effusive rift volcanism, through intraplate activity, to the explosive volcanism of island arcs and continental margins. An extensive reference bibliography is presented. S.D.

A79-46433 # **Geothermal systems and their energy resources.** D. E. White and M. Guffanti (U.S. Geological Survey, Menlo Park, Calif.). *Reviews of Geophysics and Space Physics,* vol. 17, June 1979, p. 887-902. 497 refs.

Geothermal systems of all types are reviewed, with particular reference to U.S. systems that are most likely to be utilized as energy sources. An evaluation of the systems leads to the conclusion that, although a vast quantity of thermal energy is contained in crustal rocks at temperatures high enough for electrical generation, depths are commonly too great for economic production in near future. Igneous-related systems with high thermal gradients are seen to provide attractive targets for hot dry rock technology. The feasibility of extracting energy directly from deep magma sources is being studied, but the problems appear to be formidable. V.P.

A79-46521 # **Energy production by photoelectrochemical processes.** R. Memming (Philips GmbH, Forschungslaboratorium, Hamburg, West Germany). *Philips Technical Review,* vol. 38, 1978-1979, no. 6, p. 160-177. 43 refs.

A survey of research on photoelectric chemical solar cells is presented. Such cells, consisting of a semiconductor electrode, an electrolyte, and a metal counter-electrode, generate power by light excitation similar in nature to that in p-n junctions. It is noted that a regenerative cell suitable for power generation can be made if a redox system is added to the electrolyte. Its function and construction are described in terms of the energy levels. Consideration is given to problems that arise because of side reactions such as anodic dissolution. In addition, the stability problem and the selection of suitable semiconductor materials are discussed in detail and photoelectrolysis cells that can be applied for the production of hydrogen, are described. M.E.P.

A79-46526 **Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings.** Workshop sponsored by the U.S. Department of Energy and Electric Power Research Institute. Edited by E. F. Clark and F. de Winter (Altas Corp., Santa Cruz, Calif.). Santa Cruz, Calif., Altas Corp., 1979. 465 p.

The work deals with analytic and experimental studies on the integration of wind generation into electric utility networks. Overviews of major wind program elements are included, covering activities in wind turbine generators (WTG) hardware design and development, wind energy resource assessment and environmental issue assessment. The paper covers the following sessions: (1) wind energy technology overview; (2) wind generation value in electric utility systems; (3) large wind turbine generator operation and status, and (4) network interaction analyses. Consideration is given to economic requirements and value analysis, and operational experience and status. V.T.

A79-46527 * # **Large horizontal axis wind turbine development.** W. H. Robbins and R. L. Thomas (NASA, Lewis Research Center, Cleveland, Ohio). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 50-70; Discussion, p. 71, 72.

The paper presents an overview of the NASA activities in large horizontal axis wind turbine development. First generation technology large wind turbines (Mod-0A, Mod-1) have been designed and are in operation at selected utility sites. Second generation machines (Mod-2) are scheduled to begin operations on a utility site in 1980. These machines are estimated to generate electricity at less than 4 cents/kWh when manufactured in modest production rates. Meanwhile, plans are being made to continue developing wind turbines which can meet the cost goals of 2 to 3 cents/kWh. V.T.

A79-46528 # **Economic overview of vertical axis wind turbines.** W. N. Sullivan (Sandia Laboratories, Albuquerque, N. Mex.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 73-81; Discussion, p. 82. Contract No. AT(29-1)-789.

An economic overview of vertical axis wind turbines (VAWT) is presented. The most favorable systems investigated can provide utility electricity with a cost in the range of 4-6 cents/kWh with existing technology. The cost of energy decreases as VAWT rotor size increases up to the largest system investigated (1600 kW). This is due primarily to the presence of costs which vary slowly or not at all with rotor size. These costs are associated with operation, maintenance, and automatic control hardware. These slow-varying costs dominate the smaller systems and tend to limit their cost-effectiveness. The cost of energy of all size systems is sensitive to the median annual windspeed, while the cost of larger systems is sensitive to the wind exponent. V.T.

A79-46529 # **Wind resource assessment status.** L. L. Wendell (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 83-94. 8 refs.

Wind resource assessment activities are discussed including national, northwest, and other regional assessments, techniques for regional assessments, and siting methodologies. It is noted that features indicating high wind energy potential are: (1) gaps, passes, and gorges in areas of frequent strong pressure gradients; (2) long valleys extending parallel to prevailing wind directions; (3) high elevation plains and plateaus; and (4) exposed ridges and mountain summits in areas of strong geostrophic winds. Features that indicate low wind energy potential are: (1) valleys perpendicular to the prevailing wind direction; (2) sheltered basins; and (3) short and/or narrow valleys and canyons. V.T.

A79-46530 # **Environmental issues assessment.** T. R. Kornreich and R. J. Kottler, Jr. (JBF Scientific Corp., Arlington, Va.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 95-109. 8 refs.

Electromagnetic interference, sound intensity, safety, siting impacts, ecological concerns, public acceptance, and legal and institutional issues represent potential environmental constraints to the wide-scale implementation of wind turbine systems. Of these potential problems, electromagnetic interference and certain legal and institutional issues are of the most concern. The major environmental problem (interference with television reception) is studied in detail for large-scale horizontal axis wind systems. Legal and institutional considerations (such as zoning, building and safety codes) may pose a barrier to prospective wind turbine use in urban and suburban areas. V.T.

A79-46531 # **Requirements assessment of wind power plants in electric utility systems.** W. D. Marsh (General Electric Co., Schenectady, N.Y.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 110-124; Discussion, p. 125, 126. Research supported by the Electric Power Research Institute.

A methodology developed for studying the performance and economic requirements of wind plants when applied to electric utility power systems is discussed. The adopted total system cost method of analysis consists of three models: the wind performance model, the reliability model, and the production model. The methodology was exercised in several actual utility systems to confirm and demonstrate its capability. The procedure for studying the application of wind power plants in specific utility systems consisted of three steps: calculate the performance and cost of the system as planned without new generation; substitute wind for conventional generation; and compare total system costs with the base cost. V.T.

A79-46532 # **Wind energy systems application to regional utilities.** E. E. Johanson and M. K. Goldenblatt (JFB Scientific Corp., Wilmington, Mass.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 127-154; Discussion, p. 155-157. Contract No. EX-76-C-01-2438.

A generic planning process is developed to determine the feasibility of utilizing wind energy conversion systems (WECS) as part of the future mix of equipment. The approach used is to establish the worth or value, of WECS by adding them to the utility mix at zero cost and determining what savings the utility would realize from its conventional sources, due to the presence of the WECS. The value of the WECS is established by determining, on an hour-by-hour basis, the wind availability, and what portion of the load it satisfied. The wind is treated as a negative load and utilized to satisfy as much of the utility load as it can. The mix of conventional sources is then optimized to satisfy the remaining load. The developed generic planning process was applied to two specific cases and comparisons were made between the results obtained for these cases. V.T.

A79-46533 # **Wind energy central station power generation in the Southwest and Southeast.** D. H. Guild (Stone and Webster Engineering Corp., Boston, Mass.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 158-170.

The Southwest Project and Southeast Regional Assessment Study showed that wind energy will play a minor role in electric power generation in these regions. This is primarily due to lack of good wind resources - as compared to the Northwest and Northeast coastal regions. While the wind resources in the Southwest are better, particularly in the Texas Panhandle area and mountainous regions, than in the Southeast, all these resources are remote from existing transmission lines and load centers. In all cases, the wind resources need to be quantified at specific sites in order to determine its actual value for possible central station use. Conceptual design and cost estimates of a wind power central station are considered along with system integration studies. V.T.

A79-46534 # **Electric utility application of WECS in an island location.** C. A. Lindley (Aerospace Corp., El Segundo, Calif.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 171-187; Discussion, p. 188, 189. Research supported by the U.S. Department of Energy.

An electric utility application study of wind energy conversion systems (WECS) in an island location shows economically high wind energy levels in several areas of Oahu, Hawaii, and low variability of wind speeds. The study includes a synthetic design exercise in WECS site selection, field layout, and performance estimation. A comprehensive set of siting factors and criteria useful in future site selection is developed and evaluated. A scenario WECS design used to estimate Oahu WECS performance forms the skeleton of a methodology for wind resource survey, WECS application evaluation, and WECS field design layout for mountainous terrain wind resources. Opinions on the most likely path of practical commercial exploitation of WECS are presented. V.T.

A79-46535 # **Wind/hydro generation assessment.** A. W. Watts (U.S. Bureau of Reclamation, Denver, Colo.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 190-203; Discussion, p. 204.

A three-year study of the feasibility of integrating wind turbine generators with an existing Federal hydroelectric system is discussed. As part of the study, one large wind turbine generator, in the megawatt range will be installed to verify the integration concept and provide data for environmental studies. The wind resource is in an area near Medicine Bow, Wyoming; the hydroelectric system is the Colorado River Storage Project. A computer model of the Medicine Bow wind regime was developed to simulate an average wind year by providing the wind speed each hour in the year. It is shown that the high level of on-peak generation at the site makes this resource compatible for integration with the hydrosystem. V.T.

A79-46536 # **Distributed wind generation assessment.** J. L. Oplinger (General Electric Co., Schenectady, N.Y.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 205-214.

Development of a methodology for utility evaluation of distributed wind power systems in their respective service areas is discussed. System definition includes selection of three actual utility systems in geographic areas having wind, climatic, and topographical characteristics suitable for application of wind power plants. Then, several geographical areas for wind power plant siting are selected within each utility service area. After characteristic hourly wind data are developed for the specific areas, the system definition work continues with specification of candidate wind turbine generators (WTG) for each wind regime. The rating of individual wind turbine generators and the number to be aggregated for a given candidate system will depend upon the characteristics of the utility and the particular site involved. V.T.

A79-46537 * # **Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine.** J. C. Glasgow and W. H. Robbins (NASA, Lewis Research Center, Cleveland, Ohio). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 215-245; Discussion, p. 246, 247. 6 refs.

The Mod-OA 200 kW Wind Turbine was designed and fabricated by the Lewis Research Center of the NASA under the direction of the U.S. Department of Energy. The project is a part of the Federal Wind Energy Program and is designed to obtain early wind turbine operation and performance data while gaining initial experience in the operation of large, horizontal axis wind turbines in typical utility environments. On March 6, 1978, the Mod-OA wind turbine was turned over to the Town of Clayton Light and Water Plant, Clayton, NM, for utility operation and on December 31, 1978 the machine had completed ten months of utility operation. This paper describes the machine and documents the recent operational experience at Clayton, NM. (Author)

A79-46538 # **MOD-1 wind turbine generator program status report.** R. H. Poor (General Electric Co., Philadelphia, Pa.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 248-282.

The paper reports a status of the MOD-1 wind turbine generator program for the first megawatt class machine WTG. The MOD-1 WTG is described with attention drawn to its rotor design, drive train, power generation/control system, nacelle structure, yaw drive, weight, and tower and ground equipment. WTG performance and economics are considered along with factory assembly and test, site preparation, and installation. During further blade installation, first rotation, and system testing data and operating experience will be obtained for developing future machines. V.T.

A79-46539 # **Cuttyhunk Island installation, WTG Energy Systems, Inc., MP1-200 control system design.** M. Rose (WTG Energy Systems, Inc., Angola, N.Y.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 283-296.

A system for controlling the speed of a wind generator is described, which utilizes load modulation with a fixed pitch rotor configuration. Wind turbine description is given along with control system equipment, supervisory and subsystem controls. The MP1-200 wind turbine installed on Cuttyhunk Island, Massachusetts utilizes a three bladed, 80 feet diameter rotor. All the major parameters of the system operation are monitored and displayed on the CRT and teletype. Cumulative data, such as wind velocity, kilowatt hours, kiloVAR hours, and machine hours are stored in memory and printed at periodic intervals. The performance of the wind turbine is discussed and modifications of the basic design are outlined. V.T.

A79-46540 # **A fully interconnected wind system.** W. A. Frederick, J. A. Miller, and J. E. Pfluger (Pennsylvania Power and Light Co., Allentown, Pa.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings.

Santa Cruz, Calif., Altas Corp., 1979, p. 297-309; Discussion, p. 310, 311.

A wind turbine generator (WTG) with a full three-phase connection to the electrical distribution system was installed at the Hazleton site, Pennsylvania. The WTG consists of a 40-foot tower, 45-foot-diameter rotor, gearbox, 45 kW three-phase alternator, control panel, and three-phase rectifier. The ac output from the generator is rectified to dc and fed to a synchronous inverter. The line commutated synchronous inverter maintains synchronism to the utility grid and fires pulses of power each half cycle into the established 60 Hz utility sine-wave form. A 500 ampere-hour battery is connected to the dc bus for energy storage and to provide a steady load to help regulate the dc voltage and speed of the WTG. Plans for WTG testing and engineering analysis are considered. V.T.

A79-46541 # **Status of the Southern California Edison Company 3 MW wind turbine generator /WTG/ demonstration project.** R. L. Scheffler (Southern California Edison Co., Rosemead, Calif.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 312-315; Discussion, p. 316, 317.

A79-46542 # **The MOD-2 wind turbine.** J. E. Lowe and W. W. Engle (Boeing Engineering and Construction Co., Seattle, Wash.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 318-331; Discussion, p. 332, 333.

The development of the 300-ft diameter, 2.5 MW wind turbine electrical generator MOD-2 is presented and the outlook for its future commercial application is discussed. The ground rules for the design of the turbine included a horizontal axis configuration, an energy cost of 2 to 4 cents/kWh and a 30-year service life. The determination of system dimensions, component ratings and characteristics in the conceptual and preliminary design phases is discussed. Computer codes and alternative design configurations were verified by means of a wind tunnel test program. Design and operating characteristics of the turbine components, including the teetering rotor, low-natural-frequency tower, nacelle, electrical system and the control system and the system weight, performance and maintenance characteristics are presented. Depending on the completion of a number of evaluative and production tasks, a large-scale MOD-2 unit could be produced by 1984. A.L.W.

A79-46543 # **Magdalen Islands VAWT field test.** P. South (National Science and Engineering Research Council, Ottawa, Canada) and A. Watts (Hydro-Quebec, Institut de Recherche, Varennes, Canada). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 334-351; Discussion, p. 352. 6 refs.

In the spring of 1977, an experimental large vertical axis wind turbine (VAWT) was installed in the Magdalen Islands. The main objectives of the project are installation, operation and evaluation of the VAWT. The turbine has been operated at up to about 80 percent of design rpm. The information presented includes data from some of the 31 rpm tests which provide some insight into how the turbine will perform at its rated speed. Also, descriptions of the mechanical and electrical systems, foundations and installation method are given along with some estimates of energy production. S.D.

A79-46544 # **Summary report on the collapse of the Magdalen Islands wind turbine.** R. J. Templin (National Science and Engineering Research Council, Ottawa, Canada) and R. D. McConnell (Hydro-Québec, Institut de Recherche, Varennes, Canada). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 353-365.

A79-46545 # **Wind energy conversion system transient performance analysis.** W. W. Price (General Electric Co., Schenectady, N.Y.) and S. L. Macklis (General Electric Co., Valley Forge, Pa.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 366-376; Discussion, p. 377.

A79-46546 # **Impact of storm fronts on utilities with WECS arrays.** R. A. Schlueter, G. L. Park, H. Modir, J. Dorsey, and M. Lotfallian (Michigan State University, East Lansing, Mich.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 378-387. Research sponsored by the U.S. Department of Energy.

The research work described was aimed at determining the impact of significant changes in WECS generation on automatic generation control (AGC) regulation, economic dispatch, and governor frequency regulation. The results show that AGC saturation problems will occur in the presence of large simultaneous storm-induced WECS-generation and load changes. This problem is alleviated if spinning reserve margins are increased. An improvement in response to WECS generation changes is shown to be possible by including a higher percentage of faster responding units. A cyclic phenomenon was shown to take place on nuclear units if the generation changes on echelons are sufficiently large to cause frequency deviations that exceed governor deadband on the unit under consideration. V.P.

A79-46547 * # **Lewis Research Center studies of multiple large wind turbine generators on a utility network.** L. J. Gilbert (NASA, Lewis Research Center, Cleveland, Ohio) and D. M. Triezenberg (Purdue University, West Lafayette, Ind.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 388-402. 5 refs.

A NASA-Lewis program to study the anticipated performance of a wind turbine generator farm on an electric utility network is surveyed. The paper describes the approach of the Lewis Wind Energy Project Office to developing analysis capabilities in the area of wind turbine generator-utility network computer simulations. Attention is given to areas such as, the Lewis Purdue hybrid simulation, an independent stability study, DOE multiunit plant study, and the WEST simulator. Also covered are the Lewis mod-2 simulation including analog simulation of a two wind turbine system and comparison with Boeing simulation results, and gust response of a two machine model. Finally future work to be done is noted and it is concluded that the study shows little interaction between the generators and between the generators and the bus. M.E.P.

A79-46548 # **Field experience with wind turbine generator operation in utility systems.** T. W. Reddoch (Tennessee, University, Knoxville, Tenn.). In: Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings. Santa Cruz, Calif., Altas Corp., 1979, p. 403-413.

The present paper deals with three of the seventeen candidate sites which have been chosen by the Federal Wind Energy Program to study means of integrating wind technology into electric power systems. These sites are Clayton, N. Mex., Culebra, P.R., and Block Island, Rhode Island. Each site receives a DOE/NASA Mod O-A which is rated at 200 kW in a 22.4 mph wind at 30 m above ground level. An attempt is made to quantify some of the utility experience with the Mod O-A recorder to date. V.P.

A79-46660 # **Conserving energy via cogeneration.** W. B. Wilson (General Electric Co., Schenectady, N.Y.). *Mechanical Engineering,* vol. 101, Aug. 1979, p. 20-27.

Consideration is given to the problem of whether industrial plants can realize a return on investment (ROI) with the installation of a cogeneration system, as opposed to a system with process boilers and purchased electric power. Topics covered include low-level heat recovery, waste gas-flow requirements for steam generation and inlet steam pressure effects. Data are also given showing capital requirements and annual operating costs of process boilers versus steam turbine cogeneration, along with the effect of investment tax credit and depreciation allowances on discounted rate of return. It is concluded that for cogeneration projects with a typical 4 or 5 yr gross payout period, such tax incentives should significantly increase the number that will be implemented. M.E.P.

A79-46665 **Dynamic aspects of solid solution cathodes for electrochemical power sources.** S. Atlung, K. West, and T. Jacobsen (Danmarks Tekniske Hojskole, Lyngby, Denmark). *Electrochemical Society, Journal,* vol. 126, Aug. 1979, p. 1311-1320. 20 refs. Research supported by the Danish Council for Technical Scientific Research.

This paper considers the interaction between requirements of battery systems based on alkali metal anodes and solid solution cathodes with electrochemical and constructional factors. It postulates that the energy at a given load is limited by saturation of cathode particle surface layers with cations, and that saturation time is determined by cation and electron diffusion into the host lattice. Expressions are developed for plane, cylindrical, and spherical particles, giving the relation between the battery load and the amount of cathode material utilized before saturation. Cathode performance is described by the particle shape and the ratio of discharge time at 100% cathode utilization to the time constant for diffusion through the cathode particles. The properties of plane or few particle layer cathodes are examined in relation to traction requirements on the basis of estimated parameters for the Li/TiS2 couple with LiClO4-propylene-carbonate electrode. Limiting currents in the electrolyte are discussed, and a relation between the maximum particle size and electrode spacing is derived. A.T.

A79-46717 # **Turbulence dynamics in MHD plasmas.** M. Martinez-Sanchez (MIT, Cambridge, Mass.) and Y. Yam. *American Institute of Aeronautics and Astronautics, Fluid and Plasma Dynamics Conference, 12th, Williamsburg, Va., July 23-25, 1979, Paper 79-1538.* 12 p. 14 refs. Contract No. EF-76-C-01-2215.

Linearized solutions are obtained for the evolution of low magnetic Reynolds number turbulence in two cases: (1) homogeneous turbulence, non-zero Hall effect, and (2) mean flow shear, without Hall effect. It is shown that the presence of the Hall effect reduces turbulence damping, and redistributes it angularly so as to approach isotropy rather than two-dimensionality. In the presence of shear, the ratio of Reynolds stress to kinetic energy is reduced by the magnetic interaction for electrode walls, but increased for sidewalls. The results can be of use in improved models of turbulent boundary layers in large MHD channels. (Author)

A79-46757 **Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/.** V. A. Grilikhes, M. M. Grishutin, and V. S. Evseev. *(Geliotekhnika,* no. 4, 1978, p. 3-18.) *Applied Solar Energy,* vol. 14, no. 4, 1978, p. 1-12. 43 refs. Translation.

The basic characteristics of cycles and energy converters for Rankine-cycle electric energy systems with organic heat-exchange fluids are surveyed. Consideration is also given to the basic design features of such systems, with emphasis on the heat exchange equipment (steam generators, regenerators, and condensers). The application of such organic systems to the production of electric power from low-potential heat sources - solar radiation, geothermal waters, and industrial waste heat - is considered. It is found that the use of organic heat-exchange fluids will lead to considerable cost-savings. B.J.

A79-46758 **Thermodynamic analysis of combined GTP-TEG solar energy converter.** L. M. Drabkin (Tashkentskii Institut Zheleznodorozhnogo Transporta, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 4, 1978, p. 19-22.) *Applied Solar Energy,* vol. 14, no. 4, 1978, p. 13-16. Translation.

Consideration is given to the thermodynamic cycle of a solar energy system consisting of a thermoelectric generator connected to a gas turbine. Expressions are obtained for the efficiency and specific area of the refrigerator-radiator of such a system. This combined scheme is compared with a Brayton-cycle system with respect to optimization in terms of efficiency and specific area. B.J.

A79-46759 **Optimization of exponential alloying impurity distribution in semiconductor photoconverter base.** V. M. Evdokimov and Iu. D. Lisovskii (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 4, 1978, p. 23-29.) *Applied Solar Energy,* vol. 14, no. 4, 1978, p. 17-22. 17 refs. Translation.

A theoretical analysis is presented of the effect of the uniform electric field produced by an exponential distribution of dopants in the base of a photocell of finite thickness on the accumulation of charge carriers. It is assumed that the mobility and lifetime of carriers depend in power-law fashion on dopant concentration. An optimal field strength is determined and the dependence of the field on the parameters of the semiconductor and the wavelength of incident light is considered. B.J.

A79-46760 **Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters.** S. A. Azimov, Sh. A. Mirsagatov, D. T. Rasulov, and N. Iunusov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 4, 1978, p. 30-32.) *Applied Solar Energy,* vol. 14, no. 4, 1978, p. 23-25. Translation.

A79-46761 **Solar energy thermoreceiver with selective coating and vacuum thermoisolation.** G. Ia. Umarov, V. S. Trukhov, U. Kh. Gaziev, T. Baimatov, T. Z. Abidov, and Iu. E. Kliuchevskii (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 4, 1978, p. 46-50.) *Applied Solar Energy,* vol. 14, no. 4, 1978, p. 37-40. 8 refs. Translation.

The paper describes two design modifications of a solar-thermal-radiation detector with selective coating and screening vacuum insulation which operates reliably up to temperatures of 400 C. A method for calculating the operational characteristics of the detector is presented. Curves reflecting the dependence of thermal losses and efficiency on detector temperature for different modifications of the detector system and different solar energy densities are presented. B.J.

A79-46896 **Application of extruded porous materials from sintered nickel powder as fuel cell electrodes.** I. M. Fedorchenko, V. S. Pugin, P. A. Kornienko, D. A. Tkalenko, and L. G. Voloshina (Akademiia Nauk Ukrainskoi SSR, Institut Problem Materialovedeniia; Kievskii Politekhnicheskii Institut, Kiev, Ukrainian SSR). *(Poroshkovaia Metallurgiia,* Mar. 1979, p. 38-40.) *Soviet Powder Metallurgy and Metal Ceramics,* vol. 18, no. 3, Aug. 1979, p. 174, 175. Translation.

A79-46904 **Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters.** N. M. Bordina, T. M. Golovner, G. M. Grigor'eva, K. N. Zviagina, L. B. Kreinin, and N. A. Milovanova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 6, 1978, p. 3-11.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 1-8. 7 refs. Translation.

A79-46905 **The effect of errors in their shape on the characteristics of ellipsoidal concentrators of radiant energy.** L. Ia. Paderin. *(Geliotekhnika,* no. 6, 1978, p. 12-15.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 9-11. Translation.

A79-46906 **Accelerated tests of coatings.** R. A. Zakhidov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *(Geliotekhnika,* no. 6, 1978, p. 16-22.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 12-17. 11 refs. Translation.

The application of an accelerated test method based on the so-called physical principle of reliability to accelerated life testing of the coatings for solar concentrators is considered. Considerable simplification of the method is achieved by assuming a linear form for the function relating the service life of the object to its operating regime. P.T.H.

A79-46907 **Control of the radiant flux of high-temperature solar-energy installations with respect to two parameters.** V. V. Afian and A. V. Vartanian. *(Geliotekhnika,* no. 6, 1978, p. 23-25.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 18-20. Translation.

The principles of controlling a high-temperature solar installation with parabolic concentrator by means of simultaneous control over the power and density of the radiant flux at the center of the focal plane are developed. It is shown that by this method of power control there is practically no energy redistribution in a circle of radius equal to 0.001 times the ratio of the focal parameter of the parabola generator to the mirror precision measure. P.T.H.

A79-46908 **Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems.** N. I. Koriagin, Iu. M. Sigalov, Iu. N. Malevskii, and A. I. Malykhin (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *(Geliotekhnika,* no. 6, 1978, p. 26-31.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 21-25. Translation.

A79-46909 **Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers.** G. Ia. Umarov, R. R. Avezov, and N. A. Kakharov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 6, 1978, p. 41-46.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 33-37. 7 refs. Translation.

A79-46910 **Investigation of the spectral characteristics of metallized polymer films for making solar concentrators.** A. Iazkulyev, A. A. Trofimova, N. S. Galkina, and M. Kholeva (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *(Geliotekhnika,* no. 6, 1978, p. 53, 54.) *Applied Solar Energy,* vol. 14, no. 6, 1978, p. 44, 45. 5 refs. Translation.

A79-47019 **Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells.** R. O. Loutfy and J. H. Sharp (Xerox Research Centre of Canada, Mississauga, Ontario, Canada). *Journal of Chemical Physics,* vol. 71, Aug. 1, 1979, p. 1211-1217. 17 refs. Research supported by the National Research Council of Canada.

The photovoltaic properties of Schottky barrier solar cells, made by dispersing particles of the x form of metal-free phthalocyanine in a polymer binder and sandwiching between NESA (SnO2/Sb) and aluminum electrodes, were investigated. A power conversion efficiency of over 6% for transmitted light at low power densities was obtained for monochromatic irradiation at 670 nm, and at peak solar power density of 1400 W/sq m it decreases to 0.01%. The decrease in power conversion efficiency with intensity was attributed to a space charge limitation due to nonlinear resistance. Analysis of the action spectra of these devices showed the formation of a thin photoactive depletion region at the semiconductor/metal interface, and they are capable of capturing 30% of the solar spectrum within the photoactive region. The effect of pigment loading, cell thickness, light intensity, binder materials, doping, and dye sensitization were studied. A.T.

A79-47050 **The physics of solar cells.** K. W. Böer (Delaware, University; SES, Inc., Newark, Del.). *Journal of Applied Physics,* vol. 50, Aug. 1979, p. 5356-5370. 51 refs. Research supported by the U.S. Department of Energy and SES.

The photovoltaic mechanism is analyzed with special attention to the boundary conditions between emitter and junction. In frontwall cells, these boundary conditions are rather simple and permit a transparent analysis. They connect the current, determined by the emitter/junction boundary, with the potential drop in the junction, determined by the same condition, and yield the current-voltage characteristic without invoking the superposition principle. The chemistry of the interlayer between the emitter and the junction modifies this characteristic when causing major interface recombination, resulting in a potential deformation. Such behavior is analyzed in more detail for the example of CdS/Cu2S and Cd(z)Zn(1-z)S/Cu2S solar cells. Substantially improved agreement between the results of this theory and experiment is reached. (Author)

A79-47051 * **A simple theory of back-surface-field /BSF/ solar cells.** O. von Roos (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Journal of Applied Physics,* vol. 50, Aug. 1979, p. 5371-5374. Research sponsored by the U.S. Department of Energy.

An earlier calculation of the I-V characteristics of solar cells contains a mistake. The current generated by light within the depletion layer is too large by a factor of 2. When this mistake is corrected, not only are all previous conclusions unchanged, but the agreement with experiment becomes better. Results are presented in graphical form of new computations which not only take account of the factor of 2, but also include more recent data on material parameters. (Author)

A79-47054 **Study of the interface changes during operation of n CdTe-electrolyte solar cells.** C. Vázquez-López, F. Sánchez-Sinencio, J. S. Helman, A. Lastras-Martínez (Instituto Politécnico Nacional, Mexico City, Mexico), P. M. Raccah (Illinois, University, Chicago, Ill.), R. Triboulet (CNRS, Laboratoire de Physique des Solides, Meudon-Bellevue, Hauts-de-Seine, France), and J. L. Peña. *Journal of Applied Physics,* vol. 50, Aug. 1979, p. 5391-5396. 11 refs. Research supported by the Consejo Nacional de

Ciencia y Tecnología, Secretaría de Patrimonio y Fomento Industrial, and NSF.

Deterioration of nCdTe-electrolyte solar cells was studied by Auger electron spectroscopy, electroluminescence (EL) analysis, electroreflectance (ER) spectroscopy, and spectral response. It was shown that the failure mechanism involves out-diffusion of Cd(2 plus), leaving behind a rich Te layer and a p-type CdTe region. ER and EL studies also show the existence of the p-type region, and the evolution of the ER spectra as the p-type region develops was analyzed. This method makes possible easy control and optimization of the p-n junction growth parameter. The influence of the Te layer on the cell performance was determined from spectral response measurements.

A.T.

A79-47060 **Neon spectral line broadening as a diagnostic for compressed laser-fusion targets.** J. M. Auerbach, D. S. Bailey, S. S. Glaros, L. N. Koppel, Y. L. Pan, L. M. Richards, V. W. Slivinsky, and J. J. Thomson (California, University, Livermore, Calif.). *Journal of Applied Physics*, vol. 50, Aug. 1979, p. 5478-5483. 18 refs. Contract No. W-7405-eng-48.

Experiments have been conducted on the JANUS laser system to measure fuel density in imploded laser-fusion targets filled with deuterium, tritium, and neon. An X-ray crystal spectrometer was used to record the line emission of the 1s-2p line of the Ne(+g) ion. Simultaneous measurement of the linewidth and the neutron yield indicated that symmetrically irradiated exploding pusher targets reached fuel densities of approximately 1 g/cu cm. (Author)

A79-47062 **Ultrafine nickel particles for photothermal conversion of solar energy.** G. A. Niklasson and C. G. Granqvist (Chalmers Tekniska Hogskola, Goteborg, Sweden). *Journal of Applied Physics*, vol. 50, Aug. 1979, p. 5500-5505. 47 refs.

A study of gas-evaporated Ni particles produced under conditions such that NiO coatings separate the metal cores from one another, and used as a model substance simulating the properties of Ni grain containing photothermal converting surfaces is presented. Ni particles with maximum mean diameters of 10 microns were produced by inert-gas evaporation onto KBr plates, and heating in air to 400C produced electrical decoupling of the grains by formation of NiO pellicles. Transmittance measurements in the 0.3 to 30 micron range showed excellent spectral selectivity with high absorption over the solar spectrum and low absorption in the thermal infrared range. These properties prove that coatings with Ni grains are useful for the photothermal conversion of solar energy. A theoretical analysis of the optical properties of aggregated spherical particles with dielectric shells was made using an extended effective-medium theory based on the Maxwell Garnett approach.

A.T.

A79-47063 **Collection efficiency measurements on a-Si:H solar cells.** R. S. Crandall, R. Williams, and B. E. Tompkins (RCA Laboratories, Princeton, N.J.). *Journal of Applied Physics*, vol. 50, Aug. 1979, p. 5506-5509. 11 refs. Research supported by RCA; Contract No. EY-76-C-03-1286.

The collection efficiency of a-Si:H Schottky-barrier solar cells is measured and the discrepancy between actual and maximum efficiencies is investigated. The collection efficiency of layers of a-Si:H with platinum barrier contacts was determined as a function of barrier thickness or depletion width by varying the applied voltage. Bias voltage-diode current curves for a Pt-a-Si:H diode reveal a higher fill factor in blue light (400 nm), which is absorbed near the surface, than in red light (630 nm), which is absorbed in the barrier region. In blue light the collection efficiency is found to be independent of barrier thickness, indicating a minority carrier diffusion length much greater than the barrier thickness. In blue light, however, the collection efficiency is found to vary strongly with barrier thickness, suggesting a field-dependent carrier-generation process which would dramatically reduce collection efficiency at an illumination of one sun.

A.L.W.

A79-47071 **The race for unlimited energy.** G. N. Patterson (Toronto, University, Downsview, Ontario, Canada). Research sponsored by the University of Toronto. Downsview, Ontario, Canada, University of Toronto, 1979. 158 p. 15 refs. $6.50.

The conversion of national economies from those based on fossil fuels to those based on renewable or unlimited sources of energy is examined, with emphasis given to the position of Canada. The predicted demand for energy, which defines the future requirements to be met, is outlined, and the technical feasibility, environmental protection requirements, economic viability, domestic Canadian resources and necessary research and development activities are assessed for fossil fuels, nuclear fission, nuclear fusion, geothermal energy, solar energy, biomass energy, hydropower, wind energy and tidal power. Consideration is given to electrical power transmission systems and the depletion dates for fossil fuels and the lead times necessary to bring new energy sources on line are discussed, along with specific recommendations. The roles and interrelationships of government, industry and universities in Canada's pluralistic energy system are described and improved coordination is recommended.

A.L.W.

A79-47072 **European technology for obtaining energy from solid waste.** Edited by D. J. De Renzo. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 34; Pollution Technology Review, No. 54), 1978. 299 p. $39.

Western Europe is definitely the leader in the field of energy recovery from the combustion of municipal solid waste. For each country a national overview is given, followed by a description of particularly significant developments and case histories: household sorting and collection methods, combustors, furnaces, incinerators, air pollution control, latest plant designs, operation and economics. The case studies concern Toulouse-Le Mirail, France; Geneva-Cheneviers, Switzerland; Korsor, Denmark; Munich, Germany; and Brive, France. A summary of key findings is included along with maps and a tabulation of the European systems.

S.D.

A79-47198 **Solar irradiance measurements by means of optical fibers and silicon detectors.** A. Corrons and A. Pons (Consejo Superior de Investigaciones Cientificas, Instituto de Optica, Madrid, Spain). *Applied Optics*, vol. 18, Aug. 15, 1979, p. 2902-2904. 11 refs.

An experimental system has been constructed for the continuous measurement of solar irradiance using silicon diode detectors not directly exposed to solar radiation. The received incident solar radiation is conducted from the roof of the building to the detectors by an optical fiber. An electronic computer receives the signal and processes it, introducing the necessary corrections to calculate the total solar irradiance in W sq/m. The system measures with a proved accuracy to better than 3%.

(Author)

A79-47255 **Advances in heat transfer. Volume 14.** Edited by T. F. Irvine, Jr. (New York, State University, Stony Brook, N.Y.) and J. P. Hartnett (Illinois, University, Chicago, Ill.). New York, Academic Press, Inc., 1978. 375 p. $34.50.

These articles review recent advances in the theoretical and experimental study of heat transfer in various fields. Studies of heat transfer in geothermal systems are discussed, along with the literature on electrohydrodynamically (EHD) coupled heat transfer in liquids. Other topics include heat transfer between a gas fluidized bed and immersed boiler tubes, the effect of radiative transfer on certain types of motion in planetary atmospheres, and homogeneous nucleation in single-component vapors.

F.G.M.

A79-47256 **Heat transfer in geothermal systems.** P. Cheng (Hawaii, University, Honolulu, Hawaii). In: Advances in heat transfer. Volume 14. New York, Academic Press, Inc., 1978, p. 1-105. 202 refs. Research supported by Stanford University; NSF Grants No. AER-72-03490-A04; No. ENG-77-272527; Contract No. E(04-3)-1093.

Theoretical and experimental investigations of convective heat transfer in geothermal systems are reviewed. The governing equations for such heat transfer in geothermal systems are examined, along with heat transfer in hot-water, water-steam two-phase, and geopressured geothermal systems. Lumped-parameter analyses for predicting averaged reservoir characteristics during production are considered, heat transfer in other geothermal systems (e.g., dry hot rock and magma) is briefly discussed, and investigations of heat transfer in geothermal wellbores are summarized. It is concluded that studies based on the idealization of a geothermal reservoir as a saturation porous medium can provide considerable insight into the physical processes involved. F.G.M.

A79-47260 **Space technology spinoffs.** G. Gurney (U.S. Department of Defense, Washington, D.C.). New York, Franklin Watts, Inc., 1979. 94 p. 10 refs. $5.90.

This popular work discusses the benefits derived from the NASA space program in areas including medicine, environmental protection, energy conservation and transportation. It examines the ability of space technology to meet the needs of society and its transfer into everyday life. Various contemporary and future space missions, including Landsat, Nimbus and GEOS are examined with reference to future possibilities of technology transfer. C.F.W.

A79-47360 * **Energy budget of the volcano Stromboli, Italy.** T. R. McGetchin (Lunar and Planetary Institute, Houston, Tex.) and B. A. Chouet (MIT, Cambridge, Mass.). *Geophysical Research Letters,* vol. 6, Apr. 1979, p. 317-320. 24 refs. Contract No. NSR-09-051-001.

The results of the analyses of movies of eruptions at Stromboli, Italy, and other available data are used to discuss the question of its energy partitioning among various energy transport mechanisms. Energy is transported to the surface from active volcanoes in at least eight modes, viz. conduction (and convection) of the heat through the surface, radiative heat transfer from the vent, acoustical radiation in blast and jet noise, seismic radiation, thermal energy of ejected particles, kinetic energy of ejected particles, thermal energy of ejected gas, and kinetic energy of ejected gas. Estimated values of energy flux from Stromboli by these eight mechanisms are tabulated. The energy budget of Stromboli in its normal mode of activity appears to be dominated by heat conduction (and convection) through the ground surface. Heat carried by eruption gases is the most important of the other energy transfer modes. Radiated heat from the open vent and heat carried by ejected lava particles also contribute to the total flux, while seismic energy accounts for about 0.5% of the total. All other modes are trivial by comparison. S.D.

A79-47399 **Ion heating in the LT-3 tokamak.** E. L. Bydder, B. S. Liley (Waikato, University, Hamilton, New Zealand), and A. H. Morton (Australian National University, Canberra, Australia). *Plasma Physics,* vol. 21, Aug. 1979, p. 669-686. 15 refs.

Results are reported for measurements of the ion temperature in the LT-3 tokamak device obtained by using a calibrated neutral-particle analyzer. Properties of the LT-3 machine are discussed, along with the neutral-particle analyzer, the ion energy profiles measured, time evolution of the disruptive instability in LT-3, and the calculated signal levels. The results show that the disruptive instability provides strong turbulent heating of the plasma ions and that all of the ions are most likely heated to several hundred electron volts in LT-3. However, the (energy) confinement time of the hot-ion plasma is found to be short, typically 50 to 80 microsec, presumably due to heat conduction. F.G.M.

A79-47419 **Realistic Vlasov slab equilibria with magnetic shear.** H. E. Mynick, W. M. Sharp, and A. N. Kaufman (California, University, Berkeley, Calif.). *Physics of Fluids,* vol. 22, Aug. 1979, p. 1478-1484. 13 refs. Research supported by the U.S. Department of Energy.

A method is described for generating exact Vlasov slab equilibria to model high-beta plasmas with strong magnetic shear. Physically reasonable distribution functions that account for such effects as end losses and density gradients are constructed from constants of the motion and used to calculate the self-consistent electrostatic and magnetic fields. As an application, numerically calculated equilibria modeling a tormac sheath are presented. (Author)

A79-47421 **High-frequency convective loss-cone instability in short mirror machines.** M. J. Gerver (Cornell University, Ithaca, N.Y.). *Physics of Fluids,* vol. 22, Aug. 1979, p. 1510-1516. 10 refs. Contract No. EY-76-S-02-3170-1.

The high-frequency convective loss-cone mode is found to be absolutely unstable, due to (exponentially small) reflection of waves at the mirror throats; the critical length for stability is only a few ion Larmor radii. For Beta much greater than m sub e/m sub i, the following methods are shown not to substantially increase the critical length: (1) gradual tapering of the mirror throats (to reduce reflection); (2) partial filling of the loss cone with small amounts of warm plasma; (3) considering only low k-perpendicular modes (since high k-perpendicular modes may saturate at a low level). This result places serious limitations on the design of mirror fusion reactors. (Author)

A79-47422 **Stability of tokamaks with elongated cross section.** C. H. An (Tennessee, University, Knoxville, Tenn.) and G. Bateman (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *Physics of Fluids,* vol. 22, Aug. 1979, p. 1517-1526. 37 refs. Contracts No. EY-76-S-052598; No. W-7405-eng-26.

Fixed boundary n = 1 magnetohydrodynamic instabilities are studied computationally as a function of diamagnetism Beta sub p and current profile in elongated toroidal equilibria (1 is less than b/a is less than or equal to 4). It is found that even slightly diamagnetic plasmas with a broad current profile and a highly elongated cross section are subject to a ballooning instability for q values well above unity at the magnetic axis. A peaked current profile in a mildly diamagnetic plasma decreases the elongation of the inner flux surfaces and reduces the marginal q value by suppressing ballooning modes. The maximum stable volume-averaged beta is achieved with a broad current profile and either a paramagnetic plasma (Beta sub p is less than 1) with a highly elongated cross section (b/a is greater than 2) or a diamagnetic plasma (Beta sub p is greater than 1) with only a mildly elongated cross section (b/a is less than 2). (Author)

A79-47424 **Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas.** G. P. Leclert (MIT, Cambridge, Mass.; Nancy, Université, Nancy, France), C. F. F. Karney, A. Bers (MIT, Cambridge, Mass.), and D. J. Kaup (MIT, Cambridge, Mass.; Clarkson College of Technology, Potsdam, N.Y.). *Physics of Fluids,* vol. 22, Aug. 1979, p. 1545-1553. 19 refs. NSF Grants No. ENG-75-06242; No. MPS-75-07568; Contracts No. EX-76-01-22959; No. N00014-76-C-0867.

For lower hybrid waves in an inhomogeneous plasma, the two-dimensional self-modulation effects due to ponderomotive force are studied under the assumption that the field is electrostatic and has a narrow k spectrum. For a locally linear temperature profile and a broad class of density profiles, exact nonlinear solutions (solitons) are obtained by the inverse scattering method. The solitons decay and spread as they propagate. In addition to the usual area condition on the potential integral of phi d xi is greater than or equal to pi/2. Inhomogeneity introduces a second condition for solitons to occur. It is shown that this second condition is not satisfied in typical tokamak plasmas, i.e., there is no soliton formation, in contrast to the homogeneous case. Furthermore, the scaling of the threshold conditions with density and temperature makes them more difficult to satisfy in larger machines. (Author)

A79-47426 **Effects of turbulent heating in the Texas turbulent torus.** K. W. Gentle, R. Bengtson, J. Jancarik, T. Kochanski, D. Patterson, P. Phillips, and R. Stinnett (Texas, University, Austin, Tex.). *Physics of Fluids,* vol. 22, Aug. 1979, p. 1558-1569. 17 refs. Research supported by the U.S. Department of Energy and Texas Atomic Energy Research Foundation.

Turbulent heating of a 10 cm radius plasma in a tokamak configuration with densities up to 10 to 13th per cu cm produces a strong skin effect. Although the applied electric field at the outside of the column reaches 100 V/cm and the electron drift velocity exceeds the thermal velocity, penetration is slight at these densities during the microsec pulse. The energy dissipated in the skin during the pulse can reach 5 mJ cu cm, the equivalent of 30 keV per electron there, but losses associated with the turbulence are substantial. Average electron energies from the heating larger than 2 keV in the skin and 500 eV overall have not been found. (Author)

A79-47427 **Effect of scrape-off on tokamak radial transport.** A. El-Nadi (Cairo University, Giza, Egypt). *Physics of Fluids,* vol. 22, Aug. 1979, p. 1570-1573. 11 refs.

A general procedure is presented to evaluate the tokamak particle and energy losses in the presence of a poloidal divertor or a toroidal limiter, assuming cold collisional electrons and hot collisionless ions in the scrape-off layer. The case of the limiter is treated in detail and approximate expressions for the losses, to be incorporated in the tokamak transport equations, are obtained. The importance of the barely trapped particles in determining the radial profiles is emphasized. (Author)

A79-47452 **A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas.** P. C. Efthimion, V. Arunasalam, R. Bitzer, L. Campbell, and J. C. Hosea (Princeton University, Princeton, N.J.). *Review of Scientific Instruments,* vol. 50, Aug. 1979, p. 949-951. 10 refs. Contract No. EY-76-C-02-3073.

A fast-scanning heterodyne receiver into a plasma diagnostic that measures the fundamental cyclotron emission from the PLT plasma and thus ascertains the time evolution of the electron temperature profile was developed. The receiver scans 60-90 GHz every 10 ms and is interfaced to a computer for completely automated calibrated temperature measurements. (Author)

A79-47490 # **Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels (Fotoelektricheskie kharakteristiki kremnievykh struktur dielektrik-poluprovodnik s indutsirovannym kanalom).** B. I. Gil'man, A. P. Gorban', M. B. Zaks, V. G. Litovchenko, V. V. Kasatkin, A. A. Serba, and Iu. V. Skokov (Akademiia Nauk Ukrainskoi SSR, Institut Poluprovodnikov, Kiev, Ukrainian SSR). *Poluprovodnikovaia Tekhnika i Mikroelektronika,* no. 29, 1979, p. 19-24. 14 refs. In Russian.

An experimental study of the characteristics of silicon insulator/semiconductor structures with induced channels is presented. Consideration is given to (1) the photo-I-V characteristics, (2) dependence of short-circuit current on illumination, (3) the spectral characteristics, and (4) local photosensitivity. The development of solar cells on the basis of these structures is considered. B.J.

A79-47506 **Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan.** K. Nagao, N. Takaoka (Osaka University, Toyonaka, Japan), and O. Matsubayashi (Geological Survey of Japan, Kawasaki, Japan). *Earth and Planetary Science Letters,* vol. 44, no. 1, July 1979, p. 82-90. 14 refs.

Anomalous isotopic compositions of rare gases were determined for gas samples enriched in CO2 collected in the Nigorikawa geothermal area, Hokkaido, Japan. A high isotopic ratio of 3He/4He=(9.95 plus or minus 0.25) times 10 to the minus 6th power was obtained for a sample collected from bubbles seeping out of a cold water pond in an abandoned sulfur mine. The sample had a rare gas elemental abundance pattern attributable to low-temperature solubility of atmospheric rare gases in water, and soil gas samples indicate mass fractionation of atmospheric rare gases, in addition to the originally high 3He/4He ratio. The highest 20Ne/22Ne ratio was associated with the highest 36Ar/38Ar ratio, and a systematic enrichment of the light isotopes of Kr and Xe. The enrichment of the light isotopes in gas and soil gas samples was accompanied by a systematic enrichment of the light gases, and migration of rare gas in the crust is responsible for this isotopic and elemental fractionation. A.T.

A79-47573 **Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems.** K. M. Aref'ev, V. M. Borishanskii, N. I. Ivashchenko, and N. M. Fishman. *Heat Transfer - Soviet Research,* vol. 10, Nov.-Dec. 1978, p. 132-140. 6 refs. Translation.

A technique for calculating heat and mass transfer in the condensation of an alkali-metal additive in the form of a fog has been developed. Experimental data on the deposition of cesium vapor from argon under conditions close to those prevailing in condensing heat exchangers of closed-cycle MHD units are presented. It is shown that fog formation greatly reduces the deposition of the metal from the gas onto cold surfaces of the condensing heat exchanger. (Author)

A79-47591 **Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis (Aktivierung und Adsorptionsverhalten von Eisenfällungskatalysatoren für die Fischer-Tropsch-Synthese).** J. Kneer, W. Bradler, and M. Ralek (Berlin, Technische Universität, Berlin, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 32, July 1979, p. 323-325. 22 refs. In German.

The chemisorption of CO on promoted catalysts was investigated with regard to the pretreatment by a temperature programmed desorption (TPD) technique. Two different states were indicated where the kind of pretreatment affects the BET surface, the amount of adsorbed gas, and the capacity of the two chemisorption states. It was found that catalysts treated with CO alone had a higher coverage of chemisorption while those treated with both CO and H displayed opposite behavior. Results showed that activation energies of desorption differ by approximately 6kJ/mol regardless of the degree of alkalinization at selected capacities and that the adsorption capacity shows an evident increase for H treated catalysts depending on the alkalinization which is duplicated with additional CO treatment. C.F.W.

A79-47602 **Theta-pinch description from classical electrodynamics.** E. A. Witalis (Forsvarets Forskningsanstalt, Stockholm, Sweden). *International Journal of Fusion Energy,* vol. 2, Winter 1979, p. 67-87. 32 refs.

The large and extensively reported discrepancies between theoretically expected and experimentally observed theta-pinch properties are briefly reviewed. The denial in basic MHD theory of the observed strong plasma mass rotation can be traced back to a too simplified and restrictive plasma single-fluid formulation. Adopting a two-fluid description, a basic equation for ion motion is rewritten so as to express, in a moving frame, conservation of ionic canonical angular momentum. The electronic charge transport in fluid and particle formulations is discussed and expressed quite generally as a magnetization current. The combined ion and electron charge equations yield upon integration a linear differential equation for which the presented solutions relate the magnetic flux within the plasma to the plasma column expansion or compression. Special attention is given to solutions that describe much discussed observations like the separation of the imploding plasma density gradient ahead of or behind the magnetic field gradient, or an azimuthal ion velocity reversal. The 'magnetic piston' concept is criticized. Power and energy considerations from classical electromagnetic theory of magnetized media and linear current systems explain the remarkable influence of initial bias field upon the implosion dynamics. (Author)

A79-47651 * # **A mobile apparatus for solar collector testing.** G. B. Hotchkiss (Texas Instruments, Inc., Dallas, Tex.), F. F. Simon (NASA, Lewis Research Center, Cleveland, Ohio), and L. C. Burmeister (Kansas, University, Lawrence, Kan.). *American Society of Mechanical Engineers, Design Engineering Conference and Show, Chicago, Ill., May 7-10, 1979, Paper 79-DE-5.* 6 p. 14 refs. Grant No. NsG-3087.

The design, construction, and operation of a mobile apparatus for solar collector testing (MASCOT) is described. The MASCOT is a self-contained test unit costing about $10,000 whose only external requirement for operation is electrical power and which is capable of testing two water-cooled flat-plate solar collectors simultaneously. The MASCOT is small enough and light enough to be transported to any geographical site for outdoor tests at the location of collector usage. It has been used in both indoor solar simulator tests and outdoor tests. (Author)

A79-47652 # **Computer simulation and design of the control system for a wind turbine generator.** H. Sambar, V. Pavelic, and R. J. Warner (Wisconsin, University, Milwaukee, Wis.). *American Society of Mechanical Engineers, Design Engineering Conference and Show, Chicago, Ill., May 7-10, 1979, Paper 79-DE-9.* 5 p. 8 refs.

The wind turbine generator proposed is a horizontal axis machine with three blades operating downwind. A hydraulic system actuates mechanical linkages to control blade pitch during operation. The blade pitch control concept provides active control of rotor rpm above the rated wind speed and during no load condition. The lowering of blade and tower loads while providing the capability for well tuned rotor control are its primary features. A hydraulic system, designed to control the pitch of the blades of a wind turbine generator, is simulated on the digital computer using the Runge-Kutta method. The control system subroutine is coupled with the aerodynamic subroutines of the blades to represent the model for the wind turbine generator. The response of the simulated wind turbine to a real wind case is shown to agree with the desired response. (Author)

A79-47700 # **The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station (K voprosu ob optimizatsii sootnosheniia k.p.d. obratimykh gidroagregatov gidroakkumuliruiushchikh elektrostantsii).** V. A. Shapovalova (Leningradskii Politekhnicheskii Institut, Leningrad, USSR). *Energetika,* vol. 22, Apr. 1979, p. 87-90. 6 refs. In Russian.

The optimum relationship between the efficiencies of the pump and turbine regimes of hydraulic accumulator hydroelectric station operation is investigated. Factorial design is employed to analyze the relative influences of the efficiencies of the turbine and pump regimes and the power produced and required. It is found that the effectiveness of a hydraulic accumulator power station depends on the relationship between turbine and pump efficiencies and the capital investments in the equipment, the extent of the influence of the turbine/pump relationship depending on the capital investment. A.L.W.

A79-47790 **Ni cermet selective absorbers for solar photothermal conversion.** M. Okuyama, K. Furusawa, and Y. Hamakawa (Osaka University, Toyonaka, Japan). *Solar Energy,* vol. 22, no. 6, 1979, p. 479-482. 23 refs.

Optical properties of Ni cermet thin film have been investigated for a selective absorber of photothermal conversion devices. Fabrication technology is presented for cermet with fine particles of Ni embedded in SiO2 or MgO(SiO2/Ni, MgO/Ni). Optimum design calculations for these surfaces have been made and discussed with the experimental results. Fabricated multilayer films consisting of SiO2-Ni cermet-Ni exhibit good photothermal conversion efficiency and thermal stability at high temperature up to 773K. (Author)

A79-47791 **Thermodynamic basis for the choice of working fluids for solar absorption cooling systems.** G. Ali Mansoori and V. Patel (Illinois, University, Chicago, Ill.). *Solar Energy,* vol. 22, no. 6, 1979, p. 483-491. 11 refs. NSF Grant No. GK-43139.

Through the application of the first and second laws of thermodynamics upper and lower limits for the coefficient of performance (COP) of absorption cooling cycles are derived. These upper and lower limits, besides being dependent on the environmental temperatures of components of the cycle, are also dependent on the thermodynamic properties of refrigerants, absorbents, and their mixtures. With the use of these upper and lower limits of COP it is now possible to make a quantitative comparative study of different refrigerant-absorbent combinations. The technique developed is applied for the comparative evaluation of NH3+H2O, NH3+NaSCN and H2O+LiBr combinations which are the favorable candidates used in solar absorption cooling cycles. (Author)

A79-47792 **An analysis of the terminal concentrator concept for solar central receiver systems.** K. Athavaley, F. Lipps, and L. Vant-Hull (Houston, University, Houston, Tex.). *Solar Energy,* vol. 22, no. 6, 1979, p. 493-504. 5 refs. NSF Grant No. GI-39456; Contract No. EG-77-C-04-3974.

The central receiver system concept, a large scale solar energy development for electrical power production, is presented. This system employs a large number of individual guided heliostats that reflect the sunlight towards a central receiver high above the heliostat field. In the case where high concentration is needed a terminal concentrator used to increase the concentration of solar flux reflected from the collector field is attached. It was found, however, that to provide for maximum concentration, the terminal concentrator becomes excessively large and consequently a different design was developed that produces 90% concentration and reduces the size of the conical reflector by 5 or 6 times. Results show that this design of a practical terminal concentrator of canonical variety will nearly double the concentration without losing any total power. C.F.W.

A79-47794 **Thermal analysis in the focal spot of a solar furnace.** E. Lorenzini and M. Spiga (Bologna, Università, Bologna, Italy). *Solar Energy,* vol. 22, no. 6, 1979, p. 515-520. 9 refs.

A79-47795 **Relation between concentration and acceptance in solar collectors.** F. Grasso, F. Musumeci, and A. Triglia (Catania, Università, Catania, Italy). *Solar Energy,* vol. 22, no. 6, 1979, p. 521-525. 7 refs.

The maximum concentration ratio has been derived by Winston for optical systems having an angular acceptance described by a step function. In this paper a more comprehensive relation between maximum concentration ratio and angular acceptance is obtained. This relation is valid for any acceptance function; the proof is based on thermodynamics and is valid for large angles as well. The total energies collected yearly by concentrators having different acceptance functions are compared. (Author)

A79-47796 **Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/.** P. A. Mangarella and W. E. Heronemus (Woodward-Clyde Consultants, San Francisco, Calif.). *Solar Energy,* vol. 22, no. 6, 1979, p. 527-533. 20 refs. NSF Grant No. GI-34979.

The thermal properties of the Florida Current are presented and analyzed for the available ocean thermal energy. For a cold water intake depth equal to or greater than 600 m, potential sites for ocean thermal energy conversion (OTEC) power plants appear to exist in the Straits of Florida and, to a lesser extent, off the coasts of Georgia and South Carolina. The maximum thermal differences occur on the continental shelf because of the geostrophic motion of the Gulf Stream. An estimate of the total available ocean thermal energy from the Florida Current, delivered in the form of electricity, is 3.5 x 10 to the 12th kWh/yr. For a cold water suction depth of 600 m or more, seasonal variability in the ocean thermal resource is approx. + or - 35 per cent of average annual output. (Author)

A79-47797 **An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University.** K. Hinotani, K. Kanatani, and

M. Osumi (Sanyo Electric Co., Ltd., Hirakata, Osaka, Japan). *Solar Energy,* vol. 22, no. 6, 1979, p. 535-545. 5 refs.

A79-47798 **New technologies for solar energy silicon - Cost analysis of UCC Silane process.** C. L. Yaws, F. C. Jelen, K.-Y. Li, P. M. Patel (Lamar University, Beaumont, Tex.), and C. S. Fang (Southwestern Louisiana, University, Lafayette, La.). *Solar Energy,* vol. 22, no. 6, 1979, p. 547-553. 49 refs. Research sponsored by the U.S. Department of Energy.

A preliminary process design was performed to provide detailed data for cost analysis. The design was based on a plant size of 1000 metric tons/yr production of solar cell grade silicon. Cost and sensitivity analysis results are presented for producing silicon which includes costs for raw materials, labor, utilities, and other items composing product cost. For sensitivity analysis, the order of cost parameter influence on product cost is given by plant investment, raw materials, labor, and utilities. A cost and profitability analysis summary is also presented including sales price of polysilicon at various rates of return on investment. V.T.

A79-47799 **Cover systems for high temperature flat-plate solar collectors.** R. Gani and J. G. Symons (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Highett, Victoria, Australia). *Solar Energy,* vol. 22, no. 6, 1979, p. 555-561. 11 refs.

A simulation study has been conducted of the influence of cover design on the thermal performance of flat-plate solar collectors for use at temperatures of 150 C. Detailed results are presented of the effects of changes in cover materials, cover surface treatments, cover system configuration and absorber plate surface treatments on both the instantaneous efficiency and the long term solar contribution of flat-plate collectors. For the simulation conditions, it is shown that flat-plate collectors consisting of a single high transmittance cover, a convection suppressing device such as a honeycomb and a selective absorber surface yield long term solar contributions comparable to those of evacuated tubular collectors, whereas other configurations simulated (single and multiple cover systems) are significantly inferior. (Author)

A79-47800 **Analysis of an evacuated cylindrical solar collector.** J. D. Felske (New York, State University, Amherst, N.Y.). *Solar Energy,* vol. 22, no. 6, 1979, p. 567-570. 9 refs. NSF Grant No. PTP-75-05156.

Equations for computing the transmission of beam radiation through a cylindrical glass envelope and onto an enclosed flat absorbing plate are developed for an evacuated solar collector. The study applies to the general case where the plate and cylinder are arbitrarily oriented and receive beam radiation from any arbitrary direction. The resulting cylinder transmittances for all possible orientations are compared with the corresponding flat-plate transmittances. It is shown that depending upon the conditions, the cylinder may have either a greater or a lesser transmittance than the flat plate. V.T.

A79-47802 **Fabrication and characterization of SnO2/n-Si solar cells.** T. Nagatomo, M. Endo, and O. Omoto (Shibaura Institute of Technology, Tokyo, Japan). *Japanese Journal of Applied Physics,* vol. 18, June 1979, p. 1103-1109. 17 refs.

SnO2/n-Si solar cells fabricated by the spray pyrolysis technique display significant photovoltaic effects when exposed to sunlight. These solar cells have a thin insulating layer at the SnO2/n-Si interface. The presence of the thin insulating layer can increase the open-circuit voltage by increasing the diode quality factor and by reducing the dark saturation current. The performance of this heterojunction solar cell was an open-circuit voltage of 0.52 V, short-circuit current of 21.0 mA/sq cm, fill factor of 0.53 and conversion efficiency of 7.2%. The relative photospectral response above fifty percent spreads in a range of 420 to 1020 nm and is wider than that of conventional Si p-n solar cells. One possibility for cost reduction lies in the method of junction fabrication, and the idea of a simply deposited SnO2/n-Si junction is very attractive. (Author)

A79-47804 **Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma.** T. Matoba, T. Itagaki, T. Yamauchi, and A. Funahashi (Japan Atomic Energy Research Institute, Tokai, Japan). *Japanese Journal of Applied Physics,* vol. 18, June 1979, p. 1127-1133. 5 refs.

The light scattering spectrum from a high temperature plasma is calculated for the second order in v/c (c = light speed) and the second order approximate formula is obtained from the calculation. The blue side shift of the peak derived from the second order approximate formula agrees well with that of the full relativistic spectrum for an electron temperature of several tens of keV and less. The second order apparent temperature and density are deduced with an accuracy of better than 8% in the range up to 20 keV and 100 keV for scattering angles of 90 and 50 deg, respectively, by application of the least-square procedure. (Author)

A79-47805 **Characteristics of co-axial Marx generator and its application to electron beam fusion.** K. Takagi, Y. Kubota, and A. Miyahara (Nagoya University, Nagoya, Japan). *Japanese Journal of Applied Physics,* vol. 18, June 1979, p. 1135-1141. 7 refs.

A co-axial Marx generator with a short rise time of pulse less than 4 nsec, and approximately 40 nsec flat top duration was successfully constructed. For the attainment of electron beam fusion, the requirements for the beam source are a rise time of less than 1 nsec, an impedance of less than 0.01 ohm and an inductance of less than several nH/MV. The co-axial Marx generator can be considered to be the most important tool for these purposes. The rectangular output pulse of the co-axial Marx generator was analyzed and applied to electron beam fusion. (Author)

A79-47806 **A method for measuring the photothermal conversion efficiency of solar energy.** T. Tanaka (Sony Corp., Research Center, Yokohama, Japan). *Japanese Journal of Applied Physics,* vol. 18, June 1979, p. 1153-1155.

An instrument and a method for measuring the photothermal conversion efficiency of solar energy, based on a temperature equilibrium-type radiometer, are described. The efficiency of certain transition metal oxides is measured at room temperature using samples 0.7 mm in thickness. Magnetite and cupric oxide have efficiencies of 0.93 and 0.96, respectively. (Author)

A79-47807 **Production of repetitive dense plasmas in a focus device with inductive energy storage.** I. Ueno (Tokyo, University, Tokyo, Japan), J. Salge, B. Fell, U. Braunsberger (Braunschweig, Technische Universität, Braunschweig, West Germany), and H. Conrads (EURATOM and Kernforschungsanlage Jülich GmbH, Institut für Plasmaphysik, Jülich, West Germany). *Japanese Journal of Applied Physics,* vol. 18, June 1979, p. 1189, 1190. 5 refs. Research sponsored by the Deutsche Forschungsgemeinschaft and Alexander von Humboldt-Stiftung.

A plasma focus device with inductive energy storage is described, and evidence is presented for a mode of the plasma-focalization sequence different from the mode reported by Salge et al. (1978). Characteristics of the plasma-focus repetition are examined for the case where the focus is supplied with a long-lasting current pulse from inductive energy storage. Experiments are discussed which show that the focus discharges are self-triggered at the breech end of the accelerator and that neutron bursts are observed for every subsequent pinch at the top of the accelerator. F.G.M.

A79-47812 Market penetration characteristics for energy production and atmospheric carbon dioxide growth. J. A. Laurmann (Stanford University, Stanford, Calif.). *Science,* vol. 205, Aug. 31, 1979, p. 896-898. 8 refs.

Estimates are given for the maximum rate at which fossil fuel consumption can be reduced by the introduction of noncarbon-based energy sources, according to the market penetration time concept. These estimates indicate an immediate need to implement a revised energy policy if major climatic changes induced by increased amounts of carbon dioxide are to be avoided in the next century. However, application of market penetration ideas to energy consumption is new and may not be valid for the prediction of future trends. (Author)

A79-47813 Dehydration of ethanol - New approach gives positive energy balance. M. R. Ladisch and K. Dyck (Purdue University, West Lafayette, Indiana). *Science,* vol. 205, Aug. 31, 1979, p. 898-900. 26 refs.

A method of dehydrating ethanol in which the combustion energy of the ethanol product exceeds the energy needed to carry out the dehydration by a factor of 10 is presented. This involves removing water from aqueous ethanol by using cellulosic materials, starch, corn, and other agents. Column temperature was found to have a significant effect on dehydration: at T equal to 91 C, corn easily dehydrates alcohol and at 79.5 C this capacity is diminished. The advantage of using organic rather than inorganic dehydration agents is that the temperature of regeneration is lower for starch or cellulosics (60 to 110 C) than for CaO (160 to 170 C), thus utilizing lower temperature energy for regenerating a dehydrating agent such as cellulose or starch. C.F.W.

A79-47882 # Manned strategic system concepts 1990-2000. C. D. Wiler and D. P. Raymer (Rockwell International Corp., North American Aircraft Group, Los Angeles, Calif.). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1793.* 15 p. Contract No. F33615-77-C-0115.

Manned strategic system concept designs are discussed, requiring the development of new technologies in the areas of aerodynamics, propulsion, structures, controls, and stealth. A total of 34 innovative concepts were prepared using the advanced technologies. Concepts were designed to a strategic 'high-low-low-high' missions, with several exceptions, and can be grouped into four major categories: (1) low-cost simplistic, (2) minimum weight, (3) supersonic penetration, (4) laser defended. The concepts were qualitatively rated to select the best two or three concepts in each category. These remaining candidate concepts were then subjected to a preliminary sizing exercise to select one baseline per category. The baselines were sized, configurated, analyzed, and reconfigurated. V.T.

A79-47906 # All electric subsystems for next generation transport aircraft. J. W. Phillips (Lockheed Georgia Co., Flight Sciences Div., Marietta, Ga.) and N. E. Wood (AiResearch Manufacturing Company of California, Torrance, Calif.). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1832.* 12 p.

A technology assessment study conducted to evaluate the applicability of an all-electric airplane concept to transport aircraft is presented. The study compared two all-electric variations of the Lockheed medium advanced transport aircraft (ATA) with the existing ATA that utilizes advanced structures, aerodynamics, and engines, but conventional secondary power systems. The results of reconfiguration tradeoff studies conducted on the primary and secondary flight controls, engine start, environmental control, secondary power generation and distribution, and the landing-gear brakes are considered. Maintainability, reliability, and weight analyses are outlined. V.T.

A79-47918 * # Energy efficient aircraft engines. R. Chamberlin and B. Miller (NASA, Lewis Research Center, Energy Conservative Engines Office, Cleveland, Ohio). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1861.* 11 p.

The three engine programs that constitute the propulsion portion of NASA's Aircraft Energy Efficiency Program are described, their status indicated, and anticipated improvements in SFC discussed. The three engine programs are: (1) engine component improvement, directed at current engines, (2) energy efficient engine, directed at new turbofan engines, and (3) advanced turboprops, directed at technology for advanced turboprop-powered aircraft with cruise speeds to Mach 0.8. Unique propulsion system interactive ties to the airframe resulting from engine design features to reduce fuel consumption are discussed. Emphasis is placed on the advanced turboprop since it offers the largest potential fuel savings of the three propulsion programs and also has the strongest interactive ties to the airframe. (Author)

A79-47919 # Air buoyant vehicles - Energy efficient aircraft. V. H. Pavlecka (Airships International, Inc., Tustin, Calif.). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1862.* 7 p.

Energy and overall economic considerations of airplane and two airships in terms of a cost intensity parameter indicate that Metalclad airships can now be constructed and operated with an economic superiority to wide-body jet transports. Comparisons are based on computer printouts of actual flights of 747F and on design studies of MC-80 and MC-100. B.J.

A79-47920 # Laminar flow stabilization by surface cooling on hydrogen fueled aircraft. J. G. Theisen (Lockheed-Georgia Co., Marietta, Ga.), G. D. Brewer, and L. R. Miranda (Lockheed-California Co., Burbank, Calif.). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1863.* 12 p. 30 refs. Research supported by Lockheed-California Independent Research and Development Funds.

The feasibility of delaying the transition from laminar to turbulent flow over aerodynamic surfaces by cooling those surfaces, to decrease friction and increase fuel economy of aircraft, is discussed. For the 'energy crisis', hydrogen is being considered as an alternate fuel, so its cryogenic properties may be used for cooling below the 280 deg R known to stabilize boundary layers. Equations for the stability analysis of a two-dimensional, compressible, laminar boundary layer are presented, including heat transfer and adverse pressure gradient effects which constitute the principal new technological contribution of this study, for near-cruise flight. Preliminary systems analysis for an advanced commercial transport shows drag reductions near 27% and lower direct operating costs (DOC) by over 21%. (Author)

A79-47944 Toward optimal control of solar energy systems. S. F. McCormick (Colorado State University, Fort Collins, Colo.). In: 1978 Conference on Decision and Control, 17th, San Diego, Calif., January 10-12, 1979, Proceedings.
New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 193-196. 5 refs.

The paper focuses on a project designed to investigate the feasibility of a microprocessor-based control device for use in domestic solar energy systems. The underlying objective is to emphasize that fundamental simplicity both in design and implementation is a key to reducing the software difficulties and succeeding in the development of effective devices for process control. The development goals of the controller considered include cost effectiveness, stability, flexibility, adaptability and weather predictability. Although these characteristics are achieved at the expense of additional system hardware requirements, the balance appears to be well in favor of the controller system discussed. S.D.

A79-47945 **Thermal storage of off-peak electrical energy in solar heating and cooling systems.** R. E. Crane, H. G. Lorsch, R. L. Oswald (Franklin Research Center, Philadelphia, Pa.). In: 1978 Conference on Decision and Control, 17th, San Diego, Calif., January 10-12, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 197-202. 12 refs.

Thermal storage devices of solar heating and cooling systems can be used to reduce electric demand peaks by storing off-peak power. The discussion focuses on conventional control strategy, effect of thermal storage size, control strategies to reduce electrical peak demand, and off-peak load smoothing. It is concluded that off-peak storage can be used to eliminate high backup demands for solar heating and cooling systems during on-peak periods. Additional control logic development does not appear necessary, but additional hardware must be installed to eliminate on-peak demands. The cost of this hardware must be weighed against the savings achieved through reduced on-peak energy consumption. S.D.

A79-47946 **Sophisticated solar heating controllers - Are they cost effective.** R. E. Blodgett, J. R. Nebus, W. S. Trimmer, and T. M. Taylor (Singer Corporate Research and Development Laboratory, Fairfield, N.J.). In: 1978 Conference on Decision and Control, 17th, San Diego, Calif., January 10-12, 1979, Proceedings New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 203-205. Research supported by the U.S. Department of Energy.

The paper describes the results of a study to investigate the value of applying sophisticated controls to solar heating systems. A residential solar heating system utilizing a heat pump operating in the series-storage mode is considered and optimal control theory is used to derive a control strategy. The basic question addressed is how much of an improvement in efficiency can be gained, relative to a conventionally designed controller, if an unrestricted control strategy is applied in an optimal fashion. The efficiency comparison is made on the basis of the amount of auxiliary energy required to attain an acceptable level of room-temperature regulation. The second-order model for the system is derived using basic energy balance techniques and four control inputs are employed overall. The optimal control inputs are determined using Pontriagin's maximum principle which requires solution of a two-point boundary value problem. This is solved numerically using an iterative technique. (Author)

A79-47947 **Energy savings for a solar heated and cooled building through adaptive optimal control.** D. R. Farris (California, University, Los Alamos, N. Mex.) and J. L. Melsa (Notre Dame, University, Notre Dame, Ind.). In: 1978 Conference on Decision and Control, 17th, San Diego, Calif., January 10-12, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 206-213. 17 refs. Research supported by the U.S. Department of Energy.

The paper describes a study of the applicability of adaptive and optimal control techniques to the control of heating, ventilating, and air conditioning (HVAC) systems of solar heated and cooled buildings. The suitability of optimal and adaptive concepts is discussed and the selected approach is explained. An integral quadratic cost functional to define optimal performance and an identification process to prouuce a linearized building model are combined to yield an adaptive linear regulator solution. The building model is described and heating system simulations of three versions of the adaptive optimal controller are reported along with a simulation of a conventional controller for comparison. A nonlinear, open-loop, optimal control simulation is also reported and used to indicate an upper bound on achievable performance. Cooling system simulation results are also reported for an adaptive optimal controller and a conventional controller. Substantial savings in auxiliary energy requirements are demonstrated by the adaptive optimal controllers. (Author)

A79-48009 **Singular optimal control of solar space heating systems.** C. B. Winn (Colorado State University, Fort Collins, Colo.) and D. E. Hull, III (Martin Marietta Aerospace, Denver, Colo.). In: 1978 Conference on Decision and Control, 17th, San Diego, Calif., January 10-12, 1979, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 1220-1224. 5 refs. Research supported by the U.S. Department of Energy.

The problem of space heating using solar heat and conventional heating is examined from the standpoint of a linear quadratic loss problem. The cost of control is included in the cost function in a linear form. In this way, the controls may be turned off over finite time intervals. Optimal control of space heating is combined with optimal control of collecting solar heat. A singular optimal controller is compared with a conventional controller for both liquid and air solar space heating systems. It is noted that energy savings can be affected by input data and weather conditions. V.T.

A79-48021 **The 'Facility Data Base' or data bank on energy facilities (La 'Facility Data Base' ou banque de données sur des installations énergétiques).** M. Cellerier (International Institute for Applied Systems Analysis, Laxenburg, Austria). *Revue de l'Energie*, vol. 30, June-July 1979, p. 476-481. In French.

The Facility Data Base is a principle tool in the WELMM (water, energy, land, materials, manpower) method, which comprises a systems approach to energy resouces management. In this paper, the structure and operation of the Facility Data Base are described. The classification of energy facilities in the data bank according to industrial stage of the energy process, maturity of process technology and primary source of energy in order to characterize the various components of an energy conversion chain is discussed, and the types of qualitative and quantitative information on the technical, economic and environmental aspects of facility construction and operation are indicated. The data collection procedure is outlined, and the techniques used in computerizing and retrieving the information are illustrated. A.L.W.

A79-48022 **WELMM analysis and solar energy conversion systems (Analyse WELMM et systèmes de conversion de l'énergie solaire).** J.-L. Abatut (CNRS, Laboratoire d'Automatique et d'Analyse des Systèmes, Toulouse, France). *Revue de l'Energie*, vol. 30, June-July 1979, p. 493-496. In French.

The application of the WELMM (water, energy, land, materials, manpower) systems approach to the analysis of the competitiveness of solar energy conversion systems is discussed. Economic analyses of solar energy conversion systems are shown to depend on the values of parameters (interest and inflation rates and the price of petroleum) which are difficult to predict over the long term. The analysis of the investments and yields in energy of the construction and use of facilities, while based on more stable parameters, is considered to suffer from controversies concerning calculation methods. The WELMM method, which consists of the determination of the quantities of water, energy, land, materials and manpower necessary for the construction and operation of a system, is then applied to the analysis of the comparative land, energy and materials requirements of a central tower/heliostat concept. It is proposed that the results of WELMM analysis be taken into consideration along with economic and environmental factors in the determination of solar energy policies. A.L.W.

A79-48023 **The comparison of energy chains (Comparaison de chaines énergétiques).** A. Grubler and M. Cellerier (International Institute for Applied Systems Analysis, Laxenburg, Austria). *Revue de l'Energie*, vol. 30, June-July 1979, p. 505-512. In French.

Various energy chains, which comprise all the facilities necessary for the extraction or collection of primary energy, energy transport, and conversion into secondary or final energy, are compared by means of the WELMM method. The water, energy, land, materials and manpower requirements for producing 6.1 TWh/year of electricity are considered for four chains of coal technologies, three nuclear chains and two solar energy chains. WELMM requirements are also compared for the production of 0.65 Mtec of useful domestic energy (heat) from coal-derived electricity, synthetic natural gas and liquefied natural gas, with an advantage shown for liquefied natural gas production. A.L.W.

A79-48024 **The development of the energy-materials ratios of electrical energy production systems (Elaboration des bilans énergie-matières des filières de production d'énergie électrique).** P. Gentilhomme (Bureau de Recherches Géologiques et Minières, Orléans, France). *Revue de l'Energie,* vol. 30, June-July 1979, p. 513-515. In French.

The influence of mineral extraction and metallurgical factors on systems-analysis calculations of the energy-materials balances in the construction and operation of electric power systems are considered. It is pointed out that the underestimation of the variability of mineral metal contents, extraction modes and enrichment techniques can lead to erroneous estimations of acquisition expenses. The effects of the qualitative diversity of minerals, the quantitative diversity of metal contents, types of mineral wastes and waste recovery procedures and metal fusion and alloying techniques on energy cost calculations are discussed. A.L.W.

A79-48025 **A WELMM comparison of energy scenarios (Comparaison WELMM de scénarios énergétiques).** M. Cellerier, F. Emard-Katsonis, M. Grenon, and A. Grübler (International Institute for Applied Systems Analysis, Laxenburg, Austria). *Revue de l'Energie,* vol. 30, June-July 1979, p. 516-529. In French.

Possible national energy supply scenarios for France in the year 2030 are compared by means of WELMM analysis. Comparisons are presented for the extreme cases of all-nuclear and all-solar energy sources, with all-coal and all-petroleum and natural gas scenarios as references, supplying the same amounts of energy in the forms of electricity, heat and fuels (in the form of hydrogen in the all-solar and all-nuclear scenarios). Solar energy is shown to require considerably more land and manpower than nuclear or petroleum-based energy, and to be severely limited by silver production rates, while uranium supplies tend to limit nuclear market penetration. WELMM analysis of scenarios utilizing multiple energy sources are expected to yield additional information on more realistic energy futures. A.L.W.

A79-48026 **Energy for the year 2000 - The SPS concept (Energie für das Jahr 2000 - Das SPS-Konzept).** G. Tschulena. *Nachrichten Elektronik,* vol. 33, Aug. 1979, p. 249-254. 7 refs. In German.

The solar power satellite (SPS) system is examined. Different aspects of the project are discussed including the energy conversion technology such as solar cells of different compounds and thermoelectric converters. Also covered are the microwave transmission system, and environmental concerns such as biological effects and the dispersion of microwaves. Consideration is also given to realization of the project through the Space Shuttle. Finally, the development program of the SPS project is discussed. M.E.P.

A79-48049 **Synthetic fuels at the crossroads.** C. A. Stokes. *Technology Review,* vol. 81, Aug.-Sept. 1979, p. 25-33.

The paper examines to what extent the several available alternative fuels and processes (including synthetic fuels) be exploited in order to reduce the heavy dependence of the United States on oil and gas in the short term (e.g., through about 1985) if domestic policies and international political actions do not foreclose the opportunities which technology may offer. In addition, attention is given to the impact of new research after 1985. B.J.

A79-48050 **Water for a synthetic fuels industry.** R. F. Probstein (MIT, Cambridge, Mass.). *Technology Review,* vol. 81, Aug.-Sept. 1979, p. 37-43. 5 refs.

In a synthetic fuel plant the four major consumptive uses of water are for hydrogen, cooling, waste disposal, and environmental control. It is argued that production of synthetic fuels from coal should not be limited by claims of inadequate water in the region of the plant. After other needs are met, surface water could support an industry which produces synthetic crude in amounts equal to what the United States imports. B.J.

A79-48068 **Wind and solar energies in the tornado type wind energy system.** J.-M. Chen (National Tsing Hua University, Hsinchu, Nationalist China). *International Journal of Heat and Mass Transfer,* vol. 22, July 1979, p. 1159-1161. 12 refs.

The results of an analytical model of buoyancy-driven vortices about a solar line heat source in a tornado type wind energy system are examined. The set of ordinary differential equations were reduced to eight first-order differential equations by the Runge-Kutta direct integration method. New values of the missing initial conditions for adjoint equations were solved using the shooting iterative method. The dimensionless circulation and potential temperature, tangential and vertical velocities as well as pressure distribution are evaluated and their graphs are drawn. Conclusions show that the heat from the solar collector affects the tangential velocity and pressure drop at the vortex center axis increases as the strength of the line heat source increases. C.F.W.

A79-48226 **Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria.** H. E. Dalhed, J. M. Greene, R. C. Grimm, Y. Y. Hsieh, S. C. Jardin, J. Manickam, M. Okabayashi, A. M. M. Todd (Princeton University, Princeton, N.J.), R. G. Storer (Princeton University, Princeton, N.J.; South Australia, Flinders University, Bedford Park, Australia), and J. L. Johnson. *Journal of Computational Physics,* vol. 32, Aug. 1979, p. 212-234. 33 refs. Contract No. EY-76-C-02-3073.

Numerical schemes for the determination of stationary axisymmetric toroidal equilibria appropriate for modeling real experimental devices are given. Iterative schemes are used to solve the elliptic nonlinear partial differential equation for the poloidal flux function psi. The principal emphasis is on solving the free boundary (plasma-vacuum interface) equilibrium problem where external current-carrying toroidal coils support the plasma column but fixed boundary (e.g., conducting shell) cases are also included. The toroidal current distribution is given by specifying the pressure and either the poloidal current or the safety factor profiles as functions of psi. Examples of the application of the codes to tokamak design PPPL are given. (Author)

A79-48273 **An optimized grid design for a sun-concentrator solar cell.** A. R. Moore (RCA Laboratories, Princeton, N.J.). *RCA Review,* vol. 40, June 1979, p. 140-152.

Two different collecting grid designs for a solar concentrator cell are considered: a simple linear grid pattern and an inverted square pattern. The grid dimensions of each pattern are optimized for maximum power output from the cell. The calculations show that the inverted square pattern is superior at all levels of concentration. Two methods of optimizing the square pattern are given, one of which allows the grid spacing to be a function of position across the cell face while the line thickness is kept constant. Detailed calculations are given for 100- and 300-sun concentrations. (Author)

A79-48274 **Optimum grid design for a nonuniformly illuminated sun-concentrator solar cell.** A. R. Moore (RCA Laboratories, Princeton, N.J.). *RCA Review,* vol. 40, June 1979, p. 153-165.

A method of optimization for maximum power output from a sun-concentrator-type solar cell utilizing an inverted square-grid pattern is modified taking into account nonuniform but symmetric illumination. The method is an adaptation of the optimization procedure for a simpler linear grid. It allows the grid wire spacing to be varied from the cell center to the bus edge, thus adapting it to the local current density, while the grid thickness and line width are kept constant. Detailed results are presented for a square- and trapezoidal-shaped distribution. The value of tailoring the grid to the light distribution is demonstrated. V.T.

A79-48376 # **Hydrocarbons in ambient air. I - A statistical estimation of automobile hydrocarbons by factor analysis.** Y. Tsujino (Environment Pollution Control Center, Osaka, Japan). *Japan Society of Air Pollution, Journal,* vol. 14, no. 5, 1979, p. 179-189. 12 refs. In Japanese, with abstract in English.

Statistical estimates of automobile hydrocarbon emission were made on the basis of results reported in a road/tunnel survey. Several common factors conditioning emissions were obtained, including vehicle traveling conditions, speed, type of fuel, number of engine cycles, and two background factors. Techniques for estimating the relative contributions of different types of emission sources are presented. B.J.

A79-48511 **Study of heat-pipe heat exchanger in the small gas turbine engine system.** V. K. Shchukin, I. I. Mosin, N. V. Lokai, and Iu. V. Matveev. (*Aviatsionnaia Tekhnika,* vol. 21, no. 3, 1978, p. 127-132.) *Soviet Aeronautics,* vol. 21, no. 3, 1978, p. 93-96. Translation.

In the present paper, the structural elements of a heat exchanger employing heat pipes is theoretically optimized with a view toward using such exchangers as liquid coupled indirect-transfer regenerators for gas-turbine plants. A regeneration ratio of 0.82 at duct pressure losses of less than 6 percent is obtained. This theoretical value is verified by model experiments. V.P.

A79-48632 **Computer-Aided Power System Design.** J. E. O'Reilly, Jr. (South Florida, University, Tampa, Fla.) and H. L. Southall (USAF, Aerospace Power Div., Wright-Patterson AFB, Ohio). In: NAECON 1979; Proceedings of the National Aerospace and Electronics Conference, Dayton, Ohio, May 15-17, 1979. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 504-508. 10 refs. Contract No. F33615-77-C-2059.

This paper presents the Computer-Aided Power System Design (CAPSD) computer program. This program allows for the output-to-input design of high power systems interactively. CAPSD is basically an executive routine which ties together various high-power subprograms each of which performs a vital (or at least useful) analysis to perform a piece of a total high-power system design. The design program is written in ANSI FORTRAN IV and utilizes routines also written in FORTRAN IV. CAPSD can readily be adapted to process any high-power design program. The program is implemented on both the IBM 370/165 and CDC 6600 model machines. Initial testing of the program has generated enthusiasm in the executive approach of the software as an increase in the use of the power design routines due to the ease of data entry at the interactive level. (Author)

A79-48654 **A parameter sensitivity analysis of the rectified superconducting alternator model.** T. A. Stuart (Toledo, University, Toledo, Ohio). In: NAECON 1979; Proceedings of the National Aerospace and Electronics Conference, Dayton, Ohio, May 15-17, 1979. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 713-718. Grants No. AF-AFOSR-76-2997; No. AF-AFOSR-77-3413.

A sensitivity analysis of the steady state model of the rectified superconducting alternator is discussed. The analysis indicates how the model is affected by errors in the inductance values for the six mutually coupled circuits which represent the alternator. This is accomplished by conducting a large number of computer simulations, where the results for each variable are shown in graphical form. It is shown that the model is most sensitive to those self and mutual-inductances associated with the armature windings. (Author)

A79-48734 # **Energy balance of solar thermoelectric generators (Energeticheskii balans solnechnogo termoelektrogeneratora).** V. A. Baum, Ch. Agabaev, and N. Obezsakhatov (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *Geliotekhnika,* no. 3, 1979, p. 3-6. In Russian.

The paper develops a computational method for determining the maximum efficiency of a solar thermoelectric generator. It is shown that the efficiency of a solar thermoelectric system with natural cooling and without radiation concentration is less than 1%. B.J.

A79-48735 # **Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators (Mnogoploshchadochnye kremnievye fotopreobrazovateli dlia issledovaniia optiko-energeticheskikh kharakteristik kontsentratov solnechnoi i luchistoi energii).** A. Ia. Gliberman, I. I. Kovalev, B. I. Krasilovskii, and L. M. Medvedeva (Vsesouznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Kishinev, Moldavian SSR). *Geliotekhnika,* no. 3, 1979, p. 7-10. 5 refs. In Russian.

A79-48737 # **Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells (Tonkoplenochnye i keramicheskie solnechnye preobrazovateli na osnove sul'fida i selenida kadmiia).** V. N. Komashchenko, A. I. Marchenko, and G. A. Fedorus (Akademiia Nauk Ukrainskoi SSR, Institut Poluprovodnikov, Kiev, Ukrainian SSR). *Geliotekhnika,* no. 3, 1979, p. 15-21. 12 refs. In Russian.

A79-48738 # **Principles for the calculation of heliostat fields of a solar power plant (Printsipy rascheta geliostatnykh polei solnechnoi energeticheskoi stantsii).** R. A. Zakhidov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *Geliotekhnika,* no. 3, 1979, p. 22-27. 13 refs. In Russian.

The paper attempts to develop a general computational model for solar-tower concentrating systems. The model takes into account a number of factors, including the solar radiation characteristics, the arrangement of heliostats, the shape of mirrors, collector configurations, etc. Formulas are obtained for calculating insolation for collectors and heliostats of arbitrary configuration. B.J.

A79-48739 # **Heating characteristics of concentrator/receiver systems using selective absorption surfaces (Nagrevnye kharakteristiki sistemy kontsentrator-priemnik pri ispol'zovanii poverkhnosti selektivnogo luchepogloshcheniia).** O. I. Kudrin and A. Abdurakhmanov. *Geliotekhnika,* no. 3, 1979, p. 28-33. 5 refs. In Russian.

A79-48826 # **Determination of the design states of a complex system in evaluating the reliability of electrical power supply (Opredelenie raschetnykh sostoianii slozhnoi sistemy pri otsenke nadezhnosti elektrosnabzheniia).** Iu. A. Fokin, C. D. Long, and G. P. N. Vidzhaindu (Moskovskii Energeticheskii Institut, Moscow, USSR). *Energetika,* vol. 22, May 1979, p. 5-10. In Russian.

A so-called structural approach is used to evaluate the reliability of a complex electrical energy supply system. The objectives of the study are (1) to make a preliminary selection of the subset of most probable design states from the set of all possible states, and (2) to identify in this subset that group of states which have the dominant effect on the formation of the system power deficit. This preliminary selection makes possible a considerable reduction in the computational procedure for determining system power deficit. B.J.

A79-48827 # **Effect of pressure head on the characteristics of hydroelectric stations with underwater lower reservoirs (Vliianie napora na pokazateli gidroakkumuliruiushchikh elektrostantsii s podzemnymi nizhnimi basseinami).** G. A. Pretro (Ukrainskii Institut Inzhenerov Vodnogo Khoziaistva, Revno, Ukrainian SSR). *Energetika,* vol. 22, May 1979, p. 80-86. 8 refs. In Russian.

A79-48864 **Erosion study of different materials affected by coal ash particles.** W. Tabakoff, R. Kotwal, and A. Hamed (Cincinnati, University, Cincinnati, Ohio). *Wear,* vol. 52, Jan. 1979, p. 161-173. 8 refs. Contract No. E(48-18)-2465.

Alloys in contact with coal particles or coal ash are exposed to erosion. The problem of predicting erosion is very complex. The present paper describes the test facility which is designed in such a way that the aerodynamic effects are an integral part of the erosion test parameters. Some results from the alloys studied (aluminum, stainless steel and titanium) in this investigation are reported. (Author)

A79-48911 **High-temperature alloys in high-technology systems.** C. T. Sims (General Electric Co., Gas Turbine Div., Schenectady, N.Y.). In: High temperature alloys for gas turbines; Proceedings of the Conference, Liège, Belgium, September 25-27, 1978. Barking, Essex, England, Applied Science Publishers, Ltd., 1978, p. 13-65. 23 refs.

The phase basis of austenitic superalloys is reviewed briefly, followed by comparison of their capabilities to all other alloy systems. Then, seven advanced high-technology systems including aircraft engines, coal-derived fuel-fired energy plants, and future reactor systems are viewed, first as operating plants, then as technologies utilizing superalloys, with emphasis on the problems superalloys will face. Next, an attempt is made to collate the use pattern of superalloys in these systems into superalloy families, which then leads to discussion of the metallurgical features, with emphasis on microstructural behavior. Finally the major problems expected for the future are summarized. (Author)

A79-48912 **The role of corrosion in modern gas turbines.** P. C. Felix (Brown, Boveri et Cie. AG, Baden, Switzerland). In: High temperature alloys for gas turbines; Proceedings of the Conference, Liège, Belgium, September 25-27, 1978. Barking, Essex, England, Applied Science Publishers, Ltd., 1978, p. 69-79. 5 refs.

It is shown that coatings for gas-turbine blades must meet the following requirements: corrosion resistance, erosion/impact resistance, physical integrity, thermal stability, mechanical strength, adhesion, and economy. Thus, new coatings should be optimized with a view toward each of these requirements, and not to a high corrosion resistance only. Making some tradeoffs seems unavoidable. V.P.

A79-49037 **Boundary layer velocity measurements in combustion MHD channels.** S. A. Self (Stanford University, Stanford, Calif.). In: Laser velocimetry and particle sizing; Proceedings of the Third International Workshop, West Lafayette, Ind., July 11-13, 1978. Washington, D.C., Hemisphere Publishing Corp., 1979, p. 347-356. NSF Grant No. GK-04116; Contracts No. F33615-72-C-1088; No. EX-76-C-01-2341.

The paper discusses velocity measurements by laser anemometry in the boundary layers of combustion MHD generator channel flows. Combustion MHD facility is described along with laser anemometry requirements and problems. The design and capabilities of two laser anemometer systems are presented: a single beam backscatter system, and a dual beam forward scatter system. The reported work demonstrates that valuable measurements of boundary-layer velocity profiles can be made in subscale combustion MHD generator channels despite the problems associated with high velocity, high temperature, and difficulty of access. S.D.

A79-49136 # **Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting.** A. G. Bathelt, R. Viskanta, and W. Leidenfrost (Purdue University, West Lafayette, Ind.). *(American Institute of Aeronautics and Astronautics and American Society of Mechanical Engineers, Thermophysics and Heat Transfer Conference, Palo Alto, Calif., May 25, 26, 1978, ASME Paper 78-HT-47.) ASME, Transactions, Journal of Heat Transfer,* vol. 101, Aug. 1979, p. 453-458. 15 refs. NSF Grant No. ENG-75-15030.

Melting from an array of three staggered, electrically heated cylinders imbedded in a paraffin (n-octadecane) has been studied. The shape of the melting front has been determined photographically, and the local heat transfer coefficients were measured using a shadowgraph technique. The experiments provide conclusive evidence of the important role played by natural convection on the timewise variation of the melt shape, the surface temperature and the instantaneous local as well as circumferentially averaged heat transfer coefficients around the imbedded heat sources. After a common solid-liquid interface is formed around the cylinders, natural convection circulation around each cylinder interacts strongly with the other two cylinders. The arrangement of heat sources affects significantly the melt shape but the circumferentially averaged instantaneous heat transfer coefficients differ only by about 10 percent for the two arrangements studied. The experimental findings indicate that natural convection effects are important and should be considered in analysis and design of systems involving phase change. (Author)

A79-49158 **Small-scale coal-gasification plants.** A. Verma (Saskatchewan Power Corp., Regina, Canada) and P. J. Read (Department of Energy, Mines and Resources, Ottawa, Canada). *Energy Sources,* vol. 4, no. 3, 1979, p. 281-297. Research supported by the Saskatchewan Power Corp. and Department of Energy, Mines and Resources.

This paper presents technical and economic analyses of coal-gasification processes to manufacture medium-heating-value gas and synthetic natural gas from two commercially available processes: Koppers-Totzek and Lurgi. The plants were designed for a capacity of 30 x 10 to the 9th Btu/day. (Author)

A79-49179 # **Photovoltaic cell with bilateral sensitivity (Fotopreobrazovatel' s dvukhstoronnei chuvstvitel'nost'iu).** Iu. A. Anoshin, N. M. Bordina, A. K. Zaitseva, V. A. Letin, and N. A. Milovanova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *Geliotekhnika,* no. 2, 1979, p. 3-8. 6 refs. In Russian.

In the present paper, the current-voltage equations are derived for a photovoltaic cell with a n(+)-p-p(+) heterojunction, both for illumination of the isotopic junction and for simultaneous illumination of the isotopic and p-n junctions. The influence of the base and p(+) layer parameters on the performance of the cell is studied, and some experimental data are discussed. V.P.

A79-49180 # **Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination (Varizonnye shirokopolosnye Ga/1-x/Al/x/As-Si-fotoelektropreobrazovateli s osveshchaemoi n-oblast'iu).** A. Berkeliev, V. N. Bessolov, A. N. Imenkov, N. Nazarov, B. V. Tsarenkov, and Iu. P. Iakovlev (Akademiia Nauk SSSR, Fiziko-Tekhnicheskii Institut, Leningrad, USSR; Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *Geliotekhnika,* no. 2, 1979, p. 9-12. In Russian.

A79-49181 # **Dependence of the photoelectric parameters of photovoltaic cells on illuminance (Zavisimost' fotoelektricheskikh parametrov fotopreobrazovatelei ot osveshchennosti).** E. B. Vinogradova, T. M. Golovner, S. M. Gorodetskii, and L. B. Kreinin (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *Geliotekhnika,* no. 2, 1979, p. 13-17. 7 refs. In Russian.

In the experiments described, the recombination characteristics and spectral sensitivity of photovoltaic cells were studied as a function of the illuminance level. The nature of bulk defects in the cell structure is studied for cells with a nonlinear lux-ampere characteristic. V.P.

A79-49182 # **Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity (Analiz opticheskikh kharakteristik kremnievykh fotopreobrazovatelei s dvukhstoronnei chuvstvitel'nost'iu).** V. R. Zaiavlin, V. A. Letin, and N. M. Kholeva (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *Geliotekhnika,* no. 2, 1979, p. 18-22. 7 refs. In Russian.

In the present paper, the optical characteristics of bilaterally illuminated photovoltaic cells are analyzed with the object of assessing the effectiveness of their production technology and calculating their equilibrium temperature with allowance for infrared and reflected solar radiation. The results of the analysis can be used to control current losses and to modify the production technology. V.P.

A79-49183 # **Calculation of the optical characteristics of high-power two-mirror solar furnaces (Raschet opticheskikh kharakteristik dvukhzerkal'nykh solnechnykh pechei bol'shoi moshchnosti).** S. A. Azimov, Kh. M. Mallaeva, I. I. Pirmatov, T. T. Riskiev, and S. Kh. Suleimanov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *Geliotekhnika,* no. 2, 1979, p. 23-28. 9 refs. In Russian.

A method of designing large solar furnaces is proposed. For illustration, the method is applied to the design of a two-mirror solar furnace and a tower-mounted solar plant. V.P.

A79-49184 # **Method of calculating heat storages for solar heating systems (K metodike rascheta akkumuliatora tepla sistemy solnechnogo obogreva).** O. Azimov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) and R. R. Avezov (Samarkandskii Gosudarstvennyi Universitet, Samarkand, Uzbek SSR). *Geliotekhnika,* no. 2, 1979, p. 29-32. 6 refs. In Russian.

A79-49185 # **Investigation of the aerodynamic resistance of solar air heaters (Issledovanie aerodinamicheskikh soprotivlenii solnechnykh vozdukhonagrevatelei).** S. O. Khatamov, R. R. Avezov, and G. G. Umarov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *Geliotekhnika,* no. 2, 1979, p. 48-54. 7 refs. In Russian.

The paper deals with a theoretical and experimental study of the dynamic resistance of five representative solar air heaters of the hot box type. All the heaters studied were 1 m long, 0.64 m wide, and 0.175 m thick. Good agreement between theory and experiment is established. V.P.

A79-49186 # **Investigation of the absorption and emission characteristics of an ideal selective surface (Issledovanie pogloshchatel'no-izluchatel'nykh kharakteristik ideal'noi selektivnoi poverkhnosti).** O. I. Kudrin and A. Abdurakhmanov. *Geliotekhnika,* no. 2, 1979, p. 55-62. 6 refs. In Russian.

A method for calculating the absorptivity and emissivity of a selectively absorbing surface is proposed, along with a technique for calculating the optimal threshold wave length. An improved analytical definition of an ideal selective surface for solar heating purposes is given. V.P.

A79-49207 **Thermal emissivity of selective surfaces - New lower limits.** D. M. Trotter, Jr. and A. J. Sievers (Cornell University, Ithaca, N.Y.). *Applied Physics Letters,* vol. 35, Sept. 1, 1979, p. 374-376. 16 refs. NSF Grant No. DMR-76-81083; Contract No. EG-77-S-03-1456.

Numerical calculations of the thermal emissivity epsilon of spectrally selective surfaces consisting of absorbing films on reflective metal substrates are reported. A physically realizable form for the absorption coefficient of the film, and a refractive index derived from this coefficient via a Kramers-Kronig relation were used to obtain new lower limits for epsilon. (Author)

A79-49210 **Interferometry of a gas-puff z-pinch plasma.** J. Shiloh, A. Fisher, and E. Bar-Avraham (California, University, Irvine, Calif.). *Applied Physics Letters,* vol. 35, Sept. 1, 1979, p. 390-392. 5 refs. Research supported by the U.S. Defense Nuclear Agency.

A nitrogen laser interferometer is utilized to study the density profile of a gas-puff z-pinch plasma during the implosion stage and the final collapse. The density profile and the plasma stability as a function of the different parameters are reported. (Author)

A79-49211 * **Extension of a theorem used in the investigation of P-N junctions with the scanning electron microscope to arbitrary geometries and arbitrarily inhomogeneous material.** O. von Roos (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Applied Physics Letters,* vol. 35, Sept. 1, 1979, p. 408, 409.

A79-49213 **Temperature dependence of the current-voltage characteristics of silicon MIS solar cells.** J. Shewchun, R. Singh, D. Burk, and F. Scholz (McMaster University, Hamilton, Ontario, Canada; Brown University, Providence, R.I.). *Applied Physics Letters,* vol. 35, Sept. 1, 1979, p. 416-418. 13 refs. Research supported by the National Research Council of Canada and U.S. Department of Energy.

Measurements of the dark I-V characteristics of Al-SiO(x) p-type Si solar cells as a function of temperature have been used to elucidate one of the possible current conduction mechanisms in MIS solar cells. A good fit is obtained by using the diffusion current mechanism as described previously in the authors' theory of MIS solar cells. There is little evidence in the data on the authors' devices to support the thermionic emission model which is the alternate mode of operation proposed by other investigators. (Author)

A79-49215 **Current conduction in Cr-MIS solar cells on single-crystal p-silicon.** K. Rajkanan and W. A. Anderson (New York, State University, Amherst, N.Y.). *Applied Physics Letters,* vol. 35, Sept. 1, 1979, p. 421-423. 5 refs. Contract No. ET-78-R-03-1876.

New information has been obtained about the current conduction in Cr-MIS solar cells by studying their current-voltage relationship over a wide range of temperatures. It is demonstrated that majority-carrier tunneling over the combined barrier due to the interfacial oxide and the space-charge region dominates the I-V characteristics at temperatures below 250 K for Cr-SiO(x)-(p-Si) solar cells. Insight about the shunt resistance and back-contact barrier is also obtained by plotting the activation energy versus applied bias. Majority carriers tunneling via interface states control the characteristics at higher temperatures for these devices, made on 0.4-ohm cm p-silicon. (Author)

A79-49224 **Lockheed urges hydrogen fuel.** *Interavia,* vol. 34, Sept. 1979, p. 872, 873.

The use of hydrogen as a future aircraft propellant is discussed and some advantages and disadvantages of using methane as another alternate source are examined. Although hydrogen is seen as a dangerous fuel source, its advantages clearly outweigh its disadvantages. First, it is noted that because hydrogen is lighter than air, a fire ignition would tend to roar upward and not expand sideways like a liquid fuel fire. Second, hydrogen burns cleanly and consistently, providing considerable benefits in the design of future power plants. Last, its exhaust consists mainly of water and therefore a hydrogen-fueled engine would create even less air pollution than the cleanest of modern petroleum-burning turbofans. The only disadvantage noted here is the apparent danger because of its high combustibility, and it is concluded that hydrogen may be the best alternative to many present-day energy problems. C.F.W.

A79-49227 **R&D programmes in the field of hydrogen economy.** G. Imarisio (Commission of the European Communities, Brussels, Belgium). *International Journal of Hydrogen Energy,* vol. 4, no. 3, 1979, p. 179-186. 7 refs.

The paper presents a survey of the prospects of hydrogen in the future energy market as well as a review of research and development programs in the field of hydrogen. Programs discussed include thermochemical hydrogen production, electrolytic hydrogen production and other production methods such as photochemical and photobiological. Attention is given to the corresponding efforts of each country. Finally, a rough estimate is made of the overall present R&D effort in the field of hydrogen and the possible outcomes are suggested. M.E.P.

A79-49228 **Mobile electrolytic hydrogen generators.** N. J. Louw (Stellenbosch, University, Stellenbosch, Republic of South Africa). *International Journal of Hydrogen Energy,* vol. 4, no. 3, 1979, p. 187-192.

A small mobile electrolytic hydrogen generator was developed and built in order to provide hydrogen gas for the filling of meteorological balloons in the field and at temporary and remote weather stations. The capacity of the unit is 2 standard cu m/h (H2) and utilizes 25 cells with an electrode area of 0.10 sq m each. The hydrogen gas is compressed to fill steel cylinders at 17 MPa gage. Electrical power for the plant is supplied from a separate generating set on its own trailer. The trailer with plant has a mass of 4.25 tonne on a deck area of 3.92 x 1.64 sq m. (Author)

A79-49231 **The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation.** A. Melvin (British Gas Corp., London, England). *International Journal of Hydrogen Energy,* vol. 4, no. 3, 1979, p. 223, 224.

The possibility of using solar radiation for the generation of hydrogen by the photolysis of water is discussed in relation to requirements of large-scale generation which would be needed in a hydrogen economy or in coal gasification. Although the point is conceded that solar energy is, for all practical purposes, an infinite source, the conclusion is that solar radiation is not available on the surface of the plant in energy densities which would allow large-scale hydrogen generation without overwhelming technical and economic difficulties. The particular restriction lies in the large ground areas required for generation of reasonably large quantities of hydrogen, since the volume of hydrogen at atmospheric pressure which can be generated per square metre of surface is only of the order of 0.2-0.4 cu m/day. (Author)

A79-49254 **Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak.** Y. Gomay, S. Konoshima, N. Fujisawa, S. Kasai, M. Maeno, N. Suzuki, T. Hirayama, and M. Shimada (Japan Atomic Energy Research Institute, Tokai, Ibaraki, Japan). *Japanese Journal of Applied Physics,* vol. 18, July 1979, p. 1317-1324. 29 refs.

Molybdenum, pyrolitic graphite (PG), and silicon carbide were used for the limiter of the JFT-2 tokamak. It was found that the macroscopic discharge characteristics with the PG and SiC limiters were equivalent to those with the Mo limiter, though CV line radiation with the PG and SiC limiters was 1.3 to 6 times that with the Mo limiter. For these conditions, the maximum surface temperature of the limiter during discharge was 550 C for Mo, 1900 C for PG, and 1000 C for SiC, as observed by an infrared camera. Residual gas analysis indicated that chemical reaction between the plasma and the limiter did not play a major role in carbon generation into the plasma. The estimated amount of carbon contamination of the plasma can be caused by physical sputtering, which has been separately investigated for PG. (Author)

A79-49300 **The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000 (Der Einfluss von Nachfrageentwicklung und Rohstoffangebot auf die Produktionsstruktur von Grundchemikalien - Abschätzungen mit Hilfe eines Simulationsmodells bis zum Jahre 2000).** E. Böhm, H. Herz, and E. Jochem (Fraunhofer Gesellschaft zur Förderung der angewandten Forschung, Institut für Systemtechnik und Innovationsforschung, Karlsruhe, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 32, Aug. 1979, p. 399-403. 8 refs. In German.

An examination of present and future fossil fuel consumption rates as well as other raw material reserves are discussed with an overview of the next 20 years, employing an optimization model. The model involves a multiple-linear regression method for projecting consumption amounts. Estimates for demand and export trade are made with respect to domestic needs and expectations of technological advancement. The simulation model will enable accurate projections of the changes in development due to fossil fuel mining, and bridge the gap between macroeconomic models and industrial models that are used to determine optimal production capability. Various chemical block diagrams and raw material flow charts are presented outlining the processes of converting raw materials to useable end products. C.F.W.

A79-49330 **The Eppler scenario - A critical analysis (Das Eppler-Szenario - Eine kritische Analyse).** H. Michaelis. *Energiewirtschaftliche Tagesfragen,* vol. 29, Aug. 1979, p. 455-461. In German.

The paper examines Eppler's anti-nuclear energy strategy (1979) for West Germany, with emphasis on the necessary guidelines for implementation as well as the economic consequences of future energy provisions. Two goals of energy policy are outlined: (1) to balance current energy demand against energy supply and (2) to slow down energy consumption without reducing energy production. Eppler's main concern is to stabilize the consumption rate at 580 TWh by the year 2000, which would result in an annual energy increase of only 2.1%. This can be achieved by employing more coal, oil and natural gas instead of expanding nuclear energy, and by implementing better and more efficient insulation systems. A summary is presented which analyzes the advantages and disadvantages of the proposed system, emphasizing discrepancies between Eppler's ideas and research conducted by the German Institute of Economic Research. C.F.W.

A79-49331 **Dialectical discussion on optimal order structures for an integrated energy supply system (Zur Dialektik der Diskussionen um optimale Ordnungsstrukturen der leitungsgebundenen Energieversorgung).** G. Cwienk (Stadtwerke, Tübingen, West Germany). *Energiewirtschaftliche Tagesfragen,* vol. 29, Aug. 1979, p. 472-481. 22 refs. In German.

A pluralistic order structure is compared to a mono-hierarchical structure for the West German energy supply system. The development of the system is analyzed with emphasis on the energy preamble of the 1935 energy structure policy document and the advocates and opponents of its implementation to date. The demands on the existing structure are examined with respect to the interaction between the regional and local bureaucracies and as an example, attention is given to the structure of a government-sponsored public electric utility, with emphasis on the responsibilities of each of the local governments. C.F.W.

A79-49345 * # **Characterization of a swept-strut hydrogen fuel-injector for scramjet applications.** G. B. Northam, C. A. Trexler, and G. Y. Anderson (NASA, Langley Research Center, Hampton, Va.). *Joint Army-Navy-NASA-Air Force, Interagency Propulsion Committee Combustion Meeting, 15th, Newport, R.I., Sept. 1978, Paper.* 19 p. 5 refs.

Results of an experimental investigation of a swept-strut hydrogen fuel-injector simulating the center strut of a three strut scramjet module at Mach 6 flight conditions are presented. Detailed wall pressure distributions from over 100 separate tests with overall fuel flow from 0.1 to 1.3 times stoichiometric and test gas stagnation temperature from 1100 to 2400 K were recorded. The distance for pressure rise from the point of injection was found to increase with increasing test stagnation temperature. This trend indicates that chemical kinetics in the immediate region of perpendicular injection are not likely to be the mechanism controlling the onset of pressure rise. A fluid dynamic mechanism is suggested involving separation of the boundary layer downstream of injection which is forced upstream from the trailing edge by pressure rise due to combustion occurring in the base region of the strut. The results obtained indicate that the swept-strut fuel-injector concept can be adapted to a wide range of flight conditions by varying the amount of perpendicular fuel injection. (Author)

A79-49357 **The isotopic composition of carbon in the Alberta oil sand.** K. N. Jha, J. Gray, and O. P. Strausz (Alberta, University, Edmonton, Canada). *Geochimica et Cosmochimica Acta,* vol. 43, Sept. 1979, p. 1571-1573. 25 refs. Research supported by the National Research Council of Canada, Department of Energy, Mines and Resources, and Imperial Oil Enterprises.

A79-49372 # **Effect of load factor on the characteristics of series MHD generators (Vliianie koeffitsienta nagruzki na kharakteristiki seriesnykh MGD-generatorov).** G. P. Bazarov, E. N. Kufa, and S. A. Medin. *Magnitnaia Gidrodinamika,* Apr.-June 1979, p. 99-104. In Russian.

Local and integral characteristics of singly loaded series MHD generators operating under partial loads are investigated. Two-dimensional channels with perfectly sectioned electrodes having different types of sectional connection are considered. The flow parameters and channel height are assumed to be constant, and the calculations are performed by the finite-difference technique. It is shown that in the region where the current-collecting electrodes join a sectioned part of the channel, a significant increase in electric-field density is possible when the load factor is changed. F.G.M.

A79-49373 # **Induced fields during the motion of a conducting medium in the field of an air-core magnetic system (Indutsirovannye polia pri dvizhenii provodiashchei sredy v pole bezzheleznoi magnitnoi sistemy).** A. M. Anisimov, V. F. Vasil'ev, I. V. Lavrent'ev, and V. L. Ovchinnikov. *Magnitnaia Gidrodinamika,* Apr.-June 1979, p. 136, 137. In Russian.

An equation is obtained which describes the distribution of the magnetic field induced in a conducting medium when that medium moves in the transverse field of an air-core magnetic system. It is shown that the channel height, rather than its width (as is the case for ferromagnetic systems), is the characteristic linear dimension involved in the magnetic-Reynolds-number determination. Experiments performed with electrically conducting films moving in the field of two Helmholtz coils are discussed which demonstrate that the experimental data are in completely satisfactory agreement with a computer-aided solution to the equation obtained. F.G.M.

A79-49374 # **Characteristics of series channels with a reduced electrode commutation angle in the connecting section (Kharakteristiki seriesnykh kanalov s umen'shaiushchimsia uglom kommutatsii elektrodov na perekhodnom uchastke).** G. P. Bazarov and E. N. Kufa. *Magnitnaia Gidrodinamika,* Apr.-June 1979, p. 138-140. In Russian.

Local and integral characteristics of singly loaded series MHD generators with a reduced electrode commutation angle in the connecting section are investigated. Boundary-value problems for two-dimensional channels with constant flow properties and a magnetic field that varies along the channel are solved by the finite-difference method; the parameters of the solution are the position of the channel with respect to the magnetic field and the connecting-section geometry. It is shown that the integral characteristics of the generators considered are not degraded under rated operating conditions and that channels with a smaller commutation angle are more stable under alternate operating conditions. F.G.M.

A79-49376 **Utilization of alternative fuels for transportation; Proceedings of the Symposium, University of Santa Clara, Santa Clara, Calif., June 19-23, 1978.** Symposium sponsored by the U.S. Department of Energy. Edited by M. Newman and J. Grey (American Institute of Aeronautics and Astronautics, Inc., New York, N.Y.). New York, American Institute of Aeronautics and Astronautics, Inc. (AIAA Aerospace Assessment Series. Volume 2), 1979. 244 p. $15.

This overview of alternative fuel development deals with such issues as energy supply and fuel manufacturing/processing and storage and distribution. Attention is given to fuels for both road vehicles and nonroad vehicles (e.g., aircraft and trains). Finally, discussions on impacts and institutional issues are presented. B.J.

A79-49377 # **Future transportation fuels.** M. R. Adams (U.S. Department of Energy, Washington, D.C.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 9-40.

The paper presents an overview of the expected future need for alternative transportation fuels, including an assessment of the potential of conservation technologies for reducing future fuel demand. The institutional barriers that may impede the introduction of new transportation fuel systems into the national infrastructure are described and consideration is given to the expected trend of shifting from primary gasoline consumption to a preponderance of consumption of middle distillates during the remainder of this century. A review of the technological, economic, and environmental/safety status of various alternative fuel candidates is presented and the role of government in accelerating the adoption of new technologies is assessed. B.J.

A79-49378 # **Storage and distribution of cryogenic fuels.** W. E. Timmcke (Air Products and Chemicals, Inc., Allentown, Pa.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 59-69.

The paper reviews the state of the art of storage and distribution equipment for cryogenic fuels (LNG and LH2) and discusses applications to various transportation modes. It is found that the capability to store and transport these potential fuels is well within the designers' expertise and that the evolution of a total support system for a specific transportation vehicle will improve skills already developed. B.J.

A79-49379 # **Storage and distribution of synthetic fuels.** J. E. Berger (Shell Oil Co., Houston, Tex.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 69-79.

The paper discusses the storage and distribution of noncryogenic 'conventional' synthetic fuels. The scope of the discussion is limited to reasonably foreseeable alternate synthetic fuels in the transportation industry; particular attention is given to automotive applications for a time frame of the order of 15 years. Consideration is given to the specific problems that synthetic fuels may pose to the transportation and distribution network which now exists. B.J.

A79-49380 # **Outlook for electric road vehicles.** W. Hamilton (General Research Corp., Santa Barbara, Calif.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 97-106.

Electric vehicles in very large numbers could be recharged from coal or nuclear facilities now available or projected at U.S. utilities. Resultant savings of petroleum could be correspondingly large. With future batteries, the driving range of electric cars will become adequate for most automotive travel. Unless gasoline prices increase drastically in relation to oil prices or government intervenes directly, however, relatively few electric cars are likely to be sold in this century, because they generally will cost more and do less than conventional cars. (Author)

A79-49381 # **Alternative fuels in aviation.** J. G. Borger (Pan American World Airways, Inc., New York, N.Y.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 129-142.

The state of the art and expected future advances of alternative fuels in aviation are discussed. Consideration is given to uses of liquid hydrogen and methane, broadening of turbine fuel specifications, increased aromatics, decreased flashpoint, increased freeze point, thermal stability, synthetic fuels, and the refinery process. It is noted that major fuel efficiency improvements resulting from the NASA ACEE program probably will not appear before the late 1980s. B.J.

A79-49382 # **Outlook for the development of hybrid fuels.** C. A. Moses (Southwest Research Institute, San Antonio, Tex.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 142-147.

Hybrid fuels, defined as finished fuels derived from combinations of different energy sources, are examined for their potential in conserving petroleum in the transportation sector. Carbonaceous slurries and diesel fuel blends with water and/or alcohols offer the greatest potential. Problems appear solvable in the near future. (Author)

A79-49383 # **A general history of the Nebraska Grain Alcohol and Gasohol Program.** C. R. Fricke (Agricultural Products Industrial Utilization Committee, Lincoln, Neb.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 155-162. Research supported by the Agricultural Products Industrial Utilization Committee.

A79-49384 # **The Seattle experience - Conversion of solid waste to fuels or chemicals.** J. K. Coyne (Coyne Chemical Co., Philadelphia, Pa.). In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 162-174.

This paper discusses the efforts of the city of Seattle, Washington, the Coyne Chemical Company, the former Energy Research and Development Administration, and other public and private sector participants to develop a full-scale solid waste to methanol/ammonia plant. Nearly four years of analysis, research, and development ended in May 1977, with the decision to cancel the program. A series of significant economic, social, bureaucratic, and organizational constraints to the effective implementation of large-scale alternative energy programs is evaluated. The hypothesis is offered that the existing unwillingness of venture capital sources to accept the risks inherent in alternative energy development, coupled with the procedural difficulties of marshaling public sector acceptance and support, will conspire effectively to prohibit the completion of any major alternative fuel development programs over the near term. (Author)

A79-49385 # **Synthetic fuels program.** C. L. Stone. In: Utilization of alternative fuels for transportation; Proceedings of the Symposium, Santa Clara, Calif., June 19-23, 1978. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 175-182.

The paper reviews a synthetic fuels program proposed and developed by the California Legislature. The discussion highlights alternative fuels for transportation, and the uses of methanol-X and gasohol as automotive fuels. B.J.

A79-49401 **Review - Thermophysical properties of oil shales.** K. Rajeshwar, R. Nottenburg, and J. Dubow (Colorado State University, Fort Collins, Colo.). *Journal of Materials Science,* vol. 14, Sept. 1979, p. 2025-2052. 173 refs. Research supported by the U.S. Department of Energy and NSF.

Recent developments in the characterization of the thermophysical properties of various types of oil shales are reviewed. Changes in the thermal, mechanical and electrical properties of these technologically important materials are discussed, with temperature and organic content as the experimental variables. Structural models are presented to aid in predicting the variation of thermophysical parameters with organic content in the shale. Comparison of calculated results with experimental data are shown with thermal diffusivity as a representative parameter. Areas where further research of a fundamental nature would be of a particular relevance are also highlighted in the review. (Author)

A79-49423 **The rough road to making oil and gas from coal.** A. Stuart. *Fortune,* vol. 100, Sept. 24, 1979, p. 50-52, 57, 60, 62, 64.

Methods for developing oil and gas from coal are examined. Attention is given to past (German) coal gasification methods as well as new developments of existing processes, stressing the increasing costs of gas and its effects on present production. Emphasis is given to coal gasification and the problems that are encountered, noting ways to cope with 'caking' coals. The process of coal liquification to produce methanol is described and four second-generation techniques are mentioned including solvent refined coal, Exxon donor solvent, and H-coal. C.F.W.

A79-49424 **Solar comes out of the shadows.** C. G. Burck. *Fortune,* vol. 100, Sept. 24, 1979, p. 66-70, 73, 75.

The paper discusses the problems encountered in developing solar energy to meet the governmental goal of employing 20% of the total energy need from solar means by the year 2000. Various present solar energy systems are examined including space-heating systems and evacuated-tube collectors. Some of the major problems encountered in solar-housing systems are that, although simple, these systems are actually highly complex, require infinite detail to function effectively and need better systems designs. An example is incident solar energy, which may vary between 10 and 25% at different sites within a region, due to microclimatological conditions. Attention is given to new silicon-based designs for photovoltaic cells as well as designs for pure silicon cells that generate large amounts of stored energy. C.F.W.

A79-49425 **Biomass - The self-replacing energy resource.** G. Bylinsky. *Fortune,* vol. 100, Sept. 24, 1979, p. 78, 79, 81.

The paper discusses the use of biomass as an alternative energy source, focusing mainly on coal and wood. The advantages of employing coal burning for ethanol distillation plants are discussed as well as methods of ethanol extraction from corn. Other energy sources are also discussed which include utilizing unharvested, new-grown hardwood that accounts for 55% of the total wood growth. It was determined that forest growth could be doubled if the problem of inadequate harvesting equipment could be overcome. Attention is given to wood-chip-burning house-heating systems and also to fast growing water plants, that can be harvested and converted into methane and fertilizer. C.F.W.

A79-49475 **A quantitative comparison of energy costing methods.** A. El-Sawy, J. G. Leigh, and R. K. Trehan (Mitre Corp., McLean, Va.). *Energy Systems and Policy,* vol. 3, no. 2, 1979, p. 213-226. 19 refs.

This paper presents a review and analysis of methodologies used for estimating electricity generation costs, with particular reference to geothermal energy, although the main conclusions apply equally to other sources of electricity. The costs projected by the different methods for two test cases are presented, and estimates are made of the sensitivity of the results to critical methodological choices. (Author)

A79-49479 **Computer simulation of a solar energy system.** J. M. Key. *Sunworld,* vol. 3, no. 4, 1979, p. 96-101.

A solar heating and cooling system designed for use at the El Camino Real School in Irvine, California is presented. The solar energy is collected by banks of evacuated glass tube collectors mounted on tilted platforms on the roof of the school and provide an effective collector area of 5000 sq ft. Along with the government-sponsored design and construction of the system, a computer simulation based on a mathematical model was also constructed. A two-phase simulation was described: first, the system model was driven by a weather model from data collected over the past few years and second, a TRNSYS program was run with weather data measured from the previous year. It was concluded that (1) the solar fraction was higher for the storage tank system than for the heat exchanger system at any time of the year and at any boiler setpoint and (2) the solar fraction was much less sensitive to boiler setpoint when there exists a storage tank. C.F.W.

A79-49487 * # **Applications of free-space microwave power transmission.** S. W. Fordyce (NASA, Office of Space and Terrestrial Applications, Washington, D.C.) and W. C. Brown (Raytheon Co., Lexington, Mass.). *Astronautics and Aeronautics,* vol. 17, Sept. 1979, p. 54-59, 61. 8 refs.

Some applications and properties of free-space power transmission are examined. Among the properties discussed are: no mass, either in the form of wire conductors or ferrying vehicles, is needed between the source of energy and the point of consumption; energy can be transferred at the velocity of light; no loss of energy in transferring energy throught the vacuum of space; and the energy transfer is insensitive to a difference in the gravitational potential of the transmitter and receiver locations. Applications discussed include the Solar Power Satellite, high altitude platforms for communications and remote sensing. Also discussed are rectennas and retrodirective arrays. Finally, an expression yielding minimum cost is presented. M.E.P.

A79-49488 **Battery systems for electric vehicles - A state-of-the-art review.** D. A. J. Rand (Commonwealth Scientific and Industrial Research Organization, Institute of Earth Resources, Melbourne, Australia). *Journal of Power Sources,* vol. 4, Aug. 1979, p. 101-143. 176 refs.

The future economy demands the development of more efficient power sources for urban vehicles. These sources could be electrochemical systems, i.e., batteries or fuel cells or battery-fuel cell hybrids. The purpose of this paper is to review the current world effort being directed towards developing advanced battery systems for electric vehicle power source applications. The relative merits of the various battery types under examination will be discussed in terms of their efficiency, performance, convenience, cost, and the availability of their component active materials. These factors are important in deciding whether a particular system will be suitable for use in electric vehicles. (Author)

A79-49489 **The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization.** I. G. Gurevich (Akademiia Nauk Belorusskoi SSR, Institut Teplo- i Massoobmena, Minsk, Belorussian SSR). *Journal of Power Sources,* vol. 4, Aug. 1979, p. 145-164. 10 refs.

A theory is developed for the output power stabilization of a rechargeable fuel cell battery in which the reactants and the electrochemical reaction products are in the electrolyte. Possible means of voltage stabilization are considered which employ continuous-flow and continuous flow-circulation supply of the working solution (electrolyte) to a fuel cell. Expressions are derived for the effective stabilization time and the required electrolyte flow rate. For a battery with known output parameters, the means of stabilization have been optimized based on the electrolyte flow rate and time of stabilization. The optimum solution is shown to depend on the net energy losses in implementing the stabilization procedure. (Author)

A79-49514 **A few considerations on new energy source.** L. Neel. *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 637-648. In English and French.

This general review article discusses such topics as domestic heating for scattered dwellings, domestic and industrial heating in urban areas, solar thermal power systems, photovoltaic conversion, windpower generators, wave power, biomass energy. Attention is also given to the effects of economic problems and inflation, and to long-term perspectives (beyond the year 2000) of new energy sources. B.J.

A79-49515 **What will be the price for energy tomorrow. I - Coal price.** M. Ippolito (Charbonnages de France, Service Communauté-Etrangers, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 649-662. In English and French.

A general analysis of global coal production costs is presented. Estimates of costs of coal production for European consumption are presented and attention is given to a comparative analysis of global production costs for the year 1975 and predicted costs for the year 2000. B.J.

A79-49516 **Coal yesterday and tomorrow.** D. Erza (National Coal Board, London, England). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 675-684. In English and French.

The role of coal in the post-World War II period is briefly reviewed and attention is given to ways coal can be used to meet future energy demands. Coal production requirements are reviewed with emphasis on world coal reserves, accessibility of reserves, lead times, and the environmental impact of mining. Consideration is also given to the environmental impact of coal utilization. B.J.

A79-49517 **The advance of natural gas.** M. Tomanoff (Gaz de France, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 685-695. In English and French.

Developments in the European natural gas industry over the past 30 years are reviewed with particular reference to the French situation. Various aspects of natural gas production are reviewed, with emphasis on gas reserves and transportation of liquefied gas. The enormous future potential of natural gas is emphasized. B.J.

A79-49518 **Energy, development and diplomacy.** A. Bressan (Ministère des Affaires Etrangères, Centre d'Analyse et de Prévision, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 707-720. In English and French.

The possibilities of developing a global energy policy within the framework of a New International Economic Order are examined. Attention is given to such aspects of the problem as (1) needs of the Third World, (2) energy commercialization and modernization, (3) traditional energy sources and the satisfaction of basic human needs, (4) optimal uses of traditional sources, and (5) more efficient uses of local energy sources. B.J.

A79-49519 **The economic and political conditions of access to resources of natural gas.** M. Renon (Gaz de France, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 737-753. In English and French.

Questions relating to natural gas production, consumption, and trade are considered within a global political/economic framework. Attention is given to technical-economic characteristics of gas production (raw-material recovery, transportation, etc.), to implications for the policies of producer and consumer countries, and to the influence of the policies of various countries on the natural gas industry. Future perspectives of natural gas production are briefly surveyed. B.J.

A79-49520 **The international energy agency - The way ahead.** U. Lantzke (International Energy Agency, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 767-777. In English and French.

The basic goals of the International Energy Agency (IEA) are (1) the development of an emergency oil-sharing plan for member countries, (2) the development of an information system on the international oil market to keep member countries abreast of current developments, (3) the establishment of a dialogue and cooperation with oil-producing and other oil-consuming countries, leading to the development of a stable worldwide energy supply system, and (4) the achievement of long-term reduction of dependence on imported oil through cooperative efforts in energy conservation, development of alternative energy sources, and energy R&D. This paper reviews the first five years of IEA and considers future perspectives. B.J.

A79-49521 **Energy savings.** J. Poulit (Agence pour les Economies d'Energie, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 778-785. In English and French.

Ways to save energy without cutting back on economic growth are discussed and the basic elements of an energy policy (including regulation and information) are examined. A general framework for saving energy without reducing growth is developed; the framework involves the participation of government, consumers, and manufacturers. Ways that financial assistance can induce energy saving in various sectors of the community are investigated. B.J.

A79-49522 **Chances for a low energy profile society.** J.-M. Martin (CNRS, Paris, France). *Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 786-791. 12 refs. In English and French.

Some general remarks are made on the possibilities of reducing energy consumption in the long-term future (into the 21st century). Relationships between energy costs and economic growth are discussed. B.J.

A79-49523 **Energy and society.** H. R. Linden (Illinois Institute of Technology, Chicago, Ill.). *(American Chemical Society, Symposium on Coal Dilemma II, Colorado Springs, Colo., Feb. 13, 1979.) Revue de l'Energie,* vol. 30, Aug.-Sept. 1979, p. 804-819. In English and French.

This general article discusses such topics as differences in national energy policies, the impact of political and social philosphy on energy policy, and national energy consumption patterns and energy waste. It is concluded that the rapidly growing energy needs of the world will be satisfied only by full utilization of all economically and environmentally acceptable energy sources in a climate of free world trade, combined with an extremely intensive effort of research, development, demonstration, and commercial deployment of new energy technologies by the industralized countries at budgets similar to what is now invested in defense. B.J.

A79-49524 # **Construction of combined solar installations for heating and cooling (O sozdanii kombinirovannykh solnechnykh ustanovok dlia teplo- i khladosnabzheniia).** R. Bairamov, A. Davletov, and A. F. Sokolov (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk,* no. 2, 1979, p. 54-60. 5 refs. In Russian.

Design calculations are presented for solar energy systems intended to provide heating, cooling, and hot water in desert regions. Cost and efficiency analyses are carried out for systems consisting of solar water heaters and paraboloid/cylindrical concentrators. B.J.

A79-49526 * # **Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades.** R. W. Graham (NASA, Lewis Research Center, Fundamental Heat Transfer Section, Cleveland, Ohio). *American Society of Mechanical Engineers and American Institute of Chemical Engineers, National Heat Transfer Conference, San Diego, Calif., Aug. 5-8, 1979, Paper.* 11 p. 32 refs.

Heat tranfer problems in aircraft gas turbines required for improved prediction of turbine blade or vane gas-side heat transfer are examined. Estimates of the heat transfer from the gas to vanes or rotating blades are uncertain due to the complexity of the heat transfer processes, since the gas flow is three dimensional with complex secondary viscous flow patterns that interact with the endwalls and blade surfaces. In addition, upstream disturbances, stagnation flow, curvature effects, and flow acceleration complicate the thermal transport mechanisms in the boundary layers. The thermal state and flow characteristics of the hot gases that enter the turbine blade row, analytical methods for calculating the gas-side heat transfer to turbine blades, and flow phenomena such as stagnation, curvature effects, acceleration, secondary flows, and transition that influences local heat transfer rates are discussed. A.T.

A79-49527 * # **Reduction of particulate carryover from a pressurized fluidized bed.** R. W. Patch (NASA, Lewis Research Center, Cleveland, Ohio). *Symposium on the Transfer and Utilization of Particulate Control Technology, 2nd, Denver, Colo., July 23-27, 1979, Paper.* 20 p.

A bench-scale pressurized fluidized bed combustor (PFBC) constructed with a conical shape to reduce the particulate carryover is examined. The combustor was fed coal and limestone with the coal to air ratio varying from 0.033 to 0.098 (all lean) and the coal to limestone ratio varying from 0.06 to 0.36. Two cone angles were used and it is shown that the average particulate carryover of 2.5 grains/SCF is appreciably less than cylindrical fluidized bed combustors. In addition the carryover was correlated by multiple regression analysis to yield the dependence on bed depth and hence the collection efficiency, which was 20%. Finally, a comparison with a model indicated that the exhaust port may be below the transport disengaging height for most of the tests showing that further improvements could be achieved by increasing the freeboard height of the exhaust port above the bed. M.E.P.

A79-49762 **Numerical study of drift-Alfven waves in a sheared magnetic field.** K. T. Tsang, J. C. Whitson, and J. Smith (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *Physics of Fluids,* vol. 22, Sept. 1979, p. 1689-1699. 21 refs. Contract No. W-7405-eng-26.

The coupled radial eigenmode equations for electromagnetic drift waves in a sheared magnetic field are solved numerically. In addition to the familiar drift eigenmodes, a different set of eigenmodes was found which is the analog of the sheared Alfven waves of local theory in a sheared magnetic field. The drift mode is mainly electrostatic, and the shear Alfven mode is mainly electromagnetic and closely related to the high-order tearing modes. (Author)

A79-49921 # **Drag reduction by cooling in hydrogen-fueled aircraft.** E. Reshotko (Case Western Reserve University, Cleveland, Ohio). *Journal of Aircraft,* vol. 16, Sept. 1979, p. 584-590. 28 refs.

Drag reductions are possible for cryo-fueled aircraft by using fuel to cool selected aerodynamic surfaces on its way to the engines. This is because cooled laminar boundary layers in air at subsonic and low supersonic speeds are more stable than adiabatic boundary layers and therefore more resistant to transition to turbulent flow. Calculations for M = 0.85 hydrogen-fueled transport show that drag reductions in cruise of about 20% are within reason. The weight of the fuel saved is well in excess of the weight of the required cooling system. These results suggest that the hydrogen fueled aircraft employing surface cooling is quite attractive as an energy conservative aircraft and warrants more detailed study. (Author)

A79-50001 **Application of finite element method to analysis of MHD generators.** T. Hara, J. Umoto (Kyoto University, Kyoto, Japan), and O. Matsuda (Kansai Electric Power Co., Inc., Osaka, Japan). *Electrical Engineering in Japan,* vol. 98, Mar.-Apr. 1978, p. 14-20. 16 refs. Translation.

The finite element method was used to perform two- and three-dimensional analyses of the potential and current distributions inside an MHD generator channel. The conductivity and Hall parameter of the plasma are approximately calculated taking into account the nonequilibrium ionization. Some results on output power and I-V characteristics are also presented. B.J.

A79-50007 **Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant.** Y. Yamaguchi. *Electrical Engineering in Japan*, vol. 98, Mar.-Apr. 1978, p. 108-121. Translation.

The paper describes tests performed to evaluate the electrical power generation capability of a Tokyo refuse-burning station. Consideration is also given to features of the refuse-burning power station and to its principles of operation. Test results were very satisfactory. B.J.

A79-50027 **Studies of CdSiAs2 for photovoltaic applications.** L. C. Burton, C. F. Smith, Jr., A. F. Carroll, and L. H. Slack (Virginia Polytechnic Institute and State University, Blacksburg, Va.). In: SOUTHEASTCON '79; Proceedings of the Region 3 Conference and Exhibit, Roanoke, Va., April 1-4, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 25-28. 24 refs.

Investigations related to the p-type chalcopyrite CdSiAs2 are reported. Polycrystalline bulk material has been formed by direct fusion of the elements, and thin films have been formed by RF sputtering. The bulk samples are stoichiometric, as measured by means of SEM/EDAX and electron beam microprobe, and have the chalcopyrite structure as determined by X-ray analysis. The thin films are also near stoichiometric, and are amorphous. P-N heterojunctions have been formed using CdS as the n-type material, and a photovoltaic response has been measured. The present status is reviewed, and projections are made for future work. (Author)

A79-50028 * **Considerations for accurately determining the maximum power output of solar cells.** J. W. Lathrop and J. L. Prince (Clemson University, Clemson, S.C.). In: SOUTHEASTCON '79; Proceedings of the Region 3 Conference and Exhibit, Roanoke, Va., April 1-4, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 29-32. Contract No. JPL-954929.

The most important single electrical parameter characterizing solar cell performance is Pm, the cell's maximum power output. In order to experimentally determine Pm it is necessary accurately to control both illumination and cell temperature during measurements. Two quite different measurement approaches can be used: an equilibrium method and a transient flash method. Both techniques are discussed in the paper in detail. (Author)

A79-50030 **A computer model of a heterojunction solar cell with application to GaP/Si.** R. W. Johnson and E. J. Scheibner (Georgia Institute of Technology, Atlanta, Ga.). In: SOUTHEASTCON '79; Proceedings of the Region 3 Conference and Exhibit, Roanoke, Va., April 1-4, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 37, 38.

A computer simulation model for the heterojunction solar cell is used to study the effect of doping concentration and incident solar radiation on the efficiency and I-V characteristics of the cell. The model is designed to duplicate the results of Sahai and Milnes (1970) for the special case of a GaP-Si cell, but can be easily extended to other materials. The emphasis with this study has been to optimize the design factors for maximum efficiency and also to develop a means by which the operation of the cell can be theoretically assessed after specific degradation effects due to long term environmental exposures. (Author)

A79-50072 # **Superconductive magnetic energy storage inductor converter units.** S. W. Van Sciver and R. W. Boom (Wisconsin, University, Madison, Wis.). In: Midwest Symposium on Circuits and Systems, 21st, Ames, Iowa, August 14, 15, 1978, Proceedings. North Hollywood, Calif., Western Periodicals Co., 1978, p. 615-619. 7 refs.

Superconductive magnetic energy storage is being studied by an interdisciplinary group at the University of Wisconsin. To date, the effort has shown that large scale superconducting magnets can provide a technically feasible and economical alternative to pumped hydroelectric storage for utility applications. The unit consists of a superconductive magnet or inductor buried in subterranean bedrock and interfaced to the electric power network by a thyristorized converter of the Graetz bridge type. (Author)

A79-50073 # **Digital simulation of dynamics of wind turbine generators.** H. H. Hwang and T.-H. Guo (Hawaii, University, Honolulu, Hawaii). In: Midwest Symposium on Circuits and Systems, 21st, Ames, Iowa, August 14, 15, 1978, Proceedings. North Hollywood, Calif., Western Periodicals Co., 1978, p. 634-638. 6 refs.

This paper presents a digital simulation of the dynamic stability of a wind turbine generator connected to a power system. The effects of the tower shadow and wind gusts are included in the input to the wind turbine. Different configurations of the drive train and various control methods are used in the simulations. (Author)

A79-50153 # **Photoelectrochemistry and solar energy conversion (Fotoelektrokhimiia i preobrazovanie solnechnoi energii).** Iu. V. Pleskov. *Akademiia Nauk SSSR, Vestnik*, no. 6, 1979, p. 69-76. In Russian.

Two types of photoelectrochemical devices are described: those based on photogalvanic cells and those based on photovoltaic cells. The photoelectrolysis of water is examined in some detail and attention is given to various problems (including efficiency and materials selection) associated with photoelectrochemical conversion. B.J.

A79-50174 **Lateral flow concept for rock bed systems.** J. C. Christopher (Contemporary Systems, Inc., Walpole, N.H.). *Solar Engineering Magazine*, vol. 4, Aug. 1979, p. 15-17.

The paper describes the design of a lateral flow concept rock bed system and presents the results of an experiment to determine the breakthrough time and the pressure loss characteristics of a packed stone bed thermal storage device. It is shown that the charging cycle is the exact inverse of the discharge cycle. Data are given showing the temperature of each probe plotted over a continuous 24-hr period as air was fed into the bed at 100 F. It can be seen that each successive point rises almost to the input temperature prior to any significant change in temperature in the succeeding point. The importance of limiting the vertical height of the bin to around 24 in. to prevent vertical stratification is stressed. Finally attention is given to the rock bin insulation. M.E.P.

A79-50176 **Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound.** C. Paorici, L. Zanotti (CNR, Parma, Italy), N. Romeo, G. Sberveglieri, and L. Tarricone (Parma, Università, Parma, Italy). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 3-9. 11 refs. Research supported by the Consiglio Nazionale delle Ricerche.

The preparation of single crystals of CuGa(x)In(1-x)Se2 by a chemical transport method in a closed tube is described. Electrical and optical properties, measured as a function of CuGa(x)In(1-x)Se2 composition, indicate that this material, when coupled with zinc and cadmium chalcogenide windows, can be used as an absorber in heterojunction solar cells with near-zero lattice mismatch. (Author)

A79-50177 **Optical properties and structure of amorphous silicon films prepared by CVD.** M. Janai, D. D. Allred, D. C. Booth, and B. O. Seraphin (Arizona, University, Tucson, Ariz.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 11-27. 50 refs. Research supported by the AVIAC Foundation, Technion - Israel Institute of Technology and Fulbright-Hays Foundation; Contract No. ER-78-S-02-4899.

A79-50178 **Possibilities of new materials for solar photovoltaic cells.** M. Schoijet (Instituto Politécnio Nacional, Mexico City, Mex.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 43-57. 136 refs.

The requirements for desirable technological properties of semiconductors for photovoltaic conversion are discussed, and two criteria are suggested for the selection of materials that could guide the search toward low-melting-point compounds made of cheap component elements: (1) the use of a deviation from ideality vs. energy-gap diagram for the prediction of energy gaps from the knowledge of melting temperatures or vice versa; (2) the use of the Parthé-Goryunova-Mooser-Pearson criteria for compounds of which only their chemical formula is known but not their structure, in order to guess that structure and therefore be able to use the first criterion. For materials for Schottky devices a third criterion is necessary, derived by Nethercot (1974), that relates the Mulliken electronegativities of the component elements of a compound to its electron affinity. This can also be applied in the search for metallic alloys, semimetals, or narrow-band-gap semiconductors that might replace the metal in a Schottky barrier. It is shown that a number of compounds exist which might meet these criteria. (Author)

A79-50179 **Some relations governing major solar cell parameters.** N. M. Ravindra and V. K. Srivastava (Roorkee, University, Roorkee, India). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 59-62. 9 refs.

The method for determining semiconductor materials with an optimum bandgap for photovoltaic conversion is expanded in an attempt to simplify solar cell efficiency or optimum bandgap calculations. The problem is confined to three parameters: temperature, efficiency, and bandgap. A relation is derived stating that the difference in the product of the maximum theoretical efficiency of a solar cell and the corresponding bandgap is a constant, provided that the temperature difference is the same. The relation is valid up to 100 C. V.T.

A79-50180 **Design of selective surfaces for solar energy collection.** D. M. Trotter, Jr,, H. G. Craighead, and A. J. Sievers (Cornell University, Ithaca, N.Y.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 63-68. 18 refs. NSF Grant No. DMR-76-81083; Contract No. EG-77-S-03-1456.

Numerical calculations have been done to determine the total hemispherical solar absorptivity and the total hemispherical emissivity in the infrared of selective surfaces composed of a dielectric film on a metal substrate. The selectivity of the surface as a function of the refractive index of the film is discussed, as well as the effect of grading the index of the film. It is concluded that the most effective film is one having the index at the metal surface as close to unity as possible through its entire thickness while another, unidentified parameter increases from zero at the front surface to a larger value at the back surface. (Author)

A79-50181 **The surface microstructure optical properties relationship in solar absorbers - Black chrome.** A. Ignatiev, P. O'Neill, and G. Zajac (Houston, University, Houston, Tex.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 69-79. 20 refs. Research supported by the U.S. Department of Energy.

A79-50182 **Microstructure of a black chrome solar selective absorber.** C. M. Lampert and J. Washburn (California, University, Berkeley, Calif.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 81-92. 9 refs. Research sponsored by the U.S. Department of Energy.

The structure of the 'CHROM-ONYX' type of black chrome/metal selective absorber was studied to gain a better understanding of its influence upon the mechanism of wavelength selectivity. Spectral-reflectance measurements were performed on seven samples. In this study, the best selectivity was found by these measurements to be 1.0 micron of black chrome on copper and 0.7 micron of black chrome on nickel. Both transmission and scanning electron microscopy were employed to study microstructure and chemical composition. As a result of the combined studies, some effects of black-chrome thickness and the metallic substrate were determined. It was found that black chrome consisted of a very fine metallic distribution of particles of chromium, possibly suspended within a matrix of an oxide of chromium. This combination was, in turn, agglomerated into larger particles within the 0.05-03.-micron size range. These larger particles formed a network which constituted the surface coating. (Author)

A79-50183 **Composite semiconductors - Selective absorbers of solar energy.** J. I. Gittleman, E. K. Sichel, and Y. Arie (RCA Laboratories, Princeton, N.J.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 93-104. 14 refs. Contract No. EG-77-C-02-4557.

Composite semiconductors have been produced by cosputtering CaF2 with either Ge or Si, and their optical constants were measured. Their optical behavior can be described as being similar to that of the parent semiconductor, with the same energy gap but with a reduced concentration-dependent index of refraction. The normal specular reflectance of films sputtered on mirrored surfaces was measured. These data were used to compute the solar absorptance and thermal emittance. It was found that the solar absorptance was approximately 0.7 and the thermal emittance, about 0.06 with a weak dependence on composition, thickness, and operating temperatures. Thus at T = 500 C conversion efficiencies of 50% are currently possible at solar concentration ratios C of 7-8 and about 70% for C of approximately 40, and improved performance can be expected with continuing research. (Author)

A79-50184 **Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle.** R. B. Pettit (Sandia Laboratories, Albuquerque, N. Mex.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 125-140. 9 refs. Contract No. AT(29-1)-789.

A79-50185 **Towards the design of contrived photosynthesizers.** V. Guruswamy (South Australia, Flinders University, Bedford Park, Australia) and J. O. Bockris (Texas A&M University, College Station, Tex.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 141-156. 33 refs.

Photosynthesis may be contrived to give H2 and O2. Biosystems are complex to work with; semiconductors in contact with electrolytic solutions offer more easily comprehended situations and may give enhanced efficiency of conversion of solar light (when compared with bioconversion). What is needed are criteria for optimization (1) with respect to solid-state factors connected with photoelectrochemical energy conversion; (2) with respect to the competing side reactions which destroy the electrode materials; and (3) with respect to the enhancement of conductivity which is often needed. Some quasi-quantitative numbers are derived. (Author)

A79-50186 **Electric and photovoltaic properties of CdTe pn homojunctions.** J. Mimila-Arroyo, Y. Marfaing, G. Cohen-Solal, and R. Triboulet (CNRS, Laboratoire de Physique des Solides, Meudon-Bellevue, Hauts-de-Seine, France). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 171-180. 20 refs.

A79-50187 **Stability of SnO2/n-Si solar cells.** C. Fishman, A. K. Ghosh, and T. Feng (Exxon Research and Engineering Co., Linden, N.J.). *Solar Energy Materials*, vol. 1, Feb. 1979, p. 181-185. Contract No. EY-76-C-03-1283.

SnO2/Si solar cells were encapsulated in Sylgard and then placed in a weatherometer and exposed to a deionized water spray and light from a carbon arc. Other cells were left unencapsulated and placed in a nitrogen dry box and exposed to light from an ELH lamp. Several cells were placed in quartz jars in a N2 atmosphere and then hermetically sealed. It is found that the cell behavior is independent of cell preparation. The open-circuit voltage decrease is common to all devices made and tested, decaying rapidly and then leveling towards a constant value. Short-circuit current remains constant for all cells, and the fill factor may decrease slightly and then levels. V.T.

A79-50188 Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization. J. Spitz, T. V. Danh, and A. Aubert (Commissariat à l'Energie Atomique, Laboratoire d'Etudes des Matériaux Minces, Grenoble, France). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 189-200. 13 refs.

The preparation of selective surfaces on steel and copper substrates by black chrome electroplating is described. The structural characterization of these black chrome surfaces by X-ray diffraction and photoelectron spectrometry is reported. Thermal and chemical stability tests have also been carried out on the surfaces. Finally the conversion efficiencies of black solar collectors which use black chrome and black paint absorbers are compared. (Author)

A79-50189 Chromium black coatings for photothermal conversion of solar energy. II - Optical properties. J. M. Behaghel, S. Berthier, J. Lafait, and J. Rivory (Paris VI, Université, Paris, France). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 201-213. 9 refs.

The optical characterization of chromium black coatings prepared by electrodeposition at CENG (J. Spitz) is presented. The preparation and the structural characterization of the deposits have been reported in the first part of this paper. The interest of performing measurements of hemispherical reflectivity versus angle of incidence is emphasized. The optical techniques are described. The spectral selectivity of these coatings is determined, discussed and compared to other blacks according to their structure, within the photothermal conversion of solar energy. (Author)

A79-50190 Back illuminated high efficiency thin film Cu2S/CdS solar cells. P. K. Bhat, S. R. Das, D. K. Pandya, and K. L. Chopra (Indian Institute of Technology, New Delhi, India). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 215-219. 14 refs. Research supported by the Ministry of Industrial Development of India.

Backwall Cu2S/CdS thin film solar cells of 10.4% conversion efficiency have been fabricated on SnO(x):Sb coated glass substrates by an evaporation technique involving a solid state reaction to form the junction. The cells exhibit an open circuit voltage of 470-490 mV and a short circuit current density of about 37 mA/sq cm under 100 mW/sq cm tungsten illumination. The carrier collection is enhanced as a result of a back surface n+/n junction formed at the SnO(x)/CdS interface. (Author)

A79-50191 Preparation of titanium dioxide films as solar photocatalysts. D. Haneman and P. Holmes (New South Wales, University, Kensington, Australia). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 233-236. 7 refs. Research supported by the Australian Research Grants Committee.

The use of titanium dioxide as a photoanode in photoelectrolysis cells is well known. It has been prepared as single crystals of rutile, sintered compacts, oxidized titanium sheet, chemical vapor deposited films and evaporated films. Its efficiency for solar energy conversion is generally less than 1%, since it is activated by only 3% of the solar spectrum due to its large (3 eV) bandgap. However it is robust, long lived and suited to direct hydrogen production. Therefore it is of possible economic interest if prepared in sufficiently low cost, large area form. In this report we describe preparation of durable films on low cost substrates with effective ohmic contacts in a simple inexpensive process. (Author)

A79-50193 Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material. H. Tributsch (Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Fritz-Haber-Institut, Berlin, West Germany). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 257-269. 17 refs. Research supported by the Deutsche Forschungsgemeinschaft.

The effect of doping of MoSe2 (band gap 1.4 eV) as well as the influence of the electrochemical potential of the redox-couple in the electrolyte have been investigated in an effort to optimize solar cells based on layer compounds. It is shown that in the case of I(-)/I2 the mechanism of photopotential generation is assisted by a favorable chemical modification of the electrode surface which introduces both negative charges into the double layer and traps for holes into the space charge layer. The effect is traced to the formation and reaction behavior of a five-valent Mo(V)-I complex. The MoSe2:I(-)I2 cell could be improved to an energy conversion efficiency of 8% for monochromatic and 4% for solar radiation. Its good stability was established by continued operation at 10 mA/sq cm for 10 months. This system cannot compete with solid state solar cells, but it could possibly be developed as hybride cell for the simultaneous production of heat and electricity. (Author)

A79-50194 Efficiency of tandem solar cell systems as a function of temperature and solar energy concentration ratio. N. A. Gokcen (U.S. Bureau of Mines Thermodynamics Laboratory, Albany, Ore.) and J. J. Loferski (Brown University, Providence, R.I.). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 271-286. 11 refs. Contract No. EG-77-C-03-1579.

A comprehensive theoretical analysis of tandem photovoltaic solar cells as a function of temperature and solar concentration ratio is presented. The relation governing the characteristics of the solar cells was derived, and the overall efficiencies of tandem cell stacks of up to 24 cells with energy gaps in the 0.7 to 3.6 eV range were calculated for temperatures up to 500 K, and for illumination by an AMO solar spectrum of 1, 100, 500, and 1000 suns concentration ratios. The calculations show that the optimized overall efficiency for ideal diodes has a limiting value of approximately 70% for 200 K and concentration ratio of 1000. Most of the gain in efficiency occurs between six and ten semiconductors in the tandem system, so that for 300 K and 1000 concentration ratio, an optimized six cell system has a theoretical limit efficiency of about 53%. A.T.

A79-50195 Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination. C. R. Wronski (Exxon Research and Engineering Co., Linden, N.J.). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 287-297. 32 refs.

The role of gap states in determining the transport of recombination of carriers in hydrogenated amorphous silicon (a-SiHx) is examined for discharge produced films such as are used in efficient solar cell structures. Junction, photovoltaic and photoconductivity characteristics, are presented and discussed for these films. Free carrier transport is found to be present over the temperature range of 400 to 100 K, with the role of states near the free carrier bands being limited to trapping. This is in direct contrast to the previously reported transition from carrier transport to hopping through these localized states and with direct carrier recombination between these states at about 250 K. As a result the recombination kinetics can be directly related to the different states present in the gap of a-SiHx, and examples of this are given for both electrons and holes. The recently published reversible conductivity changes must be taken into account if the ambiguities in the interpretation of the kinetics data are to be avoided. (Author)

A79-50196 Properties of chemically sprayed SnO2 antireflecting films on Si solar cells. I. Chambouleyron and E. Saucedo (Instituto Politécnico Nacional, Mexico City, Mex.). *Solar Energy Materials,* vol. 1, Mar.-May 1979, p. 299-311. 34 refs.

The properties of SnO2 films obtained by hydrolysis of stannic chloride on silicon surfaces are described. The layers grown by this method possess certain characteristics which make them interesting for photovoltaic applications. Antireflection effects on the Si-air interface are obtained together with a very large reduction of the surface recombination velocity. This latter effect is explained in terms of hydrogen or chlorine adsorption at the SnO2-Si interface via the completion of interface dangling bonds. Experimental evidence and theoretical considerations that support such an explanation are given. However, the question of whether or not chlorine could play a passivating role remains open. Finally some considerations are made concerning the possible uses of Sb doped SnO2 layers on Si solar cells. (Author)

A79-50197 **CuInS2 films prepared by spray pyrolysis.** M. Gorska, R. Beaulieu, J. J. Loferski, and B. Roessler (Brown University, Providence, R.I.). *Solar Energy Materials*, vol. 1, Mar.-May 1979, p. 313-317. 16 refs. NSF Grant No. ENG-76-84509; Contract No. EG-77-C-03-1579.

The electrical, optical and structural properties of thin films of CuInS2 prepared by spraying a solution of Cu2Cl2, InCl3 and thiourea onto heated glass and alumina substrates are described. The polycrystalline films produced at prescribed spraying rates and substrate temperatures were nearly stoichiometric as shown by EDAX analysis, homogeneous, and had the sphalerite structure. The films were p-type and their resistivity could be adjusted over the range 0.1 ohm cm to very high values by controlling the temperature of the substrate during spraying. Heterojunction devices which exhibited a weak photovoltaic effect were prepared by combining these films with either single crystals of CdS or with sprayed films of CdS. (Author)

A79-50211 **Energy storage in fluidized beds.** J. H. Harker and C. E. Hindmarch (Newcastle-upon-Tyne, University, Newcastle-upon-Tyne, England). *Institute of Energy, Journal*, vol. 52, Mar. 1979, p. 45-48.

A preliminary investigation has been carried out into energy recovery and storage from a low-temperature gas stream in fluidized beds of ballotini particles. Such a system has the advantage of high rates of heat transfer during intake and release of energy and only modest losses of energy during storage. The system is shown to be feasible and a further evaluation of the economics is proposed. (Author)

A79-50212 **Manufacture of fuel gas for power generation by fluidized bed gasification of coal.** B. Robson and G. G. Thurlow (National Coal Board, Coal Research Establishment, Cheltenham, Glos., England). *Institute of Energy, Journal*, vol. 52, June 1979, p. 94-99. 5 refs. Research supported by the European Coal and Steel Community and National Coal Board.

A fluidized bed coal gasification process proposed by Great Britain's Coal Board is outlined. Attention is given to such process requirements such as feedstock, gasifying agents, gaseous products, pressure and choice of gasifier. The results obtained from laboratory-scale experimental work carried out on the gasification stage are described. It is shown that a fuel gas of suitable quality can be produced by adjustment of the operating parameters. Finally, it is noted that a feasibility study on the pilot plant has been completed and indicates areas requiring further study as well as providing preliminary cost estimates. M.E.P.

A79-50218 **Distributed parameter modelling of urban residential energy demand.** C. Clayton and J. E. Estes (California, University, Santa Barbara, Calif.). *Remote Sensing Quarterly*, vol. 1, Jan. 1979, p. 106-115. 10 refs.

The paper presents a conceptual model illustrating the potential use of remotely sensed imagery for improving the prediction of residential energy demand in urban areas. The model is composed of four segments: (1) the evaluation, selection, and application of existing econometric models built to predict energy demand; (2) the use of data from remote sensor systems and collateral sources to provide spatially distributed estimates of the magnitude of and change in the independent variables contained in the econometric models; (3) the use of imagery from successive time periods to construct a predictive land use change model; and (4) the development of a predictive energy demand model based on changing land use patterns. Such a model, when fully operational, could effectively attain two important goals: (1) provide the ability to forecast gross future energy consumption; and (2) have the capability to predict the spatial location of such future demand. The research reported describes a conceptual model designed to predict the magnitude and location of residential energy demand in an urban environment and also predict its future location. (Author)

A79-50219 * **Solar potential inventory and modeling.** G. L. Angelici and N. A. Bryant (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Remote Sensing Quarterly*, vol. 1, Apr. 1979, p. 5-16.

Image processing procedures for calculating the energy that roof-mounted solar collectors can potentially supply in a metropolitan area are presented. Satellite multispectral imagery from which land cover types can be determined digitally was sampled in order to estimate the percentage of land area occupied by flat or south-facing roof tops in residential and commercial/industrial areas. Procedures were applied to the various power subdistricts of the western San Fernando valley of California, and it was found that on the average 120% of the existing power demand could be met if only half the useable rooftop area were utilized, amounting to 385 MW of peak power and indicating the applicability of solar cells to power generation in urban areas. A.L.W.

A79-50327 # **Evaluation of solar absorbers, reflectors and transmitters - Physical reflectance standards.** J. C. Richmond (National Bureau of Standards, Gaithersburg, Md.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 2-6. 12 refs.

The measurement of the solar reflectance and absorption of solar absorbers, reflectors and transmitters is discussed. Consideration is given to the large variations in the observed terrestrial solar spectral irradiance distribution, which are due to atmospheric attenuation by aerosols and atmospheric gasses, and it is argued that a standard solar spectral distribution representing same average air mass and pollutant condition should be adopted. Direct methods of measuring the reflectance and absorption of extraterrestrial solar radiation are discussed, and the indirect measurement of solar properties by means of computations of average absorptance, reflectance and transmittance involving spectral measurements weighted by the terrestrial standard spectrum are considered. The development of physical standards of directional-hemispherical spectral reflectance and spectral specular reflectance by the National Bureau of Standards is also noted. A.L.W.

A79-50328 **Thermal radiation from conducting surfaces.** A. J. Sievers (Cornell University, Ithaca, N.Y.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 7-11. 13 refs. NSF Grant No. DMR-76-81083; Contract No. EG-77-S-03-1456.

Qualitative arguments are used to derive the essential features of the dependences of the hemispherical thermal emissivity of conducting surfaces on temperature and the DC resistivity of the metal. An expression predicting a linear temperature dependence of the total normal and hemispherical reflectivities is obtained from the free electron model and corrected for the diffuse reflection of conduction electrons from the metal surface. The values obtained from the corrected expressions are shown to be in good agreement with experimental studies on copper and aluminum, and the expressions are used to quantify the heat-trapping ability of solar-selective surfaces. A.L.W.

A79-50329 # **'Ultra-black' coating for high absorptance of solar energy.** C. E. Johnson (National Bureau of Standards, Gaithersburg, Md.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 12, 13.

Ultra-black surfaces with a spectral reflectance of 0.5% have been produced on electroless nickel-phosphorus coatings. Coatings were applied to copper or steel substrates from the acid Brenner (1947) bath, and the surface morphology leading to the high absorption of the coating was developed by immersing the deposits in a nitric acid solution. Scanning electron microscopy has shown that selective nitric acid dissolution produces honeycomb structure of pores or channels perpendicular to the surface of the coating, which is responsible for its blackness. An average spectral reflectance of 0.5% was measured in the range 320 to 2140 nm, and an emissivity of 50% at room temperature was determined. The low spectral reflectance of the coating may lead to its application in flat plate solar collectors, as well as for low-temperature calorimetry studies. A.L.W.

A79-50335 * **Reductions in vehicle fuel consumption due to refinements in aerodynamic design.** E. J. Saltzman (NASA, Flight Research Center, Edwards, Calif.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 63-68. 43 refs.

Over-the-highway fuel consumption and coastdown drag tests were performed on cab-over-engine, van type trailer trucks and modifications of these vehicles incorporating refinements in aerodynamic design. In addition, 1/25-scale models of these configurations, and derivatives of these configurations were tested in a wind tunnel to determine the effects of wind on the magnitude of the benefits that aerodynamic refinements can provide. The results of these tests are presented for a vehicle incorporating major redesign features and for a relatively simple add-on modification. These results include projected fuel savings on the basis of annual savings per vehicle year as well as probable nationwide fuel savings. (Author)

A79-50342 * **Environmental requirements for flat plate photovoltaic modules for terrestrial applications.** A. R. Hoffman and R. G. Ross, Jr. (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 171-178. 9 refs. Research sponsored by the U.S. Department of Energy.

The environmental test requirements that have been developed for flat plate modules purchased through Department of Energy funding are described. Concurrent with the selection of the initial qualification tests from space program experience - temperature cycling and humidity - surveys of existing photovoltaic systems in the field revealed that arrays were experiencing the following failure modes: interconnect breakage, delamination, and electrical termination corrosion. These coupled with application-dependent considerations led to the development of additional qualification tests, such as cyclic pressure loading, warped mounting surface, and hail. Rationale for the selection of tests, their levels and durations is described. Comparisons between field-observed degradation and test-induced degradation show a positive correlation with some of the observed field effects. Also, the tests are proving useful for detecting design, process, and workmanship deficiencies. The status of study efforts for the development of environmental requirements for field-related problems is reviewed. (Author)

A79-50343 **Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility.** G. P. Mulholland (New Mexico State University, Las Cruces, N. Mex.) and L. K. Matthews (Sandia Laboratories, Albuquerque, N. Mex.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 179-182. 5 refs.

A qualitative test of a 3-D Winston-type concentrator at the White Sands Solar Furnace is discussed. The concentrator has an entrance aperture of 15.25 cm, an exit aperture of 7.62 cm, a length of 19.8 cm and a reflective surface of polished aluminum. Nine individually controlled channels have been cut into the wall of the concentrator for cooling water. Wall temperatures at eleven positions and flux-densities at the exit aperture have been obtained. (Author)

A79-50344 **Concentration of a cassegrain solar furnace.** M. H. Cobble, W. C. Hull, and E. F. Thacher (New Mexico State University, Las Cruces, N. Mex.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 183-187.

A solar furnace consisting of a paraboloid of revolution that tracks the sun, and a hyperboloid of revolution that has a focus in common with the paraboloid is analyzed for the concentration of a nonuniform sun, the concentration of a uniform sun, and the concentration with mirror error. The theoretical results are compared with experimental results for a specific cassegrain solar furnace. (Author)

A79-50345 **Thermal vacuum testing of solarpanels by solar simulation and infrared simulation.** H. E. Nuss (Industrieanlagen-Betriebsgesellschaft mbH, Ottobrunn, West Germany). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 188-194. 19 refs.

Solar simulation tests for the solar panels of the European Space Agency satellites OTS and Marots were carried out. The performance of the collimated beam solar simulator and the thermal test results are described. As an alternative thermal test method the capability of an infrared radiation method was studied and infrared simulation tests for the ultralight panel (ULP) and the Intelsat V solar panels were performed. The setup and the characteristics of the infrared radiation unit using a quartz lamp array of approximately 15 sq m and an LN2-cooled shutter and the thermal test results are presented. The irradiation uniformity, the solar panel temperature distribution, temperature changing rates and temperature gradients for both test methods are compared. The results indicate the infrared simulation is an effective thermal testing method. (Author)

A79-50346 **The availability of solar energy for work processes.** R. H. Edgerton (Oakland University, Rochester, Mich.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 195-200. 13 refs.

The paper discusses the effects of scattering, concentration, and optical filtering on the available energy of solar radiation. NASA standard solar energy absorption data are used to evaluate the effect of atmospheric conditions on the energy in sunlight which can be converted to work. Topics covered include black body radiation, equilibrium thermodynamics, temperature of radiation, solar geometric factors, spectral factors of solar radiation, and available energy of sunlight. M.E.P.

A79-50347 * **Multichannel temperature controller for hot air solar house.** J. R. Currie (NASA, Marshall Space Flight Center, Huntsville, Ala.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 204-208.

This paper describes an electronic controller that is optimized to operate a hot air solar system. Thermal information is obtained from copper constantan thermocouples and a wall-type thermostat. The signals from the thermocouples are processed through a single amplifier using a multiplexing scheme. The multiplexing reduces the component count and automatically calibrates the thermocouple amplifier. The processed signals connect to some simple logic that selects one of the four operating modes. This simple, inexpensive, and reliable scheme is well suited to control hot air solar systems. (Author)

A79-50350 **Special considerations in the environmental study program for coal gasification plants.** G. M. Patelunas, A. J. Krause, and E. Berkey (Energy Impact Associates, Inc., Pittsburgh, Pa.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 298-301. 5 refs.

Environmental study requirements are presented for coal gasification facilities during the preconstruction baseline monitoring program. Coal gasification processes are briefly described along with Environmental Impact Statement monitoring programs. Consideration is given to air and water monitoring and the potential environmental impact of solid wastes. This approach will determine the current existence of such major components as CO2 in air and phenols in water in the natural environment of the proposed plant sites, providing a baseline from which to judge the future performance of coal gasification facilities. V.T.

A79-50351 **Environmental implications for geothermal energy development.** R. B. Craig and G. W. Suter, II (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979.
Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 302-305. 15 refs. Contract No. W-7405-eng-26.

The nature of geothermal resources and the constraints that site characteristics place on their development are examined. The five types of geothermal energy, magma, normal gradient, hot dry rock, hydrothermal, and geopressurized are discussed, noting that the last three types have potential for near future development. Remoteness of hydrothermal areas which often conflicts with preservation of biological values is considered, and it was found that the most common characteristics of geothermal resource areas is limited water. It was shown that the characteristics of a geothermal field development are drilling activity, water evaporation, a conspicuous plant with cooling towers, dirt roads, pipelines, and transmission lines which interfere with cultural, aesthetic, and wildlife resources. Thus, proper site selection and environmental planning will decide the success of geothermal energy commercialization. A.T.

A79-50352 **Impact of H2S emission abatement on geothermal power costs.** K. D. Wells and J. W. Currie (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979.
Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 306-311. 20 refs. Contract No. EY-76-C-06-1830.

Estimates of private costs when abating emissions of hydrogen sulfide from geothermal energy sources are developed. The private costs reflect only the expenses a firm incurs in conjunction with abatement efforts, including charges for such factors as labor, materials, and capital investments. The definition of hydrogen sulfide emissions and impacts are presented as adopted for purposes of cost estimation in the study, along with the associated airborne emission standards for hydrogen sulfide. Hydrogen sulfide emission control processes are reviewed, and cost estimates are provided for those considered economically feasible as well as for a specific geothermal site. V.T.

A79-50353 **Bio-electrochemical conversion of refuse to energy.** K. Denno (New Jersey Institute of Technology, Newark, N.J.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 316-321. 10 refs. Research supported by the New Jersey Institute of Technology.

The paper presents important results relevant to the processes of synthetic fuel extraction and direct use of the bio-organic fuel in a power cell. The information presented is purely theoretical and based on mathematical and physical concepts. The discussion focuses on the biofuel cell as a perfect electrochemical apparatus, and on the dynamics of bioconversion. This process involves the extraction of multigrade saturated and unsaturated hydrocarbons of the system C(n)H(2n+2) from refuse. This process is assumed to take place through the interaction of material reactants, viz. the refuse and the environment. S.D.

A79-50354 **Problems in the redox flow cell power system for bulk energy storage.** K. Denno (New Jersey Institute of Technology, Newark, N.J.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 322-332. 8 refs. Research supported by the New Jersey Institute of Technology.

The redox flow cell operates on the principle of oxidation-reduction reaction in which the ions of the redox couple remain soluble in their electrolytes in either oxidized or reduced states. The paper focuses on the problem of the internal circulating currents and their causes in the single redox flow cell, especially in the catholyte. Attention is given to analyzing the phenomenon arising in the redox cell from the interaction of the catholyte ferric ionic flow with the local magnetic field generated by the electric current delivered to the load during discharge. Such interaction will lead to gyromagnetic alignment of the dipolar fluid and the consequent flow of circulating currents, the occurrence of power losses and limitation of output voltage. Results of theoretical and experimental work are discussed in some detail. S.D.

A79-50362 **Applicability of energy model techniques to an analysis of impacts of SO2 emissions from the U.S. electric utilities and control policies.** R. H. Kim (North Carolina, University, Charlotte, N.C.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 516-520. 40 refs.

A79-50363 **Environmental impacts of contemporary fossil energy systems.** H. K. Roffman (Energy Impact Associates, Inc., Pittsburgh, Pa.). In: Learning to use our environment; Proceedings of the Twenty-fifth Annual Technical Meeting, Seattle, Wash., April 30-May 2, 1979. Mount Prospect, Ill., Institute of Environmental Sciences, 1979, p. 521-530. 32 refs.

A procedure is outlined for assessing the environmental impacts associated with the utilization of coal, oil, and natural gas, noting that the entire fuel cycle must be taken into consideration. It is shown that for these resources three major sequential activities are involved: (1) fuel production, (2) fuel transportation, and (3) power production. The first includes extraction of the resource and its preparation (cleaning, refining, etc.). The second includes all environmental effects associated with the transportation of fuel while the third is concerned with the impacts at the power plant. M.E.P.

A79-50399 **Solar power satellite - Putting it together.** R. W. Johnson (Grumman Aerospace Corp., Bethpage, N.Y.) *IEEE Spectrum*, vol. 16, Sept. 1979, p. 37-40.

The problems of constructing a solar power satellite in earth orbit are surveyed. Consideration is given to such points as the need for an assembly line in space, for lightweight yet strong and durable materials, for a completely new heavy lift launch vehicle and for special manipulative tools for assembly work. Advanced composite materials are discussed as well as the question of whether to build in low or high earth orbit. Construction techniques described include an automatic beam making machine and remote work stations. Finally, it is concluded that the development of construction techniques for the SPS will have other uses which will reduce the R&D costs chargeable to the solar power satellite. M.E.P.

A79-50400 **Exploiting wave power.** B. M. Count (Central Electricity Generating Board, Marchwood Engineering Laboratories, Southampton, England). *IEEE Spectrum*, vol. 16, Sept. 1979, p. 42-49. 5 refs.

A survey of proposed wave power systems is presented. Five power conversion devices are studied: (1) the Salter Duck - an asymmetric, cam-shaped device, oscillating about a fixed point, (2) the Cockerell Raft - a structure of rafts hinged together, (3) the air buoy - an asymmetric chamber with trapped water and air, (4) the Kamei - a Japanese device resembling an open bottom ship with 22 air chambers, and (5) the rectifier - structure of high level and low level reservoirs. Attention is given to the two basic types of devices dynamic and passive, and compared. Consideration is also given to such points as transmitting the power to shore, control philosophy for maximum power, and power vs torque. Finally, unsolved problems such as construction of a spine structure strong enough to survive extreme wave conditions are discussed. M.E.P.

A79-50451 **Undergound pumped hydro storage - An overview.** S. W. Tam, C. A. Blomquist, and G. T. Kartsounes (Argonne National Laboratory, Argonne, Ill.). *Energy Sources*, vol. 4, no. 4, 1979, p. 329-351. 13 refs. Research supported by the U.S. Department of Energy.

This paper reviews the status of underground pumped hydro storage (UPHS) for electric utility peaking and energy-storage applications. The salient features of major recent studies are reviewed. Turbomachinery options and advances in high-head pump/turbines are discussed. The effect of head, capacity, turbomachinery unit size and type, and other performance variables on the cost of a UPHS plant are presented. Market potential, siting criteria, lower reservoir construction, and geologically related issues are addressed. The environmental impact of a UPHS plant is deduced from comparable facilities, and these issues and other safety concerns are presented. UPHS is an economically viable scheme for energy-storage and peaking applications in which considerable savings in premium fuels can be achieved through the replacement of combustion gas turbines. The technology for UPHS is available, but additional research and development are required for high-head turbomachinery, motor/generators, cavern geology, and system optimization. (Author)

A79-50452 **Development of coalbed methane as an energy source.** M. L. Olson (U.S. Department of Energy, Washington, D.C.). *Energy Sources*, vol. 4, no. 4, 1979, p. 353-365. 12 refs.

Development of coalbed methane as the unconventional gas source which could be put into production quickly and cheaply is considered. To promote the development of this potentially large resource, government can initiate a coring program for resource definition, cooperate in clarifying the status of the resource, prescribe the rights of interested parties, and establish incentive programs to speed production and use of coalbed methane. It is estimated that 300 to 800 trillion cu ft of this gas is potentially available and methods of promoting its production are discussed. Legal problems in methane production are considered, noting that they arise primarily in areas where coal rights have been leased and mining operations are underway or planned, and deeper bed mining poses explosion dangers by methane migration into coal mines. Government regulations covering gas ownership and distribution are cited, including regulation and conservation of this resource, and, finally, economics of production and sale are covered. A.T.

A79-50460 **Testing for commercialization of the central power tower.** F. Duquette (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). *Solar Engineering Magazine*, vol. 4, Sept. 1979, p. 15, 17.

The construction of a central power tower system for a 10 megawatt electrical power plant is examined. Attention is given to the concept development which employs a central receiver system using a large field of heliostats that reflect sunlight to a receiver installed at the top of a steel tower. The design of the receiver utilizes a water/steam single pass to super heat boiler which produces steam as water flows through a panel of 800 tubes and then flows to a storage facility. Consideration is given to the economics of power towers and the factors involved in the acceleration of other power tower constructions. C.F.W.

A79-50499 # **Airport power supply (Elektrosnabzhenie aeroportov).** I. S. Gladysh and P. L. Andreev. Moscow, Izdatel'stvo Transport, 1979. 248 p. In Russian.

The book deals with the basic principles and instrumentation of airport power supply. Characteristics of power consumers and techniques for reducing power consumption are discussed. General problems of power supply are considered, including electric network design, methods of design-power selecting, and determining wire and cable cross sections in accordance with heating and voltage-loss requirements. The electric power equipment and relay protection devices for airport transformers and power stations are described along with their design and circuitry. Attention is given to automatics and telemechanics of electric power networks, methods for calculating short-circuit current and selecting power, relay protection, and grounding equipment. The electrotechnic laboratory (ETL-1M) is also described. V.T.

A79-50537 **Economic evaluation and optimization of solar heating systems.** M. J. Brandemuehl and W. A. Beckman (Wisconsin, University, Madison, Wis.). *Solar Energy*, vol. 23, no. 1, 1979, p. 1-10. 7 refs.

A procedure is developed for assessing the economic viability of a solar heating system in terms of the life cycle savings of a solar heating system over a conventional heating system. The life cycle savings is expressed in a generalized form by introducing two economic parameters, P1 and P2, which relate all life cycle cost considerations for the first year fuel cost or the initial solar system investment cost. Using the generalized life cycle savings equation, a method is developed for calculating the solar heating system design which maximizes the life cycle savings. A similar method is developed for determining the set of economic conditions at which the optimal solar heating system design is just competitive with the conventional heating system. The results of these optimization methods can be presented in tabular or graphical form. The sensitivity of the economic evaluation and optimization calculations to uncertainties in constituent thermal and economic variables is also investigated. (Author)

A79-50538 **Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization.** G. Stein and A. Zeichner (Jerusalem, Hebrew University, Jerusalem, Israel). *Solar Energy*, vol. 23, no. 1, 1979, p. 11-16. 34 refs. Research supported by Boston University and NSF.

A79-50539 **Conceptual development of a solar town in Iran.** M. N. Bahadori (Shiraz University, Shiraz, Iran). *Solar Energy*, vol. 23, no. 1, 1979, p. 17-36. 25 refs.

A method of solar energy utilization for a residential town of 4000 inhabitants is presented. The energy requirements are estimated without major change in people's life style, except for introduction of low temperature cooking by steam. Four methods of solar energy utilization are considered: (1) central generation of electricity, hot or chilled water and steam (for low temperature cooking), and distribution to each building, (2) local generation of electricity, hot or chilled water, and steam, and central utilization of city wastes to produce methane gas for high temperature cooking, (3) central utilization of city wastes and plant growth for energy values, and (4) suitable design of buildings to be heated or cooled passively by solar energy and other natural sources, local generation of hot water for washing and steam for low temperature cooking, central generation of electricity, and central utilization of city wastes. It was concluded that the last of these systems is the most suitable, and that the transportation needs are to be met by electricity or liquid fuel, such as methanol, produced from an energy crop. A.T.

A79-50540 # **The steady state salt gradient solar pond.** C. F. Kooi (Lockheed Research Laboratories, Palo Alto, Calif.). *Solar Energy,* vol. 23, no. 1, 1979, p. 37-45. 20 refs. Research supported by the University of Michigan.

The three-zone salt gradient solar pond is analyzed as a steady-state flat-plate solar energy collector. The resultant efficiency equation is of the Hottel-Whillier-Bliss type commonly used for flat-plate collectors. The quantities that occur in this equation - the effective absorptivity-transmissivity product alpha-tau, the loss factor U(L), the heat removal factor F(R), and the incident angle modifier Theta(i) - are related to the physical properties and dimensions of the pond. For a given Delta T/H (fluid inlet temperature-surface temperature/insolation), the thickness of the nonconvective zone can be adjusted for maximum efficiency; U(L) and alpha-tau are smaller than the equivalent quantities for flat-plate collectors, while Theta(i) and F(R) are close to unity. As a consequence, steady-state salt-gradient solar ponds are less efficient than common flat-plate collectors at low Delta T/H, but they are more efficient at high Delta T/H. (Author)

A79-50541 **Stochastic simulation of hourly global radiation sequences.** C. Mustacchi, V. Cena, and M. Rocchi (Roma, Università, Rome, Italy). *Solar Energy,* vol. 23, no. 1, 1979, p. 47-51. 13 refs.

Stochastic simulation of hourly global radiation carried out with auto regressive moving average and factor analysis techniques is found unable to describe the statistical features of time sequences. A Markov transition-matrix approach operating on atmospheric transmittance provides a simple yet effective simulation device. Two novel sophisticated models, the transmittance transition tensor and the Gaussian mapping technique are not justified in this context. (Author)

A79-50542 **Static concentrators for two-sided photovoltaic solar cells.** J. Sangrador and G. Sala (Madrid, Universidad Politéchnica, Madrid, Spain). *Solar Energy,* vol. 23, no. 1, 1979, p. 53-60. 5 refs.

The use of cylindrical mirrors to concentrate radiant energy onto a two-sided photovoltaic absorber has been studied. Both theoretical and experimental results for the illumination intensity at the exit aperture were obtained for such a concentrator. A mathematical approach was devised to obtain the theoretical intensity distribution. Experimental intensity distribution was measured for a set of different mirrors. The mirrors all had the same profile but were made of different materials and had different reflecting surfaces. The main conclusion was that the intensity distribution at the exit aperture is very inhomogeneous. The concentration was very low (less than 3) for a certain zone of the absorber, regardless of the light rays incidence angle. Another important conclusion was the effect of truncating the mirror, which was found to be a reduction in the average number of reflections of the incident light. Finally, an arrangement, different from the theoretical one, is presented for the placement of the absorber in the concentrator. (Author)

A79-50543 **Contribution to the study of the solar radiation climate of Lisbon.** A. J. Biga and R. Rosa (Ministério da Industria e Technologia, Laboratorio de Fisica e Engenharia Nucleares, Sacavém, Portugal). *Solar Energy,* vol. 23, no. 1, 1979, p. 61-67. 9 refs.

Based upon a statistical analysis of available data, this paper offers relationships permitting the determination of the direct, diffuse and global radiation intensities, on a horizontal surface and on clear days, and it establishes linear correlation between those three components. Daily sums of diffuse and global radiation, on a horizontal surface and on cloudy days, are found to be correlated with one another and they both can be determined from the knowledge of the insolation fraction. This paper also analyzes the contribution of the direct and diffuse components to the daily sum of global radiation on the ground, with emphasis to the contribution of diffuse radiation from the cloudy regions of the sky, and infers some global characteristics of the clouds. Finally, it is shown that four regression parameters alone are enough to make fair predictions of all the statistical relationships involving daily sums of solar radiation. (Author)

A79-50544 **Performance of flat plate solar collector with fluid undergoing phase change.** R. S. Soin, K. S. Rao, D. P. Rao, and K. S. Rao (Birla Institute of Technology and Science, Pilani, India). *Solar Energy,* vol. 23, no. 1, 1979, p. 69-73. Research supported by the Ministry of Industrial Development of India and Birla Institute of Technology and Science.

The experimental set up for evaluating the performance of a solar collector with a fluid undergoing phase change is described. The effect of insolation and the liquid level on the collector performance has been studied with acetone and petroleum ether 40-60 C. The Hottel-Whillier equation, when modified to include the fraction of liquid level, correlates the experimental data. The collector efficiency increases linearly with liquid level. (Author)

A79-50545 **Chemical heat pumps - A basic thermodynamic analysis.** W. M. Raldow and W. E. Wentworth (Houston, University, Houston, Tex.). *Solar Energy,* vol. 23, no. 1, 1979, p. 75-79. 20 refs. Research supported by Styrelsen for Teknisk Utveckling and University of Houston; Contract No. N68305-77-C-0043.

The concept of a thermochemically driven chemical heat pump/refrigerator is discussed. Using Carnot analysis, it is shown that these systems can work closely to the maximal second-law efficiency. Criteria to be used in selection of chemical reactions for maximal efficiency are formulated. (Author)

A79-50546 **A comparison of some simple models used to predict solar irradiance on a horizontal surface.** B. Goldberg, W. H. Klein, and R. D. McCartney (Smithsonian Institution Radiation Biology Laboratory, Rockville, Md.). *Solar Energy,* vol. 23, no. 1, 1979, p. 81-83. 8 refs.

A79-50547 **New ideal concentrators for distant radiation sources.** D. R. Mills and J. E. Giutronich (New South Wales, University, Kensington, Australia). *Solar Energy,* vol. 23, no. 1, 1979, p. 85-87. 9 refs.

The construction of an ideal two-dimensional linear concentrator is examined for a convex cylindrical receiver using the general constraint that all rays from the extreme directions of the acceptance angle are reflected tangentially to the receiver surface. The development of an additional family of both ideal and nearly ideal concentrators for distant point sources of radiation is presented and a specific case with applications in solar thermal collection is investigated. This special case can be generally applied when the Winston-Hinterberger (1975) curve section is eliminated on one side of the concentrator, and the other surface is extended to meet the shadow line which prevents the rays coming from an outside point from directly striking the adsorber. C.F.W.

A79-50548 **Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321.** V. C. Sharma (Benin, University, Benin City, Nigeria) and M. G. Hutchins (University College, Cardiff, Wales). *Solar Energy,* vol. 23, no. 1, 1979, p. 89, 90. Research supported by the Science Research Council.

A79-50549 **Solar conversion by concentration cells with hydrides.** R. E. Salomon (Temple University, Philadelphia, Pa.). *Solar Energy,* vol. 23, no. 1, 1979, p. 91, 92. Contract No. ET-78-S-05-5669.

The conversion of solar heat into electrical energy by concentration cells with hydrides is discussed. The optimum situation is considered in which all of the heat is used to vaporize a certain amount of hydrogen. The process is carried out at either fixed volume or fixed pressure. The efficiency of using electrochemical concentration cells is discussed. The absence of moving parts is considered as an advantage. It is noted that the electrical resistance of the cell is an important parameter which must be taken into account during the initial stage of evaluation. V.T.

A79-50557 **Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic.** W. A. Adams, C. L. Gardner, and E. J. Casey (Defence Research Establishment, Energy Conversion Div., Ottawa, Canada). *Canadian Electrical Engineering Journal,* vol. 4, July 1979. p. 4-10. 17 refs.

The paper examines the potential economic and energy savings that could result from inclusion of energy storage devices into the power generation system in northern Canadian communities. The discussion is confined to an analysis of the potential benefits of incorporating energy storage systems into the utility systems of eight northern Canadian communities. Major conclusions are that fuel savings are possible, that cost benefits are achievable depending on the specific mix of cost parameters especially in high fuel cost locations, and that research and development now under way to improve the cost and performance of batteries for load leveling will make such systems more attractive as an energy conservation tool. S.D.

A79-50560 **Biomethanation of Minnesota reed sedge peat.** S. Ghosh and D. L. Klass (Institute of Gas Technology, Chicago, Ill.). *Resource Recovery and Conservation,* vol. 4, Aug. 1979, p. 115-139. 8 refs.

A method to develop a bioconversion system for the production of intermediate or high calorific value gas, from Minnesota reed sedge peat, is examined. The experimental work consisted of four parts: feed characterization, exploratory batch, digestion experiments, semicontinuous digestion of peat alone, and investigations of conditions for improved peat digestion. The effects of such factors as digestion mode, inoculum source, temperature, loading detention time, feed particle size, and chemical pretreatment on peat digester gas yield, production rate, and gas quality, were examined. It was determined that a methane yield of up to 0.31 std cu m/kg VS added, which is approximately 60% of the maximum theoretical yield, can be obtained by optimizing the digestion and feed pretreatment conditions. C.F.W.

A79-50561 **The efficiency of resource recovery from solid waste.** D. C. Wilson (Atomic Energy Research Establishment, Harwell, Oxon, England). *Resource Recovery and Conservation,* vol. 4, Aug. 1979, p. 161-188. 28 refs. Research supported by the U.K. Atomic Energy Authority.

The possible advantages that resource recovery from waste has to the conservation of energy and materials is examined. Two self-consistent measures of the energy efficiency of a process are developed and a method using the same case study as in complementary economic analysis is demonstrated. Process energy analysis is applied to evaluate both the primary energy inputs to an option for waste disposal, treatment or resource recovery, and the savings implied by the use of recovered fuel and material products. Attention is given to the accidental waste-to-oil pyrolysis system and the data regarding its efficiency as well as that of waste-derived and refuse-derived fuel are tabulated. Results show that conventional methods of local landfill are cheap and wasteful, that pulverized fuel is feasible as a fuel source and that other methods of producing a solid refuse derived fuel have the highest energy efficiency values. C.F.W.

A79-50563 **The 'effectiveness' of waste treatment systems.** B. G. Kreiter (Institute for Waste Disposal, Amersfoort, Netherlands). *Resource Recovery and Conservation,* vol. 4, Aug. 1979, p. 203-207.

The possibility of implementing an overall 'effectiveness-value' composed of parameters of volume reduction, energy production or savings, and treatment costs, is examined. An example is made by comparing separated domestic waste where the light fraction is used as a supplementary fuel for utility plants and municipal solid waste, which is incinerated and the resultant heat (from the plant) is employed to generate heat. C.F.W

A79-50700 **Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions.** L. D. Budennaia, P. P. Gorbik, V. N. Komashchenko, G. A. Fedorus, and E. V. Sharkina (Akademiia Nauk Ukrainskoi SSR, Institut Poluprovodnikov, Kiev, Ukrainian SSR). *(Geliotekhnika,* no. 1, 1979, p. 3-5.) *Applied Solar Energy,* vol. 15, no. 1, 1979, p. 1-3. Translation.

Polycrystalline thin films of Zn(x)Cd(1-x)S were produced and used to prepare pCu2S-nZn(x)Cd(1-x)S heterojunction solar cells. The optimal concentration for construction of solar cells is found to be Zn(0.1-0.2)Cd(0.9-0.8)S. The photo-emf of the heterostructure of optimal composition attains a value of 0.8 V. The short-circuit current (and therefore the efficiency) of the heterostructure is limited mainly by a large series resistance. B.J.

A79-50701 **Temperature characteristics of high-voltage germanium photogenerators.** D. S. Strebkov, V. A. Tikhomirova, and G. B. Fedosova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 1, 1979, p. 6-9.) *Applied Solar Energy,* vol. 15, no. 1, 1979, p. 4-6. Translation.

The paper reports on the volt-ampere characteristics of high-voltage germanium photoconverters in the -50 to +100 C temperature range as well as on the temperature dependence of the principal parameters of the device. It is suggested that such photoconverters can be used as high-voltage dc converters, as IR detectors, and in conjunction with silicon photoconverters. B.J.

A79-50702 **Analysis of series resistance of pCdTe-nCdS film photoconverters.** S. A. Azimov, Sh. A. Mirsagatov, D. T. Rasulov, and N. Shakirov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 1, 1979, p. 10-12.) *Applied Solar Energy,* vol. 15, no. 1, 1979, p. 7-9. 6 refs. Translation.

A79-50703 **Spectral emissivity of porous graphite heated in an air atmosphere.** N. A. Rubtsov, A. G. Tarasov, and G. V. Miakin (Akademiia Nauk SSSR, Institut Teplofiziki, Novosibirsk, USSR). *(Geliotekhnika,* no. 1, 1979, p. 13-16.) *Applied Solar Energy,* vol. 15, no. 1, 1979, p. 10-12. Translation.

An optical facility for measuring spectral emissivity is described. The system is applied to measuring the emissivity of PG-50 graphite heated in air, taking into account the character of the emitting surface and wavelength and temperature. An inverse relationship between wavelength and spectral emissivity is shown. B.J.

A79-50704 Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties. R. A. Zakhidov, A. Abdurakhmanov, and Sh. I. Klychev (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *(Geliotekhnika*, no. 1, 1979, p. 17-20.) *Applied Solar Energy*, vol. 15, no. 1, 1979, p. 13-15. Translation.

A79-50705 Combination radiant-flux radiator for high-temperature solar plant. V. V. Afian and A. V. Vartanian. *(Geliotekhnika*, no. 1, 1979, p. 21-24.) *Applied Solar Energy*, vol. 15, no. 1, 1979, p. 16-18. Translation.

The paper describes a radiant-flux controller for a high-temperature solar collector system with paraboloidal concentrator; block and kinematic diagrams are presented. The controller consists of two screening cylinders (external and internal) in simultaneous operation. The device controls two parameters: radiant flux density in the focus and collected power. An experimental controller has been tested. B.J.

A79-50706 Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions. V. N. Volkov, Ia. T. Shermazanian, N. V. Shilko, A. G. Sinakarimian, and T. A. Nersisian. *(Geliotekhnika*, no. 1, 1979, p. 39-42.) *Applied Solar Energy*, vol. 15, no. 1, 1979, p. 31-34. 8 refs. Translation.

Profiled polyethylene sleeves and sheets were subjected to accelerated testing in a solar-radiation facility. Polyethylene stabilized with soot additive was found to have the highest radiation reistance; color-tinted polyethylene was found to have the least. It is recommended that the soot-stabilized variety be used outdoors while the color-tinted variety be used indoors (under conditions of scattered solar radiation). B.J.

A79-50707 Investigation into the optical characteristics of transparent solar-energy materials. N. B. Rekant and S. A. Demidov (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *(Geliotekhnika*, no. 1, 1979, p. 46-49.) *Applied Solar Energy*, vol. 15, no. 1, 1979, p. 38-40. Translation.

A simple method is developed for measuring the absorptivity and transmissivity of thin polymeric films at room temperature. The chief characteristic of the materials tested is their semitransparence (during interaction with thermal radiation) in a wide spectral range, from the UV to the far-IR. B.J.

A79-50708 Analysis of the efficiency of a varizone photoelectric converter. L. I. Gromovoi, L. I. Tikhonov, and V. N. Diatlov. *(Geliotekhnika*, no. 1, 1979, p. 57-62.) *Applied Solar Energy*, vol. 15, no. 1, 1979, p. 47-51. 8 refs. Translation.

The volt-ampere characteristics and the photocurrent under solar illumination of a variable-band semiconductor structure are calculated. Consideration is then given to the efficiency of a variable-band pAl(x)Ga(1-x)As-nGaAs solar cell and the efficiency of this type of cell is compared to that of a homogeneous GaAs solar cell. Particular attention is given to the case when the variable-band region can be represented as a 'direct' semiconductor (i.e., x is not greater than 0.4). B.J.

A79-50775 Calculation of the external electromagnetic field of closely spaced MHD machines. S. M. Apollonskii. *(Magnitnaia Gidrodinamika*, Oct.-Dec. 1978, p. 88-92.) *Magnetohydrodynamics*, vol. 14, no. 4, Apr. 1979, p. 463-466. 5 refs. Translation.

A method is proposed for calculating the combined electromagnetic field of MHD machines located close to each other, by means of correction factors. Correction factors with respect to harmonics are obtained for calculating the combined field of two MHD sources. Illustrative calculations are presented and the results are compared with the experiment. V.P.

A79-50776 Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor. A. I. Vol'dek, N. A. Soldatenkova, and E. V. Tolvinskaia. *(Magnitnaia Gidrodinamika*, Oct.-Dec. 1978, p. 101-106.) *Magnetohydrodynamics*, vol. 14, no. 4, Apr. 1979, p. 474-479. Translation.

A79-50777 Two limiting solutions for the analysis of transverse edge effects in MHD induction machines. A. P. Rashchepkin. *(Magnitnaia Gidrodinamika*, Oct.-Dec. 1978, p. 107-111.) *Magnetohydrodynamics*, vol. 14, no. 4, Apr. 1979, p. 479-482. 5 refs. Translation.

A comparison is made of the energetic characteristics of an induction machine, calculated on the basis of Okhremenko's (1968) and Veske's (1965) models. It is found that the energetic characteristics differ under conditions of a pronounced transverse edge effect, if the channel width is smaller than or equal to the pole pitch. The results of the two models are practically identical under any conditions, if the gap is smaller and the channel width is larger than twice the pole pitch value. V.P.

A79-50778 Limit of the formation of counterparallel flows in plane-parallel induction MHD machines. R. R. Krishberg. *(Magnitnaia Gidrodinamika*, Oct.-Dec. 1978, p. 112-116.) *Magnetohydrodynamics*, vol. 14, no. 4, Apr. 1979, p. 483-486. 10 refs. Translation.

In high-power MHD machines, counterflows may arise at large magnetic Reynolds numbers, due to the demagnetizing action of secondary currents. In the present paper, the limits of formation secondary flows over the channel width are analyzed. It is shown experimentally that low-power pumps can be used to study such counterflows. In this case, high magnetic Reynolds numbers can be achieved by increasing the frequency. V.P.

A79-50779 Equations of a conduction-type MHD linkage. Iu. A. Birzvalk. *(Magnitnaia Gidrodinamika*, Oct.-Dec. 1978, p. 130-134.) *Magnetohydrodynamics*, vol. 14, no. 4, Apr. 1979, p. 498-502. 10 refs. Translation.

In the present paper, the linear equations of a classical conduction MHD ejector are obtained in an inductionless approximation, and are found to be analogous to those of an electric two-port network. The conditions for maximum efficiency are derived as a function of the output hydromechanical resistance. A relation for the optimal induction is obtained. The attainable efficiency values are identified, using a numerical example. V.P.

A79-50855 # Towards an adequate legal regulation of the geostationary orbit. A. A. Cocca. In: Colloquium on the Law of Outer Space, 20th, Prague, Czechoslovakia, September 25-October 1, 1977, Proceedings. Davis, Calif., University of California; Littleton, Colo., Fred B. Rothman and Co., 1978, p. 193-196.

Some notes on giving the geostationary orbit an appropriate juridical regime are presented. It is remarked that it is necessary to study the geostationary orbit from the following points of view: as a region in space; as a site for placement of satellites; as a point of reception and emission of telecommunications; as an area of interception and transmission of solar energy; in terms of a right to follow a route or a regime of routes of flight; as a limited natural resource; and as reference for possible delimitation of outer space. B.J.

A79-50860 # **Legal considerations on the development and use of satellite solar power stations.** R. H. Moss. In: Colloquium on the Law of Outer Space, 20th, Prague, Czechoslovakia, September 25-October 1, 1977, Proceedings. Davis, Calif., University of California; Littleton, Colo., Fred B. Rothman and Co., 1978, p. 374-385. 82 refs.

The paper summarizes a proposal for satellite solar power stations, outlines the technical system, and examines the legal controls that may affect exploitation of solar energy for terrestrial use by large satellites in geosynchronous orbit. The role of the layer is discussed, and it is urged that the lawyer engage in public advocacy with regard to SSPS development. B.J.

A79-50876 **Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings.** Conference sponsored by the American Nuclear Society. Edited by A. E. Saint Clair (Oak Ridge National Laboratory, Oak Ridge, Tenn.). La Grange Park, Ill., American Nuclear Society, 1978. 628 p. $38.

The conference presents papers on such topics as solar energy, coal conversion, biomass and waste conversion, oil shale, indirect solar energy, energy storage and hydroelectric, and geothermal energy. A review of the environmental effects and benefits of solar technologies and siting considerations for solar thermal electric generating plants are given. Environmental investigations of in situ coal classification experiments and environmental aspects of the DOE's underground coal conversion program are discussed. Environmental aspects of wood fuel are outlined along with social, economic, and legal implications of bioenergy and primary impacts of growing aquatic plants for energy. Emphasis is placed on geyser geothermal operations and other geothermal energy resources and their environmental aspects. V.T.

A79-50877 **Resolving the environmental issues in developing fuels from biomass.** J. E. Dunwoody (Mittelhauser Corp., Lisle, Ill.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 3-3 to 3-14. 15 refs.

This paper reviews recent studies on the potential for environmental impact by biomass energy technologies and outlines a framework for a national program of biomass energy environmental research. Although there has been considerable research on environmental impacts of intensive agriculture, silviculture and urban waste energy technology most of this information has not yet been applied to biomass energy technologies. The need for a substantial biomass energy environmental research program spanning the next 3-5 years is emphasized to prevent environmental concerns from inhibiting the commercial application of biomass energy technologies. (Author)

A79-50878 **A review of the environmental effects and benefits of selected solar energy technologies.** K. A. Lawrence (Solar Energy Research Institute, Golden, Colo.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 4-3 to 4-16. 30 refs.

The paper reviews and summarizes data on the environmental effects of three solar energy technologies: photovoltaic cells, wind energy conversion (WEC), and solar thermal central receivers. Potential effects are identified for each of the life cycle phases: resource extraction and component manufacture, plant construction, and operation and decommission. The life cycle phase of resource extraction and component production is found to be the most environmentally hazardous. None of the options emit sulfur oxides, nitrogen oxides, particulates, hydrocarbons, or carbon monoxide. WEC operations produce low-level noise pollution and present hazards to flying species. Solar thermal facilities may affect local air quality via wet cooling towers. V.T.

A79-50879 **Siting considerations for solar thermal electric generating plants.** E. J. McBride (Black and Veatch, Kansas City, Mo.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 5-3 to 5-7.

The paper discusses the siting considerations for a central receiver plant in which a field of two-axis tracking mirrors redirects and concentrates the solar radiation to the receiver(s) which is (are) located at the top of a centrally located tower. The siting considerations for this type of plant are similar in many aspects to those for fossil and nuclear plants. Those of most importance are insolation, meteorology, topology, and hydrology. While these limit the best land areas to a small fraction of the available land, there are nonetheless more suitable sites than will be necessary for this energy source to be commercialized to its cost effective limit in the foreseeable future. V.T.

A79-50880 **Environmental investigations of in situ coal gasification experiments.** S. W. Mead, F. T. Wang, and H. C. Ganow (California, University, Livermore, Calif.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 14-3 to 14-18. 10 refs. Research supported by the U.S. Environmental Protection Agency; Contract No. W-74595-eng-48.

Ground-water sampling and subsidence measurements were carried out at the sites of two in situ coal gasification experiments conducted in northeastern Wyoming. Changes in ground-water quality and the possible effects of subsidence and ground movement induced by the gasification cavity represent environmental concerns associated with the in situ coal gasification process. Ground-water quality measurements show a continuing decrease, after more than a year, in the concentration of important contaminants, such as phenolic materials. Laboratory measurements have provided detailed information concerning phenol absorption by coal. Data from subsurface geotechnical instruments as well as measurements of ground-water levels indicate that roof collapse connected the gasification cavity with overlying aquifers. V.T.

A79-50881 **Mixed fuel gas - A technically, economically and environmentally superior way to supplement natural gas supplies.** J. E. Sinor (Cameron Engineers, Inc., Denver, Colo.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 15-3 to 15-10.

An approach to coal conversion is discussed in which approximately 85 volume % low-Btu gas is mixed with 15 volume % natural gas to produce a 300 Btu/SCF mixture called mixed fuel gas (MFG). The Btu percentage from each source will be approximately 50/50. A value of 300 Btu/SCF was chosen because combustion efficiency is maximum at this point. MFG could be burned in existing gas-fired boilers without incurring the large loss in both efficiency and capacity that may result from burning low-Btu gas alone. It can be produced at less cost and with less total environmental impact than either medium-Btu or high-Btu coal gas. V.T.

A79-50882 **Environmental aspects of the Department of Energy's underground coal conversion program.** S. H. Zukor and E. L. Burwell (U.S. Department of Energy, Washington, D.C.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 16-3 to 16-20. 20 refs.

The Department of Energy's Underground Coal Conversion Program is described, with emphasis on environmental activities. The basic underground coal gasification (UCG) process is explained, along with potential advantages and problem areas. Results to date indicate that the environmental impacts of UCG will be minimal and well within the capability of current environmental control technology. When compared to alternate uses of coal, UCG may offer significant environmental advantages, especially in areas of the country where high-quality water is in short supply. (Author)

A79-50883 **Air emissions from waste to energy systems.** H. M. Freeman and R. A. Olexsey (U.S. Environmental Protection Agency, Cincinnati, Ohio). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 18-3 to 18-13.

This paper discusses expected air emissions from waste to energy conversion systems. It provides an overview of waste to energy conversion technology, a discussion of relevant Federal environmental standards, and a compilation of the results of environmental assessments of three systems; (1) an RDF combustion system at Ames, IA, (3) a mass burning waterwall incinerator at Braintree, MA, and (3) a partial oxidation pyrolysis unit at South Charleston, WV. Data is provided for Criteria Pollutants and for various trace elements. (Author)

A79-50884 **Environmental aspects of wood fuel.** H. T. Garabedian and C. R. Sanborn (Vermont Agency of Environmental Conservation, Montpelier, Vt.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 19-3 to 19-21. 9 refs.

An analysis of whole tree harvesting for wood fuel and the conversion of existing electric generating stations to consume wood fuel is presented. Consideration is given to planning an experimental harvest, preharvesting inventory, wood operation, environmental impacts of the harvesting operation, and the economics of wood fuel. It is noted that whole tree removal resulted in 3 - 4.5 times the yield expected by traditional inventory methods. Wood fuel is low in heating value, high in moisture, and has undesirable handling characteristics; however, the contents of sulfur and nitrogen are low. Emission testing has determined that the particulate emission rate from a mix of 45% oil/55% coal increased threefold as compared with 80% wood/20% oil. V.T.

A79-50885 **Some environmental impacts of resource recovery systems.** W. H. Fisher (Gilbert/Commonwealth, Reading, Pa.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 20-3 to 20-14. 25 refs. U.S. Environmental Protection Agency Contract No. 68-03-2645.

The interactions of combining source separation and mixed waste processing are evaluated in terms of their environmental impacts on land, air, and water. The mixed waste processing options considered are waterwall incinerators, small incinerators (refractory-lined dual-chamber incinerators of less than 100 tpd capacity), refuse-derived fuel (RDF) used either as a supplement to fossil fuels or alone in a dedicated boiler, pyrolysis of the wastes to a gas or an oil, and the Black Clawson hydrapulper process for making RDF. Ferrous wastes were assumed to be recovered in all the options except small incinerators. Land impacts are much reduced as compared with direct landfilling. Air impacts can be controlled with presently available technologies. Water impacts may be large, and effluents from some waste processing plants may require advanced treatment before discharge. Source separations have little influence on these impacts. V.T.

A79-50886 **Primary impacts of growing aquatic plants for energy.** T. Hruby (Woods Hole Oceanographic Institution, Woods Hole, Mass.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 22-1, 22-3 to 22-16. 17 refs. Research supported by the Pew Memorial Trust and Woods Hole Oceanographic Institution; Grant No. NOAA-04-7-158-44104.

The environmental impacts of systems proposed for the large-scale culture of algae or other aquatic plants on the open ocean, in shallow coastal waters, or in ponds on land are considered. All systems are found to be potentially dangerous for the natural and human environments, but those for the land-based farms are more dependent on the exact design of the ponds and their processing units than either the open-ocean or near-shore systems. Therefore, if environmental impacts are used as criteria in the choice of a system, aquatic plants grown in ponds are better suited for development as biomass sources than those cultured on the open ocean or near the shore. V.T.

A79-50887 **The status of oil shale development.** J. D. Baker (Cameron Engineers, Inc., Denver, Colo.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 23-3 to 23-10.

Four basic approaches for exploiting an oil shale deposit are considered: (1) open pit mining and surface retorting; (2) underground mining and surface retorting; (3) modified in situ recovery; and (4) true in situ recovery. Environmental problems, such as health effects, air quality, water quality and availability, and land disturbance, are discussed. Seven commercial oil shale projects in Colorado and Utah are outlined. Emphasis is placed on the role of oil shale in the national energy plan. It is noted that the increasing probability of severe shortages of liquid fuels between now and the end of the century has cast oil shale in a more prominent role in Federal energy policy than ever before. V.T.

A79-50888 **Chemical characterization of shale oil and related fuels.** P. W. Jones, R. J. Jakobsen, P. E. Strup, and A. P. Graffeo (Battelle Columbus Laboratories, Columbus, Ohio). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 26-29 to 26-35.

Results of a preliminary analytical survey of the organic constituents of shale oil, synthoil, and Prudhoe Bay crude oil are presented. The analytical techniques employed in the study are liquid chromatography (LC), Fourier transform infrared spectroscopy (FTIR), and gas-chromatographic mass spectrometry (GC-MS). This chemical characterization of new fuels provides preliminary data from which their potential environmental impacts may be judged. V.T.

A79-50889 **Environmental aspects of the Syncrude tar sands project.** N. A. Norman and N. A. Norman (Bechtel National, Inc., San Francisco, Calif.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 27-3 to 27-9. 5 refs.

The oil in the Canadian Tar Sands is in the form of bitumen mixed into sand near the land surface. The recovery of the sand is accomplished through an open-pit mining operation using four 80-cubic yard bucket drag-line excavators. A primary feature of the Syncrude tar sand project is the avoidance and mitigation of environmental impacts through facility design, extensive monitoring, and reclamation, including a field-developed program of revegetation. Environmental impacts and mitigation of mining and refining phases are discussed. The majority of the impacts associated with the pipeline to Edmonton were a result of the construction operation and were mitigated or reclaimed after the pipeline was laid. V.T.

A79-50890 **Projected impacts of a very large windpower complex.** W. E. Howell. In: Conference on Environmental Aspects of

Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 29-3 to 29-18. 19 refs.

The combination of large windfarms dispersed along the northeastern coasts of North America and over the Laurentian and Apalachian highlands with a pumped-hydroelectric plant near Niagara, and transmission lines linking these elements with major load centers of the Boston/Washington and Chicago/Pittsburgh megalopolises, is taken as the image of large-scale use of the windpower technology now approaching commercialization. A thought-experiment is performed to examine the environmental impacts of building such a large-scale windpower complex. It is concluded that large-scale windpower would involve no adverse environmental effects and could offset serious unfavorable impacts of conventional power power generation. There may be a role for centralized and dispersed power systems evolving symbiotically. S.D.

A79-50891 **Wave power, progress and prospects.** B. M. Count (Central Electricity Generating Board, Marchwood Engineering Laboratories, Marchwood, England). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 31-3 to 31-33. 12 refs.

The environmental acceptability of wave power has been one of the major arguments for proposing it as an alternative source of energy to both nuclear and fossil fuels. From the work described in the present paper, it appears that the deployment of wave power could have a varied impact on the environment. Some of the effects may be beneficiary, some adverse, and to argue the case for wave energy on environmental issues alone would certainly be unjustified and misleading. Many of the arguments presented depend crucially on the technical solutions that are likely to be employed. Certain effects, particularly littoral drift, will be device specific, with seabed fixed structures altering the wave climate more than floating ones. Expensive research work is required in view of the formidable technological problems which still exist. V.P.

A79-50892 **Technology overview of energy storage systems.** C. M. Buoni (Battelle Columbus Laboratories, Columbus, Ohio) and J. Gahimer (U.S. Department of Energy, Div. of Energy Storage, Washington, D.C.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 32-3 to 32-37.

A state-of-the-art review of energy storage technologies is presented. A discussion of thermal energy storage covers seasonal storage for heating and cooling, daily heating and cooling storage, storage for thermal power generation, and industrial waste heat generation. Thermochemical energy storage involves a discussion of thermochemical pipelines, yearly averaging storage and a chemical heat pump storage system. Attention is also given to hydrogen energy storage with four areas addressed, production, storage, transport, and utilization. In addition mechanical, magnetic and electrochemical energy storage systems are surveyed. Among the conclusions it is expected that by 1990 a number of energy storage technologies will be available for commercial use. M.E.P.

A79-50893 **Environmental considerations in R&D planning and evaluation of energy storage systems.** L. Holt (U.S. Department of Energy, Div. of Energy Storage Systems, Washington, D.C.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 33-3 to 33-25.

The National Environmental Policy Act (NEPA) of 1969 established a requirement for performing environmental assessments of developed programs and activities. In compliance with NEPA, the Division of Energy Storage Systems (STOR) of the Department of Energy has instituted an ongoing program to establish and maintain an Environmental Development Plan (EDP). Each STOR program is reviewed annually to ensure that the program considers environmental issues. If a program has potential for environmental impacts the concerns and benefits are analyzed. Environmental concerns are ranked in order of importance so that those which produce the greatest environmental effects can be assessed relative to their benefits in early stages of the program. R&D program development and the resulting environmental interactions are continuously assessed during each phase of the program. Integrations of an environmental development program with the energy technology R&D program results in economically feasible, socially acceptable, and environmentally safe energy storage technologies. (Author)

A79-50894 **Pumped storage projects and their environmental impacts - An overview.** J. K. Novak and D. L. Shumway (U.S. Department of Energy, Federal Energy Regulatory Commission, Washington, D.C.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 34-3 to 34-19. 28 refs.

Environmental impacts associated with construction activities and project operations of pumped storage projects are surveyed. Early awareness of the environmental consequences of pumped storage projects by developers and the involvement of natural resource personnel in the planning phase can serve to minimize the impact of these projects on the aquatic, terrestrial, and human resources of the area. B.J.

A79-50895 **Environmental concerns related to compressed air energy storage.** J. A. Stottlemyre, R. A. Craig, W. V. Loscutoff (Battelle Pacific Northwest Laboratories, Richland, Wash.), D. W. Boehm (U.S. Department of Energy, Div. of Environmental Control Technology, Washington, D.C.), and G. C. Chang (U.S. Department of Energy, Div. of Energy Storage Systems, Washington, D.C.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 35-3 to 35-9. Contract No. EY-76-C-06-1830.

The paper briefly describes the technologies of compressed air energy storage (CAES) and notes the environmental factors which may be of concern in the implementation of these technologies. No attempt is made to quantify these environmental factors. In CAES, the compression and combustion phases of operation of the gas- or oil-fired turbine are separated. The environmental concerns are discussed relative to air impacts, water impacts, solid waste, impacts on geological structure, impacts due to noise, impacts on esthetic values and land use, and commitment of valuable resources. Also described is an ongoing research program designed to evaluate methods to control the effects of these environmental factors. S.D.

A79-50896 **Environmental aspects of geysers geothermal operations.** C. J. Weinberg (Pacific Gas and Electric Co., San Ramon, Calif.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 38-3 to 38-22. 30 refs.

The Geysers Geothermal Project (GGP) is located in a remote area of northern California, approximately 90 miles north of San Francisco. Many of the environmental concerns which have focused on the GGP are due to lack of information rather than actual observed effects. Essentially, many environmental concerns are a direct result of the constituents of geothermal fluids. The paper focuses primarily on the vapor-dominated geothermal resource existing at the GGP. The discussion covers analysis of geothermal fluids; air quality; H2S abatement; cooling tower drift; water quality and fisheries; vegetation mapping and land use; wildlife studies; noise sources and levels; and geology, seismicity and subsidence. At present, the predominant problem is H2S emission. S.D.

A79-50897 **The consumptive use of water in geothermal energy applications.** J. F. Kunze (Forsgren, Perkins, and Associates, Rexburg, Idaho) and S. G. Spencer (EG&G Idaho, Inc., Idaho Falls, Idaho). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 39-3 to 39-8.

Water is the prime environmental concern for the future development of geothermal resources in the United States. The central questions concern the use of water, injection, and effects on conventional water supplies. The annual regional water requirements for projected geothermal developments in the year 2000 could consume in excess of 1.8 x 10 to the 6th acre-ft/yr (2.2 x 10 to the 9th cu m/yr). Alternative cooling methods which consume little or no water are available and should be considered for future geothermal developments. (Author)

A79-50898 **Environmental considerations and the geothermal energy resource in Louisiana.** R. E. Emmer (Coastal Environments, Inc., Baton Rouge, La.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 40-3 to 40-27. 18 refs.

A new source of energy from the geopressure-geothermal zone is currently being evaluated in southern Louisiana. The paper is concerned with the environmental impacts of the resource definition program for the short term and the utilization of the resource for the long term. Planning is the common denominator which connects the short-term objectives of defining the resource and the long-term objectives of using the resource. Planning is undertaken for efficient and economic resource exploitation with a minimum of delay caused by unwise decisions. Research indicates that the Pleistocene Terraces of southern Louisiana rather than the coastal wetlands afford the more compatible setting for absorbing direct adverse impact resulting from the resource exploration phase of the geopressure program and for accomodating secondary development stimulated by resource exploitation. S.D.

A79-50899 * **Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California.** L. Rosenberg (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 41-3 to 41-18. 12 refs. Research sponsored by the California Energy Commission and U.S. Department of Energy.

The paper presents an environmental analysis performed in evaluating various proposed geothermal demonstration projects at Desert Hot Springs. These are categorized in two ways: (1) indirect, or (2) direct uses. Among the former are greenhouses, industrial complexes, and car washes. The latter include aquaculture, a cascaded agribusiness system, and a mobile home park. Major categories of environmental impact covered are: (1) site, (2) construction of projects, and (3) the use of the geothermal source. Attention is also given to the disposal of the geothermal fluid after use. Finally, it is concluded that there are no major problems forseen for each project, and future objectives are discussed. M.E.P.

A79-50900 **Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project.** T. E. Perry (San Diego Gas and Electric Co., San Diego, Calif.). In: Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings. La Grange Park, Ill., American Nuclear Society, 1978, p. 44-3 to 44-19.

The potential environmental effects of developing a liquid dominated reservoir at Heber, California are addressed. The facility will utilize a binary cycle power conversion system and generate 65 megawatts of electric power. Attention is given to environmental considerations unique to such a power plant such as geothermal brine (sludge) waste disposal and cooling tower drift. Areas covered in the discussion of environmental considerations are geology, hydrology, biology, air resources, noise, and land use. Finally consideration is also given to socioeconomic and cultural resources, and a trade-off analysis matrix is presented. M.E.P.

A79-50909 **Solar photovoltaic energy.** H. Ehrenreich and J. H. Martin (Harvard University, Cambridge, Mass.). *Physics Today,* vol. 32, Sept. 1979, p. 25-32.

The paper describes the solar photovoltaic energy study of the American Physical Society. The study examined general systems questions, solar cell technologies, cost goals, and directions for future research. B.J.

A79-50913 **Char gasification. I - Transport model.** G. A. Simons (Physical Sciences, Inc., Woburn, Mass.). *Combustion Science and Technology,* vol. 20, no. 3-4, 1979, p. 107-116. 14 refs. Contract No. E(04-3)-1234.

A general model is developed to describe the mass transport and heterogeneous chemistry which occurs during the gasification of porous coal char. The pore branching sequence depicts that each pore that reaches the exterior surface of the particle is the trunk of a tree. The gasification rate per pore tree is obtained analytically. The effects of Knudsen diffusion, continuum diffusion, and both adsorption and desorption kinetics are included. Each physical mechanism may limit the gasification rate within some range of pore size, particle size, gas temperature and gas pressure. The gasification rate per pore tree is integrated over a pore distribution function to determine the total gasification rate. In general, no single mechanism controls the entire gasification process. However, the known results of existing models are recovered in the extreme limits of kinetic and diffusion controlled gasification. (Author)

A79-50914 **Char gasification. II - Oxidation results.** P. F. Lewis and G. A. Simons (Physical Sciences, Inc., Woburn, Mass.). *Combustion Science and Technology,* vol. 20, no. 3-4, 1979, p. 117-124. 23 refs. Contract No. E(04-3)-1254.

The basic heterogeneous reaction rates for the oxidation of porous carbon char have been inferred from existing laboratory data. These rates have been used to verify the basic transport model described in Part I (1979). Empirical verification has been obtained for temperatures between 630 and 2270 K, particle sizes between 4 and 89 microns in diameter and for chars from high, intermediate and low rank coals. The pressure dependence of the transport model has been verified only in the range of 0.1 to 0.2 atm of O2. Additional low pressure laboratory data are necessary in order to verify the basic model over a wider pressure range. (Author)

A79-50932 **A solid-state solar-powered heat transfer device.** M. Belic (City College, New York, N.Y.) and J. I. Gersten (Jerusalem, Hebrew University, Jerusalem, Israel; City College, New York, N.Y.). *Journal of Applied Physics,* vol. 50, Sept. 1979, p. 5682-5685.

A solar-powered solid-state heat transfer device capable of operating in either a refrigeration or a heat-pump mode is proposed. The device's operation is based on the combined utilization of the photovoltaic and Peltier effects. (Author)

A79-50937 **Gallium arsenide films and solar cells on graphite substrates.** S. S. Chu, T. L. Chu, and M. S. Lan (Southern Methodist University, Dallas, Tex.). *Journal of Applied Physics,* vol. 50, Sept. 1979, p. 5805-5809. 8 refs. Contract No. EY-76-C-03-1284.

Gallium arsenide films have been deposited on graphite substrates by the reaction of gallium, hydrogen chloride, and arsine in a hydrogen flow. The structural and electrical properties of gallium arsenide films have been investigated. The interface between undoped gallium arsenide and graphite exhibits rectifying characteristics; however, a heavily doped interlayer reduces the interface resistance to a tolerable level. MOS-type solar cells prepared from n-GaAs/n(+)-GaAs/graphite structures have AM1 efficiencies of higher than 6%. (Author)

A79-50950 **An anomalous photocurrent in SnO2-Si heterojunction solar cells.** T. Rodriguez, J. S. Maudes, and C. Dehesa (Madrid, Universidad Politécnica, Madrid, Spain). *Journal of Applied Physics,* vol. 50, Sept. 1979, p. 6011-6013.

An anomalous photocurrent observed in reverse-biased SnO2-Si heterojunctions, obtained by spraying, is reported. This current becomes voltage independent above a certain reverse voltage value and is much larger than expected from the number of photopairs generated. The anomalous photocurrent occurs above a minimum voltage value and a minimum number of incident photons, these thresholds being constant for each cell. The anomalous photocurrent is generated under the SnO2 window, its density being larger under the window edge region. (Author)

A79-50999 # **Supplementary RF plasma heating in tokamaks (Dodatecny vysokofrekvencni ohrev plazmatu v tokamacich).** V. Kopecky and J. Musil (Ceskoslovenska Akademie Ved, Ustav Fyziky Plazmatu, Prague, Czechoslovakia). *Ceskoslovensky Casopis pro Fyziku, Sekce A,* vol. 29, no. 4, 1979, p. 358-371. 40 refs. In Czech.

Supplementary plasma heating up to temperatures necessary for controlled fusion is a very important physical and technological problem. This paper analyzes different methods of RF heating and possibility of their utilization for plasma heating in tokamak installations. A short survey of main parameters of operational tokamaks and those under construction is given as well. Czechoslovak activity in this field and the Czechoslovak tokamak Tm-1-MH is also described. (Author)

A79-51008 * **Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C.** G. H. Walker and E. J. Conway (NASA, Langley Research Center, Hampton, Va.). *Applied Physics Letters,* vol. 35, Sept. 15, 1979, p. 459, 460. 7 refs.

Annealing of electron-irradiation damage in GaAs solar cells is important for space applications. This paper describes studies conducted to understand this annealing process. GaAs heteroface solar cells were irradiated with 10 to the 15th 1-MeV electrons/sq cm followed by thermal annealing. An activation energy for annealing of 1.25 + or - 0.14 eV and a frequency factor of (3.7 + or - 1.9) x 10 to the 9th per sec were determined. A small component of the irradiation damage which does not anneal measurably at 200 C was observed. (Author)

A79-51022 **Statistical correlation between daily and monthly averages of solar-radiation data.** B. Bartoli, S. Catalanotti, V. Cuomo, M. Grancesca, C. Serio, V. Silvestrini, and G. Troise (Napoli, Università, Naples, Italy). *Nuovo Cimento C, Serie 1,* vol. 2C, Mar.-Apr. 1979, p. 222-234. 11 refs. Research supported by the Consiglio Nazionale delle Ricerche.

A correlation between the monthly average of the fraction of solar radiation reaching the earth and the statistical distribution of the days belonging to such a month as a function of the daily function of the daily fraction of solar radiation is analyzed. It is found that this correlation exists in Italy and that the distribution functions are independent of the location and of the period of the year. (Author)

A79-51024 **Results of computer simulation of in situ oil shale retorting.** R. L. Braun (California, University, Livermore, Calif.). *In Situ,* vol. 3, no. 3, 1979, p. 173-207. 21 refs. Contract No. W-74050-eng-48.

A mathematical model has been developed for simulating the processes involved in the in situ retorting of rubblized beds of oils shale. The model is a transient one-dimensional treatment of a packed-bed reactor and is based on the thermodynamics and kinetics of the numerous chemical reactions and physical processes that are most important for hot inert-gas retorting and for combustion retorting. The validity of the model is tested by comparison with experimental retort data. The predicted retorting results for conditions of interest to commercial, modified, in situ retorting are discussed in detail. The initial shale properties, such as grade, carbonate content, and bed porosity, are shown to have an important bearing on the maximum retort temperature, the rate of retorting, and the oil yield. The input-gas properties, such as composition, flow rate, and temperature, are likewise shown to influence strongly the retorting results. (Author)

A79-51025 **Analysis of geological limitations to underground coal gasification.** R. F. Strickland and J. W. Jennings (Texas A & M University, College Station, Tex.). *In Situ,* vol. 3, no. 3, 1979, p. 209-226. 6 refs.

Results of a field test of the underground gasification processes have shown that a high moisture content lignite can be easily ignited. Both the field test and a mathematical model study have shown that it may be difficult if not impossible to gasify lignite seams in close proximity to water sands. (Author)

A79-51100 * # **Comparison of alternate fuels for aircraft.** R. D. Witcofski (NASA, Langley Research Center, Hampton, Va.). *Deutsche Gesellschaft für Luft- und Raumfahrt and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, International Symposium on Hydrogen in Air Transportation, Stuttgart, West Germany, Sept. 11-14, 1979, Paper.* 37 p. 19 refs.

A comparison of candidate alternate fuels for aircraft is presented. The fuels discussed include liquid hydrogen, liquid methane, and synthetic aviation kerosene. Each fuel is evaluated from the standpoint of production, transmission, airport storage and distribution facilities, and use in aircraft. Technology deficient areas for cryogenic fuels, which should be advanced prior to the introduction of the fuels into the aviation industry, are identified, as are the cost and energy penalties associated with not achieving those advances. Environmental emissions and safety aspects of fuel selection are discussed. A detailed description of the various fuel production and liquefaction processes and their efficiencies and economics is given. V.T.

A79-51103 * # **UV blocking filters for polymeric films.** G. J. Rayl (General Electric Co., Space Div., Valley Forge, Pa.). *American Vacuum Society, Meeting, Princeton, N.J., May 17, 1979, Paper.* 17 p. 5 refs. Contract No. NAS3-21264.

The concept of incorporating UV screening agents in silicone resins as a means of protecting underlying solar cell covers and adhesives from UV degradation is presented. A silicone hard-coat resin incorporating a UV screening agent was selected as a suitable coating material for PFA Teflon solar cell covers. Consideration is given to fabrication procedures and techniques for introduction of the UV screening agents into silicone resins and application of these UV-inhibited coatings to the Teflons. Some preliminary environmental tests, such as thermal shock and temperature humidity, were conducted. V.T.

A79-51177 **Optical simulation for a fixed spherical solar collector.** B. Authier, L. Hill, M. Duban, P. Trarieux, M. Sarazin, and P. Nadeau (CNRS, Laboratoire d'Astronomie Spatiale, Marseille, France). *Applied Optics,* vol. 18, Sept. 15, 1979, p. 3081-3089. 6 refs.

To calculate the absorber dimensions for a fixed spherical solar collector, an optical simulation of the ray-tracing type is proposed. The physical quantities, which have an effect upon these dimensions, are described as well as the measurement methods. Once the dimensions are determined, the incident flux on the absorber surface can be calculated by the same program in terms of different zenith distances. These calculations can be checked by comparing the calculated flux on the surface of the absorber with the measured flux at different points along the absorber aimed at the full moon instead of at the sun. Through the data obtained from the measurements, fluctuating points of high flux and permanent zones which receive double and triple reflection rays have been studied. (Author)

A79-51178 **Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation.** J. S. Batchelder (California Institute of Technology, Pasadena, Calif.), T. Cole (Ford Motor Co., Dearborn, Mich.), and A. H. Zewail. *Applied Optics,* vol. 18, Sept. 15, 1979, p. 3090-3110. 32 refs. Research supported by the U.S. Department of Energy and ARCO Solar, Inc.

Techniques and calculations are presented that give explicit expressions for the over-all performance of a luminescent solar concentrator (LSC) in terms of the intrinsic spectral response and quantum efficiency of its constituents. We examine the single dye (or inorganic ion) LSC with emphasis on the planar geometry. Preliminary data on the degradation of candidate LSC dyes under severe weathering conditions are also given. Armed with our experimental results and analysis of solar absorption, self-absorption, and solar cell efficiency, we present a new genre of solar concentrator with a theory of operation for the device. (Author)

A79-51181 **Optical properties of aggregated gold on aluminum.** T. Sato, K. Y. Szeto, and G. D. Scott (Toronto, University, Toronto, Canada). *Applied Optics,* vol. 18, Sept. 15, 1979, p. 3119-3122. 7 refs. Research supported by the Natural Science and Engineering Research Council of Canada.

The optical reflectances of evaporated deposits of gold on aluminum have been measured in the visible and IR regions. Aggregation of the gold and diffusion of the aluminum into the gold by heat treatment produces surfaces with high absorptance in the visible and high reflectance in the infrared, characteristics required of selective solar absorbers. The effects of prolonged heating at 350 C are shown to be slight. (Author)

A79-51194 **High-grade fuels from biomass farming - Potentials and constraints.** P. B. Weisz and J. F. Marshall (Mobil Research and Development Corp., Central Research Div., Princeton, N.J.). *Science,* vol. 206, Oct. 5, 1979, p. 24-29. 23 refs.

The use of biomass as a source of fuel is a topic of growing interest and debate. Here we present an analysis of the key technical and economic potentials and constraints of systems designed to use agricultural crops to displace nonrenewable hydrocarbon fuels, namely petroleum and natural gas. We first examine the controlling parameters and general behavior of such systems. We then examine the quantitative aspects of existing grain alcohol technology. This technology we use as a reference case for examining the potential for other biomass crops. It is our intent to provide a rigorous treatment and descriptive framework to aid in future research and development. (Author)

A79-51196 **Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis.** P. B. Weisz, W. O. Haag, and P. G. Rodewald (Mobil Research and Development Corp., Central Research Div., Princeton, N.J.). *Science,* vol. 206, Oct. 5, 1979, p. 57, 58. 19 refs.

Shape-selective hydrocarbon catalysis, such as the conversion capability of zeolite catalysis of the ZSM-5 type to produce high-grade gasoline from methanol, can be extended to produce a similar gasoline or aromatics from plant extracts. Examples are rubber latex, corn oil, and peanut oil. Novel mechanisms for shape-selective reaction sequences are demonstrated. (Author)

A79-51250 # **The design impact of power-augmented ram technology on large energy efficient aircraft.** C. J. Martin and F. H. Krause (U.S. Naval Material Command, David W. Taylor Naval Ship Research and Development Center, Bethesda, Md.). *American Institute of Aeronautics and Astronautics, Aircraft Systems and Technology Meeting, New York, N.Y., Aug. 20-22, 1979, Paper 79-1864.* 11 p. 17 refs.

The purpose of this paper is to present the energy saving advantages of power-augmented-ram (PAR) technology as applied to large aircraft. The increased efficiency in the areas of aerodynamic structures and propulsion are quantified. The requirements for the application of PAR to energy conservative aircraft flying in ground effect (WIG) or out of ground effect are presented. The design limitations and performance gains associated with PAR are identified. The PAR provides a substantial system performance improvement to aircraft designs flying either in or out of ground effect. Fuel efficient PAR-WIG vehicles, compared to conventional land based aircraft, are capable of three times the payload delivered for a pound of fuel used. (Author)

A79-51274 # **Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants (Ipol'zovanie sredstv avtomatizirovannogo upravleniia dlia kontrolia sostoianiia i ispytanii gidrosilovogo oborudovaniia GES).** V. I. Obrezkov, N. K. Malinin, M. G. Tiagunov, N. I. Matvienko, and V. D. Lebedeva (Moskovskii Energeticheskii Institut, Moscow, USSR). *Energetika,* vol. 22, June 1979, p. 78-82. In Russian.

A79-51405 **Advanced lasers for fusion applications.** W. F. Krupke (California, University, Livermore, Calif.). In: International Conference on Lasers, Orlando, Fla., December 11-15, 1978, Proceedings. McLean, Va., STS Press, 1979, p. 24-30. 36 refs. Contract No. W-7405-eng-48.

The technological scalability and efficiency of short-wavelength laser systems based on atomic selenium, terbium molecular vapors, thulium-doped dielectric solids and pulse compressions of KrF excimer laser radiation for laser fusion applications are examined. Preliminary device and system models for each of the laser systems considered were applied to the design of a nominal kilojoule/terawatt laser system, and technological and physical problems in the scaling of the systems to the energy of 100 kJ/beamline were assessed. It is found that all of the laser concepts examined (laser-pumped, and window and windowless fluorescence pumped OCSe systems, a XeF excimer-laser pumped Tm(3+):glass laser, KrF-pumped Tb-thd3 and Tb-Al-Cl systems and a KrF-pumped backward-wave pulsed Raman stacker-compressor laser using methane as the Raman medium) are capable of meeting the minimum energy efficiency requirements of 1% and are potentially scalable to the required levels, with the KrF-pumped CH4 Raman stacker/compressor system offering the highest efficiency (4 to 6%) at the shortest wavelength (0.27 microns) and the widest range of system design options. A.L.W.

A79-51570 **Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering.** C. M. Surko, J. J. Schuss, R. R. Parker, I. H. Hutchinson, D. Overskei, and L. S. Scaturro (MIT, Cambridge, Mass.). *Physical Review Letters,* vol. 43, Oct. 1, 1979, p. 1016-1019. 8 refs. Contract No. EG-78-C-3109.

The wavelengths, amplitudes, frequencies, and spatial distributions of driven lower-hybrid wave fluctuations are studied in the Alcator tokamak with use of CO2-laser scattering. It is found that for incident microwave power densities from 0.4 to 4.5 kW sq cm the wave amplitudes are nearly independent of the relative phase of the electric fields at the exciting waveguides. The waves are not localized in resonant cones and they have frequency widths of from 0.5 to 6 MHz. (Author)

A79-51705 # **An advanced technology engine family for general aviation.** J. L. Nye (General Electric Co., West Lynn, Mass.). *AIAA, SAE, and ASME, Joint Propulsion Conference, 15th, Las Vegas, Nev., June 18-20, 1979, AIAA Paper 79-1161.* 6 p.

The design features of the GE advanced technology CT7 turboshaft engine, a civilian derivative of the U.S. Army T700, are surveyed. The engine is the result of a development program which included studies of various configuration alternatives early in the design cycle. It is shown how the engine's features reduce operating costs. These include reduced specific fuel consumption and weight, high reliability, simplified maintenance and improved cost/benefit ratio. The engine features 97% commonality with the T700 and is made up of four major components, an accessory module, a cold-section/compressor module, a hot-section/turbine module, and a power turbine module. Performance improvements are covered and derivatives such as a turboprop and a turbofan are noted. M.E.P.

A79-51712 **Urania-yttria solid solution electrodes for high-temperature electrochemical applications.** S. P. S. Badwal and D. J. M. Bevan (South Australia, Flinders University, Adelaide, Australia). *Journal of Materials Science*, vol. 14, Oct. 1979, p. 2353-2365. 64 refs.

Measurements of total electrical conductivity of fluorite-type U_3O_8-Y_2O_3 (Sc_2O_3) solid solutions are studied as a function of temperature and U/Y (Sc) ratio. The study includes experimental data on total conductivity, transport numbers, and interdiffusion of electrode and electrolyte cations. It is found that the conductivity of these fluorite-type solid solutions is mainly electronic and the conduction mechanism being of the hopping-type. The diffusion of cations of U_3O_8-Y_2O_3 into ZrO_2-Y_2O_3 is evaluated. Attempts were made to determine the anionic contribution to the total conductivity in U_3O_8-Y_2O_3 solid solutions, using the blocking electrode technique. The diffusion coefficients calculated from the conductivity data using the Nernst-Einstein relation are two orders of magnitude higher than those obtained by a direct method. V.T.

A79-51726 **Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volumes 1 & 2.** Conference sponsored by ACS, AIChE, AIAA, ANS, ASME, IEEE, and SAE. Washington, D.C., American Chemical Society, 1979. Vol. 1, 1219 p.; vol. 2, 1179 p. Price of two volumes, $52.50.

Consideration is given to such topics as solar collectors, solar ponds, solar thermal systems, solar thermal components, OTEC systems, photovoltaic systems, wind power, dessicant cooling, biomass conversion, flywheel energy storage, compressed air energy storage technology, and thermal and magnetic energy storage. Papers are also presented on thermal energy storage for building space conditioning, fuel cells, electric vehicle systems, batteries for electric vehicles, hydrogen energy, coal liquifaction and gasification, fluidized bed processing for energy conversion systems, in situ oil shale and gas technology, geothermal energy, heat engines, and Stirling engine analysis. Finally, attention is also given to space power system requirements, satellite solar arrays, aircraft power systems, space nuclear reactor/isotope power systems, controlled fusion; thermoelectrics, thermionics, and magnetohydrodynamics. B.J.

A79-51727 **Weight minimization of sandwich type solar collector panels.** R. C. Reuter, Jr. (Sandia Laboratories, Albuquerque, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1-6. 5 refs. Contract No. AT(29-1)-789.

Solar collector modules of various types (e.g., line focusing, heliostats) require stiff, lightweight structural panels to support and protect their reflective surfaces. Symmetric, sandwich type panel construction fulfills these requirements. Analytical methods are utilized in the present work to study the existence, utilization and practicality of a minimum weight, adequately stiff design for sandwich panel construction in the solar collector application. (Author)

A79-51728 **Elastically deformed, linear focusing solar reflector.** R. A. Powell (HRP, Inc., Norristown, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 7-10.

A low-cost, high-quality, linear-focusing reflector can be produced by applying twisting moment loads to the longitudinal edges of an initially flat sheet of reflector material. This causes it to elastically deflect to a cylindrical cross-section. Additional loads force the cross-section shape into that of a parabola. Experiments using a test bed that simulates a two foot (0.61 m) long section of a six-foot (1.83 m) wide reflector made by this method support the theory. A stable, and structurally stiff reflector is produced, having a geometric concentration ratio of 21 in the cylindrical configuration and 88 in the parabolic configuration. A production design that is simple, does not require large capital outlays, and has material costs in the range of $75/sq m is discussed. (Author)

A79-51729 **Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system.** L. D. Clements and J. D. Reichert (Texas Tech University, Lubbock, Tex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 11-14. 9 refs.

This paper is concerned with both optical and thermal analyses for a fixed mirror-distributed focus (FMDF) system. This work has arisen as a part of the Crosbyton Solar Power Project at Texas Tech University. The paper addresses both detailed and approximation modeling of the optical concentration profiles and modeling of receiver performance for a once-through steam boiler receiver for the FMDF concept. The final performance results are given in terms of enthalpic power absorbed as a function of solar inclination angle, fluid inlet conditions, and windspeed. (Author)

A79-51730 * **A simulation exercise of a cavity-type solar receiver using the HEAP program.** F. L. Lansing (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 20-25. Contract No. EX-76-A-29-1060.

A computer program has been developed at JPL to support the advanced studies of solar receivers in high concentration solar-thermal-electric power plants. This work presents briefly the program methodology, input data required, expected output results, capabilities and limitations. The program was used to simulate an existing 5 kwt experimental receiver of a cavity type. The receiver is located at the focus of a paraboloid dish and is connected to a Stirling engine. Both steady state and transient performance simulation were given. Details about the receiver modeling were also presented to illustrate the procedure followed. Simulated temperature patterns were found in good agreement with test data obtained by high temperature thermocouples. The simulated receiver performance was extrapolated to various operating conditions not attained experimentally. The results of the parameterization study were fitted to a general performance expression to determine the receiver characteristic constraints. The latter were used to optimize the receiver operating conditions to obtain the highest overall conversion efficiency. (Author)

A79-51731 **Ceramic solar receivers.** P. O. Jarvinen (MIT, Lexington, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 26-31. Research sponsored by the U.S. Department of Energy.

The application of ceramic materials to high temperature solar receivers for advanced Brayton and advanced Stirling thermal electric systems is discussed. Conceptual designs for ceramic cavity receivers employing impingement jet-cooled, dome-shaped silicon carbide heat exchanger modules are offered. Optical, mechanical, heat transfer and structural analyses of this novel receiver approach are presented. (Author)

A79-51732 **Predicting solar energy fluxes in polluted urban areas.** T. R. Galloway (California, University, Livermore, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 32-38. 9 refs. Contract No. W-7405-eng-48.

The paper presents a method which employs known molecular absorption coefficients for gaseous air pollutants and various manmade and natural aerosols in an urban atmosphere model to predict the atmospheric optical thickness and thus the ratio of ground level direct incident flux to insolation flux above the atmosphere. In addition, a prediction method is developed for representative values of the 'unpolluted air' background, making it possible to derive an urban solar energy correction factor. Detailed daily local measurements have been made over a two year period in the San Francisco Bay Area in order to verify the overall accuracy and sensitivity of the method to various air pollutant input parameters. The method reduces the indicent solar flux design error from the typical 30% to less than 5% for urban areas. B.J.

A79-51733 * **Projected techno-economic improvements for advanced solar thermal power plants.** T. Fujita, R. Manvi, and E. J. Roschke (California Insitute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 39-44. 25 refs. Research sponsored by the U.S. Department of Energy.

The projected characteristics of solar thermal power plants (with outputs up to 10 MWe) employing promising advanced technology subsystems/components are compared to current (or pre-1985) steam-Rankine systems. Improvements accruing to advanced technology development options are delineated. The improvements derived from advanced systems result primarily from achieving high efficiencies via solar collector systems which (1) capture a large portion of the available insolation and (2) concentrate this captured solar flux to attain high temperatures required for high heat engine/energy conversion performance. The most efficient solar collector systems employ two-axis tracking. Attractive systems include the central receiver/heliostat and the parabolic dish. (Author)

A79-51734 **Solar pond concepts - Old and new.** T. S. Jayadev, M. Edesess, and J. Henderson (Solar Energy Research Institute, Golden, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 45-48. 16 refs.

It is shown that the salty nonconvecting pond is a viable and economical way of collecting and storing large quantities of solar energy, especially where salt is free or inexpensive. Other techniques may be more desirable where salt is not so readily available. Combinations of collectors with pond storage are appropriate for some applications and can provide water of higher temperature, but they enter the realm of higher and more expensive technology. Where salt is not free or not inexpensive the deep convecting pond may be an economically viable and environmentally acceptable alternative and deserves further investigation. B.J.

A79-51735 **Performance of a large, salt-gradient solar pond.** L. J. Wittenberg and M. J. Harris (Monsanto Research Corp., Miamisburg, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 49-52. 11 refs. Contract No. DE-AC04-76DP0053.

Initial performance data collected from the largest, salt-gradient solar pont in the U.S. indicate that it has the potential to be a very low-cost solar-heating system. The solar pond at Miamisburg, Ohio, occupies an area of 2000 sq m and was installed for only $35/sq m. The pond is predicted to deliver 281,000 kW hr/yr to be used principally for heating an outdoor swimming pool in the summer and a recreation building during October-December. Based upon straight amortization of 10%/yr, this heat is predicted to cost 2.5 cents/kW.hr. (Author)

A79-51736 **Stability criteria for saturated solar ponds.** T. L. Ochs and J. O. Bradley (Nevada, University, Boulder City, Nev.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 53-55. 8 refs.

Saturated solar ponds are non-convecting bodies of water, relying upon a density gradient brought about by differential solubility of salt with temperature. A saturated solar pond differs from a typical saline pond in that the naturally-developed temperature gradient between top and bottom develops and maintains a density gradient by ion migration. Not all salts are suitable for use in a saturated solar pond and the paper describes criteria for their choice and an example of analysis of four candidate salts. (Author)

A79-51737 **Economic and performance comparisons of salty and saltless solar ponds.** M. Edesess, D. Benson, J. Henderson, and T. S. Jayadev (Solar Energy Research Institute, Golden, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 56-61. 16 refs.

The optimum solar pond design is site-dependent and application-dependent. Foremost of the design decisions is the choice of a salty (nonconvecting) pond or a saltless (convecting) pond. The decision variables are: local availability and cost of salt, type of salt available and its properties, and possible environmental factors such as the effects of salt runoff and the existence of ground water. The availability of salt is an important factor in determining the economics of salty ponds. For example, sodium sulfate is a potentially low-cost substitute for sodium chloride, and is expected to be in plentiful and widely distributed supply in the near future as a waste product of flue gas desulfurization at coal-fired utility plants. This paper discusses the potential supply of such salts and estimates the break-point in net cost of salt at which a convecting pond becomes economically competitive with the salty pond. (Author)

A79-51738 **Sede Boqer - Shallow solar ponds project.** A. I. Kudish and A. Roy (Negev, University, Beersheba, Israel). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 62-65. 5 refs.

The results obtained at the Sede Boqer shallow solar ponds project are presented. The project consists of three small module shallow solar ponds, 2 x 1.3 m in size. All have the same lower black PVC lower film but differ either in the type of upper transparent film, glazing material or glazing angle. Performance data are presented for three criteria: (1) maximum daily water temperature achieved, (2) total daily thermal energy collected and the daily efficiency. Finally, the data are analyzed through application of the Hottel, Whillier and Bliss model and following the approach developed by Hewett (1977). M.E.P.

A79-51739 * **Advanced solar thermal technology - Potential and progress.** L. Leibowitz and E. Hanseth (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 66-71. 6 refs. Research sponsored by the U.S. Department of Energy.

The advanced thermal power technology program which develops and applies advanced technology for improved solar thermal energy subsystems and components. It is shown that the effort is aimed at systems which can achieve significant energy cost reductions. The paper describes the potential for advanced technology to achieve commercially attractive solar thermal systems and describes some recent developments in advanced heat engines, high temperature receivers, chemical transport, and storage. M.E.P.

A79-51740 **Solar thermal systems long-term performance predictions using closed-form solutions.** D. K. Anand, R. B. Abarcar, and S. R. Venkateswaran (Maryland, University, College Park, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 72-76. 6 refs. Contract No. EY-76-S-05-4976.

In this paper, a closed-loop feedback control system representation of solar thermal system is derived for each of the various modes of operation. Analysis of the transfer functions resulted in identifying the various system parameters which must be optimized in order to obtain the maximum system response to a continuous input weather function. Using a stochastic weather model, which has been validated through the detailed simulation program SHASP, as input, the thermal response of the system is obtained in a closed-form. A methodology for using the closed-form solution to represent the response, and the joint probability density matrix to represent the probabilistic nature of the weather to obtain the long-term system performance is presented. The results are compared to the predictions of both the detailed simulation and the simplified design method. (Author)

A79-51741 **A distributed microcomputer-based control system for a large scale solar total energy system.** J. O. Farrell and R. S. Reska (General Electric Co., Daytona Beach, Fla.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 77-81. Contract No. DE-AC04-77ET20260.

A unique computer-based digital control system is being designed by General Electric to control, monitor, and acquire data from the world's largest industrial solar thermal energy system, the U.S. Department of Energy's Solar Total Energy - Large Scale Experiment at Shenandoah, Georgia. The control system employs distributed microcomputer architecture, a human factors engineered control console, and Large Scale Integrated (LSI) electronics hybrid signal conditioning to control solar energy collection, storage, conversion, and utilization. The total energy system can thus operate under either automatic or manual control to produce electricity, process steam, and provide space heating and cooling for a large knitwear manufacturing plant. (Author)

A79-51742 **The control system for Fort Hood Solar Total Energy System.** F. C. Luffey and D. L. Black (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 82-85.

The Fort Hood Solar Total Energy System Large Scale Experiment (STES-LSE) was designed to supply 70 million Btu/day to the 87 thousand barracks complex at Fort Hood, Texas. Solar energy is collected via a mirrored parabolic trough and delivered to thermal storage tanks from which the balance of the plant operates up to 24 hours per day. Thermal energy is then converted to electrical power, domestic hot water, space heating in winter and air conditioning in summer. The control of the components of the STES-LSE is via a 'software driven' digital computer based control system interfaced with analog control elements. A master computer located in the central control room communicates asynchronously to field distributed process units (DPU) via parallel linked transmission lines. These DPU's contain control algorithms, control commands, and setpoints which are relayed to either conventional analog controllers or analog actuators via signal conditioned I/O terminal boards located in the DPU. (Author)

A79-51743 **Perspectives on developing country solar energy applications.** R. Ramakumar (Oklahoma State University, Stillwater, Okla.) and J. C. Beavers. In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 93-98. 32 refs. Research supported by the Oklahoma State University; Contract No. EV-78-S-05-6004.

This paper discusses some of the fundamental issues involved in the harnessing of renewable energy resources for rural development in developing countries. Utilization of several manifestations of solar energy in tandem, with the integration of benefits occurring at the user's end, appears to be attractive both from the application and the economic points of view. This can be achieved by the establishment of a rural energy center for each remote village or for a small cluster of three or four villages. It is shown that, in resource-poor population-rich countries which have to import fossil fuels at the expense of their meager foreign exchange reserves, capital costs as high as U.S. $6000 per continuous kilowatt or even higher are permissible, and sometimes even competitive, at present for renewable energy systems. A selected chronological bibliography is compiled for the benefit of readers interested in additional information on this subject of global importance. (Author)

A79-51744 **Solar collector as heat pump evaporator.** S. Chaturvedi, A. S. Roberts, Jr. (Old Dominion University, Norfolk, Va.), and V. Mei (Illinois Institute of Technology, Chicago, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 99-104.

Thermal performance of a solar assisted heat pump is analyzed for various ambient conditions. In the proposed concept, bare collector also acts as evaporator for the heat pump. Results indicate that evaporator temperature 0 to 15C above ambient temperature can be maintained for wide ranging ambient conditions. Long term system performance of the system for Norfolk, Virginia indicates that payback period of 12 years is possible for a base electricity rate of $0.06/kwhr, 10% fuel escalation rate and 8% interest rate. Payback period can be significantly reduced if the system is optimized and if the heat pump is also used for domestic water heating. (Author)

A79-51745 **Design study and cost-effectiveness of the metal hydride solar heat pump and power system /HYCSOS/.** R. Gorman and P. S. Moritz (TRW Energy Systems Group, McLean, Va.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 109-113. 5 refs.

This report presents the design, performance and cost-effectiveness of a solar-powered metal hydride heat pump and power system for use on a residence. The system design, which is limited by heat transfer, was optimized via an interative computer program. The results indicate that in Boston, the HYCSOS with electric back-up uses less than one-third the electricity annually and costs 23 percent less than direct solar heating with absorption air conditioning and electric back-up. In comparison, the HYCSOS with gas back-up uses 89 percent less gas and 50 percent less electricity than gas heating and gas air conditioning. However, it costs 17 percent more per year to own and operate because of the high capital costs of HYCSOS. For Albuquerque: the HYCSOS with electric back-up costs 27 percent less per year than direct solar heating with electric back-up; HYCSOS with gas back-up costs only 3 percent less per year. (Author)

A79-51746 **Conversion of solar energy to chemical energy using ammonia dissociation.** T. G. Lenz and J. H. Wright (Colorado State University, Fort Collins, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 114-117.

This paper deals with design of an experimental solar-absorber-ammonia dissociation reactor-heat exchanger. Such a composite absorber-reactor-heat exchanger would be at the endothermic end of a closed cycle process for conversion of solar energy to high-quality process heat or electric power. The preferred design is for a 10 kWth unit of cylindrical-cavity geometry, about one foot in diameter by one foot long, and containing 43, 0.375-in. OD, 0.245-in. ID catalyst-filled Inconel 617 tubes running axially between two ring headers. Typical catalysts would be nickel or ruthenium on Al2O3. Total pressure drop (reactor plus heat exchanger) of 4.6 psi is predicted for a 4000 cu cm/min. average volumetric flow (at 650 C, 300 bars), with 87 mole% of the NH3 fed being converted to N2 and H2. The dissociated gas temperature exiting the heat exchanger would be within 10 C of the inlet NH3 temperature. (Author)

A79-51747 **Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant.** W. Willcox (Rockwell International Corp., Energy Systems Group, Canoga Park, Calif.) and J. Beckman (California State University, Northridge, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 118-123. 11 refs.

A numerical dynamic simulation model of the thermal-hydraulic characteristics of a sodium-cooled advanced central receiver solar electric power plant has been developed. The model was used to determine the optimum receiver temperature control system configuration. Independent feedback control of each of the 24 receiver panels was found to be an adequate method of receiver outlet coolant temperature control. However, integral and derivative control modes, as well as proportional, are required for satisfactory response speed and acceptable temperature offset. The use of simple independent feedback loops for control does not cause any unusual problems even though the panels are hydraulically coupled by common feed and return lines. The degree of coupling was found to be small. Arbitrarily inducting instability in one panel does not affect the operation or control of the other panels. The limits of controller stability were explored by parametrically varying controller proportional gain. It was found that the receiver panels with the highest heat flux and coolant flow were the most sensitive to gain variation as a result of their relatively high ratio of dead time to process time constants. (Author)

A79-51748 **Solar production of industrial process steam.** J. Cherne, G. Gelb, and D. Pinkerton (TRW Energy Systems Group, Redondo Beach, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 124-128. Research sponsored by the U.S. Department of Energy.

TRW is developing the application of solar technology to food processing at the Ore-Ida Foods plant in Ontario, Oregon, under the auspices of the Department of Energy. Steam, generated at 417 F, is used for frying, then cascaded to lower temperatures for other processes in the plant. This plant consumes all of the solar-produced steam without the need for costly storage. The system selected consists of high efficiency, parabolic trough, concentrating collectors and a pressurized water heat transfer loop which generates steam in a flash tank. This system is applicable to many industries. The system interfaces with the industrial process by simply teeing into the existing process steam lines. This paper treats the trade-offs performed to select the system configuration. (Author)

A79-51749 **The solar total energy system evaluation program /STESEP/.** B. L. McFarland (Rockwell International Corp., Energy Systems Group, Canoga Park, Calif.), S. J. Nalbandian, and E. P. French (Rockwell International Corp., Space Systems Group, Downey, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 129-132. 11 refs.

A solar total energy system (STES) uses solar energy as the primary source to provide a combination of electrical and thermal power to the user to supplement or replace conventional energy sources. Either photovoltaic or solar thermal collectors can be used. Both can be evaluated by the solar total energy system evaluation program (STESEP) Computer Program to determine the equipment sizes and control methodology best suited to building applications in the commercial sector. This paper describes and discusses application of the STESEP Code which can be extended to evaluation of STES in general. (Author)

A79-51750 * **Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept.** R. L. Das and K. A. Bahrami (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 133-138. 6 refs. Contract No. NAS7-100.

This paper discusses the application of kinematic and free piston Stirling engines in a 15 kWe dish-electric approach for solar thermal electric generation. Initially, the principle of operation of Stirling engines in solar thermal electric generation is discussed. Then, under certain simplifying assumptions, mathematical models describing the dynamic operation of the kinematic and free piston Stirling engines are developed. It is found that the engine dynamics may be approximated by second order models. Control mechanisms for both types of Stirling engines are discussed. An approach based on the modulation of the working fluid mean pressure is presented. It is concluded that this approach offers a fast and effective means of control. The free piston Stirling engine, being a thermally driven mechanical oscillator, presents unique control requirements. These are discussed in this paper. (Author)

A79-51751 * **Turbine sizing of a solar thermal power plant.** R. Manvi and T. Fujita (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 139-142. Contract No. EX-76-A-29-1060.

Since the insolation is intermittent, thermal energy storage is necessary to extend the time of power generation with solar heat past sunset. There are two approaches to specifying the size of turbine-generator units depending on the system operation. In the first approach, the turbine operates at its full capacity when operating on direct solar heat, and at reduced capacity when operating on collected heat out of energy storage. In the second approach, the turbine will always operate at a uniform level either on derated energy from the receiver or from energy storage. Both of these approaches have certain advantages and disadvantages. In this paper, a simple analysis is outlined and exercised to compare the performance and economics of these two approaches. (Author)

A79-51752 **Sandia Laboratories operational experience with small heat engines in solar thermal power systems.** J. P. Abbin, Jr. (Sandia Laboratories, Albuquerque, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 143-147. Contract No. DE-AC04-76DP00789.

During the time that Sandia Laboratories has been engaged in solar energy research and development, a significant amount of hardware and operating experience has been obtained from the construction and testing of two small Rankine-cycle solar thermal power plants. The first plant is part of a prototype solar total energy system with an electrical generating capacity of 32 kW, and the second plant is part of a prototype solar irrigation unit with a shaft power output of 19 kW or an electrical output of 15 kW. This paper describes the energy-conversion hardware and summarizes the performance and operating experience with the units. (Author)

A79-51754 **A new solar thermal receiver utilizing a small particle heat exchanger.** A. J. Hunt (California, University, Berkeley, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 159-163. 10 refs. Contract No. W-7405-eng-48.

A dispersion of small absorbing particles forms an ideal system to collect radiant energy from concentrated sunlight to heat a pressurized gas that when expanded through a turbine will produce useful mechanical energy. A new type of solar thermal receiver based on this concept is being developed at LBL that is to be placed at the focus of a central tower or a parabolic dish concentrator system. An open cycle Brayton heat engine utilizing a Small Particle Heat Exchange Receiver (SPHER) operates by compressing ambient air and injecting a very small mass of fine particles into the gas stream. The air particle mixture enters a transparent heating chamber where the solar flux is concentrated. The particles absorb the radiation and because of their very large surface area, quickly release the heat to the surrounding gas. The air-particle mixture continues to heat until the particles vaporize. The optical efficiency of the receiver is 85-90% without a cavity and the thermodynamic efficiency of the Brayton cycle is greater than 40%. Calculations of the optical, thermal, and physical processes have been performed, candidate receiver designs and window materials have been determined, and the feasibility demonstrated in the laboratory. (Author)

A79-51755 * **Solar parabolic dish thermal power systems - Technology and applications.** J. W. Lucas and A. T. Marriott (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 166-175. 19 refs. Research sponsored by the U.S. Department of Energy.

Activities of two projects at JPL in support of DOE's Small Power Systems Program are reported. These two projects are the Point-Focusing Distributed Receiver (PFDR) Technology Project and the Point-Focusing Thermal and Electric Applications (PFTEA) Project. The PFDR Technology Project's major activity is developing the technology of solar concentrators, receivers and power conversion subsystems suitable for parabolic dish or point-focusing distributed receiver power systems. Other PFDR activities include system integration and cost estimation under mass production, as well as the testing of the hardware. The PFTEA Project's first major activity is applications analysis, that is seeking ways to introduce PFDR systems into appropriate user sectors. The second activity is systems engineering and development wherein power plant systems are analyzed for specific applications. The third activity is the installation of a series of engineering experiments in various user environments to obtain actual operating experience. (Author)

A79-51756 **Solar central receiver program.** L. N. Tallerico and A. C. Skinrood (Sandia Laboratories, Livermore, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 176-180.

A number of solar central receiver programs are being conducted with the goal of developing a system capable of producing low cost electricity. The programs are concentrating on the heliostat, receiver and storage subsystems. The emphasis in the heliostat program is to develop designs which are amenable to mass production and minimum maintenance. Both glass and plastic designs are being evaluated. The receiver studies have addressed the use of water/steam, salt, sodium, air and helium as the heat transport fluid in the receiver. Air, rock, salt, and sodium storage subsystems are being investigated. The water/steam, sodium and salt receivers are coupled to a Rankine cycle turbine and the air and helium receivers to a Brayton cycle turbine. Extensive parametric studies were conducted to obtain the information required to evaluate the systems. An overview of these systems, the scope of the parametric studies, the preliminary conclusions, and the future direction of the program are presented. (Author)

A79-51757 **Solar One Project - A 10-megawatt solar thermal central receiver pilot plant.** R. N. Schweinberg (U.S. Department of Energy, Solar Ten Megawatt Projects Office, El Monte, Calif.) and J. N. Reeves (Southern California Edison Co., Rosemead, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 181, 182.

Through a cooperative effort of government and private industry, a 10-megawatt solar thermal pilot plant is to be constructed in the 1980-81 timeframe using central receiver technology. The pilot plant will be tested for five years and information derived will be used for future commercial solar generating stations. (Author)

A79-51758 **Preliminary design of a cruising OTEC modular experiment.** J. F. George and D. Richards (Johns Hopkins University, Laurel, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 183-189. 9 refs.

Ocean Thermal Energy Conversion (OTEC) uses the temperature difference between warm surface water and cold deep water in a thermodynamic cycle with ammonia as the working fluid to drive a turbogenerator. This power source is available over vast areas of tropical and subtropical oceans. The Department of Energy development plan for OTEC calls for the acquisition of a modular experiment platform that can produce from 10 to 40 MW electric (net) power, using near full-scale power module components. A preliminary design of this platform has been completed and is available for use by government and industry. The paper describes the systems design of the OTEC platform, which integrates all of the requirements of sea water delivery, heat exchangers, power system components, and shipboard outfitting and furnishing. The cold water pipe is the most difficult technical problem to be solved, and analysis, design and deployment studies are discussed. (Author)

A79-51759 **An open cycle approach to ocean thermal energy conversion.** P. D. Ritland and B. Coffay (Westinghouse Electric Corp., Steam Turbine-Generator Technical Operations Div., Lester, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 195-202. 7 refs. Contract No. EG-77-C-05-1473.

A design for an open cycle 100 MW electric net ocean thermal energy conversion plant is described. In this system flashed seawater is used as the working fluid without resorting to an intermediate working fluid as is used in the closed cycle power system options. The design makes use of an ocean platform as integral part of the power system. A large diameter, low speed turbine with lightweight blades is used. The large quantities of noncondensibles require a special approach to the design of condenser and venting systems. The use of either direct contact or surface condensers is possible with a potential of fresh water production with the use of surface condensers. Attention is paid to hull stability to allow the use of barometric principles for fluid handling. The design, economic, and institutional issues relevant to commercialization are also discussed. (Author)

A79-51760 **A combined cycle for solar-fossil hybrid power generation.** E. Y. Lam and J. H. Westsik (Bechtel National, Inc., San Francisco, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 203-206. Contract No. DE-AC03-78ET21050.

A study of the combined cycle solar hybrid system concepts was initiated in October, 1978 at Bechtel as part of the Department of Energy's solar power development program. Parametric studies were conducted on a near term and an advanced version of a nominal 100

MWe commercial power system. These studies, combined with analyses of market potential in the 1985-1990 time frame, will serve as bases for selecting one of these two concept versions for conceptual design during the second half of this 12 month study. A technical and economic assessment of the concept and the preparation of a development plan and proposal will complete the study project. The combined cycle hybrid system selected by the Bechtel team for the study consists of an air operated open Brayton cycle with a steam Rankine bottoming cycle utilizing the gas turbine waste heat. Solar energy is used to preheat the air in the gas turbine cycle, with the air cooled receiver, located upstream from the combustor in a series arrangement. Cycle efficiencies of 43.5 and 47.7 percent and average annual solar fractions of .312 and .408 were predicted for the near term and advanced versions respectively. (Author)

A79-51761 * **Solar thermal power plants in small utilities - An economic impact analysis.** S. A. Bluhm, R. R. Ferber (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.), and L. G. Mayo (Burns and McDonnell Engineering Co., Kansas City, Mo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 207-211. Research sponsored by the U.S. Department of Energy.

A study was performed to assess the potential economic impact of small solar thermal electric power systems in statistically representative synthetic small utilities of the Southwestern United States. Power supply expansion plans were compared on the basis of present worth of future revenue requirements for 1980-2000 with and without solar thermal plants. Coal-fired and oil-fired municipal utility expansion plans with 5 percent solar penetration were 0.5 percent and 2.25 percent less expensive, respectively, than the corresponding conventional plan. At $969/kWe, which assumes the same low cost solar equipment but no improvement in site development costs, solar penetration of 5 percent in the oil-fired municipal reduced revenue requirements 0.88 percent. The paper concludes that some solar thermal plants are potentially economic in small community utilities of the Southwest. (Author)

A79-51762 **The design of photovoltaic systems for intermediate-sized applications.** E. L. Burgess and G. J. Jones (Sandia Laboratories, Albuquerque, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 212-218. 12 refs. Research supported by the U.S. Department of Energy.

The design techniques and resulting subsystem requirements for photovoltaic (PV) systems for intermediate load-center applications are reviewed. The designs included total-energy systems, ac and dc loads, energy storage, utility feedback, and stand-alone configurations. The National Photovoltaic Program for the development of low-cost flat-panel and concentrator PV arrays, and PV system design, including PV array types and sizes, power-conditioning unit, utility interface, electrical storage, system control, and thermal components are discussed. Three designs representative of commercial and industrial systems, utility feedback and system sizing, a total energy system, and a stand alone, dc load, energy storage system are described. Finally, economics of PV systems are analyzed, and it is concluded that their current costs are too high, but cost reduction areas are identified and programs established to reduce costs. A.T.

A79-51763 **Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation.** L. L. Bucciarelli and R. F. Hopkinson (MIT, Lexington, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 219-224. Research sponsored by the U.S. Department of Energy.

A photovoltaic solar energy system has been providing power for irrigation and crop drying at an agricultural field station of the University of Nebraska. The system, developed and maintained jointly by MIT/Lincoln Laboratory and the University and under contract to the U.S. Department of Energy, consists of a 25 kWp PV array, a battery subsystem, an inverter, a controller, and a data collection and management system. Field data indicate that the PV array performs up to expectations if allowance is made for degradation. The array operates at an efficiency (based on cell area) of between 7 and 8%; the battery subsystem at an 'in-out' efficiency of 83%, and the inverter at 87%. During the irrigation season the system delivers 70% of the energy provided by the PV array to the pump motor. Approximately 10% of the array energy is wasted when the battery is in a fully charged state and the array power exceeds the load. Performance of the system was compared with the results of a computer simulation. This comparison showed agreement to within plus or minus 5% on daily energy totals for array output, inverter input, battery input and output. (Author)

A79-51767 **Photovoltaic concentrator system for Roxborough Park.** R. L. Donovan, W. D. Miller (Martin Marietta Aerospace, Denver, Colo.), and J. Burleson (Childress-Livaudais Architects, Denver, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 245-250. Contract No. DE-AC04-78CS05312.

The Roxborough State Park Visitor's Center, located 25 miles southwest of Denver, Colorado is the planned site of a photovoltaic concentrator application experiment. The intent of the experiment is to demonstrate an energy independent application by combining the photovoltaic concentrator system with existing active and passive solar heating and cooling systems. The experiment represents remote installations of moderate size where the true cost of utility power is high due to transmission line construction in rough terrain. A description of the overall experiment concept is presented along with a description of the photovoltaic concentrator system, and results of system studies. (Author)

A79-51768 **Hybrid alternate energy system.** P. E. Payne and J. L. Sheehan (BDM Corp., Las Vegas, Nev.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 251-254.

The hybrid combination of photovoltaic (P/V) systems and Wind Energy Conversion Systems (WECS) which forms a Hybrid Alternate Energy System (HAES) increases overall energy output and decreases energy storage requirements. Climatological data from various Nevada sites shows that cost-effective application of HAES at remote locations improves the utilization of the solar energy resource. The climatology intuitively leads desert dwellers to the conclusion that the wind often blows at night when the sun doesn't shine and the sun often shines brightly when the desert is still during the day. The design studies performed have been for remote locations for independent and utility back-up HAES applications for independent and utility back-up HAES applications. The applications so far have been for remote desert communications, ranches, and remote equipment. The data taken predicts an overall system cost improvement in the range of 10% to 40%. The driving considerations are load profile, peak demand, back-up power, low maintenance, costs, and power management. (Author)

A79-51769 **A combined photovoltaic/thermal electric central power plant.** D. F. Gluck (Aerospace Corp., El Segundo, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 255-260. 18 refs.

A preliminary design and performance evaluation of the subject power plant has been completed. DC energy is produced by boiling-water-cooled gallium arsenide solar cells covering a central receiver illuminated by a heliostat field with a concentration ratio of one thousand. The steam is used to power a low pressure turbine-generator, with the exhaust steam directly condensed in a dry air heat exchanger. For the case of no energy storage, the heat exchanger size, air mass flux, turbine design temperature, and heliostat area were optimized resulting in a power plant with levelized bus bar energy cost (BBEC) of 70 mills/kWh at a plant capacity factor (PCF) of 0.30. Although PCF was increased beyond 0.30, in no case was BBEC reduced below 70 mills/kWh through the use of hot water thermal energy storage. A comparison of this combined power plant with a photovoltaic plant with cooler solar cells showed the BBEC of the combined power plant to be 9% lower. (Author)

A79-51770 **Application of a GaAs photovoltaic solar system in a utility substation.** H. J. R. Maget (Varian Associates, Palo Alto, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 261-263. Research supported by the U.S. Department of Energy.

A 50 kWp photovoltaic solar system has been designed to operate in parallel with a major utility substation. An array efficiency of 15% is predicted, based on a solar concentration ratio of 400, high efficiency GaAs solar cells and a design aimed at maximum solar to ac energy conversion. Unique high transmission Fresnel lenses, coupled with low energy consuming tracking and thermal subsystems allow to achieve these high system efficiencies. The solar system, designed to deliver utility power only under conditions of insolation, consists of five subsystems: collector, structure, thermal, power conditioning and data acquisition. The design focuses attention on key system elements such as sun tracking, solar energy conversion, heat rejection and utility interface. Details of the various subsystems, including surface preparation, shadowing, utility interface with a 21 kV transmission line, etc., will be presented, as well as the environmental, architectural and application problems associated with the location of the site in a densely populated residential area. (Author)

A79-51771 **The desiccant/rock bed method of solar cooling with air collectors.** D. B. Meredith (Pennsylvania State University, Uniontown, Pa.) and P. J. Wilbur (Colorado State University, Fort Collins, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 274-277. 7 refs.

A method of cooling buildings with solar energy is presented that incorporates a fixed desiccant bed, an evaporative cooler, associated controls and dampers, and conventional components and controls of a solar air heating system. All components are commercially available items and the three heating modes (direct heating with solar, solar heat to storage, and heating from storage) remain unchanged. The three additional operating modes pertaining to cooling (air conditioning, solar regeneration of the desiccant, and night regeneration of the rock bed) have been added. To investigate the thermal performance of the system under typical weather and insolation conditions, a transient simulation model was constructed using TRNSYS. The operating parameters assumed in the model are representative of the building and solar heating system of Solar House II at Colorado State University. The hourly weather values assumed were for a summer season in Washington, D.C. The predicted operating characteristics, thermal coefficient of performance and electrical Energy Efficiency Ratio (EER) are discussed. (Author)

A79-51772 **Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system.** M. D. Fraser, J. F. Henry, L. C. Borghi, and N. J. Barbera (Intertechnology/Solar Corp., Warrenton, Va.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 279-284. 20 refs. Contracts No. EX-76-C-01-2548; No. ET-78-C-01-3024.

A Photosynthesis Energy Factory (PEF) is an integrated bioconversion system consisting of a dry-land Energy Plantation, a wood-fired power plant, and a wetlands biological wastewater treatment system, such as an algae pond. Products of a PEF are electricity from the power plant, synthetic natural gas from digestion of the wetlands biomass, and reclaimed wastewater. The possible advantages are that effluents and by-products from one system part can be beneficially used by other parts, leading to increased energy conversion and resource recovery at lower costs. In the initial study a general technoeconomic model was used to investigate possible interactions between the various subsystems. In a second project the PEF model has been expanded and generalized by analyzing possible model improvements in the areas of materials transportation, water and nutrient balances, other types of wetlands biological systems, and improvements in wood-fired combustion systems. Direct application of municipal wastewater to a dry-land Energy Plantation has been analyzed, also. Potential sites for PEF systems will be evaluated with the improved technoeconomic model. (Author)

A79-51773 **Cogeneration with digester gas.** J. D. Eppich, G. M. Adams, W. E. Garrison, and J. C. Gratteau (Los Angeles County, County Sanitation Districts, Whittier, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 291-294.

The current electrical power demands at the County Sanitation Districts of Los Angeles County Joint Water Pollution Control Plant (JWPCP) will triple with the addition of Federally mandated secondary treatment facilities. The paper describes the power demands and the proposed cogeneration facilities. In light of the stringent California air emission rules and economic considerations, combined cycle turbines, using pretreated digester gas as fuel, were selected as the prime movers for the cogeneration facilities. The power train includes gas pretreatment system, gas turbine(s), heat recovery steam generator(s), and steam turbine(s). The proposed facility will generate approximately 14 MW from 143 MMBTUH after extracting steam for process heating requirements. With the construction of this cogeneration facility, the overall thermal efficiency of the JWPCP should increase from less than 25 percent to greater than 60 percent. (Author)

A79-51774 **Which alcohol fuel for Brasil - Methanol or ethanol.** A. V. Carvalho, Jr., V. Yang, and S. C. Trindade (Centro de Tecnologia Promon, Rio de Janeiro, Brazil). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 295-300. 13 refs.

This paper is an updated account of the achievements of the Brasilian National Alcohol Program and of the recently proposed program on methanol from wood (eucalyptus). Both programs aim at production and utilization of alcohol fuels. Production, utilization and process considerations of both methanol and ethanol are presented. Alcohols are still more expensive than petroleum fuels but provide more social benefits than imported energy. (Author)

A79-51775 **Improving octane values of unleaded gasoline via gasohol.** P. Jawetz. In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 301, 302. 7 refs.

Gasohol is defined as a mixture of 10% ethyl alcohol and 90% gasoline. This may not be the most favorable composition and we use it as it presents mathematical simplifications in our calculations. The requirements of the United States in what concerns motor vehicle fuels are: (1) to boost the octane rating of regular unleaded gasoline by 3 points, (2) to keep the price differential between unleaded and leaded gasoline at no more than 3 cents/gallon and (3) to use renewable resources. It will be shown that gasohol answers favorably these needs. A series of utility factors will be developed and it will be shown that one BTU of ethanol replaces 3.6 BTUs of petroleum when viewing the ethanol as an octane boosting additive. (Author)

A79-51776 **Operation and analysis of a vertical axis wind turbine.** S. J. Wake (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.), H. R. Braun (Defence Research Establishment, Ottawa, Canada), and D. J. Bristow (Canadian Forces, Borden, Ontario, Canada). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 303-307. 5 refs.

A 15' prototype Vertical Axis Wind Turbine (VAWT) located at the Defence Research Establishment Ottawa (DREO) has been monitored for three years. The turbine is used in combination with storage batteries to drive a continuous 60 W load. This system, the failures and modifications, are described. A computer simulation of the VAWT/battery storage system is discussed in relation to actual DREO site data. As an example, temperature and wind data from a weather station at Alert Northwest Territories are used to illustrate how the program might be utilized to assess the suitability of the system in another location. (Author)

A79-51777 **Design and performance of bicycle wind turbine rotors.** W. M. Mansour and M. H. Hirata (Rio de Janeiro, Universidade Federal, Rio de Janeiro, Brazil). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 308-311. Research supported by ELETROBRAS.

A new arrangement of the spokes is presented and compared with the currently available bicycle rotors. The new arrangement alleviates the problems existing in the present design. A stress and aerodynamic assessment is fully developed for the new configuration. The bicycle rotor is to operate on a vertical-axis machine. The wind-deflector is designed and tested in the wind tunnel. Sample results are presented with an overall assessment of the performance. Qualitative tuft-tests shows the existence of a back flow which enhances the performance. (Author)

A79-51778 **The application of wind energy to a system with an inherent energy storage medium.** T. Kobylarz and A. Al-Shehri (Petroleum and Minerals University, Dhahran, Saudi Arabia). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 312-318. 18 refs.

As is the case for other types of solar energy, economics has severely limited the exploitation of wind energy to a few special situations. Thus a tremendous energy source is wasted. One of the most costly aspects of a wind energy system is that of energy storage. It is therefore suggested that wind energy be utilized by systems having an inherent storage medium. One such system is studied in this paper. This is a chlorine and caustic soda production facility from the electrolysis of brine. By using wind speed data for Dhahran, Saudi Arabia, and published data for the system components, yields of chemicals and for power are predicted. (Author)

A79-51779 **Assessmentt of wind energy systems in a utility framework.** S. L. Macklis (General Electric Co., Valley Forge, Pa.) and J. L. Oplinger (General Electric Co., Electric Utility Systems Engineering Dept., Schenectady, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, DC., American Chemical Society, 1979, p. 319-324. Research sponsored by the Electric Power Research Institute.

This paper presents studies of the technical and economic aspects of wind energy use in a utility grid. The first project, Requirements Assessment of Wind Energy Systems, concentrated on the methods for assessing the benefits and possible difficulties of wind energy application without concern for siting or distribution of the wind energy system in the grid. The second project, Assessment of Distributed Wind Power Systems, is concerned with the impact of dispersed vs centralized wind power facilities and the comparison of small vs large machines. Wind characterization for specific sites, the interface with the utility in terms of matching load and wind available energy profiles, and analysis of the utility system using wind energy are discussed. Results are shown in terms of fuel savings and economic benefit for different utilities and wind regimes. A.T.

A79-51780 * **Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator.** R. S. Barton (General Electric Co., King of Prussia, Pa.), C. E. J. Bowler, and R. J. Piwko (General Electric Co., Electric Utility Systems Engineering Dept., Schenectady, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 325-330. 5 refs. Research supported by the U.S. Department of Energy; Contract No. NAS3-20058.

This paper describes the controls design, performance simulation process and specialized dynamic considerations for the DOE/NASA Mod 1 wind turbine generator (WTG). It shows controls, structural and utility interface considerations of the wind turbine generator and shows how a wind turbine generator can be integrated with a synchronous power system. Differences with respect to fossil or hydro generation and their implications are vital to long-term WTG reliability and availability and acceptance by utilities and consumers. The paper describes the control performance requirements to provide stable pitch and excitation control with drivetrain torsional dynamics, and the control of power swing stability and utility feeder voltage due to wind gusts. (Author)

A79-51781 **A low cost composite blade for a 300 foot diameter wind turbine.** M. L. White and W. D. Weigel (Kaman Aerospace Corp., Bloomfield, Conn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 331-336. 11 refs.

A prototype composite blade for a 300 foot diameter horizontal axis wind turbine has been designed, fabricated and successfully subjected to structural and natural frequency tests. The blade consists of a filament wound E-glass/epoxy leading edge spar, an E-glass/polyester trailing edge spline fabricated from pultrusions, sandwich panels constructed of phenolic resin impregnated kraft paper honeycomb faced with glass cloth/epoxy, and a steel hub adapter. Composite components are joined by epoxy adhesive bonding, and the hub adapter is mechanically fastened to the spar and spline. Total weight of the blade is approximately 36,000 pounds, of which almost 26,000 pounds are composite structure and the remainder the steel adapter. A woven roving material having almost all fibers oriented transverse to its length was used to wind the 19,000 pound, monocoque shell spar, producing an efficient structure with approximately 90 percent spanwise fiber orientation and a structural taper in overall dimensions and wall thickness. (Author)

A79-51782 **Prediction of vehicle performance and its sensitivity to component improvements - Application to electric and H2-fueled vehicles.** R. F. McAlevy, III (Stevens Institute of Technology, Hoboken, N.J.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1 Washington, D.C., American Chemical Society, 1979, p. 337-342. 8 refs.

Simple, algebraic equations were used to relate vehicle mass, WT, and energy consumption, C, to parameters describing vehicle components characteristics. By differentiation, the sensitivity of WT and C to component improvements was determined and used to formulate a rational R & D investment policy. For H2-fueled vehicles and electric vehicles, EV's, R & D investment in improving vehicle energy-storage device was predicted to produce greater decreases in WT and C than investment in the power-train. Using a published forecast of component characteristics, WT and C for both kinds of

vehicles were projected into future time-frames. Numerical results are presented.
(Author)

A79-51783 **Regenerative flywheel energy storage system.** E. L. Lustenader, I. H. Edelfelt, D. W. Jones, A. B. Plunkett, E. Richter, and F. G. Turnbull (General Electric Co., Schenectady, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 343-351 9 refs. Contract No. EY-76-C-02-4010.

This paper describes the status of a program to develop and evaluate a regenerative flywheel energy storage system. The system has been designed for a battery/flywheel electric vehicle in the 3000 pound class. Laboratory tests will simulate this electric vehicle operating over the SAE J227a Schedule D driving cycle. The range improvement attributed to the use of the flywheel will be established. The flywheel energy storage system will consist of a solid rotor, synchronous inductor-type flywheel drive machine electrically coupled to a DC battery electric propulsion system through a load commutated inverter. The motor/alternator unit is coupled mechanically to a small steel flywheel which provides a portion of the vehicle's accelerating energy and regenerates the vehicle's braking energy. The laboratory simulation will include a battery bank, propulsion motor coupled to a flywheel and the flywheel energy storage system comprised of the water/flywheel unit, the load commutated inverter and its control.
(Author)

A79-51784 **High-energy-density flywheel.** D. L. Satchwell (AiResearch Manufacturing Company of California, Torrance, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 352-356. Research supported by the U.S. Department of Energy.

The design and fabrication of a flywheel rotor with an energy density of 80 w-hr/kg is described. The design uses a multi-ring, S-glass and Kevlar composite rim mounted on a graphite composite spoked hub. Graphite composite material reduces the rotor assembly weight, increasing the energy density, and graphite-epoxy material was selected for the hub because of its high modulus of elasticity, light weight, and high ultimate flexural strength. The hub consists of multiple slats alternately bonded together to form a four-spoke hub of rigid cruciform shape. Hubs were compression tested and two hubs were cycled to an increased stress level equivalent to a full-life test.
A.T.

A79-51785 **Development of a low loss flywheel magnetic bearing.** D. Eisenhaure, G. Oberbeck, and J. Downer (Charles Stark Draper Laboratory, Inc., Cambridge, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 357-362. 6 refs.

This paper reviews the development of a flywheel magnetic bearing. The objective of this program is to demonstrate the economic and engineering advantages of ultralow-loss magnetic bearings by analyzing a model flywheel suspension. In addition, performance equations are being developed for the flywheel suspension, allowing it to be scaled for flywheels of various sizes and applications. Suspension alternatives such as conventional gas and ball bearings, the magnetic suspension loss analysis, magnetic design, dynamics, and the control system are discussed. It was concluded that the loss, reliability, and cost of magnetic bearings for an energy storage flywheel make it superior to conventional bearings for large scale, long storage time applications as utility peak shaving. A.T.

A79-51786 **Performance of retainerless bearings for flywheels.** E. P. Kingsbury and D. Eisenhaure (Charles Stark Draper Laboratory, Inc., Cambridge, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 363-367. Research supported by the U.S. Department of Energy.

This paper summarizes the analysis and test of losses in ball bearings for vehicular flywheel applications. Particular emphasis was placed on the full complement retainerless concept which prior research indicated had low loss and long life at high speed in a vacuum environment. Three sizes of standard bearings were modified to the full complement retainerless configuration. These modified bearings and several sets of standard retainer bearings were tested during the contract. Friction losses were obtained for a variety of radial and axial loads in vacuum and the results integrated into a performance prediction equation. The latter was formulated by combining the experimental data base with a theoretically derived model and allows the optimization of future ball bearing configurations for vehicular flywheel systems.
(Author)

A79-51787 **Design of flywheel rotors utilizing cellulosic materials.** D. L. Hagen, A. G. Erdman, and D. A. Frohrib (Minnesota, University, Minneapolis, Minn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., Aug. 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 368-373. 20 refs. Research supported by the Minnesota Energy Agency, U.S. Department of Energy, and U.S. Navy.

Natural cellulosic materials have been shown to have moderate specific energy storage potentials. The low material and assembly costs suggest that cellulosic rotors may be economically competitive in stationary flywheel storage applications where volume and total mass are not primary considerations. One to two ton pseudoisotropic plywood rotors are feasible and would cost $50/MJ. Compound rotors of hose wire or E-glass wound around plywood cores are promising. The working strengths of vacuum dried wood are being measured as a function of the cyclic fatigue and stress in a rotor. Methods are being developed to attach hubs, balance rotors and resolve problems of outgassing and cracking during evacuation. Fundamental rotor vibrational frequencies are compared with the operating speeds as functions of the dimensions and material properties of the rotor and shaft with elastomeric pads between.
(Author)

A79-51788 **Low cost flywheel energy storage system demonstration.** D. W. Rabenhorst (Johns Hopkins University, Laurel, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 374-378.

This paper presents a description of the low cost flywheel energy storage system demonstration program. The applicable flywheel configurations including pseudo-isotropic and bare filament, low cost materials such as steel wire and vinyl-impregnated fiberglass, low loss, long life bearing investigations, and the flywheel energy storage demonstration units were described. It was concluded that a very low flywheel production cost of $50 per kW-hr can be achieved with several materials, the filament configuration is best, magnetically load-relieved mechanical bearings are promising for the low cost, long life system, and a flywheel energy storage system is feasible for home applications.
A.T.

A79-51789 **Novel flywheel energy storage system.** R. Chicurel (Universidad Nacional Autónoma de México, Mexico City, Mexico). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 379-382. 7 refs.

This report describes a kinetic energy storage system in which a flywheel rotates inside an evacuated casing. Both the flywheel and the casing rotate about a horizontal axis, but the speed of the second is much lower than that of the first. This is governed by a fixed ratio mechanical drive also contained within the casing itself. The reaction torque required by the drive is provided by the action of gravity on a reaction member which is mounted in the manner of a pendulum.

Three versions of the system are proposed. A prototype of one of these with a capacity of 25 watt-hours is being built. (Author)

A79-51790 **Energy storage and conversion in conjunction with photovoltaic energy systems.** A. W. Johnson, R. L. McCarthy (General Electric Co., Valley Forge, Pa.), and G. C. Chang (U.S. Department of Energy, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 383-388.

A recently completed study investigated various possible energy storage media and concepts for use with photovoltaic energy conversion systems sized for various utility, residential, and intermediate loads. Increases in energy capture attributable to the use of storage were analyzed for conditions found at widely-separated geographical locations in the United States. A separate utility power pool simulation was run to correlate results in the utility portion of the study. The study concluded that utility energy storage should be applied on a system-wide basis, not dedicated exclusively to a photovoltaic system. It also concluded that further increases in energy costs must occur before residential and intermediate applications become generally attractive for the types of storage studied. No single energy storage concept was found to be satisfactory for all cases, although battery storage was the most generally attractive for the near-term. (Author)

A79-51791 **Flywheel energy storage interface unit for photovoltaic applications.** A. R. Millner and R. D. Hay (MIT, Lexington, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 389-394. Research sponsored by the U.S. Department of Energy.

A flywheel energy storage and conversion system has been designed and a prototype is now being built at Massachusetts Institute of Technology/Lincoln Laboratory for the U.S. Department of Energy. It is intended to serve as an interface between a solar photovoltaic array and an ac load, providing output waveform regulation as well as energy storage. Important features include magnetic bearings, an ironless armature motor generator and a low-cost flywheel rotor. This paper describes the system design and prototype characteristics and includes a preliminary economic analysis. (Author)

A79-51792 **Residential flywheel with turbine supply.** T. W. Place (AiResearch Manufacturing Company of California, Torrance, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 395-398.

A flywheel system that stores energy from a wind turbine source and converts the energy to a 60-Hz, 220-V output for residential use is described. The typical residence has a 1500-sq ft floor area, with a maximum power level of 5 kW. The flywheel system was defined in a study to determine the cost benefits of storing wind energy in a flywheel and using it on a demand basis. The systems and the flywheel rotor materials that offer the greatest promise in reducing initial costs were examined. The paper describes the progress to date on this program and the work planned to complete the study. (Author)

A79-51793 **Underground pumped hydro storage - An evaluation of the concept.** J. J. Fairfield (Chas. T. Main, Inc., Boston, Mass.), G. C. Chang (U.S. Department of Energy, Washington, D.C.), and N. J. Jacobs (U.S. Bureau of Reclamation, Denver, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 399-404. Research sponsored by the U.S. Bureau of Reclamation and U.S. Department of Energy.

A review of the present state-of-the-art of underground hydroelectric pumped storage (UHPS) and an evaluation of the technical feasibility and economic viability of the concept are presented. Design criteria selected are 2000 MW capacity, 1200 m (4000 ft) head, and 10 hour storage. Three potential schemes were identified. Suitable sites for UHPS are available within most of the electric power systems of this country. A UHPS plant significantly reduces environmental factors of a conventional pumped storage project. Capital cost estimates of three schemes vary from $318/kW to $346/kW, excluding AFDC, UHPS offers substantial savings in investment costs compared to coal-fired cycling plants and in system production costs compared to gas turbine units. Present worth system analysis favors the use of UHPS compared to alternative systems considering operating cost plus alternative unit investment cost. (Author)

A79-51794 **Turbomachinery options for an underground pumped hydroelectric storage plant.** C. A. Blomquist, S. W. Tam, and A. A. Frigo (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 405-413. 16 refs. Research supported by the U.S. Department of Energy.

Various turbomachinery options for underground pumped hydroelectric storage (UPHS) plants are reviewed. Current technology indicates that the maximum head for single-stage, reversible, Francis-type pump turbines is 625 m; for separate, single-stage, Francis-type turbines and multistage pumps, 672 m; for tandem units consisting of separate multijet impulse turbines and multistage pumps, 1440 m; and for multistage, reversible, ungated Francis-type pump turbines, 1290 m. Engineering design studies conducted for Argonne National Laboratory indicated that heads for the single-stage reversible units could be extended to 1000 m, developing 500-MW output per unit. The studies also indicated that two-stage, reversible Francis-type pump turbines with adjustable wicker gates could be developed for power outputs up to 500 MW at operating heads as high as 1500 m. Results of these studies, including performance and design data, are presented. (Author)

A79-51795 **Pumped storage battery with 100 percent efficiency.** H. Kinno (Tokushima, University, Tokushima, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 414-418.

A design for improving the efficiency in pumped storage batteries up to 100% by harnessing renewable tidal potential is presented. The procedure involves replacing the head gap between the pump and the turbine by a tidal potential. The calculations involving power pump and turbine equations are examined in detail. Attention is given to the structure of the pumped-storage battery, harnessing tidal potential, by investigating a tidal and machine model and the numerical analysis of the data. C.F.W.

A79-51796 **Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment.** R. D. Lessard, A. J. Giramonti, and R. L. Sadala (United Technologies Research Center, East Hartford, Conn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 419-425. 9 refs.

A79-51797 **Incremental cost analysis for advanced compressed air energy storage concepts.** C. A. Knutsen (Knutsen Research Services, Bothell, Wash.), M. A. McKinnon, and S. C. Schulte (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 426-428. 6 refs.

The paper describes under what conditions the compressed air energy storage (CAES) concepts, that minimize or eliminate the use of petroleum-derived fuels by storing the compression heat in thermal energy storage (TES) chambers, are economically competitive with conventional oil-fired CAES systems. The study compares the levelized costs of electricity of two advanced CAES systems - the hybrid CAES system with one stage of TES, and an unfired CAES system with two stages of TES - to the cost for a conventional CAES system in 1985 price levels. Attention is given to the cost analysis for the storage concepts as well as capital equipment and energy use comparison. It is determined that the TES systems use less turbine fuel, have higher capital costs, and use more compression energy.
C.F.W.

A79-51798 **On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns.** P. F. Gnirk and A. F. Fossum (RE/SPEC, Inc., Rapid City, S. Dak.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 429-440. 27 refs.

The primary objectives of this paper involve formulation of appropriate stability and design criteria for the construction, operational, and decommissioning phases of CAES caverns in hard rock; presentation of the elements of a numerical simulation model for cavern stability assessment; and discussion of the concept of failure probability assessment for CAES caverns. The basic notions of stability and instability are established, and the relevant phenomenological modes of cavern instability identified in conjunction with their corresponding constitutive laws. Precedent design and stability considerations are briefly addressed in the context of overall application to underground cavern development and use. Cavern shakedown for enhancement of cavern stability and the use of probabilistic design procedures are two important features of this paper.
(Author)

A79-51799 **Analysis of mass cycling in porous rock reservoirs for compressed air energy storage.** L. E. Wiles (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 441-44[illegible]. Research sponsored by the U.S. Department of Energy.

The analysis of the hydrodynamic and thermodynamic response to moist air cycling in a compressed air energy storage (CAES) porous rock reservoir is described. The analysis is based upon the numerical solution of the appropriate set of conservation equations, which define the pressure and thermal behavior of the reservoir. The sensitivity of the performance of the reservoir is evaluated with respect to reservoir parameters, which include reservoir geometry, reservoir material properties, residual water content, and operating conditions. The pressure response of the reservoir is evaluated by consideration of those parameters that define the flow resistance and the air storage volume. The potential impact of residual water on both the pressure and thermal response is evaluated. Results of the analysis are interpreted to characterize the behavior of the reservoir under conditions of daily air cycling. The results also provide design guideines for the efficient and stable operation of the reservoir.
(Author)

A79-51800 **Geologic issues related to underground pumped hydroelectric and compressed air energy storage.** W. F. Adolfson, J. S. Mahan, E. M. Schmid, and K. D. Weinstein (Booz, Allen and Hamilton, Inc., Bethesda, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 452-454. 22 refs.

Analysis of the geologic issues related to compressed air energy storage (CAES) and underground pumped hydroelectric storage (UPHS) systems demonstrated that geologic conditions will have a very significant impact on site selection, design, construction, and cost of these two systems. While CAES and UPHS have some common elements, the environments for which each is suitable are very different. Preliminary geologic investigations have indicated the existence of suitable sites for the construction of CAES chambers in three storage media over broad geographic areas of the United States. These include salt deposits, competent rock, and aquifers. Favorable locations for UPHS can be found in many competent rock media. While it may be generally concluded that there are no overall identifiable geological conditions that will prevent the development of either CAES or UPHS, geologic conditions may restrict or prevent development at specific sites.
(Author)

A79-51801 **Study of turbomachinery options for compressed air energy storage plants.** G. T. Kartsounes and C. S. Kim (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 455-458. 9 refs. Research supported by the U.S. Department of Energy.

A study of possible turbomachinery options for compressed air energy storage (CAES) plants is presented. Particular emphasis is placed on the turbine system of the plant. Plant performance is presented in terms of five parameters: (1) specific air flow rate, (2) heat rate, (3) storage volume, (4) compression rate, and (5) overall plant efficiency. It is concluded that optimum performance results from high storage pressure and high inlet gas temperatures to the turbines. The economic analysis, however, illustrates that minimum cost does not necessarily correspond to optimum plant performance. It is shown that presently available conventional turbomachinery with proven reliability is competitive with advanced concepts. M.E.P.

A79-51802 **Electric utility applications of thermal energy storage and transport.** W. Hausz (General Electric Co., Santa Barbara, Calif.), R. K. Anand, and N. LaMarche (General Electric Co., Schenectady, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 467-474. 6 refs.

The paper surveys applications of thermal energy storage (TES) to conventional light water reactor and high sulfur coal plants. Among the applications considered for thermal energy stored during off-peak periods, are electric peak power generation, and thermal transport to serve process heat demands and district heating systems. In addition, four conceptual designs as peaking power systems are covered, **two of which are based on hot rock and oil as the dual storage media. The other two store high temperature water (HTW) under pressure. Finally, the transmission of thermal energy for up to 50 km is compared for HTW, hot oil, molten salt, and steam, over their applicable temperature ranges.**
M.E.P.

A79-51803 **A thermal energy storage system for a Stirling engine powered highway vehicle.** E. D. Waters, E. W. Saaski (Sigma Research, Inc., Richland, Wash.), and W. R. Martini (Martini Engineering, Richland, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 475-480. 10 refs. U.S. Department of Energy Contract No. 31-109-38-3983.

The conceptual design of an automotive propulsion, thermal energy storage system has been developed that utilizes the sensible and latent heat of fusion of a molten fluoride salt. Electromagnetically pumped potassium serves in the vapor-liquid heat transport system, and high-performance nonmetallic insulation is utilized to minimize energy loss. Engineering analyses are presented to substantiate adequate thermal and material performance to provide at least 161-km range for a 500-kg system, with power bursts in excess of 200-kW available. The thermal energy storage system is compared with advanced electrochemical storage devices. Preliminary production costs and life-cycle costs are presented, and safety and other public acceptance issues are reviewed
(Author)

A79-51804 **Superconducting Magnetic Energy Storage for electric power system stabilization.** R. D. Turner (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 494-499. 10 refs.

A Superconducting Magnetic Energy Storage (SMES) system is being developed at the Los Alamos Scientific Laboratory (LASL) for a dynamic stabilizer to be installed in the Bonneville Power Administration (BPA) power system at Tacoma, Washington, by 1982. This unit will be an alternate stabilization method to the dc modulator now used to stabilize the 900 mile, ac intertie between BPA and Southern California. The generation control systems' response to the constantly occurring, small-load and voltage changes can result in negatively damped, low-frequency power oscillations. The SMES dynamic stabilizer design is presented herein, and status information is given about the superconducting coil, the converter, and other components of the SMES dynamic stabilizer. (Author)

A79-51805 **Methanol based heat pumps for storage of solar thermal energy.** P. O. Offenhartz and F. C. Brown (EIC Corp., Newton, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 507-509. Research supported by the U.S. Department of Energy.

The thermochemical cycle for a solar thermal storage system based on the reaction of CaCl2 and CH3OH vapor is described. This cycle is capable of pumping heat for solar air conditioning at a COP of 0.6, or for solar space and domestic water heating at a COP of 1.6. The equilibrium and kinetics of the CaCl2-CH3OH system are described, along with details of heat transfer measurements made in a small (1500 Btu) energy storage test unit. Finally, the reactor design of the energy storage unit is presented. The system requires a solar input at ca. 130 C, and can pump heat from an ambient source below 0 C to indoor air heating ducts at 43 C. Because the heat pump cycle is thermally activated, requirements for electric power are minimal. (Author)

A79-51806 **Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system.** C. C. Hiller (Sandia Laboratories, Livermore, Calif.) and E. C. Clark (Rocket Research Co., Redmond, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 510-515. 14 refs. Research supported by the U.S. Department of Energy.

The sulfuric acid system is very attractive for solar heating and cooling and other applications because of extremely high energy storage densities, low chemical and storage costs, and low solar collector field costs. Attention is given to principles of operation and preliminary economics. Testing of a prototype unit of nominal 25,000 to 35,000 Btu/hr (7 to 10 KW) capacity is covered, noting that engineering model tests have demonstrated the technical feasibility of the concept and have verified the analytical models used. M.E.P.

A79-51807 **Hybrid thermal storage subroutine for transient simulation.** E. P. French (Rockwell International Corp., Satellite Systems Div., Seal Beach, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 516-520. Contract No. EG-77-C-02-4480.

A FORTRAN subroutine models a hybrid thermal storage system consisting of a water tank surrounded by a rock bed. The subroutine conforms to the requirements of the transient simulation code TRNSYS and may be used to evaluate the thermal performance of such systems. Heat flow within the storage system is modeled by a thermal network consisting of N rock-bed nodes and N-4 water-tank nodes. The subroutine evaluates the first time-derivatives of the node temperatures, taking into account internode conduction, losses to the environment, and convection to the air and water flowing through the system. Results suggest that numerically stable transient calculations can be made with acceptable computation costs. (Author)

A79-51808 **A simplified algorithm for the evaluation of hybrid thermal storage with water systems.** M. P. Moriarty (Rockwell International Corp., Canoga Park, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 521-527. 23 refs. Research supported by the U.S. Department of Energy.

An analytical model, based on an extension of the water tank model developed by Gutierrez, is developed to compute the performance of hybrid thermal storage with water systems. The transient heat balance equations for each of nine bed nodes result in a set of 14 linear differential equations that must be integrated timewise simultaneously. The integration is accomplished by means of a backward difference technique and a compact elimination method that avoids the numerical instability problems often encountered with conventional integration schemes. The storage code is used in conjunction with a simplified systems model to analyze the performance of various configuration of storage systems in solar heating systems. It is shown that for systems of equivalent thermal mass, a metal-walled water tank in a rock bed offers significant performance gains over heavily insulated above-ground tanks, buried uninsulated tanks, and combined heat exchanger-below grade tanks. M.E.P.

A79-51809 * # **Commercial phosphoric acid fuel cell system technology development.** P. R. Prokopius, M. Warshay, S. N. Simons, and R. B. King (NASA, Lewis Research Center, Fuel Cell Projects Office, Cleveland, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 538-543. 6 refs.

A review of the current commercial phosphoric acid fuel cell system technology development efforts is presented. In both the electric utility and on-site integrated energy system applications, reducing cost and increasing reliability are the technology drivers at this time. The longstanding barrier to the attainment of these goals, which manifests itself in a number of ways, has been materials. The differences in approach among the three major participants (United Technologies Corporation (UTC), Westinghouse Electric Corporation/Energy Research Corporation (ERC), and Engelhard Industries) and their unique technological features, including electrodes, matrices, intercell cooling, bipolar/separator plates, electrolyte management, fuel selection and system design philosophy are discussed. (Author)

A79-51810 * # **The role of fuel cells in NASA's space power systems.** J. F. Been (NASA, Lewis Research Center, Cleveland, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 544-549. 11 refs.

The advances in fuel cell technology which have expanded the capabilities of the fuel cell from that of power generation to include energy storage also expanded its potential role in space power systems. This paper presents a brief evolutionary history of the fuel cell technology and compares this with NASA's increasing space power requirements. The role of fuel cells is put in perspective with other energy storage systems applicable for space using such criteria as type of mission, weight, reliability, costs, etc. Potential applications of space fuel cells with projected technology advances are examined. (Author)

A79-51811 **A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with**

autothermal reforming. K. K. Ushiba, I. Mahawili (Catalytica Associates, Inc., Palo Alto, Calif.), and T. H. Tio. In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 550-553. 14 refs. Research supported by the Electric Power Institute.

A conceptual 5-MW phosphoric acid fuel cell power plant featuring high temperature steam reforming combined with autothermal reforming is evaluated. Using a No. 2 fuel oil, this power plant can potentially achieve a 9000 Btu/kwh heat rate without a bottoming cycle. The power plant is also capable of exporting about 7000 lb/hr of a low pressure steam. The autothermal unit is used to complete the reforming conversion of the fuel and therefore it is a key factor in achieving the high thermal efficiency for this power plant.
(Author)

A79-51812 **Scale-up of phosphoric acid fuel cells.** L. G. Christner, H. C. Maru, C. V. Chi, S. R. Perkari, and M. A. Lambrech (Energy Research Corp., Danbury, Conn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 554-558. 6 refs. Contract No. EC-77-C-03-1404.

Development of phosphoric acid fuel cell power-plants has progressed significantly at the Energy Research Corporation. This progress has required development of both the component materials and the production techniques. Scale up of cells from laboratory size 2 in. x 2 in. cells to 80-cell 5 in. x 5 in. stacks has been successful and further scale up for stationary 100 to 1000kW powerplants is in progress. Although any optimization of scale up size depends on some basic assumptions, the present analysis is used for guiding the development effort. Considerations of reliability, simplicity, and cost indicated that a 1.25 sq ft cell with 0.75g sq ft of platinum and a DIGAS cooling system would be adequate for on-site integrated energy systems.
(Author)

A79-51813 **Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte.** R. Fleischmann, H. Böhm, and J. Heffler (Telefunken AG, Frankfurt am Main, West Germany). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 559-562. 7 refs.

A fuel cell system operating with tungsten carbide anodes and carbon/platinum cathodes can convert crude gas with a high amount of carbon monoxide. The report describes the complete energy generator, starting with the methanol crackreaction up to the steering of fuel consumption and working temperature. Some efforts have been made to improve the anodes and the cathodes related to crude gas and air operation. Performance data are given for 40 - cell stacks.
(Author)

A79-51814 **Molten carbonate fuel cell systems development program.** S. S. Borys and J. P. Ackerman (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 563-567.

The paper surveys the molten carbonate fuel cell (MCFC) systems development program. Attention is given to cell operation and components, as well as the current status of cell development. Goals discussed include those for performance, lifetime, contaminant tolerance and stack costs. The DOE MCFC systems development program objectives and a powerplant description are given. Also considered are the cleanup subsystem, the power processing subsystem, and different development phases such as technology and engineering development. In addition, the program schedule and milestones are discussed.
M.E.P.

A79-51815 **Solid electrolyte fuel cell for electric utility power generation.** S. Srinivasan and H. S. Isaacs (Brookhaven National Laboratory, Upton, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1 Washington, D.C., American Chemical Society, 1979, p. 568-575. 14 refs. Research sponsored by the U.S. Department of Energy.

It is shown that with the emphasis in the USA on coal as the primary fuel for the production of electrical power, solid electrolyte fuel cell power plants have the following potential advantages over phosphoric and molten carbonate fuel cell systems: (1) higher energy conversion efficiency; (2) higher power densities; (3) better utilization of waste heat from the fuel cell for coal gasification; and (4) cooling water not required for fuel cell. Attention is given to significant improvements in cell performance obtained with the thin film electrolyte construction. After a systematic screening of candidates for interconnection materials, lanthanum chromite doped with magnesium and aluminum was shown to have the requisite properties. Finally, it is noted that the engineering development and demonstration of multi-megawatt size coal gasifier solid electrolyte fuel cell power may be expected in the 1990-2000 year time frame.
M.E.P.

A79-51816 **Molten carbonate fuel cell based, coal fired power plants for electric power generation.** T. L. Bonds, M. H. Dawes, and A. W. Schnacke. In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 576-578.

The results of a broad scoping study are described, which was conducted to define an attractive configuration for an integrated molten carbonate fuel cell based power plant for electric power generation. A coal pile to bus-bar efficiency of 50.5% is adopted and the resultant configuration concepts are discussed. Attention is given to general plant requirements such as power level, fuel, site/characteristics and environmental considerations. Also discussed are fuel cell operating conditions, carbon formation, fuel cell temperatures, equipment availability, and minimization of clean up system parasitic power and process steam. The final configuration discussed includes an oxygen-blown Texaco gasifier feeding a Selexol cleanup system and a zinc oxide polisher following.
M.E.P.

A79-51817 **Molten carbonate fuel cell performance model for cycle studies.** M. H. Dawes and L. W. Spradlin (General Electric Co., Energy Systems Programs Dept., Schenectady, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 583-585.

The paper describes a model formulated to represent the performance of a molten carbonate fuel cell under various operating conditions. A fuel cell subsystem is described, noting that throughout this system, the model computes flow rates, heat fluxes, temperatures, and gas compositions as well as the fuel cell electric performance. The fuel cell model itself represents the electrochemical reactions, including important gas shift reactions and electrochemical performance. Finally, model results are presented, and it is noted that the model has been used to investigate many plant cycle configurations and many subsystem configuration and operating modes.
M.E.P.

A79-51818 **Effect of temperature and pressure on molten carbonate fuel cell fuels and performance.** K. W. Hahn, T. E. Tang, and E. H. Camara (Institute of Gas Technology, Chicago, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 586-589. Contract No. EC-78-C-03-1735.

The paper evaluates the effects of molten carbonate fuel cell operating temperature and pressure on fuel gas compositions and on fuel cell performance based on thermodynamic and experimental data. It is shown that the optimum operating temperature was experimentally determined to be 650 C for cells assembled with the Li_2CO_3/K_2CO_3 binary eutectic electrolyte, independent of fuel gas and oxidant compositions. It is reported that cell performance increased beyond the predicted Nerst gains when the pressure was increased from 1 to 10 atm, while total performance gains were found to be proportioned to 1n P. Contributions from other factors such as improved gas solubilities, mass transfer rates, and changes in meniscus shapes and locations appear to play a role in establishing cell performance at pressure. Finally, it is noted that increased operating pressure favors carbon deposition and methanation reactions. M.E.P.

A79-51820 **The effect of mechanical energy storage systems on the characteristics of electric vehicles.** M. W. Schwartz (California, University, Livermore, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 617-621.

Batteries for electric vehicle propulsion can be developed to effect trade-offs between short-term peak power capability and energy storage capacity. Such batteries in combination with a mechanical energy storage device can optimize both power and range capability of an electric vehicle. Equations are derived for determining the vehicle mass fraction of the mechanical energy storage system that is required to achieve a vehicle mass saving or increase in range. The extent to which mechanical energy storage systems can improve electric vehicle performance depends upon the battery type and the vehicle power/mass requirements. (Author)

A79-51821 **Advanced flywheel energy storage unit for a high power energy source for vehicular use.** A. E. Raynard (AiResearch Manufacturing Company of California, Torrance, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 622-626.

The design and development program of a flywheel energy storage unit (ESU) for vehicular use are surveyed. Attention is given to the fabrication and experimental determination of the performance of an advanced hermetically sealed ESU that has been sized for a typical 3000 pound curb weight vehicle. The flywheel can supply high power demands and can accept vehicle kinetic energy during braking (regeneration) at a rate limited only by the transmission power capability. It is noted that the principal goal of the development program is to provide decision making information regarding the benefits of a mechanical energy storage device, as it applies to vehicle fuel consumption or vehicle range. Finally, the testing and evaluation subtasks of the development program are covered. M.E.P.

A79-51825 # **The Department of Energy electric vehicle battery program - An overview.** M. J. Katz and K. W. Klunder (U.S. Department of Energy, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 643-645.

The paper surveys the Department of Energy electric vehicle battery program, noting that if the number of electric vehicles in use were to reach 15 million, the annual consumption of oil would be reduced by some 225 million barrels. Attention is given to the two segments that the program is divided into: the near term battery development, and advanced battery R&D. The former involves the development and engineering design of full size vehicle batteries (20-30 kwh) of three battery systems: nickel/zinc, nickel/iron, and improved lead acid. The latter involves such designs as the lithium/metal sulfide battery, the sodium/sulfur battery, the zinc/chlorine battery, and metal air batteries. M.E.P.

A79-51826 # **Performance characteristics of nickel-zinc electric vehicle battery.** M. Klein, A. Charkey, H. Vaidyanathan and S. Viswanathan (Energy Research Corp., Danbury, Conn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 646-650. U.S. Department of Energy Contract No. 31-109-38-4248; Contract No. W-31-109-eng-38.

A vented prismatic cell of 250 Ahr nominal capacity has been chosen as a baseline design for first generation vehicle and cell characterization experiments. Performance characteristics such as discharge capacity (and its dependence on temperature and rate, variation of cycle life with depth of discharge), thermal variations and cyclic behavior on a simulated J227aD discharge profile are presented. A 96 volt vehicle battery was fabricated and installed in a Jet Industries Electra-Van Model 500. Vehicle operating results are presented in terms of speed, acceleration, range and energy consumption. (Author)

A79-51827 **A comparison of metal-air batteries for electric vehicle propulsion.** W. A. Bryant and E. S. Buzzelli (Westinghouse Research and Development Center, Pittsburgh, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 651-653. 15 refs. Research supported by the U.S. Department of Energy.

A comparison is made among four metal-air systems being considered for future use in commuter electric vehicles. The anode materials are lithium, aluminum, zinc and iron. The lithium-air system is still in an early stage of development. A proposed mechanically rechargeable aluminum-air system is potentially capable of superior performance but its relative cost of ownership and operation is expected to be high. Several slurry zinc-air systems are being developed which avoid the traditional problems associated with the plate-type zinc electrode. A fully-developed iron-air system, especially one equipped with a bifunctional air electrode, is expected to be low-weight and economical. (Author)

A79-51828 **Evaluation of battery performance using computer controlled test equipment.** G. S. Hartman and D. L. Beals (ESB Technology Co., Yardley, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 654-659. 9 refs.

The paper reports on the testing of groups of lead acid batteries which involved charging and discharging at widely varying currents and at a series of temperatures. A brief description of the ANL/DOE ISOA battery development effort is presented. Attention is given to the initial experiment consisting of a total of 32 design variables involving 96 batteries. Discharges were performed at current values of 10, 40, 60, 80, 150, and 250 amperes at 25, 40, and 0 C. The design of the test equipment, its operational modes and typical data output in both graphic and tabular form is discussed in both battery and computer terms. Finally, it is concluded that a preliminary examination of the initial test data indicates that the techniques are adequate to handle the complexities of large scale testing of a substantial number of differing design lead acid batteries normally tested as a part of a major design and development program. M.E.P.

A79-51829 **Advances in the development of Li-Al/FeS cells for electric-automobile batteries.** F. J. Martino, T. W. Olszanski, L. G. Bartholme, E. C. Gay, and H. Shimotake (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 660-664. 6 refs. Research sponsored by the U.S. Department of Energy.

Industrial contractors are currently developing the Mark IA Battery for Argonne National Laboratory using BN-fabric separator material in their multiplate cell. However, cost and weight restrictions imposed by future program goals (Mark II) may require a revision of their cell design to accommodate alternative separator materials. Recent advances at ANL have shown the feasibility of replacing BN fabric with BN felt or MgO powder in both bicell and mutiplate cell configurations. This paper discusses the progress made, with emphasis on cell assembly and performance, as well as the problems associated with the development of these cells. (Author)

A79-51830 **A charging system for the LiAl/FeS electric vehicle battery.** W. DeLuca, A. Chilenskas, and F. Hornstra (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 665-670. Research sponsored by the U.S. Department of Energy.

The charging scheme selected for the EV battery application employs a current-controlled main charger and current bypass circuits which shunt charge current around individual cells for equalization. A proof-of-concept charging system has been built which accommodates batteries of up to six cells. Tests have been performed on both LiAl/FeS and lead-acid batteries. The system is described, operational data presented, and plans for a full-scale 26 kW.hr LiAl/FeS battery charging system outlined. This charging system, which incorporates electronic cell equalization, may offer advantages to other types of battery systems, such as (1) reduced generation of gases, (2) reduced water consumption, (3) cleaner battery containers, (4) reduced maintenance, and (5) increased battery life. (Author)

A79-51831 **Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery.** S. Matsuda, G. Miskolczy, F. N. Huffman (Thermo Electron Corp., Waltham, Mass.), K. Gentry, R. Hudson (Eagle-Picher Industries, Joplin, Mo.), W. Eggert, and G. Santos (Budd Technical Center, Fort Washington, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 671-675. U.S. Department of Energy Contract No. 31-109-38-4123.

A79-51832 **A zinc-bromine battery for energy storage.** R. A. Putt (Gould, Inc. Energy Research Laboratory, Rolling Meadows, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 683-690. 5 refs.

The battery comprises a cell stack of titanium electrodes and a DARAMIC microporous separator, a bromine storage device apart from the cell stack, and a plumbing network which circulates the electrolyte between the two. Testing of laboratory cells and batteries has shown this system to be capable of a high efficiency, a long cycle life, and the inherent reliability required for the utility application. Based on the results of a cost and design study, a large (100 MWh) utility battery would comprise an array of self contained, truckable, 400 kWh modules, the cost of which, although high for the first design, is subject to considerable reduction via modifications. (Author)

A79-51833 **Modeling of zinc-chloride batteries for electric vehicles.** C. H. Chi, P. Carr, and P. C. Symons (Energy Development Associates, Madison Heights, Mich.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 692-697. Research supported by the Energy Development Associates and U.S. Department of Energy.

In this paper, modeling of battery designs for typical route vehicle missions and for random use in typical urban/suburban missions are presented from the standpoints of battery size, power characteristics, energy capacity, lifetime, and other performance requirements. The overall performance of the vehicle/battery combination is presented for the selected vehicle design. The sensitivities of battery characteristics and of battery component performances with regard to the mission requirements of electric vehicles are examined. A cost analysis for operating the vehicle and a safety and environmental study are discussed. (Author)

A79-51834 **Dow sodium-sulfur battery for energy storage.** J. N. Anand (Dow Chemical Co., Walnut Creek, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 698-702.

An advanced high temperature sodium-sulfur battery using hollow glass fibers as the electrolyte is being developed at Dow for potential load-levelling application by electric utilities and power intensive industries. The multiple fiber cell structure is being designed to have a two-way efficiency of 90%. The high electrolyte surface area and corresponding low current densities yield very fast charge and discharge capabilities. These characteristics also make these batteries suitable for usage in areas of electric vehicle and solar power generation. The battery uses abundant commercially available materials such as sodium, sulfur, glass, aluminum and steel. The fabrication process is quite simple and is potentially easy to scale-up. The cell economics are projected to be at a very favorable low cost of about $31/KWH in terms of 1979 dollars. (Author)

A79-51835 **Reproducibility and performance of large prototype Na/S cells.** D. W. Bridges, D. G. Paquette (Ford Aerospace and Communications Corp., Newport Beach, Calif.), and R. W. Minck (Ford Aerospace and Communications Corp., Newport Beach, Calif.; Ford Motor Co., Dearborn, Mich.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 703-709.

Test results of twenty cells subjected to a 250-cycle endurance test are presented, noting that five ceased to function electrically before the end of the test. Fifteen survived the test while fourteen decreased in capacity less than ten percent. These cells contained beta-double-prime-alumina solid-electrolyte tubes, 34 mm OD and 250 mm long. They were operated at 350 C, discharged at 89 mA/sq cm for 4 h and charged at 51 mA/sq cm for 7 h. It is concluded that the development of a Na/S cell has advanced sufficiently to enable the testing of rudimentary batteries. Finally, it is noted that improvements have been made in the glass seal used to join the beta-double-prime-alumina electrolyte to the alpha-alumina insulator, which was the principal area of failure. M.E.P.

A79-51836 **Sodium/sulfur batteries for peak power generation.** W. Fischer, H. B. Gels, F. Gross, K. Liemert, and H. Meinhold (Brown, Boveri and Cie. AG, Mannheim, West Germany). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 710-714. 11 refs.

Load levelling and peak shaving will become more and more important because of the increasing contribution of base load plants. Several new storage devices such as batteries flywheels and hydrogen storage systems are under discussion. This paper describes some recent progress in the development of sodium/sulfur batteries, a storage device which appears attractive due to the low cost and an expected long cycle life. (Author)

A79-51837 * # **Recent advances in Redox flow cell storage systems.** L. H. Thaller (NASA, Lewis Research Center, Cleveland, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 715-719. 8 refs.

Attention is given to recent data pertaining to flow cell storage system-related features as well as the state of Redox membrane technology. In addition, the state of the technology as it relates to the two application areas of storage for photovoltaic/wind and distributed energy storage for electrical utility applications is addressed. Also covered are the cost and life advantages of Redox systems as well as a discussion of such cells as the open circuit voltage cell, the rebalance cell, and the trim cell. Finally, it is concluded that the main thrust of membrane development will be to reduce the interaction between the chloro complex of iron in the ferric state since this is the major factor in membrane area resistivity. M.E.P.

A79-51838 **Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells.** S. M. Zivi, I. Pollack, H. Kacinskas, A. A. Chilenskas, D. L. Barney (Argonne National Laboratory, Argonne, Ill.), S. Sudar, I. Goldstein, and W. Grieve (Rockwell International Corp., Groton, Conn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 722-724.

A79-51839 **Process design of the LASL bismuth sulfate thermochemical hydrogen cycle.** K. E. Cox, J. H. Pendergrass, and W. M. Jones (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 730-736. 13 refs.

A new process engineering flowsheet reflecting an improved design of the LASL bismuth sulfate thermochemical cycle is presented. The design is based on laboratory data that indicate a lowered endothermic heat load for a partial decomposition of the solid bismuth sulfate. A small electrical energy demand should result from operation of the sulfur dioxide electrolytic step at lower acid concentration, in principle. The results of the flowsheeting analysis yield a thermal efficiency of 50 percent for the cycle when coupled to a conceptual fusion energy heat source at 1500 K. A parametric analysis shows a slight drop in efficiency as the temperature of the heat source is decreased. The LASL bismuth sulfate thermochemical cycle appears to have potential as a means of producing hydrogen from high-temperature heat sources such as fusion, fission, and solar energy; it also appears to be competitive with alternative thermochemical cycles as well as with water electrolysis for hydrogen production. (Author)

A79-51840 **Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production.** G. Besenbruch, G. Caprioglio, K. McCorkle, K. Mysels, J. Norman, D. O'Keefe, J. Rode, R. Sharp, P. Trester (General Atomic Co., San Diego, Calif.), and M. Yoshimoto (Idemitsu Kosan Co., Ltd., Tokyo, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 737-742. Research sponsored by the Gas Research Institute and General Atomic Co.; Contract No. EY-76-C-03-0167-PA-63.

Progress in the development of the General Atomic (GA) sulfur-iodine thermochemical water-splitting cycle over the last 18 months is reported. The major accomplishments have been: (1) significant improvements in the chemistry of the process, (2) development, review, and revision of an engineering flowsheet, (3) screening, identification, and testing of potential materials-of-construction for the corrosive process fluids, (4) increase of the process efficiency to about 47% with additional increases projected to reach about 50%, (5) small-scale demonstration of the cycle in a closed loop under recycle conditions, and (6) installation of the next phase of scale-up equipment (bench-scale) and demonstration of parts of the process in this equipment. (Author)

A79-51841 **Hydride engines.** A. A. Heckes, T. E. Hinkebein, and C. J. M. Northrup (Sandia Laboratories, Albuquerque, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 743-746. Research supported by the U.S. Department of Energy.

Hydride engines are cyclically operated by first releasing hydrogen from metal hydrides at elevated temperatures. They perform work by moving an impermeable membrane. The hydrogen is subsequently reabsorbed at a lower temperature to return the system to the original state. Five engines which operate on this principle are described, two of which have been made operational. Efficiencies are discussed and comparisons made between Carnot, Rankine and Hydride engines which show that this engine is strongly competitive. (Author)

A79-51842 **High efficiency alkaline electrolysis technology.** J. N. Murray and M. R. Yaffe (Teledyne Energy Systems, Timonium, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 747-751. 9 refs. Research sponsored by the U.S. Department of Energy.

The major approaches to increasing the operating efficiency of hydrogen production by dc electrolysis of aqueous alkaline solutions are studied. Consideration is given to the materials critical for up to 150 C deg operation and the initial data from the electrocatalyst screening experiments with the 300 sq cm electrode test modules in the applied research industrial electrolysis system (ARIES). Alkaline solution water electrolysis had demonstrated 97% voltage efficiency capability. A compromise must be considered between the premium cost of a more stable, high filtering efficiency, sintered metal powder type filter element as opposed to a lesser efficient but more stable form, such as a woven screen element. V.T.

A79-51843 **Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process.** G. H. Parker and P. W. T. Lu (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 752-755. Contract No. EG-77-C-02-4378.

The paper reviews recent progress with a closed cycle laboratory model and in electrolyzer development activities in the framework of the sulfur cycle hydrogen production process. During 1978, a closed cycle working laboratory model, sized to produce approximately 2 liters/min of hydrogen, was designed, constructed and operated at process design temperatures and one atmosphere pressure. The model uses many glass components and the high temperature items, such as the acid vaporizer and reduction reactor, are custom designed and fabricated from quartz. The development program for the depolarized electrolyzer includes evaluation of electrocatalysts, optimization of the electrode fabrication process and exploration and selection of separator materials. (Author)

A79-51844 **On design requisites for hydrogen energy systems.** M. R. Louthan, Jr., R. P. McNitt, T. A. Adler, and J. Murali (Virginia Polytechnic Institute and State University, Blacksburg, Va.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 756-758. 5 refs.

Hydrogen-engineering material interaction leads to effects on mechanical properties that strongly depend on stress state, stress range, strain rates and cycling. This requires that a proposed material be evaluated in the laboratory under loading conditions that duplicate the real life exposure and utilization. Examples of hydrogen effects on a mild steel are given for a variety of test configurations and results are discussed in regards to the testing methods used. (Author)

A79-51845 **Suitability of gas distribution equipment in hydrogen service.** W. J. Jasionowski, D. G. Johnson, and J. B. Pangborn (Institute of Gas Technology, Chicago, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 759-762. 5 refs. Contract No. EY-76-C-02-2907.

An experimental study was conducted with contemporary gas-distribution equipment in hydrogen service. Observations and results with 3 test loops initially operated on natural gas (baseline) and then on hydrogen for 6 months indicate no incompatibilities in performance. The observed overall hydrogen-to-natural-gas leak ratio was about 3.25, and the overall energy-loss ratio was about 1.04. If piping and operating pressures are not changed, hydrogen energy delivery will be about 80% to 90% of natural gas energy delivery under turbulent flow conditions, and may be only 40% of natural gas energy delivery under laminar flow conditions. Short-term (6 months) exposure to hydrogen in distribution service did not affect the properties of metallic materials of system components; there are indications that some plastic products, some lubricants, and some adhesives were affected by the exposure. (Author)

A79-51846 **Cryogenic hydrogen storage and refueling for automobiles.** W. Peschka and C. Carpetis (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Technische Physik, Stuttgart, West Germany). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 763-767.

Based on earlier papers, new test results and experiences are reported about two tanks for liquid hydrogen, specially developed for automobile applications. Test results about evaporation rate, filling procedure and safety aspects are given. Further test results from a semi-automatic filling-station for liquid hydrogen are given. Handling and comfort of the refueling unit is comparable to that of self-service gas stations. This refueling unit, designed and constructed only for the purpose of demonstration of liquid hydrogen handling by untrained people, makes it possible to represent a basis for corresponding industrial developments. (Author)

A79-51847 **Solid polymer electrolyte water electrolysis status for large scale hydrogen production.** L. J. Nuttall (General Electric Co., Wilmington, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 768-773.

The solid polymer electrolyte technology and the status of the development program are described. The goal of the program is to develop an advanced electrolysis technology for large scale commercial hydrogen generation using the solid polymer electrolyte type of cell originally developed for aerospace fuel cell and electrolysis applications. The initial phase of the program was a design study of a 58 MW system which would be suitable for a number of potential applications including energy storage, generating hydrogen for chemical and industrial feedstock or a supplement to natural gas in certain areas. The development of large scale cell hardware is proceeding in parallel with the technology development program. Performance data and projected capital costs are presented. V.T.

A79-51848 * **Supplementary steam - A viable hydrogen power generation concept.** D. E. Wright and J. C. Lee (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 774-782. 6 refs. NASA-supported research.

Technical and economic aspects of a supplementary steam generation for peaking power applications are discussed. Preliminary designs of the hydrogen/oxygen combustors to be used for such applications are described. The integration of the hydrogen/oxygen steam-generating equipment into a typical coal-fired steam station is studied. The basic steam generation system was designed as a 20 MW supplementary system to be added to the existing 160 MW system. An analysis of the operating and design requirements of the supplementary system is conducted. Estimates were made for additional steam and fuel supply lines and for additional control required to operate the combustors and to integrate the combustor system into the facility. V.T.

A79-51849 **Thermochemical hydrogen production by the Mark-13 process - A status report.** D. van Velzen and H. Langenkamp (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 783-789. 5 refs.

A laboratory-scale complete continuous circuit has been built and operated for the demonstration of the overall chemical process where closed cycles of chemical reactions are used to decompose water into its constituting elements, hydrogen and oxygen. The hydrogen production rate of the plant is about 100 l/h. All plant items and separation units are working within their specifications. Adequate solutions to minor difficulties encountered in the preliminary phases of operation have been found and successfully applied. The plant is now running to complete satisfaction. (Author)

A79-51850 **Survey of liquid hydrogen container technology for highway vehicle fuel system applications.** W. J. D. Escher (Escher: Foster Technology Associates, Inc., St. Johns, Mich.) and E. E. Ecklund (U.S. Department of Energy, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 790-795. 5 refs. Contract No. EC-77-X-01-2752.

A review of several development and demonstration projects involving liquid hydrogen containers for fuel-system service in highway transportation systems is presented. Preliminary cryogenic container industry projections of rough-estimate production costs of liquid hydrogen containers specifically engineered for vehicle use are studied. A semiautomatic liquid hydrogen service station developed in West Germany is described. Three different cryogenic hydrogen container systems were evaluated in vehicle testing in which the engine was converted to hydrogen operation. V.T.

A79-51851 * **Toward the renewables - A natural gas/solar energy transition strategy.** J. A. Hanson (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) and W. J. D. Escher (Escher: Foster Technology Associates, Inc., St. Johns, Mich.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 796-799. 6 refs.

The inevitability of an energy transition from today's nonrenewable fossil base toward a renewable energy base is considered from the viewpoint of the need for a national transition strategy. Then, one such strategy is offered. Its technological building blocks are described in terms of both energy use and energy supply. The strategy itself is then sketched at four points in its implementation: (1) initiation, (2) early transition, (3) late transition, and (4) completion. The transition is assumed to evolve from a heavily natural gas-dependent energy economy. It then proceeds through its transition toward a balanced, hybrid energy system consisting of both centralized and dispersed energy supply technologies supplying hydrogen and electricity from solar energy. Related institutional, environmental and economic factors are examined briefly. (Author)

A79-51852 * **Hydrogen as the solar energy translator.** J. H. Kelley (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 800-802. 5 refs. Research sponsored by the U.S. Department of Energy.

Many concepts are being investigated to convert sunlight to workable energy forms with emphasis on electricity and thermal energy. The electrical alternatives include direct conversion of photons to electricity via photovoltaic solar cells and solar/thermal production of electricity via heat-energy cycles. Solar cells, when commercialized, are expected to have efficiencies of about 12 to 14 percent. The cells would be active about eight hours per day. However, solar-operated water-splitting process research, initiated through JPL, shows promise for direct production of hydrogen from sunlight with efficiencies of up to 35 to 40 percent. The hydrogen, a valuable commodity in itself, can also serve as a storable energy form, easily and efficiently converted to electricity by fuel cells and other advanced-technology devices on a 24-hour basis or on demand with an overall efficiency of 25 to 30 percent. Thus, hydrogen serves as the fundamental translator of energy from its solar form to electrical form more effectively, and possibly more efficiently, than direct conversion. Hydrogen also can produce other chemical energy forms using solar energy. (Author)

A79-51853 **Hydrogen from coal using pressurized gasification.** D. O. Moore, T. A. Czuppon, and B. G. Mandelik (Pullman Kellogg Research and Development Center, Houston, Tex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 803-806. 11 refs.

Raw materials for hydrogen production and industrial uses of hydrogen are discussed. Various coal gasification processes commercially available today and those under development are reviewed for their applicability to hydrogen manufacturing. Based on a specific gasification technology (Texaco), an optimized process flowsheet is developed with accompanying economic data. Future expansion in hydrogen economy and factors which will affect it are discussed. (Author)

A79-51854 **Hydrogen program at Electric Power Research Institute.** B. R. Mehta (Electric Power Research Institute, Palo Alto, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 807, 808. 5 refs.

The primary focus of EPRI's research and development programs for the electric utility industry is to provide improved technologies for efficient and reliable generation and utilization of energy economically as well as with minimum environmental impact. Hydrogen as an energy carrier would provide potential to improve the economy, efficiency and flexibility of utility systems. The fuel assessments have estimated that as petroleum and natural gas become very expensive or unavailable, coal-derived hydrogen will be the near term source of industrial hydrogen at costs similar to that of SNG from coal. The electrolytic hydrogen will emerge as the other alternative to generate hydrogen, where specialty applications currently utilize merchant hydrogen. Dedicated nuclear hydrogen plants, using pure electrochemical or hybrid electrochemical-thermochemical water splitting cycles, do not seem to significantly improve the cost compared to fossil fuel derived hydrogen. (Author)

A79-51855 **Advances in H-Coal.** A. G. Comolli, R. F. Bernard, and E. S. Johanson (Hydrocarbon Research, Inc., Lawrenceville, N.J.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 815-820.

Research on the H-Coal Process has led to the discovery of better catalysts, improved operating techniques, and increased process versatility. Equilibrium Catalyst test runs of thirty days' duration have successfully demonstrated syncrude mode operations planned for the H-Coal Pilot Plant. In other PDU studies, operation has been relatively trouble-free and extended for longer periods of time than had heretofore been possible. Different catalysts were tested and several were identified which considerably improve the quantity and quality of the end product. The product yields were increased, and products contained environmentally acceptable levels of elements such as nitrogen and sulfur. These improvements will be part of the H-Coal Pilot Plant now under construction. (Author)

A79-51856 **Synthetic fuels from peat gasification.** D. V. Punwani, S. A. Weil, J. E. Paganessi (Institute of Gas Technology, Chicago, Ill.), and M. J. Kopstein (U.S. Department of Energy, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 862-867. 10 refs.

This paper reviews the gasification characteristics of Minnesota peat, presents new results obtained with peats from North Carolina and Maine, and examines the economics of converting Minnesota peat to SNG, benzene, and oil. On the basis of chemistry and kinetics, peat is better than coal for conversion to SNG because it is more reactive, requires milder operating conditions, and has a higher tendency to produce methane or synthetic liquid fuels. Volatile carbon in Minnesota peat has 30% greater tendency to make methane than the North Carolina peat, and the reactivity of Maine char is lower than that of Minnesota and North Carolina peat. It is concluded that the economics of converting peat to SNG is competitive with those of converting eastern coal to SNG. A.T.

A79-51857 **Steam gasification of Illinois coal and coke.** S. L. Soo and R. T. Gibbs (Illinois, University, Urbana, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 868-873. 9 refs. Research supported by Pullman Kellogg.

In the MIGAS process, excess superheated steam supplies the heat of reaction for coal gasification. Laboratory tests on Illinois coals and coke show that after removal of the excess steam from the product gas by condensation, the product gas has a high H2/CO ratio. Various hydrocarbons were detected in the product gas via chromatography but H2S was not measurable. This is because the excess steam converted all sulfur to H2S which was removed with the condensate. Ash fusion did not seem to be a problem because coal remains at 100 deg C below steam temperature during gasification reaction. Measured reaction rates show feasibility of the process for large-scale conversion. (Author)

A79-51858 **Computer analysis of coal gasification combined cycle plants.** M. P. duPlessis. In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 874-879.

A computer program has been developed to assist in the analysis of coal gasification combined cycle plants. The program is described and then used to analyze the effects of gas turbine inlet temperature, air/fuel ratio and pressure ratio on the thermal efficiency and specific power output of a pressurized boiler combined cycle plant integrated with a slurry-charged entrained bed slagging gasifier. The results indicate that thermal efficiencies of 36.1% to 37.1% can be achieved with present generation gas turbines (950 C inlet temperature) and 39.6 to 40.2% with advanced gas turbines (1315 C) at relatively high values of specific power (370 to 900 kW/lb/sec air). Further efficiency increases can be achieved by using a coupled pressurized boiler-exhaust boiler combined cycle. The potential advantages of this cycle should be investigated further in comparative technical and economic evaluations with other alternative combined cycle plants. (Author)

A79-51859 **The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant.** R. E. Andermann and S. S. Kim (Westinghouse Electric Corp., Advanced Coal Conversion Dept., Madison, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 880-885.

This paper examines the dependence of coal gasification combined cycle (CGCC) power plant efficiency and product cost on gasifier steam demand. The study of water through a CGCC power plant showed that the latent heat required to raise the steam injected into the gasifier is not recoverable, thus reducing the net available coal energy, and resulting in lower plant efficiency for a high steam demand in the gasifier. The effect of gasifier steam on CGCC power plant efficiency is independent of gasifier type, and it is concluded that the effect of gasifier steam rate on the CGCC power plant efficiency is related to the economics of electric power cost. A.T.

A79-51860 **The pyrolysis route to gasification.** R. T. Eddinger (COGAS Development Co., Princeton, N.J.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 886-888.

The advantages of pyrolysis for coal gasification and the details of the COGAS process pyrolysis step are presented. The pyrolysis section of this process converts a portion of the feed coal to oil and gas by the thermal decomposition of the coal in several reactors in series. The advantages of pyrolysis including its capability for making all types of coal suitable for gasification and producing a reactive char of a size similar to the feed coal are discussed; design of the pyrolysis section to heat coal in absence of oxygen and drive off volatiles as oil and gas, while avoiding agglomeration, is described. The COGAS pilot plant designed to process 50 tons/day of coal-derived char is detailed, together with the COGAS demonstration plant to produce synthetic pipeline gas, fuel oil, and naphtha from Illinois coal. It is concluded that the COGAS process combining pyrolysis with gasification is economically attractive for the production of fuel oil and naphtha. A.T.

A79-51861 **IGT U-GAS pilot plant developments.** M. K. Vora, J. G. Patel, W. A. Sandstrom, and A. G. Rehmat (Institute of Gas Technology, Chicago, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 889-894. Research sponsored by the U.S. Department of Energy.

At the Institute of Gas Technology (IGT) significant effort has been expended to develop processes to utilize coal on an environmentally acceptable basis, including coal conversion to low-and medium-Btu gas. These grades of gas can be utilized in process steam boilers, industrial heat furnaces, as a local substitute for natural gas and/or fuel oil, electricity generation in combined-cycle power plants and as a feedstock for petrochemicals. The U-GAS process combines a single-stage fluidized bed gasifier with an ash agglomerating mechanism to achieve selective removal of high-ash-bearing material (agglomerates) and high carbon conversions. Successful gasification tests have been conducted that achieved carbon gasification efficiencies exceeding 90% with coal and char feeds and ash agglomerates have been produced during test operations conducted with coke breeze and bituminous coal. U-GAS process tests are being completed to produce design data at 60 psia (413 kPa) for an Industrial Fuel Gas Demonstration Plant. (Author)

A79-51862 **Equipment and strategy for environmental sampling of complex coal gasification process streams.** M. J. Pochan, J. P. Fillo (Carnegie Mellon University, Pittsburgh, Pa.), and M. J. Massey (Environmental Research Technology, Inc., Pittsburgh, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 895-898. 7 refs.

The environmental characterization of coal gasification technology must be performed on sub-commercial scale facilities. Proper characterization at this scale of operation is difficult since many of the unit operations downstream of the gasifier are non-scalable and process conditions may vary significantly from those anticipated for commerical-scale operation. To avoid these difficulties, characterization efforts in the DOE program have focused on the raw gasifier product gas. Characteristics of this process stream can be linked directly to gasifier process conditions. However, characterization of the raw product gas is difficult due to severe process conditions and the rapid repetitive sampling required to adequately link these characteristics to gasifier process conditions. These sampling difficulties were overcome, special gas sampling equipment was developed and sampling implemented successfully on the raw gasifier product gas streams of both the CO2-Acceptor and Hygas coal gasification pilot plants. (Author)

A79-51863 **New approaches and baffled heat transfer studies in fluidized bed heat storage.** M. Y. Abubakar, J. L. Sullivan, J. D. Tarasuk, and M. A. Bergougnou (Western Ontario, University, London, Canada). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 899-904. 14 refs.

Fluidized heat storage is a very versatile means of storing energy either as sensible heat or by means of a change of phase material. New schemes are described involving the latter. A fluidized bed solidification unit is proposed where a molten salt is injected into a fluidized bed of solid salt, cooled by heat exchange surfaces. The molten salt solidifies on the cold solid salt particles, the heat exchanger staying, thus, free of salt deposits. The concept can also be applied to the freezing of water by a heat pump operating in a fluidized bed of ice particles. Groundwater could be frozen during winter for space heating purposes, and the ice stored for cooling during the summer. Because fluidized bed heat storage involves heat exchange surfaces, heat transfer inside a baffled fluidized bed was studied by means of a new heat flux measuring device. Data are reported for a heat exchange tube placed near a baffle inside a fluidized bed. (Author)

A79-51864 **Multistage fluidised coal combustor.** M. R. Judd and C. M. Eleftheriades (Natal, University, Durban, Republic of South Africa). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 905-907. Research supported by the South African Council of Scientific and Industrial Research, National Institute for Metallurgy, and South African Coal, Oil and Gas Corp.

The design concept and some preliminary studies of a pilot scale multistage fluidised bed coal combustor are reported. The three stages are contained in a single pressure vessel. Combustion of the coal occurs in a medium of sand which circulates internally between stages via downcomers and externally through a pneumatic lift line and cyclones. Solids circulation is controlled by the overall pressure balances and a non-mechanical solids flow valve. Heat is recovered via immersed firetubes. (Author)

A79-51865 **An overview of in situ oil shale technology and recent advances in true in situ retort modeling.** C. E. Tyner (Sandia Laboratories, Albuquerque, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 956-961. 13 refs. Research supported by the U.S. Department of Energy.

In view of current liquid fuel shortages, development of the oil shale resources of Colorado, Utah, and Wyoming, estimated to contain more than one trillion barrels of oil equivalent, must be considered. The in situ processing of this resource offers a potentially attractive alternative, both economically and environmentally, to surface processing. True and modified in situ retorting technologies are described and current research in these areas briefly outlined. True in situ and related low-void in situ processes would minimize the mining and materials handling problems associated with other technologies. A comprehensive mathematical model has been developed to describe the retorting process in these beds. Use of the model to investigate the effect of various retort geometries and bed conditions on the oil yield from true in situ and low-void in situ retorts is discussed. (Author)

A79-51866 **Field performance of underground coal gasification.** D. R. Stephens (California, University, Livermore, Calif.), C. F. Brandenburg (U.S. Department of Energy, Laramie Energy

Technology Center, Laramie, Wyo.), and E. L. Burwell (U.S. Department of Energy, Div. of Fossil Fuel Extraction, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 996-1002. 34 refs. Contract No. W-7405-eng-48.

This paper reviews the state of art in underground coal gasification (UCG), with emphasis on the U.S. DOE program. UCG offers potential advantages as a source of pipeline quality gas cost competitive with other synfuels, the use of 1.2 trillion tons of coal that would not be economical to strip or deep mine, and possible environmental advantages. The environmental issues, pipeline gas and electricity cost comparisons with alternate sources, and recent UCG results in the DOE program are discussed. Experimental gasification with air producing low BTU gas and steam/oxygen gasification producing medium BTU gas are described, and it is concluded that (1) UCG can recover the energy in unminable coal seams to ease demand for imported oil and natural gas, (2) the coal reserve for UCG is vast and widely distributed and could supply at least 300 quads as SNG, electricity, or clean liquids, (3) conversion of medium-BTU gas to transportation fuels and SNG and low-BTU gas to electricity are priorities for UCG, and (4) tests to-date confirm economic and environmental advantages. A.T.

A79-51867 **A numerical model of underground coal gasification for air-water injection into a permeable bed.** M. L. Pasha and S. M. Farouq-Ali (Pennsylvania State University, University Park, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1010-1017. 20 refs.

The present investigation is devoted to the development of an unsteady state model of underground coal gasification for a porous and permeable bed. The coal may produce ash and tar and a mixture of nitrogen, methane, carbon dioxide, carbon monoxide, steam and hydrogen, as a result of pyrolysis. The reaction stoichiometry is described by nine reactions involving coal, char, and seven gases. The gasification of mixture may consist of both water and gas and thus this investigation simulates a two-phase fluid flow system. The problem is formulated in terms of thirteen equations. Because of the amount of available computer memory, the solution approach used is a combination of simultaneous and sequential steps. The set of equations is divided into three strongly coupled sets of equations and each set of equations is solved separately using direct solution techniques. (Author)

A79-51868 **Effect of noncondensables on the performance of geothermal steam power plants.** H. E. Khalifa, E. Michaelides, and J. Kestin (Brown University, Providence, R.I.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1029-1033. Contract No. EY-76-S-02-4051-A001.

The influence of dissolved carbon dioxide on the thermodynamic performance of geothermal steam systems is analyzed. The system is divided into its main components: the flash tank, the turbine, the condenser and the gas extraction system, and the effect of noncondensables is studied for each. The effect of the noncondensable gas on the output of the whole system is deduced from its effect on the individual components. The analysis of actual systems is preceded by an analysis of an ideal system. The optimum condenser pressure for actual systems is obtained for different gas extraction system efficiencies. (Author)

A79-51869 **Today's geothermal power economics and risks.** T. W. Lawford (EG&G Idaho, Inc., Idaho Falls, Idaho). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1034-1036.

Because of the infancy of the industry and of significant physical characteristics of the geothermal resources, significant variations in geothermal power costs have been quoted by different sources. This paper develops capital and power generation costs as a parameterized composite of a number of ongoing geothermal power projects, and evaluates several of the most commonly accepted 'risks' of geothermal power in terms of cost penalties to a basic cost of power. The status of geothermal power in the U.S. is also reviewed briefly. (Author)

A79-51870 **Low temperature geothermal energy use in existing institutional power plants.** D. Kauffman and A. V. Houghton (New Mexico, University, Albuquerque, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1037-1040. Research supported by the New Mexico Energy and Minerals Department.

Preliminary system designs and economic analyses are presented for retrofit geothermal space heating for two educational institutions. For the large, relatively low temperature, deep reservoir in the Albuquerque, New Mexico, area, there is substantial economic incentive only for larger systems, typically those capable of providing 20 million Btu/hr (6000 KWt) or more. (Author)

A79-51871 **System aspects of geothermal resources utilization - The case of Castelnuovo Val di Cecina as an example.** P. De Marchi Desenzani (Pavia, Università, Pavia, Italy). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1041-1044.

An attempt is made to face the perspectives for the investments in geothermal energy utilization systems in Italy, by the means of a mathematical computerized aid to decision making. An overall applied social-economic analysis and a complementary research program, suitable to the improvement of the necessary information, are supposed to be the basis for the computer assisted work. System analysis and system approach to decisions are developed with reference to a number of energy-related activities that are coordinated upon a regional basis. (Author)

A79-51874 **Elementary design guidelines for stirling engines.** G. Walker (Calgary, University, Calgary, Alberta, Canada). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1066-1068.

This article presents the elementary design guidelines for Stirling engines for estimating engine performance in the conceptual stages of a project. Engines where the flow of working fluid is controlled by volume changes are called Stirling engines, and they have potential applications in the automotive, power generation, and solar energy fields. Power output and the Beale number concept, thermal efficiency pressure ratio, work dependency, and cost of Stirling engines is discussed. It is concluded that design concepts presented should supplant excessively optimistic predictions presently made with the ideal Stirling cycle. A.T.

A79-51882 **DOE stationary external combustion engine program - Status report.** R. E. Holtz, T. J. Marciniak, K. L. Uherka (Argonne National Laboratory, Argonne, Ill.), W. Bunker, and J. Facey (U.S. Department of Energy, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1120-1123.

It is expected that Stirling engine based energy systems will be available in sizes ranging up to about 10 MWe in the late 1980s.

These systems are expected to be environmentally acceptable in that they will have low emissions, low noise, and be esthetically acceptable. It is predicted that these engines will provide substantial energy savings and cost savings while burning coal. Among potential applications of coal fueled plants are total energy plants, integrated community energy systems, industrial cogeneration, small municipal generating facilities, and pumping stations. B.J.

A79-51883 **Stirling engine combustion and heat transport system design alternatives for stationary power generation.** K. L. Uherka, J. G. Daley, R. E. Holtz (Argonne National Laboratory, Argonne, Ill.), and W. P. Teagan (Arthur D. Little, Inc., Cambridge, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1124-1130. 17 refs.

The paper reviews a study in support of the DOE Fossil Fuel Utilization Division program for development of large (500 to 300 Hp) Stirling engines for stationary power generation. Emphasis is on coal-based systems with high conversion efficiency for application in the industrial, commercial and residential sectors to provide electrical and thermal capacity at the point of use. Methods for integrating various coal combustors with Stirling engines are examined. Consideration is given to such indirect systems for transporting thermal energy as heat pipes, two-phase liquid metal reflux boilers, and single-phase liquid or gaseous forced circulation loops; heat transfer characteristics are presented. B.J.

A79-51884 **A solar-Stirling small power system.** R. L. Pons (Ford Aerospace and Communications Corp., Newport Beach, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1131-1135.

The paper presents results of an in-depth analysis of a 1 MWe solar power system consisting of multiple parabolic dish concentrators employing Stirling cycle engines for power conversion. The engine, ac generator, cavity receiver and integral sodium pool boiler/heat transport system are combined in a single package and mounted at the focus of each concentrator. The output of each concentrator is collected by a conventional electrical distribution subsystem which permits either grid-connected or stand-alone operation, depending on the choice of storage system selected. For annualized capacity factors in excess of 0.40, storage is required. The system can accommodate a number of options, including lead-acid batteries, advanced batteries, or fly-wheels. Without storage, system capital cost is less than $1000/kW, based on the production of 5000 MW per year by the 1990 time period. Associated life-cycle energy cost (levelized) is approximately 53 mills/kWh. (Author)

A79-51888 **Advances in Stirling engine technology.** J. R. Senft (Sunpower, Inc., Athens, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1175-1180.

The paper describes several Sunpower programs involving the design, testing, development, and commercial production of a family of free piston Stirling engine alternators, water pumps, and cooling machines. Particular attention is given to the SD-100 program, the RE-1000 program, and the 661 crank engine program. B.J.

A79-51889 **Design characteristics of an advanced Stirling engine concept.** J. Vos (Philips' Gloeilampenfabrieken, Philips Research Laboratories, Eindhoven, Netherlands). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1191-1196.

This paper deals with the design of a double acting four cylinder Stirling engine termed Advenco, which is an acronym for advanced engine concept. In this engine a number of advanced ideas are tried out. For instance the quantity of expensive heat resistant material is substantially reduced by using a ceramic material as an insulating wall inside the cylinder and regenerator housings. Furthermore the power is controlled by varying the piston stroke, leading to a favourable part load efficiency. Finally special attention has been paid to the external sealing. The rollsock used for this purpose is enclosed in a cassette system which makes replacement easy. In this paper the design features of this advanced Stirling engine are described. (Author)

A79-51890 **A variable angle wobble plate drive for a stroke controlled Stirling engine.** R. J. Meijer (Philips' Gloeilampenfabrieken, Philips Research Laboratories, Eidenhoven, Netherlands) and B. Ziph (North American Philips Laboratories, Briearcliff Manor, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 1. Washington, D.C., American Chemical Society, 1979, p. 1197-1202.

A drive mechanism has been developed for a variable displacement Stirling engine for automotive propulsion. It features a variable angle wobble plate mechanism and utilizes rolling element bearings. This paper describes the mechanism, its motion, dynamic characteristics, and the wobble plate angle control. The mechanism converts reciprocating motion into rotary motion in such a way that constant angular speed rotation of the main shaft will result in purely sinusoidal linear motion of the reciprocating pistons. It is amenable to perfect dynamic balancing for any number of pistons. The variation of the plate angle is accomplished by mounting it on the shaft at an acute angle and then rotating it around and relative to the shaft. The drive mechanism is an integral part of a complete power train designed as a single system for a front wheel drive 3,500 lb. passenger automobile. (Author)

A79-51891 * # **Results from Symposium on Future Orbital Power Systems Technology Requirements.** S. Gorland (NASA, Lewis Research Center, Cleveland, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1203-1206.

Technology deficiencies, adequacy of current programs, and recommendations for reducing the testing and risks involved in future orbital energy systems made at the NASA Symposium are summarized. Photovoltaic space power system problems, including structural dynamics and attitude control problems due to solar array flexing; solar cell radiation resistance, manufacturing capability, and cost reduction; solar arrays including inflatable arrays, spectrum selection to increase efficiency, and polymer coatings for cells; battery technology; the endurance data base for fuel cell and electrolysis technology, and power management were discussed. Other topics considered were laser/microwave power transmission, thermal management, nuclear power systems, and environmental interactions. It was concluded that a 'front end' system study is needed in each area and current programs for multi-hundred-kW power systems are underscoped. A.T.

A79-51892 **Orbital antenna farm power systems challenges.** F. H. Esch and W. L. Morgan (COMSAT Laboratories, Clarksburg, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1207-1212. Research sponsored by the Communications Satellite Corp.

This paper describes possible orbital antenna farm (OAF) systems and identifies power system design problems which must be solved. The OAF is a space platform which combines a variety of communication services on a common platform and provides varying amounts of electric power depending on amounts of communications service. Long life and high reliability are economic justifications for OAF, so that an OAF platform is expected to operate for several decades. The platform capabilities of the several initial space stations of the OAF class and applications missions of the earliest OAF designs in the geostationary orbit are summarized. The platform power distribution among these missions, space station construction, and interconnected platforms for global traffic are discussed. The OAF electric power system, including nuclear and photovoltaic generators, and energy storage systems, such as thermoelectric conversion and rotating/moving devices are described. A.T.

A79-51893 # **The military space power program.** R. R. Barthelemy (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1213-1215. 6 refs.

This paper examines a trend toward military space power requirements in the 10 to 100 kWe range due to probable needs for advanced surveillance and communications missions. Solar cell development, spacepower thrust roadmap weapon hardening, roadmap thermal and high power, and electrical energy storage are discussed, noting that significant performance enhancements in solar cell efficiency and battery energy density have been achieved of major importance in spacecraft designs. The programs include flexible rolled-up solar array, hardened array solar power system, the 2kWe long life battery, the multiple phase high efficiency solar panel, the Nickel-Hydrogen Battery, and nuclear dynamic power system applications/integration study. A.T.

A79-51894 * # **The NASA Space Power Technology Program.** J. P. Mullin, W. R. Hudson, and L. P. Randolph (NASA, Space Power and Propulsion Office, Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1216-1224. 22 refs.

This paper discusses the National Aeronautics and Space Administration's (NASA) Space Power Technology Program which is aimed at providing the needed technology for NASA's future missions. The technology program is subdivided into five areas: (1) photovoltaic energy conversion; (2) chemical energy conversion and storage; (3) thermal to electric conversion; (4) power system management and distribution, and (5) advanced energetics. Recent accomplishments, current status, and future directions are presented for each area. (Author)

A79-51897 * **A power extension package /PEP/ for the Shuttle Orbiter.** H. C. Ness (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1237-1240. 6 refs. Contract No. NAS9-15532.

A concept for solar array augmentation of the power normally provided by the Shuttle Orbiter fuel cells in support of payloads is discussed. Justification for the use of solar arrays rather than additional cryogenic fuel kits for extension of on-orbit stay time is presented. This is followed by a description of the array power system and an examination of its interfaces with the existing Orbiter fuel cell system. The system produces 29 kW total with 14 kW allocated to the Orbiter and 15 kW to payloads and permits an increase in on-orbit mission duration from 6 to approximately 20 days at 21 kW with four cryo kits. It is capable of producing full output in diverse vehicle orientations since the array is deployed and oriented by the Orbiter remote manipulator system (RMS). Power produced by the arrays is reduced to 32.25 to 32.5 volts by pulse-width-modulated buck voltage regulators to force the Orbiter fuel cells into an idle mode during the sunlighted portions of the orbit. (Author)

A79-51898 # **A DOD space energy module.** R. R. Barthelemy and V. A. Shelley (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1241-1243. 7 refs.

The development of a high level, high power density space energy module capable of being delivered to synchronous orbits and survivable in radiation environments for the future high power DOD missions in space is presented. The mission requirements for 10 to 50 kW energy systems capable of controlling and rejecting thermal energy at these power levels, launch system design based on the Space Shuttle constraints and capabilities, and the energy module concept based on delivering 25 kW at the end of 7 years and rejecting the same amount of energy in a 5000 lb weight system are discussed. Finally, the electrical power and thermal systems are described, and it is concluded that the DOD space energy module will provide a high performance energy package capable of satisfying all the energy needs of the overall space system. A.T.

A79-51899 **Long-term prediction of power system performance for geosynchronous spacecraft.** W. J. Billerbeck (COMSAT Laboratories, Clarksburg, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1244-1249. Research sponsored by the Communications Satellite Corp., and International Telecommunications Satellite Organization.

New techniques for the prediction of future electric power capabilities of operational geosynchronous communications satellites are presented. These techniques were developed for the computer modeling of Ni-Cd battery performance, incorporating parameters of current, temperature, number of discharge cycles, and the effect of reconditioning on voltage performance. The model was correlated with long-term in-orbit data on a number of spacecraft batteries, and then applied by fitting to individual batteries to predict their performance. Long-term performance prediction for solar cell arrays was performed on spacecraft using a computer model based on the measured prelaunch characteristics extrapolated to space, and the model was then used to predict future electrical performance. A.T.

A79-51901 **Potential of GaAlAs solar cells for the global positioning system missions.** W. C. Schmill (Rockwell International Corp., Satellite Systems Div., Downey, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1257-1263. 20 refs. Contract No. F04701-74-C-0527.

Gallium aluminum arsenide (GaAlAs) solar cells are evaluated for a navigational satellite mission. Both planar and concentrated solar arrays (400 to 1000 W) were analyzed. The predicted performance of early production (1982-83) GaAlAs solar cells would have an efficiency of 16.4 percent (25 C), and for the mission particulate radiation fluence degrade in power 2/3 that of silicon devices and cost 2.4 times silicon solar cells. Results of the analysis indicates that early production GaAlAs solar cells can be competitive with current production silicon solar cells on a dollar-per-watt basis and produce 20 percent more power for the same size array. With improvements in either GaAlAs solar cell efficiency, radiation hardness, and anticipated cost reductions resulting from mature production, it is indicated that GaAlAs solar cells would result in solar array cost, weight, and area savings compared to silicon cells. (Author)

A79-51902 * **High temperature, low mass solar blanket development.** H. G. Mesch (TRW Defense and Space Systems Group, Redondo Beach, Calif.) and D. E. Rockey (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1264-1269. Contract No. NAS7-100.

This paper presents methods of incorporating ultrathin silicon solar cells into photovoltaic blankets for space applications. This type of cell has the highest power-to-mass ratio and best performance under space radiation of any silicon solar cell. Interconnect materials and designs, and the results of the investigation of the applicability of parallel-gap resistance welding for interconnecting ultrathin cells are discussed. Data relating contact pull strength and cell electrical degradation to welding parameters such as time, voltage, and pressure are presented. Methods for bonding ultrathin cells to flexible substrates and for bonding thin covers to these cells are described, and the results of vacuum thermal cycling and thermal soak tests on prototype ultrathin cell test coupons are included. A.T.

A79-51903 * **High efficiency ultrathin silicon solar cells.** G. Storti and C. Y. Wrigley (Solarex Corp., Rockville, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1270-1272. Contract No. JPL-954833.

This paper summarizes developments in ultrathin, (50 micron), silicon solar cells for high power-to-weight ratio space power systems. The fabrication technology developments included uniformly thinning oriented silicon slices, enhancement of internal reflection, optimizing high-temperature processes, surface texturing and back surface field enhancement. The best textured-surface ultrathin cells have achieved 14.3% AMO efficiency, while pilot-manufacturing quantities of smooth-surfaced cells have been fabricated with efficiencies of 12%. Data are presented on cell structure, fabrication collection efficiencies and optical properties. (Author)

A79-51905 **Enhancement of solar arrays in space through the use of concentrators.** I. Baker (Hughes Aircraft Co., El Segundo, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1278-1282. 5 refs.

Results are presented of a conceptual design study and comparative evaluation of solar concentrators for enhancing the performance of photovoltaic arrays in space. Six design concepts, utilizing thin film Kapton mirrors to concentrate sunlight onto a 25 kW baseline array, are compared relative to performance and cost related parameters. Effectiveness from 1 to 6 AU, considering silicon and gallium arsenide solar cells, and vapor deposited aluminum (VDA) and 'cold mirror' reflector coatings, are evaluated. At 1 AU with silicon solar cells results show moderate improvement in specific power through the use of concentrators. When operating at greater than 1 AU, concentrator effectiveness is dramatic. Improvements as great as 300 percent in specific power or 1,570 percent in total power output using silicon solar cells were shown at 6 AU. If gallium arsenide cells are employed at 1 AU, concentrator effectiveness is increased. Better results were achieved with the VDA reflector coating than with the particular 'cold mirror' coating investigated. (Author)

A79-51923 # **Thermal management for future Air Force high power spacecraft.** E. T. Mahefkey (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1374-1376. 6 refs.

High power military missions, surveillance, space defense, and secure command, control, and communications are described, as are the military design requirements based on survivability. Potential thermal control component technology developments are suggested as a means to improve both reliability and autonomy. These include large, deployable, retractable spacecraft radiators, long-life (10 year) multifluid pump development, and extension of present heat-pipe technology to accommodate the more sophisticated temperature regulation (+ or - 0.5 C), higher transport capacity, and more unusual geometrical constraints envisioned. V.T.

A79-51924 * # **Heat rejection development requirements for orbital power systems.** J. G. Rankin and W. E. Ellis (NASA, Johnson Space Center, Houston, Tex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1377-1381. 6 refs.

Long-term orbital applications in which large amounts of electrical power are generated and utilized will require waste heat rejection beyond the capabilities of existing radiator systems. Therefore, it will be necessary to develop a new concept for large orbital energy systems. This paper presents a discussion of the primary factors to be considered in the design and development of a large orbital power module heat rejection system. Specific design requirements are defined based on these factors, and a review of supporting technology in the advanced space radiator area is presented. A proposed development approach and a candidate baseline heat rejection system are then identified and discussed. (Author)

A79-51927 **Status report of the dynamic isotope power system.** G. L. Sorensen, R. E. Niggemann, E. C. Krueger (Sundstrand Advanced Technology Group, Rockford, Ill.), R. C. Brouns (U.S. Department of Energy, Washington, D.C.), and F. A. Russo (Teledyne Energy Systems, Timonium, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1396-1400.

The development status of a dynamic space power system for use in satellites of the 1980s is discussed in this paper. This dynamic system is plutonium oxide fueled, organic Rankine cycle turbine power system producing electric power. This program was initiated with Sundstrand by the Department of Energy in August 1975, the Phase I effort was completed in June 1978. In Phase I, a flight system concept design was made and a ground demonstration system was designed, fabricated, and tested to prove the feasibility of the flight design. The current Technology Verification Phase is to improve system efficiency by component development and to further demonstrate system reliability by endurance testing a minimum of 5,000 hours. The system configuration and test results of the program to date are discussed. (Author)

A79-51928 **Dynamic Isotope Power Systems /DIPS/.** J. E. Boretz, E. Nezgoda (TRW Defense and Space Systems Group, Redondo Beach, Calif.), R. R. Barthelemy, and T. Mahefkey (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1401-1405. 7 refs.

The major technology and survivability issues concerning the use of Dynamic Isotope Power Systems (DIPS) for future space application are discussed. Power levels considered for the DIPS are 1 to 10 kWe. An operating life of 7 years with a mean mission duration (MMD) of 5 years is achievable and consistent with the KIPS program. Typical operating conditions for KIPS are described along with a flight system block diagram. KIPS flight development characteristics are outlined. It is noted that there are many inherent features of DIPS/KIPS systems that potentially could enhance satellite survivability. V.T.

A79-51929 **Application of the Dynamic Isotope Power System to a multimission spacecraft.** W. D. Kenney (U.S. Department of Energy, Washington, D.C.), W. Z. Prickett (General Electric Co., Space Div., Philadelphia, Pa.), and E. C. Krueger (Sundstrand Advanced Technology Group, Rockford, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1406-1410. Research sponsored by the U.S. Department of Energy.

Integration of the Dynamic Isotope Power System (DIPS) into a multimission spacecraft is discussed, and the resulting nuclear integrated multimission spacecraft (NIMS) is presented for candidate DOD missions. The DIPS Rankine-cycle pumped coolant is used for electronics and other subsystem cooling for both normal operations and during threat encounter. The payload and NIMS houskeeping electronics are mounted on an annular panel located inside the NIMS radiator envelope. A single NIMS bus may be developed which is compatible with the six mission payload assessed. Consideration is given to mission selection and requirements. V.T.

A79-51930 **Selection of power plant elements for future reactor space electric power systems.** D. Buden (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1411-1417. Research sponsored by the U.S. Department of Energy.

The mission requirements for high power, small size and long lifetimes imply the need for a fast spectrum, highly enriched reactor that will have a large inventory of fuel in a small volume. Consideration is given to heat-pipe-cooled and gas-cooled reactors, including Brayton-cycle gas-cooled and liquid-cooled reactors. Emphasis is placed on converter system design. It is determined that a heat-pipe reactor provides a means for emergency-cool-down in the design without large emergency-cool-down fluid storage systems. This can be done by the addition of fins on the end of the reactor heat pipes with power to the fin section regulated by a gas reservoir. V.T.

A79-51931 * **Reactor design for nuclear electric propulsion.** D. R. Koenig and W. A. Ranken (California, University, Los Alamos Scientific Laboratory, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1418-1424. 5 refs. Research sponsored by the U.S. Department of Energy and NASA.

The paper analyzes the consequences of heat pipe failures, that resulted in modifications to the basic design of a heat-pipe cooled, fast spectrum nuclear reactor and led to consideration of an entirely different core design. The new design features an integral laminated core configuration consisting of alternating layers of UO2 and molybdenum sheets that span the diameter of the core. Design characteristics are presented and compared for two reactors. A conceptual design for a heat exchanger between the core and the thermionic converter assembly is described. This heat exchanger would provide design and fabrication decoupling of these two assemblies. V.T.

A79-51932 **Baseline design of the thermoelectric reactor space power system.** W. A. Ranken and D. R. Koenig (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1425-1431. Research sponsored by the U.S. Department of Energy.

An alternative for a nuclear reactor space power system capable of delivering 10-100 kWe is presented, that employs the use of a heat-pipe-cooled fast spectrum reactor with a thermoelectric power conversion system. The reactor design features a laminated core configuration with sheets of molybdenum - extending across the full diameter of the core - interspersed between layers of UO2. The general configuration of the baseline power system is given showing the reactor core encased in a beryllium reflector. Attention is given to the conversion system which is accomplished by a network of thermoelectric elements based on silicon/germanium alloys, built into cylindrical modules surrounding the core heat pipes. Early key results showed that fuel temperatures are not excessive even when employing radiation, and that analysis has shown the layered fuel form to be less sensitive to incomplete thermal contact between the core components than expected. C.F.W.

A79-51933 **Use of modular heat source stack in RTGs.** A. Schock and A. Shostak (Fairchild Space and Electronics Co., Germantown, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1432-1439. Contract No. EN-77-C-02-4281.

A proposed light-weight scheme for solving problems encountered in the use of stacked heat source modules in a radioisotope thermoelectric generator (RTG) is described and illustrated with an actual RTG design for the NASA/ESA International Solar-Polar Mission. A detailed analytical model of the RTG and the spacecraft to which it is attached was constructed, and a NASTRAN analysis was carried out to assess the structural performance of the heat source scheme under differential thermal expansion. It was also used to determine dynamic launch loads, the systems characteristic frequencies, the loads transmitted to the RTG, and the resultant stresses and displacements. Attention is given to the structural analysis of a model RTG and the resonances and resultant deformations that occur. It was determined that the analysis demonstrated the structural viability of the basic scheme for supporting a long heat source stack without intermediate supports, under the anticipated static, dynamic, and thermal expansion loads. C.F.W.

A79-51935 **Design optimization of RTG for Solar-Polar Mission.** A. Schock and H. Sookiazian (Fairchild Space and Electronics Co., Germantown, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1444-1454. 5 refs. Contract No. EN-77-C-02-4281.

The paper presents the conceptual design of an RTG, employing stacked radioisotope heat source modules and silicon-germanium thermoelectric couples, for use on the joint NASA/ESA International Solar-Polar Mission. It describes a computer program which, for a given set of assumptions and ground rules, can rapidly examine thousands of design variations and determine the combination of design parameters which will minimize the RTG weight for a given power output. Graphical results are presented to illustrate design trends and clarify the optimization procedure. The generated results lead to interesting and somewhat unexpected conclusions about optimum design parameters, the relative constancy of RTG specific power over a wide power range, comparisons between single and split RTGs, sensitivity to variations in heat source module design, weight comparisons with the MHW RTG, and comparative RTG weights for different housing and radiator fin materials. (Author)

A79-51936 * **Radioisotope thermoelectric generator cooling in the Shuttle bay.** L. D. Stimpson (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) and D. I. Levine (Rockwell International Corp., Downey, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1455-1460. Contracts No. NAS7-100; No. NAS9-14000.

The paper describes a Shuttle-integrated radioisotope thermoelectric generator (RTG) that consists primarily of a pump package and plumbing connected directly to the Shuttle payload heat exchanger. The RTG utilizes on-board water evaporative cooling capability, which is normally used for ascent, entry, and for supplementing the radiators. Attention is given to the RTG cooling concepts which include: (1) an active thermal cooling system (ATCS), where two Freon-21 loops operate simultaneously to transport heat from the Orbiter subsystem and payloads through liquid-to-liquid heat exchangers and pin-fin coldplates to four heat sinks, and (2) an atmosphere revitalization system (ARS) which provides for thermal, pressure, and contaminate control of the crew cabin and its equipment. The use of a payload heat exchanger to reduce weight, cost and complexity associated with an independent cooling system was investigated in detail. C.F.W.

A79-51937 **Performance limits for liquid-metal heat pipes containing long adiabatic sections.** F. C. Prenger, Jr. and J. E. Kemme (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1461-1465. 6 refs. Research supported by the U.S. Department of Energy.

Analytical and experimental investigations of the performance limits of liquid-metal heat pipes containing long adiabatic sections were made. An analytical model describing the vapor flow and including the effects of wall friction and compressibility is presented. Performance limits and axial temperature profiles of a sodium-filled, stainless steel heat pipe were measured for comparison with the analytical results. Complete validation of the analytical model requires further experiments. The results show that a transition from laminar to turbulent vapor flow occurs in the adiabatic section with an accompanying decrease in the heat-pipe performance limit. The reduced performance results from an increased wall friction factor for the turbulent flow. (Author)

A79-51938 **Copper/water axially-grooved heat pipes Fabrication and performance testing.** N. P. Strazza (Teledyne Energy Systems, Timonium, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1466-1469. Contract No. ET-76-C-01-2865.

Well-controlled fabrication techniques have proven to be essential for obtaining optimum performance and long term operation of copper/water axially-grooved heat pipes. Life test results demonstrating long term operation, up to 11,500 hours, is achieved with a copper/water system operating at temperatures up to 225 C. This paper discusses the experience obtained in the fabrication and reliability testing of copper/water axially-grooved heat pipes. Fabrication experience, life-test results, and destructive and nondestructive analyses of life-tested and of as-fabricated heat pipes are presented. Performance data shows no significant degradation of heat transport or thermal conductance capability of the heat pipes. Chemical analyses of the water charge, residual gas analyses, internal heat pipe surface chemistry and metallographic findings are also presented. Additionally, this paper discusses the chemistry of known potential contaminants resulting from improper fabrication techniques and recommendations for successful fabrication. (Author)

A79-51940 **SNAP 19 performance update for Pioneer and Viking missions.** C. J. Goebel and L. R. Putnam (Teledyne Energy Systems, Timonium, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1476-1479.

The paper examines SNAP-19 radioisotope fueled thermoelectric generators that are employed in four missions including Pioneer 10 and 11 and two Viking Landers. A performance model is presented that considers RTG material properties and the effects of environmental deviations. Results are compared with telemetry data from the Pioneer flights and it is shown that the NASA required minimum power levels, which were set at a 50% probability to exceed 105.3 watts, will be met. C.F.W.

A79-51941 * **Computer modeling for a space power transmission system.** S. M. Rathjen (Boeing Aerospace Co., Seattle, Wash.) and D. K. Reynolds (Washington, University, Seattle, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1480-1485. 12 refs. Contracts No. NAS9-15636; No. NAS9-15196.

The paper summarizes the development of a computer program that simulates the performance of a large phased array antenna composed of 7220 smaller subarrays, each made up of klystron modules which act as individual radiators. The purpose of this program is to: (1) study the far-field pattern near the rectenna, (2) calculate the beam efficiency, and (3) observe the grating lobe behavior. Attention is given to the computer program which consists of a main program and four subroutines, as well as to the system configurations. The effects of amplitude, phase and random subarray failures are examined and an error budget was specified for 10 to the 0 phase error, + or - 1 dB amplitude error, and a 2% random failure rate. C.F.W.

A79-51942 **A European view of the solar satellite power system.** K. Bogus, D. Kassing, and K. K. Reinhartz (ESA, European Space Research and Technology Centre, Noordwijk, Netherlands). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1486-1491. 13 refs.

The paper discusses the European energy situation and the potential role of solar-powered systems (SPS) with emphasis on specific European tasks and aspects. Attention is given to the energy supply and demand needs as well as to the present status of European SPS activities. Possible future activities are examined and a 10 point SPS program is presented. The use of photovoltaic conversion systems such as silicon solar cells are investigated and calculations for power vs consumption are made. C.F.W.

A79-51943 **The technology base for the microwave power transmission system in the SPS.** W. C. Brown (Raytheon Co., Waltham, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1492-1499. 13 refs.

The microwave power transmission system in the Solar Power Satellite (SPS) is reviewed in terms of the existing technology base. This technology base consists of: (1) the experience that has been obtained from complete transmission systems including the interconversion of dc and microwave energy at both ends of the system and all of the interfaces between various parts of the system; (2) the efficient conversion of dc power into microwave power; (3) the microwave beam link itself; and (4) the efficient collection of microwave power at the receiving end of the link and its conversion back into dc power. Special emphasis is placed upon recent additions to this technology base and also upon the critical nature of some of the microwave technology that is needed to meet the SPS requirements. (Author)

A79-51944 * # **Microwave system performance for a solar power satellite during startup/shutdown operations.** G. D. Arndt and L. A. Berlin (NASA, Johnson Space Center, Houston, Tex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1500-1505. 6 refs.

The paper investigates the system performance and antenna characteristics under startup/shutdown conditions for the high power beam from a solar power satellite. Attention is given to the present microwave system reference configuration together with the dc power distribution system in the solar array and in the antenna. The pattern characteristics for the main beam, sidelobes, and grating lobes are examined for eight types of energizing configurations which include: random sequences, two types of concentric circles, and three types of line strips. In conclusion, it is noted that a proper choice of sequences should not cause environmental problems due to increased microwave radiation levels during the short time periods of energizing and de-energizing the antenna. C.F.W

A79-51945 * **Applicability of solid state microwave technology to solar power satellites.** E. J. Nalos, G. W. Fitzsimmons, and B. R. Sperber (Boeing Aerospace Co., Seattle, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1506-1511. 18 refs. Contract No. NAS9-15636.

A potential SPS design using antenna mounted GaAs FET's as the basic dc-RF converter is described, together with the rationale of why such a design may represent a viable cost effective complement to current SPS designs using tube type dc-RF converters such as klystrons or crossed field amplifiers. An initial description of a microwave antenna array module is given, together with a concept of how such a module is to be integrated into the SPS overall design. A comparison is made of several such designs using either antenna mounted or solar cell mounted dc-RF converters. (Author)

A79-51946 **Synfuel /hydrogen/ production from fusion power.** R. A. Krakowski, K. E. Cox, J. H. Pendergrass, and L. A. Booth (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1544-1548. 23 refs.

A potential use of fusion energy for the production of synthetic fuel (hydrogen) is described. The hybrid-thermochemical bismuth-sulfate cycle is used as a vehicle to assess the technological and economic merits of this potential nonelectric application of fusion power. (Author)

A79-51947 **Advanced synfuel production with fusion.** J. R. Powell and J. Fillo (Brookhaven National Laboratory, Upton, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1549-1552. Research supported by the U.S. Department of Energy.

Principles of high-temperature water electrolysis and results of design study are discussed. High-temperature electrolysis (HTE) has the highest potential efficiency for production of synfuels from fusion. Relative to thermochemical or direct decomposition methods, HTE technology is in a more advanced state of development, e.g., single cell units have been built and tested at 1000 C. It is noted that HTE units offer the potential to be quickly run in reverse as fuel cells to produce electricity for restart of tokamaks and possible spinning reserve for a grid system. V.T.

A79-51948 **Nitrogen fixation with fusion heat.** L. H. Rovner, K. J. Mysels, D. D. Peterman, and D. W. Kearney (General Atomic Co., San Diego, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1553-1558. 19 refs. Research supported by the Northeast Utilities Service Co. and Public Service Electric and Gas Research Corp.

The paper presents a preliminary analysis of the Wisconsin pebble-bed process. Process description is given along with process calculations carried out to examine the characteristics and optimal design parameters for the process. The design selections are flexible and give relatively broad maxima in process efficiency so that the process energy requirements can be designed with the characteristics of the fusion energy heat source. It is noted that the process is compatible with tritium breeding and the resultant energy-temperature heat characteristic of the reactor used in the process, is economic by comparison with competitive processes, and is conservative of nonrenewable resources. V.T.

A79-51949 **CO/H2 production using fusion reactor heat.** E. L. Klosterman, R. T. Taussig, P. E. Cassady, W. T. Thayer, L. C. Steinhauer, M. Shirazian, and D. Damon (Mathematical Sciences Northwest, Inc., Bellevue, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1559-1564. 14 refs. Contract No. ET-78-C-06-1095.

The paper describes the preliminary results of an analytic study conducted to determine the feasibility of producing CO using fusion reactor heat and gas dynamic compressing heating. The CO produced in this process is separated out and reacted with steam in a water-gas shift to form H2. Key elements in the system include a high-temperature fusion reactor blanket, a chemical wave reactor where gas dynamic heating and cooling occur, and a chemical separation plant. The question of technical feasibility is focused on three aspects of the system, namely, the high temperature fusion blanket design, the performance of the wave reactor, and the processes for converting the CO from the 'frozen gas mixture' to H2. V.T.

A79-51950 **Engineering aspects of demonstration fusion power reactors.** M. Biggio, G. Casini, F. Farfaletti-Casali, F. Lanza, R. Matera, G. Pierini, C. Ponti, F. W. Reiter, M. Rieger, and P. Rocco (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1565-1571.

Conceptual design study of a demonstration power reactor plant (FINTOR-D), of tokamak-type, is reviewed. FINTOR-D is defined as a full fusion plant generating electric power, able to demonstrate the feasibility of all the technologies required for a prototype reactor station. The study objective is to assess the principal physical and engineering limits connected with varying levels of capability of experimental fusion reactors. The following components are considered: (1) first wall, blanket, and magnet shields, (2) supporting structures of the reactor and magnetic coils, (3) vacuum containment systems, and (4) tritium cycle systems (plasma exhaust process, recovery from blanket, and coolant purification). V.T.

A79-51951 **Chemical processing of liquid lithium fusion reactor blankets.** J. R. Weston, W. F. Calaway, R. M. Yonco, J. B. Hines, and V. A. Maroni (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1572-1576. 15 refs. Research sponsored by the U.S. Department of Energy.

The first series of molten-salt extraction tests on the 50-gallon-capacity lithium-processing test loop (LPTL) using LiF-LiCl-LiBr are reviewed along with an analysis of the zirconium getter wires from the 10,000 hour lithium minitest loop (LMTL) test run. Test results indicate that a combination of salt extraction and cold trapping should provide adequate recovery and impurity control. It is expected that the hydrogen isotopes, nitrogen, and to some extent carbon will be removed via the salt extraction equipment and that cold trapping will control carbon, oxygen, and halogen levels. V.T.

A79-51952 **Tritium permeation through steam generator materials.** J. T. Bell and J. D. Redman (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1577-1582. 17 refs. Contract No W-7405-eng-26.

Various subjects related to tritium permeation through steam generator materials are discussed. Isotope effects based on protium and tritium permeabilities of nickel range from 1.36 at 500 K to 1.63 at 1000 K. Tritium permeation rates from a given quantity of T2 molecules will be reduced by the addition of protium and/or deuterium to a point where the tritium rates approach an inverse 0.5-power dependence on the protium and/or deuterium pressures. The permeability constants and the permeation activation energies essentially are equal for several ferritic alloys, but these parameters are significantly different from those for several austenitic type alloys. Oxide layers on construction alloys can reduce permeation rates by 2 to 3 orders of magnitude but information on this subject may not be applicable to operating steam generator systems. Recent results indicate that tritium permeation rates through oxide and glass materials are 0.5 rather than first-power dependent on pressure. (Author)

A79-51954 **A high temperature fusion reactor design.** S. D. Harkness, J. F. dePaz, M. Y. Gohar, and H. C. Stevens (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1590-1596. 6 refs.

A conceptual design of a blanket for a 7 m tokamak reactor is discussed, one that is capable of producing 1100 C process heat at a pressure of about 10 atmospheres. The design is based on the use of a falling bed of MgO spheres as the high-temperature heat-transfer system. The tritium breeding is accomplished using Li_2O modules both in front of and behind the high temperature ducts. Steam is used as the first wall and front tritium breeding module coolant, while helium is used in the rear tritium breeding region. The system produces 600 MW of net electricity for use on the grid. V.T.

A79-51955 **The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation.** J. H. Pendergrass, L. A. Booth, D. R. Peterson, and S. A. W. Gerstl (California, University, Los Alamos, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1597-1607. 37 refs.

A fusion reactor blanket concept has been developed which avoids restrictions characteristic of other blanket concepts on simultaneous delivery of almost all neutron energy as high-temperature thermal energy and achievement of tritium breeding ratios of one or greater. Suitable for either inertial confinement or magnetic confinement fusion applications, the concept involves deposition of 14.1-MeV fusion neutron kinetic and exoergic interaction energy, a majority of total fusion reactor energy release, in 1500 to 2000 K boiling lithium. Lithium vapor flow to, and condensation on, heat exchanger surfaces constitutes the efficient primary blanket heat transport mechanism. (Author)

A79-51956 **Fusion-supported decentralized nuclear energy system.** D. L. Jassby (Princeton University, Princeton, N.J.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1608-1613. 19 refs. Contract No. EY-76-C-02-3073.

A decentralized nuclear energy system is proposed, comprising mass-produced pressurized water reactors in the size range 10 to 300 MW (thermal), to be used for the production of process heat, space heat, and electricity. Attention is given to maximizing the refueling interval in order to reduce fuel transport, reactor downtime, and opportunity for fissile diversion. The preferred fissile fuel is U-233. Application of the neutral-beam-driven tokamak fusion-neutron source to a fissile breeding pilot plant is discussed. This scheme can be extended in part to a decentralized fusion energy system, wherein remotely located large fusion reactors supply excess tritium to a distributed system of relatively small nonbreeding deuterium-tritium reactors. V.T.

A79-51957 **Thermonuclear energy from ball lightning.** G. C. Dijkhuis (Zeldenrust College, Terneuzen, Netherlands). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1614-1617. 6 refs.

Ball lightning is treated as a turbulent plasma sphere with reversible transport of charge and energy. Model equations for current and heat flux lead to solutions with (1) internal circulation of charged plasma in a twin pair of counterrotating vortex rings, (2) central temperatures and densities with thermonuclear potential. (Author)

A79-51958 **The indirect Brayton energy recovery system.** B. E. Lampinen, R. R. Gutowski, A. Topouzian, and M. A. Pulick (Ford Motor Co., Dearborn, Mich.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1625-1629.

The indirect Brayton energy recovery system (IBERS) concept is described. Waste exhaust gas is expanded from atmospheric to sub-atmospheric pressure, through a turbine. The exhaust gas leaving the turbine is passed through a heat exchanger, where it is cooled. The cooled gas is then compressed back to atmospheric pressure by a compressor coupled to the turbine. The performance of the IBERS demonstration model proves that the concept is feasible. Under the unbalanced flow conditions, the unit reaches design speed and supplies surplus power. However, test data show that the two critical components in the system are the heat exchanger and compressor. Further investigations are required to determine if an IBERS can endure an industrial environment. (Author)

A79-51959 **Electricity rate systems and energy conservation.** B. Larkin (National Research Council, Div. of Mechanical Engineering, Ottawa, Canada). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1658-1661. 5 refs.

Two cases are discussed: the case of ventilation heat-recovery system and the case of solar heating system. Residental heat pumps are also considered along with the economics of system expansion. It is noted that most electricity rate systems do not reproduce exactly the effect of load factor on electricity costs. As a result, electrical loads with a low load factor are indirectly subsidized by the utility and other customers. The customer then tends to choose electricity rather than alternatives. Utilities should not actively promote expansion unless the loads concerned are particularly suitable, e.g. off-peak or high-load factor. V.T.

A79-51960 **District heating and cooling with heat pump systems.** J. M. Calm and P. T. Bauer (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1681-1686. Research sponsored by the U.S. Department of Energy.

The paper describes basic approaches to district heating and cooling with heat pump systems and the heat-pump-centered integrated community energy systems (HP-ICES) project. HP-ICES are energy systems for communities, which provide heating, cooling and/or other thermal energy services through the use of heat pumps. Since heat pumps primarily transfer energy from existing and otherwise probably unused sources rather than convert it from electrical or chemical to thermal form, HP-ICES offer potential for energy conversion. Furthermore, since conventional building heating and cooling systems would be replaced by this community energy system, nonscarce resources could be used instead of depleting fuels which are in short supply. V.T.

A79-51961 **Feasibility of a heat-actuated heat-pump-centered integrated community energy system.** B. D. Yudow, N. R. Baker, R. R. Tison (Institute of Gas Technology, Chicago, Ill.), and P. F. Swenson (Consolidated Natural Gas Service Co., Cleveland, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1687-1692.

The heat-actuated heat-pump-centered integrated community energy system (HAHP-ICES) is described. In this system, a small, high-efficiency steam turbine is combined with heat pump and thermal distribution technologies to meet the space conditioning needs of an office and residental community with over 30% less energy consumption when compared with conventional space-conditioning systems. The HAHP-ICES system performance was calculated for each hour of the-year using a computer simulation program, which incorporated the central plant's performance and operational philosophy. The sensitivity of a base-case economic model to changes in discount and interest rates, capital requirements, and operating and maintenance costs was also calculated to test the concept's economic viability. In addition, a sensitivity analysis was performed to assess the effect of climate, and the gas and electric utilities' rate structure. V.T.

A79-51962 **System performance of a Stirling engine powered heat activated heat pump.** W. D. Richards and W. S. Chiu (General Electric Co., Philadelphia, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1693-1698. 5 refs.

The paper presents the results obtained in testing the first prototype of the complete heat-activated heat pump (HAHP) system. The matching characteristics of the subsystem components, especially between the free piston Stirling engine and the free piston linear compressor are described. Optimization of the system matching techniques is outlined. The discussion includes potential improvements in the system performance based on the analytical evaluations and empirical test results of the first prototype. It is noted that an improvement in engine performance represents the most promising area to address in order to yield a more efficient heat-activated heat-pump product. An over 30% engine efficiency is predicted for the second prototype. V.T.

A79-51963 **Modeling the performance of gas-fired heat pump systems.** A. Patani and U. Bonne (Honeywell, Inc., Corporate Technology Center, Bloomington, Minn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1699-1705. 14 refs. Research supported by the Gas Research Institute.

The energy performance of gas-fired heat pumps for residences has been computer-simulated and the influence of the major factors affecting it has been studied by analyzing operation of various system configurations. The physical elements and assumptions used in the simulation model, including engine and compressor performance vs. speed and/or throttle conditions, and waste-heat recovery are described in detail. Consideration is given to such factors as engine size, engine efficiency, compressor efficiency, electric consumption, mode of operation, climate, refrigerant circuit features, cycling and crankcase losses, etc. which can affect efficiency and operating costs of a system consisting of an internal combustion engine coupled to a Rankin cycle refrigerant circuit, a heat-recovery unit, and a gas-fired auxiliary furnace. V.T.

A79-51964 **Heat pump system for process steam generation.** R. Sakhuja and G. Mileris (Thermo Electron Corp., Waltham, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1708-1712. Research sponsored by the Southern California Gas Co., Consolidated Natural Gas Co., and Gas Research Institute.

The paper deals with an open-cycle, vapor-compression, steam heat-pump system proposed to generate process steam from low-level (less than 500 F) excess industrial heat. The system will normally supply up to 150 psig steam. Excess heat sources as low as 220 F can be utilized. Fuel savings as high as 70 percent are possible in comparison with direct steam generation using a conventional boiler. Simple payback periods as low as one year can be achieved. A screw compressor is being used as the heat pump. It is capable of pressure ratios of 5 in a single stage and about 16 for two stages. The compressor is driven by a prime mover such as a gas turbine, which generates additional process steam from an exhaust boiler. (Author)

A79-51965 **Thermodynamic evaluation of heat pumps working with high temperatures.** I. A. Ekroth (Kungl. Tekniska Hogskolan, Stockholm, Sweden). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1713-1719. 11 refs. Research sponsored by the National Swedish Board for Energysource Development.

A thermodynamic evaluation of vapor compression heat pumps working with condensing temperatures up to 160 C is presented. In total about thirty different working fluids, refrigerants, are studied. Besides the thermodynamic properties, the thermal and chemical stability must be considered. The cycles examined are basic single-stage cycle, two-stage cycle with economizer arrangement, and two-stage cycle with flash intercooler. In cases where compressor efficiencies are entered into the calculations, values valid for screw compressors are used. The analysis shows that in the most elaborated systems the refrigerants R 12B1, 21, 114, 114a, and 133a are approximately equivalent concerning pressures, coefficients of performance, and swept volumes at condensing temperatures of the magnitude 100 C. For large capacities the specific first cost; including evaporators, condensers, compressors, motors, control equipment, etc.; for a well-designed water-to-water system is expected to be about $75/kW heating capacity under certain conditions. (Author)

A79-51966 **Technology impact study of a high efficiency industrial heat pump.** D. Sullivan (Hittman Associates, Inc., Columbia, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1725-1729. 6 refs. Contract No. EM-78-C-01-4127.

The objective of this study is to determine the economic feasibility, energy conservation potential, and environmental impact of a high efficiency industrial heat pump. The heat pump produces low pressure steam by extracting energy from an industrial waste heat stream. It consists of a compressor section which produces steam, and an organic Rankine cycle heat engine which extracts power for the system's operation directly from the waste heat stream. The system was found to be economically and technically feasible (under certain conditions), have no detrimental environmental or material impact, and it has the potential for saving up to 3 to 4 percent of industrial energy use. (Author)

A79-51967 **Storage assisted heat pumps using phase change materials.** G. R. Frysinger (Delaware, University, Newark, Del.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1730-1733.

Both the cooling and heating modes of storage-assisted heat pumps using phase-change materials are discussed as to proper transition temperatures for phase change materials and the application of thermal energy storage to residental air handling systems. Consideration is given to the following aspects of heat pump system performance: (1) the use of in-line thermal-energy storage materials to modify supply/demand time differentials (2) storage-assisted heat pumps in the cooling mode as a summerload management system, (3) the use of storage-assisted heat pumps in the heating mode as a winter-load management technique, and (4) energy efficiency considerations of heat-pump operation with storage. V.T.

A79-51968 **Waste heat as an alternate fuel - Its opportunities and potential.** W. F. Adolfson (Booz, Allen and Hamilton, Inc., Bethesda, Md.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1734-1736. 8 refs.

Recovery of waste heat for further electrical generation, industrial process heat, or space conditioning is discussed. In the near term, waste heat utilization technology and concepts include advanced heat exchangers, congeneration, heat pumps, and integrated community energy systems. Longer term technology development could make new bottoming cycle systems, thermionic topping cycles, and low-temperature heat engine concepts commercially acceptable. New technology theoretically could save 17 to 25 percent of domestic energy consumption after 1985. V.T.

A79-51969 **The energy reformation.** A. J. Cirrito (Lowell, University, Lowell, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1758-1761. 11 refs.

Future strategies for producing and distributing domestic and industrial heat and electricity are proposed, emphasizing the necessity of conserving all available and heat energy. Smaller, well dispersed power plants incorporating advanced technology and combined with sewage disposal facilities are discussed as means for controlling pollution and utilizing all available energy and heat generated by fuel combustion. It is suggested that the gain in available energy achieved by combined cycle power plants be used for the transfer of generated heat to fluids involved in domestic and process heating, and a gas turbine heating unit is also proposed as a source of high-pressure gases for heat transfer and utilization. In addition, the necessity of federal support to overcome the short-term economic losses involved in the development and implementation of energy-conserving technology is stressed. A.L.W.

A79-51970 **The concept of available work as applied to the conservation of fuel resources.** E. E. Michaelides (Brown University, Providence, R.I.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1762-1766. 15 refs.

The purpose of this paper is to analyze the transformations of energy occurring in everyday life in the light of the concept of available work. The utilization factor, based on available work, is then defined and the general problem of fuel savings is schematized in the following form: given a societal task, choose the best alternative process and apply it, with the purpose of minimizing the available work lost, in order to complete the task. (Author)

A79-51971 **Energy research and development at the Canada Centre for Mineral and Energy Technology /CANMET/.** G. Taylor (Department of Energy, Mines and Resources, Canada Centre for Mineral and Energy Technology, Ottawa, Canada). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1788-1792.

The Canada Centre for Mineral and Energy Technology (CANMET), a research and development arm of the federal Department of Energy, Mines and Resources, has a total staff over 700, including 270 scientists and engineers. The research program, which is administered by a matrix management system, is split about equally between energy and minerals, and is a blend of in-house projects, contract research and joint projects. This paper outlines the energy research program, how it is planned, and how it fits in with Canadian national and regional priorities. Selected highlights are described in coal mining, preparation and conversion; cokemaking; combustion technology; oil sands; renewable and nuclear energy; materials; energy storage and transportation; and technical information. (Author)

A79-51972 **Novel approaches to industrial energy conservation in Georgia.** J. D. Muzzy and J. T. Sommerfeld (Georgia Institute of Technology, Atlanta, Ga.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1793-1798. Research supported by the Georgia Office of Energy Resources and U.S. Department of Energy.

The operation of the Georgia Industrial Energy Extension Service (IEES) is described, and IEES case studies involving novel approaches to industrial energy conservation are presented. IEES serves as a vehicle of energy conservation technology transfer, conducting plant surveys in the general industrial sector and making recommendations on the ways surveyed plants and similar operations can conserve energy. Approaches suggested by the IEES include the upgrading of low-level waste heat by means of a thermal compressor, the operation of an absorption chiller with dirty boiler exhaust steam, the use of vacuum slots in textile drying, the use of waste sawdust for steam generation, the use of liquified process gases in refrigeration and air conditioning and the development of waste heat or solar-powered refrigeration systems. A.L.W.

A79-51973 **Reference Energy Systems as applied to regional energy policy.** A. L. Hermelee (Brookhaven National Laboratory, Upton, N.Y.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1799-1803. 6 refs.

The energy supply and demand projection methodology of the national-scale Reference Energy System is reformulated for regional energy policy. Residential, commercial, industrial and transportation energy consumption is estimated for a base year and projected for the period between 1985 and 2000 for the regions serviced by the Tennessee Valley Authority and the New York Power Pool. The present and future relative roles of nuclear power, coal, oil, gas and hydropower in supplying energy demand are also assessed. A.L.W.

A79-51974 **Feasibility of energy self sufficiency through decentralized use of renewable resources in Iran.** M. Sanai (Arya Mehr University of Technology, Teheran, Iran). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1804-1808.

The potential of renewable resources to ensure the future energy self-sufficiency in Iran is assessed. End-use demands for various types of energy in the residential and commercial, agriculture, transport and industrial sectors are estimated for the year 2025 on the basis of 1975 actual data and observed trends for previous years. Energy supplies based on a centralized system of petroleum, natural gas, solid fuel, nuclear and hydroelectric power and on a decentralized system of nuclear, hydroelectric, solar, biomass and wind energy are compared for the two years. It is concluded that Iran has a sufficient amount of indigenous renewable resources to meet energy requirements for further growth even after the depletion of fossil fuel supplies, however strategies should be developed well in advance to ensure a smooth transition. A.L.W.

A79-51975 **Experimental demonstration of heat-to-electricity conversion within a dielectric.** J. E. Drummond, V. Fargo, J. Ream, J. M. Briscoe, and D. Brown (Power Conversion Technology, Inc., San Diego, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1819-1824. Research supported by the U.S. Department of Energy.

The conversion of heat to electricity by means of a single-stage Solid State Heat Engine (SSHE) based on a dielectric is reported. In the SSHE, the electro-caloric effect in a ferroelectric is used in an electrical Carnot cycle to produce electrical oscillations with the addition and extraction of heat pulses by vapor condensation and evaporation in a heat pipe. Several thousand cycles of heat engine operation were found to be accompanied by a power generation of 20 mW, corresponding to an efficiency 80 to 90% of that calculated. Improvements in efficiency, power output and temperature-entropy diagram are expected with the development of computer control and diagnostics and better dielectrics, and multi-stage devvices. A.L.W.

A79-51976 # **Solar thermoelectric energy conversion.** D. K. Benson and T. S. Jayadev (Solar Energy Research Institute, Golden, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1825-1829. 17 refs. Contract No. EG-77-C-01-4042.

The use of thermoelectric energy conversion for solar applications is reexamined in the light of recent improvements in thermoelectric materials and the possible coupling to economical solar collectors. Solar thermoelectric energy conversion is shown to have several technical and possible economic advantages in applications which make use of low cost solar collectors with inherent thermal storage such as solar ponds and ocean thermal gradients. The technical advantages include system simplicity, modularity, mass-producibility, long-life, high reliability, and low maintenance requirements. Correlary economic advantages include the potential low cost of mass-production, low fixed charge rate (assuming long-term depreciation), high availability factor, and low operation and maintenance costs. Two particular applications are discussed - an agricultural irrigation system using a solar pond collector and thermoelectric powered pump, and a large, base load ocean thermal energy conversion system using thermoelectric converters. Preliminary cost estimates indicate that such applications may be economical. (Author)

A79-51977 **Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power.** M. H. Cobble and E. F. Thacher (New Mexico State University, Las Cruces, N. Mex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1831-1834.

A cassegrain solar collector is analyzed to determine the concentration, and augmented concentration. Experimental results of the concentration are shown graphically and compared to the theoretical concentration for a special design. The efficiency of a thermoelectric module is developed when there are convection and radiation losses to the surroundings at the hot plate. The concentration is also shown as a function of the hot plate temperature. (Author)

A79-51978 **Analysis of a heat exchanger - Thermoelectric generator system.** J. Henderson (Solar Energy Research Institute, Golden, Colo.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1835-1840.

Analysis of a thermoelectric generator (TEG) in an ocean thermal energy conversion (OTEC) application is presented. An analytic model is developed for describing the heat exchanger-TEG interactions. This model is used to illustrate limitations of applying conventional fixed junction temperature assumptions to systems experiencing significant temperature drops across the heat exchanger surfaces. Design methods are developed for determining the thermoelectric element geometry that produces maximum output power. Results show that a heat exchanger-TEG system may deliver about 100 W/sq m of heat exchanger surface. This compares favorably with conventional OTEC schemes. (Author)

A79-51979 **Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator.** J. C. Bass, S. Cheng, N. B. Elsner, and H. G. Staley (General Atomic Co., San Diego, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1841-1846.

A description of the shock and vibration test program conducted to qualify MB-M75(A) radioisotope powered thermoelectric generators for field use and the results of those tests are presented. Also included is a synopsis of the structural analysis which preceeded the tests. (Author)

A79-51980 **Effective application of thermoelectric heat pumps.** R. J. Buist (Marlow Industries, Inc., Garland, Tex.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1850-1853.

A new system to design, select, optimize, and analyze single-stage thermoelectric heat pumps for cooling applications in the 150 to 400 K range is presented. This method was devised by computer analysis of thermoelectric theory and empirically derived normalized parameters from experience in thermoelectric applications. The maximum efficiency and maximum cooling conditions, the voltage and heat pumping capacity of a pump, the heat pump performance at operational conditions, and the optimum efficiency and cooling conditions are discussed. Application of the derived parameters is illustrated by analysis of a thermoelectric heat pump operating at 300 K heat sink with a delta T of 34 C. It is concluded that the guidelines presented should help the user to select and modify heat pumps to maximize their effectiveness. A.T.

A79-51981 * **Thermionic energy converter investigations.** D. B. Goodale, C. Lee, D. Lieb, and P. E. Oettinger (Thermo Electron Corp., Waltham, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1862-1867. 5 refs. Contracts No. JPL-955009; No. EY-76-C-02-3056.

This paper presents evaluation of a variety of thermionic converter configurations to obtain improved efficiency. A variable-spacing diode using an iridium emitter gave emission properties comparable to platinum, but the power output from a sintered LaB6 collector diode was not consistent with its work function. Reflectivities above 0.5 were measured at thermal energies on oxygenated-cesiated surfaces using a field emission retarding potential gun. Performance of converters with structured electrodes and the characteristics of a pulsed triode were studied as a function of emitter, collector, cesium reservoir, interelectrode spacing, xenon pressure, and pulsing parameters. A.T.

A79-51982 **ZEPO - The worlds largest thermionic converter.** L. L. Begg and G. O. Fitzpatrick (Rasor Associates, Inc., Sunnyvale, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1868-1874. 5 refs. Research supported by the U.S. Department of Energy.

The design and testing of the first high current thermionic heat exchanger (THX) and the capabilities of the high current converter test facility (HCCTF) are presented. THX's were shown to increase power plant efficiency up to 50%, or more, when used as topping units, and the first converter in a series of large converters was successfully tested at currents up to 6500 amperes without detrimental effects from magnetic fields. A typical THX module, the thermionic energy conversion process, the HCCTF facility capable of providing large amounts of thermal input power over a wide emitter temperature at high power densities, a gas fired furnace used as the heat source, a jet impingement cooling system used for heat rejection, and the instrumentation system are described. The converter configuration, including the emitter, collector, current-lead region, and igniters, converter fabrication, and testing were discussed. It was concluded that the peak current of 6500 amperes and emitter temperature of 1450 K were limited by furnace operation, and that it was demonstrated that large thermionic converters can be stably operated and easily controlled. A.T.

A79-51983 **Design study of a coal-fired thermionic-topped powerplant using an advanced boiler.** G. Miskolczy (Thermo Electron Corp., Waltham, Mass.) and A. E. Margulies (Stone and Webster Engineering Corp., Boston, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1875-1879. 17 refs. Contract No. EY-76-C-02-3056.

This paper examines the engineering and economic feasibility of a thermionic-topped advanced boiler fired with pulverized coal. The thermionic emitters in an advanced boiler operate at elevated temperatures with resulting high-output power density and efficiency. The advanced coal-fired thermionic-topped system, the configuration of the thermionic boiler and its thermal performance, and plant components, such as the steam-turbine and the air preheater are described. At high operating temperatures, the molten slag runs down boiler walls and collects at the bottom. The efficiency of the thermionic-topped plant operating in the slagging mode was 41% vs 33% for the conventional untopped coal-fired plant, but the efficiency of the thermionic-topped plant using solvent refined coal was estimated to be 47%. It was concluded that an 800 MW coal-fired plant operating in a slagging mode would be economically feasible. A.T.

A79-51985 * **NEP heat pipe radiators.** D. M. Ernst (Thermacore, Inc., Leola, Pa.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1886-1889. Contract No. NAS7-100.

This paper covers improvements of heat pipe radiators for the thermionic NEP design. Liquid metal heat pipes are suitable as spacecraft radiator elements because of high thermal conductance, low mass and reliability, but the NEP thermionic system design was too large and difficult to fabricate. The current integral collector-radiator design consisting of several layers of thermionic converters, the annular-tangential collector heat pipe, the radiator heat pipe, and the transition zone designed to minimize the temperature difference between the collector heat pipe and radiator heat pipe are described. Finally, the design of micrometeoroid armor protection and the fabrication of the stainless steel annular heat pipe with a tangential arm are discussed, and it is concluded that the heat rejection system for the thermionic NEP system is well advanced, but the collector-radiator heat pipe transition and the 8 to 10 m radiator heat pipe with two bends require evaluation. A.T.

A79-51986 * **Recent progress in hybrid mode thermionic converter development.** K. Shimada (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1890-1893. Contract No. NAS7-100.

Thermionic research has been conducted to investigate a hybrid-mode thermionic converter as a candidate for reducing the barrier index. The hybrid-mode thermionic converter is designed to operate in a combination ignited mode and unignited mode by using a series of parallel grooves in the emitter. The emitter material is molybdenum and the non-grooved land area is thinly coated with rhenium metal. When the emitter is exposed to cesium vapor, as it is during the converter operation, the rhenium-coated land area achieves a lower work function than the grooved molybdenum surface by as much as 0.5 eV. The low work function land area provides a major portion of electron emission, and the high work function grooved area provides cesium ions required for efficient transport of electrons generated in adjacent land areas to the collector. Experimental results obtained from two different converters and a numerical analysis of converter characteristics are presented in this paper. (Author)

A79-51988 **Flame-fired thermionic diode development.** F. N. Huffman, B. Gunther, and G. Miskolczy (Thermo Electron Corp., Waltham, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1899-1903. 7 refs. Contract No. EY-76-C-02-3056.

The construction and testing of combustion-heated thermionic diodes using a hot shell made of available materials to protect the converter are presented. The combustion diode development to flame-heated converters with fixed spacing, the quarter-scale devices for evaluation of electrode materials and configurations, prototypic designs using Inconel 671 and ceramic-to-metal seal geometry, and the cesium-graphite reservoir, which provides the optimum cesium pressure in the converter at the operating temperature of the collector are described. It was found that: (1) the output power densities of present thermionic-diodes, operated with the temperature limitations of alloy hot shell materials are less than 1.0 W/sq cm; (2) the output characteristics of the flame-heated thermionic converters correlate with electron-bombardment-heated research diodes; and (3) Inconel 671 can be used as a hot shell up to 1450 K for 2000 hr. It was concluded that the feasibility of a thermionic converter with a cesium-graphite reservoir was demonstrated at conditions corresponding to topping a central station powerplant. A.T.

A79-51989 **State of cermet electrode development for flame heated thermionic converters.** M. von Bradke and R. Henne (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Technische Physik, Stuttgart, West Germany). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1904-1907. 5 refs.

Development of new types of cermet electrodes made of ZrO2 and molybdenum or tungsten for flame heated thermionic converters is presented. The fabrication of these electrodes by sintering can be optimized to obtain densities up to 92%. Thermionic emission measurements showed somewhat lower emission current maxima and also lower values of minimum work function down to 1.2 eV, indicating their applicability for collector application. Tests of flame heated thermionic diodes equipped with emitters of this new material showed a considerable high emission current density of more than 20 A/sq cm at 1200 C, but also a low output voltage indicating a low emitter function at operating conditions. It was concluded that further optimization of electrode composition and operating conditions is required to improve output power and efficiency. A.T.

A79-51990 **The effects of electron thermal conductivity on thermionic energy converters.** S. H. Lam (Princeton University, Princeton, N.J.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1908-1911. Contract No. AT(11-1)2533.

The present work presents an analytical theory focusing on the electron energy equation. It is shown that the ratio of electron thermal conductivity to the electron mobility (properly non-dimensionalized) is an important parameter. When this parameter is large, the theory reduces to the well-known isothermal theory. When this parameter assumes physically reasonable values, the theory indicates that a different physical mechanism is controlling the magnitude of the plasma arc-drop, and generally degrades the converter performance from that predicted by the isothermal theory. Even though the basic development assumes a steady state and a one-dimensional model, but because of the analytical nature of the present theory, reasonable generalizations and extrapolations can be made. Implications of the present results to current arc-drop reduction schemes will be discussed. (Author)

A79-51991 # **Open-cycle coal-fired liquid-metal MHD.** E. S. Pierson, M. Petrick, F. Schreiner, D. Cohen, and R. S. Smith (Argonne National Laboratory, Argonne, Ill.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1912-1917. 7 refs. Contract No. W-31-109-eng-38.

Open-cycle, coal-fired, liquid-metal MHD is described and compared with the open-cycle plasma MHD cycle, and it is shown that, in the former, temperatures are much lower and an air preheater and radiant boiler are eliminated. The constraints on electrodynamic working fluid and the choice of copper are discussed. Initial efficiency calculations yield values comparable to those for open-cycle plasma MHD at combustor temperatures more than 1000 K lower and MHD generator temperatures more than 1000 K lower than is the case for open-cycle plasma MHD. It is noted that liquid-metal MHD systems can use components that, except for the generator, are close to or within present-day technology. V.T.

A79-51992 **Considerations for adapting an MHD baseload power plant for intermediate and peaking duty.** W. R. Owens, V. B. Mantri, N. T. Truncellito (Gilbert/Commonwealth, Reading, Pa.), and J. J. Lynch (U.S. Department of Energy, MHD Div., Washington, D.C.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1918-1922. 11 refs.

The paper studies potential modifications to a commercial MHD topping/steam bottoming baseload coal-fired power plant which permit intermediate and peaking multiduty capability. These modifications are attained by increasing the power output of a baseload plant through operation at less than optimum baseload economic conditions. The output power of an MHD baseload plant can be increased by: using oxygen enriched combustion air, increasing the combustion air preheat temperature, or increasing the seed flow. Of these three options, oxygen enrichment offers the greatest potential for intermediate duty operation. Because the temperature of the combustion gas changes considerably with oxygen enrichment, finite temperature ramps have to be designed into the control system to prevent thermal shocks to the system. V.T.

A79-51993 **Environmental assessment of a coal-fired open-cycle MHD power plant.** C. D. Kalfadelis, D. W. Blair, H. Shaw (Exxon Research and Engineering Co., Linden, N.J.), B. A. Folsom, and T. L. Corley (Energy and Environmental Research Corp., Irvine, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1923-1930. 17 refs.

The environmental effects of a conceptual open-cycle MHD power plant fueled with Illinois No. 6 bituminous coal are evaluated. Equilibrium combustion gas properties are calculated in the various components of the plant, and kinetic calculations are made for NOx production. Both NOx and particulate emissions are found to meet the New Source Performance Standard (NSPS) for large power plants. The quantity of stack gas sulfur emissions is estimated for two cases. The potential sulfur emissions for a seed regeneration case are below the current NSPS. The second case assumes that once-through fuel-gas desulfurization is used for SOx control and that K2SO4 is recycled as seed. The fuel-gas desulfurization case met the current standard using a limestone scrubber that removes 80% of the sulfur entering with the coal. V.T.

A79-51994 **Operability and materials testing for MHD air heaters.** D. F. Saari, R. R. Smyth, C. J. Kniebel, and L. R. White (Fluidyne Engineering Corp., Minneapolis, Minn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1931-1938. 14 refs. Contract No. ET-78-C-01-3005.

The experimental program and test facilities for MHD heater development are described. Significant results with respect to heater operability and materials performance are shown. Stable air heater operation and removal of seed/slag deposits have been demonstrated in a test facility. Fusion cast magnesia-spinel has been identified as a candidate material for full-scale air heaters and is now being subjected to long term evaluation. (Author)

A79-51995 * # **Performance optimization of an MHD generator with physical constraints.** C. C. P. Pian, G. R. Seikel, and J. M. Smith (NASA, Lewis Research Center, Cleveland, Ohio). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1939-1944. 7 refs.

A technique has been described which optimizes the power out of a Faraday MHD generator operating under a prescribed set of electrical and magnetic constraints. The method does not rely on complicated numerical optimization techniques. Instead the magnetic field and the electrical loading are adjusted at each streamwise location such that the resultant generator design operates at the most limiting of the cited stress levels. The simplicity of the procedure makes it ideal for optimizing generator designs for system analysis studies of power plants. The resultant locally optimum channel designs are, however, not necessarily the global optimum designs. The results of generator performance calculations are presented for an approximately 2000 MWe size plant. The difference between the maximum power generator design and the optimal design which maximizes net MHD power are described. The sensitivity of the generator performance to the various operational parameters are also presented. (Author)

A79-51996 **Ball screw type wave power generator.** K.-I. Ohmata and H. Shimoda (Meiji University, Kawasaki, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1946-1951. 7 refs.

To obtain an even flow of electric power form fluctuating wave energy, the authors devised a ball screw type wave power generator (BSTWPG) which consists of a pressure plate, ball screws and nuts, one-way clutches, flywheels and generators. The equations of motion of the BSTWPG system are shown and the digital simulation using Continuous System Simulation Language is developed on the assumption that the wave force is sinusoidal. The experimental model is composed of a ball screw of outside diameter 22 mm and a flywheel having moment of inertia of 2.5 kgf sq s cm. When this model was subjected to the sinusoidal motion of amplitude 17 mm and frequency 0.7 Hz by a vibration table, six 6 volts - 6 watts bulbs were lighted up. In this case, the rotating speed of the flywheel changed within the range of 490-590 rpm. (Author)

A79-51997 **Feasibility and economics of salinity power using Osmo-Hydro Power.** G. D. Mehta, S. Loeb, and M. D. Fraser (InterTechnology/Solar Corp., Warrenton, Va.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2.
Washington, D.C., American Chemical Society, 1979, p. 1952-1957. 8 refs. Contracts No. EG-77-G-01-4066; No. EG-77-C-05-5560.

The technical feasibility and economic performance of salinity power using Osmo-Hydro Power (OHP) systems are studied. The results of two projects are reported which were completed for the DOE. Under one project, laboratory experiments were done to investigate the technical feasibility of such a system. The second project was concerned with the performance and economics of OHP systems utilizing various sources of salt and water. The cost of electricity produced by a 1 MW OPH system is estimated to be about $0.33/kWh. Desired characteristics of the pressure-retarded osmosis membrane used in the system and different configurations of an OHP system are discussed. V.T.

A79-51998 **Temperature profile and power calculations in gas core reactors.** C. B. W. Kerkdijk and J. Kistemaker (Stichting voor Fundamenteel Onderzoek der Materie, Instituut voor Atoom- en Molecuulfysica, Amsterdam, Netherlands). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1958-1961. 6 refs.

This paper deals with the calculation of the temperature profile and the power of a gas core reactor. Starting with the continuity equation and the equation for the radiative energy transport and the thermal heat conduction, a simple differential equation is obtained. The Uniform Density Diffusion Model (UDDM) is introduced which enables a first order estimate of the temperature and the power of a gas core reactor. The results of this model are in good agreement with calculations of Stoenescu. (Author)

A79-51999 # **Performance characteristics of a type of electrohydrodynamic generator.** T. H. Gawain and O. Biblarz (U.S. Naval Postgraduate School, Monterey, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1962-1967. 7 refs.

An electrohydrodynamic power generator which employs an ejector and a so-called 'fluid flywheel' is analyzed. The medium is steam containing charged water droplets. Account is taken of the empirical fact that the maximum electrical field strength that can be sustained is proportional to the fluid density. It is shown, therefore, that the electrical output can be maximized by designing the primary jet for an exit Mach number of 0.71. Estimates are made of the pump work required, of mixing losses in the ejector and of friction and secondary flow losses. Key dimensionless parameters that govern performance are clearly identified. Overall performance of the system is estimated and, unfortunately, pessimistic results are obtained. They indicate that even at 100 atmospheres, the power output is so limited that it is probably insufficient to cover the demand for pump power and to overcome the various losses involved. A hopeful note is that the analysis so clearly pinpoints the problem that it might suggest the means for surmounting it. (Author)

A79-52000 **Increasing gas turbine efficiency through the use of a waste heat methanol reactor.** C. W. Janes (California Energy Commission, Sacramento, Calif.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1968-1972. 6 refs.

The paper discusses generating of additional power from the exhaust heat of a gas turbine through the use of a waste-heat methanol reactor. With the advent of methanol as an available turbine fuel, waste heat can be recuperated as chemical energy by means of endothermic reactions and redeemed as high grade thermal energy in a combustor. The modification of a simple-cycle gas turbine by the addition of a catalytic waste-heat methanol reformer shows the 23% decrease in fuel cost. An overall coal-to-methanol-to-electricity conversion efficiency of 42% in the near term appears attainable. V.T.

A79-52002 **The energy exchanger in advanced power cycle systems.** J. F. Zumdieck, W. J. Thayer, P. E. Cassady, R. T. Taussig (Mathematical Sciences Northwest, Inc., Bellevue, Wash.), W. H. Christiansen, and A. Hertzberg (Washington, University, Seattle, Wash.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1979-1984. 6 refs. Contract No. ER-78-C-06-1034.

Energy exchanger technology becomes more complex as the pressure and temperature ratios over which they operate increase. The paper analyzes an energy exchanger applied to an advanced power cycle system. A configuration is selected which allows direct comparison with high-temperature turbine systems currently under development for the same application. A description of experiments currently in progress to substantiate the relevant scaling laws is also presented. The results indicate that the energy exchanger represents an alternative to the difficult development of high-temperature turbine blade technology. S.D.

A79-52005 **Development of CDE /Concentration Difference Energy/ system and engine.** N. Isshiki, M. Takeuchi (Tokyo Institute of Technology, Tokyo, Japan), I. Nikai (Ishikawajima-Harima Heavy Industries Co., Ltd., Yokohama, Japan), J. Kamoshida (Shibaura Institute of Technology, Omiya, Japan), and T. Akuta (Nippon Steel Corp., Tokyo, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 1998-2003.

In this paper, the recent developments of the CDE (Concentration Difference Energy) system and engine are reported. This system offers a kind of general method of energy conversion, storage and utilization of thermal and mechanical energy of alternative resources such as solar, oceanic heat and wind power using cyclic change of concentration of solvent in any solutions. An aqueous solution of $CaCl_2$ + LiCl is selected as the most suitable solution, and a nickel-copper alloy of low nickel content is selected to be the best anti-corrosive material. A manned tri-wheel CDE car is driven for more than 15 minutes, and an experimental 1 kW CDE engine is successfully tested. Future application of this CDE system, including power recovery from industrial waste heat and power generation from saline energy resources, are also proposed. (Author)

A79-52006 **Electromagnetic launchers.** H. Kolm, K. Fine, P. Mongeau, and F. Williams (MIT, Cambridge, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2004-2012. 27 refs. Grant No. DAAG29-78-G-0147.

The paper summarizes the preliminary results of a cooperative effort aimed at providing national coordination for a new project of applying pulsed electric power to a variety of propulsion tasks. The state of the art of energy storage for gun and launch applications is surveyed. A novel system is described which is the momentum transformer that transfers momentum from a massive chemically propelled armature to a much lighter, higher-velocity projectile by magnetic flux compression. Potential applications are briefly outlined. S.D.

A79-52007 **R and D on Rankine cycle engines in Japan.** N. Isshiki (Tokyo Institute of Technology, Tokyo, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2017-2022. 5 refs.

This report describes R&D in Japan on power recovery from industrial waste heat and other alternative energy resources as geothermal and solar heat, with studies and experiments on the utilization of organic Rankine cycle engines reported on in detail. In Japan, many governmental and private R&D projects are underway for new energy techniques such as the 'Sunshine Project', the 'Moonlight Project', and JSME's similar study project. The organic Rankine cycle is thought to be one of the most important and promising methods for power generation from low density thermal energy resources, and much effort has been made in its development. (Author)

A79-52008 **R & D on advanced heat exchangers in Japan.** I. Tanasawa (Tokyo, University, Tokyo, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2023-2027. 14 refs.

A state-of-the-art review is presented for the R&D of heat exchangers in Japan, with special emphasis on devices designed for effective thermal-energy use. A description is given of high-efficiency heat transfer surfaces which are essential to the improvement of heat exchangers. Porous metal surfaces, microstructural surfaces, and several types of finned surfaces are considered. Some examples of advanced heat exchangers in Japan are provided. S.D.

A79-52009 **Research and development on ocean thermal energy conversion in Japan.** H. Uehara (Saga University, Saga, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2028-2034. 9 refs.

In this paper, review of OTEC R&D activity in Japan and proposal of OTEC R&D program is made. In Japan, a feasibility study on OTEC power plant has been conducted under the leadership of a team of 'Sunshine Project', a national new energy development project promoted by the Ministry of International Trade and Industries (MITI) since 1974. OTEC Committee carries out the studies on the key problems of OTEC plant: working fluid, heat exchangers, turbines, platform, cold water pipe and assessment of environmental effects. Conceptual design and economical evaluation on a 100 MWe OTEC commercial scale power plant have been carried out and the results obtained there show electric generating cost is comparable to conventional power cost. Tests on the characteristics of OTEC power system have been conducted by ETL of MITI and Saga University. (Author)

A79-52010 **Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system.** M. Hirata (Tokyo, University, Tokyo, Japan). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2039-2044. 5 refs.

The paper outlines the government-sponsored Moon-Light Project, with particular reference to the development of a community cogenerating energy system which integrates a high-temperature gas turbine-steam turbine combined cycle plant. This combined cycle engine makes it possible to utilize heat throughout a wide range of temperatures, from the exhaust gas of the gas turbine (above 600 C) to steam or hot water. It is possible to utilize this high-temperature exhaust gas for preheating or thermal decomposition of urban refuse, and the steam or hot water is used for the heat sources of industrial processes or district heating and cooling. This combined cycle engine is expected to become the core plant of the so-called Community Energy System (CES). Examples of CES design are given. S.D.

A79-52012 **Wind tunnel tests of a 1/30 scale model of a 3.5 megawatt wind turbine.** H. S. Wainauski (Hamilton Standard, Windsor Locks, Conn.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2050-2058. 7 refs.

Results are presented for wind tunnel tests of a 1/30 scale model of a 3.5-MW wind turbine (wind energy conversion system). The model measures 2.44 m in diameter, with two aluminum blades of 37.5 activity factor. The effects of scale, blade surface roughness, blade inboard planform, and airfoil modifications are assessed. The results indicate that the measured performance of the model wind turbine, adjusted for scale effects, is within 1% of the predicted performance of the full-scale wind turbine when compared on an annual energy output basis for the 3.5 MW rating. Valuable photographs of the trailing wake are obtained to provide a basis for an improved analytical model to the wind turbine aerodynamic method. S.D.

A79-52013 **The zinc-chlorine battery in the BEST facility 1981.** C. C. Whittlesey, P. C. Symons, C. J. Warde, and B. D. Brummet (Energy Development Associates, Madison Heights, Mich.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2059-2064. 5 refs. Research supported by the U.S. Department of Energy and Electric Power Research Institute.

The paper outlines the specifications, design and operation of a 5-MWh zinc-chlorine hydrate battery system, to be placed in the battery energy storage test (BEST) facility by mid-1981. The preliminary design makes use of 100 battery modules (arranged in five racks), each delivering 52 kWh at an electrochemical energy efficiency of 65%. A refrigeration subsystem that allows chlorine hydrate formation during charge, and a hierarchical controller complete the battery system. A successful test at the BEST facility will result in commissioning a 100-MWh zinc-chlorine hydrate demonstration plant within the 1982-1984 period. S.D.

A79-52014 **Solar refrigeration utilizing zeolites.** D. I. Tchernev (Zeopower Co., Natick, Mass.). In: Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volume 2. Washington, D.C., American Chemical Society, 1979, p. 2070-2073.

Zeolites offer a unique opportunity for a solid-gas adsorption refrigeration system because of their unusual sorption properties, in particular, extremely nonlinear adsorption isotherms. The operating principle of the zeolite system and experimental results are presented. The study demonstrates a zeolite system capable of providing refrigeration and ice production with very good engineering efficiency. This system utilizes natural zeolites as the solid adsorber and water vapor as the working fluid, to produce on a sunny day two pounds of ice per each square of solar zeolite collector. S.D.

A79-52026 **Electrogenerative and voltameiotic processes.** S. H. Langer and G. P. Sakellaropoulos (Wisconsin, University, Madison, Wis.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development,* vol. 18, Oct. 1979, p. 567-579. 119 refs. Research supported by the Du Pont de Nemours and Co., Union Carbide Corp., Atlantic Richfield Co., University of Wisconsin, and NSF.

Electrogenerative processes are explained and reviewed and compared with conventional electrochemical and heterogeneous catalytic processes. These processes exploit favorable reaction thermodynamics to recover byproduct electric energy while a useful chemical is produced. Factors and considerations involved in the design and operation of electrogenerative reactors are also discussed. Electrochemical operation often is extended to previously unexplored electrochemical potential regions and selectivity may be altered. Ready control of reaction rate with the removal of energy, in a useful form, and creation of favorable reaction conditions make the electrogenerative mode attractive for some highly exothermic reactions. Related voltameiotic processes for endothermic changes also are defined and their advantages explained and illustrated. (Author)

A79-52027 # **Evaluation of use of syngas for coal liquefaction.** R. F. Batchelder and Y. C. Fu (U.S. Department of Energy, Pittsburgh Energy Technology Center, Pittsburgh, Pa.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development,* vol. 18, Oct. 1979, p. 594-599. 8 refs.

Coal liquefaction processes by direct catalytic liquefaction or extractive hydrogenation could benefit economically by using syngas in place of hydrogen. Data are presented to show that the hydrotreating of bituminous coal using syngas and steam with CoMo-K2CO3 catalyst gave product oil similar to that obtained from the hydrotreating using H2 and Co-Mo catalyst. A comparative process evaluation has been made for the direct catalytic liquefaction of coal using H2 and syngas. Summaries of mass balance, energy balance, and cost estimation are presented. The use of syngas reduces the capital and operating costs by eliminating shift convertors and gas purifying systems and thus could reduce the process cost of SYNTHOIL and H-coal by about 14%. The process economics could be further improved by the use of a high-pressure coal gasification process for the syngas production.

(Author)

A79-52028 **Entrainment coal gasification modeling.** C. Y. Wen and T. Z. Chaung (West Virginia University, Morgantown, W. Va.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development*, vol. 18, Oct. 1979, p. 684-695. 26 refs. Contract No. E(49-18)-2274.

A mathematical model is developed to simulate the Texaco downflow entrainment pilot plant gasifier using coal liquefaction residues and coal-water slurries as feedstocks. The entrainment gasifier was conceptually divided into three zones: the pyrolysis and volatile combustion zone, the gasification and combustion zone, and the gasification zone. Temperature and concentration profiles along the reactor were obtained by solving the material and energy balances and taking into consideration the gasification kinetics, the transport rates, and the hydrodynamics of the gasifier. The results of computation from the proposed model were compared with the experimental data. Sensitivity of the parameters used in the model was tested and optimum operating conditions were searched to provide a better understanding of the performance under various operating conditions utilizing the model.

(Author)

A79-52150 **Spectrally selective solar absorber coatings.** M. G. Hutchins (University College, Cardiff, Wales). *Applied Energy*, vol. 5, Oct. 1979, p. 251-262. 21 refs.

The paper presents a review of the physical processes responsible for spectral selectivity in solar absorber coatings. It is noted that solar absorber coatings may be categorized as either selective, solar absorptance high, thermal emittance low, or as nonselective, solar absorptance high and thermal emittance high. It is shown that the physical processes which contribute to the absorptance and emittance properties of thin-film coatings are complex and in most finishes selectivity is a result of two or more of these processes acting in tandem. Examples of common coatings are surveyed and the durability requirements of coatings are assessed and a summary of techniques of surface analysis is given.

M.E.P.

A79-52166 # **A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers (Istochnik parov tseziia na osnove gazoreguliruemoi teplovoi truby dlia termoemissionnykh preobrazovatelei energii).** I. G. Gverdtsiteli, A. G. Kalandarishvili, and P. D. Chilingarishvili. *Zhurnal Tekhnicheskoi Fiziki*, vol. 49, Aug. 1979, p. 1764, 1765. 7 refs. In Russian.

A79-52167 # **Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector (Nekotorye rezul'taty eksperimental'nogo issledovaniia nizkotemperaturnogo TEP s razvitym kollektorom).** I. G. Gverdtsiteli, N. E. Menabde, V. K. Tskhakaia, and L. M. Tsakadze. *Zhurnal Tekhnicheskoi Fiziki*, vol. 49, Aug. 1979, p. 1766, 1767. In Russian.

A79-52307 **Coatings for enhanced photothermal energy collection. I - Selective absorbers.** C. M. Lampert (California, University, Berkeley, Calif.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 319-341. 65 refs. Research supported by the U.S. Department of Energy.

For economical and efficient utilization of solar energy various types of absorber coatings and preparations can be used for solar collectors. In this study several varieties of commerical and research selective absorbers are reviewed and tabulated for application. For many of these coatings, detailed reflectance, emittance and thermal stability data are presented. Selective coatings can take advantage of various optical absorption methods including light trapping, particulate coatings, semiconductor-metallic layers, multilayer films, quantum size effects and intrinsic absorption. The results of this study revealed many promising low temperature (150-300 C) absorber coatings along with a few highly engineered coatings which can withstand temperatures above 500 C.

(Author)

A79-52308 **Materials aspects of photo-electrochemical systems.** D. Cahen, J. Manassen, and G. Hodes (Weizmann Institute of Science, Rehovot, Israel). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 343-355. 26 refs. Research supported by the U.S.-Israel Binational Science Foundation.

This paper discusses materials aspects of photo-electrochemical systems which are common to photovoltaic and electrochemical cells. Photocorrosion occurs which is dependent on the reaction rate between light-generated charge carriers and solution species, and the removal rate of reacted solution species from the electrode surface. Prevention of photocorrosion, the choice of a substrate material, and the materials problems of the counter electrode and the photo-electrochemical storage cell are discussed. When chemicals are produced, the energy difference between the bandgap of the semiconductor and the photopotential obtained can be used to overcome overpotentials, which is of special importance for photodiodes. It is concluded that while the combination of energy production, energy storage, and the production of chemicals into one device creates technical problems, it may be more economical as has been shown for similar cases in chemical technology.

A.T.

A79-52309 **CVD molybdenum thin films in photothermal solar converters.** G. E. Carver (Arizona, University, Tucson, Ariz.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 357-367. 17 refs. Contract No. EY-76-S-04-3709.

Molybdenum thin films deposited by pyrolytic decomposition of molybdenum carbonyl attain, after anneal in a reducing atmosphere at 1000 C, infrared reflectance values within 0.7% of the reflectance of supersmooth bulk molybdenum. This result combines the refractory nature of molybdenum with the high infrared reflectance generally associated with conventional mirror materials. The entire production sequence proceeds at one atmosphere pressure and requires less than one hour. Films deposited under oxidizing conditions exhibit a solar absorptance of a = 0.77 and a thermal emittance of e = 0.44. Absorptances of a = 0.82 with e = 0.08 are obtained by first annealing and then overcoating these black molybdenum films with an antireflecting layer. Changes in the optical properties during annealing are related to compositional and structural properties of the films, as determined by X-ray diffraction, electron microscopy and Auger spectroscopy.

(Author)

A79-52311 **Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application.** F. Arjona, E. Elizalde, E. García-Camarero, A. Feu, B. Lacal, M. León, J. Llabrés, and F. Rueda (Madrid, Universidad Autónoma, Madrid, Spain). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 379-386. 9 refs. Research supported by the Comisión Asesora Científica y Técnica; NSF Grant No. 01P-75-20264.

A79-52312 **Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon.** M. Janai and B. Karlsson (Arizona, University, Tucson, Ariz.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 387-395. 12 refs. Research supported by the Technion-Israel Institute of Technology; Contract No. ER-78-S-02-4899.

Amorphous silicon films were prepared by the pyrolytic decomposition of silane (CVD). Their optical reflectance and transmittance in the near-infrared and in the visible regions were measured at temperatures between -25 and 500 C. Optical absorption profiles and refractive indices of the films were calculated, and the thermal red shift of the absorption profile was determined. These measurements were repeated following crystallization of the silicon films. The significance of the results for thermal conversion of solar energy with CVD silicon as the absorbing material is discussed.

(Author)

A79-52313 **Inhomogeneous surfaces as selective solar absorbers.** R. B. Stephens and G. D. Cody (Exxon Research and

Engineering Co., Linden, N.J.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 397-410. 28 refs.

The purpose of the present study is threefold: (1) to describe a unified treatment of the optical properties of inhomogeneous surfaces; (2) to use the treatment to generate benchmark optical standards and to compare them to achievable surfaces; and (3) to show how this treatment can then be used to derive criteria for the development of new surfaces. The discussion covers modeling, specular reflectance, diffuse reflectance and total reflectance. It is shown that the optical properties of such surfaces are largely independent of the details of their topologies, and that they can be described with only two parameters - surface depth and correlation length. The calculations provide a new insight into the operation of the currently selective surfaces and define a bench mark against which their performance can be evaluated. S.D.

A79-52314 **A study of oxide-based heterostructure photoelectrodes.** H. P. Maruska and A. K. Ghosh (Exxon Advanced Energy Systems Laboratory, Linden, N.J.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 411-429. 24 refs. Contract No. EG-77-C-02-4271.

A review of the literature of solar-driven water photoelectrolysis cells employing semiconductor electrodes revealed that all devices tested suffered from three major problem areas: corrosion, poor sunlight absorption and external bias requirement. Only certain oxides are stable, but they are not good absorbers of sunlight and require biasing arrangements. The correlation between the external bias requirement and electron affinity of oxides was identified. A series of composite electrodes comprised of a stable wide band gap oxide (TiO2, SrTiO3, Al2O3, SnO2) and a corrosion prone sunlight absorber (CdS, CdSe, ZnTe, Si) were fabricated and tested. Performance of heterostructure electrodes was shown to be limited either by pin hole problems or by potential barriers between the valence bands. These potential barriers can be minimized by using insulating oxide samples, with high work functions, and the photovoltaic properties of insulating SrTiO3 are presented. (Author)

A79-52316 **Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode.** V. Guruswamy and J. O'M. Bockris (Texas A & M University, College Station, Tex.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 441-449. Research supported by the South Australian Energy Committee.

A photo-active anode involving lanthanum chromite has been studied. The electrodes were made by firing lanthanum and chromium oxides, or salts which are converted upon heating to the oxide, in a paste of citric acid on a titanium oxide base. The anodic photo currents obtained were around four times greater than on an TiO2 single crystal in the same potential region on a conventional scale. The photoelectrochemical spectrum showed a pronounced and characteristic peak which differed markedly in wave length region from that on TiO2. The efficiency of conversion of solar light at a LaCrO3-TiO2 electrode is at least one order of magnitude greater than on TiO2. Hence, the situation for photo-assisted electrolysis is improved. In self-generating photo-electrolysis cells in solar light, the expected efficiency of conversion is calculated to be about one order of magnitude more than the hitherto most efficient couple, GaP-TiO2. The efficiency of hydrogen production from solar light is expected to be about 1.8% (up from 0.2175%), but the implication for the use of transition metal oxides for photo anodes is encouraging. (Author)

A79-52317 **Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells.** G. H. Chapman, J. Shewchun, B. K. Garside (McMaster University, Hamilton, Ontario, Canada), J. J. Loferski, and R. Beaulieu (Brown University, Providence, R.I.). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 451-469. 27 refs. Research supported by the National Research Council of Canada; Contract No. EG-77-C-03-1979.

A79-52319 **High absorptivity Al-PbS selective surfaces for solar photothermal conversion.** B. K. Gupta, R. Thangaraj, and O. P. Agnihotri (Indian Institute of Technology, New Delhi, India). *Solar Energy Materials*, vol. 1, June-Aug. 1979, p. 481-487. 6 refs.

Low-cost two-layer Al-PbS selective coatings for solar photothermal conversion have been produced by a chemical deposition process. The Al-PbS coatings are stable at room temperature and have good adhesive properties. When cycled between room temperature and 120 C, the coatings suffer no change in their spectral absorptance. The coatings have high absorptivity in the solar spectral region (0.93) and low emittance in the infrared region (0.21). The selective coatings gave a stagnation temperature of 120 C. Ultraviolet irradiation in air caused oxidation of the sulfide to sulfate. No such effect was seen upon UV treatment in vacuum. Chemically sprayed two-layer Al-PbS provides a low-cost selective coating for solar photothermal conversion. An apparatus for measuring the normal emittance of solar selective coatings and low emittance metallic substrates over the temperature range 25 to 250 C to an accuracy of + or - 0.01 has been described. (Author)

A79-52321 **Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements.** H. T. Weaver and R. D. Nasby (Sandia Laboratories, Albuquerque, N. Mex.). *Solid-State Electronics*, vol. 22, Aug. 1979, p. 687-691. 9 refs. Research supported by the U.S. Department of Energy.

Measurements of the spectral collection efficiency and short circuit current decay rate following an X-ray pulse made on three types of single crystal silicon solar cells are represented. The cell types were n(+)-p, p(+)-n, and p(+)-n-n(+) with base resistivities from 0.3 to 10 ohm-cm. Minority carrier lifetimes were determined using analytical or device code calculations, and for the n(+)-p and p(+)-n cells, nominal lifetimes of 2 and 5 microsec, respectively, were obtained. For the p(+)-n-n(+) device a lifetime greater than 100 microsec was inferred. The difference in base lifetime for the p(+)-n and p(+)-n-n(+) structures is attributed to gettering during phosphorus diffusion to form the back surface field layer. A.T.

A79-52325 * **The potential of np GaAs solar cells for high efficiency concentrator applications.** A. Flat and A. G. Milnes (Carnegie-Mellon University, Pittsburgh, Pa.). *Solid-State Electronics*, vol. 22, Aug. 1979, p. 745-749. 8 refs. Grant No. NGR-39-087-021.

This communication considers the design of the front grid contact of np GaAs solar cells for high efficiency concentrator applications. This design involves shadowing, contact resistance, and active layer sheet resistance losses, and at high concentrations, the power loss due to voltage drop on the resistance of the grid fingers should be considered. Analysis of the performance can be calculated as a function of junction depth and surface recombination velocity. The junction depth can be optimized by considering its effect on the collection efficiency of the dark current-voltage characteristics or the open circuit voltage, and on the series resistance loss or the fill factor for material parameters. The choice of the material parameters, calculation of the short circuit current, the selection of the n layer thickness, and the cell maximum power and efficiency are discussed. It is concluded that optimized multi-grid structures should allow the use of 10 by 10 sq cm cells with good efficiencies at high concentration ratios, and efficiencies of 22 to 25% should be obtainable from large area cells at concentrations of 40 AM1. A.T.

A79-52352 **On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors.** T. D. Beynon and R. Bryant (Birmingham, University, Birmingham, England). *Journal of Physics D - Applied Physics*, vol. 12, Sept. 14, 1979, p. 1453-1462. 13 refs. Research supported by the Science Research Council.

A computational study is made of the effects on various blanket parameters of the neutron moderation produced in the highly compressed deuterium-tritium pellet of an inertially confined thermonuclear reactor based on the Wisconsin SOLASE design. For a pellet in a compressed state of a density radius product of 1.2 g/sq cm, studies are made of the blanket neutron heating, gas production and tritium production. Compared with a monoenergetic 14.1 MeV neutron source, the values of these parameters can change by as much as 15%. (Author)

A79-52368 **Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire.** E. P. Oganov, Iu. F. Kozlov, and T. P. Zorina. *(Teplofizika Vysokikh Temperatur,* vol. 17, Jan.-Feb. 1979, p. 146-151.) *High Temperature,* vol. 17, no. 1, July 1979, p. 123-127. 8 refs. Translation.

The article gives the results of the mathematical modeling of the thermal state of radioisotope thermoelectric generators under emergency fire conditions, using a digital computer. It gives experimental data used to find the overall heat transfer coefficient to the generator with a fire from the solution of the inverse thermal conductivity problem. With application to a radioisotopic generator working on Sr-90, a numerical analysis is given of the nonstationary distribution of the temperature of its elements with the short-time thermal action of a fire, taking account of the internal heat evolution with isotopic decomposition and of thermoelectric effects in the converter. (Author)

A79-52369 **Inhomogeneity of the transverse current in an MHD channel and its effect on the local characteristics of an MHD generator.** V. V. Kirillov (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, Jan.-Feb. 1979, p. 152-162.) *High Temperature,* vol. 17, no. 1, July 1979, p. 128-137. 12 refs. Translation.

The effect on the characteristics of an MHD generator of an inhomogeneity in the transverse current produced by its flowing from the plasma stream to the horizontal walls of the MHD channel is considered. An approximate method for the solution of the three-dimensional problem of the electrodynamics of an MHD channel with allowance for this effect is proposed which provides a technique to calculate the local electrical characteristics of an MHD generator with allowance for inhomogeneities in the velocity and conductivity at the electrode and insulated walls, the surface conductivity of the walls, and the cathode drop of the potential. The calculated characteristics of the MHD generator are compared to the experimental data, and the effect of the surface conductivity of the channel walls on the MHD generator is analyzed in the presence of a substantial inhomogeneity in the plasma conductivity in the boundary layers at the channel walls. A.T.

A79-52371 **Investigation of velocity profiles in an MHD generator channel using combustion products.** N. I. Mazur and M. M. Nekhamin (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, Jan.-Feb. 1979, p. 173-178.) *High Temperature,* vol. 17, no. 1, July 1979, p. 145-149. 8 refs. Translation.

The velocity profiles in the channel of an MHD generator for various electrical conditions and parameters of the working substance is investigated, measured using cooled Pitot tubes. The increase in the fullness of the profile on an insulated wall, due to the action of the magnetic field is discussed. The profile shape and the variation in the boundary layer characteristics along the channel are compared with theory. (Author)

A79-52372 **Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump.** V. A. Krutilin and A. P. Rashchepkin (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, Jan.-Feb. 1979, p. 179-184.) *High Temperature,* vol. 17, no. 1, July 1979, p. 150-154. 6 refs. Translation.

An attempt is made to describe, within the small magnetic Reynolds number approximation, the structure of the electrical eddy currents at a magnetic field inhomogeneity in a looped MHD channel of constant loop pitch, under the assumption of a constant plasma flow rate. The approximate solution is used to analyze the influence of a magnetic field inhomogeneity in the end region of a looped MHD channel with series connected segmented electrodes on the performance of the MHD generator. V.P.

A79-52381 **Nonlinear effects in propagation of lower hybrid waves in a plasma.** A. G. Litvak, A. M. Sergeev, and N. A. Shakhova (Akademiia Nauk SSSR, Institut Prikladnoi Fiziki, Gorki, USSR). *(Pis'ma v Zhurnal Tekhnicheskoi Fiziki,* vol. 5, Jan. 26, 1979, p. 86-90.) *Soviet Technical Physics Letters,* vol. 5, Jan. 1979, p. 33-35. 7 refs. Translation.

Nonlinear effects in three-dimensional quasi-optical electromagnetic beams in a homogeneous plasma are analyzed for the case where the wave frequency is near the lower hybrid frequency. The aberration-free approximation is used to determine the characteristics of nonlinear defocusing. Self-focusing of lower hybrid waves is shown to be fundamentally different from that of waves in an isotropic plasma, with the most important difference being that three-dimensional beams do not collapse. F.G.M.

A79-52536 **Calorimetric emissivities for solar-selective coatings on flat sheet.** G. B. Smith and H. Willrath (New South Wales Institute of Technology, Broadway, Australia). *Journal of Physics E - Scientific Instruments,* vol. 12, Sept. 1979, p. 813, 814. 6 refs. Research supported by the Australian Research Grants Committee.

A calorimeter designed for measuring the hemispherical emissivity of flat sheet, coated on one side only, is described. Prime interest is in solar-selective coatings. A novel technique is used to ensure negligible heat losses from all but the coated surface. Results indicate that for selective coatings hemispherical emissivity is always significantly larger than normal emissivity, as found from spectral reflectance. (Author)

A79-52537 **Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge.** C. Breton, C. De Michelis, M. Finkenthal, and M. Mattioli (EURATOM and Commissariat à l'Energie Atomique sur la Fusion, Département de Physique du Plasma et de la Fusion Contrôlée, Fontenay-aux-Roses, Hauts-de-Seine, France). *Journal of Physics E - Scientific Instruments,* vol. 12, Sept. 1979, p. 894-898. 7 refs.

A79-52538 **Operation of self-excited generators for windmill application.** H. R. Bolton and V. C. Nicodemou (Imperial College of Science and Technology, London, England). *Institution of Electrical Engineers, Proceedings,* vol. 126, Sept. 1979, p. 815-820. 15 refs. Research supported by the Science Research Council of England.

The paper deals with the operation of self-controlled wound-field generators for small-scale wind-power application in which the output is connected to a constant-resistance load and the field is connected in plain shunt or series. It is shown that, with this configuration, a fairly good natural match can be obtained between the power/speed characteristics of the generator and the windmill, particularly when the magnetic circuit of the generator goes fairly hard into saturation at higher speeds and field currents. Test results are included and indicate that an external d.c. source would often be necessary to initiate 'build-up' in a practical system. (Author)

A79-52570 **Resource recovery and recycling.** A. F. M. Barton (Murdoch University, Murdoch, Australia). New York, Wiley-Interscience, 1979. 430 p. 1232 refs. $25.95.

The scientific and technological bases and criteria for resources recycling and energy recovery are reviewed. Attention is given to economic, physical, environmental, technological, energy and social factors influencing the feasibility of recycling materials at various levels and for various secondary uses. Physical methods of separation and recovery, including mechanical, electrical, magnetic, and thermal processes, are discussed and chemical and microbiological means of separation and waste conversion are considered. Postconsumer waste is examined and its treatment is discussed, and recycling processes for industrial and agricultural wastes are presented. Consideration is also given to the thermodynamics of recycling and to recycling by elements, and extensive references permitting access to technical material in the fields of chemistry, chemical engineering, physics and microbiology are compiled. A.L.W.

A79-52572 **Cost study of superheating geothermal steam.** J. M. Hensler, III and R. C. Axtmann (Princeton University, Princeton, N.J.). *Energy* (UK), vol. 4, June 1979, p. 365-371. 18 refs.

This study compares the electrical generating costs for hybrid plans, in which fossil fuel superheats geothermal steam, with those for conventional dual-flash plants. Parameters varied in the analysis include the resource temperature and the geothermal gradient. In order to make the results generally useful, we have made conservative estimates of site-dependent variables. The results indicate that superheating can significantly improve the economic competitiveness of geothermal resources that would normally be considered uneconomical. In addition, superheat will increase total plant outputs markedly and enhance thermal efficiencies by 30-40%. (Author)

A79-52573 **Reducing institutional barriers to solar energy through the use of cooperatively-owned solar energy systems.** M. B. Packer (MIT, Cambridge, Mass.). *Energy* (U.K.), vol. 4, June 1979, p. 383-392. 51 refs.

Despite the conceptual attractiveness of solar energy systems for space-heating applications, the market penetration rate of solar systems remains low. The physical, economic, and institutional barriers to acceptance that cause this disappointing performance are closely related to the present political, social, and economic structure, and so are proving difficult and time-consuming to lower. However, aggregating small solar systems into larger cooperative ventures can avoid many of these barriers altogether. This 'product-fit' approach could greatly increase the diffusion rate of solar energy systems into the economy, thereby replacing fossil-fuel uses sooner and to a greater extent than previously expected. (Author)

A79-52574 **An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling.** M. B. Packer and L. R. Glicksman (MIT, Cambridge, Mass.). *Energy* (U.K.), vol. 4, June 1979, p. 393-399. Research supported by the Massachusetts Institute of Technology.

A79-52575 **Hydroelectric power generation and mineral recovery in the Qattara Depression of Egypt.** J. J. Murray (U.S. Army, Research Office, Research Triangle Park, N.C.). *Energy* (UK), vol. 4, June 1979, p. 463-468. 21 refs.

The Qattara Depression is a naturally formed geological sink hole located in the north central part of Egypt. It covers an expanse of over 19,400 sq km of desert surface and has an average depth of 60.9 m below sea level. Its closest point of access to the Mediterranean Sea is about 64.4 km near El Alamein. From the standpoint of electrical power generation, the Qattara is relatively close to the two principal cities of Egypt: 225 km to Cairo (the capital) and 177 km to Alexandria. Development of tremendous hydroelectric power can be achieved by diverting the Mediterranean Sea water through the intervening region of forty miles (at the Alamein sector) by means of a combination canal/tunnel or channel to the Qattara side of the 182.9-m escarpment. Hydroelectric power generation and mineral extraction from the Mediterranean Sea water are discussed. First-order estimates are presented. S.D.

A79-52644 **High power iodine atom laser.** K. Hohla (Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Garching, West Germany). In: High power laser and applications; Proceedings of the Fourth Colloquium on Electronic Transition Lasers, Munich, West Germany, June 20-22, 1977.
Berlin and New York, Springer-Verlag, 1978, p. 124-141. 29 refs.

A high-power atomic iodine laser for fusion applications is described in detail, with emphasis on future prospects and development possibilities. The lasing mechanism is reviewed, the generation of high-power laser pulses is considered, and short-pulse generation is examined. Pulse propagation in an amplifier chain is discussed, along with the scalability and efficiency of a multikilojoule-pulse-energy laser, the ASTERIX III end amplifier, and effects that degrade the efficiency of the iodine laser. The main advantages of the iodine laser as compared with the Nd-glass laser are shown to be a higher repetition rate and a higher self-focusing power level. F.G.M.

A79-52667 **Proposed non-interferometric FIR electron density measuring scheme for tokamaks.** G. Dodel and W. Kunz (Stuttgart, Universität, Stuttgart, West Germany). *(Swiss National Science Foundation, Eidgenössisches Militärdepartement, and Eidgenössische Technische Hochschule Zürich, International Conference on Infrared Physics, 2nd, Zurich, Switzerland, Mar. 5-9, 1979.) Infrared Physics,* vol. 19, Aug. 1979, p. 443-446. 9 refs.

Extension of FIR polarimetry to electron density measurements in tokamaks is suggested as a possible alternative for devices in which FIR interferometry is not applicable or difficult to handle due to reduced accessibility or strong mechanical vibrations. The method is numerically simulated. The relative experimental simplicity compared with interferometry has to be paid for with symmetry assumptions which enter into the evaluation process. (Author)

A79-52798 **Non-uniform power distribution in linear induction motors due to end effects.** R. J. A. Bevan and G. Kalman (AiResearch Manufacturing Company of California, Torrance, Calif.). *(Institute of Electrical and Electronics Engineers, Summer Meeting, Los Angeles, Calif., July 16-21, 1978.) IEEE Transactions on Power Apparatus and Systems,* vol. PAS-98, Sept.-Oct. 1979, p. 1516-1520; Discussion, p. 1521. 19 refs. Research supported by the U.S. Department of Transportation.

This paper presents experimental data showing the effects of electrical and magnetic discontinuities on linear induction motor (LIM) performance. The power distribution along the LIM, the effect of the machine length, and the validity of assuming a LIM model in which the iron extends beyond the bound of the winding were investigated. (Author)

A79-52799 **Major electrical equipment proposed for tidal power plants in the Bay of Fundy.** R. M. Seoni (Acres Consulting Services, Ltd., Niagara Falls, Canada). *(Institute of Electrical and Electronics Engineers, Summer Meeting, Mexico City, Mexico, July 17-22, 1977.) IEEE Transactions on Power Apparatus and Systems,* vol. PAS-98, Sept.-Oct. 1979, p. 1750-1758; Discussion, p. 1759, 1760. 12 refs.

The paper discusses general considerations and future possibilities for the design of generating equipment for tidal power plants with particular reference to Bay of Fundy sites. Factors affecting the design of turbines, generators, excitation system, powerhouse layout and the main electrical connections are reviewed. Various alternatives for transmission of power to shore are listed and the choice of SF6 gas insulated bus duct is substantiated by comparative data. Advantages of integrating the high-voltage switching station with the powerhouse, using SF6 gas insulated metal-clad switchgear are discussed. The paper concludes that advances in technology can make a significant contribution to economic development of tidal power. (Author)

A79-52800 **Development of a DC linear motor. II.** T. Umemori (Japanese National Railways, Railway Research Institute, Kokubunji, Tokyo, Japan), Y. Hosoda (Sumitomo Electric Industries, Ltd., Osaka, Japan), M. Iwasaki (Furukawa Electric Co., Ltd., Tokyo, Japan), and M. Toyoshima (Hitachi Cable Ltd., Hitachi, Ibaraki, Japan). *(Institute of Electrical and Electronics Engineers, Summer Meeting, Los Angeles, Calif., July 16-21, 1978.) IEEE Transactions on Power Apparatus and Systems,* vol. PAS-98, Sept.-Oct. 1979, p. 1786-1794; Discussion, p. 1795.

We have constructed a test facility for the linear motor car mainly to examine its propulsion characteristics. The 3.3 ton vehicle has a 2 ton propulsion force and can be accelerated to 165 Km/h in 200 m. In this paper, our investigation of the field-magnet and armature coils on the ground is reported. We discuss the correspon-

dence of our theoretical analysis with the results of experiments. We believe that the results of our investigation can be readily applied to an actual DCLM line.
(Author)

A79-52951 **Limits to wind-power.** R. W. B. Best (EURATOM and Stichting voor Fundamenteel Onderzoek der Materie, Instituut voor Plasmafysica, Jutphaas, Netherlands). *Energy Conversion,* vol. 19, no. 2, 1979, p. 71, 72. Research supported by the Nederlandse Organizatie voor Zuiver-Wetenschappelijk Onderzoek and EURATOM.

Simple formulas are given for the change in wind-power, frictional stress and vertical energy transport in the atmospheric boundary layer, caused by the erection of windmill arrays. The limit to wind-power conversion appears to be around 1 W/sq m of terrain in both coastal and inland areas.
(Author)

A79-52952 **Model of photofuel element on the base of chlorophyll sensitized reactions.** E. Iu. Kats, Iu. N. Kozlov, and B. A. Kiselev (Academy of Sciences, Institute of Photosynthesis, Pushchino, USSR). *Energy Conversion,* vol. 19, no. 2, 1979, p. 73-75. 10 refs.

Photogalvanic effect has been studied in ethanol-aqueous solution containing: 1 x 10 to the -3rd M cysteine, 5 x 10 to the -5th M chlorophyll 'A' and 1 x 10 to the -4th M methylviologen. During photosensitized reduction of methylviologen open-circuit photovoltage was -650 mV and short-circuit photocurrent was 100 microamperes/sq cm. The maximum power output from the photogalvanic element was 2 x 10 to the -5th W at load resistance 6 kilo ohms. Principal differences and advantages of investigated triple photochemical system have been discussed as compared with double photochemical systems consisting of pigment and electron donor. Since the power output from the element consists of absorbed light power and power of electron donor oxidation, such electricity source may be called 'photofuel element'. The possibility of application of the investigated photochemical system for creation of high efficiency photoelectroconverters of solar energy has been suggested. (Author)

A79-52953 **Electrical induction heating - A new approach to underground coal gasification.** S. T. Fisher (F. T. Fisher's Sons, Ltd., Montreal, Canada). *Energy Conversion,* vol. 19, no. 2, 1979, p. 77-84. 7 refs.

Two methods are proposed to replace underground coal gasification processes. The first involves underground distillation of coal by induction heating, and the second, underground gasification of char by combustion. It is noted that coal has a high eddy-current loss, and thus absorbs energy efficiently from an intense magnetic field. It is shown how this principle can be used to distill high-heat-value gas and tar from a coal deposit, while the residual char may be gasified by combustion heating. The overall process shows significant advantages over present methods of underground coal gasification by combustion. Finally, available physical and chemical data and laboratory investigations indicate the technical and economic feasibility of the process.
M.E.P.

A79-52954 **Evacuated heat pipe solar collector.** F. Mahdjuri (Philco Italiana S.p.A., Brembate Sopra, Italy). *Energy Conversion,* vol. 19, no. 2, 1979, p. 85-90. 6 refs.

A tubular evacuated solar collector with rectangular collector performance characteristics is described. It is reported that the heat transfer from the absorber plate (which has selective coating) to the water tubing occurs via a heat pipe system. A trap mechanism is included for the condensed liquid in order to prevent any delay in the operation - the heat pipe due to super heating of the vapor. To avoid the disadvantage of the high no load condition of the vacuum collectors, consideration is given to the physical features of the critical point of the heat pipe working fluid. Finally, for the heat pipe system discussed, working liquids with the critical temperature between 95-115 C have been chosen.
M.E.P.

A79-52955 **Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field.** D. Tanaka and Y. Hattori (Kyoto University, Uji, Japan). *Energy Conversion,* vol. 19, no. 2, 1979, p. 91-99. 12 refs.

Quasi three-dimensional analysis is made to estimate effects of applied current parallel to magnetic field on the characteristics of nonequilibrium Faraday MHD generator. Potassium-seeded argon plasma at 1500 K and 10 atm is assumed. Resistive power-extraction electrode is taken into account to reduce the current concentration phenomena occurring at electrode edges. The applied current parallel to magnetic field enlarges the stable region free from ionization instability. The net output power exceeds the power obtained for the case of no applied current in the limited ranges of applied current and Hall parameter. The resistive power-extraction electrode is useful to successfully prevent the applied current from short-circuiting along the electrode surface.
(Author)

A79-52956 **Critique on the solar rehabilitation procedures used in SOLMET-2.** D. Rapp (Texas, University, Richardson, Tex.). *Energy Conversion,* vol. 19, no. 2, 1979, p. 101-110. 7 refs.

A critique of the NOAA procedure for rehabilitation of solar data is given by comparing recent data on clear solar noon atmospheric transmission with the calculated transmissions used in the rehabilitation process. It is found that the standard year irradiance (SYI) method used by NOAA is generally within about 3% of the data except for sites at high latitude in winter. The SYI values are too low at such sites, the worst case being Seattle where winter insolation is underestimated by over 20%. The overall assessment of the NOAA rehabilitation procedures at most sites is that the final result:standard year corrected data provide a reasonable set of consistent values. However, the data at northerly sites are too low.
(Author)

A79-52957 **The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator.** G. Fabris and E. S. Pierson (Argonne National Laboratory, Argonne, Ill.). *Energy Conversion,* vol. 19, no. 2, 1979, p. 111-118. 5 refs. Research sponsored by the U.S. Department of Energy and U.S. Navy.

A brief description of the two-phase liquid-metal MHD power generation cycle and its advantages is provided. The importance of good interfacial liquid to gas heat transfer is discussed, and data confirming that satisfactory heat transfer is indeed achieved in an experimental generator is presented. An expression for the effect of the velocity difference between the gas and the liquid on generator performance is derived. An 'equivalent turbine' efficiency is defined to characterize the generator as part of a heat engine and related to experimental data.
(Author)

A79-52958 **Power output of an MHD generator - Effect of ionization instability and boundary layer.** M. S. Sodha and B. K. Gupta (Indian Institute of Technology, New Delhi, India). *Energy Conversion,* vol. 19, no. 2, 1979, p. 119-124. 12 refs. NSF-supported research.

This paper presents an investigation of the effect of ionization instability on effective conductivity and power output of an MHD generator in the presence of velocity/temperature boundary layer. Analysis is based on a phenomenological approach. It is concluded that the ratio of power output (in the presence of ionization instability), to the power output (without ionization instability) increases with an increase in the boundary layer thickness. Effective conductivity and power output both are found to decrease with the increasing magnetic field.
(Author)

A79-52960 **Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells.** R. S. Yeo and J. McBreen (Brookhaven National Laboratory, Upton, N.Y.). *(Electrochemical Society, Meeting, Seattle, Wash., May 21-26, 1978.) Electrochemical Society, Journal,* vol. 126, Oct. 1979, p. 1682-1687. 38 refs. Research sponsored by the U.S. Department of Energy.

An investigation has been carried out on the transport properties of Nafion membranes as related to electrochemically regenerative hydrogen/halogen energy storage systems. Included are a determination of membrane conductivity as a function of HCl concentration and temperature and determination of hydrogen, chlorine, and bromine permeation rates and diffusivities in various HCl and HBr environments at various temperatures. Transport properties of the membrane are related to the water content of the membrane. In the case of bromine, negatively charged complex formation results in lower permeation rates than expected. Results indicate that hydrogen/chlorine cells should have voltaic efficiencies in excess of 75% at current densities of about 300 mA/sq cm and coulombic losses in the vicinity of 2%. (Author)

A79-52967 **The synfuels scenario.** *Environmental Science and Technology*, vol. 13, Oct. 1979, p. 1190-1196. 5 refs.

Plans for reaching the Administration's goal to produce 2.5 million barrels of synthetic fuel daily by 1980 are studied. Conversion of coal to liquid is discussed, emphasizing five processes still awaiting commercialization, including Dynalectron, Exxon, Gulf, and South African State Oil (SASOL). Fundamental considerations that are inherent in a synfuel plant are analyzed and the DOE developed INTACT (Integrated Approach to Environmental Control for Coal Liquefaction Plants) program are considered. Attention is given to present liquefaction projects such as those employing ZnCl-2 hydrocracking processes. Gasification and shoal projects that could yield 100 to 300,000 barrels of oil per day are also among the topics which were examined. C.F.W.

A79-52968 **MHD emissions and their controls.** P. Matray and G. Huddleston (Montana Energy and MHD Research and Development Institute, Inc., Butte, Mont.). *Environmental Science and Technology*, vol. 13, Oct. 1979, p. 1208-1213. 6 refs. Contracts No. EP-78-C-02-4651; No. EF-77-C-01-2430.

The use of magnetohydrodynamics (MHD) as a new energy technology due to its efficiency and cost-effectiveness is examined. Three major goals of the DOE are discussed, which include (1) achieving overall coal-to-busbar efficiencies near 50% in MHD demonstration facilities, (2) demonstrating the economic feasibility of MHD, and (3) meeting environmental emission standards for sulfur dioxide, nitrogen oxides, and particulates. Attention is given to MHD generated wastes such as seed, fly ash, and slag, and those generated by conventional coal-fired power plants. The three major EPA regulations which affect air quality, such as NSPS, PSD, and the National Ambient Air Quality Standards (NAAQS) are discussed and their bearing on the development of MHD is noted. C.F.W.

A79-53209 # **Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy (O vozmozhnosti resheniia problemy upravliaemogo termoiadernogo sinteza na osnove magnitogazodinamicheskoi kumuliatsii energii).** V. N. Mokhov, V. K. Chernyshev, V. B. Iakubov, M. S. Protasov, V. M. Danov, and E. I. Zharinov. *Akademiia Nauk SSSR, Doklady*, vol. 247, no. 1, 1979, p. 83-86. 14 refs. In Russian.

Extensive studies have been made of the compression of spherical targets by means of intense laser beams. In the present paper the effectiveness of an approach to controlled thermonuclear synthesis, based on the compression of thermonuclear targets by a magnetic field is demonstrated theoretically and experimentally. V.P.

A79-53261 **Solar thermal aerostat research station /STARS/.** E. C. Okress and R. K. Soberman (Franklin Institute, Franklin Research Center, Philadelphia, Pa.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-35.* 12 p. 14 refs.

The paper introduces the concept of a large, constant volume, solar powered, warm air, spherical rigid navigable aerostat able to remain aloft in the stratosphere for many years. Equipped with compressed stratospheric air for energy storage, it will be capable of performing, on a 24-hour basis, a wide variety of missions, including surveillance, solar energy generation and radiation or particle beam transmission to the surface, environmental monitoring, local weather modifications, long-range communications and microwave power relay, nighttime target illumination, weapons platform of high energy requirements, platform for aircraft launch and recovery, platform for space hardware and reusable spacecraft catapult launching, etc. Most, if not all, of these numerous missions may be conducted simultaneously, due to the unprecedented lift capability of the proposed stratocraft. With solar energized compressed air and electric thrusters, it will be capable of 24 hours navigation and hovering in the stratosphere in most regions about the earth, and throughout the year, for many (e.g., about 10) years. (Author)

A79-53301 **Superlight rotating reflectors in space.** A. V. Luk'ianov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-112.* 14 p. 10 refs.

The use of large mirror reflectors in space to control solar and electromagnetic radiation with specific mass of order of 1 gm/sq m or less is examined. Such reflectors may be used in space energetics for concentration of solar energy for its conversion into a microwave beam and transmission to earth, for illuminating the earth surface with reflected sunlight, weather control, and research. Design and construction of the reflector, its main parameters including angular and rotative speed, and the control of rotation, precession, and nutation, and the position control in space are discussed. The control of its orientation and space position is performed with solar energy and light pressure, and the film strength permits concentrators with a radii of several kilometers and nearly flat reflectors for lighting application with a radii of several hundred meters. More than a hundred reflectors of 600 m diameter can be assembled at a station at the 1000 km height yearly, but a difficult problem of superthin film mass production and assembly technology problems must be solved to realize this program. A.T.

A79-53302 * **Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures.** E. H. Bock and R. C. Risley (General Dynamics Corp., Convair Div., San Diego, Calif.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-115.* 24 p. 16 refs. NASA-sponsored research.

This paper presents results of a study sponsored by NASA to evaluate the relative merits of constructing solar power satellites (SPS) using resources obtained from the earth and from the moon. Three representative lunar resources utilization (LRU) concepts are developed and compared with a previously defined earth baseline concept. Economic assessment of the alternatives includes cost determination, economic threshold sensitivity to manufacturing cost variations, cost uncertainties, program funding schedule, and present value of costs. Results indicate that LRU for space construction is competitive with the earth baseline approach for a program requiring 100,000 metric tons per year of completed satellites. LRU can reduce earth-launched cargo requirements to less than 10% of that needed to build satellites exclusively from earth materials. LRU is potentially more cost-effective than earth-derived material utilization, due to significant reductions in both transportation and manufacturing costs. Because of uncertainties, cost-effectiveness cannot be ascertained with great confidence. The probability of LRU attaining a lower total program cost within the 30-year program appears to range from 57 to 93%. (Author)

A79-53330 **Satellite power systems /SPS/ and semiconductor photovoltaic cells /SPC/.** M. Subotowicz (Lublin, Uniwersytet, Lublin, Poland). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-166.* 15 p. 16 refs.

This paper considers semiconductor photovoltaic cells and efficiency of solar energy conversion. The material constants of efficient solar cells and selection of photovoltaic materials for homo-, hetero-, and Schottky-barrier diodes to optimize pair generation and the space separation of the electrons and holes are discussed. The silicon materials for solar cells including single crystal, polycrystalline p-n junction, amorphous silicon, and silicon films are described, noting that the advantages of the II-VI compounds are low price, direct energy gap, and the ability to produce thin film solar cells of up to 12% efficiency. The III-V compounds, such as GaAs/Ga(1-x)Al(x)As, have the highest efficiency of up to 25%, and the two-component compounds such as GaSe, InSe, Cu2O, and SnS provide easy synthesis and crystal growth, chemical stability, low cost, and easy doping.

A.T.

A79-53333 **Optimisation of powerful energy supply systems for application in space.** J. Blumenberg (München, Technische Universität, Munich, West Germany). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-169.* 22 p. 7 refs.

Energy supply systems for application in space are, as a rule, optimized in terms of their specific mass (kg/kWe) or their specific power (kWe/kg). An optimization criterion for space power systems is defined. Nuclear power systems with turboelectric converter are discussed relative to optimization of a system with Carnot-cycle, and optimization of systems with real engine cycles. Attention is given to nuclear power systems with MHD generator, and to nuclear power systems with thermionic converters. The optimum specific masses of the system types discussed for a realistic hot-side temperature and different net electric powers are listed.

S.D.

A79-53334 **Solar power satellites for Europe.** J. Ruth and W. Westphal (Berlin, Technische Universität, Berlin, West Germany). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-173.* 12 p. 6 refs.

The potential utilization of Solar Power Satellites (SPS) as baseload powerplants for Western European countries is studied. Attention is given to significant differences with the USA in factors such as geographical, political, organizational, orbital, and industrial. Among the problems discussed which must be solved prior to full scale SPS development is the impact on the environment. Finally recommendations are made and conclude that the analysis of specific European problems has to be extended and refined, a joint group of US and European planners and engineers must work out the specifications for a cooperation in a technology program after 1982, and a specific European experimental program on the impacts of SPS installation and operation on the environment has to be implemented.

M.E.P.

A79-53335 **European technology applicable to Solar Power Satellite Systems /SPS/.** H. Stoewer (ESA, System Engineering Dept., Noordwijk, Netherlands), B. Tilgner (ESA, Technology, Industry and Infrastructure Dept., Paris, France), and D. Kassing (ESA, Spacecraft Power Supplies Div., Noordwijk, Netherlands). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-174.* 23 p. 14 refs.

The paper reviews European space technology activities that have potential for application in an SPS program. Existing and developing European space technologies are compared with the expected requirements of a study assessment and early key technology verification investigation for the SPS concept. It is shown that a number of existing European space technologies and the results of current development efforts apply well to this. Topics discussed include solar energy conversion, electrical energy conversion, electrical to microwave conversion, microwave power transmission, space structures, attitude and orbit control, thermal control, and ground receiver stations.

M.E.P.

A79-53336 **Satellite solar power station designs with concentrators and radiating control.** A. V. Luk'ianov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-176.* 6 p. 6 refs.

The paper investigates the application of superlight rotating parabolic concentrators for space energetics. The total mass of all high temperature converters considered, does not exceed that of the transmitting antenna. Attention is given to a design with two concentrators weighing 30 Mg, which offers the possibility of control of mast orientation by using thin movable mirrors of tungsten or other thermoresistant material in the concentrator foci. In this manner reflection of an insignificant part of concentrated energy in the corresponding direction will create the necessary thrust. Also discussed are a satellite power station (SSPS) with numerous concentrators and SSPS with solar cells. Here eight adjustable mirrors situated along the periphery could work as concentrators as well as corrections engines.

M.E.P.

A79-53337 **A space power station without movable parts.** M. Pospisil (Ceskoslovenska Akademie Ved, Astronomicky Ustav, Ondrejov, Czechoslovakia). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-177.* 10 p.

An area of suitable shape could be used as a receiver of solar radiation ('outer' surface) and a microwave antenna ('inner' surface). Elimination of the necessity to revolve the panels with cells, delivery of power according to the average demand and other features of this SPS concept are discussed.

(Author)

A79-53353 **Thin film solar collectors for material science experiments in space.** B. Authier, L. Hill, and C. Fayard (CNRS, Laboratoire d'Astronomie Spatiale, Marseille, France). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-202.* 10 p. 9 refs. Research supported by the European Space Agency.

The optical feasibility of thin-film solar concentrators suitable for space material science is investigated through an optical simulation of the ray-tracing type and measurements on inflated balloons of polyester film. Simulation in a meridian plane is chosen since only circular collector optics is suitable. An analytical method might be considered, but a ray trace method is more convenient to take account of the different parameters that may influence ray dispersion. Optical simulation is discussed relative to representation of the solar disk and simulation of the scattered light from the collector. Attention is given to inflatable mirror performance. Plastic film concentrating mirrors have the potential of a very lightweight mirror at low cost per unit area. The cross section of an inflated 'ellipsoidal' membrane mirror is schematically presented. The inner surface of the lower membrane is aluminized (or silvered) to form the mirror, and the upper surface is transparent. The curvature of the mirror is obtained by inflating the space between the surfaces. Also discussed are space environment requirements.

S.D.

A79-53356 **Space to benefit mankind - 1980 to 2000.** C. L. Gould (Rockwell International Corp., Satellite Systems Div., Downey, Calif.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-206.* 22 p. 13 refs.

This paper deals with the use of space for major, tangible benefits with commercial and social value over the next three decades. A background of future needs and trends is presented, and opportunities for applying space to these needs are listed. An overall suggested space industrialization program is presented, and the benefits of such a program are shown.

(Author)

A79-53357 * **Orbital demonstration - The prelude to large operational structures in space.** T. Hagler (NASA, Office of Advanced Programs, Washington, D.C.). *International Astronautical*

Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-207. 16 p. Contracts No. NAS9-15310; No. NAS8-32394; No. NAS9-14916.

The paper surveys three specific large space structures which have been analyzed to determine the technology needed to achieve a fully operational system. These are the multipurpose platforms; satellite power systems, and a deployable antenna. Further attention is also given to those technology needs which can be satisfied by ground based technology (simulation), such as payload carrier modification or design, platform element connectors and fittings, data compression and storage equipment, man-machine interface and productivity assessment, and astronaut aids. Also covered are those technology and performance parameters which require demonstration in orbit.
M.E.P.

A79-53418 **Structuring the international marketplace for maximum socio-economic benefits from space industrialization.** W. A. Good (Earth Space Transport Systems Corp., New York, N.Y.), G. S. Robinson (Smithsonian Institution, Washington, D.C.), M. F. Shakun (New York University, New York, N.Y.), and E. F. Sudit (Rutgers University, New Brunswick, N.J.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-A-14.* 14 p. 86 refs.

The methodology of situational normativism is used to suggest an effective international framework for commercial expansion into outer space, including the necessary resolution of any conflict which may arise. The possible integration of air and space commerce is examined. New commercial space technologies are evaluated in terms of their economic characteristics. Space industrialization is viewed as the process of developing space transport markets. Private common carriers are given the rights and responsibilities for developing various categories of commercial space applications based on economic and technological considerations. The role of government is seen restricted to research and development for the purpose of increasing the technology base, regulation of safety and economic activities, participation in the provision of pure public goods, and provision of supporting services.
V.T.

A79-53419 **A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere.** K. A. Ehricke (Space Global Co., La Jolla, Calif.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-A-16.* 25 p. 13 refs.

The paper presents an outlook on the energy consumption levels for inhabiting the selenosphere. Concepts for low propellant access to and from the lunar surface are presented with calculations of hydrogen and oxygen use. Attention is given to transportation and its role in the development of lunar industrial complexes, as well as to a transportation cost analysis. Various transportation cost components, such as the use of lunar liquid oxygen and reuseable chemical/nuclear IOV, are examined. The abundance of lunar elements that can be employed in industrial processes and operations is presented. Data is tabulated for converting energy sources into consumable output, and information is given on the production of nuclear power systems.
C.F.W.

A79-53432 **A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal.** H. O. Ruppe, D. Hayn, M. Braitinger, and R. H. Schmucker (München, Technische Universität, Munich, West Germany). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-A-15.* 34 p. 11 refs. (TUM-LRT-7B-79/3)

Transport of nuclear high active waste (HAW) into space is examined. With the Space Transportation System and high flight frequencies, proper casing of the HAW, and limitations to small amounts of waste per flight, economical disposal of HAW in space should be possible. Four mission concepts are evaluated: (1) the direct transfer to the sun with the waste destroyed there; (2) transport outside the solar system; (3) establishment of a lunar waste deposit with maintenance by a manned lunar station; and (4) transport to a high earth orbit and storage within a large space structure. Alternatives for nuclear waste elimination including the earth-bound solution such as dumping into sea or deposit in a salt-mine, deposit on the moon's far side, safety considerations, and costs for earth-bound deposits and spaceflight operations are also discussed. It is concluded that waste disposal in space will provide safe disposal, option of future reprocessing, and economical use of space technology.
A.T.

A79-53452 # **Legal aspects of solar power satellites - Focus on microwave exposure standards.** S. Gorove (Mississippi, University, University, Miss.). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-IISL-01.* 9 p. 12 refs.

Crucial legal problems of solar power satellites center around geostationary orbit availability, microwave frequency allocations, and microwave exposure standards. One of the major concerns involving the transmission of microwave beams from geostationary satellites to selected places on earth relates to the all important question of what effect exposure to such transmission is going to have on humans and biota in the receiving area, on the ground and in the air space which the beams traverse. Attention is given to a discussion of the nature of the microwave beam, effects of microwave exposure on humans and biota, and international aspects. With respect to the biological effects of microwave exposure and possibly other effects on the environment, it appears that there can be no choice but to pursue the route leading to a general international acceptance in order to eliminate any possible charge of negligence, should some injury or damage arise because of inadequacy. Acceptance of the most stringent exposure standards must be stressed.
S.D.

A79-53453 # **Institutional issues in international solar energy utilization.** W. von Kries (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Cologne, West Germany). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-IISL-02.* 14 p. 14 refs.

The paper examines large-scale international utilization of solar energy for production of electric power or fuel. The international features of the Solar Power Satellite Plants (SPS) and the Solar Thermal Electric Conversion Plants (STEC) are compared, noting that an SPS plant would be more international because of its installations in outer space, use of the internationally regulated frequency, and its high costs could require contributions from several countries. Reasons for internationalizing SPS and STEC plants including geographical, environmental, as well as the effect of microwave beams on organisms and the ionosphere, economic, and strategic are discussed, comparing the effects of SPS and STEC plants on these factors. The STS space and ground framework, and a European STEC partnership organization are described, noting that STEC strengths are a proven organizational pattern, industrial/geographical decentralization, and cartel exclusion, while SPS has weaknesses of organizational gigantism, geographical/industrial centralization, and supplier oligarchy, concluding that STEC will probably materialize, rather than SPS.
A.T.

A79-53482 # **Solar energy bank for mankind in contemporary international space law.** C. C. Okolie. *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-IISL-47.* 35 p. 44 refs.

The paper summarizes public and U.S. Congressional considerations on solar energy use. The new solar power technology will require legal norms to regulate utilization of solar option control and ownership, harmful effects, and cost of R & D, which should provide a code of conduct through international law. The economic factors in solar energy technology and creation of a Solar Energy Bank in the context of developing of alternative energy sources, and safe, clean environmental aspects are discussed. The U.S., U.S.S.R., European, and the European Space Agency (ESA) discussions on the solar bank international law are described, noting that the best way to develop R & D is to create an international agency to manage development of alternative energy sources. The Soviet Union's activities in solar energy research are reviewed, and, finally, it is recommended that the law on solar energy must be based on space and environmental laws and that a Solar Energy Bank must be created where all nations are encouraged to participate. A.T.

A79-53487 **A power transmission concept for a European SPS system.** R. A. Henderson (British Aerospace, Dynamics Group, Bristol, England). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper.* 14 p. 15 refs.

A hybrid SPS system is proposed in which solar power is collected in geosynchronous orbit and transmitted by a concentrated laser beam to a receiver mounted on a 2.6-km-diam rigid balloon stationed at approximately 30-km altitude; power is converted to microwave energy and beamed to the ground to multiple rectennae which are significantly reduced from those of the direct microwave transmission to ground concept. Waste heat from the energy conversion process would provide power to maintain a stable balloon platform which could perform other functions related to earth observation and communications. (Author)

A79-53490 **Optimization of a fixed solar thermal collector.** J. D. Garrison (San Diego State University, San Diego, Calif.). *Solar Energy*, vol. 23, no. 2, 1979, p. 93-102. 11 refs.

Criteria are presented for optimizing solar thermal energy collection. These criteria are then used in setting the design of a fixed solar thermal energy collector. This design is obtained by proceeding carefully through a series of optimization steps. While seeking near optimum performance, features have been retained which should lead to low cost. Initial optimization steps lead to an all glass vacuum collector tube whose side and lower walls are internally silvered to provide optimal Winston concentration on an interior glass tube coated with a selective absorber. Heat transfer calculations, performed for an array module of these collector tubes, produce values for the radiation, heat conduction and pumping losses and indicate operating conditions which minimize these losses. Near this minimum, heat conduction and pumping losses are small and can usually be neglected. Liquids provide much better heat transfer than gases. (Author)

A79-53491 * **Evaluation of models to predict insolation on tilted surfaces.** T. M. Klucher (NASA, Lewis Research Center, Cleveland, Ohio). *Solar Energy*, vol. 23, no. 2, 1979, p. 111-114. 8 refs.

An empirical study was performed to evaluate the validity of various insolation models which employ either an isotropic or an anisotropic distribution approximation for sky light when predicting insolation on tilted surfaces. Data sets of measured hourly insolation values were obtained over a 6-month period using pyranometers which received diffuse and total solar radiation on a horizontal plane and total radiation on surfaces tilted toward the equator at 37 degrees and 60 degrees angles above the horizon. Data on the horizontal surfaces were used in the insolation models to predict insolation on the tilted surface; comparisons of measured vs calculated insolation on the tilted surface were examined to test the validity of the sky light approximations. It was found that the Liu-Jordan isotropic distribution model provides a good fit to empirical data under overcast skies but underestimates the amount of solar radiation incident on tilted surfaces under clear and partly cloudy conditions. (Author)

A79-53492 **Prediction of the performance of solar heating systems over a range of storage capacities.** P. J. Lunde (Center for the Environment and Man, Inc., Hartford, Conn.). *Solar Energy*, vol. 23, no. 2, 1979, p. 115-121. 9 refs.

A new method for prediction of the performance of solar heating systems using well-mixed storage is presented which predicts monthly and annual system performance (relative to a computer simulation) over a wide range of system variables including minimum or base storage temperature, storage capacity, and geographic location. The method relies on heavily pre-processed site-specific radiation and weather data which is used with system properties to predict the quantities necessary for correlation. The method yields long-term monthly and annual performance predictions which are so accurate that they can serve simultaneously for preliminary design, economic optimization, and final design, eliminating the need for simulation. (Author)

A79-53493 # **Passive solar heating of buildings using a transwall structure.** R. Fuchs (U.S. Department of Energy, Ames, Iowa) and J. F. McClelland (Iowa State University of Science and Technology, Ames, Iowa). *Solar Energy*, vol. 23, no. 2, 1979, p. 123-128. 9 refs. Contract No. W-7405-eng-82.

A passive solar heating system is proposed employing a 'transwall', which is a partially transparent thermal storage wall placed adjacent to a window admitting solar energy. It is reported that part of the solar energy is absorbed within the transwall, and the remaining part is transmitted to the interior of the room. Calculations using thermal network models and based on reasonable assumptions for relative comparisons are used to compare the performance of transwall, Trombe wall, and direct gain systems. The analysis shows that the transwall system can be expected to have a thermal performance close to exceeding that of the other systems, depending on how effectively convective heat transfer is quenched in the thermal storage medium. Finally, the architectural attractiveness of the transwall is cited. M.E.P.

A79-53494 **On the design and operation of electrochemical solar cells.** S. Kar (Indian Institute of Technology, Kanpur, India), K. Rajeshwar, P. Singh, and J. DuBow (Colorado State University, Fort Collins, Colo.). *Solar Energy*, vol. 23, no. 2, 1979, p. 129-139. 64 refs. Research supported by the Colorado Energy Research Institute.

The theoretical principals underlying the design and operation of electrochemical solar cells are reviewed. These devices are discussed in terms of a modified Metal-Insulator-Semiconductor (MIS) model in which the interfacial layer in MIS solar cells is replaced by the electrolyte. Electrostatic aspects of electrochemical solar cells are analyzed with the help of energy band diagrams and compared with those for conventional solid state solar cells. The key factors for efficient conversion of optical to electrical energy utilizing electrochemical solar cells are also highlighted from the point of view of barrier formation, carrier transport, and equivalent circuits. (Author)

A79-53495 **On the calculation of the temperature distribution in a packed bed for solar energy applications.** H. C. White and S. A. Korpela (Ohio State University, Columbus, Ohio). *Solar Energy*, vol. 23, no. 2, 1979, p. 141-144. 18 refs.

Calculations utilizing the exact solutions for the temperature distributions of the solid in and the fluid flowing through a packed bed with arbitrary initial bed temperature and arbitrary inlet fluid temperature have been carried out. The computational method allows a reversal of the direction of the flow at arbitrary times. The influence of the nondimensional frequency of a periodic flow reversal on the bed and fluid temperatures at the steady periodic state are presented. (Author)

A79-53496 **Monolithic solar cell panel of amorphous silicon.** J. J. Hanak (RCA Laboratories, Princeton, N.J.). *Solar Energy*, vol. 23, no. 2, 1979, p. 145-147. Contract No. EY-76-C-03-1286.

A monolithic solar cell panel has been fabricated using hydrogenated amorphous silicon (a-Si:H) as the semiconductor material. This device consists of a plate glass substrate bearing a number of long, narrow, parallel cells electrically connected in series along the lengths of the cells. It features several characteristics which make it uniquely attractive for large area devices (up to several sq m): low internal power losses, due to lower current at a higher voltage; high fraction of active cell area, due to the absence of metallic grids; no basic device size limit; low cost and ease of fabrication. A device consisting of 9 cells and having an active area of 36 sq cm, open circuit voltage of 6.5 V and efficiency of 2.6 percent is described. (Author)

A79-53497 **Load optimization in solar space heating systems.** C. D. Barley (Solar Environmental Engineering Co., Fort Collins, Colo.). *Solar Energy,* vol. 23, no. 2, 1979, p. 149-156. 13 refs.

When load variables, such as window and insulation types, are included in the economic optimization of a solar space heating system, the overall cost is lower than that resulting from optimization of collection area for a fixed load. In this paper an algorithm is derived for choosing insulation levels, as well as solar collection area, so as to minimize the overall cost of constructing and heating a building. The general algorithm is applicable with any solar performance prediction method and with any economic criterion where the 'cost' is a linear function of collection area and of auxiliary energy consumption. A specific algorithm is also derived for active solar systems using the relative areas method of performance prediction and a conventional present worth life cycle cost analysis. The degree-day model is used for the load calculations. (Author)

A79-53498 **Optical and thermal analysis of a Cassegrainian solar concentrator.** C. E. Mauk, H. W. Prengle, Jr., and E. C.-H. Sun (Houston, University, Houston, Tex.). *Solar Energy,* vol. 23, no. 2, 1979, p. 157-167. 15 refs. Research supported by the University of Houston; Contract No. EG-77-C-01-3974.

For the storage of solar energy in a chemical system, a Cassegrainian type solar collector is investigated. With generalized geometry, a non-skew ray from the edge of the solar disc is followed through the Cassegrainian configuration to the final image to define the image height. Parametric results are presented in a form which can be used to predict performance based on off-axis optics. Equations and graphs allow the incorporation of angular error into the calculations. Slope of 5 for the limiting tangent to the hyperbolic secondary appears near optimum. The focal length of the hyperboloid is not an important factor as long as it is similar to the focal length of the paraboloid. The required diameter for the hyperboloid is typically half the diameter of the paraboloid. A set of design equations is developed, and their use is demonstrated. Design parameters are calculated for chemical reactor loads of 1.0, 0.5, and 0.1 MW. (Author)

A79-53522 **Large aperture components for solid state laser fusion systems.** W. W. Simmons (California, University, Livermore, Calif.). In: Electro-Optics/Laser Conference and Exposition, Boston, Mass., September 19-21, 1978, Proceedings.
Chicago, Industrial and Scientific Conference Management, Inc., 1978, p. 431-435. 6 refs. Contract No. W-7405-eng-48.

Solid state lasers for fusion experiments must reliably deliver maximum power to small (approximately 0.5 mm) targets from stand-off focal distances of 1 m or more. This requirement places stringent limits upon the optical quality, resistance to damage, and overall performance of the several major components - amplifiers, Faraday isolators, spatial filters - in each amplifier train. Component development centers about achieving (1) the highest functional material figure of merit; (2) the best optical quality; and (3) maximum resistance to optical damage. Specific examples of the performance of large aperture components will be presented within the context of the Argus and Shiva laser systems, which are presently operational at Lawrence Livermore Laboratory. Shiva comprises twenty amplifiers, each of 20 cm output clear aperture. Terawatt beams from these amplifiers are focused through two opposed, nested clusters of f/6 lenses onto such targets. Design requirements upon the larger aperture Nova laser components, up to 35 cm in clear aperture, will also be discussed; these pose a significant challenge to the optical industry. (Author)

A79-53545 # **Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy (Sulla stima della disponibilità di energia rinnovabile nell'isola di Sardegna. II - L'energia eolica).** G. Pibiri, A. Serra (Cagliari, Università, Cagliari, Italy), and A. Sollai (Aeronautica Militare, Servizio Meteorologico, Rome, Italy). *Rivista di Meteorologia Aeronautica,* vol. 39, Apr.-June 1979, p. 153-162. 18 refs. In Italian.

Tested calculation techniques are used to estimate the available wind energy in the surface layer over Sardinia. Three regions of Sardinia have been identified as feasible for economical wind energy production: the coast, the mountainous region, and the plain of Campidano. B.J.

A79-53680 # **Legal norm creation concerning solar energy in contemporary international space law.** C. C. Okolie. In: Colloquium on the Law of Outer Space, 21st, Dubrovnik, Yugoslavia, October 1-8, 1978, Proceedings. Davis, Calif., University of California, 1979, p. 40-57. 59 refs.

It is suggested that the world body speed up its efforts to reach consensus on the development of solar power satellites. Emphasis is placed on the law regulating solar power satellites, United States legislative action on solar energy, and future international legal developments with regard to solar energy. B.J.

A79-53681 # **The legal aspect concerning solar energy.** H. Safavi. In: Colloquium on the Law of Outer Space, 21st, Dubrovnik, Yugoslavia, October 1-8, 1978, Proceedings.
Davis, Calif., University of California, 1979, p. 67-71.

Legal aspects of solar energy utilization in airspace and in outer space are considered. It is concluded that there should be no laws constraining the technical exploitation of outer space, which should be considered a 'free zone' analogous to the high seas. B.J.

A79-53682 # **Some observations of the legal implications relating to the use of solar energy.** M. L. van Traa-Engelman. In: Colloquium on the Law of Outer Space, 21st, Dubrovnik, Yugoslavia, October 1-8, 1978, Proceedings. Davis,
Calif., University of California, 1979, p. 72-76. 6 refs.

Different legal regimes regarding solar energy utilization are examined, with emphasis on the legal implications in the regime of outer space. It is shown that certain articles of the Space Treaty apply to solar energy utilization. B.J.

A79-53724 **Gasohol for energy production.** N. P. Cheremisinoff (Exxon Research and Engineering Co., Florham Park; New Jersey Institute of Technology, Newark, N.J.). Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1979. 147 p. 53 refs. $14.95.

The book is an overview of the present state of the art as well as the potentials and uses of biomass as a source of alcohols and chemical feedstocks. Several topics are discussed, such as biomass as a source of energy, the chemistry of alcohols, methanol synthesis from synthesis gas and wood wastes, ethanol synthesis, and mass production of biomass for synthetic fuels. Also discussed are automotive uses of methanol, special uses and problems of alcohol fuels, and the development of a nationwide biomass-based alcohol-gasoline fuel system. (Author)

A79-53725 **Solar cells for photovoltaic generation of electricity: Materials, devices and applications.** M. Sittig. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 48), 1979. 365 p. 11 refs. $48.

The detailed, descriptive information in this book is based on U.S. patents, issued since January 1970, that deal with solar cells suitable for the photovoltaic generation of electricity. Additional material is presented concerning the principles and economics of producing electricity by means of photovoltaic cells. The discussion covers application areas of solar cells, materials for solar cells, materials availability, toxic hazards of solar-cell materials, solar cell fabrication, as well as solar cell testing, mountings and enhancement.

Also discussed are photovoltaic cogeneration (hybrid systems), photoemissive cell devices, solar cell energy storage, and photoelectrochemical energy conversion. S.D.

A79-53776 **Coal conversion technology.** Edited by C. Y. Wen (West Virginia University, Morgantown, W. Va.) and E. S. Lee (Kansas State University of Agriculture and Applied Science, Manhattan, Kan.). Reading, Mass., Addison-Wesley Publishing Co., Inc. (Energy Science and Technology, No. 2), 1979. 600 p. $29.50.

Attention is given to such topics as: (1) physical and chemical characterization of coal needed for the study of coal combustion and conversion systems, (2) reaction rates of coal pyrolysis and gasification, (3) coal combustion systems, (4) coal gasification for the production of high and low Btu fuels, and (5) coal liquefaction, with emphasis on principles rather than the individual or commercial processes. The material presented is intended primarily for researchers and scientists who are engaged in research, development, and design of coal combustion and conversion systems. B.J.

A79-53777 **Coal classification and characterization.** S. Ergun (California, University, Berkeley, Calif.). In: Coal conversion technology. Reading, Mass., Addison-Wesley Publishing Co., Inc., 1979, p. 1-56. 95 refs.

This survey paper deals with such topics as the origin of coal, its petrographic constitution and classification, and classification of coal by rank and grade. The properties of commonly used coals are discussed in detail with attention given to proximate analysis, ultimate analysis, calorific value, behavior on heating, and mechanical properties. B.J.

A79-53778 **Rates of coal pyrolysis and gasification reactions.** C. Y. Wen and S. Dutta (West Virginia University, Morgantown, W. Va.). In: Coal conversion technology. Reading, Mass., Addison-Wesley Publishing Co., Inc., 1979, p. 57-170. 124 refs.

The paper examines coal pyrolysis and char-gas reactions for the purpose of assessing the available data and correlations in a systematic way and presenting these subjects in a consolidated and useful form that can be applied to combustor and gasifier designs. Coal/char pyrolysis and hydrogasification are discussed in greater detail than the other char-gas reactions. Models for determining the rate constants of such reactions are investigated. B.J.

A79-53779 **Coal combustion.** R. H. Essenhigh (Ohio State University, Columbus, Ohio). In: Coal conversion technology. Reading, Mass., Addison-Wesley Publishing Co., Inc., 1979, p. 171-312. 179 refs.

The behavior of coal-fired systems is assessed from the operational point of view. The approach is used to describe existing coal-fired systems, the essentials of the equipment used, the present understanding of how these systems behave, and present knowledge of the underlying principles. B.J.

A79-53780 **Coal gasification for high and low Btu fuels.** L. G. Massey (Consolidated Natural Gas Service Co., Inc., Cleveland, Ohio). In: Coal conversion technology. Reading, Mass., Addison-Wesley Publishing Co., Inc., 1979, p. 313-427. 107 refs.

This survey paper on coal gasification discusses such topics as the general character of coals, gasification principles, gasifiers, and gasifier heat supply methods. Consideration is also given to low Btu gasification, intermediate and high Btu gasification, construction materials, environmental issues, and prospects for coal gasification. B.J.

A79-53781 **Coal liquefaction.** E. S. Lee (Kansas State University of Agriculture and Applied Science, Manhattan, Kan.). In: Coal conversion technology. Reading, Mass., Addison-Wesley Publishing Co., Inc., 1979, p. 428-545. 119 refs.

After a brief review of the historical development of liquefaction, attention is given to various aspects and characteristics of the coal liquefaction process, including direct liquefaction, hydrodesulfurization of coal and hydrogen requirement, pyrolysis, and indirect liquefaction. Consideration is also given to the effect of coal properties on liquefaction, solvent extraction or dissolution, kinetics or solvent extraction, catalytic hydrogenation, and properties and purifications of liquefaction products. B.J.

A79-53804 **Pollutant protection for the case of strip mining in the Rhine area (Immissionsschutz in den Braunkohlentagebauen des Rheinischen Reviers).** H.-J. Thiede. *Energiewirtschaftliche Tagesfragen*, vol. 29, Sept. 1979, p. 535-541. 8 refs. In German.

A79-53805 **Energy conservation - Focal point for energy efficient operations (Die Einsparung von Energie - ein Schwerpunkt energiewirtschaftlicher Aufgaben).** P. Schnell and M. Dehli (Energie-Versorgung Schwaben AG, Stuttgart, West Germany). *Energiewirtschaftliche Tagesfragen*, vol. 29, Sept. 1979, p. 546-552. 13 refs. In German.

A79-53938 * **A device model for the tandem junction solar cell.** W. T. Matzen, S. Y. Chiang, and B. G. Carbajal (Texas Instruments, Inc., Dallas, Tex.). *IEEE Transactions on Electron Devices*, vol. ED-26, Sept. 1979, p. 1365-1369. 8 refs. Research sponsored by the U.S. Department of Energy and NASA.

A conceptual device model has been developed to explain operation of the tandem junction cell (TJC) when back contacts only are used. Operation and parameters of the cell are explained by transistor action. Experimental observations are presented which confirm that current is collected for carrier generation in the front uncontacted n(plus) region. The model should be useful as a guideline to optimize the TJC by application of transistor design principles. (Author)

A79-54188 **Magnetoacoustic oscillations in a finite-beta current carrying plasma column.** M. L. Sawley (South Australia, Flinders University, Bedford Park, Australia). *Journal of Plasma Physics*, vol. 22, Oct. 1979, p. 223-229. 11 refs.

Forced magnetoacoustic oscillations in a fully ionized, nonuniform, current carrying plasma column of finite beta are treated theoretically. The results of numerical calculations are given for the specific case of diffuse pinch equilibrium configurations. It is found that, for these configurations, the amplitude of the axial component of the oscillating magnetic field is enhanced and the frequency at which magnetoacoustic resonance occurs is raised. It is also found that the presence of an equilibrium axial current produces a substantial azimuthal component, in addition to the axial component, of the oscillating magnetic field. (Author)

A79-54278 **Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies.** K. Train (Cambridge Systematics, Inc., Berkeley, Calif.). *Transportation*, vol. 8, Sept. 1979, p. 237-258. 48 refs.

The paper examines past economic research on automobile demand and its effect on consumers' response to fuel-efficient vehicles. Three types of econometric research are reviewed, aggregate econometric studies, disaggregate econometric studies with models of automobile ownership and class choice, and hedonic price analyses. Each category is analyzed to determine how consumers will respond to the introduction of fuel-efficient vehicles. It is shown that all of the studies provide inadequate information due to insufficient variation and too large covariation among automobile prices, fuel-efficiency, weight, and size. Because of this problem, current econometric approaches cannot obtain reliable estimates of consumers' responses to changes in automobile characteristics. A disaggregate model estimated with a large number of alternatives and no alternative-specific constants, and an experimental method of describing a set of hypothetical automobiles to a consumer and asking him which set he prefers are proposed to alleviate these problems. A.T.

A79-54294 **The photochemical reaction applied to a multiply hybridized water-splitting system.** T. Ohta, N. Kamiya, and T. Otagawa (Yokohoma National University, Yokohoma, Japan). *International Journal of Hydrogen Energy*, vol. 4, no. 4, 1979, p. 255-266. 5 refs. Research supported by the Ministry of International Trade and Industry.

Application of the photochemical reaction 2Fe(2+) + I3(-) + light yields 2Fe(3+) + 3I(-) to the water splitting cycles hybridized by photochemical, electrochemical, and thermochemical reactions is examined. The theoretical expression for the conversion efficiency of light energy to chemical energy is derived using reaction dynamics, and the factor which maximizes it and the Gibbs free energy change are investigated. It was found that the magnitude of stored energy depends on the intensity of light, the concentration of the reactants, and the type of anions in solution. The SO4(2-) system yields a large value of the Gibbs free energy change when the reactivity of the photochemical process and the retardation of the back reaction are considered; a value of 15 to 20% is obtained for the efficiency of the photochemical conversion process. A.T.

A79-54296 **Sb-I-Ca process for thermochemical hydrogen production.** N. Miura, N. Yamazoe, and T. Seiyama (Kyushu University, Fukuoka, Japan). *International Journal of Hydrogen Energy*, vol. 4, no. 4, 1979, p. 279-286. 12 refs.

A new thermochemical water-splitting process named 'Sb-I-Ca Process' is described with relevant thermochemical data and preliminary experimental results. The process, which is an improved version of the 'Sb-I Process' previously proposed, consists of basic steps involving five reactions and three phase-transitions. It was found that all reaction and separation steps in this process could be conducted without serious difficulties. From a flow diagram made on the basis of the experimental results, the overall efficiency was estimated to be about 40%, with an assumption of 70% heat recovery. (Author)

A79-54297 * **Hydrogen-fueled diesel engine without timed ignition.** H. S. Homan, P. C. T. De Boer, W. J. McLean (Cornell University, Ithaca, N.Y.), and R. K. Reynolds (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *International Journal of Hydrogen Energy*, vol. 4, no. 4, 1979, p. 315-325. 15 refs.

Experiments were carried out to investigate the feasibility of converting a diesel engine to hydrogen-fueled operation without providing a timed ignition system. Use was made of a glow plug and a multiple-strike spark plug. The glow plug was found to provide reliable ignition and smooth engine operation. It caused the hydrogen to ignite almost immediately upon the start of injection. Indicated mean effective pressures were on the order of 1.3 MPa for equivalence ratios between 0.1 and 0.4 at a compression ratio of 18. This is significantly higher than the corresponding result obtained with diesel oil (about 0.6 MPa for equivalence ratios between 0.3 and 0.9). Indicated thermal efficiencies were on the order of 0.4 for hydrogen and 0.20-0.25 for diesel oil. Operation with the multiple-strike spark system yielded similar values for IMEP and efficiency, but gave rise to large cycle-to-cycle variations in the delay between the beginning of injection and ignition. Large ignition delays were associated with large amplitude pressure waves in the combustion chamber. The measured NO(x) concentrations in the exhaust gas were of the order of 50-100 ppm. This is significantly higher than the corresponding results obtained with premixed hydrogen and air at low equivalence ratios. Compression ignition could not be achieved even at a compression ratio of 29. (Author)

A79-54298 **Proton conduction in some solids and the fuel cell with a proton conducting electrolyte.** T. Takahashi, S. Tanase, O. Yamamoto, S. Yamauchi, and H. Kabeya (Nagoya University, Nagoya, Japan). *International Journal of Hydrogen Energy*, vol. 4, no. 4, 1979, p. 327-338. 32 refs.

The electrical conductivities of some organic and inorganic solids, such as the simple organic acids, NH4H2PO4, KH2PO4, H3BO3, lambda-AlOOH, amine sulfates and amine phosphates, have been measured. A relatively high proton conductivity of about 10 to the -3/ohm per cm at 87 C was found in hexamethylenetetramine phosphate. The performance of a hydrogen-air fuel cell with proton conducting solid electrolytes has been measured at 174 C. The open-circuit voltage of the cell was 960 mV and the short-circuit current was 6 mA/sq cm. (Author)

A79-54337 * **Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory.** H. H. Helmick (California, University, Los Alamos Scientific Laboratory, Los Alamos, N. Mex.). In: International Symposium on Nuclear Induced Plasmas and Nuclear Pumped Lasers, 1st, Orsay, Essonne, France, May 23-25, 1978, Proceedings. Orsay, Essonne, France, Les Editions de Physique Z. I. de Courtaboeuf, 1979, p. 145-162. 12 refs. Research sponsored by the U.S. Department of Energy. NASA Order W-13755.

A program of research on gaseous uranium and uranium plasmas is being conducted at The Los Alamos Scientific Laboratory under sponsorship of the National Aeronautics and Space Administration. The objective of this work is twofold: (1) to demonstrate the proof of principle of a gaseous uranium fueled reactor, and (2) pursue fundamental research on nuclear pumped lasers. The relevancy of the two parallel programs is embodied in the possibility of a high-performance uranium plasma reactor being used as the power supply for a nuclear pumped laser system. The accomplishments in the two above fields are summarized. (Author)

A79-54350 **Some aspects of a fission-based plasma engine.** J. Kistemaker (Stichting voor Fundamental Onderzoek der Materie, Instituut voor Atoom- en Molecuulfysica, Amsterdam, Netherlands). In: International Symposium on Nuclear Induced Plasmas and Nuclear Pumped Lasers, 1st, Orsay, Essonne, France, May 23-25, 1978, Proceedings. Orsay, Essonne, France, Les Editions de Physique Z. I. de Courtaboeuf, 1979, p. 333-354. 21 refs. Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek.

The problem that energy conversion methods use thermal conversion, but never the high kinetic energies from primary reactions in the burning fuel is addressed. It is noted that the reason for such conservatism is corrosion trouble above 1300 K. Attention is given to energy extraction by induction covering Colgate's original idea, the gas-core oscillator, heat balance inside a high density plasma, and criticality of the gas mixture. It is concluded that a gas core fission reactor operating at very high temperatures (25,000 K) seems to be possible in principle if a mixture of UF4 plus CF4 is used. The quantity of fuel in the reactor would be of the order of 25 to 100 kg. Plutonium would recirculate until it fissioned, and the radioactive waste would be relatively short lived as it would not contain actinides. M.E.P.

A79-54351 **Gaseous fuel reactor applications.** J. S. Kendall (United Technologies Research Center, East Hartford, Conn.). In: International Symposium on Nuclear Induced Plasmas and Nuclear Pumped Lasers, 1st, Orsay, Essonne, France, May 23-25, 1978, Proceedings. Orsay, Essonne, France, Les Editions de Physique Z. I. de Courtaboeuf, 1979, p. 355-367. 8 refs.

Conceptual designs and performance estimates for two types of gaseous-fuel nuclear fission reactors which could be used as electric generators or high-temperature thermal energy sources are presented. In the mixed-flow reactor, a UF6/helium gas mixture is injected tangentially into a cylindrical cavity in order to establish a vortex flow. Different temperature flows are exhausted from the cavity to provide a mixed exhaust flow temperature compatible with a high-temperature heat exchanger. In a plasma core reactor, energy is transferred by thermal radiation from a region of hot (15,000 to 30,000 K) gaseous U-233 contained within a buffer gas vortex to a helium working fluid located near the cavity periphery. The power extraction system concepts for the reactors utilize closed-loop flowing circuits incorporating a helium gas turbine. Efficiencies of gaseous fuel reactor systems are shown to be high with resulting minimal environmental effects. A present NASA-sponsored research program includes experiments on fission in static and flowing UF6 and buffer-gas-confined UF6 cavity reactor experiments. A.L.W.

A79-54504 **Synthetic test methods of high-direct-current circuit breaker.** R. Shimada, K. Tani, H. Kishimoto, S. Tamura (Japan Atomic Energy Research Institute, Tokyo, Japan), H. Ikeda, T. Tamagawa, S. Yanabu, and T. Matsushita (Toshiba Corp., Kawasaki, Japan). *Institution of Electrical Engineers, Proceedings,* vol. 126, Oct. 1979, p. 965-970. 10 refs.

Three synthetic test methods, using a short-circuit generator as a current source, were investigated for high-dc circuit breakers: (1) a test method using equivalent alternating voltage, (2) a simplified synthetic test method, and (3) a practical synthetic test method. The test method which adopted a capacitor bank for a voltage supply was recognized to be equivalent to a practical system. With this test method, a dc circuit breaker with vacuum interrupters was tested up to 130 kA/44 kV. These breakers are used with an ohmic heating power supply of an inductive energy storage system for a tokamak device. B.J.

STAR ENTRIES

N79-28213# Aerospace Corp., El Segundo, Calif. Space Sciences Lab.

ENVIRONMENTAL FACTORS OF POWER SATELLITES Interim Report

Yam T. Chiu and Barbara K. Ching 6 Jul. 1979 49 p refs
(Contract F04701-78-C-0079)
(SAMSO-TR-79-66; TR-0079(4960-04)-5) Avail: NTIS HC A03/MF A01

All presently known factors in the construction and operation of the proposed solar power satellite which may produce effects on the environment from ground level to beyond the magnetosphere are reviewed. Characteristics of the propulsion system exhausts of the space segment, the microwave beam, the satellite physical structure, and the HLLV launch and landing activities are described. A.R.H.

N79-28229# California Univ., Livermore. Lawrence Livermore Lab.

ON-LINE TESTS OF ORGANIC ADDITIVES FOR THE INHIBITION OF THE PRECIPITATION OF SILICA FROM HYPERSALINE GEOTHERMAL BRINE

J. E. Harrar, F. E. Locke, L. E. Lorensen, C. H. Otto, Jr., S. B. Deutscher, W. P. Frey, and R. Lim 3 Apr. 1979 27 p refs
(Contract W-7405-eng-48)
(UCID-18091) Avail: NTIS HC A03/MF A01

A number of compounds were screened as potential scale control agents by examining their effect on the precipitation of silica from Magmamax No. 1 brine. Solutions of the test substances were injected into flowing brine at approximately 200 C, the brine was flashed at 125 C, and then the kinetics of solids and silica precipitation from effluent brine held at 90 C were measured. Compounds tested include a variety of cellulose derivatives, ethylene oxide polymers, several polyethoxylated surfactants, and a phosphonate. The ethylene oxide moiety was confirmed as the source of activity in substances that inhibit the precipitation of silica at 90 C, and the polyethylene glycols in the molecular weight range of approximately 10,000 to 100,000 are the most effective. A brief, in-plant scaling test with the most promising precipitation inhibitor showed that, although it significantly retarded scaling at 90 C, there was no improvement at 125 C or higher, and at 125 C there may have been a slight increase in scaling rate. DOE

N79-28252 California Univ., Berkeley.

SOLVENT SELECTIVITY FOR PURIFICATION OF NATURAL GASES Ph.D. Thesis

Orlando Rafael Rivas 1978 122 p
Avail: Univ. Microfilms Order No. 7914742

A gas solubility apparatus was developed for measuring the solubility of gases in pure or mixed solvents at pressures below one atmosphere and at temperatures ranging from -20 to 200 C. Equilibrium solubilities accurate to about one percent are determined from total gas pressure and from material balances. This apparatus was used for research on purification of sour natural gases by absorption. The absorbing liquid was a mixture, containing one chemical solvent and one physical solvent. Preliminary design calculations for sweetening natural gases by absorption suggest that under some circumstances, mixed solvent absorption may be economically superior to absorption using conventional aqueous alkanolamine solutions. Dissert. Abstr.

N79-28314*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.

DEVELOPMENT AND EVALUATION OF ELASTOMERIC MATERIALS FOR GEOTHERMAL APPLICATIONS Annual Report, Oct. 1977 - Dec. 1978

W. A. Mueller, S. H. Kalfayan, W. W. Reilly, A. H. Yavrouian, I. D. Mosesman, and J. D. Ingham 15 May 1979 45 p refs
Prepared for NASA and DOE
(Contract NAS7-100)
(NASA-CR-158813; JPL-PUB-79-40; DOE/1026-2) Avail: NTIS HC A03/MF A01 CSCL 11G

A material was formulated having about 250-350 psi tensile strength and 30-80 percent elongation at 260 C for at least 24 hours in simulated brine. The relationship between these laboratory test results and sealing performance in actual or simulated test conditions is not entirely clear, however, it is believed that no conventional formation or casing packer design is likely to perform well using these materials. The synthetic effort focused on high temperature block copolymers and development of curable polystyrene. Procedures were worked out for synthesizing these new materials. Initial results with heat-cured unfilled polystyrene 'gum' at 260 C indicate a tensile strength of about 50 psi. Cast films of the first sample of polyphenyl quinoxaline-polystyrene block copolymer, which has 'graft-block' structure consisting of a polystyrene chain with pendant polyphenyl quinoxaline groups, show elastomeric behavior in the required temperature range. Its tensile strength and elongation at 260 C were 220-350 psi and 18-36 percent, respectively. All of these materials also showed satisfactory hydrolytic stability. A.R.H.

N79-28343 Pennsylvania State Univ., University Park.

SOME ASPECTS OF THE MECHANISM AND KINETICS OF COAL LIQUEFACTION Ph.D. Thesis

Adam J. Szladow 1979 185 p
Avail: Univ. Microfilms Order No. 7915743

The relationships between the generation of materials of different solubilities and the removal of oxygen functional groups for coal/tetralin interactions, at temperatures 340-400 C and relatively short times, were studied to provide quantitative information helpful in assessing various hypotheses about the role of oxygen functional groups in the early stages of liquefaction. Studies of the effect of temperature on rates of conversion were performed with the object of shedding additional light on the reactions taking place during short contact times. Mathematical treatment of the kinetics of complex reaction mixtures, specifically the analysis of activation energies were extended from what was known from the literature in order to apply it to coal liquefaction. Dissert. Abstr.

N79-28346# Committee on Commerce, Science, and Transportation (U. S. Senate).

LIQUEFIED NATURAL GAS: SAFETY, SITING, AND POLICY CONCERNS

Washington GPO 1978 156 p refs Rept. for Comm. on Commerce, Sci., and Transportation, 95th Congr., 2d Sess., Jun. 1978
(GPO-26-349) Avail: SOD HC

The policy concerns associated with liquid natural gas (LNG) import industry are discussed as well as the issues associated with LNG safety, siting, and regulatory factors. M.M.M.

N79-28347# Committee on the District of Columbia (U. S. House).

NATURAL GAS SHORTAGE

Washington GPO 1977 142 p Oversight hearings before the Subcomm. on Economic Development and Regional Affairs of the Comm. on the District of Columbia, 95th Congr., 1st Sess., 2 Mar. and 5 Apr. 1977
(GPO-86-231) Avail: Subcomm. on Economic Development and Regional Affairs

Testimony was given on the gas shortage that occurred during the winter of 1976-77, in the states served by the Columbia Gas Transmission Corporation. The management of local crisis as well as the economic impact of the shortage was discussed. Improvement on the coordination among local jurisdictions in preparing for other emergencies was stressed. M.M.M.

N79-28348# Committee on Commerce, Science, and Transportation (U. S. Senate)

DIESEL FUEL AND GASOLINE CONSERVATION ACT OF 1977

Washington GPO 1978 92 p refs Hearing on S. 1899 before the Comm on Commerce, Sci and Transportation, 95th Congr., 2d Sess., 14 Sep 1978

(GPO-34-986) Avail Comm on Commerce, Sci and Transportation

Testimony was given and a bill amendment was proposed to section 382 of the Energy Policy and Conservation Act of 1975 to alleviate current and continuing fuel waste, to reduce empty vehicle movements, and to increase efficiency in transporting goods by motor carriers which benefit consumers, and for other purposes.

M.M.M.

N79-28349*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio

USE OF REFINERY COMPUTER MODEL TO PREDICT FUEL PRODUCTION

Francisco J. Flores Jun 1979 25 p refs

(NASA-TM-79203, E-088) Avail NTIS HC A02/MF A01 CSCL 21D

Several factors (crudes, refinery operation and specifications) that affect yields and properties of broad specification jet fuel were parameterized using the refinery simulation model which can simulate different types of refineries were used to make the calculations. Results obtained from the program are used to correlate yield as a function of final boiling point, hydrogen content and freezing point for jet fuels produced in two refinery configurations, each one processing a different crude mix. Refinery performances are also compared in terms of energy consumption.

A.R.H.

N79-28351# Congressional Budget Office, Washington, D. C.

REPLACING OIL AND NATURAL GAS WITH COAL: PROSPECTS IN THE MANUFACTURING INDUSTRIES

Aug 1978 94 p refs

Avail NTIS MF A01; SOD HC

The likely impact of alternative federal policies aimed at encouraging the use of solid coal instead of oil and natural gas in manufacturing industries is discussed. An overview of the oil and gas consumption in the industrial sector is presented and the cost factors that enter into the selection of new boiler equipment and fuel are analyzed. Assumptions concerning future environmental regulations and cost data for air pollution control equipment are examined as well as the technical feasibility for coal substitution in nonboiler uses. Industrial demand for coal for boilers is estimated (if current policies were continued), and the sensitivity of these estimates to changes in key assumptions are specified. The effects of alternative coal substitution policies on energy use and on the federal budget are also assessed.

A.R.H.

N79-28355# Massachusetts Inst. of Tech., Cambridge. Energy Lab.

ESTIMATION METHODOLOGY FOR ENERGY SUPPLY FROM NATURAL RESOURCES Final Report

Esteban Hnyilicza Nov. 1978 429 p refs

(EPRI Proj. 871-1)

(EPRI-EA-788) Avail NTIS HC A19/MF A01

The feasibility of developing improved methodologies for the estimation of reserves and for the forecasting of long term supply of subsoil energy resources was investigated. It was concluded that the development of improved tools for between the conceptual strengths of the economic theory of exhaustible resources and the relevance and realism of empirically based methodologies of model building. The application of the principles of systems science, so as to judiciously incorporate the geological, technological and behavioral determinants of resource exploitation, constitutes the most promising avenue toward achieving the above synthesis. Prototype models which serve to illustrate the potentialities of this methodology are presented. The models address the exploration and production of petroleum at the field and industry levels.

DOE

N79-28356# Department of Energy, Washington, D. C. Energy Information Administration

PETROLEUM SUPPLY/DEMAND ESTIMATES AND COST OF PETROLEUM IMPORTS, 1978-1980

Ercan Tukenmez and Cornelius Dwyer Dec 1978 26 p refs

(DOE/EIA-0102/20) Avail NTIS HC A03/MF A01

Results of the analysis show that petroleum imports to the 50-State/D.C. area covered by the DOE import statistics are expected to average 8.1 to 8.3 million barrels daily in 1978. The cost of petroleum imports to the U.S. balance of payments area, including net imports to U.S. territories such as Puerto Rico and Virgin Islands is expected to be $44 to $45 billion in 1978, expressed in constant dollars observed in the first half of 1978. Imports into the 50-State/D.C. area are expected to rise to the range of 9 to 9.4 million barrels daily in 1979 and to 10 to 10.6 million barrels daily in 1980. The cost of imports to the balance of payments area is expected to range between $49 to $51 billion in 1979 and between $54 and $57 billion in 1980 in the first half of 1978 dollars.

DOE

N79-28357# North Dakota Univ., Grand Forks.

CHEMISTRY OF LIGNITE LIQUEFACTION Quarterly Report, Apr. - Jun. 1978

Virgil I. Stenberg, Richard J. Baltisberger, Kenneth J. Klabunde, Neil F. Woolsey, Donald Severson, and Max Souby Jul 1978 50 p refs

(Contract EX-76-C-01-2211)

(FE-2211-10) Avail NTIS HC A03/MF A01

Lignite liquefaction was investigated. Emphasis was placed on development of analytical methods for the structural analysis of solvent refined lignite (SRL) and its reduction products, application of the developed analytical methods to and CO-H2O reducing systems. Results are reported.

J.M.C.

N79-28358# Institute of Gas Technology, Chicago, Ill.

RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS Annual Report, 1 Apr. 1977 - 31 Mar. 1978

Dennis A. Duncan, Justin L. Beeson and R. Donald Oberle Aug 1978 101 p refs

(Contract EX-76-C-01-2307)

(FE-2307-34) Avail NTIS HC A06/MF A01

Runs were made in the bench-scale unit using power plant grind of lignite and hydrogen. The main products obtained were methane, ethane, carbon oxides, and hydrocarbon liquids. The thermal treatment of the reactants for all runs was characterized by a kinetic severity function, which is a measure of the products of a first order decomposition rate constant and the time interval that the reactants are exposed to the reaction environment. Overall, correlation with kinetic serverity function was found to be a reasonable predictor for carbon conversion and methane yields. Initial work with liquids composition data shows that liquids composition does not correlate as well with kinetic severity function, indicating that other factors, such as reactions in sequence, influence liquids composition.

DOE

N79-28360# Institute of Gas Technology, Chicago, Ill.

HYDROGEN FROM EXISTING FALLING-WATER SITES: AN INITIAL FEASIBILITY ASSESSMENT (SUMMARY)

Dale G. Johnson, William J. D. Escher, and Jon B. Pangborn 1978 11 p refs Presented at DOE Chem. Energy Storage and Hydrogen Energy Systems Contracts Rev., Washington, D. C., 28-30 Nov. 1978

(Contract EY-76-C-02-0016)

(CONF-781142-8) Avail NTIS HC A02/MF A01

When viewed on a macroscopic scale, falling-water hydrogen cannot be a major contributor in strengthening the nation's energy base. However, when viewed on a regional or mini-regional scale, there appears to be strong possibilities that falling-water hydrogen can become an economic reality in the near term, as a high-value commodity that would serve as a replacement in part, for steam-reformed natural gas, and in the future, as an economic gas supplement through direct injection into the natural gas distribution system. Although appearing favorable, the characteristic seasonal-yearly variation in hydrogen production may or may not diminish the economic attractiveness of falling-water hydrogen. This will depend upon specific local market or energy demands and their relative location to the resource and the associated cost of storage and delivery. DOE

N79-28361# SRI International Corp., Menlo Park, Calif.
MISSION ANALYSIS FOR THE FEDERAL FUELS FROM BIOMASS PROGRAM. VOLUME 5: BIOCHEMICAL CONVERSION OF BIOMASS TO FUELS AND CHEMICALS
Jerry L. Jones, W. S. Fong, F. A. Schooley, and R. L. Dickenson Dec. 1978 203 p refs
(Contract EY-76-C-03-0015-131)
(TID-29093-Vol-5) Avail: NTIS HC A10/MF A01

In the analysis of the anaerobic digestion options, specific feedstocks, including animal manure, wheat straw, and marine algae (giant kelp), are considered on a case basis. The processes are described, investment and operating costs estimated, and the availability and reliability of the technology and environmental considerations briefly discussed. The analysis of the fermentation of biomass feedstocks to ethanol from sugars and the actual production of the sugars are described. After describing the process for fermentation of sugars to alcohol, estimating investment and operating costs, and commenting on the availability and reliability of the technology and environmental considerations, a number of alternative feedstocks and processes for producing the fermentable sugar solutions are examined. These processes for producing the sugar solutions are examined in a manner comparable with that mentioned above. The feedstocks included in the analysis are sugar cane, wheat straw, and aquatic biomass. DOE

N79-28362# Argonne National Lab., Ill. Materials Science Div.
MATERIALS TECHNOLOGY FOR COAL-CONVERSION PROCESSES Quarterly Report, Jul. - Sep. 1978
W. A. Ellingson 1978 71 p refs
(Contract W-31-109-eng-38)
(ANL-79-2; QR-15) Avail: NTIS HC A04/MF A01

An evaluation of ceramic refractories for slagging gasifiers and fused cast chrome alumina are presented along with ultrasonic erosion detection systems and data acquired during a plant run at Bi-Gas. DOE

N79-28363# Utah Univ., Salt Lake City. Dept. of Mining, Metallurgical and Fuels Engineering.
APPLIED RESEARCH AND EVALUATION OF PROCESS CONCEPTS FOR LIQUEFACTION AND GASIFICATION OF WESTERN COALS Quarterly Progress Report, Jul. - Sep. 1977
Wendell H. Wiser Apr. 1978 102 p
(Contract EX-76-C-01-2006)
(FE-2006-9) Avail: NTIS HC A06/MF A01

Studies on the extraction of coal with tetralin show that high volatile bituminous coal is converted to oil and benzene and pyridine solubles in less than 2 minutes. The products show systematic changes in hydroaromatic and aliphatic structures as the reaction proceeds. The presence of aromatic ring structures increases with reaction time. The molecular weight of liquid products decreases with reaction time. Mild hydropyrolysis appears to be a very interesting technique for upgrading coal-derived liquids to a lighter liquid. Hydrogen consumption in this process is low. Zinc chloride impregnated on coal was found to have hydrogen exchange properties of a Bronsted acid. A coal sample without ZnCl2 has similar exchange properties, but the rate is much less. The acidic oil fraction obtained by catalytic hydrogenation of coal was separated by gel permeation chromatography and gradient elution liquid chromatography. Function group content was found to be independent of molecular size. DOE

N79-28364# Metal Properties Council, Inc., New York.
PROGRAM TO DISCOVER MATERIALS SUITABLE FOR SERVICE UNDER HOSTILE CONDITIONS OBTAINING IN MATERIALS FOR THE GASIFICATION OF COAL AND OTHER SOLID FUELS Quarterly Progress Report, 1 Jan. - 31 Mar. 1978
A. O. Schaefer, ed. May 1978 172 p
(Contract EX-76-C-01-1784)
(FE-1784-39) Avail: NTIS HC A08/MF A01

The materials for use in coal gasification plants with respect to the various unique corrosive environments were screened to provide useful corrosion data as well as reliable information on other properties needed for the design, construction, and operation of such plants. DOE

N79-28398# Sandia Labs., Albuquerque, N. Mex. Antenna Development Div.
SCATTERED EM FIELD DUE TO ROTATING BLADES OF HORIZONTAL-AXIS WIND MACHINES
Billy C. Brock Mar. 1979 35 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0434) Avail: NTIS HC A03/MF A01

An analysis of the scattered electromagnetic field from the rotating blades of a horizontal axis wind machine is presented. The general analysis includes all of the near field terms and does not specify the blade geometry. After the general result is developed, appropriate approximations were made and a simple blade geometry was specified in order to simplify numerical calculations. (The simple blade geometry includes blade pitch angle and coning angle). Graphs of the magnitude vs. time of the total horizontally polarized electric field resulting from a horizontally polarized incident plane wave are given for various parameters. The FORTRAN computer code used to generate the results is also listed. DOE

N79-28439# Brookhaven National Lab., Upton, N. Y.
HIGH VOLTAGE INSULATION AND BUSHING DESIGN FOR FLEXIBLE SUPERCONDUCTING CABLES
A. J. McNerney 1979 19 p refs Presented at the EPRI Sem. on Solid Dielectric Mater. Appl. to the Elec. Power Ind., Monterey, Calif., 24-26 Jan. 1979
(Contract EY-76-C-02-0016)
(BNL-25351; Conf-790141-1) Avail: NTIS HC A02/MF A01

Design details are presented for the high voltage insulation and feedthrough bushing for a flexible, superconducting, helium-cooled, 138 kV power transmission cable. The cable when installed will have helium at 15 atmospheric pressure and 6 to 8 K temperature flowing in the hollow cable core. The insulation requirements were met by a dielectric lapped from laminated tapes made from commercially available oriented polyethylenes and polypropylenes. Epoxy bushings were chosen for further development. DOE

N79-28441# Market Facts, Inc., Washington, D. C.
HIGH-EFFICIENCY ELECTRIC MOTORS: FOCUS GROUP RESULTS
Aug. 1978 39 p
(Contract EV-78-C-01-6458)
(DOE/TIC-10005) Avail: NTIS HC A03/MF A01

The question of whether high-efficiency electric motors represent an appropriate energy conservation technology for DOE commercialization efforts is addressed and these issues are covered: (1) feasibility of the commercialization of high-efficiency motors; (2) extent and nature of the market of these motors; (3) barriers and opportunities identified as critical to the commercialization of these motors and the relative importance of each; and (4) what actions, if any, should the Federal government take to promote commercialization. DOE

N79-28470*# Grumman Aerospace Corp., Bethpage, N.Y.
CRYOGENIC THERMAL DIODE HEAT PIPES Final Report
J. Alario Feb. 1979 59 p refs
(Contract NAS2-7492)
(NASA-CR-152268) Avail: NTIS HC A04/MF A01 CSCL 20D

The development of spiral artery cryogenic thermal diode heat pipes was continued. Ethane was the working fluid and stainless steel the heat pipe material in all cases. The major tasks included: (1) building a liquid blockage (blocking orifice)

thermal diode suitable for the HEPP space flight experiment; (2) building a liquid trap thermal diode engineering model; (3) retesting the original liquid blockage engineering model, and (4) investigating the startup dynamics of artery cryogenic thermal diodes. An experimental investigation was also conducted into the wetting characteristics of ethane/stainless steel systems using a specially constructed chamber that permitted in situ observations.
G.Y.

N79-28506# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).
AERODYNAMIC SEPARATION OF GASES AND ISOTOPES: RECENT ADVANCES
1978 592 p refs Lecture held at Rhode-Saint-Genese, Belgium, 29 May - 2 Jun. 1978
(VKI-Lecture-Series-1978-8) Avail: NTIS HC A25/MF A01

A lecture series on aerodynamic methods which have been used to separate or have been proposed for separating uranium isotopes in UF6 is presented.

N79-28521# California Univ., Livermore. Lawrence Livermore Lab.
DEVELOPMENT OF MECHANISTIC THEORY FOR DRYING OF POROUS MEDIA USING TWO-FLUID, TWO-PHASE FLOW THEORY
R. W. Lyczkowski 15 Mar. 1979 31 p refs Presented at 2d Multiphase Flow and Heat Transfer Symp. Workshop, Miami Beach, Fla., 16 Apr. 1979
(Contract W-7405-eng-48)
(UCRL-81604; Conf-790423-5) Avail: NTIS HC A03/MF A01

A mechanistic phenomenological model for drying of porous media was established for a single representative pore by applying two-fluid, two-phase flow theory. The model rationally extends classical drying theory to handle rapid drying of moist solids where bulk motion of vapor and liquid water occurs within the drying matrix. The new model was developed to gain insight into the moisture dynamics of wet Western United States coals undergoing underground coal gasification. Simplifications were made to compare with other theories and models proposed or assumed in the literature to assess their correctness. Explicit expressions were also obtained for the evaporation rate and phase permeabilities. The extension to a global drying model was made.
DOE

N79-28540# Sandia Labs., Albuquerque, N. Mex.
LASER DEVELOPMENT FOR LASER FUSION APPLICATIONS Progress Report, Apr. - Sep. 1978
Dec. 1978 77 p refs
(Contract EY-76-C-04-0789)
(SAND-78-2306) Avail: NTIS HC A05/MF A01

Three high power laser systems were discussed: iodine, HF, and GROUP IV atoms. Both the iodine lasers and the HF laser possess high power capability and show promise in the laser fusion applications. The technical progress of these programs was pointed out.
DOE

N79-28592# Bureau of Mines, Albany, Oreg. Metallurgy Research Center.
EROSION TESTING OF POTENTIAL VALVE MATERIALS FOR COAL GASIFICATION SYSTEMS
J. S. Hansen, J. E. Kelley, and F. W. Wood 1979 32 p refs
(PB-293308/3; BM-RI-8335) Avail: NTIS HC A03/MF A01 CSCL 13K

In support of its objective to conserve mineral resources by minimizing premature failure of materials, the Bureau of Mines conducted a cooperative study with the U.S. Department of Energy on the erosion and abrasion resistance of hard materials for valves in coal conversion systems. A developed erosion-testing apparatus is described and data on the erosion resistance of over 200 materials are presented. Erosion resistance of most metals was comparatively low. In contrast, ceramics and cermets such as B4C, WC, SiC, Si3N4, and TiB2, when fabricated to minimize porosity, displayed greater than five times the erosion resistance of metals. Coatings such as boron diffused into Mo and WC, chemical-vapor-deposited TiCN, and electrodeposited TiB2 were highly erosion resistant if applied in thicknesses ranging from 60 to 75 micrometers. Erosion resistance of cemented carbides was inversely related to metal binder content.
GRA

N79-28594# Little (Arthur D.), Inc., Cambridge, Mass.
EVALUATION OF AUTOMOBILE DRIVETRAIN COMPONENTS TO IMPROVE FUEL ECONOMY Final Report, Jun. 1975 - Nov. 1977
Donald Hurter and Philip Gott Mar. 1979 114 p refs
(Contract DOT-TSC-1046)
(PB-293728/2; DOT-TSC-NHTSA-79-12; DOT-HS-803-840) Avail: NTIS HC A06/MF A01 CSCL 13F

Wide ratio range automatic transmissions with lockup torque converters could be in production by the early 1980's. In order to evaluate their impact upon fuel economy, emissions, driveability, acceleration, and durability, four 1975 automobiles with inertia weights and engine sizes typical of that time period were equipped with Multi-Purpose Test Transmissions. Each of the test cars were evaluated in seven different transmission modes for fuel economy, emission, driveability, acceleration, and durability. Fuel economy test results were compared to computer predicted fuel economies. Predicted values agreed with actual fuel economies within the resolution of the test method. Composite fuel economy improvements of up to 14% were achieved with no change in acceleration and durability.
GRA

N79-28596# South Coast Technology, Inc., Santa Barbara, Calif.
ALTERNATE ENGINES: STATE OF THE ART STUDY Final Report, Nov. 1977 - Nov. 1978
Roy A. Renner Nov. 1978 85 p refs
(Contract DOT-HS-7-01790)
(PB-293940/3; DOT-HS-803-880) Avail: NTIS HC A05/MF A01 CSCL 21G

Eleven different advanced automobile engine types were examined as to the possibilities for introduction prior to 1990. An assessment was made based on extensive literature survey and extrapolation of learning curves toward future values of fuel economy and emissions. Gas turbines and external combustion engines are unlikely to be in general use prior to 1990. Stratified charge engine, the advanced diesel, and internal combustion engines with variable displacement features were considered to be likely candidates for use prior to 1990. These engines were analyzed and learning curves were determined for fuel economy predictions with exhaust emission constraints.
GRA

N79-28652# Department of Energy, Washington, D. C. Energy Information Administration.
FACTORS AFFECTING THE DECLINE RATE OF OLD OIL PRODUCTION
Charles G. Everett Dec. 1978 27 p refs
(DOE/EIA-0102/29) Avail: NTIS HC A03/MF A01

Data on old oil production over the period January 1975 to March 1978 were analyzed. It is concluded that the rapid decline in reported values of Lower Tier Oil was effected by changes in the regulatory definition of Lower Tier Oil, in addition to the normal decline which would have obtained under regulatory stability. By analyzing the available data the old portion of old/new properties is projected to decline at about 5.5 percent per year. If projections from the two subcategories are combined the average annual decline between 1978 and 1985 is approximately 9.1 percent, and the 1985 forecast of Lower Tier Oil production is about 1.8 million barrels per day.
DOE

N79-28653# California Univ., Livermore. Lawrence Livermore Lab.
REACTION KINETICS FOR REMODELING OIL SHALE RETORTING
J. H. Campbell and A. K. Burnham Jan. 1979 51 p refs Presented at the Am. Inst. of Chem. Eng. Meeting, Houston, Tex., 1-5 Apr. 1979

(Contract W-7405-eng-48)
(UCRL-81622; Conf-790405-8) Avail: NTIS HC A04/MF A01

Results from recent laboratory kinetic studies on gasification, pyrolysis, and mineral reactions in oil shale are presented. The specific pyrolysis reactions investigated include the decomposition of kerogen, the evolution of oil, hydrogen and C2 plus C3 hydrocarbons and the formation of a carbonaceous residue. Data describing the evolution of H2 and CH4 during secondary pyrolysis of the carbonaceous residue are also presented. The mineral reaction kinetics discussed include the decomposition and/or reaction (with silica or silicates) of calcite, dolomite, dawsonite and nahcolite. Rate equations describing the effects of CO2 and steam on the reactions of calcite and dolomite are presented. Kinetics describing gasification of the carbonaceous residue by CO2 and H2O are examined. DOE

N79-28654# Lewin and Associates, Inc., Washington, D. C.
ENHANCED RECOVERY OF UNCONVENTIONAL GAS: THE METHODOLOGY, VOLUME 3
Vello A. Kuuskraa, J. P. Brashear, Todd M. Doscher (University of Southern California), and Lloyd E. Elkins Feb. 1979 407 p refs 3 Vol.
(Contract EF-77-C-01-2705)
(HCP/T-2705-03) Avail: NTIS HC A18/MF A01

The methodology is described on the analytic approach, estimated natural gas production, recovery from tight gas sands, recovery from Devonian shales, recovery from coal seams, and recovery from geopressured aquifers. Author (DOE)

N79-28655# Golder Associates, Inc., Kirkland, Wash.
PLAN TO DEMONSTRATE OIL SHALE MINING AND RUBBLIZING FOR A MODIFIED IN SITU RETORTING PROCESS
Jan. 1979 50 p
(Contract W-7405-eng-48)
(UCRL-13979) Avail: NTIS HC A03/MF A01

A proposed program for investigating the mining and rubblizing requirements for modified in-situ retorting is reported. The program includes basic blasting experiments in small scale retorts and is scoped in some detail with schedules and costs estimated fairly reliably. The program also includes application of the results obtained to a larger scale to test the mining concepts and the success of rubblization in a commercial size retort. This work is necessarily described in less detail and only approximate time and cost estimates are provided. DOE

N79-28656# California Univ., Livermore. Lawrence Livermore Lab.
MULTIPHASE FLOW ANALYSIS OF OIL SHALE RETORTING
D. Gidaspow (Illinois Inst. of Tech., Chicago) and R. W. Lyczkowski Mar. 1979 16 p refs Presented at 2d Multiphase Flow and Heat Transfer Symp. and Workshop, Miami Beach, Fla., 16-18 Apr. 1979
(Contract W-7405-eng-48)
(UCRL-81717-Rev-1; Conf-790423-4) Avail: NTIS HC A02/MF A01

Multiphase processes associated with oil shale retorting were analyzed including condensation of oil shale vapor, and pressure oscillations in oil shale blocks through cracked bedding planes. Energy conservation eqbations for oil shale retorting, which include the effects associated with condensation of oil, were derived on the basis of two-phase flow theory. It is suggested that an effective heat capacity associated with the latent heat of condensation should be included in the modeling of simulated modified in-situ oil shale retorting. A pressure propagation equation for fast transients in oil shale cracks was derived and examined in view of existing experimental data. For slow processes, a limiting solution for maximum pressure in oil shale rocks was obtained. DOE

N79-28657# California Univ., Livermore. Lawrence Livermore Lab.
CHALLENGE OF EFFICIENTLY RETORTING VERY NONUNIFORM BEDS OF OIL SHALE RUBBLE
T. R. Galloway 16 Mar. 1979 74 p refs Presented at AIChE Meeting, Houston, Tex., 1-5 Apr. 1979
(Contract W-7405-eng-48)
(UCRL-81721-Rev-1; Conf-790405-9) Avail: NTIS HC A04/MF A01

Recent experimental pilot scale retort work has shown significant declines in oil recovery yield as the size of the shale block increases. Current analyses of the problem were reviewed, together with experimental evidence for the key fluid mechanical, heat transfer and mass transfer processes that caused these lower yields. It was found that loss in retort oil yield was dominated by the flow patterns in the matrix material around the large blocks and by the thermal transient characteristics within the blocks. The principal mechanism appeared to be burning and cracking of the produced oil in the gas phase near the larger shale blocks. The use of process control methods involving air/steam ratio, total flow, and flow variations coupled with monitored exit gas composition appears feasible to maximize oil production. DOE

N79-28658# California Univ., Livermore. Lawrence Livermore Lab.
MULTIPHASE FLOW ANALYSIS OF OIL SHALE RETORTING
D. Gidaspow and R. W. Lyczkowski Sep. 1978 22 p refs Presented at 2d Multiphase Flow and Heat Transfer Symp. Workshop, Miami Beach, Fla., 16 Apr. 1979
(Contract W-7405-eng-48)
(UCRL-81717; Conf-790423-2) Avail: NTIS HC A02/MF A01

Several multiphase phenomena occur during oil shale retorting. An analysis is presented of two of these processes including condensation of oil shale vapor and oscillations of pressure in oil shale blocks through cracked bedding planes. Energy conservation equations for oil shale retorting, which include the effects associated with condensation of oil, are derived on the basis of two phase flow theory. It is suggested that an effective heat capacity associated with the latent heat of condensation should be included in the modeling of simulated modified in situ oil shale retorting. A pressure propagation equation for fast transients in oil shale cracks has been derived and examined in view of existing experimental data. For slow processes, a limiting solution for maximum pressure in oil shale rocks has been obtained. Generation of high pressures in rocks by thermal or other means may lead to rock fracture which may be taken advantage of in modified in situ oil shale processing. DOE

N79-28665 California Univ., Berkeley.
SOLAR ENERGY FIXATION AND CONVERSION WITH ALGAL BACTERIAL SYSTEMS Ph.D. Thesis
Moshe Uziel 1978 234 p
Avail: Univ. Microfilms Order No. 7914797

Research on methane fermentation of algae as part of an integrated biological process of solar energy fixation and conversion to natural gas, along with purification of waste water, is described. The research was initiated since there is a need for alternative energy sources and methods for pollution control. The process involves growth of algae and bacteria on waste water, harvesting of algae, methane fermentation of algae, and use of the product of fermentation and combustion for additional algae growth. Defined growth media and conditions for growth of this algae are described, as are anaerobic fermentation chemostats and analytical procedures for measurement and analysis of fermentation gases, fatty acids, and other chemical parameters. Comparative fermentability of the six species of algae were studied. Dissert. Abstr.

N79-28667*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SOLAR TRACKING SYSTEM Patent Application
Paul R. White and Donald R. Scott, inventors (to NASA) Filed 25 Feb. 1979 16 p
(NASA-Case-MFS-23999-1; US-Patent-Appl-SN-060435) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar collector is angularly oriented by motor wherein the output of two side-by-side photodetectors are discriminated as to three ranges, corresponding to a low light or darkness condition by east control circuit to light intensity lying in an intermediate range by pointing control circuit; and to light above an intermediate range, direct sunlight, by differential tracking circuit. The first output drives the motor to a selected maximum easterly angular position to await sunrise; the second enables the motor to be driven westerly at the earth rotational rate when clouds are present which prevent accurate tracking; and the third output, actually the separate outputs of the two photodetectors, differentially controls the direction of rotation of motor through east drive relay and west drive relay to effect tracking of the sun. NASA

N79-28668# California Univ., Livermore. Lawrence Livermore Lab.

PROGRAM REPORT FOR FY 1978: ATMOSPHERIC AND GEOPHYSICAL SCIENCES DIVISION OF THE PHYSICS DEPARTMENT

J. B. Knox, ed. and R. C. Orphan, ed. Dec. 1978 75 p refs
Sponsored by DOE
(UCRL-51444-78) Avail: NTIS HC A04/MF A01

The environmental issues addressed by G Division research, the technical objectives of the program, and the highlights of program accomplishments in FY-1978 are presented. A summary of G Division's numerical modeling capabilities is given, as well as an annotated bibliography of the division's publications in the atmospheric sciences during FY-1978. Supplementary material on budget and staffing is included. M.M.M.

N79-28670*# National Aeronautics and Space Administration, Washington, D. C.

FUTURE THRUSTS OF THE NASA SPACE POWER PROGRAM

Lee Holcomb *In* NASA. Goddard Space Flight Center 11th Ann. Battery Workshop 1978 p 5-16

Avail: NTIS HC A23/MF A01 CSCL 10C

General objectives and plan directions are given for current program support in the following areas: (1) solar cells and arrays; (2) batteries and fuel cells; (3) thermoelectric, thermionic, and Brayton cycle conversion systems; (4) circuits and subsystems for the management and distribution of power; and (5) the interactions of the environment with the power system and the spacecraft. Particular emphasis is given to the electrochemical energy conversion storage portion of the program where efforts are directed to improving the energy density and life of nickel cadmium batteries, to validating flight-weight silver hydrogen cells, to promoting the safe use of lithium promary batteries, to completing the silver zinc batteries and the orbital transfer fuel cell technology, to increasing the capacity of space batteries, to and to evaluating new electrochemical concepts for very high energy density. The use of the fuel cell electrolyzer concept for energy storage in both the dedicated and the truly regenerative mode is also being investigated. A.R.H.

N79-28674*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

CELL DESIGN AND MANUFACTURING CHANGES DURING THE PAST DECADE

David Baer *In its* 11th Ann. Battery Workshop 1978 p 49-56

Avail: NTIS HC A23/MF A01 CSCL 10C

Eight of the most important changes that occurred in the GE 12 AH cell over the past ten years, which are currently being used are evaluated, and a systematic approach to compare their relative merits is presented. Typical positive thickness, typical negative thickness, positive loading, negative loading, final KOH quantity, and precharge as adjustment are shown for the control cell, and the following variables: Teflon treatment; silver treatment; light loading; no PQ treatment; polypropylene separator; the A.K. 1968 plate design no PQ, old elec process, no decarb process and the A.K. 1968 plate design, no PQ, present aerospace processes. The acceptance test cell voltage and cell pressure performance and capacity test results are included. A.R.H.

N79-28709*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.

NASA'S LITHIUM CELL TECHNOLOGY PROGRAM

Gordon L. Juvinall *In* NASA. Goddard Space Flight Center 11th Ann. Battery Workshop 1978 p 431-440

Avail: NTIS HC A23/MF A01 CSCL 10C

Briefly outlined are the activities of the various research centers involved in the NASA program. Graphs are presented for: (1) the initial results on SOCl2 decomposition rate; (2) effect of rate on output of Li-SOCl2 cells; (3) comparison of high and low rate Li-SOCl2 cells; and (4) effect of temperature on output of Li-SOCl2 cells. Abusive test results and a description of secondary lithium cells are also presented. G.Y.

N79-28718*# Honeywell, Inc., Horsham, Pa.

APPLICATIONS AND SAFETY DATA

N. J. Berlangieri *In* NASA. Goddard Space Flight Center 11th Ann. Battery Workshop 1978 p 511-530

Avail: NTIS HC A23/MF A01 CSCL 10C

A general overview of activities involving lithium batteries, which shows the various applications and data that were performed for numerous industry and government sponsors is presented. Brief discussions on electrochemical criteria selection, and typical storage and performance data obtained from three systems being developed are presented. Current safety work being done on high-rate, D, SO2 cells is also discussed. Three chemistries were developed and are discussed: lithium vanadium pentoxide, lithium sulfur dioxide, and lithium thionyl chloride. Storage, performance and safety data are graphically presented. G.Y.

N79-28721*# Engineering Olympic Corp., Richland, Wash.

SOLAR HEATING, COOLING, AND HOT WATER SYSTEMS INSTALLED AT RICHLAND, WASHINGTON Final Report

Jun. 1979 258 p Sponsored by NASA
(Contract EX-76-C-01-2404)
(NASA-CR-161237; OEC-ER-014) Avail: NTIS HC A12/MF A01 CSCL 10A

The project described is part of the U. S. Department of Energy's solar demonstration program, and became operational in April 1978. The solar system uses 6,000 square feet of flat-plate liquid collectors in a closed loop to deliver solar energy through a liquid-liquid heat exchanger to the building heat-pump duct work or 9,000-gallon thermal energy storage tank. A 25-ton Arkla solar-driven absorption chiller provides the cooling, in conjunction with a 2,000 gallon chilled water storage tank and reflective ponds on three sides of the building surplus heat. A near-by building is essentially identical except for having conventional heat-pump heating and cooling, and can serve as an experimental control. An on-going public relations program was provided from the beginning of the program, and resulted in numerous visitors and tour groups. M.M.M.

N79-28722*# Westinghouse Research and Development Center, Pittsburgh, Pa.

SILICON WEB PROCESS DEVELOPMENT Annual Report, Apr. 1978 - Apr. 1979

C. S. Duncan, R. H. Hopkins, R. G. Seidensticker, J. P. McHugh, F. E. Hill, M. E. Heimlich, and J. M. Driggers Apr. 1979 233 p refs Sponsored by NASA Prepared for DOE and JPL
(Contract JPL-954654)
(NASA-CR-158852; DOE/JPL-954654-79/7) Avail: NTIS HC A11/MF A01 CSCL 10A

Silicon dendritic web, a single crystal ribbon shaped during growth by crystallographic forces and surface tension (rather than dies), is a highly promising base material for efficient low cost solar cells. The form of the product smooth, flexible strips 100 to 200 microns thick, conserves expensive silicon and facilitates automation of crystal growth and the subsequent manufacturing of solar cells. These characteristics, coupled with the highest demonstrated ribbon solar cell efficiency-15.5%-make silicon web a leading candidate to achieve, or better, the 1986 Low Cost Solar Array (LSA) Project cost objective of 50 cents per peak watt of photovoltaic output power. The main objective of the Web Program, technology development to significantly increase web output rate, and to show the feasibility for simultaneous melt replenishment and growth, have largely been accomplished. Recently, web output rates of 23.6 sq cm/min, nearly three times the 8 sq cm/min maximum rate of a year ago, were achieved. Webs 4 cm wide or greater were grown on a number of occassions. F.O.S

N79-28725*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SAFETY CONSIDERATIONS IN THE DESIGN AND OPERATION OF LARGE WIND TURBINES Final Report

Dwight H. Reilly Jun. 1979 38 p refs Sponsored in part by DOE

(Contract DE-AI01-79ET20305)

(NASA-TM-79193; E-067; DOE/NASA/20305-79/3) Avail: NTIS HC A03/MF A01 CSCL 10B

The engineering and safety techniques used to assure the reliable and safe operation of large wind turbine generators utilizing the Mod 2 Wind Turbine System Program as an example is described. The techniques involve a careful definition of the wind turbine's natural and operating environments, use of proven structural design criteria and analysis techniques, an evaluation of potential failure modes and hazards, and use of a fail safe and redundant component engineering philosophy. The role of an effective quality assurance program, tailored to specific hardware criticality, and the checkout and validation program developed to assure system integrity are described. Author

N79-28726*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

STIRLING ENGINES FOR AUTOMOBILES

Donald G. Beremand 1979 15 p refs Proposed for presentation at Intern. Conf. on Energy Use Management, Los Angeles, Calif., 22-26 Oct. 1979 Sponsored in part by DOE

(Contract EC-77-A-31-1040)

(NASA-TM-79222, E-116) Avail: NTIS HC A02/MF A01 CSCL 10B

The results of recent and ongoing automobile Stirling engine development efforts are reviewed and technology status and requirements are identified. Key technology needs include those for low cost, high temperature (1300 - 1500 F) metal alloys for heater heads, and reliable long-life, low-leakage shaft seals. Various fuel economy projections for Stirling powered automobiles are reviewed and assessed. Author

N79-28727*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DESIGN, FABRICATION, AND INITIAL TEST OF A FIXTURE FOR REDUCING THE NATURAL FREQUENCY OF THE MOD-O WIND TURBINE TOWER

J. R. Winemiller, T. L. Sullivan, R. L. Sizemore, and S. T. Yee Jul. 1979 21 p Prepared for DOE

(Contract EX-76-I-01-1028)

(NASA-TM-79200; C-081; DOE/NASA/1028-79/24) Avail: NTIS HC A02/MF A01 CSCL 10B

It was desired to observe the behavior of a two bladed wind turbine where the tower first bending natural frequency is less than twice the rotor speed. The system then passes through resonance when accelerating to operating speed. The frequency of the original Mod-O tower was reduced by placing it on a spring fixture. The fixture is adjustable to provide a range of tower bending frequencies. Fixture design details are given and behavior during initial operation is described. Author

N79-28728*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF POSITIVE PULSE CHARGE WAVEFORMS ON CYCLE LIFE OF NICKEL-ZINC CELLS Final Report

John J. Smithrick Jul. 1979 14 p refs Sponsored in part by DOE

(Contract EC-77-A-31-1044)

(NASA-TM-79215; E-100; DOE/NASA/1044-79/3) Avail: NTIS HC A02/MF A01 CSCL 10C

Five amp-hour nickel-zinc cells were life cycled to evaluate four different charge methods. Three of the four waveforms investigated were 120 Hz full wave rectified sinusoidal (FWRS), 120 Hz silicon controlled rectified (SCR), and 1 kHz square wave (SW). The fourth, a constant current method, was used as a baseline of comparison. Three sealed Ni-Zn cells connected in series were cycled. Each series string was charged at an average c/20 rate, and discharged at a c/2.5 rate to a 75% rated depth. Author

N79-28729*# Garden State Racing Association, Cherry Hill, N. J.

SOLAR HEATING AND HOT WATER SYSTEM INSTALLED AT CHERRY HILL, NEW JERSEY

16 May 1979 299 p Sponsored by NASA

(Contract EG-77-A-01-4086)

(NASA-CR-161235) Avail: NTIS HC A11/MF A01 CSCL 10A

The solar heating and hot water system installed in existing buildings at the Cherry Hill Inn in Cherry Hill, New Jersey is described in detail. The system is expected to furnish 31.5% of the overall heating load and 29.8% of the hot water load. The collectors are liquid evacuated tube type. The storage system is an above ground insulated steel water tank with a capacity of 7,500 gallons. R.E.S.

N79-28732# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).

COMBINED CYCLES FOR POWER GENERATION, VOLUME 1

1978 306 p refs Proc. of Lectures held at Rhode Saint-Genese, Belgium 2 Vol.

(VKI-Lec-Ser-1978-6-Vol-1) Avail: NTIS HC A14/MF A01

Papers included in this lecture series refer to closed cycle gas-turbine steam engines, possibilities of combined cycles, combined gas-steam steam turbine power plants with supplementary firing and the GT/ST cycle in coal gasification.

N79-28736# Kraftwerk Union A.G., Reaktortechnik, Erlangen (West Germany).

COMBINED GAS/STEAM TURBINE POWER PLANTS WITH SUPPLEMENTARY FIRING

J. Charlier and H. Brueckner *In* Von Karman Inst. for Fluid Dyn. Combined Cycles for Power Generation, Vol. 1 1978 59 p refs

Avail: NTIS HC A14/MF A01

Combined cycles systems are analyzed, especially those in the high power range. A coal and natural gas fired combined cycles power plant with a 750 MW output is described. Most of the power is produced by the steam turbine arrangement in which additional firing is involved. An efficiency on the order of 40 percent to 42 percent is obtained. Further applications of combined cycles and new developments in Germany are discussed. Author (ESA)

N79-28737# Sulzer Bros. Ltd., Winterthur (Switzerland).

THE GAS TURBINE/STEAM TURBINE CYCLE WITH COAL GASIFICATION

A. Steiner *In* Von Karman Inst. for Fluid Dyn. Combined Cycles for Power Generation, Vol. 1 1978 43 p refs

Avail: NTIS HC A14/MF A01

Available processes for solid fuel gasification and subsequent gas desulfuration are described as they are especially suitable GT/ST cycles. Economic arguments and environmental protection regulations are discussed. Coal gasification is analyzed both as fixed bed generators and fluid bed generators. Purification alternatives such as physical washing, chemical washing, physical-chemical washing and absorption are described. A 170 MW coaal gasification combined power plant located at Luner, Germany, is described as an example. A Westinghouse combined cycle plant with 'U-gas' flindized-bed gasification is also discussed. Author (ESA)

N79-28738# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).

COMBINED CYCLES FOR POWER GENERATION

1978 318 p refs Lecture held at Rhode-Saint-Genese, Belgium 24-28 Apr., 1978 2 Vol.
(VKI-Lec-Ser-1978-6-Vol-2) Avail: NTIS HC A14/MF A01

Subjects discussed include recuperative gas cycles with derivation for power and heat generation, power generation, power generation with binary cycles, magnetohydrodynamics, and thermoionic conversion.

N79-28739# Commissariat a l'Energie Atomique, Saclay (France).
RECUPERATIVE GAS CYCLES WITH DERIVATION FOR POWER AND HEAT GENERATION. APPLICATION TO COMBINED CYCLES
Z. P. Tilliette *In* Von Karman Inst. for Fluid Dyn. Combined Cycles for Power Generation, Vol. 2 1978 43 p

Avail: NTIS HC A14/MF A01

Recuperative gas cycles without a by-pass steam generator are briefly reviewed. Recuperative cycles with a by-pass steam generator are discussed along with many charts and diagrams. The main advantages include high overall plant efficiency, especially for electrical generation when using combined gas-steam cycles, favorable technological conditions for steam generation, and good operational flexibility. Three examples of conditions and performances are presented corresponding to the open cycle, the fossil fuel case, and to the closed cycle with helium as the working fluid in the fossil fuel case as well as the nuclear fuel case. Author (ESA)

N79-28740# Mechanical Technology, Inc., Latham, N. Y.
POWER GENERATION WITH BINARY CYCLES
D. D. Colosimo, R. K. Rose, and O. Decker *In* Von Karman Inst. for Fluid Dyn. Combined Cycles for Power Generation, Vol. 2 1978 196 p refs

Avail: NTIS HC A14/MF A01

The state of the art in Rankine bottoming cycles is surveyed in order to illustrate the applicability of binary cycles. Selection of Rankine cycle working fluids is discussed refereing to six available commercial products. The two favorite industrial waste heat sources, gas turbines and diesel engines, are reviewed in reference to applicability to steam organic or binary cycles. Effects of governmental policies and alternative energy prices on the economics of energy recovery are discussed. Criteria for screening organic and binary cycle adaptation to industrial processes are given. Author (ESA)

N79-28741# Massachusetts Inst. of Tech., Cambridge.
MAGNETOHYDRODYNAMICS
Jean F. Louis *In* Von Karman Inst. for Fluid Dyn. Combined Cycles for Power Generation, Vol. 2 1978 64 p refs

Avail: NTIS HC A14/MF A01

Magnetohydrodynamic theory, application schemes, and an economic analysis are surveyed. A typical example of an open cycle direct preheat MHD-steam plant project is discussed. A nominal output power of 2000 MW, 7 years construction time, an overall net efficiency oof 48 percent, and other parameters are detailed. The case of oxygen enrichment and the closed cycle inert gas MHD are briefly discussed. Author (ESA)

N79-28742# Massachusetts Inst. of Tech., Cambridge.
THERMIONIC CONVERSION
Jean F. Louis *In* Von Karman Inst. for Fluid Dyn. Combined Cycles for Power Generation, Vol. 2 1974 15 p

Avail: NTIS HC A14/MF A01

The state of the art of thermionic conversion is surveyed. It is anticipated that in the next 10 years the goal of reducing the barrier index to about 1 to 1.6 electron-volts will be reached permitting a number of practical applications such as topping units for steam power plants. A 1000 MW joint General Electric and Thermo Electron Corporation project is discussed. Pulverized coal is used as fuel, with steps of thermionic conversion complemented by steam turbogenerators. Overall efficiency is 46.7 percent. Author (ESA)

N79-28743# TRW Defense and Space Systems Group, Redondo Beach, Calif.
ENERGY RECOVERY FROM ARMY AMMUNITION PLANT SOLID WASTE BY PYROLYSIS Final Report
J. D. Pinkerton, R. F. Tobias, and Robert Scola Mar 1979 85 p refs
(Contract DAAA21-76-C-0537)
(AD-A067519; AD-E400300; ARLCD-CR-78030) Avail: NTIS HC A05/MF A01 CSCL 13/2

Army Ammunition Plants (AAP's) dispose of large quantities of solid waste by incineration, open-air burning, and landfill. There is at present no attempt at energy recovery. The present study was conducted to determine the feasibility of adapting pyrolysis technology for energy recovery from these solid wastes. Eight AAP's were surveyed to identify the types and amounts of solid waste generated. Candidate systems were evaluated to determine their suitability for this application. Safety considerations indicate that propellants, explosives and pyrotechnics (PEP) and PEP-contaminated waste with proper precautions could be handled safely by pyrolysis processes, but further work is needed to determine applicable size reduction techniques. It was determined that a 45.4 MG/d (50 TPD) plant would be sufficient to handle the largest quantity of waste generated at any AAP. Capital cost was estimated at $4.1 million and annual cost at $623,100. Based on these costs it was concluded that pyrolysis is not economically feasible at this time even under mobilization conditions. GRA

N79-28744# Naval Research Lab., Washington, D. C.
IMPROVEMENTS IN THE LEAD-ACID BATTERY FOR LOAD LEVELING APPLICATIONS Interim Report, FY 1978 Summary Report
A. C. Simon, S. M. Caulder, C. P. Wales, and R. L. Jones May 1979 27 p refs
(AD-A068990; NRL-MR-3988) Avail: NTIS HC A03/MF A01 CSCL 10/3

This report describes research conducted in FY-78 under a DOE program to improve the lead-acid battery system for load leveling at electricity-generating plants. The study has identified changes in the plate active material that occur during cycling (or service operation), viz, a progressive buildup of an electrochemically inactive PbO2 species, and the physical transformation of the active material to a structurally unfavorable coralloid form, which if eliminated, could improve battery performance. GRA

N79-28747# California Univ., Berkeley. Lawrence Berkeley Lab.
GEOTHERMAL RESOURCE EXPLORATION ASSESSMENT AND DATA INTERPRETATION, KLAMATH BASIN, OREGON: SWAN LAKE AND KLAMATH HILLS AREA
M. Stark, N. Goldstein, H. Wollenberg, B. Strisower, and M. Hege Oct. 1978 80 p refs Presented at Klamath Basin Geothermal Assessment Steering Comm. Meeting, Berkeley, Calif., 9 Nov. 1978
(Contract W-7405-eng-48)
(LBL-8186(Draft); Conf-781190-1) Avail: NTIS HC A05/MF A01

A synthesis and preliminary interpretation of predominantly geophysical information relating to the Klamath Basin geothermal resource is presented. The Swan Lake Valley area, northeast of Klamath Falls, and the Klamath Hills area, south of Klamath Falls, are discussed in detail. Available geophysical data, including gravity, magnetic, electrical resistivity, microseismic, roving dipole resistivity, audio-magnetotelluric (AMT) and magnetotelluric (MT) data sets, are examined and reinterpreted for these areas. One- and two-dimensional modeling techniques are applied, and general agreement among overlapping data sets is achieved. DOE

N79-28749# Ocean Systems, Inc., Reston, Va.
OTEC PLATFORM CONFIGURATION AND INTEGRATION STUDY. VOLUME 1: SYSTEMS ENGINEERING AND INTEGRATION Final Report
Apr. 1978 315 p refs
(Contract EC-77-C-01-4063)
(DOE/ET/4063-1-Vol-1; LMSC-D623756-Vol-1) Avail: NTIS HC A14/MF A01

The economic success of an ocean thermal energy conversion (OTEC) system is highly dependent on a platform which provides adequate support for the power system, accommodates reliably the cold water pipe, and is most cost effective. The results of a study conducted for the Department of Energy to assess six generic types of platforms to determine the most satisfactory platform for several potential sites are presented. The six plaftorm configurations are ship, circular barge, semi-submersible, tuned sphere, submersible, and spar. These represent directional and symmetric types of platforms which operate on the surface, at the interface, and submerged. The five sites for this study were primarily New Orleans, Keahole Point (Hawaii), Brazil, and secondarily Key West and Puerto Rico. Electrical transmission of energy by submarine cable is the planned form of energy transmission for all sites except Brazil, where chemical conversion is to be the method of transmission. This study is devoted to the platform (or ocean systems) of the OTEC plant which is chiefly comprised of the hull and structure, the seawater system, the position control system, and miscellaneous support/assembly systems. The principal elements in the work breakdown structure for the commercial plants are presented. The assessment of the six platform configurations was conducted utilizing a baseline plan (100-MW(e) (Net)) and site (New Orleans) with variations from the baseline to cover the range of interested platforms and sites. DOE

N79-28750# Lockheed Missiles and Space Co., Sunnyvale, Calif.
OTEC PLATFORM CONFIGURATION AND INTEGRATION STUDY. VOLUME 3: PROJECT PLAN Final Report
Apr. 1978 15 p ref
(Contract EC-77-C-01-4063)
(DOE/ET/4063-1-Vol-3; LMSC-D623756-Vol-3) Avail: NTIS HC A02/MF A01

The characteristics which were desired in the demonstration plant are discussed and the demonstration activities for that plant are commented on. The cost, scale, and state of development of the technology the plant employs are covered. DOE

N79-28751# Department of Energy, Washington, D. C. Energy Information Administration.
HISTORIC AND FORECASTED ENERGY PRICES BY US DEPARTMENT OF ENERGY REGION AND FUEL TYPE FOR THREE MACROECONOMIC SCENARIOS AND ONE IMPORTED OIL PRICE ESCALATION SCENARIO
S. Borg and R. W. Moden Dec. 1978 38 p ref
(DOE/EIA-0102/27) Avail: NTIS HC A03/MF A01

The Energy Information Administration was requested to provide forecasts of energy prices at the DOE regional level for each year through the year 2000. Historical fuel prices for 1975, and 1976, and forecasted fuel prices for 1985 and 1990 are reported as an initial step in this process. The assumption and the methodology employed are described and results are tabulated. DOE

N79-28752# Department of Energy, Washington, D. C. Energy Information Administration.
SOLAR ENERGY POTENTIAL FOR RESIDENTIAL WATER HEATING AND SPACE HEATING IN THE 12TH CONGRESSIONAL DISTRICT OF PENNSYLVANIA. ANALYSIS MEMORANDUM
R. W. Moden, P. A. DonVito, C. A. Allen, and R. D. Stoll Dec. 1978 20 p refs
(DOE/EIA-0102/22) Avail: NTIS HC A02/MF A01

The analysis reflects local fuel prices, anticipated price escalations, climatic conditions (including the level of solar energy), building characteristics and installed solar costs. The results of the analysis indicate that solar systems are not cost competitive with conventional systems available in the District except under special circumstances. Solar systems could become marginally competitive against electric resistance units in the next few years if installed system costs were to become substantially lower than presently anticipated. DOE

N79-28753# California Univ., Livermore. Lawrence Livermore Lab.
APPLICATION OF SHALLOW SOLAR PONDS FOR INDUSTRIAL PROCESS HEAT: CASE HISTORIES
Alan B. Casamajor 16 Oct. 1978 18 p refs Presented at Symp. on Commercialization of Solar and Conservation Technol., Miami Beach, Fla., 11-13 Dec. 1978 Submitted for publication
(Contract EY-76-C-02-0016)
(UCRL-81764; Conf-781235-1) Avail: NTIS HC A02/MF A01

The shallow-solar-pond collector system is approaching commercialization. Three prototype or demonstration projects are described. A critique of each project points out the significant factors that affect the individual projects and shallow-solar-pond technology in general. Particular attention is drawn to problems encountered and solutions proposed. Possible marketing organization and strategies are discussed. DOE

N79-28754# Los Alamos Scientific Lab., N. Mex.
TROMBE WALL VS DIRECT GAIN: A COMPARATIVE ANALYSIS OF PASSIVE SOLAR HEATING SYSTEMS
William O. Wray and J. Douglas Balcomb 1979 8 p refs Presented at the 3d Natl. Passive Solar Conf., San Jose, Calif., 11-13 Jan. 1979
(Contract W-7405-eng-36)
(LA-UR-116; Conf-790106-2) Avail: NTIS HC A02/MF A01

The results of performance analysis calculations for both Trombe wall and direct gain systems in Albuquerque, New Mexico, and Madison, Wisconsin, are reported. The comparative analysis included parametric variation of fundamental design parameters including building load, glazing area, total mass, mass thickness, number of glazings, night insulation value and allowable temperature swing. Thermal comfort within the two generic types of buildings was considered as well as energy efficient performance. DOE

N79-28755# Los Alamos Scientific Lab., N. Mex.
APPLICATIONS OF DOE-1 TO PASSIVE SOLAR HEATING OF COMMERCIAL BUILDINGS: PRELIMINARY RESULTS
B. D. Hunn, N. M. Schnurr, J. L. Peterson, J. F. Kerrisk, and J. E. Moore 1979 6 p refs Presented at the 3d Natl. Passive Solar Conf., San Jose, Calif., 11-13 Jan. 1979 Submitted for publication
(Contract W-7405-eng-36)
(LA-UR-79-72; Conf-790106-6) Avail: NTIS HC A02/MF A01

The DOE-1 building energy analysis computer program was modified to include analysis of passive solar and large thermal mass heating and cooling systems. SUNSPOT is a detailed thermal network computer program developed for direct gain systems as a reference analysis tool to compare with the DOE-1. It was validated by comparison of calculated results with experimental test cell data. A series of runs was then made to determine the sensitivity of solar fraction to type of glazing, location and quantity of mass, and method of computing infrared radiant interchange among inside surfaces. Simulations using DOE-1 in its present form indicate that the weighting factors used in the program are not satisfactory for large mass/direct gain systems. However, it does appear that the weighting factor approach can be retained if an efficient method of determining weighting factors appropriate to passive systems can be developed. DOE

N79-28756# Los Alamos Scientific Lab., N. Mex.
PERFORMANCE AND COST OF A HYBRID PASSIVE/ACTIVE SOLAR HOUSE
B. D. Hunn 1979 26 p refs Presented at the ASHRAE Symp. on Air Infiltration, Philadelphia, Jan. 1979
(Contract W-7405-eng-36)
(LA-UR-78-2209; Conf-790112-4) Avail: NTIS HC A03/MF A01

The design, construction, cost, and initial operation of a hybrid passive/active solar heated house in Los Alamos, New Mexico, is described. The system is dominated by a two-story Trombe wall, constructed of 0.3 m thick (1 ft) slump block, that can be operated in either a passive or active mode. In the active mode a blower circulates air through the Trombe wall air space and into a rock bed. A three zone forced air distribution system is connected to the rock bed. A separate flat plate collector array heats a preheater tank for domestic hot water. Operating results of the system are reported for just over the first year of operation. In addition, system cost, occupant observations, and conclusions are presented. Energy consumption records indicate that approximately 60% of the net space heating load was provided by solar energy. DOE

N79-28757# Lincoln Lab., Mass. Inst. of Tech., Lexington.

PHOTOVOLTAIC/THERMAL COLLECTORS AND HEAT PUMPS

Edward C. Kern, Jr. 1978 14 p refs Presented at Meeting of the Am. Sect. of the Intern. Solar Energy Soc., Denver, 28 Aug. 1978
(Contract EG-77-S-02-4577)
(COO-4577-2; Conf-780808-26) Avail: NTIS HC A02/MF A01

A simple solar-heating system comprised of an idealized heat pump and photovoltaic/thermal energy collectors is described and its performance characteristics analyzed. The mathematical model expresses the system's heating capacity as a function of insolation, ambient air temperature, and thermal-energy storage temperature. Using a closed-form solution, the system's overall efficiency is presented and compared to the efficiency of a conventional solar heating system. DOE

N79-28762# Sandia Labs., Albuquerque, N. Mex.

OVERVIEW OF SOLAR SYSTEM DESIGN AND APPLICATION PRINCIPLES

V. L. Dugan 1979 11 p refs Presented at the Solar Energy Symp., Tokyo, 5 Feb. 1979
(Contract EY-76-C-04-0789)
(SAND-78-2419C; Conf-790203-1) Avail: NTIS HC A02/MF A01

Solar thermal energy conversion systems represent a method of reducing dependency on stored energy reserves; this is done at the expense of an increased dependency on materials and land resources. The various technologies being investigated to convert solar radiation into thermal energy are reviewed, and general guidelines which should be followed in designing and applying cost-effective solar conversion systems are presented. This information is expanded upon and illustrated by a comparison of performance results for a range of solar thermal technologies and by one solar irrigation application in the United States. DOE

N79-28765# Northeast Solar Energy Center, Cambridge, Mass.

BARRIERS AND INCENTIVES TO SOLAR ENERGY DEVELOPMENT. AN ANALYSIS OF LEGAL AND INSTITUTIONAL ISSUES IN THE NORTHEAST

Arnold R. Wallenstein Dec. 1978 115 p
(Contract EM-78-C-01-4274)
(NESEC-1) Avail: NTIS HC A06/MF A01

The legal and institutional barriers and incentives to commercializing alternate energy sources are analyzed with particular emphasis on solar energy. The laws that constitute either legal barriers or possible incentives in the commercializing of solar energy in the nine states served by the Northeast Solar Energy Center are detailed. Each barrier or incentive is briefly described in conceptual terms and then each issue area is analyzed in detail, within the context of the law of the nine states in the region. An analysis is given of Federal patterns of spending and subsidy. The section also addresses life-cycle costing, the problem of obtaining loans and insurance, DOE patent regulation issues, and briefly describes potential Federal and state financial sources for solar energy development. Laws in the nine-state region that address product and tort liability, warranty protection, consumer credit, consumer protection, trade and business regulation statutes, and equipment certification and product standards problems are discussed. Zoning, land use, sun and wind access, and building codes and inspection problems are included. Public utility regulations, state energy solar office enabling legislation, and labor jurisdiction questions are covered. DOE

N79-28766# Garrett Energy Research and Engineering Co., Ojai, Calif.

THERMOCHEMICAL CONVERSION: BIOMASS GASIFICATION

D. E. Garrett 1978 16 p refs
(Contract EY-76-C-03-1241)
(TID-29391) Avail: NTIS HC A02/MF A01

The thermal conversion of biomass into medium Btu gas is being studied in process development units of the multiple hearth type. The operation of the PDU is described and a process description is given. Significant findings with respect to the steam-carbon reaction rates, stability of the hydrocarbon gases, and direct contact drying of manure are summarized. DOE

N79-28768# Sandia Labs., Albuquerque, N. Mex.

INSOLATION MODELING OVERVIEW

E. C. Boes Dec. 1978 18 p refs
(Contract EX-76-C-04-0789)
(SAND-78-0963) Avail: NTIS HC A02/MF A01

Some of the major national projects in the solar radiation resource assessment area are summarized. Historical SOLMET solar data tapes are described, including the solar radiation models used in their development. Recommendations for appropriate data sources for solar system simulations are given. DOE

N79-28769# Lincoln Lab., Mass. Inst. of Tech., Lexington.

ECONOMICS OF SOLAR PHOTOVOLTAIC ENERGY SYSTEMS FOR CROP IRRIGATION IN THE UNITED STATES

R. W. Matlin and M. T. Katzman (Texas Univ. at Dallas, Richardson) 1978 12 p refs Presented at the Atelier Pompage Solaire, Perpignam, France, 3 Jul. 1978
(Contract EY-76-C-02-4094)
(COO-4094-29; Conf-780773-2) Avail: NTIS HC A02/MF A01

In the United States, the majority of the energy for pumping water is used over extremely large areas (160-acre quarter sections), requiring large pumping units (100 to 300 kW peak power). Additionally, the American farmer has traditionally had access to low-cost energy. An economic analysis of the profitability of adopting solar photovoltaic energy systems for such situations was undertaken. The basis for this analysis is presented along with a discussion as to the time of initial profitability, the time of optimal investment, the effects of the tax system, the cost per acre that would make irrigation inviable, and possible governmental incentives that would promote the deployment of photovoltaic irrigation systems between the time of initial profitability and the time of optimal investment. DOE

N79-28770# Texas Univ. at Austin. Center for Energy Studies.

TESTING AND SAMPLING PROCEDURES FOR GEOTHERMAL-COMPRESSED WELLS Final Report

W. E. Boyd [1978] 155 p
(Contract EY-76-S-05-5243)
(UT/CES-GR-2) Avail: NTIS HC A08/MF A01

Test wells to tap and sample geothermal-geopressured formations at 15,000 to 20,000 feet in the Gulf Coast area can be drilled routinely utilizing available equipment and methods. Electrical logs, surveys and fluid samplers can be used to obtain accurate and reliable information as to depths, temperatures, pressures, and fluid content of the geopressured formations before the well is completed. But it will be necessary to set casing and flow the well, at least temporarily, to secure fluid production volume and pressure data to evaluate the producibility of the geopressured resource. Electric logging and wireline survey methods are fully developed techniques for measuring the parameters needed to assess a geopressured zone before setting casing. Formation subsidence, though it may be slow to develop, can be measured during radioactivity tracer surveys. The following conclusions are drawn: existing well logging and surveying methods and equipment are generally satisfactory for testing and sampling a geothermal-geopressured resource, no significant areas of research are needed to predict, detect, and evaluate geopressured formations for their potential as geothermal resources. Static and dynamic testing procedures using existing technology are satisfactory to test, sample, and analyze a geopressured reservoir. DOE

N79-28771# Department of Energy, Washington, D. C. Div. of Solar Applications Developments.

SOLAR HEATING AND COOLING DEMONSTRATION PROJECT SUMMARIES

Jan. 1979 319 p refs
(DOE/CS-0038-2) Avail: NTIS HC A14/MF A01

The demonstration program includes commercial and residential-type buildings sponsored by DOE alone, or jointly with other Federal agencies, city and state governments, and private agencies. The commercial projects include a wide variety of building types, such as: office buildings, schools, fire stations, civic centers, factories, and libraries. Residential projects include both single and multifamily dwellings of various configurations. Approximately 200 projects will be instrumented to measure the performance of the solar systems. Analysis of the collected data will provide definitive guides for design criteria and permit realistic economic assessment of various solar systems. The demonstrations are discussed in three sections: commercial demonstration program-non-federal buildings; commercial demonstration program-federal buildings; and residential demonstration program-federal buildings. Maps showing the locations (by state) of the buildings are provided at the beginning of each section along with an index that identifies each project and page number for the corresponding descriptive information. A map depicting the distribution of all demonstration projects is included in this introduction. The comparable map from last year's publication is also shown to depict the increase in the number of projects. The contents of this document are based on information available as of November 1, 1978. DOE

N79-28772# Radian Corp., Austin, Tex.

MATERIALS SELECTION GUIDELINES FOR GEOTHERMAL POWER SYSTEMS, FIRST EDITION

David W. DeBerry, Peter F. Ellis, and Colin C. Thomas Sep. 1978 319 p refs
(Contract EG-77-C-04-3904)
(ALO-3904-1; DCN-78-200-181-17) Avail: NTIS HC A14/MF A01

Nine potential power cycles are defined and diagrammed for the generation of electricity from geothermal fluids. General fluid properties that influence the applicability of power cycles to a particular geothermal resource are discussed. The corrosivity of individual process streams in power cycles is described based on variation in chemical composition and temperature. Results of materials performance tests are analyzed based on the chemical composition of the corrosive medium and physical factors such as temperature, duration of exposure, and fluid velocity. The key chemical components in geothermal fluids that are significant in determining corrosivity are identified. Both summarized and detailed results of materials performance tests in U.S. liquid-dominated resources are given. Seven U.S. liquid-dominated KGRA's are classified according to relative corrosiveness and their key chemical components are defined. The various forms and mechanisms of corrosive attack that can occur in geothermal process streams are described. The application of nonmetallic materials in geothermal environments is reported. DOE

N79-28773# Los Alamos Scientific Lab., N. Mex.

ELECTRICITY FROM HOT DRY ROCK GEOTHERMAL ENERGY: TECHNICAL AND ECONOMIC ISSUES

Jefferson W. Tester, Glenn E. Morris, Ronald G. Cummings (N. Mex. Univ., Albuquerque), and Robert L. Bivins Jan. 1979 27 p refs
(Contract W-7405-eng-36)
(LA-7603-MS) Avail: NTIS HC A03/MF A01

Extraction of energy from hot dry rock would make available a nearly unlimited energy source. Some of the technical problems and possible economic tradeoffs involved in a power generating system are examined and possible solutions proposed. An intertemporal optimization computer model of electricity production from a hot dry rock geothermal source has been constructed. The effects of reservoir degradation, variable fluid flow rate, and drilling operations are examined to determine optimal strategies for reservoir management and necessary conditions for economic feasibility. DOE

N79-28774# California Univ., Livermore. Lawrence Livermore Lab.

DESIGN GUIDE FOR SHALLOW SOLAR PONDS

A. B. Casamajor and R. E. Parsons 8 Jan. 1979 65 p refs Revised
(Contract W-7405-eng-48)
(UCRL-52385-Rev-1) Avail: NTIS HC A04/MF A01

The three aspects of Shallow Solar Ponds (SSP) technology discussed include: (1) an introduction to SSP technology, potential, and limitations; (2) a description of the design and operation of an SSP system including component drawings and specifications; and (3) planning information so that an SSP system can be sized for particular application and the cost can be estimated. DOE

N79-28775# Oak Ridge National Lab., Tenn.

GAS-STEAM TURBINE COMBINED CYCLE POWER PLANTS

Jeffrey E. Christian Oct. 1978 68 p refs
(Contract W-31-109-eng-38)
(ANL/CES/TE-78-4) Avail: NTIS HC A04/MF A01

Performance and cost characteristics of the combined gas and steam turbine cycle system applied to an Integrated Community Energy System (ICES) are given. The basic gas-steam turbine combined cycle consists of: (1) a gas turbine-generator set; (2) a waste-heat recovery boiler in the gas turbine exhaust stream designed to produce steam, and (3) a steam turbine acting as a bottoming cycle. Because modification of the standard steam portion of the combined cycle would be necessary to recover waste heat at a useful temperature some sacrifice in the potential conversion efficiency is necessary at this temperature. The total energy efficiency varies from about 65 to 73 percent at full load to 34 to 49 percent at 20 percent rated electric power output. Two major factors considered when installing a gas-steam turbine combines cycle are the realiability of the gas turbine portion of the cycle, and the availability of liquid and gas fuels or the feasibility of hooking up with a coal gasification/liquefaction process. DOE

N79-28776# Oak Ridge National Lab., Tenn. Engineering Technology Div.

COMPARATIVE EVALUATION OF RECENT REPORTS ON THE ENERGY CONSERVATION POTENTIAL FROM COGENERATION

R. W. Barnes (Dow Chemical USA, Midland, Mich.) and O. H. Klepper Feb. 1979 48 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6602) Avail: NTIS HC A03/MF A01

Most of the electricity generated in the U.S. and the heat used by industry, buildings, and homes are produced independently from the combustion of separate fuels. Cogeneration, the combined production of electricity and useful heat, could reduce significantly the total amount of fuel required. This report discusses areas of application and alternative technologies for cogeneration. Projections by various investigators indicate potential U.S. energy savings from 1 to 2 percent up to almost 10 percent. Several of the published estimates of potential energy conservation benefits from cogeneration are analyzed and reduced to common bases for comparison. Significiant differences in the various projections arise from differences in estimating the size of the industrial steam demand and from divergent assumptions concerning the tractability of various implementation problems. DOE

N79-28777# Argonne National Lab., Ill. Energy and Environmental Systems Div.

COST STUDY APPLICATION OF THE GUIDEBOOK ON INTEGRATED COMMUNITY ENERGY SYSTEMS: INDIRECT ECONOMIC AND ENERGY IMPACTS

Nov. 1978 31 p
(Contract W-31-109-eng-38)
(ANL/ICES-TM-17) Avail: NTIS HC A03/MF A01

An integrated community energy system (ICES) was considered for a community located in a small New England city. The ICES involves substitution of energy forms as well as modification of fuel requirements. Examination of the integrated system, in comparison with existing energy systems, includes both indirect economic impacts (employment and fiscal effects on the city) and indirect energy impacts. The indirect economic analysis proceeds from an initial description of conditions that determine employment and fiscal results through specific estimates of employment and then revenues and costs to municipal government and finally to an evaluation of ICES's worth to the city. The indirect energy analysis compares energy resource requirements of the ICES with those for gas, oil, and electric systems now serving the community. DOE

N79-28778# Development Sciences, Inc., East Sandwich, Mass.
GUIDEBOOK ON INTEGRATED COMMUNITY ENERGY SYSTEMS: INDIRECT ECONOMIC AND ENERGY IMPACTS
Nov. 1978 79 p refs
(Contract W-31-109-eng-38)
(ANL/ICES-TM-16) Avail: NTIS HC A05/MF A01

Descriptions of how indirect impacts of energy systems can be estimated are presented so that various members of the community can understand them and participate in the energy-related decisions. DOE

N79-28779# Brookhaven National Lab., Upton, N. Y.
APPLICATION OF RESOURCE ALLOCATION MODELS TO THE PROBLEMS OF REGIONAL ENERGY POLICY IN LARGE DEVELOPING COUNTRIES
P. M. Meier and V. Mubavi 4 Jan. 1979 35 p refs Presented at Intern. Seminar on Energy, Hyderabad, India, 4-7 Jan. 1979
(Contract EY-76-C-02-0016)
(BNL-25537; Conf-790134-1) Avail: NTIS HC A03/MF A01

This paper explores the applicability of optimal resource allocation models designed primarily for already-developed economies, such as that of the U.S., Canada, and Western Europe, to the emerging problems of such developing countries was presented. The potential application of electric-utility-siting models is discussed in the context of electric grid expansion in the State of Andhra Pradesh in Southern India. Specific topics addressed include the degree to which models can be effectively used in the rather different conditions and priorities of industrializing countries, the requirements for basic-model reformulations to account for unique factors of geography and the ability to include and quantify environmental impacts of energy development as well as policy considerations relevant in the context of developing countries. DOE

N79-28781# Delegationen foer Energiforskning, Stockholm (Sweden).
ENERGY RESEARCH AND DEVELOPMENT IN SWEDEN, 1978-1981
T. Josefsson and L. Ellwerth Sep. 1978 33 p refs
(DFE-13) Avail: NTIS (US Sales Only) HC A03/MF A01; DOE Depository Libraries

The objectives, structure, budget, and organization of the three year program are described. The programs and subprograms are: energy use in industrial process (general studies, wood, pulp, paper, iron, steel, agriculture, horticulture, recycling, and recovery), energy use for transportation (transportation systems, energy use in vehicles); energy use for buildings (energy conservation, heat pumps, solar heating systems and solar energy storage, planning and control mechanisms, statistics, consumer requirements, planning and evaluation of experimental building activities), energy supply (domestic fuel sources, coal, synthetic fuels, light water reactors, hot water heating, wind energy, advanced energy technology, fusion). Funds for general energy system studies, fundamental research, planning and coordination, and international cooperation and other efforts related to the main program are indicated. DOE

N79-28782# Department of Energy, Washington, D. C. Office of Consumer Affairs.
ENERGY AND URBAN POLICIES/PROGRAMS: OFFICIAL TRANSCRIPT OF PUBLIC BRIEFING AND ADDENDUM, 27 APRIL 1978, WASHINGTON, D. C.
Feb. 1979 163 p
(DOE/IR-0042) Avail: NTIS HC A08/MF A01

Sixty-one questions are indexed that were raised relative to the DOE public briefing on Energy and Urban Policies/Programs. Questions 1 through 40 were submitted by consumer and public interest groups prior to the briefing and answered by DOE program offices. With Ms. Tina Hobson as moderator, the speakers and panelists answered some of the questions in their presentations. Those presenting speeches were Dr. James Schlesinger, Sam Hughs, Alvin Alm, Donald A. Beattie, William Peacock, Fr. Geno C. Baroni, Walter Jabzanka. Three additional questions were read into the official record of the proceedings at the conclusion of the public briefing. Their answers were prepared by DOE program offices. Author (DOE)

N79-28783# Lincoln Lab., Mass. Inst. of Tech., Lexington.
CONCEPTUAL DESIGN OF A PACKED BED FOR THERMAL-ENERGY STORAGE
Nigel I. Hamilton 20 Dec. 1978 56 p refs
(Contract EX-76-A-01-2295)
(CAES-10) Avail: NTIS HC A04/MF A01

The design approach, conceptual design, and basic cost estimates for a packed bed for thermal-energy storage in an underground compressed-air-storage system are presented. The conceptual designs considered are a 200 MW(e) system operating on a weekly cycle, and a combined solar-thermal/compressed-air-storage system capable of delivering 100 MW(e) to the generator on discharge. Geological stresses in the thermal-energy storage cavity are examined. DOE

N79-28784# Los Alamos Scientific Lab., N. Mex.
DATA ACQUISITION FOR THE HOT DRY ROCK GEOTHERMAL ENERGY PROJECT
Robert G. Lawton and Everett H. Horton 1979 7 p refs Presented at 25th Intern. Instrumentation Symp., Anaheim, Calif., 7-10 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-812; Conf-790505-2) Avail: NTIS HC A02/MF A01

The data acquisition system for the Hot Dry Rock Geothermal Energy Project at Fenton Hill, in northern New Mexico, evolved to a computer controlled system complete with visual displays and emergency alarms. The system is comprised of two units. One unit monitors all surface facilities and during an energy extraction experiment is on-line 24 h a day. The other system is used for specialized downhole experiments. The data acquisition system is operator oriented so that a minimum crew can maintain the system. DOE

N79-28787# Department of Energy, Washington, D. C. Energy Information Administration.
SOLAR COLLECTOR MANUFACTURING ACTIVITY Energy Data Report, Jul. 1977 - Jun. 1978
Feb. 1979 50 p refs
(DOE/EIA-0174) Avail: NTIS HC A03/MF A01

Solar collector manufacturing activity is presented in tabular form by geographic location, producer size, collector type, end use, and type of user. Producer shipments of solar collectors increased more than 1 million square feet (20.6 percent) over the shipments reported for six months prior. The number of manufacturers reporting sales remained relatively stable. Consequently, the statistics reflect an increase in production per company. A list of the manufacturers responding to the survey is included. DOE

N79-28788# Mueller Associates, Inc., Baltimore, Md.
SOLAR PROJECT COST REPORT
H. J. Hale 1978 30 p
(Contracts W-31-109-eng-38; EG-77-C-01-4049)
(SOLAR/2018-78/60) Avail: NTIS HC A03/MF A01

A cost information for the Reedy Creek Utilities solar space heating, cooling and service water heating project located in Walt Disney World, Florida is presented. The solar energy system cools, heats and supplies service hot water for approximately 5624 square feet of office space in a general office building. The system was designed as an integral part of the building at the time the building was designed. The construction costs of this solar project are presented in this report. Category costs are listed by materials, direct labor, and subcontract costs. The subcontract costs include both materials, labor, overhead and profit for electrical, control and other minor subcontractors. DOE

N79-28790# Los Alamos Scientific Lab., N. Mex.
SOLAR HEATING AND COOLING RESULTS FOR THE LOS ALAMOS STUDY CENTER
J. C. Hedstrom, H. S. Murray, and J. D. Balcomb 1978 7 p ref Presented at Conf. on Solar Heating and Cooling Systems Operational Results, Colorado Springs, Colo., 28 Nov. - 1 Dec. 1978
(Contract W-7405-eng-36)
(LA-UR-78-2588; Conf-781236-1) Avail: NTIS HC A02/MF A01

From Conference on solar heating and cooling systems operational results; Colorado Springs, Co, USA (28 Nov 1978). The solar energy system for the Study Center consists of an 8000 sq ft array of selectively coated, single-glazed collectors, a 5000 gallon pressurized tank for hot storage in the cooling mode, and a 10,000 gallon tank, which is used for hot storage in the heating mode and cold storage in the cooling mode. Either of two chillers may be used in series with the cold storage tank, an 85 ton absorption unit, or a 77 ton Rankine cycle unit. Night evaporative cooling is also used to cool the 10,000 gallon tank. A heat recovery unit is used to preheat fresh air in the winter, and, by means of spraying the exhaust air, to pre-cool fresh air in the summer. Daily, monthly, and seasonal energy summaries are presented for the system. Performance data for the two chillers include tabulation of thermal and system coefficients of performance. DOE

N79-28791# Public Service Co. of New Mexico, Albuquerque.
TECHNICAL AND ECONOMIC ASSESSMENT OF SOLAR HYBRID REPOWERING Final Report
Sep. 1978 572 p refs
(Contract EG-77-C-03-1608)
(SAN-1608-4-1) Avail: NTIS HC A24/MF A01

The study presented was divided into the six primary tasks to allow a systematic investigation of the concept: (1) market survey and cost/benefit analysis; (2) study unit selection, (3) cost estimates; (4) unit economic analysis, (5) program planning, future phases, and (6) program management. Reeves Station No. 2 at Albuquerque, New Mexico, was selected for repowering with a design goal of 50 percent (25 MWe). The solar system design is based on the 10 MW solar central receiver pilot plant preliminary design for Barstow, California. DOE

N79-28792# Radian Corp., McLean, Va.
COMPARISON OF ATMOSPHERIC FLUIDIZED BED COMBUSTION CONCEPTUAL DESIGNS FOR UTILITY STEAM GENERATION Interim Report
Feb. 1979 134 p refs
(Contract EX-76-A-01-2314)
(HCP/T-2314) Avail: NTIS HC A07/MF A01

The information developed to date under the AFBC conceptual design project was reviewed to obtain a clear delineation of the state-of-the art and technical feasibility of the technology and to develop a design on which to base an economic analysis of the technology. Three main conceptual designs for utility AFBC electric power generating plants were prepared under this program. Much of the merit of this effort is that the boilers were designed by established boiler manufacturers and the balance of the power plants designed by highly experienced architect-engineering firms. At present, the initial conceptual designs for the AFBC plants were completed. DOE

N79-28812# Department of Energy, Washington, D. C. Div. of Environmental Control Technology
ENVIRONEMENTAL CONTROL TECHNOLOGY ACTIVITIES OF THE DEPARTMENT OF ENERGY IN FY 1978
Mar. 1979 108 p refs
(DOE/EV-0031) Avail: NTIS HC A06/MF A01

This second in a series of annual reports on environmental control technology activities within DOE serves as a basis for evaluating program progress. The total DOE-FY-78 funding allocation related to environments control activities was $294 million, which corresponds to 3.3% of the total FY-78 budget. Funding allocations for environmental control activities in the budget show fossil and nuclear energy technologies accounting for 90% of the total (26 and 64%, respectively). The majority of the fossil-energy-related activities were related to the coal program. Waste management activities demanded the majority of the nuclear energy funds. Conservation and geothermal made up 4 and 3%, respectively, of the total. The remaining portion of the total consisted of solar (2%), basic energy sciences (1%), and magnetic fusion energy (less than 1%). Author (DOE)

N79-28814# Brookhaven National Lab., Upton, N. Y.
HIERARCHIAL DECOMPOSITION APPROACH TO ENVIRONMENTAL POLICY ANALYSIS
William Marcuse May 1978 43 p refs Presented at Workshop on Econ. Meas. of Energy Related Environ. Damages, Golden, Colo., 21-22 Jun. 1978
(Contract EY-76-C-02-0016)
(BNL-24444; Conf-7806121-1) Avail: NTIS HC A03/MF A01

A methodology for environmental analysis is presented that starts with the regional and national models, in this case the multi-regional energy system optimization model and the Brookhaven energy system optimization model, used in a mode for solar technology assessment. Disaggregation to sectors was made through the Brookhaven Univ. of Illinois input-output model, and the national energy supply, energy demand, and nonenergy sectoral outputs were calibrated (used as control totals) for the regional model. The regional model is then used for energy siting through the county level electric facility siting model. The emissions, then localized at the county level, were fed into the emissions transport model that determines the air quality. These can then be used with a damage function to determine the health impact of energy generation emissions, and with appropriate coefficients, to determine the health impacts of extraction transport, and processing. DOE

N79-28932# Sandia Labs., Livermore, Calif.
USER'S GUIDE FOR MIRVAL: A COMPUTER CODE FOR COMPARING DESIGNS OF HELIOSTAT-RECEIVER OPTICS FOR CENTRAL RECEIVER SOLAR POWER PLANTS
P. L. Leary and J. D. Hankins Feb. 1979 128 p refs
(Contract EY-76-C-04-0789)
(SAND-77-8280) Avail: NTIS HC A07/MF A01

MIRVAL is a Monte Carlo program which simulates the heliostats and a portion of the receiver for solar energy central receiver power plants. Models for three receiver types and four kinds of heliostats are included in the code. The three receiver types modeled are an external cylinder, a cylindrical cavity with a downward-facing aperature, and a north-facing cavity. Three heliostats which track in elevation and azimuth are modeled, one of which is enclosed in a plastic dome. The fourth type consists of a rack of louvered reflective panels with the rack rotatable about a fixed horizontal axis. Phenomena whose effects are simulated are shadowing, blocking, mirror tracking, random errors in tracking and in the conformation of the reflective surface, optical figure of the reflective surface, insolation, angular distribution of incoming sun rays to account for limb darkening and scattering, attenuation of light between the mirrors and the receiver, reflectivity of the mirror surface, and mirror aiming strategy. DOE

N79-29021# Interagency Review Group on Nuclear Waste Management, Washington, D. C.
REPORT TO THE PRESIDENT BY THE INTERAGENCY REVIEW GROUP ON NUCLEAR WASTE MANAGEMENT
Mar. 1979 251 p refs
(TID-29442) Avail: NTIS HC A12/MF A01

Nuclear waste disposal and the future use of nuclear energy and the scope and magnitude of waste management are discussed. Emphasis is placed on national goals, planning objectives, criteria, and procedures for nuclear waste management to guide policy, planning, program, regulatory, and research and development activities. Technical strategies for high-level and transuranic wastes, low-level waste, uranium mill tailings, and waste generated by D&D activities are included. Institutional issues and management considerations including recommendations for follow-on implementation are covered. Work plans for each major type of waste, based on the goals, decisions, and interim strategic planning bases are given. J.M.S.

N79-29037* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala.
RADIATION SHADOW INDICATOR Patent
Richard A. Campbell, inventor (to NASA) Issued 3 Jul. 1979 8 p Filed 31 Oct. 1978 Continuation of abandoned US Patent Appl. SN-778311, filed 16 Mar. 1977
(NASA-Case-MFS-23546-2; US-Patent-4,159,576; US-Patent-Appl-SN-956167; US-Patent-Class-33-281; US-Patent-Class-33-1H; US-Patent-Class-350-83) Avail: US Patent and Trademark Office CSCL 20F

A radiation shadow indicator having a slight tube for sighting shadow-casting objects along a sighting axis is described. The indicator includes a system of gimbals mounting the tube for angular movement so that the sighting axis thereof may be caused to follow the apparent diurnal movement of celestial objects at various seasons of the year. Position indicators are provided for instantaneous readout of angular positions of the gimbal device which, in turn, correspond to positions of the sighting axis at given seansons and/or times of day in relation to the location of the indicator on the surface of the earth.
Official Gazette of the U.S. Patent and Trademark Office

N79-29051# Nagoya Univ. (Japan). Inst. of Plasma Physics.
TRENDS OF PLASMA PHYSICS AND NUCLEAR FUSION RESEARCH LIFE CYCLE AND RESEARCH EFFORT CURVE
Takeru Ohe, Yasumasa Kanada, Hiromu Mamota, and Yoshi H. Ichikawa May 1979 36 p refs
(IPPJ-396) Avail: NTIS HC A03/MF A01

A quantitative analysis of research trends in the fields of plasma physics and nuclear fusion is presented. The analysis is based on information retrieval from available data bases. The results indicate that plasma physics research is now in the maturation phase of its life cycle, and that nuclear fusion research is in its growth phase. It was found that there is a correlation between the number of accumulated papers in the fields of plasma physics and nuclear fusion and the experimentally attained values of the plasma ignition parameter ntT. Using this correlation research effort curve, it is forecast that the scientific feasibility of controlled fusion using magnetic confinement systems will be proved around 1983. G.Y.

N79-29061# Sandia Labs., Albuquerque, N. Mex.
NUMERICAL CODES FOR MHD FLOWS Quarterly Technical Progress Report
Frederick G. Blottner, Anthony J. Russo, John G. Taylor, and G. Ronald Hadley Feb. 1979 23 p refs
(Contract EY-76-C-04-0789)
(SAND-78-1954) Avail: NTIS HC A02/MF A01

Numerical techniques and codes for characterizing coal combustion-operated MHD generators and diffusers were developed. The work called for four tasks: (1) development of a one-dimensional channel code; (2) development of multidimensional channel codes; (3) conduct slag layer studies and heat transfer analyses; and (4) study arc formation, migration, and electrode erosion. A summary of the current progress on these tasks is presented. DOE

N79-29105# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1980, VOLUME 1, PART 2
Washington GPO 1979 427 p refs Hearing on H.R. 1786 before the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 6 Feb. 1979
(GPO-46-134) Avail: Comm. on Sci. and Technol

The President's budget for NASA is reviewed in the light of his civilian space policy and its impact on NASA programs. Major activities of FY 1980 highlighted include the space transportation system, space sciences, space and terrestrial applications, aeronautics and space technology, space tracking and data systems, construction of facilities, research and program management, and international programs. The budget request is considered to comprise a sound, balanced aeronautics and space program, given the constraints of the national anti-inflational effort. It supports the continued development of the space transportation system, meets commitments made in the past, maintains progress in ongoing programs, and provides for flexibility in future programs. A.R.H.

N79-29106*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
HYDROGEN-FUELED POSTAL VEHICLE PERFORMANCE EVALUATION
R. A. Hall 15 Jun. 1979 28 p Prepared for NASA, DOE, and US Postal Service
(Contract NAS7-100)
(NASA-CR-158811; JPL-PUB-79-55) Avail: NTIS HC A03/MF A01 CSCL 13F

Fuel consumption, range, and emissions data were obtained while operating a hydrogen-fueled postal delivery vehicle over a defined Postal Service Driving Cycle and the 1975 Urban Driving Cycle. The vehicle's fuel consumption was 0.366 pounds of hydrogen per mile over the postal driving cycle and 0.22 pounds of hydrogen per mile over the urban driving cycle. These data correspond to 6.2 and 10.6 mpg equivalent gasoline mileage for the two driving cycles, respectively. The vehicle's range was 24.2 miles while being operated on the postal driving cycle. Vehicle emissions were measured over the urban driving cycle. HC and CO emissions were quite low, as would be expected. The oxides of nitrogen were found to be 4.86 gm/mi, a value which is well above the current Federal and California standards. Vehicle limitations discussed include excessive engine flashbacks, inadequate acceleration capability the engine air/fuel ratio, the water injection systems, and the cab temperature. Other concerns are safety considerations, iron-titanium hydride observed in the fuel system, evidence of water in the engine rocker cover, and the vehicle maintenance required during the evaluation. A.R.H.

N79-29108*# National Aeronautics and Space Administration, Washington, D. C.
SPINOFF 1979 Annual Report
James J. Haggerty Feb. 1979 118 p Original contains color illustrations
(NASA-TM-80481) Avail: NTIS MF A01; SOD HC $4.25 CSCL 05A

NASA's current mainline programs which are producing public benefit through direct application of technology and, at the same time, are generating new technology which may find secondary application in the future are summarized. A representative sampling of spinoff products and processes derived from NASA technology and employed in various avenues of everyday life is included. The mechanisms of the technology transfer process, including the means by which NASA seeks to stimulate technology utilization are described as well as NASA's activities in assisting agencies interested in exploiting the benefit potential of satellite remote sensing technology. A.R.H.

N79-29110*# Mechanical Technology, Inc., Latham, N. Y.
CONCEPTUAL DESIGN STUDY OF AN AUTOMOTIVE STIRLING REFERENCE ENGINE SYSTEM
Jun. 1979 31 p Prepared for NASA and DOE
(Contracts DEN3-32; EC-77-A-31-10040)
(NASA-CR-159605; MTI-79ASE53RE1A; DOE/NASA/0032-79/1) Avail: NTIS HC A03/MF A01 CSCL 13F

The studies that were made, the methodology that was used, and the results which support the concluded recommendation of a four cylinder, double acting, square 'U' design, with external regenerators are described. Optimization of this design concept resulted in a calculated fuel economy of 36.3 mpg for a 3200 pound vehicle, compared to the program goal of 30.0 mpg., and acceleration time of 13.1 seconds compared to the program goal of 15.0 seconds. The engine will meet or exceed the program emission goals of HC $<$ 0.41 gram/mile, CO $<$ 3.4 gram/mile, and nitrogen oxide $<$ 0.4 gram/mile. A.R.H.

N79-29115# Oak Ridge National Lab., Tenn.

ENERGY INTENSITY AND RELATED PARAMETERS OF SELECTED TRANSPORTATION MODES: PASSENGER MOVEMENTS

A. B. Rose Jan. 1979 177 p refs

(Contract W-7405-eng-26)

(ORNL-5506) Avail: NTIS HC A09/MF A01

A study was undertaken aimed at determining the causes of the divergences among published energy-intensity values and at preparing a set of consistent values. The findings in relation to the passenger-transportation modes are presented. After a brief overview of the important factors to be considered and the potential pitfalls facing users and analysts of energy-intensity values, a chapter is devoted to each of the major means of passenger transportation: air, automobile, bus, and rail. In each of these chapters, after a critique of the available data sources, a consistent time series of operational data and energy-intensity values is presented for the major sectors of each mode. Engineering simulations and data analysis are also carried out. Matrices giving the great-circle distances and modal-circuity ratios among the 50 largest standard metropolitan statistical areas are included. DOE

N79-29116# California Univ., Livermore. Lawrence Livermore Lab.

PRELIMINARY DESIGN ANALYSIS OF THE QUASI-ELECTRIC DRIVE VEHICLE

M. W. Schwartz and E. Lorbeer Dec. 1978 31 p refs

(Contract W-7405-eng-48)

(UCRL-52613) Avail: NTIS HC A03/MF A01

The capability of a four-passenger, quasi-electric drive vehicle of acceptable weight to obtain a range of 80 km with improved lead acid batteries was verified. The duel-fueled hybrid vehicle described is basically an electric vehicle (EV) augmented by a small heat-engine hybrid propulsion system for extended range capability. Usually the vehicle operates as an EV, since 75% of vehicle miles traveled in the United States consist of trips of 80 km (50 mi) or less. For longer trips, the driver may select the heat-engine hybrid mode or permit automatic switching to heat-engine power when the batteries reach a prescribed level of discharge. Three candidate propulsion systems having the greatest potential for early marketability were selected. Of the three systems analyzed, the flywheel/hydromechanical transmission configuration, requiring the smallest battery mass is the lightest and most efficient. DOE

N79-29118# Ford Motor Co., Dearborn, Mich.

FORD/DOE SODIUM-SULFUR BATTERY ELECTRIC VEHICLE DEVELOPMENT AND DEMONSTRATION, PHASE 1 Quarterly Progress Report, 1 Dec. 1977 - 28 Feb. 1978

A. Topouzian 1978 27 p

(Contract EY-76-C-02-2566)

(COO-2566-37; QPR-37) Avail: NTIS HC A03/MF A01

Progress in developing an electric vehicle with sodium-sulfur batteries is reported. Information is included on NaS cell and battery trade off studies; preliminary vehicle packaging studies; projects on vehicle performance and cost; and motor/controller studies. DOE

N79-29120# General Accounting Office, Washington, D. C. Energy and Minerals Div.

THE CONGRESS NEEDS TO REDIRECT THE FEDERAL ELECTRIC VEHICLE PROGRAM

9 Apr. 1979 67 p

(PB-293977/5; EMD-79-6) Avail: NTIS HC A04/MF A01 CSCL 13F

Today's vehicles have limited commercial potential because they cost more and perform poorly compared with conventional vehicles. The GAO's review of the Department of Energy's program to develop, demonstrate, and commercialize electric vehicles recommends that electric vehicle research and development be strengthened, vehicle demonstrations be limited initially to the Federal sector, and loan quarantees for commercial production be delayed. The Congress should make the legislative changes and take other actions needed for program redirection. GRA

N79-29212# Committee on Science and Technology (U. S. House).

SOLAR POWER SATELLITE

Washington GPO 1979 344 p refs Hearings before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 28-30 Mar. 1979

(GPO-45-997) Avail: Subcomm. on Space Sci. and Applications

A technology verification program to enable the resolution of the technical, environmental, and economic issues surrounding the concept of a solar power satellite is considered. Specific issues discussed include: biological and ionospheric impacts; radio frequency interference; and research on the space segment of the microwave power system to ensure technical and economic feasibility. J.M.S.

N79-29234 Delaware Univ., Newark.

CATALYST DEACTIVATION IN THE HYDROPROCESSING OF COAL-DERIVED LIQUIDS Ph.D. Thesis

Minshon Jebb Chiou 1979 229 p

Avail: Univ. Microfilms Order No. 7918801

Aged catalysts used in H-coal liquefaction process were analyzed with a scanning electron microscope and an electron microscope. The results show that the deposition of coal mineral matter is a general phenomenon in the hydroprocessing of coal slurries. Kinetic simulations were developed to investigate the effect of coke laydown causing pore blockage and the effect of partially closed pores on hindered diffusion of larger molecules. The results show that sometimes improvements in catalyst life and activity level can be obtained by proper selection of the pore size. The moment analysis method was extended for microreactors by representing the internal diffusion processes in the catalyst as a solid film resistance. This approximation simplifies the experimental analysis for complex reaction system. Dissert. Abstr.

N79-29249# Bureau of Mines, Twin Cities, Minn.

STABILITY OF ALUMINA-BASE REFRACTORIES IN WESTERN LIGNITE-ASH SLAG ENVIRONMENTS

J. E. Pahlman, C. F. Anderson, and S. E. Khalafalla 1979 22 p refs

(PB-293238/2; BM-RI-8334) Avail: NTIS HC A02/MF A01 CSCL 11B

The use of Western lignites and subbituminous coals for firing pellet induration and metallization furnaces requires that the refractory linings of these furnaces be able to withstand attack from corrosive alkali metal oxides present in the ash of many of the low-rank fossil fuels. Dynamic and static slag tests on high-alumina and alumina-silica refractories show that increased alkali content in the lignite ash caused increased corrosion and erosion of the tested refractories. The degree of corrosion decreased with increasing alumina content, with the 99-percent-alumina refractories having the highest resistance. Also, porosity reduction and tar impregnation enhanced the corrosion and erosion resistance. GRA

N79-29271# Department of Energy, Washington, D. C. Div. of Fossil Fuel Utilization.

SECOND ANNUAL COMBUSTION AND FUELS TECHNOLOGY PROGRAM CONTRACTOR REVIEW MEETING

1978 291 p refs Meeting held at Arlington, Va., 18-21 Sep. 1978

(CONF-7809103) Avail: NTIS HC A13/MF A01

Topics covered in papers presented at the meeting include combustion technology, waste fuel utilization, boilers and furnaces, internal combustion engines, engine optimization, exhaust emissions, effects of microwaves on combustion, swirl combustors, Raman scattering, laser spectroscopy uses in combustion research, alternative fuels, and residues and wastes. DOE

N79-29276# Bureau of Mines, Rolla, Mo. Metallurgy Research Center.

CHEMICAL VAPOR DEPOSITION OF WEAR-RESISTANT COATINGS

J. B. Stephenson, D. M. Soboroff, H. O. McDonald, and A. A. Cochran 1979 14 p refs
(BM-RI-8348) Avail: NTIS HC A02/MF A01

The feasibility of hardfacing the critical surfaces of valves and similar devices by chemical vapor deposition was investigated in order to increase the wear resistance of these components for use in the abrasive and erosive environment of coal gasification units. Tungsten and molybdenum coatings were produced on nickel plated carbon steels and stainless steels by hydrogen reduction of the metal hexafluoride at 325 to 600 C. Titanium nitride coatings were produced on low-carbon steels by the reaction of titanium tetrachloride, hydrogen, and nitrogen at 1,000 C. Titanium carbonitride coatings were produced on low-carbon steels by the reaction of nitrogen, hydrogen, and methane at 900 C. DOE

N79-29306# Argonne National Lab., Ill. Materials Science Div.

CORROSION OF METALS IN COAL-GASIFICATION ENVIRONMENTS

K. Natesan 1979 50 p refs Presented at Conf. on Corrosion-Erosion of Coal-Conversion System Mater., Berkeley, Calif., 24-26 Jan. 1979
(Contract W-31-109-eng-38)
(CONF-790145-2) Avail: NTIS HC A03/MF A01

Thermodynamic aspects of high temperature corrosion processes that pertain to coal conversion were discussed, and kinetic data were used to compare the behavior of different commercial materials of interest. Regimes for corrosion protection via oxide formation on the materials were defined relative to alloy chemistry, oxygen and sulfur partial pressures in the gas environment, and temperature. Areas of additional research with particular emphasis on alloy design for improved corrosion resistance were identified. DOE

N79-29353 Stanford Univ., Calif.

IN-SITU COMBUSTION MODELS FOR THE STEAM PLATEAU AND FOR FIELDWIDE OIL RECOVERY Ph.D. Thesis

Abdurrahman Satman 1979 124 p
Avail: Univ. Microfilms Order No. 7917278

The steam plateau region of laboratory combustion tube experiments was studied and heat transfer modes describing the steam plateau were defined. The combustion parameters affecting the steam plateau were also studied and evaluated. An analytical heat model was developed which describes the movement of the steam plateau axially along a cylinder with heat loss through an annular insulation. Correlations were developed to predict field scale recovery of dry in-situ combustion processes. After developing the correlations, their validity was tested. The match between the correlations and field test results was satisfactory. The study shows that the recovery correlations developed for dry combustion processes may be used for the recovery prediction of the wet combustion test in which the air-water injected ratio is high. Dissert. Abstr.

N79-29354*# California Univ., Los Angeles. School of Engineering and Applied Science.

FORECAST OF FUTURE AVIATION FUELS. PART 1: SCENARIOS Progress Report, 1 Aug. 1976 - 20 Sep. 1977

J. M. English, C. Y. Liu, J. L. Smith, A. K. K. Yin, G. A. Pan, M. B. Ayati, M. Gyamfi, and M. R. Arabzadah 17 Mar. 1978 140 p refs Revised
(Grant NsG-3116)
(NASA-CR-158871; UCLA-ENG-77-78-Pt-1) Avail: NTIS HC A07/MF A01 CSCL 21D

A preliminary set of scenarios is described for depicting the air transport industry as it grows and changes, up to the year 2025. This provides the background for predicting the needs for future aviation fuels to meet the requirements of the industry as new basic sources, such as oil shale and coal, which are utilized to supplement petroleum. Five scenarios are written to encompass a range of futures from a serious resource-constrained economy to a continuous and optimistic economic growth. A unique feature is the choice of one immediate range scenario which is based on a serious interruption of economic growth occasioned by an energy shortfall. This is presumed to occur due to lags in starting a synfuels program. Author

N79-29356# Committee on Commerce, Science, and Transportation (U. S. Senate).

LIQUEFIED ENERGY GASES, PART 2

Washington GPO 1978 388 p refs Hearings before the Comm. on Commerce, Sci., and Transportation, 95th Congr., 2d Sess., 12-13 Dec. 1978
(GPO-39-305) Avail: Comm. on Commerce, Sci., and Transportation

Problems related to the handling, transportation, and storage of liquefied natural gas and liquefied petroleum gases are discussed with emphasis on jurisdictional ambiguities, regulatory delays, preemption, accident control, liability, compensation, inspection, and enforcement efforts. Safety management and environment protection aspects are also considered. A.R.H.

N79-29364# Monsanto Research Corp., Dayton, Ohio.

ANALYSIS OF THE EMISSIONS FROM STORAGE TANKS DURING JP-4 FUEL TRANSFER OPERATIONS. PHASE 1: WARM WEATHER CONDITIONS Final Report

W. R. Feairheller 1 May 1979 66 p refs
(Contract F41608-78-C-1240)
(AD-A069339) Avail: NTIS HC A04/MF A01 CSCL 21/4

This report summarizes the warm weather phase of a program to measure the concentration of JP-4 vapor that is emitted to the atmosphere during filling of underground storage tanks. Tests were conducted with and without pressure - vacuum breather valves. Samples were analyzed by a portable total hydrocarbon analyzer containing a flame ionization detector. Data was recorded at one minute intervals during the fuel transfer operations. All data was collected during August and September 1978 from 50,000 gallon underground JP-4 fuel storage tanks at Wright-Patterson AFB, OH. Author (GRA)

N79-29365# Sandia Labs., Albuquerque, N. Mex.

VISCOSITY REDUCTION OF COAL LIQUIDS BY DISSOLVED CARBON DIOXIDE

A. D. Yu and F. M. Orr, Jr. Mar. 1979 48 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7027) Avail: NTIS HC A03/MF A01

The solubility of carbon dioxide in coal liquids and the viscosities of mixtures of coal liquids with CO2 were measured. Carbon dioxide in coal liquids was found to be comparable to its solubility in crude oils. It is sufficiently soluble to provide substantial viscosity reductions at concentrations below 10 weight percent. Significant precipitation of heavy hydrocarbon materials was observed during the viscosity measurements. DOE

N79-29366# Sandia Labs., Albuquerque, N. Mex.

COAL LIQUEFACTION CATALYST TAGS

D. G. Sample and M. G. Thomas Feb. 1979 28 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0017) Avail: NTIS HC A03/MF A01

The identification and analysis of tagged catalysts from catalytic and liquefaction reactors that employ addition and withdrawal of catalysts can provide mixing characteristics and deactivation rates. Several methods for tagging coal liquefaction catalysts which were developed and evaluated include physical alternation, metals addition, and nuclear activation. Sputtering (vapor deposition) and painting (metal paints) are methods used for doping catalysts with metal tags which can be identified using radiographic techniques. Machining and filing catalysts, and altering extrusion dies can provide physical tags identified optically and by radiographic techniques. Neutron activation provides tags identified by a standard radiation counting method. The tags are evaluated on the bases of preparation, integrity, and detection. The use of the tags is considered for use in an H-Coal process demonstration unit. DOE

N79-29367# Gulf Research and Development Co., Pittsburgh, Pa.

INVESTIGATION OF MECHANISMS OF HYDROGEN TRANSFER IN COAL HYDROGENATION Quarterly Progress Report, Jan. - Mar. 1978

D. C. Cronauer, R. G. Ruberto, Y. T. Shah, and R. Modi Apr. 1978 54 p refs
(Contract EX-76-C-01-2305)
(FE-2305-21) Avail: NTIS HC A04/MF A01

Preparation of asphaltene samples for preliminary hydrogen transfer experiments was accomplished, and the experiments were started. The first samples of asphaltenes were recovered from distillation residues. (In this regard, asphaltenes were considered as the fraction insoluble in pentane and soluble in toluene). The levels of recoverable asphaltenes in the residues was shown to be 62 and 45%. Operating problems observed in the use of asphaltenes were primarily due to limitations of asphaltene solubility in tetralin. DOE

N79-29368# Oak Ridge National Lab., Tenn. Chemical Technology Div.

MATHEMATICAL MODEL OF THE HYGAS PILOT PLANT REACTOR

J. P. Meyer, J. W. Wells, J. R. Cox, J. P. Belk, and G. C. Frazier 1979 33 p refs Presented at the Am. Inst. of Chem. Engr., Houston, Tex., 1-5 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790405-11) Avail: NTIS HC A03/MF A01

A mathematical model of the HYGAS pilot plant reactor was developed by subdividing the gasification process into the independent and sequential steps of devolatization, volatile cracking, rapid-rate methane formation, and slow-rate hydrogasification. Algorithms for each step were obtained from the literature for Montana lignite and Illinois No. 6 coal. Results from this work indicate that, for a given coal type, the product gas composition from the reactor does not vary significantly over the range of operating conditions. In general, results from the model compared favorably with pilot plant data for the gas composition, overpredicted the reported temperature profile, and were mixed with regard to the published extent of conversion, depending on coal type. Reasons for these discrepancies were attributable to inadequacies in model formulation, the assumption of adiabatic behavior, and uncertainties in the data. DOE

N79-29369# SRI International Corp., Menlo Park, Calif.

PRELIMINARY MARKET EVALUATION FOR GAS PRODUCED BY UNDERGROUND GASIFICATION OF WESTERN COAL

D. L. Olsen, A. J. Moll, R. L. Dickenson, C. A. Trexel, G. Crooks, and N. R. Teater Aug. 1978 92 p refs
(Contract EY-76-C-03-0115)
(SAN-0115-T124-1; SRI-6581) Avail: NTIS HC A05/MF A01

The technical development of underground coal gasification (UCG) depends on the success of existing private and governmental programs. Opportunities for application of UCG-derived fuel gas in existing industrial facilities are limited and site-specific. The potential market in the United States for competitively priced SNG from UCG-derived intermediate BTU gas (IBG) is essentially supply limited through the end of this century; that is, the nation's natural gas transportation and from the UCG sources likely to be developed by the year 2000. Retrofitting existing oil- or gas-fired power plants to accommodate IBG may be attractive in some cases as an alternative to a more costly conversion to coal-fired systems. Technical suitability, gas transportation costs, and ease of retrofit favor IBG over low BTU gas in applications for UCG-derived gases, such as chemical feedstocks, synthetic natural gas precursors, industrial fuels, or retrofit power plant fuels must be considered. DOE

N79-29370# Department of Energy, Washington, D. C. Energy Technology Center.

CLEAN ENERGY FROM COAL

Jan. 1979 36 p refs
(PETC-1000) Avail: NTIS HC A03/MF A01

The Pittsburgh Energy Technology Center (PETC) program to promote production of clean energy from coal is described. Established in 1948 as an energy research laboratory of the Office of Synthetic Liquid Fuels, U.S. Bureau of Mines, PETC is the largest fossil energy research and development center in the U.S. PETC has a staff of about 350 scientists, engineers, technicians, and support personnel and is the major Federal laboratory for research in coal combustion and conversion of coal to clean fuels. The laboratories were built in the late 1940's after the Congress passed the Synthetic Liquid Fuels Act of 1944. DOE

N79-29371# Elrick and Lavidge, Inc., San Francisco, Calif.

COMMERCIALIZATION FOCUS GROUP INTERVIEW: MEDIUM AND LOW Btu COAL GASIFICATION Summary Report

Aug. 1978 14 p
(Contract EV-78-C-01-6457)
(DOE/TIC-10029) Avail: NTIS HC A02/MF A01

DOE's background papers indicate that the technology necessary for commercialization of medium and low Btu coal gasification is available. All of the respondents agree with this statement. The federal government is seen as having a role to play in the commercialization of this fuel alternative, including funding a demonstration unit, guaranteeing loans for a few of the following units and providing protection for industry innovators by establishing an explicit, stable energy policy. The government's policy of price regulation is obviously of extreme importance to people considering the major financial expenditures necessary to make these fuel alternatives commercially available. DOE

N79-29372# Kaiser Engineers, Oakland, Calif.

TECHNICAL AND ECONOMIC FEASIBILITY STUDY FOR THE INDUSTRIAL UTILIZATION OF WASTE DERIVED FUEL GAS

Feb. 1979 50 p
(Contract EM-78-C-03-2092)
(SAN-2092-T1) Avail: NTIS HC A03/MF A01

A plan is presented for managing a technical and economic feasibility study for producing waste-derived fuel gas and using it as auxilliary fuel in a steel plant and in a California power plant. The project involves processing urban refuse, sewage, and agricultural (dairy) wastes to produce medium-Btu fuel gas to the users. The personnel requirements, procedures, documentation requirements, and time schedule, are outlined. DOE

N79-29373# Insitu Consulting, Laramie, Wyo.

BIBLIOGRAPHY OF SUBSIDENCE AND RELATED TOPICS FOR IN SITU COAL GASIFICATION

C. R. McKee and A. Serafini Oct. 1978 137 p refs
(LETC/BL-71316-1) Avail: NTIS HC A07/MF A01

The topics included are subsidence, subsidence models, material properties and in situ measurements, and hydrology of fractured media. Each topic is indexed by year and then alphabetically by author within each year. Abstracts of each article are included when available. DOE

N79-29374# California Univ., Davis. Dept. of Mechanical Engineering.

TRIAXIAL TESTS OF COAL GASIFICATION SAMPLES Final Report

H. Brandt 1978 223 p refs
(Contract W-7405-eng-48)
(UCRL-13968) Avail: NTIS HC A10/MF A01

Samples were obtained from core borings at Hoe Creek In-Situ coal gasification site at Campbell County, Wyoming. A total of forty-five triaxial tests were made in which overburden and interstitial pressures were kept constant. Data analysis such as geological grouping of the samples, determination of mathematical functions for stress and strain and development of failure envelopes was also performed. DOE

N79-29375# SRI International Corp., Menlo Park, Calif.

MISSION ANALYSIS FOR THE FEDERAL FUELS FROM BIOMASS PROGRAM. VOLUME 2: MISSION SELECTION, MARKET PENETRATION MODELING, AND ECONOMIC EVALUATION Final Report

Fred A. Schooley, Katherine A. Miller, Paul C. Meagher, Gwen Crooks, Claudia Grill, and Ronald L. Dickenson Dec. 1978 69 p refs
(Contract EY-76-C-03-0115-131)
(TID-29091) Avail: NTIS HC A04/MF A01

The market penetration model is described and the procedure used in selecting for analysis missions with potential for commercialization is identified. The inputs to the market penetration model are discussed, except for feedstock availability data. The model inputs include conventional fuel prices and demands and mission conversion economics. DOE

N79-29376# Department of Energy, Washington, D. C. Energy Information Administration
ASSESSMENT OF POTENTIAL US PETROLEUM SUPPLY SHORTFALLS, 1978
Daniel Butler 2 Jun. 1978 14 p
(DOE/EIA-0102/38) Avail: NTIS HC A02/MF A01

The petroleum allocation model presented was developed by the EIA for the purpose of estimating future sources of petroleum imports to the United States and to calculate expected shortfalls in those imports that would result from supply interruptions. The model simulates total world trade in both crude oil and refined products and, in the case of a supply emergency, shares available petroleum supplies among member countries of the International Energy Agency as dictated in the International Energy Program. DOE

N79-29377# Princeton Univ., N. J. Dept. of Mechanical and Aerospace Engineering.
SYMPOSIUM ON ADVANCES IN SYNTHETIC FUELS PRESENTED BEFORE THE DIVISION OF PETROLEUM CHEMISTRY, AMERICAN CHEMICAL SOCIETY
M. J. Antal, Jr. and T. B. Reed (Solar Energy Research Inst., Golden, Colo.) 1978 9 p refs Meeting held at Miami Beach, Fla., 10 - 15 Sep. 1978
(Contract ET-78-F-02-5058)
(CONF-780902-16) Avail: NTIS HC A02/MF A01

The effects of gas phase temperature and residence time on the products of the pyrolysis/steam reforming of red alder pellets were investigated. Of the conditions studied, residence times of 6 to 9 seconds at 700 C produces the largest quantity of medium Btu gas from the pellets. The quantity of gas produced is less than one-half that obtained from cellulose under similar conditions. This relative paucity of gas yield may be an artifact of the pelletizing process, or it may reflect an inherent difficulty in gasifying red alder wood. More extreme conditions than examined here could be used to obtain higher gas yields. However, the high cost of reactors utilizing extreme conditions militates against their use for biomass gasification. More research is needed to determine the desirability of pelletized fuels for gasification processses, and the optimal conditions for steam pyrolysis/gasification of biomass. DOE

N79-29378# Badger Plants, Inc., Cambridge, Mass.
COAL-TO-GASOLINE CONCEPTUAL DESIGN AND MARKET EVALUATION OF METHANOL FUEL AND METHANOL-DERIVED GASOLINE Quarterly Technical Progress Report, 31 Jul. - 27 Oct. 1978
1978 11 p
(Contract EX-76-C-01-2416)
(FE-2416-37) Avail: NTIS HC A02/MF A01

Conceptual design work completed during the quarter on the conversion of coal to gasoline using the Mobil M-gasoline process is summarized. Preliminary work done on the marketing study for methanol is also summarized. DOE

N79-29379# Brookhaven National Lab., Upton, N. Y.
HYDROGEN TECHNOLOGY: AN OVERVIEW
F. J. Salzano, A. Mezzina, M. Beller, G. Strickland, and S. Srinivasan 1979 15 p Presented at the 177th ACS Natl. Meeting, Honolulu, Hawaii, 1 Apr. 1979
(Contract EY-76-C-02-0016)
(BNL-25760; Conf-790415-16) Avail: NTIS HC A02/MF A01

The key technologies needed for hydrogen to make major inroads into the U.S. energy economy as a fuel derived from renewable or abundant nonfossil resources is presented. The unique relationship between hydrogen and the fuel cell is discussed. The state-of-the-art of hydrogen transmission and storage are presented, and a scenario shows how the commercialization of the fuel cell as an electric-generating device in urban areas could lead to the introduction and use of hydrogen in a wider variety of end uses. At the present time there is a great deal of international interest in hydrogen. A broad picture of the activities of a number of western European countries and Japan in the area of hydrogen and a summary of international interest in this area is presented. DOE

N79-29381# Office of Technology Assessment, Washington, D. C.
THE DIRECT USE OF COAL: PROSPECTS AND PROBLEMS OF PRODUCTION AND COMBUSTION
Apr. 1979 426 p refs
(PB-295797/5; OTA-E-86; LC-79-600071) Avail: NTIS HC A19/MF A01 CSCL 08I

The benefits and risks of a massive shift to coal and away from other fuels is assessed. The social, economic, physical, and biological impacts of such a shift is studied. The complete coal system, from extraction to combustion including the key steps and institutions that policy can influence is examined. The environmental impacts and possible effects on the public health are documented. Occupational and community impacts are examined. Technologies under development that might reduce cost, increase convenience of use, or mitigate negative impacts are reviewed. GRA

N79-29384# Oak Ridge Y-12 Plant, Tenn.
AUTOMATIC TENSION CONTROL FOR WINDING SUPERCONDUCTING COILS
G. M. Henderson, J. C. Hung, and J. M. Googe 1979 8 p refs Presented at Southeastcon 79 IEEE Region 3 Conf. and Exhibit, Roanoke, Va., 1 Apr. 1979 Submitted for publication Prepared in cooperation with Tenn. Univ., Knoxville
(Contract W-7405-eng-26)
(Y/EN-257; Conf-790410-1) Avail: NTIS HC A02/MF A01

Root locus techniques were utilized in arriving at a suitable compensation network to stabilize the tension machine control system. Simulated tests of the system's response to a step input and to a pulse disturbance were performed. A mathematical model of the tension machine and the associated feedback control system is presented. A stability analysis of the system along with the applicability of a commercial controller for compensation requirements is discussed as well as simulated system responses to a step input and to a pulse disturbance. DOE

N79-29513# Addis Translations International, Portola Valley, Calif.
LASER AND ENERGETICS OF THE FUTURE
N. Basov and L. Feoktistov Mar. 1979 8 p Translated into ENGLISH from Pravda, USSR, no. 35, 8 Mar. 1978
(UCRL-Trans-11467) Avail: NTIS HC A02/MF A01

It is shown that atomic energy should and can be viewed by mankind not as a military threat but as a source of abundant energy. The achievements of science provide sufficient grounds for this. Of course, controlling the fusion reaction is not the only possible solution to the energy problem. Moreover, it is widely believed that the most important role in this sphere belongs to energy produced by uranium fission. This suggests that other possible sources, such as solar, geothermal energy, will either not be developed in time or will not provide an adequate solution. DOE

N79-29521# Harry Diamond Labs., Adelphi, Md.
AN INITIAL MODEL FOR THE FINITE DISPLACEMENT RESPONSE CHARACTERISTICS OF A FLUIDYNE PUMP
Tadeusz M. Drzewiecki Feb. 1979 43 p refs
(DA Proj. 1T1-61101-A-91A)
(AD-A069159; HDL-TR-1868) Avail: NTIS HC A03/MF A01 CSCL 20/13

This paper is the final report on the independent laboratory in house research (ILIR) sponsored work by the Harry Diamond Laboratories on the Fluidyne pump. The effort started with a survey of the extant literature on the subject, continued with experimental observations that led to a mathematical model, and has culminated with a comprehensive statement on the physical operation of the pump. The literature is particularly sparse on the subject; hence, only the basic references are cited. The report presents a detailed mathematical model of the fluid mechanical and thermodynamic processes occurring during oscillation. A positive-feedback simulation model is postulated that demonstrates, for the first time, physically why there is an onset of oscillations and subsequent sustained motion. This model is based on actual observations of the startup process in a prototype pump. The initially reported thermodynamic efficiency of this heat engine was less than 0.3 percent. Currently, Fluidyne pumps have demonstrated efficiencies of about 2 percent. The peak efficiencies, however, may theoretically approach 10 percent. The mathematical model has shown that large losses occur in the heat transfer to the working gas, heat losses to the displacer liquid, and friction in the output line. Improvements in these areas may dramatically improve the observed overall efficiency. The efficiency of the cycle itself, that is, the work done by the thermodynamic cycle relative to the output work, is on the order of 10 percent. GRA

N79-29524# Barber-Nichols Engineering Co., Arvada, Colo.
TECHNOLOGY ASSESSMENT OF GEOTHERMAL PUMPING EQUIPMENT Final Report, Jul. 1978
Kenneth E. Nichols and A. J. Malgieri Sep. 1978 88 p refs
(Contract EG-77-C-04-4162)
(ALO-4162-2) Avail: NTIS HC A05/MF A01

Interviews were conducted with DOE personnel, DOE contractors doing geothermal research, persons associated with geothermal installations, companies engaged in the drilling and completion of geothermal well, and pump manufactures. The reports of these interviews are presented and summarized and conclusions are drawn. DOE

N79-29566 Oregon Univ., Eugene.
WATER AND ENERGY RESOURCE DEVELOPMENT IN THE TONGUE RIVER BASIN, SOUTHEASTERN MONTANA Ph.D. Thesis
David Hunter Hickcox 1979 383 p
Avail: Univ. Microfilms Order No. 7918722

Water use, water availability, and energy development from the perspective of historical-cultural geography, physical geography, and resource management are examined. Water has been the key to the settlement and economy of the Tongue River Basin and is the key to future development of the basin. Massive development of the basin's coal resources which can alter the basin's hydrologic systems and traditional means of livelihood are discussed. Dissert. Abstr.

N79-29575# Pullman Kellogg, Houston, Tex.
SOURCES AND DELIVERY OF CARBON DIOXIDE FOR ENHANCED OIL RECOVERY Final Report, Oct. 1977 - Dec. 1978
M. Hare, H. Perlich, R. Robinson, M. Shah, and F. Zimmerman Dec. 1978 398 p refs
(Contract EX-76-C-01-2515)
(FE-2515-24) Avail: NTIS HC A17/MF A01

The carbon dioxide supply situation for miscible flooding operations to enhance oil recovery (EOR) is presented. The carbon dioxide sources within the geographic areas of potential EOR are shown on four regional maps with the tabular data for each region describing the sources in terms of quantity and quality. Evaluation of all the costs, such as purchase, production, processing, and transportation, associated with delivering the carbon dioxide from its source to its destination are presented. DOE

N79-29576# Mathematica, Inc., Princeton, N. J.
OIL SHALE: REPORT ON A FOCUS GROUP DISCUSSION
G. R. Christophersen 10 Nov. 1978 47 p refs
(Contract EV-78-C-01-6388)
(DOE/TIC-10032) Avail: NTIS HC A03/MF A01

The panel discussion focused on four types of barriers to oil shale commercialization including technological, economic, institutional, and environmental. The discussants agreed that both the size and potential demand for syncrude are massive. It was agreed that if this nation is to develop a domestic industry which is to produce liquid hydrocarbons as an energy source, the commercialization of the oil shale industry is important. Oil shale is viewed as the most economical option for domestic syncrude. Industry representatives share a strong optimism that an environmentally acceptable technology can be developed that will be economically attractive to industry. The environmentalists are concerned that as of yet no such environmentally acceptable technology exists. DOE

N79-29577# Mathematica, Inc., Princeton, N. J.
ENHANCED OIL RECOVERY: REPORT ON A FOCUS GROUP DISCUSSION
Irving Crespi 10 Nov. 1978 40 p refs
(Contract EV-78-C-01-6388)
(DOE/TIC-10021) Avail: NTIS HC A03/MF A01

A qualitative assessment is presented of the dimensions of opinion concerning the commercialization potential of enhanced oil recovery. There was a group consensus that commercialization of EOR is contingent on the existence of financial incentives, primarily in the form of prices which will make EOR attractive for capital investment. A second prerequisite is loan guarantees to reduce the risk inherent in technologies that are still in the process of being developed. It was felt that tax credits would be an effective incentive. Current price regulations, and what appears to be a trend of DOE to resolve issues case by case rather than through standard rules, were considered to be disincentives to commercialization. DOE

N79-29578# Market Facts, Inc., Washington, D. C.
ENHANCE OIL RECOVERY: FOCUS GROUP RESULTS
Aug. 1978 37 p refs
(Contract EV-78-C-01-6458)
(DOE/TIC-100200) Avail: NTIS HC A03/MF A01

The research on the evaluation of the potential for commercialization of enhanced oil recovery, determination of the barriers to development of this resource, and evaluation of actions required by the federal government to promote commercialization are presented. Group agreement with the DOE assessment of EOR with some reasonably predictable difference in emphasis is reported. It was felt that price controls placed a particularly heavy burden on EOR not only because of the disincentive effect of the (then) current price (since the meeting the ERA has recommended a higher price for EOR oil), but because of the dislocation caused by two-tier pricing. DOE

N79-29579# Gruy Federal, Inc., Houston, Tex.
ASSESSMENT OF POTENTIAL INCREASED OIL PRODUCTION BY POLYMER-WATERFLOOD IN NORTHERN AND SOUTHERN MID-CONTINENT OIL FIELDS Progress Report, period ending 30 Sep. 1978
15 Oct. 1978 34 p refs
(Contract EW-78-C-19-0026)
(BETC-0026/4) Avail: NTIS HC A03/MF A01

Results of polymer-waterflood studies are reported. The Burbank-Bartlesville sand reservoir, located in the north half of the Stanley Stringer Field, Osage County, Oklahoma was studied. Progress is summarized in a chart. DOE

N79-29584# Technicolor Graphic Services, Inc., Sioux Falls, S. Dak.
A SELECTED BIBLIOGRAPHY: REMOTE SENSING TECHNIQUES FOR EVALUATING THE EFFECTS OF SURFACE MINING
David M. Carneggie and Donald O. Ohlen 6 Mar. 1979 15 p refs

(Contract DI-14-08-0001-16439)
(PB-294299/3) Avail: NTIS HC A02/MF A01 CSCL 08I

Thirty-one citations of technical papers and other publications dealing with the monitoring surface mining are presented. These references summarize recent developments in methods used to identify, map, analyze, and monitor surface mining, particularly coal surface mining. GRA

N79-29592 Emory Univ., Atlanta, Ga.
URBAN AREAS AS ENERGY FLOW SYSTEMS Ph.D. Thesis
Arwood James Ruttenber, Jr. 1979 371 p
Avail: Univ. Microfilms Order No. 7916058

The application of energy flow analysis to the study of urban dynamics is evaluated from both theoretical and methodological perspectives. The paradigm of energy flow is discussed in terms of its relevance to the fields of theoretical biology, systems ecology, cultural anthropology, evolutionism, regional planning theory, and general system theory. An energy flow modeling technique is described and compared with other modeling approaches. A detailed explanation of the computer simulation of energy flow models is also provided. Dissert. Abstr.

N79-29593 Wisconsin Univ. - Madison.
AN ASSESSMENT OF WIND CHARACTERISTICS AND WIND ENERGY SYSTEMS APPLICATIONS TO ELECTRIC UTILITIES IN WISCONSIN AND SECTIONS OF MINNESOTA, IOWA AND ILLINOIS Ph.D. Thesis
Carel Christiaan Dewinkel 1978 313 p
Avail: Univ. Microfilms Order No. 7902397

Wind speed data from the National Climatic Center were analyzed to assess the wind characteristics for the application of wind energy conversion systems (WECS) to electric utility. In addition, five Coast Guard Stations along the shores of Lakes Superior and Michigan were analyzed. WECS as part of an electric utility system can be evaluated by electric utility planning methods. The method of analysis employs predicted wind power output data, based on 5 years of wind speed observations, that are subtracted on an hourly basis from the predicted load levels. These adjusted hourly load levels serve as an input of a conventional production cost model. Savings in production costs over the lifetime of the WECS, minus the O & M, taxes and insurance costs of the WECS, result in the estimated break even capital cost of the WECS. Dissert. Abstr.

N79-29594 Virginia Univ., Charlottesville.
THE USE OF CHLOROPHYLL IN A NOVEL SOLAR BATTERY Ph.D. Thesis
James Christopher Ludlow 1978 85 p
Avail: Univ. Microfilms Order No. 7916266

A novel solar battery was developed, one which uses chlorophyll a for the generation of a current. The battery consisted of a platinum foil electrode, onto which a mixture of chlorophyll a and lipoic acid was deposited, and a platinum current collector. With such a device, voltages greater than 0.35 volts were reproducibly developed. The dependence of the output of the cell as a function of chlorophyll levels, carotenoid levels, and intensity and wavelength of the incident light was determined. It is felt that this solar cell which, in essence, mimics the action of the green leaf, offers promise as a photovoltaic device. Dissert. Abstr.

N79-29595 Washington Univ., Seattle.
A CONTROL SYSTEM ANALYSIS OF THE ENERGY GROWTH MODEL: COAL Ph.D. Thesis
Ole Arvid Bakken 1978 357 p
Avail: Univ. Microfilms Order No. 7917535

The application of optimal control theory to allow for maximum use of solar power, in concert with coal and nuclear, for the generation of electricity beyond 1990, with oil and gas having been phased out by 1990 is described and demonstrated. The literature search for a model resulted in the selection of the Dartmouth College model termed COAL. The model equations, written in DYNAMO simulation language, and illustrated by DYNAMO diagrams, are studied in detail, and then transformed into differential equations with associated flow diagrams. The electricity generation sector and the demand sector of this model, including a solar sector developed, are selected for detailed control system analysis. Three options for generating future electricity by solar are discussed, and numerical parameters for one option are incorporated into the computer simulation programs. Dissert. Abstr.

N79-29596 Commission of the European Communities, Brussels (Belgium).
ENERGY RESEARCH AND DEVELOPMENT PROGRAMME First Status Report, 1975 - 1976
Jul. 1977 389 p
(EUR-5889; ISBN-9-024-72059-1) Copyright. Avail: Issuing Activity

Details of work carried out under contract and within the scope of the research and development program adopted by the council of Ministers of the European Community on August 22, 1975, are presented. Headings under which individual projects are grouped include 'Energy Conversion', 'Production and Utilization of Hydrogen', 'Solar Energy', 'Geothermal Energy', and 'Systems Analysis' (development of models). Author (ESA)

N79-29597# Committee on Energy and Natural Resources (U.S. Senate).
ENERGY CONSERVATION AND REGULATION IN THE PRESIDENT'S BUDGET
Washington GPO 1978 399 p refs Hearing before the Subcomm. on Energy Convervation and Regulation of the Comm. on Energy and Natural Resources, 95th Congr., 2d Sess., 3 Mar. 1978
(GPO-25-418; Publ-95-139) Avail: Subcommittee on Energy Conservation and Regulation

The potential impact of the enactment of the National Energy Act on the manpower and budget requirements of the Department of Energy is examined. Funding for programs under the Assistant Secretary for Conservation and Solar Applications, the Economic Regulatory Administration, the Federal Energy Regulatory Commision, the Energy Information Administration, and the Director of Information is examined in testimony delivered and in written answers to specific questions supplied by members of the Committee. A.R.H.

N79-29598*# Motorola, Inc., Phoenix, Ariz.
SEMICONDUCTOR GRADE, SOLAR SILICON PURIFICATION PROJECT Final Report, Feb. 1976 - Jan. 1979
W. M. Ingle, R. S. Rosler, S. W. Thompson, and R. E. Chaney Jan. 1979 173 p refs Prepared for NASA and DOE
(Contract JPL-954442)
(NASA-CR-158868; Rept-2257/12; DOE/JPL-954442-78/12)
Avail: NTIS HC A08/MF A01 CSCL 10A

A low cost by-product, SiF4, is reacted with mg silicon to form SiF2 gas which is polymerized. The (SiF2)x polymer is heated forming volatile SixFy homologues which disproportionate on a silicon particle bed forming silicon and SiF4. The silicon analysis procedure relied heavily on mass spectroscopic and emission spectroscopic analysis. These analyses demonstrated that major purification had occured and some samples were indistinguishable from semiconductor grade silicon (except possibly for phosphorus). However, electrical analysis via crystal growth reveal that the product contains compensated phosphorus and boron. A.W.H.

N79-29599*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DYNAMIC ANALYSIS OF A PHOTOVOLTAIC POWER SYSTEM WITH BATTERY STORAGE CAPABILITY Final Report
Walter C. Merrill, Ronald J. Blaha and Roy L. Pickrell Jul. 1979 47 p ref
(DE-AI01-79ET20485)
(NASA-TM-79209; E-094; DOE/NASA/20485-79/4) Avail: NTIS HC A03/MF A01 CSCL 10C

A photovolataic power system with a battery storage capability is analyzed. A dual battery current control concept is proposed which enables the battery to either supply or accept power depending upon system environment and load conditions. A simulation of the power system, including the battery current control, is developed and evaluated. The evaulation demonstrate the visbility of the battery control concept of switch the battery from a charge to discharge mode and back as required by load and environmental conditions. An acceptable system operation is demonstrated over the entire insolation range. Additionally, system sensitivity, bandwidth, and damping characteristics of the battery control are shown to be acceptable for a projected hardware implementation. Author

N79-29601*# Wyle Labs., Inc., Huntsville, Ala.
LONG-TERM WEATHERING EFFECTS ON THE THERMAL PERFORMANCE OF THE SOLARGENICS (LIQUID) SOLAR COLLECTOR AT OUTDOOR CONDITIONS
Jul. 1979 13 p refs Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-150523; TR-531-28-Add) Avail: NTIS HC A02/MF A01 CSCL 10A

The test procedures and the results obtained during the evaluation of a single-covered liquid solar collector are presented. The tests were performed under outdoor natural conditions. The collector was under stagnation conditions for a total of approximately ten months. The solar collector is a liquid, single-glazed, flat plate collector, and is about 240 inches long, and 3.8 inches in depth. K.L.

N79-29602*# Wilson and Co., Salina, Kans.
SOLAR HEATING AND HOT WATER SYSTEM INSTALLED AT SOUTHEAST OF SALINE, UNIFIED SCHOOL DISTRICT 306, MENTOR, KANSAS
Jul. 1979 119 p Prepared for NASA and DOE
(Contract EG-77-A-01-4077)
(NASA-CR-161271) Avail: NTIS HC A06/MF A01 CSCL 10A

The solar system, installed in a new building, was designed to provide 52 percent of the estimated annual space heating load and 84 percent of the estimated annual potable hot water requirement. The liquid flat plate collectors are ground-mounted and cover a total area of 5125 square feet. The system will provide supplemental heat for the school's closed-loop water-to-air heat pump system and domestic hot water. The storage medium is water inside steel tanks with a capacity of 11,828 gallons for space heating and 1,600 gallons for domestic hot water. The solar heating facility is described and drawings are presented of the completed system which was declared operational in September 1978, and has functioned successfully since. A.R.H.

N79-29604*# Energy Research Corp., Danbury, Conn.
TECHNOLOGY DEVELOPMENT FOR PHOSPHORIC ACID FUEL CELL POWERPLANT, PHASE 2 Quarterly Report
Larry Christner Mar. 1979 50 p refs Prepared for NASA and DOE
(Contract DEN3-67)
(NASA-CR-159572; DOE/NASA/0067-79/1) Avail: NTIS HC A03/MF A01 CSCL 10B

Component development has resulted in routine molding of 12 in. by 17 in. bipolar plates with 80 percent acceptance. A 5 C per hour post-cure heating cycle for these plates was found to give blister free materials. Lowering the resin in a bipolar plate content from 32 percent to 22 percent decreases the resistivity more than 50 percent. Evaluation of the corrosion resistance of Novolak and Resol resins at 185 C in phosphoric acid indicates a slow etch. Aresol modified phenolics, however, decompose rapidly. Estimates of acid loss by the use of analytical expressions known as Margule, van Laar, and Wilson equations were not satisfactory. Experimental evaluation of the P4O10 vapor concentration of 103 wt percent acid at 191 C provided a value of 2 ppm. This value is based on a single experiment. Author

N79-29605# Resource Planning Associates, Inc., Washington, D. C.
EUROPEAN WASTE-TO-ENERGY SYSTEMS: CASE STUDY OF RENNES, FRANCE
Sep. 1978 45 p ref
(Contract EC-77-C-01-2103)
(HCP/M2103-0008) Avail: NTIS HC A03/MF A01

The Rennes waste-to-energy unit is described. The unit, which burns the municipal solid waste of the city and 26 surrounding small communities, is connected to the district heating network. Along with an oil-fired heating plant, the Rennes combustion unit provides space heating and domestic hot water for nearly 5,000 housing units, hospital buildings, university dormitories, and other institutional and commercial buildings. The sale of energy recovered from municipal solid waste more than pays for the operation of the combustion unit. The collection of waste, the design and operation of the system, and the cost of the system are discussed in detail. R.E.S.

N79-29606*# North Carolina State Univ., Raleigh. Solid State Electronics Lab.
A THEORETICAL ANALYSIS OF THE CURRENT-VOLTAGE CHARACTERISTICS OF SOLAR CELLS Final Report
R. C. Y. Fang and J. R. Hauser Jan 1979 334 p refs
(Grant NGR-34-002-195)
(NASA-CR-158872) Avail: NTIS HC A15/MF A01 CSCL 10A

The following topics are discussed: (1) dark current-voltage characteristics of solar cells; (2) high efficiency silicon solar cells; (3) short circuit current density as a function of temperature and the radiation intensity; (4) Keldysh-Franz effects and silicon solar cells; (5) thin silicon solar cells; (6) optimum solar cell designs for concentrated sunlight; (7) nonuniform illumination effects of a solar cell; and (8) high-low junction emitter solar cells. G.Y.

N79-29607*# RCA Labs., Princeton, N. J.
AUTOMATED ARAY ASSEMBLY, PHASE 2 Interim Report
R. V. DAiello Jan 1979 136 p refs Prepared for JPL and DOE
(Contracts NAS7-100; JPL-954868)
(NASA-CR-158874; DOE/JPL-954868-79/1) Avail: NTIS HC A07/MF A01 CSCL 10A

A manufacturing process suitable for the large-scale production of silicon solar array modules at a cost of less than $500/peak kW is described. Factors which control the efficiency of ion implanted silicon solar cells, screen-printed thick film metallization, spray-on antireflection coating process, and panel assembly are discussed. Conclusions regarding technological readiness or cost effectiveness of individual process steps are presented. J.M.S.

N79-29608*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
SOLAR ENGINE Patent Application
Ronald N. Jensen, inventor (to NASA) Filed 22 Jun. 1979 12 p
(NASA-Case-LAR-12148-1; US-Patent-Appl-SN-051275) Avail: NTIS HC A02/MF A01 CSCL 10B

A solar engine is disclosed in which a fluid, which is first heated and then cooled, forces a piston outward as the fluid is heated, and then draws inward as the fluid is cooled. The piston is connected to a shaft and produces work as it moves outward and inward. A displacer plate moves between an absorber plate and a cooling plate to form an air space between the displacer and one or the other of these two plates for heating and cooling the fluid. The displacer plate is for heating and cooling the fluid. The displacer plate is moved from one plate to the other by the displacer push ring as the piston nears the midpoint of its travel on the outward stroke and again on the inward stroke. NASA

N79-29609# Committee on Government Operations (U. S. House).
SOLAR ENERGY
Washington GPO 1979 634 p refs Hearings before a Subcomm. of the Comm. on Government Operations, 95th Congr., 2d Sess., 12 May; 12-14 Jun. 1978
(GPO-36-957) Avail: Comm. on Government Operations

A general overview of the status of solar energy technology in the United States is given with emphasis on the state of

California. Solar collectors, photovoltaics as well as biomass conversion and other less direct, but solar based technologies are discussed. Demonstration projects, in industrial as well as residential buildings, are included. Program goals, incentives, projected energy savings, and cost factors are among the factors considered.
J.M.S.

N79-29612# Gulton Industries, Inc., Hawthorne, Calif. Engineered Magnetics Div.

DEVELOPMENT PROGRAM FOR 3.0 KW INVERTER: MILITARIZED INVERTER FOR USE WITH FUEL CELL OR BATTERY POWER PLANTS Final Report, Dec. 1976 - Dec. 1978

John E. Rance 15 Jan. 1979 24 p
(Contract DAAK70-77-C-0012)
(AD-A068433) Avail: NTIS HC A02/MF A01 CSCL 10/2

This report describes the design, construction and testing of a static inverter rated at 3.0 kilowatts. Circuit techniques were evaluated to obtain desired results with considerations to cost, reliability, maintainability, weight, size and efficiency. The application of this portable, rugged inverter is to replace mechanical alternating generators used in the field. GRA

N79-29614# Tetra Tech, Inc., Arlington, Va.

DEPARTMENT OF THE NAVY ENERGY FACT BOOK

May 1979 520 p refs
(Contract N00014-78-C-0434)
(AD-A069138; TETRAT-A-6054-403) Avail: NTIS HC A22/MF A01 CSCL 10/2

The Department of the Navy Energy Fact Book presents the U.S., including the DoD and Navy, energy situation; summarizes Navy energy R and D initiatives; provides an in-depth description of the various processes and developments related to hydrocarbon fuels, synthetic fuels, non-hydrocarbon energy sources, and energy conversion, and briefly describes energy R and D legislation and cooperative energy programs. GRA

N79-29615# Coast Guard Research and Development Center, Groton, Conn.

ECONOMIC ANALYSIS OF SOLAR PHOTOVOLTAICS FOR LOW-POWER LIGHTED AIDS TO NAVIGATION Final Report

William R. Allen Jun. 1978 53 p refs
(AD-A068365; CGR/DC-11/78; USCG-D-23-79) Avail: NTIS HC A04/MF A01 CSCL 20/1

A detailed economic analysis with decision-making criteria for converting the present energy storage system used on U.S. Coast Guard low-power lighted aids to navigation to one that relies upon conversion of solar energy by photovoltaics is presented. The analysis demonstrates that converting 12-volt lighted aids to navigation from reliance on primary air-cell batteries to reliance on solar photovoltaics is attractive from an economic point of view. However, questions concerning reliability and life must be answered before the Coast Guard plans conversion to solar photovoltaics.
GRA

N79-29616# IIT Research Inst., Chicago, Ill.

HYDROGEN GENERATOR SUBSYSTEM: CATALYST AND EQUIPMENT DEVELOPMENT FOR THERMO-CATALYTIC CRACKER Final Technical Report

R. Henry Nov. 1978 106 p refs
(Contract DAAG53-76-C-0081; DA Proj. 1L2-63701-DG-10)
(AD-A068452; IITRI-C6363-33) Avail: NTIS HC A06/MF A01 CSCL 10/2

Future Army plans call for generation of silent electrical power in field situations. Hydrogen/air fuel cells are considered viable electrical power generators. Currently available logistic fuels are hydrocarbon; requiring a fuel conditioning process to free hydrogen for use by the fuel cell. This report concerns one such process to obtain hydrogen from hydrocarbon fuels. Experimental work is aimed at optimizing a catalyst for catalytic cracking and the development of a breadboard hydrogen generator. Further work is needed in both these areas. GRA

N79-29617# Michigan State Univ., East Lansing.

SMALL LOW-HEAD HYDROELECTRIC POWER

O. Krauss Aug. 1978 495 p refs Presented at Midwest Regional Conf., East Lansing, Mich., 23 May 1978
(Contract ET-78-S-07-1732)
(IDO-10076; Conf-7805120) Avail: NTIS HC A21/MF A01

The rehabilitation of abandoned hydro sites and generation of power at dams which were constructed for nonpower purposes which could add to the supply of electric energy is presented. Such development near the sites could aid local economies. Multipurpose uses were considered. Major economic and/or institutional problems were delineated. DOE

N79-29620# Department of Energy, Washington, D. C. Div. of Solar Technology.

GUIDE TO SOLAR ENERGY PROGRAMS

Jun. 1978 75 p refs
(DOE/ET-0036/1) Avail: NTIS HC A04/MF A01

The following are included: Department of Energy mission and objectives, overview of the Department of Energy's solar energy programs, program activities and structure, solar energy programs now functioning under the Division of Conversion and Solar Applications, methods of procurement and guides for proposal preparation, and sources of solar energy information and activities supporting the solar energy program. Author (DOE)

N79-29621# Battelle Pacific Northwest Labs., Richland, Wash.

ROLE OF GOVERNMENT IN SOLAR ENERGY DEVELOPMENT: A VIEW FROM THE NORTHWEST

Jill A. Goodnight and Sarah T. King Aug. 1978 181 p refs
(Contract EY-76-C-06-1830)
(PNL-2784) Avail: NTIS HC A09/MF A01

Several economic feasibility studies of solar heating in the Northwest are described. The case for federal assistance to the solar industry and the consumer is developed. The solar related activities undertaken by the Northwest states of Oregon, Idaho, Washington, and Montana are detailed. Finally, roles are addressed which municipal government may play either to encourage or to deter the widespread use of solar heating systems. DOE

N79-29622# Brown Univ., Providence, R. I. Div. of Engineering.

GEOTHERMAL POWER PLANTS OF NEW ZEALAND, PHILIPPINES, AND INDONESIA: A TECHNICAL SURVEY OF EXISTING AND PLANNED INSTALLATIONS

Ronald DiPippo Jun. 1978 123 p refs
(Contract EY-76-S-02-4051)
(COO-4051-23; CATMET/17) Avail: NTIS HC A06/MF A01

Geothermal power plants in the south Pacific area were surveyed including New Zealand, the Philippines and Indonesia. The geologic characteristics of the fields are described along with wellflow particulars, energy conversion systems, environmental impacts, economic factors and operating experiences, where available. The geothermal resource utilization efficiency is computed or estimated for the power plants covered. Furthermore, some discussion is devoted to the other sites which may prove exploitable for the production of electricity. DOE

N79-29623# Market Facts, Inc., Washington, D. C.

LARGE WIND ENERGY FOCUS GROUP RESULTS

Aug. 1978 35 p
(Contract EY-78-C-01-6458)
(DOE/TIC-10038) Avail: NTIS HC A03/MF A01

A report is presented of the focus group research on large wind energy systems prepared for the Department of Energy as part of the commercialization program. The potential for commercialization of wind energy is evaluated to determine the barriers to development of this resource, and to judge what actions are required by the Federal Government to promote commercialization. The issues of commercialization as examined by a focus group consisting of key individuals from various organizations involved in large wind energy systems development are discussed.
DOE

N79-29624# Kernforschungsanlage, Juelich (West Germany). Programmgruppe Systemforschung und Technologische Entwicklung.

POSSIBILITIES AND LIMITATIONS OF SOLAR ENERGY UTILIZATION WITH THE USE OF LOW-TEMPERATURE COLLECTORS IN THE GERMAN FEDERAL REPUBLIC: PRINCIPLES, ENGINEERING SYSTEMS, ECONOMY
M. Melib Dec. 1978 247 p refs In GERMAN; ENGLISH abstract
(Juel-Spez-25; ISSN-0313-7639) Avail: NTIS (US Sales Only) HC A11/MF A01; DOE Depository Libraries

Technical performance and economy of low-temperature solar collector systems are investigated with regard to their possible application for the LT-heat supply in the FRG. The systems consist of a flat plate collector system, including storage, and a conventional back-up system and may be assisted by an electrically driven heat pump. The analysis is carried out by computer simulation based on a mathematical model of the differant kinds of LT-system-components. The separate modelling of collector, heat exchanger, storage facility, heat pump, etc. makes the various composition of components possible. Four types of LT-collector systems are investigated: domestic hot water supply system, house heating system, combined house heating and hot water supply system, and solar assisted heat pumps for heating and hot water supply. Simulations are based upon hourly data of total insolation and ambient temperature measured at Hamburg and Munich. DOE

N79-29625# Lincoln Lab., Mass. Inst. of Tech., Lexington.
PHASE-ONE EXPERIMENT TEST PLAN SOLAR PHOTOVOLTAIC/THERMAL RESIDENTIAL EXPERIMENT
Edward C. Kern, Jr. 15 Mar. 1979 16 p refs
(Contract EG-77-S-02-4577)
(COO-4577-6) Avail: NTIS HC A02/MF A01

Objectives, rationale, and method of a one-year experiment using a residential photovoltaic/thermal power system are presented. Data archived and processed to investigate: (1) series heat pump system performance, and (2) electric utility impacts. A parallel heat pump system is investigated in a subsequent experiment. DOE

N79-29627# Lincoln Lab., Mass. Inst. of Tech., Lexington.
PHOTOVOLTAIC POWER SYSTEM FIELD TESTS
M. D. Pope and R. W. Matlin Jun. 1978 9 p refs Presented at IEEE Photovoltaic Specialists Conf., Washington, D. C., 5 Jun. 1978
(Contract EY-76-C-02-4094)
(COO-4094-15; Conf-780619-20) Avail: NTIS HC A02/MF A01

The systems discussed are photovoltaic (PV) agricultural testing which includes the existing 25 kW peak system as well as on-going development of very small microirrigation systems consuming less than 1 kW peak, a 1.6 kW system, the Lincoln PV system test facility at Lexington, Massachusetts, four real-time endurance test sites located in the northeast, the Natural Bridges 100 kW PV power system, and a 20 kW PV power system for one AM radio station. The latter two systems are presently being designed. Experience gained from these projects is discussed in the contexts of storage, system reliability and safety, efficiency implications, and costs of PV structural and foundation elements. DOE

N79-29630# Oak Ridge National Lab., Tenn.
ELECTRICITY IN LIEU OF NATURAL GAS AND OIL FOR INDUSTRIAL THERMAL ENERGY: A PRELIMINARY SURVEY
J. R. Tallackson Feb. 1979 126 p refs
(Contract W-7405-eng-26)
(ORNL/TM-5937) Avail: NTIS HC A07/MF A01

The capability of the process industries to substitute utility-generated electricity for natural gas and oil is assessed. It is concluded that the existing technology will permit substitution of electricity for approximately 75% of the natural gas and petroleum now being consumed by industrial processors. Process steam generation, representing 40% of its energy usage, offers the best near-term potential for conversion to electricity. Electric boilers and energy costs for steam are briefly discussed. Electrically driven heat pumps are considered as a possible method to save additional low-grade energy. Electrical reheating at high temperatures in the primary metals sector will be in effective way to conserve gas and oil. A wholesale shift by industry to electricity to replace gas and oil will produce impacts on the public utilities. The principal bar to large-scale electrical substitution is economics, not technology. DOE

N79-29631# Westinghouse Electric Corp., East Pittsburgh, Pa. Advanced Systems Technology Div.
METHODOLOGY FOR SOLAR-THERMAL POWER PLANT EVALUATION
J. T. Day Aug. 1978 129 p refs Sponsored by Elec. Power Res. Inst.
(EPRI Proj. 648-1)
(EPRI-ER-869) Avail: NTIS HC A07/MF A01

The development of an evaluation methodology, including process for evaluating solar thermal plant impact on utility reliability and margin requirements and economics, plus the impact of solar plant penetration is presented. In addition to a general methodological framework, specific methods covered include a specific economic calculation methodology, a process for modeling the interdependent operation of a solar plant and the balance of the utility system, a procedure for reserve margin analysis, and a method for solar plant penetration analysis. DOE

N79-29633# Dunham Associates, Inc., Bismarck, N. Dak.
BISMARCK, NORTH DAKOTA, OFFICE COMMERCIAL SOLAR DEMONSTRATION DESIGN AND CONSTRUCTION REPORT
5 Jan. 1979 25 p
(Contract EG-77-C-02-4228)
(COO-4228-1) Avail: NTIS HC A02/MF A01

The demonstration consisted of adding 5000 square feet of flat, plate collector to an existing four story, 75,000 square feet office building. The existing mechanical system is an electric water to water heat pump system with 60,000 gallons of thermal storage. The retrofit design converted one 20,000 gallon tank for use as solar storage and added the 5000 square feet of double glazed, selective surface, flat plate collector. The solar collector is mounted as a ground mounted array which is stepped down a hillside. The array is expected to provide 1944 million BTU of useable energy annually. That energy is equivalent to 34% of the building heating energy. DOE

N79-29634# Los Alamos Scientific Lab., N. Mex. Systems, Analysis, and Assessment Div.
TROMBE WALLS AND DIRECT GAIN: PATTERNS OF NATIONWIDE APPLICABILITY
Scott A. Noll, J. Fred Roach, and Shaul Ben-David (New Mex. Univ., Albuquerque) 1979 9 p refs Presented at 3d Natl. Passive Solar Conf., San Jose, 11-13 Jan. 1979
(Contract W-7405-eng-36)
(LA-UR-79-239; Conf-790106-5) Avail: NTIS HC A02/MF A01

The economic performance of Trombe wall and direct gain passive solar heating designs are elevated on a nationwide basis using the LASL/UNM solar economic performance code. Both designs are integrated into a ranch style tract home concept thereby facilitating regional comparisons. Solar add-on costs are established for each design with regional differences in material and labor prices accounted for at each site. System sizes are optimized against the natural gas and electric resistance heating alternatives, the current price and future escalation of which is established for each locale. Results for each passive solar design are summarized on a state-by-state basis followed by a discussion of their comparative economic performance. DOE

N79-29635# Solar Systems of Virginia, Inc., Hampton.
COST EFFECTIVE SOLAR HOT WATER SYSTEM FOR ECONO-TRAVEL MOTOR HOTEL LOCATED AT WOODBRIDGE, VIRGINIA Final Report
Nov. 1978 18 p
(Grant EM-78-G-02-4661)
(COO-4661-1) Avail: NTIS HC A02/MF A01

The description of the system presented along with the final breakdown, performance data and payback time are given. The payback time for the installed system is approximately four years.

instead of the 7.2 years estimated for the proposal. The additional savings is due to the reduction in the peak demand charge since the electric hot water heaters are not required to operate at the same time each morning as the dryers used for the laundry. As called for in the proposal to DOE, the success of the system is determined by the reduction in the utility cost and reduced use of our fossil fuels. The lower hotel's monthly electricity bills indicate that this goal was accomplished. DOE

N79-29636# Argonne National Lab., Ill. Solar Energy Group.
DESIGN AND INSTALLATION MANUAL FOR THERMAL ENERGY STORAGE
Roger L. Cole, ed., Kenneth J. Nield, ed., Raymond R. Rhode, ed., and Ronald M. Wolosewicz, ed. Feb. 1979 283 p refs
(Contract W-31-109-eng-38)
(ANL-79-15) Avail: NTIS HC A13/MF A01

Information on the design and installation of thermal energy storage in solar heating systems is provided. The manual presented includes sizing storage, choosing a location for the storage device, and insulation requirements. Both air-based and liquid-based systems are covered with topics on designing rock beds, tank types, pump and fan selection, installation, costs, and operation and maintenance. Topics relevant to heating domestic water include safety, single- and dual-tank systems, domestic water heating with air- and liquid-based space heating system, and stand-alone domestic hot water systems. DOE

N79-29637# B and A Engineers Ltd., Chicago, Ill.
ASSESSMENT OF THE TECHNOECONOMIC FEASIBILITY OR SEASONAL THERMAL ENERGY STORAGE SYSTEMS (STES)
Dec. 1978 81 p refs
(Contract W-31-109-eng-38)
(ANL/EES-TM-35) Avail: NTIS HC A05/MF A01

The feasibility of the use of seasonal thermal energy storage systems employing large volumes of water is examined on the bases of technology and economics. Three building types are considered: single-family houses, low-rise multi-family apartment buildings, and small commercial buildings. Construction costs are based on prevailing conditions in the suburban Chicago area marketplace. Various types of vessels above and below ground are considered along with possible vessel materials. DOE

N79-29638# Brown Univ., Providence, R. I. Engineering Div.
GEOTHERMAL POWER PLANTS OF MEXICO AND CENTRAL AMERICA: A TECHNICAL SURVEY OF EXISTING AND PLANNED INSTALLATIONS
Ronald DiPippo Jul. 1978 103 p refs
(Contract EY-76-S-02-4051)
(COO-4051-26) Avail: NTIS HC A06/MF A01

The geoethermal power plants of Mexico and Central America were studied. The geothermal plants are located in areas of recent and active volcanism; the resources are of the liquid-dominated type. Details are given about the plants located at Cerro Prieto in Mexico and at Ahuachapan in El Salvador. In both cases, attention is paid to the geologic nature of the fields, the well programs, geofluid characteristics, energy conversion systems, materials of construction, effluent handling systems, economic factors and plant operating experience. Exploration and development activities are described for other promising geothermal areas in Mexico and El Salvador, along with those in the countries of Costa Rica, Nicaragua, Guatemala, Honduras, and Panama. DOE

N79-29639# Brown Univ., Providence, R. I. Engineering Div.
INTRODUCTION TO ELECTRIC ENERGY CONVERSION SYSTEMS FOR GEOTHERMAL ENERGY RESOURCES
Ronald DiPippo Jun. 1978 21 p refs
(Contract EY-76-S-02-4051)
(COO-4051-28) Avail: NTIS HC A02/MF A01

The types of geothermal energy conversion systems in use are classified as follows: direct, dry steam; separated steam; single-flash steam, double-flash steam, multi-flash steam, brine/Freon binary cycle; and brine/isobutane binary cycle. The thermodynamics of each of these is discussed with reference to simplified flow diagrams. Typical existing power plants are identified for each type of system. DOE

N79-29640# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
POTENTIAL APPLICATION OF MADISON FORMATION WATERS FOR COMMUNITY HEATING IN SOUTH DAKOTA
R. A. Freeman and R. F. Meier Sep. 1978 44 p refs
(Contract EX-76-A-36-1008)
(APL/JHU/QM-78-042R) Avail: NTIS HC A03/MF A01

The general design of such a community system is discussed along with its cost, means of financing, and life expectancy. Legal questions and state statutes that are pertinent are cited and the life expectancy of the entire Madison resource and equipment to exploit the resource are considered. DOE

N79-29642# Pacific Gas and Electric Co., San Francisco, Calif.
IMPLICATIONS OF THE FUSION POWER SOURCE TO THE ELECTRIC UTILITY INDUSTRY
Nov. 1978 144 p refs Presented at EPRI Executive Seminar on Fusion, San Francisco, Calif., 11 Oct. 1977
(Contract ES-77-G-05-5576)
(EPRI-ER-943-54; Conf-771071-Summ) Avail: NTIS HC A07/MF A01

The viewpoints and plans of the utility industry and the fusion community with respect to thermonuclear power plants are examined. Basic background material concerning the fusion process is emphasized including the current status and future plans of the fusion research and development effort. DOE

N79-29643# Ohio State Univ., Columbus.
WORKSHOP ON ENERGY SOURCES AND ELECTRIC POWER GENERATION FOR HIGH SCHOOL STUDENTS Final Report
Donald D. Glower and Herbert L. Coon Sep. 1978 345 p refs Workshop held at Columbus, Ohio, 11-30 Jun. 1978
(Contract EY-76-C-02-2449)
(TID-28975) Avail: NTIS HC A15/MF A01

Workshop participants studied various aspects of the national energy problem and prepared instructional materials for use in their classrooms. Attention was given to short and long term resources available; to conversion systems; to economic, social and philosophical problems associated with energy production and use; and the importance of conservation. The conversion steps involved in transforming uranium ore into electric power were examined through lectures, audio visual aids, and extensive discussions. DOE

N79-29645# Market Facts, Inc., Washington, D. C.
LOW HEAD HYDROPOWER: FOCUS GROUP RESULTS
Aug. 1978 32 p refs
(Contract EV-78-C-01-6458)
(DOE/TIC-10017) Avail: NTIS HC A03/MF A01

The barriers and opportunities associated with the successful commercialization of low head hydropower and the appropriate Federal actions for promoting and facilitating commercialization of this technology were evaluated. The primary questions put before the discussion group participants were: is commercialization of low head hydropower feasible; what is the nature and extent of the market for this technology; what barriers and opportunities are critical to the commercialization of low head hydropower; and what actions, if any, should be taken by the Federal government to bring about successful commercialization of this technology. The opinions, attitudes, and knowledge of the participants on these issues are summarized. DOE

N79-29647# International Research and Technology Corp., McLean, Va.
TEN SCENARIOS OF TRANSPORTATION ENERGY CONSERVATION USING TECNET Final Report
Ralph M. Doggett, R. Meyer, and M. Heller Mar. 1979 114 p refs

(Contract EX-76-C-01-2101)
(HCP/M2101-1) Avail: NTIS HC A06/MF A01

The TECNET system was developed to provide DOE with the capability to measure the total energy consequences of alternative transportation strategies out to the year 2025. Ten scenarios were tested to obtain a wide array of policy alternatives, beginning with a Base Case scenario (business as usual). The other scenarios include a conservation scenario, scenarios with high penetration rates for alternative engine automobiles, a gas rationing scenario, and a series of sensitivity analyses in which various parameters were altered to test their effects.
Author (DOE)

N79-29648# International Research and Technology Corp., McLean, Va.
FURTHER DEVELOPMENT AND USE OF THE TRANSPORTATION ENERGY CONSERVATION NETWORK (TECNET)
Ralph M. Doggett, A. Shapanka, R. Meyer, and R. Strieter Mar. 1979 184 p refs
(Contract EX-76-C-01-2101)
(HCP/M2101-2) Avail: NTIS HC A09/MF A01

The TECNET model underwent a variety of changes and was used to assess the implications of many different patterns of future transportation demand. Its primary purpose is to estimate the total energy requirements of the transportation sector, under alternative assumptions of transportation trends, out to the year 2025. The model is unique in that it estimates both direct and indirect energy requirements of the transportation sector, within a comprehensive framework that includes a large input-output model for assessing economic impacts, the methodologies for estimating pollution emission from both mobile and stationary sources.
Author (DOE)

N79-29649# Midland-Ross Corp., Toledo, Ohio.
RECUPERATIVE SYSTEM FOR HIGH AND ULTRA-HIGH TEMPERATURE FLUE GASES Quarterly Report, Apr. - Jun. 1978
J. G. Reitz 17 Jul. 1978 89 p refs
(Contract EC-77-C-07-1672)
(IDO-1672-2) Avail: NTIS HC A05/MF A01

Progress is reported in the development of a tile-metallic recuperative system for industrial application with flue gases in the 1200 to 1900 F temperature range. The selection of a steel soaking pit demonstration site is investigated, and design studies are included.
DOE

N79-29650# Gordian Associates, Inc., Washington, D. C.
ENERGY SUPPLY AND DEMAND BALANCES AND FINANCING REQUIREMENTS IN NON-OPEC DEVELOPING NATIONS Final Report
Feb. 1979 178 p refs
(Contract EH-77-C-01-6407)
(HCP/H6407) Avail: NTIS HC A09/MF A01

The question of possible LDC (less developed countries) responses to energy shortages in three respects is addressed. First, energy conservation and fuel-switching alternatives are examined for industry, transporation, the urban residential sector, and the rural and agricultural sector. Second, small-scale technologies for renewable energy resources are discussed in terms of their potential applications for LDCs. Finally, each LDC country group's range of likely responses to energy shortages is examined in terms of both historical patterns and resource constraints.
DOE

N79-29651# General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
REGIONAL CONCEPTUAL DESIGN AND ANALYSIS STUDIES FOR RESIDENTIAL PHOTOVOLTAIC SYSTEMS. VOLUME 1: EXECUTIVE SUMMARY Final Report
Jan. 1979 54 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7039) Avail: NTIS HC A04/MF A01

A wide range of roof-mounted array systems was studied including PV-only systems and combined and separate PV/thermal collection systems which provide heat for space conditioning and domestic hot water. The attractiveness of the system options were assessed in terms of performance and economic competitiveness based on hourly weather data for twelve designated regions of the US representing a broad spectrum of climatic characteristics. The study determined that if PV economic goals are achieved, PV-only solar energy systems for residential use should be emphasized because of their potential economic viability in all regions. On the basis of the costs and benefits used in the analysis, residential systems without batteries are preferred over systems with batteries assuming utility feedback acceptance at some differential buy-back rate such as 40 to 50% of the sell rate. Side-by-side PV/thermal systems become more viable across the nation with a PV system cost to thermal system cost ratio of 1.
DOE

N79-29653# Florestal Acesita, Belo Horizonte (Brazil).
SHORT NOTICE ON A GRAND FOREST: TROPICAL LAND CONVERTING SUNLIGHT TO ENERGY
[1978] 20 p
(NP-23278) Avail: NTIS (US Sales Only) HC A02/MF A01; DOE Depository Libraries

The factors that make reforestation of a large area in Brazil feasible are presented. The trees planted are eucalyptus destined for the production of charcoal for steel making in the area. DOE

N79-29655# Wisconsin Univ., Madison. Solar Energy Lab.
SIMULATION AND DESIGN OF SOLAR THERMAL PROCESSES
Dec. 1978 11 p
(Contract EY-76-S-02-2588)
(COO-2588-2) Avail: NTIS HC A02/MF A01

Process component model formulations were developed, including: transient LiBr-H2O absorption cooler; CPC and other 'advanced' collectors; and windows, storage wall and shading devices for passive solar heating. Systems studies included: parallel and series solar/heat pump combinations; phase change storage in solar heating; absorption cooling with and without cooler transients. The general solar process simulation program, TRNSYS, was further developed, documented, distributed and supported. Design procedure studies led to development of a method for calculating the phi, the average solar radiation availability, and the development of the phi, f-chart method for design of closed-loop solar heating systems which can have load temperatures other than 20 C and have approximately constant COP of any energy converters between storage and load.
DOE

N79-29656# Pennsylvania Univ., Philadelphia. Dept. of Mechanical Engineering and Applied Mechanics.
STANDARDS APPLICABLE TO PERFORMANCE MEASUREMENT OF SOLAR HEATING AND COOLING SYSTEMS
Noam Lior 1978 8 p
(Contract EG-77-S-02-4142)
(COO-4142-2; Conf-780432-4) Avail: NTIS HC A02/MF A01

The advantage of the utilization of existing standards in the performance monitoring of solar heating and cooling systems is discussed. Existing applicable measurement standards and practices are listed.
DOE

N79-29657# Brookhaven National Lab., Upton, N. Y. Policy Analysis Div.
SYSTEMS APPROACH TO ENERGY PLANNING
Philip F. Palmedo and Robert Nathans 18 Nov. 1978 21 p refs Presented at Caribbean Consultation on Energy and Agr., Santo Domingo, 1 Dec. 1978
(Contract EY-76-C-02-0016)
(BNL-25523; Conf-781226-1) Avail: NTIS HC A02/MF A01

The criteria of successful energy planning and ways to go about such planning are outlined. Economic, social, and political factors are discussed along with a wide range of geographical scales, from the household and village to the world scene. A reduced reliance on oil imports is emphasized.
DOE

N79-29658# Argonne National Lab., Ill. Energy and Environment Systems Div.
PROCEEDINGS OF THE 2ND WORKSHOP ON ENERGY-CONSERVING SITE DESIGN CASE STUDIES
Robert Hrabak Jan. 1979 111 p refs Proc. held on 14-15 Sep. 1978
(Contract W-31-109-eng-38)
(ANL/ICES-TM-22) Avail: NTIS HC A06/MF A01

Various options for increasing energy conservation through building design are identified and evaluated. Design case studies discussed include: Burke Center in Fairfax Co., Virginia; Radisson in central New York; Greenbrier in Virginia near Norfolk; Shenandoah in Georgia near Atlanta; and the Woodlands in Texas near Houston. Technological progress for each development is summarized. An energy conservation system that collects heat in summer for winter heating and preserves the chill in winter for summer cooling is described.
DOE

N79-29659# Argonne National Lab., Ill. Energy and Environmental Systems Div.
METHOD FOR THE PRELIMINARY FEASIBILITY ANALYSIS OF COMMUNITY ENERGY SYSTEMS
Chinmei Lee, Wayne P. Pferdehirt, and Allen S. Kennedy 1979 9 p refs Presented at 3d Natl. Conf. on Technol. for Energy Conversion, Tucson, Ariz., 23-25 Jan. 1979
(Contract W-31-109-eng-38)
(CONF-790107-5) Avail: NTIS HC A02/MF A01

This analysis is provided as a tool to indicate whether, on the basis of potential economic benefits, the application of a community energy system to a specific site should receive additional investigation. Major elements of the analysis include, characterization of community energy demands, engineering design of the system, cost estimation, and economic analysis.
DOE

N79-29660# Philips Labs., Briarcliff Manor, New York.
SYSTEM ANALYSIS, DESIGN AND PROOF-OF-CONCEPT EXPERIMENT OF A TOTAL ENERGY SYSTEM, PHASE 2 Final Report, 16 Sep. 1977 - 15 May 1978
B. Ziph Jul. 1978 53 p refs
(Contract EY-76-C-02-2947)
(COO-2947-5) Avail: NTIS HC A04/MF A01

Alternative candidate Stirling engine condigurations for a 1000 kw prime mover were evaluated to determine the configuration showing the most desirable combination of pertinent characteristics. Both single-cylinder and multi-cylinder, and single-acting and double-acting condigurations were considered. Having expressed all characteristics in terms of cost-ownership, the multi-cylinder (8), single-acting configuration was optimum.
DOE

N79-29661# Argonne National Lab., Ill. Transportation Energy Systems.
TRANSPORTATION ENERGY CONSERVATION: AN ENVIRONMENTAL OVERVIEW
Martin J. Bernard, III Nov. 1978 24 p refs Presented at DOE Environ. Control Symp., Washington, D. C., 28-30 Nov. 1978
(Contract W-31-109-eng-38)
(CONF-781109-16) Avail: NTIS HC A02/MF A01

The DOE environmental evaluation process, designed to implement NEPA policies and guidance, is effective in addressing environmental concerns early in the development of a technology, strategy, or policy, and in projecting the research and assessment requirements necessary to resolve those concerns. The real success of DOE's method for NEPA implementation will not be known until environmentally and technologically sound transportation energy systems are availabe as a result of the RD and D efforts, or useful policies are implemented. Assessment efforts completed to date focused on electric vehicles since they are about to be demonstrated and have uncovered some possible impacts requiring further study to understand them and to mitigate them. The process is systematic, comprehensively searches all environmental areas for concerns relating to Transportation Energy Conservation program elements, and rigorously assesses the impacts of those concarns.
DOE

N79-29662# Logistics Management Inst., Washington, D. C.
INTERNATIONAL ENERGY EVALUATION SYSTEM. VOLUME 1: EXECUTIVE SUMMARY
M. L. Shaw and M. J. Hutzler Mar. 1977 43 p ref
(Contract EC-77-C-01-8602)
(HCP/I8602-01/1) Avail: NTIS HC A03/MF A01

The following topics are discussed: the energy forecasting problem in general; the international energy evaluation system (IEES) forecasting method and how it is distinguished from other international energy forecasting systems; the major components of IEES; and the principal applications of IEES. IEES provides alternatives forecasts of energy prices, supplies, demands, and conversion activities.
DOE

N79-29663# United Engineers and Constructors, Inc., Philadelphia, Pa.
TOTAL GENERATING COSTS: COAL AND NUCLEAR PLANTS
Feb. 1979 227 p
(Contract EY-76-C-02-2477)
(NUREG-0248; COO-2477-12) Avail: NTIS HC A11/MF A01

Single and multi-unit coal- and nuclear-fueled electric-generating solutions are described. The total generating cost estimates were developed for commercial operation dates of 1985 and 1990; for 5 and 8% escalation rates, for 10 and 12% discount rates; and, for capacity factors of 50, 60, 70, and 80%. The methodology for obtaining annualized capital costs, levelized coal and nuclear fuel costs, levelized operation and maintenance costs, and the resulting total generating costs for each type of station are reported. The costs are applicable to a hypothetical Middletown site in the Northeastern United States. Plant descriptions with general design parameters are included. The report reprints for convenience, summaries of capital cost by account type developed in the previous commercial electric-power cost studies.
DOE

N79-29664# Main (Charles T.), Inc., Boston, Mass.
UNDERGROUND HYDROELECTRIC PUMPED STORAGE: AN EVALUATION OF THE CONCEPT Final Report
Nov. 1978 354 p refs
(Contract EC-77-C-01-2133)
(TID-29412) Avail: NTIS HC A16/MF A01

A contribution to the Bureau of Reclamation's Underground Hydroelectric Pumped Storage (UHPS) Program is presented. The state-of-the-art through research and developmental work was enhanced. The review consisted of an evaluation of the technical feasibility and economic viability of UHPS, identification for further research, and recommendation for a continuing program of development.
DOE

N79-29665# California Univ., Livermore. Lawrence Livermore Lab.
DOE/STOR BIBLIOGRAPHY FOR FLYWHEEL ENERGY SYSTEMS, 1977
B. Mallon and R. W. Kuhn 5 Jan. 1979 330 p
(Contract W-7405-eng-48)
(UCRL-52637) Avail: NTIS HC A15/MF A01

Five hundred and fifty-five selected references to the world literature through December 1977 are presented. It includes citations that describe flywheel designs, properties and materials, and the actual and contemplated applications of flywheels in vehicles, utilities, aircraft, and spacecraft. The citations are selectively grouped according to the subjects mentioned above and organized by author and by date. An alphabetical index of authors is presented as well as a listing of keyphrases organized by subject matter. An alphabetical listing of authors and keyphrases are reported.
DOE

N79-29666# Los Alamos Scientific Lab., N. Mex.
NON-ELECTRICAL USES OF THERMAL ENERGY GENERATED IN THE PRODUCTION OF FISSILE FUEL IN FUSION-FISSION REACTORS: A COMPARATIVE ECONOMIC PARAMETRIC ANALYSIS FOR HYBRID WITH OR WITHOUT SYNTHETIC FUEL PRODUCTION
A. S. Tai and R. A. Krakowski 1979 19 p refs Presented at the 3rd US/USSR Symp. on Fusion: Fission Hybrids, Princeton, N.J., 22 Jan. 1979

(Contract W-7405-eng-36)
(LA-UR-79-574; Conf-790117) Avail: NTIS
HC A02/MF A01

The sensitivity of the synfuel production cost in relation to crucial economic and technologic quantities (investment costs of hybrid and synfuel plant, energy multiplication of the fission blanket, recirculating power friction of the fusion driver, etc.) was analyzed parametrically. In addition, a minimum synfuel selling price was evaluated, from which the fission-fusion-synfuel complex brings about a higher economic benefit than does the fusion-fission hybrid entirely devoted to fissile fuel and electricity generation. Assuming an electricity cost of 2.7 cents/kWh, an annual investment cost per power unit of 4.2 to 6 $/GJ for the fission-fusion complex and 1.5 to 3 $/GJ for the synfuel plant, the synfuel production net cost varies between 6.5 and 8.6 $/GJ. These costs can compete with those obtained by other processes (natural gas reforming, resid partial oxidation, coal gasification, nuclear fission, solar electrolysis, etc.). DOE

N79-29667# Istituto Superiore di Sanita, Rome (Italy). Lab. delle Radiazioni.

PROBLEMS AND PROSPECTIVES ON SOLAR ENERGY UTILIZATION [PROBLEMI E PROSPETTIVE NELL'UTILIZZAZIONE DELL'ENERGIA SOLARE]

G. CamposVenuti, S. Frullani, E. Tabet, and P. Vecchia 1 Feb. 1978 23 p refs In ITALIAN; ENGLISH summary
(ISS-P-78/1) Avail: NTIS HC A02/MF A01

Some aspects and problems related to the development of solar technologies are discussed. Special attention is devoted to the development outlook for solar electric conversion techniques, mainly via the photovoltaic effect, which is estimated to have the best potential, especially considering the efficiency increase and cost reduction of these devices foreseen in the near future. The particular problems related 10 solar energy development in Italy are discussed separately. Author (ESA)

N79-29668# Open Univ., Milton (England). Energy Research Group.

ALTERNATIVE ENERGY SOURCES: AN ANALYSIS OF THEIR ROLE IN ENERGY POLICY

P. F. Chapman 1978 64 p refs
Avail: NTIS HC A04/MF A01

Combined heat and power, substitute natural gas, solar energy, and wave power are examined then compared with traditional and nuclear energy sources. The study refers to Great Britain's needs and energy policy up to the year 2025. Wave power is shown to be the most attractive potential source. Nuclear power shows poor performance compare other alternatives. A power demand growth rate leveling off at 1 percent per year is assumed. Electric car development is considered very probable and beneficial to rational use energy. Author (ESA)

N79-29669# Laboratoires d'Electronique et de Physique Appliquee, Limeil-Brevannes (France).

SOLAR CELLS MADE FROM POLYCRYSTALLINE SILICON European Concerted Action: Photopiles Solaire Final Report [REALISATION DE CELLULES SOLAIRES A PARTIR DE SILICIUM POLYCRISTALLIN]

E. Fabre Oct. 1978 34 p refs In FRENCH; ENGLISH summary
(Contract DGRST-76-7-1495)
(LEP-78/519-679-D) Avail: NTIS HC A03/MF A01

Three structures were investigated relative to their use as the collecting junction of solar cells made from polycrystalline silicon. These are n + /p homojunction, M.I.S. barrier, heterojunction involving indium oxide. The n + /p homojunction, as obtained using a modified diffusion process, yielded the best result: per cent under AM1 conditions. The paramount influence of the silicon-carbon interface on the conversion efficiency was revealed. An increase of the minority carrier diffusion length was observed as a function of the incident light flux. Author (ESA)

N79-29670# KVB, Inc., Minneapolis, Minn.

FIELD TESTS OF INDUSTRIAL STOKER COAL-FIRED BOILERS FOR EMISSIONS CONTROL AND EFFICIENCY IMPROVEMENT: SITE A (DATA SUPPLEMENT) Supplement Report, Jun. - Dec. 1977

J. E. Gabrielson, P. L. Langsjoen, and T. C. Kosvic Dec. 1978 279 p refs
(Contract EF-77-C-01-2609)
(PB-293731/6; EPA-600/7-78-136B) Avail: NTIS HC A13/MF A01 CSCL 13A

A compilation of test data is presented. Panel board data for each test, detailed particulate, O2, CO2, CO, NO, SO2, and SO3 data, particle size distribution data, modified spoke spot data, and data on chemical analysis of the coal and coal size consistency are included. GRA

N79-29671# Old West Regional Commission, Billings, Mont.

ENERGY RESEARCH INFORMATION SYSTEM, VOLUME 3, NO. 1 (PROJ. NOS. 00001081 THROUGH 00001224)

Catherine A. Boyd, comp. and Laura Schillinger, comp. Aug. 1978 98 p Sponsored in part by DOE and Geol. Survey
(PB-294342/1; OWRC/ERIS-7808) Avail: NTIS HC A02/MF A01 CSCL 10B

An inventory of the energy related programs and research activities from 1974 to the present in the states of Montana, Nebraska, North Dakota, South Dakota, and Wyoming is provided. Coal, petroleum, oil shales, fission fuels, synthetic fuels, hydroenergy, renewable energy resources, energy policy, reclamation, socioeconomic impacts, environmental impacts and land use are topics included. GRA

N79-29672# Old West Regional Commission, Billings, Mont.

ENERGY RESEARCH INFORMATION SYSTEM, VOLUME 3, NO. 2 (PROJECT NOS. 00001225 THROUGH 00001362) Report, Aug. - Dec. 1978

Catherine A. Boyd, comp. and Janet Jelinek, comp. Dec. 1978 117 p Sponsored in part by DOE and Geol. Survey
(PB-294951/9; OWRC/ERIS-7812) Avail: NTIS HC A06/MF A01 CSCL 10B

An inventory of the energy-related programs and research activities from 1974 to the present in the states of Montana, Nebraska, North Dakota, South Dakota and Wyoming, is presented. Areas of research covered include: coal, petroleum, oil shales, fission fuels, synthetic fuels, hydroenergy, renewable energy resources, energy policy, reclamation, socioeconomic impacts, environmental impacts and land use. Each project decription lists title, investigator, research institution, sponsor, funding, time frame, location, a decription abstract of the research and title reports projects are publications generated by the research. All projects are indexed by location, personal names, organizations and subject keywords. GRA

N79-29673# Old West Regional Commission, Billings, Mont.

ENERGY RESEARCH INFORMATION SYSTEM. VOLUME 3, NO. 3: PROJECTS REPORT CUMULATIVE INDEXES Report, Apr. 1977 - Dec. 1978

Catherine A. Boyd, comp. and Janet Jelinek, comp. Jan. 1979 76 p Sponsored in part by DOE and Geol. Survey
(PB-294952/7; OWRC/ERIS-7901) Avail: NTIS HC A05/MF A01 CSCL 10B

The cumulative indexes include a state-location index, a personal name index, and organization index and a subject keyword index incorporating the indexes from ERIS Volume 3, No. 1 and 2 and 3, comprises a set of 1362 research project references for the States of the Old West region. GRA

N79-29674# Executive Office of the President, Washington, D.C. Assistant to the President for Intergovernmental Affairs.

RURAL DEVELOPMENT INITIATIVES: ENERGY FOR RURAL AMERICA

May 1979 24 p
(PB-295234/9) Avail: NTIS HC A02/MF A01 CSCL 10A

The initiatives undertaken to provide energy for rural America are described. These initiatives include small-scale hydroelectric power, the production of natural gas from coal and shale, the production of gasahol from renewable agricultural products, and the use of wood as a source of energy. GRA

N79-29683# Arizona State Univ., Tempe. Coll. of Mines.
POLLUTANT CONTROL THROUGH STAGED COMBUSTION OF PULVERIZED COAL
J. O. L. Wendt, J. W. Lee, and J. W. Glass Jun. 1978 26 p refs
(Contract EX-76-C-01-1817)
(FE-1817-5) Avail: NTIS HC A03/MF A01

A 2Kg/h pulverized-fuel, plane-flame combustor was used to determine time-resolved NO profiles under fuel rich and staged combustion conditions. Seven solid fuels, including two coal chars, were investigated. Results show that at all fuel rich conditions NO is formed rapidly and then is slowly destroyed. The peak NO value and the rate of destruction are strong functions of coal composition and stoichiometry. Under staged combustion conditions, NO may increase or decrease at the staging point depending on the fuel and on the quantity of NO formed in the first stage. Use of artificial oxidants confirmed that the NO formed in the first and second stages consisted of fuel NO. Heterogeneous formation and reduction of NO during char combustion was modeled by a two reaction scheme. Heterogeneous reduction was less than first order in NO and had an activation energy of 47 kcal/mole. The roles of devolatilization and homogeneous reactions are discussed in the light of the data presented. DOE

N79-29709# North Carolina Univ. at Chapel Hill. Dept. of Environmental Sciences and Engineering.
ASSESSMENT OF COAL CONVERSION WASTE-WATERS: CHARACTERIZATION AND PRELIMINARY BIOTHREATABILITY Technical Report, Nov. 1976 - May 1978
P. C. Singer, F. K. Pfaender, J. Chinchilli, A. F. Maciorowski, and J. C. Lamb, III Sep. 1978 116 p refs
(Grant EPA-R-804917)
(PB-294338/9; EPA-600/7-78-181) Avail: NTIS HC A06/MF A01 CSCL 13B

Characteristics of coal conversion wastewaters were obtained from the literature and from information gathered during visits to facilities for coal conversion process development. About 60-80% of total organic carbon is phenolic. Remaining organic material includes, nitrogen-containing aromatics, oxygen and sulfur-containing heterocyclics, polynuclear aromatic hydrocarbons, and simple aliphatic acids. A synthetic wastewater was formulated which includes 28 organic compounds, inorganic nutrients, and pH buffering additives. For each class of compounds in real wastewaters, one or more representatives are in the synthetic wastewater at the appropriate mean concentrations. Experiments are underway using the synthetic wastewater at quarter strength in four 25-liter biological treatment units. These units are to test biodegradability as a function of retention time and produce acclimated microorganisms for use in respirometric studies. GRA

N79-29716 Stanford Univ., Calif.
EVALUATION OF INTERMEDIATE-PERIOD SEISMIC WAVES AS A GEOTHERMAL EXPLORATION TOOL Ph.D. Thesis
Robert George Daniel 1979 143 p
Avail: Univ. Microfilms Order No. 7917220

The usefulness of 1 to 30 sec seismic waves in locating sources of geothermal energy in the crust and upper mantle was investigated using a portable, rugged, field recording system to measure teleseismic shear wave travel time delays and surface wave phase velocities on the site of a powerful crustal heat source, Yellowstone caldera, Wyoming. Seismic data obtained and previous U.S.G.S. experiments in the Yellowstone area were combined to yield a model for seismic velocities and Poisson's ratio beneath the caldera. The low shear velocities and high Poisson's ratio below approximately 4.5 km depth are strong evidence for the presence of a partial melt zone penetrating the entire crustal thickness; volume and anomalous heat content of this body are estimated at 1.5 x 10 to the 10th power cu km and 4.5 x 10 to the 22nd power cal. Dissert. Abstr.

N79-29743# Atomics International, Canoga Park, Calif.
DETERMINISTIC INSOLATION MODEL PROGRAM DESCRIPTION AND USER'S GUIDE
E. P. French Jul. 1978 53 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7044) Avail: NTIS HC A04/MF A01

A simple mathematical model is described for estimating the monthly average insolation experienced by a fixed or tracking collector. It is designed to fulfill the need for a rapid, economical method of assessing the availability of solar radiation as a basis for site selection and system performance estimation. It attempts to make maximum use of predictable factors, introducing random factors associated with local weather in the simplest way possible. The method lends itself to a formulation in terms of simple mathematical expressions and is suitable for use by hand calculators and small computers. DOE

N79-29783# Dames and Moore, Los Angeles, Calif.
THE MISSISSIPPI, ALABAMA, FLORIDA, OUTER CONTINENTAL SHELF BASELINE ENVIRONMENTAL SURVEY, MAFLA, 1977/1978. VOLUME 1-B: EXECUTIVE SUMMARY REPORT Final Report
26 Jan. 1979 30 p
(Contract DI-AA550-CT7-34)
(PB-294228/2; Rept-08699-008-88-Vol-1-B; BLM/YM/ES-79/02-Vol-1-B) Avail: NTIS HC A03/MF A01 CSCL 13B

Potential impacts on the outer continental shelf (OCS) environment from oil and gas development are discussed. Methodology, geology, physical oceanography, chemistry, and biology are among the factors considered. A brief summary and lists of recommended monitoring parameters and major deficiencies in the data base are also included. GRA

N79-29798 Michigan State Univ., East Lansing.
A GENERAL PURPOSE ELECTROANALYTICAL SYSTEM BASED ON A MICROCOMPUTER CONTROLLED COULOSTATIC GENERATOR Ph.D. Thesis
Spyros Emmanouel Hourdakis 1978 198 p
Avail: Univ. Microfilms Order No. 7917713

A microcomputer controlled and operated electrochemical analysis system was developed and, in its polarographic mode, it was shown to be more sensitive than polarography in the determination of cadmium. A charge generator was designed which uses the charge injection technique to add charge pulses into the electrochemical cell. The characteristics of the charge generator were studied and its operation is discussed. The function of the charge generator is the injection of charges into the cell and the function of the voltage measurement system. The advantages of the multimicrocomputer system over the single microcomputer, for real time control of the instrument, are the speed, the modularity, and the convenience of the programming of the system. The electrochemical system was applied in the polarographic determination of cadmium. Dissert. Abstr.

N79-30036# Argonne National Lab., Ill.
POTASSIUM SEED ACTIVITIES IN OPEN-CYCLE MHD SYSTEM: PREDICTIONS USING A MULTIPHASE MULTICOMPONENT SOLUTION MODEL
C. C. Hsu and C. E. Johnson 1978 33 p refs Presented at the 10th Mater. Res. Symp. on Characterization of High Temp. Vapors and Gases, Gaithersburg, Md., 18-22 Sep. 1978
(Contract W-31-109-eng-38)
(CONF-780941-6) Avail: NTIS HC A03/MF A01

A multiphase, multicomponent solution model was developed by modifying the computer program for calculation of complex chemical equilibrium compositions to include a subroutine that calculates solution formation from the condensed phase species. This model was used to predict the potassium activity in the K2O + SiO2, K2O + SiO2 + Al2O3, K2O + SiO2 + MgO, and K2O + SiO2 + CaO systems over the temperature range of 2300 to 1200 K, in which condensed phase components (i.e., K2SiO3, K2Si2O5) were assumed to form an ideal solution. Calculations showed that the addition of Al2O3, CaO, or MgO to the K2O SiO2 binary system resulted in an increase in potassium activity in the gas phase, especially for CaO. Such information improves predictive capability and may be used in the selection of materials and in establishing optimum conditions for operation of the combustor-generator high temperature air heater components of an open cycle MHD system. DOE

N79-30088# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY INFORMATION DATA BASE. SERIAL TITLES, SUPPLEMENT 3
Dec. 1978 80 p refs
(TID-4579-R10-Suppl-3) Avail: NTIS HC A05/MF A01

Changes and additions to TID-4579-R10 (the authority list for serial titles used by TIC) are contained in this supplement. The supplement is intended to be used with that publication.
DOE

N79-30102# Department of Energy, Washington, D. C.
ENVIRONMENTAL READINESS DOCUMENT: URBAN WASTE ENERGY RECOVERY. COMMERCIALIZATION PHASE 3 PLANNING
Sep. 1978 28 p refs
(DOE/ERD-0002) Avail: NTIS HC A03/MF A01

Environmental Readiness Documents are prepared periodically to review and evaluate the environmental status of an energy technology during the several phases of development of that technology. Through these documents, an independent and objective assessment of the environmental risks and potential impacts associated with the extensive use of the technology is provided. This document was prepared to assist the DOE Commercialization Task Force on Urban Waste Energy Recovery to evaluate the commercial readiness of this technology with respect to environmental issues. An effort was made to identify potential environmental problems that may be encountered based upon current knowledge, proposed and possible new environmental regulations and the uncertainties inherent in planned environmental research.
G.Y.

N79-30105# Canterbury Univ., Christchurch (New Zealand).
ENERGY RECOVERY AND CONSERVATION BY RECYCLING MUNICIPAL SOLID WASTE M.S. Thesis
Barbara Rouse (Lincoln Coll.) and David Lindley New Zealand Energy Res. and Develop. Comm. Oct. 1978 38 p refs
(NZERDC-P7; ISSN-0110-5388) Avail: NTIS HC A03/MF A01

The utilization of recycled materials as energy sources for 2% of the industrial energy in New Zealand is presented. Plans for expanding this program into other energy consuming areas is considered.
DOE

N79-30107# Market Facts, Inc., Washington, D. C.
ELECTRIC HYBRID VEHICLES FOCUS GROUP RESEARCH
Aug. 1978 39 p refs
(Contract EV-78-C-01-6458)
(DOE/TIC-10009) Avail: NTIS HC A03/MF A01

The evaluation of barriers and opportunities associated with successful commercialization of electric hybrid vehicles, and the evaluation of appropriate Federal actions for promoting and facilitating commercialization of these vehicles is presented. Whether electric hybrid vehicles represent the appropriate alternative technology for DOE commercialization efforts is emphasized.
DOE

N79-30262*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena. DSN Engineering Section.
COMPARISON OF TWO TOTAL ENERGY SYSTEMS FOR A DIESEL POWER GENERATION PLANT
V. W. Chai *In its* The Deep Space Network 15 Aug. 1979 p 89-93 ref
Avail: NTIS HC A06/MF A01 CSCL 10B

The capabilities and limitations, as well as the associated costs for two total energy systems for a diesel power generation plant are compared. Both systems utilize waste heat from engine cooling water and waste heat from exhaust gases. Pressurized water heat recovery system is simple in nature and requires no engine modifications, but operates at lower temperature ranges. On the other hand, a two-phase ebullient system operates the engine at constant temperature, provides higher temperature water or steam to the load, but is more expensive.
M.M.M.

N79-30393 Committee on Science and Technology (U. S. House).
BIOCONVERSION
Washington GPO 1978 409 p refs Hearings before the Subcomm. on Advanced Energy Technologies and Energy Conservation Res., Development and Demonstration of the Comm. on Sci. and Technol., 95th Congr., 2d Sess., 15 Jul. and 5 Aug. 1978
(GPO-37-136) Avail: Subcomm. on Advanced Energy Technologies and Energy Conservation Res., Development and Demonstration

Testimony and statements on issues and priorities surrounding the development of bioconversion (biomass energy conversion) in the different geographical regions of the United States are presented.
R.E.S.

N79-30394# Maryland Univ., College Park.
COOPERATIVE EXTENSION SERVICE: ENERGY RESOURCE NOTES
Jul. 1979 12 p refs
Avail: NTIS HC A02/MF A01

The production, potential uses, legislation, availability, and economic feasibility of gasohol in Maryland are addressed.
M.M.M.

N79-30396# Chevron Research Co., Richmond, Calif.
CONVERTING GREEN RIVER SHALE OIL TO TRANSPORTATION FUELS
R. F. Sullivan and B. E. Stangeland 1978 41 p refs Presented at the 11th Oil Shale Symp., Golden, Colo., 11 Apr. 1978
(Contract EX-76-C-01-2315)
(CONF-780460-3) Avail: NTIS HC A03/MF A01

Pilot plant data for three processing schemes were generated: hydrotreating followed by hydrocracking, hydrotreating followed by fluid catalytic cracking, and delayed coking followed by hydrotreating. Yields and product inspections are presented for these three cases.
DOE

N79-30397# Rocketdyne, Canoga Park, Calif.
HYDROGASIFIER DEVELOPMENT FOR THE HYDRANE PROCESS Annual Report, Mar. 1977 - Feb. 1978
Jun. 1978 273 p refs
(Contract EX-77-C-01-2518)
(FE-2518-17) Avail: NTIS HC A12/MF A01

Work performed on a program to develop a single-stage short-residence-time reactor for flash hydrogasification of coal is described. Experiments involve two different hydrogasifier reactor systems. The first is a bench-scale apparatus with coal feed rates of 2 to 4 lb/hr. Results are reported for a subbituminous coal reacted with hydrogen pressures up to 1600 psig, reactor temperatures ranging from 1475 to 1728 F, and residence times ranging from 300 to 3500 msec. Overall carbon conversions were quite comparable with conversion of lignite observed previously. The second reactor has a nominal coal feed rate of 1/4 ton/hr. Results from tests with subbituminous coal compared well with those from the bench-scale reactor. A computerized numerical model was developed for pulverized coal flow and reaction in an entrained-flow reactor. Formulation and computer programming of the reactor model are described, and some preliminary results from selected 1/4 ton/hour experiments are discussed.
DOE

N79-30398# Oak Ridge National Lab., Tenn.
COAL LIQUEFACTION ADVANCED RESEARCH DIGEST
F. M. OHara, Jr. Feb. 1979 51 p refs
(Contract W-7405-eng-26)
(ORNL/FE-2) Avail: NTIS HC A04/MF A01

The solvent refined coal-2 (SRC-2) process, the consol synthetic fuel (CSF) process, and the Fischer-Tropsch synthesis are reviewed. The histories of the chemical processes are traced and present states of knowledge are detailed. The SRC-2 process combines dissolution and hydrogenation to produce hydrocarbon fuels. The CSF process splits dissolution and hydrogenation into two distinct steps and employs indirect hydrogenation. The Fischer-Tropsch synthesis catalytically produces hydrocarbons from carbon monoxide and hydrogen.
K.L.

N79-30399# Department of Energy, Washington, D. C. Economic Regulatory Administration.

MOTOR GASOLINE DEREGULATION AND THE GASOLINE TILT Final Report

Jan. 1979 390 p refs

(DOE/EIS-0039-Vol-1) Avail: NTIS HC A17/MF A01

The environmental impact statement evaluates the environmental impacts, including social and economic impacts, that may result from the exemption of motor gasoline from DOE's mandatory petroleum price and allocation regulations, and the adoption of the gasoline tilt, a proposed regulation that would allow refiners to recover an additional amount of their total increased costs on gasoline. The impacts of the two proposals are considered separately rather than cumulatively. A principal reason for adopting either of these proposals is to eliminate the impediments in current regulations that prevent refiners from recovering, in the prices charged for gasoline, the full amount of costs associated with producing gasoline. Adoption of either proposal may be necessary to encourage increased investments in refining capacity and to prevent shortages of gasoline, particularly unleaded gasoline, after 1980. DOE

N79-30400# Department of Energy, Washington, D. C. Energy Information Administration.

NATIONAL COAL MODEL: COAL SUPPLY CURVES

Sep. 1978 218 p

(DOE/EIA-0103/2) Avail: NTIS HC A10/MF A01

The computerized National Coal Model (NCM) is designed to project future levels of United States coal production, consumption, and prices and to permit the analysis of the impact of coal related public policy issues on such factors. Four major functional components, or modules are integrated: coal supply, electric utility coal demand, nonelectric utility coal demand, and coal transportation. The model has a high degree of resolution and includes 30 supply regions, 35 demand regions, 40 possible coal types, and six consuming sectors. The coal supply component of the NCM is described and the detailed coal supply curves which are its primary output are presented. DOE

N79-30401# Department of Energy, Washington, D. C. Economic Regulatory Administration.

MOTOR GASOLINE DEREGULATION AND THE GASOLINE TILT. VOLUME 2: PUBLIC COMMENTS Final Environmental Impact Statement

Jan. 1979 567 p

(DOE/EIS-0039-Vol-2) Avail: NTIS HC A24/MF A01

The oral comment statement submitted at the December 19, public hearing are contained as well as all the written comments which DOE received on the draft EIS as of the date of publication. Related to the findings in the final EIS is an Analysis Memorandum 1980 Motor Gasoline Supply and Demand, which was prepared by DOE's EIA. Included are the written comments received from the public on the analysis memorandum. DOE

N79-30402# Department of Energy, Washington, D. C. Energy Information Administration.

FACT SHEET: FORECASTED AUTOMOBILE GASOLINE CONSUMPTION

H. Walton and F. Emerson May 1978 11 p refs

(DOE/EIA-0102/1) Avail: NTIS HC A02/MF A01

The impact of the use of alternative assumptions on projected 1985 automobile gasoline consumption is duscussed. The level of 1985 automotive gasoline consumption consistent with meeting EPCA standards under the alternative mileage degradation relationships was found to range between 81.7 and 88.5 billion gallons. DOE

N79-30403# Department of Energy, Washington, D. C. Energy Information Administration.

PETROLEUM SUPPLY/DEMAND ESTIMATES AND COST OF PETROLEUM EXPORTS, 1978-1979

R. Farmer, C. Bwyer, S. Atkinson, and D. Ahl 5 Feb. 1979 29 p

(DOE/EIA-0102/40) Avail: NTIS HC A03/MF A01

Total demand for refined products in 1979 is estimated at between 19.2 and 19.7 million barrels daily, compared with 18.7 million barrels per day in 1978. Demand for motor gasoline in 1979 is expected to be between 7.4 and 7.7 million barrels daily, compared with 7.4 million barrels daily in 1978. To meet the 1979 demand projections, domestic crude production of 8.5 to 8.7 million barrels daily is expected to be supplemented, respectively by 7.4 to 6.9 million barrels of imported crude oil daily. Total petroleum imports (including product) to the 50-State area covered by the DOE imports statistics are expected to average 8.7 to 9.3 million barrels daily in 1979. The cost of petroleum imports to the U.S. balance of payments area, including net imports to U.S. territories such as Puerto Rico and Virgin Islands is expected to be $52 to $55 billion in 1979, (in current dollars). These estimates include over $2 billion for Strategic Petroleum Reserve crude oil purchases. DOE

N79-30405# Department of Energy, Washington, D. C. Energy Information Administration.

PETROLEUM SUPPLY VULNERABILITY, 1985

G. D. Butler and W. C. Kilgore 8 Jan. 1979 39 p refs

(DOE/EIA-0102/44) Avail: NTIS HC A03/MF A01

Potential U.S. petroleum supply shortfalls are assessed for the year 1985. The potential 1985 shortfalls vary significantly over various scenarios, ranging from 2.6 to 8.5 million barrels per day. The shortfalls increase as the economic growth rate increases. The imposition of an OPEC production capacity constraint diminishes the level of the shortfalls due to the reduced demand growth brought about by increasing world oil prices. Projected OPEC production at constant oil prices is less than the assumed OPEC production capacity. DOE

N79-30406# Department of Energy, Washington, D. C. Energy Information Administration.

OIL AND GAS SUPPLY CURVES FOR THE ADMINISTRATOR'S ANNUAL REPORT

14 Sep. 1978 114 p ref

(DOE/EIA-0103/4; TM/ES/78-17) Avail: NTIS HC A06/MF A01

Regional supply curves are presented for crude oil, natural gas, and natural gas liquids for the years of 1985 and 1990. These curves are generated by DOE's Oil and Gas Model and are part of the database for PIES, a static equilibrium model. The PIES system integrates supply and demand and other factors in energy markets for each region and for several categories of product. The supply projections are based on economic and engineering factors which effect oil and gas supply decisions. The DOE model produces a supply forecast for crude oil, associated-dissolved natural gas, and associated natural gas liquids production which consists of a fifteen year production series based on an assumed new oil price trajectory. The DOE gas model likewise produces a fifteen year production forecast of non-associated natural gas and natural gas liquids based on an assumed trajectory for new natural gas prices. The oil and gas modeling system then combines several oil and gas cases to produce a supply curve for a given year. DOE

N79-30407# Department of Energy, Washington, D. C.

STRATEGIC PETROLEUM RESERVE: EXPANSION OF RESERVE. FINAL SUPPLEMENT TO FINAL ENVIRONMENTAL IMPACT STATEMENT Final Report

Jan. 1979 397 p refs

(DOE/EIS-0034) Avail: NTIS HC A17/MF A01

The environmental impacts of storing one hundred fifty million barrels (MMB) of oil by 1978 and five hundred MMB by 1982 are addressed. The most sensitive parameters appear to be water quality and geology. The adverse impacts that could result from the expanded program include the degradation of surface water quality from construction runoff, increased dredging, and more frequent oil spills. In addition, brine disposal associated with solution mining salt cavities will increase the salinity of the receiving waters, whether underground saline aquifers or small portions of the Gulf of Mexico. Changes in water quality will have a short-term impact on aquatic organisms in local areas. Use of large quantities of ground water for developing salt cavities could cause some surface subsidence over water storage areas, slow salt water encroachment, and movement of near-surface geologic faults. DOE

N79-30408# Institute of Gas Technology, Chicago, Ill.
BEHAVIOR OF GAS DISTRIBUTION EQUIPMENT IN HYDROGEN SERVICE
Jon B. Pangborn, Dale G. Johnson, and Walter J. Jasionowski 1979 16 p refs Presented at 14th World Gas Conf., Toronto, 27 May - 1 Jun. 1979
(Contract EY-76-C-02-2907)
(CONF-790512-2) Avail: NTIS HC A02/MF A01

Prospects for hydrogen delivery in conventional gas distribution systems are addressed. Three model distribution systems were constructed and operated using components loaned or donated by manufacturers and gas utility companies. Specific components for any evident effects of hydrogen exposure are examined. It was experimentally observed that energy delivery as hydrogen could be about 80% that of natural gas under the same operating conditions using a distribution model. Volumetric leakage ratios (hydrogen-to-natural gas) of 2.6:1 to 4.6:1 were measured for various different components in the model systems. DOE

N79-30410# Department of Energy, Washington, D. C. Office of Building and Community Systems.
PROCEEDINGS OF A SYMPOSIUM ON THE UTILIZATION OF METHANE GENERATED IN LANDFILLS
1978 34 p refs Symp. held at Laurel, Md., 9-10 Mar. 1978
(Grant EM-78-G-01-4206)
(CONF-780340) Avail: NTIS HC A03/MF A01

Past and present experiences in the production of landfill methane in California, New York, and Colorado are summarized. Technical and institutional factors related to the use of landfill methane are identified. The problems identified in implementation included technology transfer, decision-making on the part of local government as to its appropriateness, optimization of recovery, little correlation between laboratory tests and field experiences, design of gas gathering systems, overall landfill design and siting, regulatory restrictions, financing mechanisms, information transfer, and uncertainties on gas ownership and legal liabilities. DOE

N79-30412# Salzgitter A.G. (West Germany).
METHANE AND METHANOL AS ALTERNATIVE ENERGY SOURCES: A COMPARATIVE PROFITABILITY STUDY Final Report
Heinrich Deipenau Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 357 p refs In GERMAN; ENGLISH summary
(Contract BMFT-ETS-3057-A)
(BMFT-FB-77-84) Avail: NTIS HC A16/MF A01; ZLDI, Munich DM 74,35

Elaborations of the economic and technical ways and means for the supply of LNG and methanol to industrial centers, using natural gas from the Iranian area as raw material, were compared. The classification of given possibilities for the preparation, transportation, and storage of potential sources of energy is discussed. Cost estimates of transportation, a comparative examination of economic and technical aspects, and a description of the use of LNG and methanol in Germany (motor cars, power plants, gas supply) are presented. It is concluded that energy costs for LNG in Wilhelmshaven are lower than those for methanol, and that large quantities of LNG and methanol from the Persian Gulf can be sold in the various sectors of the German energy market on the condition that crude gas prices on the Persian Gulf do not exceed 3-DM/Gcal. Author (ESA)

N79-30413# National Technical Information Service, Springfield, Va.
HYDROGEN STORAGE, PART 1. STORAGE AS A GAS OR LIQUID. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1974 - May 1979
Diane M. Cavagnaro Jun. 1979 135 p
(NTIS/PS-79/0581) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

This bibliography references aspects of storing hydrogen fuels as a liquid or gas. Topics covered include fuel storage, energy storage, and the construction of storage tanks. Batteries, fuel cells, and solar cells, if related to hydrogen storage, are also mentioned. GRA

N79-30415*# Boeing Engineering and Construction, Seattle, Wash.
MOD-2 FAILURE MODE AND EFFECTS ANALYSIS
Robert Lynette and Robert Poore Jul. 1979 302 p Sponsored by NASA
(Contract DEN3-2; DE-AI01-79ET20485)
(NASA-CR-159632) Avail: NTIS HC A14/MF A01 CSCL 13L

The results of a failure mode and effects analysis of the Mod-2 wind turbine are presented. Author

N79-30499*# B & K Engineering, Inc., Towson, Md.
DEVELOPMENT OF CRYOGENIC THERMAL CONTROL HEAT PIPES Final Report
Aug. 1978 40 p refs
(Contract NAS2-9613)
(NASA-CR-152302; BK042-1012) Avail: NTIS HC A03/MF A01 CSCL 20D

The development of thermal control heat pipes that are applicable to the low temperature to cryogenic range was investigated. A previous effort demonstrated that stainless steel axially grooved tubing which met performance requirements could be fabricated. Three heat pipe designs utilizing stainless steel axially grooved tubing were fabricated and tested. One is a liquid trap diode heat pipe which conforms to the configuration and performance requirements of the Heat Pipe Experiment Package (HEPP). The HEPP is scheduled for flight aboard the Long Duration Flight Exposure Facility (LDEF). Another is a thermal switch heat pipe which is designed to permit energy transfer at the cooler of the two identical legs. The third thermal component is a hybrid variable conductance heat pipe (VCHP). The design incorporates both a conventional VCHP system and a liquid trap diode. The design, fabrication and thermal testing of these heat pipes is described. The demonstrated heat pipe behavior including start-up, forward mode transport, recovery after evaporator dry-out, diode performance and variable conductance control are discussed. F.O.S.

N79-30522# Argonne National Lab., Ill.
FLOW-INDUCED VIBRATION IN SHELL-AND-TUBE HEAT EXCHANGERS FOR OCEAN THERMAL ENERGY CONVERSION (OTEC)
J. J. Lorenz and D. Yung Aug. 1978 49 p refs
(Contract EY-76-C-02-0016)
(ANL-OTEC-78-3) Avail: NTIS HC A03/MF A01

The problem of crossflow-induced vibration in shell-and-tube heat exchangers for OTEC was considered. Models of the dominant excitation mechanisms are discussed: vortex shedding, turbulent buffeting, fluid-eleastic instability, and acoustic excitation. Criteria are presented for assessing vibration and equations are derived for predicting the maximum allowable span length as a function of crossflow velocity and other system variables. Also regions of acoustic resonance and noise are defined. Among the system variables studied are tube diameter, tube material, tube-field layout, and pitch to diameter ratio. All models are presented in a simple form that can readily be applied to the mechanical design of OTEC heat exchangers. DOE

N79-30599*# Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
REMOTE SENSORS APPLIED TO THE PROSPECTING OF THERMOMINERAL WATERS IN THE MUNICIPALITY OF CALDAS NOVAS-GOIAS [SENSORES REMOTOS APPLICADOS A PROSPECCAO DE AGUAS TERMOMINERAIS NO MUNICIPIO DE CALDAS NOVAS-GOIAS]
Nelson deJesusParade, Principal Investigator, Paulo Veneziani, and Celio Eustaquio dosSanjos Jan. 1979 16 p refs In PORTUGUESE Sponsored by NASA ERTS
(E79-10238; NASA-CR-158802; INPE-1413-RPE/001) Avail: NTIS HC A02/MF A01 CSCL 08H

N79-30609# California Univ., Berkeley. Lawrence Berkeley Lab.

GEOTHERMAL EXPLORATION ASSESSMENT AND INTERPRETATION, KLAMATH BASIN, OREGON - SWAN LAKE AND KLAMATH HILLS AREA
M. Stark, N. Goldstein, H. Wollenberg, B. Strisower, H. Hege, and M. Wilt May 1979 83 p refs
(Contract W-7405-eng-48)
(LBL-8186) Avail: NTIS HC A05/MF A01

A synthesis and preliminary interpretation of predominantly geophysical information relating to the Klamath Basin geothermal resource is presented. The Swan Lake Valley area, northeast of Klamath Falls, and the Klamath Hills area, south of Klamath Falls, are discussed in detail. Available geophysical data, including gravity, magnetic, electrical resistivity, microearthquake, roving dipole resistivity, audio magnetotelluric (AMT) and magnetotelluric (MT) data sets, are examined and reinterpreted for these areas. One and two dimensional modeling techniques are applied, and general agreement among overlapping data sets is achieved. The MT method appears well suited to this type of exploration, although interpretation is difficult in the complex geology. Roving dipole and AMT are useful in reconnaissance, while gravity and magnetics help in defining structure. Author

N79-30686# Department of Energy, Washington, D. C. Oil, Gas, Shale and In Situ Technology Div.
OFFICE OF NAVAL PETROLEUM AND OIL SHALE RESERVE. REPORT OF OPERATIONS, 1 OCTOBER 1978 Annual Report
Dec. 1978 50 p
(DOE/RA-0011) Avail: NTIS HC A03/MF A01

Total production for FY 1978 from Elk Hills averaged 119,138 barrels of oil per day (BOPD). The Government's share of this production was approximately 100,000 BOPD. During this period, the Government's share of production was sold at two crude oil sales. At year end, two rigs were active in the development of the Shallow Oil zone, six in the Stevens Zone, and one in the Carneros Zone. Earlier in the year, two additional rigs were utilized for drilling deep exploratory test wells. No new productive horizons were discovered. During FY 1978, production at Teapot Dome averaged 1,957 BOPD. All sales during FY 1978 were to one purchaser. Activities included continuation of a three-year surface hydrology study, completion of a seven-well corehole program initiated in FY 1977, and the implementation of another three-well corehole program. DOE

N79-30687# Oak Ridge National Lab., Tenn.
TECHNICAL ASPECTS OF THE RESOURCE CONSERVATION AND RECOVERY ACT UPON COAL COMBUSTION AND CONVERSION SYSTEMS
D. W. Weeter and M. P. Bahor Feb. 1979 76 p refs
(Contract W-7405-eng-26)
(ORNL/OEPA-10) Avail: NTIS HC A05/MF A01

An extensive literature review was conducted in order to evaluate the hazardous potential of the various solids; literature based leachate data were compared to inorganic drinking water standards. All processes studied, even under leaching conditions, have a hazardous potential. Two conventional steam generation facilities, which have electrostatic precipitators, but do not have sulfur removal, were used as case studies. In each case, RCRA should induce minimal technical and cost impact; the Federal Water Pollution Control Act and the Federal Clean Air Act may have potentially more future impact on these two plants than does RCRA; it is not certain that this conclusion holds for all conventional steam plants or that it holds for other processes. DOE

N79-30688# Department of Energy, Washington, D. C. Energy Information Administration.
BITUMINOUS COAL AND LIGNITE DISTRIBUTION, JANUARY - SEPTEMBER 1978
8 Jan. 1979 77 p
(DOE/EIA-0125/3-78) Avail: NTIS HC A05/MF A01

During January-September 1978, production of bituminous coal and lignite in the United States totaled 456 million tons; 448 million tons were shipped for consumption while 8 million tons were stockpiled. Of the total coal distributed in the first nine months of 1978 (Table 1), 422.6 million tons (94 percent) were delivered to consumers in the United States and 25.7 million tons (6 percent) were exported (9.1 million tons to Canada and 16.6 million tons to Mexico and destinations overseas). A summary of coal shipments by district of origin are summarized. Shipments by geographic division destinations are shown in tables. DOE

N79-30689# Oak Ridge National Lab., Tenn. Analytical Chemistry Div.
POLAR CONSTITUENTS OF A SHALE OIL: COMPARATIVE COMPOSITION WITH OTHER FOSSIL-DERIVED LIQUIDS
I. B. Rubin, N. A. Goeckner (University of Western Ill., Macomb), and B. R. Clark 1979 22 p refs Presented at the Oil Shale Symp., Denver, 26 Mar. 1979
(Contract W-7405-eng-26)
(CONF-790334-2) Avail: NTIS HC A02/MF A01

Similarities and differences in the polar portions of a variety of types of fossil fuel oils including oil from shale, from several coal liquefaction processes and from a mixture of natural petroleum crudes are described. Samples were fractionated by acid/base distribution as well as by gel partition chromatography which was then followed by acid/base distribution and adsorption chromatography. One subfraction of particular interest was that obtained from the hydrophilic fraction after gel partition chromatography, extracted into a neutral subfraction, and then eluted from an alumina column by methanol. This subfraction was not gas chromatographable, and was partially characterized by elemental analysis, NMR spectroscopy and infrared spectrophotometry. DOE

N79-30691# Department of Energy, Washington, D. C. Energy Information Administration.
ANALYSIS OF THE PRODUCTIVITY OF DOMESTIC PETROLEUM EXPLORATION ACTIVITIES
Jul. 1978 61 p
(DOE/EIA-0102/7) Avail: NTIS HC A04/MF A01

The recent decline in the productivity of domestic petroleum exploration activities is examined. Data are presented on the recent changes in the productivity of domestic exploration activities and an analysis is provided of a number of underlying economic relationships that are likely influencing the trends in exploration activity. There is suggested a research agenda whose purpose would be to discern the transitory effects that the sudden increases petroleum prices have had on exploration activities. It is concluded that a significant change in the price of crude oil and/or natural gas could influence the productivity of domestic exploratory drilling. Exploration productivity would be a function not only of the declining quality of drilling prospects, but also of the current (and expected future) price levels. DOE

N79-30701# General Accounting Office, Washington, D. C. Energy and Minerals Div.
UNIQUE HELIUM RESOURCES ARE WASTING: A NEW CONSERVATION POLICY IS NEEDED
7 Mar. 1979 116 p
(PB-293751/4; EMD-78-98) Avail: NTIS HC A06/MF A01 CSCL 05C

The loss of helium through the use of natural gas, its most economical source, is considered. Available alternatives to conserve helium are discussed. Continuing investment in helium dependent, energy related technologies is predicted to sharply increase demand after the year 2000. The present helium program is shown to be inadequate and in need of congressional legislation to establish Federal responsibility for conserving helium for national needs. GRA

N79-30710 California Univ., Berkeley.
ENERGY AND MATERIALS IN THREE SECTORS OF THE ECONOMY: A DYNAMIC MODEL WITH TECHNOLOGICAL CHANGE AS AN ENDOGENOUS VARIABLE Ph.D. Thesis
Alfred Linden Levinson 1978 168 p
Avail: Univ. Microfilms Order No. 7914673

One of the major difficulties encountered when modelling the demand for energy and resources is the lack of an adequate method for introducing technological change into the model. Embodied technological change and its effect on the technical coefficients of input-output models is examined. The recursive programming method is used to dynamically model embodied technological change in three industries, steel, aluminum, and can manufacturing. The method is composed of two phases, the static and the recursive or dynamic. The static or short run phase uses a linear program to optimize production by the various technologies. The dynamic phase consists of an econometric submodel where the level of investment in the technologies, the marginal cost of the technologies, the supply of some of the material inputs, and the demand for the output of the industries are determined. Dissert. Abstr.

N79-30712*# Miami Univ., Coral Gables, Fla. Dept. of Mechanical Engineering.
DETERMINATION OF POTENTIAL SOLAR POWER SITES IN THE UNITED STATES BASED UPON SATELLITE CLOUD OBSERVATIONS Final Report, 5 Jun. 1975 - 4 Sep. 1977
H. W. Hiser, H. V. Senn, S. T. Bukkapatnam, and K. Akyuzlu
Dec. 1977 47 p refs
(Contract NAS5-22417)
(NASA-CR-159944) Avail: NTIS HC A03/MF A01 CSCL 10B

The use of cloud images in the visual spectrum from the SMS/GOES geostationary satellites to determine the hourly distribution of sunshine on a mesoscale in the continental United States excluding Alaska is presented. Cloud coverage and density as a function of time of day and season are evaluated through the use of digital data processing techniques. Low density cirrus clouds are less detrimental to solar energy collection than other types; and clouds in the morning and evening are less detrimental than those during midday hours of maximum insolation. Seasonal geographic distributions of cloud cover/sunshine are converted to langleys of solar radiation received at the earth's surface through relationships developed from long term measurements at six widely distributed stations. A.W.H.

N79-30713# Hittman Associates, Inc., Columbia, Md.
COMPREHENSIVE COMMUNITY ENERGY PLANNING. VOLUME 2: APPENDICES
Nov. 1978 229 p refs 2 Vol.
(Contract EC-77-C-10-0023)
(HCP/M0023-02-Vol-2) Avail: NTIS HC A11/MF A01

Energy saving strategies and components for energy conservation in cities and residential areas are presented. Estimates for alternative energy saving measures are discussed in areas of land use, mass transit, and building modifications. Energy conservation plans in these areas, such as tax credits and loans, are discussed and estimation methods are described. A.W.H.

N79-30715*# Wyle Labs., Inc., Huntsville, Ala. Solar Energy Systems Div.
INDOOR TEST AND LONG-TERM WEATHERING EFFECTS ON THE THERMAL PERFORMANCE OF THE SOLAR ENERGY SYSTEM (LIQUID) SOLAR COLLECTOR
May 1979 41 p refs Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-150794; WYLE-TR-531-23) Avail: NTIS HC A03/MF A01 CSCL 10A

The procedures used and the results obtained during the evaluation test program on a liquid solar collector are presented. The narrow flat plate collector with reflective concentrating mirrors uses water as the working fluid. The double-covered collector weighs 137 pounds and has overall dimensions of about 35' by 77' by 6.75'. The test program was conducted to obtain the following information: thermal performance data under simulated conditions, structural behavior under static load, and the effects of long term exposure to natural weathering. K.L.

N79-30718*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THERMAL POWER SYSTEMS SMALL POWER SYSTEMS APPLICATIONS PROJECT. VOLUME 2: DETAILED REPORT Annual Technical Report, Fiscal Year 1978
A. T. Marriott 15 Jan. 1979 212 p
(Contract NAS7-100; JPL Proj. 5103-36)
(NASA-CR-162104; JPL-Pub-79-43-Vol-2; DOE/JPL-1060-9)
Avail: NTIS HC A10/MF A01 CSCL 10B

Small power system technology as applied to power plants up to 10 MW in size was considered. Markets for small power systems were characterized and cost goals were established for the project. Candidate power plant system design concepts were selected for evaluation and preliminary performance and cost assessments were made. Breakeven capital costs were determined for leading contenders among the candidate systems. The potential use of small power systems in providing part of the demand for pumping power by the extensive aqueduct system of California, was studied. Criteria and methodologies were developed for the ranking of candidate power plant system design concepts. Experimental power plant concepts of 1 MW rating were studied to define a power plant configuration for subsequent detail design construction, testing and evaluation. Site selection criteria and ground rules were developed. K.L.

N79-30719*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
WIND TURBINES FOR ELECTRIC UTILITIES: DEVELOPMENT STATUS AND ECONOMICS
J. R. Ramler and R. M. Donovan 1979 21 p refs Presented at Terrest. Energy Systems Conf., Orlando, Fla., 4-6 Jun. 1979; sponsored by AIAA
(Contract E(49-26)-1028)
(NASA-TM-79170; E-035; DOE/NASA/1028-79/23) Avail: NTIS HC A02/MF A01 CSCL 10B

The technology and economics of the large, horizontal-axis wind turbines currently in the Federal Wind Energy Program are presented. Wind turbine technology advancements made in the last several years are discussed. It is shown that, based on current projections of the costs of these machines when produced in quantity, they should be attractive for utility application. The cost of electricity (COE) produced at the busbar is shown to be a strong function of the mean wind speed at the installation site. The breakeven COE as a fuel saver is discussed and the COE range that would be generally attractive to utilities is indicated. Author

N79-30720*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE CHARACTERISTICS OF A SLAGGING GASIFIER FOR MHD COMBUSTOR SYSTEMS Final Report
Kenneth O. Smith Jun. 1979 49 p refs Sponsored in part by DOE
(Contract EF-77-A-01-2674)
(NASA-TM-79195; E-072; DOE/NASA/2674-79/6) Avail: NTIS HC A03/MF A01 CSCL 10A

The performance of a two stage, coal combustor concept for magnetohydrodynamic (MHD) systems was investigated analytically. The two stage MHD combustor is comprised of an entrained flow, slagging gasifier as the first stage, and a gas phase reactor as the second stage. The first stage was modeled by assuming instantaneous coal devolatilization, and volatiles combustion and char gasification by CO2 and H2O in plug flow. The second stage combustor was modeled assuming adiabatic instantaneous gas phase reactions. Of primary interest was the dependence of char gasification efficiency on first stage particle residence time. The influence of first stage stoichiometry, heat loss, coal moisture, coal size distribution, and degree of coal devolatilization on gasifier performance and second stage exhaust temperature was determined. Performance predictions indicate that particle residence times on the order of 500 msec would be required to achieve gasification efficiencies in the range of 90 to 95 percent. The use of a finer coal size distribution significantly reduces the required gasifier residence time for acceptable levels of fuel use efficiency. Residence time requirements are also decreased by increased levels of coal devolatilization. Combustor design efforts should maximize devolatilization by minimizing mixing times associated with coal injection. K.L.

N79-30721*# Clarksville Community School Corp., Ind.
SOLAR ENERGY RETROFIT FOR CLARKSVILLE MIDDLE SCHOOL, CLARKSVILLE, INDIANA
Aug. 1979 126 p Sponsored in part by NASA

(Contract EG-77-A-01-4076)
(NASA-CR-161272) Avail: NTIS HC A07/MF A01 CSCL 10A

The solar energy retrofit heating system installed to provide heating for two gymnasiums at the Clarksville Middle School located in Clarksville, Indiana is described in detail. The system type is hot water using existing chilled water piping and chilled water coils in an air handler system. Flat plate, single-glazed selectively coated solar collectors were installed on the roof of each gymnasium. Total collector area covers 6,520 square feet. The liquid is stored in a 10,000 gallon steel tank installed below grade. Author

N79-30722# Hittman Associates, Inc., Columbia, Md.
COMPREHENSIVE COMMUNITY ENERGY PLANNING. VOLUME 1: A WORKBOOK
Nov. 1978 147 p refs 2 Vol.
(Contract EC-77-C-10-0023)
(HCP/M0023-01-Vol-1) Avail: NTIS HC A07/MF A01

The project resulted in the development of a methodology and workbook which enables community officials and staff to develop and evaluate energy conservation programs for their community. This methodology is a pioneering effort in the field of community energy planning. As such, many of the procedures generated were not subjected to test and evaluation in actual communities. In an effort to validate the procedures presented, the U.S. DOE is sponsoring a test and demonstration of this methodology in various selected communities. Based upon the results of these demonstrations, the procedures may require refinement to more accurately reflect actual community needs. G.Y.

N79-30723# Department of Energy, Washington, D. C. Div. of Industrial Applications and Commercialization.
OVEN CURING: ENERGY CONSERVATION AND EMISSION CONTROL IN COIL COATING
1978 33 p Original contains color illustrations
(TID-28705) Avail: NTIS HC A03/MF A01

An energy saving system is presented which recovers heat from the exhaust streams of coil curing ovens. A zone incinerator is retrofitted to the curing ovens to recover and recycle the significant portions of energy lost in the curing process. This reduces the natural gas consumption in the ovens by 74% and the solvent emission by 40 to 60%. The performance and economics of this system are surveyed. A.W.H.

N79-30724# Goodyear Atomic Corp., Piketon, Ohio.
REFRIGERANT-114 RANKINE CYCLE ENERGY RECOVERY TECHNOLOGY FROM THE GASEOUS DIFFUSION INDUSTRY
Clair O. Langerbbrake 8 Sep. 1978 39 p refs
(Contract EY-76-C-05-0001)
(GAT-916) Avail: NTIS HC A03/MF A01

An unclassified accounting of energy recovery technology developed in the gaseous diffusion (uranium enrichment) industry during the past twenty years is presented. This spin-off knowledge may be of value to those in industry seeking to reduce operating costs while meeting the national objective of conserving energy. Four Rankine cycle energy recovery installations using Refrigerant-114 (R-114) as the working fluid are described, and the conclusions drawn from their operation are given. In all these installations, energy was extracted from waste heat by using R-114 vapor to drive expansion turbines connected to compressor motor shafts. This arrangement resulted either in reducing the electric load on the motor, or, if the motor could be overdriven to act as a generator, in returning electric power to the plant electrical grid. Factors significant in the design of these energy recovery systems, as well as economic and design considerations that may be significant in applications in other industries, are discussed. The following topics are included: the selection of suitable system controls; the superiority of R-114 to steam as the working fluid in some energy recovery systems; the advantages and disadvantages of different turbine types; the uses and limitations of positive contact seals in refrigerant systems; and methods of enhancing energy recovery, such as tracking ambient conditions and using countercurrent flow cooling. F.O.S.

N79-30725 Committee on Energy and Natural Resources (U. S. Senate).
SOLAR PHOTOVOLTAIC ENERGY RESEARCH, DEVELOPMENT, AND DEMONSTRATION ACT OF 1978
Washington GPO 1978 116 p refs Hearing on S. 3392 and H.R. 12874 before the Subcomm. on Energy Res. and Development of the Comm. on Energy and Natural Resources, 95th Congr., 2d Sess., 19 Sep. 1978
(GPO-36-187; Publ-95-167) Avail: Subcomm. on Energy Res. and Development

Testimony was given and arguments were heard on a bill and an act to provide for an accelerated program of research, development, and demonstration of solar photovoltaic energy technologies leading to early competitive commercial applicability of such technologies to be carried out by the Department of Energy, with the support of NASA, the National Bureau of Standards, the General Services Administration, and other federal Services agencies. M.M.M.

N79-30726 Committee on Energy and Natural Resources (U. S. Senate).
SOLAR POWER SATELLITE RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAM ACT OF 1978
Washington GPO 1978 270 p refs Hearing on S. 2860 and H.R. 12505 before the Subcomm. on Energy and Natural Resources, 95th Congr., 2d Sess., 14 Aug. 1978
(GPO-35-994; Publ-95-166) Avail: Subcomm. on Energy Res. and Development

Satellite solar energy conversion transmission to earth to generate electricity for domestic purposes is studied. A space orbiting mirror system designed to provide continuous and slightly concentrated reflected solar energy to selected solar conversion sites is examined. Development of this system is discussed through economic viability, design feasibility, and energy storage and conversion techniques. A.W.H.

N79-30727# Illinois Univ. at Urbana-Champaign. Energy Research Group.
ENERGY AND LABOR INTENSITIES PROJECTED TO THE YEAR 2010
Bruce Hannon and Andrew R. Pleszkun DoE Sep. 1978 163 p refs
(Contract EM-78-S-02-4628)
(COO-4628-2) Avail: NTIS HC A08/MF A01

Total (direct and indirect) energy and labor intensities were projected to the year 2000 for a 40-sector economy. Energy intensities were derived by modifying the CONAES results with four possible energy price change scenarios between 1975 and 2010. Labor intensities were projected using data from the CAC model and projected BLS materials to approximate the effect of a doubling of energy prices between 1975 and 2010. As an example, the projected data were used to determine the net energy and employment impacts of the National Energy Plan on residential energy use to the year 2000. K.L.

N79-30728# Brookhaven National Lab., Upton, N. Y.
FUEL CELLS: APPLIED RESEARCH FUEL CELL MATERIALS AND ELECTROCATALYSIS Annual Report, 1 Jan. - 31 Dec. 1977
S. Srinivasan, H. S. Isaacs, W. E. Ogrady, P. G. Russell, H. Olender, C. R. Davidson, L. J. Olmer, and A. C. C. Tseung Dec. 1978 39 p refs
(Contract EY-76-C-02-0016)
(BNL-50951) Avail: NTIS HC A03/MF A01

The electrocatalysis of fuel cell reactions is examined with emphasis on the inhibition of sintering of fuell cell catalyst particles, electrochemical methods for surface regeneration, and the use of oxides as oxygen electrodes. Overpotentials in solid electrolyte fuel cells are analyzed and methods for the selection and evaluation of interconnector materials are discussed. A.R.H.

N79-30729# Comptroller General of the United States, Washington, D.C.
IMPROVED ENERGY CONTINGENCY PLANNING IS NEEDED TO MANAGE FUTURE ENERGY SHORTAGES MORE EFFECTIVELY

10 Oct. 1978 65 p
(EMD-78-106) Avail: NTIS HC A04/MF A01

The Federal, State, and Industry efforts in preparing for coping with energy emergencies are reported. The development and accuracy of the unemployment estimate announced by the Department of Energy during the 1977-78 coal strike are addressed. Recommendations to the Secretary of Energy and the Chairman of the Federal Energy Regulatory Commission are pointed out. M.M.M.

N79-30730# European Space Agency, Paris (France).
PHOTOVOLTAIC GENERATORS IN SPACE
K. Bogus, ed and T. D. Guyenne, ed Nov. 1978 344 p refs
Proc. of 1st European Symp. on Photovoltaic Generators in Space, Noordwijk, Neth., 11-13 Sep. 1978
(SP-140) Avail: NTIS HC A15/MF A01

A series of lectures was given including, as main topics, solar cell technology, module and blanket technology, design analysis and verification, interface problems, evolution of photovoltaics, solar power satellites, solar arrays, and test results as well as flight data.

N79-30732# AEG-Telefunken, Wedel (West Germany).
SPACE APPLICATION OF LARGE AREA TERRESTRIAL SOLAR CELLS FOR MULTI-KW-ARRAYS
H. Bebermier *In* ESA Photovoltaic Generators in Space Nov. 1978 p 7-14 refs

Avail: NTIS HC A15/MF A01

Future development activities in the field of space silicon solar arrays were studied, considering the applicability of low cost photovoltaic solar arrays for terrestrial use. Investigations indicate that large area solar cells represent an optimum solution due to technology and cost reductions for large area solar arrays of the post Spacelab mission. Author (ESA)

N79-30736# AEG-Telefunken, Wedel (West Germany).
SOME CURRENT DEVELOPMENTS IN SOLAR ARRAY TECHNOLOGY AT AEG-TELEFUNKEN
J. Koch *In* ESA Photovoltaic Generators in Space Nov. 1978 p 33-40 refs Sponsored by Bundesmin. fuer Forsch. u. Technol.

Avail: NTIS HC A15/MF A01

Techniques applicable to solar generators with advanced requirements were developed, including repair technique for welded solar cells on a single cell basis, the space qualification of a new low outgassing silicon adhesive for solar cell bonding, and a solar cell interconnector design with extended fatigue lifetime, made by etching on silver foil. Author (ESA)

N79-30745# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Space Div.
A EUROPEAN LOW-COST SOLUTION FOR SPACELAB POWER AUGMENTATION
D. E. Koelle *In* ESA Photovoltaic Generators in Space Nov. 1978 p 101-105

Avail: NTIS HC A15/MF A01

The design approach and the capabilities of the Spacelab Power Augmentation System (SPAS) Power Module are examined in relation to possible improvements of he Spacelab capabilities. A modular shuttle payload support structure is used, consisting of tubular carbon filter composite truss elements, spanning the shuttle cargo bay. One specific application in combination with the ultra light platform (ULP) solar array is described which Can serve as a power augmentation module for European Spacelab flights. In this case a two element SPAS structure should be used in combination with the hybrid or simirigid ULP flatpack array with a panel size of 3.3 x 1.1 m. The pallet structure is designed for installation above the Spacelab access tunnel, thus not demanding additional cargo bay length. Author (ESA)

N79-30746# National Aeronautics and Space Administration, Washington, D. C. Space Power Systems Branch.
THE NASA SPACE POWER TECHNOLOGY PROGRAM
J. P. Mullin *In* ESA Photovoltaic Generators in Space Nov. 1978 p 107-111

Avail: NTIS HC A15/MF A01

The objective and planning of the NASA space power research and technology program are reviewed. The areas of research covered include photovoltaic energy conversion, chemical energy conversion and storage, thermal to electric conversion, environmental interactions and power systems management of distribution. Author (ESA)

N79-30747# European Space Agency, Noordwikj (Netherlands).
REVIEW OF EUROPEAN SOLAR ARRAY TECHNOLOGY AND POTENTIAL FUTURE DEVELOPMENTS
K. K. Reinhartz *In* ESA Photovoltaic Generators in Space Nov. 1978 p 113-118 refs

Avail: NTIS HC A15/MF A01

A review of the European solar array technology status considering both ESA and nationally funded developments is presented. Deployable rigid solar arrays as well as flexible roll-out and fold-out arrays and the major components of solar arrays are included. It is expected that in the future, advanced solar array technologies will be needed for television broadcast satellites, earth resources satellites, and shuttle launched and tended spacecraft. The technology for the first two mission types is believed to either exist or to be under development already. The design, development, and manufacture of solar arrays for future Shuttle missions, which may require from 50 to 250 kW array power will represent a major technical challenge if Europe should decide o develop the necessary technology. Author (ESA)

N79-30748# British Aerospace Dynamics Group, Bristol (England).
A STUDY ON SOLAR ARRAYS FOR PROGRAMMES LEADING FROM THE EXTENSION OF SPACELAB TOWARDS SPACE PLATFORMS
P. R. C. Gillett *In* ESA Photovoltaic Generators in Space Nov. 1978 p 119-129 refs Sponsored by ESA

Avail: NTIS HC A15/MF A01

A review of a mission scenario cavering the period from 1982 to the end of the century is presented, including some preliminary solar array concepts. These concepts range from the augmentation of Spacelab by 6 kW arrays through Power Module and Space Platform arrays along with Pilot Power Plants, to a brief examination of 10 GW Space Solar Power Stations. The second phase of the study concentrates on concepts for a 50 kW Orbiter mounted array, a 55 kW Power Module array, and two types of 2 50 kW Space Platform arrays, these representing items of likely interest for European contributions to the near and medium term programs. Finally, an outline strategy for the implementation of these arrays is considered. Author (ESA)

N79-30749*# Boeing Aerospace Co., Seattle, Wash.
SOLAR CELLS FOR SOLAR POWER SATELLITES
H. Oman *In* ESA Photovoltaic Generators in Space Nov. 1978 p 133-138 refs

(Contract NAS9-15196)
Avail: NTIS HC A15/MF A01

The concept of a solar-cell array for a solar power satellite is developed to permit evaluation of its economic feasibility for generating power for delivery to public utilities on earth. Gallium arsenide solar cells were considered but it could not be assured that the world gallium resources could support constructions of two solar power satellites per year. Therefore, for preliminary design an array blanket made from 5 by 10 cm silicon solar cells, 50 microns thick, and electrostatically bonded between borosilicate glass sheets was adopted. In annealing experiments, a radiated 50 microns thick cell was restored to its initial performance in a 500 C. Solar-cell efficiency effects significantly the solar power satellite mass, which varies from 90,000 metric tons for 20 percent cells to 120,000 metric tons for 12 percent cells. The anticipated cost of delivered power, based on 1977 dollars, varies from 4 cents per kWh with 18 percent cells, to 5 cents per kWh for 12 percent efficient cells. Author (ESA)

N79-30750*# Boeing Aerospace Co., Seattle, Wash.

SOLAR POWER SATELLITES: THE ENGINEERING CHALLENGES

G. R. Woodcock *In* ESA Photovoltaic Generators in Space Nov. 1978 p 139-147

(Contract NAS9-15196)
Avail: NTIS HC A15/MF A01

Certain elements of solar power satellite design and system engineering studies are reviewed analyzing solar power satellites as a potential baseload electric power source. The complete system concept concept includes not only the satellites and their ground stations, but also the space transportation for delivery of the satellites, piece by piece, into space, and the factories for their construction in space. Issues related to carrying the solar power satellite concept from the present design study phase through implementation of actual hardware are considered. The first issue category is environmental aspects of the SPS systems. The second category of issues is the technology risks associated with achieving the necessary component and subsystem performances. The third category includes the engineering issues associated with carrying out such a large scale project. The fourth issue category is financial: the funding required to bring such a project into being and the costs of the satellites and resulting cost of the power produced as compared to potential alternative energy sources. Author (ESA)

N79-30751# European Space Agency, Noordwijk (Netherlands).

INTERFACE PROBLEMS ON AN SPS SOLAR ARRAY BLANKET

D. Kassing *In* ESA Photovoltaic Generators in Space Nov. 1978 p 149-159 refs

Avail: NTIS HC A15/MF A01

Starting from a survey of proposed photovoltaic Solar Power Satellite (SPS) configurations, the design trend of solar arrays applicable in an SPS development program is sketched out indicating physical and other interface problems of the solar array sub-system with adjacent sub-system and the space environment. The nature of research and development program on SPS solar cell blankets is descussed and a list containing potential study tasks for the near future is presented. The objective is to identify, from a systems engineering of view, the limiting conditions and interface problems associated with the development and operation of large solar generator blankets to be used in SPS systems and to discuss the nature of the supporting research and technology program aimed at solving the mentioned interface problems. Author (ESA)

N79-30752# Technische Univ., Berlin (West Germany). Inst. fuer Luft und Raumfahrt.

MOSGEN: A POTENTIAL EUROPEAN CONTRIBUTION IN DEVELOPING LARGE SOLAR GENERATORS SUITABLE FOR GROWING POWER LEVELS UP TO SPS-SYSTEMS

J. Ruth and W. Westphal *In* ESA Photovoltaic Generators in Space Nov. 1978 p 161-166 refs

Avail: NTIS HC A15/MF A01

A potential development program for large solar generators in space, which seems to be suited especially for European needs is discussed. The cost of production and transport have to be reduced to a minimum by constructive and technological steps so that they become competitive power plants. The concept or a modular collector system represents one steps in that direction. The modular philosophy is easily transferable to different sizes and applications of solar generators leading to solar power satellites. An evolutionary strategy of development helps to provide high economical benefit of the modular attempt compared to nonmodular separately developed alternatives. This strategy means governing the development process by feed back dynamic optimization. Author (ESA)

N79-30757# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany).

INTELSAT 5 SOLAR ARRAY

H. Brodersen and I. Rizos *In* ESA Photovoltaic Generators in Space Nov. 1978 p 209-217 refs

Avail: NTIS HC A15/MF A01

The INTELSAT 5 solar arrays are described. The solar array provides the primary energy source for the first three-axes-stabilized INTELSAT spacecraft, which is designed to satisfy INTELSAT communication requirements for the Atlantic, Pacific and Indian Ocean regions. The solar array is designed to provide approximately 1.2 kW continously at synchronous orbit for a seven year orbital lifetime. The electrical and a mechanical design of the INTELSAT 5 solar array is discussed. The results of specific development tests performed are presented. Also included are the results of the cover integrated cell tests performed on selected solar cell samples. Author (ESA)

N79-30766# Centre National d'Etudes Spatiales, Toulouse (France).

BEHAVIOR OF SOLAR GENERATORS IN LOW ORBITS [COMPORTEMENT DE GENERATEURS SOLAIRES EN ORBITE BASSE]

E. duTrieu *In* ESA Photovoltaic Generators in Space Nov. 1978 p 287-292 In FRENCH

Avail: NTIS HC A15/MF A01

The performance of the identical generators carried by the D2B and the Signe 3 satellites was analyzed and compared. The current supplied (1 sub GS) was very close in both cases although the orbits of the satellites have been very different. After 200 days of orbital life, the 1 sub GS degraded about 8%. The law of variation is logarithmic with time. As regards temperature, there is good agreement between theory and the results telemetered from Signe 3. No evidence can be given for the development of the thermo-optical characteristics of the generators. Transl. by A.R.H.

N79-30770# Johns-Manville Sales Corp., Denver, Colo. Research and Development Center.

PERFORMANCE AND EVALUATION OF CONCEPTS AND DEVICES FOR HEAT RECLAMATION FROM AIR CONDITIONERS, HEAT PUMPS, AND REFRIGERATION EQUIPMENT Final Report

S. S. Mohammadi (Colorado School of Mines) and E. D. Sloan (Colorado School of Mines) Aug. 1978 43 p refs
(Contract DAAK70-78-D-0002)
(AD-A069650; USAFESA-TSD-2057) Avail: NTIS HC A03/MF A01 CSCL 13/1

A heat recovery system is described which uses air conditioner or heat pump waste heat for domestic water heating. Current commercial units and field test data are detailed with economic guidelines to aid in choice of a unit. This report enables the reader to determine the cost effectiveness of having such a unit installed. Safety, product warranty, and city and state coding restrictions are discussed. The current and future testing and demonstration plans are cited for the unit. GRA

N79-30771# Market Facts, Inc., Washington, D. C.

SMALL WIND ENERGY: FOCUS GROUP RESULTS

1978 43 p
(Contract EV-78-C-01-6458)
(DOE/TIC-10018) Avail: NTIS HC A03/MF A01

The potential for commercialization of small wind energy was evaluated. The barriers to development of this resource were determined. Actions required by the Federal Government to promote commercialization were also determined. DOE

N79-30772# Sandia Labs., Albuquerque, N. Mex.

SOME VARIABILITY STATISTICS OF AVAILABLE WIND POWER

J. W. Reed Mar. 1979 50 p refs
(Contract EY-76-C-04-0789)
(SAND-78-1735) Avail: NTIS HC A03/MF A01

The long-term variability of available wind power was studied in ten-year records of hourly wind speed observations at fifteen selected weather stations. Month by month and year by year sums of wind power occurrences were used to generate average, standard deviation, and autocorrelation statistics. The amplitude of the annual cycle in available wind power was at least 70% of the average at all locations. Long term integrated power production showed maxima and minima that differed by 36 to 91% from average annual production. DOE

N79-30773# Sandia Labs., Albuquerque, N. Mex.
ECONOMIC OVERVIEW OF VERTICAL AXIS WIND TURBINES
W. N. Sullivan 1979 9 p Presented at the EPRI Wind-Energy Econ. Workshop, Monterey, Calif., 27 Mar. 1979
(Contract EY-76-C-04-0789)
(SAND-79-9733C; Conf-790352-1) Avail: NTIS HC A02/MF A01

The class of vertical axis wind turbines (VAWT) investigated use curved, fixed-pitch blades of constant section rigidly attached to a vertical rotating tower. Qualitatively, the main advantages of the VAWT over more conventional, propeller-type machines are the elimination of yaw controls, the placement of mechanical equipment at ground level, its amenability to simple, low-cost blade fabrication techniques, and aerodynamic stall characteristics which eliminate the need for active pitch control devices. The main disadvantages relative to modern propeller machines are a somewhat lower aerodynamic efficiency (about 10 percent lower), the limited ability of the rotor to self-start, and generally lower rotor operating RPM's, which leads to higher torque capacity requirements for the drive train. DOE

N79-30774# TRW, Inc., McLean, Va. Energy Systems Planning Div.
COST AND PERFORMANCE EVALUATION OF PASSIVE SOLAR SYSTEMS
Nov. 1978 68 p refs
(Contract W-31-109-eng-38)
(ANL/EES-TM-34) Avail: NTIS HC A04/MF A01

This study was undertaken to produce a detailed methodology for designing optimal passive solar systems for single family residences. Earlier work showed that passive solar systems were economically more favorable than conventional HVAC systems. The earlier results were refined and a broader range of passive solar system configurations were examined in a wider variety of climate and insolation conditions. This study was divided into the following four major tasks: methodology development, refinement of cost and performance data, development of computer program, and analysis of thermal/storage walls. DOE

N79-30776# Brookhaven National Lab., Upton, N. Y.
ROLE OF THE VAPOR COMPRESSION CYCLE IN SOLAR ENERGY UTILIZATION
Edward A. Kush, Jr. 1978 5 p refs Presented at Meeting of the Am. Section of the Intern. Solar Energy Soc., Denver, 28 Aug. 1978
(Contract EY-76-C-02-0016)
(BNL-24573; Conf-780808-14) Avail: NTIS HC A02/MF A01

The vapor compression cycle lends itself to solar energy utilization in two important ways. Its ability to utilize a relatively low temperature heat supply to produce space heating via heat pumps allows the use of solar input to the evaporator to provide potential coefficients of performance which are 2 to 3 times higher than present electric driven heat pumps, and the use of relatively inexpensive solar collectors is possible since the collection temperatures can be low grade. Secondly, the compression process of the vapor cycle can be powered by a solar-driven heat engine, typically using a Rankine cycle, for solar cooling purposes. Discriminating coupling of solar with vapor compression allows the well-developed technology and manufacturing capability of the vapor compression industry to be brought into play in the solar field, widening its base and promoting its diversification. The cycle thermodynamics, potential practical hardware, and R and D projects in both of these areas are reviewed. Particular attention is given to the solar assisted heat pump and its characteristics and the heat pump simulator activities at Brookhaven National Laboratory. DOE

N79-30777# Wayne State Univ., Detroit, Mich.
CUPROUS OXIDE PHOTOVOLTAIC CELLS
Dan Trivich, E. Y. Wang, R. J. Komp, and A. S. Kakar 1978 5 p refs Presented at the IEEE Photovoltaic Specialists Conf., Washington, D. C., 5 Jun. 1978
(Contract ET-78-S-02-4726)
(CONF-780619-16) Avail: NTIS HC A02/MF A01

Cuprous oxide, with a band gap of 2.0 eV, is an attractive material for solar cells because of low cost and great availability. The current conversion efficiency is 1 percent, but theoretical estimates are greater than 13 percent. For various Schottky barriers, e.g., Al/Cu2O, it is proposed that the V/sub oc/ is limited by chemical conversion of the junctions to Cu/Cu2O junctions, and the model is supported by Auger and ESCA results. It is proposed to avoid the reaction by use of an oxide interlayer as in Al/Al2O3/Cu2O, which also gives an MIS structure, but only minimal success has yet been achieved with the methods tried. Sb2O3 and SiO/sub x/ layers were explored. Another approach could be to use oxide heterojunctions on Cu2O. Several were explored and ZnO/Cu2O was best. In and Cd are effective dopants for Cu2O. With samples annealed at 500 C, diffusion lengths of approximately 4 micron were measured by an SPV method. The spectral sensitivity of Cu/Cu2O cells has a threshold at 630 nm and a maximum at 500 nm. DOE

N79-30778# California Univ., Berkeley. Lawrence Berkeley Lab.
STRUCTURE OF A BLACK CHROME SOLAR SELECTIVE SURFACE
Carl M. Lampert Jul. 1978 6 p refs Presented at the Meeting of the Am. Section of the Intern. Solar Energy Soc., Denver, Colo., 28 Aug. 1978
(Contract W-7405-eng-48)
(LBL-6691-Rev; Conf-780808-11) Avail: NTIS HC A02/MF A01

The structure of Chrom-Onyx type of black chrome/metal selective absorber was studied to gain a better understanding of its influence upon the mechanisms of wavelength selectivity. Spectral reflectance measurements were performed on seven samples. The best selectivity was found by these measurements to be 0.7 micron of black chrome on nickel and 1.0 micron of black chrome on copper. Both scanning and transmission electron microscopy were employed to study microstructure and chemical composition. As a result of the combined studies, some effects of black chrome thickness and the metallic substrate were determined. It was found that black chrome consisted of a very fine metallic distribution of particles of chromium, possibly suspended within a matrix of an oxide of chromium. This combination was, in turn, agglomerated into larger particles within 0.05 to 0.3 micron size range. These larger particles formed a network which constituted the surface coating. DOE

N79-30779# California Univ., Berkeley. Lawrence Berkeley Lab.
ENERGY UTILIZATION ANALYSIS OF BUILDINGS
M. Lokmanhekim Jun. 1978 20 p refs Presented at the Symp. on Solar Energy, Cairo, 16 Jun. 1978
(Contract W-7405-eng-48)
(LBL-7826; Conf-780667-4) Avail: NTIS HC A02/MF A01

The accurate calculation of the energy requirements and heating and cooling equipment sizes for buildings is one of the most important, as well as one of the most difficult problems facing the engineer. The fundamental principles utilized in the procedures developed by American Society of Heating, Refrigerating and Air-Conditioning Engineers are explained and brief descriptions of the computer programs using these procedures are given. Such computer programs generally are capable of simulating the thermal response of a building to all sources of heat gains and losses, accounting for all nonthermal energy requirements in the building or on the sites, translating the building operating schedules into energy demand and consumption, identifying the peak capacity requirements of heating and cooling equipment, and performing an economic analysis that would select the most economical overall owning and operating cost, equipment and energy source that minimize the building's life cycle cost. DOE

N79-30780# Sandia Labs., Albuquerque, N. Mex.
STATUS OF THE DOE PHOTOVOLTAIC SYSTEMS ENGINEERING AND ANALYSIS PROJECT
G. J. Jones and D. G. Schueler 1978 6 p refs Presented at the IEEE Photovoltaic Specialists Conf., Washington, D. C., 5 Jun. 1978
(Contract EY-76-C-04-0789)
(SAND-78-0955C; Conf-780619-14) Avail: NTIS HC A02/MF A01

The economic viability of photovoltaic power systems depends not only on the reduction of photovoltaic array prices but also on the realization of acceptable total installed system price. The allowable total installed system price is calculated for various major application sectors, based on a range of projected levelized energy costs. These allowable prices are then compared to projected prices which are obtained by examining the current and future expected prices of the major subsystems comprising an operational system. Based on this comparison an assessment of the status of the major subsystem technologies, exclusive of the photovoltaic array, is given and areas requiring emphasis are identified. DOE

N79-30781# Argonne National Lab., Ill.
RELIABILITY, MAINTAINABILITY, AND MATERIALS PERFORMANCE OF SOLAR DEMONSTRATION SYSTEMS
Prem S. Chopra 1978 9 p Presented at the Conf. on the Energy Solar Updates, Atlanta, 12 Jul. 1978
(Contract W-31-109-eng-38)
(ANL/EES-CP-14; Conf-780701-1) Avail: NTIS HC A02/MF A01

The Department of Energy is conducting the National Program for Solar Heating and Cooling of Buildings. A major element of that program is the National Solar Data Program which includes data collection, evaluation and report publication. Information and technical data are being collected and reported on a number of residential and commercial sites. Recently, a program was initiated at Argonne National Laboratory (ANL) under the auspices of the National Solar Data Program to collect, evaluate, and publish reliability, maintainability, and material performance data from these sites. The plans which have been made and some of the early results which can be expected from the ANL Solar Data Program are described. DOE

N79-30782# Los Alamos Scientific Lab., N. Mex.
COMPARATIVE ECONOMICS OF PASSIVE AND ACTIVE SYSTEMS
J. F. Roach, S. A. Noll, and S. Ben-David 1978 41 p refs Presented at the Intern. Symp. Workshop on Solar Energy, Cairo, 16-22 Jun. 1978
(Contract W-7405-eng-36)
(LA-UR-78-1878; Conf-780667-3) Avail: NTIS HC A03/MF A01

As the interest in solar energy applications for residential space heating grows, it becomes imperative to evaluate the economic performance of alternative designs. One passive design is concentrated on the thermal mass storage wall. The economic performance of this design is examined and subsequently contrasted with one active design-the air collector/rock storage system. Architectural design criteria, solar performance characteristics, and the incremental solar cost of each design is briefly reviewed. Projections of conventional energy prices are discussed, along with the optimal sizing/feasibility criterion employed in the economic performance analysis. In addition, the effects of two incentive proposals-income tax credits and low interest loans-upon each design are examined. Results are reported on a state-by-state basis for the U.S., with major conclusions summarized for each design. It is generally the case that incentives greatly enhance the economics of both system designs, although the contrast is greater for the passive design. Also, against the less expensive conventional fuels (natural gas and heating oil) the passive design was shown to offer a more cost effective alternative than the active system for most states. DOE

N79-30784# Sandia Labs., Albuquerque, N. Mex.
LINEAR CONCENTRATING SOLAR COLLECTORS: CURRENT TECHNOLOGY AND APPLICATIONS
James A. Leonard Jul. 1978 36 p refs
(Contract EY-76-C-04-0789)
(SAND-78-0949) Avail: NTIS HC A03/MF A01

Linear concentrating collector technology is reviewed. Included are fundamentals of the technology; descriptions of collectors with particular emphasis on the types tested at the DOE/Sandia Midtemperature Solar Systems Test Facility (MSSTF); performance test results; problems identified through operating experience; cost projections; and a discussion of applications of linear concentrating and midtemperature solar collectors. DOE

N79-30785# Department of Energy, Washington, D. C. Div. of Solar Applications Developments.
NATIONAL SOLAR HEATING AND COOLING COMMERCIAL DEMONSTRATION PROGRAM: KEY PERSONNEL DIRECTORY
Jan. 1979 152 p
(DOE/CS-0057) Avail: NTIS HC A08/MF A01

Firms and individuals who are principal participants in The Department of Energy (DOE) solar heating and cooling demonstration projects for Federal and non-Federal commercial buildings are identified. This directory is intended to facilitate communication with and among active participants in demonstrations of solar heating and cooling technology currently sponsored by DOE. The listing provides identification for several participants in each active DOE commercial demonstration project. When available, identifying information is provided for owners, architects, solar designers, mechanical engineers, builders, and other key personnel directly involved in each project. DOE

N79-30786# Battelle Pacific Northwest Labs., Richland, Wash.
ENERGY-INTENSIVE INDUSTRY FOR ALASKA. VOLUME 1: ALASKA COST FACTORS, MARKET FACTORS, SURVEY OF ENERGY-INTENSIVE INDUSTRIES Final Report
W. H. Swift, M. Clement, E. G. Baker, D. C. Elliot, J. J. Jacobsen, T. B. Powers, C. A. Rohrmann, and G. L. Schiefelbein Sep. 1978 267 p refs 3 Vol.
(Contract EY-77-C-06-1002-001)
(TID-29025/1) Avail: NTIS HC A12/MF A01

The Alaskan and product market factors influencing industry locations in the state are described and a survey of the most energy-intensive industries is presented. Battelle analyzed the factors external to Alaska that would influence development and the cost of energy and labor in Alaska. This volume covers the industries likely to be drawn to Alaska because of its energy resources and analyzes these in terms of: (1) cost of using Alaska energy resources in Alaska as apposed to the Lower 48; (2) skill-adjusted wage and salary differentialls between relevant Alaskan areas and the Lower 48; and (3) basic plant and equipment and other operating-cost differentials between relevant Alaskan areas and the Lower 48. This report also develops an understanding of the likely level at which development might take place and its timing. Industries that will tend to locate in Alaska as a result of energy consideration are listed, in order of merit: lime, aluminum, portland cement, methanol, carbon black, ammonia, and chlorine industries. DOE

N79-30787# Battelle Pacific Northwest Labs., Richland, Wash.
ENERGY INTENSIVE INDUSTRY FOR ALASKA. VOLUME 2: CASE ANALYSIS Final Report
Kent Miller Sep. 1978 107 p refs 3 Vol.
(Contract EY-77-C-06-1002-001)
(TID-29025/2) Avail: NTIS HC A06/MF A01

Volume 1 evaluated a number of energy industries that might be attracted to the state as a consequence of the availability of its large and diversified sources of primary energy. However, it was concluded that of all industries examined, the primary aluminum metal industry (the most energy-intensive) appeared to be the most likely to succeed in Alaska, assuming the future availability of a large block of low-cost hydropower. It was further concluded that, due to the trends in the domestic and worldwide aluminum industry and markets and the potential implications, a large electroprocess industry would have to interphase with Alaska's electric-power-supply planning; so, a more detailed analysis of that industry's potential was warranted. The aluminum industry is examined in detail as a model locational analysis of an industry along with the environmental economic, and electric-power implications. DOE

N79-30788# Battelle Pacific Northwest Labs., Richland, Wash.
ENERGY-INTENSIVE INDUSTRY FOR ALASKA. VOLUME 3: BACKGROUND DATA
Kent Miller Sep. 1978 320 p refs Prepared in cooperation with Alaska Univ., Anchorage 3 Vol.
(Contract EY-77-C-06-1002-001)
(TID-29025/3) Avail: NTIS HC A14/MF A01

Background data are summarized on evaluating energy-intensive industry for Alaska covering objectives, available infrastructure, and possible future economic growth. Catalogs are presented of energy, mineral, and renewable natural resources on which industrial development may be based. DOE

N79-30790# Argonne National Lab., Ill. Fusion Power Program.
FUSION ENERGY FOR ALTERNATIVE APPLICATIONS: THE GENERATION OF SYNTHETIC GASEOUS FUELS Interim report
Jan. 1979 110 p refs
(Contract W-31-109-eng-38)
(ANL/FPP/TM-117) Avail: NTIS HC A06/MF A01

Methods for generating synthetic fuels from the high temperature process heat produced by fusion reactors is discussed. A high temperature fusion reactor blanket design is presented which has the capability to produce process heat in excess of 1000 C, eliminates ceramics are structural materials in the reactor, and is self sustaining with respect to tritium breeding. A.W.H.

N79-30791# Elrick and Lavidge, Inc., San Francisco, Calif.
GEOTHERMAL/HYDROTHERMAL ENERGY. GROUP INTERVIEW
1 Aug. 1978 14 p
(Contract EV-78-C-01-6457)
(DOE/TIC-10030) Avail: NTIS HC A02/MF A01

A group interview conducted on geothermal/hydrothermal (liquid dominated) energy suitable for generating electricity and/or direct heat applications was analyzed. The group was composed of representatives of the following types of organizations: electric utilities, geothermal developers, industrial process heat users, engineering consultants, equipment manufacturers, environmentalist, regulatory commission, and financial institutions. The analysis was divided into four subjects: commercial feasibility, future market potential, the relative importance of barriers to commercialization, and the proper role of the Federal Government. DOE

N79-30792# Colorado Univ., Boulder. Dept. of Mechanical Engineering.
MODELING HEAT AND MASS TRANSFER AT THE MESA GEOTHERMAL ANOMALY, IMPERIAL VALLEY, CALIFORNIA Final Report
D. R. Kassoy and K. P. Goyal Feb. 1979 175 p refs.
(Contract W-7405-eng-48)
(LBL-8784) Avail: NTIS HC A08/MF A01

The geothermal reservoir modeling effort is reviewed and technical accomplishments during the final funding period are described. It is concluded that a physically viable mathematical model of an unexploited geothermal system can be constructed in terms of the fault zone controlled charging of the thermally active section of a reservoir. DOE

N79-30793# Barber-Nichols Engineering Co., Arvada, Colo.
GEOTHERMAL PUMP TEST FACILITY Final Report, Jul. 1977 - Jul. 1978
R. W. Blakemore Sep. 1978 16 p
(Contract EY-76-C-04-3715)
(ALO-3715-1) Avail: NTIS HC A02/MF A01

The design configuration and fabrication of a transportable geothermal pump test facility are described. The test facility, consisting of a test rig and data acquisition system trailer, provides the user with the unique opportunity to develop and calibrate geothermal pumps with less liability and risk, and at lower cost than would be incurred by actually installing the pump in a geothermal well. Pump tests may be performed using either domestic water, heated by pumping energy, or by using actual geothermal brines supplied directly to the test rig which would be located adjacent to the well. The geothermal pump test facility is completely self supporting and requires only an electrical supply source to become fully operational. DOE

N79-30795# Oak Ridge National Lab., Tenn.
ECONOMY OF A RETROFIT SOLAR SYSTEM
J. M. Schreyer 1979 20 p ref Presented at the 6th Energy Technol. Conf. and Exposition, Washington, D. C., 26 Feb. 1979
(Contract W-7405-eng-26)
(CONF-790213-2) Avail: NTIS HC A02/MF A01

The use of 8 flate plate collectors each 10 sq ft for the solar water system retrofitted on a 20 year old house is presented. A 50/50 glycol/water fluid was circulated through the collector circuit. A 120 gal galvanized water tank was used for storage. An economic analysis of the hot-water system is presented. DOE

N79-30796# Logistics Management Inst., Washington, D. C.
INTERNATIONAL ENERGY EVALUATION SYSTEM. VOLUME 2: TECHNICAL DOCUMENTATION, SEPTEMBER 1, 1978
M. L. Shaw and B. J. Allen Mar. 1979 277 p
(Contract EC-77-C-01-8602)
(HCP/L8602-01/2) Avail: NTIS HC A13/MF A01

A model was developed to analyze the impact of various national and international policies on energy flows between the U.S. and the rest of the world. This model forecasts equilibrium levels and prices for a typical day in 1985 and 1990. The modeling structure and its objectives are described. The demand for energy in the U.S., the other Organization for Economic Cooperation and Development countries, and the non-OECD regions-each of which is analyzed using different modeling approaches are discussed. The supply of primary energy materials, their transportation to consuming regions, and their conversion to final demand products are examined. The mathematical formulation of the problem and how the supply, transportation, conversion, and demand activities are combined to produce an equilibrium is presented. DOE

N79-30797# Logistics Management Inst., Washington, D. C.
ENERGY SECTOR CAPITAL REQUIREMENTS, 1978-1985
Jan. 1979 64 p Sponsored by DOE
(DOE/EIA-0103/24) Avail: NTIS HC A04/MF A01

The approach used, and the values derived, to estimate capital requirements for the energy sector of the U.S. economy for the period 1 Jan. 1978 to 1 Jan. 1985 are described. The capital requirements of the energy supply industries needed to produce the energy equilibrium levels projected to 1985 are discussed. The capital requirements estimates for the major energy subsectors and three supply/demand scenarios are summarized. Energy subsectors addressed include oil and gas production and refining, coal, electric utilities (including nuclear generation), and the advanced technologies (solar, geothermal, wind, and synthetics). DOE

N79-30799# Department of Energy, Washington, D. C. Energy Information Administration.
SHORT-TERM PROJECTIONS OF THE ENERGY SUPPLY AND DEMAND IN THE UNITED STATES FROM THE EIA REPORT TO CONGRESS, 1977 Annual Report
Dec. 1978 108 p
(DOE/EIA-0102/37) Avail: NTIS HC A06/MF A01

Short-term energy projections obtained using the data, industry expertise, and computer-based forecasting models are presented. United States domestic consumption of gross energy inputs (not accounting for generation and transmission losses projected to grow from 73.7 quadrillion BTu (quads) in 1976 to 79.6 quads by 1979, an increase of about 2.6% per year, accelerating somewhat from the 1970-1976 growth rate of about 1.8%. This assumes a mid-range projections of economic activity. A low growth assumption yields a 1979 domestic consumption figure of 79.2 quads (2.4% growth) and the high demand assumption yields consumption of 81.9 quads (3.6% growth rate). The major factors affecting demands and supplies, the ranges of the forecasts, the sensitivity of the forecasts to significant uncertainties, and comparisons with other relevant forecasts are presented. DOE

N79-30801*# Boeing Engineering and Construction, Seattle, Wash.

APPLICATIONS OF THERMAL ENERGY STORAGE TO PROCESS HEAT STORAGE AND RECOVERY IN THE PAPER AND PULP INDUSTRY Final Report, Sep. 1977 - May 1978

J. H. Carr, P. J. Hurley, and P. J. Martin Sep. 1978 244 p refs Sponsored by NASA

(Contracts EC-77-A-31-1034; EC-77-C-01-5082)

(NASA-CR-159398; CONS-5082-1) Avail: NTIS HC A11/MF A01 CSCL 10C

Applications of Thermal Energy Storage (TES) in a paper and pulp mill power house were studied as one approach to the transfer of steam production from fossil fuel boilers to waste fuel of (hog fuel) boilers. Data from specific mills were analyzed, and various TES concepts evaluated for application in the process steam supply system. Constant pressure and variable pressure steam accumulators were found to be the most attractive storage concepts for this application. DOE

N79-30802# California Univ., Berkeley. Lawrence Berkeley Lab.

ENERGY USE AND CONSERVATION IN INDUSTRIALIZED COUNTRIES

L. Schipper Nov. 1978 46 p refs Presented at the Conf. on Energy Productivity, New York, 2 Nov. 1978

(Contract W-7405-eng-48)

(LBL-7872; Conf-781124-1) Avail: NTIS HC A03/MF A01

Economic factors influencing energy use and development energy saving technology in industrialized countries are discussed. International comparisons of energy use show that there is much technical flexibility and conservation potential within present U.S. energy use patterns, and in other countries, provided that economic incentives and time are allowed to play a role. Energy use policies per se are of a secondary nature in the establishment of today's practices, but policies will be more important in the future. Energy consumption in the U.S. is compared with that in Sweden. DOE

N79-30803# Argonne National Lab., Ill.

EVALUATION OF SELECTED NEAR-TERM ENERGY-CONSERVATION OPTIONS FOR THE MIDWEST

A. R. Evans, C. S. Colsher, R. W. Hamilton, and W. A. Buehring Nov. 1978 172 p refs

(Contract W-31-109-eng-38)

(ANL/EES-TM-41) Avail: NTIS HC A08/MF A01

The potential for implementation of near-term energy conservation practices for the residential, commercial, agricultural, industrial, transportation, and utility sectors of the economy is evaluated for 12 states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. The information used to evaluate the magnitude of achievable energy savings includes regional energy use, the regulatory/legislative climate relating to energy conservation, technical characteristics of the measures, and their feasibility of implementation. Baseline information for an ongoing regional assessment of energy and environmental impacts in the Midwest is provided. DOE

N79-30804# California Univ., Berkeley. Lawrence Berkeley Lab. Dept. of Materials Science and Mineral Engineering.

MICROSTRUCTURE AND OPTICAL PROPERTIES OF BLACK CHROME BEFORE AND AFTER EXPOSURE TO HIGH TEMPERATURES

Carl M. Lampert Jan. 1979 15 p refs Presented at the 2d Ann. Conf. on Absorber Surfaces for Solar Receivers, Boulder, Colo., 24 Jan. 1979

(Contract W-7405-eng-48)

(LBL-8632; Conf-790120-2) Avail: NTIS HC A02/MF A01

Short term high temperature heat treatments were used to simulate stagnation conditions. Samples were annealed in both air and vacuum, which resulted in similar characteristics. Annealing in air appeared to mildly accelerate optical degradation at high temperatures. For short term heat treatments below 300 C the reflective and microstructural properties appeared to be unchanged. By in situ vacuum annealing of the coating above 400 C microscrystalline Cr2O3 was identified. By observation of diffraction patterns it was concluded that a Cr2O3 was transformed into crystalline Cr2O3. The Cr2O3 phase continued to grow at higher temperatures at the expense of chromium content. At temperatures above 500 C in vacuum, a new phase identified as Cr3O4 formed. It was found that black chrome failed optically between 500 to 600 C for 1 hour heat treatments in both air and vacuum; also the coating heated in air failed mechanically by peeling at 600 C. DOE

N79-30805# Battelle Columbus Labs., Ohio.

DEVELOPMENT OF A LOW-TEMPERATURE, LOW-COST, BLACK-LIQUID SOLAR COLLECTOR

D. K. Landstrom 1978 5 p refs Presented at the 3d Solar Heating and Cooling R and D Branch Contractors' Meeting, Washington D.C., 24 Sep. 1978

(Contract EG-77-C-04-4097)

(CONF-780983-14) Avail: NTIS HC A02/MF A01

A cost effective, high efficiency, low-temperature nonconcentrating black liquid type collector is presented. Whether this collector would have specific advantages when used as a thermal energy source for a heat pumps is analyzed. DOE

N79-30806# Sandia Labs., Albuquerque, N. Mex. Systems Analysis Div.

ANALYSIS OF COLLECTORS FOR PROCESS HEAT APPLICATIONS

James K. Linn Feb. 1979 25 p refs

(Contract EY-76-C-04-0789)

(SAND-78-1977) Avail: NTIS HC A02/MF A01

The economic viability of solar energy for industrial process heat applications depends directly on the collector array performance and cost. Various distributed solar collectors were evaluated in terms of solar availability, attainable performance and projected costs. Collectors were rank ordered in their projected cost effectiveness for future industrial process heat applications. DOE

N79-30807# Sandia Labs., Albuquerque, N. Mex.

GEOTHERMAL WELL TECHNOLOGY PROGRAM

S. G. Varnado 1978 8 p refs Presented at Workshop on Geothermal Drilling Fluids, Houston, Tex., 23 May 1978

(Contract EY-76-C-04-0789)

(SAND-78-1063; Conf-780580-1) Avail: NTIS HC A02/MF A01

A program aimed at developing drilling and completion techniques for geothermal wells is presented. The reduction of well costs by 25% by 1982 and by 50% by 1986 is discussed. Program justification which relates well cost to busbar energy cost and to power-on-line goals is presented. Technological deficiencies encountered when current rotary drilling techniques are used for geothermal wells are discussed. A program for correcting these deficiencies is described. DOE

N79-30808# Argonne National Lab., Ill.

EFFECTS OF THE PROPOSED NEW SOURCE PERFORMANCE STANDARDS: A COMPARATIVE ASSESSMENT OF THE ENERGY AND ECONOMIC IMPACT

Paul S. Farber and C. D. Livengood 1978 22 p refs Presented at the 71st Air Pollution Control Assoc. Meeting, Houston, Tex., 25 Jun. 1978
(Contract W-31-109-eng-38)
(ANL/EES-CP-6; Conf-780636-6) Avail: NTIS HC A02/MF A01

In order to study the effect of the proposed vis-a-vis existing, New Source Performance Standards (NSPS) a number of coal sources were chosen to adequately represent the various coal supply regions in the U.S. Power plant scenarios were chosen to reflect both the mine mouth type of power plant and the effects of interstate coal shipment. Case studies were performed in order to determine the least cost mix of coal type and control techniques (particulate, FGD, coal cleaning, and NO/sub x/) needed to meet present and proposed NSPS. Costs and energy usage for environmental control were derived on an incremental basis with respect to a 500 MWe output base power plant. DOE

N79-30809# TRW, Inc., McLean, Va. Energy Systems Planning Div.
METHODOLOGY FOR THE ANALYSIS OF INVESTMENT ALTERNATIVES TO STIMULATE DEVELOPMENT AND TECHNOLOGY TRANSFER FOR ENERGY TECHNOLOGIES
Sep. 1978 27 p refs
(Contract ET-78-C-05-5670)
(TID-28971) Avail: NTIS HC A03/MF A01

The incentives to encourage the development and commercialization of selected energy technologies are examined through a final model. A decision oriented approach was adopted in characterizing a typical company's response to implementation of a particular incentive. This approach is described in detail. A computer model that calculates net present values and internal rates of return for prescribed investments in manufacturing facilities is included. DOE

N79-30810# Thermo Electron Corp., Waltham, Mass.
ENERGY CONSERVATION OPPORTUNITIES IN COMMERCIAL APPLIANCES Final Report
J. R. Hurley Dec. 1978 281 p refs
(Contract W-7405-eng-26)
(ORNL/Sub-7261/1) Avail: NTIS HC A13/MF A01

A data base of energy consuming applicances in the commercial sector was established which identifies and rates the most promising development opportunities that would save significant amounts of energy on a national level. A detailed national inventory of 45 major appliances and their energy consumption was established for the year 1975. Thirty-four potential appliance improvements were identified, evaluated, and ranked. The major energy consuming appliances in the following functional use categories were identified, space heating and cooling, water heating, refrigeration, cooking, and lighting. The equipment in these categories was estimated to consume 87% of the total energy used in the commercial sector, with the remaining 13% consumed by equipment such as computers, business machines, laundry equipment, dishwashing, and other food service equipment. DOE

N79-30811# District of Columbia Bar Association, Washington, D. C.
INTERNATIONAL ENERGY CONSERVATION: COMPARATIVE LAW AND POLICY. PROCEEDINGS FROM THE 1978 INTERNATIONAL CONFERENCE ON ENERGY CONSERVATION
Feb. 1979 362 p refs Conf. held at Washington, D. C., 23-24 Feb. 1978; sponsored by DOE and Am. Soc. of Intern. Law
(CONF-780274) Avail: NTIS HC A16/MF A01

The policies and laws that highly industrialized nations have used and considered to meet the challenge of energy conservation were compared and discussed. The following countries participated in the conference: U.K.; Australia; Federal Republic of Germany; Japan; France; Canada Sweden; Italy; the Netherlands; and the U.S. The IEA and the Commision of the European Communities also participated. The conference format consisted of ministerial addresses to the conference, interspersed with panel discussions focusing on energy conservation in transportation, industry, agriculture, and utilities; residential, commercial, and industrial buildings; and emergency situations. There was also a panel discussion on the role of government in energy conservation and energy information collection. The panels were composed of participating countries' representatives. DOE

N79-30812# Solar Systems of Virginia, Inc., Hampton.
COST EFFECTIVE SOLAR HOT WATER SYSTEM FOR ECONO-TRAVEL MOTOR HOTEL, CHESAPEAKE, VIRGINIA Final Report
Dec. 1978 17 p refs
(Contract EM-78-G-02-4663)
(COO-4663-1) Avail: NTIS HC A02/MF A01

The final report of a cost effective solar hot water heating system is presented. The description of the system along with the final breakdown performance data and payback time are given. The payback time for the installed system will be approximately four years instead of the 6.65 years estimated for the proposal. The additional savings is due to the reduction in the peak demand charge since the electric hot water heaters are not required to operate at the same time each morning as the dryers used for the laundry. The results shown in the hotel's monthly electricity bills indicate that this goal has been accomplished. DOE

N79-30813# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
COMMUNITY SYSTEMS PROGRAM
Feb. 1979 55 p refs
(DOE/CS-0072) Avail: NTIS HC A04/MF A01

The Community Systems program of DOE through research, development, and demonstration will help communities develop and put into practice effective energy conservation programs. To do this, the program develops and demonstrates approaches to community energy conservation that: combine use of the energy resources available within a community, reducing reliance on external and scarce fuels; increase the use of fuel-efficient energy systems in supplying utility services; substitute energy systems that use nonscarce fuels for those that consume oil and natural gas; and reduce the end-use demand for energy through planning and development practices. A community is described here as any complex of buildings and open spaces used by large numbers of people and connected by networks for moving the people as well as messages, goods, and services. Before energy conservation in communities can have a national impact, comprehensive energy management must become an integral part of community processes. The Community Systems program is organized into three components--systems engineering products, planning and development products, and implementing mechanisms products. The activities within each program element are presented followed by a discussion of current site-specific prototype application projects (grid-connected systems, coal-using systems, district heating and cooling, heat pump systems, power plant retrofit, site design applications, subsystems development case studies, general development planning applications, and comprehensive community energy management pilot projects). Program management, organizational responsibilities, and budget are summarized. The current program activities and significant milestones are described. A list of publications resulting from Community Systems programs efforts is presented. DOE

N79-30814# Department of Energy, Washington, D. C. Office of State and Local Programs.
COMPREHENSIVE PROGRAM AND PLAN FOR FEDERAL ENERGY EDUCATION, EXTENSION AND INFORMATION ACTIVITIES Second Report to Congress
Jan. 1979 161 p refs
(Contracts EC-77-C-03-1446; EU-78-C-01-6280)
(DOE/CS-0071) Avail: NTIS HC A08/MF A01

This second annual Comprehensive Program and Plan for Federal Energy Education, Extension and Information Activities continues to survey federal outreach programs, to report on several considerations important to their effectiveness, and to provide a plan for their improved coordination. It provides individual

Americans with the capability they need to adopt energy-saving measures. Outreach programs provide information and technical assistance tailored to communicate the importance of changes in energy consumption patterns; the energy and renewable-fuel options available; and the associated short-and long-term cost savings. Thirteen Federal departments and agencies have reported 68 programs dedicated in whole or in part to to energy-outreach activities. They describes in detail these energy-conservation programs and the use of renewable fuels; addresse procedures for minimizing potential conflict of federal energy education, extension, and information activities with those offered by the private sector, the relationship of these activities to other federal assistance and incentive programs, and procedures for evaluating the effectiveness of federal energy education, extension, and information efforts. The final chapter presents a plan of action for the coming year through which increased coordination of federal energy education, extension, and information activities will be sought. DOE

N79-30815# Department of Energy, Washington, D. C. Energy Information Administration.

PROJECTIONS OF ENERGY SUPPLY AND DEMAND FOR THE 1978-1979 WINTER HEATING SEASON

David T. Hulett Nov. 1978 43 p refs

(DOE/EIA-0102/33) Avail: NTIS HC A03/MF A01

National projections were made for petroleum, natural gas, and coal based on an economic assumption that reflects moderate growth in real GNP of 2.6 percent in 1979, normal weather conditions, and no major disruption in foreign or domestic supplies. Range of these projections based on legitimate real work uncertainties are presented. The projections showed that supplies together with realistic inventory drawdown strategies and feasible import levels would be adequate to meet the foreseen consumption requirements for all fuels for the winter, although there were some indications of possible tightness in the supply and demand balances for each major fuel. DOE

N79-30816# Department of Energy, Washington, D. C. Office of Policy and Evaluation.

ROLE OF THE STATES IN ENERGY

Sep. 1978 42 p refs

(DOE/PE-0009) Avail: NTIS HC A03/MF A01

Some 44 separate energy programs and policies which involve states, and are administered by 8 Federal departments, are examined. Of these programs, 17 received primary emphasis and were selected for further detailed study, and were divided into conservation programs/policies and supply programs/policies. Field studies in 8 selected Case Study States were selected so that they would be representative of the problems and opportunities associated with energy production and consumption. The states were Alabama, California, Colorado, Illinois, Massachusetts, Minnesota, New York, and Texas. The study approach described and analyzed state energy capabilities, existing problems and opportunities, and the Federal government's role in aiding and improving state energy capabilities. The range of Federal energy programs and policies is outlined, and the burdens these programs placed on the states are explored. DOE

N79-30817# Department of Energy, Washington, D. C. Energy Information Administration.

RECENT ENERGY CONSUMPTION TRENDS IN EUROPEAN ECONOMIC COMMUNITY COUNTRIES

Mark Rodekohr Jan. 1979 56 p refs

(DOE/EIA-0103/16) Avail: NTIS HC A04/MF A01

A descriptive analysis of EEC energy comsumption and production in the pre- and post-embargo period from 1973 to 1976 is provided. Primarily aggregate EEC data is presented, however, some individual country data is shown to highlight some of the more important trends. Sectoral consumption is shown along with the appropriate measure of economic activity and other important indicators of energy consumption. From 1973 to 1975, net imports to the EEC declined by 140 metric tons of oil equivalent (MTOE) of which 75 MTOE was due to a decline in total energy requirements (TER) and the remaining 65 MTOE was due to an increase in indigenous production. The trends in TER are illustrated in a figure and table, where the sectoral consumption levels are shown. DOE

N79-30818# California Univ., Berkeley. Lawrence Berkeley Lab.

ENERGY CONSERVATION: POLICY ISSUES AND END-USE SCENARIOS OF SAVINGS POTENTIAL. PART 6. END-USE ENERGY CONSERVATION DATA BASE AND SCENARIOS

Sep. 1978 398 p refs

(Contract W-7405-eng-48)

(LBL-7896-Pt-6) Avail: NTIS HC A17/MF A01

End-use energy conservation scenarios discussed show the combined effect on energy consumption of implementing a number of conservation measures. The scenarios serve two overall purposes. First, they provide a contrast of a series of nonconservation cases based on assumption of growth rate and appliance saturation with conservation cases on similar assumptions. Second, they provide detailed data and documentation for the savings potential for each conservation measure, the stock affected, and the calculation of total energy savings. Included are conservation measures of both a behavioral nature and technological nature. Quantitative estimates of energy consumption and conservation potential in the major residential and commercial end uses, transportation modes, and industrial subsectors made. For each measure and for the total scenario a base case and a conservation case were computed. DOE

N79-30819# Iowa State Univ. of Science and Technology, Ames. Heat Transfer Lab.

ENERGY CONSERVATION VIA HEAT TRANSFER ENHANCEMENT Quarterly Progress Report, 1 Jul. - 30 Sep. 1978

A. E. Bergles, G. H. Junkhan, and R. L. Webb Oct. 1978 34 p refs

(Contract EG-78-S-02-4649)

(COO-4649-3) Avail: NTIS HC A03/MF A01

Progress on the subject contract for the period July 1, 1978 to September 30, 1978, is discussed. Discussions with manufactures of heat exchange equipment; as well as R and D personnel, were held in order to identify further examples of commercial equipment utilizing enhanced or augmented heat transfer. A listing of 127 manufacturers of enhanced heat transfer articles is presented. An additional 400 citations were added to the computerized file of literature. Many new full-size copies were obtained. The patent search has been continued, and progress has been made in identifying the patent classes and sub-classes of major interest. Summaries of preliminary work in two Key Application Areas are reported: waste heat recovery and sensible thermal energy storage. Key Technology Areas have also been identified, and preliminary reports on enhancement by free-stream turbulence and optimization of integral inner-fin tubes have been prepared. A number of other Key Areas have been identified. DOE

N79-30822# Argonne National Lab., Ill.

PRELIMINARY EVALUATION OF THE USE OF HYDRAULIC AIR COMPRESSORS IN WATER-COMPENSATED RESERVOIR COMPRESSED AIR STORAGE POWER PLANTS

F. W. Ahrens and J. A. Berghmans 1978 23 p refs Presented at CAES Technol. Symp., Pacific Grove, Calif., 15 May 1978

(Contract W-31-109-eng-38)

(CONF-780599-2) Avail: NTIS HC A02/MF A01

An air compression system for CAES applications, based on the hydraulic compressor principle, is described and evaluated. In addition to yielding a more efficient use of energy from the base power plant, due to isothermal air compression, the hydraulic air compressor does not require the conventional intercoolers and it replaces the air compressors with water pumps. Using performance characteristics predicted with an analytical model, a hydraulic compression system for a CAES plant is designed and compared with an equivalent conventional air compression system. The hydraulic air compressor-based CAES system uses less compression energy but can be costly due to the number and size of the water shafts required. DOE

N79-30823# Brookhaven National Lab., Upton, N. Y.

MULTIOBJECTIVE ANALYSIS IN A NATIONAL ENERGY SYSTEM MODEL

Joseph Schank 1978 7 p refs Presented at 9th Conf. on Modeling and Simulation, Pittsburgh, Pa., 27 Apr. 1978

(Contract EY-76-C-02-0016)

(BNL-24371; Conf-780450-2) Avail: NTIS HC A02/MF A01

An automated methodology for the analysis described is developed. Both the previous and automated procedures are executed upon a variant of the 1985 National Energy plan scenario and the respective results are compared. DOE

N79-30824# Pennsylvania Univ., Philadelphia.

STATUS OF ENERGY-MANAGEMENT ACADEMIC PROGRAMS IN US INSTITUTIONS OF HIGHER EDUCATION: EXECUTIVE SUMMARY

L. Eisenberg, C. Daspit, and G. Shimamoto Sep. 1978 29 p

(Contract EE-77-S-02-4465)

(COO-4465-2-Exec-Summ) Avail: NTIS HC A03/MF A01

A formal course of study, leading to the bachelor's or higher degree, which addresses the range of energy management issues is described. Some 2,602 U.S. institutions of higher education were surveyed in order to identify energy management programs and related courses. More detailed information was sought from respondents who indicated that they had, or planned to offer, such a program. Ten existing, and planned, programs were identified. In addition, 303 institutions were found to offer one or more courses on some aspect of energy management. The 10 existing programs were classified as undergraduate; engineering focused, or general/diversified. They were analyzed in terms of their administrative organization, enrollment and number of degrees awarded to date, availability of financial support for graduate students, program goals and curriculum design. DOE

N79-30825# Mathematica, Inc., Princeton, N. J.

ENERGY FROM URBAN WASTES: REPORT ON A FOCUS GROUP DISCUSSION

W. E. Nicholson 10 Nov. 1978 42 p

(Contract EV-78-C-01-6388)

(DOE/TIC-10022) Avail: NTIS HC A03/MF A01

A qualitative assessment of the opinion concerning the commercialization potential of urban waste technologies is presented. Barriers to the commercialization of the urban waste energy production systems that were discussed include problems in serving long-term contracts, uncertainty about environmental laws, problems with the supply of refuse, disposal and use of residue, uncertainties about future tax laws, legal barriers, technical reliability, and citizen dissent. DOE

N79-30826# Lincoln Lab., Mass. Inst. of Tech., Lexington.

SOLAR MODULE CURVE TRACER

A. R. Millner 7 Feb. 1979 22 p

(Contract EY-76-C-02-4094)

(COO-4094-35) Avail: NTIS HC A02/MF A01

The solar module curve tracer, a hand portable, battery powered instrument, is used to measure the output I-V characteristics of a solar module in a solar cell array. A physical description of the instrument, operating procedure, and circuit theory are presented. DOE

N79-30827# Sandia Labs., Albuquerque, N. Mex.

METHODOLOGY FOR DETERMINING THE ECONOMIC FEASIBILITY OF RESIDENTIAL OR COMMERCIAL SOLAR ENERGY SYSTEMS

Audrey M. Perino Jan. 1979 38 p

(Contract EY-76-C-04-0789)

(SAND-78-0931) Avail: NTIS HC A03/MF A01

A methodology for analyzing the economic feasibility of solar energy systems based upon a life cycle costing criterion is presented. Both residential and commercial solar energy systems are included in the analysis. The analysis provides for a comparison between solar and conventional energy systems. DOE

N79-30828# Los Alamos Scientific Lab., N. Mex.

ECONOMIC PERFORMANCE: EVALUATIONS FOR SOLAR ENERGY

James Frederick Roach and S. A. Noll 1979 11 p refs Presented at the 6th Energy Technol. Conf. and Exposition, Washington, D.C., 26 Feb. 1979

(Contract W-7405-eng-36)

(LA-UR-79-901; Conf-790213-3) Avail: NTIS HC A02/MF A01

The LASL/UNM economic performance methodology--computer code, is reported. The inputs, sets of evaluative procedures, and outputs associated with the methodology/code are discussed. Present status plus on going modifications to the various components are highlighted. The utility of the LASL/UNM code is demonstrated through illustrative examples. DOE

N79-30831# Electricite de France, Chatou. Dept. d'Optimisation et Automisation des Processus.

ENERGY ANALYSIS OF THE HELIO-THERMAL-ELECTRIC CONVERSION [ANALYSE ENERGETIQUE DE LA CONVERSION HELIO-THERMO-ELECTRIQUE]

T. S. Trans Feb. 1977 22 p In FRENCH

(P-77/P40/242) Avail: NTIS HC A02/MF A01

A precise description of the relationship of the sun to the earth in terms of energy is given. The physical position of the sun for any point on the earth is specified. Optical concentration of solar energy is discussed. A system for solar heat conversion is outlined. Thermodynamic conversion of solar energy is also mentioned. Author (ESA)

N79-30832# Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).

RATIONAL ENERGY UTILIZATION IN COKE-OVEN-PLANT OPERATIONS Final Report

Lutz Trepte and Hermann Bankwitz Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1977 209 p refs In GERMAN; ENGLISH summary

(Contract BMFT-ETS-400-A; DFVLR-BPT-03-E5-110A)

(BMFT-FB-T-77-72) Avail: NTIS HC A10/MF A01; ZLDI, Munich DM 43,45

The economic use of energy in coke-oven-plant operations is discussed. In the process of high temperature coking more than 880 percent the heat applied remains as sensible heat in coke and raw gas. Due to present practice in coke plants these amounts of heat have to be considered as energy losses. Technological processes such as dry quenching of coke or methods for heat-recycling from raw gas could save 430,000 Gcal of energy per year in an average sized plant. This energy could be reused internally or provided to external consumers. In the first case the specific energy consumption of a traditional coke-plant would drop by 1/3. Considering the quantitative coke production in the Federal Republic of Germany there are considerable amounts of energy not reused. Because of the concentration of coke production in some highly populated areas it can be favorable to exchange energy between coke-plants and industrial plants or to use the heat energy gained as waste heat from coke-plants in large heating systems (e.g. multi-building heating). Author (ESA)

N79-30833# Deutscher Naturschutzring, e.V., Bonn-Oberkassel (West Germany).

STATEMENT AND COMPARISON BETWEEN DIFFERENT STUDIES ON ENERGY REQUIREMENT Final Report

Hans Hammer, Peter Schmidt-Burr, Heinz W. Simoneit, and Erwin Deischl Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1977 164 p refs In GERMAN; ENGLISH summary Prepared in cooperation with Wirtschaft u. Infrastruktur G.m.b.H. und Co. Planungs-Kg, Munich

(Contract BMFT-ET-5207-A)

(BMFT-FB-T-77-92) Avail: NTIS HC A08/MF A01; ZLDI, Munich DM 29,40

A comparison between two energy requirement investigations on new energy systems ordered by the German government as well as a statement on the results are presented. An analysis of the demand for long distance heat supply is included. Possibilities for energy conservation by a more efficient utilization of energy and the possible use of new sources of energy are shown. Author (ESA)

N79-30834# Engins Matra, Velizy (France). Automatisme Dept.

STUDY OF SYSTEM IMPLICATIONS OF HIGH SPEED FLYWHEELS AS ENERGY STORAGE DEVICES ON SATELLITES, VOLUME 1 Final Report
H. Nghia Nguyen and Francois Mariau Oct. 1978 68 p refs 2 Vol.
(Contract ESA-3261/77/NL-AK)
(Rept-30/1020-Vol-1; ESA-CR(P)-1168-Vol-1) Avail: NTIS HC A04/MF A01

The feasibility of integrated energy storage and attitude control systems using high speed flywheels is demonstrated. The impact of magnetic bearing technologies on these flywheel applications is assessed. The flywheel designs for different mission objectives are briefly reviewed to establish the level of technology required. In particular, power and attitude control sub-systems are evaluated to characterize their functional interaction. Proposed wheel arrays are presented and compared to alternative electrochemical systems. These comparisons indicate that in terms of mass, volume, and reliability, flywheels for satellite applications are preferable. The concise design synthesis of the integrated energy storage and attitude control system concept is presented as well as the technical indexes. Author (ESA)

N79-30836# Engins Matra, Velizy (France). Automatisme Dept.
STUDY OF SYSTEM IMPLICATIONS OF HIGH SPEED FLYWHEELS AS ENERGY STORAGE DEVICES ON SATELLITES, VOLUME 2
H. Nghia Nguyen and Francois Mariau Oct. 1978 262 p refs 2 Vol.
(Contract ESA-3261/77/NL-AK)
(Rept-30/1020-Vol-2; ESA-CR(P)-1168-Vol-2) Avail: NTIS HC A12/MF A01

The feasibility of integrated energy storage and attitude control systems using high speed flywheels is demonstrated. The impact of magnetic bearing technologies on these flywheel applications is assessed. The flywheel designs for different mission objectives are briefly reviewed at the level of technology required. In particular, power and attitude control sub-systems are evaluated to characterize their functional interaction. Proposed wheel arrays are presented and compared to alterative electrochemical systems. These comparisons indicate that in terms of mass, volume, and reliability flywheels for satellite applications are preferable. This report exists as two volumes. Volume 1 contains the concise design synthesis of the Integrated Energy Storage and Attitude Control System concept. Volume 2 contains the technical appendixes. Author (ESA)

N79-30836# Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Trauen (West Germany). Inst. fuer Chemische Antriebe und Verfahrenstechnik.
PHOTOLYTIC DECOMPOSITION OF WATER INTO OXYGEN AND HYDROGEN AS AN ALTERNATIVE ENERGY SOURCE FOR HOUSEHOLDS AND SMALL CONSUMERS
Wolfgang U. Wendekamm Jan. 1978 48 p refs In GERMAN; ENGLISH summary Report will also be announced as translation (ESA-TT-582)
(DLR-FB-78-17) Avail: NTIS HC A03/MF A01; DFVLR, Cologne DM 19.90

The photolytic decomposition of water into oxygen and hydrogen is one of the possible alternatives for the transformation of solar energy into storable secondary energy for practical utilization by households and small consumers. After a survey of the possible cycles of water decomposition, the chemical and physical fundamentals of the photolytic accomposition of water using inorganic catalysts and sensitizers are described. Finally, a total house energy supply system is presented as one illustration of the application possibilities. Author (ESA)

N79-30837# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
GEOTHERMAL ENERGY MARKET STUDY ON THE ATLANTIC COASTAL PLAIN. A REVIEW OF RECENT ENERGY PRICE PROJECTIONS FOR TRADITIONAL SPACE HEATING FUEL, 1985-2000
Richard Weissbrod and William Barron Mar. 1979 47 p refs
(Contract EX-76-A-36-1008)
(PB-294013/8; APL/JHU/GEMS-005; APL/JHU/QM-79-016; MCGER-79/0001) Avail: NTIS HC A03/MF A01 CSCL 21D

In order to develop an initial estimate of the potential competitiveness of low-temperature (45 to 100 C) geothermal resources on the Atlantic Coastal Plain, available energy price projections are reviewed and compared. Since low-temperature geothermal energy competes primarily for the space and process heating markets currently held by petroleum, natural gas, and electricity, projected trends in the real prices for these fuels were examined. GRA

N79-30839# Federal Trade Commission, Washington, D.C. Bureau of Economics.
ECONOMIC STRUCTURE AND BEHAVIOR IN THE NATURAL GAS PRODUCTION INDUSTRY
Joseph P. Mulholland Feb. 1979 179 p refs
(PB-294610/1; FTC/BE-79/04) Avail: NTIS HC A09/MF A01 CSCL 10A

The competitive potential of the natural gas production industry is evaluated. Attention focuses primarily on seller structure within the gas sector, on both a nationwide and regional basis. In a behavioral context, charges of monopolistic supply restraint by the major producers are evaluated by examining the ownership pattern of nonproducing leases in the Federal offshore area. Since Federal price regulation has had a pervasive effect on the gas sector's performance up to the present time, the report's objective is not to evaluate the industry's past performance but, rather, to gauge its potential for workable competition in the absence of price regulation in the future. GRA

N79-30840# United Nations Industrial Development Organization, Vienna (Austria).
INTERNATIONAL FORUM ON APPROPRIATE INDUSTRIAL TECHNOLOGY. APPROPRIATE TECHNOLOGY FOR RURAL ENERGY SUPPLY IN DEVELOPING COUNTRIES
T. Turner Oct. 1978 269 p refs Forum held at New Delhi/Anand, 20-30 Nov. 1978
(PB-294602/8) Avail: NTIS HC A12/MF A01 CSCL 10A

Trends in the search for appropriate energy technologies are described. Situation of the issues of energy supply for integrated rural development within an institutional and international framework was discussed. Recommendations are given. GRA

N79-30846# Argonne National Lab., Ill. Div. of Environmental Control Technology.
ENVIRONMENTAL CONTROL IMPLICATIONS OF INCREASED COAL UTILIZATION UNDER THE NATIONAL ENERGY PLAN
Myron Gottlieb (DOE, Washington, D.C.), C. D. Livengood, and K. E. Wilzbach 1978 18 p refs Presented at the 71st Air Pollution Control Assoc. Meeting, Houston, Tex., 25 Jun. 1978
(Contract W-31-109-eng-38)
(ANL/EES-CP-10; Conf-780636-9) Avail: NTIS HC A02/MF A01

The development, selection, and use of proper environmental controls for the increased utilization of coal is discussed. The complexity of the regulatory and control issues for environmental quality are presented with the impacts they will incur on the coal industry and population. A.W.H.

N79-30848# Southern Research Inst., Birmingham, Ala.
STUDY OF ELECTROSTATIC PRECIPITATORS INSTALLED ON OIL-FIRED BURNERS Final Report
Alan H. Dean Jun. 1978 185 p refs
(EPRI Proj. 413-1)
(EPRI-FP-792-Vol-2) Avail: NTIS HC A09/MF A01

The use of electrostatic precipitators for collection of effluent from oil-fired boilers in the utility industry is discussed. Basically, the information is presented in two sections-literature survey and industry survey. The objectives were to document usage of electrostatic precipitators on oil-fired utility boilers, to present any available design and performance data, to discuss the operating experience, and to present procedure employed to remedy problems identified. A detailed report is presented concerning costs of an electrostatic precipitator for a hypothetical 100 MW oil-fired utility plant; costs were based on year 1971 and are updated to 1976. DOE

N79-30856# SRI International Corp., Menlo Park, Calif.
MODELING OF STATIONARY AIR POLLUTION SOURCES IN THE CENTRAL AND WESTERN KERN COUNTY OIL FIELDS. TASK REPORT. VOLUME 2: APPENDICES
Patricia B. Simmon Jan. 1979 78 p
(Contract EPA-68-01-4137)
(PB-294813/1; SRI-5258-7-Vol-2) Avail: NTIS HC A05/MF A01 CSCL 13B

Sulfur dioxide pollution from steam-injection oil recovery and from other sources in Kern County, California, was studied with a mathematical model. This volume consists of tables of data and of a list of modifications made to the CDM program. GRA

N79-30857# National Technical Information Service, Springfield, Va.
POLLUTION AND ENVIRONMENTAL ASPECTS OF FUEL CONVERSION. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - Mar. 1979
Audrey S. Hundemann May 1979 278 p Supersedes NTIS/PS-78/0314, NTIS/PS-77/0212, NTIS/PS-76/0222 and NTIS/PS-75/371
(NTIS/PS-79/0378; NTIS/PS-78/0314; NTIS/PS-77/0212; NTIS/PS-76/0222; NTIS/PS-75/371) Avail: NTIS HC $28.00/MF $28.00 CSCL 07A

Abstracts dealing with environmental impacts related to fossil fuel conversion processes (primarily coal gasification) are presented. A few citations concerning environmental considerations pertaining to future energy growth are included. GRA

N79-30864# Radian Corp., Austin, Tex.
TRACE ELEMENTS OF FLY ASH: EMISSIONS FROM COAL-FIRED STEAM PLANTS EQUIPPED WITH HOT-SIDE AND COLD-SIDE ELECTROSTATIC PRECIPITATORS FOR PARTICULATE CONTROL Final Report
Robert M. Mann, Robert A. Magee, Robert V. Collins, Michael R. Fuchs, and Frank G. Mesich Dec. 1978 163 p refs
(Contract EPA-68-01-3702)
(PB-295040/0; RAD-78-216-137-09; EPA-908/4-78-008) Avail: NTIS HC A08/MF A01 CSCL 07D

The results of a sampling and chemical analysis study of emissions from two coal-fired steam plants equipped with electrostatic precipitators for particulate control are described. Fly ash collected from the stack using cyclones and cascade impactors was analyzed to define trace element concentration of individual size fractions. Trace element enrichment of ash fractions was compared with an enrichment model to define the dependence of enrichment on particle size. Samples of the feed coal at each station were subjected to density separation to determine the association of each element with mineral (ash) and organio (ash-free) phases of the coal. GRA

N79-30866# North Carolina State Univ. at Raleigh. Dept. of Chemical Engineering.
POLYMERIC INTERFACES FOR STACK MONITORING Final Report, Jan. 1973 - Jun. 1976
Richard M. Felder and James K. Ferrell Nov. 1978 187 p refs
(Grant EPA-R-801578)
(PB-294997/2; EPA-600/2-78-214) Avail: NTIS HC A09/MF A01 CSCL 14B

Research has been performed on the use of polymeric interfaces for in situ continuous stack monitoring of gaseous pollutants. Permeabilities of candidate interface materials to SO2 were measured at temperatures from ambient to 200 C, and the results were used to design interfaces for field tests. A portable field monitoring system was constructed and used to carry out SO2 monitoring runs in two SO3 absorption tower stacks, and in oil-fired and coal-fired power plant boiler stacks. The results were in agreement with data obtained by standard wet chemical methods. GRA

N79-30908# Sandia Labs., Albuquerque, N. Mex.
STATUS OF THE OFFSHORE TECHNOLOGY PROGRAM
Eric W. Reece 1978 9 p refs Presented at the 4th Symp. on Enhanced Oil and Gas Recovery and Improved Drilling Methods, Tulsa, Okla., 29 Aug. 1978
(Contract EY-76-C-04-0789)
(SAND-78-0665; Conf-780825-11) Avail: NTIS HC A02/MF A01

The development of instrumentation systems capable of collecting marine and geologic hazards data in frontier regions of the outer continental shelf is described. Elements common to a variety of remote seafloor instrumentation applications such as acoustic telemetry, digital data acquisition, processing, and storage plus command and control techniques were demonstrated. The design of a seafloor earthquake measurement system was completed. DOE

N79-30923# Oak Ridge National Lab., Tenn.
MUTAGENIC COMPONENTS OF ALTERNATE ENERGY SOURCES
James L. Epler and M. R. Guerin 1978 13 p refs Presented at 71st Air Pollution Assoc. Meeting, Houston, Tex., 25 Jun. 1978
(Contract W-7405-eng-26)
(CONF-780636-8) Avail: NTIS HC A02/MF A01

The use of short term mutagenicity assays to predict the potential biohazard of various crude and complex test materials was examined in a coupled chemical and biological approach. Preliminary chemical characterization and preparation for bioassay, followed by testing in the histidine reversion assay was emphasized. The mutagenicity tests are intended to act as predictors of profound long range health effects such as mutagenesis and/or carcinogenesis, act as a mechanism to rapidly isolate and identify a hazardous biological agent in a complex mixture, and function as a measure of biological activity correlating base line data with changes in process conditions. Mutagenicity tests can also aid in identifying the specific hazardous compounds involved and in establishing priorities for further validative testing, testing in whole animals, and more definitive chemical analysis and monitoring. DOE

N79-31024# Argonne National Lab., Ill.
HAZARDS FROM RADIOACTIVE WASTE IN PERSPECTIVE
Bernard L. Cohen 27 Feb. 1979 9 p Presented at Symp. on Waste Management and Fuel Cycles 1979, Tucson, Ariz., 28 Feb. 1979
(Contract W-31-109-eng-38)
(CONF-790204-9) Avail: NTIS HC A02/MF A01

The hazards from wastes from a 1000 MW(e) nuclear power plant to these from wastes from a 1000 MW(e) coal fueled power plant are compared. The latter hazards is much greater than the former. The toxicity and carcinogenity of the chemicals prodcued in coal burning ins emphasized. Comparisons are also made with other toxic chemicals and with nautral radioactivity. DOE

N79-31067# Decision Focus, Inc., Palo Alto, Calif.
RESOURCE-ALLOCATION METHODOLOGY FOR ESTABLISHING RD AND D BUDGETARY PRIORITIES
D. W. Boyd, D. W. North, and S. G. Regulinski Feb. 1978 178 p refs
(Contract ET-78-C-05-5474)
(ORO-5474-T1) Avail: NTIS HC A09/MF A01

The R, D and D resource-allocation methodology is designed for use by the Assistant Secretary, Energy Technology, in establishing budgetary priorities. It defines a logical process for developing a portfolio of programs consistent with policy goals of the Assistant Secretary, the complexities of the energy marketplace, and the departmental resource constraints. The

methodology has two important components: a set of analytic procedures and a process for communicating information. Both of these aspects are necessary if the methodology is to be successfully implemented. Thus, it is the combination of these two aspects that provides the logical decision process that can cope with the complexities of choosing a portfolio of programs.
DOE

N79-31082# Department of Energy, Washington, D. C. Energy Information Administration.
EVALUATION OF FUTURE WORLD OIL PRICES
K. L. Kincel, C. Kilgore, and M. Rodekohr 2 Jun. 1978 81 p refs
(DOE/EIA-0102/4) Avail: NTIS HC A05/MF A01

An analysis is presented which documents an application of several EIA macroeconomic and energy models to the evaluation of higher world oil prices in the 1980's. An assessment of severe price increases is presented and several adjustments that were made to the models in order to assess the higher world oil prices are included.
DOE

N79-31083# Department of Energy, Dallas, Tex. Energy Information Administration.
REGIONAL RESIDENTIAL SECTOR ENERGY PRICE FORECASTS FOR 1978: ELECTRICITY, NATURAL GAS, NUMBER 2 FUEL OIL, AND PROPANE
P. Donvito and H. Walton Mar. 1979 20 p
(DOE/EIA-0102/46) Avail: NTIS HC A02/MF A01

The prices are intended for use in appliance labeling. Average (as opposed to marginal) prices were requested, because they were considered more comprehensible to consumers and, therefore, appropriate for labeling purposes. Regional prices were calculated from state data. State prices can vary substantially, even within regions. Consequently, state price data are also provided. The estimates for 1978 were developed by extending price trends from the three prior years for electricity and natural gas, and the previous 12 months for heating oil and propane. A discussion of the methods and sources used for each energy source is presented.
DOE

N79-31085# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1980, VOLUME 1, PART 4
Washington GPO 1979 760 p refs Hearings on H.R. 1756 before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 15, 21-22, 28 Feb., 9, 12 Mar. 1979
(GPO-46-423) Avail: Subcomm. on Space Sci. and Applications

Budget requests for NASA's Office of Space Transportation are justified with emphasis on the supplemental request for space shuttle appropriations. Space applications programs related to using space as a relay point, for Earth observation, and to exploit its specific characteristics are dicussed as well as the satellite conversion and transmission of energy to Earth. Field hearings at Rockwell International and Lockheed are included. A.R.H.

N79-31087*# Detroit Diesel Allison, Indianapolis, Ind.
CONCEPTUAL DESIGN STUDY OF AN IMPROVED GAS TURBINE (IGT) POWERTRAIN Report, Mar. - Nov. 1978
R. A. Johnson Jul. 1979 241 p refs Revised
(Contract DEN3-28)
(NASA-CR-159604; DDA-EDR-9719; DOE/NASA/0028-79/1) Avail: NTIS HC A11/MF A01 CSCL 13F

Design concepts for an improved automotive gas turbine powertrain are discussed. Twenty percent fuel economy improvement (over 1976), competitive costs (initial and life cycle), high reliability/life, low emissions, and noise/safety compliance were among the factors considered. The powertrain selected consists of a two shaft gas turbine engine with variable geometry aerodynamic components and a single disk rotating regenerator. The regenerator disk, gasifier turbine rotor, and several hot section flowpath parts are ceramic. The powertrain utilizes a conventional automatic transmission. The closest competitor was a single shaft turbine engine matched to a continuously variable transmission (CVT). Both candidate powertrain systems were found to be similar in many respects; however, the CVT represented a significant increase in development cost, technical risk, and production start-up costs over the conventional automatic transmission. Installation of the gas turbine powertrain was investigated for a transverse mounted, front wheel drive vehicle.
K.L.

N79-31088*# Ford Motor Co., Dearborn, Mich.
CONCEPTUAL DESIGN STUDY OF IMPROVED AUTOMOTIVES GAS TURBINE POWERTRAIN Final Report
May 1979 215 p refs Prepared in cooperation with AiResearch Mfg. Co., Phoenix, Ariz.
(Contracts DEN3-37; EC-77-A-31-1040)
(NASA-CR-159580; DOE/NASA/0037-79/1) Avail: NTIS HC A10/MF A01 CSCL 13F

Twenty-two candidate engine concepts and nineteen transmission concepts. Screening of these concepts, predominantly for fuel economy, cost and technical risk, resulted in a recommended powertrain consisting of a single-shaft engine, with a ceramic radial turbine rotor, connected through a differential split-power transmission utilizing a variable stator torque converter and a four speed automatic gearbox. Vehicle fuel economy and performance projections, preliminary design analyses and installation studies in a were completed. A cost comparison with the conventional spark ignited gasoline engine showed that the turbine engine would be more expensive initially, however, lifetime cost of ownership is in favor of the gas turbine. A powertrain research and development plan was constructed to gain information on timing and costs to achieve the required level of technology and demonstrate the engine in a vehicle by the year 1983.
A.R.H.

N79-31093# Oak Ridge National Lab., Tenn.
ECONOMICS OF THE ANFLOW PROCESS FOR MUNICIPLE SEWAGE TREATMENT
W. L. Griffith Mar. 1979 88 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6574) Avail: NTIS HC A05/MF A01

The cost and energy requirements for conventional activated sludge, trickling-filter, and ANFLOW processes were compared to assess the potential of the ANFLOW process for municipal sewage treatment. Based on literature sources, capital-cost estimates, operating manpower requirements, energy requirements, and combined annual costs were developed for each alternative.
DOE

N79-31105# Office of Technology Assessment, Washington, D. C.
TECHNOLOGY ASSESSMENT OF CHANGES IN THE FUTURE USE AND CHARACTERISTICS OF THE AUTOMOBILE TRANSPORTATION SYSTEM. SUMMARY AND FINDINGS
Feb. 1979 48 p refs 2 Vol.
(PB-293645/8; OTA-T-83; LC-79-600030-1) Avail: NTIS HC A03/MF A01 CSCL 13F

The assessment deals with changes in the future use and characteristics of the automobile transportation system that are expected in the near term (by 1985) and those that might evolve over a longer period (through 2000 and beyond). The scope of the assessment is broad and includes not only automobiles but also highways, fuel supply and distribution, automotive repair and service, insurance, traffic management, and law enforcement in short, all of the industries and services that contribute to use of the automobile as a mode of personal transportation. The report analyzes the restraints of energy supply, environmental impacts, highway safety, and consumer cost on the further development of the automobile transportation system. It discusses Government initiatives that may be necessary to assure such further development.
GRA

N79-31106# Office of Technology Assessment, Washington, D. C.
TECHNOLOGY ASSESSMENT OF CHANGES IN THE FUTURE USE AND CHARACTERISTICS OF THE AUTOMOBILE TRANSPORTATION SYSTEM, VOLUME 2

Feb. 1979 385 p refs 2 Vol
(PB-293646/6; OTA-T-84; LC-79-600030-2) Avail: NTIS
HC A17/MF A01 CSCL 13F

The report consists of three parts. The first part contains background information, a description of the elements of the automobile transportation system. Base Case projections, and delineation of the policy alternatives that were considered. A baseline of present and future automobile system characteristics that serve as the frame of reference for policy analysis is provided. The second part contains analyses of policy options in each of the five issue areas: energy, environment, safety, mobility, and cost and capital. A discussion of issues, a summary of present policy, a statement of policy options and analysis of effects and impacts are included. The third part is a survey of expected technological developments in the near term (through 1985) and in the far term (to 2000 and beyond). A summary of major findings is also included. GRA

N79-31107# Minibus Forest, Inc., Montreal (Quebec).
MODIFICATION AND EVALUATION OF A SMALL STATION WAGON DESIGNED FOR TRANSPORTATION OF THE HANDICAPPED Final Report
Jacques Forest and C. A. Versailles Jun. 1978 40 p Transl. into ENGLISH of Can. Rept. on Elderly and Handicapped Modification Tests Sponsored by DOT and Centre de Rech. et de Develop. Transports Can.
(Proj. 6281)
(PB-295106/9; UMTA-MA-06-0025-79-12; TP-1777) Avail: NTIS HC A03/MF A01 CSCL 13F

The project was designed to modify and evaluate a small stationwagon to be used to transport handicapped people in a door-to-door service. The project made it possible to determine specific data in terms of future modifications. The report concludes that: (1) the project shows that a small modified stationwagon can be used to transport handicapped people and provide both a useful and viable service; (2) the prototype evaluated has the required size, capacity, comfort, and versatility; and (3) the cost of modification, the weight and gas consumption could be substantially reduced if these vehicles were modified en masse, because that would justify using a fiberglass body rather than a steel one. GRA

N79-31110# Transportation Systems Center, Cambridge, Mass.
DIESEL BUS PERFORMANCE SIMULATION PROGRAM Final Report, Mar. 1977 - Apr. 1979
Glenn Larson and Harry Zuckerberg Apr. 1979 206 p refs
(PB-295524/3; DOT-TSC-UMTA-79-16;
UMTA-MA-06-0044-79-1) Avail: NTIS HC A10/MF A01
CSCL 13F

A diesel bus performance computer simulation program was developed. This program provides information on acceleration, velocity, horsepower, distance traveled, and fuel comsumption as a function of time from the originating station. The program was written for diesel engine operation although heat engines other than diesel may be substituted. Fuel economy calculations, using the program, agree well with available measurements on urban buses and may be considered as representative of a baseline urban bus. Component submodels and vehicle coefficients used in the program were carefully structured to represent current urban buses. A general description of the simulation program and the type of input data it required along with the results obtained by simulating a typical transit bus are included. GRA

N79-31163*# National Aeronautics and Space Administration, Washington, D. C.
SUPERSONIC TRANSPORT VIS-A-VIS ENERGY SAVINGS
G. Cormery Sep. 1979 27 p Transl. into ENGLISH from Aeron. Astronaut (Paris), vol. 69, no. 2, 1978 p 3-14 Original language document was announced as A78-35893 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-75464) Avail: NTIS HC A03/MF A01 CSCL 01C

The energy and economic saving modifications in supersonic transportation are studied. Modifications in the propulsion systems and in the aerodynamic configurations of the Concorde aircraft to reduce noise generation and increase fuel efficiency are discussed. The conversion of supersonic aircraft from fuel oils to synthetic fuels is examined. A.W.H.

N79-31208*# Pratt and Whitney Aircraft, East Hartford, Conn. Commercial Products Div.
JT9D-70/59 IMPROVED HIGH PRESSURE TURBINE ACTIVE CLEARANCE CONTROL SYSTEM
W. O. Gaffin 8 Jun. 1979 66 p ref
(Contract NAS8-20630)
(NASA-CR-159661; PWA-5515-87C) Avail: NTIS
HC A04/MF A01 CSCL 21E

The JT9D-70/59 high pressure turbine active clearance control system was modified to provide reduction of blade tip clearance when the system is activated during cruise operation. The modification increased the flow capacity and air impingement effectiveness of the cooling air manifold to augment turbine case shrinkage capability, and increased responsiveness of the airseal clearance to case shrinkage. The simulated altitude engine testing indicated a significant improvement in specific fuel consumption with the modified system. A 1000 cycle engine endurance test showed no unusual wear or performance deterioration effects on the engine or the clearance control system. Rig tests indicated that the air impingement and seal support configurations used in the engine tests are near optimum. K.L.

N79-31251*# PRC Energy Analysis Co., McLean, Va.
SATELLITE POWER SYSTEM (SPS) RESOURCE REQUIREMENTS (CRITICAL MATERIALS, ENERGY, AND LAND)
Allan D. Kotin (Kotin (Allan D.) Economic Consultants, Los Angeles, Calif.) Oct. 1978 126 p refs Sponsored in cooperation with NASA
(Contract EG-77-C-01-4024)
(NASA-CR-162310; SE-4024-T1) Avail: NTIS
HC A07/MF A01 CSCL 10A

The resource impacts of the proposed satellite power system (SPS) were reviewed. Three classes of resource impacts were considered separately: critical materials, energy and land use. The analysis focused on the requirements associated with the annual development of two five-gigawatt satellites and the associated receiving facilities. DOE

N79-31269# Royal Netherlands Aircraft Factories Fokker, Schiphol-Oost.
EXPERIENCES RELATED TO GEOS THERMAL CONTROL
N. J. vandeBraak *In* ESA Spacecraft Thermal and Environ. Control Systems Oct. 1978 p 19-25 refs

Avail: NTIS HC A99/MF A01

The thermal control subsystem of the European scientific satellite GEOS is described. Experience obtained during design, development, and hardware assembly is reviewed. Special attention is paid to electrical conductivity and grounding of thermal control materials. Further specific problem areas related to appendages, the apogee boost motor, and the reaction control equipment are examined. Author (ESA)

N79-31272# ISRO Satellite Centre, Peenya, Bangalore (India).
OBSERVATIONS MADE DURING THE DEVELOPMENT OF A THERMAL CONTROL SYSTEM FOR A NEAR EARTH ORBITING SATELLITE
H. N. Murthy, D. R. Bhandari, and V. Prasad *In* ESA Spacecraft Thermal and Environ. Control Systems Oct. 1978 p 47-51 refs
Avail: NTIS HC A99/MF A01

The experience gained during the development of a passive thermal control system for the near earth orbiting spacecraft 'Aryabhata' shows that the system cost could be brought down by minimizing the fabrication complexities and the thermal balance

tests. Analysis carried out show that the reduced conduction exchange between top and bottom shells of the spacecraft due to the change in fabrication procedures would not affect the temperature distribution appreciably. The results of thermal balance test conducted on a 0.4 size scale model yield satisfactory results. The inflight temperature data received at the ground station shows good agreement with the predicted temperatures.
Author (ESA)

N79-31274# Stuttgart Univ. (West Germany). Inst. fuer Kernenergetik und Energiesysteme.
HEAT PIPE TECHNOLOGY FOR SPACECRAFT THERMAL CONTROL
M. Groll *In* ESA Spacecraft Thermal and Environ. Control Systems Oct. 1978 p 61-70 refs

Avail: NTIS HC A99/MF A01

Heat pipe design concepts, materials, and temperature ranges of operation are surveyed. Characteristics of capillary structures and of heat pipe performance are discussed. Variable conductance and thermal diode techniques are discussed and their performance characteristics are presented. The state-of-the-art of heat pipe technology for spacecraft temperature control is reviewed and examples of satellite applications are presented. In addition, the spin-off of this space technology with respect to terrestrial applications is discussed and respective examples are presented.
Author (ESA)

N79-31275# Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).
DEVELOPMENT OF A HEAT PIPE COOLED 200 WATT TWT WITH IMPROVED EFFICIENCY
H. Kreeb and P. Pawlowski *In* ESA Spacecraft Thermal and Environ. Control Systems Oct. 1978 p 71-72

Avail: NTIS HC A99/MF A01

The self-radiating collector of a 200 W, 12 GHz TWT is replaced by a heat pipe cooling system. The outer diameter of the collector, including the heat pipe cooling system is limited to 40 mm, small enough for focusing of the electron beam by magnetic rings. The TWT with a magnetically focused collector (3 stages) will improve the overall efficiency to about 44%. The other parts of the TWT will be cooled by a separate heat pipe system including a gas-controlled heat pipe radiator. A test of the whole system is planned for one of the first missions.
Author (ESA)

N79-31276# Erno Raumfahrttechnik G.m.b.H., Bremen (West Germany).
A HEAT PIPE RADIATOR FOR SHUNT ELECTRONICS: DEVELOPMENT AND TEST RESULTS
R. Schlitt *In* ESA Spacecraft Thermal and Environ. Control Systems Oct. 1978 p 73-83 refs Sponsored by Bundesmin. fuer Forsch. und Technol.

Avail: NTIS HC A99/MF A01

The design fabrication, and test of a 350 mm x 1600 mm heat pipe radiator to cool large dissipation shunt electronics are described. A configuration with six parallel heat pipes held between layers of a honeycomb sandwich was selected using ammonia as the working fluid. Special attention was given to the interface with the power transistor. Tests were carried out in a liquid nitrogen shrouded vacuum chamber to simulate deep space environment. Test results correlate very well with calculated temperatures.
Author (ESA)

N79-31278# Societe Nationale Industrielle Aerospatiale, Cannes (France).
HEAT PIPES IN THE THERMAL CONTROL OF COMMUNICATION SATELLITES OF THE FORTHCOMING GENERATION (H-SAT)
B. Moschetti *In* ESA Spacecraft Thermal and Environ. Control Systems Oct. 1978 p 91-97 refs

Avail: NTIS HC A99/MF A01

Performance of a telecommunications panel with variable conductance heat pipe (VCHP) regulation, and of an experimental radiator module with extruded constant conductance heat pipe (CCHP) regulation are described. The VCHP regulated panel, already presented at the International Heat Pipe Conference in 1976, successfully passed all thermal tests scheduled until September 1976, the results of which are given. In December 1977, the panel was once more tested in thermal vacuum and the original thermal performance data recorded 14 months earlier was verified. This prototype is currently undergoing the endurance qualification test scheduled for a period exceeding 7 years. The CCHP equipped radiator module involves a special mounting technique which combines a carrier honeycomb sandwich structure and two crossed networks of heat pipes. The radiator has also passed thermal vacuum tests with quite satisfactory results as to the performance.
Author (ESA)

N79-31360*# Celanese Research Co., Summit, N.J.
ULTRAFINE POLYBENZIMIDAZOLE (PBI) FIBERS Final Report, Jun. 1976 - Jun. 1979
E. C. Chenevey Jun. 1979 119 p refs
(Contract NAS3-20040)
(NASA-CR-159644) Avail: NTIS HC A06/MF A01 CSCL 11D

Mats were made from ultrafine polybenzimidazole (PBI) fibers to provide an alternate to the use of asbestos as separators in fuel cells and alkaline batteries. To minimize distortion during mat drying, a process to provide a dry fibrid was developed. Two fibrid types were developed: one coarse, making mats for battery separators; the other fine, making low permeability matrices for fuel cells. Eventually, it was demonstrated that suitable mat fabrication techniques yielded fuel cell separators from the coarser alkaline battery fibrids. The stability of PBI mats to 45% KOH at 123 C can be increased by heat treatment at high temperatures. Weight loss data to 1000 hours exposure show the alkali resistance of the mats to be superior to that of asbestos.
Author

N79-31363# Oak Ridge National Lab., Tenn.
ENHANCED OIL RECOVERY CHEMICALS FROM RENEWABLE WOOD RESOURCES
W. N. Grune, A. L. Compere, W. L. Griffith, and J. M. Crenshaw Apr. 1979 69 p refs
(Contract W-7405-eng-26)
(ORNL-5525) Avail: NTIS HC A04/MF A01

Processes which produce useful materials from pulp and paper wastewater streams are surveyed. Emphasis is placed on chemical recovery processes, particularly production of micellar flooding chemicals to be used in advanced petroleum recovery techniques. It is indicated that production of industrial chemicals from a renewable, continuously harvested resource (wood pulp wastewater streams) may be a viable method to decrease U.S. dependence on foreign oil producers, to decrease cost of advanced petroleum recovery techniques through the synthesis of low cost chemicals, and to decrease accumulation of pollutable industrial wastes.
J.M.S.

N79-31364# Brookhaven National Lab., Upton, N. Y.
FeTi METHANATION CATALYST
James R. Lynch, Len D. Spaulding, and Richard S. Sapienza Jun. 1978 12 p refs Presented at Am. Chem. Soc. Meeting, Miami, Fla., 10-15 Sep. 1978
(Contract EY-76-C-02-0016)
(BNL-24477; Conf-780902-1) Avail: NTIS HC A02/MF A01

The intermetallic compound FeTi was found to catalyze the reduction of CO and CO2 to methane by hydrogen. The CO reduction yielded traces of ethane as did CO2, in addition, CO2 reduction yielded small amounts of methanol. The appearance of CH4 was linear with time for both CO and CO2 and the rate of CO2 reduction was faster than that observed for CO. The product distribution and rate data lend support to and are discussed in terms of the proposed oxide theory for Fischer-Tropsch and related synthesis.
DOE

N79-31383# Sandia Labs., Livermore, Calif.
FORMATION OF PROTECTIVE LAYERS ON ALLOYS DEVELOPED FOR USE IN COAL GASIFICATION ENVIRONMENTS Final Report
R. W. Bradshaw, R. E. Stoltz, and D. R. Adolphson 30 Sep. 1978 100 p refs
(Contract EY-76-C-04-0789)
(SAND-78-8277) Avail: NTIS HC A05/MF A01

Improvement in high temperature compatibility of iron and nickel based alloys in coal gasification environments was investigated. The addition of a few weight percent titanium to 310 stainless steel and Ni-30Cr was very effective in both isothermal and cyclic high temperature atmospheres which simulated the corrosion potential existing in the 1800 F high Btu coal gasification process. Alloy fabrication practices were unaffected and standard welding processes did not alter mechanical behavior or compatibility. Further work on 310 revealed that the as-received mechanical properties were unaffected by the Ti additions; that the normal levels of impurities and minimum specification level of chromium did not alter the beneficial effects of Ti; and that the mechanism by which Ti improves compatibility is linked to microstructural or chemical changes in the surface CR2O3 coating. DOE

N79-31386# International Nickel Co., Inc., Suffern, N. Y. Inco Research and Development Center.
EVALUATION OF HIGH CHROMIUM OVERLAYS TO PROTECT LESS ALLOYED SUBSTRATES FROM CORROSION IN A COAL GASIFICATION ATMOSPHERE Quarterly Report, 1 Dec. 1977 - 28 Feb. 1978
Edward P. Sadowski 1978 31 p
(Contract EF-77-C-01-2621)
(FE-2621-2) Avail: NTIS HC A03/MF A01

The development and evaluation of weld deposited overlays to provide resistance to corrosion in coal gasification atmospheres is reported. Weld deposition techniques and procedures for three weld processes are described. The weld processes are gas tungsten arc with hot wire, gas metal arc, and submerged arc. Single and double overlays were tested and evaluated. The tests consisted of hardness surveys, bend and tensile tests, bulk chemical analysis of the overlay, and microprobe analysis for the distribution of the major alloying elements from the outside edge of the overlay through the thickness of the base plate. A.W.H.

N79-31404# Committee on Government Operations (U. S. House).
BIOMASS CONVERSION
Washington GPO 1978 163 p refs Hearing before a Subcomm. of the Comm. on Government Operations, 95th Congr., 2d Sess., 14 Apr. 1978
(GPO-32-317) Avail: Comm. on Government Operations

Testimony was given and arguments were heard on the economics and the technical viability of producing alcohol fuels and chemical feedstocks from agricultural products and wastes and urban organic wastes. M.M.M.

N79-31405*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARISON OF THE PROPERTIES OF SOME SYNTHETIC CRUDES WITH PETROLEUM CRUDES
Albert C. Antoine Jul. 1979 31 p refs
(NASA-TM-79220; E-115) Avail: NTIS HC A03/MF A01 CSCL 21D

Physical properties and chemical compositions of six synthetic crudes were determined. The results were compared to those of typical petroleum crudes, with the interest being the feasibility of making jet fuels from oil shale and coal syncrudes. The specific gravity, viscosity, and pour point were measured, showing that these crudes would be described as heavier rather than lighter crudes. The boiling range distribution of the crudes was determined by distillation and by gas chromatography. In addition, gel permeation chromatograms were obtained, giving a unique molecular weight distribution profile for each crude. Analyses for carbon, hydrogen, nitrogen and sulfur concentrations were performed, as well as for hydrocarbon group type and trace element concentrations. It was found that the range in concentration of vanadium, an element whose presence in turbine fuels is of major concern, was lower than that of petroleum crudes. Sodium and potassium, other elements of concern, were present in comparatively high concentrations. Author

N79-31406# National Technical Information Service, Springfield, Va.
HYDROGEN PRODUCTION, VOLUME 1. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - 1977
Diane M. Cavagnaro Jun. 1979 233 p
(NTIS/PS-79/0540/9) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

This bibliography contains citations on the manufacturing of hydrogen by electrolysis, coal gasification, and other techniques. They cover both experimental research and production on the industrial scale. Although most of the citations are on production methods, economic studies are also included. (This updated bibliography contains 227 abstracts, none of which are new entries to the previous edition.) GRA

N79-31407# National Technical Information Service, Springfield, Va.
HYDROGEN PRODUCTION, VOLUME 2. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1978 - May 1979
Diane M. Cavagnaro Jun. 1979 150 p Supersedes NTIS/PS-75/379; NTIS/PS-78/0514; NTIS/PS-77/0492; NTIS/PS-76/0459
(NTIS/PS-79/0541/7; NTIS/PS-75/379; NTIS/PS-78/0514; NTIS/PS-77/0492; NTIS/PS-76/0459) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

The cited reports include studies on the manufacturing of hydrogen by electrolysis, coal gasification and other techniques. They cover both experimental research and production on the industrial scale. Although most of the reports are on production methods, economic studies are also included. The updated bibliography contains 144 abstracts, 49 of which are new entries to the previous edition. GRA

N79-31410# Institute of Gas Technology, Chicago, Ill.
RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS (RISER CRACKING OF COAL) Quarterly Report, 1 Jul. - 30 Sep. 1978
D. A. Duncan, Justin L. Beeson, and R. Donald Oberle Dec. 1978 34 p refs
(Contract EX-76-C-01-2307)
(FE-2307-42; QR-2) Avail: NTIS HC A03/MF A01

Methods for handling caking coals were explored including the use of dry diluents, extractive solvents, and additives. Both silica sand and devolatilized char were successfully used as dry diluents, but processing was inefficient. Slurrying with a solvent carrier comprised of 20% weight naphthalene, 40% by weight toluene, and 40% by weight phenol is in the evaluation stage, as is the use of additives which are used at the level of 10% by weight additive with 90% by weight coal. One of the most promising systems is coal treated in water with calcium hydroxide with subsequent evaporation of the water to obtain dry solids for feeding. A low pressure simulator of a PD combustor section was built and operated; there does not appear to be any critical relationship between the mainstream velocity and the entering oxygen velocity, allowing considerable latitude in sizing the air/oxygen injection needle. For temperature changes of 300 F, the use of ceramic shields does not appear to be necessary. DOE

N79-31411# SRI International Corp., Menlo Park, Calif.
HOMOGENEOUS CATALYTIC HYDROCRACKING PROCESSES FOR CONVERSION OF COAL TO LIQUID FUELS: BASIC AND EXPLORATORY RESEARCH Quarterly Report, 16 Sep. - 15 Dec. 1978
12 Mar. 1979 33 p refs
(Contract EX-76-C-01-2202)
(FE-2202-39) Avail: NTIS HC A03/MF A01

The role of base in both coal and lignite liquefaction in the CO-H_2O system was explored as well as the catalysis of coal conversion in tetralin by KOH, and the effects of $LiA1H_4$ pretreatment of coal on its subsequent upgradability. Results suggest that, although KOH is important for obtaining high conversion yields from bituminous coal in CO-H_2O, its importance is largely indirect, serving to leach transition metals from the autoclave. Lignite conversion is little affected by the presence or absence of KOH in the system. The addition of KOH and H_2O to tetralin had no effect on bituminous coal conversion: the action of tetralin was not catalyzed. Pretreatment of a bituminous coal with $LiA1H_4$ to reduce any quinones present had a small but measurably favorable effect on its solubility compared with that of untreated coal. This difference remained even after heating under vacuum, but disappeared upon heating in H_2 or tetralin. DOE

N79-31413# Midwest Research Inst., Golden, Colo.
PROCESS DESIGNS AND COST ESTIMATES FOR A MEDIUM BTU GASIFICATION PLANT USING A WOOD FEEDSTOCK
Raymond E. Desrosiers Feb. 1979 61 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-33-151) Avail: NTIS HC A04/MF A01

A gasification plant to effect the conversion of wood to medium Btu gas described. The cost of the processing steps common to all gasification schemes and specific research areas are examined. Capital investment statements for three plant sizes are included along with manufacturing costs for each of these at three feedstock prices. The design incorporates a front end handling system, package cryogenic oxygen plant, the gasifier, a gas cleaning train consisting of a spray scrubber, ionizing wet scrubber, and condenser, and a wastewater treatment facility including a cooling tower and a package activated sludge unit. Cost figures for package units were obtained from suppliers and used for the oxygen and wastewater treatment plants. The gasifier is fed with wood chips at 20% moisture (wet basis). For each pound of wood, 0.32 lb of oxygen are required, and 1.11 lb of gas are produced. DOE

N79-31414# Braun (C. F.) and Co., Alhambra, Calif.
COMBINED SHIFT-METHANATION PROCESSES Final Report
N. G. Kertamus Sep. 1978 32 p
(Contract EX-76-C-01-2240)
(FE-2240-97) Avail: NTIS HC A03/MF A01

The potential advantage of combining shift and methanation reactions is the reduction of two gas processing operations employing separate catalysts and reactors into a single operation with only one catalyst. Multiple reactors are required for both the combined shift methanation and separate shift methanation processes. The basis for economic comparison is the lowest total of capital cost plus four years of operating costs. The results show that the separate shift and methanation process is clearly superior economically to the three combined shift and methanation processes originally proposed by the licensors. Because of the high cost of energy, the relative economics of these processes is strongly influenced by energy recovery. The major factor in favor of the separate shift and methanation processes is that it recovers more useful energy than the combined shift methanation processes. The relative rankings are shown. DOE

N79-31415# Utah Univ., Salt Lake City Dept. of Mining and Fuels Engineering.
APPLIED RESEARCH AND EVALUATION OF PROCESS CONCEPTS FOR LIQUEFACTION AND GASIFICATION OF WESTERN COALS Quarterly Progress Report, Apr. - Jun. 1978
W. H. Wiser Jul. 1978 49 p
(Contract EX-76-C-01-2006)
(FE-2006-12) Avail: NTIS HC A03/MF A01

Sixteen research projects in the gasification or liquefaction of coal, catalysis, or related research are reviewed. Fundamental principles involved and the properties of coal and coal conversion products are discussed. DOE

N79-31416# Bechtel Corp., San Francisco, Calif.
ANALYSIS OF COAL HYDROGASIFICATION PROCESSES Final Report
M. Epstein, T. P. Chen, and M. A. Ghaly Aug. 1978 166 p refs
(Contract EF-77-A-01-2565)
(FE-2565-14) Avail: NTIS HC A08/MF A01

The operability potential and scaleup feasibility of coal hydrogasification processes were investigated. The entrained downflow reactor systems operate at temperatures up to 2,000 F and pressures up to 3,000 psi. Reactor product is primarily methane. Bituminous, subbituminous, and lignite coal hydrogasification and hydropyrolysis data for each process were collected and analyzed. Semiempirical correlations for predicting overall carbon conversion efficiency and carbon selectivity to gaseous products were fitted to the data. A conceptual design of a full-scale hydrogasification reactor was generated on the basis of the subbituminous coal data gathered in the various reactors, together with the predictive reactor performance models fitted to the data. DOE

N79-31417# Braun (C. F.) and Co., Alhambra, Calif.
CONSIDERATIONS IN SIZING COAL GASIFICATION PLANTS Final Report
R. E. Musgrove and D. L. Maifield 1978 68 p refs
(Contract EX-76-C-01-2240)
(FE-2240-40) Avail: NTIS HC A04/MF A01

The economy of scale favors the largest practical size plant. The size constraints of practicality for coal gasification at this time are principally technological, through under some circumstances coal availability, market demand, labor conditions capital availability, and particularly regulatory policy may have some influence on the size of a plant at a particular location. The 250 billion Btu per day size plant seems to meet all of the constraints fairly well, though the specific size is not mandatory. Many plants of that size could be built in the areas we studied. The increased cost of gas produced from plants smaller than 250 billion Btu per day practically dictates the alternative of transporting coal and water over reasonable distances to a 250 billion Btu per day or larger size plant. Building separate smaller plants at the site of the coal deposits should only be considered under unusual circumstances of local demand or terrain which would make transportation of resources significantly less attractive. DOE

N79-31418# Pittsburgh Univ., Pa. Dept. of Chemical and Petroleum Engineering.
ADDITION OF DEVOLATILIZATION EQUATIONS TO SYNTHANE COMPUTERIZED MATHEMATICAL MODEL Quarterly Report, 15 Sep. - 15 Dec. 1978
J. T. Cobb, Jr. Jan. 1979 10 p refs
(Contract EW-78-S-22-0277)
(COO-0277-1) Avail: NTIS HC A02/MF A01

Six approaches to devolatilization modeling were reviewed. Two were further evaluated: the Vand-type model of Anthony and Howard and the diffusion model of Russel et al. The first of these treats particles under kinetic control only. The second includes some mass transfer control along with kinetic control. Behavior of particles in the synthane process appears to be in the transition region between kinetic and mass transfer control. DOE

N79-31419# Oklahoma State Univ., Stillwater School of Chemical Engineering.
DEVELOPMENT OF A PROCESS FOR PRODUCING AN ASHLESS, LOW-SULFUR FUEL FROM COAL. VOLUME 4: PRODUCT STUDIES. PART 10: COAL LIQUIDS CATALYST WORK PERFORMED AT OKLAHOMA STATE UNIVERSITY. SOLVENT REFINED COAL (SRC) PROCESS Final Interim Report, 17 Jun. 1970 - 16 Jun. 1975
Billy L. Crynes Jan. 1979 79 p refs Prepared in cooperation with Pittsburg and Midway Coal Mining Co., Shawnee Mission, Kans.
(Contract EX-76-C-01-0496)
(FE-0496-T10-Vol-4-Pt-10; FIR-19;
Res/Develop-53-Vol-4-Pt-10) Avail: NTIS HC A05/MF A01

The effects of catalyst support pore properties on sulfur and nitrogen removal from certain coal liquids were assessed. The research was divided into three broad areas: (1) equipment and analytical operability; (2) catalyst assessment over variables of space time, temperature, and pressure; and (3) 200 hour catalyst activity tests at fixed conditions. DOE

N79-31421# Brookhaven National Lab., Upton, N. Y.
FUSION REACTORS FOR SYNTHETIC FUELS
J. R. Powell 1979 5 p Presented at the ANS Ann. Meeting, Atlanta, 3-6 Jun. 1979
(Contract EY-76-C-02-0016)
(BNL-25634; Conf-790602-39) Avail: NTIS HC A02/MF A01

Some of the types of processes now being considered for synthetic fuels production from fusion energy, together with an example of each type are listed. The process efficiency is defined as the chemical energy in the generated hydrogen (at the higher heating value (HHV)) divided by the total fusion energy release, including alpha particles and secondary neutron reactions in the blanket. Except where specifically noted, both high and low temperature blanket heats are counted as part of total fusion energy release. DOE

N79-31422# Midwest Research Inst., Golden, Colo.
PHOTOBIOLOGICAL PRODUCTION OF HYDROGEN: A SOLAR ENERGY CONVERSION OPTION
P. Weaver, S. Lien, and M. Seibert Jan. 1979 109 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-33-122) Avail: NTIS HC A06/MF A01

The history of photobiological hydrogen production from its discovery in relatively pure cultures during the early 1930s to the present is reviewed with emphasis on hydrogen production by phototrophic organisms (and their components) which occurs at the expense of light energy and electron-donating substrates. Among the topics included is an overview of hydrogen metabolism in photosynthetic bacteria, eucaryotic algae, and cyanobacteria (blue-green algae). The primary enzyme systems, including hydrogenase and nitrogenase, are discussed along with the manner in which they are coupled to electron transport and the primary photochemistry of photosynthesis. A number of in vivo and in vitro photobiological hydrogen evolving schemes including photosynthetic bacterial, green algal, cyanobacterial, two-stage, and cell-free systems are examined. Specific technical problem areas that currently limit the yield and duration of many of the systems and research that might lead to progress in these specific areas are discussed. DOE

N79-31423# Department of Energy, Bartlesville, Okla. Energy Technology Center.
ETHANOL/GASOLINE BLENDS AS AUTOMOTIVE FUEL
J. R. Allsup and D. B. Eccleston May 1979 17 p refs
(BETC/RI-79/2) Avail: NTIS HC A02/MF A01

Vehicle tests were conducted to determine the influence of ethanol in a 10% ethanol/90% gasoline fuel mixture on fuel economy, regulated and unregulated exhaust emissions, exhaust hydrocarbon distribution, and road octane quality. Volumetric fuel economy was shown to be slightly decreased while energy economy was slightly increased using the ethanol/gasoline blend compared to gasoline. When compared to the base gasoline, the use of the ethanol/gasoline blend caused no deleterious effects upon regulated emissions at ambient temperatures from 20 to 75 F; at 100 F ambient there were minor increases in emissions using the ethanol/ gasoline blend. The ethanol/gasoline blend generally had either no effect on or reduced all unburned hydrocarbon components except at the 100 F test conditions compared to gasoline. Road octane quality was shown to be increased by the use of the ethanol/gasoline blend compared to gasoline. DOE

N79-31432# Aerospace Corp., El Segundo, Calif.
UTILIZATION OF USED OIL Final Report
G. J. Mascetti and H. M. White Aug. 1978 396 p
(Contract EY-76-C-1101-003)
(ATR-78(7384)1) Avail: NTIS HC A17/MF A01

The potential impact of re-refining used automotive and industrial lubricating oils on the national petroleum consumption is assessed. The technical base for this assessment is derived from a comprehensive review of the processes utilized in re-refining used oil and those processes used to produce lube oil from crude. Existing and recently proposed processes are considered. An extensive review of processes described in the patent literature is provided. Re-refining processes are surveyed and evaluated. Process descriptions are provided, hardware is identified, and process energy and economic requirements are calculated. Factors affecting the profitability of a re-refining operation are discussed. Economic projections of the demand for lube oil and the ability to satisfy this demand from crude oil are made and the value of lube oil as a vital resource and the need for conservation are addressed. DOE

N79-31433# National Technical Information Service, Springfield, Va.
SYNTHETIC FUELS FROM MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL WASTES. CITATIONS FROM THE NTIS DATA BASE Report, 1964 - Apr. 1979
Audrey S. Hundemann Jun. 1979 172 p Supersedes NTIS/PS-78/0499; NTIS/PS-77/0112; NTIS/PS-76/0795; NTIS/PS-75/655
(NTIS/PS-79/0545/8; NTIS/PS-78/0499; NTIS/PS-77/0112; NTIS/PS-76/0795; NTIS/PS-75/655) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

This bibliography contains 164 citations on the production of gaseous and liquid synthetic fuels from solid wastes. Waste products used in the syntheses including manure, sewage, paper, and wood are included. Methane is the primary fuel produced, however, the production of oils, methanol, and ethanol is also discussed. GRA

N79-31434# National Technical Information Service, Springfield, Va.
SYNTHETIC FUELS FROM MUNICIPAL, INDUSTRIAL AND AGRICULTURAL WASTES, VOLUME 1. CITATIONS FROM THE AMERICAN PETROLEUM INSTITUTE DATA BASE Report, 1975 - 1977
Audrey S. Hundemann Jun. 1979 289 p
(NTIS/PS-79/0546/6) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

This bibliography cites worldwide literature on the production of fuels from waste materials such as animal manure, wood chips, sewage sludge, urban garbage, agricultural wastes, and old automobile tires. This updated bibliography contains 283 abstracts, none of which is new to the previous edition. GRA

N79-31435# National Technical Information Service, Springfield, Va.
SYNTHETIC FUELS FROM MUNICIPAL, INDUSTRIAL AND AGRICULTURAL WASTES, VOLUME 2. CITATIONS FROM THE AMERICAN PETROLEUM INSTITUTE DATA BASE Progress Report, 1978 - Mar. 1979
Audrey S. Hundemann Jun. 1979 63 p Supersedes NTIS/PS-78/0500 and NTIS/PS-77/0113
(NTIS/PS-79/0547/4; NTIS/PS-78/0500; NTIS/PS-77/0113) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

The bibliography cites worldwide literature on the production of fuels from waste materials, such as animal manure, wood chips, sewage sludge, urban garbage, agricultural wastes and old automobile tires. (This updated bibliography contains 57 abstracts, all of which are new entries to the previous edition.) GRA

N79-31436# Minnesota Univ., Minneapolis. School of Public Health.
HOSPITAL VENTILATION STANDARDS AND ENERGY CONSERVATION: A SUMMARY OF THE LITERATURE WITH CONCLUSIONS AND RECOMMENDATIONS Final Report, FY 1978
Roger L. DeRoos, Robert S. Banks, David Rainer, Jonna L. Anderson, and George S. Michaelson Sep. 1978 308 p refs
Prepared for California Univ., Lawrence Berkeley Lab.

(Contract W-7405-eng-48)
(LBL-8316; EEB-Hosp-78-3) Avail: NTIS HC A14/MF A01

The basis for current hospital heating, ventilation, and air conditioning standards were examined to determine if the standards could be relaxed based on criteria that does not compromise the health, safety, and comfort of patients and staff and that has acceptance of the health community. Principles are presented which favor a reduction of dependence on outdoor air for conrol of the unique hazards in hospitals. Control of these hazards could be managed by point source control of microenvironments. Then, ventilation air criteria would become analagous to that for other building spaces. However, it must be recognized that implementation of the presented principles requires concurrent changes in hospital operating procedures, some of which require additional research. R.E.S.

N79-31438# Bechtel National, Inc., San Francisco, Calif.
CONCEPTUAL DESIGN AND COST STUDY FOR A DUAL-PURPOSE NUCLEAR-ELECTRIC REVERSE OSMOSIS SEAWATER CONVERSION PLANT
Apr. 1979 130 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6821) Avail: NTIS HC A07/MF A01

A conceptual design and cost estimate for a 25 million gallon per day seawater reverse osmosis desalting plant operating at both Caribbean and Persian Gulf sites were developed. The plant would operate in conjunction with a 1000 MW(e) nuclear power plant. Four seawater membrane manufacturers were supplied with feedwater analysis and a simplified cost estimating procedure in order to recommend membrane systems which would be applicable. For both sites a two-stage system was selected for development of a conceptual cost estimate. DOE

N79-31439# California Univ., Berkeley. Lawrence Berkeley Lab.
COMPUTER DESIGN AND OPTIMIZATION OF CRYOGENIC REFRIGERATION SYSTEMS
M. A. Green, H. S. Pines, and P. A. Doyle Jun. 1978 10 p refs Presented at the 7th Intern. Conf. of Eng., London, 4-7 Jul. 1978
(Contract W-7405-eng-48)
(LBL-7934; Conf-780718-4) Avail: NTIS HC A02/MF A01

The design and optimization of a cryogenic refrigerator using the LBL computer program GEOTHM are described. This computer program has been used extensively to design and optimize geothermal power plants and power cycles of other types. GEOTHM can calculate the thermodynamics of a wide variety of cycles including refrigeration cycles. GEOTHM has an optimizer which permits single step multiparameter optimization of a thermodynamic cycle. A refrigeration cycle may be optimized for minimum cost refrigeration, or maximum thermodynamic performance using up to 55 optimizable parameters. The use of the optimizer in GEOTHM is demonstrated on two liquid nitrogen refrigeration cycles which are optimized for minimum refrigeration cost and minimum input power. DOE

N79-31513# AEG-Telefunken, Wedel (West Germany). Abt. Raumfahrt-Elecktronik.
ASSESSMENT OF SHORT AND MEDIUM TERM IMPROVEMENTS TO THE SPACELAB POWER SYSTEM
26 Oct. 1978 56 p 2 Vol.
(Contract ESA-3538/78-F-HEW(SC))
(ESA-CR(P)-1193-Vol-2) Avail: NTIS HC A04/MF A01

The results of a study to improve Spacelab's baseline electrical power and distribution system (EPDS) are presented. An additional 3 kW power source for experiment power augmentation is discussed, including the analysis of fuel cell kits as add-on power modules. A solar array subsystem, technical descriptions, and a cost/schedule assessments are also discussed. Author (ESA)

N79-31706* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COAL-ROCK INTERFACE DETECTOR
Stephen D. Rose, Charles E. Crouch, and Elborn W. Jones, inventors (to NASA) (Mississippi State Univ., Mississippi State) 21 Aug. 1979 8 p Filed 4 Nov. 1977
(NASA-Case-MFS-23725-1; US-Patent-4,165,460;
US-Patent-Appl-SN-848793; US-Patent-Class-250-253;
US-Patent-Class-250-272) Avail: US Patent and Trademark Office CSCL 08I

A coal-rock interface detector is presented which employs a radioactive source and radiation sensor. The source and sensor are separately and independently suspended and positioned against a mine surface of hydraulic pistons, which are biased from an air cushioned source of pressurized hydraulic fluid.
Official Gazette of the U.S. Patent and Trademark Office

N79-31720*# ECON, Inc., Princeton, N. J.
STATUS OF SEASAT COMMERCIAL DEMONSTRATION PROGRAM
Larrain Luckl and B. P. Miller, Principal Investigators Dec. 1978 86 p refs Workshop held at Pasadena, Calif., 31 Oct. - 1 Nov. 1978 Sponsored by NASA ERTS
(E79-10260; NASA-CR-158875; ECON-78-292) Avail: NTIS HC A05/MF A01 CSCL 17B

N79-31730*# Stanford Univ., Calif. School of Applied Earth Sciences.
GEOLOGICAL AND GEOTHERMAL DATA USE INVESTIGATIONS FOR APPLICATION EXPLORER MISSION-A, HEAT CAPACITY MAPPING MISSION Quarterly Report, 1 Nov. 1978 - 28 Feb. 1979
R. J. P. Lyon and A. E. Prelat, Principal Investigators 28 Feb. 1979 2 p ERTS
(Contract NAS5-24232)
(E79-10273; NASA-CR-162094) Avail: NTIS HC A02/MF A01 CSCL 08B

N79-31731*# Stanford Univ., Calif. School of Applied Earth Sciences.
GEOLOGICAL AND GEOTHERMAL DATA USE INVESTIGATIONS FOR APPLICATION EXPLORER MISSION-A, HEAT CAPACITY MAPPING MISSION Quarterly Report, 1 Mar. - 30 Jun. 1979
R. J. P. Lyon and J. C. Broderick, Principal Investigators 30 Jun. 1979 2 p ERTS
(Contract NAS5-24232)
(E79-10274; NASA-CR-162095) Avail: NTIS HC A02/MF A01 CSCL 08B

N79-31737*# ECON, Inc., Princeton, N. J.
SEASAT-A ASVT: COMMERCIAL DEMONSTRATION EXPERIMENTS. RESULTS ANALYSIS METHODOLOGY FOR THE SEASAT-A CASE STUDIES
28 Aug. 1979 62 p refs Revised
(Contract NASw-3047)
(NASA-CR-162162; DOC-79-292-2-Rev-2) Avail: NTIS HC A04/MF A01 CSCL 05B

The SEASAT-A commercial demonstration program ASVT is described. The program consists of a set of experiments involving the evaluation of a real time data distributions system, the SEASAT-A user data distribution system, that provides the capability for near real time dissemination of ocean conditions and weather data products from the U.S. Navy Fleet Numerical Weather Central to a selected set of commercial and industrial users and case studies, performed by commercial and industrial users, using the data gathered by SEASAT-A during its operational life. The impact of the SEASAT-A data on business operations is evaluated by the commercial and industrial users. The approach followed in the performance of the case studies, and the methodology used in the analysis and integration of the case study results to estimate the actual and potential economic benefits of improved ocean condition and weather forecast data are described. A.W.H.

N79-31741# Sandia Labs., Albuquerque, N. Mex.

TRUE IN SITU PROCESSING OF OIL SHALE: AN EVALUATION OF CURRENT BED PREPARATION TECHNOLOGY

R. R. Boade, A. L. Stevens, A. Long, and A. E. Harak Mar. 1979 88 p refs
(Contract EY-76-C-04-0789)
(SAND-78-2162) Avail: NTIS HC A05/MF A01

It is concluded that the wellbore springing and hydraulic/explosives fracturing concepts both have inherent traits which prohibit their practical application to deep oil shale seams. Difficulties with the wellbore springing concept stem largely from the cylindrical geometry which leads to rapidly attenuating stress waves (hence to comparatively small fractured regions) and to the creation of a residually stressed region around the explosive cavity that restricts fluid flow and hinders void redistribution efforts. Major problems with the hydraulic/explosive fracturing concept are that many operations cannot be controlled and that regions of enhanced permeability are formed only in the vicinity of explosive filled hydrofractures. The physical characteristics of a successful bed preparation concept are defined along with recommendations for a research oriented program to develop the technology necessary to achieve a successful true in situ retorting capability. DOE

N79-31743# Oak Ridge National Lab., Tenn. Chemical Technology Div.

ENGINEERING ANALYSIS AND COMPARISON OF NEW PROCESSES FOR THE RECOVERY OF RESOURCE MATERIALS FROM COAL ASH

R. M. Canon, F. G. Seeley, and J. S. Watson 1979 18 p refs Presented at the 5th Intern. Ash Util. Symp., Atlanta, 25-27 Feb. 1979
(Contract W-7405-eng-26)
(CONF-790205-3) Avail: NTIS HC A02/MF A01

During the past 2 years, several promising new processes for the recovery of valuable resource materials from coal ash, primarily power plant fly ash, were conceived and investigated. These processes, which include direct acid leach, the salt-soda sinter process, and the Calsinter (CaSo4-CaCO3) process, are designed to remove the major metals (aluminum, iron, and titanium) from fly ash; however, some are also capable of recovering trace metals. DOE

N79-31744# Sandia Labs., Albuquerque, N. Mex.

USE OF ELECTRICAL GEOPHYSICAL TECHNIQUES TO MAP AND MONITOR IN SITU OIL SHALE RECOVERY PROCESSES

L. C. Bartel 1979 25 p refs Presented at 12th Oil Shale Symp., Golden, Colo., 18 Apr. 1979
(Contract EY-76-C-04-0789)
(SAND-79-0746C; Conf-790440-2) Avail: NTIS HC A02/MF A01

The electrical conducting property of the in situ coal gasification and oil shale retort reaction zones forms the basis for using electrical geophysical prospecting techniques to map and monitor these in situ processes. The electrical geophysical techniques include: mise-a-la-masse, Schlumberger, and a borehole electrical survey. The field measurements are supported by extensive model calculation and data reduction efforts. The in situ coal gasification reaction boundaries were successfully delineated using the mise-a-la-masse technique and a ridge regression data inversion algorithm. DOE

N79-31745# Los Alamos Scientific Lab., N. Mex.

ROCKY MOUNTAIN COAL FOR SOUTHERN CALIFORNIA'S COAL-FIRED ELECTRIC POWER GENERATION

O. L. Anderson Feb. 1979 144 p refs
(Contract W-7405-eng-36)
(LA-6915-MS) Avail: NTIS HC A07/MF A01

A scaled-down version of a Study of Alternative Locations of Coal-Fired Electrical Generating Plants to Supply Western Coal to the Department of Water Resources is reported. It covers three aspects of the major report: (1) coal resources in the Upper Colorado Plateau, (2) the possible transportation of those coal resources to southern California, and (3) the cost analyses of the coal transportation. Descriptions of 92 coalfields within an 800 mile radius of the Los Angeles energy market are included. The general legal regulations governing the acquisition and development of coal from state, federal, and private lands are discussed. The existing and potential methods of transporting the coal to southern California are also described. DOE

N79-31746# Dow Chemical Co., Midland, Mich. Hydrocarbons and Energy Research Dept.

ENERGY FROM IN SITU PROCESSING OF ANTRIM OIL SHALE

J. P. Humphrey 19 Jul. 1979 44 p refs
(Contract EX-76-C-01-2346)
(FE-2346-29) Avail: NTIS HC A03/MF A01

In situ combustion was maintained for a 61 day period while several continuous and cyclic production procedures were tested. Gas having energy values in the target range (150 Btu scf) was produced at various times, although the flow rate at these times was minimal and hence the energy production was low. A hydraulic fracturing and sand propping program was completed in 100 Series wells. Preparations for explosive fracturing are essentially complete. The plans for the first explosive shot in the explosive underreaming experiment were completed and final preparations are underway. Shale characterization and resource inventory activities are continuing in four of the major universities of Michigan. DOE

N79-31756*# Battelle Columbus Labs., Ohio.

EVALUATION OF SELECTED CHEMICAL PROCESSES FOR PRODUCTION OF LOW-COST SILICON, PHASE 3 Quarterly Progress Report, 1 Apr. - 30 Jun. 1979

J. M. Blocher, Jr. and M. F. Browning 15 Aug. 1979 18 p ref Sponsored in part by DOE Prepared for JPL
(Contracts NAS7-100; JPL-954339)
(NASA-CR-162168; DOE/JPL-954339-79/15; QPR-15) Avail: NTIS HC A02/MF A01 CSCL 10A

The construction and operation of an experimental process system development unit (EPSDU) for the production of granular semiconductor grade silicon by the zinc vapor reduction of silicon tetrachloride in a fluidized bed of seed particles is presented. The construction of the process development unit (PDU) is reported. The PDU consists of four critical units of the EPSDU: the fluidized bed reactor, the reactor by product condenser, the zinc vaporizer, and the electrolytic cell. An experimental wetted wall condenser and its operation are described. Procedures are established for safe handling of SiCl4 leaks and spills from the EPSDU and PDU. A.W.H.

N79-31758*# RCA Labs., Princeton, N. J.

EPITAXIAL SILICON GROWTH FOR SOLAR CELLS Final Report

R. V. DAiello, P. H. Robinson, and D. Richman Apr. 1979 66 p refs Prepared for DOE and JPL
(Contracts NAS7-100; JPL-954817)
(NASA-CR-162177; DOE/JPL-954817-79/4) Avail: NTIS HC A04/MF A01 CSCL 10A

The epitaxial procedures, solar cell fabrication, and evaluation techniques are described. The development of baseline epitaxial solar cell structures grown on high quality conventional silicon substrates is discussed. Diagnostic layers and solar cells grown on four potentially low cost silicon substrates are considered. The crystallographic properties of such layers and the performance of epitaxially grown solar cells fabricated on these materials are described. An advanced epitaxial reactor, the rotary disc, is described along with the results of growing solar cell structures of the baseline type on low cost substrates. The add on cost for the epitaxial process is assessed and the economic advantages of the epitaxial process as they relate to silicon substrate selection are examined. A.W.H.

N79-31759*# RCA Labs., Princeton, N. J.
AUTOMATED ARRAY ASSEMBLY, PHASE 2 Quarterly Report
R. V. DAiello Jun. 1979 36 p refs Prepared for DOE and JPL
(Contracts NAS7-100; JPL-954868)
(NASA-CR-162176; DOE/JPL-954868-79/7; QR-6) Avail: NTIS HC A03/MF A01 CSCL 10A

The large scale production of silicon solar cell array panels is discussed. The cost and performance of three manufacturing sequences designed to convert silicon sheet and wafers into solar panels is analyzed. The production of ion implanted and furnace annealed solar cells made using solar grade n- and p-type wafers is examined. The performance of production size lots is examined with regard to the relationship between the ion implant and furnace anneal parameters and the ability to form consistently good thick film screen printed contacts. The spray on antireflection coating process is evaluated. The performance of several lots of cells before and after coating is measured. The structure and refractive index of the RCA I (TiO2) coating is compared with commercial solutions. Sensitivity of coated, screen printed cells to the post heat treatment required to cure the films is assessed. A.W.H.

N79-31762*# Westinghouse Research and Development Center, Pittsburgh, Pa.
SILICON WEB PROCESS DEVELOPMENT Quarterly Report, 20 Apr. - 30 Jun. 1979
C. S. Duncan, R. G. Seidensticker, R. H. Hopkins, J. P. McHugh, F. E. Hill, M. E. Heimlich, and J. M. Driggers 30 Jun. 1979 55 p refs Sponsored by NASA Prepared for DOE and JPL
(Contract JPL-954654)
(NASA-CR-162181; DOE/JPL-954654-79/3) Avail: NTIS HC A04/MF A01 CSCL 10A

Silicon dendritic web, ribbon form of silicon and capable of fabrication into solar cells with greater than 15% AMI conversion efficiency, was produced from the melt without die shaping. Improvements were made both in the width of the web ribbons grown and in the techniques to replenish the liquid silicon as it is transformed to web. Through means of improved thermal shielding stress was reduced sufficiently so that web crystals nearly 4.5 cm wide were grown. The development of two subsystems, a silicon feeder and a melt level sensor, necessary to achieve an operational melt replenishment system, is described. A gas flow management technique is discussed and a laser reflection method to sense and control the melt level as silicon is replenished is examined. A.W.H.

N79-31763*# TRW Systems Group, Redondo Beach, Calif. Manufacturing Div.
STUDY OF AUTOMATED MODULE FABRICATION FOR LIGHTWEIGHT SOLAR BLANKET UTILIZATION Final Report
Charles E. Gibson May 1979 79 p refs Prepared for JPL
(Contracts NAS7-100; JPL-955205)
(NASA-CR-162157; TRW-79.5536.3-06) Avail: NTIS HC A05/MF A01 CSCL 10A

Cost-effective automated techniques for accomplishing the titled purpose; based on existing in-house capability are described. As a measure of the considered automation, the production of a 50 kilowatt solar array blanket, exclusive of support and deployment structure, within an eight-month fabrication period was used. Solar cells considered for this blanket were 2 x 4 x .02 cm wrap-around cells, 2 x 2 x .005 cm and 3 x 3 x .005 cm standard bar contact thin cells, all welded contacts. Existing fabrication processes are described, the rationale for each process is discussed, and the capability for further automation is discussed. G.Y.

N79-31764*# Chicago Univ., Ill. Enrico Fermi Inst.
WINSTON SOLAR CONCENTRATORS AND EVALUATION SUPPORT. PHASE 2: NON-IMAGING CONCENTRATORS FOR SPACE APPLICATIONS Final Report, Oct. 1977 - Jul. 1978
Roland Winston, Joseph OGallagher, and Peretz Greenman 28 Aug. 1978 81 p refs Prepared for JPL
(Contract JPL-954563)
(NASA-CR-162279) Avail: NTIS HC A05/MF A01 CSCL 10A

A 4.67X, plus or minus 5 deg. compound parabolic concentrator (CPC) for a large photovoltaic array in space was analyzed. The design was demonstrated to be effective in achieving a net power gain which can be varied from more than a factor of 3 down to approximately unity. A method for reducing nonuniformities in illumination to a given desired level was found. The effectiveness of this method, which involves the introduction of a degree of non-specularity in the reflector surface, was confirmed by direct measurements with prepared foil reflectors in a CPC in terrestrial sunshine as well as by computer ray tracing. Further ray tracing confirms that the CPC design is extremely tolerant to pointing and alignment errors, minor distortions, etc. A two stage non-imaging design was shown, by preliminary measurements and analysis, to provide both the desired angular tolerance and the required degree of intensity uniformity if higher concentrations (4X-10X) are necessary. Author

N79-31765*# Solarex Corp., Rockville, Md.
HIGH EFFICIENCY, HIGH DENSITY TERRESTRIAL PANEL Final Report
John Wohlgemuth, Manfred Wihl, and Thomas Rosenfield Feb. 1979 70 p Sponsored in part by DOE Prepared for JPL
(Contract JPL-954822)
(NASA-CR-162167; DOE/JPL-954822-78/1) Avail: NTIS HC A04/MF A01 CSCL 10A

Terrestrial panels were fabricated using rectangular cells. Packing densities in excess of 90% with panel conversion efficiencies greater than 13% were obtained. Higher density panels can be produced on a cost competitive basis with the standard salami panels. K.L.

N79-31767*# Solarex Corp., Rockville, Md.
DEVELOPMENT OF AN IMPROVED HIGH EFFICIENCY THIN SILICON SOLAR CELL Quarterly Report
G. Storti and C. Wrigley Jul. 1979 18 p Prepared for JPL
(Contracts NAS7-100; JPL-954883)
(NASA-CR-162159; SX/115/7Q; QR-7) Avail: NTIS HC A02/MF A01 CSCL 10A

Breakage and front contact failure in high efficiency, textured ultrathin cells was reduced as a consequence of the introduction of process modifications. In a small production run over one hundred ultrathin cells, having an average AMO efficiency of 13%, were fabricated from 10-25 ohm cm silicon. An in-house aluminum paste for back surface field formation was developed that resulted in cell efficiencies equivalent to those from commercial pastes. The quality of the back surface field was found to be dependent on the orientation of the silicon slice during alloying. G.Y.

N79-31769*# Pennsylvania Univ., Philadelphia School of Electrical Engineering.
ANALYSIS AND EVALAUTION IN THE PRODUCTION PROCESS AND EQUIPMENT AREA OF THE LOW-COST SOLAR ARRAY PROJECT Quarterly Report, Jan. - Apr. 1979
H. Goldman and M. Wolf Jun. 1979 176 p refs Sponsored by NASA and DOE Prepared for JPL
(Contract JPL-954796)
(NASA-CR-162163; DOE/JPL-954796-79/6) Avail: NTIS HC A09/MF A01 CSCL 10A

The manufacturing methods for photovoltaic solar energy utilization are assessed. Economic and technical data on the current front junction formation processes of gaseous diffusion and ion implantation are presented. Future proposals, including modifying gaseous diffusion and using ion implantation, to decrease the cost of junction formation are studied. Technology developments in current processes and an economic evaluation of the processes are included. A.W.H.

N79-31771*# Sensor Technology, Inc., Chatsworth, Calif.
AUTOMATED ARRAY ASSEMBLY TASK IN-DEPTH STUDY OF SILICON WAFER SURFACE TEXTURIZING Quarterly Technical Report, 14 Dec. 1978 - 31 Mar. 1979

Gregory T. Jones, Sanjeev Chitre, Sang S. Rhee, and Kimberly L. Allison Mar. 1979 51 p refs Sponsored by NASA and DOE Prepared for JPL
(Contract JPL-955266)
(NASA-CR-162161; DOE/JPL-955266-79/1; QTR-1) Avail: NTIS HC A04/MF A01 CSCL 10A

A low cost wafer surface texturizing process was studied. An investigation of low cost cleaning operations to clean residual wax and organics from the surface of silicon wafers was made. The feasibility of replacing dry nitrogen with clean dry air for drying silicon wafers was examined. The two stage texturizing process was studied for the purpose of characterizing relevant parameters in large volume applications. The effect of gettering solar cells on photovoltaic energy conversion efficiency is described. A.W.H.

N79-31772*# Materials Research, Inc., Centerville, Utah.
QUANTITATIVE ANALYSIS OF DEFECTS IN SILICON Quarterly Progress Report, 1 Apr. - 31 Jun. 1979
R. Natesh, J. M. Smith, H. A. Qidwai, and T. Bruce 12 Jul. 1979 177 p refs Sponsored by NASA Prepared for DOE and JPL
(Contract JPL-954977)
(NASA-CR-162173; MRI-273; QPR-5; DOE/JPL-954977-79/6) Avail: NTIS HC A09/MF A01 CSCL 10A

The evaluation and prediction of the conversion efficiency for a variety of silicon samples with differences in structural defects, such as grain boundaries, twin boundaries, precipitate particles, dislocations, etc. are discussed. Quantitative characterization of these structural defects, which were revealed by etching the surface of silicon samples, is performed by using an image analyzer. Due to different crystal growth and fabrication techniques the various types of silicon contain a variety of trace impurity elements and structural defects. The two most important criteria in evaluating the various silicon types for solar cell applications are cost and conversion efficiency. A.W.H.

N79-31773*# Sensor Technology, Inc., Chatsworth, Calif.
ARRAY AUTOMATED ASSEMBLY TASK LOW COST SILICON SOLAR ARRAY PROJECT, PHASE 2 Annual Technical Report
Sang S. Rhee, Gregory T. Jones, and Kimberly L. Allison 1978 187 p refs Sponsored by NASA Prepared for DOE and JPL
(Contract JPL-954865)
(NASA-CR-162174; DOE/JPL-954865-79/5) Avail: NTIS HC A09/MF A01 CSCL 10A

Progress in the development of solar cells and module process steps for low-cost solar arrays is reported. Specific topics covered include: (1) a system to automatically measure solar cell electrical performance parameters; (2) automation of wafer surface preparation, printing, and plating; (3) laser inspection of mechanical defects of solar cells; and (4) a silicon antireflection coating system. Two solar cell process steps, laser trimming and holing automation and spray-on dopant junction formation, are described. K.L.

N79-31775*# Crystal Systems, Inc., Salem, Mass.
SILICON INGOT CASTING: HEAT EXCHANGER METHOD. MULTI-WIRE SLICING: FIXED ABRASINE SLICING TECHNIQUE, PHASE 3 Quarterly Progress Report, 1 Apr. - 30 Jun. 1979
Frederick Schmid and Chandra P. Khattak Jun. 1979 34 p refs Sponsored by NASA Prepared for DOE and JPL
(Contract JPL-954373)
(NASA-CR-162182; DOE/JPL-954373-79/11; QPR-3) Avail: NTIS HC A03/MF A01 CSCL 10A

Ingot casting was scaled up to 16 cm by 16 cm square cross section size and ingots weighing up to 8.1 kg were cast. The high degree of crystallinity was maintained in the large ingot. For large sizes, the nonuniformity of heat treatment causes chipping of the surface of the ingot. Progress was made in the development of a uniform graded structure in the silica crucibles. The high speed slicer blade-head weight was reduced to 37 pounds, allowing surface speeds of up to 500 feet per minute. Slicing of 10 cm diameter workpieces at these speeds increased the through-put of the machine to 0.145 mm/min. K.L.

N79-31776*# Honeywell Corporate Material Sciences Center, Bloomington, Minn.
SILICON-ON CERAMIC PROCESS: SILICON SHEET GROWTH AND DEVICE DEVELOPMENT FOR THE LARGE-AREA SILICON SHEET AND CELL DEVELOPMENT TASKS OF THE LOW-COST SOLAR ARRAY PROJECT Quarterly Report, 2 Apr. - 29 Jun. 1979
P. W. Chapman, J. D. Zook, J. D. Heaps, B. L. Grung, B. Koepke, and S. B. Schuldt 31 Jul. 1979 66 p refs Sponsored in part by DOE Prepared for JPL
(Contracts NAS7-100; JPL-954356)
(NASA-CR-162158; DOE/JPL-954356-79/2; QR-12) Avail: NTIS HC A04/MF A01 CSCL 10A

The technical and economic feasibility of producing solar cell-quality silicon was investigated. This was done by coating one surface of carbonized ceramic substrates with a thin layer of large-grain polycrystalline silicon from the melt. Significant progress in the following areas was demonstrated: (1) fabricating a 10 sq cm cell having 9.9 percent conversion efficiency; (2) producing a 225 sq cm layer of sheet silicon; and (3) obtaining 100 microns thick coatings at pull speed of 0.15 cm/sec, although approximately 50 percent of the layer exhibited dendritic growth. G.Y.

N79-31777*# Union Carbide Corp., New York.
LOW-COST SOLAR ARRAY PROJECT. FEASIBILITY OF THE SILANE PROCESS FOR PRODUCING SEMICONDUCTOR-GRADE SILICON Final Report, Oct. 1975 - Mar. 1979
Jun. 1979 362 p refs Prepared for JPL
(Contracts NAS7-100; JPL-954334)
(NASA-CR-162172) Avail: NTIS HC A16/MF A01 CSCL 10A

The feasibility of Union Carbide's silane process for commercial application was established. An integrated process design for an experimental process system development unit and a commercial facility were developed. The corresponding commercial plant economic performance was then estimated. R.E.S.

N79-31779*# National Aeronautics and Space Administration, Washington, D. C.
INVESTIGATION OF A GENERATOR SYSTEM FOR GENERATING ELECTRICAL POWER, TO SUPPLY DIRECTLY TO THE PUBLIC NETWORK, USING A WINDMILL
C. Tromp Aug. 1979 159 p refs Transl. into ENGLISH of "Onderzoek aan een Generatorsystem voor het Opwekken van, Direkt aan het Openbare Net te Leveren, Elektrische Energie Net Behulp van een Windmolen" Delft Univ. of Technol., Power Electron. Lab., Netherlands, May 1957 122 p Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-75497) Avail: NTIS HC A08/MF A01 CSCL 10B

A windpowered generator system is described which uses a windmill to convert mechanical energy to electrical energy for a three phase (network) voltage of constant amplitude and frequency. The generator system controls the windmill by the number of revolutions so that the power drawn from the wind for a given wind velocity is maximum. A generator revolution which is proportional to wind velocity is achieved. The stator of the generator is linked directly to the network and a feed converter at the rotor takes care of constant voltage and frequency at the stator. A.W.H.

N79-31780*# Alabama Univ., University. Dept. of Physics and Astronomy.
DEVELOPMENT OF SURFACES OPTICALLY SUITABLE FOR FLAT SOLAR PANELS Final Report
Aug. 1979 46 p refs Prepared for DOE
(Contract NAS8-32481)
(NASA-CR-161290) Avail: NTIS HC A03/MF A01 CSCL 10A

A reflectometer which can separately evaluate the spectral and diffuse reflectivities of surfaces is described. A phase locked detection system for the reflectometer is also described. A selective coating on aluminum potentially useful for flat plate solar collector applications is presented. The coating is composed of strongly bound copper oxide (divalent) and is formed by an etching process performed on an aluminum alloy with high copper content. Fabrication costs are expected to be small due to the one stop fabrication process. A number of conclusions gathered from the literature as to the required optical properties of flat plate solar collectors are discussed. A.W.H.

N79-31781*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DISCHARGE CHARACTERISTICS OF 300 AMPERE-HOUR Ni-Zn TRACTION CELLS
John G. Ewashinka Aug. 1979 11 p
(NASA-TM-79244; E-151) Avail: NTIS HC A02/MF A01 CSCL 10C

Preliminary tests were performed on 300 amphere-hour nickel-zinc cells containing the Lewis improved inorganic-organic (I/O) separator. These cells also have other design features included to optimize performance and cycle life. The tests carried out were formation tests and characteristic discharge tests. Information obtained include case temperature and maximum power delivered. A.R.H.

N79-31782# Scientific Service, Inc., Redwood City, Calif.
OPPORTUNITIES FOR ENERGY CONSERVATION IN FINISHED CONCRETE PRODUCTS Final Report
J. V. Zaccor and J. Jewett Sep. 1978 104 p refs
(Contract EC-77-S-03-1549)
(HCP/CS-1549) Avail: NTIS HC A06/MF A01

Two energy convservation opportunities are identified as applicable to the finished concrete products industry. One involves substituting a naturally cementitious material, pozzolan, for a portion of the cement, and the other involves the application of an appropriate insulation to achieve thermal isolation of material needlessly cycled with the product. A.W.H.

N79-31783# Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho.
ENERGY CONSERVATION WITH FIRED HEATERS
Neil G. Cox and W. Paul Jensen Dec. 1978 65 p refs
(Contract EY-76-C-07-1570)
(TREE-1308) Avail: NTIS HC A04/MF A01

The energy consumption and the energy conservation potential with the operation of fired heaters in the petroleum refining and petrochemical industries are examined. Data were gathered to estimate the current and anticipated energy usage of fired heaters. The progress made in energy conservation efforts by the industries is assessed. Energy conservation limits with current technology are estimated and any needed for furthering energy conservation in the use of fired heaters is identified. A.W.H.

N79-31784*# United Technologies Corp., South Windsor, Conn. Power Systems Div.
STRIP CELL TEST AND EVALUATION PROGRAM Final Report, 15 Jun. 1976 - 30 Apr. 1977
B. Gitlow, W. F. Bell, and R. E. Martin 27 Oct. 1978 76 p refs
(Contract NAS3-20042)
(NASA-CR-159652; FCR-0945) Avail: NTIS HC A05/MF A01 CSCL 10B

The performance characteristics of alkaline fuel cells to be used for space power systems were tested. Endurance tests were conducted on the cells during energy conversion operations. A feature of the cells fabricated and tested was the capability to evaporate the product water formed during the energy conversion reaction directly to space vacuum. A fuel cell powerplant incoporating these cells does not require a condenser and a hydrogen recirculating pump water separator to remove the product water. This simplified the fuel cell powerplant system, reduced the systems weight, and reduced the systems parasite power. A.W.H.

N79-31787# Brookhaven National Lab., Upton, N. Y.
SOAR (SOLAR ASSISTED REACTOR) POWER SYSTEM
R. F. Benenati and J. R. Powell 1979 5 p ref Presented at the ANS Ann. Meeting, Atlanta, 3 Jun. 1979
(Contract EY-76-C-02-0016)
(BNL-25633; Conf-790602-29) Avail: NTIS HC A02/MF A01

The concept of utilizing solar energy as a supplementary energy source for hybrid power plants in which the main input is nuclear or coal is discussed. Low and intermediate temperature solar collectors can supply feedwater heat and/or reheat steam after expansion in a high pressure turbine. The Comanche Peak nuclear plant was selected for the study. A flowsheet with all feedwater heaters and the steam reheater using solar heat is given. The increased plant output is plotted as a function of the number of solar feedwater heaters. Author (DOE)

N79-31788# Illinois Univ., Urbana.
ENERGY AND LABOR INTENSITIES PROJECTED TO THE YEAR 2010
B. Hannon and A. R. Pleskun Sep. 1978 162 p refs
(Contract EM-78-S-02-4628)
(COO-4628-2) Avail: NTIS HC A08/MF A01

Total (direct and indirect) energy and labor intensities were projected to the year 2000 for a 40-sector economy. Energy intensities were derived by modifying the CONAES results with four possible energy price change scenarios between 1975 and 2010. Labor intensities were projected using data from the CAC model and projected BLS matrices to approximate the effect of a doubling of energy prices between 1975 and 2010. As an illustrative example, the projected data were used to determine the net energy andemployment impacts of the National Energy Plan on residential energy use to the year 2000. DOE

N79-31789# Argonne National Lab., Ill.
SOLAR ENERGY PROGRAM Annual Report, 1978
Feb. 1979 95 p refs
(Contract W-31-109-eng-38)
(ANL-79-16) Avail: NTIS HC A05/MF A01

The work done at Argonne National Laboratory on the Solar Energy Program during FY 1978 (July 1, 1977 to June 30, 1978) is described. Areas included in this report are solar energy collection, heating and cooling, thermal energy storage, ocean thermal energy conversion, photovoltaics, satellite power systems, bioconversion, central receiver solar thermal power, and wind energy conversion. DOE

N79-31790# Department of Energy, Washington, D. C. Energy Information Administration.
END-USE ENERGY-CONSUMPTION DATA BASE. VERSION 10: USER'S MANUAL
M. Maloney Feb. 1979 94 p refs
(DOE/EIA-0175) Avail: NTIS HC A05/MF A01

The end use energy consumption data base contains estimates of United States energy consumption categorized by fuel type, section of the economy, end use, and geographic area. Eight sectors are considered: agriculture, mining, construction, manufacturing, transportation, commercial, household, and electric utilities. Consumption estimates are at the national, census-division, and state levels, except for the household and commercial sectors, which are only at the national and census-division levels. The version of the data base described by this manual (version 10) contains consumption estimates for 1967, 1971, and 1974; the commercial sector estimates are for 1974 only. Future versions will contain estimates for 1975. The data base exists in two forms: as a sequential file on tape and as a random access file on computer. The random access file must be accessed by use of the data base management system. DOE

N79-31791# Brookhaven National Lab., Upton, N. Y. National Center for Analysis of Energy Systems.
LONG-TERM STRATEGIC ANALYSIS (TOWARDS AN ENERGY DOCTRINE)
Kenneth C. Hoffman and Steven C. Carhart Nov. 1978 30 p refs Presented at the Intern. Sci. Form on an Acceptable World Energy Future, Miami, 27 Nov. - 1 Dec. 1978
(Contract EY-76-C-02-0016)
(BNL-25250; Conf-781129-1) Avail: NTIS HC A03/MF A01

The formulation of long-term energy strategies requires the synthesis of a large number of economic, social, technical, and environmental factors with due regard to regional and international needs and constraints. An approach to strategic analysis in the energy sector is outlined. Emphasis is placed on the logic of the approach to strategic planning and analysis. DOE

N79-31792# Department of Energy, Washington, D. C. Office of the Controller.
DEPARTMENT OF ENERGY FY 1980 OBLIGATIONS
5 Feb. 1979 341 p
(DOE/CR-0005) Avail: NTIS HC A15/MF A01

Detailed estimates are shown for the respective states based on existing contracts and grants which were assumed to continue in 1980. Some programs could not be identified at the contractor level, and some elements of programs could not be identified by states. These are listed in an undesigned category. DOE

N79-31793# Argonne National Lab., Ill.
HIGH-PERFORMANCE BATTERIES FOR ELECTRIC-VEHICLE PROPULSION AND STATIONARY ENERGY STORAGE Progress Report, Oct. 1977 - Sep. 1978
P. A. Nelson, D. L. Barney, and R. K. Steunenberg Nov. 1978 246 p refs
(Contract W-31-109-eng-38)
(ANL-78-94) Avail: NTIS HC A11/MF A01

High-temperature batteries for electric vehicle propulsion and stationary energy storage applications were developed. The cells, which operate at 400 to 500 C, are of a vertically oriented, prismatic design with one or more inner positive electrodes of FeS or FeS2, facing electrodes of lithium-aluminum alloy, and molten LiCl KCl electrolyte. Development of a 40 kWh battery (Mark IA) for testing in an electric van was initiated and conceptual design studies on a 100 MWh stationary energy storage module were conducted. Multiplate cells, which are capable of higher performance than bicells, were developed. DOE

N79-31794# Department of Energy, Washington, D. C.
SOLAR THERMAL POWER SYSTEMS, PROGRAM SUMMARY
Dec. 1978 280 p refs
(DOE/ET-0078) Avail: NTIS HC A13/MF A01

Each of DOE's Solar Thermal Power Systems projects funded and/or in existence during FY 1978 is described and the status as of September 30, 1978 is reflected. These projects are divided as follows: small thermal power applications, large thermal power applications, and advanced thermal technology. Also included are: 1978 project summary tables, bibliography, and an alphabetical index of contractors. DOE

N79-31795# TRW, Inc., McLean, Va. Energy Systems Planning Div.
ANALYSIS OF INVESTMENT ALTERNATIVES TO STIMULATE DEVELOPMENT AND TECHNOLOGY TRANSFER FOR ENERGY TECHNOLOGIES, SOLAR PHOTOVOLTAICS, A CASE STUDY
Sep. 1978 151 p refs
(Contract ET-78-C-05-5670)
(TID-28968) Avail: NTIS HC A08/MF A01

The return on investment that could be achieved by building a plant with the aid of six types of incentives was simulated based on five distinct plant designs. Descriptions and results of these analyses are presented. The general decision tree analysis in which other options are considered is illustrated. Using the residential market as a testbed, and for a variety of types or applications within the residential market, the significance of the balance-of-system costs issue is addressed in some detail. A survey of the photovoltaic industry is presented and the potential impact of incentives on the future competitiveness of the industry is discussed. Details of the methodology used to simulate corporate responses to inventive programs and computational details for balance-of-system costs are presented. DOE

N79-31796# Sandia Labs., Albuquerque, N. Mex.
SUMMARY OF APPLICATION ANALYSIS FOR PHOTOVOLTAIC SYSTEMS
G. J. Jones and J. L. Watkins 1979 12 p refs Presented at DOE Battery Storage Workshop, Denver, Colo., 11 Jan. 1979
(Contract EY-76-C-04-0789)
(SAND-78-0980C; Conf-790138-1) Avail: NTIS HC A02/MF A01

The cost effectiveness of consumer-owned photovoltaic systems was analyzed. The results indicate cost effectiveness in many regions in 1986 and everywhere by 2000, providing DOE price goals are met and battery storage is considered an integral part of only smaller (residential, remote) photovoltaic systems. The economic justification of battery storage in larger systems, especially utility owned ones, is relatively independent of the presence of the photovoltaic array. The greatest general area of uncertainly in all sectors is the utility-customer interface for consumer owned systems, and the worth of the photovoltaic system to the utility for utility owned systems. DOE

N79-31797# Department of Energy, Washington, D. C.
DOMESTIC POLICY REVIEW OF SOLAR ENERGY
Feb. 1979 146 p
(TID-28834) Avail: NTIS HC A07/MF A01

Solar technologies and government policy towards competing fuels were assessed and existing Federal solar energy programs were evaluated. Solar energy's potential contributions to national and international needs are identified. Three options for future government policy are presented and specific initiatives which could be adopted to implement each are described. DOE

N79-31798# Department of Energy, Washington, D. C. Energy Information Administration.
MACROECONOMIC AND SECTOR IMPLICATIONS OF INSTALLING 2.2 MILLION RESIDENTIAL SOLAR UNITS
R. F. Earley, M. M. Mohtadi, E. L. Rossidivito, and H. Weisman Apr. 1979 102 p refs
(DOE/EIA-0102/51) Avail: NTIS HC A06/MF A01

The macroeconomic sector, and employment implications of cumulatively installing 2.2 million solar heating and hot water units through 1985 are analyzed. K.L.

N79-31799# Midwest Research Inst., Golden, Colo.
IMPLEMENTATION OF STATE SOLAR INCENTIVES: RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAMS
B. Green Feb. 1979 41 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-51-161) Avail: NTIS HC A03/MF A01

The states view high-risk, capital-intensive R, D, and D solar projects as being most appropriately performed by the federal government and private industry. For the states, solar energy R, D, and D programs function primarily in support of commercialization efforts. The close programmatic relationship between solar energy R, D, and D and commercialization efforts at the state level is a function of a more-immediate or near-term emphasis within state-level programs, some states perceive their solar energy R, D, and D programs as predominantly a commercialization activity. Available R, D, and D incentives at the state level are reviewed and the implementation of research programs in New Mexico, Montana, California, and Florida is described. The following are included: a catalog of state solar energy R, D, and D programs; the choice of case-study states; program-implementation experience in the case-study states; and observations, recommendations, and conclusions. DOE

N79-31800# Midwest Research Inst., Golden, Colo.
ROLE OF EDUCATION AND TRAINING PROGRAMS IN THE COMMERCIALIZATION AND DIFFUSION OF SOLAR ENERGY TECHNOLOGIES
B. Burns, B. Mason, and K. Armington Jan. 1979 56 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-53-128) Avail: NTIS HC A04/MF A01

An important part of analyzing employment and labor force requirements in the solar energy field is determining the availability of trained and experienced workers and of programs to provide additional training. A base for analysis of these labor force supply questions by identifying the importance of education and training in the commercialization and diffusion of solar technologies is provided, issues for planning and analysis of solar education and training efforts are discussed, and the range of programs and courses presently available is illustrated. Four general perspectives are reviewed, on the diffusion of a new technology such as solar energy systems, with special attention to the education and training issues. DOE

N79-31801# Argonne National Lab., Ill.
ASSESSMENT OF NATIONAL CONSEQUENCES OF INCREASED COAL UTILIZATION, EXECUTIVE SUMMARY, VOLUME 1
Feb. 1979 89 p refs Prepared in cooperation with BNL, California Univ., Berkeley Lawrence Berkeley Lab., LASL, ORNL, and Battelle Pacific Northwest Labs. Sponsored by DOE
(TID-29425-Vol-1) Avail: NTIS HC A05/MF A01

Environmental constraints to reaching the coal use goals of the NEP were analyzed. The major constraint, air quality, arises primarily because of the postulated siting of power plants and coal-burning industries in or near areas where air quality standards are currently violated and prevention of significant deterioration' class 1 and 2 areas. Further air quality constraints may arise from potential short-term violations of National Ambient Air Quality Standards for total suspended particulates and SO2. These constraints may affect 35 percent of projected for the NEP. Other constraints discussed are: long range sulfur transport as dioxide and sulfates, health effects of air pollution, water quality and availability, solid waste disposal, socio-economic effects, economics (capital and labor investment required), occupational health and safety (accidents in mining and transporting coal), etc. DOE

N79-31802# Argonne National Lab., Ill.
ASSESSMENT OF NATIONAL CONSEQUENCES OF INCREASED COAL UTILIZATION, EXECUTIVE SUMMARY, VOLUME 2
Feb 1979 346 p refs Prepared in cooperation with BNL, California Univ., Berkeley Lawrence Berkeley Lab., LASL, ORNL, and Battelle Pacific Northwest Labs. Sponsored by DOE
(TID-29425-Vol-2) Avail: NTIS HC A15/MF A01

The constraints to reaching National Energy Plan (NEP) coal use goals were analyzed. The major constraint, air quality, involves the siting of utility and industrial sources in or near nonattainment areas or prevention of significant deterioration class 1 and 2 areas. Further restrictions arise from potential short term SO2 and total suspended particulates National Ambient Air Quality Standards violations. Implementation of NEP initiatives should not cause major public health impacts. Water quality and water availability constraints on site specific bases are expected. Solid waste does not appear to be a constraint for achieving NEP coal use goals. Neither national economic nor regional socioeconomic impacts appear to cause major restrictions. There may be socioeconomic impacts on a local basis where large scale energy facilities will be located in areas of low assimilative capacity. DOE

N79-31803# AIA Research Corp., Washington, D. C.
PASSIVE SOLAR DESIGN: A SURVEY OF MONITORED BUILDINGS
Oct. 1978 360 p refs
(Contract EG-77-C-01-4113)
(HCP/CS-4113-2) Avail: NTIS HC A16/MF A01

This survey consists of collected articles reporting the thermal performance of buildings using passive solar techniques, plus a matrix tabulating the information contained in the reports, and a verbal summary of the results. Most of the articles were published previously; additional information was gathered from owners and designers and is attached as an addendum to the articles. DOE

N79-31804# AIA Research Corp., Washington, D. C.
PASSIVE SOLAR DESIGN: AN EXTENSIVE BIBLIOGRAPHY
Dec. 1978 210 p
(Contract EG-77-C-01-4113)
(HCP/CS-4113-3) Avail: NTIS HC A10/MF A01

Approximately 2445 citations on passive solar design are presented. Materials included in major data banks as of January, 1978 are included along with the proceedings of the Second National Passive Conference. Subject areas include agriculture, costs, design concepts, greenhouses, energy storage, and evaporation. DOE

N79-31805# Midwest Research Inst., Golden, Colo.
CLASSIFICATION SCHEME FOR THE COMMON PASSIVE AND HYBRID HEATING AND COOLING SYSTEMS
Michael J. Holtz, W. Place (California Univ., Berkeley. Lawrence Berkeley Lab.), and R. C. Kammerud (California Univ., Berkeley. Lawrence Berkeley Lab.) Feb. 1979 9 p refs Presented at 3d Natl. Passive Solar Conf., San Jose, Calif., 11 Jan. 1979
(Contract W-7405-eng-48)
(LBL-8814; Conf-790118-6) Avail: NTIS HC A02/MF A01

A systematic nomenclature and classification scheme is proposed for passive space heating and cooling systems. It is based upon the mode of energy transport to and from the space and the environmental resource from which the energy is received or to which it is discharged. A number of passive and hybrid space heating and cooling systems are characterized. DOE

N79-31806# Sandia Labs., Albuquerque, N. Mex.
HELIOS MODEL FOR THE OPTICAL BEHAVIOR OF REFLECTING SOLAR CONCENTRATORS
F. Biggs and C. N. Vittitoe Mar. 1979 324 p refs
(Contract EY-76-C-04-0789)
(SAND-76-0347) Avail: NTIS HC A14/MF A01

The Helios model simulates the optical behavior of reflecting concentrators. The model follows the incident solar radiation through the system (including the atmosphere) and includes all the factors that influence the optical performance of a collector. An important output is the flux-density pattern at a grid of points on a surface such as the absorbing surface of a receiver and its integral (power in watts) over the surface. The angular distribution of sunrays for the radiation incident on a concentrator is modified by convolution to incorporate the effects of other nondeterministic factors. The analytical methods used for the statistics, the off-axis reflecting optics, the atmospheric effects, and the various coordinate systems are described and illustrated. This model forms a basis for the simulation code HELIOS as well as for other codes under development. Some of the HELIOS routines are described. DOE

N79-31807# Market Facts, Inc., Washington, D. C.
PASSIVE SOLAR ENERGY FOCUS GROUP RESULTS
1978 44 p
(Contract EV-78-C-01-6458)
(DOE/TIC-10016) Avail: NTIS HC A03/MF A01

The following are covered: the current state of passive solar energy, barriers to the commercialization of passive solar energy, possible actions for surmounting barriers to commercialization, and the role of the Federal Government in commercialization passive solar energy. Author (DOE)

N79-31808# Midwest Research Inst., Golden, Colo.
IMPLEMENTATION OF STATE SOLAR INCENTIVES: STATE TESTING AND CERTIFICATION
Robert Odland Mar. 1979 38 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-51-162) Avail: NTIS HC A03/MF A01

Implementation experiences of four states (Florida, California, Minnesota, and Oregon) with testing and certification programs were examined in order to: (1) provide information to other states and local governments that are contemplating adoption and implementation of such programs; (2) provide information to the Federal government for their use in formulating national policies recognize and accommodate regional diversity. Florida and California have testing and certification programs, both currently voluntary although certification in Florida will be required after January 1, 1980, and certification in California may be made a condition of their state income tax credit. Minnesota has a system whereby the characteristics of solar equipment are to be disclosed to the buyer; the manufacturer is charged with developing the necessary information. Oregon has several programs that require qualifying standards or criteria to be developed. One Oregon program requires certification by a state agency. DOE

N79-31810# Department of Energy, Washington, D. C. Office of Energy Research.
SOCIAL ASSESSMENT OF ON-SITE SOLAR ENERGY TECHNOLOGIES
Apr. 1979 251 p refs
(Grant EG-77-G-01-4040)
(HCP/R-4040-02) Avail: NTIS HC A12/MF A01

The results of an assessment of the impact of on-site solar energy technology upon society are presented. The assessment utilizes the methodology of social indicators. Twenty-five appropriate social descriptions provide the framework for assessing the technologies of solar space heating and cooling, solar water heating, wind energy conversion, fuelwood and photovoltaics. The report concentrates upon those areas which cause concern as these forms of solar energy realize increasing acceptance and usage by individual citizens. DOE

N79-31813# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
PASSIVE SOLAR ENERGY PLANNING AID KIT FOR BUILDING DESIGN ARCHITECTS AND PLANNERS
1978 97 p refs Presented at the 2d Natl. Passive Solar Conf., Philadelphia, 16 Mar. 1978
(Contract EM-78-C-01-4228)
(CONF-780337-P1) Avail: NTIS HC A05/MF A01

Fourteen articles are presented each containing building design and planning information for passive solar energy application. The articles are organized into three catagories: (1) planning and analysis, (2) residential buildings, and 3) office buildings. In a separate section passive design ideas are given along with planning consideration tips. DOE

N79-31814# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
PASSIVE SOLAR ENERGY PLANNING AID KIT FOR THE BUSINESS COMMUNITY AND GENERAL PUBLIC
1978 124 p Presented at the 2d Natl. Passive Solar Conf., Philadelphia, 16 Mar. 1978
(Contract EM-78-C-01-4228)
(CONF-780337-P2) Avail: NTIS HC A06/MF A01

Twenty-three articles are presented each containing information representative of some planning aid aspect of the state of the art in passive solar energy. The articles are organized into four categories: (1) passive solar approach, (2) real buildings in different locations, (3) greenhouses and greenrooms, and (4) design ideas and illustrations. R.E.S.

N79-31815# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
PASSIVE SOLAR ENERGY PLANNING AID KIT FOR SOLAR ENERGY SYSTEMS ENGINEERS
1978 106 p refs Presented at the 2d Natl. Passive Solar Conf. Philadelphia, 16 Mar. 1978
(Contract EM-78-C-01-4228)
(CONF-780337-P3) Avail: NTIS HC A06/MF A01

Separate abstracts were prepared for eleven of the included papers. The remaining two papers appeared previously in ERA. Author (DOE)

N79-31816# Midwest Research Inst., Golden, Colo.
GENERATOR GAS: THE SWEDISH EXPERIENCE FROM 1939-1945
Jan. 1979 334 p refs Transl. into ENGLISH of the book "Gengas" Stockholm, Swedish Academy of Engineering, 1950 334 p
(Contract EG-77-C-01-4042)
(SERI/SP-33-140) Avail: NTIS HC A15/MF A01

The scientific, technical, and commercial information developed during World War 2 when Sweden, cut off from fossil fuels, converted 40% of its entire motor vehicle fleet to burning wood is summarized. Topics discussed include: (1) history; (2) the theory of gas generation; (3) generator gas fuels; (4) shape and design of the gas generator; (5) cooling and cleaning of generator gas; (6) adoption of generator gas for motor operation; (7) adaptation of engines to generator gas for motor operation; (8) gas generator installation; (9) garage and services; (10) practical operating experience; (11) the economics of generators gas operations; and (12) the hazards of generator gas operation. DOE

N79-31817# Department of Energy, Washington, D. C.
THERMAL AND MECHANICAL ENERGY STORAGE PROGRAM
Mar. 1979 184 p
(DOE/ET-0091) Avail: NTIS HC A09/MF A01

DOE's Division of Energy Systems is supporting a broad range of projects to conserve energy and to make possible shifting away from oil and natural gas by developing central power generation, dispersed power generating, solar and waste heat utilization, and vehicle propulsion. Categories on mechanical and magnetic energy storage, and chemical/hydrogen energy stoage are addressed. DOE

N79-31818# Department of Energy, Washington, D. C.
BRIEFING RELATED TO EXECUTIVE ORDER 12003 AND THE NATIONAL ENERGY ACT
Nov. 1978 63 p
(Contract EM-77-C-01-8962)
(DOE/TIC-10065) Avail: NTIS HC A04/MF A01

The following briefings are discussed: (1) Managerial Plan Executive Order 12003 and the National Energy Act (NEA), the Plan is outlined and some of the historical background that preceded the presidential issuance of EO 12003 program are covered; (2) Roles and Responsibilities of EO 12003, NEA, and other authorities; (3) impact of the NEA on the Federal Energy Management Program; and (4) proposed interagency Task Group, designated as the Federal Energy Management and Policy Group. Supporting graphics for the briefings are included. DOE

N79-31819# Battelle Pacific Northwest Labs., Richland, Wash.
ANALYSIS OF FEDERAL INCENTIVES USED TO STIMULATE ENERGY PRODUCTION
B. W. Cone, D. L. Brenchley, and V. L. Brix Dec. 1978 400 p refs
(Contract EY-76-C-06-1830)
(PNL-2410-1-Rev) Avail: NTIS HC A17/MF A01

Federal incentives for the development of solar energy are studied and recommendations for the development of a solar energy policy based upon cost incentives for competing energy sources are made. The cost incentives for the other forms of energy are identified and analyzed. Federal incentives to stimulate energy research and development with respect to alternate energy sources are examined. A.W.H.

N79-31820# Unified Industries, Inc., Alexandria, Va.
RECOMMENDED CHANGES TO EXECUTIVE ORDER 12003 AND RELATED AUTHORITIES
27 Oct. 1978 9 p
(Contract EM-77-C-01-8962)
(DOE/TIC-10066) Avail: NTIS HC A02/MF A01

Executive Order (EO) 12003, directing that all federal agencies set the example in conservation by upgrading the efficiency of all government buildings and operations so as to achieve sizable energy savings, is discussed. Adjustments to the EO 12003 definition of a building is required to eliminate the need to include leased (new) buildings in the 45 percent energy reduction requirement. Ten changes directed at EO 12003 are presented in a table. DOE

N79-31821# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
ENERGY POLICY AND MATHEMATICS
A. M. Weinburg Mar. 1979 22 p refs
(Contract EY-75-C-05-0033)
(ORAU/IEA-79-5(0)) Avail: NTIS HC A02/MF A01

Mathematics as it applies to the energy policy and energy policy analysis is discussed. The author suggests that the undecidability of energy estimates of the future may to some degree be finessed by the development of technological options whose feasibility can be established through the help of deterministic mathematics. DOE

N79-31823# Unified Industries, Inc., Alexandria, Va.
ANALYSIS AND UPDATE OF ROLES AND RESPONSIBILITIES DERIVED FROM EXECUTIVE ORDER 12003 AND RELATED AUTHORITIES
31 Oct. 1978 51 p refs
(Contract EM-77-C-01-8962)
(DOE/TIC-10064) Avail: NTIS HC A04/MF A01

All program activities that DOE should perform as part of its management responsibilities for carrying out the President's directive for conserving energy in Federal buildings and operations are identified and analyzed. Activities in which DOE should not become involved are also identified. The basic authorities include: the Energy Policy and Conservation Act 381 (1975), Executive Order 11912 (1976), Public Law 95-91 (1977), Executive Order 12003 (1977), and the proposed National Energy Act. A summary of the authorities applicable to the Federal Energy Management Program are given. Based on the analyses, twelve recommendations are presented as strategies for DOE to carry out the initiatives. DOE

N79-31824# Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.
BUILDINGS ENERGY MANAGEMENT PROGRAM WORKSHOP DESIGN Final Report
Dec. 1978 66 p refs
(Contract EM-76-C-01-8630)
(CONS-8630-T1) Avail: NTIS HC A04/MF A01

Activities undertaken for design and development of the format, content, and materials that were used in conducting 129 one-day energy management workshops for specific commercial business audiences are described. The Building Energy Management Workshop Program was part of a National Workshop Program that was intended to increase awareness of energy-related issues and to encourage energy-conservation actions on the part of commercial and industrial sectors. DOE

N79-31826# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
MANAGERIAL PLAN: EXECUTIVE ORDER 12003 AND THE NATIONAL ENERGY ACT, PROPOSED, SYNOPSIS
Sep. 1978 18 p refs
(Contract EM-77-C-01-8962)
(DOE/TIC-10062) Avail: NTIS HC A02/MF A01

Upgrading the efficiency of all government buildings and operations to achieve sizable energy savings is considered. A managerial plan developed as a basic document to serve the needs of various levels of management is summarized. DOE

N79-31827# Hydroscience, Inc., Knoxville, Tenn.
ASSESSMENT OF LONG-DISTANCE THERMAL-ENERGY TRANSPORT: A COMPARISON BETWEEN WATER, STEAM, AND HOT OILS
Mar. 1979 96 p refs
(Contract W-7405-eng-26)
(ORNL/SUB-79/14274/1) Avail: NTIS HC A05/MF A01

Capital and operating costs required to supply low to moderate temperature (120 deg to 130 deg) thermal energy via a long distance pipeline system were assessed. Preliminary sizing calculations were performed and basic design requirements were developed. The cases studied involved short (8 km), intermediate (24 km), and long (64 km) transport distances as well as low (273 GJ/hr), intermediate (1370 GJ/hr), and high (4100 GJ/hr) levels of heat input. Thermal energy delivery costs are computed for each case to determine which systems are most economical to construct and operate. Energy outputs were studied for hot water at 1200 C, saturated steam at 177 C, and saturated steam at 249 C. DOE

N79-31828# Exxon Research and Engineering Co., Linden, N. J.
FUEL CELL CATALYST SINTERING STUDIES Final Report
Y. C. Pan and G. Ciprios Jul. 1978 104 p refs
(EPRI-EM-833) Avail: NTIS HC A03/MF A01

The impact of phosphorous chemistry in controlling the sintering phenomenon in phosphoric acid fuel cells was investigated. Extensive sintering tests were carried out on Pt catalysts supported on P-100 and other H3PO4 activated carbons from different manufacturers. These tests were conducted at temperatures ranging from 130 C and potentials ranging from +100 mV/SCE to +800 mV/SCE. The results with these supports show good sintering resistance at temperatures below 170 C and potentials up to +700 mV/SCE. At higher temperatures or potentials, such as those representative of FCG-1 operating conditions, the catalysts sintered at measurable rates. However, it was found that the phosphorus content of these spent catalysts had decreased, and furthermore, that the Pt crystallite stability was directionally consistent with the phosphorus retention data. DOE

N79-31829# Argonne National Lab., Ill.
FEASIBILITY OF DISTRICT HEATING OF NORTHERN US CITIES BY COGENERATION
D. J. Santini, A. A. Davis, and S. M. Marder 1978 19 p refs
Presented at 1st Conf. on Energy and Community Development, Athens, Greece, 10 Jul. 1978
(ANL/EES-CP-18; Conf-780744-1) Avail: NTIS HC A02/MF A01

A study is summarized that examines the engineering and economic feasibility of providing district heating to six major northern U.S. central cities by utlizing cogenerated electrical and thermal energy from retrofit of existing power plants. The four major components of the analysis are discussed, namely (1) demand estimation, (2) supply analysis, (3) transmission/distribution design, and (4) approximation of operations. A cost comparison to three coal-based heating alternatives is made. In addition to costs, energy savings are illustrated for the district-heating technology. Results indicate that cogeneration-based district heating is a technology worthy of continued evaluating by the U.S. DOE

N79-31830# Argonne National Lab., Ill.
APPLICATION OF AIR EJECTORS TO THE PERFORMANCE IMPROVEMENT AND COST REDUCTION OF COMPRESSED AIR STORAGE POWER PLANTS
F. W. Ahrens, T. T. Ng, and D. R. Otis 1978 27 p refs
Presented at CAES Technol. Symp., Pacific Grove, Calif., 15 May 1978
(Contract W-31-109-eng-38)
(CONF-780599-1) Avail: NTIS HC A03/MF A01

Ways in which air ejectors could be integrated into compressed air energy storage (CAES) power systems in order to achieve a reduction in costly air storage volume and a possible savings in air compression work are explored. Primary emphasis is given to a scheme involving multiple constant-volume caverns, with the pumping effect of the air ejector replacing the wasteful throttling process. The results cover a range of ejector efficiency and CAES system design conditions. It appears that volume reductions of 20 to 30% or more and compression work savings of 2 to 4% can be achieved. DOE

N79-31831# Gulf Universities Research Consortium, Bellaire, Tex.
REQUIREMENTS FOR THE DEVELOPMENT, MANAGEMENT AND IMPLEMENTATION OF RESEARCH IN SUPPORT OF THE DEPARTMENT OF ENERGY ENHANCED OIL RECOVERY PROGRAM
C. R. Hocott and R. H. Maier Feb. 1979 114 p
(Contract EX-76-C-01-2025)
(BETC-2025-1; GURC-163A) Avail: NTIS HC A06/MF A01

Recommendations concerning a supplemental research program for enhanced oil recovery (EOR) are outlined. A program of studies to identify, describe, and quantify geologic and geochemical factors, which have a major influence on EOR processes, should be initiated. The interactions within EOR systems and the interactions between fluid system components and rocks and fluids in the reservoir environment should be studied as a unified program. Dialogue and exchange of data and materials between laboratory investigations and field tests should be promoted and, for some projects, should be a requirement. Research programs which are not as developed as the surfactant-polymer program should be expanded. Comprehensive systems and procedures must be adopted soon for the collection, analysis filing dissemination, and interchange of data being developed in the different program sections. DOE

N79-31832# Boeing Engineering and Construction, Seattle, Wash.

CENTRAL RECEIVER DESIGN CONSIDERATIONS FOR BRAYTON CYCLE SOLAR POWER PLANTS

J. R. Gintz and R. C. Zentner 1978 21 p refs Presented at Symp. on Solar-Thermal Power Stations, Cologne, West Ger., 12 Apr. 1978 Prepared for EPRI
(EPRI Proj. RP-377-1)
(AED-Conf-78-212-016; Conf-780425-13) Avail: NTIS (US Sales Only) HC A02/MF A01; DOE Depository Libraries

A central solar power plant utilizing gas turbine machinery for the power conversion cycle is described. The design requirements, design rationale, thermal performance, and technical feasibility of the receiver system are discussed. The cavity receiver concept and initial receiver configurations are examined. Candidate materials to satisfy the design requirements for a commercial sized receiver are evaluated. DOE

N79-31836# National Technical Information Service, Springfield, Va.

WIND POWER, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1977 - Apr. 1979

Audrey S. Hundemann Jun. 1979 282 p Supersedes NTIS/PS-78/0416; NTIS/PS-77/0399; NTIS/PS-76/0358; NTIS/PS-75/348; COM-74-11103
(NTIS/PS-79/0534/2; NTIS/PS-78/0416; NTIS/PS-77/0399; NTIS/PS-76/0358; NTIS/PS-75/348; COM-74-11103) Avail: NTIS HC $28.00/MF $28.00 CSCL 10B

This bibliography contains 276 citations on the feasibility, use, and engineering aspects of wind power and windmills. The use of wind power for electric power generation and wind turbine design and performance is examined. Comparative analyses of wind power and alternative energy soures are included, as are energy storage devices which can be used in these systems. GRA

N79-31837# National Technical Information Service, Springfield, Va.

WIND POWER, VOLUME 1. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - 1977

Audrey S. Hundemann Jun. 1979 225 p
(NTIS/PS-79/0535/9) Avail: NTIS HC $28.00/MF $28.00 CSCL 10B

This bibliography contains 210 citations on windmill and wind power feasibility, use, and engineering. The use of wind power for electric power generation and wind turbine design and performance is reported. The use of wind power in developing countries and comparative analyses of wind power and alternative energy sources are included, as are studies on energy storage systems. GRA

N79-31838# National Technical Information Service, Springfield, Va.

WIND POWER, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1978 - Apr. 1979

Audrey S. Hundemann Jun. 1979 131 p Supersedes NTIS/PS-78/0417; NTIS/PS-77/0400; NTIS/PS-76/0359
(NTIS/PS-79/0536/7; NTIS/PS-78/0417; NTIS/PS-77/0400; NTIS/PS-76/0359) Avail: NTIS HC $28.00/MF $28.00 CSCL 10B

Windmill and wind power feasibility, use, and engineering are discussed in these citations of world-wide research. Abstracts primarily cover the use of wind power for electric power generation and wind turbine design and performance. General studies dealing with the use of wind power in developing countries and comparative analyses of wind power and alternative energy sources are included, as are studies on energy storage systems. This updated bibliography contains 125 abstracts, 113 of which are new entries to the previous edition. GRA

N79-31839*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

REMOTE MONITORING OF THE GRAVELLY RUN THERMAL PLUME AT HOPEWELL AND THE THERMAL PLUME AT THE SURRY NUCLEAR POWER PLANT ON THE JAMES RIVER

T. A. Talay, K. W. Sykes (Army Corps of Engineers, Norfolk, Va.), and C. Y. Kuo (Virginia Polytechnic Inst. and State Univ., Blacksburg) Jul. 1979 21 p refs Presented at the Virginia Academy of Science, 56th Ann. Meeting, Blacksburg, 9-12 May 1978
(NASA-TM-80124) Avail: NTIS HC A02/MF A01 CSCL 13B

On May 17, 1977, a remote sensing experiment was conducted on the James River, Virginia, whereby thermal spectrometer and near-infrared photography data of thermal discharges at Hopewell and the Surry nuclear power plant were obtained by an aircraft for one tidal cycle. These data were used in subsequent investigations into the near field discharge trajectories. For the Gravelly Run thermal plume at Hopewell, several empirical expressions for the plume centerline were evaluated by comparisons of the computed trajectories and those observed in the remote sensing images. Author

N79-31844# Mitre Corp., McLean, Va.

NATIONAL ENVIRONMENTAL IMPACT PROJECTION NO. 1

Richard J. Kalaagher, Beth L. Borko, Deborah Elcock, Robert Kline, Andy Lawrence, Nazir Dossani, Alan D. Berstein, Thomas H. Piwowar, William P. Weygandt, and Marc Narkus-Kramer Feb. 1979 107 p refs Prepared in cooperation with CONSAD Res. Corp., Pittsburgh,Pa., Intern. Res. and Technol. Corp., Mclean, Va., and Control Data Corp., Minneapolis, Minn.
(Contract E-77-C-01-6119)
(HCP/P-6119) Avail: NTIS HC A06/MF A01

Environmental and economic impacts expected to result under the Energy Information Administration's energy supply and demand projections to 1990 are presented. DOE

N79-31845# Washington Univ., Seattle. Center for Quantitative Science in Forestry, Fisheries, and Wildlife.

ASSESSING THE IMPACT OF NUCLEAR-POWER PLANTS ON THE ENVIRONMENT Annual Progress Report

D. G. Chapman, D. P. Lettenmaier, A. H. Seymour, G. L. Swartzman, and H. E. Lawson Dec. 1978 179 p refs
(NUREG/CR-0552; APR-2) Avail: NTIS HC A09/MF A01

An assessment of the wide-ranging effects that nuclear power plants can have on the environment is presented. The effects include mortality to fish and other organisms resulting from impingement and entrainment in the cooling system; changes in behavioral and physiological characteristics of aquatic animals by higher temperatures present in the discharge plume; and toxic effects of biocides, heavy metals and radionuclides released in the aquatic or atmospheric environment. DOE

N79-32075# Atomics International Div., Richland, Wash. Rockwell Hanford Operations.

SPENT FUEL HANDLING AND PACKAGING PROGRAM

Sep. 1978 24 p refs
(Contract EY-77-C-06-1030)
(RHO-LD-78-4-SEP) Avail: NTIS HC A02/MF A01

The objective is to design, develop, and demonstrate a spent fuel package for geologic storage and disposal; to design, license, and construct the facilities to produce this package; and to develop and demonstrate technology for the dry, passive surface storage of spent fuel. Progress is reported on engineering and system studies, technical R and D studies, demonstrations, project support studies, spent fuel facility project, and program management. DOE

N79-32081# Atomics International Div., Richland, Wash. Rockwell Hanford Operations.

SPENT FUEL HANDLING AND PACKAGING PROGRAM Management Summary Report, Aug. 1978

Dec. 1978 23 p

(Contract EY-77-C-06-1030)
(RHO-LD-78-4-AUG) Avail: NTIS HC A02/MF A01

The program has the objective to design, develop, and demonstrate a spent fuel package for geologic storage and disposal and design, license, and construct the facilities to produce this package, and to develop and demonstrate technology for the dry, passive surface storage of spent fuel. A 90% complete draft of the Spent Fuel Receiving and Packaging Facility conceptual design report was completed. The construction work at the Nevada Test Site, in support of the 1978 Spent Fuel Demonstration was restarted. DOE

N79-32113# Oak Ridge National Lab., Tenn.
OPTIMIZATION OF THE FISSION-FUSION HYBRID CONCEPT
M. J. Saltmarsh, W. R. Grimes, and R. T. Santoro Apr. 1979 56 p refs
(Contract W-7405-eng-26)
(ORNL/PPA-79/3) Avail: NTIS HC A04/MF A01

The role of the fission-fusion hybrid reactor as a fissile fuel producer is discussed. The advantages of the concept in terms of the performance of the fusion device and the breeding blankets are presented. Some of the troublesome features of existing design studies are described. Hybrids based on deuterium-tritium (D-T) fusion devices are unlikely to be economically attractive and present formidable blanket technology problems. An alternative approach based on a semicatalyzed deuterium-deuterium fusion reactor and a molten salt blanket is discussed. This concept is shown to emphasize the desirable features of the hybrid, to have considerably greater economic potential, and to mitigate many of the disadvantages of D-T-based systems. DOE

N79-32129*# Detroit Diesel Allison, Indianapolis, Ind.
SINGLE SHAFT AUTOMOTIVE GAS TURBINE ENGINE CHARACTERIZATION TEST Final Report
R. A. Johnson Sep. 1979 103 p Prepared for NASA and DOE
(Contracts DEN3-4; EC-77-A-31-1040)
(NASA-CR-159654; DDA-EDR-9790; DOE/NASA/0004-79/1) Avail: NTIS HC A06/MF A01 CSCL 13F

An automotive gas turbine incorporating a single stage centrifugal compressor and a single stage radial inflow turbine is described. Among the engine's features is the use of wide range variable geometry at the inlet guide vanes, the compressor diffuser vanes, and the turbine inlet vanes to achieve improved part load fuel economy. The engine was tested to determine its performance in both the variable geometry and equivalent fixed geometry modes. Testing was conducted without the originally designed recuperator. Test results were compared with the predicted performance of the nonrecuperative engine based on existing component rig test maps. Agreement between test results and the computer model was achieved. A.W.H.

N79-32130*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THREE STATE-OF-THE-ART INDIVIDUAL ELECTRIC AND HYBRID VEHICLE TEST REPORTS, VOLUME 2
Nov. 1978 329 p refs
(Contract EC-77-A-31-1011)
(NASA-CR-162311; HCP/M1011-03/2-Vol-2) Avail: NTIS HC A15/MF A01

Procedures used in determining the energy efficiency and economy of a gasoline-electric hybrid taxi, an electric passenger car, and an electric van are described. Tabular and graphic data show results of driving cycle and constant speed tests, energy distribution to various components, efficiency of the components, and, for the hybrid vehicle, the emissions. A.R.H.

N79-32131# Sandia Labs., Albuquerque, N. Mex.
PROBLEMS OF TECHNOLOGY TRANSFER TO INDUSTRY
1979 15 p refs Presented at the 6th Energy Technol. Conf. and Exposition, Washington, D.C., 26 Feb. 1979
(Contract EY-76-C-04-0789)
(SAND-79-0096; Conf-790213-1) Avail: NTIS HC A02/MF A01

The following are discussed: solar energy utilization, technology development, technology transfer, and problems with technology transfer. Examples of technology development and transfer to industry are given. DOE

N79-32135# Dynamic Science, Phoenix, Ariz.
PARATRANSIT VEHICLE TEST AND EVALUATION. VOLUME 4: FUEL ECONOMY TESTS Final Report, Nov. 1976 - Jul. 1977
L. Wesson, C. Culley, and R. L. Anderson Jun. 1978 51 p 5 Vol.
(Contract DOT-TSC-1241)
(PB-295478/2; UMTA-MA-06-0052-78-4; DOT-TSC-UMTA-77-49-4) Avail: NTIS HC A04/MF A01; also available in set of 5 reports HC E14 as PB-295474-SET CSCL 13F

A series of tests and evaluations of two prototype vehicles for paratransit were conducted. The test procedures and results of the fuel economy tests are presented. The test series determined the fuel economy of the vehicles as they were driven through simulated urban and suburban driving cycles. The relationships between fuel consumption and vehicle speeds were determined and maximum fuel economies were established. GRA

N79-32237*# Michigan Univ., Ann Arbor. Dept. of Aeronautical Engineering.
EXTRATERRESTRIAL FIBERGLASS PRODUCTION USING SOLAR ENERGY
Darwin Ho and Leon E. Sobon *In* NASA. Ames Res. Center Space Resources and Space Settlements 1979 p 225-232 refs
Avail: NTIS MF A01; SOD HC CSCL 22A

A conceptual design is presented for fiberglass production systems in both lunar and space environments. The raw material, of lunar origin, will be plagioclase concentrate, high silica content slag, and calcium oxide. Glass will be melted by solar energy. The multifurnace in the lunar plant and the spinning cylinder in the space plant are unique design features. Furnace design appears to be the most critical element in optimizing system performance. A conservative estimate of the total power generated by solar concetrators is 1880 kW; the mass of both plants is 120 tons. The systems will reproduce about 90 times their total mass in fiberglass in 1 year. A new design concept would be necessary if glass rods were produced in space. Author

N79-32372# Department of Energy, Washington, D. C. Information Administration.
ROLE OF REFINED PRODUCT IMPORTS IN THE DOMESTIC FUEL MARKET
M. J. Frederiksen Apr. 1979 64 p refs
(DOE/EIA-0102/53) Avail: NTIS HC A04/MF A01

The effects of domestic petroleum regulations on refined product prices in the United States and on the tradeoff between the levels of domestic refinery production and refined product imports were analyzed: (1) the crude oil cost advantage which domestic refiners enjoy because of crude oil price controls decreased by 50 percent since March 1976; (2) at least some of the resulting increase in crude oil acquisition cost was passed through into gasoline and distillate prices; (3) in the East Coast residual fuel oil market, imports have increased substantially since 1976, and the increase may have prevented the passthrough of crude oil cost increases; (4) the crude oil cost advantage and the small refiner bias in the entitlements program have caused greater domestic refinery production and lower utilization of foreign refining capacity than would have occurred without the regulations; and (5) deregulation of crude oil prices is likely to result in some increase in refined product prices. DOE

N79-32373# Sandia Labs., Albuquerque, N. Mex.
FUELS FROM MAGMA: A POTENTIAL ENERGY SOURCE
T. M. Gerlach 1978 8 p refs Presented at the 2d Circum-Pacific Energy and Mineral Resources Conf., Honolulu, 30 Jul. 1978
(Contract EY-76-C-04-0789)
(SAND-78-0191; Conf-780737-1) Avail: NTIS HC A02/MF A01

The chemical and thermodynamic basis, the confirmatory laboratory experiments, and the geological data that point to the potential of magma as a resource that could produce large amounts of hydrogen as well as carbon monoxide and methane are discussed. The method of fuel production proposed depends on the reducing action of basalt on injected water; this chemical interaction causes the oxidation of ferrous components in the basalt and the production of hydrogen. The amount of hydrogen produced by a given body of basalt can be enhanced by introducing natural organic matter (biomass) into the injected water. This also would permit the method to be used to produce appreciable quantities of carbon monoxide and methane, and allows the exploitation of less FeO-rich magmas and hot rocks. Calculations show that the thermal energy of the magma may be used to gasify the biomass with resultant gas species resembling those from more conventional coal gasification processes. DOE

N79-32374# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
REVIEW OF CURRENT RESEARCH ON HYDROCARBON PRODUCTION BY PLANTS
H. M. Benedict and B. Inman Jan. 1979 38 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-33-129) Avail: NTIS HC A03/MF A01

Except in the case of guayule (Parthenium argentatum Gray), research on hydrocarbon species generally has not advanced beyond preliminary screening, extraction, and growth studies. Virtually no field studies have been initiated; hydrocarbon component extraction, separation, identification, and characterization have been only timidly approached; the biochemistry of hydrocarbon formation remains virtually untouched; and potential market analysis has been based on insufficient data. Due to the infant state of technology in this area of energy research, it is not possible to predict or satisfactorily assess at this time the potential contribution that plant hydrocarbons might make toward decreasing the nation's dependence upon petroleum. However, the general impression received from experts interviewed during this review was that the major thrust of research should be directed toward the manufacture of petrochemical substitutes rather than fuel production. DOE

N79-32375# Department of Energy, Laramie, Wyo. Energy Technology Center.
MATHEMATICAL MODEL OF FORWARD COMBUSTION RETORTING OF OIL SHALE
L. Dockter and H. G. Harris Jul. 1978 24 p refs
(Contract EX-76-S-01-2234)
(LETC/TPR-78/1) Avail: NTIS HC A02/MF A01

The first version or base model is described of a mathematical model of vertical, forward combustion retorting of oil shale that was developed through 1974 at the Laramie Energy Technology Center in Laramie, Wyoming. The model was written to simulate conditions and processes occurring in LETC's experimental batch-type 150-ton retort. Information presented deals with the reasoning and justification for developing the model, a description of the modeling effort, and a comparison of the yields, retorting rates, and other information obtained from the model as compared with actual results from the 150-ton retort. Good qualitative agreement between the base model and actual experimental results is found. However, quantitative agreement is not realized in this version of the model; some reasons for this are discussed. DOE

N79-32379# Marquette Univ., Milwaukee, Wis.
THERMODYNAMIC-ECONOMIC ANALYSIS OF THE SYNTHANE PROCESS
R. Gaggioli, L. Rodriguez, and W. Wepfer Nov. 1978 104 p refs
(Contract EY-77-S-02-4589)
(COO-4589-1) Avail: NTIS HC A06/MF A01

An exhaustive Second Law analysis of the synthane process is presented, including an efficiency and a costing study, both based on the available energy concept. The analysis shows an overall process efficiency of 46%. For 100 kwhr of useful energy supplied with coal, 51 kwhr are consumed driving the various unit operations while effluents carry 3 kwhr. The conceptual design of units clearly leads to inordinately high costs for utilities (steam, power, oxygen), compared to common utility costs readily attainable even with more expensive fuels. A preliminary recosting, assuming reasonable (yet conservatively high) costs of utility production, showed that product gas cost would be reduced from 2.1 cents/kwhr to 1.7 cents/kwhr, readily. DOE

N79-32382# Braun (C. F.) and Co., Alhambra, Calif.
FIXED BED METHANATION PROCESSES Final Report
V. P. Sirohi Aug. 1978 36 p refs
(Contract EX-76-C-01-2240)
(FE-2240-96) Avail: NTIS HC A03/MF A01

Based on the economic comparison of this study, it was concluded that the process arrangement of Hot Gas Recycle is economically attractive because it allows a maximum steam production at high pressure. The use of a high temperature catalyst results in a more economical process design in comparison with a low temperature catalyst. This is due to the increase in temperature rise across the methanator reactors, which in turn reduces the recycle flow rate, catalyst requirements, and vessel sizes. More efficienct heat recovery is also obtained. It is also concluded that the three reactor system is more economical than a single reactor mathanation process. The use of the Hot Gas Recycle with three reactors is recommended for all types of methanation catalysts. A high temperature catalyst has a further economic advantage over other catalysts. It is recommended that such a catalyst be demonstrated commercially to confirm its potential. DOE

N79-32383# Oak Ridge National Lab., Tenn.
RECENT DEVELOPMENTS IN COAL LIQUEFACTION IN THE UNITED STATES
L. E. McNeese, L. E. Salmon, and H. D. Cochran, Jr. 26 Feb. 1979 38 p refs Presented at 6th Energy Technol. Conf. and Exposition, Washington, D. C., 26 Feb. 1979
(Contract W-7405-eng-26)
(CONF-790213-5) Avail: NTIS HC A03/MF A01

The mechanisms by which the synthetic fuels industry developed were considered. It is not at all clear that natural marketplace forces are able to build the industry rapidly enough to meet the demands expected in the next 20 to 30 years. The need for government initiative was widely discussed. The need for careful consideration of the demand-time curve for synthetic liquid fuels and of the length of time required to build an industry of the size needed was emphasized. DOE

N79-32384# SRI International Corp., Menlo Park, Calif.
MISSION ANALYSIS FOR THE FEDERAL FUELS FROM BIOMASS PROGRAM. VOLUME 4: THERMOCHEMICAL CONVERSION OF BIOMASS TO FUELS AND CHEMICALS Final Report
S. M. Kohan and P. M. Barkhordar Jan. 1979 179 p refs
(SAN-0115-T3) Avail: NTIS HC A09/MF A01

The selection of the feedstock used in the analysis of thermochemical conversion technologies is discussed. Detailed technical and economic evaluation are presented of biomass conversion to electricity and steam by combustion, SNG by gasification and methanation, methanol by gasification and synthesis, oil by catalytic liquefaction, oil and char by pyrolysis, and ammonia by gasification and synthesis. DOE

N79-32385# SRI International Corp., Menlo Park, Calif.
MISSION ANALYSIS FOR THE FEDERAL FUELS FROM BIOMASS PROGRAM. VOLUME 1: SUMMARY AND CONCLUSIONS Final Report, Dec. 1978
F. A. Schooley, R. L. Dickenson, S. M. Kohan, and J. L. Jones Mar. 1979 76 p refs
(Contract EY-76-C-03-0115-131)
(SAN-0115-T2) Avail: NTIS HC A05/MF A01

An overview report on biomass derived fuels likely to achieve future market penetration and commercialization for the DOE, Solar Energy Division, Fuels From Biomass System Branch is presented. Fifteen feedstock-to-product routes were studied in detail, and economic data were summarized for 53 missions. Using a market penetration model and assuming base case feedstock availability (without federal incentives), it was determined that seven of the 53 missions studied penetrate the market in 1985, 15 missions penetrate in 2000, and 15 penetrate in 2020, producing about 0.7, 3.5, and 5.4 quadrillion Btu of useful fuel products, respectively, in each of the years. DOE

N79-32386# Pittsburgh Univ., Pa.
SCREENING OF ZEOLITE CATALYSTS FOR METHANOL CONVERSION TO LIGHT HYDROCARBONS Final Report, 1 Jan. - 30 Sep. 1978
J. T. Cobb, Jr., V. T. Coon, and P. Tipnis Sep. 1978 38 p refs
(Contract EW-78-S-02-4691)
(COO-4691-1) Avail: NTIS HC A03/MF A01

Eleven tests were performed with Zeolon 500 (chabazite) and lanthanum-exchanged Zeolon 500. During the first 300 to 800 minutes of each test, catalyst performance was examined. The independent variables explored were extent of lanthanum exchange, temperature, space velocity, and short-term aging. Selectivity was greatly affected by aging with paraffins being the major product in the first few minutes, olefins being present at intermediate times, and dimethly ether being the major product toward the end of the study period in each test. At higher temperatures, the rate of aging decreased, the maximum olefins produced increased, and the production of dimethyl ether decreased. Eleven catalyst samples were analyzed for carbon content by standard techniques and for structural features by powder X-ray diffraction. Aged samples contained about 10% carbon. Fresh samples and samples regenerated once showed 0.1% carbon and similar X-ray patterns. DOE

N79-32387# Brookhaven National Lab., Upton, N. Y.
METAL HYDRIDE TECHNOLOGY
J. J. Reilly Feb. 1979 60 p Presented at Hydrogen in Metals Intern. Meeting, Munster, W. Ger., 6 Mar. 1979
(Contract EY-76-C-02-0016)
(BNL-26047, Conf-790301-10) Avail: NTIS HC A04/MF A01

The properties and applications of systems which have proven of potential utility as hydrogen storage compounds are summarized. Specific systems discussed are magnesium alloy hydrides, iron-titanium alloys, titanium-chromium alloys, and rare earth alloys. DOE

N79-32388# Brookhaven National Lab., Upton, N. Y.
ADVANCED SYNFUEL PRODUCTION WITH FUSION
J. R. Powell and J. A. Fillo 1979 8 p refs Presented at 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract EY-76-C-02-0016)
(BNL-26130; Conf-790803-26) Avail: NTIS HC A02/MF A01

An important first step in the synthesis of liquid and gaseous fuels is the production of hydrogen. Thermonuclear fusion offers a nearly inexhaustible source of energy for the production of hydrogen from water. Depending on design, electric generation efficiencies of approximately 40 to 60% and hydrogen production efficiencies by high temperature electrolysis of approximately 50 to 70% are projected for fusion reactors using high temperature blankets. DOE

N79-32390# TRW, Inc., McLean, Va. Energy Systems Planning Div.
METHANE RECOVERY FROM COALBEDS PROJECT TECHNOLOGY TEST PROJECTS EVALUATION OF CANDIDATE PROJECTS
Feb. 1979 26 p
(Contract EW-78-C-21-8089)
(DOE/TIC-10128) Avail: NTIS HC A03/MF A01

Of twelve candidate methane recovery projects evaluated, eight have sufficient information for a fair ranking. Three of the other four had concepts which did not offer any features not found in the eight ranked projects. The four projects recommended for further pursuit were selected on the basis of potential technology gains, economics, transferability of generated data, and on the potential for evolving widely used concepts. The selected projects are: (1) Occidental Research/Island Creek Coal - horizontal boreholes in advance of mining; (2) Bethlehem Mines - vertical wells in advance of mining; (3) Waynesburg College - multiple completion technology project, and (4) Pennsylvania Energy Resources - multiple completion, multiple wells in anthracite. The major features of these projects are described. DOE

N79-32391# Institute of Gas Technology, Chicago, Ill.
PEAT GASIFICATION: AN EXPERIMENTAL STUDY
D. V. Punwani, S. P. Nandi, L. W. Gavin, and J. L. Johnson 1978 34 p refs Presented at the 85th Natl. Meeting of the Am. Inst. of Chem. Engr., Philadephia, 4-8 Jun. 1978
(Contract EX-76-C-01-2469)
(CONF-780611-8) Avail: NTIS HC A03/MF A01

Compared to lignite, peat is several times more reactive and makes four times as much light hydrocarbon gases during initial short-residence-time (5 seconds) hydrogasification. Compared to coal (at temperatures above 1440 F), hydrogen pressures above 4 atmospheres are relatively less essential for increasing light hydrocarbon gas yields. On an overall basis, peat is an exceptionally good raw material for SNG production. Based on the experimental results, a conceptual commercial reactor configuration was selected which incorporates a dilute-phase, cocurrent, short-residence-time, hydrogasification stage followed by fluidized-bed char gasification with steam and oxygen. Tests in process development units are in progress. DOE

N79-32393# Rheinische Braunkohlenwerke A.G., Cologne (West Germany). Abt. Forschung und Entwicklung.
RESEARCH AND DEVELOPMENT WORK FOR HYDROGASIFICATION OF COAL WITH NUCLEAR PROCESSING HEAT DONE IN THE FRAMEWORK OF THE PROTOTYPE NUCLEAR PROCESSING HEATER PROJECT Final Report
Lothar Schrader Bonn Bundesmin. fuer Forsch. u. Technol. Nov. 1978 120 p refs In GERMAN; ENGLISH summary
(Contract BMFT-PLE-ET-1399-C)
(BMFT-FB-T-78-25) Avail: NTIS HC A06/MF A01; Fachinformationszentrum, Eggenstein-Leopoldshafen, West Germany DM 25,20

A technique for coal gasification using nuclear processing heat was developed, then studied following the construction of a pilot plant for hydrogasification in a fluidized bed with an input of 100 kg coal/hr. This process for the production of synthetic natural gas or carbon monoxide and hydrogen gas containing mixtures is shown to have the advantages of saving feed coal, improving efficiency, reducing emissions, and stabilizing energy costs. The design, construction, and operation of the pilot plant are described. Components have been proven for the hydrogasification of brown coal and rock coal. Results demonstrate the suitability of this unit as a part of a large scale gasification plant. Author (ESA)

N79-32394# Bergbau-Forschung G.m.b.H., Essen (West Germany). Abt. Physikalische Chemie.
RESEARCH AND DEVELOPMENT CONCERNING STEAM GASIFICATION OF COAL: REPORT ON THE CONCEPT OF A PROTOTYPE PLANT USING NUCLEAR PROCESSING HEAT Final Report
Karl-Heinrich vanHeek Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 93 p refs In GERMAN; ENGLISH summary
(Contract BMFT-03E-1399-A/ETS-0004-1)
(BMFT-FB-T-78-29) Avail: NTIS HC A05/MF A01; Fachinformationszentrum; Eggenstein-Leopoldshafen, West Germany DM 19,35

The development of a coal gasification process using a high temperature nuclear reactor to meet the energy requirements of the process is described. A key point in the development is the gas generator in which the nuclear heat is transferred into a fluidized bed of coal and steam via an intermediate loop and a heat exchanger immersed in the bed. On the basis of former results concerning reaction kinetics and heat transfer, further experiments with different devices were performed and the program for the testing and the development of new alloys to be used was continued. A pilot plant (0.2 T/hr) using an electrically heated helium loop was constructed and is now in operation. The data gathered confirm the feasibility of the gas generator as well as the process and are being used for the design of bigger plants. Author (ESA)

N79-32477# Los Alamos Scientific Lab., N. Mex.
THERMOELASTIC ANALYSIS OF A SUPERCONDUCTING CABLE
P. D. Smith Sep. 1978 24 p refs
(Contract W-7405-eng-36)
(LA-7465-MS) Avail: NTIS HC A02/MF A01

The thermoelastic response of a superconducting power transmission cable when it is chilled from ambient to operating temperature is described. The cable consists of coaxial stranded conductors separated with a cylindrical dielectric. Cable and reactions and internal stresses are determined. Sample results for a hypothetical cable indicate that cable end reactions and peak stresses in the strands are sensitive to the initial helix angles and initial helix radii of the conductor strands. DOE

N79-32481# Los Alamos Scientific Lab., N. Mex.
ENERGY LOSSES IN A FLAT TRANSPOSED CABLE
Bernard Turck Feb. 1979 13 p refs
(Contract W-7405-ENG-36)
(LA-7635-MS) Avail: NTIS HC A02/MF A01

Extra energy losses caused by the coupling currents between strands in a flat superconducting cable that is exposed to an external changing field are derived. Special attention is given to the cable with an insulating strap interposed between the two layers of strands so as to reduce the losses. It is shown that the losses are not reduced as much as expected. DOE

N79-32515# Oak Ridge National Lab., Tenn.
CONDENSATION OF REFRIGERANTS ON VERTICAL FLUTED TUBES
S. K. Combs, G. S. Mailen, and R. W. Murphy Aug. 1978 203 p refs
(Contract W-7405-eng-26)
(ORNL/TM-5848) Avail: NTIS HC A10/MF A01

Experiments were run to determine heat transfer performance of single vertical fluted tubes with selected fluids condensing on the outside. Working fluids included six fluorocarbons (Refrigerants 11, 21, 22, 113, 114, and 115) and a hydrocarbon (Refrigerant 600a or isobutane). The nine test tubes were of 2.54-cm nominal outside diameter and 1.2 m in length with from 0 (smooth) to 60 axial flutes. Condensing heat transfer coefficients ranged from 620 to 7900 W/sq m K over the heat flux range of 2000 to 43,000 W/sq m. All parameters are based on total condensing surface area. The data show that, for a given heat flux, a fluted tube can increase condensing coefficents up to 6.0 times smooth tube values. Further heat transfer enhancement was achieved by the use of drainage skirts on fluted tubes; these skirts effectively divided the 1.2-m tubes into two, four, and eight equal condensing lengths. DOE

N79-32516# Stanford Univ., Calif. Petroleum Research Inst.
TRANSIENT FLOW OF NON-NEWTONIAN POWER-LAW FLUIDS IN POROUS MEDIA Ph.D. Thesis
C. U. Ikoku and H. J. Ramey, Jr. Feb. 1979 271 p refs
(Contract EY-76-C-03-1265)
(SAN-1265-9; SU-SUPRI-TR-9) Avail: NTIS HC A12/MF A01

The basic characteristics of transient injection of a power-law non-Newtonian fluid were studied. A nonlinear partial differential equation for flow of power-law fluids was derived. The diffusivity equation is a special case of this equation. The partial differential equation describes the flow of a slightly compressible, non-Newtonian power-law fluid in a homogeneous and isotropic porous medium. This equation should govern the flow of most agents used in enchanced oil recovery projects. A linear form of the partial differential equation was also derived. A model for the flow of foam in porous media gave rise to another nonlinear partial differential equation which considers the compressibility of foam, and the pressure-dependent quality of foam. Analytical solutions of the transient and steady state forms of the linear partial differential equation were obtained. DOE

N79-32518# Los Alamos Scientific Lab., N. Mex.
CERAMIC HEAT PIPES FOR HIGH TEMPERATURE HEAT REMOVAL
E. S. Keddy and W. A. Ranken 1978 17 p refs Presented at the 18th Natl. Heat Transfer Conf. (AICHE-ASME), San Diego, Calif., 5-8 Aug. 1978
(Contract W-7405-ENG-36)
(LA-UR-79-332; Conf-7808101-1) Avail: NTIS HC A02/MF A01

A development program was initiated to demonstrate the technical and eventually the economical feasibility of ceramic heat pipts and ceramic heat pipe recuperators. The prime candidate for heat pipe construction is SiC. Closed-end tubes of this material were prepared by chemical vapor deposition (CVD). These tubes were lined internally with tungsten by a subsequent CVD operation, partially filled with sodium, and sealed by brazing a tungsten lined SiC plug into the open end with a palladium-cobalt alloy. Heat pipes constructed in this manner were successfully operated in vacuum at temperatures of 1225 K and in air at a temperature of 1125 K. The heat source used initially for the air testing was an induction heated metallic sleeve in thermal contact with the test unit. Subsequent testing has shown that a silicon carbide heat pipe can be successfully operated with natural gas burners providing the input heat. Methods of fabricating and testing these devices are described. DOE

N79-32565# Oak Ridge National Lab., Tenn.
FREQUENCY ANALYSIS OF A THICK-RIM FLYWHEEL
D. N. Fanning Sep. 1978 50 p refs
(Contract W-7405-eng-26)
(ORNL/TM-5804) Avail: NTIS HC A03/MF A01

The calculation of natural frequencies of a thick rim flywheel is presented using two analysis methods: the finite element method and the transfer matrix method. A listing of the computer program developed using the transfer matrix method is included. The results of the finite element analysis indicate that the computer programs NONSAP and ADINA are incapable of determining out-of-plane natural frequencies of the flywheel. The results of the analysis using the transfer matrix method are satisfactory for out-of-plane as well as in-plane frequencies. DOE

N79-32617# Department of Energy, Washington, D. C. Office of Strategic Petroleum Reserve.
STRATEGIC PETROLEUM RESERVE Annual Report
16 Feb. 1979 89 p Sponsored by DOE
(DOE/TIC-10107; AR-2) Avail: NTIS HC A05/MF A01

Reserve development activities during 1978 are reported. Status of the 9 sites is discussed in appendixes. DOE

N79-32618# Department of Energy, Washington, D. C. Energy Information Administration.
REEXAMINATION OF THE ESTIMATION OF UNDISCOVERED OIL RESOURCES IN THE US
N. Uri Apr. 1979 23 p refs
(DOE/EIA-0103/31; TM/ES/79-03) Avail: NTIS HC A02/MF A01

The estimation of total producible oil in the United States is discussed. Two specific models, a logistic model and a Gompertz model, are suggested and estimated in a fashion consistent with the theoretical consideratons. The results indicate that approximately 159 billion barrels are ultimately recoverable and producible of which 117 billion barrels have been produced through the end of 1978. DOE

N79-32619# Department of Energy, Washington, D. C. Information Administration.
ASSESSMENT OF POTENTIAL US PETROLEUM SUPPLY SHORTFALLS, 1978 - 1980
D. Butler 15 Sep. 1978 40 p refs
(DOE/EIA-0102/13) Avail: NTIS HC A03/MF A01

The 1977 Energy Information Administration projection series was modified to reflect the likelihood of constrained world oil supplies in the 1980's and the associated increases in oil prices required to balance world supply and demand. DOE

N79-32620# Argonne National Lab., Ill. Energy and Environmental Systems Div.
MICELLAR/POLYMER FLOODS FOR ENHANCED OIL RECOVERY: A REVIEW OF DISPLACEMENT MECHANISMS AND THEIR SIMULATION

V. J. Kremesec and J. C. Slattery (Northwestern Univ.) Oct. 1978 46 p refs
(Contract W-31-109-eng-38)
(ANL/ES-74) Avail: NTIS HC A03/MF A01

Current literature is reviewed and criticized in order to explain the qualitative features of the oil displacement process and to point out those areas needing additional research. A comprehensive research program is outlined. The engineering aspects of the design and prediction of micellar/polymer floods in oil reservoirs are examined with emphasis on the physical mechanisms of oil displacement, the parameters that govern those mechanisms, and the numerical simulation of the process. It is felt that these have not been emphasized in the nationally supported research effort to make enhanced oil recovery a viable process. DOE

N79-32629# Little (Arthur D.), Inc., Cambridge, Mass.
ENERGY CONSERVATION OPPORTUNITIES IN APPLIANCES USING ENERGY STORAGE Final Report
W. Thompson Lawrence, Elia P. Demetri, and David W. Lee 30 Nov. 1978 203 p refs
(Contract W-7405-eng-26)
(ORNL/SUB-7303/1) Avail: NTIS HC A10/MF A01

Fuel-fired appliances, electric appliances, and utility load leveling by energy storage on the customer's side of the meter were considered. For each of the appliances treated, various energy storage techniques were evaluated by estimating the energy savings and the cost of the required storage system. An estimate of the commercial feasibility of each system was made based on the years necessary to pay back the cost of the storage system. In addition, when alternate approaches could be used to improve the efficiency of the appliance without energy storage, the costs of these methods were considered in the evaluation. The analyses found that the most promising applications involved the use of point-of-use thermal energy storage for electric utility load-leveling. However, although substantial utility operating cost savings can be achieved, there may be little or no actual energy saving when all losses are considered. For applications other than load-leveling, energy savings were too small to pay back the added cost of the storage system in an acceptable time. Author

N79-32631*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
CHARACTERIZATION OF SOLAR CELLS FOR SPACE APPLICATIONS. VOLUME 9: ELECTRICAL CHARACTERISTICS OF SPECTROLAB BSF, TEXTURED, 10-OHM-cM 200-MICRON CELLS AS A FUNCTION OF INTENSITY, TEMPERATURE, AND IRRADIATION
B. E. Anspaugh, D. M. Beckert, R. G. Downing, T. F. Miyahira, and R. S. Weiss 15 Sep. 1979 43 p refs
(Contract NAS7-100)
(NASA-CR-162289; JPL-Pub-78-15-Vol-9) Avail: NTIS HC A03/MF A01 CSCL 10A

Electrical characteristics of textured, back surface field, 10 ohm cm, 200 micron silicon solar cells are presented. A filtered solar simulator was used in order to approximate the spectral distribution of space sunlight. The temperature range covered was from -160 C to 140 C while the solar intensity range covered was 5 mW/sq cm to 250 mW/sq cm. The data were taken at each environment point in the matrix in the form of an I-V curve. A.W.H.

N79-32632*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A PRELIMINARY ASSESSMENT OF SMALL STEAM RANKINE AND BRAYTON POINT-FOCUSING SOLAR MODULES
E. J. Roschke, L. Wen, H. Steele, N. ElGabalawi, and J. Wang 1 Mar. 1979 140 p refs Prepared for DOE
(Contract NAS7-100; JPL Proj. 5104-38)
(NASA-CR-162302; JPL-Pub-79-21; DOE/JPL-1060-16) Avail: NTIS HC A07/MF A01 CSCL 10B

A preliminary assessment of three conceptual point-focusing distributed solar modules is presented. The basic power conversion units consist of small Brayton or Rankine engines individually coupled to two-axis, tracking, point-focusing solar collectors. An array of such modules can be linked together, via electric transport, to form a small power station. Each module also can be utilized on a stand-alone basis, as an individual power source. Author

N79-32633*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
LSA PROJECT TECHNOLOGY DEVELOPMENT UPDATE Low-Cost Solar Array Project
John V. Goldsmith and Donald B. Bickler 30 Aug. 1978 26 p Presented at 10th Project Integration Meeting, Pasadena, Calif., 16-17 Aug. 1978 Prepared for DOE
(Contract NAS7-100; JPL Proj. 5101-104)
(NASA-CR-162301; JPL-Pub-79-26; DOE/JPL-1012-7) Avail: NTIS HC A03/MF A01 CSCL 10A

The state of low cost solar array technology is discussed. The goal of achieving $500/kW by 1986 is also discussed. R.E.S.

N79-32636*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
RESULTS OF THE 1978 NASA/JPL BALLOON FLIGHT SOLAR CELL CALIBRATION PROGRAM
C. H. Seaman and L. B. Sidwell 1 Sep. 1979 13 p refs
(Contract NAS7-100)
(NASA-CR-162298; JPL-Pub-79-66) Avail: NTIS HC A02/MF A01 CSCL 10A

The 1978 scheduled solar cell calibration balloon flight was successfully completed. Thirty six modules were carried to an altitude of above 36 kilometers. Recovery of telemetry and flight packages was without incident. These calibrated standard cells are used as reference standards in simulator testing of cells and arrays with similar spectral response characteristics. The factors affecting the spectral transmission of the atmosphere at various altitudes are summarized. A.W.H.

N79-32637*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
COMPARISON OF ALTERNATE FUELS FOR AIRCRAFT
Robert D. Witcofski Sep. 1979 38 p refs Presented at the International DGLR/DFLR Symp. on Hydrogen in Air Transportation, Stuttgart, Germany, 11-14 Sep. 1979
(NASA-TM-80155) Avail: NTIS HC A03/MF A01 CSCL 21D

Liquid hydrogen, liquid methane, and synthetic aviation kerosene were assessed as alternate fuels for aircraft in terms of cost, capital requirements, and energy resource utilization. Fuel transmission and airport storage and distribution facilities are considered. Environmental emissions and safety aspects of fuel selection are discussed and detailed descriptions of various fuel production and liquefaction processes are given. Technological deficiencies are identified. K.L.

N79-32638*# Hughes Aircraft Co., El Segundo, Calif. Space and Communications Group.
CONCEPTUAL DESIGN STUDY OF CONCENTRATOR ENHANCED SOLAR ARRAYS FOR SPACE APPLICATIONS VOLUME 1: STUDY OVERVIEW AND SUMMARY Interim Final Report
15 May 1979 18 p ref
(Contracts NAS7-100; JPL-955194)
(NASA-CR-162328; HAC-REF-E3256-Vol-1) Avail: NTIS HC A02/MF A01 CSCL 10A

The enhancement of arrays of thin silicon solar cells was studied, including the investigation of thin gallium arsenide cells and conventional thick silicon cells on a rigid substrate. Concentrator concepts employing thin film Kapton mirrors were evaluated for performance in space environments. A.W.H.

N79-32639*# Hughes Aircraft Co., El Segundo, Calif. Space and Communications Group.
CONCEPTUAL DESIGN STUDY OF CONCENTRATOR ENHANCED SOLAR ARRAYS FOR SPACE APPLICATIONS VOLUME 2: TECHNICAL Interim Final Report
15 May 1979 115 p ref
(Contracts NAS7-100; JPL-955194)
(HAC-REF-E3256-VOL-2) Avail: NTIS HC A06/MF A01 CSCL 10A

Concentrator concepts which utilize Kapton mirror material were evaluated and selected for solar array use due to their zero mass. All concepts considered employed thin silicon solar cells. Design requirements for the concentrator were: the cell temperature was not to exceed 150 C; the concentrators were to produce illumination of the array within 15% of being perfectly uniform; the concentrators were to operate while misaligned as much as 5 degrees with the solar axis. Concentrator designs along with mirror structure and configurations are discussed and comparisons are made for optimal space applications. A.W.H.

N79-32640*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SOLAR CELL HIGH EFFICIENCY AND RADIATION DAMAGE, 1979

Aug. 1979 290 p refs Conf. held at Cleveland, 13-14 Jun. 1979
(NASA-CP-2097; D-133) Avail: NTIS HC A13/MF A01 CSCL 10A

Progress in the effort to increase the end-of-life efficiency of solar cells for space use is assessed. Silicon solar cell efficiency, radiation effects, and gallium arsenide cells are emphasized.

N79-32641*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THE NASA LEWIS RESEARCH CENTER PROGRAM IN SPACE SOLAR CELL RESEARCH AND TECHNOLOGY

Henry W. Brandhorst, Jr. *In its* Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 1-4

Avail: NTIS HC A13/MF A01 CSCL 10A

Progress in space solar cell research and technology is reported. An 18 percent-AMO-efficient silicon solar cell, reduction in the radiation damage suffered by silicon solar cells in space, and high efficiency wrap-around contact and thin (50 micrometer) coplanar back contact silicon cells are among the topics discussed. Reduction in the cost of silicon cells for space use, cost effective GaAs solar cells, the feasibility of 30 percent AMO solar energy conversion, and reliable encapsulants for space blankets are also considered. J.M.S.

N79-32642*# Air Force Aero Propulsion Lab., Wright-Patterson AFB, Ohio.

SOLAR PHOTOVOLTAIC RESEARCH AND DEVELOPMENT PROGRAM OF THE AIR FORCE AERO PROPULSION LABORATORY

Joseph Wise *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 5-8

Avail: NTIS HC A13/MF A01 CSCL 10A

Progress is reported in the following areas: laser weapon effects, solar silicon solar cell concepts, and high voltage hardened, high power system technology. Emphasis is placed on solar cells with increased energy conversion efficiency and radiation resistance characteristics for application to satellite power systems. J.M.S.

N79-32643*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.

THE JPL SPACE PHOTOVOLTAIC PROGRAM

John A. Scott-Monck *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 9-12
(Contract NAS7-100)
Avail: NTIS HC A13/MF A01 CSCL 10A

The development of energy efficient solar cells for space applications is discussed. The electrical performance of solar cells as a function of temperature and solar intensity and the influence of radiation and subsequent thermal annealing on the electrical behavior of cells are among the factors studied. Progress in GaAs solar cell development is reported with emphasis on improvement of output power and radiation resistance to demonstrate a solar cell array to meet the specific power and stability requirements of solar power satellites. J.M.S.

N79-32644*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

LANGLEY PROGRAM OF GaAs SOLAR CELLS

E. J. Conway *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 13-14

Avail: NTIS HC A13/MF A01 CSCL 10A

A brief overview of the development of GaAs solar cell technology is provided. An 18 to 20 percent AMO efficiency, stability under radiation and elevated-temperature operation, and high power-to-weight ratio are among the factors studied. Cell cost and availability are also examined. J.M.S.

N79-32645*# Pennsylvania Univ., Philadelphia.

UPDATING THE LIMIT EFFICIENCY OF SILICON SOLAR CELLS

M. Wolf *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 15-34 refs
Sponsored in part by DOE

(Contract JPL-KM-68903)
Avail: NTIS HC A13/MF A01 CSCL 10A

Evaluation of the limit efficiency based on the simplest, most basic mathematical method that is appropriate for the conditions imposed by the cell model is discussed. The methodology, the solar cell structure, and the selection of the material parameters used in the evaluation are described. The results are discussed including a set of design goals derived from the limit efficiency. J.M.S.

N79-32646*# Comsat Labs., Clarksburg, Md.

LIMITING PROCESS IN SHALLOW JUNCTION SOLAR CELLS

A. Meulenberg and E. Rittner *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 35-36 Submitted for publication

Avail: NTIS HC A13/MF A01 CSCL 10A

In extending the violet and nonreflective cell technology to lower resistivities, several processes limiting output power were encountered. The most important was the dark diffusion current due to recombination at the front grid contacts. After removal of this problem by reduction of the silicon metal contact area (to 0.14 percent of the total area), the electric field enhanced junction recombination current J sub r was the main limitation. Alteration of the diffusion profile to reduce the junction field is shown to be an effective means of influencing J sub r. The remaining problems are the bulk recombination in the n+ layer and the surface recombination at the oxide-silicon interface; both of these problems are aggravated by band-narrowing resulting from heavy doping in the diffused layer. Experimental evidence for the main limitations is shown, where increased diffusion temperature is seen to reduce both the influence of the front grid contacts and the junction electric field by increasing the junction depth. The potential for further significant improvement in efficiency appears to be high. J.M.S.

N79-32647*# Florida Univ., Gainesville. Dept. of Electrical Engineering.

DESIGN OF HIGH EFFICIENCY HLE SOLAR CELLS FOR SPACE AND TERRESTRIAL APPLICATIONS

A. Neugroschel and F. A. Lindholm *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 37-50 refs
(Grant NsG-3018)
Avail: NTIS HC A13/MF A01 CSCL 10A

A first-order analysis of HLE cells is presented for both beginning-of-life and end-of-life conditions. Based on this analysis and on experimentally observed values for material parameters. Design approaches for both space and terrestrial cells are presented. The approaches result in specification of doping levels, junction depths, and surface conditions. The proposed structures are projected to have both high V sub OC and high J sub SC. J.M.S.

N79-32648*# Spire Corp., Bedford, Mass.
APPLICATIONS OF ION IMPLANTATION TO HIGH PERFORMANCE, RADIATION TOLERANT SILICON SOLAR CELLS
Allen R. Kirkpatrick, John A. Minnucci, and Keith W. Matthei *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 51-59 refs

(Contracts NAS3-20823; NAS3-21276)
Avail: NTIS HC A13/MF A01 CSCL 10A

Progress in the development of ion implanted silicon solar cells is reported. Effective back surface preparation by implantation, junction processing to achieve high open circuit voltages in low-resistivity cells, and radiation tolerance cells are among the topics studied. J.M.S.

N79-32649*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
OPEN-CIRCUIT VOLTAGE IMPROVEMENTS IN LOW-RESISTIVITY SOLAR CELLS
Michael P. Godlewski, Thomas M. Klucher, George A. Mazaris, and Victor G. Weizer *In its* Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 61-70 refs

Avail: NTIS HC A13/MF A01 CSCL 10A

Mechanisms limiting the open-circuit voltage in 0.1 ohm-cm solar cells were investigated. It was found that a rather complicated multistep diffusion process could produce cells with significantly improved voltages. The voltage capabilities of various laboratory cells were compared independent of their absorption and collection efficiencies. This was accomplished by comparing the cells on the basis of their saturation currents or, equivalently, comparing their voltage outputs at a constant current-density level. The results show that for both the Lewis diffused emitter cell and the Spire ion-implanted emitter cell the base component of the saturation current is voltage controlling. The evidence for the University of Florida cells, although not very conclusive, suggests emitter control of the voltage in this device. The data suggest further that the critical voltage-limiting parameter for the Lewis cell is the electron mobility in the cell base. R.E.S.

N79-32650*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MODELING OF THIN, BACK-WALL SILICON SOLAR CELLS
Cosmo R. Baraona *In its* Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 73-78 refs

Avail: NTIS HC A13/MF A01 CSCL 10A

The performance of silicon solar cells with p-n junctions on the nonilluminated surface (i.e., upside-down or back-wall cells) was calculated. These structures consisted of a uniformly shaped p-type substrate layer, a p(+)-type field layer on the front (illuminated) surface, and a shallow, n-type junction on the back (nonilluminated) surface. A four-layer solar cell model was used to calculate efficiency, open-circuit voltage, and short-circuit current. The effect on performance of p-layer thickness and resistivity was determined. The diffusion length was varied to simulate the effect of radiation damage. The results show that peak initial efficiencies greater than 15 percent are possible for cell thicknesses or 100 micrometers or less. After 10 years of radiation damage in geosynchronous orbit, thin (25 to 50 micrometers thick) cells made from 10 to 100 ohm cm material show the smallest decrease (approximately 10 percent) in performance. Author

N79-32651*# Texas Instruments, Inc., Dallas.
DESIGN CONSIDERATIONS FOR THE TANDEM JUNCTION SOLAR CELL
W. T. Matzen, B. G. Carbajal, and R. W. Hardy *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 79-85 refs Sponsored in cooperation with JPL and DOE

Avail: NTIS HC A13/MF A01 CSCL 10A

Structure and operation of the tandem junction cell (TJC) are described. The impact of using only back contacts is discussed. A model is presented which explains operation of the TJC in terms of transistor action. The model is applied to predict TJC performance as a function of physical parameters. Author

N79-32652*# Solarex Corp., Rockville, Md.
THIN CELLS FOR SPACE
G. Storti, J. Wohlgemuth, and C. Wrigley *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 87-95 refs

(Contracts NAS3-21250; JPL-954883)
Avail: NTIS HC A13/MF A01 CSCL 10A

Research and pilot line production efforts directed towards the fabrication of high efficiency ultrathin silicon solar cells (50 micrometers) are reported. Conventional ultrathin cells with air-mass-zero (AMO) efficiencies exceeding 14% and coplanar back contact cells with AMO efficiencies up to 11.7% were developed. The primary mechanisms limiting efficiency were determined in both types of cells, and they are discussed within the context of further improving efficiency. Results of pilot line production of conventional ultrathin cells are also presented. Average AMO efficiencies of 12% were radily achieved for 2000 cell production runs. R.E.S.

N79-32653*# General Electric Co., Schenectady, N. Y.
HIGH EFFICIENCY CELL GEOMETRY
R. N. Hall *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 97-100

Avail: NTIS HC A13/MF A01 CSCL 10A

A new silicon solar cell is described which has an array of small-area conduction paths to transport current directly through the wafer to metal electrodes on the back. This design eliminates grid shadowing and many of the other losses inherent in conventional cells. Early experimental units without texturing or antireflection coatings show 13.3% efficiency under air-mass-one illumination insolation. Author

N79-32654*# Optical Coating Lab., Inc., City of Industry, Calif.
SILICON SOLAR CELLS FOR SPACE USE: PRESENT PERFORMANCE AND TRENDS
P. A. Iles, F. F. Ho, and S. Khemthong *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 101-104

Avail: NTIS HC A13/MF A01 CSCL 10A

A technology assessment of present performance levels and current fabrication methods and designs is presented. R.E.S.

N79-32656*# Naval Research Lab., Washington, D. C.
AN INTERIM REPORT ON THE NTS-2 SOLAR CELL EXPERIMENT
Richard L. Statler and Delores H. Walker *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 117-129 refs Sponsored in part by AFAPL and SAMSO

Avail: NTIS HC A13/MF A01 CSCL 10A

Data obtained from the fourteen solar cell modules on the NTS-2 satellite are presented together with a record of panel temperature and sun inclination. The following flight data are discussed: (1) state of the art solar cell configurations which embody improvements in solar cell efficiency through new silicon surface and bulk technology, (2) improved coverslip materials and coverslip bonding techniques, (3) short and long term effects of ultraviolet rejection filters vs. no filters on the cells, (4) degradation on a developmental type of liquid epitaxy gallium-aluminum-arsenide solar cell, and (5) space radiation effects. R.E.S.

N79-32659*# Boeing Aerospace Co., Seattle, Wash.
CO2 LASER ANNEALING OF 50-MICRONS-THICK SILICON SOLAR CELLS
Frank E. Walker *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 145-160 refs
(Contract NAS9-15636)
Avail: NTIS HC A13/MF A01 CSCL 10A

A test program is conducted to determine thin solar cell annealing effects using a laser energy source. A CO2 continuous-wave laser was used in annealing experiments on 50 micrometers-thick silicon solar cells after proton irradiation. Test cells were irradiated to a fluence of 1.0 x 10 to the 12th power protons/sq cm with 1.9 MeV protons. After irradiation, those cells receiving full proton dosage were degraded by an average of 30% in output power. In annealing tests laser beam exposure times on the solar cell varied from 2 seconds to 16 seconds reaching cell temperatures of from 400 C to 500 C. Under those conditions annealing test results showed recovery in cell output power of from 33% to 90%. M.M.M.

N79-32661*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
EFFECT OF DOPANTS ON ANNEALING PERFORMANCE OF SILICON SOLAR CELLS
John A. Scott-Monck and Bruce E. Anspaugh *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 173-183 refs

(Contract NAS7-100)
Avail: NTIS HC A13/MF A01 CSCL 10A

The optimum annealing parameters of time and temperature for producing cell output recovery were established. Devices made from gallium doped and boron doped silicon were investigated. The cells ranged in resistivity from 0.1 to 20 ohm-cm and in thickness from 50 to 250 micrometers. The observations can be explained in a qualitative manner by postulating a pair of competing mechanisms to account for the low temperature reverse annealing seen in most boron and gallium doped silicon solar cells. Still another mechanism dominates at higher temperatures (350 C and greater) to complete this model. One of the mechanisms, defined as B, allows migrators to couple with radiation induced recombination sites thus increasing or enhancing their capture cross sections. This would tend to reduce minority carrier diffusion length. The new recombination complex is postulated to be thermally stable up to temperatures of approximately 350 C. M.M.M.

N79-32663*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
RADIATION DAMAGE IN GaAs SOLAR CELLS
E. J. Conway and G. H. Walker *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 201-207 refs

Avail: NTIS HC A13/MF A01 CSCL 10A

Recent results of electron and proton irradiation and annealing of GaAs solar cells are presented along with some implications of these results. A comparison between the energy-levels produced by protons and by electrons which are not stopped in the material indicate that the damage produced by protons and electrons may be qualitatively different. Thus, annealing of proton damage may be very different from the annealing of electron damage. M.M.M.

N79-32664*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
FABRICATION OF HIGH EFFICIENCY AND RADIATION RESISTANT GaAs SOLAR CELLS
S. Kamath, R. C. Knechtli, R. Loo, and Bruce E. Anspaugh *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage. 1979 Aug. 1979 p 209-216 Prepared in cooperation with Hughes Res. Labs., Malibu, Calif.

(Contracts NAS1-14727, F33615-77-C-3150)
Avail: NTIS HC A13/MF A01 CSCL 10A

Systematic improvements in fabrication yield were obtained by appropriate control of the liquid phase epitaxial growth process, contact fabrication and surface preparation. To improve radiation hardness, the junction depth was decreased while overcoming the penalty in decreased solar cell efficiency which tends to go hand-in-hand with the reduction of junction depth in (AlGa)As-GaAs solar cells. Cells were made with an AMO efficiency of 18% and a junction depth of 0.5 micrometers, as compared to junction depths on the order of 1.0 micrometers. With respect to the damage caused by proton irradiation, the nature of the observed damage was correlated to the energy and penetration depth of the damaging protons. M.M.M.

N79-32666*# Lincoln Lab., Mass. Inst. of Tech., Lexington.
SHALLOW-HOMOJUNCTION GaAs SOLAR CELLS
John C. C. Fan *In* NASA. Lewis Res. Center Solar Cell High Frequency and Radiation Damage, 1979 Aug. 1979 p 227-233 refs Sponsored in part by AF

Avail: NTIS HC A13/MF A01 CSCL 10A

Single-crystal GaAs shallow-homojunction solar cells on GaAs or Ge substrates, without Ga sub 1-x Al sub x As window layers, that have conversion efficiencies exceeding 20% at AM1 (17% at AMO). Using a simple theoretical model, good fits were obtained between computer calculations and experimental data for external quantum efficiency and conversion efficiency of cells with different values of n+ layer thickness. The calculations not only yield values for material properties of the GaAs layers composing the cells but will also permit the optimization of cell designs for space and terrestrial applications. Preliminary measurements indicate that the shallow-homojunction cells are resistant to electron irradiation. In the best test so far, bombardment with 1 x 10 to the 16th power/sq cm fluence of 1 MeV electrons reduced the short-circuit current by only about 6%. G.Y.

N79-32671*# Bureau of Mines, Washington, D. C.
EFFICIENCY OF TANDEM SOLAR CELL SYSTEMS AS FUNCTION OF TEMPERATURE AND SOLAR ENERGY CONCENTRATION RATIO
N. A. Gokcen and J. J. Loferski (Brown Univ.) *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 263-265

Avail: NTIS HC A13/MF A01 CSCL 10A

The results of a comprehensive theoretical analysis of tandem photovoltaic solar cells as a function of temperature and solar concentration ratio are presented. The overall efficiencies of tandem cell stacks consisting of as many as 24 cells having gaps in the 0.7 to 3.6 eV range were calculated for temperatures of 200, 300, 400, and 500 K and for illumination by an AMO solar spectrum having concentration ratios of 1, 100, 500, and 1000 suns. For ideal diodes (A = B = 1), the calculations show that the optimized overall efficiency has a limiting value eta sub opt of approximately 70 percent for T = 200 K and C = 1000; for T = 300 K and C = 1000, this limiting efficiency approaches 60 percent. G.Y.

N79-32672*# Research Triangle Inst., Research Triangle Park, N. C.
COMPUTER MODELING OF A TWO-JUNCTION, MONOLITHIC CASCADE SOLAR CELL
M. F. Lamorte and D. Abbott *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 267-281 refs Sponsored in cooperation with AFAL, DOE and Sandia Labs., Albuquerque, N. Mex.

Avail: NTIS HC A13/MF A01 CSCL 10A

The theory and design criteria for monolithic, two-junction cascade solar cells are described. The departure from the conventional solar cell analytical method and the reasons for using the integral form of the continuity equations are briefly discussed. The results of design optimization are presented. The energy conversion efficiency that is predicted for the optimized

structure is greater than 30% at 300 K, AMO and one sun. The analytical method predicts device performance characteristics as a function of temperature. The range is restricted to 300 to 600 K. While the analysis is capable of determining most of the physical processes occurring in each of the individual layers, only the more significant device performance characteristics are presented.
Author

N79-32673*# Rockwell International Corp., Thousand Oaks, Calif. Electronics Research Center.
INTERCELL OHMIC CONTACTS FOR HIGH EFFICIENCY MULTIJUNCTION SOLAR CONVERTERS
Stanley W. Zehr, D. L. Miller, and J. S. Harris, Jr. *In* NASA. Lewis Res. Center Solar Cell High Efficiency and Radiation Damage, 1979 Aug. 1979 p 283-291 refs

(Contract F33615-78-C-2036)
Avail: NTIS HC A13/MF A01 CSCL 10A

The monolithic multijunction converter is an attractive approach to achieving solar/electric conversion with greater than 30% efficiency. A major technical challenge in the development of such devices is the requirement for low resistance, optically transparent intercell contacts between adjacent junctions. These contacts should transmit, without significant loss, the spectral fraction of the incident sunlight which is not absorbed and converted in the overlying junction materials. Their contact resistances must be low enough to prevent significant I to the 2d power R loss at the designed current density levels. They should also exhibit adequate thermal conductivity to prevent device overheating when subjected to the designed illumination level. Recent encouraging results for the development of such contacts are presented.
G.Y.

N79-32677# Oak Ridge National Lab., Tenn.
DECENTRALIZED SOLAR ENERGY TECHNOLOGY ASSESSMENT PROGRAM: RESEARCH PLAN
B. H. Bronfman, M. Schweitzer, S. A. Carnes, E. Peelle, G. Samuels, Jr., and T. J. Wilbanks May 1979 53 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6913) Avail: NTIS HC A04/MF A01

The social, political, institutional and life-style impacts of the widespread adoption of decentralized solar technology are assessed. The major components are described and the research plan for the Technology Assessment Program is presented. Responsibilities, milestones and deliverables for all components are identified where applicable.
DOE

N79-32678# Los Alamos Scientific Lab., N. Mex.
ENERGY EXTRACTION OPERATIONS: SOME PRELIMINARY RESULTS
R. H. Hendron 1979 10 p refs Presented at 3d US Natl. Congr. on Pressure Vessels and Piping, San Francisco, 25 Jun. 1979
(Contract W-7405-eng-36)
(LA-UR-79-679; Conf-790615-10) Avail: NTIS HC A02/MF A01

Thermal energy was extracted from Precambrian granitic rock by injection and circulating water through fractured zones or reservoirs. Two boreholes were drilled to depths of about 3 km (10,000 ft) in a location selected for high heat flow and an apparent lack of faulting. Bottom-hole temperature was 205 C (400 F). The holes were connected at depth by hydraulic fracturing to form a flow path and heat extraction surface. Energy has been extracted at rates exceeding 5 MW(t) in three operations totaling 2847 h. These operations are summarized.
DOE

N79-32679# Los Alamos Scientific Lab., N. Mex.
THE FUTURE OF HOT DRY ROCK GEOTHERMAL ENERGY SYSTEMS
Morton C. Smith 1979 13 p refs Presented at 3d US Natl. Congr. on Pressure Vessels and Piping, San Francisco, 25 Jun. 1979
(Contract W-7405-eng-36)
(LA-UR-79-683; Conf-790615-12) Avail: NTIS HC A02/MF A01

The magnitude and distribution of hot dry rock and the variety of possible heat extraction techniques were studied. It is concluded that this energy supply can eventually be used on a large scale.
DOE

N79-32680# Mound Lab., Miamisburg, Ohio.
EVALUATION OF A LARGE NONCONVECTIVE SOLAR POND
Layton J. Wittenberg and Marc J. Harris 1979 12 p refs Presented at the Solar Energy Storage Options Workshop, San Antonio, 18 Mar. 1979
(Contract EY-76-C-04-0053)
(MLM-2606(OP); Conf-790328-2) Avail: NTIS HC A02/MF A01

The operational performance of one of the largest functional, salt-gradient solar ponds in the world is evaluated. This solar pond was constructed by the City of Miamisburg on property adjacent to the Mound Facility. Data are collected on the annual thermal cycle characteristics of this combined solar energy collector and thermal storage system, and system performance is evaluated based upon models developed at several university research ponds.
DOE

N79-32681# Sandia Labs., Albuquerque, N. Mex. Experimental Systems Operations Div.
PERFORMANCE TESTING OF THE DEL CONCENTRATING SOLAR COLLECTOR
Vernon E. Dudley (Edgerton, Germeshausen and Grier, Inc., Albuquerque, N. Mex.) and Robert M. Workhoven Apr. 1979 28 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0515) Avail: NTIS HC A03/MF A01

The results of tests performed on the Del Solar Collector at the Midtemperature Solar Systems Test Facility are summarized. Test objectives are defined, test procedures are described, and test results and conclusions are given.
DOE

N79-32682# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
STRATIFIED THERMAL STORAGE IN RESIDENTIAL SOLAR ENERGY APPLICATIONS
M. K. Sharp and R. I. Lohrke Washington DOE Jun. 1978 64 p refs
(Contract EG-77-S-02-4523; N68305-76-0036)
(COO-4523-1) Avail: NTIS HC A04/MF A01

The benefits of thermal stratification in sensible heat storage were investigated for several residential solar applications. The operation of space heating, air conditioning and water heating systems with water storage was simulated on a computer. The performance of comparable systems with mixed and stratified storage was determined in terms of the fraction of the total load supplied by solar energy. The effects of design parameters such as collector efficiency, storage volume, tank geometry, etc., on the relative advantage of stratified over well-mixed storage were assessed.
DOE

N79-32683# Sandia Labs., Albuquerque, N. Mex.
CORROSION IN MOLTEN SALTS USED FOR SOLAR THERMAL STORAGE APPLICATIONS
William H. Smyrl 1978 12 p refs Presented at the Reliability of Mater. Workshop, Denver, 18 Dec. 1978
(Contract EY-76-C-04-0789)
(SAND-79-0246C; Conf-781228-1) Avail: NTIS HC A02/MF A01

Some of the broad outlines of corrosion behavior are discussed. The compatibility of materials with the molten nitrate-nitrite class of salts selected for solar thermal storage applications is discussed at some length. A brief summary is given of recommendations for areas of future work on these salts to increase the reliability of materials behaviors in solar systems.
Author (DOE)

N79-32684# California Univ., Berkeley. Lawrence Berkeley Lab.
DESCRIPTION OF THE 3-DIMENSIONAL 2-PHASE SIMULATOR SHAFT78 FOR USE IN GEOTHERMAL RESERVOIR STUDIES

Karsten Pruess, J. Mike Zerzan, Ron C. Schroeder, and Paul A. Witherspoon Jan. 1979 17 p refs Presented at the 5th Symp. on Reservoir Simulation, Denver, 31 Jan. 1979
(Contract W-7405-eng-48)
(LBL-8802; Conf-790119-2) Avail: NTIS HC A02/MF A01

The algorithm of SHAFT78, based on mass and energy balance equations for two phase flow in a porous medium, is described with emphasis on its application to geothermal reservoir studies. Finite difference equations are obtained by integrating the basic partial differential equations for mass and energy flow over arbitrary polyhedral volume elements; regular and irregular reservoir shapes are handled with the same ease. The equations are solved semi-implicitly for discrete time steps and the coupling between mass and energy flow is treated in a noniterative way. Results of calculations for idealized systems which verify the program and give insight into the pressure response of two phase reservoirs during production are discussed DOE

N79-32685# Brown Univ., Providence, R. I. Engineering Div.
AVAILABLE WORK IN GEOTHERMAL ENERGY
Joseph Kestin Jul. 1978 95 p refs
(Contract EY-76-S-02-4051)
(COO-4051-25) Avail: NTIS HC A05/MF A01

The most important thermodynamic considerations needed for a clear understanding of the operation of geothermal installations used for the production of electricity are presented. A brief description is given of the nature of a geothermal reservoir and the characteristics of the most practical systems for the conversion of geothermal energy into work are described. The shortcomings of the method of cycle analysis are discussed when applied to geothermal plants. Special attention is devoted to a detailed discussion of the most important general indicators that follow for the designer from a thermodynamic analysis. Various methods of graphically interpreting the concept of available work are described in detail and the importance of easily accessible, reliable formulations of the thermophysical properties of the pure substances, solutions, and mixtures that the designer needs for success are discussed. DOE

N79-32686# University of Southeastern Massachusetts, North Dartmouth.
GEOTHERMAL POWER PLANTS OF THE SOVIET UNION. A TECHNICAL SURVEY OF EXISTING AND PLANNED INSTALLATIONS
R DiPippo Jan. 1979 25 p refs Prepared in cooperation with Brown Univ.
(Contract EY-76-S-02-4051)
(COO-4051-41) Avail: NTIS HC A02/MF A01

Some of the geothermal areas in the Soviet Union which may support electric generating stations are described. The plants at Pauzhetka (single-flash steam), at Paratunka (Freon binary), and at Bolshoye-Bannoye (multi-flash steam) are described in technical detail. The reference list contains some of the most recent sources of information on geothermal power plant developments in the Soviet Union. DOE

N79-32687# Aerospace Corp., El Segundo, Calif.
SOLAR HEATING AND COOLING OF BUILDINGS (SHACOB): REQUIREMENTS DEFINITION AND IMPACT ANALYSIS
C. K. Cretcher and W. C. Melton Jun. 1978 82 p refs Sponsored by Elec. Power Res. Inst.
(EPRI Proj. 553)
(EPRI-ER-808-SY) Avail: NTIS HC A05/MF A01

The economic impact of various (SHACOB) design concepts on the electric utilities and their customers was assessed along with system requirements for optimizing this impact. Weather and insolation inputs for simulations were established for locations across the United States. Reference buildings and their thermal properties were defined, and detailed internal and external load models generated to characterize building thermal performance. Both solar and conventional systems, including load management systems featuring nighttime thermal storage were simulated. The systems analyzed in detail were direct solar systems with and without a load management capability, solar assisted heat pumps, and customer load management systems. These systems were evaluated with respect to conventional resistive and heat pump systems. Projections for buildings and types of heating system installations in those buildings were developed by eight participating utilities for their own service areas. DOE

N79-32688# Midwest Research Inst., Golden, Colo.
SOLAR THERMAL TEST FACILITIES USERS ASSOCIATION
C. J. Bishop Jan. 1979 54 p refs
(Contract EG-77-C-01-4042)
(SERI/PR-13-154) Avail: NTIS HC A04/MF A01

The current status and needs of high temperature research is summarized along with some of the experiments which might be undertaken in the solar thermal test facilities (STTF). The use of high temperatures for industrial processes is also reviewed. Proposals received and reviewed by the STTF Users Association are included. Operation of the STTFUA is described with emphasis on dissemination of information on the STTF through conferences, workshops, and newsletters. J.M.S.

N79-32689# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
SOLAR REPOWERING WORKSHOP Summary Report
D. Nordman 2 Aug. 1978 31 p Presented at Workshop on Solar Repowering, Denver, 2 Aug. 1978
(Contract EG-77-C-01-4042)
(SERI/TP-35-57; Conf-780894-Summ) Avail: NTIS HC A03/MF A01

The demand for solar thermal technologies is discussed along with the key issues in the supply of solar thermal technologies. Discussion questions are listed and the responses are summarized. DOE

N79-32690# Los Alamos Scientific Lab., N. Mex.
FEDERAL HOT DRY ROCK GEOTHERMAL ENERGY DEVELOPMENT PROGRAM: AN OVERVIEW
Gregory J. Nunz 1979 8 p refs Presented at 3d US Natl. Congr. on Pressure Vessels and Piping, San Francisco, 25 Jun. 1979
(Contract W-7405-eng-36)
(LA-UR-79-670; Conf-790615-9) Avail: NTIS HC A02/MF A01

The formulation and evolution of the Federal hot dry rock geothermal energy development program were traced. Accomplishments to date, including the establishment and evaluation of the 5 MW sub t phase one reservoir at Fenton Hill, N.M. and various instrument and equipment developments, are discussed. Future plans presented include (1) establishment of a 20 to 50 MW sub t phase 2 reservoir at Fenton Hill that will be used to demonstrate longevity and, eventually, electric power production and (2) the selection of a second site at which a direct thermal application will be demonstrated. DOE

N79-32691# Arizona State Univ., Tempe.
COMBINED PHOTOVOLTAIC/THERMAL SYSTEM STUDIES
D. L. Evans, W. A. Facinelli, and R. T. Otterbein Aug. 1978 183 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7031) Avail: NTIS HC A09/MF A01

Modelling of concentrating combined collectors (those that produce both electricity from solar cells as well as thermal energy from the sun's rays) is discussed. Particular attention is devoted to accurately modelling the IV curves of present day 2 x 2 cm silicon cells designed for concentration. Also discussed is modelling of storage batteries, regulators and inverters all of which are usually found in photovoltaic systems. The models devised were formalized in subroutines that are compatible with TRNSYS. Some preliminary systems studies for both constant collector inlet fluid temperature and floating temperature systems are reported. DOE

N79-32692# Battelle Pacific Northwest Labs., Richland, Wash.
SYSTEMS ANALYSIS OF SOLAR THERMAL POWER SYSTEMS. REPORT ON TASK 1: DETERMINATION AND CHARACTERIZATION OF SOLAR THERMAL CONVERSION OPTIONS
W. J. Apley Jul. 1978 65 p
(Contract EY-76-C-06-1830)
(PNL-2693) Avail: NTIS HC A04/MF A01

Seven general solar thermal conversion concepts were selected initially. The literature review confirmed that these are the only concepts that are developed to a level suitable for inclusion in the comparative analysis to be performed. A summary of information pertaining to these concepts is given and the concepts are briefly described. The seven concepts are: point-focusing distributed receiver system; point focusing, central receiver systems; fixed mirror/distributed focus system; line-focus central receiver system; line-focus distributed receiver system; fixed mirror line-focus distributed receiver system, and low concentrator non-tracking systems. Author (DOE)

N79-32693# California Univ., Livermore. Lawrence Livermore Lab.
PERFORMANCE TESTS OF THE RADIAL OUTFLOW REACTION TURBINE FOR GEOTHERMAL APPLICATIONS
P. A. House 21 Aug. 1978 11 p refs
(Contract W-7405-eng-48)
(UCID-17902) Avail: NTIS HC A02/MF A01

A pure reaction turbine, for geothermal applications, was developed. This radial outflow reaction turbine is designed specifically to produce power from the expansion of saturated or compressed liquid at temperatures of less than 180 C. In the tests reported here the highest efficiency measured was 32.7%, clearly below the peak efficiency for this small machine. Extrapolations to larger machines indicate that an efficiency near 50% is a credible goal, an attractive performance as either a total flow expander for liquid or in conjunction with conventional flashed steam systems. The development and proof of feasiblity of efficient liquid expanders broadens the opportunities for economic power production from lower temperature geothermal resources, and possibly utilization of waste heat in industrial processes. DOE

N79-32694# Sandia Labs., Albuquerque, N. Mex. Solar Project Div.
THERMAL ENERGY STORAGE FOR ADVANCED SOLAR CENTRAL RECEIVER POWER SYSTEMS
L. G. Radosevich Aug. 1978 35 p refs
(Contract EY-76-C-04-0789)
(SAND-78-8221) Avail: NTIS HC A03/MF A01

Thermal energy storage is used in the advanced solar central receiver power systems currently being studied under Department of Energy sponsorship. The following are described: (1) the storage operating requirements imposed by interface constraints between energy storage and the receiver and electrical power generation systems; (2) several storage concept candidates which may meet these requirements; (3) potential cost differences between each of the storage concepts; and (4) the technical uncertainties associated with each storage concept. DOE

N79-32695# California Univ., Livermore. Lawrence Livermore Lab.
DEMONSTRATION OF THE CAPABILITIES OF THE LIVERMORE ENERGY POLICY MODEL
S. S. Sussman and W. F. Rousseau Jul. 1978 34 p refs
(Contract W-7405-eng-48)
(UCRL-52508) Avail: NTIS HC A03/MF A01

A computer tool is described which can analyze, within the framework of a general equilibrium model, the potential economic effects of government policies that alter free-market equilibrium in the energy sector. Aspects of the model discussed are the specification of input data and output formats, and the use of a new language for defining the energy network and data. DOE

N79-32696# Department of Energy, Washington, D. C.
FOSSIL ENERGY PROGRAM SUMMARY DOCUMENT
Mar. 1979 484 p refs
(DOE/ET-0087) Avail: NTIS HC A21/MF A01

The programs and projects involving the fossil energy resources of the United States (coal, petroleum, natural gas, and oil shales) are described in detail. Commercialization, environmental, and socio-economic issues involved in these activities are of prime consideration. The contributions of the energy technology centers and national laboratories to the overall goals of the Fossil Energy Program are summarized. International programs on the production and utilization of fossil fuels are described. The requested funding for FY 1980 is $747.6 million, of which $662.7 million is planned for coal, $57.4 million for petroleum, and $27.6 million for gas. DOE

N79-32697# Argonne National Lab., Ill.
ENERGY AND COST CALCULATIONS. 1: OPTIMIZATION OF ELECTROCHEMICAL PROCESSES TO ACHIEVE MINIMUM PRODUCT COST AND THE IMPACT ON ENERGY CONSUMPTION
R. Keller Apr. 1979 49 p refs
(Contract W-31-109-eng-38)
(ANL/OEPM-78-2) Avail: NTIS HC A03/MF A01

In industrial electrochemical processes, the cost resulting from energy consumption and other costs are optimized by operating at an optimum current density. The interrelationships between process operating conditions, product cost, and energy consumption were studied by means of model calculations. The effect of changes in energy price and of process improvements was estimated; the energy consumption of new, undeveloped processes was predicted; and electrolytic processes to produce aluminum, chlor-alkali electrolysis, and copper refining were examined. DOE

N79-32698# Los Alamos Scientific Lab., N. Mex.
POTENTIAL PREDICTION NEEDS IN SUPPORT OF ENERGY SYSTEMS
R. L. Blake 1979 7 p refs Presented at Intern. Solar-Terrestrial Predictions Workshop, Boulder, Colo., 23 Apr. 1979
(Contract W-7405-eng-36)
(LA-UR-79-673; Conf-790413-3) Avail: NTIS HC A02/MF A01

Examples are given to show that energy systems are tied to global solar-terrestrial processes. The need for long term basic research on the solar-terrestrial system is emphasized. DOE

N79-32699*# PRC Energy Analysis Co., McLean, Va.
ECONOMIC AND DEMOGRAPHIC ISSUES RELATED TO DEPLOYMENT OF THE SATELLITE POWER SYSTEM (SPS)
Thomas E. Baldwin, Lawrence G. Hill, Danilo J. Santini, and Erik J. Stenehjem Oct. 1978 71 p refs Sponsored in part by NASA
(Contract W-31-109-eng-38)
(NASA-CR-158886; ANL/EES/TM-23) Avail: NTIS HC A04/MF A01 CSCL 10B

Growth in energy consumption stimulated interest in exploitation of renewable sources of electric energy. One technology that was proposed is the Satellite Power System (SPS). Before committing the U.S. to such a large program, the Department of Energy and the National Aeronautics and Space Administration are jointly participating in an SPS Concept Development and Evaluation Program. This white paper on industrial and population relocation is part of the FY 78 preliminary evaluation of related socio-economic issues. Results of four preliminary assessment activities are documented. DOE

N79-32700# Lincoln Lab., Mass. Inst. of Tech., Lexington.
FIELD TESTS OF PHOTOVOLTAIC POWER SYSTEMS
M. D. Pope and R. W. Matlin 1979 10 p refs Presented at the ASME Gas Turbine Closed-Cycle Session, San Diego, 11 Mar. 1979
(Contract EY-76-C-02-4094)
(COO-4094-32; Conf-790305-5) Avail: NTIS HC A02/MF A01

Field test experience gained at existing photovoltaic test sites is discussed. These sites include a 25 kW peak power system at Mead, Nebraska, a 12 kW peak array at MIT/Lincoln Laboratory, a 1.6 kW peak PV power system at the Chicago Museum of Science and Industry, and several small (approximately 100 watts peak) arrays located in various urban and rural sites. Data are given on failures which have occurred in the field and on the frequency of unscheduled outages. Also, information is presented concerning the environmental extremes to which the systems have been exposed. Operating experience gained from these projects is discussed in the contexts of storage, reliability, safety and cost. Finally, some projects which are currently in the design are discussed. DOE

N79-32701# Lockheed Missiles and Space Co., Palo Alto, Calif. Electro-Optics Lab.
CADMIUM SULFIDE-COPPER SULFIDE HETEROJUNCTION CELL RESEARCH Technical Progress Report, 1 Mar. 1978 - 31 May 1978
30 Jun. 1978 37 p
(Contract EG-77-C-03-1459)
(SAN-1459-3; LMSC-D626523; TPR-3) Avail: NTIS HC A03/MF A01

The program objective is to investigate and evaluate the application of cylindrical-post magnetron reactive sputtering to the production of solar cell quality thin films of CdS/Cu2S for large scale terrestrial photovoltaic energy conversion. Cominco American has encountered difficulties in maintaining the desired 6-9's purity while casting Cd, Cd-Zn, and Zn sputtering targets over the nickelplated copper mandrels which are used to provide strength to the overall assembly. A major activity has been a systematic study of Cu/sub x/S coatings deposited by reactive sputtering Cu in Ar-H2S gas mixtures at various injection rates (partial pressures) of H2S. The coatings were deposited on borosilicate glass substrates at substrate temperatures of about 35 C and 130 C. The coatings were analyzed with respect to electrical, optical, and structural characteristics. Van der Pauw and temperature dependence of resistivity measurements were made on selected films. Optical constants were obtained from transmission and reflection measurements. Structural and compositional measurements were made using X-ray diffraction, scanning electron microscopy, microprobe, and X-ray energy spectroscopy. DOE

N79-32702# Lincoln Lab., Mass. Inst. of Tech., Lexington.
MICROPROCESSOR-CONTROLLED AUTONOMOUS SUN-FOLLOWING MOUNT FOR SOLAR PHOTOVOLTAIC ENERGY PLANNING
Carl H. Much, Peter L. Rossini, and David G. Stuart 1979 6 p refs Presented at the IECI 1979 Conf. on Ind. Appl. of Microprocessors, Philadelphia, 19-21 Mar. 1979
(Contract EY-76-C-02-4094)
(COO-4094-34; Conf-790353-2) Avail: NTIS HC A02/MF A01

A sun-following pyroheliometer mount and control system for support of a solar photovoltaic energy program was designed. The system features the use of a microprocessor for controlling the mount and handling complex control functions required by variations in the motion of the sun. The system is a stand-alone, unattended system with capabilities for remote diagnosis by telephone. DOE

N79-32704# Brookhaven National Lab., Upton, N. Y.
EXPERIMENTAL PERFORMANCE STUDY OF A SERIES SOLAR HEAT PUMP
Edward A. Kush 1979 6 p refs Presented at the 4th Ann. Heat Pump Technol. Conf., Stillwater, Okla., 9-10 Apr. 1979
(Contract EY-76-C-02-0016)
(BNL-25928; Conf-790446-2) Avail: NTIS HC A02/MF A01

A systematic experimental study of heat pump performance at evaporator temperatures typical of series solar input, 50 to 100 F, was conducted using a laboratory assembled heat pump and specially constructed testing simulator. Results which show that coefficients of performance which follow the thermodynamic potential can be achieved are presented and discussed. DOE

N79-32705# Zia Associates, Inc., Boulder, Colo.
HEAT PUMP/ROCK BED STORAGE SYSTEMS
G. L. Mills and H. E. Remmers 1979 9 p refs Presented at the Solar Energy Storage Options Workshop, San Antonio, 18 Mar. 1979
(Contract EM-78-C-02-4704)
(COO-4704-2; Conf-790328-3) Avail: NTIS HC A02/MF A01

The characteristics of heat pump/rock bed storage components were analyzed and used to formulate TRNSYS models of potentially cost effective systems. The systems were then analyzed for performance on a typical house in Albuquerque, New Mexico and Madison, Wisconsin. Considerable emphasis was placed on system economics, since the principal goal of the project is to determine the most cost effective system. A new TRNSYS subroutine was developed to account properly for utility energy costs. DOE

N79-32707# Institute of Gas Technology, Chicago, Ill.
PRODUCTION OF HIGH-ENERGY CHEMICALS USING SOLAR ENERGY HEAT Final Report, 1 Sep. 1977 - 31 May 1978
J. R. Dafler, J. Sinnott, M. Novil, B. D. Yudow, and M. G. Rackoff Dec. 1978 61 p refs
(Contract W-7405-eng-26; Proj. 8999)
(ORNL/SUB-7390/1) Avail: NTIS HC A04/MF A01

Techno-economic studies and thermodynamic assessments of chemical reactions and processes were made and the market potentials for major chemical commodities that use significant amounts of fossil resources were determined in order to identify energy-intensive processes that would be suitable for the production of chemicals and fuels using solar energy porcess heat. Of particular importance was the comparison of relative costs and energy requirements for the selected solar product versus costs for the product derived from conventional processing. The assessment methodology used a systems analytical approach to identify processes and products having the greatest potential for solar energy-thermal processing. Four conventional processes were selected for assessment namely, methanol synthesis, styrene monomer production, vinyl chloride monomer production, and terephthalic acid production. DOE

N79-32708# Pennsylvania Univ., Philadelphia. Dept. of Mechanical Engineering and Applied Mechanics.
ISOTHERMAL FLOW DISTRIBUTION IN SOLAR COLLECTORS AND COLLECTOR MANIFOLDS
Gerald F. Jones and Noam Lior 1978 5 p refs Presented at Meeting of the Am. Sect. of the Intern. Solar Energy Soc., Denver, 28-31 Aug. 1978
(Contract EM-78-C-04-5319)
(ALO-5319-1; Conf-780808-27) Avail: NTIS HC A02/MF A01

As a first step to a detailed analysis of the influence of flow in solar collector absorber tubes on the collector's heat transfer and thermal performance, the distribution of isothermal flow through a typical system consisting of two manifolds connected by a number of parallel riser-tubes was investigated. No thermal effects were taken into account. A discreet hydrodynamic model was developed for this system, and the resulting set of simultaneous nonlinear algebraic equations was solved numerically by the successive substitution method, for 23 different combinations of the major independent variables. Quantitative flow distribution results are presented. In the investigated range, it was determined that the two parameters which have the major influence on flow distribution are the ratio of riser diameter to manifold diameter, and the number of risers, with maldistribution increasing with both of them. DOE

N79-32709# Battelle Pacific Northwest Labs., Richland, Wash.
EFFECTS OF NONCONTACT CLEANERS ON TRANSPARENT SOLAR MATERIALS
H. L. Hampton and M. A. Lind Apr. 1979 72 p
(Contract EY-76-C-06-1830)
(PNL-2969) Avail: NTIS HC A04/MF A01

A brief study was undertaken to evaluate the performance of noncontact cleaning agents for use on solar collectors. Several techniques are used to compare cleansing agents which were recommended by their respective manufacturers for cleaning solar mirrors. Wetting and residue buildup properties were evaluated for over 50 of these commercially available cleaners. The wetting properties of each cleaner were evaluated by measuring the growth of the contact area of a constant volume drop as a function of time. Losses due to residue buildup were solar weighted and considered equally with the wetting parameters and cost figures to construct a figure of merit for cleaner comparison. DOE

N79-32710# Sandia Labs., Albuquerque, N. Mex.
STRUCTURAL OPTIMIZATION OF SHEET MOLDING COMPOUND LINE FOCUSING COLLECTORS
R. C. Reuter, Jr. and R. E. Allred 1979 6 p refs Presented at the 24th Ann. SAMPE Symp., San Francisco, 8 May 1979
(Contract EY-76-C-04-0789)
(SAND-79-0215C; Conf-790517-1) Avail: NTIS HC A02/MF A01

One of the primary structural components of a line focusing solar collector is the reflector support. In this design, it must be a stiff, light weight, parabolic trough which provides and maintains the correct optical shape for the reflective surface, and protects it from detrimental environmental effects. A viable candidate for the reflector support is a moldable, fiber reinforced, rib stiffened structure which has a low cost, high production rate potential. Material and analytical considerations made to insure that the sheet molding compound panel design meets specified structural requirements are described. A detailed analysis is provided and optimization is achieved through steps taken to minimize panel weight. DOE

N79-32711# Oak Ridge National Lab., Tenn.
WIND TURBINES
John C. Yeoman, Jr. Dec. 1978 61 p refs
(Contract W-31-109-eng-38)
(ANL/CES/TE-78-9) Avail: NTIS HC A04/MF A01

Wind turbines, ranging in size from 200 W to 10 MW, are discussed as candidates for prime movers in community energy systems. Estimates of performance characteristics and cost as a function of rated capacity and rated wind speed are presented. Data concerning material requirements, environmental effects, and operating procedures also are given and are represented empirically to aid computer simulation. DOE

N79-32713# Mechanical Technology, Inc., Latham, N. Y.
DEMONSTRATION OF A FREE PISTON STIRLING ENGINE DRIVEN LINEAR ALTERNATOR SYSTEM Annual Report
1 Sep. 1978 126 p
(Contract EY-76-C-02-2764)
(COO-2764-002) Avail: NTIS HC A07/MF A01

A linear alternator concept was demonstrated which meets design power requirements and will operate at 88 percent efficiency. A free piston Stirling engine/linear alternator energy conversion system was successfully tested, demonstrating concept feasibility. In particular, stable and controllable operation, gas bearing operation, and engine start-up using the alternator as a driver were demonstrated. A demonstrator preliminary design in which the system operating conditions and the system concept were defined was completed. In addition, the detailed demonstrator design layout was completed. One approach for analytically modeling free piston Stirling engines was evaluated. Based on this analysis, the decision was made to design the demonstrator with an existing free piston Stirling engine computer program. In addition, the development of a new computer program was initiated. DOE

N79-32714# Los Alamos Scientific Lab., N. Mex.
STATUS REVIEW OF THE TECHNOLOGY ASSESSMENT OF SOLAR ENERGY PROGRAM Interim Status Report
John H. Altseimer and Robert P. Blaunstein (DOE, Washington, D. C.) 1979 6 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-1369; Conf-790541-4) Avail: NTIS HC A02/MF A01

A number of emerging solar technologies and selected applications were assessed for the environmental, institutional, and social impacts resulting from the large scale deployment of decentralized solar technologies. Two national energy scenarios for the year 2000 were used, one predicting 6 quads of solar and the other 14.2 quads. A few results of a preliminary study of the system characterization data are given. DOE

N79-32715# Planning Research Corp., McLean, Va.
APPLICATION AND SYSTEM DESIGN STUDY FOR COST-EFFECTIVE SOLAR PHOTOVOLTAIC SYSTEMS AT FEDERAL INSTALLATIONS
Mar. 1979 133 p refs
(Contract EG-77-C-01-2522)
(HCP/M2522-01) Avail: NTIS HC A07/MF A01

The results are given of an effort to identify the potential for cost effective solar photovoltaic power systems applications within the U.S. Federal Government. An implementation plan is provided for the installation of the first phase of cost effective applications. DOE

N79-32716# Los Alamos Scientific Lab., N. Mex.
SMALL-SCALE SOLAR SIMULATOR FOR INDOOR TESTING OF COLLECTOR MODULES AND MATERIALS
D. P. Grimmer and L. Bronisz 1979 8 p refs Presented at the 1979 Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-1335; Conf-790541-6) Avail: NTIS HC A02/MF A01

The simulator design follows general construction guidelines, but modifications were necessary to insure a + or - 10% uniform flux over a 0.1 sq m area. Considerable adjustments were necessary to achieve desired performance for the testing of collector modules and materials. These adjustments and details of simulator construction, including design schematics and simulator mounting, are described. Also presented are flux maps for the twelve lamp array. Finally, construction materials costs are discussed for this inexpensive solar simulator suitable for many-testing applications. DOE

N79-32717# Energy Resources Co., Inc., Cambridge, Mass.
POTENTIAL USE OF WOOD AND AGRICULTURE WASTES AS STEAM GENERATOR FUEL FOR THERMAL ENHANCED OIL RECOVERY Final Report
Herbert M. Kosstrin and Roy K. McDonald May 1979 32 p refs
(Contract EW-78-X-03-1038)
(SAN-1038-PO-1) Avail: NTIS HC A03/MF A01

The potential to use wood and agriculture wastes to replace crude oil as steam generator fuel was evaluated. California's San Joaquin Valley was the focus for the study. The production of waste materials by county, estimated energy value of each material, and estimated transportation cost for each material are documented. Both agriculture and wood wastes were found to be available in sizeable quantities and could become attractive steam generation fuels. However, some qualifications need to be made on the use of these materials. Transporation costs will probably limit the range of shipping these materials to perhaps 50 to 100 miles. Availability is subject to competition from existing and developing uses of these materials, such as energy sources in their immediate production area. Existing steam generators probably cannot be retrofitted to burn these materials. Fluidized bed combustion, or low Btu gasification, may be a good technology for utilization. DOE

N79-32718# Brookhaven National Lab., Upton, N. Y. Medical Dept.
AVOIDING FUTURE HEALTH PROBLEMS RELATED TO SOLAR ENERGY (PHOTOVOLTAIC) TECHNOLOGY
Louis V. Stang 4 Apr. 1979 25 p refs Presented at the Conf. on Health Implications of the New Energy Technol., Park City, Utah, 4 Apr. 1979
(Contract EY-76-C-02-0016)
(BNL-25935; Conf-790447-1) Avail: NTIS HC A02/MF A01

The hazards involved in disposing of solar cells at the end of their service life are discussed. Several chemical elements that are likely candidates for photovoltaic development are enumerated. The present state of knowledge concerning their toxicities are commented on briefly, and studies that should be undertaken in the near future to provide adequate information on these toxicities are suggested. DOE

N79-32719# Sandia Labs., Albuquerque, N. Mex.
AVAILABILITY OF WIND POWER
J. W. Reed 1978 15 p refs Presented at Seminar on Wind Energy for Electrical Generation, Recife, Brazil, 13-16 Feb. 1978
(Contract EY-76-C-04-0789)
(SAND-78-0548C; Conf-780253-1) Avail: NTIS HC A02/MF A01

Meteorological studies of available wind power to support the development of a vertical-axis wind turbine are presented and reviewed. Climatological studies that are needed to assist and promote wind energy exploitation in Brazil are summarized. DOE

N79-32720# Sandia Labs., Livermore, Calif.
RECENT ADVANCES IN THERMOCHEMICAL ENERGY STORAGE AND TRANSPORT
T. T. Bramlette 1978 7 p refs Presented at 13th Intersoc. Energy Conversion Eng. Conf., San Diego, Calif., 20 Aug. 1978
(Contract EY-76-C-04-0789)
(SAND-78-8505; Conf-780801-22) Avail: NTIS HC A02/MF A01

The potential role of thermal storage systems based on reversible chemical reactions was investigated for both solar and nonsolar utilities. System studies are described for those based on the more promising chemical reactions which utilize calcium hydroxide, sulfur trioxide, and ammonium hydrogen sulfate. Chemical heat pipes and heat pump storage projects using sulfuric acid methanolates are also examined. DOE

N79-32721# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY INFORMATION DATA BASE. SERIAL TITLES
Jun. 1978 40 p
(TID-4579-R-10-Suppl-1) Avail: NTIS HC A03/MF A01

This supplement contains changes and additions to TID-4579-R10 and is intended to be used with that publication. DOE

N79-32722# Brookhaven National Lab., Upton, N. Y.
SYSTEMS FRAMEWORK FOR ENERGY ANALYSIS IN DEVELOPING COUNTRIES
Philip F. Palmedo Oct. 1978 18 p refs
(Contract EY-76-C-02-0016)
(BNL-25933) Avail: NTIS HC A02/MF A01

Criteria that successful energy planning must meet are outlined and some ways to go about such planning are suggested. Distinction is made between energy planning and energy policy analysis. Some concerns in national energy planning and policymaking considered are energy investment decisions, pricing policy, energy conservation policy, research and development policy, broad energy policies and strategies, and economic and social development planning. DOE

N79-32723# Department of Energy, Washington, D. C. Energy Information Administration.
ENERGY EMERGENCY MANAGEMENT INFORMATION SYSTEM (EEMIS): PROGRAM PLAN
Mar. 1979 123 p
(DOE/EIA-0135) Avail: NTIS HC A06/MF A01

The energy emergency management information system (EEMIS) program is described. EEMIS will be called upon to provide information to users as soon as fuel supply/demand imbalances are anticipated. Potential causes of fuel shortages where EEMIS would respond to are: sudden decreases in petroleum imports, gaseous fuel supplies, and petroleum production in the US; regional transportation outages; sudden decrease in coal production in the US; unanticipated heavy regional demand; and disruption of power plant operations. DOE

N79-32724# West Virginia Univ., Morgantown. Dept. of Geology and Geography.
IMPACTS OF THE RESOURCE CONSERVATION AND RECOVERY ACT ON THE SITING OF COAL-CONVERSION ENERGY FACILITIES IN THE UNITED STATES
Frank J. Calzonetti Feb. 1979 42 p refs
(Contract W-7405-Eng-26)
(ORNL/OEPA-12) Avail: NTIS HC A03/MF A01

Facilities holding wastes that are sited at sandy locations are likely to have serious leachate contamination problems forcing the developer to take special precautions or use expensive pond liners, such as membranes. The Resource Conservation and Recovery Act may add to the attractiveness of using low-ash coals because the amount of wastes generated depends critically on the amount of noncombustible material in the coal and will probably decrease the attractiveness of urban locations for new energy facilities. Most facilities producing the largest volumes of heavy, inexpensive substances are to be located far from the traditional markets and off barge-scale, navigable rivers. Long-distance overland hauls of ash and sulfur are infeasible, so ways must be found to use them locally. Markets for sulfur are more regionally concentrated than those for ash. DOE

N79-32725# Oak Ridge National Lab., Tenn.
PROPOSED INDUSTRIAL ENERGY DATA BASE FOR TECHNICAL EVALUATION OF ALTERNATIVE ENERGY SYSTEMS
Richard W. Barnes 1978 30 p Presented at the Workshop on Design of Ind. Energy Inform. Systems, Hilton Head Island, S. C., 6 Dec. 1978
(Contract W-7405-ENG-26)
(CONF-781244-1) Avail: NTIS HC A03/MF A01

Energy information required by industrial managers to make effective decisions concerning (1) management of energy use and supply, (2) introduction of new energy technology, and (3) conversion to new manufacturing processes is discussed. Energy accounting and auditing systems, significant technological and economic factors, and the pertinent external (to the industrial user) variables are also discussed. DOE

N79-32726# Oak Ridge National Lab., Tenn.
OVERVIEW OF WASTE HEAT UTILIZATION TECHNIQUES
Mitchell Olszewski Apr. 1979 18 p refs Presented at Am. Power Conf., Chicago, 23 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790443-2) Avail: NTIS HC A02/MF A01

Cooling water from power plants is generally discharged in the range of 15 to 43 C (60 to 110 F) depending on the temperature of the available inlet water, quantity circulated, plant load, and heat-rejection system used. Possible uses for this low-grade heat include greenhouse horticulture; soil heating (both open field and in greenhouses); spray irrigation for frost protection; organic waste treatment (particularly for algae or biomass production); and aquaculture/mariculture. To date greenhouse and aquaculture/mariculture systems have received the most attention and have, therefore, progressed farthest. Several innovative techniques that utilize powerplant reject heat for these applications are described for the U.S., Canada, France, West Germany, and the USSR. DOE

N79-32727# California Univ., Livermore. Lawrence Livermore Lab.
ENERGY AND TECHNOLOGY REVIEW
Mar. 1979 29 p refs
(Contract W-7405-eng-48)
(UCRL-52000-79-3) Avail: NTIS HC A03/MF A01

A laser system that produces tunable, coherent beams of radiation covering the electromagnetic spectrum from below 200 nm in the ultraviolet to above 1000 nm in the infrared has been developed. The system uses a tunable dye laser in the visible region and converts the laser light to shorter and longer wavelength by stimulated Raman scattering in molecular hydrogen or deuterium gas. For example, in the ultraviolet region, wavelengths as short as 171.3 nm have been generated. Tunable ultraviolet beams can be applied to atomic and molecular spectroscopy as well as to isotopic and chemical analyses. DOE

N79-32730# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Raumfahrt.
DEVELOPMENT OF A PROTOTYPE 10kW SOLAR POWER PLANT Final Report
Dietmar Wolf, Herrmann Bihlmayr, Jochen Carl, Veit Merges, Peter Prikryl, and Peter Vinz Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 167 p refs In GERMAN; ENGLISH summary
(Contract BMFT-03E-4055-C/ETS-8000)
(BMFT-FB-T-78-33) Avail: NTIS HC A08/MF A01; Fachinformationszentrum, Eggenstein-Leopoldshafen, West Ger. DM 34.90

A solar power plant built in the Federal Republic of Germany is described. The development of three other small plants for the generation of electricity from solar energy is also reported on. The design, installation, and commissioning of the plant and of the supporting systems are reviewed. Autonomous operation using technologies as simple as possible and components from series production is emphasized. During acceptance tests the specified maximum net electrical power output of 10 kW at a cooling water temperature of 35 C, the observance of the voltage and frequency tolerances for the generated current, and partial load operation were successfully demonstrated. Further long term tests under real operation conditions are recommended.
Author (ESA)

N79-32731# National Aerospace Lab., Amsterdam (Netherlands). Div. of Fluid Dynamics.
INVESTIGATIONS ON THE AEROELASTIC STABILITY OF LARGE WIND TURBINES
H. H. Ottens and R. J. Zwaan 10 Apr. 1978 21 p refs Presented at the 2d Intern. Symp. on Wind Energy Sys., Amsterdam, 3-5 Oct. 1978
(NPL-MP-78014-U) Avail: NTIS HC A02/MF A01

The aeroelastic stability of wind turbines with vertical axis (VAWT) and with horizontal axis (HAWT) is discussed. Results are given for an existing 5 m VAWT test-bed with and without a tie-down system. Finally, difficulties are discussed in interpreting preliminary results for a horizontal axis wind turbine. Stability, diagrams are shown.
Author (ESA)

N79-32732# MITEC G.m.b.H., Ottobrunn (West Germany).
THE USE OF THE HEAT PUMPS TO RAISE TEMPERATURES IN AN ECONOMICAL AND ECOLOGICAL WAY Final Report, Jul. 1977
Max Huber and Fritz Bukau Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 295 p refs
(Contract BMFT-03E-5211-A/ETS-0004-A)
(BMFT-FB-T-78-35) Avail: NTIS HC A13/MF A01; Fachinformationszentrum, Eggenstein-Leopoldshafen, West Ger. DM 61.75

The use of heat pumps to transfer the cooling water from plant condensers to a hot water district heating system was investigated both from a thermodynamic and economic point of view. A model of the system was derived and evaluated in detail. The specific consumption of primary energy and the expected specific heat costs were determined, depending on different parameters. Results show that if certain marginal conditions are presumed, such district heating system may be equivalent to or even better than conventional hot water district heating performed on the basis of combined power-heat generation.
Author (ESA)

N79-32733# Austrian Solar and Space Agency, Vienna.
METEOROLOGICAL DATA FOR SOLAR ENERGY APPLICATIONS
M. Bruck 1978 12 p refs
Avail: NTIS HC A02/MF A01

Meteorological quantities and the mathematical techniques used for acquiring them are presented. Their relevance to solar energy utilization is emphasized. Following a discussion of the definitions of extraterrestrial solar radiation and terrestrial radiation (thermal radiation), meteorological radiation quantities are listed and a formula, easily adaptable to a programmable pocket calculator, for the calculation of the yearly variation in the global radiation incident on a horizontal plane is presented. Air temperature, relative humidity, and wind are also discussed as important meteorological parameters.
Author (ESA)

N79-32734# Polytechnic Inst. of New York, Brooklyn.
ASSESSMENT OF HYDROPOWER RESTORATION AND EXPANSION IN NEW YORK STATE, VOLUME 1
R. S. Brown and A. S. Goodman Aug. 1978 90 p Sponsored by the Power Authority of the State of New York and New York State Energy Research and Development Authority
(PB-295782/7; NYSERDA-78/6-Vol-1) Avail: NTIS HC A05/MF A01 CSCL 10B

The study of the potential for the development of small scale hydropower indicates a potential of 3,000 megawatts of undeveloped capacity at a minimum of 754 sites in New York State. This figure for exceeds all previous estimates. The cost of such development will not be cheap but may well be competitive with new generating capacity either thermal or nuclear. Small hydropower has these added advantages: (1) this technology has the shortest time frame for implementation; (2) environmental impact will be minimal, and (3) socioeconomic impact will be positive.
GRA

N79-32735# Office of Technology Assessment, Washington, D. C.
RENEWABLE OCEAN ENERGY SOURCES. PART 2: WORKING PAPERS: OCEAN WINDS, CURRENTS, WAVES, TIDES AND SALINITY GRADIENTS
Mar. 1979 153 p refs
(PB-295876/7) Avail: NTIS HC A08/MF A01 CSCL 10B

Renewable ocean energy systems are described. Six ocean energy systems are presented. They are: ocean thermal energy conversion, tidal power generation, ocean winds for windpowered generators, ocean waves for waterwave energy conversion, ocean currents, and salinity gradients. The relative potential for contributing to future energy supplies and the state of advancement are assessed.
A.W.H.

N79-32736# New Mexico Energy Inst., Albuquerque.
THEORETICAL ANALYSIS OF A PASSIVE HEAT PIPE HEATING AND COOL SYSTEM
K. T. Feldman Dec. 1978 46 p refs Sponsored in part by N. Mex. Energy and Minerals Dept., Santa Fe
(PB-296066/4; NMEI-23/SA) Avail: NTIS HC A03/MF A01 CSCL 13A

A totally new concept which combines both a heat pipe and a flat plate solar collector for daytime solar water heating and nighttime water cooling was studied theoretically. Since the heat pipe is a passive heat transfer device, the entire system requires no pumps or auxiliary power for its operation. This makes the system reliable and should require very little maintenance. This system with a collector area of 400 sq ft can meet both winter space heating and summer space cooling requirements. For a typical winter day it can provide about 8000 lbs/day of hot water at 140 F or about 530,000 Btu/day. For a summer day it can provide about 4000 lbs/day of chilled water at 45 F or about 100,000 Btu/day for space cooling.
GRA

N79-32737# Joint Center for Graduate Study, Richland, Wash.
INVESTIGATION OF LOW COST SOLAR CELLS BASED ON Cu2O Annual Progress Report, 1 Oct. 1975 - 30 Sep. 1976
Larry C. Olsen 30 Sep. 1976 91 p refs
(Grant NSF AER-75-20501)
(PB-295888/2; NSF/RANN/AER-75-20501/PR/76/3 NSF/RA-761743) Avail: NTIS HC A05/MF A01 CSCL 10B

Fabrication of thin-film backwall Cu/Cu2O cells, collection efficiency measurements and analysis, MIS solar cell theory, and initiation of frontwall solar cell studies are discussed. A system was established for controlled oxidation of copper. Both thick film and thin film backwall cells were fabricated and characterized. These cells typically have J about 0.00003 A/sq cm and n 3.5. Analysis of thick film diodes suggest that a high interface state density exists at the Cu-Cu2O junction. The thin film cells have very low shunt resistances due to the granular structure. Spectral collection efficiency of thin film backwall cells was measured to be 25 percent at 600 nm. Assuming a reasonable collection efficiency for backwall cells, the upper limit of performance for backwall cells is projected to be 4 percent. GRA

N79-32738# National Bureau of Standards, Washington, D. C. Center for Building Technology.
HUD UTILITIES DEMONSTRATION SERIES. VOLUME 9: DESCRIPTION OF THE DATA ACQUISITION AND INSTRUMENTATION SYSTEMS, JERSEY CITY TOTAL ENERGY PROJECT
Charles Bulik, William G. Rippey, C. Warren Hurley, and Daniel E. Rorrer Mar. 1979 161 p refs Sponsored in part by HUD
(PB-294926/1; NBSIR-79-1709) Avail: NTIS HC A08/MF A01 CSCL 13A

The design and operation of the instrumentation system and the data acquisition system used to monitor the total energy plant and certain utility services to the site buildings are described. A description of the types, characteristics, and locations of instruments used to measure physical variables is given. The capabilities and operational modes of the data acquisition system components are described in detail. A description of the total energy plant and site, instrument costs, data processing procedures and some of the instrumentation problems encountered is presented. GRA

N79-32739# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
ENERGY PROGRAMS AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LAB. Quarterly Report, Oct. - Dec. 1978
W. J. Toth, K. Yu, F. C. Paddison, R. S. P. Weissbrod, and C. S. Leffel, Jr. Jan. 1979 46 p refs Sponsored in part by DOE, Wash., D.C.
(PB-295439/4; APL/JHU/EQR-78/4) Avail: NTIS HC A03/MF A01 CSCL 10A

Progress in developing energy resources, utilization concepts, and storage methods is reported. Energy technology areas discussed include: (1) geothermal energy marketing and development in the Delmarva region of Maryland; (2) redevelopment of dams for small-scale hydroelectric energy projects; (3) ocean engineering and heat exchangers for ocean thermal energy conversion; and (4) flywheels and heat pumps for energy conservation and storage. K.L.

N79-32746# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN, FOSSIL FUEL UTILIZATION PROGRAM
Apr. 1979 101 p refs
(DOE/EDP-0046) Avail: NTIS HC A06/MF A01

A common basis for planning, managing, and reviewing all environmental aspects of the energy programs under DOE's jurisdiction is provided by environmental development plans (EDP) which identify the environmental concerns and research and development necessary for assessing the potential environmental impacts and mitigating measures associated with an energy technology. To ensure that environmental, health, and safety (EH&S) considerations will be addressed adequately in the technology decision making process, the EDP (1) identifies and evaluates EH&S concerns; (2) defines EH&S research and related assessments to examine or resolve the concerns; (3) provides a coordinated schedule with the technology program for required EH&S research and development; and (4) indicates the timing for environmental assessments, environmental impact statements, environmental readiness documents, and safety analysis reports. DOE

N79-32747# Water Purification Associates, Cambridge, Mass.
WATER RELATED ENVIRONMENTAL EFFECTS IN FUEL CONVERSION. 1: SUMMARY VOLUME
H. Gold and D. J. Goldstein 1978 259 p refs
(Contract EX-76-C-01-2445)
(FE-2445-1-Vol-1) Avail: NTIS HC A12/MF A01

Effects that could be expected from siting specific conversion plants at given locations in the major coal and oil shale bearing regions of the United States were investigated. The synthetic fuel technologies examined include: coal gasification to convert coal to pipeline gas; coal liquefaction to convert coal to low sulfur fuel oil; coal refining to produce a de-ashed, low sulfur solvent refined (clean) coal; and oil shale retorting to produce synthetic crude. The results presented include the range of water requirements, the conditions for narrowing the range and optimizing the use of water, the ranges of residual solid wastes, and the cost and energy requirements for wastewater treatment. Water resources data in the coal and oil shale regions were assessed. Potential water supply sources for each site were evaluated in terms of the available water supply. The degree of wet cooling used to dissipate waste heat was determined on the basis of water availability and cost. DOE

N79-32751# Saarbergwerke A.G. Saarbruecken (West Germany). Hauptabt. Forschung und Entwicklung, Umweltschutz.
ENGINEERING STUDY OF THE FLUE GAS DESULFURIZATION UNIT FOR THE POWER PLANT WEIHER 3 Final Report, Jun. 1977
Friedrich Hofmann, Heinrich Igelbuescher, and Gerhard Scholl Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 55 p refs In GERMAN; ENGLISH summary
(Contract BMFT-03E-1012/ETS-6000-A)
(BMFT-FB-T-78-28) Avail: NTIS HC A04/MF A01; Fachinformationszentrum, Eggenstein-Leopoldshafen, West Ger. DM 11,35

Following the experience gathered during operation of the test facility for flue gas desulfurization at the Weiher 2 power station, the possible construction of a fullscale plant was examined. Results show that with a few exceptions the successful concept of Weiher 2 can be retained as well as the equipment and aggregates used there. The technology transfer of the experience gathered at the test facility for a flue gas throughput of 125,000 cu m/hr to the projected plant is shown to be feasible. In individual cases improvements are possible regarding the equipment and aggregates. For example the installation of the fan (now preceding the plant) or the general use of shallow bottoms for the tanks instead of hopper gates is discussed. Author (ESA)

N79-32811# Sandia Labs., Albuquerque, N. Mex.
WIND POWER CLIMATOLOGY OF THE UNITED STATES, SUPPLEMENT
Jack W. Reed Apr. 1979 85 p refs
(Contract AC-04-76-DP-00789)
(SAND-78-1620) Avail: NTIS HC A05/MF A01

The summaries in the earlier Wind Power Climatology of the United States are extended to include monthly and annual average wind speeds. Station histories that allow adjustment for local air density, based on station pressure-altitude and the annual temperature cycle, were obtained from the National Climatic Center. The logs of anemometer exposures were used to adjust both wind speeds and wind powers to standard height, 10 m above ground. Extrapolations for speed and power at 20- and 50-m heights are also provided. DOE

N79-32995# Battelle Pacific Northwest Labs., Richland, Wash.
SUMMARY OF NATIONAL AND INTERNATIONAL RADIOACTIVE WASTE MANAGEMENT PROGRAMS
K. M. Harmon Mar. 1979 94 p
(Contract EY-76-C-06-1830)
(PNL-2941) Avail: NTIS HC A05/MF A01

The status of fuel cycle and waste management programs is described for Argentina, Australia, Austria, Belgium, Brazil, Canada, China, Denmark, Finland, France, Democratic Republic of Germany, Federal Republic of Germany, India, Iran, Italy, Japan, Mexico, the Netherlands, Pakistan, Spain, Sweden, Switzerland, United Kingdom, United States, and USSR. This compilation attempts to provide current information as of the end of January 1979. DOE

N79-33036# Florida Univ., Gainesville. Dept. of Engineering Sciences.
HARTMANN FLOWS IN THE MHD GENERATOR CONFIGURATION
Rush E. Elkins, III, Thomas A. Trovillion, and E. Rune Lindgren Jun. 1979 60 p refs

(Contract N00014-76-C-0410)
(AD-A070080; TR-01-002) Avail: NTIS HC A04/MF A01 CSCL 20/9

Specific features and characteristics of Hartmann flows in the Faraday generator configuration are reported. These features concern the effect of longitudinal baffling along the insulating duct walls, effects of slip between gas-liquid phases in the flow. The report also contains an analysis of a compensating system of a Faraday generator as well as a one-dimensional zero-slip model of a two-phase MHD flow through the generator. GRA

N79-33042# STD Research Corp., Arcadia, Calif.
MAGNETOGASDYNAMIC PHENOMENA IN PULSED MHD FLOWS Interim Summary Report, 1 Aug. 1977 - 31 Oct. 1978
S. T. Demetriades, D. M. Markham, C. D. Maxwell, D. A. Oliver, and T. F. Swean Jan. 1978 66 p refs
(Contract N00014-77-C-0574)
(AD-A070590; STD-UP-002-77-1; STDR-79-2) Avail: NTIS HC A04/MF A01 CSCL 20/9

This report examines some of the detailed structure of magnetogasdynamic flows encountered in pulsed magnetohydrodynamic (MHD) generators. Two illustrations of magnetogasdynamic nonuniformities are considered. The first is for conventional explosive-driven MHD generators. Here we reveal the detailed structure of the deceleration of the conducting slug formed by the compression of plasma between the explosive-driven shock wave and its following contact surface. The second illustration is for steady high Magnetic Reynolds Number channel flows. Here we exhibit the nonuniform manner in which the external magnetic field is diffused into the plasma and the corresponding nonuniform deceleration of the flow. GRA

N79-33096# Brown Univ., Providence, R. I. Div. of Engineering.
THERMODYNAMIC AND TRANSPORT PROPERTIES OF ISOBUTANE: A SURVEY OF AVAILABLE DATA
J. Kestin, H. E. Khalifa, and B. Kumar Nov. 1978 204 p refs
(Contract EY-76-S-02-4051)
(COO-4051-35; CATMEC/27) Avail: NTIS HC A10/MF A01

An extensive compilation of the available equilibrium and transport properties of isobutane (2-methyl propane) is presented. Also, the available correlations of the thermodynamic properties of isobutane are listed; the statement is made that these correlations do not agree among themselves, and that none is obviously superior to the others. The compilation of available experimental data on equilibrium properties (up to 1978) is preparatory step towards the formulation of a new, more accurate correlation as an aid for design of geothermal installations. DOE

N79-33107# Raytheon Co., Burlington, Mass.
TRANSPORTATION SYSTEMS CENTER BIBLIOGRAPHY OF TECHNICAL REPORTS
Janice A. Bilsback Mar. 1979 133 p
(PB-296342/9; DOT-TSC-RSPA-79-5) Avail: NTIS HC A07/MF A01 CSCL 01C

The bibliography lists unlimited distribution reports released by the Transportation Systems Center from January through December 1978. It supplements the Transportation Systems Center Bibliogrpahy of Technical Reports, July 1970 - December 1976 (DOT-TSC-OST-77-17) and January - December 1977 (DOT-TSC-OST-78-14). Reports are listed by sponsoring agency, and are indexed by subject, personal author, corporate author, title, contract number and report number. GRA

N79-33115# Executive Office of the President, Washington, D. C.
AERONAUTICS AND SPACE REPORT OF THE PRESIDENT, 1978 ACTIVITIES
Jimmy Carter NASA Jul. 1979 109 p
Avail: NTIS MF A01; SOD HC as NAS1.52:978

Highlights of national aeronautics and space programs for the year are described for the following areas: communications, Earth resources, space science, transportation, and space energy. Activities of NASA and five other Federal agencies with the largest programs in these areas are discussed. The national space policy statement is included in the appendixes along with records of U. S. spacecraft launchings, the history of U. S. and Soviet manned space flights; and data related to applications satellites, scientific payloads, and space probes. Budgetary summaries are included. A.R.H.

N79-33151# Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e. V., Karlsruhe (West Germany). Inst. fuer Systemtechnik und Innovationsforschung.
PUBLISHED PATENT APPLICATIONS AND PATENTS RESULTING FROM GERMAN GOVERNMENT SPONSORED RESEARCH AND DEVELOPMENT Final Report
Gerhard Jaeckel and Ingrid Zierl Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 112 p In GERMAN; ENGLISH summary
(Contract BMFT-NT-0442)
(BMFT-FB-T-78-31) Avail: NTIS HC A06/MF A01; Fachinformationszentrum, Eggenstein-Leopoldshafen, West Ger. DM 23,55

The ministry for Research and Technology of the Federal Republic of Germany has sponsored research and development related to industrial innovations since 1969. Work reported on includes the published patent applications and patents from all projects which were sponsored up to and including 1974. Fields covered are electronics, optics, nonnuclear energy technology, applications of pure physics, materials development, and industrial processes technology. Author (ESA)

N79-33158 West Virginia Univ., Morgantown.
A FREE-VORTEX MODEL WITH NUMERICAL SOLUTION FOR THE UNSTEADY LIFTING CHARACTERISTICS OF STRAIGHT BLADED DARRIEUS WIND TURBINES Ph.D. Thesis
Paul Gerald Migliore 1979 295 p
Avail: Univ. Microfilms Order No. 7920716

A method was developed to analyze the flow and predict the lifting characteristics of vertical axis wind turbines. Blades are modelled by a number of discrete bound vortices located on the airfoil mean camber line; the wake is modelled by a number of discrete vortices shed from the blade trailing edge. Application of the flow tangency boundary condition and the Kutta condition permit a numerical solution for the strengths of the bound vortices. Blade forces are then determined from potential theory. This vortex model faithfully reflects the important phenomena of flow unsteadiness and wake/blade interaction. Wake details and energy extraction efficiency are analyzed for single and multi-bladed turbines. A comparison of experimental data to analytical predictions shows close agreement for the maximum power coefficient and the tip speed ratio at which at occurs. Dissert. Abstr.

N79-33207*# Lockheed-California Co., Burbank.
STUDY OF THE APPLICATION OF HYDROGEN FUEL TO LONG-RANGE SUBSONIC TRANSPORT AIRCRAFT. VOLUME 1: SUMMARY Final Report
G. D. Brewer, R. E. Morris, R. H. Lange, and J. W. Moore Jan. 1975 56 p refs For vol. 2 see N75-30163
(Contract NAS1-12972)
(NASA-CR-132558; LR-26752-1) Avail: NTIS HC A04/MF A01 CSCL 21E

The feasibility of using liquid hydrogen as fuel in advanced designs of long range, subsonic transport aircraft is assessed. Both passenger and cargo type aircraft are investigated. Comparisons of physical, performance, and economic parameters of the LH2 fueled designs with conventionally fueled aircraft are presented. Design studies are conducted to determine appropriate characteristics for the hydrogen related systems required on board the aircraft. These studies included consideration of material, structural, and thermodynamic requirements of the cryogenic fuel tanks and fuel systems with the structural support and thermal protection systems. A.W.H.

N79-33211# Monsanto Research Corp., Dayton, Ohio.
RECLAMATION OF SYNTHETIC TURBINE ENGINE OIL MIXTURES Final Report, 15 Mar. 1976 - 15 Mar. 1978
Gerald Glasgow and Richard J. Bruns Apr. 1979 179 p refs
(Contract F33615-76-C-2037; AF Proj. 3048)
(AD-A071813; MRC-DA-780; AFAPL-TR-78-50) Avail: NTIS HC A09/MF A01 CSCL 11/8

The objective of this program was to develop a technique for reclaiming used synthetic turbine engine oil mixtures and to demonstrate the technical feasibility of the developed reclamation technique by restoring a limited number of used MIL-L-7808 oils to a satisfactory performance level. Reclamation process studies based on approaches utilized by the natural oil and fat refining industry resulted in the development of a reclamation process applicable to synthetic ester turbine engine oils. The components of a reclamation process applicable to a broad range of used MIL 7808G oil mixtures were defined and the technical feasibility established by reclamation and evaluation (via qualification tests) of two batches of used oils. Recommendations for improvement and refinement of the process and approaches to more extensive documentation of its viability were made. GRA

N79-33253*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REDUCED POWER PROCESSOR REQUIREMENTS FOR THE 30-cm DIAMETER Hg ION THRUSTER
Vincent K. Rawlin 1979 14 p refs Presented at the 14th Intern. Conf. on Electric Propulsion, Princeton, N. J., 30 Oct. - 1 Nov. 1979; sponsored by AIAA and Deutsche Gesselschaft fuer Luft- und Raumfahrt
(NASA-TM-79257; E-169; AIAA-Paper-79-2081) Avail: NTIS HC A02/MF A01 CSCL 21C

An evaluation of simplifications for the thruster power processor interface for a 30 cm Hg ion thruster is presented. Tests on the engine, thruster control, and the power supplies are performed. Reduced power processors requirements are defined and the impact on thruster design, performance, and lifetime are assessed. A.W.H.

N79-33336*# National Aeronautics and Space Administration. Lewis Researvh Center, Cleveland, Ohio.
JET FUEL THERMAL STABILITY
William F. Taylor, ed. (Exxon Research and Engineering Co., Linden, N. J.) 1979 158 p Workshop held at Cleveland, 1-2 Nov. 1978
(NASA-TM-79231) Avail: NTIS HC A08/MF A01 CSCL 21D

Various aspects of the thermal stability problem associated with the use of broadened-specification and nonpetroleum-derived turbine fuels are addressed. The state of the art is reviewed and the status of the research being conducted at various laboratories is presented. Discussions among representatives from universities, refineries, engine and airframe manufacturers, airlines, the Government, and others are presented along with conclusions and both broad and specific recommendations for future stability research and development. It is concluded that significant additional effort is required to cope with the fuel stability problems which will be associated with the potentially poorer quality fuels of the future such as broadened specification petroleum fuels or fuels produced from synthetic sources. A.R.H.

N79-33340# Institute of Gas Technology, Chicago, Ill.
DEVELOPMENT OF COMBUSTION DATA TO UTILIZE LOW-Btu GASES AS INDUSTRIAL PROCESS FUELS. FLAT-FLAME BURNER
Richard T. Waibel and Edward S. Fleming Dec. 1978 30 p refs
(Contract EX-76-C-01-2489; Proj. 61004)
(FE-2489-36; Special-Rept-5) Avail: NTIS HC A03/MF A01

Eight types of industrial burners were tested using three different low- and medium-Btu gases. The performance of each burner with these gases was compared to its performance with natural gas in terms of flame stability and shape, furnace efficiency, heat absorption profile, noise level, temperature profiles, radiant heat flux, post-flame emissivity, and flow direction. DOE

N79-33341# National Technical Information Service, Springfield, Va.
ALCOHOL FUELS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Jun. 1979
Diane M. Cavagnaro Jul. 1979 247 p Supersedes NTIS/PS-78/0674 and NTIS/PS-77/0621
(NTIS/PS-79/0714/0; NTIS/PS-78/0674; NTIS/PS-77/0621) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Reports from a worldwide literature survey discuss new technology in the field of alcohol fuels. The different blends, synthesis, processes used, properties, engine performance evaluations, economics, safety measures, pollution effects, and combustion studies are covered. Sources from which alcohol fuels can be obtained, such as coal, solid wastes, industrial by-products, and agricultural wastes are reported. Two hundred and forty one abstracts, 50 of which are new entries to the previous edition are presented. GRA

N79-33342# National Technical Information Service, Springfield, Va.
ALCOHOL FUELS, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1978 - Jun. 1979
Diane M. Cavagnaro Jul. 1979 144 p Supersedes NTIS/PS-78/0673 and NTIS/PS-77/0620
(NTIS/PS-79/0713/2; NTIS/PS-78/0673; NTIS/PS-77/0620) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Federally-funded research on alcohol based fuels that may be used in the future as a fuel source is presented. Synthesis, chemical analysis, performance testing, processing, pollution, economics, environmental effects, and feasibility are included. One hundred and thirty five abstracts, 109 of which are new entries to the previous edition are reported. GRA

N79-33343# National Technical Information Service, Springfield, Va.
ALCOHOL FUELS, VOLUME 1. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - 1977
Diane M. Cavagnaro Jul. 1979 170 p
(NTIS/PS-79/0712/4) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Reports from Federally-funded research are cited covering chemical analysis, performance testing, synthesis, processing, pollution, economics, environmental effect, and feasibility. (This updated bibliography contains 161 abstracts, none of which is new to the previous edition.) GRA

N79-33344# Gulf Research and Development Co., Chestwick, Pa.
INVESTIGATION OF MECHANISM OF REACTIONS INVOLVING OXYGEN-CONTAINING COMPOUNDS IN COAL HYDROGENATION Final Report, Mar. 1979
D. C. Cronauer and R. G. Ruberto Mar. 1979 245 p refs Prepared for EPRI
(EPRI Proj. 713-1)
(EPRI-AF-913) Avail: NTIS HC A11/MF A01

Reactions involving oxygen during hydrogenative liquefaction are presented as well as the establishment of a kinetic model to describe coal liquefaction. Emphasis was directed toward the liquefaction of Belle Ayr subbituminous coal with subsequent test runs made with Burning Star bituminous coal. The liquefaction experiments were made in a CFSTR bench-scale unit operated at temperatures between 400 and 470 C, space times between 5 and 60 minutes and a fixed total pressure of 2000 psig. It was shown that betwen 70% and 85% of the coal organic oxygen is removed as carbon oxides and water. Carboxylic, carbonylic, and etheric functionalities of coal are essentially removed during the liquefaction reaction. The most abundant oxygen-containing group in the reaction product is hydroxylic, a portion of which is necessarily formed by a reduction of other groups. The results of liquefying Belle Ayr coal were correlated by a kinetic model. DOE

N79-33345# General Accounting Office, Washington, D. C. Energy and Minerals Div.
THE POTENTIAL FOR HYDROGEN AS AN ENERGY SOURCE
20 Apr. 1979 16 p

(PB-295317/2; EMD-79-58) Avail: NTIS HC A02/MF A01 CSCL 21D

GAO surveyed a portion of the literature on the status, progress, and problems surrounding the development and commercialization of hydrogen as an energy source. GRA

N79-33346# Columbia Univ., New York. Dept. of Chemical Engineering and Applied Chemistry.

ETHANOLIC FUELS FROM RENEWABLE RESOURCES IN THE SOLAR AGE

Harry P. Gregor and Thomas W. Jeffries 1979 34 p refs

(PB-295645/6) Avail: NTIS HC A03/MF A01 CSCL 21D

Production of ethanol, other liquid fuels, and organic chemicals from cellulosic biomass at prices that can compete with those of petroleum derived materials by employing presently available or soon to be developed membrane technologies is described. Contemporary membrane technologies can already effect major savings in process costs for the conventional fermentation of grains or molasses to produce ethanol; developing membrane technologies could employ cheap cellulosic substrates for ethanol production. GRA

N79-33347# National Technical Information Service, Springfield, Va.

HYDROGEN USE AS A FUEL. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Jun. 1979

Audrey S. Hundemann Aug. 1979 191 p Supersedes NTIS/PS-78/0635; NTIS/PS-77/0522; NTIS/PS-76/0458

(NTIS/PS-79/0779/3; NTIS/PS-78/0635; NTIS/PS-77/0522; NTIS/PS-76/0458) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Federally-funded research studies pertaining to the technical feasibility of using hydrogen as a fuel for vehicular transportation, electric power generation, and both subsonic and supersonic aircraft are discussed. One hundred and eighty six abstracts, 24 of which are new entries to the previous edition are reported. GRA

N79-33348# Michigan Univ., Ann Arbor. Dept. of Chemical Engineering.

PHYSICAL PROPERTIES AND STABILITY OF WATER IN FUEL OIL EMULSIONS Final Report, Aug. 1977 - Aug. 1978

H. S. Fogler, S. R. Reddy, M. L. Storbeck, J. B. Cross, and S. C. Siegmund Mar. 1979 121 p refs

(Contract DOT-OS 70056)

(PB-296146/4; UMICH-015657; DOT/RSPD/DPB/50-78/17) Avail: NTIS HC A06/MF A01 CSCL 07D

The physical properties of water-in-fuel oil emulsions were investigated. Ultrasonically induced cavitation was used to produce emulsions in gasoline, No. 2 diesel oil, No. 4 heating oil, and No. 6 fuel oil without the use of surfactants. Density and viscosity measurements for each of the four fuels used are presented for various temperatures in the range from 20C to 90C. Interfacial tension measurements, against water for each of the four fuels used are presented for temperatures in the range from 30C to 79C. The stability of water-in-fuel oil emulsions was also studied. A scanning electron microscope and a spectrophotometer were used to study the aging of oil-in-water emulsions, while water-in-oil emulsions were studied using a creaming cell. GRA

N79-33349# General Accounting Office, Washington, D. C. Energy and Minerals Div.

THE UNITED STATES REFINING POLICY IN A CHANGING WORLD OIL ENVIRONMENT Report to the Congress

29 Jun. 1979 35 p refs

(PB-297136/4; EMD-79-59) Avail: NTIS HC A03/MF A01 CSCL 21D

The implications of international and domestic factors affecting the United States refining industry are addressed. This report considers such matters as the control of domestic crude price under The Entitlement Program, the small refinery bias, the availability of domestic and imported crude supplies, environmental and other regulations, and other factors affecting refinery capacity issues. Producer-nation control of crude supplies, foreign refining capacity and supplier-nation downstream developments are also addressed. GRA

N79-33352# Stearns-Roger Corp., Denver, Colo.

ECONOMIC EVALUATION OF FABRIC FILTRATION VERSUS ELECTROSTATIC PRECIPITATION FOR ULTRA-HIGH PARTICULATE COLLECTION EFFICIENCY Final Report

S. D. Severson, F. A. Horney, D. S. Ensor (Meteorology Res., Inc.), and G. R. Markowski (Meteorology Res., Inc.) Jun. 1978 137 p refs Sponsored by Elec. Power Res. Inst.

(EPRI Proj. 834-1)

(EPRI-FP-775) Avail: NTIS HC A07/MF A01

The economic selection in each case described was dependent on the particulate emission limit to be met, the physical and chemical characteristics of the coal and fly ash, and the bag replacement schedule of the fabric filter. For systems designed to meet the Federal particulate emission limitation of 0.1 lb/10 to the 6th power BTU, the electrostatic precipitator had a clear advantage in one of the four cases. For systems designed to meet the more stringent New Mexico regulations, the fabric filter had a significant economic advantage in three of the four cases. If designs are based on obtaining a clear stack plume, the fabric filter has a significant advantage. Precipitator costs increase significantly as collection efficiency requirements are increased. Baghouse costs, on the other hand, remain essentially constant due to their inherently high collection efficiency. Baghouses become the economic choice for all coals, even low-resistivity eastern ones, when permissible emission levels drop much below the current NSPS of 0.1 lb/10 to the 6th power BTU. DOE

N79-33518*# Geological Survey, Denver, Colo. Petrophysics and Remote Sensing Branch.

GEOLOGIC APPLICATIONS OF THERMAL-INERTIA MAPPING FROM SATELLITE Progress Report, 1 Mar. - 31 May 1979

Terry W. Offield, Principal Investigator, Susanne H. Miller, and Kenneth Watson May 1979 6 p Sponsored by NASA ERTS

(E79-10279; NASA-CR-162144) Avail: NTIS HC A02/MF A01 CSCL 08B

The author has identified the following significant results. After digitization, a noise rejection filter was applied to data obtained by USGS aircraft. An albedo image was formed by combining three bands of visible data. Along with the day and nighttime thermal data, the albedo image was used to construct a relative thermal-inertia image. This image, registered to a topographic base, shows there are thermal property differences in the vicinity of the contact between the Fort Union and Wasatch formations in the Powder River Basin, Wyoming.

N79-33526*# Bureau de Recherches Geologiques et Minieres, Orleans (France).

SPATIAL THERMAL RADIOMETRY CONTRIBUTION TO THE MASSIF ARMORICAIN AND THE MASSIF CENTRAL (FRANCE) LITHO-STRUCTURAL STUDY Progress Report, Apr. - Aug. 1979

Jean-Yves Scanvic, Principal Investigator Sep. 1979 28 p refs Sponsored by NASA Original contains imagery. Original photography may be purchased from the EROS Data Center, Sioux Falls, S. D. 57198 ERTS

(E79-10294; NASA-CR-162325; Rept-1) Avail: NTIS HC A03/MF A01 CSCL 08G

N79-33538# Denver Research Inst., Colo.

EPA PROGRAM STATUS REPORT: OIL SHALE, 1979 UPDATE

R. E. Pressey and P. A. Westcott Mar. 1979 71 p refs

(Contract EPA-R-806156)

(PB-294998/0; EPA-600/7-79-089) Avail: NTIS HC A04/MF A01 CSCL 08I

EPA studies related to the development and commercialization of oil shale are providing information on health and ecological effects from pollutants created by the extraction and processing of oil shale, and on technological methods that can be used to control the release of those pollutants. The program is also assessing the environmental impact of the use of the fuels refined from shale oil. The reader with an overview of current oil shale research and development (R and D) efforts being performed by EPA, or being funded by EPA monies passed through to other Federal agencies under the five-year old 17 agency Interagency Energy Environment R and D Program. It covers extraction and handling, processing, energy-related processes and effects, and overall assessments. Project title, sponsoring agency, performing organization, project duration, and project contact are given.
GRA

N79-33549# Golder Associates, Inc., Kirkland, Wash.
OIL MINING: A TECHNICAL AND ECONOMIC FEASIBILITY STUDY OF OIL PRODUCTION BY MINING METHODS Open File Report, Apr. 1977 - Jul. 1978
Anthony Edey, Bruce A. Kennedy, and Leigh A. Readdy Oct. 1978 293 p refs
(Contract DI-BM-JO-275018)
(PB-297134/9; BM-OFR-55-79) Avail: NTIS HC A13/MF A01 CSCL 08I

The characteristics of oil fields which would make them amenable to mining techniques were identified. An inventory of known U.S. oil fields that offer this potential was collated. Data was then divided into fields having potential for underground and surface mining systems development. Several candidate fields in Arkansas, California, and Utah that fit particular underground and surface mining system types were selected. Conceptual mining systems were designed for the selected fields. Five underground and four surface methods were chosen. Costs of oil production were estimated for these selections. The impact of oil mining on the environment was also considered. GRA

N79-33552# TRW Energy Systems, Redondo Beach, Calif.
TECHNOLOGY OVERVIEW REPORTS FOR EIGHT SHALE OIL RECOVERY PROCESSES
C. C. Shih, J. E. Cotter, C. H. Prien, and T. D. Nevens Mar. 1979 115 p refs Prepared in cooperation with Denver Research Inst., Colo.
(Contract EPA-68-02-1881)
(PB-295665/4; EPA-600/7-79-075) Avail: NTIS HC A06/MF A01 CSCL 08I

Information for the evaluation of environmental impacts and pollution control technologies in connection with oil shale development is presented. General process descriptions, shale preparation requirements, equipment types, operating conditions, and process products and byproducts are reported. The physical and chemical characteristics of shale oil recovery, the energy and water requirements, the waste disposal, and site specific environmental aspects are examined. A.W.H.

N79-33553# California Univ., Riverside. Institute of Geophysics and Planetary Physics.
TELLURIC SOUNDING AND MAPPING IN THE VICINITY OF THE SALTON SEA GEOTHERMAL AREA, IMPERIAL VALLEY, CALIFORNIA M.S. Thesis
Eugene Drake Humphreys Jun. 1978 127 p refs
(Grant NSF AER-72-03551)
(PB-296081/3; UCR/IGPP-78/17; NSF/RA-780510) Avail: NTIS HC A07/MF A01 CSCL 08I

A geophysical survey conducted in the region of the Salton Sea geothermal fields is discussed. Telluric sounding was utilized to determine the subsurface resistivity structure in order to indicate resistivity to a great depth. A wide span of frequencies were used in order to determine the electrical properties with depth. The correlation of high rock temperature and low resistivity is discussed and the Jacobian of the transformation matrix is calculated. Mappings of the resistivity of the area are presented. A.W.H.

N79-33554# Office of Technology Assessment, Washington, D. C.
MANAGEMENT OF FUEL AND NONFUEL MINERALS IN FEDERAL LAND: CURRENT STATUS AND ISSUES
Apr. 1979 444 p
(PB-295788/4; OTA-M-88) Avail: NTIS HC A19/MF A01 CSCL 05A

The land management and disposal laws, policies, and practices that affect mineral exploration, development, and production on Federal onshore lands are analyzed. The discovery and production of minerals, including onsite processing and removal of the minerals from the mine site, and the effects on air, land, and water are discussed. The establishment of a mineral land management system that will identify and develop mineral resources in an environmentally safe manner is proposed. A.W.H.

N79-33557 Clark Univ., Worcester, Mass.
SHELTER DESIGN AND ENERGY USAGE: A METHODOLOGY FOR EVALUATING THE IMPACTS OF RESIDENTIAL SPACE CONDITIONING TECHNOLOGIES ON THE CONSUMER, THE ELECTRIC UTILITY, AND SOCIETY Ph.D. Thesis
Robert M. Wirtshafter 1979 242 p
Avail: Univ. Microfilms Order No. 7923167

A 'total systems' methodology was developed to examine technologies for residential space conditioning including active and passive solar energy, building design, and energy conservation. Assessment of each technology include measurement of cost effectiveness for the homeowner, impact on electric utility loads and finances, and societal benefits. Trade-offs between technologies and preferred public policy options were identified for the case study of Colorado Springs, Colorado. Dissert. Abstr.

N79-33558 Carnegie-Mellon Univ., Pittsburgh, Pa.
STUDIES OF AlGaAs-GaAs SOLAR CELLS Ph.D. Thesis
Ariel Flat 1979 157 p
Avail: Univ. Microfilms Order No. 7919142

The operation of AlGaAs-GaAs solar cells are described. The interpretation of minority carrier diffusion length measurements by electron beam induced measurements and the development of contact grid patterns in concentration applications are discussed. Liquid phase epitaxy processing and diffusion studied of Zn in GaAs are considered. Dissert. Abstr.

N79-33560*# General Electric Co., Schenectady, N. Y.
CONCEPTUAL DESIGN OF THERMAL ENERGY STORAGE SYSTEMS FOR NEAR TERM ELECTRIC UTILITY APPLICATIONS Final Report
E. W. Hall, W. Hausz, R. Anand, N. LaMarche, J. Oplinger, and M. Katzer Jul. 1979 359 p refs Sponsored by NASA Prepared for DOE
(Contracts DEN3-12; EC-77-A-31-1034-2; EPRI Proj. RP1082-1)
(NASA-CR-159577; GE79ET0101; DOE/NASA/0012-79/2) Avail: NTIS HC A16/MF A01 CSCL 10B

Potential concepts for near term electric utility applications were identified. The most promising ones for conceptual design were evaluated for their economic feasibility and cost benefits. The screening process resulted in selecting two coal-fired and two nuclear plants for detailed conceptual design. The coal plants utilized peaking turbines and the nuclear plants varied the feedwater extraction to change power output. It was shown that the performance and costs of even the best of these systems could not compete in near term utility applications with cycling coal plants and typical gas turbines available for peaking power. Lower electricity costs, greater flexibility of operation, and other benefits can be provided by cycling coal plants for greater than 1500 hours of peaking or by gas turbines for less than 1500 hours if oil is available and its cost does not increase significantly.
R.E.S.

N79-33561*# Wyle Labs., Inc., Huntsville, Ala.
INDOOR TEST FOR THERMAL PERFORMANCE OF THE SUNMASTER EVACUATED TUBE (LIQUID) SOLAR COLLECTOR

Sep. 1979 40 p Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-161306; WYLE-TR-531-30R) Avail: NTIS HC A03/MF A01 CSCL 10A

The test procedures used to obtain the thermal performance data for a solar collector under simulated conditions are presented. Tests included a stagnation test, a time constant test, a thermal efficiency test, an incident angle modifier test, and a hot fill test. All tests were performed at ambient conditions and the transient effect and the incident angle effect on the collector were determined. The solar collector is a water working fluid type. A.W.H.

N79-33564*# Spire Corp., Bedford, Mass.
INTEGRAL GLASS ENCAPSULATION FOR SOLAR ARRAYS Quarterly Progress Report
Jun. 1979 18 p Sponsored by NASA and DOE Prepared for JPL
(Contract JPL-954521)
(NASA-CR-162361; DOE/JPL-954521-79/2; QPR-10) Avail: NTIS HC A02/MF A01 CSCL 10A

Progress in the development of permanent, integral glass encapsulation of terrestrial solar photovoltaic arrays by electrostatic bonding is reported. Two basic types of electrostatically bonded modules were demonstrated and their reliability proven in accelerated environmental testing. Economic analyses indicate that electrostatic bonding can be a cost effective, practical, and automatable process for large-scale production of arrays with lifetimes of more than 20 years. J.M.S.

N79-33566*# ARCO Solar, Inc., Chatsworth, Calif.
VACUUM DIE CASTING OF SILICON SHEET FOR PHOTOVOLTAIC APPLICATIONS Quarterly Report, 16 Mar. - 30 Jun. 1979
30 Jun. 1979 31 p Sponsored by NASA and DOE Prepared for JPL
(Contract JPL-955325)
(NASA-CR-162360; DOE/JPL-955325-79/1; QR-1) Avail: NTIS HC A03/MF A01 CSCL 10A

The development of a vacuum die-casting process for producing silicon sheet suitable for photovoltaic cells with a terrestrial efficiency greater than 12 percent and having the potential to be scaled for large quantity production is considered. The initial approach includes: (1) obtaining mechanical design parameters by using boron nitride, which has been shown to non-wetting to silicon; (2) optimizing silicon nitride material composition and coatings by sessile drop experiments; (3) testing effectiveness of fluoride salt interfacial media with a graphite mold; and (4) testing the effect of surface finish using both boron nitride and graphite. When the material and mechanical boundary conditions are established, a finalized version of the prototype assembly will be constructed and the casting variables determined. A.R.H.

N79-33567*# Siltec Corp., Menlo Park, Calif.
LSA LARGE AREA SILICON SHEET TASK ENHANCED I.D. SLICING TECHNOLOGY FOR SILICON INGOTS Quarterly Report, Feb. - Mar. 1979
Dorothea Walters Apr. 1979 22 p refs Sponsored by NASA and DOE Prepared for JPL
(Contract JPL-955282)
(NASA-CR-162359; DOE/JPL-955282-79/1; QR-1) Avail: NTIS HC A02/MF A01 CSCL 10A

Development of inside diameter slicing technology to significantly increase the number of useable slices per inch of crystal over industry practice is discussed. The required reduction of both blade and slice thickness is to be accomplished by a combination of three key elements of slicing technology: (1) ingot rotation with minimum exposed blade area; (2) dynamic cutting edge control; and (3) the use of prefabricated insert blades. Design modifications on a slicing saw with microprocessor controls and hardware fabrication to complete this conversion were initiated. Several runs were conducted on the engineering saw incorporating the method of ingot rotation. Ingots with diameters up to six inches were sliced successfully on a production saw. K.L.

N79-33568*# Wyle Labs., Inc., Huntsville, Ala. Solar Energy Systems Div.
INDOOR TEST FOR THERMAL PERFORMANCE OF THE GE TC-100 LIQUID SOLAR COLLECTOR EIGHT- AND TEN-TUBE CONFIGURATION
Sep. 1979 47 p Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-161305; WYLE-TR-531-36R) Avail: NTIS HC A03/MF A01 CSCL 10A

The thermal performance of a liquid solar collector was tested in eight- and ten-tube configurations under simulated conditions. A time constant test and an incident angle modifier test were also conducted to determine the transient and incident angle effects on the collector. Performance loss with accessory covers is demonstrated. The gross collector area is about 17.4 ft sq without manifold and 19.1 ft sq with manifold. The collector weight is approximately 60 pounds empty and 75 pounds with manifold. K.L.

N79-33570*# Owens-Illinois, Inc., Toledo, Ohio.
OWENS-ILLINOIS SUBSYSTEM DESIGN PACKAGE FOR THE SEC-601 AIR-COOLED SOLAR COLLECTOR
Feb. 1979 19 p Prepared for DOE
(Contract NAS8-32259)
(NASA-CR-161094) Avail: NTIS HC A02/MF A01 CSCL 10A

The subsystem design of the SEC-601 solar collector was evaluated. The collector is of modular design and is approximately 12 feet three inches wide and eight feet seven inches tall. It contains 72 collector tube elements and weighs approximately 300 pounds. Included in this report are the subsystem performance specifications and the assembly and installation drawings of the solar collectors and manifold. R.E.S.

N79-33571*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
NASA TECH HOUSE: AN EARLY EVALUATION
1977 23 p refs
(NASA-TM-80751) Avail: NTIS HC A02/MF A01 CSCL 10A

An architect-engineering firm, as well as university participants, performed system studies, evaluated construction methods, performed cost effectiveness studies, and prepared construction drawings which incorporated the selected technology features into a final design. A Technology Utilization House (Tech House) based on this design was constructed at the NASA Langley Research Center in Hampton, Virginia. The Tech House is instrumented so that the performance of the design features and energy systems can be evaluated during a planned family live-in period. As such, the house is both a demonstration unit and a research laboratory. The Tech House is to demonstrate the kind of single-family residence that will probably be available within the next five years. G.Y.

N79-33572*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANNEALING OF RADIATION DAMAGE IN 0.1- AND 2-OHM-CENTIMETER SILICON SOLAR CELLS
Irving Weinberg and Clifford K. Swartz Oct. 1979 13 p refs
(NASA-TP-1559; E-9997) Avail: NTIS HC A02/MF A01 CSCL 10A

Isochronal and isothermal annealing studies were conducted on 0.1 and 2 ohm centimeter n(+)/p silicon cells after irradiation by 1 MeV electrons at fluences of 10 to the 14th power, 5 times 10 to the 14th power, and 10 to the 15th power per square centimeter. For the 0.1 ohm centimeter cells, reverse annealing was not observed in the isochronal data. However, reverse annealing was observed between approximately 200 and 325 C in the isochronal data of the 2 ohm centimeter cells. Isothermal annealing of 0.1 ohm centimeter cells at 500 C restored pre-irradiation maximum power P sub max within 20 minutes at fluence = 10 to the 14th power, in 180 minutes at fluence = 5 times 10 to the 14th power and to 92 percent of pre-irradiation P sub max in 180 minutes for fluence = 10 to the 15th power. Annealing at 450 C was found inadequate to restore 0.1 ohm centimeter cell performance within reasonable times for all fluence levels. By comparison, at 450 C, the P sub max of 2 ohm centimeter cells was restored within 45 minutes, for the two highest fluence levels, while for the lowest fluence, restoration was completed within 15 minutes. Spectral response data indicate that, for both resistivities, degradation occurs predominantly in the cells p-type base region. Author

N79-33573*# Ford Aerospace and Communications Corp., Newport Beach, Calif. Aeroneutronic Div.

PHASE 1 OF THE FIRST SOLAR SMALL POWER SYSTEM EXPERIMENT (EXPERIMENTAL SYSTEM NO. 1). VOLUME 1: TECHNICAL STUDIES FOR SOLAR POINT-FOCUSING, DISTRIBUTED COLLECTOR SYSTEM, WITH ENERGY CONVERSION AT THE COLLECTOR, CATEGORY C Final Report

T. B. Clark, ed. 5 May 1979 294 p Prepared for JPL 3 Vol.
(Contract NAS7-100; JPL-955115)
(NASA-CR-162369; U-6529-Vol-1) Avail: NTIS HC A13/MF A01 CSCL 10A

The technical and economic feasibility of a solar electric power plant for a small community is evaluated and specific system designs for development and demonstration are selected. All systems investigated are defined as point focusing, distributed receiver concepts, with energy conversion at the collector. The preferred system is comprised of multiple parabolic dish concentrators employing Stirling cycle engines for power conversion. The engine, AC generator, cavity receiver, and integral sodium pool boiler/heat transport system are combined in a single package and mounted at the focus of each concentrator. The output of each concentrator is collected by a conventional electrical distribution system which permits grid-connected or stand-alone operation, depending on the storage system selected. K.L.

N79-33574*# Ford Aerospace and Communications Corp., Newport Beach, Calif. Aeronutronic Div.

PHASE 1 OF THE FIRST SOLAR SMALL POWER SYSTEM EXPERIMENT (EXPERIMENTAL SYSTEM NO. 1). VOLUME 2: APPENDIX A - D Final Report

T. B. Clark, ed. 5 May 1979 279 p Prepared for JPL 3 Vol.
(Contract NAS7-100; JPL-955115)
(NASA-CR-162370; U-6529-Vol-2) Avail: NTIS HC A13/MF A01 CSCL 10A

Recommended conceptual designs for the baseline solar concentrator and electrical subsystems are defined, and trade offs that were evaluated to arrive at the baseline systems are presented. In addition, the developmental history of the Stirling engine is reviewed, the U4 configuration is described, and a Stirling engine heat pipe system is evaluated for solar application where sodium vapor is used as the heat source. An organic Rankine cycle engine is also evaluated for solar small power system application. K.L.

N79-33575*# Ford Aerospace and Communications Corp., Newport Beach, Calif. Aeronutronic Div.

PHASE 1 OF THE FIRST SOLAR SMALL POWER SYSTEM EXPERIMENT (EXPERIMENTAL SYSTEM NO. 1). VOLUME 3: APPENDIX E - N Final Report

T. B. Clark, ed. 5 May 1979 187 p Prepared for JPL 3 Vol.
(Contract NAS7-100; JPL-955115)
(NASA-CR-162371; U-6529-Vol-3) Avail: NTIS HC A09/MF A01 CSCL 10A

The design of a solar electric power plant for a small community is reported. Topics covered include: (1) control configurations and interface requirements for the baseline power system; (2) annual small power system output; (3) energy requirements for operation of the collectors and control building; (4) life cycle costs and reliability predictions; (5) thermal conductivities and costs of receiver insulation materials; (6) transient thermal modelling for the baseline receiver/thermal transport system under normal and inclement operating conditions; (7) high temperature use of sodium; (8) shading in a field of parabolic collectors; and (9) buffer storage materials. K.L.

N79-33576*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.

PHASE 1 OF THE FIRST SMALL POWER SYSTEM EXPERIMENT (ENGINEERING EXPERIMENT NO. 1). VOLUME 1: EXECUTIVE SUMMARY Final Report

R. J. Holl May 1979 69 p Prepared for JPL 5 Vol.
(Contract NAS7-100; JPL-955117)
(NASA-CR-162372; MDC-G7833-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 10A

The development of a modular solar thermal power system for application in the 1 to 10 MWe range is presented. The system is used in remote utility applications, small communities, rural areas, and for industrial uses. Investigations are performed on the energy storage requirements and type of energy storage, concentrator design and field optimization, energy transport, and power conversion subsystems. The system utilizes a Rankine cycle, an axial flow steam turbine for power conversion, and heat transfer sodium for collector fluid. A.W.H.

N79-33577*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.

PHASE 1 OF THE FIRST SMALL POWER SYSTEM EXPERIMENT (ENGINEERING EXPERIMENT NO. 1). VOLUME 2: SYSTEM CONCEPT SELECTION Final Report

R. J. Holl May 1979 312 p Prepared for JPL 5 Vol.
(Contract NAS7-100; JPL-955117)
(NASA-CR-162373; MDC-G7833-Vol-2) Avail: NTIS HC A14/MF A01 CSCL 10A

The development of a modular solar thermal power system for application in the 1 to 10 MWe range is presented. The system is used in remote utility applications, small communities, rural areas, and for industrial uses. Systems design and systems optimization studies are conducted which consider plant size, annual capacity factors, and startup time as variables. Investigations are performed on the energy storage requirements and type of energy storage, concentrator design and field optimization, energy transport, and power conversion subsystems. The system utilizes a Rankine cycle, an axial flow steam turbine for power conversion, and heat transfer sodium for collector fluid. A.W.H.

N79-33578*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.

PHASE 1 OF THE FIRST SMALL POWER SYSTEM EXPERIMENT (ENGINEERING EXPERIMENT NO. 1). VOLUME 3: EXPERIMENTAL SYSTEM DESCRIPTIONS Final Report

R. J. Holl May 1979 361 p Prepared for JPL 5 Vol.
(Contract NAS7-100; JPL-955117)
(NASA-CR-162374; MDC-G7833-Vol-3) Avail: NTIS HC A16/MF A01 CSCL 10A

The design and development of a modular solar thermal power system for application in the 1 to 10 MWe range is described. The system consists of five subsystems: the collector, power conversion, energy transport, energy storage, and the plant control subsystem. The collector subsystem consists of concentrator, receiver, and tower assemblies. The energy transport subsystem uses a mixture of salts with a low melting temperature to transport thermal energy. A steam generator drives a steam Rankine cycle turbine which drives an electrical generator to produce electricity. Thermal and stress analysis tests are performed on each subsystem in order to determine the operational reliability, the minimum risk of failure, and the maintenance and repair characteristics. A.W.H.

N79-33579*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.

PHASE 1 OF THE FIRST SMALL POWER SYSTEM EXPERIMENT (ENGINEERING EXPERIMENT NO. 1). VOLUME 4: COMMERCIAL SYSTEM DEFINITION Final Report

R. J. Holl May 1979 113 p Prepared for JPL 5 Vol.
(Contract NAS7-100; JPL-955117)
(NASA-CR-162375; MDC-G7833-Vol-4) Avail: NTIS HC A06/MF A01 CSCL 10A

The development and design of a modular solar thermal power system for application in the 1 to 10 MWe range is described. The system is used in remote utility applications, small communities, rural areas, and for industrial uses. The operational reliability, the minimum risk of failure, and the maintenance and repair characteristics are determined and the commercial system design is defined. A.W.H.

N79-33580*# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.

PHASE 1 OF THE FIRST SMALL POWER SYSTEM EXPERIMENT (ENGINEERING EXPERIMENT NO. 1). VOLUME 5: SUPPORTING ANALYSES AND TRADE STUDIES Final Report

R. J. Holl May 1979 210 p refs Prepared for JPL 5 Vol.
(Contracts NAS7-100; JPL-955117)
(NASA-CR-162376; MDC-G7833-Vol-5) Avail: NTIS HC A10/MF A01 CSCL 10A

The development and design of a modular solar thermal power system for application in the 1 to 10 MWe range is described. The system is used in remote utility applications, small communities, rural areas, and for industrial uses. Thermal and stress analyses are performed on the collector subsystem, energy storage subsystem, energy transport subsystem, the power conversion subsystem, and the plant control subsystem. A.W.H.

N79-33581*# United Technologies Corp., South Windsor, Conn. Power Systems Div.

ADVANCED TECHNOLOGY LIGHT WEIGHT FUEL CELL PROGRAM Final Report, 9 May 1977 - 16 Jun. 1978

R. E. Martin 16 Jun. 1978 73 p refs
(Contracts NAS3-20621; NAS3-20604)
(NASA-CR-159653; FCR-1017) Avail: NTIS HC A04/MF A01 CSCL 10A

A high performance hydrogen-oxygen alkaline fuel cell was investigated. Cell performance goals include: 0.9 volts at a current density of 1000 amperes per sq ft for 3000 hours at a cell temperature up to 300 F and reactant pressure up to 250 psia. Subscale research cells were tested in the evaluation of five anode and five cathode catalyst configurations. Fuel cell matrices were fabricated from NASA supplied polybenzimidazole (PBI) powder. A cell edge frame and PBI matrix samples were corrosion tested in 42 wt% KOH at 250 F (121 C). A total of 13,828 hours of research cell testing at 250 F was completed. In addition 494 hours of testing at temperatures up to 300 F and reactant pressures up to 250 psia with 27 hours of operation at or above 0.9 V/c at 1000 ASF was completed. A supported platinum-on-carbon catalyst configuration demonstrated stable operation at high temperature. A new cell edge frame structure showed low weight loss during corrosion testing, an indication of the material stability and long life potential. J.M.S.

N79-33582# Energy Research Corp., Danbury, Conn.

IMPROVEMENT OF PHOSPHORIC ACID FUEL CELL STACKS Interim Technical Report, Aug. 1977 - Nov. 1978

S. G. Abens, F. J. Ascenzo, B. S. Baker, G. Garretson, and M. Lambrech May 1979 71 p refs
(Contract DAAK70-77-C-0174)
(AD-A070881) Avail: NTIS HC A04/MF A01 CSCL 10/3

Phosphoric acid fuel cell components and stack assembly methods were evaluated. Electrodes with Pt loading between 0.3 and 0.9 g/sq ft. were employed. Matrix materials were phenolic (Kynol) fibers and SiC. Graphite bipolar plates with 33% phenolic resin binder were used. Stacks were tested on hydrogen and simulated reformed methanol for up to 6,800 hours. An 80-cell (2.1 kW) stack was built and delivered to MERADCOM. GRA

N79-33583# Johns-Manville Sales Corp., Denver, Colo. Research and Development Center.

PERFORMANCE EVALUATION OF SOLAR FILMS AND SCREENS Final Report, 6 Jun. - Sep. 1978

Ronald R. Bishop Apr. 1979 75 p refs
(Contract DAAK70-78-D-0002)
(AD-A070636; USAFESA-TSD-2060) Avail: NTIS HC A04/MF A01 CSCL 13/1

The use of solar films and screens to reduce energy usage is surveyed by means of Market and Literature Surveys that provide basic information on the availability, manufacture, function, cost, and solar optical properties of solar films and screens. A simplified method of determining potential energy savings is given in a step by step format that includes consideration of solar heat gain, heat loss, and daylighting aspects of the application of solar films and screens. This simplified hand calculation procedure should provide an interim means of providing the energy saving information required by the Energy Conservation Investment Program. More sophisticated methods of calculation are under development by the Lawrence Berkeley Laboratory. At this time, it appears that for most regions of the country, flexible window shading that can be adjusted during the day or from season to season offer the most potential to saving energy. GRA

N79-33584# DCS Corp., Arlington, Va.

STATUS OF THERMAL IMAGING TECHNOLOGY AS APPLIED TO CONSERVATION

D. L. Shumaker, F. J. Snow, R. C. Barthle, T. L. Culp, and J. T. Wood Dec. 1978 115 p
(Contract EM-78-C-01-4228)
(HCP/M4228-01) Avail: NTIS HC A06/MF A01

The application of both imaging and non-imaging infrared equipment in the performance of thermal surveys is discussed, and a concise up-to-date status of the commercial availability and performance of infrared surveys for the detection of heat loss/heat gain in buildings is provided. DOE

N79-33586# TRW Energy Systems, Redondo Beach, Calif.

ANALYSIS OF BATTERY STORAGE FOR COMMERCIAL BUILDINGS, PHASE 1 Final Report

Sep. 1978 107 p refs
(Contract EC-77-C-02-4556)
(COO-4556-2) Avail: NTIS HC A06/MF A01

The application of battery storage to load leveling by the utility user represents a new concept in energy management. The possibility of combining an energy management computer/control system with a lead acid/power processor system was studied, and the feasibility of demonstrating power management at a government facility was explored. Candidate sites in the Washington, D. C. metropolitan area were evaluated by analyzing demand curves for electricity. One site, the Department of the Treasury's Bureau of Printing and Engraving is recommended as the best of the sites evaluated. Preliminary specifications are supplied. Facility modification and system layout are presented, giving alternate placements for the batteries. Floor loading and system safety are two critical design parameters. DOE

N79-33587# Mineral Economics Consultants, Inc., Swarthmore, Pa.

ENERGY REQUIREMENTS OF THE US PULP AND PAPER INDUSTRY

C. M. Cosman Jan. 1979 119 p refs
(Contract W-31-109-eng-38)
(ANL/EES/TM-42) Avail: NTIS HC A06/MF A01

The energy requirements of the U.S. pulp and paper industry were studied in an attempt to establish order of magnitude data. In view of the great divergency of products, processes, plant designs that reflect on specific energy consumption rates, it was not possible to provide much detail. The study is restricted to pointing out how public policy can help to channel the industry's efforts into less energy-intensive practices. Although recommendations are given, no specific process modifications were advised. R.E.S.

N79-33588# Department of Energy, Denver, Colo.

REGIONAL PROFILE, ENERGY-IMPACTED COMMUNITIES: REGIONAL 8

Mar. 1979 434 p
(DOE/TIC-10001) Avail: NTIS HC A19/MF A01

Data on population, administration, finance, housing, health and safety, human services, education, and water and sewage for 325 energy-impacted communities are presented. A review of current and potential energy developments in the region shows over 900 energy resource impacts listed for the 325 impacted communities. Coal development represents over one third of the developments listed. Energy conversion initiatives represent another high incidence of energy resource impact, with uranium development following closely. These projections indicate continued development of regional energy resources to serve national energy requirements. The 325 impacted communities as reported: Colorado (46), Montana (73), North Dakota (62), South Dakota (21), Utah (80), and Wyoming (43) illustrates that no area of the region will escape the impacts of energy development. DOE

N79-33589# Argonne National Lab., Ill. Energy and Environmental Systems Div.

TRANSPORTATION ENERGY CONSERVATION (TEC) ENVIRONMENTAL DEVELOPMENT PLAN

M. J. Bernard, III 1978 22 p Presented at DOE/TEC Div. Highway Vehicle Systems Contractors' Coordinating Meeting, Troy, Mich., 9-12 May 1978
(Contract W-31-109-eng-38)
(ANL/EES/CP-11; Conf-7805102-1) Avail: NTIS HC A02/MF A01

The goal of the National Environmental Policy Act of 1969 is shown. The act requires the preparation of Environmental Impact Statements (EIS) for major Federal actions significantly affecting the quality of the human environment. The process, as implemented by DOE, to produce an EIS for a technology program or demonstration is expected to have in chronological order, (1) an environmental development plan with annual updates, (2) an environmental assessment (EA), a negative determination (ND) or a draft environmental impact statement (DEIS), and (3) a final environmental impact statement (EIS). The EA details the expected environmental impacts thus allowing the decision between preparing ND or a DEIS. Public reviews of the DEIS are held for revisions before the EIS becomes finalized. DOE

N79-33591# Little (Arthur D.), Inc., Cambridge, Mass.

IMPACT OF NATIONAL ENERGY AND ENVIRONMENTAL POLICIES ON INDUSTRY LOCATION DYNAMICS: A METHODOLOGICAL REVIEW

Feb. 1979 222 p refs
(Contract EJ-78-C-01-2833)
(DOE/TIC-10129) Avail: NTIS HC A10/MF A01

The findings are presented of a study performed to assess the pertinent theoretical and empirical literature on industry location dynamics, with emphasis on energy-intensive industries in order to help guide DOE's subsequent research activities in analyzing the impact of national energy and environmental policies on industrial location and regional growth patterns. The nine chapters are entitled: Summary; Identification of Energy-Intensive Industries for Analytical Emphasis; National Energy Policies and Their Implications for the Dynamics of Industrial Location; Environmental Regulations and Their Implications for the Dynamics of Industrial Location for Energy-Intensive Industries; Industrial Location Theory: An Overview; Empirical Analyses of Industrial Location: Partial Equilibrium Location; Empirical Analyses of the Dynamics of Industrial Location: General Equilibrium Approaches; Demonstration 1: A Partial Equilibrium Approach to an Analysis of the Impact of Energy Policies on the Dynamics of Industrial Location; and Demonstration 2: Experimental Illustrative Application of the Partial Equilibrium Approach. DOE

N79-33592# Swedish Council for Building Research, Stockholm.

STORAGE OF HEAT: A SURVEY OF EFFORTS AND POSSIBILITIES

Gunnar Wettermark, Bo Carlsson, and Hans Stymne 1979 162 p refs
(PB-295936/9; ISBN-91-540-2955-4) Avail: NTIS HC A08/MF A01 CSCL 13B

Various methods are described for storing heat. Topic areas discussed include the following: the role of heat storage in different energy systems; heat storage with passive and active solar heat systems; sensible heat; latent heat - phase change; thermochemical reactions; the American program for storage of heat. GRA

N79-33593# New Mexico Energy Inst., Las Cruces.

DEVELOPMENT OF RETROFIT ENERGY CONSERVATION AND SOLAR HEATING SYSTEMS, PHASE 1 Final Report

W. Reed Edgel Sep. 1978 138 p refs Sponsored in part by New Mexico Energy and Minerals Dept.
(PB-295847/8; NMEI-20) Avail: NTIS HC A07/MF A01 CSCL 13A

The type and frequency of use of various construction systems and HVAC systems in existing buildings in New Mexico was examined. Several of the most frequently occurring combinations of buildings and HVAC systems were selected, and the materials, components, and subsystems which could be used in retrofit energy conservation and solar heating applications were identified. When existing thermal envelope assessment and retrofit solar heating system design were complete, performance and cost comparisons with the unimproved buildings were made to determine cost effectiveness and energy savings. GRA

N79-33594# National Technical Information Service, Springfield, Va.

FUEL CELLS, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1977 - Jun. 1979

Diane M. Cavagnaro Jul. 1979 244 p Supersedes NTIS/PS-78/0633, NTIS/PS-77/0544, NTIS/PS-76/0507, NTIS/PS-75/479, and COM-74-11533
(NTIS/PS-79/0717/3; NTIS/PS-78/0633; NTIS/PS-77/0544; NTIS/PS-76/0507; NTIS/PS-75/479; COM-74-11533) Avail: NTIS HC $28.00/MF $28.00 CSCL 10B

Fuel cell applications, components, fabrication, design, catalysts, and chemistry are covered. The bibliography includes different types of fuel cells, such as hydrogen oxygen cells, hydrocarbon air cells, and biochemical cells. This updated bibliography contains 235 abstracts 97 of which are new entries to the previous edition. GRA

N79-33595# National Technical Information Service, Springfield, Va.

HYDROCARBON FUEL CELLS. CITATIONS FROM THE AMERICAN PETROLEUM INSTITUTE DATA BASE Report, 1967 - Apr. 1979

Diane M. Cavagnaro Jul. 1979 135 p Supersedes NTIS/PS-78/0651
(NTIS/PS-79/0718/1; NTIS/PS-78/0651) Avail: NTIS HC $28.00/MF $28.00 CSCL 10B

This bibliography cites worldwide research on hydrocarbon fuel cells. The citations cover applications, design, performance, fabrication, catalysts, and electrochemistry. This updated bibliography contains 128 abstracts, 3 of which are new entries to the previous edition. GRA

N79-33596# National Bureau of Standards, Washington, D. C. Building Thermal and Service Systems Div.

TESTING OF PEBBLE-BED AND PHASE-CHANGE THERMAL ENERGY STORAGE DEVICES ACCORDING TO ASHRAE STANDARD 94-77 Final Report

Dennis E. Jones and James E. Hill May 1979 45 p refs Sponsored in part by DOE
(PB-295898/1; NBSIR-79-1737) Avail: NTIS HC A03/MF A01 CSCL 10C

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) recently adopted ASHRAE Standard 94-77 Methods of Testing Thermal Storage Devices Based on Thermal Performance. Experiments were completed at the National Bureau of Standards in which a 7 cu m (250 cu ft) pebble-bed and a similarly-sized 164 MJ (250,000 Btu) phase-change unit using sodium sulfate decahydrate, both using air as the transfer fluid, were tested in accordance with this Standard. A description of the test procedure, test apparatus, and detailed test results is given. Some problems were encountered in using the Standard for these kinds of thermal energy storage devices, and modifications to the Standard are recommended based on these experiments. GRA

N79-33597# National Bureau of Standards, Washington, D. C. Electron Devices Div.

STANDARDS FOR PHOTOVOLTAIC ENERGY CONVERSION SYSTEMS Final Report, Feb. - Sep. 1978

Harry A. Schaft May 1979 19 p refs Prepared for Solar Energy Research Institute
(Contract EG-77-C-01-4042)
(PB-296274/4; NBSIR-79-1743) Avail: NTIS HC A02/MF A01 CSCL 10B

The results are presented of a search for existing domestic standards and related documents for possible application in the development of a standards base for photovoltaic energy conversion systems. The search resulted in locating about 150 test methods, recommended practices, standards, solar-thermal performance criteria, and other standards-related documents. They are listed by topic areas in the appendix. The listing was prepared to assist those involved in developing performance criteria for photovoltaic systems and in identifying methods of test system performance against these criteria. It is clear from the results of the search that few standards are directly applicable to terrestrial solar photovoltaic systems and that much standard development is required to support the commercialization of such systems.
GRA

N79-33598# United Nations Industrial Development Organization, Vienna (Austria).
TECHNOLOGY FOR SOLAR ENERGY UTILIZATION
Hans Kleinrath, U. G. Bhide, and Jean Paul Durand 1978 160 p Sponsored in part by Agency for International Development
(PB-296572/1) Avail: NTIS HC A08/MF A01 CSCL 10A

Work being done in various countries and institutions dealing with: (1) the conversion of solar energy into mechanical or electrical energy, (2) the design of solar collectors, (3) the utilization of solar energy in heating, cooling, distillation, drying and cooking, and (4) the transfer of technology is presented. GRA

N79-33599# State Univ. of New York at Albany. Atmospheric Sciences Research Center.
NEW YORK STATE SOLAR ENERGY ATLAS
Jul. 1978 182 p Sponsored by N.Y. State Energy R and D Authority
(PB-295453/5; NYSERDA-78/5) Avail: NTIS HC A09/MF A01 CSCL 10A

Total horizontal solar radiation measurements through 1978 for New York State are presented in hourly, daily, and monthly formats. Tables, maps, and charts describing this total irradiation at 15 New York State locations compose the bulk of the atlas. An explanatory text serves as a guide to the material, and a section of climatological tables for temperature, heating and cooling degree days, and cloud cover is included. For many solar energy applications, solar irradiation is better represented in terms of its direct and diffuse components. The results of five months of direct and diffuse solar irradiation measurements at three New York State sites is presented. GRA

N79-33600# New Mexico Energy Inst., Las Cruces.
DIELECTRIC DEVELOPMENT FOR GaAs SOLAR CELLS Technical Completion Report
W. W. Granneman (N. Mex. Univ., Albuquerque) and Chien-Sheng Su (N. Mex. Univ., Albuquerque) Jan. 1979 27 p Sponsored in part by New Mexico Energy and Minerals Dept.
(PB-295837/9; NMEI-21) Avail: NTIS HC A03/MF A01 CSCL 10B

Gallium phosphate passivation on gallium arsenide was studied for use in gallium arsenide solar cells. The gallium phosphate has good antireflective characteristics when applied to gallium arsenide. Metal-gallium phosphate-gallium arsenide capacitors were constructed so that capacitance versus voltage measurement could be made. Interface state densities were determined from the c-v curves. The fast interface state densities were excellent and the corresponding surface recombination velocities should be low. Using this passivation layer should yield a major improvement in gallium arsenide solar cell efficiency.
GRA

N79-33601# International Science and Technology Inst., Inc., Washington, D. C.
DEVELOPING SMALL HYDROELECTRIC DAM POTENTIAL
Mary Lyon-Allen Apr. 1979 19 p Sponsored by Community Services Admin.
(PB-296238/9; CSA/LN-2391; CSA/Pam-6143-12) Avail: NTIS HC A02/MF A01 CSCL 10B

This is a report to inform local governments, legislators, Community Action Agencies, Community Development Corporations, and other community organizations of the importance of hydropower as a method to alleviate the impact of high energy prices on low-income persons. The potential of small hydro development is discussed as well as suggestions for communities to begin the process of feasibility assessment. GRA

N79-33602# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
ENERGY PROGRAMS AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY Quarterly Report, Jan. - Mar. 1979
Apr. 1979 29 p ref Sponsored in part by DOE
(PB-296217/3; APL/JHU-EQR-79-1) Avail: NTIS HC A03/MF A01 CSCL 10A

The report is devided into three sections. The first, Geothermal Energy Development Planning, contains reports on the progress of those geothermal related tasks where effort was concentrated during the quarter. The tasks include an ongoing Atlantic Coastal Plain Geothermal Energy Market Survey, the Delmarva Geothermal Development Prospectus, Evaluation of Federal Strategies for Hydrothermal Developments, and comments on limited tasks performed in support of the major tasks. The second section, Operational Research, Hydroelectric Power Development, includes reports on a method for quantifying institutional constraints and on institutional and regulatory restraints in New Jersey. The third section, Energy Conversion and Storage Techniques, contains a report on flywheel development. GRA

N79-33603# Community Services Administration, Washington, D. C.
SOLAR ENERGY POLICY
Jan. 1979 57 p refs
(PB-296193/6; CSA/NF-03; CSA/Pam-6143-10) Avail: NTIS HC A04/MF A01 CSCL 13A

The energy-related problems of the poor and near-poor are described. Including their lack of funds with which to pay sharply increasing utility bills, the decline in health and deterioration in living conditions when increasing numbers of families have to choose between food and energy, and in the cases of the elderly and the handicapped, a challenge to survival which they face. The Community Service Administration's energy-related policy goals are detailed. GRA

N79-33605# National Technical Information Service, Springfield, Va.
ENERGY SUPPLY AND DEMAND MODELING. A BIBLIOGRAPHY WITH ABSTRACTS Report, 1964 - May 1979
Audrey S. Hundemann Jul. 1979 151 p Supersedes NTIS/PS-78/0599
(NTIS/PS-79/0665; NTIS/PS-78/0599) Avail: NTIS HC $28.00/MF $28.00 CSCL 10A

The use of energy models to estimate the supply and demand of electricity, oil, natural gas, coal, and petroleum products on national, regional, and state levels is discussed. The models cover residential, commercial, and industrial supply and demand, the impact of economic conditions on demand, energy use alternatives, and optimal allocation of regionally produced energy resources. Abstracts pertaining to design and development of energy models are included. GRA

N79-33607# Educational Facilities Labs., Inc., New York.
A REPORT ON THE DEVELOPMENT OF A MODEL ENERGY MANAGEMENT PROGRAM FOR NEW YORK STATE SCHOOLS, PHASE 2
Jul. 1978 144 p
(PB-295452/7; NYSERDA-78/7) Avail: NTIS HC A07/MF A01 CSCL 13A

Topic areas covered include: implementation of energy management programs; goals and elements of the plan; administrative organization; suggested activities and organizational strategies; incentive considerations; program cost estimates.
GRA

N79-33608# National Technical Information Service, Springfield, Va.

STATE-OF-THE-ART REVIEWS AND BIBLIOGRAPHIES ON ENERGY. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, 1964 - May 1979
Audrey S. Hundeman Jul. 1979 316 p Supersedes NTIS/PS-78/0586 and NTIS/PS-77/0520
(NTIS/PS-79/0639/9; NTIS/PS-78/0586; NTIS/PS-77/0520) Avail: NTIS HC $28.00/MF $28.00 CSCL 10A

Citations to bibliographies, state-of-the-art reviews, and literature surveys on various aspects of fossil fuels, wind, solar energy, hydrogen, geothermal energy, nuclear energy, and batteries are presented. A few citations pertain to electric power. (This updated bibliography contains 310 abstracts, 96 of which are new entries to the previous edition.) GRA

N79-33609 California Univ., Los Angeles.
ENVIRONMENTAL, SOCIOECONOMIC, AND CONSUMER PROTECTION ASPECTS OF SELECTED DECENTRALIZED SOLAR ENERGY APPLICATIONS Ph.D. Thesis
Steven Robert Sim 1979 202 p
Avail: Univ. Microfilms Order No. 7921455

The solar market was studied to determine if a meaningful amount of consumer problems with solar power had arisen. Extensive literature searches, widespread public comment and reaction, field visits to operating solar units, and a national workshop were utilized. The conclusions reached indicated that at least 20 percent of solar consumers experienced significant problems especially in installation of the units. Potential for future electricity generation through the conversion of solar energy was determined. The environmental and socioeconomic aspects of decentralized photovoltaic, wind, and solar thermal technologies were discussed. The conclusions indicated that environmental impacts of such technologies are relatively minor and those which existed are of the nature of public health considerations. Dissert. Abstr.

N79-33611*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MEASUREMENT TECHNIQUES FOR TRACE METALS IN COAL-PLANT EFFLUENTS: A BRIEF REVIEW
Jag J. Singh Washington Oct. 1979 34 p refs
(NASA-RP-1047; L-13164) Avail: NTIS HC A03/MF A01 CSCL 13B

The strong features and limitations of techniques for determining trace elements in aerosols omitted from coal plants are discussed. Techniques reviewed include atomic absorption spectroscopy, charged particle scattering and activation, instrumental neutron activation analysis, gas/liquid chromatography, gas chromatographic/mass spectrometric methods, X-ray fluorescence, and charged-particle-induced X-ray emission. The latter two methods are emphasized. They provide simultaneous, sensitive multielement analyses and lend themselves readily to depth profiling. It is recommended that whenever feasible, two or more complementary techniques should be used for analyzing environmental samples. K.L.

N79-33614# California Univ., Berkeley. Lawrence Berkeley Lab.
AQUATIC MICROCOSMS FOR ASSESSMENT OF EFFLUENT EFFECTS Final Report
John Harte, D. Levy, E. Lapan, A. Jassby, M. Dudzik, and J. Rees Nov. 1978 98 p refs
(Contract W-7405-eng-48; EPRI Proj. 939-1)
(EPRI-EA-936) Avail: NTIS HC A05/MF A01

Laboratory freshwater lake microcosms were studied with respect to their usefulness in providing a tool for environmental impact assessment. Three four month studies were carried out, each with a different pollutant expected to be found in significant concentration in the aqueous effluent from coal gasification operations. These studies have led to: (1) identification of those biological and chemical parameters most useful for evaluating the responses of microcosms to chemical pollutants; (2) characterization of the difficulties in obtaining replicate microcosms that approximately simulate natural systems; (3) a test of the usefulness of microcosms in evaluating hypothetical stability indicators; (4) evaluation of the relative usefulness of the bloom and the quiescent stages of microcosm development for impact assessment studies; and (5) a specific research plan for determining optimum procedures for microcosm design, initiation, and operation. DOE

N79-33639# SRI International Corp., Menlo Park, Calif.
MODELING OF STATIONARY AIR POLLUTION SOURCES IN THE CENTRAL AND WESTERN KERN COUNTY OIL FIELDS. TASK REPORT. VOLUME 1: TEXT
Patricia B. Simmon, F. L. Ludwig, and Kenneth C. Nitz Jan. 1979 117 p refs
(Contract EPA-68-01-4137)
(PB-294812/3; SRI-5258-7-Vol-1) Avail: NTIS HC A06/MF A01 CSCL 13B

Air quality was assessed in two locations of Kern County: the oil fields in the central portion of the county, near Bakersfield, and the oil fields well to the west of Bakersfield, lying on a roughly NW to SE line about 40 miles in length, between the towns of McKittrick and Maricopa. Data describing the meteorological conditions, the measured SO2 levels, and inventories of both generator and nongenerator sources were collected and reduced. A limited verification of data detailing generator source characteristics, particularly location was performed. GRA

N79-33648# National Oceanic and Atmospheric Administration, Boulder, Colo. Environmental Research Labs.
PROCEEDINGS OF A WORKSHOP ON SCIENTIFIC PROBLEMS RELATING TO OCEAN POLLUTION
Edward D. Golberg, ed. (Scripps Inst. of Oceanog., La Jolla, Calif.) Mar. 1979 229 p refs Conf. held at Estes Park, Colo., 10-14 Jul. 1978
(PB-297467/3; NOAA-79061309) Avail: NTIS HC A11/MF A01 CSCL 13B

Ocean pollution research, development, and monitoring needs are discussed. Specific topics covered include synthetic organic compounds, chlorination products, dredging and disposal of its large volume waste, artificial radionuclides, microorganisms, trace metals, biostimulants, fossil fuel compounds, and biological effects. GRA

N79-33654# KVB, Inc., Minneapolis, Minn.
FIELD TESTS OF INDUSTRIAL STOKER COAL FIRED BOILERS FOR EMISSION CONTROL AND EFFICIENCY IMPROVEMENT, SITE B Final Report, Dec. 1977 - Mar. 1978
J. E. Gabrielson, P. L. Langsjoen, and T. C. Kosvic Apr. 1979 113 p
(Contract EF-77-C-01-2609)
(PB-295535/9) Avail: NTIS HC A06/MF A01 CSCL 13B

The results of field measurements made on a 200,000 lb/hr spreader stoker boiler were given. The effect of various parameters on boiler emissions and efficiency was studied. Parameters studied included overfire air, flyash reinjection, excess air, boiler load, and fuel properties. Measurements included gaseous emissions, particulate emissions, particle size distribution of the flyash, and combustible content of the ash. Gaseous emissions measured were O2, CO2, CO, NO,SO2, and SO3 in the flue gas. Sample locations included the boiler outlet, multiclone cutlet, and electrostatic precipitator outlet. In addition to test results and observations, the facility tested coals fired, test equipment, and procedures are presented. GRA

N79-33664 Colorado School of Mines, Golden.
MODAL ANALYSIS OF SEISMIC GUIDED WAVES IN COAL SEAMS Ph.D. Thesis
Steven Douglas Peterson 1978 127 p
Avail: Univ. Microfilms Order No. 7918309

The propagation and dispersion of seismic waves within coal are analyzed to determine the properties of coal and the character of its seams using a modal wave theory. Dissert. Abstr.

N79-33699# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
UNCERTAINTIES ASSOCIATED WITH GLOBAL EFFECTS OF ATMOSPHERIC CARBON DIOXIDE
R. M. Rotty Mar. 1979 29 p refs

(Contract EY-76-C-05-0033)
(ORAU/IEA-79-6(0)) Avail: NTIS HC A03/MF A01

Although the evidence is quite clear that the increase in atmospheric CO2 is at least to a large degree a result of fossil fuel burning, and it is equally clear that this increase will result in some change in the global climate, there are quantitative uncertainties that require additional understanding before full assessments can be made. There are also quantitative uncertainties regarding the natural carbon cycle, the behavior of the various reservoirs when perturbed by man, the terrestrial biosphere, and the rate at which the oceans can assimilate and store carbon. There are uncertainties in regard to the climate change that can result from increased atmospheric CO2. Progress in modeling the atmosphere must continue to narrow these uncertainties before the impacts of climate change on man can be adequately determined. The future demands for fossil fuels are uncertain. The growth of the developing world will be closely linked to fossil energy for the next five to eight decades. Only the observed increase in the atmospheric concentration and the present (and recent past) rate of production of CO2 from fossil fuels provide data without uncertainties. DOE

N79-33881*# Boeing Computer Services, Inc., Seattle, Wash. Energy Technology Applications Div.
AN EXPANDED SYSTEM SIMULATION MODEL FOR SOLAR ENERGY STORAGE (TECHNICAL REPORT), VOLUME 1 Final Report
A. W. Warren Aug. 1979 107 p refs 2 Vol.
(Contracts DEN3-42; EX-76-A-31-1026)
(NASA-CR-159601; DOE/NASA/0042-79/1-Vol-1;
BCS-40159-1) Avail: NTIS HC A06/MF A01 CSCL 09B

The simulation model for wind energy storage (SIMWEST) program now includes wind and/or photovoltaic systems utilizing any combination of five types of storage (pumped hydro, battery, thermal, flywheel and pneumatic) and is available for the UNIVAC 1100 series and the CDC 6000 series computers. The level of detail is consistent with a role of evaluating the economic feasibility as well as the general performance of wind and/or photovoltaic energy systems. The software package consists of two basic programs and a library of system, environmental, and load components. The first program is a precompiler which generates computer models (in FORTRAN) of complex wind and/or photovoltaic source/storage/application systems, from user specifications using the respective library components. The second program provides the techno-economic system analysis with the respective I/O, the integration of system dynamics, and the iteration for conveyance of variables. A.R.H.

N79-33882*# Boeing Computer Services, Inc., Seattle, Wash. Energy Technology Applications Div.
AN EXPANDED SYSTEM SIMULATION MODEL FOR SOLAR ENERGY STORAGE (UNIVAC OPERATION MANUAL REVISIONS), VOLUME 2 Final Report
A. W. Warren Aug. 1979 198 p refs 2 Vol.
(Contracts DEN3-42; EX-76-A-31-1026)
(NASA-CR-159602; DOE/NASA/0042-79/2-Vol-2;
BCS-40180-2-Rev) Avail: NTIS HC A09/MF A01 CSCL 09B

Additions or revisions of components of the SIMWEST program are provided for insertion into the manual used with the UNIVAC 1100 series computer. A.R.H.

N79-33883*# Boeing Computer Services, Inc., Seattle, Wash. Energy Technology Applications Div.
SIMWEST: A SIMULATION MODEL FOR WIND AND PHOTOVOLTAIC ENERGY STORAGE SYSTEMS (CDC USER'S MANUAL), VOLUME 1 Final Report
A. W. Warren and A. W. Esinger Aug. 1979 486 p refs 2 Vol.
(Contracts DEN3-42; EX-76-A-31-1026)
(NASA-CR-159607; DOE/NASA/0042-79/3-Vol-1;
BCS-40262-1) Avail: NTIS HC A21/MF A01 CSCL 09B

Procedures are given for using the SIMWEST program on CDC 6000 series computers. This expanded software package includes wind and/or photovoltaic systems utilizing any combination of five types of storage (pumped hydro, battery, thermal, flywheel, and pneumatic). A.R.H.

N79-33884*# Boeing Computer Services, Inc., Seattle, Wash. Energy Technology Applications Div.
SIMWEST: A SIMULATION MODEL FOR WIND AND PHOTOVOLTAIC ENERGY STORAGE SYSTEMS (CDC PROGRAM DESCRIPTIONS), VOLUME 2 Final Report
A. W. Warren, R. W. Edsinger, and J. D. Burroughs Aug. 1979 247 p 2 Vol.
(Contracts DEN3-42; EX-76-A-31-1026)
(NASA-CR-159608; DOE/NASA/0042-79/4-Vol-2;
BCS-40262-2) Avail: NTIS HC A11/MF A01 CSCL 09B

The computer programs for the CDC version of SIMWEST (1979 revision) are described. Macro flow charts and source code listings for each major program entity are presented. A.R.H.

N79-34006# General Accounting Office, Washington, D. C. Div. of Energy and Minerals.
FEDERAL FACILITIES FOR STORING SPENT NUCLEAR FUEL; ARE THEY NEEDED
27 Jun. 1979 42 p
(PB-297071/3; EMD-79-82) Avail: NTIS HC A03/MF A01 CSCL 18G

The question of whether commercial spent fuel is processed and how and where spent fuel is permanently stored is considered. GRA

N79-34044# Los Alamos Scientific Lab., N. Mex.
MHD DECELERATION OF FUSION REACTION PRODUCTS
S. Chow and I. O. Bohachevsky Apr. 1979 20 p refs
(Contract W-7405-eng-36)
(LA-7778-MS) Avail: NTIS HC A02/MF A01

The feasibility of magnetohydrodynamic (MHD) deceleration of fuel pellet debris ions exiting from an inertial confinement fusion (ICF) reactor cavity was investigated using one-dimensional flow equations. For engineering reasons, induction-type devices are emphasized; their performance characteristics are similar to those of electrode-type decelerators. Results presented indicate that MHD decelerators can be designed within conventional magnet technology to not only decelerate the high-energy fusion pellet debris ions, but also to produce some net electric power in the process. DOE

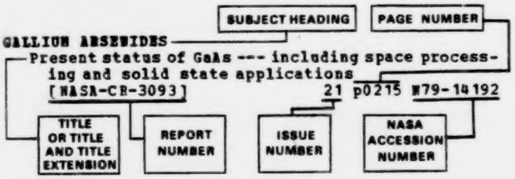
N79-34074*# ESC Energy Corp., Daly City, Calif.
DISTRIBUTION AUTOMATION AND CONTROL SUPPORT; ANALYSIS AND INTERPRETATION OF DAC WORKING GROUP RESULTS FOR USE IN PROJECT PLANNING
Peter Klock and Dave Evans Apr. 1979 16 p
(Contract JPL-955231)
(NASA-CR-162331) Avail: NTIS HC A02/MF A01 CSCL 10B

The Executive Summary and Proceedings of the Working Group Meeting was analyzed to identify specific projects appropriate for Distribution Automation and Control DAC RD&D. Specific projects that should be undertaken in the DAC RD&D program were recommended. The projects are presented under broad categories of work selected based on ESC's interpretation of the results of the Working Group Meeting. Some of the projects are noted as utility industry projects. The ESC recommendations regarding program management are presented. Utility versus Government management responsibilities are noted. M.M.M.

SUBJECT INDEX

ENERGY/*A Continuing Bibliography (Issue 24)* JANUARY 1980

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title or title and title extension provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The issue page and accession numbers are located beneath and to the right of the title e.g., 21 p0215 N79-14192. Under any subject heading the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABRASION RESISTANCE
Erosion testing of potential valve materials for coal gasification systems
[PB-293308/3] 24 p0720 N79-28592
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276

ABSORBENTS
The potential of zeolite molecular sieves as hydrogen storage media
23 p0415 A79-34123

ABSORBERS (MATERIALS)
Hydrogen absorption in rare earth intermetallic compounds
22 p0249 A79-21693
Solar energy application of natural zeolites --- solid absorber-water vapor working fluid system for sorption-refrigeration cycles
22 p0286 A79-27213
Chemical vapor deposition of spectrally selective surfaces for high-temperature photothermal conversion
23 p0445 A79-37155
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques
23 p0445 A79-37156
Relationship of optical degradation to surface morphology changes in solar absorbers
23 p0446 A79-37158
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

ABSORPTANCE
Effect of surface curvature on measurement of the absorptance properties of solar coatings
21 p0042 A79-11879
The alpha factor - Controlling solar cell absorptance
23 p0502 A79-40935
Thermal emissivity of selective surfaces - New lower limits
24 p0648 A79-49207

ABSORPTION
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
Kinetics of hydrogen absorption and desorption --- for energy storage
22 p0248 A79-21687

ABSORPTIVITY
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874
Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407
Temperature dependence of the optical properties of silicon
23 p0437 A79-35820
A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors
23 p0530 A79-42895
Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780

ABSTRACTS
Energy information data base. Guide to abstracting and indexing
[TID-4583-R1] 21 p0184 N79-11488
Hydrogen energy. A bibliography with abstracts
[NASA-CR-157962] 23 p0540 N79-22613
Solar thermal power generation. A bibliography with abstracts
[NASA-CR-158004] 23 p0540 N79-22614
Solar thermal components: A bibliography with abstracts
[NASA-CR-158699] 23 p0570 N79-25479
Forecasts of energy technology. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0337/0] 23 p0575 N79-25531

AC GENERATORS
Status of free-piston Stirling engine/linear alternator power conversion system development
21 p0025 A79-10212
On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742
Air Force applications of lightweight superconducting machinery --- in airborne power sources
22 p0290 A79-27666
Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters --- for gallium arsenide solar photovoltaic arrays
23 p0416 A79-34140
Transient analysis of the rectified superconducting alternator
23 p0462 A79-38529
A parameter sensitivity analysis of the rectified superconducting alternator model
24 p0646 A79-48654
Commercial synchronous alternating-current generators
23 p0580 N79-26482
Demonstration of a free piston Stirling engine driven linear alternator system
[COO-2764-002] 24 p0790 N79-32713

ACCELERATED LIFE TESTS
Accelerated tests for coatings --- for solar concentrators
22 p0296 A79-28668
Characteristics of GRP for applications in solar energy collectors
23 p0385 A79-33218
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Exposure test results for reflective materials --- used in solar concentrators
23 p0430 A79-35068

Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383

Procedure for developing experimental designs for accelerated tests for service-life prediction --- for solar cell modules
23 p0496 A79-40886

Accelerated tests of coatings --- for solar concentrators
24 p0627 A79-46906

Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706

Accelerated test program
22 p0370 N79-21577

ACCEPTABILITY

Comparison of collector test methods
[ASSA-SI-B24/77] 23 p0574 N79-25526

ACCUMULATORS

Problems in the development of high-service-life capacitative accumulators --- for fusion reactors
22 p0243 A79-21249

ACIDITY

Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells
21 p0040 A79-11824

ACIDS

O2 reduction kinetics in concentrated acids --- in fuel cells
21 p0038 A79-11809

A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558

Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689

ACOUSTIC EMISSION

Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization
21 p0076 A79-14744

Acoustic emissions during hydride formation
22 p0249 A79-21691

ACOUSTIC MEASUREMENTS

Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974

ACOUSTICS

European Scientific notes, volume 32, number 4
[AD-A065399] 23 p0552 N79-23886

ACOUSTO-OPTICS

Photoacoustic determination of photovoltaic energy conversion efficiency
21 p0154 A79-18503

ACRYLIC RESINS

Cast acrylic Fresnel lenses for solar energy concentration
23 p0432 A79-35076

Assessment of potential increased oil production by polymer-waterflood in northern and southern mid-continent oil fields
[BETC-0026-4] 24 p0735 N79-29579

ACTINIDE SERIES COMPOUNDS

Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713

ACTIVATED CARBON

Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions
22 p0245 A79-21483

Treatment of petroleum refinery, petrochemical and combined industrial-municipal wastewaters with activated carbon: Literature review
[PB-288211/6] 22 p0350 N79-18497

ACTIVATED SLUDGE

There is a lot of energy in digester gas . . . use it --- in municipal waste water plants
21 p0035 A79-11448

ADAPTIVE CONTROL

Development of gas turbine performance seeking logic
[ASME PAPER 78-GT-13] 21 p0031 A79-10257

Conference on Decision and Control, and Symposium on Adaptive Processes, 16th, and Special Symposium on Fuzzy Set Theory and Applications, New Orleans, La., December 7-9, 1977, Proceedings. Volumes 1 & 2
21 p0081 A79-14957

Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

ADAPTIVE OPTICS

Non-adaptive optics for solar thermal electric power
21 p0112 A79-16733

Historical review of adaptive optics technology
21 p0114 A79-17171

ADDITIVES

Recent advances in electrocatalysis and their implications for fuel cells
21 p0038 A79-11807

Transparent conducting coatings for solar cells
21 p0124 A79-17350

Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777

Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779

High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197

Optimization of exponential alloying impurity distribution in semiconductor photoconverter base
24 p0636 A79-46759

Denaturants for ethanol/gasoline blends
[HCP/M2098-01] 21 p0180 N79-11237

On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

ADIABATIC CONDITIONS

The economics of upgrading geothermal steam by adiabatic compression
23 p0409 A79-34081

ADSORPTION

Electrocatalysis, charge-transfer and the states of H adsorption in the hydrogen evolution reaction
21 p0038 A79-11801

Oxygen adsorption on stainless steel --- in tokamak reactors
23 p0445 A79-36965

Treatment of petroleum refinery, petrochemical and combined industrial-municipal wastewaters with activated carbon: Literature review
[PB-288211/6] 22 p0350 N79-18497

AERIAL PHOTOGRAPHY

The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta
23 p0438 A79-36505

Estimating heat loss in residential structures using aerial infrared imagery
23 p0522 A79-41125

AERODYNAMIC CHARACTERISTICS

A low cost blade design for a Darrieus-type vertical-axis wind turbine
21 p0067 A79-14291

Some effects of flow curvature on the performance of Darrieus wind turbines
[AIAA PAPER 79-0112] 21 p0156 A79-19538

Fluid dynamics of diffuser-augmented wind turbines
22 p0238 A79-20798

Theoretical study of a hybrid wind turbine
23 p0405 A79-34047

Design analysis of a vertical axis wind turbine
23 p0472 A79-38656

Reductions in vehicle fuel consumption due to refinements in aerodynamic design --- for trailer trucks
24 p0658 A79-50335

The use of wind data with an operational wind turbine in a research and development environment
[NASA-TM-73832] 23 p0581 N79-26502

Aerodynamic performance of the 17-metre-diameter Darrieus wind turbine
[SAND-78-1737] 23 p0595 N79-27670

AERODYNAMIC COEFFICIENTS

An inverse problem of vertical-axis wind turbines
22 p0239 A79-20800

AERODYNAMIC CONFIGURATIONS
Recent developments in wind energy 23 p0482 A79-40104
The development of wind power plants in Japan 23 p0482 A79-40105
Design, fabrication, and test of a composite material wind turbine rotor blade [NASA-CR-135389] 21 p0173 N79-10525
AERODYNAMIC DRAG
An inverse problem of vertical-axis wind turbines 22 p0239 A79-20800
Investigation of the aerodynamic resistance of solar air heaters 24 p0648 A79-49185
AERODYNAMIC HEAT TRANSFER
Evaluation of a sodium heat pipe/thermal energy storage unit utilizing LiF-MgF2-KF phase change material [AIAA PAPER 79-1095] 23 p0462 A79-38565
AERODYNAMIC LOADS
Measurements of performance and structural response of the Danish 200kW Gedser windmill 23 p0484 A79-40121
AERODYNAMICS
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment 23 p0479 A79-39807
AEROELASTICITY
Aeroelastic wind energy converter 21 p0047 A79-12275
Aeroelastic pump --- wind energy from flutter of suspended liquid-filled cables 23 p0406 A79-34055
Investigations on the aeroelastic stability of large wind turbines 23 p0483 A79-40116
Aeroelastic stability and response of horizontal axis wind turbine blades 23 p0483 A79-40117
The aeroelastic behaviour of large Darrieus-type wind energy converters derived from the behaviour of a 5,5 m rotor 23 p0483 A79-40118
Aeroelastic response and stability of a coupled rotor/support system with application to large horizontal axis with turbines 22 p0332 N79-16346
Investigations on the aeroelastic stability of large wind turbines [NPL-MP-78014-U] 24 p0792 N79-32731
AERONAUTICAL ENGINEERING
The impact of aeronautical sciences on other modes of transport 22 p0325 A79-31915
National Aeronautics and Space Act of 1958, as amended, and related legislation [GPO-34-175] 21 p0214 N79-13932
The AGARD propulsion and energetics panel, 1952-1977 [AGARD-AR-111] 22 p0337 N79-16848
Spinoff 1979 [NASA-TM-80481] 24 p0730 N79-29108
Aeronautics and space report of the President, 1978 activities 24 p0794 N79-33115
AEROSOLS
The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant 21 p0076 A79-14757
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion 21 p0082 A79-15077
Trace element emissions from coal-fired power plants [ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
Differential insolation and turbidity measurements --- solar radiation attenuation by aerosols 22 p0241 A79-21056
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation 22 p0262 A79-23757
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant --- for weather modification studies 23 p0438 A79-36432
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements 24 p0611 A79-45531
Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements 24 p0612 A79-45532
A study of long range air pollution problems related to coal development in the Northern Great Plains 24 p0612 A79-45538
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators 24 p0629 A79-46231
Elemental characteristics of aerosols emitted from a coal-fired heating plant [NASA-TM-78749] 21 p0191 N79-11560
Measurement techniques for trace metals in coal-plant effluents: A brief review [NASA-RP-1047] 24 p0803 N79-33611
AEROSPACE ENGINEERING
Energy and aerospace; Proceedings of the Anglo/American Conference, London, England, December 5-7, 1978 22 p0325 A79-31908
FY 1978 scientific and technical reports, articles, papers, and presentations --- bibliography [NASA-TM-78203] 21 p0214 N79-13915
OAST Space Theme Workshop. Volume 1: Summary report. 1: Introduction. 2: General observations and some key findings. 3: Follow-on activity. Quick-look comments and working papers [NASA-TM-80001] 21 p0224 N79-15113
Heat pipe technology. A bibliography with abstracts [NASA-CR-158005] 23 p0546 N79-23364
NASA authorization, 1980, volume 1, part 4 [GPO-46-423] 24 p0762 N79-31085
Aeronautics and space report of the President, 1978 activities 24 p0794 N79-33115
AEROSPACE ENVIRONMENTS
Optics in adverse environments; Proceedings of the Seminar, San Diego, Calif., August 25, 26, 1977 21 p0044 A79-12037
Large space system - Charged particle environment interaction technology --- effects on high voltage solar array performance [AIAA 79-0913] 23 p0425 A79-34775
Electrical power distribution subsystem --- electromagnetic environment effects on orbiter and Spacelab payload 23 p0493 A79-40719
UV blocking filters for polymeric films 24 p0668 A79-51103
High temperature, low mass solar blanket development 24 p0691 A79-51902
Space environmental effects and the solar power satellite 23 p0552 N79-24028
Environmental factors of power satellites [SAMSO-TR-79-66] 24 p0717 N79-28213
AEROSPACE INDUSTRY
International Instrumentation Symposium, 24th, Albuquerque, N. Mex., May 1-5, 1978, Proceedings. Parts 1 & 2 21 p0144 A79-17576
Commercial potential of the Space Shuttle [AAS PAPER 79-058] 23 p0438 A79-36548
AEROSPACE MEDICINE
Health maintenance and health surveillance considerations for an SPS space construction base community [AAS PAPER 78-176] 22 p0243 A79-21273
AEROSPACE SCIENCES
Some perspectives on research into the biological response to non-ionizing electromagnetic radiation --- relation to SETI, SPS, and other government projects 22 p0271 A79-24879
Technology assessment, volume 2. A bibliography with abstracts [NTIS/PS-78/0830/6] 21 p0179 N79-10951
FY 1978 scientific and technical reports, articles, papers, and presentations --- bibliography [NASA-TM-78203] 21 p0214 N79-13915

Symposium on the Future of Space Science and Space
Applications
[GPO-23-876] 21 p0224 N79-15105
AEROSPACE SYSTEMS
Future large space systems opportunities: A case
for space-to-space power? --- spacecraft power
supplies microwave and laser transmission
21 p0169 N79-10095
AEROSPACE TECHNOLOGY TRANSFER
Activities in the field of solar cells in the
Federal Republic of Germany
21 p0056 A79-13636
Current and potential uses of aerospace technology
by the U.S. Department of the Interior
[AIAA PAPER 78-1716] 21 p0060 A79-13833
Space Congress, 15th, Cocoa Beach, Fla., April
26-28, 1978, Proceedings
21 p0099 A79-16126
The Solar Heating and Cooling Commercial
Demonstration Program at Marshall Space Flight
Center - Some problems and conclusions
21 p0099 A79-16135
Selective application of materials for products
and energy; Proceedings of the Twenty-third
National Symposium and Exhibition, Anaheim,
Calif., May 2-4, 1978
22 p0239 A79-20801
The Energy Research and Development Program of the
United States
22 p0325 A79-31909
Selected areas of aerospace technical applications
to civil engineering
23 p0397 A79-33925
Hydrogen/oxygen steam generation - An example of
aerospace technology transfer
24 p0613 A79-45585
Space technology spinoffs --- Book
24 p0639 A79-47260
Space to benefit mankind - 1980 to 2000
[IAF PAPER 79-206] 24 p0710 A79-53356
Spinoff 1979
[NASA-TM-80481] 24 p0730 N79-29108
AEROTHERMODYNAMICS
A contribution to solution of the energy crisis -
Proposed solution: Aerothermal plants
23 p0465 A79-38594
AFRICA
Results of the geoscientific investigations from
the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592
AGE FACTOR
The effect of maturation on the configuration of
pristane in sediments and petroleum
22 p0272 A79-25375
AGGLOMERATION
Fuel contaminants, volume 4: Application of oil
agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236
AGING (MATERIALS)
Process aging studies in the conversion of
methanol to gasoline in a fixed bed reactor
23 p0492 A79-40454
Catalyst aging tests and the role of catalyst
wetting on hydrodesulfurization of a coal
derived liquid
22 p0352 N79-19169
Aging behavior of crude shale oil
[AD-A062420] 22 p0357 N79-20272
AGITATION
Design of a direct wind energy converter to heat
water by agitation in a closed tank
21 p0067 A79-14290
AGRICULTURE
Compartmental model for agricultural conversion of
solar energy into fixed biomass
21 p0022 A79-10181
Potential agricultural uses of fluidized bed
combustion waste
21 p0064 A79-14108
Environmental factors affecting the installation
and operation of gas turbine engines in
agricultural aircraft
[SAE PAPER 781010] 22 p0274 A79-25892
Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545
An assessment of the gasification characteristics
of some agricultural and forest industry
residues using a laboratory gasifier
23 p0381 A79-32592
Function of economics in energy policy
23 p0422 A79-34179
An incremental model for conversion of solar
energy in agricultural systems
23 p0479 A79-39840
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Field testing and evaluation of PV module
performance
23 p0496 A79-40885
Solar farm buildings collect energy for crop drying
24 p0610 A79-45224
High-grade fuels from biomass farming - Potentials
and constraints
24 p0669 A79-51194
Preliminary environmental assessment of energy
conversion processes for agricultural and forest
product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574
Multidisciplinary research related to the
atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679
Solar irrigation program plan: Second revision
[SAND-78-0308-REV] 21 p0187 N79-11525
Applying NASA remote sensing data to geologically
related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289
Solar energy for agricultural and industrial
process heat
[DOE/CS-0053] 23 p0597 N79-27688
AGROCLIMATOLOGY
Construction of combined solar installations for
heating and cooling
24 p0653 A79-49524
AIR
Reducing combustion air temperature variations in
magnetohydrodynamic/steam power plants
21 p0016 A79-10135
Operability and materials testing for MHD air
heaters
24 p0701 A79-51994
General-purpose aluminum-air/flywheel electric
vehicles
[UCRL-82003] 23 p0564 N79-24503
AIR CARGO
Public policy
21 p0179 N79-11011
AIR CONDITIONING
Liquid desiccant solar air conditioner and energy
storage system
21 p0021 A79-10176
Simulations of the performance of open cycle
desiccant systems using solar energy
21 p0066 A79-14262
A solar energy system for space heating and space
cooling --- retrofitting aged buildings
21 p0072 A79-14686
Barriers and incentives to the commercialization
of solar heating and cooling of buildings
21 p0072 A79-14687
Heat recovery devices for building HVAC systems
--- Heating Ventilating and Air Conditioning
21 p0073 A79-14697
Instrumentation, data acquisition and monitoring
system for an air heating solar system
21 p0088 A79-15836
Moderate cost, calculator-based data acquisition
for solar HVAC systems
21 p0088 A79-15837
Boosting the performance of solar HVAC systems by
improving component interactions --- Heating,
Ventilating and Air Conditioning
21 p0089 A79-15851
sing controls to reduce component size and energy
needs for solar HVAC --- Heating Ventilation,
. Air Conditioning
21 p0102 A79-16421
The El Camino Real Solar Cooling Demonstration
Project
21 p0102 A79-16425
Stochastic simulation experiments on solar air
conditioning systems
21 p0138 A79-17474
Simulation and design of evacuated tubular solar
residential air conditioning systems and
comparison with actual performance
21 p0138 A79-17475

An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481
Solar heated and cooled financial building
21 p0139 A79-17484
System performance predictions for solar cooling using regional stochastic weather models
22 p0264 A79-23781
Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center
22 p0277 A79-25944
A 'real life' solar air conditioned house project
23 p0463 A79-38577
Solar air conditioning and refrigeration in arid regions
23 p0466 A79-38608
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212
Investigation of the aerodynamic resistance of solar air heaters
24 p0648 A79-49185
Solid desiccant air conditioning with silica gel using solar energy
21 p0181 N79-11464
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part A: Options and strategies. Volume 1: Executive summary
[HCP/M70065-01/1] 21 p0207 N79-13512
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part B: Analysis of market development, volume 2
[HCP/M70066-01/2] 21 p0207 N79-13513
Solar space heating and air conditioning, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1014/6] 21 p0211 N79-13545
Solar space heating and air conditioning volume 3. Citations from the NTIS data base
[NTIS/PS-78/1015/3] 21 p0211 N79-13546
Solar space heating and air conditioning, volume 3. Citations from the engineering index data base
[NTIS/PS-78/1017/9] 21 p0211 N79-13547
Preliminary design package for prototype solar heating and cooling systems
[NASA-CR-150853] 21 p0229 N79-15409
Environmental and safety considerations for solar heating and cooling applications
[PB-287772/8] 22 p0343 N79-17350
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059
Preliminary design package for residential heating/cooling system: Rankine air conditioner redesign
[NASA-CR-150871] 22 p0354 N79-19453
A fixed tilt solar collector employing reversible vee-through reflectors and evaluated tube receivers for solar heating and cooling systems
[NASA-CR-158420] 22 p0359 N79-20490
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519
Solar energy pilot study
[PB-299380/8] 22 p0363 N79-20525
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
EPRI Methodology for Preferred Solar Systems (EMPSS) computer program documentation. User's guide
[EPRI-ER-771] 23 p0543 N79-22635
Solar heating and cooling demonstration project summaries
[DOE/CS-0038/2] 24 p0727 N79-28771
Performance and evaluation of concepts and devices for heat reclamation from air conditioners, heat pumps, and refrigeration equipment
[AD-A069650] 24 p0752 N79-30770
Energy utilization analysis of buildings
[LBI-7826] 24 p0753 N79-30779
Reliability, maintainability, and materials performance of solar demonstration systems
[ANL/EES-CP-14] 24 p0754 N79-30781

AIR CONDITIONING EQUIPMENT
Solar heating and ventilating by natural means
21 p0103 A79-16458
Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
Heat pump technology for saving energy --- Book
22 p0302 A79-29624
Solar Rankine engines - Examples and projected costs
[ASME PAPER 79-SOL-3] 22 p0307 A79-30541
Refined model of solar space cooling system
23 p0401 A79-34012
An economic comparison between solar and conventional residential air conditioning in Miami, Florida
23 p0401 A79-34013
Liquid sorbent solar air conditioner
23 p0401 A79-34014
Rankine cycle solar driven heat pump development
24 p0610 A79-45221
System performance of a Stirling engine powered heat activated heat pump
24 p0697 A79-51962
Optimum dry-cooling sub-systems for a solar air conditioner
[NASA-TM-79007] 21 p0183 N79-11477
Solar evacuated tube collector: Absorption chiller systems simulation
[COC-2577-13] 21 p0209 N79-13530
Candidate chemical systems for air cooled, solar powered, absorption air conditioner design. Part 2: Solid absorbents, high latent heat refrigerants
[SAN-1587-2] 21 p0211 N79-13544

AIR COOLING
Design data brochure for the Owens-Illinois Sunpak (TM) air-cooled solar collector
[NASA-CR-150868] 21 p0229 N79-15404

AIR DUCTS
Hybrid air to water solar collector design
21 p0021 A79-10174
Tropospheric conduits --- for pollution abatement and energy production
22 p0266 A79-24275

AIR FILTERS
Particulate control for coal-fired industrial boilers
21 p0065 A79-14123
Gas turbine operating and maintenance experience in Saudi Arabia
22 p0298 A79-28989
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610

AIR FLOW
Progress in the testing of materials and design concepts for directly-fired MHD air heater service
21 p0017 A79-10141
Return flow solar air-heater
21 p0055 A79-13609
The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors
21 p0102 A79-16423
Cheap packed bed absorbers for solar air heaters
21 p0128 A79-17388
Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402
An air-modulated fluidic fuel-injection system --- automobile fuel management
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766
Application of a hot air turbine for efficiency improvement in MHD/steam power plants
[ASME PAPER 79-GT-36] 23 p0375 A79-32341

Measurement of the performance of domestic air-to-air heat pumps 23 p0397 A79-33768
Further modeling of a solar collector based on linear clipped-V channels 23 p0399 A79-33993
Air collector testing utilizing ASHRAE 93-77 --- standards for testing of solar collectors using air as heat transfer medium 23 p0430 A79-35062
Testing and evaluation methods to determine an optimal air-flow rate in flat-plate solar collectors [AIAA PAPER 79-0972] 23 p0456 A79-38179
A numerical study of the effects of complex terrain on dynamics of airflow and pollutant dispersion 23 p0535 A79-43383
Lateral flow concept for rock bed systems --- of solar heating 24 p0654 A79-50174
Multichannel temperature controller for hot air solar house 24 p0658 A79-50347
Analysis of mass cycling in porous rock reservoirs for compressed air energy storage 24 p0680 A79-51799
Measured air flow rates through microorifices and flow prediction capability [PB-286868/5] 21 p0217 N79-14344

AIR INTAKES
Investigation of turbo-dyne energy chamber (G:R: value trademark): An air bleed device [PB-285391/0] 21 p0217 N79-14397

AIR JETS
The theoretical analysis of an air turbine generation system --- for waterwave energy conversion 21 p0151 A79-18106

AIR POLLUTION
Factors limiting limestone utilization efficiency in fluidized-bed combustors --- in determining sulfur dioxide emission level 21 p0008 A79-10069
Controlling NOx from a coal-fired MHD process 21 p0017 A79-10139
Alternative fuels and combustion problems 21 p0051 A79-12978
Use of alternative fuels in stationary combustors 21 p0052 A79-12981
Role of aromatics in soot formation 21 p0053 A79-12988
Emission control techniques for alternative fuel combustion 21 p0053 A79-12990
State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes 21 p0064 A79-14111
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry 21 p0064 A79-14112
Ambient air quality assessment of the Synthane coal gasification pilot plant, six month study /August 1976-January 1977/ 21 p0064 A79-14113
Particulate control for coal-fired industrial boilers 21 p0065 A79-14123
The direct reduction of sulfur dioxide 21 p0065 A79-14124
The impact of a coal fired power plant on ambient sulfur dioxide levels 21 p0082 A79-15032
On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin 21 p0082 A79-15052
Source emissions factors for refuse derived fuels 21 p0082 A79-15084
Shock tube studies of coal devolatilization 21 p0083 A79-15247
Particulate and sulfur oxide control options for conventional coal combustion 21 p0092 A79-15883
Coal-based electricity and air pollution control - A case for solvent refined coal 21 p0096 A79-15922
Commercialization of fluidized-bed combustion systems by the State of Ohio 21 p0096 A79-15923
Clean Air Act amendments of 1977 and the impact on control efforts 21 p0097 A79-16091
Motor vehicle lead emissions in the United States - An analysis of important determinants, geographic patterns and future trends 21 p0113 A79-16745
Reducing inefficiency and emissions of large steam generators in the United States 21 p0114 A79-17075
An analysis of air pollution control costs in N.S.W. --- New South Wales, Australia 21 p0115 A79-17228
Advanced emissions control and test facility of the Electric Power Research Institute 21 p0115 A79-17249
The fate of trace elements in coal after combustion 21 p0116 A79-17250
The influence of lead compounds on automotive exhaust catalysts 21 p0116 A79-17253
Assessment of current flue gas desulfurization technology 21 p0145 A79-17637
A survey of particulate collection devices for coal-fired boilers 21 p0147 A79-17645
Emission control for SO2 - An update [ASME PAPER 78-JPGC-PWR-11] 21 p0150 A79-18097
Operating experience with three 20 MW prototype flue gas desulfurization processes [ASME PAPER 78-JPGC-PWR-12] 21 p0150 A79-18098
Emissions of nitrogen dioxide from a large gas-turbine power station 21 p0152 A79-18344
The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil 21 p0156 A79-19219
Real-time, continuous measurement of automotive sulfuric acid emissions 21 p0156 A79-19359
Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures [ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735
Modification of electrostatic precipitator performance by use of fly-ash conditioning agents [ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers [ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738
Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility [ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters [ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
Tropospheric conduits --- for pollution abatement and energy production 22 p0266 A79-24275
Oxidation of SO2 on the surface of fly ash particles under low relative humidity conditions 22 p0277 A79-26038
Electrostatic precipitation tests with fuel oil ash 22 p0296 A79-28390
Electric car project of the Eindhoven University of Technology 22 p0302 A79-29498
The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations [ASME PAPER 79-GT-16] 22 p0306 A79-30510
Chemical studies of stack fly ash from a coal-fired power plant 22 p0309 A79-30595
Emissions and economy potential of prechamber stratified charge engines [SAE PAPER 790436] 22 p0315 A79-31374

A new combustion system in the three-valve
  stratified charge engine
  [SAE PAPER 790439] 22 p0316 A79-31376
The effect of environmental regulations on the
  General Electric research and development
  program for combustion turbines using
  coal-derived fuels
  [ASME PAPER 79-GT-41] 23 p0375 A79-32344
The problem of carbon dioxide --- fossil fuel
  consumption effect on air pollution
  23 p0438 A79-36201
Aerosol and ice nuclei measurements in the plume
  of the Homer City, Pa., power plant --- for
  weather modification studies
  23 p0438 A79-36432
Characterization and formation of submicron
  particles in coal-fired plants
  23 p0460 A79-38316
Investigating the formation of oxides of nitrogen
  when burning solid fuel --- air pollution by
  industrial exhaust gases
  23 p0474 A79-38864
An investigation of the formation of oxides of
  nitrogen in a pulverised coal flame
  23 p0474 A79-38865
Environmental implications of energy recovery from
  municipal solid waste
  23 p0476 A79-38949
H2S emissions in the domain of chemical industry
  and means of suppressing emissions
  23 p0481 A79-40068
H2S associated with mineral oil refineries and
  natural gas processing plants - Emissions and
  absorptions
  23 p0481 A79-40069
Air pollution control --- Book
  23 p0486 A79-40134
Gaseous, particulate, and smoke emissions from a
  heavy duty automotive gas turbine engine
  23 p0522 A79-41154
Symposium on Turbulence, Diffusion, and Air
  Pollution, 4th, Reno, Nev., January 15-18, 1979,
  Preprints
  23 p0534 A79-43351
Diffusion model validation from ambient air
  measurements around five coal-fired electrical
  power plants in Indiana
  23 p0534 A79-43370
Impact of coal fired power plant emissions on the
  air quality in Huntington Canyon, Utah
  23 p0534 A79-43371
A numerical study of the effects of complex
  terrain on dynamics of airflow and pollutant
  dispersion
  23 p0535 A79-43383
The extent of catalytic SO2 reactions in smoke
  plumes
  24 p0616 A79-45748
Comparison of dust collection efficiencies of
  particulate emission samplers in a power plant
  burning fuel oil and coal fuel oil mixtures
  24 p0616 A79-45749
Design of land-based, foam OTEC plants for
  bottoming cycles
  24 p0624 A79-45839
Market penetration characteristics for energy
  production and atmospheric carbon dioxide growth
  24 p0643 A79-47812
Hydrocarbons in ambient air. I - A statistical
  estimation of automobile hydrocarbons by factor
  analysis
  24 p0646 A79-48376
Reduction of particulate carryover from a
  pressurized fluidized bed
  24 p0653 A79-49527
Impact of H2S emission abatement on geothermal
  power costs
  24 p0659 A79-50352
Applicability of energy model techniques to an
  analysis of impacts of SO2 emissions from the
  U.S. electric utilities and control policies
  24 p0659 A79-50362
Air emissions from waste to energy systems
  24 p0665 A79-50883
Predicting solar energy fluxes in polluted urban
  areas
  24 p0671 A79-51732
Particulate and sulfur dioxide emission control
  costs for large coal-fired boilers
  [PB-281271/7] 21 p0178 N79-10591
Particulate control mobile test units: Third
  year's operation
  [PB-283657/5] 21 p0178 N79-10603
Low NOx combustion concepts for advanced power
  generation systems firing low-Btu gas
  [PB-282983/6] 21 p0178 N79-10610
Elemental characteristics of aerosols emitted from
  a coal-fired heating plant
  [NASA-TM-78749] 21 p0191 N79-11560
National Emissions Data System (NEDS) fuel use
  report (1974)
  [PB-284658/2] 21 p0194 N79-12251
Nitrogen oxide air pollution. Volume 2, part 1:
  Control technology. A bibliography with abstracts
  [NTIS/PS-78/0971/8] 21 p0199 N79-12591
Nitrogen oxide air pollution. Part 3:
  Atmospheric chemistry. A bibliography with
  abstracts
  [NTIS/PS-78/0973/4] 21 p0199 N79-12593
Evaluations of novel particulate control devices
  [PB-283973/6] 21 p0199 N79-12601
Regional air pollution study: Heat emission
  inventory
  [PB-284081/7] 21 p0200 N79-12602
Environmental effects of increased coal
  utilization ecological effects of gaseous
  emission from coal combustion
  [PB-285440/4] 21 p0213 N79-13591
Investigation of turbo-dyne energy chamber (G:R:
  value trademark): An air bleed device
  [PB-285381/0] 21 p0217 N79-14397
Evaluation of electrostatic precipitator during
  SRC combustion tests
  [PB-285864/5] 21 p0223 N79-14618
Analysis of radioactive contaminants in
  by-products from coal-fired power plant operations
  [PB-286365/2] 21 p0232 N79-15473
Combustion research on the fate of fuel-nitrogen
  under conditions of pulverized coal combustion
  [PB-286208/4] 21 p0232 N79-15474
Assessment of coal cleaning technology
  [PB-287091/3] 22 p0330 N79-16139
Environmental assessment for residual oil
  utilization
  [PB-286982/4] 22 p0336 N79-16446
Combustion of hydrothermally treated coals
  [PB-287521/9] 22 p0338 N79-17025
Pollutants from synthetic fuels production:
  Facility construction and preliminary tests ---
  coal gasification plant effluents
  [PB-287730/6] 22 p0339 N79-17027
Low-sulfur western coal use in existing small and
  intermediate size boilers --- particulate
  sampling and combustion efficiency
  [PB-287937/7] 22 p0346 N79-18061
Source assessment: Open mining of coal. State of
  the Art
  [PB-288497/1] 22 p0353 N79-19429
Effects of low ambient temperature on the exhaust
  emissions and fuel economy of 84 automobiles in
  Chicago
  [PB-288400/5] 22 p0355 N79-19488
Assessment of coal cleaning technology: An
  evaluation of chemical coal cleaning processes
  [PB-289493/9] 22 p0372 N79-21625
Environmental assessment: Source test and
  evaluation report, Chapman low-Btu gasification
  [PB-289940/9] 22 p0373 N79-21662
National Emissions Data Systems (NEDS) fuel use
  report (1975)
  [PB-290162/7] 22 p0373 N79-21670
Air quality impacts using SRC versus conventional
  coal in power plants
  [PB-290237/7] 22 p0373 N79-21671
SRC (solvent refined coal) site, specific
  pollutant evaluation. Volume 1: Discussion
  [PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific
  pollutant evaluation. Volume 2: Appendices
  [PB-291496/8] 23 p0539 N79-22319
Combustion modification effects on NOx emissions
  from gas-, oil-, and coal-fired utility boilers
  [PB-289878/1] 23 p0545 N79-22661
Conventional combustion on environmental
  assessment program
  [PB-291401/8] 23 p0545 N79-22668

- Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment 23 p0551 N79-23539
- Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results [PB-290514/9] 23 p0566 N79-24534
- Balloon-borne particulate sampling for monitoring power plant emissions [PB-290473/8] 23 p0566 N79-24543
- An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption [PB-290953/9] 23 p0568 N79-25249
- Air pollutant emission factors for military and civil aircraft [PB-292520/4] 23 p0575 N79-25567
- Fuel contaminants. Volume 3: Control of coal-related pollutants [PB-293328/1] 23 p0578 N79-26234
- Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 427 cubic inch 1977 California GMC 6500 [PB-293530/2] 23 p0578 N79-26410
- Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 361 cubic inch 1966 Ford F-600 [PB-293529/4] 23 p0586 N79-26567
- A micrometeorological network for study of transport and diffusion of pollutants in two Apennine Valleys 23 p0586 N79-26638
- A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions 23 p0590 N79-27546
- Status of NO sub x control for coal-fired power plants 23 p0592 N79-27609
- Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers 23 p0592 N79-27610
- Program report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department [UCRL-51444-78] 24 p0722 N79-28668
- Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement) [PB-293731/6] 24 p0743 N79-29670
- Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact [ANL/EES-CP-6] 24 p0756 N79-30808
- Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task Report. Volume 2: Appendices [PB-294813/1] 24 p0761 N79-30856
- Polymeric interfaces for stack monitoring [PB-294997/2] 24 p0761 N79-30866
- Assessment of national consequences of increased coal utilization, executive summary, volume 1 [TID-29425-VOL-1] 24 p0774 N79-31801
- Assessment of national consequences of increased coal utilization, executive summary, volume 2 [TID-29425-VOL-2] 24 p0774 N79-31802
- Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text [PB-294812/3] 24 p0803 N79-33639
- Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b [PB-295535/9] 24 p0803 N79-33654

AIR QUALITY

- Ambient air quality assessment of the Synthane coal gasification pilot plant, six month study /August 1976-January 1977/ 21 p0064 A79-14113
- Clean Air Act amendments of 1977 and the impact on control efforts 21 p0097 A79-16091
- A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley 21 p0116 A79-17262
- The influence of rough terrain on pollutant dispersion and transport from a geothermal power complex 23 p0534 A79-43372
- The Geysers geothermal area emissions and aerometric data base and air quality analysis 23 p0534 A79-43373
- Application of long-range transport modeling to assess coal development --- for impact on air quality 23 p0535 A79-43429
- A practical regional scale air quality simulation model for energy resource development in the four corners area 23 p0535 A79-43430
- A study of long range air pollution problems related to coal development in the Northern Great Plains 24 p0612 A79-45538
- Special considerations in the environmental study program for coal gasification plants 24 p0659 A79-50350
- Air quality assessment of particulate emissions from diesel-powered vehicles [PB-286172/2] 21 p0223 N79-14641
- Environmental conservation concerns in transportation: Energy, noise, and air quality [PB-286550/9] 21 p0232 N79-15868
- Air quality impacts using SRC versus conventional coal in power plants [PB-290237/7] 22 p0373 N79-21671
- Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks [PB-290579/2] 23 p0566 N79-24537
- Air monitoring network design for power plant siting 23 p0591 N79-27590
- Air quality as a constraint to the use of coal in California 23 p0592 N79-27605
- Energy-related air quality monitoring in the western energy resource development area [PB-293160/8] 23 p0599 N79-27730
- Assessment of national consequences of increased coal utilization, executive summary, volume 1 [TID-29425-VOL-1] 24 p0774 N79-31801
- Assessment of national consequences of increased coal utilization, executive summary, volume 2 [TID-29425-VOL-2] 24 p0774 N79-31802

AIR TRAFFIC CONTROL

- Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity [SAE PAPER 780523] 21 p0031 A79-10398
- Procedure for flight guidance in the terminal maneuvering area for an experimental program employing a flying test device 21 p0147 A79-17680
- Dynamic simulation studies of fuel conservation procedures used in terminal areas 22 p0259 A79-23501

AIR TRANSPORTATION

- Energy conservation aircraft design and operational procedures [ONERA, TP NO. 1978-107] 21 p0036 A79-11572
- Alternate aircraft fuels prospects and operational implications 21 p0066 A79-14139
- Role of fuel management --- for airlines 21 p0155 A79-18521
- The Sunship --- solar powered airship design 22 p0254 A79-22320
- Advanced air transport concepts --- review of design methods for very large aircraft 22 p0312 A79-31121
- The impact of aeronautical sciences on other modes of transport 22 p0325 A79-31915
- New energy conversion techniques in space, applicable to propulsion --- powering of aircraft with laser energy from SPS [AIAA PAPER 79-1338] 23 p0493 A79-40490
- The airport performance model. Volume 1: Extensions, validations, and applications [AD-A062863] 23 p0568 N79-25040
- Supersonic transport vis-a-vis energy savings [NASA-TM-75464] 24 p0763 N79-31163

AIR WATER INTERACTIONS
A cost effective vertical air/water solar heating collector
22 p0320 A79-31430

AIRBORNE EQUIPMENT
Surtrace - An airborne geochemical system --- for earth surface micro-layer exploration
22 p0255 A79-22557
Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620

AIRBORNE/SPACEBORNE COMPUTERS
Fuel conservative subsonic transport --- control surfaces activated by computers
22 p0337 N79-16874

AIRCRAFT CARRIERS
Air pollutant emission factors for military and civil aircraft
[PB-292520/4] 23 p0575 N79-25567

AIRCRAFT CONFIGURATIONS
Nuclear aircraft innovations and applications
[AIAA PAPER 79-0846] 23 p0526 A79-41913
Manned strategic system concepts 1990-2000
[AIAA PAPER 79-1793] 24 p0643 A79-47882
Technology requirements and readiness for very large vehicles
[NASA-TM-80127] 23 p0587 N79-27086

AIRCRAFT CONSTRUCTION MATERIALS
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels
[AD-A060322] 21 p0226 N79-15203

AIRCRAFT DESIGN
Energy conservation aircraft design and operational procedures
[ONERA, TP NO. 1978-107] 21 p0036 A79-11572
Pilot's view of the evolving air transport
21 p0053 A79-13085
Technology for aircraft energy efficiency
21 p0066 A79-14136
The improved rigid airship --- design characteristics and cost analysis
21 p0086 A79-15572
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087
Very large vehicles - To be or --- aircraft design concepts
22 p0305 A79-30484
Large-vehicle concepts --- aircraft design
22 p0306 A79-30485
Advanced air transport concepts --- review of design methods for very large aircraft
22 p0312 A79-31121
Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911
The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912
Nuclear aircraft innovations and applications
[AIAA PAPER 79-0846] 23 p0526 A79-41913
An analysis of operational procedures and design modifications for aircraft fuel conservation
[AIAA 79-1656] 24 p0611 A79-45328
Manned strategic system concepts 1990-2000
[AIAA PAPER 79-1793] 24 p0643 A79-47882
All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft
[AIAA PAPER 79-1863] 24 p0643 A79-47920
The design impact of power-augmented ram technology on large energy efficient aircraft
[AIAA PAPER 79-1864] 24 p0669 A79-51250
Solar thermal aerostat research station /STARS/
[IAF PAPER 79-35] 24 p0709 A79-53261
Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026
Energy conservation aircraft design and operational procedures
21 p0202 N79-13200
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft. Volume 1: Executive summary
[AD-A061746] 22 p0351 N79-18969
Adaptation for the economy or adaptation for energy conservation --- passenger aircraft design
[AAAF-NT-77-23] 23 p0551 N79-23537

AIRCRAFT ENGINES
Powerplant integration - The application of current experience to future developments
[ASME PAPER 78-GT-113] 21 p0032 A79-10788
Making turbofan engines more energy efficient
[ASME PAPER 78-GT-198] 21 p0033 A79-10818
Impact of future fuel properties on aircraft engines and fuel systems
21 p0036 A79-11600
Automotive engines - A viable alternative for aircraft
21 p0047 A79-12379
Turbine engines in light aircraft
21 p0047 A79-12380
Current problems in the development and production of small gas turbine engines
21 p0048 A79-12529
Laser aircraft propulsion
21 p0109 A79-16618
Laser-powered aircraft and rocket systems with laser energy relay units
21 p0109 A79-16619
Fuel conservative aircraft engine technology
21 p0164 A79-20078
Engine technology for production turbofan engines
22 p0270 A79-24827
Effect of broadened-specification fuels on aircraft engines and fuel systems
[AIAA 79-7008] 22 p0300 A79-29383
The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912
Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331
Manufacturers developing fuel-efficient engines
23 p0438 A79-36380
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737
A review of Curtiss-Wright rotary engine developments with respect to general aviation potential
[SAE PAPER 790621] 23 p0440 A79-36749
Garrett ATF 3
23 p0535 A79-43469
Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918
High-temperature alloys in high-technology systems
24 p0647 A79-48911
Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526
An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705
Energy efficient engine preliminary design and integration study
[NASA-CR-135396] 21 p0194 N79-12084
Aircraft Engine Future Fuels and Energy Conservation
[AGARD-LS-96] 21 p0201 N79-13192
Future fuels for aviation
21 p0201 N79-13193
The role of fundamental combustion in the future aviation fuels program --- carbon formation in gas turbine primary zones
21 p0202 N79-13195
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
Engine component improvement and performance retention
21 p0202 N79-13198
Low energy consumption engines
21 p0202 N79-13199
The rotary combustion engine: A candidate for general aviation --- conferences
[NASA-CP-2067] 22 p0329 N79-15961
General aviation energy-conservation research programs
22 p0329 N79-15963

Development status of rotary engine at Toyo Kogyo --- for general aviation aircraft 22 p0329 N79-15964
Update of development on the new Audi NSU rotary engine generation --- for application to aircraft engines 22 p0329 N79-15965
Review of the Rhein-Flugzeugbau Wankel powered aircraft program --- ducted fan engines 22 p0329 N79-15966
Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential --- with direct chamber injection 22 p0329 N79-15967
Engine requirements for future general aviation aircraft 22 p0329 N79-15968
Effect of broadened-specification fuels on aircraft engines and fuel systems [NASA-TM-79086] 22 p0330 N79-16136
Energy efficient aircraft engines [NASA-TM-79204] 23 p0587 N79-27141

AIRCRAFT EQUIPMENT
Air Force applications of lightweight superconducting machinery --- in airborne power sources 22 p0290 A79-27666
Applications of free-space microwave power transmission 24 p0652 A79-49487
Nickel-zinc battery for aircraft and missile applications [AD-A059295] 21 p0220 N79-14561

AIRCRAFT FUEL SYSTEMS
Drag reduction by cooling in hydrogen-fueled aircraft 24 p0653 A79-49921
Comparison of alternate fuels for aircraft 24 p0668 A79-51100
Effect of broadened-specification fuels on aircraft engines and fuel systems [NASA-TM-79086] 22 p0330 N79-16136
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary [NASA-CR-132558] 24 p0794 N79-33207

AIRCRAFT FUELS
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity [SAE PAPER 780523] 21 p0031 A79-10398
Advanced turbofan engines for low fuel consumption [ASME PAPER 78-GT-192] 21 p0033 A79-10816
Alternative aircraft fuels 21 p0033 A79-10824
Some aspects of aircraft jet engine fuels 21 p0035 A79-11368
Characteristics and combustion of future hydrocarbon fuels 21 p0036 A79-11599
Alternative aviation turbine fuels 21 p0047 A79-12378
Impact of fuel availability and other cost trends on air carrier operations 21 p0053 A79-13077
Impact of fuel availability and other cost trends on general aviation 21 p0053 A79-13078
Alternate aircraft fuels prospects and operational implications 21 p0066 A79-14138
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream 21 p0114 A79-16786
Rule of fuel management --- for airlines 21 p0155 A79-18521
A characteristic time correlation for combustion inefficiency from alternative fuels [AIAA PAPER 79-0357] 21 p0158 A79-19687
Drag reduction by cooling in hydrogen fueled aircraft 21 p0165 A79-20084
The potential of liquid hydrogen as a military aircraft fuel 22 p0238 A79-20773
Effects of fuel properties on soot formation in turbine combustion [SAE PAPER 781026] 22 p0274 A79-25899
Shale oil - The answer to the jet fuel availability question [SAE PAPER 781027] 22 p0274 A79-25900
Laser aircraft --- using kerosene 22 p0284 A79-26597
Cryohydrogen-fuel for tomorrow's commercial aircraft 22 p0289 A79-27656
High-freezing-point fuels used for aviation turbine engines [ASME PAPER 79-GT-141] 22 p0309 A79-30555
The chemical stability of kerosene fractions 23 p0529 A79-42275
An analysis of operational procedures and design modifications for aircraft fuel conservation [AIAA 79-1656] 24 p0611 A79-45328
Liquid hydrogen fueled commercial aircraft 24 p0615 A79-45600
Alternative fuels in aviation 24 p0651 A79-49381
Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors [NASA-CR-159454] 21 p0200 N79-13050
Effect of broadened-specification fuels on aircraft engines and fuel systems [NASA-TM-79086] 22 p0330 N79-16136
Alternative hydrocarbon fuels: Combustion and chemical kinetics --- synthetic aircraft fuels [AD-A061050] 22 p0338 N79-17011
Study of hydrogen recovery systems for gas vented while refueling liquid-hydrogen fueled aircraft [NASA-CR-158991] 22 p0346 N79-18057
Design and evaluation of aircraft heat source systems for use with high-freezing point fuels [NASA-CR-159568] 23 p0553 N79-24172
Compatibility of elastomers in alternate jet fuels [NASA-CR-158773] 23 p0588 N79-27321
Findings and views concerning the exemption of aviation gasoline from the mandatory petroleum allocation and price regulations [DOE/ERA-0024] 23 p0589 N79-27336
Forecast of future aviation fuels. Part 1: Scenarios [NASA-CR-158871] 24 p0732 N79-29354
Supersonic transport vis-a-vis energy savings [NASA-TM-75464] 24 p0763 N79-31163
Comparison of alternate fuels for aircraft --- liquid hydrogen, liquid methane, and synthetic aviation kerosene [NASA-TM-80155] 24 p0782 N79-32637
Jet Fuel Thermal Stability [NASA-TM-79231] 24 p0795 N79-33336

AIRCRAFT GUIDANCE
Procedure for flight guidance in the terminal maneuvering area for an experimental program employing a flying test device 21 p0147 A79-17680

AIRCRAFT INSTRUMENTS
Flying angle of attack 21 p0048 A79-12384

AIRCRAFT SAFETY
Lockheed urges hydrogen fuel 24 p0648 A79-49224

AIRCRAFT SPECIFICATIONS
Effect of broadened-specification fuels on aircraft engines and fuel systems [AIAA 79-7008] 22 p0300 A79-29383

AIRFOIL PROFILES
The influence of blade camber on the output of vertical-axis wind turbines 21 p0045 A79-12242
A low cost blade design for a Darrieus-type vertical-axis wind turbine 21 p0067 A79-14291
Airfoil data for use of wind turbine designers 21 p0073 A79-14702
Diffuser designs for improved wind energy conversion 22 p0279 A79-26182
The design construction and proving of a low cost 5kW wind powered turbine for isolated applications 23 p0452 A79-37893
Design analysis of a vertical axis wind turbine 23 p0472 A79-38656

AIRFOILS
Airfoil data for use of wind turbine designers 21 p0073 A79-14702
Energy from sea and air by large-span tensioned foils 23 p0410 A79-34084

AIRFRAMES
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087
A cooling system for an aircraft having a cruise range from Mach 2 to Mach 8
[NASA-CASE-LAR-12406-1] 23 p0568 N79-24980

AIRLINE OPERATIONS
Economy in flight operations
21 p0048 A79-12383
Impact of fuel availability and other cost trends on air carrier operations
21 p0053 A79-13077
Rule of fuel management --- for airlines
21 p0155 A79-18521
Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23591
Liquid hydrogen fueled commercial aircraft
24 p0615 A79-45600
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040

AIRPORT PLANNING
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398
Airport power supply --- Russian book
24 p0660 A79-50499

AIRPORTS
Comparison of alternate fuels for aircraft
24 p0668 A79-51100
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040

AIRSHIPS
The improved rigid airship --- design characteristics and cost analysis
21 p0086 A79-15572
The Sunship --- solar powered airship design
22 p0254 A79-22324
Air buoyant vehicles - Energy efficient aircraft
[AIAA PAPER 79-1862] 24 p0643 A79-47919
Solar thermal aerostat research station /STARS/
[IAF PAPER 79-35] 24 p0709 A79-53261

ALABAMA
The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report
[PB-294228/2] 24 p0744 N79-29783

ALASKA
Non-electric applications of geothermal energy in six Alaskan towns
[IDO-1622-4] 21 p0208 N79-13523
Northern Alaska hydrocarbon resources
[PB-287394/1] 22 p0332 N79-16342
Environmental assessment of the Alaskan Continental Shelf. Volume 1: Biological studies
[PB-289154/7] 22 p0344 N79-17366
Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies
[PB-289155/4] 22 p0344 N79-17367
Environmental assessment of the Alaskan Continental Shelf. Volume 3: Biological studies
[PB-289156/2] 22 p0344 N79-17368
Marine biological effects of OCS petroleum development
[PB-288935/0] 22 p0344 N79-17374
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970
Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3] 23 p0546 N79-22971
Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems --- eskimos
[PB-291918/1] 23 p0546 N79-22972
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
Energy intensive industry for Alaska. Volume 2: Case analysis
[TID-29025-2] 24 p0754 N79-30787
Energy-intensive industry for Alaska. Volume 3: Background data
[TID-29025-3] 24 p0755 N79-30788

ALCOHOLS
The status of alcohol fuels utilization technology for highway transportation
21 p0003 A79-10035
Sweet sorghum - A renewable source for alcohol production
23 p0389 A79-33263
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Photosynthetic pathway and biomass energy production
24 p0605 A79-44580
Storage and distribution of synthetic fuels
24 p0650 A79-49379
Biomass - The self-replacing energy resource
24 p0651 A79-49425
Alcohol fuels program plan
[DOE/US-0001/2] 21 p0180 N79-11242
Status of alcohol fuels utilization technology for highway transportation
[HCP/M2923-01] 21 p0201 N79-13190
Alcohol fuels
[GPO-22-334] 23 p0588 N79-27322
Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341
Alcohol fuels, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0713/2] 24 p0795 N79-33342
Alcohol fuels, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0712/4] 24 p0795 N79-33343

ALGAE
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419
Practical aspects and applications of bioconversion
23 p0467 A79-38617
The economics and engineering of large-scale algae biomass energy systems
[PB-287868/4] 21 p0226 N79-15207
Photoproduction of hydrogen by marine blue-green algae
[PB-287508/6] 22 p0343 N79-17354
Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650
Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665
Photobiological production of hydrogen: A solar energy conversion option --- hydrogen metabolism in photosynthetic bacteria and algae
[SERI/TR-33-122] 24 p0767 N79-31422

ALGORITHMS
The use and limitations of ASHRAE solar algorithms in solar energy utilization studies
21 p0101 A79-16416
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327
Non-linear numerical algorithms for studying tearing modes --- in tokamaks
22 p0257 A79-22981
Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059
An algorithm and BASIC computer program for calculating simple coal gasification equilibria
[PB-291241/8] 23 p0539 N79-22265

ALIGNMENT
Five MW solar thermal test facility heliostat focus and alignment system
21 p0043 A79-11972
A simple solar tracking system --- manually adjusted rotating shaft for solar concentrator positioning
21 p0136 A79-17457

Microwave systems analysis, solar power satellite
--- alignment of the antenna array
[NASA-CR-160091] 22 p0337 N79-16892
ALKALI METALS
Ionizing seed --- for open cycle MHD power
generation
21 p0106 A79-16490
Absorption of solar radiation by alkali vapors ---
for efficient high temperature energy converters
21 p0108 A79-16612
The electric conductivity of a plasma of
combustion products of hydrocarbon fuels with
alkali impurity
21 p0167 A79-20415
Deposition of the conduction-enhancing alkali
metal from a fog in closed-cycle MHD generator
systems
24 p0640 A79-47573
ALKALIES
Catalytic coal gasification exploratory research
program
21 p0030 A79-10247
Advanced electrolysis in alkaline solution --- for
hydrogen production
21 p0037 A79-11798
High efficiency alkaline electrolysis technology
--- for hydrogen production
24 p0685 A79-51842
ALKALINE BATTERIES
Development and evaluation of a 600-kWh
lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095
An improved method for analysis of hydroxide and
carbonate in alkaline electrolytes containing zinc
21 p0035 A79-11546
The zinc electrode in sealed alkaline cells
21 p0040 A79-11823
Electrochemical determinations of the chemical
potential and diffusivity of sodium in Na/K/TaS2
at 300 K
21 p0040 A79-11830
Recent developments in power sources with special
emphasis on alkaline batteries --- for electric
vehicles
22 p0301 A79-29490
Ultrafine polybenzimidazole (PBI) fibers ---
separators for alkaline batteries and dfuel cells
[NASA-CR-159644] 24 p0764 N79-31350
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784
ALKANES
Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986
The effect of maturation on the configuration of
pristane in sediments and petroleum
22 p0272 A79-25375
The preparation of some novel electrolytes:
Synthesis of partially fluorinated alkane
sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483
ALKENES
Hydropyrolysis of coal derived liquids and related
model compounds
23 p0553 N79-24171
ALKYLATION
Coal anion structure and chemistry of coal
alkylation
[COO-4227-2] 21 p0170 N79-10178
ALLOCATIONS
Motor gasoline deregulation and the gasoline tilt
[DOE/EIS-0039-VOL-1] 24 p0746 N79-30399
Motor gasoline deregulation and the gasoline tilt.
Volume 2: Public comments
[DOE/EIS-0039-VOL-2] 24 p0746 N79-30401
Oil and gas supply curves for the administrator's
annual report
[DOE/EIA-0103/4] 24 p0746 N79-30406
ALPHA PARTICLES
Compact experiments for alpha-particle heating ---
of confined D-T plasma in tokamak
21 p0078 A79-14786
Alpha transport and blistering in tokamaks
22 p0253 A79-22243
Self-consistent analysis of alpha-particle heating
of a fast-solenoid plasma --- in laser fusion
22 p0291 A79-27879
The effect of thermo-electric forces on the
density profiles in a thermonuclear plasma
surrounded by a cold blanket
22 p0292 A79-27886
ALPS MOUNTAINS (EUROPE)
A micrometeorological network for study of
transport and diffusion of pollutants in two
Apennine Valleys
23 p0586 N79-26638
ALTERNATING CURRENT
Proposals for power conditioning systems of high
power communication satellites
21 p0033 A79-10897
ALTERNATIVES
Alternatives for coal based power generation - An
international overview
21 p0008 A79-10074
Coal gasification and its alternatives
21 p0071 A79-14679
ALTITUDE TESTS
Turbine engine altitude chamber and flight testing
with liquid hydrogen
[NASA-TM-79196] 23 p0587 N79-27140
ALUMINATES
A study of positive electrode materials for
batteries operating in a halide-aluminate medium
22 p0245 A79-21480
ALUMINUM
New processes for the recovery of resource
materials from coal combustion wastes
21 p0007 A79-10065
Energy analysis of an aluminum solar collector
22 p0316 A79-31405
Optical properties of aggregated gold on aluminum
24 p0669 A79-51181
Method for making an aluminum or copper substrate
panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-1] 21 p0182 N79-11469
General-purpose aluminum-air/flywheel electric
vehicles
[UCRL-82003] 23 p0564 N79-24503
Energy intensive industry for Alaska. Volume 2:
Case analysis
[TID-29025-2] 24 p0754 N79-30787
ALUMINUM ALLOYS
The structure and properties of Cu based selective
surfaces formed on an Al-Cu alloy by chemical
brightening and etching treatments --- for flat
plate solar collectors
21 p0127 A79-17384
Production and application of rolling-welded
aluminum alloy panels for solar water heaters
for hot water and cooling systems
22 p0297 A79-28670
Aluminum in solar technology
23 p0481 A79-40024
Fracture strength of thick 5083-0 aluminum alloy
for LNG storage tanks
24 p0604 A79-44537
Low-temperature, fracture properties of a USSR
aluminum-6% magnesium alloy
24 p0604 A79-44549
Fracture toughness of cryogenic alloys
24 p0604 A79-44550
Production and use of rolled-welded panels of
aluminum alloys for solar water heaters of hot
water supply and cooling systems
24 p0637 A79-46908
Erosion study of different materials affected by
coal ash particles
24 p0646 A79-48864
Design, fabrication and test of a hydrogen heat pipe
--- extruding and grooving 6063-T6 aluminum
tubes for cryogenic heat pipes
[NASA-CR-152267] 23 p0556 N79-24298
ALUMINUM ARSENIDES
Potential of GaAlAs solar cells for the global
positioning system missions
24 p0691 A79-51901
ALUMINUM COATINGS
Exposure test results for reflective materials ---
used in solar concentrators
23 p0430 A79-35068
Investigation of the spectral characteristics of
metallized polymer films for making solar
concentrators
24 p0637 A79-46910

High absorptivity Al-PbS selective surfaces for solar photothermal conversion
24 p0705 A79-52319

ALUMINUM GALLIUM ARSENIDES
The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024
Performance of a tilted solar cell under various atmospheric conditions
21 p0066 A79-14261
A high-efficiency GaAlAs double-heterostructure photovoltaic detector --- with antireflection coating
21 p0154 A79-18489
A two-junction cascade solar-cell structure
22 p0256 A79-22856
High-efficiency AlGaAs/GaAs concentrator solar cells
22 p0261 A79-23710
Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745
Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure --- heterostructure solar cell fabrication
22 p0305 A79-30258
Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180
Analysis of the efficiency of a varizone photoelectric converter
24 p0663 A79-50708

ALUMINUM OXIDES
Preparation and ionic conductivity of H3O/+/ beta alumina --- for hydrogen-oxygen fuel cells
21 p0040 A79-11821
Advanced batteries --- sodium sulfur batteries for electric motor vehicles
21 p0067 A79-14270
Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479
Spectrally selective surfaces of Ni-pigmented anodic Al2O3 --- solar energy absorbers
24 p0629 A79-46202
Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces
[PB-293238/2] 24 p0731 N79-29249

ALUMINUM SILICATES
Ceramic applications in the advanced Stirling automotive engine
21 p0051 A79-12851

AMBIENT TEMPERATURE
Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

AMBIPOLAR DIFFUSION
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357

AMMONIA
Energy storage efficiency for the ammonia/hydrogen-nitrogen thermochemical energy transfer system
22 p0261 A79-23718
Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960
Observations on the production of methanol and anhydrous ammonia from wood
23 p0386 A79-33230
Ammonia dissociation for solar thermochemical absorbers
23 p0396 A79-33765
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Modern ammonia synthesis use of hydrogen
24 p0612 A79-45581
Performance optimization of an OTEC turbine
24 p0618 A79-45793
Experimental and analytical OTEC studies at ORNL
24 p0626 A79-45859
The Seattle experience - Conversion of solid waste to fuels or chemicals
24 p0651 A79-49384
Conversion of solar energy to chemical energy using ammonia dissociation
24 p0672 A79-51746

AMMUNITION
Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743

AMORPHOUS SEMICONDUCTORS
A new amorphous silicon-based alloy for electronic applications
21 p0100 A79-16226
Amorphous semiconductors in photovoltaic and solar thermal conversion
[BNL-24216] 21 p0122 A79-17339
Characterisation of amorphous semiconductor materials for solar cell applications
21 p0123 A79-17341
The interfacial layer in MIS amorphous silicon solar cells
22 p0258 A79-23039
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149
Cast semicrystalline silicon for solar cells
[ASME PAPER 79-SOL-16] 22 p0309 A79-30550
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971
Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777
Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778
Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779
The dependence of solar cell characteristics on the electronic properties of discharge produced, hydrogenated amorphous silicon
23 p0510 A79-41007
M-I-S solar cells on amorphous silicon
23 p0510 A79-41008
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177
Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination
24 p0656 A79-50195
Monolithic solar cell panel of amorphous silicon
24 p0712 A79-53496

AMPLIFICATION
VKI Short Course on Magnetohydrodynamic Accelerators and Generators
[VKI-LECTURE-SERIES-8] 23 p0545 N79-22891

ANAEROBES
Fuel gas production from animal residue. I - Technical perspective
23 p0381 A79-32593
The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754
Methane production from manure
23 p0494 A79-40741
Liquid fuels from carbonates by a microbial system
23 p0494 A79-40742
Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371

Farm-scale generation of bio-gas
24 p0631 A79-46312
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States
[PB-286940/2] 21 p0231 N79-15440
The anaerobic attached film expanded bed reactor for the treatment of dilute organic wastes
22 p0356 N79-19928

ANALOG CIRCUITS
Temperature dependent parameter analysis of thermoelectric devices
21 p0113 A79-16740
Validation of an electric circuit model of a solar house
22 p0321 A79-31440

ANALOG SIMULATION
A contribution to evaluation of flat-plate solar collectors performance
21 p0133 A79-17427
Digital or analog modelling in the design of hydrostatic vehicular systems
22 p0264 A79-23808
Solar-cell panel simulator
22 p0265 A79-23867
Validation of an electric circuit model of a solar house
22 p0321 A79-31440
Mathematical modelling of passive solar systems
22 p0321 A79-31441

ANALYTICAL CHEMISTRY
Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513

ANCHORS (FASTENERS)
Preliminary selection of anchor systems for ocean thermal energy conversion
23 p0437 A79-35846
An overview of the OTEC-1 design --- including mooring, anchoring, site selection, installation, manufacturing, etc
24 p0625 A79-45846

ANDES MOUNTAINS (SOUTH AMERICA)
The Puchuldiza geothermal field --- hot springs in Chilean Andes mountains
23 p0408 A79-34070

ANGLE OF ATTACK
Flying angle of attack
21 p0048 A79-12384

ANGULAR DISTRIBUTION
Sun-position diagrams using examples from Flensburg to Mittenwald
21 p0055 A79-13626

ANGULAR VELOCITY
Flap-cone control of windmill speed
23 p0405 A79-34046

ANIMALS
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679

ANIONS
Coal anion structure and chemistry of coal alkylation
[COO-4227-2] 21 p0170 N79-10178

ANISOTROPY
Stability properties of an anisotropic guiding center plasma and relation with the Suydam function
23 p0438 A79-36411

ANNEALING
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685
Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C --- for space applications
24 p0668 A79-51008
Automated array assembly, phase 2 --- making ion implanted and furnace annealed solar cells
[NASA-CR-162176] 24 p0770 N79-31759
CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659
Effect of dopants on annealing performance of silicon solar cells
24 p0785 N79-32661
Annealing of radiation damage in 0.1- and 2-ohm-centimeter Silicon solar cells
[NASA-TP-1559] 24 p0798 N79-33572

ANNUAL VARIATIONS
Selection of method for calculating the parameters of wind and solar power station storage facilities
21 p0054 A79-13293
Hourly vs daily method of computing insolation on inclined surfaces
22 p0242 A79-21164
Prediction of the performance of solar heating systems utilizing annual storage
22 p0263 A79-23760
Solar radiation charts --- monthly average insolation
22 p0263 A79-23763
Hawaii solar radiation summary
23 p0398 A79-33985
Seasonal heat pump performance for a typical northern United States environment
23 p0418 A79-34153
Interannual and month-to-month variations of wind speed --- for wind turbine sites
24 p0629 A79-46221
Critique on the solar rehabilitation procedures used in SOLMET-2
24 p0708 A79-52956

ANODES
The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution --- fuel cell electrocatalysis
21 p0037 A79-11795
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397
Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries
23 p0495 A79-40749
Improved anodes for liquid hydrocarbon fuel cell
[AD-A058456] 21 p0206 N79-13504
Advanced technology light weight fuel cell program --- for space power applications
[NASA-CR-159653] 24 p0800 N79-33581

ANODIC COATINGS
Spectrally selective surfaces of Ni-pigmented anodic Al2O3 --- solar energy absorbers
24 p0629 A79-46202

ANOMALIES
Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792

ANTENNA ARRAYS
Large active retrodirective arrays for solar power satellites
21 p0107 A79-16604
Achievable flatness in a large microwave power antenna study
[NASA-CR-151831] 21 p0171 N79-10272
Microwave systems analysis, solar power satellite --- alignment of the antenna array
[NASA-CR-160091] 22 p0337 N79-16892

ANTENNA DESIGN
Microwave phased array design considerations for SPS --- Solar Powered Satellites
21 p0003 A79-10031
Large active retrodirective arrays for solar power satellites
21 p0107 A79-16604
Attitude and pointing control system for the microwave antenna of the solar power satellite
21 p0113 A79-16739
Space will be the next big construction site
22 p0268 A79-24450
Superconductivity in antenna engineering
22 p0311 A79-31008

ANTENNAS
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494
Satellite Power System (SPS) mapping of exclusion areas for rectenna sites
[NASA-CR-157435] 23 p0548 N79-23499

ANTIFRICTION BEARINGS
- Flywheel components for satellite applications [AD-A060586] 21 p0226 N79-15145

ANTIKNOCK ADDITIVES
- Fluid bed process studies on selective conversion of methanol to high octane gasoline [FE-2490-15] 23 p0555 N79-24190

ANTIMONY
- Sodium-antimony trichloride battery development program for load leveling [EPRI-EM-751] 21 p0186 N79-11501
- Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste [PB-285196/2] 21 p0213 N79-13590

ANTIMONY COMPOUNDS
- Performance of molten salt sodium/beta-alumina/SbCl3 cells 22 p0245 A79-21479

ANTIREFLECTION COATINGS
- Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells 21 p0042 A79-11955
- A high-efficiency GaAlAs double-heterostructure photovoltaic detector --- with antireflection coating 21 p0154 A79-18489
- Thin-film GaAs solar cells with grain-boundary edge passivation 23 p0436 A79-35749
- A low cost, durable anti-reflective film for solar collectors 23 p0507 A79-40983
- The surface microstructure optical properties relationship in solar absorbers - Black chrome 24 p0655 A79-50181
- Microstructure of a black chrome solar selective absorber 24 p0655 A79-50182
- Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization 24 p0656 A79-50188
- Chromium black coatings for photothermal conversion of solar energy. II - Optical properties 24 p0656 A79-50189
- Properties of chemically sprayed SnO2 antireflecting films on Si solar cells 24 p0656 A79-50196
- CVD molybdenum thin films in photothermal solar converters 24 p0704 A79-52309
- Calorimetric emissivities for solar-selective coatings on flat sheet 24 p0706 A79-52536
- Silicon Schottky photovoltaic diodes for solar energy conversion [PB-287417/0] 22 p0343 N79-17349
- Optical coatings for solar cells and solar collectors. Citations from the NTIS data base [NTIS/PS-78/1341/3] 22 p0350 N79-18465
- Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base [NTIS/PS-78/1342/1] 22 p0350 N79-18466

APERTURES
- An aperture-augmented prototype power satellite 21 p0046 A79-12268

APPLICATIONS EXPLORER SATELLITES
- Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission [E79-10274] 24 p0768 N79-31731

APPLICATIONS OF MATHEMATICS
- Energy policy and mathematics [ORAU/IEA(O)-79-5] 24 p0775 N79-31821

APPROACH CONTROL
- Procedure for flight guidance in the terminal maneuvering area for an experimental program employing a flying test device 21 p0147 A79-17680

APPROPRIATIONS
- Authorizing appropriations to the National Aeronautics and Space Administration [H-REPT-96-52] 22 p0364 N79-20928
- NASA authorization, 1980, volume 1, part 2 [GPO-46-134] 24 p0730 N79-29105
- Department of Energy FY 1980 obligations [DOE/CR-0005] 24 p0773 N79-31792

APPROXIMATION
- Isotropic distribution approximation in solar energy estimations --- diffuse insolation on tilted surface 22 p0262 A79-23753
- Combustion of coal particles in wall-burning swirl combustors --- for MHD generators 24 p0632 A79-46317
- Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma 24 p0642 A79-47804

AQUEOUS SOLUTIONS
- Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems 21 p0016 A79-10133
- Advanced electrolysis in alkaline solution --- for hydrogen production 21 p0037 A79-11798
- Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution 23 p0531 A79-42900
- Evaluation of flow properties of dilute aqueous polymer solutions for enhanced oil recovery applications 23 p0556 N79-24408

AQUICULTURE
- Solar energy conversion in marine biological systems 23 p0402 A79-34021
- Primary impacts of growing aquatic plants for energy 24 p0665 A79-50886
- Multidisciplinary research related to the atmospheric sciences [PB-283076/8] 21 p0179 N79-10679
- Geothermal resources for aquaculture [PB-290345/8] 22 p0356 N79-19563
- Overview of waste heat utilization techniques --- spray irrigation, soil heating, aquiculture and biomass production [CONF-790443-2] 24 p0791 N79-32726

AQUIFERS
- Large-scale thermal energy storage for cogeneration and solar systems --- in aquifers 21 p0092 A79-15886
- Underground aquifer storage of hot water from solar energy collectors 21 p0120 A79-17317
- Natural convection in porous media and geothermal systems 23 p0533 A79-43014

ARC DISCHARGES
- Construction of a mathematical model for MHD generator electrodes in the arc regime of operation 22 p0258 A79-23138
- Discharge characteristics of slagging metal electrodes --- magnetohydrodynamic generators 23 p0391 A79-33392
- Study of the thermal inertia of an electrode microarc 23 p0530 A79-42869
- The effects of electron thermal conductivity on thermionic energy converters 24 p0700 A79-51990

ARC GENERATORS
- Magnetic multipole line-cusp plasma generator for neutral beam injectors 22 p0238 A79-20746

ARC HEATING
- Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry [NASA-CR-159397] 21 p0183 N79-11473
- Development of a process for a high capacity arc heater production of silicon for solar arrays [NASA-CR-158745] 23 p0581 N79-26499

ARCHITECTURE
- Vacation homes near the sea with solar and wind energy utilization - Research done at the Technical University of Hannover: Architectural considerations 21 p0058 A79-13653
- Passive solar heating of buildings [LA-UR-77-1162] 21 p0090 A79-15859

Long-term thermal storage in solar architecture in northern latitudes, with reference to typical single family dwellings
21 p0119 A79-17313

Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463

Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0138 A79-17471

An earth-wrapped solar greenhouse house --- partially buried structure
21 p0140 A79-17493

Passive solar heating of buildings
22 p0275 A79-25928

Thomson Solar House I
22 p0276 A79-25936

CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940

The Philips experimental house - A system's performance study --- of solar energy utilization and energy conservation
22 p0277 A79-25941

Passive solar energy design and materials --- Book
22 p0302 A79-29625

Component cost of solar energy systems
22 p0319 A79-31429

Energy management through energy conservation in buildings
22 p0320 A79-31431

Design study on solar energy systems for commercial buildings
22 p0320 A79-31433

Solar energy retrofit system for an older-type building - The Williamstown Museum project
22 p0320 A79-31434

Designing thermally efficient buildings for the U.S. Midwest
23 p0397 A79-33951

The solar house --- overview of French designs
23 p0401 A79-34017

Theoretical considerations in the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36630

Initial experimental tests on the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36631

Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206

Traditional architecture in West Africa and passive methods of cooling in the Tropics
23 p0463 A79-38580

Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660

Summary results from the NASA Tech House one year live-in
[AIAA PAPER 79-0987] 23 p0475 A79-38892

Development of a shingle-type solar cell module
23 p0499 A79-40906

ARCTIC REGIONS

An ocean thermal difference power plant in the Canadian Arctic
22 p0318 A79-31415

Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557

Power supplies for Arctic radio repeater systems
[AD-A061609] 22 p0339 N79-17118

AREA

Optimal sizing of solar collectors by the method of relative areas
21 p0066 A79-14263

ARGON

Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897

ARGON PLASMA

A collisional plasma rotating between two cylinders
21 p0049 A79-12694

Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524

Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210

Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field
24 p0708 A79-52955

ARID LANDS

Small solar power plant with a Freon turbine
21 p0057 A79-13642

Possibilities for solar energy utilization in Egypt
21 p0102 A79-16453

Effect of dust on flat plate collectors
21 p0129 A79-17399

Solar air conditioning and refrigeration in arid regions
23 p0466 A79-38608

Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549

ARIZONA

Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380

Design of a 150 kWe distributed collector solar thermal power station
[AED-CONF-78-212-013] 23 p0583 N79-26517

ARMED FORCES

Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743

ARMED FORCES (UNITED STATES)

The potential of alternative energy sources in meeting Air Force requirements --- electrical and thermal ground power systems
23 p0420 A79-34169

USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

Energy utilization survey pamphlet for buildings
[AD-A062930] 22 p0371 N79-21624

Satellite Power System (SPS) military implications
[NASA-CR-157436] 23 p0549 N79-23500

AROMATIC COMPOUNDS

Role of aromatics in soot formation
21 p0053 A79-12988

Methane formation during the hydrogasification and the gas phase pyrolysis of defined aromatics
22 p0265 A79-23829

ARRAYS

Directional arrays of windmills
23 p0453 A79-37896

Depletion of available wind power by a large network of wind generators
23 p0453 A79-37899

Wake interaction in an array of windmills - Theory and preliminary results
23 p0483 A79-40112

Limits to wind-power
24 p0708 A79-52951

A 10-kilowatt photovoltaic concentrator array
[SAND-78-7024] 23 p0598 N79-27699

ARTIFICIAL SATELLITES

Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334

ASHES

Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077

The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants
21 p0009 A79-10078

Ash deposits and corrosion due to impurities in combustion gases; Proceedings of the International Conference, New England College, Henniker, N.H., June 26-July 1, 1977
21 p0080 A79-14926

Modification of electrostatic precipitator performance by use of fly-ash conditioning agents
[ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736

On the dynamics of electrostatically precipitated fly ash
[ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787
Oxidation of SO2 on the surface of fly ash particles under low relative humidity conditions
22 p0277 A79-26038
A model for coal fly ash filtration
22 p0296 A79-28389
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864
Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743

ASPECT RATIO
Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409

ASPHALT
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453
Kinetics of coal liquefaction to preasphaltenes, asphaltenes and oils
23 p0588 N79-27320

ASSEMBLING
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534

ASSESSMENTS
Citizens' solar program: State reports on barriers and strategies to renewable energy development
[HCP/U6308-01] 23 p0598 N79-27703
Ten scenarios of transportation energy conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647

ASTIGMATISM
Optical analysis of solar facility heliostats
22 p0296 A79-28360

ASTRODYNAMICS
Dynamics of stepping of the Hermes flexible solar array
22 p0323 A79-31615

ASTRONAUTICS
Space to benefit mankind - 1980 to 2000
[IAF PAPER 79-206] 24 p0710 A79-53356

ASTRONOMICAL MODELS
Insolation modeling overview
[SAND-78-0963] 24 p0726 N79-28768

ASTRONOMICAL OBSERVATORIES
Installation package for Hyde Memorial Observatory, Lincoln, Nebraska
[NASA-CR-150867] 22 p0334 N79-16373

ASYMMETRY
The place of extreme asymmetrical non-focussing concentrators in solar energy utilization
21 p0149 A79-18024

ASYMPTOTIC METHODS
Asymptotic behaviour as a guide to the long term performance of solar water heating systems
21 p0041 A79-11872
Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces --- in toroidal plasmas
22 p0270 A79-24855
Two asymptotic solutions for analyzing the transverse edge effect in induction MHD machines
22 p0298 A79-29287
Two limiting solutions for the analysis of transverse edge effects in MHD induction machines
24 p0663 A79-50777

ATLANTIC OCEAN
A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine
22 p0323 A79-31554
Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants
24 p0621 A79-45816
Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796
ERDA'S oceanographic program for the mid-Atlantic coastal region --- impact of offshore energy development on coastal ecology
[BNL-24016] 21 p0192 N79-11641
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837

ATMOSPHERIC ATTENUATION
Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models
21 p0065 A79-14117
Direct solar transmittance for a clear sky --- for insolation of solar conversion systems
22 p0296 A79-28361
A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723
Atmospheric attenuation of centimeter microwaves
[AIAA PAPER 79-1423] 23 p0427 A79-34849
Conservation of satellite transmitter energy with propagation and demand variations
23 p0493 A79-40587
Predicting solar energy fluxes in polluted urban areas
24 p0671 A79-51732
Critique on the solar rehabilitation procedures used in SOLMET-2
24 p0708 A79-52956

ATMOSPHERIC BOUNDARY LAYER
Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539
Frequency distribution of wind speed near the surface
21 p0165 A79-20139
Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana
23 p0534 A79-43370
Limits to wind-power
24 p0708 A79-52951
Wind engineering research digest, volume 3, 1978 --- a bibliography of ongoing research projects
[PB-290694/9] 23 p0567 N79-24621

ATMOSPHERIC CHEMISTRY
Oxidation of SO2 on the surface of fly ash particles under low relative humidity conditions
22 p0277 A79-26038
The extent of catalytic SO2 reactions in smoke plumes
24 p0616 A79-45748
Nitrogen oxide air pollution. Part 3: Atmospheric chemistry. A bibliography with abstracts
[NTIS/PS-78/0973/4] 21 p0199 N79-12593

ATMOSPHERIC CIRCULATION
The regulation of an electricity supply system including wind energy generators
23 p0485 A79-40130
Analysis of the potential of wind energy conversion systems
[SAND-78-2099C] 23 p0595 N79-27668

ATMOSPHERIC COMPOSITION
On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052
The effects of different energy strategies on the atmospheric CO2 concentration and climate
21 p0106 A79-16523
The atmospheric CO2 consequences of heavy dependence on coal
21 p0107 A79-16524
The problem of carbon dioxide --- fossil fuel consumption effect on air pollution
23 p0438 A79-36201
Studies of different energy strategies in terms of their effects on the atmospheric CO2 concentration
23 p0495 A79-40796

The natural and perturbed troposphere 21 p0179 N79-10636
Air monitoring network design for power plant siting 23 p0591 N79-27590
Uncertainties associated with global effects of atmospheric carbon dioxide [ORAU/IEA-79-6(0)] 24 p0803 N79-33699

ATMOSPHERIC DIFFUSION
Symposium on Turbulence, Diffusion, and Air Pollution, 4th, Reno, Nev., January 15-18, 1979, Preprints 23 p0534 A79-43351
Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana 23 p0534 A79-43370
A numerical study of the effects of complex terrain on dynamics of airflow and pollutant dispersion 23 p0535 A79-43383

ATMOSPHERIC EFFECTS
Climatic change in connection with energy growth --- resource consumption effects 22 p0284 A79-26623
Meteorological effects on Schottky-barrier solar cells 23 p0441 A79-36781
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement [NASA-TM-79719] 22 p0345 N79-17897

ATMOSPHERIC ENERGY SOURCES
Thermal gradient-hydro generation cycle /TGUC/ 21 p0098 A79-16102
Clean energy from humid air --- conversion into electric power 23 p0406 A79-34053
A contribution to solution of the energy crisis - Proposed solution: Aerothermal plants 23 p0465 A79-38594
Studies of different energy strategies in terms of their effects on the atmospheric CO2 concentration 23 p0495 A79-40796
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy 24 p0713 A79-53545

ATMOSPHERIC MODELS
A probabilistic model of insolation for the Mojave desert-area 21 p0076 A79-14766
The effects of different energy strategies on the atmospheric CO2 concentration and climate 21 p0106 A79-16523
Determining the terrestrial, incident solar flux on an arbitrarily oriented surface using available solar/weather data 21 p0119 A79-17310
Stochastic simulation experiments on solar air conditioning systems 21 p0138 A79-17474
A study of long range air pollution problems related to coal development in the Northern Great Plains 24 p0612 A79-45538
Limits to wind-power 24 p0708 A79-52951
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy 24 p0713 A79-53545

ATMOSPHERIC MOISTURE
Clean energy from humid air --- conversion into electric power 23 p0406 A79-34053

ATMOSPHERIC OPTICS
Dependence of solar radiation availability on atmospheric turbidity 21 p0119 A79-17308

ATMOSPHERIC PRESSURE
Flow modeling of an atmospheric pressure, entrained-type coal gasifier 22 p0280 A79-26188
The distributed flow, below atmospheric pressure solar collector 24 p0631 A79-46314

ATMOSPHERIC RADIATION
Determining the terrestrial, incident solar flux on an arbitrarily oriented surface using available solar/weather data 21 p0119 A79-17310

ATMOSPHERIC SCATTERING
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion 21 p0082 A79-15077

ATMOSPHERIC TEMPERATURE
Computation of IR sky temperature and comparison with surface temperature --- for solar collector energy budgets 21 p0042 A79-11875
Power generation using thermal vapor pumping and hydro-pumped storage - Thermal gradient utilization cycle /TGUC/ 21 p0095 A79-15914
Thermal gradient-hydro generation cycle /TGUC/ 21 p0098 A79-16102
The influence of environmental parameters on flat plate solar collector performance 24 p0604 A79-44557

ATMOSPHERIC TURBULENCE
Analysis of wind turbine generator rotor response to one-dimensional turbulence 21 p0077 A79-14768
Atmospheric turbulence structure in relation to wind generator design 23 p0483 A79-40114
Symposium on Turbulence, Diffusion, and Air Pollution, 4th, Reno, Nev., January 15-18, 1979, Preprints 23 p0534 A79-43351

ATOM CONCENTRATION
A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a 22 p0255 A79-22379

ATOMIC EXCITATIONS
Heat transport near the wall of a tokamak reactor 22 p0324 A79-31764

ATOMIC SPECTRA
Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges 23 p0478 A79-39676

ATOMIC STRUCTURE
Electronic structure and physical properties of Ti-H and Zr-H using NMR 22 p0248 A79-21685

ATOMIZING
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors 21 p0052 A79-12982
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters [ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742

ATTITUDE (INCLINATION)
Performance of a tilted solar cell under various atmospheric conditions 21 p0066 A79-14261
Tilt, orientation and overshadowing of solar collectors in the Netherlands 21 p0131 A79-17414
Optimum tilt for the flat plate collector 21 p0132 A79-17426
Variation of solar cell sensitivity and solar radiation on tilted surfaces 23 p0512 A79-41023
Relative effective solar space heating over the United States obtained from southward-tilted solar collectors [PB-292963/6] 23 p0565 N79-24513
Global radiation on randomly oriented and inclined surfaces in Austria [ASSA-SE-INFO-7/78] 23 p0574 N79-25528

AUGER SPECTROSCOPY
Study of the interaction of H2O and O2 with the surface of TiO2 by electron stimulated desorption and Auger and characteristic loss spectroscopies 21 p0037 A79-11793
Chemical origin of the space-charge layer in cuprous oxide front-wall solar cells 23 p0424 A79-34530

Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054

AURORAL IONIZATION

Solar Power Satellite beam disturbance of the upper ionosphere
[AIAA PAPER 79-1422] 23 p0426 A79-34848

AUSTENITIC STAINLESS STEELS

Fracture toughness of cryogenic alloys
24 p0604 A79-44550

Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321
24 p0662 A79-50548

AUSTRIA

Austrian 10kWE solar power plant. A project of the Federal Ministry for Science and Research
22 p0349 N79-18460

Solar energy Measuring stations in Austria: Results and experiences
[ASSA-SE-INFO-6/78] 23 p0574 N79-25527

Thermal utilization of solar energy in Austria. Part 1: Hot water preparation, swimming pool and space heating
23 p0574 N79-25529

Solar stream in Austria
23 p0574 N79-25530

AUTOCLAVING

Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies
22 p0282 A79-26465

AUTOMATIC CONTROL

Control of solar energy systems, heat storage, and heat utilization
21 p0056 A79-13630

Field testing of 5-kW commercial wind generator with an automatic load-matching device for utilizing its output
21 p0143 A79-17515

Computer based sun following system
22 p0242 A79-21165

Stability of work and sensitivity of semiconductor thermoelectric systems under automatic control
22 p0261 A79-23624

An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871

Flap-cone control of windmill speed
23 p0405 A79-34046

MOD-1 wind turbine generator program status report
24 p0634 A79-46538

Cuttyhunk Island installation, WTG Energy Systems, Inc., MP1-200 control system design --- Wind Turbine Generator
24 p0634 A79-46539

Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274

Automatic phase control in solar power satellite systems
[NASA-CR-151856] 21 p0194 N79-12130

Microprocessor control of a wind turbine generator
[NASA-TM-79021] 21 p0195 N79-12548

Phase 1 of the automated array assembly task of the low cost silicon solar array project
[NASA-CR-158120] 22 p0348 N79-18451

Proceedings of the distribution automation and control working group. Volume 1: Executive summary
[NASA-CR-158642] 23 p0555 N79-24259

Automated solar panel assembly line. LSA task; production processes and equipment
[NASA-CR-158671] 23 p0559 N79-24455

Array automated assembly, phase 2
[NASA-CR-158728] 23 p0561 N79-26498

Automatic tension control for winding superconducting coils --- conferences
[Y/EN-257] 24 p0734 N79-29384

Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157] 24 p0770 N79-31763

Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074

AUTOMATIC TEST EQUIPMENT

Evaluation of battery performance using computer controlled test equipment
24 p0683 A79-51828

AUTOMATION

An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871

Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000

Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773

AUTOMOBILE ENGINES

Some problems and benefits from the hydrogen fueled spark ignition engine
21 p0016 A79-10130

Combined cycle gas turbine for an automobile application
21 p0019 A79-10157

Conceptual design of a variable displacement Stirling engine for automotive propulsion
21 p0025 A79-10207

Mechanical efficiency of the Stirling cycle machine with rhombic drive
21 p0025 A79-10208

The propulsion of vehicles by a flywheel
21 p0031 A79-10452

Ceramic components for vehicular gas turbines
21 p0034 A79-11150

Effect of inlet temperature on the performance of a catalytic reactor
21 p0035 A79-11542

Automotive engines - A viable alternative for aircraft
21 p0047 A79-12379

Designing and testing Si3N4 turbine components at Mercedes-Benz
21 p0050 A79-12830

Development of ceramic parts for a truck gas turbine at MTU
21 p0050 A79-12831

Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design
21 p0050 A79-12850

Ceramic applications in the advanced Stirling automotive engine
21 p0051 A79-12851

Correlations of catalytic combustor performance parameters
21 p0081 A79-14956

The influence of lead compounds on automotive exhaust catalysts
21 p0116 A79-17253

Real-time, continuous measurement of automotive sulfuric acid emissions
21 p0156 A79-19359

Influences on exhaust emissions from automotive gas turbines
[ASME PAPER 78-GT-85] 22 p0255 A79-22338

Digital or analog modelling in the design of hydrostatic vehicular systems
22 p0264 A79-23808

Optimization of a novel hydrostatic drive performance using hybrid computing technique --- for automobile engines
22 p0264 A79-23809

Measured effects of flow leakage on the performance of the GT-225 automotive gas turbine engine
[ASME PAPER 79-GT-3] 22 p0306 A79-30502

A multivariable controller for an automotive gas turbine
[ASME PAPER 79-GT-73] 22 p0307 A79-30537

Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

Air bearing development for a GM automotive gas turbine
[SAE PAPER 790107] 22 p0314 A79-31355

Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356

Some design considerations of automotive gas turbines
[SAE PAPER 790128] 22 p0314 A79-31360

Field experience with the Detroit Diesel Allison
404/505 industrial gas turbine engines
[SAE PAPER 790129] 22 p0314 A79-31361
Initial comparison of single cylinder Stirling
engine computer model predictions with test
results
[SAE PAPER 790327] 22 p0315 A79-31368
An air/fuel control system for the Stirling engine
[SAE PAPER 790328] 22 p0315 A79-31369
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370
A one-dimensional combustion model for a dual
chamber stratified charge spark ignition engine
[SAE PAPER 790355] 22 p0315 A79-31371
Emissions and economy potential of prechamber
stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374
A new combustion system in the three-valve
stratified charge engine
[SAE PAPER 790439] 22 p0316 A79-31376
Analytical consideration of fuel economy and
dynamic response of a regenerative high
temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396
Gaseous, particulate, and smoke emissions from a
heavy duty automotive gas turbine engine
23 p0522 A79-41154
NOx formation with various combustion processes of
premixed gas
23 p0528 A79-42220
Regenerator matrices for automotive gas turbines
23 p0532 A79-42981
Annular diffuser performance for an automotive gas
turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790
Design and development of a low emission combustor
for a car gas turbine
[ASME PAPER 78-GT-155] 24 p0605 A79-44793
A thermal energy storage system for a Stirling
engine powered highway vehicle
24 p0680 A79-51803
Design characteristics of an advanced Stirling
engine concept
24 p0690 A79-51889
A variable angle wobble plate drive for a stroke
controlled Stirling engine
24 p0690 A79-51890
US Army/Environmental Projection Agency re-refined
engine oil program
[AD-A056806] 21 p0171 N79-10216
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435
Computer modeling of automotive engine combustion
[UCRL-80451] 21 p0181 N79-11412
Study of heat engine/flywheel: Hybrid propulsion
configuration with electrical transmission
system. Phase 2: Design definition
[ALO-41/2] 21 p0185 N79-11493
The stirling engine for vehicle propulsion
[NASA-TM-75442] 21 p0195 N79-12547
The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370
Investigation of turbo-dyne energy chamber (G:R:
value trademark): An air bleed device
[PB-285381/0] 21 p0217 N79-14397
Air quality assessment of particulate emissions
from diesel-powered vehicles
[PB-286172/2] 21 p0223 N79-14641
Performance characteristics of automotive engines
in the United States. First Series: Report No.
14 1975 Mazda Rotary 79 CID (1.1 Liters), 4V ---
fuel consumption and emissions
[PB-286074/0] 21 p0226 N79-15304
Performance characteristics of automotive engines
in the United States. First series: Report no.
15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305
Performance characteristics of automotive engines
in the United States. Second series: Report
no. 5 1977 Ford 140 CID (2.3 liters), 2V ---
fuel consumption and exhaust gases
[PB-286076/5] 21 p0227 N79-15306
Performance characteristics of automotive engines
in the United States Third series: Report No. 1
1977 Volvo 130 CID (2.1 liters), F.I. --- fuel
consumption and exhaust gases
[PB-286077/3] 21 p0227 N79-15307
Performance characteristics of automotive engines
in the United States. Second series, report no.
4: 1976 Chevrolet 85 CID (1.4 liters), IV
[PB-286294/4] 21 p0227 N79-15308
Performance characteristics of automotive engines
in the United States. Second series, report no.
6: 1976 Nissan diesel 198 CID (3.2 liters), F. I.
[PB-286295/1] 21 p0227 N79-15309
Performance characteristics of automotive engines
in the United States. Second series, report no.
7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310
Performance characteristics of automotive engines
in the United States. First series, report no.
16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311
Performance characteristics of automotive engines
in the United States. First series, report no.
17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312
Performance characteristics of automotive engines
in the United States. First series, report no.
18: 1976 Ford CID (6.6 liters), 2V --- fuel
consumption and exhaust gases
[PB-286299/3] 21 p0227 N79-15313
Performance characteristics of automotive engines
in the United States. First series, report no.
20: 1975 Chevrolet 350 CID (5.7 liters) with
dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315
Update of development on the new Audi NSU rotary
engine generation --- for application to
aircraft engines
22 p0329 N79-15965
Cold-air performance of free power turbine
designed for 112-kilowatt automotive gas-turbine
engine. 2: Effects of variable
stator-vane-chord setting angle on turbine
performance
[NASA-TM-78993] 22 p0345 N79-17859
Evaluation of ceramics for stator application:
Gas turbine engine report
[NASA-CR-159533] 22 p0364 N79-21075
Performance characteristics of automotive engines
in the United States. Third series: Report no.
2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411
Conceptual design study of an automotive Stirling
reference engine system
[NASA-CR-159605] 24 p0730 N79-29110
Preliminary design analysis of the quasi-electric
drive vehicle --- with an improved lead acid
battery for extended range
[UCRL-52613] 24 p0731 N79-29116
Conceptual design study of an Improved Gas Turbine
(IGT) powertrain
[NASA-CR-159604] 24 p0762 N79-31087
Conceptual design study of improved automotives
gas turbine powertrain
[NASA-CR-159580] 24 p0762 N79-31088
Single shaft automotive gas turbine engine
characterization test
[NASA-CR-159654] 24 p0778 N79-32129

AUTOMOBILE FUELS

The status of alcohol fuels utilization technology
for highway transportation
21 p0003 A79-10035
Vehicle operation on fuels from solar energy
21 p0059 A79-13663
Federal automobile fuel economy standards - A
status report
21 p0073 A79-14693
An air-modulated fluidic fuel-injection system ---
automobile fuel management
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766
Applications of metal hydrides --- emphasizing use
as energy storage media
22 p0251 A79-21715
The development of alternate combustibles for
diesel engines
23 p0385 A79-33227
Optimum design of automotive vehicles employing
alternate energy sources of low energy density -
Impact on selection of an energy-carrier for
future urban vehicle transportation systems
23 p0415 A79-34128
A technological and economic study of the
distribution of hydrogen for motor vehicles
23 p0447 A79-37774

Methanol decomposition bottoming cycle for IC engines
[SAE PAPER 790427] 23 p0495 A79-40774
Assessment of hydrogen-fueled intercity trucking and rail transportation
24 p0615 A79-45601
Hydrocarbons in ambient air. I - A statistical estimation of automobile hydrocarbons by factor analysis
24 p0646 A79-48376
Synthetic fuels program --- in California for automotive transportation
24 p0651 A79-49385
Cryogenic hydrogen storage and refueling for automobiles
24 p0686 A79-51846
Survey of liquid hydrogen container technology for highway vehicle fuel system applications
24 p0686 A79-51850
Gasohol for energy production --- Book
24 p0713 A79-53724
Denaturants for ethanol/gasoline blends
[HCP/M2098-01] 21 p0180 N79-11237
Automotive Stirling engine development program
[NASA-CR-159436] 21 p0181 N79-11406
Identification of probable automotive fuels consumption: 1985-2000, executive summary
[HCP/W3684-01/2] 21 p0194 N79-12249
Status of alcohol fuels utilization technology for highway transportation
[HCP/M2923-01] 21 p0201 N79-13190
Identification of probable automotive fuels composition: 1985-2000
[HCP/W3684-01/1] 21 p0201 N79-13191
The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370
Motor gasolines, summer 1978
[BETC/PPS-79/1] 23 p0555 N79-24189
Fluid bed process studies on selective conversion of methanol to high octane gasoline
[FE-2490-15] 23 p0555 N79-24190
National motor gasoline surveys: A key source of fuel trend data
[BETC/RI-78/16] 23 p0568 N79-25248
An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249
Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412
Hydrogen storage devices for automobiles
[BNL-25263] 23 p0583 N79-26518
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337
Hydrogen-fueled postal vehicle performance evaluation
[NASA-CR-158811] 24 p0730 N79-29106
Electric hybrid vehicles focus group research
[DOE/TIC-10009] 24 p0745 N79-30107
Fact sheet: Forecasted automobile gasoline consumption
[DOE/EIA-0102/1] 24 p0746 N79-30402
Ethanol/gasoline blends as automotive fuel
[BETC/RI-79/2] 24 p0767 N79-31423

AUTOMOBILES
Motor vehicle lead emissions in the United States - An analysis of important determinants, geographic patterns and future trends
21 p0113 A79-16745
Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies
24 p0714 A79-54278
Electric automobiles. Citations from the NTIS data base
[NTIS/PS-78/0880/1] 21 p0171 N79-10363
Electric automobiles, volume 2. Citations from the engineering index data base
[NTIS/PS-78/0881/9] 21 p0172 N79-10364
Effects of low ambient temperature on the exhaust emissions and fuel economy of 84 automobiles in Chicago
[PB-288400/5] 22 p0355 N79-19488
Exhaust emissions and fuel economy from automobiles using alcohol/gasoline blends under high-altitude conditions
[PB-290612/1] 23 p0555 N79-24191
Automotive Fuel Economy Contractor's Coordination Meeting
[PB-290516/4] 23 p0556 N79-24358
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930
Evaluation of automobile drivetrain components to improve fuel economy
[PB-293728/2] 24 p0720 N79-28594
Alternate engines: State of the art study
[PB-293940/3] 24 p0720 N79-28596
Stirling engines for automobiles
[NASA-TM-79222] 24 p0723 N79-28726
Electric hybrid vehicles focus group research
[DOE/TIC-10009] 24 p0745 N79-30107
Technology assessment of changes in the future use and characteristics of the automobile transportation system. Summary and findings
[PB-293645/8] 24 p0762 N79-31105
Technology assessment of changes in the future use and characteristics of the automobile transportation system, volume 2
[PB-293646/6] 24 p0762 N79-31106
Modification and evaluation of a small station wagon designed for transportation of the handicapped
[PB-295106/9] 24 p0763 N79-31107

AUTOROTATION
Lag damping in autorotation by a perturbation method --- for rigid rotor blades
[AHS 78-25] 21 p0152 A79-18151

AUXILIARY POWER SOURCES
Partial energy supply to electric vehicles through solar cell system
21 p0077 A79-14767
The interface with solar - Alternative auxiliary supply systems --- for solar space heating
21 p0137 A79-17468
Design and development of a monorotor gas turbine auxiliary power unit
[ASME PAPER 78-WA/GT-2] 21 p0160 A79-19791
Multiple section Minto Wheel driven by heat recovery from flue, steam, and return pipes of household heating systems /plus solar heat/
23 p0417 A79-34146
Development of a high energy storage flywheel module
[AD-A060351] 21 p0230 N79-15413
Integrated power unit
[AD-A066543] 23 p0569 N79-25396
SOAR (solar assisted reactor) power system
[BNL-25633] 24 p0772 N79-31787

AXES OF ROTATION
Vertical axis wind turbine status
21 p0143 A79-17516

AXIAL FLOW
Performance prediction methods for horizontal axis wind turbines
21 p0045 A79-12244

AXIAL FLOW PUMPS
Characteristics of a fully reversible axial pump-turbine for application in tidal power plants
23 p0450 A79-37868

AXIAL FLOW TURBINES
Low head power generation with bulb turbines --- hydroelectric installations
21 p0074 A79-14705
Operational characteristics of MHD turbine with air-core superconducting rotor
22 p0297 A79-28924
An axial-flow wind-turbine with delta-wing blades
23 p0405 A79-34044
Characteristics of a fully reversible axial pump-turbine for application in tidal power plants
23 p0450 A79-37868
Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance
[NASA-TM-78993] 22 p0345 N79-17859

AXIAL LOADS
Axial field limitations in MHD generators
[FE-2341-8] 22 p0362 N79-20512

AXISYMMETRIC BODIES
Optimal geometries for one- and two-faced symmetric side-wall booster mirrors --- for solar collectors
21 p0149 A79-18019

AZO COMPOUNDS
Merocyanine organic solar cells
21 p0165 A79-20216

B

BACKSCATTERING
Effects of nonlinear decay of backscattered light on the anomalous reflectivity --- in laser plasmas
22 p0310 A79-30742

BACKUPS
Distributed energy storage for solar applications
22 p0317 A79-31410

Off-peak electrical backup experience in the Meadowvale Solar Experiment
22 p0318 A79-31421

BACTERIA
Ultrasonic detection of microbial slime films --- on OTEC heat exchanger tubes
24 p0620 A79-45807

Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665

Photobiological production of hydrogen: A solar energy conversion option --- hydrogen metabolism in photosynthetic bacteria and algae
[SERI/TR-33-122]
24 p0767 N79-31022

BALL BEARINGS
Performance of retainerless bearings for flywheels
24 p0678 A79-51786

BALL LIGHTNING
Thermonuclear energy from ball lightning
24 p0696 A79-51957

BALLOON FLIGHT
Results of the 1978 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-162298]
24 p0782 N79-32635

BALLOON-BORNE INSTRUMENTS
Weightless solar energy collection
23 p0385 A79-33215

BAND STRUCTURE OF SOLIDS
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889

BARIUM
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

BARIUM OXIDES
Energy storage using the reversible oxidation of barium oxide
22 p0242 A79-21169

BARRIER LAYERS
Barrier heights and interfacial effects in SnO2/Si solar cells
23 p0505 A79-40965

Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985

BASES (CHEMICAL)
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2]
24 p0748 N79-30689

BATCH PROCESSING
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2]
23 p0550 N79-27342

BATTERY CHARGERS
A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215]
24 p0723 N79-28728

BAYS (TOPOGRAPHIC FEATURES)
A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine
22 p0323 A79-31554

Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866

BEACHES
Application of remote sensing to state and regional problems
[E79-10196]
23 p0569 N79-25446

BEAM SPLITTERS
Multicolor solar cell power system for space
21 p0108 A79-16611

BEAMS (RADIATION)
Distribution of beam radiation of the receiver plane of a CPC solar concentrator --- Compound Parabolic Concentrators
21 p0135 A79-17451

A profile of power transmission by microwaves
23 p0427 A79-34987

A power transmission concept for a European SPS system
24 p0712 A79-53487

BEARINGS
Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785

Development of a satellite flywheel family operating on one active axis magnetic bearings
22 p0366 N79-21392

BEAUFORT SEA (NORTH AMERICA)
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5]
23 p0546 N79-22970

Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3]
23 p0546 N79-22971

Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems --- eskimos
[PB-291918/1]
23 p0546 N79-22972

BEDS (GEOLOGY)
Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401

Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409

BEDS (PROCESS ENGINEERING)
Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983

The anaerobic attached film expanded bed reactor for the treatment of dilute organic wastes
22 p0356 N79-19928

BEHAVIOR
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 6. End-use energy conservation data base and scenarios
[LBL-7896-PT-6]
24 p0758 N79-30818

BENDING
Lag damping in autorotation by a perturbation method --- for rigid rotor blades
[AHS 78-25]
21 p0152 A79-18151

BENDING FATIGUE
Absence of bending effects on solar-receiver-tube fatigue
23 p0537 A79-43682

BENDING MOMENTS
Design of a D-shaped toroidal field coil
21 p0156 A79-19083

BENDING VIBRATION
A limiting mechanism for the heave induced Mathieu type instability of a cold water pipe --- for OTEC plant
24 p0621 A79-45813

BENEFICIATION
Beneficiation of lignites
21 p0146 A79-17642

BERYLLIUM OXIDES
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide --- tokamak wall materials
23 p0444 A79-36893

BESSEL FUNCTIONS
Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41981

BETA PARTICLES
Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034

BIBLIOGRAPHIES
Bibliographic and numeric data bases for fiber composites and matrix materials
21 p0114 A79-16984

Energy related mathematical models - Annotated bibliography
21 p0154 A79-18472
Heat transfer - A review of 1977 literature
21 p0155 A79-18973
Electric automobiles. Citations from the NTIS data base
[NTIS/PS-78/0880/1] 21 p0171 N79-10363
Electric automobiles, volume 2. Citations from the engineering index data base
[NTIS/PS-78/0881/9] 21 p0172 N79-10364
Energy conservation: Policies, programs and general studies. A bibliography with abstracts
[NTIS/PS-78/0693/8] 21 p0176 N79-10552
Solar ponds. Citations from the NTIS data base
[NTIS/PS-78/0836/3] 21 p0176 N79-10553
Solar ponds. Citations from the engineering index data base
[NTIS/PS-78/0837/1] 21 p0176 N79-10554
Solar energy concentrator design and operation. Citations from the NTIS data base
[NTIS/PS-78/0838/9] 21 p0178 N79-10566
Technology assessment, volume 2. A bibliography with abstracts
[NTIS/PS-78/0830/6] 21 p0179 N79-10951
Electric batteries. A bibliography
[TID-3361] 21 p0184 N79-11491
Design and applications of flywheels. Citations from the NTIS data base
[NTIS/PS-78/0997/3] 21 p0190 N79-11550
Design and applications of flywheels. Citations from the engineering index data base
[NTIS/PS-78/0998/1] 21 p0190 N79-11551
Energy policy and research planning, volume 2. A bibliography with abstracts
[NTIS/PS-78/0961/9] 21 p0191 N79-11552
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-78/0962/7] 21 p0191 N79-11553
Nitrogen oxide air pollution. Volume 2, part 1: Control technology. A bibliography with abstracts
[NTIS/PS-78/0971/9] 21 p0199 N79-12591
Nitrogen oxide air pollution. Part 3: Atmospheric chemistry. A bibliography with abstracts
[NTIS/PS-78/0973/4] 21 p0199 N79-12593
Solar space heating and air conditioning, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1014/6] 21 p0211 N79-13545
Solar space heating and air conditioning volume 3. Citations from the NTIS data base
[NTIS/PS-78/1015/3] 21 p0211 N79-13546
Solar space heating and air conditioning, volume 3. Citations from the engineering index data base
[NTIS/PS-78/1017/9] 21 p0211 N79-13547
Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549
Solar space heating and air conditioning, volume 2. Citations from the engineering index data base
[NTIS/PS-78/1016/1] 21 p0212 N79-13550
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-78/0840/5] 21 p0212 N79-13551
An annotated compilation of the sources of information related to the usage of electricity in non-industrial applications
[PB-285260/6] 21 p0212 N79-13552
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1114/8] 21 p0212 N79-13554
Silicon solar cells, volume 3. Citations from the NTIS data base
[NTIS/PS-78/1115/1] 21 p0212 N79-13555
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1116/9] 21 p0212 N79-13556
Solar electric power generation, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1108/6] 21 p0212 N79-13557
Solar electric power generation, volume 2. Citations from the Engineering Index data base
[NTIS/PS-78/1109/4] 21 p0212 N79-13558
FY 1978 scientific and technical reports, articles, papers, and presentations --- bibliography
[NASA-TM-78203] 21 p0214 N79-13915
Combined cycle power generation. Citations from the NTIS data base
[NTIS/PS-78/1156/5] 21 p0222 N79-14587
Combined cycle power generation. Citations from the Engineering Index data base
[NTIS/PS-78/1157/3] 21 p0222 N79-14588
Cadmium sulfide solar cells. Citations from the NTIS data base
[NTIS/PS-78/1213/4] 21 p0231 N79-15436
Cadmium sulfide solar cells. Citations from the Engineering Index Data base
[NTIS/PS-78/1214/2] 21 p0231 N79-15437
Cryogenic refrigeration, volume 2. A bibliography with abstracts
[NTIS/PS-78/1261/3] 22 p0331 N79-16144
Cryogenic refrigeration, volume 3. A bibliography with abstracts
[NTIS/PS-78/1262/1] 22 p0331 N79-16145
Oil pollution reports, volume 5, number 2 --- bibliographies
[PB-287071/5] 22 p0336 N79-16437
Solar water pumps. Citations from the Engineering Index data base
[NTIS/PS-78/1288/6] 22 p0343 N79-17348
Optical coatings for solar cells and solar collectors. Citations from the NTIS data base
[NTIS/PS-78/1341/3] 22 p0350 N79-18465
Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base
[NTIS/PS-78/1342/1] 22 p0350 N79-18466
Synthetic fuels: Methane. Citations from the Engineering Index data base
[NTIS/PS-79/0030/1] 22 p0365 N79-21223
Hydrogen energy. A bibliography with abstracts
[NASA-CR-157962] 23 p0540 N79-22613
Solar thermal power generation. A bibliography with abstracts
[NASA-CR-158004] 23 p0540 N79-22614
Heat pipe technology. A bibliography with abstracts
[NASA-CR-158005] 23 p0546 N79-23364
Corrosion of stainess steel, volume 2. A bibliography with abstracts
[NTIS/PS-79/0208/3] 23 p0553 N79-24143
Wind engineering research digest, volume 3, 1978 --- a bibliography of ongoing research projects
[PB-290694/9] 23 p0567 N79-24621
Heat pipes, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0299/2] 23 p0569 N79-25360
Heat pipes volume 3. Citations from the NTIS data base
[NTIS/PS-79/0298/4] 23 p0569 N79-25361
Solar thermal components: A bibliography with abstracts
[NASA-CR-158699] 23 p0570 N79-25479
Solar thermal heating and cooling: A bibliography with abstracts
[NASA-CR-158693] 23 p0570 N79-25480
Forecasts of energy technology. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0337/0] 23 p0575 N79-25531
Solar energy for agricultural and industrial process heat
[DOE/CS-0053] 23 p0597 N79-27688
Bibliography of subsidence and related topics for in situ coal gasification
[LETC/RL-71316-1] 24 p0733 N79-29373
A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining
[PB-294299/3] 24 p0735 N79-29584
DOE/STOR bibliography for flywheel energy systems, 1977
[UCRL-52637] 24 p0742 N79-29665
Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224) --- bibliographies
[PB-294342/1] 24 p0743 N79-29671
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362)
[PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes
[PB-294952/7] 24 p0743 N79-29673
Energy information data base. Serial titles, supplement 3 --- bibliographies
[TID-4579-R10-SUPPL-3] 24 p0745 N79-30088

Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413
Energy conservation via heat transfer enhancement --- bibliographies
[COO-4649-3] 24 p0758 N79-30819
Pollution and environmental aspects of fuel conversion. A bibliography with abstracts
[NTIS/PS-79/0378] 24 p0761 N79-30857
Hydrogen production, volume 1. A bibliography with abstracts
[NTIS/PS-79/0540/9] 24 p0765 N79-31406
Hydrogen production, volume 2. A bibliography with abstracts --- by electrolysis and coal gasification
[NTIS/PS-79/0541/7] 24 p0765 N79-31407
Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433
Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0546/6] 24 p0767 N79-31434
Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0547/4] 24 p0767 N79-31435
Passive solar design: An extensive bibliography
[HCP/CS-4113-3] 24 p0774 N79-31804
Wind power, volume 2. Citations from the NTIS data base --- bibliographies
[NTIS/PS-79/0534/2] 24 p0777 N79-31836
Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837
Wind power, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0536/7] 24 p0777 N79-31838
Transportation systems center bibliography of technical reports
[PB-296342/9] 24 p0794 N79-33107
Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341
Alcohol fuels, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0713/2] 24 p0795 N79-33342
Alcohol fuels, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0712/4] 24 p0795 N79-33343
Hydrogen use as a fuel. Citations from the NTIS data base
[NTIS/PS-79/0779/3] 24 p0796 N79-33347
Fuel Cells, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0717/3] 24 p0801 N79-33594
Hydrocarbon fuel cells. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0718/1] 24 p0801 N79-33595
Energy supply and demand modeling. A bibliography with abstracts
[NTIS/PS-79/0665] 24 p0802 N79-33605
State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts
[NTIS/PS-79/0639/9] 24 p0802 N79-33608

BINARY FLUIDS
Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324

BINARY MIXTURES
Mixed fuel gas - A technically, economically and environmentally superior way to supplement natural gas supplies
24 p0664 A79-50881

BINARY SYSTEMS (MATERIALS)
Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model
[CONF-780941-6] 24 p0744 N79-30036

BIOASSAY
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923

BIOCHEMICAL FUEL CELLS
Utility fuel cells for biomass fuel
21 p0016 A79-10131
Fuel Cells, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0717/3] 24 p0801 N79-33594
Hydrocarbon fuel cells. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0718/1] 24 p0801 N79-33595

BIOCHEMISTRY
Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals
[TID-29093-VOL-5] 24 p0719 N79-28361
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923

BIODEGRADABILITY
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709

BIODEGRADATION
Cogeneration with digester gas
24 p0676 A79-51773
Stimulated biodegradation of waste petroleum
22 p0336 N79-16388

BIOELECTRIC POTENTIAL
Biomass conversion potential in the Southeast
24 p0611 A79-45231

BIOGEOCHEMISTRY
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419

BIOLOGICAL EFFECTS
Some perspectives on research into the biological response to non-ionizing electromagnetic radiation --- relation to SETI, SPS, and other government projects
22 p0271 A79-24879
The effects of oil on marine life --- water pollution effects on ocean biology
23 p0434 A79-35463
Environmental impact assessment for OTEC-1
24 p0626 A79-45857
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568
Marine biological effects of OCS petroleum development
[PB-288935/0] 22 p0344 N79-17374
Health effects associated with diesel exhaust emissions, literature review and evaluation
[PB-289817/9] 22 p0364 N79-20727
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845

BIOMAGNETISM
Calculation of the external electromagnetic field of closely spaced MHD machines
22 p0298 A79-29285
Calculation of the external electromagnetic field of closely spaced MHD machines
24 p0663 A79-50775

BIOMASS
Solid waste and biomass. Their potential as energy sources in Illinois, 1977
[PB-281649/4] 21 p0177 N79-10562
Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180
Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391
Overview of waste heat utilization techniques --- spray irrigation, soil heating, aquiculture and biomass production
[CONF-790443-2] 24 p0791 N79-32726

BIOMASS ENERGY PRODUCTION
Energy from biomass through hydrolysis of wood
21 p0003 A79-10036
The Garrett Energy Research biomass gasification process
21 p0004 A79-10037
Utility fuel cells for biomass fuel
21 p0016 A79-10131
Compartmental model for agricultural conversion of solar energy into fixed biomass
21 p0022 A79-10181

There is a lot of energy in digester gas . . . use it --- in municipal waste water plants 21 p0035 A79-11448

Liquid fuels from biomass [AIAA PAPER 78-1781] 21 p0063 A79-13876

Biomass and wastes as energy resources - 1977 update 21 p0091 A79-15868

Petroleum plantations --- hydrocarbon fuels from artificial photosynthesis and plants 21 p0095 A79-15910

New concepts in waste utilization and biomass 21 p0095 A79-15915

Advanced processes for more efficient use of forest products residual material 21 p0096 A79-15919

Inexpensive solar energy utilization in human settlements 21 p0104 A79-16470

Urban wastes as an energy source 21 p0115 A79-17220

Energy through solar aided bio-gas systems 21 p0125 A79-17367

Efficiency of sugar cane and cowpea as solar energy converters 21 p0125 A79-17368

Harvesting solar energy using biological systems 21 p0126 A79-17372

Bio-mass energy for rural areas 21 p0126 A79-17373

Electrochemical use of biomass 22 p0254 A79-22273

Biological conversion of solar energy 22 p0312 A79-31146

An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier 23 p0381 A79-32592

Fuel gas production from animal residue. I - Technical perspective 23 p0381 A79-32593

Fuel gas production from animal residue. II - An economic assessment 23 p0381 A79-32594

Simple methane digestors 23 p0386 A79-33234

The microbial production of methane from the putrescible fractions of sorted household waste 23 p0396 A79-33753

A comparison of coal and biomass as feedstocks for synthetic fuel production 23 p0412 A79-34097

Renewable energy supplies for developing countries 23 p0422 A79-34178

Function of economics in energy policy 23 p0422 A79-34179

Bioconversion - Energy and agriculture 23 p0435 A79-35489

Solar energy use through biology - Past, present and future 23 p0439 A79-36627

The prospects of a biological-photochemical approach for the utilization of solar energy 23 p0448 A79-37850

Electricity from municipal wastes 23 p0454 A79-37911

Use of low grade fuel derived from domestic and trade wastes 23 p0454 A79-37912

Design, operation, and economics of the Energy Plantation as an alternate source of fuels 23 p0467 A79-38616

Practical aspects and applications of bioconversion 23 p0467 A79-38617

Rough cost estimates of solar thermal/coal or biomass derived fuels [AIAA PAPER 79-0988] 23 p0476 A79-38893

An incremental model for conversion of solar energy in agricultural systems 23 p0479 A79-39840

Properties and operating experience with bagasse as a boiler fuel --- raw sugarcane processing waste 23 p0489 A79-40395

Potential of biomass to substitute for petroleum in Canada 23 p0494 A79-40743

Potential for biomass utilization in Canada 23 p0494 A79-40744

Material and energy balances in the production of ethanol from wood 23 p0495 A79-40745

Design criteria and operational guidelines for a pilot-scale anaerobic digester 23 p0523 A79-41371

Bioconversion of solar energy 23 p0524 A79-41808

Photosynthetic pathway and biomass energy production 24 p0605 A79-44580

Biomass conversion potential in the Southeast 24 p0611 A79-45231

Small scale gasification of biomass - The case of corn cob gasifiers 24 p0631 A79-46311

Farm-scale generation of bio-gas 24 p0631 A79-46312

Fuels and chemicals from biomass 24 p0631 A79-46313

Biomass - The self-replacing energy resource 24 p0651 A79-49425

Bio-electrochemical conversion of refuse to energy 24 p0659 A79-50353

Biomethanation of Minnesota reed sedge peat 24 p0662 A79-50560

Resolving the environmental issues in developing fuels from biomass 24 p0664 A79-50877

Primary impacts of growing aquatic plants for energy 24 p0665 A79-50886

High-grade fuels from biomass farming - Potentials and constraints 24 p0669 A79-51194

Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis 24 p0669 A79-51196

Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system 24 p0676 A79-51772

Gasohol for energy production --- Book 24 p0713 A79-53724

Conversion of biomass materials into gaseous products, phase 1 [SAN-1241-77-1] 21 p0171 N79-10237

Biomass utilization in Minnesota [PB-282531/3] 21 p0171 N79-10241

Parameters for legislative consideration of bioconversion technologies [PB-284742/4] 21 p0194 N79-12250

Biological solar energy conversion approaches to overcome yield stability and product limitations [PB-284823/2] 21 p0199 N79-12577

The economics and engineering of large-scale algae biomass energy systems [PB-287868/4] 21 p0226 N79-15207

Identification of wood energy resources in central Michigan [NASA-CR-158130] 22 p0347 N79-18424

Bioconversion study conducted by JPL [NASA-CR-158228] 22 p0354 N79-19450

Preliminary environmental assessment of biomass conversion to synthetic fuels [PB-289775/9] 22 p0365 N79-21224

Hydrocarbons and energy from plants [LBL-8596] 23 p0564 N79-24507

Investigation of gasification of biomass in the presence of catalysts [CONF-7809125-1] 23 p0588 N79-27327

Methane production from beef cattle feedlots [CONF-7806107-2] 23 p0589 N79-27333

Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals [TID-29093-VOL-5] 24 p0719 N79-28361

Solar energy fixation and conversion with algal bacterial systems 24 p0721 N79-28665

Thermochemical conversion: Biomass gasification [TID-29391] 24 p0726 N79-28766

Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation [TID-29091] 24 p0733 N79-29375

Bioconversion [GPO-37-136] 24 p0745 N79-30393

Biomass conversion --- congressional reports agriculture technology assessment
[GPO-32-317] 24 p0765 N79-31404

Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413

Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0547/4] 24 p0767 N79-31435

Domestic policy review of solar energy
[TID-28834] 24 p0773 N79-31797

Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32384

Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385

Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PO-1] 24 p0790 N79-32717

Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0796 N79-33346

BIONICS

Energy impact on economic activity and long-term trend forecast
23 p0419 A79-34163

BIOSPHERE

Protection of the biosphere --- MHD power stations pollution reduction
21 p0105 A79-16483

BIOTECHNOLOGY

Emergence of biotechnology
[TID-28983] 23 p0567 N79-24626

BISMUTH COMPOUNDS

Process design of the IASL bismuth sulfate thermochemical hydrogen cycle
24 p0685 A79-51839

Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946

BITUMENS

Continuous extrusion of coal --- plastic fluidizing process
22 p0282 A79-26372

Factors affecting bitumen recovery by the hot water process
22 p0282 A79-26463

A mass and energy balance of a Wellman-Galusha gasifier --- bituminous coal conversion
22 p0283 A79-26467

Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system
22 p0283 A79-2646

The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739

Development of the oil sands of Canada
23 p0524 A79-41812

The isotopic composition of carbon in the Alberta oil sand
24 p0650 A79-49357

Technology and Use of Lignite --- conferences
[GFERC/IC-77/1] 21 p0216 N79-14241

Analysis of coal hydrogasification processes
[FE-2565-13] 23 p0554 N79-24183

BLACK BODY RADIATION

A new concept for solar pumped lasers
21 p0110 A79-16624

Thermodynamics of the conversion of diluted radiation --- solar energy application
22 p0310 A79-30910

Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600

Blackbody optical pumping of carbon dioxide laser mixtures
21 p0203 N79-13343

Development of a low-temperature, low-cost, black-liquid solar collector
[CONF-780983-14] 24 p0756 N79-30805

BLADES (CUTTERS)

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158744] 23 p0580 N79-26485

BLANKETS (FUSION REACTORS)

Nuclear characteristics of D-D fusion reactor blankets - Technical data
21 p0162 A79-19826

The potential of fusion reactors as process heat source
22 p0284 A79-26624

The effect of thermo-electric forces on the density profiles in a thermonuclear plasma surrounded by a cold blanket
22 p0292 A79-27886

Thermoelectric magnetohydrodynamics
22 p0312 A79-31098

CO/H2 production using fusion reactor heat
24 p0695 A79-51949

Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950

Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951

A high temperature fusion reactor design
24 p0696 A79-51954

The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0696 A79-51955

On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors
24 p0705 A79-52352

BLOWDOWN WIND TUNNELS

Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

BLUE GREEN ALGAE

Solar energy conversion in marine biological systems
23 p0402 A79-34021

BODY CENTERED CUBIC LATTICES

Advanced batteries --- sodium sulfur batteries for electric motor vehicles
21 p0067 A79-14270

BOILERS

Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071

Use of alternative fuels in stationary combustors
21 p0052 A79-12981

Particulate control for coal-fired industrial boilers
21 p0065 A79-14123

Solid waste and coal firing in industrial boilers
21 p0096 A79-15918

Steam generator and turbomachines --- MHD power plant design and Soviet operational experience
21 p0106 A79-16489

Reducing inefficiency and emissions of large steam generators in the United States
21 p0114 A79-17075

Honeycomb type flat plate collectors - Experiments leading to drinking straw --- heat retention material for solar steam generation
21 p0132 A79-17424

A survey of particulate collection devices for coal-fired boilers
21 p0147 A79-17645

Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735

Combustion modifications for the control of air pollutant emissions from coal fired utility boilers
[ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738

Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742

Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788

Solar storage unit with built-in oil-gas boiler 22 p0268 A79-24322
Performance of a 5 MWt solar steam generator 22 p0288 A79-27399
Ways of improving steam-gas power plants --- fuel economy 22 p0299 A79-29298
Soot and the combined cycle boiler [ASME PAPER 79-GT-67] 22 p0307 A79-30533
Residual shale oil as a boiler fuel 23 p0412 A79-34105
The development of the Advanced Components Test Facility --- for solar powered steam generator system 23 p0429 A79-35047
Study of a thermal converter using both the concentration and the greenhouse effects 23 p0464 A79-38585
Experience with solid waste as a supplementary fuel 23 p0488 A79-40388
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler 23 p0488 A79-40391
Properties and operating experience with bagasse as a boiler fuel --- raw sugarcane processing waste 23 p0489 A79-40395
Flue gas emissions from a shredded-municipal-refuse-fired steam generator 23 p0489 A79-40399
Oceanside Disposal Plant improvement program - Design, construction and operating experience 23 p0491 A79-40425
Utilization of sewage skimmings as fuel to generate process steam 23 p0492 A79-40426
30 years of refuse-fired boiler experience 23 p0523 A79-41374
Regulation of the water steam cycle in a solar receiver 24 p0603 A79-44296
Supplementary steam - A viable hydrogen power generation concept 24 p0686 A79-51948
Tritium permeation through steam generator materials 24 p0695 A79-51952
Heat pump system for process steam generation 24 p0697 A79-51964
Design study of a coal-fired thermionic-topped powerplant using an advanced boiler 24 p0700 A79-51983
Particulate and sulfur dioxide emission control costs for large coal-fired boilers [PB-281271/7] 21 p0178 N79-10591
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment [BNL-50816] 21 p0210 N79-13538
Proceedings of symposium on water-in-fuel emulsions in combustion --- marine diesels, boilers, and gas turbine engines [AD-A061503] 22 p0338 N79-17019
Low-sulfur western coal use in existing small and intermediate size boilers --- particulate sampling and combustion efficiency [PB-287937/7] 22 p0346 N79-18061
Engineering test facility conceptual design, part 2 [FE-2614-2-PT-2] 22 p0369 N79-21561
Combustion modification effects on NOx emissions from gas-, oil-, and coal-fired utility boilers [PB-289878/1] 23 p0545 N79-22661
Optimum combinations of cooling alternatives for stream-electric power plants, volume 2 [PB-290576/8] 23 p0565 N79-24515
Feasibility and economics of cogeneration in California's thermal enhanced oil recovery operations [PB-291794/6] 23 p0566 N79-24517
Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results [PB-290514/9] 23 p0566 N79-24534
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers 23 p0592 N79-27610
Economic considerations in coverting from oil/gas firing to coal 23 p0592 N79-27611
Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement) [PB-293731/6] 24 p0743 N79-29670
Study of electrostatic precipitators installed on oil-fired burners --- for use in the utility industry [EPRI-FP-792-VOL-2] 24 p0760 N79-30848
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b [PB-295535/9] 24 p0803 N79-33654

BOILING
A generalized correlation of critical heat flux for the forced convection boiling in vertical uniformly heated round tubes - A supplementary report 23 p0487 A79-40301

BOMBER AIRCRAFT
Manned strategic system concepts 1990-2000 [AIAA PAPER 79-1793] 24 p0643 A79-47882
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft. Volume 1: Executive summary [AD-A061746] 22 p0351 N79-18969
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft, volume 2 [AD-A062609] 22 p0356 N79-20109

BONDING
Integral glass encapsulation for solar arrays [NASA-CR-162361] 24 p0798 N79-33564

BORON
Defect free very shallow p+/n junction and associated photovoltaic effect 23 p0520 A79-41082
Effects of laser irradiation on a diffused layer in silicon 23 p0521 A79-41083
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy 23 p0521 A79-41086
Effect of dopants on annealing performance of silicon solar cells 24 p0785 N79-32661

BOUNDARY LAYER CONTROL
Drag reduction by cooling in hydrogen fueled aircraft 21 p0165 A79-20084

BOUNDARY LAYER FLOW
Attenuating the transverse edge effect in MHD generators 21 p0063 A79-13985
Wind turbine generator wakes [AIAA PAPER 79-0113] 21 p0156 A79-19539
Boundary layer velocity measurements in combustion MHD channels 24 p0647 A79-49037
Power output of an MHD generator - Effect of ionization instability and boundary layer 24 p0708 A79-52958

BOUNDARY LAYER PLASMAS
Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators 21 p0153 A79-18469
MHD stability of Spheromak 22 p0313 A79-31189
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section 22 p0327 A79-32103

BOUNDARY LAYER SEPARATION
Demonstration of a rotary separator for two-phase brine and steam flows [TID-28519] 22 p0365 N79-21309

BOUNDARY LAYER STABILITY
Power output of an MHD generator - Effect of ionization instability and boundary layer 24 p0708 A79-52958

BOUNDARY LAYERS
Transport phenomena in MHD generators - Effect of boundary layers 21 p0156 A79-19098

BOUNDARY VALUE PROBLEMS
Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation 23 p0398 A79-33990
Active and passive solar energy utilization in urban construction 23 p0463 A79-38582
The physics of solar cells 24 p0637 A79-47050

BRAKES (FOR ARRESTING MOTION)
The brake system for the DOE/Sandia 17-meter vertical axis wind turbine 21 p0067 A79-14289
Optimal control of on-board and station flywheel storage for rail transit systems 21 p0148 A79-17822
Wind energy - Heat generation 23 p0486 A79-40133
Wayside energy storage summary. Volume 1: Summary [DOT-TSC-FRA-79-7-1-VOL-1] 22 p0370 N79-21563

BRAKING
Optimal control of on-board and station flywheel storage for rail transit systems [ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771

BRAYTON CYCLE
Combined cycle gas turbine for an automobile application 21 p0019 A79-10157
Brayton Isotope Power System - The versatile dynamic power converter --- for spacecraft 21 p0023 A79-10190
Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine 21 p0024 A79-10201
A ceramic heat exchanger for a Brayton cycle solar electric power plant 22 p0239 A79-20822
Thermodynamic basis for combining cycles of heat producing power plants 22 p0298 A79-29297
Brayton engines for dispersed solar power 23 p0477 A79-38950
Turning to the sun for power 24 p0601 A79-44239
A new solar thermal receiver utilizing a small particle heat exchanger 24 p0674 A79-51754
A combined cycle for solar-fossil hybrid power generation 24 p0674 A79-51760
The indirect Brayton energy recovery system 24 p0696 A79-51958
Mini-BRU/BIPS 1300 watt (sub)e dynamic power conversion system development: Executive summary [NASA-CR-159440] 21 p0173 N79-10526
Mini-Brayton heat source assembly development [NASA-CR-159447] 21 p0196 N79-12554
Benefits of solar/fossil hybrid gas turbine systems [NASA-TM-79083] 21 p0229 N79-15410
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems 23 p0545 N79-22950
Brayton-cycle component characteristics 23 p0580 N79-26479
Candidate power-conversion system cycles, appendix A 23 p0580 N79-26484
Central receiver design considerations for Brayton cycle solar power plants [AED-CONF-78-212-016] 24 p0777 N79-31832

BRAZIL
Solar distillation in Brasil 23 p0385 A79-33214
Fluidised bed combustion of high ash Brazilian coals 23 p0385 A79-33225
Fluidized bed combustion of Brazilian coals 23 p0385 A79-33226
Principal sources of electric power generation in Brazil 23 p0388 A79-33255
New energy sources - An option for the energy crisis 23 p0388 A79-33256
Subsidies for a formulation of a plan of action for alternative energy sources and forms 23 p0388 A79-33258
World energy scene and Brazil's alternatives 23 p0388 A79-33259
New policy for electrical energy 23 p0388 A79-33260
Energy projects at the Sao Paulo State Institute of Technological Research 23 p0389 A79-33261
Development of Brazilian hydroelectric potential - Future prospects and planning options 23 p0389 A79-33267
Heat flow and radiogenic heat production in Brazil with implications for thermal evolution of continents 22 p0373 N79-21689
Short notice on a grand forest: Tropical land converting sunlight to energy [NP-23278] 24 p0741 N79-29653
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil [E79-10238] 24 p0747 N79-30599

BREADBOARD MODELS
A parabolic solar reflector for accurate and economic producibility 22 p0293 A79-28145

BREAKDOWN
'Local' breakdown criterion in highly ionized gas flow 21 p0049 A79-12683

BREEDER REACTORS
Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems 24 p0629 A79-46236
Fusion-supported decentralized nuclear energy system 24 p0696 A79-51956
Optimization of the fission-fusion hybrid concept [ORNL/PPA-79/3] 24 p0778 N79-32113

BREMSSTRAHLUNG
Compact experiments for alpha-particle heating --- of confined D-T plasma in tokamak 21 p0078 A79-14786

BRILLOUIN EFFECT
Self-adjusting laser-target system for laser fusion 21 p0086 A79-15625
Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution 23 p0478 A79-39566

BRINES
Electrical production from moderate temperature geothermal brines 23 p0486 A79-40197
Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project 24 p0667 A79-50900
The application of wind energy to a system with an inherent energy storage medium 24 p0677 A79-51778
Demonstration of a rotary separator for two-phase brine and steam flows [TID-28519] 22 p0365 N79-21309
An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells [NVO-1531-2] 22 p0366 N79-21523
Kinetics of silica deposition from simulated geothermal brines [CONF-790108-1] 23 p0597 N79-27691
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine [UCID-18091] 24 p0717 N79-28229

BROMIDES
Performance predictions of a LiBr absorption air conditioner utilizing solar energy 21 p0139 A79-17482
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems 21 p0139 A79-17483
Solar energy storage as hydrogen and bromine from hydrogen bromide 22 p0265 A79-24045
A new electrolytic cell type for hydrogen production in hybrid cycles 23 p0414 A79-34115
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems 23 p0439 A79-36629

BROMINE
The thermochemical decomposition of water using bromine and iodine
22 p0238 A79-20770
A zinc-bromine battery for energy storage
24 p0684 A79-51832
Thermochemical hydrogen production by the Mark-13 process - A status report
24 p0686 A79-51849
Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479

BROMINE COMPOUNDS
The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

BUDGETING
Guide to reducing energy-use budget costs
[HCP/U60505-01] 21 p0184 N79-11489
Economic impacts of a transition to higher oil prices --- estimation and budget allocations
[BNL-50871] 22 p0364 N79-20927
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067

BUILDINGS
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899
Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691
Fuel cell on-site integrated energy system parametric analysis of a residential complex
21 p0081 A79-14947
Principles of solar cooling and heating
21 p0103 A79-16457
Integrated solar building systems
21 p0103 A79-16460
Energy utilization analysis of buildings
21 p0103 A79-16462
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415
Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486
Pressure measurements on wind tunnel models of the Aylesbury experimental house
22 p0300 A79-29372
Energy management through energy conservation in buildings
22 p0320 A79-31431
Design study on solar energy systems for commercial buildings
22 p0320 A79-31433
Solar energy retrofit system for an older-type building - The Williamstown Museum project
22 p0320 A79-31434
Designing thermally efficient buildings for the U.S. Midwest
23 p0397 A79-33951
Liquid sorbent solar air conditioner
23 p0401 A79-34014
Honeywell General Offices solar HVAC system
23 p0401 A79-34018
Heat pump application to single family dwellings - An analysis by computer model
23 p0449 A79-37855
Passive solar heating of buildings using a transwall structure
24 p0712 A79-53493
Instrumentation at the Decade 80 solar house in Tucson, Arizona
[NASA-CR-150951] 21 p0204 N79-13491
Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520
Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403
Phase one/base data for the development of energy performance standards for new buildings: Data analysis
[PB-286901/4] 22 p0331 N79-16148
Phase one/base data for the development of energy performance standards for new buildings: Sample design
[PB-286903/0] 22 p0331 N79-16150
The effects of resource impact factors on energy conservation standards for buildings
[PB-286909/7] 22 p0335 N79-16384
Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497
Life-cycle costing. A guide for selecting energy conservation projects for public buildings --- computing the cost effectiveness of retrofitting and new buildings
[PB-287804/9] 22 p0345 N79-17744
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059
Solar heating of buildings: Design optimization and economic analysis
22 p0353 N79-19439
Phase one/base data for the development of energy performance standard for new buildings. Task report: Building classification
[PB-286904/8] 22 p0355 N79-19468
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
Solar energy pilot study
[PB-289380/8] 22 p0363 N79-20525
Solar space heaters for low-income families
[PB-289244/6] 22 p0363 N79-20526
Solar building regulatory study, volume 1
[PB-289823/7] 22 p0365 N79-21235
Energy utilization survey pamphlet for buildings
[AD-A062930] 22 p0371 N79-21624
Conservation where it counts: Energy management systems
[PB-289837/7] 22 p0372 N79-21628
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
National Energy Peak-Leveling Program (NEPLP)
[HCP/W1152-01] 23 p0551 N79-23534
Solar project cost report: Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/60] 23 p0561 N79-24480
Wind engineering research digest, volume 3, 1978 --- a bibliography of ongoing research projects
[PB-290694/9] 23 p0567 N79-24621
Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report)
[BMFT-FB-T-78-15] 23 p0590 N79-27345
Modeling passive solar buildings with hand calculations --- conferences
[LBL-8583] 23 p0596 N79-27683
Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis
[EPRI-ER-808-VOL-1] 23 p0597 N79-27687
Solar heating and hot water system installed at Southeast of Saline, Unified School District 306, Mentor, Kansas
[NASA-CR-161271] 24 p0737 N79-29602
Regional conceptual design and analysis studies for residential photovoltaic systems. Volume 1: Executive summary
[SAND-78-7039] 24 p0741 N79-29651
Energy utilization analysis of buildings
[LBL-7826] 24 p0753 N79-30779
Buildings energy management program workshop design
[CONS-8630-T1] 24 p0776 N79-31824

BUOYANCY
Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402
Buoyancy effects in a solar regenerator --- for air dehumidifier absorbent solutions
22 p0262 A79-23752
Hydrogen production at reduced cost through electrolysis and buoyancy
23 p0414 A79-34116

BUOYS
Wave power electric generation study in Japan --- large scale buoy facility
21 p0151 A79-18107
BURNERS
Regenerative burner system for thermoelectric power sources
22 p0261 A79-23621
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
A development program for hydrogen burners
23 p0386 A79-33232
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538
BURNING RATE
LAG-Process, some results of utilization in transport and mechanical engineering
21 p0030 A79-10248
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983
BUS CONDUCTORS
Optimization of tapered busses for solar cell contacts
23 p0440 A79-36638
BUTANES
Thermodynamic and transport properties of isobutane: A survey of available data
[COO-4051-35] 24 p0794 N79-33096
BY-PRODUCTS
The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179
Hydropyrolysis of coal derived liquids and related model compounds
23 p0553 N79-24171
Enthalpy measurements for coal-derived liquids
23 p0587 N79-26997
BYPASSES
Analysis of electrolyte shunt currents in fuel cell powerplants
21 p0039 A79-11816
Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles
24 p0724 N79-28739

C

C-135 AIRCRAFT
Winglets give USAF KC-135 new look in life
22 p0265 A79-23975
CABLES (ROPES)
Aeroelastic pump --- wind energy from flutter of suspended liquid-filled cables
23 p0406 A79-34055
CADMIUM COMPOUNDS
Photovoltaic effects in II-VI heterojunctions
21 p0042 A79-11967
CADMIUM SELENIDES
Polycrystalline CdSe-based photo-electrochemical cells
21 p0037 A79-11785
Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737
CADMIUM SULFIDES
n-CdS/n-GaAs photoanode --- electrochemical solar cells
21 p0037 A79-11784
Recent progress in thin film polycrystalline solar cells based on cadmium sulfide
21 p0042 A79-11966
Cu2S-CdS thin-film solar cells
21 p0057 A79-13637
The photovoltaic effect in CdS/Cu2S solar cells
21 p0091 A79-15871
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346
The photovoltaic effects in CdS/Cu2S solar cells
21 p0123 A79-17347
Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell
21 p0125 A79-17361
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428
Low cost thin-film CdS-based solar cells progress and promise
[ASME PAPER 79-SOL-15] 22 p0309 A79-30549
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Photovoltaic cells and their future
23 p0435 A79-35486
Cadmium-sulphide/copper-sulphide thin-film solar cells - Review of methods of producing the CdS and Cu2S layers
23 p0441 A79-36786
Order-disorder transformations and the nature of the copper-sulphide layer in Cu/x/S/CdS solar cells
23 p0442 A79-36789
p-InP/n-CdS heterojunction solar cells
23 p0442 A79-36791
Technique to determine the growth rate and resistivity of evaporated CdS thin films
23 p0445 A79-37157
Cu2S-CdS thin-film solar cells
23 p0466 A79-38601
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films
23 p0505 A79-40963
The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171
Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis
24 p0616 A79-45745
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications
24 p0629 A79-46249
Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737
Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700
Cadmium sulfide solar cells. Citations from the NTIS data base
[NTIS/PS-78/1213/4] 21 p0231 N79-15436
Cadmium sulfide solar cells. Citations from the Engineering Index Data base
[NTIS/PS-78/1214/2] 21 p0231 N79-15437

Cadmium sulfide-copper sulfide heterojunction cell research
[SAN-1459-3] 24 p0789 N79-32701

CADMIUM TELLURIDES
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354
Recent investigations of metal oxide/CdTe heterojunction solar cells
23 p0502 A79-40926
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186

CAISSONS
Prefabricated caissons for tidal power development
21 p0152 A79-18113
Marine structures for energy conversion
23 p0450 A79-37867

CALCIUM
Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296

CALCIUM OXIDES
Stabilization of power plant scrubbing slurries and fine coal refuse with the additive Calcilox
21 p0063 A79-14107
A regenerative process for fluidized-bed combustion of coal with lime additives
22 p0297 A79-28984
Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878
Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

CALCIUM SULFIDES
Calcium/iron sulfide secondary cells
21 p0041 A79-11835

CALDERAS
Evaluation of intermediate-period seismic waves as a geothermal exploration tool
24 p0744 N79-29716

CALIBRATING
Calibration standards and field instruments for the precision measurement of insolation
21 p0076 A79-14765
Flow rate calibration for solar heating and cooling system evaluation
21 p0089 A79-15845
Temperature calibration for solar heating and cooling system evaluation
21 p0089 A79-15846
Geothermal pump test facility
[ALO-3715-1] 24 p0755 N79-30793
Results of the 1978 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-162298] 24 p0782 N79-32635

CALIFORNIA
Santa Clara Community Center Project, USA --- solar building
22 p0277 A79-25945
Environmental aspects of geysers geothermal operations
24 p0666 A79-50896
Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California
24 p0667 A79-50899
Direct heat applications of geothermal energy in the geysers/Clear Lake Region, volume 2: Environmental assessment
[SAN-1326-1-2] 21 p0174 N79-10532
Recommendations for the conceptual design of the Barstow, California, solar central receiver pilot plant: Executive summary
[SAND-77-8035] 21 p0221 N79-14571
Cooking with offshore oil: A handbook for California local government --- regional planning
[PB-288656/2] 22 p0331 N79-16140
Geothermal element, Imperial County, California
[PB-287115/0] 22 p0335 N79-16385
Solar project description: Aratex Services, Incorporated, industrial laundry, Fresno, California
[SOLAR/2008-78/50] 23 p0562 N79-24485
Inventory of underground energy storage sites in California
[PB-290835/8] 23 p0566 N79-24519
An evaluation of the hydrothermal resources of the Desert Hot Springs Region, California
[PB-290942/2] 23 p0575 N79-25536
Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0595 N79-26539
Proceedings of the Conference on Coal Use for California
[NASA-CR-158770] 23 p0591 N79-27597
Using coal inside California for electric power
23 p0591 N79-27598
Using coal inside California for nonelectric applications
23 p0591 N79-27599
A systems examination of the opportunities of coal for California
23 p0591 N79-27600
Electric energy demand and supply prospects for California
23 p0591 N79-27601
Coal's role in California's energy needs
23 p0591 N79-27602
Energy supply and demand in California
23 p0591 N79-27603
Possible environmental effects of increased coal use in California
23 p0592 N79-27604
Air quality as a constraint to the use of coal in California
23 p0592 N79-27605
Water as a constraint to the use of coal for California
23 p0592 N79-27606
Coal supply for California
23 p0592 N79-27607
Prospects for coal slurry pipelines in California
23 p0592 N79-27608
A large scale wind energy program for the state of California
23 p0594 N79-27648
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658
Rocky mountain coal for southern California's coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text
[PB-294812/3] 24 p0803 N79-33639

CALORIMETERS
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874
Photoacoustic determination of photovoltaic energy conversion efficiency
21 p0154 A79-18503
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839

CAMBER
The influence of blade camber on the output of vertical-axis wind turbines
21 p0045 A79-12242

CANADA
Mississauga solar house /Mississauga, Ontario, Canada/
22 p0276 A79-25935
The role of applied meteorology in the Canadian energy programme
22 p0317 A79-31414
An ocean thermal difference power plant in the Canadian Arctic
22 p0318 A79-31415
NRC solar monitoring program
22 p0318 A79-31419
The Prince Edward Island Wind Energy Program
22 p0319 A79-31427
Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866

Wind energy prospecting in Prince Edward Island - A program overview and status report
23 p0482 A79-40109
Operating experience with the Magdalen Islands wind turbine
23 p0484 A79-40122
Development of the oil sands of Canada
23 p0524 A79-41812
The race for unlimited energy --- Book
24 p0638 A79-47071
Energy research and development at the Canada Centre for Mineral and Energy Technology /CANMET/
24 p0698 A79-51971
Coal preparation design for export markets, with particular reference to South African and Canadian coals
22 p0340 N79-17318

CANALS
Hydroelectric power generation and mineral recovery in the Qattara Depression of Egypt
24 p0707 A79-52575

CAPACITANCE
Measurement of free carrier lifetime in an illuminated solar cell from capacitance measurements
23 p0497 A79-40891

CAPACITANCE SWITCHES
Problems in the development of high-service-life capacitative accumulators --- for fusion reactors
22 p0243 A79-21249

CAPACITORS
Induction-generator/synchronous-condenser system for wind-turbine power
22 p0286 A79-27219

CARBIDES
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces --- for photothermal solar energy conversion
21 p0126 A79-17377
Sputtering yields of graphite and carbides and their potential use as first wall materials --- in Tokamak reactor
23 p0444 A79-36892

CARBON
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522
Study of the electrochemical activity of a porous vitreous carbon
23 p0389 A79-33264
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254
Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal
22 p0364 N79-21215

CARBON COMPOUNDS
Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels
21 p0179 N79-11150
Surfactant-assisted liquefaction of particulate carbonaceous substances
[NASA-CASE-NPO-13904-1] 21 p0179 N79-11152

CARBON DIOXIDE
The effects of different energy strategies on the atmospheric CO2 concentration and climate
21 p0106 A79-16523
The atmospheric CO2 consequences of heavy dependence on coal
21 p0107 A79-16524
A comparison of the performance of steam turbine cycles using gas contaminated geothermal steam
[ASME PAPER 78-WA/ENER-3] 21 p0159 A79-19776
Effect of noncondensables on the performance of geothermal steam power plants
24 p0689 A79-51868
Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177
Viscosity reduction of coal liquids by dissolved carbon dioxide
[SAND-79-7027] 24 p0732 N79-29365
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
Uncertainties associated with global effects of atmospheric carbon dioxide
[ORAU/IEA-79-6(0)] 24 p0803 N79-33699

CARBON DIOXIDE CONCENTRATION
Molten-carbonate CO2 concentrator - Preliminary experiments
[ASME PAPER 78-ENAS-2] 21 p0048 A79-12551
The problem of carbon dioxide --- fossil fuel consumption effect on air pollution
23 p0438 A79-36201
Studies of different energy strategies in terms of their effects on the atmospheric CO2 concentratio
23 p0495 A79-40799
Market penetration characteristics for energy production and atmospheric carbon dioxide growth
24 p0643 A79-47812

CARBON DIOXIDE LASERS
CO2-laser fusion
21 p0018 A79-10150
DOE programs in material development for fusion laser systems
21 p0082 A79-15137
The TELEC - A plasma type of direct energy converte --- Thermo-Electronic Laser Energy Converter for electric power generation
21 p0110 A79-16629
Prepulse damage to targets and alignment verification
22 p0258 A79-23027
Solar-radiation-excited CO2-Br2-He gas laser
23 p0397 A79-33887
An optical evaluation laboratory for laser fusion
23 p0447 A79-37667
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570
Blackbody optical pumping of carbon dioxide laser mixtures
21 p0203 N79-13343
Potential of laser for SPS power transmission
[NASA-CR-157432] 23 p0548 N79-23496
CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659

CARBON DIOXIDE REMOVAL
Molten-carbonate CO2 concentrator - Preliminary experiments
[ASME PAPER 78-ENAS-2] 21 p0048 A79-12551
Wilson parameters for the system H2, N2, CO, CO2, CH4, H2S, CH3OH, and H2O --- for cold methanol absorption in coal gasification
22 p0282 A79-26462

CARBON FIBER REINFORCED PLASTICS
Rotating strength of glass-carbon fiber-reinforced hybrid composite discs
21 p0165 A79-20273

CARBON ISOTOPES
The isotopic composition of carbon in the Alberta oil sand
24 p0650 A79-49357

CARBON MONOXIDE
Evaluation of commercial catalysts for the Fischer-Tropsch reaction --- for coal conversion to liquid fuel or chemical feedstock
22 p0272 A79-25124
The economics of hydrogen and carbon monoxide separation with cuprous ammonium lactate solutions --- hydrogen production from coal
22 p0299 A79-29313
A steam process for coal gasification
24 p0632 A79-46321
CO/H2 production using fusion reactor heat
24 p0695 A79-51949
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179
Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177
Fuels from magma: A potential energy source --- producing hydrogen, carbon monoxide, and methane
[SAND-78-0191] 24 p0778 N79-32373

CARBON MONOXIDE LASERS
Laser aircraft --- using kerosene
22 p0284 A79-26597

CARBON STEELS
Qualification of a duplex, clad material for OTEC --- heat exchangers
24 p0623 A79-45828

CARBONACEOUS MATERIALS
Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908

CARBONACEOUS ROCKS
- Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study [E79-10294] 24 p0796 N79-33526

CARBONATES
- An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc 21 p0035 A79-11546
- Molten carbonate fuel cell systems - Status and potential 21 p0039 A79-11817
- Partial processes and transport parameters in molten carbonate fuel cell operation 21 p0040 A79-11819
- Molten-carbonate CO2 concentrator - Preliminary experiments [ASME PAPER 78-ENAS-2] 21 p0048 A79-12551
- Vaporization of drops of a melt of potassium carbonate in a medium of combustion products 21 p0167 A79-20411
- Steady-state composition profiles in mixed molten salt electrochemical devices. II - Molten carbonate fuel cell analogs 22 p0305 A79-30333
- Liquid fuels from carbonates by a microbial system 23 p0494 A79-40742
- Molten carbonate fuel cell systems development program 24 p0682 A79-51814
- Effect of temperature and pressure on molten carbonate fuel cell fuels and performance 24 p0682 A79-51818
- Advanced technology fuel cell program --- molten carbonate and phosphoric acid fuel cells and coal utilization in power plants [EPRI-EM-956] 23 p0598 N79-27702

CARBONIZATION
- Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies --- Process Development Unit 21 p0045 A79-12121
- The role of fundamental combustion in the future aviation fuels program --- carbon formation in gas turbine primary zones 21 p0202 N79-13195

CARGO AIRCRAFT
- The design impact of power-augmented ram technology on large energy efficient aircraft [AIAA PAPER 79-1864] 24 p0669 A79-51250
- Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels [NASA-CR-145070] 21 p0200 N79-13026

CARGO SHIPS
- Sail power for the world's cargo ships 22 p0305 A79-30374
- Wind energy ships - Potential for modern wind-driven sea transport systems 23 p0472 A79-38661

CARNOT CYCLE
- Reversible thermoelectric power conversion of energy fluctuations 22 p0261 A79-23619
- Production of mechanical energy by thermodynamic conversion of solar energy 22 p0310 A79-30999
- Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion 23 p0463 A79-38583
- Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution 23 p0531 A79-42900
- Combined cycles for power generation, volume 1 --- conferences, Belgium, Apr. 1978 [VKI-LEC-SEP-1978-6-VOL-1] 24 p0723 N79-28732

CARRIER INJECTION
- Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells 24 p0606 A79-44919

CASCADE CONTROL
- Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra 23 p0528 A79-42170

CASCADE FLOW
- Thermophoresis - Enhanced deposition rates in combustion turbine blade passages [ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790

CASE HISTORIES
- Case study energy recovery from wastes from an automobile assembly plant 23 p0489 A79-40394
- Use of waste wood in plywood manufacture - A case history 23 p0489 A79-40396
- Application of shallow solar ponds for industrial process heat: Case histories [UCRL-81764] 24 p0725 N79-28753

CASSEGRAIN OPTICS
- Analysis of a Cassegrain solar furnace 22 p0293 A79-28147
- Concentration of a cassegrain solar furnace 24 p0658 A79-50344
- Optical and thermal analysis of a Cassegrainian solar concentrator 24 p0713 A79-53498

CASTING
- Vacuum die casting of silicon sheet for photovoltaic applications [NASA-CR-162360] 24 p0798 N79-33566

CASTINGS
- Cast semicrystalline silicon for solar cells [ASME PAPER 79-SOL-16] 22 p0309 A79-30550
- Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing [NASA-CR-158038] 21 p0219 N79-14540

CATALOGS (PUBLICATIONS)
- International project catalog of modular integrated utility systems [PB-283477/8] 21 p0190 N79-11544

CATALYSIS
- Prerefining true in situ shale oil 21 p0004 A79-10044
- Catalytic gasification predevelopment research 21 p0029 A79-10246
- Catalysis in coal conversion --- Book 21 p0051 A79-12873
- The H-Coal project --- catalytic hydrogenation of coal 21 p0145 A79-17635
- Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes 22 p0245 A79-21482
- Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies 22 p0282 A79-26465
- Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source 22 p0283 A79-26466
- The effect of coal characteristics on the catalytic liquefaction of Utah coals 24 p0628 A79-45991
- Selectivity improvement in the SRC process --- Solvent Refined Coal hydrodesulfurization over hydrogenation 24 p0628 A79-45992
- Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis 24 p0669 A79-51196
- Advances in H-Coal --- coal liquefaction process 24 p0687 A79-51855
- Increasing gas turbine efficiency through the use of a waste heat methanol reactor 24 p0702 A79-52000
- Evaluation of use of syngas for coal liquefaction 24 p0703 A79-52027
- Coal liquefaction 24 p0714 A79-53781
- Low cost solar array project: Composition measurements by analytical photo catalysis [NASA-CR-158598] 23 p0550 N79-23513
- The H-Coal processes: A status report 23 p0593 N79-27617
- EXXON donor solvent coal liquefaction process 23 p0593 N79-27618

Methanol from coal
23 p0593 N79-27619

Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386

CATALYSTS

Catalytic coal gasification exploratory research program
21 p0030 A79-10247

The Dow Chemical liquefaction process
21 p0147 A79-17644

Evaluation of commercial catalysts for the Fischer-Tropsch reaction --- for coal conversion to liquid fuel or chemical feedstock
22 p0272 A79-25124

Coal gasification studies. II - Reduction in the presence of I2 with H2, and H2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors
22 p0283 A79-26468

Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470

Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806

A thermoanalytical investigation of nickel catalysts for fuel cells
23 p0481 A79-40008

Changes within tin-containing catalysts under hydrorefining conditions --- for coal liquefaction
24 p0628 A79-45993

Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591

Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels
[FE-2321-12] 21 p0216 N79-14240

Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177

Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

Catalyst aging tests and the role of catalyst wetting on hydrodesulfurization of a coal derived liquid
22 p0352 N79-19169

Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327

Catalyst deactivation in the hydroprocessing of coal-derived liquids
24 p0731 N79-29234

Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-29366

FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364

Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research
[FE-2202-39] 24 p0765 N79-31411

Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419

Fuel cell catalyst sintering studies --- platinum catalysts in phosphoric acid fuel cells
[EPRI-EM-833] 24 p0776 N79-31828

Fixed bed methanation processes
[FE-2240-96] 24 p0779 N79-32382

Advanced technology light weight fuel cell program --- for space power applications
[NASA-CR-159653] 24 p0800 N79-33581

CATALYTIC ACTIVITY

Effect of inlet temperature on the performance of a catalytic reactor
21 p0035 A79-11542

Generation of electrical energy from hydrogen and oxygen by means of fuel cells
21 p0059 A79-13662

Correlations of catalytic combustor performance parameters
21 p0081 A79-14956

The influence of lead compounds on automotive exhaust catalysts
21 p0116 A79-17253

Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713

Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091

Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119

Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191

Catalytic conversion of coal energy to hydrogen
[FE-2206-14] 21 p0180 N79-11239

Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal
22 p0364 N79-21215

Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker
[AD-A068452] 24 p0738 N79-29616

CATHODES

Solid state electrodes for high energy batteries
24 p0611 A79-45479

Advanced technology light weight fuel cell program --- for space power applications
[NASA-CR-159653] 24 p0800 N79-33581

CATIONS

Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272

CAVES

Eighty atmospheres in reserve --- compressed air storage in caverns for peaking power source
23 p0436 A79-35800

CAVITIES

Cavity-type surfaces for solar collectors
22 p0283 A79-26497

A simulation exercise of a cavity-type solar receiver using the HEAP program
24 p0670 A79-51730

CDC COMPUTERS

SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883

SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884

CELL ANODES

n-CdS/n-GaAs photoanode --- electrochemical solar cells
21 p0037 A79-11784

Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode --- for solar cells
22 p0317 A79-31411

Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272

CELL CATHODES

Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells
22 p0246 A79-21491

Dynamic aspects of solid solution cathodes for electrochemical power sources
24 p0636 A79-46665

CELLULOSE

The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634

Dehydration of ethanol - New approach gives positive energy balance
24 p0643 A79-47813

Design of flywheel rotors utilizing cellulosic materials
24 p0678 A79-51787

CENTIMETER WAVES
Atmospheric attenuation of centimeter microwaves
[AIAA PAPER 79-1423] 23 p0427 A79-34849
CENTRAL AMERICA
Opportunities for direct use of geoheat in Central America and other tropical countries
21 p0057 A79-16074
CENTRAL EUROPE
Solar options in central Europe - A synthesis of solar possibilities in technological terms according to present-day /1978/ criteria
23 p0435 A79-35490
CENTRIFUGAL COMPRESSORS
Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors
[ASME PAPER 79-GT-81] 23 p0376 A79-32360
CENTRIFUGAL FORCE
Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems
23 p0530 A79-42893
CENTRIFUGES
Aerodynamic separation of gases and isotopes: Recent advances --- conferences, Belgium, May-Jun. 1978
[VKI-LEC-SER-1978-8] 24 p0720 N79-28506
CERAMIC COATINGS
Metallurgical coatings 1978; Proceedings of the Fifth International Conference, San Francisco, Calif., April 3-7, 1978. Volumes 1 & 2
22 p0327 A79-31951
Selective-black absorbers using sputtered cermet films
22 p0327 A79-31969
CERAMIC NUCLEAR FUELS
Fusion energy for alternative applications: The generation of synthetic gaseous fuels --- approach to high temperature fusion reactor design
[ANL/FPP-TM-117] 24 p0755 N79-30790
CERAMICS
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
Ceramic components for vehicular gas turbines
21 p0034 A79-11150
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821
Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826
Development of ceramic parts for a truck gas turbine at MTU
21 p0050 A79-12831
Development of multi-density silicon nitride turbine rotors
21 p0050 A79-12832
Preliminary design of a subscale ceramic helical-rotor expander
21 p0050 A79-12849
Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design
21 p0050 A79-12850
Ceramic applications in the advanced Stirling automotive engine
21 p0051 A79-12851
Program to establish ceramic technology readiness for large combustion turbine utility application
[ASME PAPER 78-WA/GT-8] 21 p0160 A79-19796
Ceramic materials for vehicular gas turbine applications
21 p0165 A79-20095
Preliminary analysis of advanced ceramic magnetohydrodynamic /MHD/ combustor design concepts
22 p0240 A79-20838
The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381
Properties and test results of super-hot wall electrode materials --- for MHD generators
23 p0394 A79-33415
Ceramic receivers for solar power conversion
[AIAA PAPER 79-1008] 23 p0459 A79-38200
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Ceramic solar receivers
24 p0670 A79-51731
Ceramic technology readiness program
[FE-2664-7] 21 p0180 N79-11223
Tests of NASA ceramic thermal barrier coating for gas-turbine engines
[NASA-TM-79116] 22 p0357 N79-20118
MHD power generation: Research, development and engineering
[FE-3087-2] 22 p0363 N79-20518
Evaluation of ceramics for stator application: Gas turbine engine report
[NASA-CR-159533] 22 p0364 N79-21075
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557
Basic research on ceramic materials for energy storage and conversion system
[COO-2564-4] 23 p0564 N79-24506
Performance prediction evaluation of ceramic materials in point-focusing solar receivers
[NASA-CR-158774] 23 p0594 N79-27654
Materials technology for coal-conversion processes
[ANL-79-2] 24 p0719 N79-28362
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332] 24 p0781 N79-32518
CERMETS
Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors
22 p0256 A79-22855
Selective-black absorbers using sputtered cermet films
22 p0327 A79-31969
Spectrally selective surfaces of Ni-pigmented anodic Al2O3 --- solar energy absorbers
24 p0629 A79-46202
Ni cermet selective absorbers for solar photothermal conversion
24 p0641 A79-47790
State of cermet electrode development for flame heated thermionic converters
24 p0700 A79-51989
CERTIFICATION
Comparison of collector test methods
[ASSA-SE-B24/77] 23 p0574 N79-25526
CESIUM PLASMA
Radiatively sustained cesium plasmas for solar electric conversion
21 p0109 A79-16615
Magnetically confined plasma solar collector --- satellite based system in space
21 p0109 A79-16617
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940
CESIUM VAPOR
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems
24 p0640 A79-47573
A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers
24 p0704 A79-52166
CHALCOGENIDES
Low voltage behavior of lithium/metal dichalcogenide topochemical cells
22 p0286 A79-26995
CHANNEL FLOW
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693
Attenuating the transverse edge effect in MHD generators
21 p0063 A79-13985

Supersonic flow in an MHD channel with a downwash flow at the inlet
21 p0085 A79-15342
Effect of force field nonuniformity on flow in an MHD channel
21 p0101 A79-16365
Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators
21 p0153 A79-18469
Slag deposition and its effect on the performance of MHD channels --- in electric generators
[AIAA PAPER 79-0189] 21 p0157 A79-19588
Subsonic flow in the channel of an MHD-generator
21 p0167 A79-20413
Turbulence of a combustion product plasma in an MHD channel
22 p0246 A79-21538
Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626
Optimization of a diagonal MHD channel
22 p0247 A79-21628
Two-dimensional MHD channel design --- for energy performance improvement at lower wall temperature
22 p0279 A79-26183
Subsonic diffusers for MHD generators
22 p0279 A79-26185
Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392
Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity
22 p0324 A79-31845
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402
Diagonal frame RM channel of the U-25 power plant --- MHD generators
23 p0393 A79-33407
Further modeling of a solar collector based on linear clipped-V channels
23 p0399 A79-33993
Combustion-products turbulence in the channel of an MHD generator
23 p0442 A79-36812
Effect of diffusion on electron density across the nonequilibrium MHD channel
23 p0479 A79-39839
Heat transfer in a high-power MHD channel
23 p0533 A79-43171
Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371
Parametric study of the performance of a CDIF 1-B coal-fired MHD generator
[ANL-MHD-79-3] 22 p0361 N79-20503

CHARACTERIZATION
A theoretical analysis of the current-voltage characteristics of solar cells
[NASA-CR-158872] 24 p0737 N79-29606

CHARGE CARRIERS
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Carrier lifetime in silicon and its impact on solar cell characteristics
23 p0437 A79-36148
Measurement of free carrier lifetime in an illuminated solar cell from capacitance measurements
23 p0497 A79-40891
Contactless measurement of lifetime by free carrier infrared absorption --- in solar cells
23 p0497 A79-40892

CHARGE DISTRIBUTION
A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558
Plasma sheath effects and voltage distributions of large high-power satellite solar arrays
23 p0552 N79-24024

CHARGE TRANSFER
Electrocatalysis, charge-transfer and the states of H adsorption in the hydrogen evolution reaction
21 p0038 A79-11801
Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-2232

CHARGED PARTICLES
Single-particle behaviour in plasmas
22 p0257 A79-2297
Large space system - Charged particle environment interaction technology --- effects on high voltage solar array performance
[AIAA 79-0913] 23 p0425 A79-3477
NASCAP modelling of high-voltage power system interactions with space charged-particle environments --- particle impact on solar satellite surfaces
23 p0479 A79-3980
Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-2402

CHARGING
Rapid, efficient charging of lead-acid and nickel-zinc traction cells --- for electric vehicles
21 p0009 A79-1008

CHELATES
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates --- in fuel cell electrodes
21 p0038 A79-1180
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-3419

CHEMICAL ANALYSIS
Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion
21 p0054 A79-1329
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-3059
Chemical characterization of shale oil and related fuels
24 p0665 A79-5088
Chemicals from coal. Report based on HRI H-coal product
[FE-1534-50] 21 p0180 N79-1116
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
[NASA-TM-79035] 22 p0338 N79-1693
Sampling and analysis methods for geothermal fluids and gases
[PNL-SA-572-APP] 23 p0596 N79-2767
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-2835
Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-2936
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-3086

CHEMICAL ATTACK
Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-1493

CHEMICAL BONDS
Structure and bonding in metal hydrides
22 p0247 A79-2167

CHEMICAL CLEANING
Trace element characterization and removal/recovery from coal and coal wastes
[LA-7048-PR] 21 p0222 N79-1460

CHEMICAL COMPOSITION
The zinc electrode in sealed alkaline cells
21 p0040 A79-1182
Alternative aviation turbine fuels
21 p0047 A79-1237
Effect of broadened-specification fuels on aircraft engines and fuel systems
[AIAA 79-7008] 22 p0390 A79-2930
Compositional modeling of MHD channel slag, with preliminary vapor pressure data
23 p0391 A79-3339
Coal anion structure and chemistry of coal alkylation
[COO-4227-2] 21 p0170 N79-1017

Identification of probable automotive fuels consumption: 1985-2000, executive summary
[HCP/W3684-01/2] 21 p0194 N79-12249
Identification of probable automotive fuels composition: 1985-2000
[HCP/W3684-01/1] 21 p0201 N79-13191
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
Compatibility of elastomers in alternate jet fuels
[NASA-CR-158773] 23 p0588 N79-27321

CHEMICAL ENERGY
Basic physical and chemical processes for storage of heat
21 p0038 A79-11805
Chemically driven heat pumps for solar thermal storage
21 p0120 A79-17316
Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505
New chemical sources of current --- Russian book
22 p0237 A79-20679
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716
A hybrid chemical concept for solar energy storage
22 p0254 A79-22271
Solar and chemical energy
23 p0462 A79-38573
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O
23 p0470 A79-38641
The exergy of fuels --- energy conversion factors
24 p0611 A79-45500
Hydrogen from falling water --- hydraulic energy conversion to chemical energy
24 p0614 A79-45594
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595
DOE program on hydrogen energy systems
24 p0615 A79-45605
Dehydration of ethanol - New approach gives positive energy balance
24 p0643 A79-47813
Technology overview of energy storage systems
24 p0666 A79-50892
Conversion of solar energy to chemical energy using ammonia dissociation
24 p0672 A79-51746
Optical and thermal analysis of a Cassegrainian solar concentrator
24 p0713 A79-53498

CHEMICAL ENGINEERING
Engineering analysis of in situ liquefaction of coal
21 p0032 A79-10521
Chemical solutions to problems encountered in the gasification of coal
23 p0410 A79-34088
Chemistry for energy; Proceedings of the Symposium, Winnipeg, Manitoba, Canada, June 5-7, 1978
23 p0493 A79-40736
Prospects for coal conversion in Canada
23 p0494 A79-40737
Laboratory simulation of in-situ coal gasification
23 p0494 A79-40740
Hydrogen production via the K-T gas gasification process - Current economic and technological aspects
24 p0613 A79-45586
Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591
The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179
Prospective needs for physical property data in the chemical and allied industries during the next decade
[NPL-CHEM-84] 23 p0546 N79-23185
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508

CHEMICAL EQUILIBRIUM
An algorithm and BASIC computer program for calculating simple coal gasification equilibria
[PB-291241/8] 23 p0539 N79-22265

CHEMICAL EXPLOSIONS
Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells
22 p0246 A79-21487

CHEMICAL FUELS
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375

CHEMICAL PROPERTIES
Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319
Coal classification and characterization
24 p0714 A79-53777
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A058795] 21 p0206 N79-13503
Compilation of level 1 environmental assessment data
[PB-286924/6] 22 p0336 N79-16439
A study of the physical and chemical properties of oil shale relevant to physical concentration processes
23 p0569 N79-25445

CHEMICAL REACTIONS
A thermochemical energy storage system and heat pump
21 p0012 A79-10105
Electrocatalysis, charge-transfer and the states of H adsorption in the hydrogen evolution reaction
21 p0038 A79-11801
Liquid-phase reactions of vaporizing hydrocarbon fuels
21 p0052 A79-12987
Experimental study of thermal energy storage by use of reversible chemical reactions
23 p0416 A79-34137
Solar chemical reactors
23 p0462 A79-38572
A numerical model of underground coal gasification for air-water injection into a permeable bed
24 p0689 A79-51867
Nitrogen fixation with fusion heat
24 p0695 A79-51948
Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951
Coal combustion
24 p0714 A79-53779
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-9] 24 p0719 N79-28363
Reaction kinetics for remodeling oil shale retorting
[UCRL-81622] 24 p0720 N79-28653
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
Combined shift-methanation processes
[FE-2240-97] 24 p0736 N79-31414
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707
Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341

CHEMICAL REACTORS
Effect of inlet temperature on the performance of a catalytic reactor
21 p0035 A79-11542
Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342

Coal gasification studies. II - Reduction in the presence of I2 with H2, and H2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors 22 p0283 A79-26468
Effect of operating variables on reactor performance in the Synthoil coal conversion process 23 p0412 A79-34099
Solar chemical reactors 23 p0462 A79-38572
Theoretical and experimental study of a cylindrical solar photochemical reactor 23 p0467 A79-38618
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor 23 p0492 A79-40452
Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor 23 p0492 A79-40454
Laboratory simulation of in-situ coal gasification 23 p0494 A79-40740
The effect of coal characteristics on the catalytic liquefaction of Utah coals 24 p0628 A79-45991
Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels [FE-2321-12] 21 p0216 N79-14240
Development of a model and computer code to describe solar grade silicon production processes --- phase changes in chemical reactors [NASA-CR-158037] 21 p0219 N79-14555
Hydrogasifier development for the hydrane process [FE-2518-17] 24 p0745 N79-30397
Applied research and evaluation of process concepts for liquefaction and gasification of western coals [FE-2006-12] 24 p0766 N79-31415
Considerations in sizing coal gasification plants [FE-2240-40] 24 p0766 N79-31417
Evaluation of selected chemical processes for production of low-cost silicon, phase 3 --- using a fluidized bed reactor [NASA-CR-162168] 24 p0769 N79-31756
Fixed bed methanation processes [FE-2240-96] 24 p0779 N79-32382

CHEMISORPTION
Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis 24 p0640 A79-47591

CHILE
The Puchuldiza geothermal field --- hot springs in Chilean Andes mountains 23 p0408 A79-34070

CHLORIDES
Chloride corrosion and its inhibition in refuse firing 21 p0080 A79-14930
Sodium-antimony trichloride battery development program for load leveling [EPRI-EM-751] 21 p0186 N79-11501

CHLORINATION
Coal desulfurization by low-temperature chlorinolysis 21 p0045 A79-12119

CHLORINE
The zinc-chlorine battery in the BEST facility - 1981 24 p0703 A79-52013

CHLOROPHYLLS
Harvesting solar energy using biological systems 21 p0126 A79-17372
Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes --- for solar energy conversion 22 p0273 A79-25548
Model of photofuel element on the base of chlorophyll sensitized reactions 24 p0708 A79-52952
The use of chlorophyll in a novel solar battery 24 p0736 N79-29594

CHLOROPLASTS
Synthetic chloroplasts --- for photosynthetic solar energy conversion 22 p0262 A79-23721
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-286487/4] 21 p0230 N79-15422

CHLOROSILANES
Possibility of production of low cost solar grade silicon by trichlorosilane process 21 p0125 A79-17363

CHOKES (RESTRICTIONS)
Improved techniques for gasifying coal [FE-2340-7] 23 p0554 N79-24186

CHROMATOGRAPHY
Applied research and evaluation of process concepts for liquefaction and gasification of western coals [FE-2006-9] 24 p0719 N79-28363

CHROMIUM
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath 21 p0127 A79-17379
Selective absorption of solar energy by ultrafine metal particles 21 p0127 A79-17382
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber 21 p0127 A79-17383
Microstructure dependence of the optical properties of solar-absorbing black chrome 22 p0256 A79-22858
Selective absorption of solar energy in ultrafine metal particles - Model calculations 22 p0273 A79-25746
Optimization studies on black chrome electroplating variables for solar selective surfaces 22 p0317 A79-31407
Temperature dependence of selective properties for black chromium solar absorbers 23 p0465 A79-38600
Current conduction in Cr-MIS solar cells on single-crystal p-silicon 24 p0648 A79-49215
The surface microstructure optical properties relationship in solar absorbers - Black chrome 24 p0655 A79-50181
Microstructure of a black chrome solar selective absorber 24 p0655 A79-50182
Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization 24 p0656 A79-50188
Chromium black coatings for photothermal conversion of solar energy. II - Optical properties 24 p0656 A79-50189
Supply of reactants for Redox bulk energy storage systems [NASA-TM-78995] 21 p0183 N79-11479
Structure of a black chrome solar selective surface [LBL-6691-REV] 24 p0753 N79-30778
Microstructure and optical properties of black chrome before and after exposure to high temperatures [LBL-8632] 24 p0756 N79-30804
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-2] 24 p0765 N79-31386

CIRCUIT BREAKERS
Synthetic test methods of high-direct-current circuit breaker --- used with ohmic heating power supply for tokamak device 24 p0716 A79-54504

CIRCUIT PROTECTION
Operating systems for solar electric energy supplies 23 p0466 A79-38606
Airport power supply --- Russian book 24 p0660 A79-50499

CIRCUIT RELIABILITY
High reliability contacts for miniature thermoelectric converters 21 p0027 A79-10228
Simmer-enhanced flashlamp-pumped dye laser 23 p0384 A79-32981

CIRCUITS
Power management and control for space systems 21 p0170 N79-10134

CIRCULAR CONES
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974
CIRCULAR CYLINDERS
Comparative performance of tracking type and non-tracking type solar collectors
21 p0136 A79-17454
CIRCULAR TUBES
Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion
21 p0008 A79-10070
Optimum tube pitch in solar collectors
21 p0132 A79-17421
Core unit testing of the APL/JHU shell-less folded tube heat exchanger --- for OTEC
24 p0618 A79-45788
CIRCUMSOLAR RADIATION
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion
21 p0082 A79-15077
CITIES
Energy from urban waste
21 p0096 A79-15917
Comparative outdoor measurements on flat-plate solar collectors in a metropolitan area in Western Germany
21 p0128 A79-17394
Planning program to accelerate energy conservation in municipalities
[HCP/M05017-01/1] 21 p0210 N79-13536
Baltimore applications project
[NASA-TM-79667] 22 p0351 N79-18815
Urban areas as energy flow systems
24 p0736 N79-29592
Environmental readiness document: Urban waste energy recovery. Commercialization phase 3 planning
[DOE/ERD-0002] 24 p0745 N79-30102
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599
Comprehensive community energy planning. Volume 2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713
Community systems program --- for effective energy conservation
[DOE/CS-0072] 24 p0757 N79-30813
Energy from urban wastes: Report on a focus group discussion
[DOE/TIC-10022] 24 p0759 N79-30825
Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829
CIVIL AVIATION
Impact of fuel availability and other cost trends on air carrier operations
21 p0053 A79-13077
Pilot's view of the evolving air transport
21 p0053 A79-13085
Technology for aircraft energy efficiency
21 p0066 A79-14136
Alternate aircraft fuels prospects and operational implications
21 p0066 A79-14138
Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911
Air pollutant emission factors for military and civil aircraft
[PB-292520/4] 23 p0575 N79-25567
CLASSIFICATIONS
Energy information data base. Guide to abstracting and indexing
[TID-4583-R1] 21 p0184 N79-11488
CLASSIFYING
Air classify first, then shred --- solid waste processing to reduce danger of explosions
23 p0489 A79-40404
CLEAN ENERGY
Coal desulfurization: Chemical and physical methods; Proceedings of the Symposium, New Orleans, La., March 23, 1977
21 p0044 A79-12114
An overview of coal preparation --- for producing clean fuel through desulfurization
21 p0044 A79-12115
German Solar Energy Forum, 1st, Hamburg, West Germany, September 26-28, 1977, Proceedings. Volume 2
21 p0055 A79-13619
Fuel-cell power plants
21 p0068 A79-14398
Particulate and sulfur oxide control options for conventional coal combustion
21 p0092 A79-15883
Development of central station power plants integrated with coal gasifiers --- utilizing molten-carbonate fuel cells
21 p0093 A79-15895
Ocean energy unlimited --- water wave conversion
21 p0095 A79-15908
Hot dry rock, an abundant clean energy resource
21 p0098 A79-16106
A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system
21 p0098 A79-16107
International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 16-22, 1978, Symposium Lectures
21 p0102 A79-16451
Solar-hydrogen energy system and solar-hydrogen production methods
21 p0104 A79-16463
Tidal power plants - Sites, history and geographical distribution
21 p0150 A79-18102
Wind power and other energy options --- Book
21 p0153 A79-18346
Burn coal cleanly in a fluidized bed - The key is in the controls
22 p0282 A79-26374
The use of ocean energy - A hydrostatic motor
22 p0288 A79-27391
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 2 - Solar energy 2
23 p0400 A79-34002
Low-head hydroelectric power - A realizable alternative
23 p0409 A79-34082
Hydrogen from the wind - A clean energy system
23 p0413 A79-34112
Remote new energy sources utilization in on-site non-polluting power plant - Liquid air as energy carrier concept and final conversion plant design
23 p0416 A79-34141
A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0419 A79-34156
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157
Hydrogen energy system concept and engineering applications
23 p0451 A79-37874
Aspects of solar energy use in the Federal Republic of Germany
23 p0473 A79-38668
Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution
23 p0531 A79-42900
Renewable energy sources --- overview of West German options
24 p0606 A79-44958
Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings
24 p0664 A79-50876
Preliminary design of a cruising OTEC modular experiment
24 p0674 A79-51758
Feasibility of energy self sufficiency through decentralized use of renewable resources in Iran
24 p0698 A79-51974
Electrical induction heating - A new approach to underground coal gasification
24 p0708 A79-52953
Passive solar heating of buildings using a transwall structure
24 p0712 A79-53493

An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357
LLL wind energy studies (OAHU)
[UCRL-82171] 23 p0582 N79-26510
A large scale wind energy program for the state of California
23 p0594 N79-27648
Large wind energy focus group results
[DOE/TIC-10038] 24 p0738 N79-29623

CLEAN FUELS
Economic evaluation of the ATC/Wellman incandescent two-stage low Btu coal gas producer
21 p0146 A79-17640
Upgrading lignite by the Koppelman process
21 p0146 A79-17641
Synthetic fuels from Gulf Coast lignite
21 p0146 A79-17643
The Dow Chemical liquefaction process
21 p0147 A79-17644
Market penetration characteristics for energy production and atmospheric carbon dioxide growth
24 p0643 A79-47812
Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels
21 p0179 N79-11150

CLEANERS
Effects of noncontact cleaners on transparent solar materials
[PNL-2969] 24 p0789 N79-32709

CLEANING
Application of the Cathelco system for control of fouling in OTEC systems
24 p0627 A79-45870
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378
Interagency coal cleaning technology development
22 p0347 N79-18361
Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625

CLIMATE
Optimum collector slope for residential heating in adverse climates
22 p0263 A79-23761
Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497
Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days
[PB-289204/0] 22 p0355 N79-19467

CLIMATOLOGY
The effects of different energy strategies on the atmospheric CO2 concentration and climate
21 p0106 A79-16523
Climatic change in connection with energy growth --- resource consumption effects
22 p0284 A79-26623
Solutions to energy conservation in northern climates
22 p0321 A79-31443
On solar energy heating and degree days during the winter months
24 p0610 A79-45226
Interannual and month-to-month variations of wind speed --- for wind turbine sites
24 p0629 A79-46221
Multidisciplinary research related to the atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679
Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811

CLOSED CYCLES
Closed Cycle Gas Turbine power generation opportunities
21 p0004 A79-10039
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826
The nuclear closed-cycle gas turbine /GT-HTGR/ - A utility power plant for the year 2000
[AIAA PAPER 79-0191] 21 p0157 A79-19590
Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524
Cogeneration in Europe and the combined cycle gas turbine
22 p0297 A79-28988
Conceptual design of a solar powered closed-cycle gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532
Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines
[ASME PAPER 79-GT-54] 23 p0376 A79-32349
Utilization of the cold by LNG vaporization with closed-cycle gas turbine
[ASME PAPER 79-GT-84] 23 p0376 A79-32361
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370
The relationship of power and heat production with closed cycle gas turbines
[ASME PAPER 79-GT-103] 23 p0377 A79-32379
Conceptual design of a pulverized coal furnace for a utility size closed-cycle, gas-turbine power plant
[ASME PAPER 79-GT-158] 23 p0378 A79-32420
Closed cycle gas turbines, an ECAS update. I
[ASME PAPER 79-GT-204] 23 p0380 A79-32461
Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418
Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837
Closed cycle gas turbines, volume 1
[VKI-LECTURE-SERIES-100-VOL-1] 22 p0331 N79-16260
Large closed-cycle gas turbine plant
[GA-A-14311] 22 p0331 N79-16261
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268
Stirling engine characteristics
23 p0580 N79-26480

CLOUD COVER
On solar energy heating and degree days during the winter months
24 p0610 A79-45226
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712

CLOUD PHOTOGRAPHY
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712

COAGULATION
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements
24 p0612 A79-45532

COAL
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
Liquefaction of high ash Brazilian coals
23 p0385 A79-33224
Pollutant protection for the case of strip mining in the Rhine area
24 p0714 A79-53804
Coal anion structure and chemistry of coal alkylation
[COO-4227-2] 21 p0170 N79-10178
Proceedings of the Engineering Foundation Conference on Clean Combustion of Coal
[PB-282949/7] 21 p0171 N79-10243
Application of multispectral scanner data to the study of an abandoned surface coal mine
[NASA-TM-78912] 21 p0204 N79-13472
A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0204 N79-13474

Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243
Source assessment: Water pollutants from coal storage areas
[PB-285420/6] 21 p0223 N79-14635
Proceedings of Energy Resource 5th Conference
[PB-286246/4] 21 p0230 N79-15423
GAO work involving title V of the Energy Policy and Conservation Act of 1975
[PB-286400/7] 21 p0230 N79-15424
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474
Assessment of coal cleaning technology
[PB-287091/3] 22 p0330 N79-16139
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany
[E79-10102] 22 p0339 N79-17291
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6] 22 p0339 N79-17309
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311
Coal preparation design for export markets, with particular reference to South African and Canadian coals
22 p0340 N79-17318
Influence of marketing requirements on definition of coal resources
22 p0340 N79-17319
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378
Interagency coal cleaning technology development
22 p0347 N79-18361
Catalyst aging tests and the role of catalyst wetting on hydrodesulfurization of a coal derived liquid
22 p0352 N79-19169
Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429
Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625
Pollution control guidelines for coal refuse piles and slurry ponds
[PB-291369/7] 22 p0373 N79-21682
Methane drainage study in the Sunnyside coalbed, Utah
[PB-289772/6] 23 p0540 N79-22606
Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181
Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187
Development of sensitized pick coal interface detector system
[NASA-CR-161225] 23 p0556 N79-24417
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443
High-gradient magnetic separation for removal of sulfur from coal
[PB-290945/5] 23 p0569 N79-25469
Minnesota coal study
[PB-292106/2] 23 p0575 N79-25538
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236
Stability of coal-oil mixtures --- conferences
[CONF-7805152-1] 23 p0589 N79-27332
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0590 N79-27342
Coal supply for California
23 p0592 N79-27607
Prospects for coal slurry pipelines in California
23 p0592 N79-27608
Status of NO sub x control for coal-fired power plants
23 p0592 N79-27609
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610
Fluidized combustion of coal --- to limit SO2 and NOx emissions
23 p0593 N79-27613
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667
Comparison of atmospheric fluidized bed combustion conceptual designs for utility steam generation
[HCP/T2314] 24 p0729 N79-28792
Clean energy from coal
[PETC-1000] 24 p0733 N79-29370
Water and energy resource development in the Tongue River Basin, southeastern Montana
24 p0735 N79-29566
Short notice on a grand forest: Tropical land converting sunlight to energy
[NP-23278] 24 p0741 N79-29653
Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement)
[PB-293731/6] 24 p0743 N79-29670
Bituminous coal and lignite distribution, January - September 1978
[DOE/EIA-0125/3-78] 24 p0748 N79-30688
Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864
Hazards from radioactive waste in perspective --- comparison with wastes from burning coal
[CONF-790204-9] 24 p0761 N79-31024
Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419
Coal-rock interface detector
[NASA-CASE-MFS-23725-1] 24 p0768 N79-31706
Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743
Rocky mountain coal for southern California's coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0780 N79-32390
Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming
[E79-10279] 24 p0796 N79-33518
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654
Modal analysis of seismic guided waves in coal seams
24 p0803 N79-33664

COAL GASIFICATION
Design considerations for an in situ gasification test of eastern bituminous coals
21 p0005 A79-10049
Instrumentation development for in situ coal gasification
21 p0006 A79-10053

Coal conversion by flash hydropyrolysis and hydrogasification
21 p0006 A79-10055

Synthane - A process for the gasification of caking and noncaking coals
21 p0006 A79-10057

Process development for the Westinghouse advanced fluidized-bed coal gasification system
21 p0006 A79-10058

Theoretical studies of coal pyrolysis in an entrained bed flow reactor
21 p0007 A79-10063

Computer aided optimization of integrated coal gasification combined cycle power plants
21 p0008 A79-10075

Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077

Catalytic gasification predevelopment research
21 p0029 A79-10246

Catalytic coal gasification exploratory research program
21 p0030 A79-10247

Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520

Underground coal gasification research at the University of New Mexico
21 p0032 A79-10523

Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778

Desulfurization and sulfidation of coal and coal char
21 p0045 A79-12120

Ambient air quality assessment of the Synthane coal gasification pilot plant, six month study /August 1976-January 1977/
21 p0064 A79-14113

Coal gasification and its alternatives
21 p0071 A79-14679

Shock tube studies of coal devolatilization
21 p0083 A79-15247

Risk control in the development of energy processes --- environment, worker and capital considerations in coal gasification
21 p0085 A79-15372

H-Coal pilot plant project and status of commercial development at Ashland --- coal gasification producing hydrogen and hydrocarbons
21 p0092 A79-15888

Development of central station power plants integrated with coal gasifiers --- utilizing molten-carbonate fuel cells
21 p0093 A79-15895

SNG production by the Rockgas process
21 p0093 A79-15896

Incentives and requirements for gasification based power systems
21 p0094 A79-15904

Integrated low Btu gasification, combined cycle plant considerations and control
21 p0094 A79-15905

Production and use of low and medium Btu gas
21 p0095 A79-15912

Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924

A methodological note on the evaluation of new technologies - The case of coal gasification
21 p0099 A79-16122

Gasification Combined Cycle Test Facility at Pekin, Illinois
21 p0145 A79-17632

Advances in fluidized bed gasification process development
21 p0145 A79-17633

Synthetic fuels from coal
21 p0145 A79-17636

Economic evaluation of the ATC/Wellman incandescent two-stage low Btu coal gas producer
21 p0146 A79-17640

Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401

A theoretical study of wood gasification processes
22 p0257 A79-22923

Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719

Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

Methane formation during the hydrogasification and the gas phase pyrolysis of defined aromatics
22 p0265 A79-23829

Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188

Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189

Wilson parameters for the system H_2, N_2, CO, CO_2, CH_4, H_2S, CH_3OH, and H_2O --- for cold methanol absorption in coal gasification
22 p0282 A79-26462

Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source
22 p0283 A79-26466

A mass and energy balance of a Wellman-Galusha gasifier --- bituminous coal conversion
22 p0283 A79-26467

Coal gasification studies. II - Reduction in the presence of I_2 with H_2, and H_2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors
22 p0283 A79-26468

Sampling and analysis of synthetic fuel processes --- coal gasification and liquefaction effluent analysis
22 p0284 A79-26538

Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395

Hydrogen via gasification - Today and tomorrow
22 p0289 A79-27652

Lignite - Abundant raw material of the future
22 p0296 A79-28438

Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983

The economics of hydrogen and carbon monoxide separation with cuprous ammonium lactate solutions --- hydrogen production from coal
22 p0299 A79-29313

Coal gasification studies. III - Reduction in the presence of some metal iodides and iron halides
22 p0299 A79-29314

Energy conversion engineering --- Book
22 p0302 A79-29575

Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974

Study of integrated gasification combined cycle plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530

Gasification of raw lignite in the tube-furnace gasifier
22 p0310 A79-30996

High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249

Development of an industrial gas turbine combustor burning a variety of coal-derived low Btu fuels and distillate
[ASME PAPER 79-GT-172] 23 p0379 A79-32433

A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434

Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455

Mechanistic modeling of pulverized coal combustion --- in MHD generators
23 p0390 A79-33380

A two-dimensional pulverized coal combustor model --- for MHD generators
23 p0390 A79-33383

Behavior of eastern and western coals in fuel-rich
reaction conditions --- gasification behavior of
Montana Rosebud and Pittsburgh seam bituminous
coals for MHD generators
23 p0390 A79-33384
Cyclone and fluidized bed combustion concepts for
coal fired open cycle MHD
23 p0391 A79-33385
The cost of hydrogen from coal
23 p0396 A79-33766
Alternative energy sources; Proceedings of the
Miami International Conference, Miami Beach,
Fla., December 5-7, 1977. Volume 7 - Hydrocarbon
conversion technology
23 p0410 A79-34086
A numerical simulation model for entrained flow
coal gasification. I - The hydrodynamical model
23 p0410 A79-34087
Chemical solutions to problems encountered in the
gasification of coal
23 p0410 A79-34088
The Synthane process - A technical and economic
assessment --- of coal gasification
23 p0410 A79-34089
HYGAS - A process ready for commercial demonstration
--- coal gasification
23 p0411 A79-34090
Catalytic gasification of coals pretreated with
liquid ammonia
23 p0411 A79-34091
In situ gasification - Recovery of inaccessible
coal reserves
23 p0411 A79-34093
An evaluation of integrated coal
gasification/water-splitting processes
23 p0411 A79-34094
Coal gasification as applied to MHD power cycle
23 p0411 A79-34095
Transmission of energy by open-loop chemical
energy pipeline
23 p0411 A79-34096
Dynagas Process
23 p0412 A79-34098
A coal gasification-gas cleaning pilot plant at
North Carolina State University
23 p0419 A79-34156
Energy sources of the future - A challenge to
man's ingenuity
23 p0423 A79-34389
The Powerton gasification combined-cycle test
facility - A preview
23 p0424 A79-34454
Coal gasification for electric utilities
23 p0436 A79-35799
Hydrogen production from coal, water and electrons
23 p0445 A79-37072
Fuel release from solid fossil-fuel deposits by
electrical induction heating
23 p0446 A79-37285
The potential application of rotating fluidised
beds to power generating schemes
23 p0454 A79-37906
Prospects of MHD power generation in India using
coal
23 p0454 A79-37907
Integrated coal conversion utilization program
[AIAA PAPER 79-0997] 23 p0459 A79-38195
Converting coal to liquid/gaseous fuels
23 p0461 A79-38376
Pulverized-coal combustion and gasification:
Theory and applications for continuous flow
processes --- Book
23 p0474 A79-38871
Rough cost estimates of solar thermal/coal or
biomass derived fuels
[AIAA PAPER 79-0988] 23 p0476 A79-38893
Materials problems experienced at the Synthane
coal-gasification pilot plant
23 p0478 A79-39788
Post mortem assessment - Coal gasification plant
23 p0480 A79-39909
Use of high-frequency electromagnetic waves for
mapping an in situ coal gasification burn front
23 p0486 A79-40251
A stoichiometric analysis of coal gasification
23 p0492 A79-40456
Prospects for coal conversion in Canada
23 p0494 A79-40737
Laboratory simulation of in-situ coal gasification
23 p0494 A79-40740
An information approach to examining developments
in an energy technology - Coal gasification
23 p0523 A79-41375
In situ coal gasification - New energy source for
Europe
23 p0525 A79-41815
A method of iteration for calculating the
gasification gas composition of hydrocarbons and
coal dust at low temperatures and high pressure
23 p0528 A79-42228
Analysis of conduction responses during an
underground coal gasification experiment
23 p0531 A79-42898
A numerical study of the effects of complex
terrain on dynamics of airflow and pollutant
dispersion
23 p0535 A79-43383
The conversion of SO2 to sulfate particles in coal
fired power plant plumes
23 p0535 A79-43391
The future of methane supply
24 p0601 A79-44242
Evolution of particles in the plumes of coal-fired
power plants. II - A numerical model and
comparisons with field measurements
24 p0612 A79-45532
Hydrogen production via the K-T gas gasification
process - Current economic and technological
aspects
24 p0613 A79-45586
Developmental hydrogen via coal gasification
processes
24 p0613 A79-45587
Combustion of coal particles in wall-burning swirl
combustors --- for MHD generators
24 p0632 A79-46317
A steam process for coal gasification
24 p0632 A79-46321
Synthetic fuels at the crossroads --- coal
gasification technology
24 p0645 A79-48049
Small-scale coal-gasification plants
24 p0647 A79-49158
Lockheed urges hydrogen fuel
24 p0648 A79-49224
The rough road to making oil and gas from coal
24 p0651 A79-49423
Manufacture of fuel gas for power generation by
fluidized bed gasification of coal
24 p0657 A79-50212
Special considerations in the environmental study
program for coal gasification plants
24 p0659 A79-50350
Development of coalbed methane as an energy source
24 p0660 A79-50452
Environmental investigations of in situ coal
gasification experiments
24 p0664 A79-50880
Mixed fuel gas - A technically, economically and
environmentally superior way to supplement
natural gas supplies
24 p0664 A79-50881
Environmental aspects of the Department of
Energy's underground coal conversion program
24 p0664 A79-50882
Char gasification. I - Transport model
24 p0667 A79-50913
Char gasification. II - Oxidation results
24 p0667 A79-50914
Analysis of geological limitations to underground
coal gasification
24 p0668 A79-51025
Solid electrolyte fuel cell for electric utility
power generation
24 p0682 A79-51815
Hydrogen from coal using pressurized gasification
24 p0687 A79-51853
Steam gasification of Illinois coal and coke
24 p0687 A79-51857
Computer analysis of coal gasification combined
cycle plants
24 p0687 A79-51858
The effect of gasifier steam demand on the overall
efficiency of a coal gasification combined-cycle
power plant
24 p0687 A79-51859

COAL GASIFICATION CONTD

The pyrolysis route to gasification 24 p0688 A79-51860

IGT U-GAS pilot plant developments --- of fluidized-bed gasification 24 p0688 A79-51861

Equipment and strategy for environmental sampling of complex coal gasification process streams 24 p0688 A79-51862

Field performance of underground coal gasification 24 p0688 A79-51866

A numerical model of underground coal gasification for air-water injection into a permeable bed 24 p0689 A79-51867

Entrainment coal gasification modeling 24 p0704 A79-52028

Electrical induction heating - A new approach to underground coal gasification 24 p0708 A79-52953

Rates of coal pyrolysis and gasification reactions 24 p0714 A79-53778

Coal gasification for high and low Btu fuels 24 p0714 A79-53780

Low NOx combustion concepts for advanced power generation systems firing low-Btu gas [PB-282983/6] 21 p0178 N79-10610

Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier [EPRI-AF-782] 21 p0180 N79-11238

Catalytic conversion of coal energy to hydrogen [FE-2206-14] 21 p0180 N79-11239

Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation [EPRI-AF-753] 21 p0185 N79-11498

Environmental Development Plan (EDP): Underground coal conversion program, FY 1977 [DOE/EDP-0011] 21 p0192 N79-11569

Measurement of high-temperature, high-pressure processes [PB-284041/1] 21 p0195 N79-12424

Guidelines for preparing environmental test plans for coal gasification plants [PB-286659/8] 21 p0232 N79-15479

Thermoelastic solutions for in-situ gasification of coal 22 p0330 N79-16135

Modelling and control of a fluidized bed gasifier 22 p0332 N79-16345

Pollutants from synthetic fuels production: Facility construction and preliminary tests --- coal gasification plant effluents [PB-287730/6] 22 p0339 N79-17027

Coal gasification and South Africa 22 p0340 N79-17321

Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion [PB-288602/6] 22 p0350 N79-18487

Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C [PB-288603/4] 22 p0350 N79-18488

Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F [PB-288604/2] 22 p0350 N79-18489

Water-related environmental effects in fuel conversion, volume 1. Summary [PB-288313/0] 22 p0351 N79-18834

Applicability of petroleum refinery control technologies to coal conversion [PB-288630/7] 22 p0352 N79-19173

Water-related environmental effects in fuel conversion. Volume 2: Appendices [PB-288874/1] 22 p0356 N79-19496

Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal 22 p0364 N79-21215

Environmental assessment: Source test and evaluation report, Chapman low-Btu gasification [PB-289940/9] 22 p0373 N79-21662

Air quality impacts using SRC versus conventional coal in power plants [PB-290237/7] 22 p0373 N79-21671

An algorithm and BASIC computer program for calculating simple coal gasification equilibria [PB-291241/8] 23 p0539 N79-22265

The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems 23 p0545 N79-22950

Analysis of coal hydrogasification processes [FE-2565-13] 23 p0554 N79-24183

Pipeline gas from coal-hydrogenation: IGT hydrogasification process, project 9000 [FE-2434-29] 23 p0554 N79-24184

Improved techniques for gasifying coal [FE-2340-7] 23 p0554 N79-24186

Low Btu coal gasification processes. Volume 1: Summary, screening, and comparisons [ORNL/ENG/TM-13-VOL-1] 23 p0555 N79-24188

Study of heat transfer through refractory lined gasifier vessel walls [FE-2210-29] 23 p0556 N79-24306

In situ coal gasification modeling [UCRL-82269] 23 p0561 N79-24479

Process design for coal conversion reactors [CONF-781110-15] 23 p0577 N79-26232

A Kentucky energy resource utilization program [PB-292949/5] 23 p0585 N79-26538

Coal gasification, commercial concepts, gas cost guidelines, revision 1 [FE-2240-100] 23 p0589 N79-27331

Investigation of flow phenomena in pulverized coal gasification for the new process [BMFT-FB-T-78-27] 23 p0590 N79-27341

The Texaco coal gasification process for manufacture of medium BTU gas 23 p0593 N79-27614

Synthetic natural gas in California: When and why --- from coal 23 p0593 N79-27615

Methanol from coal 23 p0593 N79-27619

Materials technology for coal-conversion processes [ANL-79-2] 24 p0719 N79-28362

Applied research and evaluation of process concepts for liquefaction and gasification of western coals [FE-2006-9] 24 p0719 N79-28363

Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels [FE-1784-39] 24 p0719 N79-28364

Erosion testing of potential valve materials for coal gasification systems [PB-293308/3] 24 p0720 N79-28592

The gas turbine/steam turbine cycle with coal gasification 24 p0723 N79-28737

Chemical vapor deposition of wear-resistant coatings [BM-RI-8348] 24 p0732 N79-29276

Corrosion of metals in coal-gasification environments [CONF-790145-2] 24 p0732 N79-29305

Mathematical model of the HYGAS pilot plant reactor [CONF-790405-11] 24 p0733 N79-29368

Preliminary market evaluation for gas produced by underground gasification of western coal [SAN-0115-T124-1] 24 p0733 N79-29369

Commercialization focus group interview: Medium and low Btu coal gasification [DOE/TIC-10029] 24 p0733 N79-29371

Bibliography of subsidence and related topics for in situ coal gasification [LETC/BL-71316-1] 24 p0733 N79-29373

Triaxial tests of coal gasification samples [UCRL-13968] 24 p0733 N79-29374

Rural development initiatives: Energy for rural America [PB-295234/9] 24 p0743 N79-29674

Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability [PB-294338/9] 24 p0744 N79-29709

Hydrogasifier development for the hydrane process [FE-2518-17] 24 p0745 N79-30397

Performance characteristics of a slagging gasifier for MHD combustor systems [NASA-TM-79195] 24 p0749 N79-30720

Rational energy utilization in coke-oven-plant operations [BMFT-FB-T-77-72] 24 p0759 N79-30832

Pollution and environmental aspects of fuel conversion. A bibliography with abstracts [NTIS/PS-79/0378] 24 p0761 N79-30857

Formation of protective layers on alloys developed for use in coal gasification environments [SAND-78-8277] 24 p0765 N79-31383
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-2] 24 p0765 N79-31386
Hydrogen production, volume 1. A bibliography with abstracts [NTIS/PS-79/0540/9] 24 p0765 N79-31406
Hydrogen production, volume 2. A bibliography with abstracts --- by electrolysis and coal gasification [NTIS/PS-79/0541/7] 24 p0765 N79-31407
Applied research and evaluation of process concepts for liquefaction and gasification of western coals [FE-2006-12] 24 p0766 N79-31415
Analysis of coal hydrogasification processes [FE-2565-14] 24 p0766 N79-31416
Considerations in sizing coal gasification plants [FE-2240-40] 24 p0766 N79-31417
Addition of devolatilization equations to synthane computerized mathematical model [COO-0277-1] 24 p0766 N79-31418
Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes [SAND-79-0786C] 24 p0769 N79-31744
Fixed bed methanation processes [FE-2240-96] 24 p0779 N79-32382
Research and development work for hydrogasification of coal with nuclear processing heat done in the framework of the prototype nuclear processing heater project [BMFT-FB-T-78-25] 24 p0780 N79-32393
Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat [BMFT-FB-T-78-29] 24 p0780 N79-32394
Aquatic microcosms for assessment of effluent effects [EPRI-EA-936] 24 p0803 N79-33614

COAL LIQUEFACTION
Coal conversion by flash hydropyrolysis and hydrogasification 21 p0006 A79-10055
H-coal products for direct application to power generation --- coal liquefaction derived fuels 21 p0006 A79-10056
Gasification of coal liquefaction residues 21 p0006 A79-10059
Exxon Donor Solvent coal liquefaction process development 21 p0007 A79-10060
Coal liquefaction - Status and new directions 21 p0007 A79-10062
Scaling up coal liquids 21 p0031 A79-10475
Engineering analysis of in situ liquefaction of coal 21 p0032 A79-10521
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen [ASME PAPER 78-GT-126] 21 p0033 A79-10791
Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies --- Process Development Unit 21 p0045 A79-12121
SRC-II - Review of development and status --- Solvent Refined Coal process for fuel oil production 21 p0092 A79-15887
Status and outlook of the Exxon Donor Solvent coal liquefaction process development 21 p0092 A79-15889
Coal-based electricity and air pollution control - A case for solvent refined coal 21 p0096 A79-15922
The H-Coal project --- catalytic hydrogenation of coal 21 p0145 A79-17635
Synthetic fuels from coal 21 p0145 A79-17636
Synthetic fuels from Gulf Coast lignite 21 p0146 A79-17643
The Dow Chemical liquefaction process 21 p0147 A79-17644
Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam 22 p0262 A79-23719
Failure analysis in coal conversion systems --- pilot plant for liquefaction 22 p0266 A79-24137
Evaluation of commercial catalysts for the Fischer-Tropsch reaction --- for coal conversion to liquid fuel or chemical feedstock 22 p0272 A79-25124
Moessbauer spectroscopy of iron in coal and coal hydrogenation products 22 p0282 A79-26464
Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies 22 p0282 A79-26465
Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system 22 p0283 A79-26469
Sampling and analysis of synthetic fuel processes --- coal gasification and liquefaction effluent analysis 22 p0284 A79-26538
Reaction mechanism of alkali-alcohol treatment of coal 22 p0299 A79-29315
Energy conversion engineering --- Book 22 p0302 A79-29575
Aviation fuels from coal 22 p0325 A79-31913
Fuel effects in recent combustion turbine burner tests of six coal liquids [ASME PAPER 79-GT-137] 23 p0378 A79-32406
Liquefaction of high ash Brazilian coals 23 p0385 A79-33224
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 7 - Hydrocarbon conversion technology 23 p0410 A79-34086
Dynagas Process 23 p0412 A79-34098
Effect of operating variables on reactor performance in the Synthoil coal conversion process 23 p0412 A79-34099
The H-Coal pilot plant - History, description, and present status 23 p0412 A79-34100
COIL process - First generation commercial coal liquefaction plant 23 p0412 A79-34101
Coal liquefaction - The H-Coal process 23 p0412 A79-34102
Converting coal to liquid/gaseous fuels 23 p0461 A79-38376
Enhancement of magnetic separability in coal liquefaction residual solids 23 p0461 A79-38434
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor 23 p0492 A79-40452
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes 23 p0492 A79-40453
Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor 23 p0492 A79-40454
Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process 23 p0492 A79-40455
Prospects for coal conversion in Canada 23 p0494 A79-40737
The effect of coal characteristics on the catalytic liquefaction of Utah coals 24 p0628 A79-45991
Changes within tin-containing catalysts under hydrorefining conditions --- for coal liquefaction 24 p0628 A79-45993
A survey of methods of coal hydrogenation for the production of liquids 24 p0628 A79-45994
Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures 24 p0632 A79-46318

The rough road to making oil and gas from coal 24 p0651 A79-49423

Advances in H-Coal --- coal liquefaction process 24 p0687 A79-51855

Evaluation of use of syngas for coal liquefaction 24 p0703 A79-52027

Coal liquefaction 24 p0714 A79-53781

Phase equilibria in coal hydrogenation systems [FE-2334-6] 21 p0171 N79-10238

Standards of Practice Manual for the solvent refined coal liquefaction process [PB-283028/9] 21 p0178 N79-10595

Surfactant-assisted liquefaction of particulate carbonaceous substances [NASA-CASE-NPO-13904-1] 21 p0179 N79-11152

Chemicals from coal. Report based on HRI H-coal product [FE-1534-50] 21 p0180 N79-11166

Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels [FE-2321-12] 21 p0216 N79-14240

Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient [ANL/CEN-FE-77-5] 21 p0216 N79-14242

Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5 [PB-287180/4] 22 p0339 N79-17026

Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes [PB-287799/1] 22 p0344 N79-17364

Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes [PB-287800/7] 22 p0344 N79-17365

Water-related environmental effects in fuel conversion, volume 1. Summary [PB-288313/0] 22 p0351 N79-18834

SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion [PB-291495/0] 23 p0539 N79-22318

SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices [PB-291496/8] 23 p0539 N79-22319

Hydropyrolysis of coal derived liquids and related model compounds 23 p0553 N79-24171

Conceptual design for advanced coal liquefaction commercial plant [FE-2251-52] 23 p0554 N79-24182

Analysis of coal hydrogasification processes [FE-2565-13] 23 p0554 N79-24183

Heat transfer simulation in underground coal liquefaction 23 p0555 N79-24292

Coal liquefaction test center [FE-1517-67] 23 p0577 N79-26226

Process design for coal conversion reactors [CONF-781110-15] 23 p0577 N79-26232

Fuel contaminants. Volume 3: Control of coal-related pollutants [PB-293328/1] 23 p0578 N79-26234

A Kentucky energy resource utilization program [PB-292949/5] 23 p0585 N79-26538

Enthalpy measurements for coal-derived liquids 23 p0587 N79-26997

Enthalpy measurement of coal-derived liquids [FE-2035-12] 23 p0588 N79-27282

Kinetics of coal liquefaction to preasphaltenes, asphaltenes and oils 23 p0588 N79-27320

Coal liquefaction: Report on a focus group discussion [DOE/TIC-10039] 23 p0589 N79-27339

Status report the SRC-1 and SRC-2 processes 23 p0593 N79-27616

The H-Coal processes: A status report 23 p0593 N79-27617

EXXON donor solvent coal liquefaction process 23 p0593 N79-27618

Some aspects of the mechanism and kinetics of coal liquefaction 24 p0717 N79-28343

Chemistry of lignite liquefaction [FE-2211-10] 24 p0718 N79-28357

Applied research and evaluation of process concepts for liquefaction and gasification of western coals [FE-2006-9] 24 p0719 N79-28363

Catalyst deactivation in the hydroprocessing of coal-derived liquids 24 p0731 N79-29234

Viscosity reduction of coal liquids by dissolved carbon dioxide [SAND-79-7027] 24 p0732 N79-29365

Coal liquefaction catalyst tags [SAND-79-0017] 24 p0732 N79-29366

Investigation of mechanisms of hydrogen transfer in coal hydrogenation [FE-2305-21] 24 p0733 N79-29367

Coal liquefaction advanced research digest [ORNL/FE-2] 24 p0746 N79-30398

Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research [FE-2202-39] 24 p0765 N79-31411

Applied research and evaluation of process concepts for liquefaction and gasification of western coals [FE-2006-12] 24 p0766 N79-31415

Recent developments in coal liquefaction in the United States --- conferences [CONF-790213-5] 24 p0779 N79-32383

Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation [EPRI-AF-913] 24 p0795 N79-33344

COAL UTILIZATION

Coal-fired gas turbine power cycles with steam injection 21 p0004 A79-10042

Underground thermal generation of hydrocarbons from dry, southwestern coals 21 p0005 A79-10050

Electrochemical engines for power generation and load-leveling at sites for underground coal conversion 21 p0005 A79-10051

Status of the DOE underground coal conversion program 21 p0005 A79-10052

Operation of the Ft. Lewis, Washington Solvent Refined Coal /SRC/ Pilot Plant in the SRC I and SRC II processing modes 21 p0006 A79-10054

Exploratory research in coal conversion 21 p0007 A79-10061

New processes for the recovery of resource materials from coal combustion wastes 21 p0007 A79-10065

Fluidized-bed combustion of low-quality fuels 21 p0007 A79-10066

A review of the PFBC combined cycle and its influence on gas turbine design parameters --- Pressurized Fluidized Bed Combustion 21 p0007 A79-10067

Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant 21 p0008 A79-10068

Factors limiting limestone utilization efficiency in fluidized-bed combustors --- in determining sulfur dioxide emission level 21 p0008 A79-10069

Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion 21 p0008 A79-10070

Alternatives for coal based power generation - An international overview 21 p0008 A79-10074

Pressurized fluidized-bed combustion/component test and integration unit preliminary design report 21 p0008 A79-10076

The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants 21 p0009 A79-10078

Heat exchanger designs for coal-fired fluidized beds 21 p0009 A79-10079

Economic optimization of the coal-fired MHD Steam Power Plant 21 p0016 A79-10134

Thermal modeling of coal-fired MHD plant components 21 p0017 A79-10138

Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139

Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142

Underground coal gasification research at the University of New Mexico
21 p0032 A79-10523

Alternative aircraft fuels
21 p0033 A79-10824

Materials problems and opportunities in coal conversion systems
21 p0034 A79-11146

Thin film high temperature solid electrolyte fuel cells
21 p0040 A79-11820

Coal desulfurization: Chemical and physical methods; Proceedings of the Symposium, New Orleans, La., March 23, 1977
21 p0044 A79-12114

An overview of coal preparation --- for producing clean fuel through desulfurization
21 p0044 A79-12115

Desulfurization of coals by high-intensity high-gradient magnetic separation - Conceptual process design and cost estimation
21 p0044 A79-12116

Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals --- through chemical leaching
21 p0044 A79-12117

Coal desulfurization test plant status - July 1977 --- utilizing Meyers leach process
21 p0044 A79-12118

Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119

Desulfurization and sulfidation of coal and coal char
21 p0045 A79-12120

Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies --- Process Development Unit
21 p0045 A79-12121

Combustion of porous particles --- coal for MHD generators
21 p0049 A79-12708

Catalysis in coal conversion --- Book
21 p0051 A79-12873

Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

Advanced processes for generation of electric power - Solvent refining of coal and combined cycle plants
21 p0064 A79-14110

Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121

Particulate control for coal-fired industrial boilers
21 p0065 A79-14123

The direct reduction of sulfur dioxide
21 p0065 A79-14124

Comparison of nuclear and coal power plants using Net Energy Analysis
21 p0073 A79-14692

The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant
21 p0076 A79-14757

Chloride corrosion and its inhibition in refuse firing
21 p0080 A79-14930

Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931

Corrosion of superalloys, inconels, and stainless steels by the products from fluidized-bed coal combustion
21 p0080 A79-14932

Coal slag effects in MHD generators
21 p0080 A79-14934

Corrosion and deposits in MHD generator systems
21 p0081 A79-14935

Controlled utilization of coal slag in the MHD topping cycle
21 p0081 A79-14936

The impact of a coal fired power plant on ambient sulfur dioxide levels
21 p0082 A79-15032

On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052

Particulate and sulfur oxide control options for conventional coal combustion
21 p0092 A79-15883

SRC-II - Review of development and status --- Solvent Refined Coal process for fuel oil production
21 p0092 A79-15887

Materials problems and opportunities in coal conversion systems
21 p0094 A79-15900

Solid waste and coal firing in industrial boilers
21 p0096 A79-15918

Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921

Coal-based electricity and air pollution control - A case for solvent refined coal
21 p0096 A79-15922

Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923

The atmospheric CO2 consequences of heavy dependence on coal
21 p0107 A79-16524

Energy requirements of a limestone FGD system --- Flue Gas Desulfurization
21 p0114 A79-16747

The fate of trace elements in coal after combustion
21 p0116 A79-17250

Coal technology '78; International Coal Utilization Convention, Houston, Tex., October 17-19, 1978, Conference Papers. Volumes 1 & 2
21 p0145 A79-17631

The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634

Synthetic fuels from coal
21 p0145 A79-17636

MHD power generation
21 p0146 A79-17638

A summary of R&D programs --- for coal utilization
21 p0146 A79-17639

Upgrading lignite by the Koppelman process
21 p0146 A79-17641

Beneficiation of lignites
21 p0146 A79-17642

A survey of particulate collection devices for coal-fired boilers
21 p0147 A79-17645

Coal - Meeting the energy challenge
21 p0147 A79-17647

Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401

National program for the development of commercial MHD
[AIAA PAPER 79-0188] 21 p0157 A79-19587

Slag deposition and its effect on the performance of MHD channels --- in electric generators
[AIAA PAPER 79-0189] 21 p0157 A79-19588

Recent developments in pressurized fluidized bed coal combustion research
[AIAA PAPER 79-0190] 21 p0157 A79-19589

Combustion of pulverized coal in high temperature preheated air
[AIAA PAPER 79-0298] 21 p0158 A79-19654

Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735

Combustion modifications for the control of air pollutant emissions from coal fired utility boilers
[ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738

Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility
[ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741

Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789

Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808

COAL UTILIZATION CONTD

Emissions from pressurized fluidized-bed combustion processes
22 p0261 A79-23640
An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871
Continuous extrusion of coal --- plastic fluidizing process
22 p0282 A79-26372
Burn coal cleanly in a fluidized bed - The key is in the controls
22 p0282 A79-26374
Open-cycle MHD development --- for power generation
22 p0289 A79-27659
A model for coal fly ash filtration
22 p0296 A79-28389
Lignite - Abundant raw material of the future
22 p0296 A79-28438
A regenerative process for fluidized-bed combustion of coal with lime additives
22 p0297 A79-28984
Reaction mechanism of alkali-alcohol treatment of coal
22 p0299 A79-29315
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595
Aviation fuels from coal
22 p0325 A79-31913
The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Development progress on the atmospheric fluidized bed coal combustor for cogeneration gas turbine system for industrial cogeneration plants
[ASME PAPER 79-GT-104] 23 p0377 A79-32380
Conceptual design of a pulverized coal furnace for a utility size closed-cycle, gas-turbine power plant
[ASME PAPER 79-GT-158] 23 p0378 A79-32420
Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware
[ASME PAPER 79-GT-160] 23 p0378 A79-32422
Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428
Laser-particulate control for open-cycle, coal fired gas turbines
[ASME PAPER 79-GT-177] 23 p0379 A79-32437
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451
Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455
Closed cycle gas turbines, an ECAS update. I
[ASME PAPER 79-GT-204] 23 p0380 A79-32461
Fluidised bed combustion of high ash Brazilian coals
23 p0385 A79-33225
Fluidized bed combustion of Brazilian coals
23 p0385 A79-33226
The Coal Information Center of the Foundation for Science and Technology --- for energy technology dissemination
23 p0389 A79-33262
Coal combustor technology development
23 p0390 A79-33381
Sensitivities of outputs to variations of inputs in MHD combustors
23 p0390 A79-33382
Compositional modeling of MHD channel slag, with preliminary vapor pressure data
23 p0391 A79-33390
Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0391 A79-33391
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393
MHD slag electrical conductivity studies
23 p0391 A79-33394
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395
Electrode development for coal fired MHD generators
23 p0392 A79-33396
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
A comparison of coal and biomass as feedstocks for synthetic fuel production
23 p0412 A79-34097
Status and future promise of fluidized-bed coal combustion
23 p0412 A79-34103
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157
Engineering studies of open-cycle coal-fired MHD for power generation
23 p0424 A79-34456
Advanced power cycles and their potential for electrical energy generation
23 p0424 A79-34457
Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458
The use of non-fossil-derived hydrogen in coal conversion processes
23 p0451 A79-37882
Fluid bed combustion coal fired steam locomotive
23 p0453 A79-37903
Integrated coal conversion utilization program
[AIAA PAPER 79-0997] 23 p0459 A79-38195
Characterization and formation of submicron particles in coal-fired plants
23 p0460 A79-38316
Investigating the formation of oxides of nitrogen when burning solid fuel --- air pollution by industrial exhaust gases
23 p0474 A79-38864
An investigation of the formation of oxides of nitrogen in a pulverised coal flame
23 p0474 A79-38865
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391
Particle size variation in the solvent refined coal process
23 p0492 A79-40451
Application of fluidization techniques to the combustion of coal - The state of the art
23 p0528 A79-42250
Materials, problems and research in German coal conversion projects
23 p0529 A79-42425
Energy on the horizon
23 p0529 A79-42458
Design study of coal-fired cored brick regenerative heat exchangers --- for MHD generator
23 p0532 A79-42983
Coal desulfurization --- for reduction of pollution emissions
23 p0533 A79-43200
Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana
23 p0534 A79-43370
Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah
23 p0534 A79-43371
Application of long-range transport modeling to assess coal development --- for impact on air quality
23 p0535 A79-43429
Electrostatic separation of coal macerals
24 p0603 A79-44525
Coal usage --- review of current technologies
24 p0606 A79-44957
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538

Thermodynamic considerations in the production of
synthetic fuels from coal
24 p0615 A79-45603

Comparison of dust collection efficiencies of
particulate emission samplers in a power plant
burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749

Selectivity improvement in the SRC process ---
Solvent Refined Coal hydrodesulfurization over
hydrogenation
24 p0628 A79-45992

Emissions and particle-size distributions of minor
and trace elements at two western coal-fired
power plants equipped with cold-side
electrostatic precipitators
24 p0629 A79-46231

Combustion of single coal particles in a jet ---
fluidized bed simulation
24 p0632 A79-46319

A WELMM comparison of energy scenarios ---
evaluation of different energy production
systems in France
24 p0645 A79-48025

Water for a synthetic fuels industry
24 p0645 A79-48050

Erosion study of different materials affected by
coal ash particles
24 p0646 A79-48864

What will be the price for energy tomorrow. I -
Coal price
24 p0652 A79-49515

Coal yesterday and tomorrow --- coal utilization
forecasting
24 p0652 A79-49516

Reduction of particulate carryover from a
pressurized fluidized bed
24 p0653 A79-49527

Environmental impacts of contemporary fossil
energy systems
24 p0659 A79-50363

Coal-fired fluid bed compressed air energy storage
power plants - A preliminary technical assessment
24 p0679 A79-51796

Molten carbonate fuel cell based, coal fired power
plants for electric power generation
24 p0682 A79-51816

Multistage fluidised coal combustor
24 p0688 A79-51864

Stirling engine combustion and heat transport
system design alternatives for stationary power
generation
24 p0690 A79-51883

Design study of a coal-fired thermionic-topped
powerplant using an advanced boiler
24 p0700 A79-51983

Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991

Considerations for adapting an MHD baseload power
plant for intermediate and peaking duty
24 p0701 A79-51992

Environmental assessment of a coal-fired
open-cycle MHD power plant
24 p0701 A79-51993

The synfuels scenario
24 p0709 A79-52967

MHD emissions and their controls
24 p0709 A79-52968

Coal conversion technology --- Book
24 p0714 A79-53776

Coal classification and characterization
24 p0714 A79-53777

Coal combustion
24 p0714 A79-53779

National coal utilization assessment: An
integrated assessment of increased coal use in
the midwest: Impacts and constraints, volume 1
[ANL/AA-11-VOL-1-DRAFT] 21 p0174 N79-10537

Fluidized-bed combustion test of low-quality
fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543

Fundamental data needs for coal conversion
technology appendices
[TID-28152-APP] 21 p0187 N79-11512

Elemental characteristics of aerosols emitted from
a coal-fired heating plant
[NASA-TM-78749] 21 p0191 N79-11560

Energy-related pollutants in the environment: The
use of short-term for mutagenicity in the
isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568

Environmental Development Plan (EDP): Underground
coal conversion program, FY 1977
[DOE/EDP-0011] 21 p0192 N79-11569

The department of Defense's alternate energy policy
[AD-A058200] 21 p0197 N79-12563

A Kentucky energy resource utilization program
[PB-283796/1] 21 p0198 N79-12574

Some measures of regional-industrial interfuel
substitution potentials
[BNL-24368] 21 p0208 N79-13525

Environmental control implications of generating
electric power from coal. Appendix A, part 2:
Coal preparation and cleaning assessment study
appendix
[ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571

Coal loan guarantee program (PL 94-163)
[DOE/EIS-0004] 21 p0213 N79-13574

Environmental effects of increased coal
utilization ecological effects of gaseous
emission from coal combustion
[PB-285440/4] 21 p0213 N79-13591

Technology and Use of Lignite --- conferences
[GFERC/IC-77/1] 21 p0216 N79-14241

Trace element characterization and
removal/recovery from coal and coal wastes
[LA-7048-PR] 21 p0222 N79-14602

Evaluation of electrostatic precipitator during
SRC combustion tests
[PB-285864/5] 21 p0223 N79-14618

Analysis of radioactive contaminants in
by-products from coal-fired power plant operations
[PB-286365/2] 21 p0232 N79-15473

Coal research: Data systems and information
transfer
[ORAU-133] 21 p0232 N79-15830

Compilation of level 1 environmental assessment data
[PB-286924/6] 22 p0336 N79-16439

Thermal and kinetic analysis of the pyrolysis of
coals
22 p0336 N79-16704

Combustion of hydrothermally treated coals
[PB-287521/9] 22 p0338 N79-17025

EPA program conference report: Coal cleaning, an
option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

Low-sulfur western coal use in existing small and
intermediate size boilers --- particulate
sampling and combustion efficiency
[PB-287937/7] 22 p0346 N79-18061

Ecological effects of coal-fired steam-electric
generating stations
22 p0346 N79-18358

Fluidized-bed combustion
22 p0347 N79-18365

Public hearing transcript: Federal non-nuclear
energy research and development program
[PB-287910/4] 22 p0349 N79-18464

Environmental impact determination of action to be
taken under the Energy Supply and Environmental
Coordination Act for powerplants 1, 2, 3, and 4,
Portsmouth Generating Station, Portsmouth,
Virginia
[DOE/EA-0033] 22 p0362 N79-20514

A biologist's manual for the evaluation of impacts
of coal-fired power plants on fish, wildlife and
their habitats
[PB-291330/9] 22 p0373 N79-21679

Preliminary comparison of theory and experiment
for a conical, pressurized-fluidized-bed coal
combustor
[NASA-TM-79137] 23 p0542 N79-22623

Minnesota coal study
[PB-292106/2] 23 p0575 N79-25538

Pulverised fuel non-return flap valve
[TDB-317] 23 p0578 N79-26408

System study on the feasibility of a coal-fired
total-energy plant (with solar options) for
Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530

Solvent Refined Coal (SRC) process: Environmental
program. Volume 3: Pilot plant development
work, part 5
[FE-0496-T8] 23 p0588 N79-27329

Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330
Proceedings of the Conference on Coal Use for California
[NASA-CR-158770] 23 p0591 N79-27597
Using coal inside California for electric power
23 p0591 N79-27598
Using coal inside California for nonelectric applications
23 p0591 N79-27599
A systems examination of the opportunities of coal for California
23 p0591 N79-27600
Coal's role in California's energy needs
23 p0591 N79-27602
Possible environmental effects of increased coal use in California
23 p0592 N79-27604
Air quality as a constraint to the use of coal in California
23 p0592 N79-27605
Water as a constraint to the use of coal for California
23 p0592 N79-27606
Economic considerations in coverting from oil/gas firing to coal
23 p0592 N79-27611
Direct firing of coal for power production
23 p0592 N79-27612
Locational response to regulatory policy: A regional analysis of energy facility location --- conferences
[BNL-23597] 23 p0598 N79-27695
Advanced technology fuel cell program --- molten carbonate and phosphoric acid fuel cells and coal utilization in power plants
[EPRI-EM-956] 23 p0598 N79-27702
Replacing oil and natural gas with coal: Prospects in the manufacturing industries
24 p0718 N79-28351
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels
[FE-2307-34] 24 p0718 N79-28358
Coal-to-gasoline conceptual design and market evaluation of methanol fuel and methanol-derived gasoline
[FE-2416-37] 24 p0734 N79-29378
The direct use of coal: Prospects and problems of production and combustion
[PB-295797/5] 24 p0734 N79-29381
Total generating costs: Coal and nuclear plants
[NUREG-0248] 24 p0742 N79-29663
Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683
National coal model: Coal supply curves
[DOE/EIA-0103/2] 24 p0746 N79-30400
Technical aspects of the Resource Conservation and Recovery Act upon coal combustion and conversion systems
[ORNL/OEPA-10] 24 p0748 N79-30687
Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808
Environmental control implications of increased coal utilization under the National Energy Plan --- regulatory and control technology issues
[ANL/EES-CP-10] 24 p0760 N79-30846
Polymeric interfaces for stack monitoring
[PB-294997/2] 24 p0761 N79-30866
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410
Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416
Rocky mountain coal for southern California's coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745
Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801
Assessment of national consequences of increased coal utilization, executive summary, volume 2
[TID-29425-VOL-2] 24 p0774 N79-31802
Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724
Measurement techniques for trace metals in coal-plant effluents: A brief review
[NASA-RP-1047] 24 p0803 N79-33611

COASTAL ECOLOGY
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722
ERDA'S oceanographic program for the mid-Atlantic coastal region --- impact of offshore energy development on coastal ecology
[BNL-24016] 21 p0192 N79-11681
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576

COASTAL PLAINS
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837

COASTS
Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0585 N79-26539

COATINGS
Coal slag effects in MHD generators
21 p0080 A79-14934
Accelerated tests for coatings --- for solar concentrators
22 p0296 A79-28668
Optical properties of materials under simulated operating environments --- selective coatings for solar thermal conversion
23 p0431 A79-35071
Accelerated tests of coatings --- for solar concentrators
24 p0637 A79-46906
Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544
The development of a method of producing etch resistant wax patterns on solar cells
[NASA-CR-158563] 23 p0550 N79-23527

COBALT ALLOYS
The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707

COBALT COMPOUNDS
Development of a satellite flywheel family operating on one active axis magnetic bearings
22 p0366 N79-21392

COHERENT LIGHT
Direct conversion of solar energy into laser radiation
22 p0311 A79-31086

COHERENT RADIATION
Generation of the new coherent radiation by harmonic conversion and nonlinear mixing for certain applications --- optical interactions
21 p0111 A79-16639

COKE
Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470
Analysis of coke combustion during in-situ oil recovery
23 p0553 N79-24095

COLD FLOW TESTS
Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance
[NASA-TM-78993] 22 p0345 N79-17859

COLD PLASMAS
Review of results from DITE tokamak
21 p0069 A79-14456
Stabilization of drift loss-cone instability /DCI/ by addition of cold ions --- in collisional hydrogen plasma confinement
22 p0291 A79-27882
Joint Soviet-American studies in the domain of plasma diagnostics
23 p0529 A79-42853

Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854

COLD WATER
Performance testing of a three ton solar absorption chiller
[AIAA PAPER 78-1757] 21 p0060 A79-13858
The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739
Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC
24 p0617 A79-45782
Land-based OTEC plants - Cold water pipe
24 p0620 A79-45799
Development of a lightweight concrete for OTEC cold water pipes
24 p0622 A79-45823
Vortex excited oscillations of marine structures with application to the OTEC cold water pipe
24 p0622 A79-45825
Multiple staging of the cold water in the open cycle OTEC Systems
24 p0624 A79-45840

COLD WEATHER
Solar water heaters for a cold climate
22 p0254 A79-22325
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424

COLD WEATHER TESTS
Effects of low ambient temperature on the exhaust emissions and fuel economy of 84 automobiles in Chicago
[PB-288400/5] 22 p0355 N79-19488

COLLISIONAL PLASMAS
A collisional plasma rotating between two cylinders
21 p0049 A79-12694
Collisional transport --- particle diffusion and heat transport in tokamak
21 p0078 A79-14780
Local theory of finite-beta, collisional drift modes --- plasma stability analysis
22 p0253 A79-22284
Collisional transport --- of plasmas in plane and toroidal geometry
22 p0257 A79-22980
Integral invariants and quasi-MHD nonlinear dissipation --- in magnetized toroidal plasmas
22 p0270 A79-24862
Stabilization of drift loss-cone instability /DCI/ by addition of cold ions --- in collisional hydrogen plasma confinement
22 p0291 A79-27882
Theory of dissipative drift instabilities in sheared magnetic fields --- in confined toroidal plasmas
22 p0292 A79-27884
Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184

COLLISIONLESS PLASMAS
Stability criteria for current-driven drift wave eigenmodes --- in tokamaks
22 p0269 A79-24813

COLORADO
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507
Converting Green River shale oil to transportation fuels --- conferences
[CONF-780460-3] 24 p0745 N79-30396

COLUMNS (PROCESS ENGINEERING)
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271

COMBUSTIBLE FLOW
A two-dimensional pulverized coal combustor model --- for MHD generators
23 p0390 A79-33383

COMBUSTION
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115
Technical notes for the conceptual design for an atmospheric fluidized-bed direct combustion power generating plant
[HCP/T2583-01/2] 21 p0203 N79-13280
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498
Development of combustion data to utilize low-Btu gases as industrial process fuels
[FE-2489-30] 23 p0576 N79-26143
Comparison of atmospheric fluidized bed combustion conceptual designs for utility steam generation
[HCP/T2314] 24 p0729 N79-28792
In-situ combustion models for the steam plateau and for fieldwide oil recovery
24 p0732 N79-29353
The direct use of coal: Prospects and problems of production and combustion
[PB-295797/5] 24 p0734 N79-29381

COMBUSTION CHAMBERS
Pressurized fluidized-bed combustion/component test and integration unit preliminary design report
21 p0008 A79-10076
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791
Development of a compact gas turbine combuster to give extended life and acceptable exhaust emissions
[ASME PAPER 78-GT-146] 21 p0033 A79-10799
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821
Use of alternative fuels in stationary combustors
21 p0052 A79-12981
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927
Correlations of catalytic combustor performance parameters
21 p0081 A79-14956
Fuels and combustion --- for open cycle MHD system
21 p0106 A79-16488
Technology evolution in the Allison Model 250 engine --- for helicopter propulsion
21 p0155 A79-18681
Program to establish ceramic technology readiness for large combustion turbine utility application
[ASME PAPER 78-WA/GT-8] 21 p0160 A79-19796
Preliminary analysis of advanced ceramic magnetohydrodynamic /MHD/ combustor design concepts
22 p0240 A79-20838
Hydrogen enrichment for low-emission jet combustion
22 p0244 A79-21347
Influences on exhaust emissions from automotive gas turbines
[ASME PAPER 78-GT-85] 22 p0255 A79-22338
Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189
The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations
[ASME PAPER 79-GT-16] 22 p0306 A79-30510
A one-dimensional combustion model for a dual chamber stratified charge spark ignition engine
[SAE PAPER 790355] 22 p0315 A79-31371
The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375
The influence of fuel composition on smoke emission from gas-turbine-type combustors - Effect of combustor design and operating conditions
22 p0323 A79-31510
Development of the combustion chamber of an experimental MHD generator
22 p0327 A79-32105

Application of the Centaur industrial gas turbine
  to the central receiver concept for solar
  electric power
  [ASME PAPER 79-GT-45]   23 p0375 A79-32345
The optimization of heat exchanger solidity for
  coal-fired fluidized bed combustors
  [ASME PAPER 79-GT-78]   23 p0376 A79-32357
Operation of a GT-225 diffusion-flame combustor on
  alternative fuels performance, durability and
  emissions
  [ASME PAPER 79-GT-138]   23 p0378 A79-32407
Development of an industrial gas turbine combustor
  burning a variety of coal-derived low Btu fuels
  and distillate
  [ASME PAPER 79-GT-172]   23 p0379 A79-32433
Closed cycle gas turbines, an ECAS update. I
  [ASME PAPER 79-GT-204]   23 p0380 A79-32461
A development program for hydrogen burners
  23 p0386 A79-33232
Mechanistic modeling of pulverized coal combustion
  --- in MHD generators
  23 p0390 A79-33380
Coal combustor technology development
  23 p0390 A79-33381
Sensitivities of outputs to variations of inputs
  in MHD combustors
  23 p0390 A79-33382
A two-dimensional pulverized coal combustor model
  --- for MHD generators
  23 p0390 A79-33383
Cyclone and fluidized bed combustion concepts for
  coal fired open cycle MHD
  23 p0391 A79-33385
Status and future promise of fluidized-bed coal
  combustion
  23 p0412 A79-34103
The potential application of rotating fluidised
  beds to power generating schemes
  23 p0454 A79-37906
The Grimethorpe Experimental Pressurised Fluidised
  Bed Combustor
  23 p0454 A79-37910
Heat transfer in a high temperature combustion
  chamber with premixing --- in MHD generators
  23 p0474 A79-38869
NOx formation with various combustion processes of
  premixed gas
  23 p0528 A79-42220
Design and development of a low emission combustor
  for a car gas turbine
  [ASME PAPER 78-GT-155]   24 p0605 A79-44793
Combustion of coal particles in wall-burning swirl
  combustors --- for MHD generators
  24 p0632 A79-46317
Reduction of particulate carryover from a
  pressurized fluidized bed
  24 p0653 A79-49527
Computer modeling of automotive engine combustion
  [UCRL-80451]   21 p0181 N79-11412
Parametric performance of a turbojet engine
  combustor using jet A and A diesel fuel
  [NASA-TM-79089]   22 p0357 N79-20114
Simulation of fluidized bed coal combustors
  [NASA-CR-159529]   22 p0359 N79-20487
High pressure MHD coal combustors investigation
  [FE-2706-08]   22 p0362 N79-20510
Single-cylinder diesel engine tests with
  unstabilized water-in-fuel emulsions
  [AD-A062751]   22 p0366 N79-21406
Preliminary comparison of theory and experiment
  for a conical, pressurized-fluidized-bed coal
  combustor
  [NASA-TM-79137]   23 p0542 N79-22623
Experimental clean combustor program: Diesel no. 2
  fuel addendum, phase 3
  [NASA-CR-135413]   23 p0576 N79-26221
Fuel hydrogen content as an indicator of radiative
  heat transfer in an aircraft gas turbine combustor
  [AD-A067709]   23 p0577 N79-26224
Mixing and kinetic processes in pulverized coal
  combustors
  [EPRI-FP-806-SY]   23 p0589 N79-27330
Second Annual Combustion and Fuels Technology
  Program Contractor Review Meeting
  [CONF-7809103]   24 p0731 N79-29271
Performance characteristics of a slagging gasifier
  for MHD combustor systems
  [NASA-TM-79195]   24 p0749 N79-30720

COMBUSTION CONTROL
LAG-Process, some results of utilization in
  transport and mechanical engineering
  21 p0030 A79-10248
Energy consumption of environmental controls -
  Fossil fuel, steam electric generating industry
  21 p0064 A79-14112
Combustion modifications for the control of air
  pollutant emissions from coal fired utility
  boilers
  [ASME PAPER 78-WA/APC-7]   21 p0158 A79-19738
Combustion modification pollutant control
  techniques for industrial boilers - The
  influence of fuel oil properties and atomization
  parameters
  [ASME PAPER 78-WA/APC-13]   21 p0159 A79-19742

COMBUSTION EFFICIENCY
Fluidized-bed combustion of low-quality fuels
  21 p0007 A79-10066
Combustion rates for oil shale carbonaceous residue
  21 p0032 A79-10522
Alternative fuels for reciprocating internal
  combustion engines
  21 p0051 A79-12980
Reducing inefficiency and emissions of large steam
  generators in the United States
  21 p0114 A79-17075
A characteristic time correlation for combustion
  inefficiency from alternative fuels
  [AIAA PAPER 79-0357]   21 p0158 A79-19687
Regenerative burner system for thermoelectric
  power sources
  22 p0261 A79-23621
The optimization of heat exchanger solidity for
  coal-fired fluidized bed combustors
  [ASME PAPER 79-GT-78]   23 p0376 A79-32357
Coal combustor technology development
  23 p0390 A79-33381
Behavior of eastern and western coals in fuel-rich
  reaction conditions --- gasification behavior of
  Montana Rosebud and Pittsburgh seam bituminous
  coals for MHD generators
  23 p0390 A79-33384
Fossil fuel heat pumps for domestic, commercial
  and industrial space heating
  23 p0449 A79-37852
Combustion of coal particles in wall-burning swirl
  combustors --- for MHD generators
  24 p0632 A79-46317
Combustion characteristics of droplets of coal/oil
  and coal/oil/water mixtures
  24 p0632 A79-46318
Proceedings of the Engineering Foundation
  Conference on Clean Combustion of Coal
  [PB-282949/7]   21 p0171 N79-10243
Fluidized-bed combustion test of low-quality
  fuels: Texas lignite and lignite refuse
  [MERC/RI-78/3]   21 p0175 N79-10543
Analytical evaluation of the impact of broad
  specification fuels on high bypass turbofan
  engine combustors
  [NASA-CR-159454]   21 p0200 N79-13050
Evaluation of future jet fuel combustion
  characteristics
  [AD-A060218]   21 p0216 N79-14231
Low-sulfur western coal use in existing small and
  intermediate size boilers --- particulate
  sampling and combustion efficiency
  [PB-287937/7]   22 p0346 N79-18061
Fluidized combustion of coal --- to limit SO2 and
  NOx emissions
  23 p0593 N79-27613
Field tests of industrial stoker coal-fired
  boilers for emissions control and efficiency
  improvement: Site A (data supplement)
  [PB-293731/6]   24 p0743 N79-29670
Performance characteristics of a slagging gasifier
  for MHD combustor systems
  [NASA-TM-79195]   24 p0749 N79-30720
Paratransit vehicle test and evaluation. Volume
  4: Fuel Economy tests
  [PB-295478/2]   24 p0778 N79-32135
Development of combustion data to utilize low-Btu
  gases as industrial process fuels. Flat-flame
  burner
  [FE-2489-36]   24 p0795 N79-33340

COMBUSTION PHYSICS

Oil recovery from a Utah tar sand deposit by in situ combustion 21 p0004 A79-10043

Aspects of pulsating combustion --- gaseous methane burning system 21 p0008 A79-10072

Combustion of porous particles --- coal for MHD generators 21 p0049 A79-12708

A one-dimensional combustion model for a dual chamber stratified charge spark ignition engine [SAE PAPER 790355] 22 p0315 A79-31371

The exergy of fuels --- energy conversion factors 24 p0611 A79-45500

Field performance of underground coal gasification 24 p0688 A79-51866

The role of fundamental combustion in the future aviation fuels program --- carbon formation in gas turbine primary zones 21 p0202 N79-13195

Characteristics and combustion of future hydrocarbon fuels 21 p0202 N79-13196

Fundamental combustion studies of emulsified fuels for diesel applications [PB-287386/7] 22 p0330 N79-16138

Combustion of hydrothermally treated coals [PB-287521/9] 22 p0338 N79-17025

Analysis of coke combustion during in-situ oil recovery 23 p0553 N79-24095

COMBUSTION PRODUCTS

New processes for the recovery of resource materials from coal combustion wastes 21 p0007 A79-10065

Alternative fuels and combustion problems 21 p0051 A79-12978

Future fuels in gas turbine engines 21 p0051 A79-12979

Use of alternative fuels in stationary combustors 21 p0052 A79-12981

Flame emissivities - Alternative fuels 21 p0052 A79-12984

Kinetics of nitric oxide formation in combustion 21 p0053 A79-12989

Emission control techniques for alternative fuel combustion 21 p0053 A79-12990

Ash deposits and corrosion due to impurities in combustion gases; Proceedings of the International Conference, New England College, Henniker, N.H., June 26-July 1, 1977 21 p0080 A79-14926

Corrosion of superalloys, inconels, and stainless steels by the products from fluidized-bed coal combustion 21 p0080 A79-14932

Corrosion and deposits in MHD generator systems 21 p0081 A79-14935

Coal-based electricity and air pollution control - A case for solvent refined coal 21 p0096 A79-15922

Ionizing seed --- for open cycle MHD power generation 21 p0106 A79-16490

The atmospheric CO2 consequences of heavy dependence on coal 21 p0107 A79-16524

Reducing inefficiency and emissions of large steam generators in the United States 21 p0114 A79-17075

The fate of trace elements in coal after combustion 21 p0116 A79-17250

The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil 21 p0156 A79-19219

Thermophoresis - Enhanced deposition rates in combustion turbine blade passages [ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790

Vaporization of drops of a melt of potassium carbonate in a medium of combustion products 21 p0167 A79-20411

The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity 21 p0167 A79-20415

Turbulence of a combustion product plasma in an MHD channel 22 p0246 A79-21538

Emissions from pressurized fluidized-bed combustion processes 22 p0261 A79-23640

Effects of fuel properties on soot formation in turbine combustion [SAE PAPER 781026] 22 p0274 A79-25899

Toxic component concentration in kerosene-air mixture combustion products 22 p0291 A79-27733

Operation of a GT-225 diffusion-flame combustor on alternative fuels performance, durability and emissions [ASME PAPER 79-GT-138] 23 p0378 A79-32407

Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware [ASME PAPER 79-GT-160] 23 p0378 A79-32422

Laser-particulate control for open-cycle, coal fired gas turbines [ASME PAPER 79-GT-177] 23 p0379 A79-32437

Chemical solutions to problems encountered in the gasification of coal 23 p0410 A79-34088

Effect of friction on motion of a piston driven by combustion products 23 p0436 A79-35656

Combustion-products turbulence in the channel of an MHD generator 23 p0442 A79-36812

Heavy duty diesel particulate emission factors 23 p0461 A79-38481

Investigating the formation of oxides of nitrogen when burning solid fuel --- air pollution by industrial exhaust gases 23 p0474 A79-38864

Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes --- Book 23 p0474 A79-38871

Flue gas emissions from a shredded-municipal-refuse-fired steam generator 23 p0489 A79-40399

30 years of refuse-fired boiler experience 23 p0523 A79-41374

Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah 23 p0534 A79-43371

Erosion study of different materials affected by coal ash particles 24 p0646 A79-48864

The role of corrosion in modern gas turbines 24 p0647 A79-48912

The pyrolysis route to gasification 24 p0688 A79-51860

IGT U-GAS pilot plant developments --- of fluidized-bed gasification 24 p0688 A79-51861

Equipment and strategy for environmental sampling of complex coal gasification process streams 24 p0688 A79-51862

Investigation of velocity profiles in an MHD generator channel using combustion products 24 p0706 A79-52371

MHD emissions and their controls 24 p0709 A79-52968

Hydrogen-fueled diesel engine without timed ignition 24 p0715 A79-54297

Conversion of biomass materials into gaseous products, phase 1 [SAN-1241-77-1] 21 p0171 N79-10237

Low NOx combustion concepts for advanced power generation systems firing low-Btu gas [PB-282983/6] 21 p0178 N79-10610

Ceramic technology readiness program [FE-2664-7] 21 p0180 N79-11223

Elemental characteristics of aerosols emitted from a coal-fired heating plant [NASA-TM-78749] 21 p0191 N79-11560

National Emissions Data System (NEDS) fuel use report (1974) [PB-284658/2] 21 p0194 N79-12251

Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste [PB-285196/2] 21 p0213 N79-13590

Environmental effects of increased coal utilization ecological effects of gaseous emission from coal combustion
[PB-285440/4] 21 p0213 N79-13591

Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311

Analysis of radioactive contaminants in by-products from coal-fired power plant operations
[PB-286365/2] 21 p0232 N79-15473

Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474

Sooting characteristics of liquid pool diffusion flames
[AD-A064111] 23 p0539 N79-22252

Conventional combustion on environmental assessment program
[PB-291401/8] 23 p0545 N79-22668

Sandia laboratory combustion simulation facility --- for analyzing the flow of high temperature combustion products
[SAND-78-2240] 23 p0576 N79-26146

Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement)
[PB-293731/6] 24 p0743 N79-29670

Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654

Uncertainties associated with global effects of atmospheric carbon dioxide
[ORAU/IEA-79-6(O)] 24 p0803 N79-33699

COMBUSTION STABILITY

Aspects of pulsating combustion --- gaseous methane burning system
21 p0008 A79-10072

Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691

COMBUSTION TEMPERATURE

Use of fluidized media in thermal power systems
23 p0436 A79-35525

COMMERCE

Shale oil: Focus group results
[DOE/TIC-10019] 23 p0593 N79-27644

Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800

Passive solar energy focus group results
[DOE/TIC-10016] 24 p0774 N79-31807

COMMERCIAL AIRCRAFT

Advanced turbofan engines for low fuel consumption
[ASME PAPER 78-GT-192] 21 p0033 A79-10816

Technology for aircraft energy efficiency
21 p0066 A79-14136

Alternate aircraft fuels prospects and operational implications
21 p0066 A79-14138

Cryohydrogen-fuel for tomorrow's commercial aircraft
22 p0289 A79-27656

Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911

Liquid hydrogen fueled commercial aircraft
24 p0615 A79-45600

Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050

COMMERCIAL ENERGY

The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170

Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899

Commercial realization of MHD - A challenge for superconducting magnets
21 p0084 A79-15302

Residential and commercial thermal storage --- for solar heating and cooling systems
21 p0090 A79-15865

An overview of solar markets
21 p0092 A79-15884

H-Coal pilot plant project and status of commercial development at Ashland --- coal gasification producing hydrogen and hydrocarbons
21 p0092 A79-15888

Status and outlook of the Exxon Donor Solvent coal liquefaction process development
21 p0092 A79-15889

Factors influencing solar energy commercialization
21 p0093 A79-15897

Identification of cost effective energy conservation measures
21 p0099 A79-16133

The Solar Heating and Cooling Commercial Demonstration Program at Marshall Space Flight Center - Some problems and conclusions
21 p0099 A79-16135

Principles of solar cooling and heating
21 p0103 A79-16457

Integrated solar building systems
21 p0103 A79-16460

Application of solar cooling for a school building in subtropics
21 p0103 A79-16461

Energy utilization analysis of buildings
21 p0103 A79-16462

National program for the development of commercial MHD
[AIAA PAPER 79-0188] 21 p0157 A79-19587

Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

Wind energy - The long road to commercialization
22 p0269 A79-24612

Design study on solar energy systems for commercial buildings
22 p0320 A79-31433

Honeywell General Offices solar HVAC system
23 p0401 A79-34018

The commercialization of OTEC - Problems and opportunities
23 p0405 A79-34043

COIL process - First generation commercial coal liquefaction plant
23 p0412 A79-34101

Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources
23 p0435 A79-35484

Commercialization aspects of solar process hot water systems for the textile industry
[AIAA PAPER 79-1027] 23 p0476 A79-38896

Field testing and evaluation of PV module performance
23 p0496 A79-40885

Solar photovoltaic intermediate power system operating strategies and economic considerations
23 p0516 A79-41051

Large-area concentrator solar cells
23 p0517 A79-41057

Commodity hydrogen production and marketing
24 p0613 A79-45582

Economics of small user hydrogen --- future requirements and predicted costs for industrial use
24 p0613 A79-45583

Analysis of prospects for OTEC commercialization for baseload power
24 p0617 A79-45786

Advanced lasers for fusion applications
24 p0669 A79-51405

The solar total energy system evaluation program /STESEP/
24 p0673 A79-51749

Feasibility of a heat-actuated heat-pump-centered integrated community energy system
24 p0696 A79-51961

Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439

Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part A: Options and strategies. Volume 1: Executive summary
[HCP/M70065-01/1] 21 p0207 N79-13512

Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part B: Analysis of market development, volume 2
[HCP/M70066-01/2] 21 p0207 N79-13513

Energy use in Japan and the United States
[BNL-23101] 21 p0221 N79-14578

Venture analysis case study for on-site fuel cell energy systems
[FCR-0783-VOL-1] 22 p0361 N79-20505
Econometric-engineering analysis of Federal energy conservation programs in the commercial sector
[ORNL/CON-30] 23 p0562 N79-24489
Solar energy commercialization for European countries, volume 2
[HCP/CS-4250-VOL-2] 23 p0563 N79-24493
Commercial synchronous alternating-current generators
23 p0580 N79-26482
Environmental readiness document. Solar: Hot water and passive, commercialization phase 3 planning
[DOE/ERD-0010] 23 p0597 N79-27690
Commercialization focus group interview: Medium and low Btu coal gasification
[DOE/TIC-10029] 24 p0733 N79-29371
Enhance oil recovery: Focus group results
[DOE/TIC-100200] 24 p0735 N79-29578
Energy and materials in three sectors of the economy: A dynamic model with technological change as an endogenous variable
24 p0748 N79-30710
Energy conservation opportunities in commercial appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810

COMMUNICATION SATELLITES
Proposals for power conditioning systems of high power communication satellites
21 p0033 A79-10897
Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138
Conservation of satellite transmitter energy with propagation and demand variations
23 p0453 A79-40587
The TDRSS solar array --- Tracking and Data Relay Satellite System
23 p0500 A79-40917
Flywheel components for satellite applications
[AD-A060586] 21 p0226 N79-15145
Nuclear powered satellite studies
[COO-4045-3] 23 p0588 N79-27221
Heat pipes in the thermal control of communication satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278

COMMUNICATIONS TECHNOLOGY SATELLITE
Dynamics of stepping of the Hermes flexible solar array
22 p0323 A79-31615

COMMUNITIES
Solid waste utilization in integrated community energy systems
23 p0490 A79-40415
Guidebook on integrated community energy systems: Indirect economic and energy impacts
[ANL/ICES-TM-16] 24 p0728 N79-28778
Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659
Comprehensive community energy planning. Volume 1: A workbook
[HCP/M0023-01-VOL-1] 24 p0750 N79-30722

COMPATIBILITY
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels
[AD-A060322] 21 p0226 N79-15203

COMPENSATION
Optimality criteria in the compensation of the longitudinal boundary effect in induction MHD machines
22 p0298 A79-29277

COMPLEX SYSTEMS
Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement
23 p0421 A79-34172

COMPONENT RELIABILITY
Preliminary controller evaluation for the MERC/CTIU using a mathematical process model --- of Component Test and Integration Unit in fluidized bed combustion
21 p0008 A79-10073
Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823
Reliability analysis of contracts to silicon solar cells for use in concentrated sunlight
23 p0517 A79-41058

COMPOSITE MATERIALS
Advanced composites - Future space applications
21 p0086 A79-15504
Large filament wound structures for energy and transportation systems --- turbine blades for windpowered energy systems
21 p0086 A79-15507
Flywheels for vehicles --- auxiliary power in electric automobiles
21 p0092 A79-15885
Bibliographic and numeric data bases for fiber composites and matrix materials
21 p0114 A79-16984
Selective application of materials for products and energy; Proceedings of the Twenty-third National Symposium and Exhibition, Anaheim, Calif., May 2-4, 1978
22 p0239 A79-20801
Suitable optical materials for solar collector applications
22 p0239 A79-20823
A composite-rim flywheel design
22 p0240 A79-20840
Spectral selectivity of composite materials --- as solar energy absorbers
23 p0437 A79-36146
Materials for windmill blades
23 p0453 A79-37897
Composite rotor blades for large wind energy installations
23 p0522 A79-41235
Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
24 p0603 A79-44526
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183
Solar power satellite - Putting it together --- fabrication, composite materials, and building site considerations
24 p0659 A79-50399
Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525
Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants
[UCRL-52000-78-6] 21 p0215 N79-14168
Satellite Power System (SPS) resource requirements (critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
Outgassing tests of fiber-epoxy composite materials
[SAND-78-7075] 23 p0552 N79-24071

COMPOSITE STRUCTURES
Rotating strength of glass-carbon fiber-reinforced hybrid composite discs
21 p0165 A79-20273
Composite material flywheel for the electric-powered passenger vehicle
22 p0240 A79-20842
A status of the 'Alpha-ply' composite flywheel concept development
22 p0241 A79-20843
Flywheel energy accumulators for road vehicles
22 p0241 A79-20845
Composite material flywheels for energy storage on electricity supply systems
22 p0241 A79-20852
Current status of composite flywheel development
22 p0241 A79-20853
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121

COMPOSITE WRAPPING
Composite-rim flywheels - Spin tests
23 p0423 A79-34281

COMPOSITION (PROPERTY)

The influence of fuel composition on smoke emission from gas-turbine-type combustors - Effect of combustor design and operating conditions
22 p0323 A79-31510

COMPRESSED AIR

Ejector augmentation of the air supply in a compressed air energy storage plant
21 p0013 A79-10109

Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190

Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems
22 p0280 A79-26191

Eighty atmospheres in reserve --- compressed air storage in caverns for peaking power source
23 p0436 A79-35800

Compressed air storage --- off-peak energy storage by power plants
23 p0451 A79-37876

Design of optimum compressed air energy-storage systems
24 p0631 A79-46308

Environmental concerns related to compressed air energy storage
24 p0666 A79-50895

Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment
24 p0679 A79-51796

Incremental cost analysis for advanced compressed air energy storage concepts
24 p0679 A79-51797

On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns
24 p0680 A79-51798

Analysis of mass cycling in porous rock reservoirs for compressed air energy storage
24 p0680 A79-51799

Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800

Study of turbomachinery options for compressed air energy storage plants
24 p0680 A79-51801

Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes
[PNL-2871] 23 p0562 N79-24487

Design of optimum compressed air energy storage systems
[CONF-7811101-1] 23 p0565 N79-24508

Geologic assessment of compressed air storage sites in Kansas
[EPRI-EM-877] 23 p0597 N79-27689

Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783

Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants --- conferences
[CONF-780599-2] 24 p0758 N79-30822

Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants
[CONF-780599-1] 24 p0776 N79-31830

COMPRESSED GAS

High efficiency wave engine --- featuring rotor blade exit nozzle design for high efficiency
22 p0279 A79-26187

COMPRESSING

Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457

COMPRESSOR EFFICIENCY

Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190

Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems
22 p0280 A79-26191

COMPRESSORS

The matching of a free piston Stirling engine coupled with a free piston linear compressor for a heat pump application
21 p0024 A79-10204

Some applications of LaNi5-type hydrides --- using reversible reaction with hydrogen working fluid for heat storage
22 p0249 A79-21694

Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants --- conferences
[CONF-780599-2] 24 p0758 N79-30822

COMPUTATION

Calculation of backup requirements
21 p0218 N79-14533

COMPUTER GRAPHICS

Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement
23 p0421 A79-34172

Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018

COMPUTER NETWORKS

A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555

COMPUTER PROGRAMS

SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241

Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739

The use and limitations of ASHRAE solar algorithms in solar energy utilization studies
21 p0101 A79-16416

Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463

WATSUN - A simulation program for solar-assisted heating systems
22 p0321 A79-31439

The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075

Heat pump application to single family dwellings - An analysis by computer model
23 p0449 A79-37855

Analytical and experimental evaluation of Cycloturbine aerodynamic performance --- vertical-axis windmill
[AIAA PAPER 79-0968] 23 p0456 A79-38176

Computer-Aided Power System Design
24 p0646 A79-48632

Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026

Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520

Integrated safeguards information System (ISIS), executive summary --- nuclear power plant and fissionable materials security
[PB-286869/3] 21 p0223 N79-14934

Life-cycle costing. A guide for selecting energy conservation projects for public buildings --- computing the cost effectiveness of retrofitting and new buildings
[PB-287804/9] 22 p0345 N79-17744

Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

An algorithm and BASIC computer program for calculating simple coal gasification equilibria
[PB-291241/8] 23 p0539 N79-22265

EPRI Methodology for Preferred Solar Systems (EMPSS) computer program documentation. User's guide
[EPRI-ER-771] 23 p0543 N79-22635

A directory of computer software applications: Natural resources and earth sciences
[PB-288486/4] 23 p0551 N79-23710

Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers --- solving the heat transfer problem [NASA-CR-158640] 23 p0560 N79-24466

SAMICS validation. SAMICS support study, phase 3 [NASA-CR-158746] 23 p0581 N79-26491

Alternative, semi-automated method for performing multiobjective analyses [BNL-50892] 23 p0599 N79-27921

Use of refinery computer model to predict fuel production [NASA-TM-79203] 24 p0718 N79-28349

Numerical codes for MHD flows [SAND-78-1954] 24 p0730 N79-29061

An initial model for the finite displacement response characteristics of a fluidyne pump --- thermodynamic efficiency [AD-A069159] 24 p0734 N79-29521

A control system analysis of the energy growth model: Coal 24 p0736 N79-29595

Combined photovoltaic/thermal system studies [SAND-78-7031] 24 p0787 N79-32691

Demonstration of the capabilities of the Livermore energy policy model [UCRL-52508] 24 p0788 N79-32695

Heat pump/rock bed storage systems --- computer program for economic analysis [COO-4704-2] 24 p0789 N79-32705

COMPUTER SYSTEMS DESIGN

A microprocessor based solar monitoring system 21 p0088 A79-15838

A microprocessor-based control system for solar heating and cooling 21 p0107 A79-16565

Solar Total Energy Control Data Acquisition System 21 p0144 A79-17618

Data acquisition and signal processing for a vertical axis wind energy conversion system 23 p0432 A79-35078

COMPUTER SYSTEMS PROGRAMS

Computer modeling of automotive engine combustion [UCRL-80451] 21 p0181 N79-11412

Computer software for planning design of community energy systems [CONF-781182-2] 23 p0600 N79-28063

COMPUTER TECHNIQUES

Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models 21 p0065 A79-14117

Improvement of direct-current electrical prospecting methods for the geothermal investigation of the Rhine Graben 21 p0075 A79-14734

National Computer Conference, Anaheim, Calif., June 5-8, 1978, Proceedings 21 p0100 A79-16177

Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant [ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775

Computer based sun following system 22 p0242 A79-21165

The application of hydraulics in the 2,000 kW wind turbine generator 22 p0288 A79-27400

Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges 22 p0298 A79-29286

Control of a heliostat field by distributed microcomputer technique 23 p0389 A79-33269

The DOE 5 MW Solar Thermal Test Facility 23 p0428 A79-35046

Solar energy system testing - Some experiences with minicomputers 23 p0432 A79-35082

Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor 24 p0663 A79-50776

Evaluation of battery performance using computer controlled test equipment 24 p0683 A79-51828

Computer analysis of coal gasification combined cycle plants 24 p0687 A79-51858

Economic performance: Evaluations for solar energy [LA-UR-79-901] 24 p0759 N79-30828

COMPUTERIZED DESIGN

Airfoil data for use of wind turbine designers 21 p0073 A79-14702

Capital cost system optimization of OTEC power modules 21 p0101 A79-16249

Anticonvective antiradiative systems --- for solar collectors 21 p0132 A79-17420

Optimization of a diagonal MHD channel 22 p0247 A79-21628

Digital or analog modelling in the design of hydrostatic vehicular systems 22 p0264 A79-23808

Optimization of a novel hydrostatic drive performance using hybrid computing technique --- for automobile engines 22 p0264 A79-23809

Two-dimensional MHD channel design --- for energy performance improvement at lower wall temperature 22 p0279 A79-26183

WATSUN - A simulation program for solar-assisted heating systems 22 p0321 A79-31439

An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] 23 p0375 A79-32348

Computer modelling of solar energy collection 23 p0398 A79-33986

Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells 23 p0475 A79-38877

A discrete, stochastic simulation model for the analysis and design of solar energy heating systems 23 p0475 A79-38878

Cold water pipe verification test --- for OTEC 24 p0621 A79-45811

Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria 24 p0645 A79-48226

Computer-Aided Power System Design 24 p0646 A79-48632

Parametric study of two planar high power flexible solar array concepts [NASA-CR-157841] 21 p0205 N79-13501

Computer design and optimization of cryogenic refrigeration systems --- conferences [LBL-7934] 24 p0768 N79-31439

COMPUTERIZED SIMULATION

Computer aided optimization of integrated coal gasification combined cycle power plants 21 p0008 A79-10075

Economic optimization of the coal-fired MHD Steam Power Plant 21 p0016 A79-10134

Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants 21 p0016 A79-10135

Simulation of solar powered Rankine cycle systems 21 p0022 A79-10179

A computer and experimental simulation of Stirling cycle machines 21 p0023 A79-10192

SIMWEST - A simulation model for wind energy storage systems 21 p0029 A79-10241

The laser fusion scientific feasibility experiment 21 p0030 A79-10250

Magnetohydrodynamic/steam power plant modeling and control 21 p0046 A79-12274

Simulations of the performance of open cycle desiccant systems using solar energy 21 p0066 A79-14262

Estimating hourly solar radiation for one-axis tracking focusing collectors 21 p0071 A79-14678

A microprocessor based solar controller 21 p0082 A79-14979

Passive solar heating of buildings [LA-UR-77-1162] 21 p0090 A79-15859

Performance of vacuum tube solar collector systems 21 p0102 A79-16424

The El Camino Real Solar Cooling Demonstration Project
21 p0102 A79-16425

Energy utilization analysis of buildings
21 p0103 A79-16462

Temperature dependent parameter analysis of thermoelectric devices
21 p0113 A79-16740

On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742

Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744

The relationship between diffuse and total solar radiation in computer simulation of solar energy systems
21 p0119 A79-17304

A simulation study of phase change energy store
21 p0120 A79-17318

Phase change thermal storage for a solar total energy system
21 p0120 A79-17321

Simulation and cost of photovoltaic generators
21 p0122 A79-17334

Computer simulation of the performance of a solar pond in the southern part of Iran
21 p0133 A79-17432

Comparison between simulation and experiment of solar heating
21 p0137 A79-17461

Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475

Solar heating for a novel dwelling independent of servicing networks
21 p0140 A79-17492

Gasification Combined Cycle Test Facility at Pekin, Illinois
21 p0145 A79-17632

Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822

Energy requirements of the rail mode
[ASME PAPER 78-RT-1] 21 p0150 A79-18085

Modeling energy and power requirements of electric vehicles
21 p0153 A79-18465

Energy effectiveness of arbitrary arrays of wind turbines
[AIAA PAPER 79-0114] 21 p0156 A79-19540

Gas stream composition and temperature determination in a coal-fired MHD simulation facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810

Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166

Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581

Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776

System performance predictions for solar cooling using regional stochastic weather models
22 p0264 A79-23781

Solar system modeling using a modular approach with generalized programs for working fluid properties
22 p0266 A79-24310

A computer simulation model for determining preferred solar heating and cooling systems
22 p0267 A79-24313

Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188

Performance of combined solar-heat pump systems
22 p0285 A79-26817

An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871

A general design method for closed-loop solar energy systems
22 p0295 A79-28359

Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007

Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393

Further modeling of a solar collector based on linear clipped-V channels
23 p0399 A79-33993

A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model
23 p0410 A79-34087

Technical-economic modeling in energy planning
23 p0419 A79-34164

A retrofitted geothermal heating system
23 p0425 A79-34602

Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183

Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607

Central receiver solar heating system
23 p0468 A79-38621

Design analysis of a vertical axis wind turbine
23 p0472 A79-38656

Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

Annual Simulation Symposium, 11th, Tampa, Fla., March 15-17, 1978, Record of Proceedings
23 p0475 A79-38876

NASCAP modelling of high-voltage power system interactions with space charged-particle environments --- particle impact on solar satellite surfaces
23 p0479 A79-39806

An incremental model for conversion of solar energy in agricultural systems
23 p0479 A79-39840

Boltzmann simulation of a storage ring laser
23 p0487 A79-40381

Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940

A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061

Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra
23 p0528 A79-42170

Application of long-range transport modeling to assess coal development --- for impact on air quality
23 p0535 A79-43429

A practical regional scale air quality simulation model for energy resource development in the four corners area
23 p0535 A79-43430

Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212

The modeling of thin film heat exchangers --- for OTEC
24 p0622 A79-45820

Steady-state and dynamic performance of an OTEC plant
24 p0624 A79-45838

Computer simulation of laser implosive compression of ACT target and analytic solutions on the shock waves and thermal waves
24 p0629 A79-46254

Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652

A parameter sensitivity analysis of the rectified superconducting alternator model 24 p0646 A79-48654

Computer simulation of a solar energy system 24 p0652 A79-49479

A computer model of a heterojunction solar cell with application to GaP/Si 24 p0654 A79-50030

Stochastic simulation of hourly global radiation sequences 24 p0661 A79-50541

Results of computer simulation of in situ oil shale retorting 24 p0668 A79-51024

A simulation exercise of a cavity-type solar receiver using the HEAP program 24 p0670 A79-51730

Solar thermal systems long-term performance predictions using closed-form solutions 24 p0672 A79-51740

Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation 24 p0675 A79-51763

Hybrid thermal storage subroutine for transient simulation 24 p0681 A79-51807

Computer modeling for a space power transmission system 24 p0694 A79-51941

Modeling the performance of gas-fired heat pump systems 24 p0697 A79-51963

Ball screw type wave power generator --- with flywheel drive 24 p0701 A79-51996

Component-based simulator for solar systems [LA-UR-78-1494] 21 p0208 N79-13521

The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings 22 p0351 N79-19059

Simulation of fluidized bed coal combustors [NASA-CR-159529] 22 p0359 N79-20487

Insulating wall boundary layer in a Faraday MHD generator [FE-23417] 22 p0365 N79-21310

Computerized simulation and parameterization of a new high-performance tubular solar collector 23 p0539 N79-22163

HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers --- solving the heat transfer problem [NASA-CR-158640] 23 p0560 N79-24466

The airport performance model. Volume 1: Extensions, validations, and applications [AD-A062863] 23 p0568 N79-25040

Assessment of potential US petroleum supply shortfalls, 1978 [DOE/EIA-0102/38] 24 p0734 N79-29376

Simulation and design of solar thermal processes [COO-2588-2] 24 p0741 N79-29655

Helios model for the optical behavior of reflecting solar concentrators [SAND-76-0347] 24 p0774 N79-31806

Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies --- mass and energy balance for two phase flow in porous media [LBL-8802] 24 p0786 N79-32584

An expanded system simulation model for solar energy storage (technical report), volume 1 [NASA-CR-159601] 24 p0804 N79-33881

An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2 [NASA-CR-159602] 24 p0804 N79-33882

SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1 [NASA-CR-159607] 24 p0804 N79-33883

SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2 [NASA-CR-159608] 24 p0804 N79-33884

COMPUTERS

Computer modeling of a two-junction, monolithic cascade solar cell 24 p0785 N79-32672

CONCENTRATING

A study of the physical and chemical properties of oil shale relevant to physical concentration processes 23 p0569 N79-25485

CONCENTRATORS

Design, construction, and testing of a Fixed Mirror Solar Concentrator field 21 p0020 A79-10164

Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator 21 p0020 A79-10166

Photovoltaic concentrating array 21 p0021 A79-10172

A vacuum solar thermal collector with optimal concentration 21 p0043 A79-11970

Optical evaluation techniques for reflecting solar concentrators 21 p0043 A79-11971

Nonimaging solar concentrators 21 p0043 A79-11973

Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones 21 p0043 A79-11974

Molten-carbonate CO2 concentrator - Preliminary experiments [ASME PAPER 78-ENAS-2] 21 p0048 A79-12551

General principles of multielement concentrating system design --- solar collectors 21 p0054 A79-13291

Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics 21 p0054 A79-13292

Solar power plants in the U.S.A. 21 p0057 A79-13640

Development of solar thermal power plants 21 p0057 A79-13641

Experimental results and concepts of different solar concentrators 21 p0057 A79-13643

Solar thermal power stations 21 p0057 A79-13644

Design of a second generation concentrating tracking solar collector [AIAA PAPER 78-1775] 21 p0062 A79-13872

Performance of evacuated solar collectors with compound parabolic concentrators 21 p0089 A79-15855

Verification of wedge concentration using a helium neon laser --- solar collector design 21 p0098 A79-16104

Analysis of optical behavior and collector performance of a solar concentrator 21 p0107 A79-16545

Concentrator photovoltaic systems for economical electricity and heat 21 p0124 A79-17354

On the design of CPC photovoltaic solar collectors --- Compound Parabolic Concentrator [CONF-780114-8] 21 p0124 A79-17355

Transcell, a novel approach for improving static photovoltaic concentration 21 p0124 A79-17356

Response of a solar cell to intense and nonuniform illumination when used with solar concentrators 21 p0125 A79-17357

Performance of optimal geometry three step compound wedge stationary concentrator --- solar collector using flat side mirrors 21 p0134 A79-17438

A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year 21 p0134 A79-17439

Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system 21 p0134 A79-17440

Development of solar collectors for low temperature level and of concentrators for thermal and photoelectric conversion 21 p0135 A79-17445

High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448

The USA 5MW solar thermal test facility
21 p0135 A79-17449

Distribution of beam radiation of the receiver plane of a CPC solar concentrator --- Compound Parabolic Concentrators
21 p0135 A79-17451

Large-aperture radiant solar energy concentrators
21 p0135 A79-17452

Performance of solar concentrators - A theoretical study
21 p0135 A79-17453

Solar concentrators --- using cheap refractive lenses
21 p0136 A79-17455

A simple solar tracking system --- manually adjusted rotating shaft for solar concentrator positioning
21 p0136 A79-17457

Manufacture of curved glass mirrors for linear concentrators
21 p0136 A79-17459

Design of solar energy concentrators for power generation in residential and nonresidential areas
21 p0136 A79-17460

A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

The development of photovoltaic conversion systems with sunlight concentration
21 p0148 A79-17995

Econometric analysis of concentrators for solar cells
21 p0149 A79-18017

Ideal prism solar concentrators
21 p0149 A79-18023

The place of extreme asymmetrical non-focussing concentrators in solar energy utilization
21 p0149 A79-18024

A cavity receiver design for solar heated gas turbine generating systems
[ONERA, TP NO. 1978-137] 21 p0155 A79-18[illegible]60

Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838

Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

A comparison of compound parabolic and simple parabolic concentrating solar collectors
22 p0262 A79-23754

Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design
22 p0263 A79-23764

Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745

Efficient Fresnel lens for solar concentration
22 p0285 A79-26816

Effect of form errors on the characteristics of ellipsoidal radiant energy concentrators
22 p0296 A79-28667

Symmetrical and asymmetrical ideal cylindrical radiation transformers and concentrators
22 p0303 A79-29647

Photovoltaic concentrator system technology and applications experiments
[ASME PAPER 79-SOL-9] 22 p0308 A79-30544

Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector
22 p0317 A79-31408

Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970

A combination solar direct electric conversion concentrator and heat collector system
23 p0399 A79-33996

Solar energy conversion system - Four quadrant, two dimension linear solar concentrators
23 p0399 A79-33999

Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024

Cast acrylic Fresnel lenses for solar energy concentration
23 p0432 A79-35076

Health and safety hazards associated with solar concentration systems
23 p0439 A79-36628

Practical design considerations for CPC solar collectors --- Compound Parabolic Concentrator
23 p0439 A79-36634

Concentrator cost bound for high-efficiency photovoltaic power production --- mathematical model
23 p0440 A79-36637

Concentrator for solar air heater
23 p0487 A79-40379

Status of the photovoltaic concentrator applications experiments
23 p0496 A79-40884

Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975

Design of a 10kW photovoltaic 200/1 concentrator
23 p0508 A79-40993

Fresnel optics for solar concentration on photovoltaic cells
23 p0508 A79-40994

Evaluation of a plastic parabolic concentrator for terrestial photovoltaic applications
23 p0508 A79-40995

A novel low-cost photovoltaic concentrator
23 p0508 A79-40996

Luminescent solar concentrators
23 p0509 A79-40997

Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight
23 p0509 A79-40999

Photovoltage in concentrator cells
23 p0511 A79-41013

Analysis of multiple-cell concentrator/photovoltaic systems
23 p0513 A79-41026

Status of the DOE Photovoltaic Concentrator Technology Development Project
23 p0517 A79-41054

Design, technology and cost of Si cells for concentrator applications
23 p0517 A79-41055

Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056

Large-area concentrator solar cells
23 p0517 A79-41057

A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061

Performance of a one kilowatt concentrator photovoltaic array utilizing active cooling
23 p0519 A79-41069

10 kW photovoltaic concentrator system design
23 p0519 A79-41070

Fixed-focal-axis solar concentrators with a curvature determined by gravity
23 p0523 A79-41254

Optimal control of sun tracking solar concentrators
23 p0526 A79-41831

Concentration augmentation of power in a Savonius-type wind rotor
23 p0527 A79-41947

Orientation studies for single-axis concentrating collectors
23 p0537 A79-43677

Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259

Solar radiation concentrator for uniform irradiation of flat energy receivers and converters
24 p0602 A79-44260

Accuracy and energy characteristics of paraboloidal heliostat system
24 p0602 A79-44261

Composite paraboloidal radiant energy concentrators
24 p0602 A79-44262

Solar concentrator flux distributions using backward ray tracing
24 p0603 A79-44365

The effect of errors in their shape on the characteristics of ellipsoidal concentrators of radiant energy 24 p0637 A79-46905

Investigation of the spectral characteristics of metallized polymer films for making solar concentrators 24 p0637 A79-46910

An analysis of the terminal concentrator concept for solar central receiver systems 24 p0641 A79-47792

Optimum grid design for a nonuniformly illuminated sun-concentrator solar cell 24 p0645 A79-48274

Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators 24 p0646 A79-48735

Heating characteristics of concentrator/receiver systems using selective absorption surfaces 24 p0646 A79-48739

Calculation of the optical characteristics of high-power two-mirror solar furnaces 24 p0648 A79-49183

Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility 24 p0658 A79-50343

Concentration of a cassegrain solar furnace 24 p0658 A79-50344

Static concentrators for two-sided photovoltaic solar cells 24 p0661 A79-50542

New ideal concentrators for distant radiation sources 24 p0661 A79-50547

Enhancement of solar arrays in space through the use of concentrators 24 p0692 A79-51905

The potential of np GaAs solar cells for high efficiency concentrator applications 24 p0705 A79-52325

Satellite solar power station designs with concentrators and radiating control [IAF PAPER 79-176] 24 p0710 A79-53336

Design package for concentrating solar collector panels [NASA-CR-150788] 21 p0173 N79-10523

Status of the DOE photovoltaic concentrator technology development project [SAND-78-0948C] 21 p0176 N79-10550

Thermal analysis of receivers for solar concentrators and optimization procedure for power production 21 p0182 N79-11465

Non-tracking solar energy collector system [NASA-CASE-NPO-13817-1] 21 p0182 N79-11471

Fixed mirror solar concentrator for power generation [GA-A-14883] 21 p0187 N79-11526

Concentrating solar collector test results, Collector Module Test Facility [SAND-78-0815] 21 p0208 N79-13522

Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator [NASA-TM-78222] 22 p0360 N79-20495

Photovoltaic concentrator system technology and applications experiments [SAND-78-2184] 23 p0565 N79-24511

Performance testing of the General Atomic Fixed mirror solar concentrator [SAND-78-0624] 23 p0573 N79-25519

Concentrating solar collector test results from DOE/Sandia collector module test facility [SAND-78-0881C] 23 p0573 N79-25520

Analysis of flat mirror V-trough solar concentrator 23 p0579 N79-26472

Helios model for the optical behavior of reflecting solar concentrators [SAND-76-0347] 24 p0774 N79-31806

Conceptual design study of concentrator enhanced solar arrays for space applications Volume 1: Study overview and summary [NASA-CR-162328] 24 p0782 N79-32638

Conceptual design study of concentrator enhanced solar arrays for space applications Volume 2: Technical [HAC-REF-E3256-VOL-2] 24 p0782 N79-32639

CONCENTRIC CYLINDERS

Optimum design parameters of horizontal coaxial cylinders for a solar energy collector 21 p0134 A79-17444

CONCORDE AIRCRAFT

Powerplant integration - The application of current experience to future developments [ASME PAPER 78-GT-113] 21 p0032 A79-10788

Supersonic transport vis-a-vis energy savings [NASA-TM-75464] 24 p0763 N79-31163

CONCRETES

Periodic heating/cooling by solar radiation --- through concrete slab buildings 21 p0140 A79-17491

Limit analysis and design of a semi-submerged concrete hull for an ocean thermal differences power plant 23 p0486 A79-40195

Development of a lightweight concrete for OTEC cold water pipes 24 p0622 A79-45823

Opportunities for energy conservation in finished concrete products [HCP/CS-1549] 24 p0772 N79-31782

CONDENSATION

Ammonia vaporization and condensation investigations related to OTEC heat exchangers 24 p0622 A79-45819

CONDENSERS

History and development of condensers at the Geysers geothermal power plant [ASME PAPER 78-JPGC-PWR-18] 21 p0150 A79-18099

Selection of thermal operating regimes for fuel cell reactor-condenser systems 21 p0165 A79-20342

CONDENSERS (LIQUIFIERS)

Heat exchangers for Ocean Thermal Energy Conversion plants 21 p0142 A79-17506

Application of gas turbine/compressors in LNG plants [ASME PAPER 79-GT-85] 23 p0376 A79-32362

Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC 24 p0618 A79-45787

Evaluation of selected chemical processes for production of low-cost silicon, phase 3 --- using a fluidized bed reactor [NASA-CR-162168] 24 p0769 N79-31756

Condensation of refrigerants on vertical fluted tubes [ORNL/TM-5848] 24 p0781 N79-32515

CONDITIONING (LEARNING)

Energy conservation: Policy issues and end-use scenarios of savings potential. Part 6. End-use energy conservation data base and scenarios [LBL-7896-PT-6] 24 p0758 N79-30818

CONDUCTING FLUIDS

On the diffusive instability of some simple steady magnetohydrodynamic flows 22 p0278 A79-26163

Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane 23 p0479 A79-39841

Induced fields during the motion of a conducting medium in the field of an air-core magnetic system 24 p0650 A79-49373

CONDUCTIVE HEAT TRANSFER

Heat transfer in phosphoric acid fuel cell stacks 21 p0010 A79-10091

Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water 21 p0167 A79-20360

Optimal distribution of heat conducting material in the finned pipe solar energy collector 22 p0242 A79-21163

Estimating heat loads on multistage thermoelectric heat pumps 22 p0260 A79-23614

Earth-conducted heat losses from thermal storage systems 22 p0281 A79-26208

Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium 23 p0383 A79-32963

Transient behaviour of solar flat plate collectors
23 p0467 A79-38612

Thermal performance of single-pass solar fluid heaters
23 p0467 A79-38613

Analysis of conduction responses during an underground coal gasification experiment
23 p0531 A79-42898

On the problem of heat transfer in low-temperature heat pipes
23 p0532 A79-42938

Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976

CONDUCTORS

Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309

CONFERENCES

Intersociety Energy Conversion Engineering Conference, 13th, San Diego, Calif., August 20-25, 1978, Proceedings. Volumes 1, 2 & 3
21 p0001 A79-10001

Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776

Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965

Optics in adverse environments; Proceedings of the Seminar, San Diego, Calif., August 25, 26, 1977
21 p0044 A79-12037

Coal desulfurization: Chemical and physical methods; Proceedings of the Symposium, New Orleans, La., March 23, 1977
21 p0044 A79-12114

National Conference on Energy Conservation in General Aviation, 1st, Kalamazoo, Mich., October 10, 11, 1977, Proceedings
21 p0047 A79-12376

Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers
21 p0051 A79-12977

German Solar Energy Forum, 1st, Hamburg, West Germany, September 26-28, 1977, Proceedings. Volume 2
21 p0055 A79-13619

Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106

Annual Conference on Energy, 4th, University of Missouri-Rolla, Rolla, Mo., October 11-13, 1977, Proceedings. Volume 4
21 p0071 A79-14676

Seminar on Geothermal Energy, 1st, Brussels, Belgium, December 6-8, 1977, Proceedings. Volumes 1 & 2
21 p0075 A79-14726

Miami International Conference on Alternative Energy Sources, Miami Beach, Fla., December 5-7, 1977, Proceedings of Condensed Papers
21 p0076 A79-14760

Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program --- Book
21 p0077 A79-14776

Ash deposits and corrosion due to impurities in combustion gases; Proceedings of the International Conference, New England College, Henniker, N.H., June 26-July 1, 1977
21 p0080 A79-14926

Conference on Decision and Control, and Symposium on Adaptive Processes, 16th, and Special Symposium on Fuzzy Set Theory and Applications, New Orleans, La., December 7-9, 1977, Proceedings. Volumes 1 & 2
21 p0081 A79-14957

Joint Conference on Sensing of Environmental Pollutants, 4th, New Orleans, La., November 6-11, 1977, Proceedings
21 p0082 A79-15023

Advances in cryogenic engineering. Volume 23 - Proceedings of the Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
21 p0084 A79-15301

Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826

Energy technology V: Challenges to technology; Proceedings of the Fifth Conference, Washington, D.C., February 27-March 1, 1978
21 p0091 A79-15879

Combined environments: Technology interrelations; Proceedings of the Twenty-fourth Annual Technical Meeting, Fort Worth, Tex., April 18-20, 1978
21 p0097 A79-16076

Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings
21 p0099 A79-16126

National Computer Conference, Anaheim, Calif., June 5-8, 1978, Proceedings
21 p0100 A79-16177

Ocean thermal energy conversion; Proceedings of the Energy Technology Conference and Exhibition, Houston, Tex., November 6-9, 1978
21 p0100 A79-16245

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Albuquerque, N. Mex., June 25-29, 1978, Technical and Symposium Papers
21 p0101 A79-16415

International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 16-22, 1978, Symposium Lectures
21 p0102 A79-16451

Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1979, Technical Papers
21 p0107 A79-16601

Energy '78; Annual Conference, Tulsa, Okla., April 16-18, 1978, Record of Conference Papers
21 p0111 A79-16726

Sun: Mankind's future source of energy; Proceedings of the International Solar Energy Congress, New Delhi, India, January 16-21, 1978. Volumes 1, 2 & 3
21 p0116 A79-17276

International Instrumentation Symposium, 24th, Albuquerque, N. Mex., May 1-5, 1978, Proceedings. Parts 1 & 2
21 p0144 A79-17576

Coal technology '78; International Coal Utilization Convention, Houston, Tex., October 17-19, 1978, Conference Papers. Volumes 1 & 2
21 p0145 A79-17631

International Symposium on Wave and Tidal Energy, University of Kent, Canterbury, England, September 27-29, 1978, Proceedings. Volume 1
21 p0150 A79-18101

Applied Superconductivity Conference, Pittsburgh, Pa., September 25-28, 1978, Proceedings
22 p0235 A79-20526

Selective application of materials for products and energy; Proceedings of the Twenty-third National Symposium and Exhibition, Anaheim, Calif., May 2-4, 1978
22 p0239 A79-20801

Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977
22 p0247 A79-21676

International Conference on Thermoelectric Energy Conversion, 2nd, University of Texas, Arlington, Tex., March 22-24, 1978, Proceedings and Supplement
22 p0259 A79-23603

Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776

Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309

International Solar Energy Conference on the Performance of Solar Heating and Cooling Systems, Duesseldorf, West Germany, April 19, 20, 1978, Proceedings [NATO/CCMS-85] 22 p0275 A79-25926

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978 22 p0278 A79-26176

Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978 22 p0280 A79-26201

Oceans '78: The ocean challenge; Proceedings of the Fourth Annual Combined Conference, Washington, D.C., September 6-8, 1978 22 p0287 A79-27376

Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978 22 p0289 A79-27651

Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978 22 p0293 A79-28140

Nuclear Science Symposium, 25th, and Symposium on Nuclear Power Systems, 10th, Washington, D.C., October 18-20, 1978, Proceedings 22 p0297 A79-28901

International Conference on Electric Vehicle Development, London, England, May 31, June 1, 1977, Proceedings 22 p0300 A79-29487

ICEC 7; Proceedings of the Seventh International Cryogenic Engineering Conference, London, England, July 4-7, 1978 22 p0311 A79-31001

Renewable alternatives; Proceedings of the Fourth Annual Conference, University of Western Ontario, London, Canada, August 20-24, 1978. Volumes 1 & 2 22 p0316 A79-31401

Energy and aerospace; Proceedings of the Anglo/American Conference, London, England, December 5-7, 1978 22 p0325 A79-31908

Metallurgical coatings 1978; Proceedings of the Fifth International Conference, San Francisco, Calif., April 3-7, 1978. Volumes 1 & 2 22 p0327 A79-31951

Brazilian Conference on Energy, 1st, Rio de Janeiro, Brazil, December 12-14, 1978, Proceedings. Volumes A, B, & C 23 p0384 A79-33212

Symposium on the Engineering Aspects of Magnetohydrodynamics, 17th, Stanford University, Stanford, Calif., March 27-29, 1978, Proceedings 23 p0390 A79-33379

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 1 - Solar energy 1 23 p0398 A79-33984

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 2 - Solar energy 2 23 p0400 A79-34002

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 3 - Solar Energy 3 23 p0402 A79-34022

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy 23 p0404 A79-34036

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 6 - Geothermal energy and hydropower 23 p0408 A79-34067

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 7 - Hydrocarbon conversion technology 23 p0410 A79-34086

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 8 - Hydrogen energy 23 p0413 A79-34106

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 9 - Energy delivery, conservation, and environment 23 p0416 A79-34131

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy 23 p0419 A79-34158

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 11 - Index 23 p0422 A79-34182

American Power Conference, Illinois Institute of Technology, Chicago, Ill., April 24-26, 1978, Proceedings. Volume 40 23 p0423 A79-34451

The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2 23 p0427 A79-34860

Seminar on Testing Solar Energy Materials and Systems, Gaithersburg, Md., May 22-24, 1978, Proceedings 23 p0427 A79-35038

Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978 23 p0442 A79-36876

International Conference on Future Energy Concepts, London, England, January 30-February 1, 1979, Proceedings 23 p0448 A79-37842

International Solar Forum, 2nd, Hamburg, West Germany, July 12-14, 1978, Reports. Volumes 1, 2 & 3 23 p0463 A79-38576

Annual Simulation Symposium, 11th, Tampa, Fla., March 15-17, 1978, Record of Proceedings 23 p0475 A79-38876

International Symposium on Wind Energy Systems, 2nd, Amsterdam, Netherlands, October 3-6, 1978, Proceedings. Volume 1 23 p0481 A79-40101

Energy conservation through waste utilization; Proceedings of the Eighth Biennial National Waste Processing Conference, Chicago, Ill., May 7-10, 1978 23 p0487 A79-40386

Chemistry for energy; Proceedings of the Symposium, Winnipeg, Manitoba, Canada, June 5-7, 1978 23 p0493 A79-40736

Photovoltaic Specialists Conference, 13th, Washington, D.C., June 5-8, 1978, Conference Record 23 p0496 A79-40881

INOVA: Industrial innovation; Conference, Paris, France, June 13-17, 1977, Proceedings. Volume 2 - New energy 23 p0523 A79-41801

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 2 - Heat transfer in energy conversion, natural convection, combined heat and mass transfer, condensation, and forced convection 23 p0530 A79-42886

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 4 - Process and industrial heat transfer, heat transfer in energy utilization, heat exchangers 23 p0532 A79-42973

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 6 - Keynote papers 23 p0532 A79-43012

The enigma of the eighties: Environment,
economics, energy; Proceedings of the
Twenty-fourth National Symposium and Exhibition,
San Francisco, Calif., May 8-10, 1979. Books 1 & 2
23 p0533 A79-43228

Symposium on Turbulence, Diffusion, and Air
Pollution, 4th, Reno, Nev., January 15-18, 1979,
Preprints
23 p0534 A79-43351

Advances in cryogenic engineering. Volume 24 -
Proceedings of the Second International
Cryogenic Materials Conference, University of
Colorado, Boulder, Colo., August 2-5, 1977
24 p0603 A79-44526

Meteorology for solar energy applications;
Proceedings of the Conference, Royal Institution
of Great Britain, London, England, January 24,
1979
24 p0604 A79-44551

Application of solar energy; Proceedings of the
Third Southeastern Conference, Huntsville, Ala.,
April 17-19, 1978
24 p0607 A79-45201

Hydrogen for energy distribution; Proceedings of
the Symposium, Chicago, Ill., July 24-28, 1978
24 p0612 A79-45576

Ocean thermal energy for the 80's; Ocean Thermal
Energy Conversion Conference, 6th, Washington,
D.C., June 19-22, 1979, Preprints. Volumes 1 & 2
24 p0616 A79-45776

Midwest Energy Conference, Chicago, Ill., November
19-21, 1978, Proceedings
24 p0630 A79-46301

Workshop on Economic and Operational Requirements
and Status of Large Scale Wind Systems,
Monterey, Calif., March 28-30, 1979, Proceedings
24 p0633 A79-46526

Conference on Environmental Aspects of
Non-Conventional Energy Resources - II, Denver,
Colo., September 26-29, 1978, Proceedings
24 p0664 A79-50876

Intersociety Energy Conversion Engineering
Conference, 14th, Boston, Mass., August 5-10,
1979, Proceedings. Volumes 1 & 2
24 p0670 A79-51726

Future Orbital Power Systems Technology Requirements
[NASA-CP-2058] 21 p0169 N79-10122

Proceedings of the Engineering Foundation
Conference on Clean Combustion of Coal
[PB-282949/7] 21 p0171 N79-10243

Improved Conversion Efficiency Workshop. Volume 2:
Summary
[CONF-771003-P2-VOL-2] 21 p0176 N79-10551

Multidisciplinary research related to the
atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679

Committee on the challenges of modern society
rational use of energy pilot study modular
integrated utility system project. Volume 2:
Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11558

The energy dilemma: A challenge for Maryland.
Proceedings Maryland General Assembly/AISLE
Conference
[PB-284703/6] 21 p0199 N79-12579

Naval Air Systems Command-Naval Research
Laboratory Workshop on Basic Research Needs for
Synthetic Hydrocarbon Jet Aircraft Fuels
[AD-A060081] 21 p0216 N79-14235

Technology and Use of Lignite --- conferences
[GFERC/IC-77/1] 21 p0216 N79-14241

Proceedings of Energy Resource 5th Conference
[PB-286246/4] 21 p0230 N79-15423

The rotary combustion engine: A candidate for
general aviation --- conferences
[NASA-CP-2067] 22 p0329 N79-15961

Alternative hydrocarbon fuels: Combustion and
chemical kinetics --- synthetic aircraft fuels
[AD-A061050] 22 p0338 N79-17011

Proceedings of symposium on water-in-fuel
emulsions in combustion --- marine diesels,
boilers, and gas turbine engines
[AD-A061503] 22 p0338 N79-17019

Symposium on Energy Today and Tomorrow
[CSIR-S-145] 22 p0340 N79-17316

EPA program conference report: Coal cleaning, an
option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

Energy environment III
[EPA-600/9-78-022] 22 p0346 N79-18352

Public hearing transcript: Federal non-nuclear
energy research and development program
[PB-287910/4] 22 p0349 N79-18464

Energy/environment 1978: Symposium on energy
development impacts
[PB-288578/8] 22 p0355 N79-19470

Geothermal resources for aquaculture
[PB-290345/8] 22 p0356 N79-19563

The 1977 Goddard Space Flight Center Battery
Workshop
[NASA-CP-2041] 22 p0370 N79-21565

Report of the 4th CCMS (Committee on the
Challenges of Modern Society) Solar Energy Pilot
Study Meeting
[PB-289492/1] 22 p0372 N79-21631

Thermal Storage Applications Workshop. Volume 1:
Plenary Session Analysis
[NASA-CR-158643] 23 p0559 N79-24460

Thermal Storage Applications Workshop. Volume 2:
Contributed Papers
[NASA-CR-158644] 23 p0559 N79-24461

Proceedings of the US DOE Photovoltaics Technology
Development and Applications Program Review
[NASA-CR-158682] 23 p0570 N79-25485

Design of a 150 kWe distributed collector solar
thermal power station
[ATD-CONF-78-212-013] 23 p0583 N79-26517

Proceedings of the Workshop on Mechanical Storage
of Wind Energy
[SAND-79-0001] 23 p0584 N79-26529

Stability of coal-oil mixtures --- conferences
[CONF-7805152-1] 23 p0589 N79-27332

Material and energy balances in the production of
ethanol from wood --- conferences
[CONF-7806139-1] 23 p0589 N79-27338

Assessment of load management on the electric
power system --- conferences
[CONF-781182-3] 23 p0590 N79-27412

Proceedings of the Conference on Coal Use for
California
[NASA-CR-158770] 23 p0591 N79-27597

Proceedings of the Distribution Automation and
Control Working Group. Volume 2: Proceedings
[NASA-CR-158769] 23 p0595 N79-27659

Mead 25 kilowatt photovoltaic system --- conferences
[COO-4094-19] 23 p0596 N79-27677

Modeling passive solar buildings with hand
calculations --- conferences
[LBL-8583] 23 p0596 N79-27683

Impacts of new energy technologies as measured
against reference energy systems --- conferences
[BNL-25475] 23 p0597 N79-27690

Locational response to regulatory policy: A
regional analysis of energy facility location
--- conferences
[BNL-23597] 23 p0598 N79-27695

Aerodynamic separation of gases and isotopes:
Recent advances --- conferences, Belgium,
May-Jun. 1978
[VKI-LEC-SER-1978-8] 24 p0720 N79-28506

Combined cycles for power generation, volume 1 ---
conferences, Belgium, Apr. 1978
[VKI-LEC-SER-1978-6-VOL-1] 24 p0723 N79-28732

Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28734

Application of resource allocation models to the
problems of regional energy policy in large
developing countries --- conferences
[BNL-25537] 24 p0728 N79-28779

Second Annual Combustion and Fuels Technology
Program Contractor Review Meeting
[CONF-7809103] 24 p0731 N79-29271

Symposium on Advances in Synthetic Fuels presented
before the Division of Petroleum Chemistry,
American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377

Hydrogen technology: An overview --- conferences
[BNL-25760] 24 p0734 N79-29379

Automatic tension control for winding
superconducting coils --- conferences
[I/EN-257] 24 p0734 N79-29384

Small low-head hydroelectric power --- conferences
[IDO-10076] 24 p0738 N79-29617

Standards applicable to performance measurement of
solar heating and cooling systems --- conferences
[COO-4142-2] 24 p0741 N79-29656

Proceedings of the 2nd Workshop on Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658
Converting Green River shale oil to transportation fuels --- conferences
[CONF-780460-3] 24 p0745 N79-30396
Behavior of gas distribution equipment in hydrogen service --- conferences
[CONF-790512-2] 24 p0747 N79-30408
Proceedings of a Symposium on the Utilization of Methane Generated in Landfills
[CONF-780340] 24 p0747 N79-30410
Photovoltaic generators in space --- conference, ESTEC, Netherlands, Sep. 1978
[SP-140] 24 p0751 N79-30730
Economic overview of vertical axis wind turbines --- conferences
[SAND-79-9733C] 24 p0753 N79-30773
International energy conservation: Comparative law and policy. Proceedings from the 1978 International Conference on Energy conservation
[CONF-780274] 24 p0757 N79-30811
Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants --- conferences
[CONF-780599-2] 24 p0758 N79-30822
Multiobjective analysis in a national energy system model --- conferences
[BNL-24371] 24 p0759 N79-30823
Status of the offshore technology program --- conferences
[SAND-78-0665] 24 p0761 N79-30908
Fusion reactors for synthetic fuels
[BNL-25634] 24 p0767 N79-31421
Computer design and optimization of cryogenic refrigeration systems --- conferences
[LBL-7934] 24 p0768 N79-31439
Buildings energy management program workshop design
[CONS-8630-T1] 24 p0776 N79-31824
Recent developments in coal liquefaction in the United States --- conferences
[CONF-790213-5] 24 p0779 N79-32383
Solar Cell High Efficiency and Radiation Damage, 1979
[NASA-CP-2097] 24 p0783 N79-32640
Jet Fuel Thermal Stability
[NASA-TM-79231] 24 p0795 N79-33336
Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution
[PB-297467/3] 24 p0803 N79-33648

CONGRESSIONAL REPORTS
National Aeronautics and Space Act of 1958, as amended, and related legislation
[GPO-34-175] 21 p0214 N79-13932
Energy information: Report to Congress
[NTISUB/C/027-001] 21 p0221 N79-14576
Symposium on the Future of Space Science and Space Applications
[GPO-23-876] 21 p0224 N79-15105
The national energy plan: Options under assumptions of national security threat --- economic impact procurement policy, and resources management
[H-PRINT-95-48] 21 p0229 N79-15398
US energy demand and supply, 1976-1985: Limited options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
Energy and the economy: The economic impact of alternative energy supply-demand assumptions
[H-PRINT-95-51] 22 p0333 N79-16352
Industrial energy conservation
[GPO-24-367] 22 p0333 N79-16353
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339
Electric and Hybrid Vehicle Act, Public Law 94-413 demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810
Authorizing appropriations to the National Aeronautics and Space Administration
[H-REPT-96-52] 22 p0364 N79-20928
Impact of solar energy on rural housing
[GPO-31-641] 23 p0560 N79-24867
Electric and hybrid vehicle program
[DOE/CS-0068] 23 p0567 N79-24900
Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513
Executive energy documents
[GPO-24-112] 23 p0582 N79-26507
Energy: Fiscal year 1980 budget request
[GPO-42-886] 23 p0582 N79-26508
The National Energy Act
[GPO-36-956] 23 p0582 N79-26509
Alcohol fuels
[GPO-22-334] 23 p0588 N79-27322
Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPO-26-349] 24 p0717 N79-28346
Natural gas shortage --- Congressional reports
[GPO-86-231] 24 p0717 N79-28347
Diesel Fuel and Gasoline Conservation Act of 1977 --- congressional reports
[GPO-34-986] 24 p0718 N79-28348
NASA authorization, 1980, volume 1, part 2
[GPO-46-134] 24 p0730 N79-29105
Solar power satellite
[GPO-45-997] 24 p0731 N79-29212
Liquefied energy gases, part 2 --- safety factors and legal liabilities
[GPO-39-305] 24 p0732 N79-29356
Energy conservation and regulation in the President's budget
[GPO-25-418] 24 p0736 N79-29597
Solar energy
[GPO-36-957] 24 p0737 N79-29609
Bioconversion
[GPO-37-136] 24 p0745 N79-30393
Unique helium resources are wasting: A new conservation policy is needed
[PB-293751/4] 24 p0748 N79-30701
Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 --- congressional reports
[GPO-36-187] 24 p0750 N79-30725
Solar Power Satellite Research, Development, and Demonstration Program Act of 1978
[GPO-35-994] 24 p0750 N79-30726
Short-term projections of the energy supply and demand in the United States from the EIA report to Congress, 1977
[DOE/EIA-0102/37] 24 p0755 N79-30799
NASA authorization, 1980, volume 1, part 4
[GPO-46-423] 24 p0762 N79-31085
Biomass conversion --- congressional reports agriculture technology assessment
[GPO-32-317] 24 p0765 N79-31404
Aeronautics and space report of the President, 1978 activities
24 p0794 N79-33115

CONICAL BODIES
Preliminary comparison of theory and experiment for a conical, pressurized-fluidized-bed coal combustor
[NASA-TM-79137] 23 p0542 N79-22623

CONNECTICUT
A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin
21 p0093 A79-15893

CONSTRAINTS
Air quality as a constraint to the use of coal in California
23 p0592 N79-27605
Water as a constraint to the use of coal for California
23 p0592 N79-27606

CONSTRUCTION
Principles of design and construction for marine structures for wave/tidal/ocean thermal energy
21 p0152 A79-18114
The construction of satellite solar power stations from nonterrestrial materials - Feasibility and economics
23 p0403 A79-34028
Satellite Power Systems (SPS) concept definition study (exhibit C)
[NASA-CR-150827] 21 p0183 N79-11475
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 1: Executive summary
[NASA-CR-161219] 23 p0547 N79-23484

CONSTRUCTION MATERIALS
Materials problems and opportunities in coal conversion systems
21 p0034 A79-11146

Materials problems and possible solutions for near term tokamak fusion reactors
21 p0079 A79-14790

Materials problems and opportunities in coal conversion systems
21 p0094 A79-15900

Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901

Materials and economics of energy systems
21 p0095 A79-15911

Selective application of materials for products and energy; Proceedings of the Twenty-third National Symposium and Exhibition, Anaheim, Calif., May 2-4, 1978
22 p0239 A79-20801

Encapsulant materials for $2/watt terrestrial photovoltaic arrays
22 p0266 A79-24138

Sputtering yields of graphite and carbides and their potential use as first wall materials --- in Tokamak reactor
23 p0444 A79-36892

Materials for windmill blades
23 p0453 A79-37897

The design and construction of the Aldborough aerogenerator
23 p0453 A79-37900

CONTACT POTENTIALS

Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486

CONTACT RESISTANCE

High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228

Determination of thermal contact resistances --- for solar thermoelectric generators
21 p0166 A79-20351

CONTAMINANTS

Source emissions factors for refuse derived fuels
21 p0082 A79-15084

Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234

CONTAMINATION

Measuring dirt on photovoltaic modules
23 p0533 A79-43283

CONTINENTAL SHELVES

ERDA'S oceanographic program for the mid-Atlantic coastal region --- impact of offshore energy development on coastal ecology
[BNL-24016] 21 p0192 N79-11641

Environmental assessment of the Alaskan Continental Shelf. Volume 1: Biological studies
[PB-289154/7] 22 p0344 N79-17366

Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies
[PB-289155/4] 22 p0344 N79-17367

Environmental assessment of the Alaskan Continental Shelf. Volume 3: Biological studies
[PB-289156/2] 22 p0344 N79-17368

Marine biological effects of OCS petroleum development
[PB-288935/0] 22 p0344 N79-17374

Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592

The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report
[PB-294228/2] 24 p0744 N79-29783

CONTINENTS

Heat flow and radiogenic heat production in Brazil with implications for thermal evolution of continents
22 p0373 N79-21689

CONTINUOUS WAVE LASERS

Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202

CONTROL

Regulation and control concepts for the possibilities of a utilization of solar energy in the low-temperature range
22 p0305 A79-30345

Power management and control for space systems
21 p0170 N79-10134

CONTROL CONFIGURED VEHICLES

Fuel conservative subsonic transport --- control surfaces activated by computers
22 p0337 N79-16874

CONTROL EQUIPMENT

Preliminary controller evaluation for the MERC/CTIU using a mathematical process model --- of Component Test and Integration Unit in fluidized bed combustion
21 p0008 A79-10073

Design and operating experience on the U.S. Department of Energy Experimental Mod-0 100 kW Wind Turbine
21 p0028 A79-10234

Electronic components in solar technology
21 p0056 A79-13629

Control of solar energy systems, heat storage, and heat utilization
21 p0056 A79-13630

Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13631

Considerations in choosing solar energy monitoring systems
21 p0087 A79-15831

Controls for residential solar heating
21 p0101 A79-16418

Solar controls and control modifications - New century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419

Control strategy for a variable-speed wind energy conversion system
22 p0303 A79-29800

Control system for solar hot water system
22 p0321 A79-31442

Combined radiant-flux controller for a high-temperature solar energy system
23 p0433 A79-35382

Cuttyhunk Island installation, WTG Energy Systems, Inc., MP1-200 control system design --- Wind Turbine Generator
24 p0634 A79-46539

Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652

Combination radiant-flux radiator for high-temperature solar plant
24 p0663 A79-50705

A distributed microcomputer-based control system for a large scale solar total energy system
24 p0672 A79-51741

The control system for Fort Hood Solar Total Energy System
24 p0672 A79-51742

Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508

Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

CONTROL SIMULATION

Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398

A microprocessor based solar controller
21 p0082 A79-14979

Control of wind turbine generators connected to power systems
21 p0086 A79-15574

Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744

Study of integrated gasification combined cycle plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530

Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183

Toward optimal control of solar energy systems
24 p0643 A79-47944

CONTROL SURFACES

Fuel conservative subsonic transport --- control surfaces activated by computers
22 p0337 N79-16874

CONTROL THEORY
Dynamic model of an industrial plant manufacturing a variety of products
21 p0051 A79-12957
Conference on Decision and Control, and Symposium on Adaptive Processes, 16th, and Special Symposium on Fuzzy Set Theory and Applications, New Orleans, La., December 7-9, 1977, Proceedings. Volumes 1 & 2
21 p0081 A79-14957
Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776
Optimal control of sun tracking solar concentrators
23 p0526 A79-41831
A control system analysis of the energy growth model: Coal
24 p0736 N79-29595
CONTROL VALVES
An optical valve for flat-plate solar energy collectors
24 p0607 A79-45154
CONTROLLABILITY
Modelling and control of a fluidized bed gasifier
22 p0332 N79-16345
CONTROLLED FUSION
Fusion-Fission Energy Systems
21 p0017 A79-10144
Doublet III design and construction --- Tokamak fusion research device
21 p0018 A79-10145
Demonstration and commercial prototype tokamak reactors
21 p0018 A79-10146
The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147
Mirror fusion reactors
21 p0018 A79-10148
Overview of inertial confinement fusion reactor designs
21 p0018 A79-10149
Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151
The fast power cycle for fusion reactors
21 p0018 A79-10152
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658
Fusion power with particle beams
21 p0034 A79-11121
Development of energetic neutral beams to the megawatt power level for controlled thermonuclear research
21 p0054 A79-13439
Heavy-ion beam inertial-confinement fusion
21 p0054 A79-13448
Ohmic heating experiments in the L-2 stellarator
21 p0070 A79-14460
The mirror machine program in the USA --- controlled fusion experiments and research facilities
21 p0070 A79-14461
Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466
Fusion reactor problems --- plasma confinement and interface engineering
21 p0071 A79-14468
Philosophy and physics of predemonstration fusion devices
21 p0078 A79-14783
Predemonstration fusion devices - Research and development needs
21 p0078 A79-14785
Superconducting magnets - Some fundamentals and their state of the art
21 p0079 A79-14788
Fusion power by magnetic confinement - Program plan
21 p0080 A79-14794
Large-scale cryopumping for controlled fusion
21 p0085 A79-15330
Materials and economics of energy systems
21 p0095 A79-15911
Dynamics and feedback control of ISX tokamak
21 p0107 A79-16559
Superconductivity for mirror fusion
22 p0236 A79-20542
Optimum properties of a noncylindrical pinch --- neutron energy yield in fusion plasma
22 p0244 A79-21433
The synergetics of the catalytic D-D-fusion-fission breeder
22 p0252 A79-22236
Minimum-average-B wells in linked magnetic mirror fields --- for plasma control in fusion reactors
22 p0252 A79-22237
Particle orbits in field-reversed mirrors --- for plasma confinement in fusion reactor
22 p0253 A79-22239
Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978
22 p0289 A79-27651
Doublet III --- tokamak program review
22 p0290 A79-27667
The Alcator liquid nitrogen-cooled tokamaks
22 p0290 A79-27668
Status report on TFTR --- Toroidal Fusion Test Reactor
22 p0290 A79-27669
Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003
MHD stability of Spheromak
22 p0313 A79-31189
Large tokamak experiments - Report on the Third IAEA Technical Committee Meeting, Paris, 1-6 September 1978
22 p0313 A79-31193
The JET project - A step towards the production of power by nuclear fusion
22 p0326 A79-31918
Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057
Prospects of generating power with particle-beam-drive inertial confinement fusion
23 p0407 A79-34063
Conceptual design study of a doublet fusion ignition test reactor
23 p0407 A79-34065
Energy sources of the future - A challenge to man's ingenuity
23 p0423 A79-34389
Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876
Progress in tokamak and stellarator experiments
23 p0443 A79-36878
Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938
Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940
A realistic alternative for practical fusion power
24 p0602 A79-44275
Large superconducting magnets for new energy technologies
24 p0604 A79-44527
Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor
24 p0630 A79-46302
A possible route to small, flexible fusion units --- fusion reactor design
24 p0630 A79-46304
Characteristics of co-axial Marx generator and its application to electron beam fusion
24 p0642 A79-47805
Supplementary RF plasma heating in tokamaks
24 p0668 A79-50999
Advanced synfuel production with fusion
24 p0695 A79-51947
Nitrogen fixation with fusion heat
24 p0695 A79-51948

Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887

CONTROLLERS

A Thermic Controller for a thermic diode solar panel
[ASME PAPER 78-WA/SCL-9] 21 p0163 A79-19841

A multivariable controller for an automotive gas turbine
[ASME PAPER 79-GT-73] 22 p0307 A79-30537

An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047

Design package for programmable controller and hydronic subsystem
[NASA-CR-161151] 22 p0371 N79-21619

CONVECTION

Conditions for absolute stability of salt gradient solar ponds
21 p0133 A79-17431

CONVECTIVE HEAT TRANSFER

Rate of desorption in a solar regenerator
21 p0055 A79-13611

A simulation study of phase change energy store
21 p0120 A79-17318

A passive rock bed - Design, construction, and performance
21 p0121 A79-17328

Convective effects in 'slat collectors'
21 p0129 A79-17400

Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection
21 p0129 A79-17401

Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

The cryogenic heat transfer tunnel - A new tool for convective research --- thermal efficiency testing of solar tower receiver
22 p0267 A79-24316

Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors
22 p0281 A79-26206

Dimensional relations for free convective heat transfer in flat-plate collectors --- solar collector heat loss
22 p0316 A79-31406

Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation
23 p0398 A79-33990

Review of hydrodynamics and heat transfer for large helium cooling systems
23 p0481 A79-40073

An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures
23 p0531 A79-42908

Natural convection in porous media and geothermal systems
23 p0533 A79-43014

Enhancement of heat transfer
23 p0533 A79-43016

Heat transfer in a high-power MHD channel
23 p0533 A79-43171

Advances in heat transfer. Volume 14 --- Book
24 p0638 A79-47255

Heat transfer in geothermal systems
24 p0638 A79-47256

Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136

Methods for reducing heat losses from flat plate solar collectors, phase 2
[COO-2597-4] 21 p0188 N79-11533

CONVERSION

Domestic policy review of solar energy
[TID-28834] 24 p0773 N79-31797

CONVERTERS

Thermal converters with transverse thermoelectromotive forces
22 p0256 A79-22847

Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377

Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379

Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

COOLING

Estimating heat loads on multistage thermoelectric heat pumps
22 p0260 A79-23614

Use of fluidized media in thermal power systems
23 p0436 A79-35525

Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998

An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling
24 p0707 A79-52574

An assessment of thermal energy storage and waste heat dissipation with total energy systems for MI
[AD-A059061] 21 p0205 N79-13502

Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150861] 22 p0334 N79-16372

Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days
[PB-289204/0] 22 p0355 N79-19467

COOLING SYSTEMS

Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041

Performance of a Stirling engine powered heat activated heat pump --- gas heating-cooling syste
21 p0011 A79-10098

Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10186

Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191

A solar energy system for space heating and space cooling --- retrofitting aged buildings
21 p0072 A79-14686

Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687

Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691

Development of cryogenic targets for laser fusion
21 p0085 A79-15333

Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335

Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826

Application of solar cooling for a school building in subtropics
21 p0103 A79-16461

Stochastic simulation experiments on solar air conditioning systems
21 p0138 A79-17474

Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475

Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479

An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483

Solar heated and cooled financial building
21 p0139 A79-17484

Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant
[ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775

Design of a freon jet pump for use in a solar cooling system
[ASME PAPER 78-WA/SCI-15] 21 p0164 A79-19847

Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

Optimization and design of radiative heat-discharge system for energy unit with Stirling engine --- operating in planetary environment
21 p0166 A79-20349

Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530

Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility --- SuperConducting Magnet System
22 p0235 A79-20532

Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

System performance predictions for solar cooling using regional stochastic weather models
22 p0264 A79-23781

The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311

Design of a heat pipe with separate channels for vapor and liquid
22 p0268 A79-24486

Selective covers for natural cooling devices --- in space
22 p0272 A79-25522

Solar absorption cooling feasibility
22 p0295 A79-28358

Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264

Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536

ICEC 7; Proceedings of the Seventh International Cryogenic Engineering Conference, London, England, July 4-7, 1978
22 p0311 A79-31001

Superconductivity in antenna engineering
22 p0311 A79-31008

Refrigeration requirements for future superconductive energy related applications
22 p0311 A79-31019

Solar cooling in the tropics
23 p0397 A79-33950

Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009

Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010

Design, performance, and economics of solar heating and cooling systems for single and multi-family residences
23 p0401 A79-34011

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629

Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184

LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624

Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648

Review of hydrodynamics and heat transfer for large helium cooling systems
23 p0481 A79-40073

Performance of a one kilowatt concentrator photovoltaic array utilizing active cooling
23 p0519 A79-41069

Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems
23 p0530 A79-42893

Early developments in solar cooling equipment
24 p0609 A79-45218

Drag reduction by cooling in hydrogen-fueled aircraft
24 p0653 A79-49921

Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936

District heating and cooling with heat pump systems
24 p0696 A79-51960

Feasibility of a heat-actuated heat-pump-centered integrated community energy system
24 p0696 A79-51961

System performance of a Stirling engine powered heat activated heat pump
24 p0697 A79-51962

Modeling the performance of gas-fired heat pump systems
24 p0697 A79-51963

Solar heating and cooling system design and development
[NASA-CR-150803] 21 p0172 N79-10516

Optimum dry-cooling sub-systems for a solar air conditioner
[NASA-TM-79007] 21 p0183 N79-11477

Passive thermosyphon solar heating and cooling module with supplementary heating
[NASA-CR-150849] 21 p0229 N79-15402

Cooling systems addendum: Capital and total generating cost studies
[PB-287306/5] 21 p0231 N79-15431

Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497

Installation package for the Solaron solar subsystem
[NASA-CR-161190] 23 p0548 N79-23491

Prototype solar heating and cooling systems
[NASA-CR-161204] 23 p0557 N79-24437

Optimum combinations of cooling alternatives for stream-electric power plants, volume 2
[PB-290576/8] 23 p0565 N79-24515

A cooling system for an aircraft having a cruise range from Mach 2 to Mach 8
[NASA-CASE-LAR-12406-1] 23 p0568 N79-24980

A primer on the rejection of waste heat from power plants
[PB-292529/5] 23 p0575 N79-25570

Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDP-TM-78-3] 23 p0596 N79-27674

Solar heating, cooling, and hot water systems installed at Richland, Washington
[NASA-CR-161237] 24 p0722 N79-28721

Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790

Standards applicable to performance measurement of solar heating and cooling systems --- conferences
[COO-4142-2] 24 p0741 N79-29656

Development of a heat pipe cooled 200 watt TWT with improved efficiency
24 p0764 N79-31275

A heat pipe radiator for shunt electronics: Development and test results
24 p0764 N79-31276

Heat pipes in the thermal control of communication satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278

COORDINATE TRANSFORMATIONS

Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41941

COPOLYMERS

Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

COPPER

Copper/water axially-grooved heat pipes for RTG applications
21 p0023 A79-10188

Photovoltaic conversion in Cu2O
23 p0384 A79-32973

The effects of copper and titanium on silicon solar cells 23 p0504 A79-40961
Copper/water axially-grooved heat pipes - Fabrication and performance testing 24 p0694 A79-51938
Method for making an aluminum or copper substrate panel for selective absorption of solar energy [NASA-CASE-MFS-23518-1] 21 p0182 N79-11469

COPPER ALLOYS
The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments --- for flat plate solar collectors 21 p0127 A79-17384
Qualification of a duplex, clad material for OTEC --- heat exchangers 24 p0623 A79-45828

COPPER OXIDES
A copper oxide-copper sulfate water-splitting cycle 21 p0015 A79-10128
The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments --- for flat plate solar collectors 21 p0127 A79-17384
Explanation for low-efficiency Cu2O Schottky-barrier solar cells 22 p0256 A79-22859
Photovoltaic conversion in Cu2O 23 p0384 A79-32973
Chemical origin of the space-charge layer in cuprous oxide front-wall solar cells 23 p0424 A79-34530
Cuprous oxide photovoltaic cells 23 p0499 A79-40908
The photovoltaic properties of thin copper oxide films 23 p0499 A79-40909
Cuprous oxide photovoltaic cells --- fabricating schottky barrier devices [PB-290529/7] 23 p0565 N79-24514
Cuprous oxide photovoltaic cells [CONF-780619-16] 24 p0753 N79-30777
Investigation of low cost solar cells based on Cu2O --- MIS solar cell theory [PB-295888/2] 24 p0792 N79-32737

COPPER SELENIDES
Suppression of vaporization in copper-silver-selenide thermoelectric materials 21 p0027 A79-10224
Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide 23 p0505 A79-40969
Photovoltaic effect in Cu/CuGaSe2 Schottky barriers 24 p0605 A79-44721
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells 24 p0705 A79-52317

COPPER SULFIDES
Cu2S-CdS thin-film solar cells 21 p0057 A79-13637
The photovoltaic effect in CdS/Cu2S solar cells 21 p0091 A79-15871
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells 21 p0123 A79-17344
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells 21 p0123 A79-17345
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells 21 p0123 A79-17346
The photovoltaic effects in CdS/Cu2S solar cells 21 p0123 A79-17347
Stoichiometric Cu2S thin films for solar cells 21 p0123 A79-17349
A pilot line for the production of large area Cu/x/S-CdS solar cells 21 p0124 A79-17351
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency 22 p0300 A79-29428
Cadmium-sulphide/copper-sulphide thin-film solar cells - Review of methods of producing the CdS and Cu2S layers 23 p0441 A79-36786
Order-disorder transformations and the nature of the copper-sulphide layer in Cu/x/S/CdS solar cells 23 p0442 A79-36789
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques 23 p0445 A79-37156
Cu2S-CdS thin-film solar cells 23 p0466 A79-38601
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells 23 p0503 A79-40949
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films 23 p0505 A79-40963
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance 23 p0528 A79-42171
Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis 24 p0616 A79-45745
Back illuminated high efficiency thin film Cu2S/CdS solar cells 24 p0656 A79-50190
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application 24 p0704 A79-52311
Cadmium sulfide-copper sulfide heterojunction cell research [SAN-1459-3] 24 p0789 N79-32701

CORE SAMPLING
Microcrack technology for geothermal exploration and assessment [PB-290173/4] 22 p0367 N79-21530
Triaxial tests of coal gasification samples [UCRL-13968] 24 p0733 N79-29374

CORN
Small scale gasification of biomass - The case of corn cob gasifiers 24 p0631 A79-46311

CORRELATION
Stochastic analysis of wind characteristics for energy conversion 22 p0350 N79-18535

CORROSION
Ash deposits and corrosion due to impurities in combustion gases; Proceedings of the International Conference, New England College, Henniker, N.H., June 26-July 1, 1977 21 p0080 A79-14926
Corrosion and deposits in MHD generator systems 21 p0081 A79-14935
The problem of fouling in the utilisation of geothermal energy 23 p0449 A79-37853
Fundamental solid electrode studies related to corrosion prevention, fuel cells and batteries [AD-A064554] 23 p0544 N79-22641
European Scientific notes, volume 32, number 4 [AD-A065399] 23 p0552 N79-23886
Corrosion of stainess steel, volume 2. A bibliography with abstracts [NTIS/PS-79/0208/3] 23 p0553 N79-24143
Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels [FE-1784-39] 24 p0719 N79-28364
Corrosion of metals in coal-gasification environments [CONF-790145-2] 24 p0732 N79-29305
Corrosion in molten salts used for solar thermal storage applications [SAND-79-0246C] 24 p0786 N79-32683

CORROSION PREVENTION
Gas-turbine critical research and advanced technology support project [NASA-TM-79139] 23 p0571 N79-25498
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine [UCID-18091] 24 p0717 N79-28229
Chemical vapor deposition of wear-resistant coatings [BM-RI-8348] 24 p0732 N79-29276

Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386

CORROSION RESISTANCE

Corrosion of superalloys, inconels, and stainless steels by the products from fluidized-bed coal combustion
21 p0080 A79-14932

Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788

Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0289 A79-27395

Gas turbine operating and maintenance experience in Saudi Arabia
22 p0298 A79-28989

Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398

The role of corrosion in modern gas turbines
24 p0647 A79-48912

State of the art and science report on design of alloys resistant to high-temperature corrosion-erosion in coal conversion environments
[EPRI-FP-557] 21 p0200 N79-13149

Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669

Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159572] 24 p0737 N79-29604

Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386

CORROSION TESTS

Chloride corrosion and its inhibition in refuse firing
21 p0080 A79-14930

Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931

Casing materials for sodium/sulfur cells
22 p0245 A79-21481

Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428

OTEC biofouling and corrosion testing program --- for heat exchangers
23 p0429 A79-35057

Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806

Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826

Oxygen, temperature and pH effects on corrosion of aluminum in seawater --- for OTEC heat exchanger tubes
24 p0623 A79-45827

The effects of biofouling and corrosion on heat transfer measurements --- for OTEC
24 p0623 A79-45829

Materials selection guidelines for geothermal power systems, first edition
[ALO-3904-1] 24 p0727 N79-28772

Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386

COST ANALYSIS

Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179

Solar and wind energy applications in Hawaii
21 p0066 A79-14265

Breakdown of rapid rail energy costs - A study of three systems
21 p0068 A79-14323

Total energy and labor requirements for an electric commuter railroad
21 p0068 A79-14325

Life cycle costing of energy systems
21 p0072 A79-14683

Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687

Development of industrial owned, small hydroelectric facilities
21 p0073 A79-14699

Status of photovoltaic systems and applications
21 p0095 A79-15907

A methodological note on the evaluation of new technologies - The case of coal gasification
21 p0099 A79-16122

Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605

An analysis of air pollution control costs in N.S.W. --- New South Wales, Australia
21 p0115 A79-17228

Cost of solar energy
21 p0118 A79-17291

A comparison between sun and wind as energy sources in irrigation plants
21 p0118 A79-17295

Costs and impacts of financial incentives for solar energy systems
21 p0119 A79-17296

The interface with solar - Alternative auxiliary supply systems --- for solar space heating
21 p0137 A79-17468

The economics of Fundy tidal power
21 p0152 A79-18112

Universal generator storer curves --- Economic and relative size optimization of solar photovoltaic energy
22 p0238 A79-20799

Costing the satellite power system
[AAS PAPER 78-166] 22 p0243 A79-21270

Solar Rankine engines - Examples and projected costs
[ASME PAPER 79-SOL-3] 22 p0307 A79-30541

Solar photovoltaic power for residential use
[ASME PAPER 79-SOL-11] 22 p0308 A79-30546

Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551

Allowable costs for alternative domestic heating systems using utility supplied electricity for backup or charging energy
22 p0319 A79-31428

Component cost of solar energy systems
22 p0319 A79-31429

The cost of hydrogen from coal
23 p0396 A79-33766

Fusion power demonstration study at ORNL
23 p0407 A79-34059

System studies for a tokamak fusion power plant
23 p0407 A79-34061

The economics of upgrading geothermal steam by adiabatic compression
23 p0409 A79-34081

The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy
23 p0419 A79-34158

A unified methodology for cost analysis of energy production
23 p0419 A79-34159

The impact of oil price increases on the competitiveness of non-conventional energy technologies
23 p0419 A79-34162

Three modes of energy cost analysis - Then-current, base-year, and perpetual-constant dollar
23 p0422 A79-34277

Lunar resources utilization - An economic assessment --- of manufacturing and construction of large structures in space
[AIAA PAPER 79-1412] 23 p0426 A79-34845

Solar power plants. II - Economic aspects of solar power towers
23 p0435 A79-35482

Solar energy utilization in comparison with utilization of other energy types
23 p0465 A79-38598

Design of solar heated warm water heating facilities from an economic viewpoint
23 p0468 A79-38622
Parametric cost analysis of photovoltaic systems
23 p0477 A79-39102
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
Product pricing in the Solar Array Manufacturing Industry - An executive summary of SAMICS
23 p0513 A79-41032
Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells
23 p0514 A79-41034
Model for comparing cost of flat-array and concentrator photovoltaic solar-cell systems
23 p0514 A79-41035
Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036
Lifetime Cost and Performance model for photovoltaic power systems
23 p0514 A79-41037
Status of the DOE Photovoltaic Systems Engineering and Analysis Project
23 p0519 A79-41075
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077
Analysis of photovoltaic total energy system concepts for single-family residential applications
23 p0520 A79-41079
Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications
23 p0520 A79-41081
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225
Incremental cost analysis for advanced compressed air energy storage concepts
24 p0679 A79-51797
Electricity rate systems and energy conservation
24 p0696 A79-51959
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302
Cost analysis of new and retrofit hot-air type solar assisted heating systems
[NASA-TM-78186] 21 p0173 N79-10519
Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558
Particulate and sulfur dioxide emission control costs for large coal-fired boilers
[PB-281271/7] 21 p0178 N79-10591
Three modes of energy cost analysis: Then-current dollars, base-year dollars, and perpetual-constant dollars
[ORAU/IEA(M)-78-10] 21 p0209 N79-13531
Analytical methods
21 p0218 N79-14531
Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels
21 p0218 N79-14532
Results of systems analysis --- effectiveness of integrated solar energy systems
21 p0218 N79-14534
A detailed analysis of the impact of onsite equipment on utility costs --- marginal costs of providing backup power for solar energy systems
21 p0218 N79-14535
Satellite Power Systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis
[NASA-CR-158068] 21 p0225 N79-15141
Cooling systems addendum: Capital and total generating cost studies
[PB-287306/5] 21 p0231 N79-15431
Analysis and evaluation of process and equipment in tasks 2 and 4 of the Low Cost Solar Array project
[NASA-CR-158089] 22 p0335 N79-16378
Comparative cost analyses: Total flow vs other power conversion systems for the Salton Sea Geothermal Resource
[UCRL-52589] 22 p0342 N79-17337
LSA Low-cost Solar Array project
[NASA-CR-158250] 22 p0355 N79-19462
Coal and nuclear: A comparison of the cost of generating baseload electricity by region
[PB-289585/2] 22 p0355 N79-19469
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522
Feasibility study of solar dome encapsulation of photovoltaic arrays
[NASA-CR-158368] 22 p0367 N79-21545
Assessment of economic factors affecting the satellite power system. Volume 1: System cost factors
[NASA-CR-161185] 22 p0368 N79-21551
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564
Report on capital requirements for transportation of energy materials
[TID-28599] 23 p0545 N79-22965
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics
[NASA-CR-161220] 23 p0547 N79-23486
Satellite Power System (SPS) financial management scenarios
[NASA-CR-157438] 23 p0549 N79-23502
A normative price for a manufactured product: The SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504
A normative price for a manufactured product: The SAMICS methodology. Volume 2: Analysis
[NASA-CR-158503] 23 p0549 N79-23505
The establishment of a production-ready manufacturing process utilizing thin silicon substrates for solar cells
[NASA-CR-158566] 23 p0550 N79-23523
Conceptual design for advanced coal liquefaction commercial plant
[FE-2251-52] 23 p0554 N79-24182
Solar project cost report: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/60] 23 p0562 N79-24482
Solar project cost report: Terrell E. Moseley Office Building, Lynchburg, Virginia
[SOLAR/2011-78/60] 23 p0562 N79-24483
Solar project cost report: Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/60] 23 p0562 N79-24484
Solar project cost report. Iris Images, Incorporated, Film Laboratory, Mill Valley, California
[SOLAR/2005-78/60] 23 p0563 N79-24494
Solar project cost report. Aratex Services, Inc., Industrial Laundry, Fresno, California
[SOLAR/2008-78/60] 23 p0563 N79-24495
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Comparison of different techniques for producing hydrogen: Production costs analysis
[P/51/76/14] 23 p0578 N79-26240
Rankine-cycle component characteristics
23 p0579 N79-26478
SAMICS validation. SAMICS support study, phase 3
[NASA-CR-158746] 23 p0581 N79-26491
Elements for technological and economic modeling of tower-type solar power plants
[P/51/76/17] 23 p0584 N79-26535
Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area --- energy technology
[P/51/77/21] 23 p0584 N79-26536
Cost study application of the guidebook on integrated community energy systems: Indirect economic and energy impacts
[ANL/ICES-TM-17] 24 p0727 N79-28777
Solar project cost report
[SOLAR/2018-78/60] 24 p0728 N79-28788
Environmental control technology activities of the Department of Energy in FY 1978
[DOE/EV-0031] 24 p0729 N79-28812

Enhance oil recovery: Focus group results
[DOE/TIC-100200] 24 p0735 N79-29578
Total generating costs: Coal and nuclear plants
[NUREG-0248] 24 p0742 N79-29663
Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production
[LA-UR-79-574] 24 p0742 N79-29666
Motor gasoline deregulation and the gasoline tilt
[DOE/EIS-0039-VOL-1] 24 p0746 N79-30399
Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170] 24 p0749 N79-30719
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
Economy of a retrofit solar system
[CONF-790213-2] 24 p0755 N79-30795
Energy sector capital requirements, 1978-1985
[DOE/EIA-0103/24] 24 p0755 N79-30797
Methodology for determining the economic feasibility of residential or commercial solar energy systems
[SAND-78-0931] 24 p0759 N79-30827
Evaluation of future world oil prices
[DOE/EIA-0102/4] 24 p0762 N79-31082
Regional residential sector energy price forecasts for 1979: Electricity, natural gas, number 2 fuel oil, and propane
[DOE/EIA-0102/46] 24 p0762 N79-31083
Economics of the ANFLOW process for municiple sewage treatment
[ORNL/TM-6574] 24 p0762 N79-31093
Conceptual design and cost study for a dual-purpose nuclear-electric reverse osmosis seawater conversion plant
[ORNL/TM-6821] 24 p0768 N79-31438
Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549

COST EFFECTIVENESS
100MWh zinc-chlorine peak-shaving battery plants
21 p0011 A79-10096
Cost effective solar collectors using heat pipes
21 p0014 A79-10115
Energy conversion in the long run
21 p0019 A79-10154
Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173
Army facility energy conservation
21 p0028 A79-10233
Direct energy converters - Efficiency and cost estimates for two electrostatic concepts
21 p0046 A79-12266
On the thermal and thermo-electrolytical generation of hydrogen by solar energy
21 p0059 A79-13660
Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy
[AIAA PAPER 78-1767] 21 p0061 A79-13866
Heat pumps without supplemental heat
21 p0073 A79-14695
A challenging role for the assurance sciences --- in energy conversion technology
21 p0086 A79-15396
Factors influencing solar energy commercialization
21 p0093 A79-15897
Solar power satellites revisited
21 p0093 A79-15898
Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901
Identification of cost effective energy conservation measures
21 p0099 A79-16133
The use of lasers for the transmission of power
21 p0109 A79-16621
Compatibility of direct energy storage devices with ac. processing power system components
21 p0111 A79-16728
Solar Thermal Electric Program
21 p0112 A79-16730
Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741
Energy storage requirements for autonomous and hybrid solar thermal electric power plants
21 p0120 A79-17315
Simulation and cost of photovoltaic generators
21 p0122 A79-17334
Cost effective optimum design of solar air heaters
21 p0127 A79-17386
Economic use of materials in the design of solar water-heating collector plates of the pipe and fin type
21 p0129 A79-17396
Evacuated solar flat-plate collectors for economic applications
21 p0133 A79-17435
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446
An evaluation of the strategy of low cost horizontal axis windmills
21 p0143 A79-17517
Energy storage - Economics and fuel conservation
21 p0153 A79-18464
Conceptual design of large heat exchangers for ocean thermal energy conversion
[ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813
Cost-effectiveness of the vortex-augmented wind turbine
22 p0266 A79-24048
Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543
Heat pump design - Cost effectiveness in the collection, storage and distribution of solar energy
22 p0313 A79-31316
A cost effective vertical air/water solar heating collector
22 p0320 A79-31430
Economic design of a solar domestic water heating system
22 p0321 A79-31438
P.E.I. solar assisted domestic water heat project
22 p0323 A79-31458
Solar energy - Four sites demonstrate potential
22 p0328 A79-32194
Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416
An economic comparison between solar and conventional residential air conditioning in Miami, Florida
23 p0401 A79-34013
Wind energy conversion systems /WECS/ for central station and dispersed power applications
23 p0406 A79-34052
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Liquid hydrogen from solar energy now
23 p0414 A79-34117
Hydrogen as a mid-term gaseous fuel supplement by blending with natural gas
23 p0415 A79-34129
Comparative economics of alternative fuels for intermediate services, combined cycle power plant
23 p0419 A79-34160
Energy utilization in industry - The case of Israel
23 p0421 A79-34171
What is the true cost of electric power from a cogeneration plant
23 p0424 A79-34453
Cost effective solar collector performance testing under combined indoor and outdoor conditions
23 p0430 A79-35063
Performance and cost of domestic solar water heating in Australia
23 p0452 A79-37889
Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192
The development of a stationary concentrator --- parabolic solar absorber surface effects on energy conversion performance
23 p0464 A79-38586
Cu2S-CdS thin-film solar cells
23 p0466 A79-38601

Analysis of a 1 kW photovoltaic generator with concentration 23 p0466 A79-38604

Solar energy systems and life cycle cost 23 p0474 A79-38672

An economic model to establish the value of WECS to a utility system --- Wind Energy Conversion System 23 p0485 A79-40131

Recycle energy system - City of Akron, Ohio 23 p0488 A79-40392

Integrating an electrostatic precipitator into a municipal solid waste resource recovery system 23 p0489 A79-40398

A high volume cost efficient production macrostructuring process --- for silicon solar cell surface treatment 23 p0499 A79-40904

Optimized solar module design 23 p0510 A79-41005

Optimization of the geometrical parameters for arrays of tracking solar collectors to give minimum energy cost 23 p0511 A79-41016

Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells 23 p0514 A79-41034

Terrestrial concentrating photovoltaic systems comparative performance and costs 23 p0514 A79-41036

The economics of solar domestic hot water systems in state university and community college buildings 24 p0610 A79-45227

Electric utility system planning studies for OTEC power integration 24 p0625 A79-45848

Potential for ocean thermal energy conversion electric power generation in the Southeast region 24 p0626 A79-45855

Experimental and analytical OTEC studies at ORNL 24 p0626 A79-45859

Sophisticated solar heating controllers - Are they cost effective 24 p0644 A79-47946

Singular optimal control of solar space heating systems 24 p0644 A79-48009

The rough road to making oil and gas from coal 24 p0651 A79-49423

Biomass - The self-replacing energy resource 24 p0651 A79-49425

Projected techno-economic improvements for advanced solar thermal power plants 24 p0671 A79-51733

Design study and cost-effectiveness of the metal hydride solar heat pump and power system /HYCSOS/ 24 p0672 A79-51745

Load optimization in solar space heating systems 24 p0713 A79-53497

Statement of Doctor Robert A. Frosch, Administrator, National Aeronautics and Space Administration 21 p0224 N79-15111

The economics and engineering of large-scale algae biomass energy systems [PB-287868/4] 21 p0226 N79-15207

The effects of resource impact factors on energy conservation standards for buildings [PB-286909/7] 22 p0335 N79-16384

Life-cycle costing. A guide for selecting energy conservation projects for public buildings --- computing the cost effectiveness of retrofitting and new buildings [PB-287804/9] 22 p0345 N79-17744

Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells [NASA-CR-158588] 23 p0549 N79-23507

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project [NASA-CR-158580] 23 p0550 N79-23519

SEMTAP: A new technology transfer network to link business and industry with Federal research and development --- energy technology [PB-292882/8] 23 p0587 N79-27026

Economic considerations in coverting from oil/gas firing to coal 23 p0592 N79-27611

Cost effective solar hot water system for Econo-Travel Motor Hotel located at Woodbridge, Virginia [COO-4661-1] 24 p0739 N79-29635

Economy of a retrofit solar system [CONF-790213-2] 24 p0755 N79-30795

Cost effective solar hot water system for Econo-Travel Motor Hotel, Chesapeake, Virginia [COO-4663-1] 24 p0757 N79-30812

Energy and cost calculations. 1: Optimization of electrochemical processes to achieve minimum product cost and the impact on energy consumption [ANL/OEPM-78-2] 24 p0788 N79-32697

COST ESTIMATES

Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant 21 p0008 A79-10068

A method for the comparative economic assessment of storage systems [BNL-24473] 21 p0013 A79-10111

Thermosyphon solar water heating system under Brasilian conditions 21 p0021 A79-10177

The fossil fuel cost of solar heating 21 p0022 A79-10180

Direct energy converters - Efficiency and cost estimates for two electrostatic concepts 21 p0046 A79-12266

A standard procedure of economic evaluation for energy-producing and pollution-abatement operations 21 p0064 A79-14109

Coal gasification and its alternatives 21 p0071 A79-14679

Assessing environmental costs of energy procurement 21 p0071 A79-14682

Steam raising with low-Btu gas generators and potential for other applications 21 p0072 A79-14690

An overview of the U.S. OTEC development program 21 p0100 A79-16247

OTEC power systems 21 p0101 A79-16248

Solar thermal conversion 21 p0104 A79-16466

Energy storage for tokamak reactor cycles --- during downtime for periodic plasma quench and reignition 21 p0111 A79-16727

Estimation of collector and electrical energy cost for STEPS in Japan --- Solar Thermal Electric Power System 21 p0118 A79-17288

Solar thermal electric power systems - Comparison of line-focus collectors 22 p0263 A79-23758

An update of OTEC baseline design --- cost estimates and market potential 23 p0404 A79-34038

Three modes of energy cost analysis - Then-current, base-year, and perpetual-constant dollar 23 p0422 A79-34277

Thin-film solar cells - A chance to convert economically solar energy into electric energy 23 p0425 A79-34610

Solar electric generator for developing nations 23 p0452 A79-37885

Wind turbines for electric utilities - Development status and economics [AIAA PAPER 79-0965] 23 p0475 A79-38888

Rough cost estimates of solar thermal/coal or biomass derived fuels [AIAA PAPER 79-0988] 23 p0476 A79-38893

Recent developments in wind energy 23 p0482 A79-40104

Program overview for the wind characteristics program element of the United States Federal Wind Energy Program 23 p0482 A79-40108

Central station power plant applications for photovoltaic solar energy conversion 23 p0520 A79-41080

The NASA budget - Fiscal years 1979-80 23 p0535 A79-43448

The Westinghouse Sulfur Cycle Hydrogen Production Process
24 p0614 A79-45591

The mist-transport cycle - Progress in economic and experimental studies --- OTEC power plant
24 p0624 A79-45841

Economic overview of vertical axis wind turbines
24 p0633 A79-46528

Wind energy systems application to regional utilities
24 p0633 A79-46532

New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798

Air buoyant vehicles - Energy efficient aircraft
[AIAA PAPER 79-1862] 24 p0643 A79-47919

Lockheed urges hydrogen fuel
24 p0648 A79-49224

A quantitative comparison of energy costing methods
24 p0651 A79-49475

Applications of free-space microwave power transmission
24 p0652 A79-49487

What will be the price for energy tomorrow. I - Coal price
24 p0652 A79-49515

The international energy agency - The way ahead
24 p0652 A79-49520

Solar photovoltaic energy --- research and development
24 p0667 A79-50909

Solid polymer electrolyte water electrolysis status for large scale hydrogen production
24 p0686 A79-51847

Field performance of underground coal gasification
24 p0688 A79-51866

Today's geothermal power economics and risks
24 p0689 A79-51869

Low temperature geothermal energy use in existing institutional power plants
24 p0689 A79-51870

A solar-Stirling small power system
24 p0690 A79-51884

Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997

Cost study of superheating geothermal steam
24 p0707 A79-52572

Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics, appendixes
[NASA-CR-161221] 23 p0547 N79-23487

Coal gasification, commercial concepts, gas cost guidelines, revision 1
[FE-2240-100] 23 p0589 N79-27331

Federal photovoltaic utilization program. Planning resource document
[HCP/M50081-01] 23 p0599 N79-27706

Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980
[DOE/EIA-0102/20] 24 p0718 N79-28356

Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783

Motor gasoline deregulation and the gasoline tilt. Volume 2: Public comments
[DOE/EIS-0039-VOL-2] 24 p0746 N79-30401

Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40] 24 p0746 N79-30403

International energy evaluation system. Volume 2: Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796

Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837

Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413

Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758

COST INCENTIVES

Incentives and requirements for gasification based power systems
21 p0094 A79-15904

Analysis of Federal incentives used to stimulate energy production --- with emphasis on solar energy
[PNL-2410-1-REV] 24 p0775 N79-31819

COST REDUCTION

Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092

Cost minimization of photovoltaic power supplies
21 p0021 A79-10171

Solar thermal electric power systems - Manufacturing cost estimation and systems optimization
21 p0046 A79-12273

Economy in flight operations
21 p0048 A79-12383

High efficiency low cost solar cell power
21 p0048 A79-12471

Electricity from sunlight --- low cost silicon for solar cells
21 p0065 A79-14116

Heat recovery devices for building HVAC systems --- Heating Ventilating and Air Conditioning
21 p0073 A79-14697

Capital cost system optimization of OTEC power modules
21 p0101 A79-16249

Solar collectors. II - Recent developments and future performance data and economic analysis
21 p0103 A79-16456

Factors affecting market initiation of solar total energy
21 p0112 A79-16732

Non-adaptive optics for solar thermal electric power
21 p0112 A79-16733

The Power Wheel - Elimination of energy-consuming drive components
21 p0112 A79-16734

The status of solar energy --- for domestic water heating and thermal electric power generation
21 p0115 A79-17219

Concentrator photovoltaic systems for economical electricity and heat
21 p0124 A79-17354

Cheap packed bed absorbers for solar air heaters
21 p0128 A79-17388

Some aspects towards the performance evaluation and ensuing design components of solar collector systems
21 p0130 A79-17404

Optimal profile of solar energy collectors
21 p0130 A79-17408

Optimal distribution of heat conducting material in the finned pipe solar energy collector
22 p0242 A79-21163

An overview of photovoltaic power systems
[ASME PAPER 79-SOL-12] 22 p0308 A79-30547

New concept in solar thermal collectors
23 p0398 A79-33988

A new electrolytic cell type for hydrogen production in hybrid cycles
23 p0414 A79-34115

Hydrogen production at reduced cost through electrolysis and buoyancy
23 p0414 A79-34116

A survey of the hydrogen storage properties of nickel-copper-mischmetal-calcium alloys
23 p0414 A79-34121

Estimating the commercial potential and energy benefits of ERDA electric energy research
23 p0419 A79-34161

Silicon terrestrial solar photovoltaic installations
23 p0441 A79- 6782

Approaches to low-cost solar cells
23 p0441 A79-36784

Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894

Cost reduction using modular installation for solar heating, cooling and water heating at the life clinic in Brandon, Florida
[AIAA PAPER 79-1021] 23 p0476 A79-38895

A novel photovoltaic panel for low cost power
23 p0510 A79-41006

Photovoltaic design optimization for terrestrial applications
23 p0517 A79-41060

The influence of increasing energy costs on the economic dimensioning of electrical energy distribution equipment
23 p0535 A79-43524

Economics of preheating water for commercial use --- solar collector system 24 p0608 A79-45206

Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid --- for OTEC 24 p0619 A79-45794

Thermal storage of off-peak electrical energy in solar heating and cooling systems 24 p0644 A79-47945

Advanced solar thermal technology - Potential and progress 24 p0671 A79-51739

Guide to reducing energy-use budget costs [HCP/U60505-01] 21 p0184 N79-11489

Geothermal well technology program [SAND-78-1063] 24 p0756 N79-30807

Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants [CONF-780599-1] 24 p0776 N79-31830

COSTS

Economic impacts of a transition to higher oil prices --- estimation and budget allocations [BNL-50871] 22 p0364 N79-20927

Solar project cost report: Radian Corporation Office Building, Austin, Texas [SOLAR/2002-78/60] 23 p0561 N79-24480

Findings and views concerning the exemption of aviation gasoline from the mandatory petroleum allocation and price regulations [DOE/ERA-0024] 23 p0589 N79-27336

Historic and forecasted energy prices by US Department of Energy region and fuel type for three macroeconomic scenarios and one imported oil price escalation scenario [DOE/EIA-0102/27] 24 p0725 N79-28751

Cost and performance evaluation of passive solar systems [ANL/EES-TM-34] 24 p0753 N79-30774

COUNTERFLOW

Limit of formation of counterflows in plane linear induction MHD machines 22 p0298 A79-29288

Limit of the formation of counterparallel flows in plane-parallel induction MHD machines 24 p0663 A79-50778

COUPLED MODES

Local theory of finite-beta, collisional drift modes --- plasma stability analysis 22 p0253 A79-22244

Numerical study of drift-Alfven waves in a sheared magnetic field 24 p0653 A79-49762

COVERINGS

Filon panels - A technical report --- fiberglass reinforced plastics for solar collectors 21 p0031 A79-10403

Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses 21 p0164 A79-19949

Cover systems for high temperature flat-plate solar collectors 24 p0642 A79-47799

CRACK INITIATION

Thermal stress cracking and the enhancement of heat extraction from fractured geothermal reservoirs [LA-7235-MS] 21 p0198 N79-12568

CRACKING (CHEMICAL ENGINEERING)

Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling 23 p0488 A79-40389

Pyrolysis of Western Kentucky heavy oil using a transfer line reactor 23 p0492 A79-40452

Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker [AD-A068452] 24 p0738 N79-29616

Screening of zeolite catalysts for methanol conversion to light hydrocarbons [COO-4691-1] 24 p0780 N79-32386

CRACKING (FRACTURING)

Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B [PB-282924/0] 21 p0181 N79-11446

Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report [PB-282923/2] 21 p0181 N79-11447

CROP GROWTH

Photosynthetic pathway and biomass energy production 24 p0605 A79-44580

Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation 24 p0675 A79-51763

CROP IDENTIFICATION

Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289

CROP INVENTORIES

Solar farm buildings collect energy for crop drying 24 p0610 A79-45224

CROSS FLOW

Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/ 24 p0618 A79-45790

CROSSED FIELDS

Theory of anomalous transport due to electrostatic fluctuations --- low frequency plasma instabilities of drift wave type 22 p0270 A79-24858

CRUDE OIL

Petroleum plantations --- hydrocarbon fuels from artificial photosynthesis and plants 21 p0095 A79-15910

The effect of maturation on the configuration of pristane in sediments and petroleum 22 p0272 A79-25375

Energy policies in the context of global economics 23 p0433 A79-35228

Numerical modeling of the thermal boundary layer near a synthetic crude oil plant 24 p0628 A79-46065

Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures 24 p0632 A79-46318

Environmental impacts of contemporary fossil energy systems 24 p0659 A79-50363

Chemical characterization of shale oil and related fuels 24 p0665 A79-50888

Environmental development Plan (EDP). Oil supply, FY 1977 [DOE/EDP-0024] 21 p0175 N79-10545

Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B [PB-282924/0] 21 p0181 N79-11446

Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report [PB-282923/2] 21 p0181 N79-11447

The department of Defense's alternate energy policy [AD-A058200] 21 p0197 N79-12563

Proceedings of Energy Resource 5th Conference [PB-286246/4] 21 p0230 N79-15423

GAO work involving title V of the Energy Policy and Conservation Act of 1975 [PB-286400/7] 21 p0230 N79-15424

Cooking with offshore oil: A handbook for California local government --- regional planning [PB-288656/2] 22 p0331 N79-16140

Northern Alaska hydrocarbon resources [PB-287394/1] 22 p0332 N79-16342

Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5 [PB-287180/4] 22 p0339 N79-17026

Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images [E79-10099] 22 p0347 N79-18373

Aging behavior of crude shale oil [AD-A062420] 22 p0357 N79-20272

Direct utilization of crude oil as fuel in the US Army four-cycle diesel engine, model LDT-465-1C [AD-A062387] 22 p0357 N79-20279

Economic impacts of a transition to higher oil prices --- estimation and budget allocations [BNL-50871] 22 p0364 N79-20927

Estimates of New Mexico's future oil production including reserves of the 50 largest pools [PB-291780/5] 23 p0540 N79-22597

Analysis of coke combustion during in-situ oil
recovery
23 p0553 N79-24095
US refining capacity: How much is enough
[PB-291437/2] 23 p0555 N79-24192
Inventory of underground energy storage sites in
California
[PB-290835/8] 23 p0566 N79-24519
Control of volatile organic emissions from
petroleum liquid storage in external floating
roof tanks
[PB-290579/2] 23 p0566 N79-24537
Crude and product storage: State-of-the-art
review and assessment
[AD-A066605] 23 p0568 N79-25243
Analysis of the energy and economic effects of
Iranian oil shortfall
[PB-292634/3] 23 p0575 N79-25540
Relative chemical composition of selected
synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
Stability of coal-oil mixtures --- conferences
[CONF-7805152-1] 23 p0589 N79-27332
Findings and views concerning the exemption of
aviation gasoline from the mandatory petroleum
allocation and price regulations
[DOE/ERA-0024] 23 p0589 N79-27336
Midterm oil and gas supply modeling system
methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059
Use of refinery computer model to predict fuel
production
[NASA-TM-79203] 24 p0718 N79-28349
Petroleum supply/demand estimates and cost of
petroleum imports, 1978-1980
[DOE/EIA-0102/20] 24 p0718 N79-28356
Factors affecting the decline rate of old oil
production
[DOE/EIA-0102/29] 24 p0720 N79-28652
Electricity in lieu of natural gas and oil for
industrial thermal energy: A preliminary survey
[ORNL/TM-5937] 24 p0739 N79-29630
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Strategic petroleum reserve: Expansion of
reserve. Final supplement to final
environmental impact statement
[DOE/EIS-0034] 24 p0746 N79-30407
Office of Naval Petroleum and Oil Shale Reserve.
Report of operations, 1 October 1978
[DOE/RA-0011] 24 p0748 N79-30686
Polar constituents of a shale oil: Comparative
composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689
Analysis of the productivity of domestic petroleum
exploration activities
[DOE/EIA-0102/7] 24 p0748 N79-30691
Evaluation of future world oil prices
[DOE/EIA-0102/4] 24 p0762 N79-31082
Comparison of the properties of some synthetic
crudes with petroleum crudes
[NASA-TM-79220] 24 p0765 N79-31405
Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432
Strategic petroleum reserve
[DOE/TIC-10107] 24 p0781 N79-32617
Reexamination of the estimation of undiscovered
oil resources in the US
[DOE/EIA-0103/31] 24 p0781 N79-32618
Assessment of potential US petroleum supply
shortfalls, 1978 - 1980
[DOE/EIA-0102/13] 24 p0781 N79-32619
The United States refining policy in a changing
world oil environment
[PB-297136/4] 24 p0796 N79-33349
Oil mining: A technical and economic feasibility
study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549

CRYOGENIC EQUIPMENT
Investigation of the thermophysical
characteristics of cryogenic heat pipes with a
metal-fiber wick
22 p0288 A79-27529
High energy physics superconducting magnets and
cryogenic systems --- review
22 p0290 A79-27663
Hydrogen isotope distillation for fusion power
reactors
23 p0427 A79-34989
Development and testing of two- and three-stage
heat pipe radiators
[AIAA PAPER 79-1060] 23 p0455 A79-38040
Cryogenic refrigeration, volume 2. A bibliography
with abstracts
[NTIS/PS-78/1261/3] 22 p0331 N79-16144
Cryogenic refrigeration, volume 3. A bibliography
with abstracts
[NTIS/PS-78/1262/1] 22 p0331 N79-16145
Transient shutdown analysis of low-temperature
thermal diodes
[NASA-TP-1369] 22 p0346 N79-18287
Cryogenic thermal diode heat pipes
[NASA-CR-152268] 24 p0719 N79-28470
Computer design and optimization of cryogenic
refrigeration systems --- conferences
[LBL-7934] 24 p0768 N79-31439

CRYOGENIC FLUID STORAGE
The utilization of LH2 and LNG cold for generation
of electric power by a cryogenic-type Stirling
engine
22 p0311 A79-31020
Storage and distribution of cryogenic fuels ---
for transportation
24 p0650 A79-49378
Cryogenic hydrogen storage and refueling for
automobiles
24 p0686 A79-51846
Survey of liquid hydrogen container technology for
highway vehicle fuel system applications
24 p0686 A79-51850
Liquefied natural gas safety research overview
[AD-A063714] 22 p0365 N79-21233
Hydrogen storage, part 1. Storage as a gas or
liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413

CRYOGENIC MAGNETS
Commercial realization of MHD - A challenge for
superconducting magnets
21 p0084 A79-15302
Cryogenic aspects of the U.S. SCMS superconducting
dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating
characteristics of the U.S. SCMS superconducting
dipole magnet for MHD research
21 p0084 A79-15304
Design study of superconducting magnets for a
combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305
Design of superconducting magnets for full-scale
MHD generators
21 p0084 A79-15306
Conductor for LASL 10-MWhr superconducting energy
storage coil
21 p0085 A79-15309
Preliminary results in the NASA Lewis H2-O2
combustion MHD experiment
23 p0479 A79-39807
Review of hydrodynamics and heat transfer for
large helium cooling systems
23 p0481 A79-40073

CRYOGENIC STORAGE
Fracture strength of thick 5083-0 aluminum alloy
for LNG storage tanks
24 p0604 A79-44537
Low-temperature, fracture properties of a USSR
aluminum-6% magnesium alloy
24 p0604 A79-44549
Fracture toughness of cryogenic alloys
24 p0604 A79-44550

CRYOGENICS
Advances in cryogenic engineering. Volume 23 -
Proceedings of the Conference, University of
Colorado, Boulder, Colo., August 2-5, 1977
21 p0084 A79-15301
A new method for producing cryogenic laser fusion
targets
21 p0085 A79-15332
Development of cryogenic targets for laser fusion
21 p0085 A79-15333
Cryogenic pellets for laser-fusion research -
Theoretical and practical considerations
21 p0085 A79-15334
Point-contact conduction-cooling technique and
apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335
Superconducting magnets --- for MHD applications
21 p0105 A79-16485

Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility --- SuperConducting Magnet System
22 p0235 A79-20532
MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549
The cryogenic heat transfer tunnel - A new tool for convective research --- thermal efficiency testing of solar tower receiver
22 p0267 A79-24316
Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978
22 p0289 A79-27651
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264
ICEC 7; Proceedings of the Seventh International Cryogenic Engineering Conference, London, England, July 4-7, 1978
22 p0311 A79-31001
Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003
Superconductivity in antenna engineering
22 p0311 A79-31008
Refrigeration requirements for future superconductive energy related applications
22 p0311 A79-31019
Utilization of the cold by LNG vaporization with closed-cycle gas turbine
[ASME PAPER 79-GT-84] 23 p0376 A79-32361
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937
Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
24 p0603 A79-44526
Development of cryogenic thermal control heat pipes --- of stainless steels
[NASA-CR-152302] 24 p0747 N79-30499

CRYOPUMPING

Large-scale cryopumping for controlled fusion
21 p0085 A79-15330

CRYOSTATS

A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

CRYSTAL DEFECTS

Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545
Structure and electrical activity of planar defects in EFG ribbons
[NASA-CR-158572] 23 p0551 N79-23806

CRYSTAL DISLOCATIONS

The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964
Quantitative analysis of defects in silicon --- to predict energy conversion efficiency of silicon samples for solar cells
[NASA-CR-162173] 24 p0771 N79-31772

CRYSTAL GROWTH

Large area silicon sheet by EFG --- Edge-defined Film-fed Growth
21 p0123 A79-17340
Approaches to low-cost solar cells
23 p0441 A79-36784
Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900
Directional solidification of crack-free silicon ingots by heat exchanger method
23 p0498 A79-40901
Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176
Silicon solar cells, volume 3. Citations from the NTIS data base
[NTIS/PS-78/1115/1] 21 p0212 N79-13555
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1116/9] 21 p0212 N79-13556
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158082] 22 p0333 N79-16365
Continuous Czochralski growth: Silicon sheet growth development of the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158096] 22 p0334 N79-16369
Analysis and evaluation of process and equipment in tasks 2 and 4 of the Low Cost Solar Array project
[NASA-CR-158089] 22 p0335 N79-16378
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Large area silicon sheet by EFG
[NASA-CR-158379] 22 p0359 N79-20483
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776

CRYSTAL OPTICS

Review of theories for predicting n2 in glasses and crystals --- refractive index of fusion laser materials
21 p0083 A79-15139

CRYSTAL STRUCTURE

Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177
Quantitative analysis of defects in silicon --- to predict energy conversion efficiency of silicon samples for solar cells
[NASA-CR-162173] 24 p0771 N79-31772

CRYSTALLOGRAPHY

Crystallographic contributions to the energy problem
23 p0535 A79-43466
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758

CULTURE (SOCIAL SCIENCES)
  Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems --- eskimos
  [PB-291918/1] 23 p0546 N79-22972
  Satellite Power System (SPS) centralization/decentralization
  [NASA-CR-157434] 23 p0548 N79-23498
CURING
  Oven curing: Energy conservation and emission control in coil coating
  [TID-28705] 24 p0750 N79-30723
CURRENT DENSITY
  Migrational polarization in high-current density molten salt electrochemical devices
  21 p0039 A79-11811
  Electromagnetic excitation of a moving conducting piston
  22 p0237 A79-20658
  Migrational polarization in high current density molten salt battery and fuel cell analogs
  23 p0486 A79-37273
  Determination of the minority carrier diffusion length in silicon solar cells
  23 p0528 A79-42248
CURRENT DISTRIBUTION
  Attenuating the transverse edge effect in MHD generators
  21 p0063 A79-13985
  MHD equilibrium and stability --- in tokamak devices
  21 p0078 A79-14779
  Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
  21 p0153 A79-18868
  Structure of the current shell in a Z pinch
  22 p0245 A79-21438
  Three-dimensional effects of electrode configuration on diagonal MHD generator performance
  22 p0283 A79-26523
  The effect of limiters and current profile on elliptic free-boundary MHD equilibria
  22 p0291 A79-27881
  Optimum grid design for a nonuniformly illuminated sun-concentrator solar cell
  24 p0645 A79-48278
  Application of finite element method to analysis of MHD generators
  24 p0653 A79-50001
  Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump
  24 p0706 A79-52372
  Assessment of load management on the electric power system --- conferences
  [CONF-781102-3] 23 p0590 N79-27412
CURRENT REGULATORS
  Advancements in the design of solar array to battery charge current regulators
  21 p0033 A79-10902
CURRENT SHEETS
  Investigation of a staged plasma-focus apparatus --- pinch construction and current sheet dynamics investigation
  22 p0255 A79-22365
CURVATURE
  Effect of surface curvature on measurement of the absorptance properties of solar coatings
  21 p0042 A79-11879
  Fixed-focal-axis solar concentrators with a curvature determined by gravity
  23 p0523 A79-41254
CURVED BEAMS
  Flexed beams in central receiver heliostat drives
  [AIAA PAPER 78-1755] 21 p0060 A79-13856
CUTTERS
  Coal-shale interface detection
  [NASA-CASE-MFS-23720-3] 23 p0569 N79-25483
CYCLOTRON FREQUENCY
  Electron cyclotron heating in high density toroidal plasmas
  22 p0265 A79-24037
  Non-thermal emission at the plasma frequency --- spectra obtained on tokamak fusion reactors
  22 p0270 A79-24854
  Magneto-acoustic resonance heating in the ion-cyclotron frequency domain --- of tokamak plasmas
  22 p0271 A79-24866
  Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device --- microwave heating of tokamak plasma
  22 p0271 A79-24867
CYCLOTRON RADIATION
  The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
  22 p0312 A79-31183
  Interpretation of cyclotron radiation spectra from runaway discharges in TFR
  22 p0313 A79-31185
  Warm plasma effects on drift cyclotron loss cone mode --- in mirror machines
  23 p0478 A79-39568
  Advanced-fuel pellet approaches to inertial fusion
  24 p0630 A79-46303
  A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
  24 p0640 A79-47452
CYCLOTRON RESONANCE
  Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma
  21 p0071 A79-14467
  Electrons of high perpendicular energy in the low-density regime of tokamaks
  22 p0270 A79-24852
  RF-heating in stationary systems --- of toroidal plasma in tokamaks
  22 p0271 A79-24864
  Magneto-acoustic resonance heating in the ion-cyclotron frequency domain --- of tokamak plasmas
  22 p0271 A79-24866
  Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
  22 p0292 A79-27885
  Electron cyclotron heating in Bumpy Torus Program
  24 p0607 A79-45033
  Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
  24 p0607 A79-45034
CYLINDRICAL BODIES
  An analysis of a cylindrical parabolic focussing collector for distributed collector power system
  21 p0134 A79-17442
  Geometrical aspects of a cylindrical parabolic collector
  21 p0134 A79-17443
  Performance of solar concentrators - A theoretical study
  21 p0135 A79-17453
  A theory for wave-power absorption by two independently oscillating bodies
  22 p0259 A79-23307
  Symmetrical and asymmetrical ideal cylindrical radiation transformers and concentrators
  22 p0303 A79-29647
  Solar concentrator flux distributions using backward ray tracing
  24 p0603 A79-44365
  Heat transfer simulation in underground coal liquefaction
  23 p0555 N79-24292
CYLINDRICAL CHAMBERS
  Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes
  [ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836
CYLINDRICAL WAVES
  Analysis of a cylindrical imploding shock wave
  21 p0155 A79-18846
CZOCHRALSKI METHOD
  Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
  23 p0504 A79-40958
  LSA large area silicon sheet task continuous liquid feed Czochralski growth
  [NASA-CR-158366] 22 p0357 N79-20281

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506

D

DAMPERS (VALVES)

Effects of air damper leaks on solar energy system performance
[SOLAR/0012-78/29] 23 p0563 N79-24497

DAMPING

Lag damping in autorotation by a perturbation method --- for rigid rotor blades
[AHS 78-25] 21 p0152 A79-18151

Power train analysis for the DOE/NASA 100-kW wind turbine generator
[NASA-TM-78997] 22 p0333 N79-16355

DAMS

Small hydropower - Promise and reality in New York State and the northeast
23 p0410 A79-34083

Potential use of small dams to produce power for low-income communities
[PB-292745/7] 23 p0575 N79-25535

Small low-head hydroelectric power --- conferences
[IDO-10076] 24 p0738 N79-29617

DATA ACQUISITION

A theoretical method for the prediction of monthly mean solar radiation parameters
21 p0022 A79-10183

Analysis of data user's needs for performance evaluation of solar heating and cooling systems
21 p0087 A79-15827

Collection of data for estimating the probable life cycle costs of solar energy systems
21 p0087 A79-15828

Acceleration of solar heating application via improved data evaluation
21 p0087 A79-15829

Considerations in choosing solar energy monitoring systems
21 p0087 A79-15831

Data acquisition using a modular data logger --- for solar heated building monitoring
21 p0088 A79-15832

Experience gained and lessons learned from monitoring the solar building, Albuquerque
21 p0088 A79-15833

The use of computer-controlled data acquisition systems in determining solar heating and cooling system performance
21 p0088 A79-15834

Instrumentation, data acquisition and monitoring system for an air heating solar system
21 p0088 A79-15836

Moderate cost, calculator-based data acquisition for solar HVAC systems
21 p0088 A79-15837

Design of the data acquisition system at Solar One --- home energy monitoring via minicomputers
21 p0088 A79-15841

Low-cost monitoring of solar system performance
21 p0088 A79-15843

Sensor selection and placement in the National Solar Data Program
21 p0089 A79-15844

A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing
21 p0144 A79-17617

Solar Total Energy Control Data Acquisition System
21 p0144 A79-17618

Master control and data system for the 5MW Solar Thermal Test Facility
21 p0144 A79-17620

Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing
22 p0257 A79-22924

Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452

The DOE 5 MW Solar Thermal Test Facility
23 p0428 A79-35046

Data acquisition and signal processing for a vertical axis wind energy conversion system
23 p0432 A79-35078

Solar radiation data in the southeastern United States
24 p0608 A79-45204

Use of meteorological data in system evaluation --- of solar energy collection efficiency
24 p0610 A79-45225

Ocean thermal and current velocity data requirements for design of an OTEC plant - An update
24 p0622 A79-45822

Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305

Data acquisition and signal processing for a vertical axis wind energy conversion system
[SAND-78-1000C] 21 p0187 N79-11517

Solar energy Measuring stations in Austria: Results and experiences
[ASSA-SE-INFO-6/78] 23 p0574 N79-25527

Design development and implementation of data acquisition systems for photovoltaic tests and applications project
[COO-4094-24] 23 p0596 N79-27672

Mead 25 kilowatt photovoltaic system --- conferences
[COO-4094-19] 23 p0596 N79-27677

Applications and safety data
24 p0722 N79-28718

Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784

Meteorological data for solar energy applications
24 p0792 N79-32733

HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738

Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner
[FE-2489-36] 24 p0795 N79-33340

DATA BASES

Bibliographic and numeric data bases for fiber composites and matrix materials
21 p0114 A79-16984

A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205

The 'Facility Data Base' or data bank on energy facilities
24 p0644 A79-48021

End use energy consumption data base: Series 1 tables
[PB-281817/7] 21 p0177 N79-10560

Energy information data base. Guide to abstracting and indexing
[TID-4583-R1] 21 p0184 N79-11488

Energy information data base: Serial titles
[TID-4579-R10] 21 p0197 N79-12566

Geothermal emissions data base: Cerro Prieto geothermal field
[UCID-4033] 21 p0204 N79-13480

Industrial international data base: Energy analysis methodology. Rational use of energy program pilot study
[NATO/CCMS-75] 21 p0206 N79-13508

Solar Irrigation Program Data Base Management System (SIPDBMS)
[SAND-78-0641] 21 p0209 N79-13532

Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion
[PB-288602/6] 22 p0350 N79-18487

Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C
[PB-288603/4] 22 p0350 N79-18488

Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F
[PB-288604/2] 22 p0350 N79-18489

Prospective needs for physical property data in the chemical and allied industries during the next decade
[NPI-CHEM-84] 23 p0546 N79-23185

A normative price for a manufactured product: The SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504

Meteorological measurement data for solar energy utilization
[ASSA-FA-5] 23 p0574 N79-25524

Handbook of data on selected engine components for solar thermal applications
[NASA-TM-79027] 23 p0579 N79-26476
Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018
Energy information data base. Serial titles, supplement 3 --- bibliographies
[TID-4579-R10-SUPPL-3] 24 p0745 N79-30088
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 6. End-use energy conservation data base and scenarios
[LBL-7896-PT-6] 24 p0758 N79-30818
End-use energy-consumption data base. Version 10: User's manual
[DOE/EIA-0175] 24 p0772 N79-31790
Alcohol fuels, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0713/2] 24 p0795 N79-33342

DATA COLLECTION PLATFORMS
Selected areas of aerospace technical applications to civil engineering
23 p0397 A79-33925

DATA CORRELATION
Critique on the solar rehabilitation procedures used in SOLMET-2
24 p0708 A79-52956

DATA PROCESSING
A generalized correlation of critical heat flux for the forced convection boiling in vertical uniformly heated round tubes - A supplementary report
23 p0487 A79-40301
Collection, processing and dissemination of data for the national solar demonstration program
24 p0608 A79-45208
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany
[E79-10102] 22 p0339 N79-17291
Translations on USSR science and technology: Physical sciences and technology, no. 67
[JPRS-73388] 23 p0568 N79-24946

DATA RECORDERS
Data acquisition using a modular data logger --- for solar heated building monitoring
21 p0088 A79-15832

DATA RECORDING
Solar energy measuring stations in Austria: Results and experiences
[ASSA-SE-INFO-6/78] 23 p0574 N79-25527
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738

DATA REDUCTION
Post mortem assessment - Coal gasification plant
23 p0480 A79-39909
Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811

DATA STORAGE
A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205

DATA SYSTEMS
Collection, processing and dissemination of data for the national solar demonstration program
24 p0608 A79-45208
Federal Energy Data System (FEDS) technical documentation
[PB-281815/1] 21 p0189 N79-11542
National Emissions Data System (NEDS) fuel use report (1974)
[PB-284658/2] 21 p0194 N79-12251
Coal research: Data systems and information transfer
[ORAU-133] 21 p0232 N79-15830

DECELERATION
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

DECISION MAKING
A multivariate-utility approach for selection of energy sources
21 p0098 A79-16120
A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas
21 p0143 A79-17514
Optimal decisions for long-term operation of hydropower systems
22 p0245 A79-21473
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511
Energy and the economy
[EPRI-EA-620-VOL-1] 21 p0189 N79-11539
Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics
[NASA-CR-157953] 21 p0200 N79-12970
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339
The development of a laser Doppler velocimetry system for unsteady separated flow research: Preliminary results
[AD-A061724] 22 p0352 N79-19305
SAMICS validation. SAMICS support study, phase 3
[NASA-CR-158746] 23 p0581 N79-26491
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024
Electric utilities and solar energy: The service contract in a new social context
[CPAU/IEA(O)-79-3] 23 p0597 N79-27685
Impacts of new energy technologies as measured against reference energy systems --- conferences
[BNL-25475] 23 p0597 N79-27694
Alternative, semi-automated method for performing multiobjective analyses
[BNL-50892] 23 p0599 N79-27921
Role of the states in energy
[DOE/PE-0009] 24 p0758 N79-30816
Multiobjective analysis in a national energy system model --- conferences
[BNL-24371] 24 p0758 N79-30823
Environmental development plan, fossil fuel utilization program
[DOE/EDP-0046] 24 p0793 N79-32746

DECISION THEORY
Conference on Decision and Control, and Symposium on Adaptive Processes, 16th, and Special Symposium on Fuzzy Set Theory and Applications, New Orleans, La., December 7-9, 1977, Proceedings. Volumes 1 & 2
21 p0081 A79-14957
Thermal power systems small power systems applications project. Decision analysis for evaluating and ranking small solar thermal power system technologies. Volume 1: A brief introduction to multiattribute decision analysis --- explanation of multiattribute decision analysis methods used in evaluating alternatives for small powered systems
[NASA-CR-158425] 22 p0368 N79-21548
Long-term strategic analysis (towards an energy doctrine)
[BNL-25250] 24 p0772 N79-31791

DECOMPOSITION
Problems around Fe-Cl cycles --- thermochemical decomposition of water hydrogen production
22 p0238 A79-20771
Reaction kinetics for remodeling oil shale retorting
[UCRL-81622] 24 p0720 N79-28653

DEEP SPACE NETWORK
Comparison of two total energy systems for a diesel power generation plant --- deep space network
24 p0745 N79-30262

DEEPWATER TERMINALS
Preliminary selection of anchor systems for ocean thermal energy conversion
23 p0437 A79-35846

DEFENSE PROGRAM
The national energy plan: Options under assumptions of national security threat --- economic impact procurement policy, and resources management
[H-PRINT-95-48] 21 p0228 N79-15398
Energy Materials Coordinating Committee (EMACC)
[DOE/US-002] 23 p0563 N79-24490

DEGASSING

Methane drainage study in the Sunnyside coalbed, Utah
[PB-289772/6] 23 p0540 N79-22606

DEGRADATION

Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

MHD power generation: Research, development and engineering
[FE-3087-2] 22 p0363 N79-20518

DEHUMIDIFICATION

Rate of desorption in a solar regenerator
21 p0055 A79-13611

Buoyancy effects in a solar regenerator --- for air dehumidifier absorbent solutions
22 p0262 A79-23752

DEHYDRATION

Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

Dehydration of ethanol - New approach gives positive energy balance
24 p0643 A79-47813

DELAYED FLAP APPROACH

Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581

DELTA WINGS

An axial-flow wind-turbine with delta-wing blades
23 p0405 A79-34044

DEMAND (ECONOMICS)

Factors influencing solar energy commercialization
21 p0093 A79-15897

Coupled systems and energy policy - Closing the supply/demand gap: Are there many roads not taken
23 p0421 A79-34175

Energy, helium, and the future --- U.S. He demand projection and conservation program
23 p0422 A79-34191

The impact of price expectations on the demand for electrical energy in the United States
23 p0447 A79-37286

Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580

Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541

Energy availabilities for state and local development: 1974 data volume
[ORNL/TM-5890-S3] 21 p0175 N79-10542

Future aviation fuels fuel suppliers views
21 p0202 N79-13194

Calculation of backup requirements
21 p0218 N79-14533

US energy demand and supply, 1976-1985: Limited options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400

Symposium on Energy Today and Tomorrow
[CSIR-S-145] 22 p0340 N79-17316

The planning and economic aspects of energy supply and demand in South Africa
22 p0341 N79-17325

Alternative models of energy demand
22 p0353 N79-19440

The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337

Energy supply and demand in California
23 p0591 N79-27603

Comprehensive areal model of residential heating demands
[BNL-24998] 23 p0597 N79-27692

Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980
[DOE/EIA-0102/20] 24 p0718 N79-28356

Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369

Energy supply and demand balances and financing requirements in non-OPEC developing nations
[HCP/H6407] 24 p0741 N79-29650

Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40] 24 p0746 N79-30403

Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405

Energy sector capital requirements, 1978-1985
[DOE/EIA-0103/24] 24 p0755 N79-30797

Projections of energy supply and demand for the 1978-1979 winter heating season
[DOE/EIA-0102/33] 24 p0758 N79-30815

Assessment of potential US petroleum supply shortfalls, 1978 - 1980
[DOE/EIA-0102/13] 24 p0781 N79-32619

Energy Emergency Management Information System (EEMIS): Program plan
[DOE/EIA-0135] 24 p0791 N79-32723

DENDRITIC CRYSTALS

Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940

DENITROGENATION

Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5
[PB-287180/4] 22 p0339 N79-17026

DENMARK

Solar energy use in Denmark /56 deg N/ and higher latitudes in Scandinavia
21 p0128 A79-17393

CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940

DENSE PLASMAS

Review of results from DITE tokamak
21 p0069 A79-14456

Investigation of a staged plasma-focus apparatus --- pinch construction and current sheet dynamics investigation
22 p0255 A79-22365

A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a
22 p0255 A79-22379

Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037

Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943

Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

Some aspects of a fission-based plasma engine
24 p0715 A79-54350

DENSIFICATION

Evaluation of densified refuse derived fuels for use in pulverized coal-fired steam generators
23 p0491 A79-40422

Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180

DENSITOMETERS

Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324

DENSITY DISTRIBUTION

A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a
22 p0255 A79-22379

The effect of thermo-electric forces on the density profiles in a thermonuclear plasma surrounded by a cold blanket
22 p0292 A79-27886

DENSITY MEASUREMENT

Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324

Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479

Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma
22 p0255 A79-22369

DEPOSITION

Thermophoresis - Enhanced deposition rates in combustion turbine blade passages
[ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790

Kinetics of silica deposition from simulated geothermal brines [CONF-790108-1] 23 p0597 N79-27691

DEPOSITS
- High sulfur fuel effects in a two-cycle high speed army diesel engine [AD-A059534] 21 p0216 N79-14232

DESALINIZATION
- Sea water desalination by means of solar energy 21 p0057 A79-13645
- The use of wave powered systems for desalination - A new opportunity --- seawater pumping for reverse osmosis 21 p0151 A79-18108
- East Mesa geothermal test site 22 p0259 A79-23458
- Solar distillation in Brasil 23 p0385 A79-33214

DESERTS
- Hybrid alternate energy system --- wind-photovoltaic system for desert regions 24 p0675 A79-51768

DESICCANTS
- Liquid desiccant solar air conditioner and energy storage system 21 p0021 A79-10176
- Simulations of the performance of open cycle desiccant systems using solar energy 21 p0066 A79-14262
- Solid desiccant air conditioning with silica gel using solar energy 21 p0181 N79-11464

DESIGN ANALYSIS
- Design considerations for an in situ gasification test of eastern bituminous coals 21 p0005 A79-10049
- Optimum design conditions for a power plant at a vapor dominated geothermal resource, Pacific Gas and Electric's The Geysers Power Plant Unit 16 21 p0014 A79-10121
- Design studies and trade-off analyses for a superconducting magnet/MHD power generator system 21 p0017 A79-10142
- Design, construction, and testing of a Fixed Mirror Solar Concentrator field 21 p0020 A79-10164
- Energy conservation aircraft design and operational procedures [ONERA, TP NO. 1978-107] 21 p0036 A79-11572
- General principles of multielement concentrating system design --- solar collectors 21 p0054 A79-13291
- Selection of method for calculating the parameters of wind and solar power station storage facilities 21 p0054 A79-13293
- Design of a second generation concentrating tracking solar collector [AIAA PAPER 78-1775] 21 p0062 A79-13872
- Design optimization for solar array of multiple collector types 21 p0071 A79-14677
- The improved rigid airship --- design characteristics and cost analysis 21 p0086 A79-15572
- Acceleration of solar heating application via improved data evaluation 21 p0087 A79-15829
- Solar energy and the flat plate collector - An annotated bibliography 21 p0090 A79-15858
- Design of active solar heating systems 21 p0090 A79-15860
- Layout and design characteristics of MHD power stations 21 p0105 A79-16481
- MHD generators --- Faraday, Hall and diagonal generator designs 21 p0105 A79-16484
- Design considerations for solar power satellites 21 p0113 A79-16738
- Temperature dependent parameter analysis of thermoelectric devices 21 p0113 A79-16740
- On the design of CPC photovoltaic solar collectors --- Compound Parabolic Concentrator [CONF-780114-8] 21 p0124 A79-17355
- Design and optimization of a flat plate collector for cooling application 21 p0132 A79-17419
- Flat plate collector - Experimental studies and design data for India 21 p0132 A79-17425
- P.E.R.I.C.L.E.S. - Design of a stationary spherical collector --- solar energy application 21 p0134 A79-17441
- Design fabrication and testing of three meter diameter parabolic dish heliostat system 21 p0135 A79-17447
- Two thermodynamic optima in the design of sensible heat units for energy storage 21 p0150 A79-18091
- Preliminary analysis of advanced ceramic magnetohydrodynamic /MHD/ combustor design concepts 22 p0240 A79-20838
- Analysis and design of a field of heliostats for a solar power plant 22 p0242 A79-21161
- Some flow analyses for Tornado-type wind turbines 22 p0279 A79-26181
- Analysis and design of air heating unglazed flat plate solar collectors 22 p0280 A79-26202
- First-order design variables for concentrating solar collectors 22 p0293 A79-28141
- Fiat Research Center hybrid vehicle prototype [SAE PAPER 790014] 22 p0313 A79-31351
- Electric vehicle battery development [SAE PAPER 790158] 22 p0314 A79-31363
- Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system 23 p0399 A79-33994
- A novel design of evacuated-concentrating spherical collector 23 p0399 A79-33998
- The solar house --- overview of French designs 23 p0401 A79-34017
- Low cost Darrieus vertical-axis wind turbine design [AIAA PAPER 79-0966] 23 p0456 A79-38174
- Conceptual design of sodium-cooled central receiver solar power plant [AIAA PAPER 79-0994] 23 p0459 A79-38194
- Design problems of the hydraulic network in a linear collector power plant 23 p0464 A79-38591
- Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics 23 p0464 A79-38592
- Design analysis of a vertical axis wind turbine 23 p0472 A79-38656
- Materials problems experienced at the Synthane coal-gasification pilot plant 23 p0478 A79-39788
- Post mortem assessment - Coal gasification plant 23 p0480 A79-39909
- Gears for wind power plants 23 p0484 A79-40119
- Early developments in solar cooling equipment 24 p0609 A79-45218
- TRW PSD-I power system design --- for OTEC 24 p0618 A79-45792
- Dynamic and off-design analysis of OTEC closed cycle power systems 24 p0624 A79-45837
- Cover systems for high temperature flat-plate solar collectors 24 p0642 A79-47799
- A parameter sensitivity analysis of the rectified superconducting alternator model 24 p0646 A79-48654
- Heat rejection development requirements for orbital power systems 24 p0692 A79-51924
- Solar heating and cooling system design and development [NASA-CR-150803] 21 p0172 N79-10516
- Preliminary design package for Sunair SEC-601 solar collector [NASA-CR-150875] 22 p0341 N79-17332
- A 200-kW wind turbine generator conceptual design study [NASA-TM-79032] 22 p0341 N79-17333
- Evaluation of the ECAS open cycle MHD power plant design [NASA-TM-79012] 22 p0341 N79-17335

Satellite Power System (SPS) concept definition study (exhibit C)
[NASA-CR-161173] 22 p0352 N79-19071
Solar heating of buildings: Design optimization and economic analysis
22 p0353 N79-19439
MHD-ETF program. Volume 1: Executive summary
[FE-2613-6-VOL-1] 22 p0362 N79-20515
MHD-ETF program. Volume 2A, parts 1 and 2: Reference design description
[FE-2613-6-VOL-2A] 22 p0363 N79-20516
Engineering test facility conceptual design, part 1
[FE-2614-2-PT-1] 22 p0369 N79-21560
Engineering test facility conceptual design, part 2
[FE-2614-2-PT-2] 22 p0369 N79-21561
Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report)
[BMFT-FB-T-78-15] 23 p0590 N79-27345
Preliminary design analysis of the quasi-electric drive vehicle --- with an improved lead acid battery for extended range
[UCRL-52613] 24 p0731 N79-29116
INTELSAT 5 solar array
24 p0752 N79-30757
Conceptual design and cost study for a dual-purpose nuclear-electric reverse osmosis seawater conversion plant
[ORNL/TM-6821] 24 p0768 N79-31438
Design of high efficiency HLE solar cells for space and terrestrial applications
24 p0783 N79-32647
Owens-Illinois subsystem design package for the SEC-601 air-cooled solar collector
[NASA-CR-161094] 24 p0798 N79-33570
NASA Tech House: An early evaluation
[NASA-TM-80751] 24 p0798 N79-33571

DESORPTION
Study of the interaction of H2O and O2 with the surface of TiO2 by electron stimulated desorption and Auger and characteristic loss spectroscopies
21 p0037 A79-11793
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
Rate of desorption in a solar regenerator
21 p0055 A79-13611
Kinetics of hydrogen absorption and desorption --- for energy storage
22 p0248 A79-21687
Laser-induced desorption experiments with technical metal surfaces --- carbon monoxide and hydrogen interaction with Ni
23 p0445 A79-36969

DESULFURIZING
Coal desulfurization: Chemical and physical methods; Proceedings of the Symposium, New Orleans, La., March 23, 1977
21 p0044 A79-12114
An overview of coal preparation --- for producing clean fuel through desulfurization
21 p0044 A79-12115
Desulfurization of coals by high-intensity high-gradient magnetic separation - Conceptual process design and cost estimation
21 p0044 A79-12116
Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals --- through chemical leaching
21 p0044 A79-12117
Coal desulfurization test plant status - July 1977 --- utilizing Meyers leach process
21 p0044 A79-12118
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119
Desulfurization and sulfidation of coal and coal char
21 p0045 A79-12120
Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies --- Process Development Unit
21 p0045 A79-12121
Recent operating experience of the Wellman-Lord FGD process on a coal-fired boiler --- flue gas desulfurization
21 p0065 A79-14120
The Research-Cottrell/Bahco SO2 and particulate removal system at Rickenbacker Air Force Base
21 p0065 A79-14122
Energy requirements of a limestone FGD system --- Flue Gas Desulfurization
21 p0114 A79-16747
Assessment of current flue gas desulfurization technology
21 p0145 A79-17637
Operating experience with three 20 MW prototype flue gas desulfurization processes
[ASME PAPER 78-JPGC-PWR-12] 21 p0150 A79-18098
Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies
22 p0282 A79-26465
Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157
Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458
Options for treating and disposing of scrubber sludge
23 p0424 A79-34460
Coal desulfurization --- for reduction of pollution emissions
23 p0533 A79-43200
Selectivity improvement in the SRC process --- Solvent Refined Coal hydrodesulfurization over hydrogenation
24 p0628 A79-45992
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864
Assessment of coal cleaning technology
[PB-287091/3] 22 p0330 N79-16139
Catalyst aging tests and the role of catalyst wetting on hydrodesulfurization of a coal derived liquid
22 p0352 N79-19169
Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120
High-gradient magnetic separation for removal of sulfur from coal
[PB-290945/5] 23 p0569 N79-25469
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234
Evaluation of available MHD seed-regeneration processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0590 N79-27342
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751

DETECTION
Development of sensitized pick coal interface detector system
[NASA-CR-161225] 23 p0556 N79-24417

DETECTORS
Coal-rock interface detector
[NASA-CASE-MFS-23725-1] 24 p0768 N79-31706

DETONATION WAVES
Mathematical models of direct initiation of unconfined gas phase detonations --- hazards of LNG/air clouds from spills
[AIAA PAPER 79-0289] 21 p0157 A79-19649

DEUTERIUM
Nuclear characteristics of D-D fusion reactor blankets - Technical data 21 p0162 A79-19826
High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy 22 p0249 A79-21689
Advanced-fuel pellet approaches to inertial fusion 24 p0630 A79-46303

DEUTERIUM PLASMA
Overview of inertial confinement fusion reactor designs 21 p0018 A79-10149
Compact experiments for alpha-particle heating --- of confined D-T plasma in tokamak 21 p0078 A79-14786
Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak --- safety factor 21 p0155 A79-18830
Structure of the current shell in a Z pinch 22 p0245 A79-21434
Cyclotron-wave spectrum in a plasma with two ion species 22 p0245 A79-21443
The synergetics of the catalytic D-D-fusion-fission breeder 22 p0252 A79-22236
Alpha transport and blistering in tokamaks 22 p0253 A79-22243
Prepulse damage to targets and alignment verification 22 p0258 A79-23027
Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets 22 p0258 A79-23034
Pellet X-ray spectra for laser fusion reactor designs 22 p0291 A79-27878
Calculation of the Q factor for a two-component tokamak 22 p0324 A79-31763
Recycling processes in tokamaks 23 p0443 A79-36882
Measurement of the neutron spectra from beam-heated PLT plasmas 23 p0478 A79-39724
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks 24 p0606 A79-44979
Computer simulation of laser implosive compression of ADT target and analytic solutions on the shock waves and thermal waves 24 p0629 A79-46254
On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors 24 p0705 A79-52352

DEVELOPING NATIONS
Prospects for harnessing renewable energy sources in developing countries 21 p0117 A79-17286
Energy balances as a means for the evaluation of solar energy in developing countries 21 p0118 A79-17290
Bio-mass energy for rural areas 21 p0126 A79-17373
Photovoltaic power systems for rural areas of developing countries 22 p0278 A79-26131
Modern technology for recovering energy and materials from urban wastes - Its applicability in developing countries 22 p0295 A79-28183
Solar energy in developing countries: An overview and buyers' guide for solar scientists and engineers --- Book 22 p0327 A79-32139
The role of solar energy in the solution of Turkey's energy predicament 23 p0404 A79-34035
Fusion energy - The iceberg beneath the tip 23 p0406 A79-34057
Introducing new technologies for alternative energy sources - The economic, social, and environmental considerations for developing countries 23 p0421 A79-34177
Renewable energy supplies for developing countries 23 p0422 A79-34178
Solar electric generator for developing nations 23 p0452 A79-37885
Commercialisation of solar energy devices in developing countries - Problems and prospects 23 p0477 A79-39105
Energy, development and diplomacy --- international relations among petroleum producers and consumers 24 p0652 A79-49518
Perspectives on developing country solar energy applications 24 p0672 A79-51743
Energy needs, uses, and resources in developing countries [BNL-50784] 21 p0185 N79-11500
Analytical framework for the assessment of energy resource and technology options for developing countries [BNL-50800] 21 p0208 N79-13524
Photovoltaic power systems for rural areas of developing countries [NASA-TM-79097] 21 p0229 N79-15411
Application of resource allocation models to the problems of regional energy policy in large developing countries --- conferences [BNL-25537] 24 p0728 N79-28779
International Forum on Appropriate Industrial Technology. Appropriate technology for rural energy supply in developing countries [PB-294602/8] 24 p0760 N79-30840
Systems framework for energy analysis in developing countries [BNL-25933] 24 p0791 N79-32722

DIAGRAMS
Solar energy diagrams --- combining position and insolation data 22 p0253 A79-22267

DIAMAGNETISM
Stability of tokamaks with elongated cross section 24 p0639 A79-47422

DIELECTRIC PROPERTIES
The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma 22 p0312 A79-31183

DIELECTRICS
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels 24 p0640 A79-47490
Experimental demonstration of heat-to-electricity conversion within a dielectric 24 p0698 A79-51975
High voltage insulation and bushing design for flexible superconducting cables [BNL-25351] 24 p0719 N79-28439
Dielectric development for GaAs solar cells [PB-295837/9] 24 p0802 N79-33600

DIES
Vacuum die casting of silicon sheet for photovoltaic applications [NASA-CR-162360] 24 p0798 N79-33566

DIESEL ENGINES
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator 22 p0258 A79-23137
Dynamics of a free-piston Diesel- MHD generator 23 p0395 A79-33424
Heavy duty diesel particulate emission factors 23 p0461 A79-38481
Hydrogen-fueled diesel engine without timed ignition 24 p0715 A79-54297
The emissions and fuel economy of a Detroit diesel 6-71 engine burning a 10-percent water-in-fuel emulsion [AD-A058550] 21 p0203 N79-13375
High sulfur fuel effects in a two-cycle high speed army diesel engine [AD-A059534] 21 p0216 N79-14232
Air quality assessment of particulate emissions from diesel-powered vehicles [PB-286172/2] 21 p0223 N79-14641

Performance characteristics of automotive engines in the United States. Second series, report no. 6: 1976 Nissan diesel 198 CID (3.2 liters), F. I. [PB-286295/1] 21 p0227 N79-15309
Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment [NASA-TM-79037] 21 p0229 N79-15403
Proceedings of symposium on water-in-fuel emulsions in combustion --- marine diesels, boilers, and gas turbine engines [AD-A061503] 22 p0338 N79-17019
Direct utilization of crude oil as fuel in the US Army four-cycle diesel engine, model LDT-465-1C [AD-A062387] 22 p0357 N79-20279
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions [AD-A062751] 22 p0366 N79-21406
Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area --- energy technology [P/51/77/21] 23 p0584 N79-26536
Diesel organic rankine cycle compound engine (Bottoming Cycle) program plan [DOE/CS-0052] 23 p0590 N79-27521
Comparison of two total energy systems for a diesel power generation plant --- deep space network 24 p0745 N79-30262
Diesel bus performance simulation program [PB-295524/3] 24 p0763 N79-31110

DIESEL FUELS
The development of alternate combustibles for diesel engines 23 p0385 A79-33227
A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it [AD-A056018] 21 p0192 N79-11686
A literature review-problem definition studies on selected toxic chemicals. Volume 8: Environmental aspects of diesel fuel and fog oils SGF number 1 and SGF number 2 and smoke screens generated from them [AD-A056021] 21 p0193 N79-11688
High sulfur fuel effects in a two-cycle high speed army diesel engine [AD-A059534] 21 p0216 N79-14232
Fundamental combustion studies of emulsified fuels for diesel applications [PB-287386/7] 22 p0330 N79-16138
Parametric performance of a turbojet engine combustor using jet A and A diesel fuel [NASA-TM-79089] 22 p0357 N79-20114
Health effects associated with diesel exhaust emissions, literature review and evaluation [PB-289817/9] 22 p0364 N79-20727
Dependence of the pour point of diesel fuels on the properties of the initial components [NASA-TM-75424] 22 p0364 N79-21217
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions [AD-A062751] 22 p0366 N79-21406
Experimental clean combustor program: Diesel no. 2 fuel addendum, phase 3 [NASA-CR-135413] 23 p0576 N79-26221
Diesel Fuel and Gasoline Conservation Act of 1977 --- congressional reports [GPO-34-986] 24 p0718 N79-28348

DIFFERENTIAL EQUATIONS
Heat transfer simulation in underground coal liquefaction 23 p0555 N79-24292

DIFFUSE RADIATION
A theoretical method for the prediction of monthly mean solar radiation parameters 21 p0022 A79-10183
The relationship between diffuse and total solar radiation in computer simulation of solar energy systems 21 p0119 A79-17304
Hourly vs daily method of computing insolation on inclined surfaces 22 p0242 A79-21164
Diffuse solar radiation on a horizontal surface for a clear sky 22 p0242 A79-21167
Isotropic distribution approximation in solar energy estimations --- diffuse insolation on tilted surface 22 p0262 A79-23753
Thermodynamics of the conversion of diluted radiation --- solar energy application 22 p0310 A79-30910
Statistical analysis of solar radiation data in Montreal for solar energy utilization 22 p0322 A79-31452
The development of a stationary concentrator --- parabolic solar absorber surface effects on energy conversion performance 23 p0464 A79-38586
Solar radiation data in the southeastern United States 24 p0608 A79-45204

DIFFUSERS
Experimental demonstration of the Diffuser Augmented Wind Turbine concept 21 p0029 A79-10238
Fluid dynamics of diffuser-augmented wind turbines 22 p0238 A79-20798
Diffuser designs for improved wind energy conversion 22 p0279 A79-26182
Subsonic diffusers for MHD generators 22 p0279 A79-26185
On supersonic and subsonic diffusers for magnetohydrodynamic generator applications 22 p0279 A79-26186
Evaluation of the expected diffuser performance for a large MHD generator 23 p0393 A79-33408
Annular diffuser performance for an automotive gas turbine [ASME PAPER 78-GT-147] 24 p0605 A79-44790

DIFFUSION
Response of defects to illumination in silicon solar cells 23 p0521 A79-41084

DIFFUSION COEFFICIENT
Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion 21 p0054 A79-13290
Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency 22 p0252 A79-21807

DIFFUSION ELECTRODES
Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes 22 p0245 A79-21482
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions 22 p0245 A79-21483

DIFFUSION FLAMES
Influences on exhaust emissions from automotive gas turbines [ASME PAPER 78-GT-85] 22 p0255 A79-22338

DIFFUSION THEORY
Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment 23 p0551 N79-23539

DIFFUSIVITY
Electrochemical determinations of the chemical potential and diffusivity of sodium in Na/x/TaS2 at 300 K 21 p0040 A79-11830

DIGESTING
Simple methane digestors 23 p0386 A79-33234

DIGITAL DATA
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany [E79-10102] 22 p0339 N79-17291

DIGITAL SIMULATION
Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant [AIAA PAPER 78-1752] 21 p0060 A79-13854
Control of wind turbine generators connected to power systems 21 p0086 A79-15574

Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432
Structure of the current shell in a Z pinch
22 p0245 A79-21434
Non-linear numerical algorithms for studying tearing modes --- in tokamaks
22 p0257 A79-22981
Digital or analog modelling in the design of hydrostatic vehicular systems
22 p0264 A79-23808
WATSUN - A simulation program for solar-assisted heating systems
22 p0321 A79-31439
Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963
Computer modelling of solar energy collection
23 p0398 A79-33986
Impurity behaviour in real and simulated tokamak plasmas
23 p0444 A79-36885
Numerical modeling of impurity effects --- on energy balance in tokamak experiments
23 p0445 A79-36945
Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells
23 p0475 A79-38877
A discrete, stochastic simulation model for the analysis and design of solar energy heating systems
23 p0475 A79-38878
Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column
23 p0480 A79-39845
Digital simulation of dynamics of wind turbine generators
24 p0654 A79-50073
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721

DIGITAL TECHNIQUES
A distributed microcomputer-based control system for a large scale solar total energy system
24 p0672 A79-51741

DILUTION
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271

DIMENSIONAL ANALYSIS
Dimensioning of energy-production systems - The use of geometric programming --- solar cell array application
23 p0388 A79-33254
Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads --- Cold Water Pipe
24 p0621 A79-45812

DIODES
Cooling applications of thermic diode panels
[ASME PAPER 78-WA/SCL-10] 21 p0163 A79-19842
Polysilicon MIS solar cells with low work function metals
23 p0510 A79-41010
A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061
Transient shutdown analysis of low-temperature thermal diodes
[NASA-TP-1369] 22 p0346 N79-18287

DIOXIDES
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task Report. Volume 2: Appendices
[PB-294813/1] 24 p0761 N79-30856

DIRECT CURRENT
Compatibility of direct energy storage devices with ac. processing power system components
21 p0111 A79-16728
A single insulated sodium conductor for HVDC underwater power transmission
24 p0620 A79-45800
Development of a DC linear motor. II
24 p0707 A79-52800

DIRECT POWER GENERATORS
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Design of a direct wind energy converter to heat water by agitation in a closed tank
21 p0067 A79-14290
Solar electricity production
21 p0104 A79-16467
Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370
Feasibility of MHD-ac induction electric power plant --- using tokamak reactor exhaust plasma
22 p0303 A79-29794
Electro/mechanical aspects of the Mauritius 'passive' type wave energy project
23 p0449 A79-37856
Directly driven generators for wave energy conversion
23 p0449 A79-37858
Thermodynamic analysis of combined GTP-TEG solar energy converter --- Gas Turbine power Plants - Thermoelectric Generators
24 p0636 A79-46758
Mini-BRU/BIPS 1300 watt (sub)e dynamic power conversion system development: Executive summary
[NASA-CR-159440] 21 p0173 N79-10526
Direct firing of coal for power production
23 p0592 N79-27612

DIRECTIONAL ANTENNAS
Large active retrodirective arrays for solar power satellites
21 p0107 A79-16604
Solar power satellite rectenna design study: Directional receiving elements and parallel-series combining analysis
[NASA-CR-151866] 22 p0330 N79-16039

DIRECTIONAL SOLIDIFICATION (CRYSTALS)
Directional solidification of crack-free silicon ingots by heat exchanger method
23 p0498 A79-40901

DIRECTIVITY
Directional arrays of windmills
23 p0453 A79-37896

DISEASES
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289

DISPLACEMENT
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435
An initial model for the finite displacement response characteristics of a fluidyne pump --- thermodynamic efficiency
[AD-A069159] 24 p0734 N79-29521
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620

DISPLACEMENT MEASUREMENT
Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization
21 p0076 A79-14744

DISPLAY DEVICES
Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement
23 p0421 A79-34172

DISTILLATION
Solar distillation in Brasil
23 p0385 A79-33214
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653
Enthalpy measurement of coal-derived liquids
[FE-2035-12] 23 p0588 N79-27282

DISTILLATION EQUIPMENT
The solar still - A new design
23 p0384 A79-33213
Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34989
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653

DISTRIBUTED PARAMETER SYSTEMS
A new approach for solar energy systems design by means of the sensitivity theory
23 p0448 A79-37849
Distributed parameter modelling of urban residential energy demand --- using remotely sensed imagery
24 p0657 A79-50218
DISTRIBUTION (PROPERTY)
Bituminous coal and lignite distribution, January - September 1978
[DOE/EIA-0125/3-78] 24 p0748 N79-30688
DIURNAL VARIATIONS
Selection of method for calculating the parameters of wind and solar power station storage facilities
21 p0054 A79-13293
Selective covers for natural cooling devices --- in space
22 p0272 A79-25522
Sede Boqer - Shallow solar ponds project
24 p0671 A79-51738
DIVERTERS
Magnetic divertors --- in large tokamak plasma confinement experiments
21 p0078 A79-14781
Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881
Effect of scrape-off on tokamak radial transport
24 p0640 A79-47427
DOCUMENTATION
How to tap NASA developed technology
21 p0164 A79-19896
DOMESTIC ENERGY
Design considerations for an in situ gasification test of eastern bituminous coals
21 p0005 A79-10049
Operation of the Ft. Lewis, Washington Solvent Refined Coal /SRC/ Pilot Plant in the SRC I and SRC II processing modes
21 p0006 A79-10054
Can solar energy contribute significantly to the solution of the world's energy famine
21 p0019 A79-10155
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Design and operating experience on the U.S. Department of Energy Experimental Mod-0 100 kW Wind Turbine
21 p0028 A79-10234
Experimental demonstration of the Diffuser Augmented Wind Turbine concept
21 p0029 A79-10238
ERDA fuel cell programs
21 p0039 A79-11814
Energy efficiency in the transport sector
21 p0054 A79-13574
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652
Vacation homes near the sea with solar and wind energy utilization - Research done at the Technical University of Hannover: Architectural considerations
21 p0058 A79-13653
Total energy systems --- domestic solar and windpowered facilities
21 p0058 A79-13654
Passive solar heating and cooling
[AIAA PAPER 78-1756] 21 p0060 A79-13857
The economic performance of passive solar heating - A preliminary analysis --- thermal storage wall for family home design
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Future solar total energy markets for the U.S. industrial sector
[AIAA PAPER 78-1773] 21 p0062 A79-13870
Solar and wind energy applications in Hawaii
21 p0066 A79-14265
Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292
Exploring future energy options - An economic analysis
21 p0068 A79-14324
The National Program for Solar Energy
21 p0072 A79-14688
Residential energy design
21 p0073 A79-14694
Heat pumps without supplemental heat
21 p0073 A79-14695
Quantification of energy resource consumption
21 p0073 A79-14701
Passive solar design --- for domestic heating and cooling systems
21 p0074 A79-14720
Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739
Preliminary results of the new geothermal domestic heating system at Creil
21 p0075 A79-14740
A challenging role for the assurance sciences --- in energy conversion technology
21 p0086 A79-15396
A low cost approach to performance monitoring for the evaluation of a solar domestic hot water system
21 p0088 A79-15842
Residential and commercial thermal storage --- for solar heating and cooling systems
21 p0090 A79-15865
Geothermal energy from a utility perspective --- Imperial Valley of Southern California
21 p0091 A79-15880
Storage as an energy strategy for utilities
21 p0093 A79-15891
Status of photovoltaic systems and applications
21 p0095 A79-15907
Time, technology and capital - Do we have enough to solve the energy crisis
21 p0097 A79-16100
Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101
A multivariate-utility approach for selection of energy sources
21 p0098 A79-16120
A comparative analysis of three of ERDA's major R & D programs
21 p0099 A79-16121
An overview of the U.S. OTEC development program
21 p0100 A79-16247
Controls for residential solar heating
21 p0101 A79-16418
Solar controls and control modifications - New century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419
Inexpensive solar energy utilization in human settlements
21 p0104 A79-16470
Solar Thermal Electric Program
21 p0112 A79-16730
The status of solar energy --- for domestic water heating and thermal electric power generation
21 p0115 A79-17219
A solar energy system with a dual-source heat pump and long-term storage
21 p0119 A79-17312
Economic use of materials in the design of solar water-heating collector plates of the pipe and fin type
21 p0129 A79-17396
Comparison between simulation and experiment of solar heating
21 p0137 A79-17461
Design, operation and performance of the BBC Solar House
21 p0137 A79-17462
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465
Conceptual development of a solar town in Iran
21 p0138 A79-17469
Some experimental investigations on solar space heating in Korea
21 p0138 A79-17470
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0138 A79-17471
Heattube, a universal electrical solar heat equipment for building, community and agricultural purposes
21 p0138 A79-17473

Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489

Optimum insulation with internal and solar heat gains
21 p0140 A79-17490

Periodic heating/cooling by solar radiation --- through concrete slab buildings
21 p0140 A79-17491

Solar heating for a novel dwelling independent of servicing networks
21 p0140 A79-17492

A summary of R&D programs --- for coal utilization
21 p0146 A79-17639

Performance evaluation of the New Mexico State University Solar House
[ASME PAPER 78-WA/SOL-8] 21 p0163 A79-19840

Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

Investigations of solar heat production for household heating in Turkey
22 p0253 A79-22265

Solar water heaters for a cold climate
22 p0254 A79-22325

Solar energy and heat insulation --- materials for residential buildings
22 p0268 A79-24321

Solar storage unit with built-in oil-gas boiler
22 p0268 A79-24322

What and where - Solar active systems or energy conservation in buildings
22 p0275 A79-25927

Passive solar heating of buildings
22 p0275 A79-25928

CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940

Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131

The Tritherm test house --- solar heating experiment
22 p0290 A79-27723

Economic feasibility of solar water and space heating
22 p0292 A79-27899

Solar thermal electrical power plants for Iran
22 p0295 A79-28352

Pressure measurements on wind tunnel models of the Aylesbury experimental house
22 p0300 A79-29372

The impact of alternate energy resources on the future supply of electric power
[IEEE PAPER F 78 672-8] 22 p0304 A79-29939

Solar photovoltaic power for residential use
[ASME PAPER 79-SOL-11] 22 p0308 A79-30546

Measured and predicted performance of solar domestic water heaters
22 p0319 A79-31422

Allowable costs for alternative domestic heating systems using utility supplied electricity for backup or charging energy
22 p0319 A79-31428

Domestic water preheating using solar energy
22 p0321 A79-31437

Economic design of a solar domestic water heating system
22 p0321 A79-31438

Solutions to energy conservation in northern climates
22 p0321 A79-31443

Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444

Integration of a passive and active solar heated, low density, multiple dwelling with atrium
22 p0322 A79-31446

First year performance data and lessons learned in the NRC 14 house solar demonstration program
22 p0323 A79-31453

Alternate energy installations on the Jordan College Campus
22 p0323 A79-31454

Determination of the potential for solar retrofitting in Edmonton --- pilot systems for single family dwellings
22 p0323 A79-31456

Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457

P.E.I. solar assisted domestic water heat project
22 p0323 A79-31458

Performance of a solar space heating system
23 p0385 A79-33223

Behavior of eastern and western coals in fuel-rich reaction conditions --- gasification behavior of Montana Rosebud and Pittsburgh seam bituminous coals for MHD generators
23 p0390 A79-33384

Modelling of a domestic wind power system including storage
23 p0396 A79-33764

Measurement of the performance of domestic air-to-air heat pumps
23 p0397 A79-33768

Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009

Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010

Refined model of solar space cooling system
23 p0401 A79-34012

Sunbird I - Utah's first commercial solar home
23 p0401 A79-34015

Perspectives on solar electric power for small homes
23 p0401 A79-34016

The solar house --- overview of French designs
23 p0401 A79-34017

Regional viability and solar commitment - An early adopter study
23 p0404 A79-34034

HYGAS - A process ready for commercial demonstration --- coal gasification
23 p0411 A79-34090

In situ gasification - Recovery of inaccessible coal reserves
23 p0411 A79-34093

Hydrogen Homestead --- replacement fuel for homes
23 p0415 A79-34125

An evaluation of the potential for district heating in the United States
23 p0417 A79-34142

A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143

Waste heat as an alternative heat source
23 p0417 A79-34144

Extraction of sensible heat from waste water for domestic heating applications
23 p0418 A79-34152

Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155

Energy use and society in the 21st century --- development cost effects on growing GNP economy
23 p0420 A79-34165

The inexhaustible energy resources study --- U.S. R and D to meet future requirements
23 p0420 A79-34166

Survey and appraisal of primary future energy sources
23 p0420 A79-34167

Energy utilization in industry - The case of Israel
23 p0421 A79-34171

Strategies for alternative energy sources
23 p0421 A79-34173

Renewable energy supplies for developing countries
23 p0422 A79-34178

Energy, helium, and the future --- U.S. He demand projection and conservation program
23 p0422 A79-34181

Effects of energy conservation research, development, and demonstration on residential energy use
23 p0422 A79-34276

Solar energy and heat pumps - A possible substitute for fossil fuels for heating private households
23 p0434 A79-35464

Domestic space and water heating for existing dwellings using a heat pump and conventional roofs as energy absorbers
23 p0449 A79-37851

Performance estimation of a total energy domestic heat pump 23 p0449 A79-37854

Some practical aspects of the design and installation of domestic solar energy systems in the UK 23 p0452 A79-37884

Performance and cost of domestic solar water heating in Australia 23 p0452 A79-37889

A low cost wind energy conversion system for heating of domestic premises 23 p0452 A79-37894

Wind power for domestic use in the United Kingdom 23 p0453 A79-37902

Central receiver solar heating system 23 p0468 A79-38621

One year's experience with a do-it-yourself gravity-driven solar domestic hot water unit 23 p0468 A79-38623

Direct-contact heat exchange-storage tank in solar houses 23 p0468 A79-38626

Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States 23 p0470 A79-38646

Architectural planning - The possibility of using solar energy must be kept open 23 p0473 A79-38665

Potential for use of solar energy in private households to the year 2000 23 p0473 A79-38667

Energy analysis of low-temperature solar energy systems 23 p0473 A79-38670

Comparison of 100 per cent solar heated residences using active solar collection systems 23 p0477 A79-39106

Solar collector development in Iran 23 p0493 A79-40675

Potential for stand-alone photovoltaic on-site total-energy residential systems 23 p0516 A79-41050

Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station 23 p0519 A79-41071

Estimating heat loss in residential structures using aerial infrared imagery 23 p0522 A79-41125

Transport, distribution and storage of heat by water - Status and developments 23 p0524 A79-41803

Peak period of household load in the different stages of electrical power supply 23 p0528 A79-42226

Collection, processing and dissemination of data for the national solar demonstration program 24 p0608 A79-45208

Solar 'Plus' - Huntsville, Alabama 24 p0608 A79-45209

Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex 24 p0608 A79-45210

The economics of solar domestic hot water systems in state university and community college buildings 24 p0610 A79-45227

Hydrogen in the U.S. energy picture 24 p0612 A79-45577

French OTEC program 24 p0616 A79-45778

An overview of the Japanese OTEC development 24 p0616 A79-45779

Analysis of prospects for OTEC commercialization for baseload power 24 p0617 A79-45786

Sophisticated solar heating controllers - Are they cost effective 24 p0644 A79-47946

Singular optimal control of solar space heating systems 24 p0644 A79-48009

Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California 24 p0667 A79-50899

High-grade fuels from biomass farming - Potentials and constraints 24 p0669 A79-51194

The control system for Fort Hood Solar Total Energy System 24 p0672 A79-51742

Energy storage and conversion in conjunction with photovoltaic energy systems 24 p0679 A79-51790

Residential flywheel with turbine supply 24 p0679 A79-51792

Modeling the performance of gas-fired heat pump systems 24 p0697 A79-51963

Waste heat as an alternate fuel - Its opportunities and potential 24 p0698 A79-51968

Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system 24 p0703 A79-52010

An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling 24 p0707 A79-52574

Preliminary design package for solar heating and hot water system [NASA-CR-150619] 21 p0173 N79-10520

Solar heating and cooling demonstration project summaries [DOE/CS-0009] 21 p0186 N79-11503

Energy use in Japan and the United States [BNL-23101] 21 p0221 N79-14578

Passive thermosyphon solar heating and cooling module with supplementary heating [NASA-CR-150849] 21 p0229 N79-15402

Short-term projections of the energy supply and demand in the United States from the EIA report to Congress, 1977 [DOE/EIA-0102/37] 24 p0755 N79-30799

Reexamination of the estimation of undiscovered oil resources in the US [DOE/EIA-0103/31] 24 p0781 N79-32618

The use of the heat pumps to raise temperatures in an economical and ecological way --- domestic heating via industrial waste energy [BMFT-FB-T-78-35] 24 p0792 N79-32732

DOMESTIC SATELLITE COMMUNICATIONS SYSTEMS

Space will be the next big construction site 22 p0268 A79-24450

DOPED CRYSTALS

Preparation and properties of pure and tin doped indium oxide selective coatings 21 p0127 A79-17381

New models of solar cells and prospects for their optimization 21 p0166 A79-20346

Characterization of the effects of metallic impurities on silicon solar cell performance 23 p0504 A79-40960

The effects of copper and titanium on silicon solar cells 23 p0504 A79-40961

Effect of copper impurity on polycrystalline silicon solar cells 23 p0504 A79-40962

Optimization of exponential alloying impurity distribution in semiconductor photoconverter base 24 p0636 A79-46759

Effect of dopants on annealing performance of silicon solar cells 24 p0785 N79-32661

DOWNWASH

Supersonic flow in an MHD channel with a downwash flow at the inlet 21 p0085 A79-15342

DRAG REDUCTION

Drag reduction by cooling in hydrogen fueled aircraft 21 p0165 A79-20084

Winglets give USAF KC-135 new look in life 22 p0265 A79-23975

The minimization of drag torque for rotating disks 23 p0387 A79-33247

Laminar flow stabilization by surface cooling on hydrogen fueled aircraft [AIAA PAPER 79-1863] 24 p0643 A79-47920

Drag reduction by cooling in hydrogen-fueled aircraft
24 p0653 A79-49921

DRAINAGE
Source assessment: Water pollutants from coal storage areas
[PB-285420/6] 21 p0223 N79-14635

DRIFT RATE
Stability criteria for current-driven drift wave eigenmodes --- in tokamaks
22 p0269 A79-24813

DRILLING
Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets --- application to geothermal sources
23 p0409 A79-34076
North Stanley Polymer Demonstration Project
[BETC/RI-78/19] 23 p0588 N79-27313
Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807
Status of the offshore technology program --- conferences
[SAND-78-0665] 24 p0761 N79-30908

DROP SIZE
Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft
[AIAA PAPER 79-0186] 21 p0157 A79-19585

DRY HEAT
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280
Hot dry rock - A new potential for energy
22 p0265 A79-23832
Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems
22 p0304 A79-30123
Hot dry rock energy project
[LA-UR-77-2744] 21 p0175 N79-10540
The future of hot dry rock geothermal energy systems
[LA-UR-79-683] 24 p0786 N79-32679
Federal hot dry rock geothermal energy development program: An overview
[LA-UR-79-670] 24 p0787 N79-32690

DRYING
Upgrading lignite by the Koppelman process
21 p0146 A79-17641

DRYING APPARATUS
25 kilowatt photovoltaic powered irrigation and grain drying experiment
21 p0143 A79-17519
Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Solar farm buildings collect energy for crop drying
24 p0610 A79-45224
Solid desiccant air conditioning with silica gel using solar energy
21 p0181 N79-11464
Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638
Photovoltaic-powered irrigation experiments in the United States --- crop drying and irrigating in Nebraska
[COO-4094-28] 23 p0596 N79-27673

DUAL SPIN SPACECRAFT
Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control
21 p0148 A79-17792

DUCTED FAN ENGINES
Review of the Rhein-Flugzeugbau Wankel powered aircraft program --- ducted fan engines
22 p0329 N79-15966

DUCTED FANS
Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918

DUCTED FLOW
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
Thermoelectric magnetohydrodynamics
22 p0312 A79-31098
Two-dimensional analyses related to wave-energy extraction by submerged resonant ducts
22 p0312 A79-31099
Fully developed laminar heat transfer in passages of triangular cross section for application to solar collector plate design
[AIAA PAPER 79-0974] 23 p0458 A79-38189
Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column
23 p0480 A79-39845
Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136
MHD generator duct flow with cross stream dependent fluid properties
22 p0336 N79-16668

DUST
Effect of dust on flat plate collectors
21 p0129 A79-17399
Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067
Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749

DUST COLLECTORS
On the dynamics of electrostatically precipitated fly ash
[ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787

DUST STORMS
Effect of dust on flat plate collectors
21 p0129 A79-17399

DYE LASERS
Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981
Energy and technology review --- tunable laser system for the ultraviolet, visible, and infrared regions
[UCRL-52000-79-3] 24 p0791 N79-32727

DYES
Merocyanine organic solar cells
21 p0165 A79-20216
Performance tests of organic dyes in a planar solar concentrator with ribbon photovoltaic cells
23 p0519 A79-41074

DYNAMIC CHARACTERISTICS
New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298
On the dynamics of electrostatically precipitated fly ash
[ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator
22 p0258 A79-23137
Analysis of dynamic effects in solar thermal energy conversion systems
23 p0400 A79-34008
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937
Cryogenic thermal diode heat pipes
[NASA-CR-152268] 24 p0719 N79-28470
Applications and safety data
24 p0722 N79-28718

DYNAMIC CONTROL
Controlling the radiant flux of a high-temperature solar energy conversion system over two parameters
22 p0296 A79-28669
Control of the radiant flux of high-temperature solar-energy installations with respect to two parameters
24 p0637 A79-46907
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780

DYNAMIC LOADS
Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827
Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007
Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads --- Cold Water Pipe
24 p0621 A79-45812
Oscillations of and drift force acting on an OTEC-CWP structure --- Cold Water Pipe
24 p0622 A79-45824

Evaluation of MOSTAS computer code for predicting
dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

DYNAMIC MODELS
Dynamic model of an industrial plant manufacturing
a variety of products
21 p0051 A79-12957
A comparative analysis of three of ERDA's major R
& D programs
21 p0099 A79-16121
Gasification Combined Cycle Test Facility at
Pekin, Illinois
21 p0145 A79-17632
Transient response of MHD/steam bottoming plants
with phased air preheaters and heat capacitor
23 p0395 A79-33428
Dynamic modeling of water- and air-heating solar
collectors
23 p0531 A79-42897
Evaluation of analytical and experimental methods
for determining OTEC plant dynamics and CWP loads
--- Cold Water Pipe
24 p0621 A79-45812
Modelling and control of a fluidized bed gasifier
22 p0332 N79-16345
The Brookhaven buildings energy conservation
optimization model
[BNL-50828] 22 p0370 N79-21560
General-equilibrium approach to
energy/environmental economic analysis
[BNL-24781] 23 p0564 N79-24504
Solar Heating and Cooling of Buildings (SHACOB)
commercialization report, part B, analysis of
market development. Volume 1: Executive
summary, September 1977
[HCP/M70066-01/1-VOL-1] 23 p0574 N79-25522
Energy and materials in three sectors of the
economy: A dynamic model with technological
change as an endogenous variable
24 p0748 N79-30710

DYNAMIC RESPONSE
Dynamic response of a wind turbine system and its
effect on performance
21 p0067 A79-14293
Dynamic response of a novel solar water heater ---
collector using low-boiling liquid between flat
plates
21 p0140 A79-17488
Comparison of transient heat transfer models for
flat plate collectors
22 p0242 A79-21168
Aeroelastic stability and response of horizontal
axis wind turbine blades
23 p0483 A79-40117
Measurements of performance and structural
response of the Danish 200kW Gedser windmill
23 p0484 A79-40121
Optimal value of the rated speed of a wind generator
23 p0527 A79-41948
Dynamic and off-design analysis of OTEC closed
cycle power systems
24 p0624 A79-45837
Steady-state and dynamic performance of an OTEC
plant
24 p0624 A79-45838
Nonlinear dynamic response of wind turbine rotors
[NASA-TM-78324] 21 p0195 N79-12542
Modeling passive solar buildings with hand
calculations --- conferences
[LBL-8583] 23 p0596 N79-27683

DYNAMIC STRUCTURAL ANALYSIS
Evaluation of MOSTAS computer code for predicting
dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007
Prediction of stresses and natural frequencies for
high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177
Investigations on the aeroelastic stability of
large wind turbines
23 p0483 A79-40116
The aeroelastic behaviour of large Darrieus-type
wind energy converters derived from the
behaviour of a 5,5 m rotor
23 p0483 A79-40119

DYNAMIC TESTS
Air bearing development for a GM automotive gas
turbine
[SAE PAPER 790107] 22 p0314 A79-31355
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937

DYNAMOMETERS
Performance characteristics of automotive engines
in the United States. First series, report no.
19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-1531

E

EARTH ALBEDO
Irradiances on inclined surfaces --- from solar
and sky radiation and earth albedo
21 p0055 A79-13624

EARTH ATMOSPHERE
Diffuse solar radiation on a horizontal surface
for a clear sky
22 p0242 A79-21167

EARTH CRUST
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-2328
Continental geotherms during the Archaean --- heat
production in ancient earth crust
22 p0269 A79-24620
Hot dry rock energy project
23 p0408 A79-3407
Determination and interpretation of the geothermal
flux at Bournac /Haute-Loire/
23 p0480 A79-39850
Evaluation of intermediate-period seismic waves as
a geothermal exploration tool
24 p0744 N79-29716

EARTH ENVIRONMENT
Optics in adverse environments; Proceedings of the
Seminar, San Diego, Calif., August 25, 26, 1977
21 p0044 A79-12037

EARTH ORBITS
Enhanced solar energy options using earth-orbiting
mirrors
21 p0019 A79-10162
Orbiting mirrors for terrestrial energy supply
21 p0108 A79-1660
Behavior of solar generators in low orbits
24 p0752 N79-30766

EARTH RESOURCES
Comparison of shale oils from different sources
produced by controlled-state retort
21 p0005 A79-10047
Permeability enhancement using explosive techniques
--- georesources recovery techniques
21 p0005 A79-10048
Toward a materials-conservation ethic
21 p0167 A79-20438
Future programs and prospects for resource
exploration from space by the year 2000
[AAS PAPER 78-182] 22 p0243 A79-21275
Climatic change in connection with energy growth
--- resource consumption effects
22 p0284 A79-26623
World energy scene and Brazil's alternatives
23 p0388 A79-33259
Outlook for world oil into the 21st century with
emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-1105
A synoptic description of coal basins via image
processing
[NASA-CR-157970] 21 p0204 N79-13474
Identification of wood energy resources in central
Michigan
[NASA-CR-158130] 22 p0347 N79-1842
The world balance for energy needs in view of year
2000: Development of the problem and areas
involved, part 2
[PLI-BISLEY-TR-3395-(9091.9F)] 22 p0347 N79-18442
A directory of computer software applications:
Natural resources and earth sciences
[PB-288486/4] 23 p0551 N79-2371
European Scientific notes, volume 32, number 4
[AD-A065399] 23 p0552 N79-2388
Re-examination of undiscovered oil resources in
the United States
[DOE/EIA-0103/9] 23 p0593 N79-27643
Estimation methodology for energy supply from
natural resources
[EPRI-EA-788] 24 p0718 N79-2035
Program report for FY 1978: Atmospheric and
Geophysical Sciences Division of the Physics
Department
[UCRL-51444-78] 24 p0722 N79-2066

Application of resource allocation models to the problems of regional energy policy in large developing countries --- conferences
[BNL-25537] 24 p0728 N79-28779
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354
Clean energy from coal
[PETC-1000] 24 p0733 N79-29370
International energy evaluation system. Volume 1: Executive summary
[HCP/T8602-01/1] 24 p0742 N79-29662
Technical aspects of the Resource Conservation and Recovery Act upon coal combustion and conversion systems
[ORNL/OEPA-10] 24 p0748 N79-30687
Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 --- congressional reports
[GPO-36-187] 24 p0750 N79-30725

EARTH SATELLITES
Towards an adequate legal regulation of the geostationary orbit
24 p0663 A79-50855
Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272

EARTH SURFACE
Fundamentals of mathematical modeling of solar-radiation regime energy structure
21 p0166 A79-20352
Surtrace - An airborne geochemical system --- for earth surface micro-layer exploration
22 p0255 A79-22557

ECOLOGY
Assessing environmental costs of energy procurement
21 p0071 A79-14682
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6] 22 p0339 N79-17309
Ecological effects of coal-fired steam-electric generating stations
22 p0346 N79-18358
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679
An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California
[PB-293331/1] 23 p0585 N79-26562
Water and energy resource development in the Tongue River Basin, southeastern Montana
24 p0735 N79-29566
The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report
[PB-294228/2] 24 p0744 N79-29703
EPA program status report: Oil shale, 1979 update
[PB-294998/0] 24 p0796 N79-33538

ECONOMETRICS
Econometric analysis of concentrators for solar cells
21 p0149 A79-19017
Technical-economic modeling in energy planning
23 p0419 A79-34164
Econometric-engineering analysis of Federal energy conservation programs in the commercial sector
[ORNL/CON-30] 23 p0562 N79-24489
Demonstration of the capabilities of the Livermore energy policy model
[UCRL-52508] 24 p0788 N79-32695

ECONOMIC ANALYSIS
A method for the comparative economic assessment of storage systems
[BNL-24473] 21 p0013 A79-10111
Considerations for MHD power generation development
21 p0016 A79-10136
Advanced wind furnace systems for residential and agricultural heating and electrical supply applications
21 p0028 A79-10237
Economic methodology for solar power-generating systems
21 p0030 A79-10251
The economic performance of passive solar heating - A preliminary analysis --- thermal storage wall for family home design
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy
[AIAA PAPER 78-1767] 21 p0061 A79-13866
A standard procedure of economic evaluation for energy-producing and pollution-abatement operations
21 p0064 A79-14109
Exploring future energy options - An economic analysis
21 p0068 A79-14324
Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691
Comparison of nuclear and coal power plants using Net Energy Analysis
21 p0073 A79-14692
Heat pumps without supplemental heat
21 p0073 A79-14695
Low head power generation with bulb turbines --- hydroelectric installations
21 p0074 A79-14705
Economics and net energy analysis - Is a new analytical technique needed for energy decision making
21 p0074 A79-14706
Basic technical and economical aspects of the use of solar energy for pumping irrigation water
21 p0076 A79-14763
A challenging role for the assurance sciences --- in energy conversion technology
21 p0086 A79-15396
Design of active solar heating systems
21 p0090 A79-15860
Theory of solar assisted heat pumps
21 p0090 A79-15864
An introduction to ocean thermal energy conversion /OTEC/ power plants
21 p0091 A79-15869
Materials and economics of energy systems
21 p0095 A79-15911
A methodological note on the evaluation of new technologies - The case of coal gasification
21 p0099 A79-16122
An economist looks at solar energy - The government's role
21 p0099 A79-16132
Current solar applications and economics
21 p0099 A79-16134
Economic opportunities of space enterprise in the next decades
21 p0100 A79-16137
Controls for residential solar heating
21 p0101 A79-16418
Solar collectors. II - Recent developments and future performance data and economic analysis
21 p0103 A79-16456
Energy conservation by means of recycling
21 p0112 A79-16735
The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736
Input-output method applied to energy planning
21 p0112 A79-16737
Design considerations for solar power satellites
21 p0113 A79-16738
Energy economics - A research analysis --- considering OPEC Cartel impact
21 p0115 A79-17222
Energy and input-output analysis --- for predicting impact on U.S. economy
21 p0115 A79-17223
Energy balances as a means for the evaluation of solar energy in developing countries
21 p0118 A79-17290
Economic evaluation and optimization of solar heating systems
21 p0118 A79-17293
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294
Optimal profile of solar energy collectors
21 p0130 A79-17408

Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505
Technical and economic feasibility of making fertilizer from wind energy, water, and air
21 p0142 A79-17512
OTEC in Europe --- economic aspects of Ocean Thermal Energy Conversion
21 p0152 A79-18109
Review of optimization and economic evaluation of potential tidal power developments in the Bay of Fundy
21 p0152 A79-18111
The economics of Fundy tidal power
21 p0152 A79-18112
Energy storage - Economics and fuel conservation
21 p0153 A79-18464
Financial/management scenarios for a satellite power system program
[AAS PAPER 78-144] 22 p0243 A79-21259
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
The economics of geothermal energy development at the regional level
22 p0256 A79-22756
An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing
22 p0264 A79-23780
Economic feasibility of solar water and space heating
22 p0292 A79-27899
Solar thermal electrical power plants for Iran
22 p0295 A79-28352
The energy and resource implications associated with the widespread use of electric vehicles
22 p0301 A79-29489
The fleet operator's viewpoint --- on prototype electric bus development
22 p0302 A79-29495
A flywheel energy storage and conversion system for solar photovoltaic applications
[ASME PAPER 79-SOL-1] 22 p0307 A79-30539
The economics of electric power generation from wind energy
22 p0310 A79-30998
Fuel gas production from animal residue. II - An economic assessment
23 p0381 A79-32594
Some economic considerations in the rush toward alternate energy sources
23 p0389 A79-33268
Modular stackable hot water storage/heat exchanger system for solar installations
23 p0400 A79-34004
An economic comparison between solar and conventional residential air conditioning in Miami, Florida
23 p0401 A79-34013
System studies for a tokamak fusion power plant
23 p0407 A79-34061
The Synthane process - A technical and economic assessment --- of coal gasification
23 p0410 A79-34089
An evaluation of integrated coal gasification/water-splitting processes
23 p0411 A79-34094
Hydrogen fuel production by wind energy conversion
23 p0413 A79-34113
A thermoeconomic analysis of thermal energy storage
23 p0416 A79-34138
A unified methodology for cost analysis of energy production
23 p0419 A79-34159
Comparative economics of alternative fuels for intermediate services, combined cycle power plant
23 p0419 A79-34160
The impact of oil price increases on the competitiveness of non-conventional energy technologies
23 p0419 A79-34162
Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future
23 p0420 A79-34168
Coupled systems and energy policy - Closing the supply/demand gap: Are there many roads not taken
23 p0421 A79-34175
Effects of energy conservation research, development, and demonstration on residential energy use
23 p0422 A79-34276
Solar energy conversion: The solar cell --- Book
23 p0423 A79-34449
Excavation costs for lunar materials
[AIAA PAPER 79-1376] 23 p0425 A79-34828
Aspects of the supply potential of the heat pump --- economic analysis
23 p0433 A79-35229
Solar power plants. II - Economic aspects of solar power towers
23 p0435 A79-35482
Solar energy as the basis of an energetic system
23 p0435 A79-35491
The impact of price expectations on the demand for electrical energy in the United States
23 p0447 A79-37286
A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774
System economic optimisation for wave energy
23 p0450 A79-37864
A 'real life' solar air conditioned house project
23 p0463 A79-38577
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592
Analysis of a 1 kW photovoltaic generator with concentration
23 p0466 A79-38604
Solar air conditioning and refrigeration in arid regions
23 p0466 A79-38608
A solar assisted economy --- system for peak electrical generation and off-peak storage or fuel production
23 p0469 A79-38632
Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States
23 p0470 A79-38646
Legal and economic aspects of engineering design in solar water heating systems
23 p0473 A79-38664
Solar energy systems and life cycle cost
23 p0474 A79-38672
Commercialization aspects of solar process hot water systems for the textile industry
[AIAA PAPER 79-1027] 23 p0476 A79-38896
Critical comments on energy models
23 p0481 A79-39990
An economic model to establish the value of WECS to a utility system --- Wind Energy Conversion System
23 p0485 A79-40131
The economics of energy recovery from industrial waste incineration
23 p0490 A79-40406
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/ --- Book
23 p0493 A79-40699
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079
Remarks on economic growth and energy requirements
23 p0535 A79-43523
The influence of increasing energy costs on the economic dimensioning of electrical energy distribution equipment
23 p0535 A79-43524
Energy management up to the turn of the century - Options and constraints
23 p0536 A79-43525
Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy
23 p0536 A79-43575
The economics of solar domestic hot water systems in state university and community college buildings
24 p0610 A79-45227
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595
An overview of the Japanese OTEC development
24 p0616 A79-45779

Economic overview of vertical axis wind turbines
24 p0633 A79-46528
Electric utility application of WECS in an island location --- Wind Energy Conversion System in Hawaii
24 p0634 A79-46534
WELMM analysis and solar energy conversion systems --- economic analysis
24 p0644 A79-48022
Solar comes out of the shadows --- energy conversion technology forecasting
24 p0651 A79-49424
Projected techno-economic improvements for advanced solar thermal power plants
24 p0671 A79-51733
Economic and performance comparisons of salty and saltless solar ponds
24 p0671 A79-51737
Solar thermal power plants in small utilities - An economic impact analysis
24 p0675 A79-51761
The design of photovoltaic systems for intermediate-sized applications
24 p0675 A79-51762
Technology impact study of a high efficiency industrial heat pump
24 p0697 A79-51966
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere
[IAF PAPER 79-A-16] 24 p0711 A79-53419
Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies
24 p0714 A79-54278
An economical approach to space power systems
21 p0170 N79-10139
Energy: The new economic development wildcard
[PB-282494/4] 21 p0177 N79-10564
Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation
[EPRI-AF-753] 21 p0185 N79-11499
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537
Energy and the economy
[EPRI-FA-620-VOL-1] 21 p0189 N79-11539
Application of solar technology to today's energy needs, volume 1
[PB-283770/6] 21 p0190 N79-11548
Methanol from wood waste: A technical and economic study
[FPL-12] 21 p0194 N79-12239
Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026
Energy systems studies program
[BNL-50822] 21 p0209 N79-13526
Three modes of energy cost analysis: Then-current dollars, base-year dollars, and perpetual-constant dollars
[ORAU/IEA(M)-78-10] 21 p0209 N79-13531
Proposed standby gasoline rationing plan. Economic and regulatory analysis draft
[DOE/ERA-0009] 21 p0214 N79-13934
Analytical methods
21 p0218 N79-14531
Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946
Satellite Power Systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis
[NASA-CR-158068] 21 p0225 N79-15141
Satellite power systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis, appendixes
[NASA-CR-150702] 21 p0225 N79-15142
Energy and economic analysis of industrial process heat recovery with heat pumps
22 p0331 N79-16210
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380
Solar heating of buildings: Design optimization and economic analysis
22 p0353 N79-19439
An economic analysis of a commercial approach to the design and fabrication of a space power system
[NASA-TM-79153] 23 p0539 N79-22193
Space-based solar power conversion and delivery systems study. Volume 1: Executive summary
[NASA-CR-150294] 23 p0541 N79-22617
Space-based solar power conversion and delivery systems study. Volume 5: Economic analysis
[NASA-CR-150298] 23 p0541 N79-22621
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508
General-equilibrium approach to energy/environmental economic analysis
[BNL-24781] 23 p0564 N79-24504
Method for the comparative economic assessment of energy storage systems
[BNL-25291] 23 p0565 N79-24509
A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives --- economic analysis
23 p0567 N79-24813
Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501
Analysis of the energy and economic effects of Iranian oil shortfall
[PB-292634/3] 23 p0575 N79-25540
The production of ethanol from agricultural waste: An economic evaluation
[PB-292552/7] 23 p0577 N79-26233
Coal liquefaction: Report on a focus group discussion
[DOE/TIC-10039] 23 p0589 N79-27339
Citizens' solar program: State reports on barriers and strategies to renewable energy development
[HCP/U6308-01] 23 p0598 N79-27703
Midterm oil and gas supply modeling system methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059
Technical and economic assessment of solar hybrid repowering
[SAN-1608-4-1] 24 p0729 N79-28791
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
Oil shale: Report on a focus group discussion
[DOE/TIC-10032] 24 p0735 N79-29576
Economic analysis of solar photovoltaics for low-power lighted aids to navigation
[AD-A068365] 24 p0738 N79-29615
Role of government in solar energy development: A view from the northwest --- economic feasibility of solar heating
[PNL-2784] 24 p0738 N79-29621
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634
Energy supply and demand balances and financing requirements in non-OPEC developing nations
[HCP/H6407] 24 p0741 N79-29650
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Energy and materials in three sectors of the economy: A dynamic model with technological change as an endogenous variable
24 p0748 N79-30710
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
International energy evaluation system. Volume 2: Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796
Energy use and conservation in industrialized countries
[LBL-7872] 24 p0756 N79-30802

Methodology for the analysis of investment
  alternatives to stimulate development and
  technology transfer for energy technologies
  [TID-28971] 24 p0757 N79-30809
Methodology for determining the economic
  feasibility of residential or commercial solar
  energy systems
  [SAND-78-0931] 24 p0759 N79-30827
Economic performance: Evaluations for solar energy
  [LA-UR-79-901] 24 p0759 N79-30828
Evaluation of future world oil prices
  [DOE/EIA-0102/41] 24 p0762 N79-31082
Analysis of investment alternatives to stimulate
  development and technology transfer for energy
  technologies, solar photovoltaics, a case study
  [TID-28968] 24 p0773 N79-31795
Summary of application analysis for photovoltaic
  systems
  [SAND-78-0980C] 24 p0773 N79-31796
Feasibility of district heating of northern US
  cities by cogeneration
  [ANL/EES-CP-18] 24 p0776 N79-31829
Role of refined product imports in the domestic
  fuel market
  [DOE/EIA-0102/53] 24 p0778 N79-32372
Heat pump/rock bed storage systems --- computer
  program for economic analysis
  [COO-4704-2] 24 p0789 N79-32705
Economic evaluation of fabric filtration versus
  electrostatic precipitation for ultrahigh
  particulate collection efficiency
  [EPRI-FP-775] 24 p0796 N79-33352
Energy supply and demand modeling. A bibliography
  with abstracts
  [NTIS/PS-79/0665] 24 p0802 N79-33605
ECONOMIC DEVELOPMENT
Uncoupling of economic growth and energy
  consumption - A new strategy of energy politics
  or only a new slogan
  22 p0310 A79-30997
Energy impact on economic activity and long-term
  trend forecast
  23 p0419 A79-34163
Energy needs, uses, and resources in developing
  countries
  [BNL-50784] 21 p0185 N79-11500
Characteristics of a typical village in the solar
  belt of the developing countries of Asia,
  Africa, and Latin America
  23 p0571 N79-25497
SEMTAP: A new technology transfer network to link
  business and industry with Federal research and
  development --- energy technology
  [PB-292882/8] 23 p0587 N79-27026
Forecast of future aviation fuels. Part 1:
  Scenarios
  [NASA-CR-158871] 24 p0732 N79-29354
National coal model: Coal supply curves
  [DOE/EIA-0103/2] 24 p0746 N79-30400
Energy and labor intensities projected to the year
  2010
  [COO-4628-2] 24 p0750 N79-30727
Short-term projections of the energy supply and
  demand in the United States from the EIA report
  to Congress, 1977
  [DOE/EIA-0102/37] 24 p0755 N79-30799
Methodology for the analysis of investment
  alternatives to stimulate development and
  technology transfer for energy technologies
  [TID-28971] 24 p0757 N79-30809
Energy and labor intensities projected to the year
  2010
  [COO-4628-2] 24 p0772 N79-31788
ECONOMIC FACTORS
Performance and economic risk evaluation of
  dispersed solar thermal power systems by Monte
  Carlo simulation
  21 p0020 A79-10163
Residential energy design
  21 p0073 A79-14694
Factors influencing solar energy commercialization
  21 p0093 A79-15897
Time, technology and capital - Do we have enough
  to solve the energy crisis
  21 p0097 A79-16100
The economics and policy of alternative energy
  sources - A review
  21 p0103 A79-16454
Technical and economic aspects of open-cycle MHD
  power plants
  21 p0105 A79-16482
Factors affecting market initiation of solar total
  energy
  21 p0112 A79-16732
Economic evaluation of the ATC/Wellman
  incandescent two-stage low Btu coal gas producer
  21 p0146 A79-17640
Gasification of coal with high-temperature reactor
  heat - Investigations concerning the market and
  the economics
  22 p0264 A79-23828
Space reflector technology and its system
  implications
  [AIAA PAPER 79-0545] 22 p0273 A79-25852
Economic prospects for solar energy for industrial
  process heat
  23 p0403 A79-34033
Economic, political and psychosocial barriers to a
  change-over to renewable energy resources
  23 p0421 A79-34176
Introducing new technologies for alternative
  energy sources - The economic, social, and
  environmental considerations for developing
  countries
  23 p0421 A79-34177
Technical and economic factors for evaluating flue
  gas desulfurization technologies
  23 p0424 A79-34458
Lunar resources utilization - An economic assessment
  --- of manufacturing and construction of large
  structures in space
  [AIAA PAPER 79-1412] 23 p0426 A79-34845
Commercial potential of the Space Shuttle
  [AAS PAPER 79-058] 23 p0438 A79-36548
Power management battery storage systems
  [AIAA PAPER 79-0932] 23 p0457 A79-38186
Selection and development of small solar thermal
  power applications
  [AIAA PAPER 79-1005] 23 p0459 A79-38198
Converting coal to liquid/gaseous fuels
  23 p0461 A79-38376
Mass production of solar collectors and components
  23 p0467 A79-38614
The LN solar/heat pump house at Skive, Denmark
  23 p0471 A79-38652
Wind energy plants for electric generation -
  Economic significance and example
  23 p0472 A79-38662
Conditions for the use of solar energy
  23 p0473 A79-38669
Wind turbines for electric utilities - Development
  status and economics
  [AIAA PAPER 79-0965] 23 p0475 A79-38888
Recent developments in wind energy
  23 p0482 A79-40104
Windpower programmes in Tanzania
  23 p0482 A79-40106
Economic factors in refuse derived fuel utilization
  23 p0490 A79-40407
Planning for resource recovery in the 'Big Apple'
  --- New York City plans for refuse utilization
  23 p0491 A79-40424
New energy conversion techniques in space,
  applicable to propulsion --- powering of
  aircraft with laser energy from SPS
  [AIAA PAPER 79-1338] 23 p0493 A79-40490
Potential of biomass to substitute for petroleum
  in Canada
  23 p0494 A79-40743
Role of hydrogen in Eco Energy
  24 p0612 A79-45579
Economics of small user hydrogen --- future
  requirements and predicted costs for industrial
  use
  24 p0613 A79-45583
Hydrogen production via the K-T gas gasification
  process - Current economic and technological
  aspects
  24 p0613 A79-45586
Dedicated nuclear facilities for electrolytic
  hydrogen production
  24 p0614 A79-45592
Workshop on Economic and Operational Requirements
  and Status of Large Scale Wind Systems,
  Monterey, Calif., March 28-30, 1979, Proceedings
  24 p0633 A79-46526

Conserving energy via cogeneration
24 p0636 A79-46660

Outlook for electric road vehicles
24 p0650 A79-49380

A few considerations on new energy source
24 p0652 A79-49514

What will be the price for energy tomorrow. I - Coal price
24 p0652 A79-49515

Energy, development and diplomacy --- international relations among petroleum producers and consumers
24 p0652 A79-49518

Energy savings
24 p0653 A79-49521

Energy and society
24 p0653 A79-49523

Economic evaluation and optimization of solar heating systems
24 p0660 A79-50537

Today's geothermal power economics and risks
24 p0689 A79-51869

System aspects of geothermal resources utilization - The case of Castelnuovo Val di Cecina as an example
24 p0689 A79-51871

Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418

Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier
[EPRI-AF-782] 21 p0180 N79-11238

Energy situation in the Mid-Atlantic region
[BNL-50703] 21 p0188 N79-11528

Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics
[PB-284743/2] 21 p0217 N79-14521

Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108

Assessment of the potential of solar thermal small power systems in small utilities
[NASA-CR-158093] 22 p0335 N79-16377

Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503

Adaptation for the economy or adaptation for energy conservation --- passenger aircraft design
[AAAF-NT-77-23] 23 p0551 N79-23537

Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis
[EPRI-ER-808-VOL-1] 23 p0597 N79-27687

Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0599 N79-27712

Energy intensity and related parameters of selected transportation modes: Passenger movements
[ORNL-5506] 24 p0731 N79-29115

Commercialization focus group interview: Medium and low Btu coal gasification
[DOE/TIC-10029] 24 p0733 N79-29371

Assessment of the technoeconomic feasibility or Seasonal Thermal Energy Storage systems (STES)
[ANL/EES-TM-35] 24 p0740 N79-29637

Analysis of the productivity of domestic petroleum exploration activities
[DOE/EIA-0102/7] 24 p0748 N79-30691

A European low-cost solution for Spacelab Power augmentation
24 p0751 N79-30745

Economic overview of vertical axis wind turbines --- conferences
[SAND-79-9733C] 24 p0753 N79-30773

Energy use and conservation in industrialized countries
[LBL-7872] 24 p0756 N79-30802

Economic performance: Evaluations for solar energy
[LA-UR-79-901] 24 p0759 N79-30828

Economic structure and behavior in the natural gas production industry
[PB-294610/1] 24 p0760 N79-30839

Supersonic transport vis-a-vis energy savings
[NASA-TM-75464] 24 p0763 N79-31163

Biomass conversion --- congressional reports agriculture technology assessment
[GPO-32-317] 24 p0765 N79-31404

Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

Fossil energy program summary document
[DOE/ET-0087] 24 p0788 N79-32696

The potential for hydrogen as an energy source
[PB-295317/2] 24 p0795 N79-33345

Solar energy policy
[PB-296193/6] 24 p0802 N79-33603

Environmental, socioeconomic, and consumer protection aspects of selected decentralized solar energy applications
24 p0803 N79-33609

ECONOMIC IMPACT

Thermionic power plant design point selection - The economic impact
21 p0025 A79-10214

Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741

Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294

Costs and impacts of financial incentives for solar energy systems
21 p0119 A79-17296

Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719

The impact of alternate energy resources on the future supply of electric power
[IEEE PAPER F 78 672-8] 22 p0304 A79-29939

Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057

Estimating the commercial potential and energy benefits of ERDA electric energy research
23 p0419 A79-34161

Energy use and society in the 21st century --- development cost effects on growing GNP economy
23 p0420 A79-34165

National coal utilization assessment: An integrated assessment of increased coal use in the midwest: Impacts and constraints, volume 1
[ANL/AA-11-VOL-1-DRAFT] 21 p0174 N79-10537

Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

A detailed analysis of the impact of onsite equipment on utility costs --- marginal costs of providing backup power for solar energy systems
21 p0218 N79-14535

The national energy plan: Options under assumptions of national security threat --- economic impact procurement policy, and resources management
[H-PRINT-95-48] 21 p0228 N79-15398

Energy and the economy: The economic impact of alternative energy supply-demand assumptions
[H-PRINT-95-51] 22 p0333 N79-16352

Economic impacts of a transition to higher oil prices --- estimation and budget allocations
[BNL-50871] 22 p0364 N79-20927

Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970

Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3] 23 p0546 N79-22971

Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems --- eskimos
[PB-291918/1] 23 p0546 N79-22972

Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming
23 p0551 N79-23551

Cost study application of the guidebook on integrated community energy systems: Indirect economic and energy impacts
[ANL/ICES-TM-17] 24 p0727 N79-28777

Guidebook on integrated community energy systems: Indirect economic and energy impacts
[ANL/ICES-TM-16] 24 p0728 N79-28778

Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0750 N79-30727
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798
Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699
Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724

ECONOMICS
The economics of solar heating and cooling - A cautious view
21 p0119 A79-17297
Function of economics in energy policy
23 p0422 A79-34179
Energy policies in the context of global economics
23 p0433 A79-35228
The enigma of the eighties: Environment, economics, energy; Proceedings of the Twenty-fourth National Symposium and Exhibition, San Francisco, Calif., May 8-10, 1979. Books 1 & 2
23 p0533 A79-43228
Assessmentt of wind energy systems in a utility framework
24 p0677 A79-51779
Economics of fusion research
[COO-4181-] 21 p0193 N79-11890
Factors affecting the decline rate of old oil production
[DOE/EIA-0102/29] 24 p0720 N79-28652

ECOSYSTEMS
Energy technologies and natural environments - The search for compatibility
21 p0074 A79-14721
Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549
Impact prediction manual for geothermal development
[PB-288128/2] 22 p0349 N79-18462
Environmental development plan for transportation energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899

EDDY CURRENTS
On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742
Differential pressure measurements in high temperature environments
21 p0144 A79-17599

EDUCATION
Industrial aspects in solar energy instruction
22 p0254 A79-22274
Training energy specialists - A proposal
23 p0388 A79-33257
Energy education training: Feasibility study
[PB-285910/6] 21 p0230 N79-15428
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495
Workshop on Energy Sources and Electric Power Generation for High School Students --- Coal-fueled systems were studied in similar fashion but enriched by visits to strip mining
[TID-28975] 24 p0740 N79-29643
Comprehensive program and plan for federal energy education, extension and information activities
[DOE/CS-0071] 24 p0757 N79-30814
Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800

EFFICIENCY
Solar cells for solar power satellites
24 p0751 N79-30749

EFFLUENTS
The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358
Emissions from pressurized fluidized-bed combustion processes
22 p0261 A79-23640
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614

EGYPT
Possibilities for solar energy utilization in Egypt
21 p0102 A79-16453

EJECTORS
Ejector augmentation of the air supply in a compressed air energy storage plant
21 p0013 A79-10109
Equations of a conduction MHD ejector
22 p0298 A79-29289
Equations of a conduction-type MHD linkage
24 p0663 A79-50779

EL SALVADOR
Geothermal power plants of Mexico and Central America: A technical survey of existing and planned installations
[COO-4051-26] 24 p0740 N79-29638

ELASTIC DEFORMATION
Elastically deformed, linear focusing solar reflector
24 p0670 A79-51728

ELASTOMERS
Compatibility of elastomers in alternate jet fuels
[NASA-CR-158773] 23 p0588 N79-27321
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

ELECTRETS
Polyelectrolyte electrets for electrical energy storage
24 p0632 A79-46316

ELECTRIC ARCS
Mechanism of erosion of metal electrodes of the channel of a MHD generator
22 p0306 A79-30391
Axial field limitations in MHD generators
[FE-2341-8] 22 p0362 N79-20512

ELECTRIC AUTOMOBILES
The propulsion of vehicles by a flywheel
21 p0031 A79-10452
Electric automobiles - Yes
21 p0046 A79-12265
Partial energy supply to electric vehicles through solar cell system
21 p0077 A79-14767
Flywheels for vehicles --- auxiliary power in electric automobiles
21 p0092 A79-15885
Electric vehicles challenge battery technology
21 p0093 A79-15892
Composite material flywheel for the electric-powered passenger vehicle
22 p0240 A79-20842
Flywheel energy accumulators for road vehicles
22 p0241 A79-20845
Electric vehicle progress in the U.S. - Where to
22 p0269 A79-24611
Electricity - An indigenous transport fuel
22 p0292 A79-27898
EPRI/TVA pilot electric vehicle demonstration program
[SAE PAPER 790110] 22 p0314 A79-31357
The London Electric Delivery Van Assessment Scheme
[SAE PAPER 790111] 22 p0314 A79-31358
Electric vehicle battery development
[SAE PAPER 790158] 22 p0314 A79-31363
Outlook for electric road vehicles
24 p0650 A79-49380
Battery systems for electric vehicles - A state-of-the-art review
24 p0652 A79-49488
Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538
Impact of electric passenger automobiles on utility system loads, 1985 - 2000
[EPRI-EA-623] 21 p0203 N79-13281
Electric and hybrid vehicle program
[DOE/CS-0068] 23 p0567 N79-24900

ELECTRIC BATTERIES
The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838

Progress in batteries and solar cells. Volume 1 --- Book
21 p0148 A79-17989
Energy storage by the use of high temperature electrochemical systems
21 p0148 A79-17992
Development of a 1 kW fuel cell aggregate with acid electrolyte
21 p0148 A79-17994
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480
Effect of electrolyte impurity on the electrochemical performance of the lead/tetrafluoroboric acid/lead dioxide cell
22 p0246 A79-21485
Energy storage requirements for spacecraft
22 p0246 A79-21486
Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells
22 p0246 A79-21487
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996
On future carburants. II --- alternative fuels from alcohols and hydrogen
22 p0296 A79-28439
EPRI/TVA pilot electric vehicle demonstration program
[SAE PAPER 790110] 22 p0314 A79-31357
Batteries, fuel cells, a hydrogen economy - Keynote address
23 p0451 A79-37873
Power management battery storage systems
[AIAA PAPER 79-0982] 23 p0457 A79-38186
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079
Spacecraft power systems
23 p0533 A79-43199
Solid state electrodes for high energy batteries
24 p0611 A79-45479
Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557
Regenerative flywheel energy storage system
24 p0678 A79-51783
A zinc-bromine battery for energy storage
24 p0684 A79-51832
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838
Long-term prediction of power system performance for geosynchronous spacecraft
24 p0691 A79-51899
Technology status: Batteries and fuel cells
21 p0170 N79-10132
Battery workshop
21 p0170 N79-10143
Battery and electrochemical systems program summary, FY 1977
[DOE/ET-0014] 21 p0176 N79-10546
Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479
Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1] 21 p0184 N79-11490
Electric batteries. A bibliography
[TID-3361] 21 p0184 N79-11491
Sodium-antimony trichloride battery development program for load leveling
[EPRI-EM-751] 21 p0186 N79-11501
A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558
Design and cost study of a nickel-iron oxide battery for electric vehicles. Volume 2: Public report
[ANL-K-3723-VOL-1] 21 p0222 N79-14579
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344
The optimum voltage for batteries used in standby lighting systems
[BLL-RTS-11512] 22 p0347 N79-18439
Thin film battery/fuel cell power generating system
[CONS/1197-9] 22 p0369 N79-21556
The 1977 Goddard Space Flight Center Battery Workshop
[NASA-CP-2041] 22 p0370 N79-21565
Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571
NASA's OAST program: An overview
22 p0370 N79-21574
Effort of the Jet Propulsion Laboratory
22 p0370 N79-21575
Lewis Research Center program
22 p0370 N79-21576
Accelerated test program
22 p0370 N79-21577
Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930
Demands and effects of solar technology on electric power storage
[AED-CONF-78-155-047] 23 p0596 N79-27678
NASA's lithium cell technology program
24 p0722 N79-28709
Applications and safety data
24 p0722 N79-28718

ELECTRIC BRIDGES
Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690

ELECTRIC CELLS
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091

ELECTRIC COILS
Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489

ELECTRIC CONDUCTORS
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318
Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44545
High-current Al-TiNb composite conductor for large energy storage magnets
24 p0604 A79-44546
A single insulated sodium conductor for HVDC underwater power transmission
24 p0620 A79-45800
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298

ELECTRIC CONNECTORS
Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530
Some current developments in solar array technology at AEG-Telefunken
24 p0751 N79-30736

ELECTRIC CONTACTS
High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228
Optimization of tapered busses for solar cell contacts
23 p0440 A79-36638
High-temperature contacts for silicon solar cells
23 p0502 A79-40934
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977
Contact resistance of silver ink on solar cell
23 p0506 A79-40978
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979
Evaluation of thick film materials for use as solar cell contacts
23 p0507 A79-40980

Optimizing solar cell performance by simultaneous consideration of grid pattern design and interconnect configuration 23 p0507 A79-40981

Reliability analysis of contracts to silicon solar cells for use in concentrated sunlight 23 p0517 A79-41058

Intercell ohmic contacts for high efficiency multijunction solar converters 24 p0786 N79-32673

ELECTRIC CONTROL

Consolidation and local control of power in an MHD generator 23 p0395 A79-33425

ELECTRIC CORONA

Theory of the striated corona in a theta pinch 22 p0295 A79-28315

ELECTRIC CURRENT

Analysis of electrolyte shunt currents in fuel cell powerplants 21 p0039 A79-11816

Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells 21 p0166 A79-20354

The economics of electric power generation from wind energy 22 p0310 A79-30998

Plasma behavior near the neutral line between parallel currents --- in planar zeta pinch 22 p0324 A79-31754

Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents 23 p0511 A79-41012

Inhomogeneity of the transverse current in an MHD channel and its effect on the local characteristics of an MHD generator 24 p0706 A79-52369

Plasma sheath effects and voltage distributions of large high-power satellite solar arrays 23 p0552 N79-24024

A theoretical analysis of the current-voltage characteristics of solar cells [NASA-CR-158872] 24 p0737 N79-29606

ELECTRIC DISCHARGES

Response of lead-acid batteries to chopper-controlled discharge --- for electric vehicles 21 p0011 A79-10097

'Local' breakdown criterion in highly ionized gas flow 21 p0049 A79-12683

Environmental interaction implications for large space systems 23 p0552 N79-24027

Discharge characteristics of 300 ampere-hour Ni-Zn traction cells [NASA-TM-79244] 24 p0772 N79-31781

ELECTRIC ENERGY STORAGE

Electrochemical engines for power generation and load-leveling at sites for underground coal conversion 21 p0005 A79-10051

100MWh zinc-chlorine peak-shaving battery plants 21 p0011 A79-10096

Calcium/iron sulfide secondary cells 21 p0041 A79-11835

Conductor for LASL 10-MWhr superconducting energy storage coil 21 p0085 A79-15309

Compatibility of direct energy storage devices with ac. processing power system components 21 p0111 A79-16728

Controlling a wind generator for increased efficiency 21 p0113 A79-16743

Energy storage - Economics and fuel conservation 21 p0153 A79-18464

Superconducting energy storage magnets 22 p0236 A79-20537

Composite material flywheels for energy storage on electricity supply systems 22 p0241 A79-20852

Economic prospects for the application of new electric energy storage devices 22 p0246 A79-21490

Prospects for improvements in lead-acid batteries --- for electric vehicles 22 p0300 A79-29488

Homopolar generator energy storage for fusion reactors 22 p0304 A79-29942

Unique aspects of terrestrial photovoltaic system design [ASME PAPER 79-SOL-14] 22 p0308 A79-30548

Storage of electricity 23 p0524 A79-41804

High-current Al-TiNb composite conductor for large energy storage magnets 24 p0604 A79-44546

Polyelectrolyte electrets for electrical energy storage 24 p0632 A79-46316

Thermal storage of off-peak electrical energy in solar heating and cooling systems 24 p0644 A79-47945

Superconductive magnetic energy storage inductor converter units 24 p0654 A79-50072

Region at the crossroads: The Pacific Northwest searches for new sources of electric energy [PB-284691/3] 21 p0222 N79-14583

Dynamic analysis of a photovoltaic power system with battery storage capability [NASA-TM-79209] 24 p0736 N79-29599

ELECTRIC EQUIPMENT

Major electrical equipment proposed for tidal power plants in the Bay of Fundy 24 p0707 A79-52799

Energy conservation opportunities in appliances using energy storage [ORNL/SUB-7303/1] 24 p0782 N79-32629

ELECTRIC EQUIPMENT TESTS

Field testing of 5-kW commercial wind generator with an automatic load-matching device for utilizing its output 21 p0143 A79-17515

Photovoltaic tests and applications project [NASA-TM-79018] 22 p0342 N79-17336

ELECTRIC FIELDS

Investigation of the Hall effect in a discharge with a rotational electric field 22 p0246 A79-21532

Plasma behavior near the neutral line between parallel currents --- in planar zeta pinch 22 p0324 A79-31754

Hall effect in an induction discharge 23 p0442 A79-36806

Effect of load factor on the characteristics of series MHD generators 24 p0650 A79-49372

Characteristics of series channels with a reduced electrode commutation angle in the connecting section --- MHD generators 24 p0650 A79-49374

Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump 24 p0706 A79-52372

Axial field limitations in MHD generators [FE-2341-8] 22 p0362 N79-20512

ELECTRIC GENERATORS

A new power cycle that combines power generation with energy storage 21 p0004 A79-10040

Electrochemical engines for power generation and load-leveling at sites for underground coal conversion 21 p0005 A79-10051

Potential of the Stirling engine for stationary power applications in the 500-2000 HP range 21 p0025 A79-10211

There is a lot of energy in digester gas . . . use it --- in municipal waste water plants 21 p0035 A79-11448

Small solar power plant with a Freon turbine 21 p0057 A79-13642

Low-cost concept for energy supply from the wind 21 p0058 A79-13651

Wave driven power generating system 21 p0059 A79-13657

Projecting energy resource utilization - The geothermal case 21 p0068 A79-14321

Solar engines - The thermal wheel and beyond 21 p0095 A79-15909

Solar electricity production 21 p0104 A79-16467

The Netherlands experimental vertical axis wind turbine
21 p0114 A79-17120

The Campbell Chinese Type Windmill
21 p0142 A79-17510

Wind generation of electricity for a novel dwelling independent of servicing networks
21 p0142 A79-17513

Vertical axis wind turbine status
21 p0143 A79-17516

A technique for longitudinal correlation of wind data - Theory and its application to siting of wind power plants
21 p0143 A79-17518

Wave power electric generation study in Japan --- large scale buoy facility
21 p0151 A79-18107

A cavity receiver design for solar heated gas turbine generating systems
[ONERA, TP NO. 1978-137] 21 p0155 A79-18560

Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342

Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448

MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549

Electrochemical use of biomass
22 p0254 A79-22273

On the dynamics of wave-power devices
22 p0269 A79-24539

Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131

Solar power satellite
22 p0287 A79-27375

A wave activated electric generator --- waterwave energy conversion
22 p0288 A79-27389

Development and application of techniques to evaluate cogeneration impacts --- simultaneous electric energy and process heat production in electric power plants
22 p0303 A79-29795

The combined reheat gas turbine/steam turbine cycle. I - A critical analysis of the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-7] 22 p0306 A79-30505

The combined reheat gas turbine/steam turbine cycle. II - The LM 5000 gas generator applied to the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-8] 22 p0306 A79-30506

Photovoltaic electric power generation from a utility perspective
[ASME PAPER 79-SOL-18] 22 p0309 A79-30552

The economics of electric power generation from wind energy
22 p0310 A79-30998

The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020

Some economic considerations in the rush toward alternate energy sources
23 p0389 A79-33268

SOLARES - A new hope for solar energy
23 p0399 A79-33992

Wind energy conversion systems /WECS/ for central station and dispersed power applications
23 p0406 A79-34052

An energy analysis of a wind energy conversion system for fuel displacement
23 p0406 A79-34054

Assessment of energy conservation by using alternate energy sources in Kansas
23 p0418 A79-34151

A gas absorption cycle for electric power generation
23 p0418 A79-34154

Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480

Coal gasification for electric utilities
23 p0436 A79-35799

Solar electric generator for developing nations
23 p0452 A79-37885

Fluidised combustion for power generation
23 p0454 A79-37909

Electrical generation from a randomly varying input --- waterwave energy conversion
23 p0455 A79-37915

Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192

Accounting for intangibles in a present worth comparison of advanced power generation alternatives
23 p0461 A79-38500

Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593

The regulation of an electricity supply system including wind energy generators
23 p0485 A79-40130

Electrical production from moderate temperature geothermal brines
23 p0486 A79-40197

Future energy alternatives
24 p0602 A79-44276

Thermal energy conversion - Tapping the sea depths
24 p0628 A79-45979

Electrogenerative chemical reactors
24 p0631 A79-46310

Impact of storm fronts on utilities with WECS arrays --- Wind Energy Conversion System
24 p0635 A79-46546

The comparison of energy chains --- different electrical energy production processes
24 p0644 A79-48023

The development of the energy-materials ratios of electrical energy production systems
24 p0645 A79-48024

Computer-Aided Power System Design
24 p0646 A79-48632

Bio-electrochemical conversion of refuse to energy
24 p0659 A79-50353

Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813

Solid electrolyte fuel cell for electric utility power generation
24 p0682 A79-51815

The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant
24 p0687 A79-51859

DOE stationary external combustion engine program - Status report
24 p0689 A79-51882

Orbital antenna farm power systems challenges
24 p0690 A79-51892

The military space power program
24 p0691 A79-51893

The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0696 A79-51955

Waste heat as an alternate fuel - Its opportunities and potential
24 p0698 A79-51968

Thermionic energy converter investigations
24 p0699 A79-51981

Recent progress in hybrid mode thermionic converter development
24 p0700 A79-51986

Flame-fired thermionic diode development
24 p0700 A79-51988

State of cermet electrode development for flame heated thermionic converters
24 p0700 A79-51989

Ball screw type wave power generator --- with flywheel drive
24 p0701 A79-51996

Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997

Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

Electrogenerative and voltameiotic processes
24 p0703 A79-52026

Operation of self-excited generators for windmill application
24 p0706 A79-52538

Future Orbital Power Systems Technology Requirements
[NASA-CP-2058] 21 p0169 N79-10122
Alternative power-generation systems
21 p0169 N79-10129
Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation
[EPRI-AF-753] 21 p0185 N79-11498
Definition of engineering development and research problems relating to the use of geothermal fluids for electric power generation and nonelectric heating
[LBL-7025] 21 p0188 N79-11534
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528
Solar electric power generation, volume 2. Citations from the Engineering Index data base
[NTIS/PS-78/1109/4] 21 p0212 N79-13558
Harnessing tidal energy
[PB-286671/3] 21 p0222 N79-14581
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454
MHD power generation: Research, development and engineering
[FE-2524-8] 22 p0363 N79-20517
Thin film battery/fuel cell power generating system
[CONS/1197-9] 22 p0369 N79-21556
Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443
Digest of equipment for converting solar, wind, and geothermal energy into electric power for USN application ashore
[AD-A066221] 23 p0561 N79-24475
Feasibility and economics of cogeneration in California's thermal enhanced oil recovery operations
[PB-291794/6] 23 p0566 N79-24517
Potential use of small dams to produce power for low-income communities
[PB-292745/7] 23 p0575 N79-25535
Solar thermal power-conversion system
23 p0579 N79-26477
Commercial synchronous alternating-current generators
23 p0580 N79-26482
Power-conversion system component summation
23 p0580 N79-26483
Candidate power-conversion system cycles, appendix A
23 p0580 N79-26494
Central receiver thermal power system
[AED-CONF [illegible] -212-008] 23 p0582 N79-26513
Technical [illegible] economic assessment of solar hybrid repowering
[SAN-1608-4-1] 24 p0729 N79-28791
An assessment of wind characteristics and wind energy systems applications to electric utilities in Wisconsin and sections of Minnesota, Iowa and Illinois
24 p0736 N79-29593
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
System analysis, design and proof-of-concept experiment of a total energy system, phase 2
[COO-2947-5] 24 p0742 N79-29660
Total generating costs: Coal and nuclear plants
[NUREG-0248] 24 p0742 N79-29663
A general purpose electroanalytical system based on a microcomputer controlled coulostatic generator
24 p0744 N79-29798
Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779
Wind power, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0536/7] 24 p0777 N79-31838
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
Assessment of hydropower restoration and expansion in New York State, volume 1
[PB-295782/7] 24 p0792 N79-3273
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738
Hydrogen use as a fuel. Citations from the NTIS data base
[NTIS/PS-79/0779/3] 24 p0796 N79-33347

ELECTRIC HYBRID VEHICLES
Fiat Research Center hybrid vehicle prototype
[SAE PAPER 790014] 22 p0313 A79-31351
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370
Electric automobiles. Citations from the NTIS data base
[NTIS/PS-78/0880/1] 21 p0171 N79-10363
Electric automobiles, volume 2. Citations from the engineering index data base
[NTIS/PS-78/0881/9] 21 p0172 N79-10364
Advanced secondary batteries for electric vehicle propulsion
[CONF-780426-2] 21 p0186 N79-11508
Recommended performance standards for electric and hybrid vehicles
[SAN-1335-1] 21 p0195 N79-12450
Electric and Hybrid Vehicle Act, Public Law 94-413 Demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810
Electric and hybrid vehicle program
[DOE/CS-0068] 23 p0567 N79-24900
Preliminary design analysis of the quasi-electric drive vehicle --- with an improved lead acid battery for extended range
[UCRL-52613] 24 p0731 N79-29116
Electric hybrid vehicles focus group research
[DOE/TIC-10009] 24 p0745 N79-30107
Three state-of-the-art individual electric and hybrid vehicle test reports, volume 2
[NASA-CR-162311] 24 p0778 N79-32130

ELECTRIC MOTOR VEHICLES
User experience with on-road electric vehicles in the U.S.A. and Canada
21 p0009 A79-10080
A critical review and evaluation of published electric-vehicle performance data
21 p0009 A79-10081
Pulse characteristics of sodium sulfur cells for electric vehicle propulsion
21 p0009 A79-10082
Rapid, efficient charging of lead-acid and nickel-zinc traction cells --- for electric vehicles
21 p0009 A79-10084
Review of industrial participation in the ANL lithium/iron sulfide battery development program --- for electric vehicles
21 p0010 A79-10086
High performance lithium/iron disulfide cells --- for electric vehicle propulsion
21 p0010 A79-10087
Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries
21 p0010 A79-10088
Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries
21 p0010 A79-10089
Bipolar lithium/iron disulfide cells --- for electric vehicle propulsion
21 p0010 A79-10090
Mechanically rechargeable, metal-air batteries for automotive propulsion
[CONF-780801-8] 21 p0011 A79-10093
Iron-air batteries for electric vehicles
21 p0011 A79-10094
Response of lead-acid batteries to chopper-controlled discharge --- for electric vehicles
21 p0011 A79-10097
Batteries for transportation and load-leveling applications
21 p0041 A79-11837

Advanced batteries --- sodium sulfur batteries for electric motor vehicles
21 p0067 A79-14270

Total energy and labor requirements for an electric commuter railroad
21 p0068 A79-14325

Flywheels for vehicles --- auxiliary power in electric automobiles
21 p0092 A79-15885

Electric vehicles challenge battery technology
21 p0093 A79-15892

The Power Wheel - Elimination of energy-consuming drive components
21 p0112 A79-16734

Modeling energy and power requirements of electric vehicles
21 p0153 A79-18465

The sodium/sulfur battery - A storage battery for peak load adjustment and electric traction
21 p0165 A79-20244

Evaluation of the effectiveness of electric power systems for transport purposes
22 p0284 A79-26723

Superbatteries - A progress report --- for utility energy storage and electric vehicles
22 p0286 A79-27207

International Conference on Electric Vehicle Development, London, England, May 31, June 1, 1977, Proceedings
22 p0300 A79-29487

Prospects for improvements in lead-acid batteries --- for electric vehicles
22 p0300 A79-29488

The energy and resource implications associated with the widespread use of electric vehicles
22 p0301 A79-29489

Recent developments in power sources with special emphasis on alkaline batteries --- for electric vehicles
22 p0301 A79-29490

The role of the battery electric vehicle
22 p0301 A79-29491

Support services for electric vehicles
22 p0301 A79-29492

Electric vehicles - Can they be fitted into urban Britain
22 p0301 A79-29493

Road vehicles with combined, at least partly electrical driving systems and energy supplies
22 p0301 A79-29494

The fleet operator's viewpoint --- on prototype electric bus development
22 p0302 A79-29495

Developing electric vehicles
22 p0302 A79-29496

Latest developments in sponsored test programs for electric vehicles in France
22 p0302 A79-29497

Electric car project of the Eindhoven University of Technology
22 p0302 A79-29498

An electric propulsion system for a town and city bus
22 p0302 A79-29499

Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366

A high energy tubular battery for a 1800 kg payload electric delivery van
[SAE PAPER 790162] 22 p0315 A79-31367

Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses
23 p0387 A79-33245

All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906

Battery systems for electric vehicles - A state-of-the-art review
24 p0652 A79-49488

Prediction of vehicle performance and its sensitivity to component improvements Application to electric and H2-fueled vehicles
24 p0677 A79-51782

Regenerative flywheel energy storage system
24 p0678 A79-51783

The effect of mechanical energy storage systems on the characteristics of electric vehicles
24 p0683 A79-51820

The Department of Energy electric vehicle battery program - An overview
24 p0683 A79-51825

Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826

A comparison of metal-air batteries for electric vehicle propulsion
24 p0683 A79-51827

Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829

A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833

Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798

Development of a DC linear motor. II
24 p0707 A79-52800

Electric automobiles. Citations from the NTIS data base
[NTIS/PS-78/0880/1] 21 p0171 N79-10363

Electric automobiles, volume 2. Citations from the engineering index data base
[NTIS/PS-78/0881/9] 21 p0172 N79-10364

Recommended performance standards for electric and hybrid vehicles
[SAN-1335-1] 21 p0195 N79-12450

Design and cost study of a nickel-iron oxide battery for electric vehicles. Volume 2: Public report
[ANL-K-3723-VOL-1] 21 p0222 N79-14579

Electric and Hybrid Vehicle Act, Public Law 94-413 demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810

Characterization study of an electric motor-transmission system for electric vehicles
[HCP/M2835-01] 22 p0351 N79-18817

General-purpose aluminum-air/flywheel electric vehicles
[UCRL-82003] 23 p0564 N79-24503

Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930

Ford/DOE sodium-sulfur battery electric vehicle development and demonstration, phase 1
[COO-2566-37] 24 p0731 N79-29118

The Congress needs to redirect the federal electric vehicle program
[PB-293977/5] 24 p0731 N79-29120

High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793

Three state-of-the-art individual electric and hybrid vehicle test reports, volume 2
[NASA-CR-162311] 24 p0778 N79-32130

ELECTRIC MOTORS

Analysis of a direct coupling d.c. motor and a photovoltaic converter
21 p0046 A79-12272

Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control
21 p0148 A79-17792

Performance analysis of dc-motor-photovoltaic converter system. I - Separately excited motor
23 p0477 A79-39104

Development of a DC linear motor. II
24 p0707 A79-52800

Characterization study of an electric motor-transmission system for electric vehicles
[HCP/M2835-01] 22 p0351 N79-18817

High-efficiency electric motors: Focus group results
[DOE/TIC-10005] 24 p0719 N79-28441

ELECTRIC NETWORKS

Validation of an electric circuit model of a solar house
22 p0321 A79-31440

Initial thoughts on the transmission implications of large wave power complexes 23 p0455 A79-37916

Lewis Research Center studies of multiple large wind turbine generators on a utility network 24 p0635 A79-46547

Airport power supply --- Russian book 24 p0660 A79-50499

ELECTRIC POTENTIAL

Observation of voltage fluctuations in a superconducting magnet during MHD power generation 22 p0235 A79-20531

The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization 24 p0652 A79-49489

Electrical power loss from high-voltage power circuits through plasma leakage 21 p0169 N79-10113

The optimum voltage for batteries used in standby lighting systems [BLL-RTS-11512] 22 p0347 N79-18439

Plasma sheath effects and voltage distributions of large high-power satellite solar arrays 23 p0552 N79-24024

A theoretical analysis of the current-voltage characteristics of solar cells [NASA-CR-158872] 24 p0737 N79-29606

Open-circuit voltage improvements in low-resistivity solar cells 24 p0784 N79-32649

ELECTRIC POWER

Power distribution study for a 5-GW space power satellite 21 p0002 A79-10026

Solar Power Satellite thermal analysis 21 p0003 A79-10028

Construction of a 10GWe solar power satellite 21 p0003 A79-10029

Environmental considerations for the microwave beam from a solar power satellite 21 p0003 A79-10030

Microwave phased array design considerations for SPS --- Solar Powered Satellites 21 p0003 A79-10031

A 5-GWe nuclear satellite power system conceptual design 21 p0003 A79-10033

Closed Cycle Gas Turbine power generation opportunities 21 p0004 A79-10039

High efficiency thermal energy storage system for utility applications 21 p0012 A79-10102

Laboratory evaluation of a composite flywheel energy storage system 21 p0013 A79-10110

Molten carbonate fuel cell systems - Status and potential 21 p0039 A79-11817

Partial processes and transport parameters in molten carbonate fuel cell operation 21 p0040 A79-11819

Thin film high temperature solid electrolyte fuel cells 21 p0040 A79-11820

Thermodynamic and kinetic considerations on zinc-halogen batteries 21 p0040 A79-11822

Thermal energy storage heat exchanger design [ASME PAPER 78-ENAS-30] 21 p0049 A79-12579

The wind as a potential energy source in future hydrogen technology 21 p0059 A79-13661

Generation of electrical energy from hydrogen and oxygen by means of fuel cells 21 p0059 A79-13662

Modelling energy storage systems for electric utility applications Preliminary considerations 21 p0081 A79-14960

Perspective on the fusion-fission energy concept 21 p0095 A79-15913

Energy conservation by means of recycling 21 p0112 A79-16735

Bio-mass energy for rural areas 21 p0126 A79-17373

1MW calorimetric receiver for Solar Thermal Test Facility [ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839

Electromagnetic excitation of a moving conducting piston 22 p0237 A79-20658

New chemical sources of current --- Russian book 22 p0237 A79-20679

Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations 22 p0265 A79-24046

Risk with energy from conventional and nonconventional sources 22 p0266 A79-24151

Energy for Europe from space 22 p0273 A79-25605

Evaluation of the effectiveness of electric power systems for transport purposes 22 p0284 A79-26723

A proposed thermophotovoltaic solar energy conversion system 22 p0287 A79-27317

A Variable Speed Constant Frequency /VSCF/ wind generator for low power applications 22 p0303 A79-29799

Hydrogen-electric power drives 23 p0386 A79-33231

New policy for electrical energy 23 p0388 A79-33260

Perspectives on solar electric power for small homes 23 p0401 A79-34016

Analysis of various OTEC missions --- market potential of applications 23 p0404 A79-34037

Clean energy from humid air --- conversion into electric power 23 p0406 A79-34053

Conserving electric power by geothermal refrigeration - Cooling and freezing 23 p0409 A79-3407

Energy conserving cogeneration plant benefits utility and industrial companies 23 p0423 A79-34452

What is the true cost of electric power from a cogeneration plant 23 p0424 A79-34453

The Powerton gasification combined-cycle test facility - A preview 23 p0424 A79-34454

The impact of price expectations on the demand for electrical energy in the United States 23 p0447 A79-37286

Options and constraints in the use of wave power 23 p0454 A79-37914

Guaranteed power /capacity effect/ and total power as defining parameters of wind conversion system energy production 23 p0472 A79-38663

Parametric cost analysis of photovoltaic systems 23 p0477 A79-39102

Combined photovoltaic and thermal hybrid collector systems 23 p0519 A79-41073

Peak period of household load in the different stages of electrical power supply 23 p0528 A79-42226

Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/ 24 p0636 A79-46757

Technology overview of energy storage systems 24 p0666 A79-50892

A distributed microcomputer-based control system for a large scale solar total energy system 24 p0672 A79-51741

The control system for Fort Hood Solar Total Energy System 24 p0672 A79-51742

The solar total energy system evaluation program /STESEP/ 24 p0673 A79-51749

Operation and analysis of a vertical axis wind turbine 24 p0677 A79-51776

Energy storage and conversion in conjunction with photovoltaic energy systems 24 p0679 A79-51790

Incremental cost analysis for advanced compressed air energy storage concepts
24 p0679 A79-51797

Analysis of mass cycling in porous rock reservoirs for compressed air energy storage
24 p0680 A79-51799

The energy reformation --- waste energy utilization for heating and electricity
24 p0698 A79-51969

Reference Energy Systems as applied to regional energy policy
24 p0698 A79-51973

Experimental demonstration of heat-to-electricity conversion within a dielectric
24 p0698 A79-51975

Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power
24 p0699 A79-51977

Program information notice --- technologies relevant to u.s. electric energy systems
[DOE/ET-0059] 21 p0207 N79-13517

Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels
21 p0218 N79-14532

USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530

ELECTRIC POWER PLANTS

A new power cycle that combines power generation with energy storage
21 p0004 A79-10040

Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant
21 p0008 A79-10068

Computer aided optimization of integrated coal gasification combined cycle power plants
21 p0008 A79-10075

The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants
21 p0009 A79-10078

Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092

100MWh zinc-chlorine peak-shaving battery plants
21 p0011 A79-10096

A technical analysis for cogeneration systems with potential applications in twelve California industrial plants --- energy saving heat-electricity utility systems
21 p0011 A79-10099

Performance of a 10 MW geothermal energy conversion test facility
21 p0014 A79-10119

Optimum design conditions for a power plant at a vapor dominated geothermal resource, Pacific Gas and Electric's The Geysers Power Plant Unit 16
21 p0014 A79-10121

Fossil superheating in geothermal steam power plants
21 p0014 A79-10122

Heat exchanger design for geothermal power plants
21 p0015 A79-10123

Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124

Effect of noncondensable gases on geothermal power generation
21 p0015 A79-10125

Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133

Economic optimization of the coal-fired MHD Steam Power Plant
21 p0016 A79-10134

Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants
21 p0016 A79-10135

Considerations for MHD power generation development
21 p0016 A79-10136

A proposed 40 MWe MHD pilot plant
21 p0017 A79-10137

Thermal modeling of coal-fired MHD plant components
21 p0017 A79-10138

CO2-laser fusion
21 p0018 A79-10150

Energy conversion in the long run
21 p0019 A79-10154

Preliminary design of the solar total energy-large scale experiment at Shenandoah, Georgia
21 p0019 A79-10159

Conceptual design of the Fort Hood Solar Total Energy-Large Scale Experiment
21 p0019 A79-10160

JPL - Small Power Systems Applications Project --- for solar thermal power plant development and commercialization
21 p0019 A79-10161

Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation
21 p0020 A79-10163

Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173

Operating experience at the DOE/Sandia midtemperature Solar Systems Test Facility
21 p0022 A79-10182

A free-piston Stirling engine for small solar power plants
21 p0024 A79-10205

The Department of Energy's thermionic energy conversion program
21 p0025 A79-10213

Thermionic power plant design point selection - The economic impact
21 p0025 A79-10214

A summary of USSR thermionic energy conversion activity
21 p0026 A79-10216

Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249

Economic methodology for solar power-generating systems
21 p0030 A79-10251

Scaling up coal liquids
21 p0031 A79-10475

Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778

ERDA fuel cell programs
21 p0039 A79-11814

Analysis of electrolyte shunt currents in fuel cell powerplants
21 p0039 A79-11816

Perspectives on utility central station photovoltaic applications
21 p0041 A79-11873

Predicted performance of heliostats for ERDA's 10 MWe power plant
21 p0044 A79-12045

Solar thermal electric power systems - Manufacturing cost estimation and systems optimization
21 p0046 A79-12273

Magnetohydrodynamic/steam power plant modeling and control
21 p0046 A79-12274

U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692

Solar power plants in the U.S.A.
21 p0057 A79-13640

Small solar power plant with a Freon turbine
21 p0057 A79-13642

Solar One - A 10-megawatt solar thermal central receiver pilot plant project
[AIAA PAPER 78-1750] 21 p0060 A79-13853

Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854

Alternative central receiver solar power plant using salt as a heat transfer and storage medium
[AIAA PAPER 78-1753] 21 p0060 A79-13855

Advanced processes for generation of electric power - Solvent refining of coal and combined cycle plants
21 p0064 A79-14110

Energy consumption of environmental controls - Fossil fuel, steam electric generating industry
21 p0064 A79-14112

Fuel-cell power plants
21 p0068 A79-14398

Low head power generation with bulb turbines --- hydroelectric installations
21 p0074 A79-14705

Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity
21 p0076 A79-14741

The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant
21 p0076 A79-14757

Salinity power station at the Swedish west-coast - Possibilities and energy-price for a 200 MW-plant
21 p0077 A79-14772

Fuel cell on-site integrated energy system parametric analysis of a residential complex
21 p0081 A79-14947

The impact of a coal fired power plant on ambient sulfur dioxide levels
21 p0082 A79-15032

On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052

Operation and control of wind-electric systems
21 p0086 A79-15575

Power from glaciers - The hydropower potential of Greenland's glacial water
21 p0087 A79-15672

External single pass to superheat receiver --- for central receiver solar power plant
[AIAA PAPER 78-1751] 21 p0089 A79-15849

An introduction to ocean thermal energy conversion /OTEC/ power plants
21 p0091 A79-15869

A central receiver solar thermal power system
21 p0091 A79-15872

Geothermal energy from a utility perspective --- Imperial Valley of Southern California
21 p0091 A79-15880

Large wind turbine generators --- NASA program status and potential costs
21 p0092 A79-15881

Utility applications of wind power plants
21 p0092 A79-15882

A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin
21 p0093 A79-15893

Role and status of dispersed electric utility fuel cell power plants
21 p0093 A79-15894

Development of central station power plants integrated with coal gasifiers --- utilizing molten-carbonate fuel cells
21 p0093 A79-15895

Market penetration for OTEC
21 p0094 A79-15903

Incentives and requirements for gasification based power systems
21 p0094 A79-15904

Hybrid fossil-geothermal power plants
21 p0096 A79-15920

Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921

Coal-based electricity and air pollution control - A case for solvent refined coal
21 p0096 A79-15922

Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924

A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system
21 p0098 A79-16107

An overview of the U.S. OTEC development program
21 p0100 A79-16247

Capital cost system optimization of OTEC power modules
21 p0101 A79-16249

Advances in ocean engineering aspects of ocean thermal energy conversion
21 p0101 A79-16250

Power cables to accommodate the motions of an OTEC plant
21 p0101 A79-16251

Open-cycle magnetohydrodynamic electrical power generation --- Book
21 p0104 A79-16478

The MHD power plant and its environmental aspects - Introduction
21 p0105 A79-16479

MHD power plant characteristics
21 p0105 A79-16480

Layout and design characteristics of MHD power stations
21 p0105 A79-16481

Technical and economic aspects of open-cycle MHD power plants
21 p0105 A79-16482

Protection of the biosphere --- MHD power stations pollution reduction
21 p0105 A79-16483

Steam generator and turbomachines --- MHD power plant design and Soviet operational experience
21 p0106 A79-16489

Radiatively sustained cesium plasmas for solar electric conversion
21 p0109 A79-16615

Energy storage for tokamak reactor cycles --- during downtime for periodic plasma quench and reignition
21 p0111 A79-16727

Solar Thermal Electric Program
21 p0112 A79-16730

A status report on the Solar Thermal Test Facility
21 p0112 A79-16731

Non-adaptive optics for solar thermal electric power
21 p0112 A79-16733

Energy requirements of a limestone FGD system --- Flue Gas Desulfurization
21 p0114 A79-16747

Advanced emissions control and test facility of the Electric Power Research Institute
21 p0115 A79-17249

Estimation of collector and electrical energy cost for STEPS in Japan --- Solar Thermal Electric Power System
21 p0118 A79-17288

Energy storage requirements for autonomous and hybrid solar thermal electric power plants
21 p0120 A79-17315

Mechanical energy storage system for a 10 KWe solar power pack
21 p0121 A79-17329

Analysis of thermal storage unit for solar energy
21 p0122 A79-17332

The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358

An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17402

Design of solar energy concentrators for power generation in residential and nonresidential areas
21 p0136 A79-17460

Exploitation of solar energy via modular power plants and multiple utilization of waste heat
21 p0141 A79-17497

The French CNRS 1 MW solar power plant
21 p0141 A79-17499

A small solar power plant with a freon turbine
21 p0141 A79-17501

Development of small solar power plants for rural areas in India
21 p0141 A79-17502

Power plant systems based on solar energy --- powered by sea water evaporation-produced osmotic pressure head mechanical energy
21 p0142 A79-17508

A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

Master control and data system for the 5MW Solar Thermal Test Facility
21 p0144 A79-17620

Gasification Combined Cycle Test Facility at Pekin, Illinois
21 p0145 A79-17632

MHD power generation
21 p0146 A79-17638

Emission control for SO2 - An update
[ASME PAPER 78-JPGC-PWR-11] 21 p0150 A79-18097

Operating experience with three 20 MW prototype
flue gas desulfurization processes
[ASME PAPER 78-JPGC-PWR-12] 21 p0150 A79-18098

Tidal power plants - Sites, history and
geographical distribution
21 p0150 A79-18102

Selection of optimum sites for tidal power
development in the Bay of Fundy
21 p0152 A79-18110

The role of tidal power stations in future
scenarios for electricity storage in U.K.
21 p0152 A79-18116

Integrating wave power into the electricity supply
system
21 p0152 A79-18117

Emissions of nitrogen dioxide from a large
gas-turbine power station
21 p0152 A79-18384

The Madaras Rotor Power Plant - An alternate
method for extracting large amounts of power
from the wind
[AIAA PAPER 79-0115] 21 p0157 A79-19541

National program for the development of commercial
MHD
[AIAA PAPER 79-0188] 21 p0157 A79-19587

Floating dry cooling, a competitive alternative to
evaporative cooling in a binary cycle geothermal
power plant
[ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775

The Stirling engine, an energy converter for
cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777

Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789

Gas stream composition and temperature
determination in a coal-fired MHD simulation
facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810

The use of heat exchangers with THERMOEXCEL's
tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

Parametric analysis of power conversion systems
for central receiver solar power generation
[ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835

Tidal power in the Bay of Fundy
22 p0237 A79-20729

A ceramic heat exchanger for a Brayton cycle solar
electric power plant
22 p0239 A79-20822

Composite material flywheels for energy storage on
electricity supply systems
22 p0241 A79-20852

Analysis and design of a field of heliostats for a
solar power plant
22 p0242 A79-21161

Economic prospects for the application of new
electric energy storage devices
22 p0246 A79-21490

Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23290

Industrial cogeneration - Problems and promise ---
waste heat utilization from electricity production
22 p0265 A79-24047

The geothermal power station at Ahuachapan, El
Salvador
22 p0266 A79-24239

Soil cooling for geothermal electric power plants
in the Western United States - The Raft River
experiment
22 p0266 A79-24240

Storage peak gas-turbine power plant ---
compressor for electric energy storage
22 p0268 A79-24507

Medium-power /100-1000 kWe/ solar power plants
using distributed collectors
22 p0269 A79-24622

Space reflector technology and its system
implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

No ill winds for New Mexico utility --- windpower
utilization in municipal electric power system
22 p0286 A79-27208

Induction-generator/synchronous-condenser system
for wind-turbine power
22 p0286 A79-27219

Technology considerations in the design of a
commerical offshore energy conversion /OTEC/ plant
22 p0288 A79-27378

Performance of a 5 MWt solar steam generator
22 p0288 A79-27399

Open-cycle MHD development --- for power generation
22 p0289 A79-27659

Solar thermal electrical power plants for Iran
22 p0295 A79-28352

Optical analysis of solar facility heliostats
22 p0296 A79-28360

Optimum power plant capacity of ocean-based ocean
thermal energy conversion systems
22 p0297 A79-28922

Cogeneration in Europe and the combined cycle gas
turbine
22 p0297 A79-28988

Gas turbine operating and maintenance experience
in Saudi Arabia
22 p0298 A79-28989

Thermodynamic basis for combining cycles of heat
producing power plants
22 p0298 A79-29297

Ways of improving steam-gas power plants --- fuel
economy
22 p0299 A79-29298

Wind power and electric utilities - A review of
the problems and prospects
22 p0300 A79-29374

Feasibility of MHD-ac induction electric power plant
--- using tokamak reactor exhaust plasma
22 p0303 A79-29794

Development and application of techniques to
evaluate cogeneration impacts --- simultaneous
electric energy and process heat production in
electric power plants
22 p0303 A79-29795

Control problems of the magnetohydrodynamic
electrical power generation in power station
cooperating with electrical power system
22 p0303 A79-29798

The impact of alternate energy resources on the
future supply of electric power
[IEEE PAPER F 78 672-8] 22 p0304 A79-29939

Energy, resources, and policy --- Book
22 p0304 A79-30175

Conceptual design of a solar powered closed-cycle
gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522

Study of integrated gasification combined cycle
plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530

Structural cost optimization of photovoltaic
central power station modules and support
structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551

Benefits of solar/fossil hybrid gas turbine systems
[ASME PAPER 79-GT-38] 22 p0309 A79-30554

Chemical studies of stack fly ash from a
coal-fired power plant
22 p0309 A79-30595

Solar power plants --- thermoelectric conversion
in Canada
22 p0318 A79-31416

A scheme for direct conversion of plasma thermal
energy into electrical energy
22 p0324 A79-31765

Repowering of a small utility - A unique solution
to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332

Application of a hot air turbine for efficiency
improvement in MHD/steam power plants
[ASME PAPER 79-GT-36] 23 p0375 A79-32341

A simple solar gas turbine plant
[ASME PAPER 79-GT-90] 23 p0377 A79-32367

GUD - An unfired combined cycle approach to energy
utilization --- in turbine power plant gas and
steam waste heat recovery system
[ASME PAPER 79-GT-131] 23 p0377 A79-32400

Major considerations in the design and engineering
of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416

Conceptual design of a pulverized coal furnace for
a utility size closed-cycle, gas-turbine power
plant
[ASME PAPER 79-GT-158] 23 p0378 A79-32420

Design of pressurized fluid-bed
combustor/particulate control system for
reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449

Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451

Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455

Closed cycle gas turbines, an ECAS update. I
[ASME PAPER 79-GT-204] 23 p0380 A79-32461

MHI's recent achievements in the field of geothermal power generation
23 p0381 A79-32591

Free-wheeling hydraulic power mills --- wind or water current driven electric plants
23 p0387 A79-33244

Principal sources of electric power generation in Brazil
23 p0388 A79-33255

Diagonal frame RF channel of the U-25 power plant --- MHD generators
23 p0393 A79-33407

Design and operation of the Westinghouse electrode systems test facility /WESTF/ --- for MHD generator
23 p0393 A79-33411

Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor
23 p0395 A79-33428

Dual purpose solar-electric power plants
23 p0403 A79-34027

Complex solar-electrical plant of large capacity
23 p0403 A79-34029

Ocean thermal energy conversion /OTEC/ plant working fluid study
23 p0404 A79-34040

Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042

System studies for a tokamak fusion power plant
23 p0407 A79-34061

Coal gasification as applied to MHD power cycle
23 p0411 A79-34095

Dynagas Process
23 p0412 A79-34098

A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143

Waste heat as an alternative heat source
23 p0417 A79-34144

Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155

Comparative economics of alternative fuels for intermediate services, combined cycle power plant
23 p0419 A79-34160

Estimating the commercial potential and energy benefits of ERDA electric energy research
23 p0419 A79-34161

Energy utilization in industry - The case of Israel
23 p0421 A79-34171

Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement
23 p0421 A79-34172

Engineering studies of open-cycle coal-fired MHD for power generation
23 p0424 A79-34456

Advanced power cycles and their potential for electrical energy generation
23 p0424 A79-34457

Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610

Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051

Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171

The fusion hybrid
23 p0434 A79-35461

Solar power plants. I - Present programs and outlooks
23 p0434 A79-35481

Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources
23 p0435 A79-35484

Compressed air storage --- off-peak energy storage by power plants
23 p0451 A79-37876

Performance and cost of domestic solar water heating in Australia
23 p0452 A79-37889

The integration of a complex of wind-driven generators into a power system
23 p0454 A79-37913

Conceptual design of sodium-cooled central receiver solar power plant
[AIAA PAPER 79-0994] 23 p0459 A79-38194

A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199

The THEK program for solar energy plants with 'distributed' converters
23 p0462 A79-38574

Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575

Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583

The concept of the 1 MW/el/ solar thermal power plant of the European economic community
23 p0464 A79-38590

Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592

New developments and plannings for solar power plants of M.A.N.-Company
23 p0467 A79-38619

Wind energy plants for electric generation - Economic significance and example
23 p0472 A79-38662

Thermodynamic considerations for the energy conversion process in geothermal power plants
23 p0476 A79-38947

Brayton engines for dispersed solar power
23 p0477 A79-38950

Design criteria to achieve industrial power plant reliability in solid waste processing plants with energy recovery
23 p0491 A79-40417

Oceanside Disposal Plant improvement program - Design, construction and operating experience
23 p0491 A79-40425

Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033

Lifetime Cost and Performance model for photovoltaic power systems
23 p0514 A79-41037

Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038

The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells
23 p0515 A79-41044

A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046

Solar photovoltaic intermediate power system operating strategies and economic considerations
23 p0516 A79-41051

Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079

Central station power plant applications for photovoltaic solar energy conversion
23 p0520 A79-41080

Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications
23 p0520 A79-41081

The Odeillo solar electric power plant
23 p0524 A79-41807

Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930

Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana
23 p0534 A79-43370
The conversion of SO2 to sulfate particles in coal fired power plant plumes
23 p0535 A79-43391
Turning to the sun for power
24 p0601 A79-44239
Construction of Lur'e type Lyapunov function with effect of magnetic flux decay
24 p0606 A79-44916
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements
24 p0612 A79-45532
Hydrogen from falling water --- hydraulic energy conversion to chemical energy
24 p0614 A79-45594
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595
DOE program on hydrogen energy systems
24 p0615 A79-45605
The extent of catalytic SO2 reactions in smoke plumes
24 p0616 A79-45748
Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749
The conceptual basis of the electric utility sub-model of Project Independence Evaluation System
24 p0616 A79-45764
Eurocean OTEC project
24 p0616 A79-45777
An overview of the Japanese OTEC development
24 p0616 A79-45779
OTEC ocean engineering progress report
24 p0617 A79-45783
OTEC goes to sea /A review of Mini-OTEC/
24 p0617 A79-45784
Development of a Test Program for OTEC-1
24 p0617 A79-45785
Analysis of prospects for OTEC commercialization for baseload power
24 p0617 A79-45786
Core unit testing of the APL/JHU shell-less folded tube heat exchanger --- for OTEC
24 p0618 A79-45788
Compact heat exchanger design progress --- for OTEC plants
24 p0618 A79-45789
Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid --- for OTEC
24 p0619 A79-45794
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797
Land-based OTEC plants - Cold water pipe
24 p0620 A79-45799
A case study of OTEC financing for the Middle South Utilities
24 p0621 A79-45810
Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads --- Cold Water Pipe
24 p0621 A79-45812
Ocean thermal and current velocity data requirements for design of an OTEC plant - An update
24 p0622 A79-45822
Oscillations of and drift force acting on an OTEC-CWP structure --- Cold Water Pipe
24 p0622 A79-45824
OTEC 100-MWe alternate power systems study
24 p0623 A79-45831
Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839
The mist-transport cycle - Progress in economic and experimental studies --- OTEC power plant
24 p0624 A79-45841
System design considerations for a floating OTEC modular experiment platform
24 p0625 A79-45847
Electric utility system planning studies for OTEC power integration
24 p0625 A79-45848
Station keeping subsystem designs for modular experiment OTEC plants
24 p0626 A79-45851
Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries
24 p0626 A79-45854
Potential for ocean thermal energy conversion electric power generation in the Southeast region
24 p0626 A79-45855
Results of a near field physical model study --- OTEC plant interaction with ocean environment
24 p0626 A79-45856
Environmental impact assessment for OTEC-1
24 p0626 A79-45857
Modeling the intermediate field of ocean thermal energy conversion discharges
24 p0626 A79-45858
Land-based application of an OTEC open-cycle power system
24 p0627 A79-45871
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231
Field experience with wind turbine generator operation in utility systems
24 p0635 A79-46548
Computer-Aided Power System Design
24 p0646 A79-48632
Mobile electrolytic hydrogen generators
24 p0649 A79-49228
A quantitative comparison of energy costing methods
24 p0651 A79-49475
Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant
24 p0654 A79-50007
Testing for commercialization of the central power tower --- pilot plant for megawatt solar power generation
24 p0660 A79-50460
Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557
Siting considerations for solar thermal electric generating plants
24 p0664 A79-50879
Environmental aspects of wood fuel
24 p0665 A79-50884
Wave power, progress and prospects
24 p0666 A79-50891
Environmental aspects of geysers geothermal operations
24 p0666 A79-50896
Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project
24 p0667 A79-50900
Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system
24 p0670 A79-51729
A simulation exercise of a cavity-type solar receiver using the HEAP program
24 p0670 A79-51730
Projected techno-economic improvements for advanced solar thermal power plants
24 p0671 A79-51733
Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant
24 p0673 A79-51747
Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept
24 p0673 A79-51750

Turbine sizing of a solar thermal power plant 24 p0673 A79-51751

A new solar thermal receiver utilizing a small particle heat exchanger 24 p0674 A79-51754

Solar central receiver program 24 p0674 A79-51756

Solar One Project - A 10-megawatt solar thermal central receiver pilot plant 24 p0674 A79-51757

Preliminary design of a cruising OTEC modular experiment 24 p0674 A79-51758

An open cycle approach to ocean thermal energy conversion 24 p0674 A79-51759

A combined cycle for solar-fossil hybrid power generation 24 p0674 A79-51760

Solar thermal power plants in small utilities - An economic impact analysis 24 p0675 A79-51761

A combined photovoltaic/thermal electric central power plant 24 p0675 A79-51769

Assessmentt of wind energy systems in a utility framework 24 p0677 A79-51779

Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment 24 p0679 A79-51796

Electric utility applications of thermal energy storage and transport 24 p0680 A79-51802

A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming 24 p0681 A79-51811

Scale-up of phosphoric acid fuel cells 24 p0682 A79-51812

Molten carbonate fuel cell based, coal fired power plants for electric power generation 24 p0682 A79-51816

Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells 24 p0685 A79-51838

Computer analysis of coal gasification combined cycle plants 24 p0687 A79-51858

ZEPO - The worlds largest thermionic converter 24 p0699 A79-51982

Design study of a coal-fired thermionic-topped powerplant using an advanced boiler 24 p0700 A79-51983

Considerations for adapting an MHD baseload power plant for intermediate and peaking duty 24 p0701 A79-51992

Environmental assessment of a coal-fired open-cycle MHD power plant 24 p0701 A79-51993

The zinc-chlorine battery in the BEST facility - 1981 24 p0703 A79-52013

Major electrical equipment proposed for tidal power plants in the Bay of Fundy 24 p0707 A79-52799

MHD emissions and their controls 24 p0709 A79-52968

Solar power satellites for Europe [IAF PAPER 79-173] 24 p0710 A79-53334

Particulate and sulfur dioxide emission control costs for large coal-fired boilers [PB-281271/7] 21 p0178 N79-10591

Low NOx combustion concepts for advanced power generation systems firing low-Btu gas [PB-282983/6] 21 p0178 N79-10610

International project catalog of modular integrated utility systems [PB-283477/8] 21 p0190 N79-11544

Committee on the Challenges of Modern Society Rational use of Energy Pilot Study Modular Integrated Utility Systems Project. Volume 1: Description, activities, and products [PB-283429/1] 21 p0190 N79-11549

Regional air pollution study: Heat emission inventory [PB-284081/7] 21 p0200 N79-12602

Technical notes for the conceptual design for an atmospheric fluidized-bed direct combustion power generating plant [HCP/T2583-01/2] 21 p0203 N79-13280

Solar electric power generation, volume 2. Citations from the NTIS data base [NTIS/PS-78/1108/6] 21 p0212 N79-13557

Environmental control implications of generating electric power from coal. Appendix A, part 2: Coal preparation and cleaning assessment study appendix [ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571

Assessment of the solid waste impact of the National Energy Plan [BNL-50708] 21 p0213 N79-13572

An assessment of mercury emissions from fossil fueled power plants [PB-285227/5] 21 p0213 N79-13592

Lead-acid battery: An evaluation of commercialization strategies [MTR-7593] 21 p0220 N79-14565

Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses [ORNL-TR-4483] 21 p0221 N79-14574

Combined cycle power generation. Citations from the NTIS data base [NTIS/PS-78/1156/5] 21 p0222 N79-14587

Combined cycle power generation. Citations from the Engineering Index data base [NTIS/PS-78/1157/3] 21 p0222 N79-14588

Cooling systems addendum: Capital and total generating cost studies [PB-287306/5] 21 p0231 N79-15431

Large closed-cycle gas turbine plant [GA-A-14311] 22 p0331 N79-16261

Local perceptions of energy development: The case of the Kaiparowits Plateau [PB-287314/9] 22 p0335 N79-16380

Environmental assessment for residual oil utilization [PB-286982/4] 22 p0336 N79-16446

Description of hydro-electric development and proposal for future development on the Zambezi 22 p0340 N79-17323

Evaluation of the ECAS open cycle MHD power plant design [NASA-TM-79012] 22 p0341 N79-17335

Ecological effects of coal-fired steam-electric generating stations 22 p0346 N79-18358

Austrian 10kWE solar power plant. A project of the Federal Ministry for Science and Research 22 p0349 N79-18460

Coal and nuclear: A comparison of the cost of generating baseload electricity by region [PB-289585/2] 22 p0355 N79-19469

Technical support for open-cycle MHD program [ANL-MHD-78-8] 22 p0361 N79-20507

Measurement and control techniques in geothermal power plants [TREE-1312] 22 p0362 N79-20508

Environmental impact determination of action to be taken under the Energy Supply and Environmental Coordination Act for powerplants 1, 2, 3, and 4, Portsmouth Generating Station, Portsmouth, Virginia [DOE/EA-0033] 22 p0362 N79-20514

Air quality impacts using SRC versus conventional coal in power plants [PB-290237/7] 22 p0373 N79-21671

A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats [PB-291330/9] 22 p0373 N79-21679

Systems definition space based power conversion systems: Executive summary [NASA-CR-150209] 23 p0541 N79-22616

Analysis of a fuel cell on-site integrated energy system for a residential complex [NASA-TM-79161] 23 p0542 N79-22624

Advanced subsystems development [NASA-CR-158335] 23 p0542 N79-22627

Combustion modification effects on NOx emissions from gas-, oil-, and coal-fired utility boilers [PB-289978/1] 23 p0545 N79-22661

Techno-economic projections for advanced small
solar thermal electric power plants to years
1990-2000
[NASA-CR-158519] 23 p0549 N79-23503
Thermal power systems, small power systems
application project. Volume 1: Executive summary
[NASA-CR-157441] 23 p0560 N79-24462
Balloon-borne particulate sampling for monitoring
power plant emissions
[PB-290473/8] 23 p0566 N79-24543
Power industry application of MHD technology
23 p0568 N79-24949
A primer on the rejection of waste heat from power
plants
[PB-292529/5] 23 p0575 N79-25570
Nuclear closed-cycle gas turbine (GT-HTGR): A
utility power plant for the year 2000
[GA-A-15184] 23 p0582 N79-26515
Air monitoring network design for power plant siting
23 p0591 N79-27590
Status of NO sub x control for coal-fired power
plants
23 p0592 N79-27609
Economic considerations in coverting from oil/gas
firing to coal
23 p0592 N79-27611
Direct firing of coal for power production
23 p0592 N79-27612
The Texaco coal gasification process for
manufacture of medium BTU gas
23 p0593 N79-27614
The effects of regional insolation differences
upon advanced solar thermal electric power plant
performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660
Locational response to regulatory policy: A
regional analysis of energy facility location
--- conferences
[BNL-23597] 23 p0598 N79-27695
Advanced technology fuel cell program --- molten
carbonate and phosphoric acid fuel cells and
coal utilization in power plants
[EPRI-EM-956] 23 p0598 N79-27702
Combined cycles for power generation, volume 1 ---
conferences, Belgium, Apr. 1978
[VKI-LEC-SER-1978-6-VOL-1] 24 p0723 N79-28732
Combined gas/steam turbine power plants with
supplementary firing
24 p0723 N79-28736
Magnetohydrodynamics
24 p0724 N79-28741
Thermionic conversion
24 p0724 N79-28742
Improvements in the lead-acid battery for load
leveling applications
[AD-A068990] 24 p0724 N79-28744
OTEC platform configuration and integration study.
Volume 3: Project plan
[DOE/ET/4063-1-VOL-3] 24 p0725 N79-28750
Materials selection guidelines for geothermal
power systems, first edition
[ALO-3904-1] 24 p0727 N79-28772
Gas-steam turbine combined cycle power plants
[ANL/CES-TE-78-4] 24 p0727 N79-28775
Technical and economic assessment of solar hybrid
repowering
[SAN-1608-4-1] 24 p0729 N79-28791
Preliminary market evaluation for gas produced by
underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369
Development program for 3.0 KW inverter:
Militarized inverter for use with fuel cell or
battery power plants
[AD-A068433] 24 p0738 N79-29612
Geothermal power plants of New Zealand,
Philippines, and Indonesia: A technical survey
of existing and planned installations
[COO-4051-23] 24 p0738 N79-29622
Methodology for solar-thermal power plant evaluation
[EPRI-ER-869] 24 p0739 N79-29631
Thermal power systems small power systems
applications project. Volume 2: Detailed report
[NASA-CR-162104] 24 p0749 N79-30718
Geothermal/hydrothermal energy. Group interview
[DOE/TIC-10030] 24 p0755 N79-30791
Effects of the proposed new source performance
standards: A comparative assessment of the
energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808
Rocky mountain coal for southern California's
coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745
SOAR (solar assisted reactor) power system
[BNL-25633] 24 p0772 N79-31787
Central receiver design considerations for Brayton
cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832
Available work in geothermal energy
[COO-4051-25] 24 p0787 N79-32685
Geothermal power plants of the Soviet Union. A
technical survey of existing and planned
installations
[COO-4051-41] 24 p0787 N79-32686
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730
Engineering study of the flue gas desulfurization
unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751
Conceptual design of thermal energy storage
systems for near term electric utility
applications
[NASA-CR-159577] 24 p0797 N79-33560
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 1:
Executive summary --- development and testing of
a solar thermal power plant
[NASA-CR-162372] 24 p0799 N79-33576
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 2:
System concept selection --- development and
testing of a solar thermal power plant
[NASA-CR-162373] 24 p0799 N79-33577
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 3:
Experimental system descriptions --- development
and testing of a solar thermal power plant
[NASA-CR-162374] 24 p0799 N79-33578
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 4:
Commercial system definition --- development and
testing of a solar thermal power plant
[NASA-CR-162375] 24 p0799 N79-33579
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 5:
Supporting analyses and trade studies ---
development and testing of a solar thermal power
plant
[NASA-CR-162376] 24 p0800 N79-33580

ELECTRIC POWER SUPPLIES

Development and evaluation of a 600-kWh
lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095
Recent terrestrial and undersea applications of
radioisotope thermoelectric generators /RTGs/
21 p0027 A79-10226
Advanced wind furnace systems for residential and
agricultural heating and electrical supply
applications
21 p0028 A79-10237
Thyristor controlled rectifier inverting at unity
power factor
21 p0033 A79-10898
Advancements in the design of solar array to
battery charge current regulators
21 p0033 A79-10902
Solar electric power supplies - Design and layout
21 p0057 A79-13639
The impact of advanced technology on the future
electric energy supply problem
21 p0112 A79-16736
Solar cell modules for terrestrial use
21 p0149 A79-17996
Electrochemical utilization of metal hydrides
22 p0251 A79-21709
Determining the reliability of radioisotope
thermoelectric generators /RTGs/ designed for
terrestrial and undersea applications
22 p0261 A79-23622
Recent terrestrial and undersea applications of
radioisotope thermoelectric generators /RTGs/
22 p0261 A79-23623
Air Force applications of lightweight
superconducting machinery --- in airborne power
sources
22 p0290 A79-27666
Off-peak electrical backup experience in the
Meadowvale Solar Experiment
22 p0318 A79-31421

Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses
23 p0387 A79-33245

Electromagnetic propulsion alternatives --- in mass drivers
[AIAA PAPER 79-1400] 23 p0426 A79-34840

Operating systems for solar electric energy supplies
23 p0466 A79-38606

The regulation of an electricity supply system including wind energy generators
23 p0485 A79-40130

Electrical power distribution subsystem --- electromagnetic environment effects on orbiter and Spacelab payload
23 p0493 A79-40719

Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089

Preliminary designs of 10 MWe and 50 MWe power modules --- for OTEC
24 p0618 A79-45791

Solar power for telecommunications
24 p0628 A79-46050

All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906

Determination of the design states of a complex system in evaluating the reliability of electrical power supply
24 p0646 A79-48826

Airport power supply --- Russian book
24 p0660 A79-50499

Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557

Photovoltaic concentrator system for Foxborough Park
24 p0675 A79-51767

Thermal management for future Air Force high power spacecraft
24 p0692 A79-51923

Heat rejection development requirements for orbital power systems
24 p0692 A79-51924

Status report of the dynamic isotope power system
24 p0692 A79-51927

Dynamic Isotope Power Systems /DIPS/ --- for space applications
24 p0692 A79-51928

Selection of power plant elements for future reactor space electric power systems
24 p0693 A79-51930

Reactor design for nuclear electric propulsion
24 p0693 A79-51931

Advanced synfuel production with fusion
24 p0695 A79-51947

Electricity rate systems and energy conservation
24 p0696 A79-51959

Synthetic test methods of high-direct-current circuit breaker --- used with ohmic heating power supply for tokamak device
24 p0716 A79-54504

OAST space power technology program
21 p0169 N79-10123

Comprehensive overview of winter energy data bulletins
[PB-282787/1] 21 p0177 N79-10565

Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473

Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283171/7] 21 p0191 N79-11554

Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283170/9] 21 p0191 N79-11555

An annotated compilation of the sources of information related to the usage of electricity in non-industrial applications
[PB-285260/6] 21 p0212 N79-13552

The 25 kW power module updated baseline system --- for space transportation system payloads
[NASA-TM-78212] 21 p0226 N79-15247

Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403

Power supplies for Arctic radio repeater systems
[AD-A061609] 22 p0339 N79-17118

USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans
[NASA-CR-161146] 22 p0345 N79-17890

Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

Wind power, volume 2. Citations from the NTIS data base --- bibliographies
[NTIS/PS-79/0534/2] 24 p0777 N79-31836

Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837

ELECTRIC POWER TRANSMISSION

Market penetration for OTEC
21 p0094 A79-15903

30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555

Initial thoughts on the transmission implications of large wave power complexes
23 p0455 A79-37916

Electrical power distribution subsystem --- electromagnetic environment effects on orbiter and Spacelab payload
23 p0493 A79-40719

Optimization of terrestrial photovoltaic power systems
23 p0520 A79-41076

The influence of increasing energy costs on the economic dimensioning of electrical energy distribution equipment
23 p0535 A79-43524

Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595

A single insulated sodium conductor for HVDC underwater power transmission
24 p0620 A79-45800

Load criteria for OTEC riser cable design
24 p0620 A79-45801

Superconducting Magnetic Energy Storage for electric power system stabilization
24 p0681 A79-51804

Computer modeling for a space power transmission system
24 p0694 A79-51941

The technology base for the microwave power transmission system in the SPS
24 p0694 A79-51943

Microwave system performance for a solar power satellite during startup/shutdown operations
24 p0694 A79-51944

Applicability of solid state microwave technology to solar power satellites
24 p0695 A79-51945

Major electrical equipment proposed for tidal power plants in the Bay of Fundy
24 p0707 A79-52799

Study of heat engine/flywheel: Hybrid propulsion configuration with electrical transmission system. Phase 2: Design definition
[ALO-41/2] 21 p0185 N79-11493

Microwave power transmitting phased array antenna research project
[NASA-CR-157843] 21 p0202 N79-13263

Systems definition space based power conversion systems: Executive summary
[NASA-CR-150209] 23 p0541 N79-22616

Potential use of small dams to produce power for low-income communities
[PB-292745/7] 23 p0575 N79-25535

Assessment of load management on the electric power system --- conferences
[CONF-781182-3] 23 p0590 N79-27412

ELECTRIC PROPULSION

Reactor design for nuclear electric propulsion
24 p0693 A79-51931

Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

ELECTRIC PULSES
Pulse characteristics of sodium sulfur cells for electric vehicle propulsion
21 p0009 A79-10082
Contribution to the theory of the pulsed mode of operation of the thermionic energy converter. II
22 p0246 A79-21542
Theory of the pulsed operation of a thermionic converter. II - Ionization stage
23 p0442 A79-36815
ELECTRICAL ENGINEERING
MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549
ELECTRICAL FAULTS
Mathematical model of interelectrode breakdown in MHD generator
21 p0167 A79-20418
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment
23 p0479 A79-39807
Transient response to three-phase faults on a wind turbine generator
21 p0180 N79-11312
ELECTRICAL GROUNDING
Lightning protection for the vertical axis wind turbine
[SAND-77-1241] 21 p0221 N79-14567
ELECTRICAL INSULATION
High voltage insulation and bushing design for flexible superconducting cables
[BNL-25351] 24 p0719 N79-28439
ELECTRICAL MEASUREMENT
Improvement of direct-current electrical prospecting methods for the geothermal investigation of the Rhine Graben
21 p0075 A79-14734
Detailed characterization of MHD generator operating parameters
23 p0393 A79-33409
Solar module curve tracer --- for evaluation of a photovolatic power system
[COO-4094-35] 24 p0759 N79-30826
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738
ELECTRICAL PROPERTIES
Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402
Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841
Behavior of a sodium-sulfur cell with a dynamic sulfur electrode
23 p0487 A79-40372
The dependence of solar cell characteristics on the electronic properties of discharge produced, hydrogenated amorphous silicon
23 p0510 A79-41007
The effect of solar cell parameter variation on array power output
23 p0517 A79-41059
An experimental study of series combination of solar cells
23 p0518 A79-41062
Effect of load factor on the characteristics of series MHD generators
24 p0650 A79-49372
Characteristics of series channels with a reduced electrode commutation angle in the connecting section --- MHD generators
24 p0650 A79-49374
Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50028
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311
Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371
Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543
Solid Polymer Electrolyte (SPE) fuel cell technology program
[NASA-CR-160159] 22 p0371 N79-21622
Structure and electrical activity of planar defects in EFG ribbons
[NASA-CR-158572] 23 p0551 N79-23806
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158740] 23 p0580 N79-26490
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495
A theoretical analysis of the current-voltage characteristics of solar cells
[NASA-CR-158872] 24 p0737 N79-29606
Solar module curve tracer --- for evaluation of a photovolatic power system
[COO-4094-35] 24 p0759 N79-30826
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631
ELECTRICAL RESISTANCE
A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242
Contact resistance of silver ink on solar cell
23 p0506 A79-40978
ELECTRICAL RESISTIVITY
Modified silicon-germanium alloys with improved performance --- thermoelectric material
21 p0027 A79-10225
Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
MHD slag electrical conductivity studies
23 p0391 A79-33394
Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875
Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159572] 24 p0737 N79-29604
ELECTRICITY
Rationing energy to industries - Priorities and input-output dependence
23 p0423 A79-34278
Rational utilization of electricity in order to satisfy the general objectives of the national energy policy
23 p0525 A79-41821
Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822

Laser power conversion system analysis, volume 1 [NASA-CR-159523-VOL-1] 22 p0366 N79-21334

Laser power conversion system analysis, volume 2 [NASA-CR-159523-VOL-2] 22 p0366 N79-21335

Proceedings of the distribution automation and control working group. Volume 1: Executive summary [NASA-CR-158642] 23 p0555 N79-24259

Translations on USSR science and technology: Physical sciences and technology, no. 67 [JPRS-73388] 23 p0568 N79-24946

Social and economic impact of solar electricity at Schuchuli Village [NASA-TM-79194] 23 p0572 N79-25501

Using coal inside California for electric power 23 p0591 N79-27598

Electric energy demand and supply prospects for California 23 p0591 N79-27601

Direct firing of coal for power production 23 p0592 N79-27612

Proceedings of the Distribution Automation and Control Working Group. Volume 2: Proceedings [NASA-CR-158769] 23 p0595 N79-27659

Electricity from hot dry rock geothermal energy: Technical and economic issues [LA-7603-MS] 24 p0727 N79-28773

Electricity in lieu of natural gas and oil for industrial thermal energy: A preliminary survey [ORNL/TM-5937] 24 p0739 N79-29630

Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000 [PB-294013/8] 24 p0760 N79-30837

Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill [NASA-TM-75497] 24 p0771 N79-31779

ELECTRIFICATION

Solar electrification and rural electrification - A techno-economic review 21 p0118 A79-17289

ELECTRO-OPTICAL PHOTOGRAPHY

Temporally and spatially resolved harmonic emission from spherical laser fusion targets 23 p0480 A79-39940

ELECTRO-OPTICS

Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters 21 p0053 A79-13288

Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators 24 p0646 A79-48735

ELECTROCATALYSTS

The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution --- fuel cell electrocatalysis 21 p0037 A79-11795

Electrocatalysis, charge-transfer and the states of H adsorption in the hydrogen evolution reaction 21 p0038 A79-11801

Recent advances in electrocatalysis and their implications for fuel cells 21 p0038 A79-11807

On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates --- in fuel cell electrodes 21 p0038 A79-11808

Fuel cell electrocatalysis - Where have we failed 21 p0039 A79-11810

Materials for fuel cells [PB-285360/4] 21 p0212 N79-13553

Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium [P/539/77/20] 23 p0588 N79-27284

Fuel cells: Applied research fuel cell materials and electrocatalysis [BNL-50951] 24 p0750 N79-30728

ELECTROCHEMICAL CELLS

Electrochemical engines for power generation and load-leveling at sites for underground coal conversion 21 p0005 A79-10051

Polycrystalline CdSe-based photo-electrochemical cells 21 p0037 A79-11785

Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures --- for fuel cells 21 p0039 A79-11812

Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells 21 p0040 A79-11824

Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes 21 p0040 A79-11832

Current state-of-the-art of electrochemical batteries from a users point of view 21 p0071 A79-14681

Energy storage by the use of high temperature electrochemical systems 21 p0148 A79-17992

Development of a 1 kW fuel cell aggregate with acid electrolyte 21 p0148 A79-17994

Selection of thermal operating regimes for fuel cell reactor-condenser systems 21 p0165 A79-20342

New chemical sources of current --- Russian book 22 p0237 A79-20679

Performance of molten salt sodium/beta-alumina/SbCl3 cells 22 p0245 A79-21479

Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes 22 p0245 A79-21482

Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions 22 p0245 A79-21483

Silver selenate and silver tellurate as positive materials for lithium primary power sources 22 p0245 A79-21484

Metal hydride electrodes for electrochemical energy storage 22 p0249 A79-21695

Electrochemical utilization of metal hydrides 22 p0251 A79-21709

Electrochemical use of biomass 22 p0254 A79-22273

Low voltage behavior of lithium/metal dichalcogenide topochemical cells 22 p0286 A79-26995

Steady-state composition profiles in mixed molten salt electrochemical devices. II - Molten carbonate fuel cell analogs 22 p0305 A79-30333

Study of the electrochemical activity of a porous vitreous carbon 23 p0389 A79-33264

An electrochemically regenerative hydrogen-chlorine energy storage system 23 p0397 A79-33836

Redox flow cell energy storage systems [AIAA PAPER 79-0989] 23 p0458 A79-38191

Advanced electrochemical energy sources for space power systems - A review 23 p0487 A79-40371

Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy 23 p0495 A79-40748

The Westinghouse Sulfur Cycle Hydrogen Production Process 24 p0614 A79-45591

Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation 24 p0625 A79-45849

Electrogenerative chemical reactors 24 p0631 A79-46310

Energy production by photoelectrochemical processes 24 p0633 A79-46521

Dynamic aspects of solid solution cathodes for electrochemical power sources 24 p0636 A79-46665

The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization
24 p0652 A79-49489

Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material
24 p0656 A79-50193

Problems in the redox flow cell power system for bulk energy storage
24 p0659 A79-50354

Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712

A zinc-bromine battery for energy storage
24 p0684 A79-51832

Reproducibility and performance of large prototype Na/S cells
24 p0684 A79-51835

Recent advances in Redox flow cell storage systems
24 p0684 A79-51837

Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

Electrogenerative and voltameiotic processes
24 p0703 A79-52026

Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316

Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960

On the design and operation of electrochemical solar cells
24 p0712 A79-53494

Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403

Thermoelectrochemical cycles for power and hydrogen production
[BNL-24387] 23 p0563 N79-24491

Future thrusts of the NASA space power program --- with emphasis on electrochemical energy conversion and storage
24 p0722 N79-28670

Cell design and manufacturing changes during the past decade
24 p0722 N79-28674

Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215] 24 p0723 N79-28728

A general purpose electroanalytical system based on a microcomputer controlled coulostatic generator
24 p0744 N79-29798

ELECTROCHEMICAL CORROSION

Casing materials for sodium/sulfur cells
22 p0245 A79-21481

Mechanism of erosion of metal electrodes of the channel of a MHD generator
22 p0306 A79-30391

Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398

Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399

Properties and test results of super-hot wall electrode materials --- for MHD generators
23 p0394 A79-33415

ELECTROCHEMICAL OXIDATION

Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966

Hydrogen production from coal, water and electrons
23 p0445 A79-37072

ELECTROCHEMISTRY

Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776

Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799

Effects of sintering on porous fuel cell electrodes
21 p0039 A79-11818

Electrochemical determinations of the chemical potential and diffusivity of sodium in Na/x/TaS2 at 300 K
21 p0040 A79-11830

A practical electrochemical transport equation for non-dilute solutions --- for energy storage application
21 p0041 A79-11841

Effect of electrolyte impurity on the electrochemical performance of the lead/tetrafluoroboric acid/lead dioxide cell
22 p0246 A79-21485

On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells
22 p0246 A79-21491

Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process
24 p0685 A79-51843

Toward the renewables - A natural gas/solar energy transition strategy
24 p0686 A79-51851

Battery and electrochemical systems program summary, FY 1977
[DOE/ET-0014] 21 p0176 N79-10546

Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A058795] 21 p0206 N79-13503

Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

Redox flow cell development and demonstration project, calendar year 1977
[NASA-TM-79067] 23 p0558 N79-24445

ELECTRODE FILM BARRIERS

Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes --- for solar energy conversion
22 p0273 A79-25548

ELECTRODEPOSITION

Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber
21 p0127 A79-17383

Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy
23 p0495 A79-40748

Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189

ELECTRODES

High performance lithium/iron disulfide cells --- for electric vehicle propulsion
21 p0010 A79-10087

Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries
21 p0010 A79-10088

Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries
21 p0010 A79-10089

Bipolar lithium/iron disulfide cells --- for electric vehicle propulsion
21 p0010 A79-10090

Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776

On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates --- in fuel cell electrodes
21 p0038 A79-11808

Effects of sintering on porous fuel cell electrodes
21 p0039 A79-11818

The zinc electrode in sealed alkaline cells
21 p0040 A79-11823

Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells
21 p0040 A79-11824

Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes
21 p0040 A79-11832

The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838
Hydrogen production by conventional and modified water electrolysis
21 p0059 A79-13659
The photogalvanovoltaic cell
21 p0066 A79-14264
Coal slag effects in MHD generators
21 p0080 A79-14934
Mathematical model of interelectrode breakdown in MHD generator
21 p0167 A79-20418
Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419
Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489
Metal hydride electrodes for electrochemical energy storage
22 p0249 A79-21695
Hydrogen storage electrode systems
22 p0251 A79-21710
Photoelectrolysis of water with semiconductors
22 p0259 A79-23343
Mechanism of erosion of metal electrodes of the channel of a MHD generator
22 p0306 A79-30391
A new concept of thermionic converter
23 p0381 A79-32636
Study of the electrochemical activity of a porous vitreous carbon
23 p0389 A79-33264
Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398
Properties and test results of super-hot wall electrode materials --- for MHD generators
23 p0394 A79-33415
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
High temperature batteries --- energy stores using Na and sulfur electrodes
23 p0451 A79-37881
Behavior of a sodium-sulfur cell with a dynamic sulfur electrode
23 p0487 A79-40372
Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage
23 p0495 A79-40747
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896
Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material
24 p0656 A79-50193
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167
A study of oxide-based heterostructure photoelectrodes --- for solar cells
24 p0705 A79-52314
Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field
24 p0708 A79-52955
Optimization of PtDoped KOCITE (trade name) electrodes in H3PO4 fuel cells
[AD-A061242] 22 p0342 N79-17340
Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-9] 22 p0361 N79-20504
Critical contributions in MHD power generation
[FE-2215-11] 22 p0362 N79-20511
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557
Development, testing and evaluation of MHD materials and component designs --- electrode and insulator systems for mhd generators
[FE-2248-19] 22 p0369 N79-21558
Fundamental solid electrode studies related to corrosion prevention, fuel cells and batteries
[AD-A064554] 23 p0544 N79-22641

ELECTRODYNAMICS
Subsonic flow in the channel of an MHD-generator
21 p0167 A79-20413
Electromagnetic excitation of a moving conducting piston
22 p0237 A79-20658
Theta-pinch description from classical electrodynamics
24 p0640 A79-47602
Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373
Inhomogeneity of the transverse current in an MHD channel and its effect on the local characteristics of an MHD generator
24 p0706 A79-52369

ELECTROHYDRODYNAMICS
Two asymptotic solutions for analyzing the transverse edge effect in induction MHD machines
22 p0298 A79-29287
Two limiting solutions for the analysis of transverse edge effects in MHD induction machines
24 p0663 A79-50777
Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

ELECTROLUMINESCENCE
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications
24 p0629 A79-46249

ELECTROLYSIS
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780
Iron oxide semiconductor electrodes in photoassisted electrolysis of water
21 p0037 A79-11781
Hydrogen production in a solar-hydrogen economy
21 p0037 A79-11796
Advanced electrolysis in alkaline solution --- for hydrogen production
21 p0037 A79-11798
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
Hydrogen production by conventional and modified water electrolysis
21 p0059 A79-13659
On the thermal and thermo-electrolytical generation of hydrogen by solar energy
21 p0059 A79-13660
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13874
Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-22320
Photoelectrolysis of water with semiconductors
22 p0259 A79-23343
Progress in solid polymer electrolyte water electrolysis --- for large-scale hydrogen production
22 p0289 A79-27653
Discharge reaction mechanisms in Li/SOCl2 cells
22 p0305 A79-30331
Development of a unipolar electrolysis unit --- for hydrogen fuel production
23 p0386 A79-33235
Hydrogen fuel production by wind energy conversion
23 p0413 A79-34113
State of development in the area of water electrolysis /near term/ --- hydrogen production technology
23 p0414 A79-34114

Hydrogen production at reduced cost through electrolysis and buoyancy 23 p0414 A79-34116
Hydrogen as a mid-term gaseous fuel supplement by blending with natural gas 23 p0415 A79-34129
Electrolytic hydrogen production by means of solar and wind energy 23 p0469 A79-38633
Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage 23 p0495 A79-40747
Alkaline electrolysis - Past, present and future 24 p0613 A79-45588
Water electrolysis using solid polymer electrolytes 24 p0613 A79-45589
Dedicated nuclear facilities for electrolytic hydrogen production 24 p0614 A79-45592
Towards the design of contrived photosynthesizers 24 p0655 A79-50185
The application of wind energy to a system with an inherent energy storage medium 24 p0677 A79-51778
High efficiency alkaline electrolysis technology --- for hydrogen production 24 p0685 A79-51842
Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process 24 p0685 A79-51843
Solid polymer electrolyte water electrolysis status for large scale hydrogen production 24 p0686 A79-51847
Hydrogen as the solar energy translator --- in photochemical and photovoltaic processes 24 p0686 A79-51852
Advanced synfuel production with fusion 24 p0695 A79-51947
Electrolysis of zinc. Statistical model of the process parameters for an industrial cell [BLL-RTS-11317] 22 p0345 N79-17984
Hydrogen production, volume 1. A bibliography with abstracts [NTIS/PS-79/0540/9] 24 p0765 N79-31406
Hydrogen production, volume 2. A bibliography with abstracts --- by electrolysis and coal gasification [NTIS/PS-79/0541/7] 24 p0765 N79-31407

ELECTROLYTES
The state-of-the-art of hydrogen-air phosphoric acid electrolyte fuel cells 21 p0039 A79-11815
Analysis of electrolyte shunt currents in fuel cell powerplants 21 p0039 A79-11816
Thin film high temperature solid electrolyte fuel cells 21 p0040 A79-11820
A practical electrochemical transport equation for non-dilute solutions --- for energy storage application 21 p0041 A79-11841
Development of a 1 kW fuel cell aggregate with acid electrolyte 21 p0148 A79-17994
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions 22 p0245 A79-21483
Effect of electrolyte impurity on the electrochemical performance of the lead/tetrafluoroboric acid/lead dioxide cell 22 p0246 A79-21485
Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage 23 p0416 A79-34130
Water electrolysis using solid polymer electrolytes 24 p0613 A79-45589
Technology status: Fuel cells and electrolysis cells 21 p0170 N79-10133
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes [AD-A056278] 21 p0184 N79-11483
Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells [AD-A058380] 21 p0206 N79-13505
Solid Polymer Electrolyte (SPE) fuel cell technology program [NASA-CR-160159] 22 p0371 N79-21622

ELECTROLYTIC CELLS
Pulse characteristics of sodium sulfur cells for electric vehicle propulsion 21 p0009 A79-10082
The photogalvanovoltaic cell 21 p0066 A79-14264
Saur vidyut kosh - The solar cell --- reversible charging electrolytic batteries 21 p0126 A79-17371
Discharge reaction mechanisms in Li/SOCl2 cells 22 p0305 A79-30331
A lithium/dissolved sulfur battery with an organic electrolyte 22 p0305 A79-30332
Development of a unipolar electrolysis unit --- for hydrogen fuel production 23 p0386 A79-33235
A new electrolytic cell type for hydrogen production in hybrid cycles 23 p0414 A79-34115
Solar photoelectrolysis with semiconductor electrodes 23 p0437 A79-36147
Hydrogen production with the ELOFLUX electrolysis cell 23 p0469 A79-38631
Alkaline electrolysis - Past, present and future 24 p0613 A79-45588
Water electrolysis using solid polymer electrolytes 24 p0613 A79-45589
Mobile electrolytic hydrogen generators 24 p0649 A79-49228
The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization 24 p0652 A79-49489
Problems in the redox flow cell power system for bulk energy storage 24 p0659 A79-50354
Advances in the development of Li-Al/FeS cells for electric-automobile batteries 24 p0683 A79-51829
High efficiency alkaline electrolysis technology --- for hydrogen production 24 p0685 A79-51842
Synfuel /hydrogen/ production from fusion power 24 p0695 A79-51946
Technology status: Fuel cells and electrolysis cells 21 p0170 N79-10133
Definition of chemical and electrochemical properties of a fuel cell electrolyte [AD-A058795] 21 p0206 N79-13503
Fabrication and testing of silver-hydrogen cells [NASA-CR-159431] 22 p0334 N79-16374
The use of fuel cell ion exchange membranes in electrolytic cells [P/539/77/23] 23 p0584 N79-26532
Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium [P/539/77/20] 23 p0588 N79-27284

ELECTROMAGNETIC ABSORPTION
Selective solar absorbers --- coatings for solar collector applications 21 p0057 A79-13646
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation 22 p0262 A79-23757
Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device --- microwave heating of tokamak plasma 22 p0271 A79-24867
Selective absorption of solar energy in ultrafine metal particles - Model calculations 22 p0273 A79-25746
Thermodynamics of the conversion of diluted radiation --- solar energy application 22 p0310 A79-30910

Electromagnetic radiation energy arrangement --- coatings for solar energy absorption and infrared reflection [NASA-CASE-WOO-00428-1] 22 p0352 N79-19186

ELECTROMAGNETIC COMPATIBILITY

Initial assessment: Electromagnetic compatibility aspects of proposed SPS Microwave Power Transmission System (MPTS) operations [PNL-2482] 21 p0202 N79-13252

ELECTROMAGNETIC FIELDS

Electromagnetic excitation of a moving conducting piston 22 p0237 A79-20658

Calculation of the external electromagnetic field of closely spaced MHD machines 22 p0298 A79-29285

Induced fields during the motion of a conducting medium in the field of an air-core magnetic system 24 p0650 A79-49373

Calculation of the external electromagnetic field of closely spaced MHD machines 24 p0663 A79-50775

Scattered EM field due to rotating blades of horizontal-axis wind machines [SAND-79-0434] 24 p0719 N79-28398

ELECTROMAGNETIC INTERFERENCE

Electromagnetic interference to television reception caused by horizontal axis windmills 24 p0627 A79-45923

ELECTROMAGNETIC PROPULSION

Electromagnetic propulsion alternatives --- in mass drivers [AIAA PAPER 79-1400] 23 p0426 A79-34840

Electromagnetic launchers 24 p0702 A79-52006

ELECTROMAGNETIC PUMPS

Calculation and design of liquid-metal MHD induction machines --- Russian book 22 p0286 A79-27302

Limit of formation of counterflows in plane linear induction MHD machines 22 p0298 A79-29288

Equations of a conduction MHD ejector 22 p0298 A79-29289

Limit of the formation of counterparallel flows in plane-parallel induction MHD machines 24 p0663 A79-50778

Equations of a conduction-type MHD linkage 24 p0663 A79-50779

ELECTROMAGNETIC RADIATION

Some perspectives on research into the biological response to non-ionizing electromagnetic radiation --- relation to SETI, SPS, and other government projects 22 p0271 A79-24879

ELECTROMAGNETIC WAVE TRANSMISSION

Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device --- microwave heating of tokamak plasma 22 p0271 A79-24867

New methods for the conversion of solar energy to R. F. and laser power [AIAA PAPER 79-1416] 23 p0426 A79-34846

Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front 23 p0486 A79-40251

The measurement of plasma electrical conductivity by the electromagnetic transmission method 23 p0530 A79-42875

Nonlinear effects in propagation of lower hybrid waves in a plasma 24 p0706 A79-52381

ELECTROMAGNETS

High-current Al-TiNb composite conductor for large energy storage magnets 24 p0604 A79-44546

ELECTROMECHANICAL DEVICES

Dispersed power systems and total energy --- solar energy conversion for combined mechanical/electrical and thermal loads [AIAA PAPER 79-1770] 21 p0062 A79-13868

Electromechanical conversion of energy during the deceleration of a piston in a uniform magnetic field 22 p0309 A79-30599

ELECTROMOTIVE FORCES

Thermal converters with transverse thermoelectromotive forces 22 p0256 A79-22847

ELECTRON ACCELERATORS

Characteristics of co-axial Marx generator and its application to electron beam fusion 24 p0642 A79-47805

ELECTRON ATTACHMENT

Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system 22 p0283 A79-26469

ELECTRON BEAMS

Application of electron beams in space for energy storage and optical beam generation 21 p0108 A79-16606

Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes 21 p0154 A79-18480

An overview of design space for small fusion targets 22 p0253 A79-22241

Microstability of a focused ion beam propagating through a z-pinch plasma 22 p0270 A79-24817

Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications 22 p0272 A79-25084

Prospects of generating power with particle-beam-drive inertial confinement fusion 23 p0407 A79-34063

High-energy laser mirror thermal distortion testing techniques 23 p0447 A79-37670

Efficient electron-beam-deposited ITO/n-Si solar cells 24 p0629 A79-46152

Characteristics of co-axial Marx generator and its application to electron beam fusion 24 p0642 A79-47805

ELECTRON DENSITY (CONCENTRATION)

Effect of diffusion on electron density across the nonequilibrium MHD channel 23 p0479 A79-39839

Boltzmann simulation of a storage ring laser 23 p0487 A79-40381

A study of waveguides for far infrared interferometers measuring electron density of tokamak plasmas 23 p0526 A79-41842

Proposed non-interferometric FIR electron density measuring scheme for tokamaks 24 p0707 A79-52667

ELECTRON DENSITY PROFILES

Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak 22 p0244 A79-21430

ELECTRON DIFFUSION

Diffusion length measurements in Schottky barrier GaAs solar cells 22 p0281 A79-26243

Effect of diffusion on electron density across the nonequilibrium MHD channel 23 p0479 A79-39839

Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells 23 p0497 A79-40890

Minority carrier diffusion length from spectral response measurements --- for solar cells 23 p0497 A79-40893

Diffusion length inhomogeneities in silicon solar cells 23 p0497 A79-40894

Determination of the minority carrier diffusion length in silicon solar cells 23 p0528 A79-42248

ELECTRON DISTRIBUTION

Transport phenomena in MHD generators - Effect of boundary layers 21 p0156 A79-19098

An experimental determination of the parallel electron velocity distribution during strong turbulence --- in Texas Turbulent Torus 23 p0446 A79-37264

Finite beta trapped electron fluid mode 23 p0478 A79-39561

ELECTRON ENERGY
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430
Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452

ELECTRON IRRADIATION
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086
Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C --- for space applications
24 p0668 A79-51008
Radiation damage in GaAs solar cells
24 p0785 N79-32663

ELECTRON MICROSCOPY
The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study
22 p0285 A79-26947
Extension of a theorem used in the investigation of P-N junctions with the scanning electron microscope to arbitrary geometries and arbitrarily inhomogeneous material
24 p0648 A79-49211

ELECTRON MOBILITY
The effects of electron thermal conductivity on thermionic energy converters
24 p0700 A79-51990

ELECTRON PLASMA
Non-thermal emission at the plasma frequency --- spectra obtained on tokamak fusion reactors
22 p0270 A79-24854
Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces --- in toroidal plasmas
22 p0270 A79-24855
Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device --- microwave heating of tokamak plasma
22 p0271 A79-24867
Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27885
Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943
Electron cyclotron heating in Bumpy Torus Program
24 p0607 A79-45033
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

ELECTRON RECOMBINATION
Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells
22 p0313 A79-31347
Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545
Extension of a theorem used in the investigation of P-N junctions with the scanning electron microscope to arbitrary geometries and arbitrarily inhomogeneous material
24 p0648 A79-49211
Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination
24 p0656 A79-50195

ELECTRON RUNAWAY (PLASMA PHYSICS)
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852
Non-thermal emission at the plasma frequency --- spectra obtained on tokamak fusion reactors
22 p0270 A79-24854
On the motion of runaway electrons in momentum space --- analysis for multi-component plasma in tokamaks
22 p0291 A79-27880
Interpretation of cyclotron radiation spectra from runaway discharges in TFR
22 p0313 A79-31185

ELECTRON SPECTROSCOPY
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054

ELECTRON STATES
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686

ELECTRON TUNNELING
On the role of interface states in MOS solar cells
21 p0156 A79-19092
Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-22320
Current conduction in Cr-MIS solar cells on single-crystal p-silicon
24 p0648 A79-49215

ELECTRON-ION RECOMBINATION
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

ELECTRONIC CONTROL
Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898
The application of hydraulics in the 2,000 kW wind turbine generator
22 p0288 A79-27400
The DOE 5 MW Solar Thermal Test Facility
23 p0428 A79-35046
Suntrack-systems for solar concentrators
23 p0464 A79-38587
Multichannel temperature controller for hot air solar house
24 p0658 A79-50347

ELECTRONIC EQUIPMENT
Electronic components in solar technology
21 p0056 A79-13629
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
22 p0261 A79-23623
Development of a heat pipe cooled 200 watt TWT with improved efficiency
24 p0764 N79-31275
A heat pipe radiator for shunt electronics: Development and test results
24 p0764 N79-31276

ELECTRONIC EQUIPMENT TESTS
Evaluation of battery performance using computer controlled test equipment
24 p0683 A79-51828
Synthetic test methods of high-direct-current circuit breaker --- used with ohmic heating power supply for tokamak device
24 p0716 A79-54504

ELECTRONIC MODULES
Thermal and other tests of photovoltaic modules performed in natural sunlight
[NASA-CR-158174] 22 p0354 N79-19460
Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471

ELECTROPLATING
Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407
The fabrication of Schottky-barrier solar cells by electroless nickel plating
23 p0436 A79-35746
Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization
24 p0656 A79-50188

ELECTROSTATIC GENERATORS
Direct energy converters - Efficiency and cost estimates for two electrostatic concepts
21 p0046 A79-12266
ELECTROSTATIC PRECIPITATORS
Particulate control for coal-fired industrial boilers
21 p0065 A79-14123
Modification of electrostatic precipitator performance by use of fly-ash conditioning agents
[ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736
On the dynamics of electrostatically precipitated fly ash
[ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390
High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157
Integrating an electrostatic precipitator into a municipal solid waste resource recovery system
23 p0489 A79-40398
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231
Particulate control mobile test units: Third year's operation
[PB-283657/5] 21 p0178 N79-10603
Evaluation of electrostatic precipitator during SRC combustion tests
[PB-285864/5] 21 p0223 N79-14618
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610
Study of electrostatic precipitators installed on oil-fired burners --- for use in the utility industry
[EPRI-FP-792-VOL-2] 24 p0760 N79-30848
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0796 N79-33352
ELECTROSTATIC SHIELDING
Effect of electrode shielding on beamlet-beamlet interaction in multiaperture sources
21 p0154 A79-18481
ELECTROSTATIC WAVES
Stability criteria for current-driven drift wave eigenmodes --- in tokamaks
22 p0269 A79-24813
Theory of anomalous transport due to electrostatic fluctuations --- low frequency plasma instabilities of drift wave type
22 p0270 A79-24858
The theory of lower hybrid heating of tokamak plasmas
24 p0606 A79-45028
Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424
ELECTROSTATICS
Electrostatic separation of coal macerals
24 p0603 A79-44525
Integral glass encapsulation for solar arrays
[NASA-CR-162361] 24 p0798 N79-33564
ELLIPSOIDS
Effect of form errors on the characteristics of ellipsoidal radiant energy concentrators
22 p0296 A79-28667
The effect of errors in their shape on the characteristics of ellipsoidal concentrators of radiant energy
24 p0637 A79-46905
EMERGENCIES
Improved energy contingency planning is needed to manage future energy shortages more effectively
[EMD-78-106] 24 p0750 N79-30729
EMISSION
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-10] 23 p0585 N79-26546
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654
EMISSION SPECTRA
Non-thermal emission at the plasma frequency --- spectra obtained on tokamak fusion reactors
22 p0270 A79-24854
Evidence for neutral-beam-injected oxygen impurities in 2XIIB --- mirror confined plasma
22 p0292 A79-27887
EMISSIVITY
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874
Flame emissivities - Alternative fuels
21 p0052 A79-12984
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588
A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors
23 p0530 A79-42895
Thermal emissivity of selective surfaces - New lower limits
24 p0648 A79-49207
Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703
Calorimetric emissivities for solar-selective coatings on flat sheet
24 p0706 A79-52536
EMITTANCE
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600
EMITTERS
The physics of solar cells
24 p0637 A79-47050
EMPLOYMENT
Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108
EMULSIONS
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197
The emissions and fuel economy of a Detroit diesel 6-71 engine burning a 10-percent water-in-fuel emulsion
[AD-A058550] 21 p0203 N79-13375
Fundamental combustion studies of emulsified fuels for diesel applications
[PB-287386/7] 22 p0330 N79-16138
Proceedings of symposium on water-in-fuel emulsions in combustion --- marine diesels, boilers, and gas turbine engines
[AD-A061503] 22 p0338 N79-17019
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions
[AD-A062751] 22 p0366 N79-21406
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348
ENCAPSULATING
Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
A life prediction methodology for encapsulated solar cells
23 p0428 A79-35041
Low-cost encapsulation materials for terrestrial solar cell modules
23 p0439 A79-36636
Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation
23 p0466 A79-38603
The development of a storage system based on encapsulated p.c.m.-materials --- phase change materials for solar thermal storage
23 p0470 A79-38639
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982

Terrestrial solar arrays with integral glass construction 23 p0509 A79-41004
Encapsulation materials for photovoltaic arrays 23 p0534 A79-43294
Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants [NASA-CR-157939] 21 p0195 N79-12544
Feasibility study of solar dome encapsulation of photovoltaic arrays [NASA-CR-158368] 22 p0367 N79-21545
Develop silicone encapsulation systems for terrestrial silicon solar arrays [NASA-CR-158537] 23 p0561 N79-24471
Integral glass encapsulation for solar arrays [NASA-CR-162361] 24 p0798 N79-33564

ENCLOSURES
An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures 23 p0531 A79-42908

ENDOTHERMIC REACTIONS
A new thermochemical process for hydrogen production 22 p0312 A79-31153
Solar and chemical energy 23 p0462 A79-38573
A stoichiometric analysis of coal gasification 23 p0492 A79-40456
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle 24 p0685 A79-51839

ENERGETIC PARTICLES
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement [NASA-TM-79719] 22 p0345 N79-17897

ENERGY
Solar irrigation program [SAND-78-0049] 21 p0210 N79-13537
Energy and the economy: The economic impact of alternative energy supply-demand assumptions [H-PRINT-95-51] 22 p0333 N79-16352
Shelter design and energy usage: A methodology for evaluating the impacts of residential space conditioning technologies on the consumer, the electric utility, and society 24 p0797 N79-33557

ENERGY ABSORPTION
A theory for wave-power absorption by two independently oscillating bodies 21 p0151 A79-18103
A theory for wave-power absorption by two independently oscillating bodies 22 p0259 A79-23307
The absorption of energy from ocean waves 23 p0449 A79-37859
The availability of solar energy for work processes 24 p0658 A79-50346

ENERGY ABSORPTION FILMS
The measurement of optical properties of selective surfaces using a solar calorimeter 21 p0041 A79-11874
Effect of surface curvature on measurement of the absorptance properties of solar coatings 21 p0042 A79-11879
Recent progress in thin film polycrystalline solar cells based on cadmium sulfide 21 p0042 A79-11966
Photovoltaic effects in II-VI heterojunctions 21 p0042 A79-11967
Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters 21 p0053 A79-13288
Cu2S-CdS thin-film solar cells 21 p0057 A79-13637
Selective solar absorbers --- coatings for solar collector applications 21 p0057 A79-13646
Selective coatings for aluminum and steel solar absorbers 21 p0058 A79-13647
Solaronyx - Selective coating for solar energy absorbers 21 p0058 A79-13648
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces --- for photothermal solar energy conversion 21 p0126 A79-17377
Studies on the selective absorption surface on stainless steel --- for flat type solar collectors 21 p0127 A79-17378
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath 21 p0127 A79-17379
Preparation and properties of pure and tin doped indium oxide selective coatings 21 p0127 A79-17381
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber 21 p0127 A79-17383
Materials for low-cost solar cells 22 p0252 A79-22099
Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors 22 p0256 A79-22855
Microstructure dependence of the optical properties of solar-absorbing black chrome 22 p0256 A79-22858
Chemical vapor deposited molybdenum films for use in photothermal conversion 22 p0294 A79-28148
Chemical vapor deposited amorphous silicon for use in photothermal conversion 22 p0294 A79-28149
Colored stainless steel - A new type of selective absorber --- for solar thermal conversion 22 p0294 A79-28150
Microstructural characterization of a black chrome solar selective absorber 22 p0294 A79-28151
New instrumentation for high temperature and hemispherical measurements of selective surfaces --- for solar energy conversion 22 p0294 A79-28152
Selective-black absorbers using sputtered cermet films 22 p0327 A79-31969
Black germanium solar selective absorber surfaces 22 p0327 A79-31970
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties 23 p0433 A79-35381
Thin-film coatings in solar water heating systems 23 p0452 A79-37887
Thin film solar absorber consisting of Au-particles in SiO2 23 p0465 A79-38599
Solar energy thermoreceiver with selective coating and vacuum thermoisolation 24 p0636 A79-46761
Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties 24 p0663 A79-50704
High absorptivity Al-PbS selective surfaces for solar photothermal conversion 24 p0705 A79-52319
Microstructure and optical properties of black chrome before and after exposure to high temperatures [LBL-9632] 24 p0756 N79-30804
Epitaxial silicon growth for solar cells [NASA-CR-162177] 24 p0769 N79-31758

ENERGY BANDS
Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells 22 p0313 A79-31347
Energy production by photoelectrochemical processes 24 p0633 A79-46521

ENERGY BUDGETS
Building energy standards and codes 21 p0073 A79-14596
Energy balances as a means for the evaluation of solar energy in developing countries 21 p0118 A79-17290
The conceptual basis of the electric utility sub-model of Project Independence Evaluation System 24 p0616 A79-45764

ENERGY CONSERVATION

A technical analysis for cogeneration systems with potential applications in twelve California industrial plants --- energy saving heat-electricity utility systems
21 p0011 A79-10099

Army facility energy conservation
21 p0028 A79-10233

Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398

Energy conservation aircraft design and operational procedures
[ONERA, TP NO. 1978-107] 21 p0036 A79-11572

The need for materials recycling
21 p0047 A79-12340

National Conference on Energy Conservation in General Aviation, 1st, Kalamazoo, Mich., October 10, 11, 1977, Proceedings
21 p0047 A79-12376

Turbine engines in light aircraft
21 p0047 A79-12380

Energy conservation in general aviation and operation and maintenance of Avco Lycoming piston engines
21 p0048 A79-12381

Economy in flight operations
21 p0048 A79-12383

Flying angle of attack
21 p0048 A79-12384

Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826

Impact of fuel availability and other cost trends on air carrier operations
21 p0053 A79-13077

Impact of fuel availability and other cost trends on general aviation
21 p0053 A79-13078

Pilot's view of the evolving air transport
21 p0053 A79-13085

Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652

Technology for aircraft energy efficiency
21 p0066 A79-14136

A methodology for evaluating the effectiveness of energy conservation programs
21 p0072 A79-14684

Residential energy design
21 p0073 A79-14694

Quantification of energy resource consumption
21 p0073 A79-14701

A systems study of our energy problems
21 p0074 A79-14704

Conservation as an energy source
21 p0077 A79-14769

Solar energy for residential housing
21 p0090 A79-15857

Identification of cost effective energy conservation measures
21 p0099 A79-16133

The Power Wheel - Elimination of energy-consuming drive components
21 p0112 A79-16734

Energy conservation by means of recycling
21 p0112 A79-16735

Solar energy and the second law of thermodynamics
21 p0118 A79-17292

Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0138 A79-17471

Optimum insulation with internal and solar heat gains
21 p0140 A79-17490

Enhancement of intrinsic solar heating --- thermal performance of house design option
21 p0140 A79-17494

A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649

Energy storage - Economics and fuel conservation
21 p0153 A79-18464

Rule of fuel management --- for airlines
21 p0155 A79-18521

Fuel conservative aircraft engine technology
21 p0164 A79-20078

Toward a materials-conservation ethic
21 p0167 A79-20438

Energy conservation through sealing technology
22 p0237 A79-20700

Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581

Optimization of a novel hydrostatic drive performance using hybrid computing technique --- for automobile engines
22 p0264 A79-23809

What and where - Solar active systems or energy conservation in buildings
22 p0275 A79-25927

CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940

The Philips experimental house - A system's performance study --- of solar energy utilization and energy conservation
22 p0277 A79-25941

Energy development --- for future global demand
22 p0282 A79-26402

Cogeneration in Europe and the combined cycle gas turbine
22 p0297 A79-28988

Energy analysis of an aluminum solar collector
22 p0316 A79-31405

Distributed energy storage for solar applications
22 p0317 A79-31410

Off-peak electrical backup experience in the Meadowvale Solar Experiment
22 p0318 A79-31421

Allowable costs for alternative domestic heating systems using utility supplied electricity for backup or charging energy
22 p0319 A79-31428

Energy management through energy conservation in buildings
22 p0320 A79-31431

Solutions to energy conservation in northern climates
22 p0321 A79-31443

Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911

The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912

Conserving electric power by geothermal refrigeration - Cooling and freezing
23 p0409 A79-34079

Energy conservation by waste heat utilization
23 p0417 A79-34145

Alternative energy sources and conservation technologies - Optimal systems
23 p0418 A79-34150

Assessment of energy conservation by using alternate energy sources in Kansas
23 p0418 A79-34151

Economic, political and psychosocial barriers to a change-over to renewable energy resources
23 p0421 A79-34176

Energy, helium, and the future --- U.S. He demand projection and conservation program
23 p0422 A79-34181

Effects of energy conservation research, development, and demonstration on residential energy use
23 p0422 A79-34276

Energy conserving cogeneration plant benefits utility and industrial companies
23 p0423 A79-34452

Heat pump application to single family dwellings - An analysis by computer model
23 p0449 A79-37855

Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192

A low energy house in Sweden heated by a solar energy system with heat pump
23 p0471 A79-38650

Energy conservation and solar energy - Partners in progress --- TVA program overview
[AIAA PAPER 79-0979] 23 p0475 A79-38890

Summary results from the NASA Tech House one year live-in
[AIAA PAPER 79-0987] 23 p0475 A79-38892

Practice of heat utilization from refuse
23 p0498 A79-40393

Conservation of satellite transmitter energy with propagation and demand variations
23 p0493 A79-40587

Rational utilization of electricity in order to satisfy the general objectives of the national energy policy
23 p0525 A79-41821

Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822

Energy on the horizon
23 p0529 A79-42458

Evaluation of a thermographic scanning device for solar energy and conservation applications
24 p0611 A79-45229

An analysis of operational procedures and design modifications for aircraft fuel conservation
[AIAA 79-1656] 24 p0611 A79-45328

Midwest Energy Conference, Chicago, Ill., November 19-21, 1978, Proceedings
24 p0630 A79-46301

Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305

Energy conservation via heat transfer enhancement --- in heat exchangers
24 p0630 A79-46307

Air buoyant vehicles - Energy efficient aircraft
[AIAA PAPER 79-1862] 24 p0643 A79-47919

Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

Energy savings
24 p0653 A79-49521

Electricity rate systems and energy conservation
24 p0696 A79-51959

District heating and cooling with heat pump systems
24 p0696 A79-51960

Technology impact study of a high efficiency industrial heat pump
24 p0697 A79-51966

The concept of available work as applied to the conservation of fuel resources
24 p0698 A79-51970

Novel approaches to industrial energy conservation in Georgia
24 p0698 A79-51972

Energy conservation - Focal point for energy efficient operations
24 p0714 A79-53805

Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies
24 p0714 A79-54278

Some aspects of a fission-based plasma engine
24 p0715 A79-54350

Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179

Energy conservation: Policies, programs and general studies. A bibliography with abstracts
[NTIS/PS-78/0693/8] 21 p0176 N79-10552

Outlook for world oil into the 21st century with emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-11454

Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487

Guide to reducing energy-use budget costs
[HCP/U60505-01] 21 p0184 N79-11489

Integrating technologies to produce energy conservation
[CONF-780109-6] 21 p0189 N79-11541

The Federal Government should establish and meet energy conservation goals
[PB-283066/9] 21 p0190 N79-11546

Fuel cell on-site integrated energy system parametric analysis of a residential complex
[NASA-TM-78996] 21 p0193 N79-11955

Energy efficient engine preliminary design and integration study
[NASA-CR-135396] 21 p0194 N79-12084

US Navy energy plan and program, 1978
[AD-A058054] 21 p0197 N79-12560

Energy future Northwest: Northwest Energy Policy project
[PB-284697/0] 21 p0199 N79-12578

Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026

Aircraft Engine Future Fuels and Energy Conservation
[AGARD-LS-96] 21 p0201 N79-13192

Future fuels for aviation
21 p0201 N79-13193

Engine component improvement and performance retention
21 p0202 N79-13198

Low energy consumption engines
21 p0202 N79-13199

Energy conservation aircraft design and operational procedures
21 p0202 N79-13200

Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506

Three modes of energy cost analysis: Then-current dollars, base-year dollars, and perpetual-constant dollars
[ORAU/IEA(M)-78-10] 21 p0209 N79-13531

Planning program to accelerate energy conservation in municipalities
[HCP/M05017-01/1] 21 p0210 N79-13536

Solar irrigation program
[SAND-78-0049] 21 p0210 N79-13537

Analysis of federal incentives used to stimulate energy production
[PNL-2410] 21 p0210 N79-13539

Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

Energy conservation and the rural home: Economic considerations for the nation and the individual
[PB-286222/5] 21 p0230 N79-15425

Energy education training: Feasibility study
[PB-285910/6] 21 p0230 N79-15428

Amended Oregon State energy conservation plan, 1978 Prepared in response to the Energy Policy and Conservation Act of 1975 (PL 94-163), and the Energy Conservation and Production Act of 1976 (PL 94-385)
[PB-286078/1] 21 p0231 N79-15430

Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868

General aviation energy-conservation research programs
22 p0329 N79-15963

Phase one/base data for the development of energy performance standards for new buildings: Data analysis
[PB-286901/4] 22 p0331 N79-16148

Industrial energy conservation
[GPC-24-067] 22 p0333 N79-16353

The effects of resource impact factors on energy conservation standards for buildings
[PB-286909/7] 22 p0335 N79-16384

Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497

Energy efficient engine: Propulsion system-aircraft integration evaluation
[NASA-CR-159488] 22 p0337 N79-16850

Fuel conservative subsonic transport --- control surfaces activated by computers
22 p0337 N79-16874

Energy conservation: Policy issues and end-use scenarios of savings potential. Part 1: Summary
[LBL-7896] 22 p0341 N79-17329

Life-cycle costing. A guide for selecting energy conservation projects for public buildings --- computing the cost effectiveness of retrofitting and new buildings
[PB-287804/9] 22 p0345 N79-17744

Technology assessment of western energy resource development
22 p0347 N79-18368

Electric and Hybrid Vehicle Act, Public Law 94-413 demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810

Phase one/base data for the development of energy
performance standard for new buildings. Task
report: Building classification
[PB-286904/8] 22 p0355 N79-19468
Evaluation of four energy conservation
programs--fiscal year 1977
[PB-288825/3] 22 p0355 N79-19472
Measuring energy conservation
[DOE/EIA-0103/18] 22 p0362 N79-20509
Single-cylinder diesel engine tests with
unstabilized water-in-fuel emulsions
[AD-A062751] 22 p0366 N79-21406
The role of thermal energy storage in industrial
energy conservation
[NASA-TM-79122] 22 p0368 N79-21550
Transportation energy conservation data book,
edition 3
[ORNL-5493] 22 p0369 N79-21562
The Brookhaven buildings energy conservation
optimization model
[BNL-50828] 22 p0370 N79-21564
Energy conservation through source reduction
[PB-290126/2] 22 p0372 N79-21626
Conservation where it counts: Energy management
systems
[PB-289837/7] 22 p0372 N79-21628
Industrial energy efficiency improvement program
[DOE/CS-0033/1] 23 p0540 N79-22332
Recovery of waste heat from propellant forced-air
dry house
[AD-A064108] 23 p0543 N79-22638
Opportunities for energy conservation in
transportation planning and systems management
[PB-291743/3] 23 p0544 N79-22643
More use should be made of energy-saving products
in federal buildings
[PB-291692/2] 23 p0544 N79-22647
Adaptation for the economy or adaptation for
energy conservation --- passenger aircraft design
[AAAF-NT-77-23] 23 p0551 N79-23537
Modeling and verification of heat pump performance
for industrial energy conservation
23 p0556 N79-24293
Econometric-engineering analysis of Federal energy
conservation programs in the commercial sector
[ORNL/CON-30] 23 p0562 N79-24489
Community application of integrated energy/utility
systems
[PB-290675/8] 23 p0566 N79-24520
Environmental development plan for transportation
energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899
Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513
Contextual analysis for industrial energy
conservation R and D
[PB-290981/0] 23 p0575 N79-25537
Energy Tax Act of 1978
[PUB-LAW-95-618] 23 p0576 N79-25926
Executive energy documents
[GPO-24-112] 23 p0582 N79-26507
Use of waste heat from nuclear power plants
[CONF-7811109-4] 23 p0583 N79-26527
Diesel organic rankine cycle compound engine
(Bottoming Cycle) program plan
[DOE/CS-0052] 23 p0590 N79-27521
Energy and cost saving results for advanced
technology systems from the Cogeneration
Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665
Computer software for planning design of community
energy systems
[CONF-781182-2] 23 p0600 N79-28063
Diesel Fuel and Gasoline Conservation Act of 1977
--- congressional reports
[GPO-34-986] 24 p0718 N79-29348
High-efficiency electric motors: Focus group
results
[DOE/TIC-10005] 24 p0719 N79-28441
Energy recovery from army ammunition plant solid
waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743
Comparative evaluation of recent reports on the
energy conservation potential from cogeneration
[ORNL/TM-6602] 24 N79-28776
Energy conservation and regulation in the
President's budget
[GPO-25-418] 24 p0736 N79-29597
Department of the Navy energy fact book
[AD-A069138] 24 p0738 N79-29614
Guide to solar energy programs
[DOE/ET-0036/1] 24 p0738 N79-29620
Ten scenarios of transportation energy
conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647
Further development and use of the transportation
energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648
Proceedings of the 2nd Workshop on
Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658
Transportation energy conservation: An
environmental overview
[CONF-781109-16] 24 p0742 N79-29661
Energy recovery and conservation by recycling
municipal solid waste
[NZERDC-P7] 24 p0745 N79-30105
Technical aspects of the Resource Conservation and
Recovery Act upon coal combustion and conversion
systems
[ORNL/CEPA-10] 24 p0748 N79-30687
Unique helium resources are wasting: A new
conservation policy is needed
[PB-293751/4] 24 p0748 N79-30701
Comprehensive community energy planning. Volume
2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713
Oven curing: Energy conservation and emission
control in coil coating
[TID-28705] 24 p0750 N79-30723
Energy use and conservation in industrialized
countries
[LBL-7872] 24 p0756 N79-30802
Evaluation of selected near-term
energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803
Energy conservation opportunities in commercial
appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810
International energy conservation: Comparative
law and policy. Proceedings from the 1978
International Conference on Energy conservation
[CONF-780274] 24 p0757 N79-30811
Community systems program --- for effective energy
conservation
[DOE/CS-0072] 24 p0757 N79-30813
Energy conservation: Policy issues and end-use
scenarios of savings potential. Part 6.
End-use energy conservation data base and
scenarios
[LBL-7896-PT-6] 24 p0758 N79-30818
Energy conservation via heat transfer enhancement
--- bibliographies
[COO-4649-3] 24 p0758 N79-30819
Statement and comparison between different studies
on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833
JT9D-70/59 improved high pressure turbine active
clearance control system --- for specific fuel
consumption improvement
[NASA-CR-159661] 24 p0763 N79-31208
Hospital ventilation standards and energy
conservation: A summary of the literature with
conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436
Opportunities for energy conservation in finished
concrete products
[HCP/CS-1549] 24 p0772 N79-31782
Energy conservation with fired heaters
[TREE-1308] 24 p0772 N79-31783
Passive solar energy planning aid kit for the
business community and general public
[CONF-780337-P2] 24 p0775 N79-31814
Generator gas: The Swedish experience from
1939-1945
[SERI/SP-33-140] 24 p0775 N79-31816
Thermal and mechanical energy storage program
[DOE/ET-0091] 24 p0775 N79-31817
Recommended changes to Executive Order 12003 and
related authorities --- for lighting and heating
standards in buildings
[DOE/TIC-10066] 24 p0775 N79-31820
Analysis and update of roles and responsibilities
derived from Executive Order 12003 and related
authorities
[DOE/TIC-10064] 24 p0776 N79-31823

Buildings energy management program workshop design [CONS-8630-T1] 24 p0776 N79-31824
Managerial plan: Executive order 12003 and the National Energy Act, proposed, synopsis [DOE/TIC-10062] 24 p0776 N79-31826
Paratransit vehicle test and evaluation. Volume 4: Fuel economy tests [PB-295478/2] 24 p0778 N79-32135
Energy conservation opportunities in appliances using energy storage [ORNL/SUB-7303/1] 24 p0782 N79-32629
Production of high-energy chemicals using solar energy heat [ORNL/SUB-7390/1] 24 p0789 N79-32707
NASA Tech House: An early evaluation [NASA-TM-80751] 24 p0798 N79-33571
Performance evaluation of solar films and screens [AD-A070636] 24 p0800 N79-33583
Status of thermal imaging technology as applied to conservation [HCP/M4228-01] 24 p0800 N79-33584
Development of retrofit energy conservation and solar heating systems, phase 1 [PB-295847/8] 24 p0801 N79-33593
A report on the development of a model energy management program for New York state schools, phase 2 [PB-295452/7] 24 p0802 N79-33607

ENERGY CONSUMPTION
User experience with on-road electric vehicles in the U.S.A. and Canada 21 p0009 A79-10090
Army facility energy conservation 21 p0028 A79-10233
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry 21 p0064 A79-14112
Breakdown of rapid rail energy costs - A study of three systems 21 p0068 A79-14323
Total energy and labor requirements for an electric commuter railroad 21 p0068 A79-14325
Building energy standards and codes 21 p0073 A79-14696
Preliminary results of the new geothermal domestic heating system at Creil 21 p0075 A79-14740
Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology 21 p0097 A79-16101
Analysis and design of solar buildings using the Cal-ERDA computer programs [CONF-780114-9] 21 p0137 A79-17463
Use of solar energy for industrial process heat 21 p0143 A79-17524
Dornier/RWE solar house in Essen, FRG 22 p0276 A79-25933
Energy development --- for future global demand 22 p0282 A79-26402
Energy policy of the European Economic Community 22 p0282 A79-26403
Climatic change in connection with energy growth --- resource consumption effects 22 p0284 A79-26623
Metropolitan work-trip energy consumption patterns 22 p0299 A79-29335
Uncoupling of economic growth and energy consumption - A new strategy of energy politics or only a new slogan 22 p0310 A79-30997
Fiat Research Center hybrid vehicle prototype [SAE PAPER 790014] 22 p0313 A79-31351
Strategies for alternative energy sources 23 p0421 A79-34173
Economic, political and psychosocial barriers to a change-over to renewable energy resources 23 p0421 A79-34176
Energy conservation and solar energy - Partners in progress --- TVA program overview [AIAA PAPER 79-0979] 23 p0475 A79-38890
Critical comments on energy models 23 p0481 A79-39994
Energy consumption structures in the year 2000 23 p0523 A79-41241
Peak period of household load in the different stages of electrical power supply 23 p0528 A79-42226
Energy on the horizon 23 p0529 A79-42458
Energy management up to the turn of the century - Options and constraints 23 p0536 A79-43525
Thermodynamic considerations in the production of synthetic fuels from coal 24 p0615 A79-45603
Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants 24 p0629 A79-46228
Energy savings 24 p0653 A79-49521
Chances for a low energy profile society 24 p0653 A79-49522
Energy and society 24 p0653 A79-49523
Distributed parameter modelling of urban residential energy demand --- using remotely sensed imagery 24 p0657 A79-50218
Feasibility of a heat-actuated heat-pump-centered integrated community energy system 24 p0696 A79-51961
Waste heat as an alternate fuel - Its opportunities and potential 24 p0698 A79-51968
End use energy consumption data base: Series 1 tables [PB-281817/7] 21 p0177 N79-10560
Energy analysis [NP-23145] 21 p0187 N79-11513
Urbanism and energy in developing regions [LBL-7808] 21 p0189 N79-11540
Army energy plan [AD-A057987] 21 p0197 N79-12562
Impact of electric passenger automobiles on utility system loads, 1985 - 2000 [EPRI-EA-623] 21 p0203 N79-13281
An annotated compilation of the sources of information related to the usage of electricity in non-industrial applications [PB-285260/6] 21 p0212 N79-13552
Energy use in Japan and the United States [BNL-23101] 21 p0221 N79-14578
LPG in Missouri [PB-286329/8] 21 p0230 N79-15421
Energy education training: Feasibility study [PB-285910/6] 21 p0230 N79-15428
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 1: Summary [LBL-7896] 22 p0341 N79-17329
The world balance for energy needs in view of year 2000: Development of the problem and areas involved, part 2 [BLL-RISLEY-TR-3395-(9091.9F)] 22 p0347 N79-18442
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings 22 p0351 N79-19059
Alternative models of energy demand 22 p0353 N79-19440
The good news about energy 22 p0355 N79-19461
Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days [PB-289204/0] 22 p0355 N79-19467
Measuring energy conservation [DOE/EIA-0103/18] 22 p0362 N79-20509
Energy utilization survey pamphlet for buildings [AD-A062930] 22 p0371 N79-21624
Minnesota coal study [PB-292106/2] 23 p0575 N79-25538
Assessment of load management on the electric power system --- conferences [CONF-781182-3] 23 p0590 N79-27412
Using coal inside California for nonelectric applications 23 p0591 N79-27599
Electric energy demand and supply prospects for California 23 p0591 N79-27601
A review of energy models. Part 4: July 1978 [IIASA-RR-78-11-PT-4] 23 p0594 N79-27652
Natural gas shortage --- Congressional reports [GPO-86-231] 24 p0717 N79-28347

Cost study application of the guidebook on integrated community energy systems: Indirect economic and energy impacts [ANL/ICES-TM-17] 24 p0727 N79-28777
Ten scenarios of transportation energy conservation using TECNET [HCP/M2101-1] 24 p0740 N79-29647
Energy supply and demand balances and financing requirements in non-OPEC developing nations [HCP/H6407] 24 p0741 N79-29650
Oil and gas supply curves for the administrator's annual report [DOE/EIA-0103/4] 24 p0746 N79-30406
Energy and materials in three sectors of the economy: A dynamic model with technological change as an endogenous variable 24 p0748 N79-30710
Energy sector capital requirements, 1978-1985 [DOE/EIA-0103/24] 24 p0755 N79-30797
Energy use and conservation in industrialized countries [LBL-7872] 24 p0756 N79-30802
Energy conservation opportunities in commercial appliances [ORNL/SUB-7261/1] 24 p0757 N79-30810
Projections of energy supply and demand for the 1978-1979 winter heating season [DOE/EIA-0102/33] 24 p0758 N79-30815
Recent energy consumption trends in European Economic Community countries [DOE/EIA-0103/16] 24 p0758 N79-30817
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations [LBL-8316] 24 p0767 N79-31436
Opportunities for energy conservation in finished concrete products [HCP/CS-1549] 24 p0772 N79-31782
Energy conservation with fired heaters [TREE-1308] 24 p0772 N79-31783
End-use energy-consumption data base. Version 10: User's manual [DOE/EIA-0175] 24 p0772 N79-31790
Long-term strategic analysis (towards an energy doctrine) [BNL-25250] 24 p0772 N79-31791
Recommended changes to Executive Order 12003 and related authorities --- for lighting and heating standards in buildings [DOE/TIC-10066] 24 p0775 N79-31820
National environmental impact projection no. 1 --- impacts of energy projections [HCP/P-6119] 24 p0777 N79-31844
Energy and cost calculations. 1: Optimization of electrochemical processes to achieve minimum product cost and the impact on energy consumption [ANL/OEPM-78-2] 24 p0788 N79-32697
Energy Emergency Management Information System (EEMIS): Program plan [DOE/EIA-0135] 24 p0791 N79-32723
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex [PB-294926/1] 24 p0793 N79-32738
Energy requirements of the US pulp and paper industry [ANL/EES/TM-42] 24 p0800 N79-33587
Energy supply and demand modeling. A bibliography with abstracts [NTIS/PS-79/0665] 24 p0802 N79-33605

ENERGY CONVERSION
Intersociety Energy Conversion Engineering Conference, 13th, San Diego, Calif., August 20-25, 1978, Proceedings. Volumes 1, 2 & 3 21 p0001 A79-10001
Underground thermal generation of hydrocarbons from dry, southwestern coals 21 p0005 A79-10050
Potential of the Stirling engine for stationary power applications in the 500-2000 HP range 21 p0025 A79-10211
Materials problems and opportunities in coal conversion systems 21 p0034 A79-11146
Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings 21 p0036 A79-11776
Nitinol thermodynamic state surfaces --- heat engine material 21 p0045 A79-12264
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields 21 p0049 A79-12692
Catalysis in coal conversion --- Book 21 p0051 A79-12873
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes 21 p0053 A79-13098
Low-cost concept for energy supply from the wind 21 p0058 A79-13651
Space power technology - Current status and future development trends --- for powering spacecraft [DGLR PAPER 78-167] 21 p0063 A79-14054
Energy technologies and natural environments - The search for compatibility 21 p0074 A79-14721
Geothermal energy from a utility perspective --- Imperial Valley of Southern California 21 p0091 A79-15880
Energy conversion at a lunar polar site 21 p0108 A79-16607
Status and summary of laser energy conversion --- for space power transmission systems 21 p0111 A79-16635
The Netherlands experimental vertical axis wind turbine 21 p0114 A79-17120
New chemical sources of current --- Russian book 22 p0237 A79-20679
Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion 22 p0260 A79-23615
An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing 22 p0264 A79-23780
A mass and energy balance of a Wellman-Galusha gasifier --- bituminous coal conversion 22 p0283 A79-26467
Energy conversion engineering --- Book 22 p0302 A79-29575
Electromechanical conversion of energy during the deceleration of a piston in a uniform magnetic field 22 p0309 A79-30599
MHD gas turbine energy conversion for mirror fusion reactors 22 p0313 A79-31192
Brazilian Conference on Energy, 1st, Rio de Janeiro, Brazil, December 12-14, 1978, Proceedings. Volumes A, B, & C 23 p0384 A79-33212
Energy projects at the Sao Paulo State Institute of Technological Research 23 p0389 A79-33261
Clean energy from humid air --- conversion into electric power 23 p0406 A79-34053
Aeroelastic pump --- wind energy from flutter of suspended liquid-filled cables 23 p0406 A79-34055
Transmission of energy by open-loop chemical energy pipeline 23 p0411 A79-34096
Hydrogen fuel production by wind energy conversion 23 p0413 A79-34113
Analysis of an edge-illuminated graded-gap solar cell 23 p0442 A79-36793
Marine structures for energy conversion 23 p0450 A79-37867
Tidal current energy conversion 23 p0450 A79-37870
Offshore wind energy systems for the U.K. 23 p0453 A79-37901
Post mortem assessment - Coal gasification plant 23 p0480 A79-39909

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 2 - Heat transfer in energy conversion, natural convection, combined heat and mass transfer, condensation, and forced convection
23 p0530 A79-42886

Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225

Electrostatic separation of coal macerals
24 p0603 A79-44525

DOE program on hydrogen energy systems
24 p0615 A79-45605

Midwest Energy Conference, Chicago, Ill., November 19-21, 1978, Proceedings
24 p0630 A79-46301

The comparison of energy chains --- different electrical energy production processes
24 p0644 A79-48023

Air emissions from waste to energy systems
24 p0665 A79-50883

Conversion of solar energy to chemical energy using ammonia dissociation
24 p0672 A79-51746

Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772

Resource recovery and recycling --- Book
24 p0706 A79-52570

Alternative power-generation systems
21 p0169 N79-10129

Biomass utilization in Minnesota
[PB-282531/3] 21 p0171 N79-10241

An evaluation of wood-waste energy conversion systems
21 p0174 N79-10528

Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574

Multidisciplinary research related to the atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679

Program THEK energy production units of average power and using thermal conversion of solar radiation
[NASA-TM-75369] 21 p0183 N79-11474

Structural performance of the DOE/Sandia 17 meter vertical axis wind turbine
[SAND-78-0990C] 21 p0187 N79-11516

Data acquisition and signal processing for a vertical axis wind energy conversion system
[SAND-78-1000C] 21 p0187 N79-11517

Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439

Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555

Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 2: Photovoltaic systems with energy storage
[HCP/T22221-01/2-2] 21 p0207 N79-13510

Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 1: Study summary and concept screening
[HCP/T22221-01/1-VOL-1] 21 p0207 N79-13511

Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527

Photovoltaic program: Program summary
[DOE/ET-0019/1] 21 p0209 N79-13529

Summary of atmospheric wind design criteria for wind energy conversion system development
[NASA-TP-1389] 21 p0223 N79-14678

Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414

Total energy consumption for municipal wastewater treatment
[PB-286688/7] 21 p0231 N79-15439

USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

Expert opinion on wind energy conversion systems designed by Hermann Honnef
[BMFT-FB-T-77-35] 22 p0349 N79-18456

Stochastic analysis of wind characteristics for energy conversion
22 p0350 N79-18535

Water-related environmental effects in fuel conversion, volume 1. Summary
[PB-288313/0] 22 p0351 N79-18834

Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171

Applicability of petroleum refinery control technologies to coal conversion
[PB-288630/7] 22 p0352 N79-19173

Evaluation of the use of oxygen as oxidant in fossil fuel fired open cycle MHD-steam energy conversion processes
22 p0353 N79-19444

V-groove multijunction solar cells
22 p0353 N79-19445

Bioconversion study conducted by JPL
[NASA-CR-158228] 22 p0354 N79-19450

Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

An improved solar energy receiver for a stirling engine
[NASA-CASE-NPO-14619-1] 22 p0362 N79-20513

Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224

Results from Symposium on Future Orbital power systems technology requirements
[NASA-TM-79125] 23 p0539 N79-22191

Thermal power systems small power systems application project: Siting issues for solar thermal power plants with small community applications
[NASA-CR-158520] 23 p0542 N79-22629

Heat pipe technology. A bibliography with abstracts
[NASA-CR-158005] 23 p0546 N79-23364

Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

Proceedings of the distribution automation and control working group. Volume 1: Executive summary
[NASA-CR-158642] 23 p0555 N79-24259

Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444

Thermoelectrochemical cycles for power and hydrogen production
[BNL-24387] 23 p0563 N79-24491

Basic research on ceramic materials for energy storage and conversion system
[COO-2564-4] 23 p0564 N79-24506

Hydrocarbons and energy from plants
[LBL-8596] 23 p0564 N79-24507

Emergence of biotechnology
[TID-28983] 23 p0567 N79-24626

Planning and analysis for development of photovoltaic energy conversion systems
23 p0570 N79-25487

Solar photovoltaic field tests and applications project
23 p0571 N79-25493

Forecasts of energy technology. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0337/0] 23 p0575 N79-25531

Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222

Process design for coal conversion reactors
[CONF-781110-15] 23 p0577 N79-26232

A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption
[AD-A067165] 23 p0582 N79-26510

HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529

The Texaco coal gasification process for manufacture of medium BTU gas
23 p0593 N79-27614

Synthetic natural gas in California: When and why --- from coal
23 p0593 N79-27615

Status report the SRC-1 and SRC-2 processes
23 p0593 N79-27616

The H-Coal processes: A status report
23 p0593 N79-27617

EXXON donor solvent coal liquefaction process
23 p0593 N79-27618

Methanol from coal
23 p0593 N79-27619

Proceedings of the Distribution Automation and Control Working Group. Volume 2: Proceedings
[NASA-CR-158769] 23 p0595 N79-27659

Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665

Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667

Design development and implementation of data acquisition systems for photovoltaic tests and applications project
[COO-4094-24] 23 p0596 N79-27672

Materials technology for coal-conversion processes
[ANL-79-2] 24 p0719 N79-28362

Clean energy from coal
[PETC-1000] 24 p0733 N79-29370

European waste-to-energy systems: Case study of Rennes, France
[HCP/M2103-0008] 24 p0737 N79-29605

Workshop on Energy Sources and Electric Power Generation for High School Students --- Coal-fueled systems were studied in similar fashion but enriched by visits to strip mining
[TID-28975] 24 p0740 N79-29643

Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224) --- bibliographies
[PB-294342/1] 24 p0743 N79-29671

The NASA space power technology program
24 p0751 N79-30746

Small wind energy: Focus group results
[DOE/TIC-10018] 24 p0752 N79-30771

Energy from urban wastes: Report on a focus group discussion
[DOE/TIC-10022] 24 p0759 N79-30825

Energy analysis of the helio-thermal-electric conversion
[P-77/P40/242] 24 p0759 N79-30831

Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413

Fusion reactors for synthetic fuels
[BNL-25634] 24 p0767 N79-31421

Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433

Energy from in situ processing of Antrim oil shale
[FE-2346-29] 24 p0769 N79-31746

Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779

Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784

Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837

Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32384

Advanced synfuel production with fusion
[BNL-26130] 24 p0780 N79-32388

State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts
[NTIS/PS-79/0639/9] 24 p0802 N79-33608

ENERGY CONVERSION EFFICIENCY

Vertical junction silicon solar cell --- for spacecraft power sources
21 p0001 A79-10013

Status of wraparound contact solar cells and arrays --- for spacecraft electric propulsion
21 p0001 A79-10014

The NTS-2 satellite solar cell experiment
21 p0001 A79-10016

Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017

The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024

From sunlight in space to 60 Hz on earth - The losses along the way --- satellite solar power transmission efficiency
21 p0003 A79-10027

Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041

Electrochemical engines for power generation and load-leveling at sites for underground coal conversion
21 p0005 A79-10051

A review of the PFBC combined cycle and its influence on gas turbine design parameters --- Pressurized Fluidized Bed Combustion
21 p0007 A79-10067

Rapid, efficient charging of lead-acid and nickel-zinc traction cells --- for electric vehicles
21 p0009 A79-10084

Response of lead-acid batteries to chopper-controlled discharge --- for electric vehicles
21 p0011 A79-10097

Performance of a Stirling engine powered heat activated heat pump --- gas heating-cooling system
21 p0011 A79-10098

The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100

Considerations for MHD power generation development
21 p0016 A79-10136

The fast power cycle for fusion reactors
21 p0018 A79-10152

Energy conversion in the long run
21 p0019 A79-10154

Analysis and design of an 18-ton solar-powered heating and cooling system
21 p0019 A79-10156

Combined cycle gas turbine for an automobile application
21 p0019 A79-10157

Thermal performance trade-offs for point focusing solar collectors
21 p0020 A79-10165

The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170

Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173

Hybrid air to water solar collector design
21 p0021 A79-10174

Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177

Heat pipe central solar receiver gas turbine plant
21 p0022 A79-10178

Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179

Compartmental model for agricultural conversion of solar energy into fixed biomass
21 p0022 A79-10181

Operating experience at the DOE/Sandia midtemperature Solar Systems Test Facility
21 p0022 A79-10182

Status of free-piston Stirling engine/linear alternator power conversion system development
21 p0025 A79-10212

Prospects of thermionic power systems
21 p0026 A79-10220

Selenide thermoelectric converter technology
21 p0026 A79-10221

Selenide technology evaluation program at JPL
21 p0026 A79-10222

Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223

Militarized thermoelectric power sources
21 p0027 A79-10227

Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229

Nitinol heat engines for economical conversion of low grade thermal density 21 p0027 A79-10230

Research on the sodium heat engine 21 p0028 A79-10231

DOE/NASA Mod-OA wind turbine performance 21 p0028 A79-10235

Experimental demonstration of the Diffuser Augmented Wind Turbine concept 21 p0029 A79-10238

Torque ripple in a vertical axis wind turbine 21 p0029 A79-10239

Toroidal Accelerator Rotor Platforms for wind energy conversion 21 p0029 A79-10240

Ultra-thin silicon solar cells for high performance panel applications 21 p0029 A79-10243

LAG-Process, some results of utilization in transport and mechanical engineering 21 p0030 A79-10248

Making turbofan engines more energy efficient [ASME PAPER 78-GT-198] 21 p0033 A79-10818

Role of semiconductor properties in photoelectrolysis 21 p0037 A79-11780

Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation 21 p0037 A79-11783

Migrational polarization in high-current density molten salt electrochemical devices 21 p0039 A79-11811

Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells 21 p0039 A79-11813

Perspectives on utility central station photovoltaic applications 21 p0041 A79-11873

Theoretical upper limit to the conversion efficiency of solar energy 21 p0042 A79-11876

Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells 21 p0042 A79-11955

Recent progress in thin film polycrystalline solar cells based on cadmium sulfide 21 p0042 A79-11966

High efficiency solar cells based on indium phosphide 21 p0042 A79-11968

A problem of optimizing the setting angle of sun-battery panels of concave shape --- onboard satellite 21 p0045 A79-12186

Calculation of wake effects in wind turbine parks 21 p0045 A79-12241

Direct energy converters - Efficiency and cost estimates for two electrostatic concepts 21 p0046 A79-12266

Aeroelastic wind energy converter 21 p0047 A79-12275

High efficiency low cost solar cell power 21 p0048 A79-12471

Low-grade thermal energy-conversion Joule effect heat engines [ASME PAPER 78-ENAS-7] 21 p0048 A79-12556

Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields 21 p0049 A79-12693

Energy efficiency in the transport sector 21 p0054 A79-13574

The efficiencies of thermochemical energy transfer 21 p0054 A79-13575

Performance of a honeycomb type flat plate collector with serpentine tube 21 p0054 A79-13579

Return flow solar air-heater 21 p0055 A79-13609

Testing the efficiency of solar collectors 21 p0056 A79-13627

Dynamic behaviour of light-weight solar collectors 21 p0056 A79-13628

Experimental results and concepts of different solar concentrators 21 p0057 A79-13643

Reduction of the heat loss flux of collectors by infrared reflecting coatings on cover plates 21 p0058 A79-13649

Generation of electrical energy from hydrogen and oxygen by means of fuel cells 21 p0059 A79-13662

Dispersed power systems and total energy --- solar energy conversion for combined mechanical/electrical and thermal loads [AIAA PAPER 78-1770] 21 p0062 A79-13868

Design of a second generation concentrating tracking solar collector [AIAA PAPER 78-1775] 21 p0062 A79-13872

A hybrid thermochemical hydrogen production cycle using solar energy process heat [AIAA PAPER 78-1779] 21 p0062 A79-13874

Performance of a tilted solar cell under various atmospheric conditions 21 p0066 A79-14261

Optimal sizing of solar collectors by the method of relative areas 21 p0066 A79-14263

Solar water pumping 21 p0066 A79-14266

Output power variations with solar power satellites 21 p0067 A79-14267

Progress in laser-fusion research 21 p0070 A79-14464

Residential energy design 21 p0073 A79-14694

Determining optimal angles of nonconvex solar battery panel mounting 21 p0080 A79-14837

A challenging role for the assurance sciences --- in energy conversion technology 21 p0086 A79-15396

Operation and control of wind-electric systems 21 p0086 A79-15575

Technique and instrumentation for measuring the performance of integrated solar heating/cooling systems 21 p0087 A79-15830

Boosting the performance of solar HVAC systems by improving component interactions --- Heating, Ventilating and Air Conditioning 21 p0089 A79-15851

Solar absorption cooling 21 p0090 A79-15861

Theory of solar assisted heat pumps 21 p0090 A79-15864

Incentives and requirements for gasification based power systems 21 p0094 A79-15904

Hybrid fossil-geothermal power plants 21 p0096 A79-15920

Increasing the efficiency of coal-fired steam electric plants with thermionic topping 21 p0096 A79-15921

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Albuquerque, N. Mex., June 25-29, 1978, Technical and Symposium Papers 21 p0101 A79-16415

Testing of solar collectors according to ASHRAE Standard 93-77 21 p0101 A79-16417

A graphical approach to the efficiency of flat-plate collectors 21 p0102 A79-16422

The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors 21 p0102 A79-16423

Performance of vacuum tube solar collector systems 21 p0102 A79-16424

Solar electricity production 21 p0104 A79-16467

The MHD power plant and its environmental aspects - Introduction 21 p0105 A79-16479

MHD generators --- Faraday, Hall and diagonal generator designs 21 p0105 A79-16484

A search for space energy alternatives 21 p0108 A79-16608

Overview of novel photovoltaic conversion techniques at high intensity levels 21 p0108 A79-16610

Multicolor solar cell power system for space
21 p0108 A79-16611
Absorption of solar radiation by alkali vapors --- for efficient high temperature energy converters
21 p0108 A79-16612
MHD conversion of solar energy --- space electric power system
21 p0109 A79-16614
Thermionics and its application to the SPS --- solar power satellite for energy conversion
21 p0109 A79-16616
The use of lasers for the transmission of power
21 p0109 A79-16621
Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space
21 p0110 A79-16623
The TELEC - A plasma type of direct energy converter --- Thermo-Electronic Laser Energy Converter for electric power generation
21 p0110 A79-16629
Quasi-isentropic laser engines
21 p0111 A79-16632
Generation of the new coherent radiation by harmonic conversion and nonlinear mixing for certain applications --- optical interactions
21 p0111 A79-16639
Methods for the photochemical utilization of solar energy
21 p0111 A79-16641
Factors affecting market initiation of solar total energy
21 p0112 A79-16732
The Power Wheel - Elimination of energy-consuming drive components
21 p0112 A79-16734
On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742
Controlling a wind generator for increased efficiency
21 p0113 A79-16743
Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744
A comparison between sun and wind as energy sources in irrigation plants
21 p0118 A79-17295
Theoretical and experimental analysis of a latent heat storage system --- solar energy absorbers
21 p0121 A79-17323
Role of high performance solar cells in practical photovoltaic systems
21 p0122 A79-17336
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360
A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell
21 p0125 A79-17361
Efficiency of conventional silicon solar cells
21 p0125 A79-17362
Efficiency of sugar cane and cowpea as solar energy converters
21 p0125 A79-17368
Investigation and perspectives on iron oxide, zinc conversion coating, zinc oxide, cobalt oxide and tungsten oxide as spectral selective solar absorber surfaces
21 p0126 A79-17375
Cheap packed bed absorbers for solar air heaters
21 p0128 A79-17388
Flat plate collector dynamic evaluation
21 p0128 A79-17390
A parametric investigation on flat-plate solar collectors
21 p0128 A79-17391
A comparison among various flat plate collectors with honeycomb structures
21 p0128 A79-17392
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398
Effect of dust on flat plate collectors
21 p0129 A79-17399
Thermal performance of solar collectors used in the national solar heating and cooling demonstration program
21 p0130 A79-17403
Comparative performance testing of flat-plate solar water heaters
21 p0130 A79-17405
Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator
21 p0130 A79-17406
Thermal performance testing of flat-plate solar collectors
21 p0130 A79-17407
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I.
21 p0130 A79-17409
Testing of water-heating collectors according to ASHRAE Standard 93-77
21 p0130 A79-17410
Double-exposure collector system for solar heating applications
[CONF-780114-6] 21 p0131 A79-17411
Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417
Solar collector optimization
21 p0132 A79-17418
Design and optimization of a flat plate collector for cooling application
21 p0132 A79-17419
Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422
A contribution to evaluation of flat-plate solar collectors performance
21 p0133 A79-17427
Computer simulation of the performance of a solar pond in the southern part of Iran
21 p0133 A79-17432
Evacuated solar flat-plate collectors for economic applications
21 p0133 A79-17435
Construction and test of a test apparatus for determining the efficiency of solar collectors with the ASE-test method
21 p0134 A79-17436
Theoretical and experimental yields of a solar heater with flat plate collectors
21 p0134 A79-17437
Performance of optimal geometry three step compound wedge stationary concentrator --- solar collector using flat side mirrors
21 p0134 A79-17438
A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439
Optimum design parameters of horizontal coaxial cylinders for a solar energy collector
21 p0134 A79-17444
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
The attainable efficiency of the solar thermoelectric generators
21 p0140 A79-17496
Design and performance of 1/4 H.P. solar power unit
21 p0141 A79-17503
Heat exchangers for Ocean Thermal Energy Conversion plants
21 p0142 A79-17506

Solar cell modules for terrestrial use
21 p0149 A79-17996

Solar fuels --- photochemical reaction kinetics and energy storage
21 p0149 A79-18009

A theory for wave-power absorption by two independently oscillating bodies
21 p0151 A79-18103

A wave power machine using free floating vertical plates
21 p0151 A79-18104

Modeling energy and power requirements of electric vehicles
21 p0153 A79-18465

Some aspects of the transient response of a flat-plate solar energy collector
21 p0153 A79-18466

The design and testing of a vertical-axis wind turbine using sails
21 p0153 A79-18467

Gas-cycle solar refrigeration system performance
21 p0153 A79-18471

A high-efficiency GaAlAs double-heterostructure photovoltaic detector --- with antireflection coating
21 p0154 A79-18489

Photoacoustic determination of photovoltaic energy conversion efficiency
21 p0154 A79-18503

Performance testing of solar collectors
21 p0155 A79-18875

Energy effectiveness of arbitrary arrays of wind turbines
[AIAA PAPER 79-0114] 21 p0156 A79-19540

Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant
[ASME PAPER 78-WA/ENEF-2] 21 p0159 A79-19775

The Stirling engine, an energy converter for cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777

The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
[ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814

Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834

Parametric analysis of power conversion systems for central receiver solar power generation
[ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835

Efficiency degradation due to tracking errors for point focusing solar collectors
[ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837

Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838

Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

Efficiency improvement by means of multicomponent processes - Improvement of the efficiency of heat-power transformation by means of an employment of Clausius-Rankine sorption processes
21 p0164 A79-19975

Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358

Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448

Superconducting energy storage magnets
22 p0236 A79-20537

Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

Optimization of an ideal thermionic converter
22 p0241 A79-20941

Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166

The application of thermography to large arrays of solar energy collectors
22 p0242 A79-21171

Recent advances in Na/S cell development - A review
22 p0246 A79-21488

Electrochemical utilization of metal hydrides
22 p0251 A79-21709

Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807

The oscillating water column wave-energy device
22 p0252 A79-22223

The synergetics of the catalytic D-D-fusion-fission breeder
22 p0252 A79-22236

Storage efficiency in a solar plant
22 p0254 A79-22270

Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272

Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768

Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859

Performance of a new high-intensity silicon solar cell
22 p0257 A79-22862

Optimizing the conversion mode for solar energy
22 p0258 A79-23125

Wave-tank experiments on an immersed parallel-plate duct --- for testing performance of sub-sea wave energy converter
22 p0258 A79-23306

A theory for wave-power absorption by two independently oscillating bodies
22 p0259 A79-23307

Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612

Optimization method of isotopic thermoelectric microgenerator geometry
22 p0260 A79-23613

Estimating heat loads on multistage thermoelectric heat pumps
22 p0260 A79-23614

Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator
22 p0260 A79-23616

Efficiency of a series of thermoelectric generators in a solar wedge concentrator
22 p0260 A79-23618

Reversible thermoelectric power conversion of energy fluctuations
22 p0261 A79-23619

Regenerative burner system for thermoelectric power sources
22 p0261 A79-23621

High-efficiency AlGaAs/GaAs concentrator solar cells
22 p0261 A79-23710

On the dynamics of wave-power devices
22 p0269 A79-24539

Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells
22 p0272 A79-25069

An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720

Passive solar house in Vetlanda - Interim report
22 p0277 A79-25943

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0278 A79-26176

Vortex sheet analysis of the Giromill --- vertical axis wind turbine with straight blades
22 p0278 A79-26179

Wind power distribution, control, and conversion in vortex augmentors --- influence on turbomachinery design and development
22 p0278 A79-26180

Diffuser designs for improved wind energy conversion
22 p0279 A79-26182

Two-dimensional MHD channel design --- for energy performance improvement at lower wall temperature
22 p0279 A79-26183

Subsonic diffusers for MHD generators
22 p0279 A79-26185

High efficiency wave engine --- featuring rotor blade exit nozzle design for high efficiency
22 p0279 A79-26187

Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189

Working fluids and turbines for OTEC power systems
22 p0280 A79-26192

A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242

Cavity-type surfaces for solar collectors 22 p0283 A79-26497
Three-dimensional effects of electrode configuration on diagonal MHD generator performance 22 p0283 A79-26523
Performance of a closed-cycle MHD generator with molecular impurities 22 p0283 A79-26524
Performance of combined solar-heat pump systems 22 p0285 A79-26817
Discharge characteristics of a soluble iron-titanium battery system 22 p0286 A79-26996
Induction-generator/synchronous-condenser system for wind-turbine power 22 p0286 A79-27219
Energy from sea waves - System optimization by diffraction theory 22 p0288 A79-27390
First-order design variables for concentrating solar collectors 22 p0293 A79-28141
Thermal analysis of black liquid cylindrical parabolic collector 22 p0295 A79-28354
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors 22 p0295 A79-28356
Solar absorption cooling feasibility 22 p0295 A79-28358
Optimum power plant capacity of ocean-based ocean thermal energy conversion systems 22 p0297 A79-28922
Operational characteristics of MHD turbine with air-core superconducting rotor 22 p0297 A79-28924
Cogeneration in Europe and the combined cycle gas turbine 22 p0297 A79-28988
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency 22 p0300 A79-29428
Recent developments in power sources with special emphasis on alkaline batteries --- for electric vehicles 22 p0301 A79-29490
The role of the battery electric vehicle 22 p0301 A79-29491
Developing electric vehicles 22 p0302 A79-29496
Electric car project of the Eindhoven University of Technology 22 p0302 A79-29498
The limiting efficiency of an edge-illuminated multigap solar cell 22 p0305 A79-30259
Review of liquid piston pumps and their operation with solar energy [ASME PAPER 79-SOL-4] 22 p0308 A79-30542
Do photovoltaics have a future [ASME PAPER 79-SOL-7] 22 p0308 A79-30543
Photovoltaic concentrator system technology and applications experiments [ASME PAPER 79-SOL-9] 22 p0308 A79-30544
Unique aspects of terrestrial photovoltaic system design [ASME PAPER 79-SOL-14] 22 p0308 A79-30548
Low cost thin-film CdS-based solar cells progress and promise [ASME PAPER 79-SOL-15] 22 p0309 A79-30549
Superconductivity in antenna engineering 22 p0311 A79-31008
Superconducting magnets - Present status and problems 22 p0311 A79-31009
Ranking and evaluation of flat-plate collectors - Two new approaches --- for seasonal storage solar-heating systems 22 p0316 A79-31402
Optimization of the flow passage geometry for air heating solar collectors 22 p0316 A79-31403
Performance analysis of a flat-plate solar collector using 'forge-fin' tubes 22 p0316 A79-31404
A solar collector thermal performance test for developmental programs 22 p0317 A79-31413
The Saskatchewan Conservation House - Some preliminary performance results 22 p0318 A79-31417
Performance of the Meadowvale solar home 22 p0318 A79-31420
Measured and predicted performance of solar domestic water heaters 22 p0319 A79-31422
The performance of a site built, air heating, vertical collector with snow reflector in Quebec 22 p0319 A79-31423
A cost effective vertical air/water solar heating collector 22 p0320 A79-31430
Collector and storage efficiencies in solar heating systems 22 p0320 A79-31432
The honeycomb heat trap - Its application in flat plate solar collectors 22 p0322 A79-31447
Cylindrical parabolic collector optimization for interfacing with steam turbine generators 22 p0322 A79-31448
A hybrid wind turbine suitable for developing regions 22 p0323 A79-31455
A scheme for direct conversion of plasma thermal energy into electrical energy 22 p0324 A79-31765
Application of a hot air turbine for efficiency improvement in MHD/steam power plants [ASME PAPER 79-GT-36] 23 p0375 A79-32341
Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines [ASME PAPER 79-GT-54] 23 p0376 A79-32349
Application of recuperative gas cycles with a bypass heat generator to solar energy power plants [ASME PAPER 79-GT-89] 23 p0376 A79-32366
Laser-particulate control for open-cycle, coal fired gas turbines [ASME PAPER 79-GT-177] 23 p0379 A79-32437
A new concept of thermionic converter 23 p0381 A79-32636
A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations 23 p0382 A79-32723
Solar-tower power plants - Optimization of the mirror field and application to the field scale effect 23 p0382 A79-32951
Contribution to the study of optimal conditions for optical concentration in solar power plant designs - Reduction of the radiation spot provided by a field of heliostats by use of optimized conical mirrors 23 p0382 A79-32952
Optimization of the heat transfer circuit of solar power plants using distributed solar thermal converters - Application to collectors of the THEK type 23 p0382 A79-32953
Comparative efficiencies of solar energy collectors 23 p0382 A79-32955
Theoretical and practical aspects of heat transfer in the window-absorber cavity of a flat plate collector 23 p0383 A79-32957
Simmer-enhanced flashlamp-pumped dye laser 23 p0384 A79-32981
System data on flat-plate collectors and its optimization 23 p0385 A79-33217
A practical technique for basic windmill design 23 p0387 A79-33238
Complementary nature of wind and solar energy at a continental mid-latitude station 23 p0396 A79-33763
An electrochemically regenerative hydrogen-chlorine energy storage system 23 p0397 A79-33836
Accuracy of empirical relations for flat plate collector performance prediction 23 p0398 A79-33987
Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector 23 p0398 A79-33989

Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991
Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system
23 p0399 A79-33994
Test results of a moderately focusing flat-plate solar collector
23 p0399 A79-33995
A combination solar direct electric conversion concentrator and heat collector system
23 p0399 A79-33996
Solar energy conversion system - Four quadrant, two dimension linear solar concentrators
23 p0399 A79-33999
Optimization of a fixed solar thermal collector
23 p0400 A79-34000
Photovoltaic conversion - Can its efficiency be improved through the application of color response data
23 p0402 A79-34025
Windmills with increased power output due to tipvanes
23 p0405 A79-34045
Theoretical study of a hybrid wind turbine
23 p0405 A79-34047
A review of wind-electric conversion technology
23 p0406 A79-34050
An energy analysis of a wind energy conversion system for fuel displacement
23 p0406 A79-34054
Chemical solutions to problems encountered in the gasification of coal
23 p0410 A79-34038
An evaluation of integrated coal gasification/water-splitting processes
23 p0411 A79-34094
Optimum design of automotive vehicles employing alternate energy sources of low energy density - Impact on selection of an energy-carrier for future urban vehicle transportation systems
23 p0415 A79-34128
Seasonal heat pump performance for a typical northern United States environment
23 p0418 A79-34153
A gas absorption cycle for electric power generation
23 p0418 A79-34154
Comparative economics of alternative fuels for intermediate services, combined cycle power plant
23 p0419 A79-34160
Renewable energy supplies for developing countries
23 p0422 A79-34178
Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372
Advanced power cycles and their potential for electrical energy generation
23 p0424 A79-34457
A retrofitted geothermal heating system
23 p0425 A79-34602
The efficiency of solar assisted hot water systems
23 p0430 A79-35061
Correlation of instantaneous and all-day thermal performance of flat-plate solar collectors
23 p0430 A79-35065
SERI solar energy standards activities
23 p0431 A79-35075
Aspects of the supply potential of the heat pump --- economic analysis
23 p0433 A79-35229
Solar energy and heat pumps - A possible substitute for fossil fuels for heating private households
23 p0434 A79-35464
Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601
Concentrator cost bound for high-efficiency photovoltaic power production --- mathematical model
23 p0440 A79-36637
Comment on a simple measurement of absolute solar cell efficiency
23 p0440 A79-36693
Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778
Meteorological effects on Schottky-barrier solar cells
23 p0441 A79-36781
Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782
Approaches to low-cost solar cells
23 p0441 A79-36784
Thin-film solar cells produced by physical vapour deposition
23 p0441 A79-36787
High temperature solar thermoelectric generator
23 p0447 A79-37299
Development of vertical-axis wind-energy converters - Darrieus design
23 p0447 A79-37744
The development and construction of a simulator for the proof testing of solar power devices
23 p0448 A79-37846
The significance of longwave radiation in flat plate solar collector testing
23 p0448 A79-37847
Performance estimation of a total energy domestic heat pump
23 p0449 A79-37854
System economic optimisation for wave energy
23 p0450 A79-37864
The use of non-fossil-derived hydrogen in coal conversion processes
23 p0451 A79-37882
Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888
Large scale solar thermal power generation
23 p0452 A79-37890
The design construction and proving of a low cost 5kW wind powered turbine for isolated applications
23 p0452 A79-37893
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898
Energy analysis of wave and tidal power
23 p0455 A79-37918
A method to increase the efficiency of solar photovoltaic devices by secondary emission
[AIAA PAPER 79-0981] 23 p0457 A79-38185
Power management battery storage systems
[AIAA PAPER 79-0982] 23 p0457 A79-38186
Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190
Redox flow cell energy storage systems
[AIAA PAPER 79-0989] 23 p0458 A79-38191
Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192
Design of the Eichenau solar house --- emphasizing heat insulation and solar collection and conversion
23 p0463 A79-38579
Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581
Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583
Critical study of energy parameters of solar energy /illumination and concentration/ - Application to catoptric collectors
23 p0463 A79-38584
Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585
The development of a stationary concentrator --- parabolic solar absorber surface effects on energy conversion performance
23 p0464 A79-38586
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588
Photoelectric conversion in monomolecular layer formations
23 p0464 A79-38589
Cu2S-CdS thin-film solar cells
23 p0466 A79-38601
Analysis of a 1 kW photovoltaic generator with concentration
23 p0466 A79-38604

Thermal performance of single-pass solar fluid heaters
23 p0467 A79-38613

The air-water collector - Operating experience and utilization possibilities --- for solar heating
23 p0467 A79-38615

Hydrogen production with the ELOFLUX electrolysis cell
23 p0469 A79-38631

A case study of a solar assisted heat pump system - 1977
23 p0469 A79-38634

Solar collector tests in Rwanda
23 p0470 A79-38643

Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648

Test report and power measurement on a 200-watt wind generator
23 p0472 A79-38658

Spatial uniformity of quantum efficiency of a silicon photovoltaic detector
23 p0478 A79-39593

A novel thermal engine using metal hydride
23 p0479 A79-39944

Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column
23 p0480 A79-39845

Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945

The Netherlands research program on wind energy
23 p0481 A79-40102

Performance evaluation of wind power units
23 p0483 A79-40115

A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123

An economic model to establish the value of WECS to a utility system --- Wind Energy Conversion System
23 p0485 A79-40131

Power extraction from ocean surface waves
23 p0486 A79-40198

Optimization of power absorption from sea waves
23 p0486 A79-40199

Integrating an electrostatic precipitator into a municipal solid waste resource recovery system
23 p0489 A79-40398

The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells
23 p0498 A79-40897

High efficiency, low cost processes for 3 in. diameter silicon solar cells
23 p0501 A79-40924

The alpha factor - Controlling solar cell absorptance
23 p0502 A79-40935

Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949

High efficiency solar panel /HESP/
23 p0503 A79-40951

Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon
23 p0504 A79-40959

Air Force High Efficiency Solar Panel - GaAs cell development --- or military satellites
23 p0506 A79-40971

The V-Groove Multijunction solar cell
23 p0511 A79-41015

Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight
23 p0511 A79-41018

Increased photovoltaic conversion efficiency through use of spectrum splitting and multiple cells
23 p0512 A79-41024

Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025

Analysis of multiple-cell concentrator/photovoltaic systems
23 p0513 A79-41026

Two-junction cascade solar cell characteristics under 1000 concentration ratio and AM 0-AM 5 spectral conditions
23 p0513 A79-41027

Spectrally split tandem cell converter studies
23 p0513 A79-41028

Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029

Concepts for rheotaxially-grown thin-film tandem III-V solar cells
23 p0513 A79-41030

Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base
23 p0513 A79-41031

Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells
23 p0514 A79-41034

Lifetime Cost and Performance model for photovoltaic power systems
23 p0514 A79-41037

Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038

GaAs solar cells for high solar concentration applications
23 p0514 A79-41039

High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040

High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041

Large area thin film gallium arsenide solar cells
23 p0515 A79-41042

Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells
23 p0515 A79-41044

Solar cells based on GaP/x/As/1-x/ compounds
23 p0515 A79-41045

A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046

Combined photovoltaic thermal collector testing
23 p0519 A79-41072

Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093

Design considerations for silicon HLE solar cells
23 p0521 A79-41094

Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra
23 p0528 A79-42170

Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171

A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors
23 p0530 A79-42895

An overview of intermediate temperature solar collector and energy storage technology
23 p0533 A79-43018

Spacecraft power systems
23 p0533 A79-43199

High-temperature lifetesting of Al/SiCx/p-Si contacts for MIS solar cells
23 p0536 A79-43569

Cretan windmills
23 p0536 A79-43576

An efficient optical window for flat-plate solar energy collectors
23 p0536 A79-43591

Parametric performance analysis of a Darrieus wind turbine system
23 p0536 A79-43676

Energy analysis of the Solar Power Satellite
24 p0601 A79-44160

Turning to the sun for power
24 p0601 A79-44239

Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715

Photovoltaic effect in Cu/CuGaSe2 Schottky barriers
24 p0605 A79-44721

Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873
Heating of current-free stellarators
24 p0607 A79-45037
Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201
Overview of solar energy programs and activities in the Southeast
24 p0607 A79-45202
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212
Heat storage in crushed limestone
24 p0609 A79-45215
Graphical representation of solar collector performance
24 p0609 A79-45216
Instrumenting hybrid passive/active solar systems --- for building heating
24 p0610 A79-45223
Use of meteorological data in system evaluation --- of solar energy collection efficiency
24 p0610 A79-45225
Biomass conversion potential in the Southeast
24 p0611 A79-45231
The exergy of fuels --- energy conversion factors
24 p0611 A79-45500
Role of hydrogen in Eco Energy
24 p0612 A79-45578
Hydrogen from falling water --- hydraulic energy conversion to chemical energy
24 p0614 A79-45594
TRW PSD-I power system design --- for OTEC
24 p0618 A79-45792
Performance optimization of an OTEC turbine
24 p0618 A79-45793
Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837
Steady-state and dynamic performance of an OTEC plant
24 p0624 A79-45838
Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation
24 p0625 A79-45849
OTEC system response and control analysis --- optimization of thermal cycle with seawater pumps
24 p0625 A79-45850
Photochemical energy conversion studies in systems containing methylene blue
24 p0628 A79-45995
Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems
24 p0629 A79-46236
An investigative study of a wave-energy device
24 p0631 A79-46315
Conserving energy via cogeneration
24 p0636 A79-46660
Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells
24 p0637 A79-47019
A simple theory of back-surface-field /BSF/ solar cells
24 p0637 A79-47051
Collection efficiency measurements on a-Si:H solar cells
24 p0638 A79-47063
Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796
Analysis of an evacuated cylindrical solar collector
24 p0642 A79-47800
Fabrication and characterization of SnO2/n-Si solar cells
24 p0642 A79-47802
A method for measuring the photothermal conversion efficiency of solar energy
24 p0642 A79-47806
Toward optimal control of solar energy systems
24 p0643 A79-47944
Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946
The development of the energy-materials ratios of electrical energy production systems
24 p0645 A79-48024
Energy balance of solar thermoelectric generators
24 p0646 A79-48734
Heating characteristics of concentrator/receiver systems using selective absorption surfaces
24 p0646 A79-48739
Investigation of the absorption and emission characteristics of an ideal selective surface --- for solar energy absorbers
24 p0648 A79-49186
Solar comes out of the shadows --- energy conversion technology forecasting
24 p0651 A79-49424
Applications of free-space microwave power transmission
24 p0652 A79-49487
A few considerations on new energy source
24 p0652 A79-49514
Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526
Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant
24 p0654 A79-50007
Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50028
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176
Possibilities of new materials for solar photovoltaic cells
24 p0655 A79-50178
Some relations governing major solar cell parameters
24 p0655 A79-50179
Design of selective surfaces for solar energy collection
24 p0655 A79-50180
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183
Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle
24 p0655 A79-50184
Towards the design of contrived photosynthesizers
24 p0655 A79-50185
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186
Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization
24 p0656 A79-50188
Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189
Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190
Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191
Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material
24 p0656 A79-50193
Efficiency of tandem solar cell systems as a function of temperature and solar energy concentration ratio
24 p0656 A79-50194
Properties of chemically sprayed SnO2 antireflecting films on Si solar cells
24 p0656 A79-50196
The availability of solar energy for work processes
24 p0658 A79-50346
Exploiting wave power --- electric energy source from ocean waves
24 p0660 A79-50400
Economic evaluation and optimization of solar heating systems
24 p0660 A79-50537
The steady state salt gradient solar pond
24 p0661 A79-50540

Static concentrators for two-sided photovoltaic solar cells 24 p0661 A79-50542

Performance of flat plate solar collector with fluid undergoing phase change 24 p0661 A79-50544

New ideal concentrators for distant radiation sources 24 p0661 A79-50547

The efficiency of resource recovery from solid waste 24 p0662 A79-50561

The 'effectiveness' of waste treatment systems 24 p0662 A79-50563

Solar photovoltaic energy --- research and development 24 p0667 A79-50909

Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation 24 p0669 A79-51178

Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system 24 p0670 A79-51729

A simulation exercise of a cavity-type solar receiver using the HEAP program 24 p0670 A79-51730

Projected techno-economic improvements for advanced solar thermal power plants 24 p0671 A79-51733

Performance of a large, salt-gradient solar pond 24 p0671 A79-51735

Economic and performance comparisons of salty and saltless solar ponds 24 p0671 A79-51737

Sede Boger - Shallow solar ponds project 24 p0671 A79-51738

Advanced solar thermal technology - Potential and progress 24 p0671 A79-51739

Solar thermal systems long-term performance predictions using closed-form solutions 24 p0672 A79-51740

Pumped storage battery with 100 percent efficiency 24 p0679 A79-51795

High efficiency alkaline electrolysis technology --- for hydrogen production 24 p0685 A79-51842

Supplementary steam - A viable hydrogen power generation concept 24 p0686 A79-51848

High efficiency ultrathin silicon solar cells 24 p0692 A79-51903

The concept of available work as applied to the conservation of fuel resources 24 p0698 A79-51970

Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power 24 p0699 A79-51977

Open-cycle coal-fired liquid-metal MHD 24 p0701 A79-51991

Considerations for adapting an MHD baseload power plant for intermediate and peaking duty 24 p0701 A79-51992

Evaluation of use of syngas for coal liquefaction 24 p0703 A79-52027

A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers 24 p0704 A79-52166

Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector 24 p0704 A79-52167

Coatings for enhanced photothermal energy collection. I - Selective absorbers 24 p0704 A79-52307

CVD molybdenum thin films in photothermal solar converters 24 p0704 A79-52309

Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements 24 p0705 A79-52321

The potential of np GaAs solar cells for high efficiency concentrator applications 24 p0705 A79-52325

Operation of self-excited generators for windmill application 24 p0706 A79-52538

Solar thermal aerostat research station /STARS/ [IAF PAPER 79-35] 24 p0709 A79-53261

Optimization of a fixed solar thermal collector 24 p0712 A79-53490

Load optimization in solar space heating systems 24 p0713 A79-53497

A device model for the tandem junction solar cell 24 p0714 A79-53938

Improved Conversion Efficiency Workshop. Volume 2: Summary [CONF-771003-P2-VOL-2] 21 p0176 N79-10551

Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier [EPRI-AF-782] 21 p0180 N79-11238

Catalytic conversion of coal energy to hydrogen [FE-2206-14] 21 p0180 N79-11239

MSFC hot air collectors [NASA-TM-78206] 21 p0196 N79-12556

The definition of a national program in. energy-efficient pump utilization, volume 1 [HCP/W1260-01/1] 21 p0207 N79-13514

The definition of a national program in energy-efficient pump utilization. Volume 2: Appendices [HCP/W1260-01/2] 21 p0207 N79-13515

Harnessing tidal energy [PB-286671/3] 21 p0222 N79-14581

Phase one/base data for the development of energy performance standards for new buildings: Data analysis [PB-286901/4] 22 p0331 N79-16148

Silicon web process development [NASA-CR-158376] 22 p0357 N79-20282

Large area silicon sheet by EFG [NASA-CR-158379] 22 p0359 N79-20483

A study of the effective resistance of the diffused layer and its effect on solar cell performance 22 p0367 N79-21541

High power magnetohydrodynamic system, volume 1 [AD-A064796] 23 p0543 N79-22639

High power magnetohydrodynamic system, volume 2 [AD-A064435] 23 p0544 N79-22640

Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000 [NASA-CR-158519] 23 p0549 N79-23503

In situ coal gasification modeling [UCRL-82269] 23 p0561 N79-24479

Systematic computation of the performance of photovoltaic based on first principles [UCID-1804-PT-1] 23 p0567 N79-24877

High efficiency GaAs solar cell development [AD-A066616] 23 p0573 N79-25514

Preparation and properties of Au-(-n) A sub X Ga sub 1 minus X aS-(n)GaAs Schottky-Barrier solar cells 23 p0579 N79-26473

Method of construction of a multi-cell solar array [NASA-CASE-MFS-23540-1] 23 p0579 N79-26475

Silicon solar cell process development, fabrication and analysis [NASA-CR-158736] 23 p0580 N79-26488

Silicon solar cell process development, fabrication and analysis [NASA-CR-158740] 23 p0580 N79-26490

Silicon solar cell process development, fabrication and analysis [NASA-CR-158735] 23 p0581 N79-26495

Array automated assembly, phase 2 [NASA-CR-158728] 23 p0581 N79-26498

Analysis of helio-thermoelectrical energy conversion efficiency [REPT-77/HP-40-241] 23 p0584 N79-26534

Energy efficient aircraft engines [NASA-TM-79204] 23 p0587 N79-27141

Photovoltaic-powered irrigation experiments in the United States --- crop drying and irrigating in Nebraska [COO-4094-28] 23 p0596 N79-27673

A 10-kilowatt photovoltaic concentrator array [SAND-78-7024] 23 p0598 N79-27699

Market assessment of fuel cell total energy systems [ORNL/CON-36] 23 p0598 N79-27704

Photovoltaic/thermal collectors and heat pumps --- solar heating system efficiency
[COO-4577-2] 24 p0726 N79-28757
Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790
Automated aray assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607
Small low-head hydroelectric power --- conferences
[IDO-10076] 24 p0738 N79-29617
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624
Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659
Comparison of two total energy systems for a diesel power generation plant --- deep space network
24 p0745 N79-30262
Behavior of solar generators in low orbits
24 p0752 N79-30766
Energy conservation opportunities in commercial appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 6. End-use energy conservation data base and scenarios
[LBL-7896-PT-6] 24 p0758 N79-30818
Silicon web process development --- for solar cell fabrication
[NASA-CR-162181] 24 p0770 N79-31762
High efficiency, high density terrestrial panel --- for solar cell modules
[NASA-CR-162167] 24 p0770 N79-31765
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Quantitative analysis of defects in silicon --- to predict energy conversion efficiency of silicon samples for solar cells
[NASA-CR-162173] 24 p0771 N79-31772
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832
Results of the 1978 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-162298] 24 p0782 N79-32635
Solar Cell High Efficiency and Radiation Damage, 1979
[NASA-CP-2097] 24 p0783 N79-32640
The NASA Lewis Research Center program in space solar cell research and technology --- efficient silicon solar cell development program
24 p0783 N79-32641
Solar photovoltaic research and development program of the Air Force Aero Propulsion Laboratory --- silicon solar cell applicable to satellite power systems
24 p0783 N79-32642
The JPL space photovoltaic program --- energy efficient sol silicon solar cells for space applications
24 p0783 N79-32643
Langley program of GaAs solar cells --- emphasizing energy conversion efficiency and radiation resistance
24 p0783 N79-32644
Updating the limit efficiency of silicon solar cells
24 p0783 N79-32645
Limiting process in shallow junction solar cells
24 p0783 N79-32646
Design of high efficiency HLE solar cells for space and terrestrial applications
24 p0783 N79-32647
Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648
Open-circuit voltage improvements in low-resistivity solar cells
24 p0784 N79-32649
Modeling of thin, back-wall silicon solar cells
24 p0784 N79-32650
Design considerations for the Tandem Junction Solar Cell
24 p0784 N79-32651
Thin cells for space
24 p0784 N79-32652
High efficiency cell geometry
24 p0784 N79-32653
Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-32671
Performance testing of the Del concentrating solar collector
[SAND-79-0515] 24 p0786 N79-32681

ENERGY DISSIPATION

Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166
Review of tokamak theory results
21 p0069 A79-14454
Fuel technology and the environment --- nuclear reactor caused radiation effects and transmutation
21 p0079 A79-14787
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I.
21 p0130 A79-17409
Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes
[ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836
Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530
Integral invariants and quasi-MHD nonlinear dissipation --- in magnetized toroidal plasmas
22 p0270 A79-24862
Heat loss characteristics of an evacuated plate-in-tube collector
22 p0285 A79-26818
The effect of the dispersion of the characteristics of solar cells in large systems
22 p0285 A79-26822
Dimensional relations for free convective heat transfer in flat-plate collectors --- solar collector heat loss
22 p0316 A79-31406
Optimization of a fixed solar thermal collector
23 p0400 A79-34000
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588
Estimating heat loss in residential structures using aerial infrared imagery
23 p0522 A79-41125
Effect of scrape-off on tokamak radial transport
24 p0640 A79-47427
Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785
Performance of retainerless bearings for flywheels
24 p0678 A79-51786
Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report)
[BMFT-FB-T-78-15] 23 p0590 N79-27345
Energy losses in a flat transposed cable --- superconducting cable
[LA-7635-MS] 24 p0781 N79-32481

ENERGY DISTRIBUTION

Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112
Use of satellites in solar applications --- for insolation mapping and space power stations
21 p0104 A79-16468
An experimental study of walls with latent heat for residences
23 p0470 A79-38640
The influence of increasing energy costs on the economic dimensioning of electrical energy distribution equipment
23 p0535 A79-43524
Energy management up to the turn of the century - Options and constraints
23 p0536 A79-43525

Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978
24 p0612 A79-45576
Storage and distribution of cryogenic fuels --- for transportation
24 p0650 A79-49378
Storage and distribution of synthetic fuels
24 p0650 A79-49379

ENERGY GAPS (SOLID STATE)
The limiting efficiency of an edge-illuminated multigap solar cell
22 p0305 A79-30259

ENERGY LEVELS
Energy production by photoelectrochemical processes
24 p0633 A79-46521

ENERGY POLICY
Alternatives for coal based power generation - An international overview
21 p0008 A79-10074
The Department of Energy's thermionic energy conversion program
21 p0025 A79-10213
Options for solar thermal conversion
21 p0043 A79-11969
Impact of fuel availability and other cost trends on general aviation
21 p0053 A79-13078
Hydropower from a national point of view --- projects for future energy production
21 p0059 A79-13656
Photovoltaic overview
[AIAA PAPER 78-1763] 21 p0061 A79-13964
Venture analysis of a proposed federal photovoltaic eight-year procurement plan
[AIAA PAPER 78-1766] 21 p0061 A79-13965
Annual Conference on Energy, 4th, University of Missouri-Rolla, Rolla, Mo., October 11-13, 1977, Proceedings. Volume 4
21 p0071 A79-14676
Coal gasification and its alternatives
21 p0071 A79-14679
Assessing environmental costs of energy procurement
21 p0071 A79-14682
Life cycle costing of energy systems
21 p0072 A79-14683
A methodology for evaluating the effectiveness of energy conservation programs
21 p0072 A79-14684
A survey of energy information systems and its implications for industrial energy management
21 p0072 A79-14685
Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687
The National Program for Solar Energy
21 p0072 A79-14688
Forest residues as an alternate energy source
21 p0072 A79-14689
Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690
Federal automobile fuel economy standards - A status report
21 p0073 A79-14693
Building energy standards and codes
21 p0073 A79-14696
Quantification of energy resource consumption
21 p0073 A79-14701
Economics and net energy analysis - Is a new analytical technique needed for energy decision making
21 p0074 A79-14706
DOE programs in material development for fusion laser systems
21 p0082 A79-15137
An introduction to ocean thermal energy conversion /OTEC/ power plants
21 p0091 A79-15869
Storage as an energy strategy for utilities
21 p0093 A79-15891
A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin
21 p0093 A79-15893
Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923
Hydrogen economy - An alternative
21 p0096 A79-15925
Combined environments: Technology interrelations; Proceedings of the Twenty-fourth Annual Technical Meeting, Fort Worth, Tex., April 18-20, 1978
21 p0097 A79-16076
Clean Air Act amendments of 1977 and the impact on control efforts
21 p0097 A79-16091
Time, technology and capital - Do we have enough to solve the energy crisis
21 p0097 A79-16100
Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101
A multivariate-utility approach for selection of energy sources
21 p0098 A79-16120
A comparative analysis of three of ERDA's major R & D programs
21 p0099 A79-16121
An economist looks at solar energy - The government's role
21 p0099 A79-16132
Current solar applications and economics
21 p0099 A79-16134
The economics and policy of alternative energy sources - A review
21 p0103 A79-16454
Solar Thermal Electric Program
21 p0112 A79-16730
Input-output method applied to energy planning
21 p0112 A79-16737
Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741
Energy systems: An analysis for engineers and policy makers --- Book
21 p0114 A79-17218
Potential research problems in energy systems analysis
21 p0115 A79-17221
Energy economics - A research analysis --- considering OPEC Cartel impact
21 p0115 A79-17222
Energy and input-output analysis --- for predicting impact on U.S. economy
21 p0115 A79-17223
Analysis of alternatives for U.S. international cooperation in solar energy
21 p0116 A79-17277
Plans and prospects for solar energy utilisation in Malawi
21 p0117 A79-17285
Energy balances as a means for the evaluation of solar energy in developing countries
21 p0118 A79-17290
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294
Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464
A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas
21 p0143 A79-17514
The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634
Synthetic fuels from coal
21 p0145 A79-17636
Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/ --- Book
21 p0147 A79-17646
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649
Solar power satellites - An AIAA position paper
21 p0148 A79-17872
National program for the development of commercial MHD
[AIAA PAPER 79-0188] 21 p0157 A79-19587
Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

The need for closed service areas in a supply economy based on line networks --- for German gas and electric utilities
21 p0168 A79-20447

Costing the satellite power system
[AAS PAPER 78-166] 22 p0243 A79-21270

Optimal decisions for long-term operation of hydropower systems
22 p0245 A79-21473

Investigations of solar heat production for household heating in Turkey
22 p0253 A79-22265

Energy and remote sensing applications
22 p0255 A79-22516

The economics of geothermal energy development at the regional level
22 p0256 A79-22756

A planning and information system for strategic energy policy assessment --- Book
22 p0259 A79-23600

Structuring a small national or state solar energy program
22 p0262 A79-23751

Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations
22 p0265 A79-24046

Prospects for solar heating and cooling in the United States
22 p0275 A79-25929

Santa Clara Community Center Project, USA --- solar building
22 p0277 A79-25945

Energy policy of the European Economic Community
22 p0282 A79-26403

Fuels of the future. I --- demand and proposed sources
22 p0282 A79-26404

Electricity - An indigenous transport fuel
22 p0292 A79-27898

Energy, resources, and policy --- Book
22 p0304 A79-30175

Uncoupling of economic growth and energy consumption - A new strategy of energy politics or only a new slogan
22 p0310 A79-30997

The role of applied meteorology in the Canadian energy programme
22 p0317 A79-31414

NRC solar monitoring program
22 p0318 A79-31419

NRC's wind energy program
22 p0319 A79-31426

The Prince Edward Island Wind Energy Program
22 p0319 A79-31427

Energy management through energy conservation in buildings
22 p0320 A79-31431

The Energy Research and Development Program of the United States
22 p0325 A79-31909

Energy research and development - A U.K. view
22 p0325 A79-31910

New energy sources - An option for the energy crisis
23 p0388 A79-33256

Training energy specialists - A proposal
23 p0388 A79-33257

Subsidies for a formulation of a plan of action for alternative energy sources and forms
23 p0388 A79-33258

New policy for electrical energy
23 p0388 A79-33260

Development of Brazilian hydroelectric potential - Future prospects and planning options
23 p0389 A79-33267

Some economic considerations in the rush toward alternate energy sources
23 p0389 A79-33268

The role of the local authority in waste reclamation
23 p0395 A79-33752

The crucial role of financial institutions in solar heating installations
23 p0403 A79-34031

Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies
23 p0403 A79-34032

Regional viability and solar commitment - An early adopter study
23 p0404 A79-34034

The role of solar energy in the solution of Turkey's energy predicament
23 p0404 A79-34035

An evaluation of the potential for district heating in the United States
23 p0417 A79-34142

Alternative energy sources and conservation technologies - Optimal systems
23 p0418 A79-34150

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy
23 p0419 A79-34158

The impact of oil price increases on the competitiveness of non-conventional energy technologies
23 p0419 A79-34162

Energy impact on economic activity and long-term trend forecast
23 p0419 A79-34163

Technical-economic modeling in energy planning
23 p0419 A79-34164

The inexhaustible energy resources study --- U.S. R and D to meet future requirements
23 p0420 A79-34166

Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future
23 p0420 A79-34168

Strategies for alternative energy sources
23 p0421 A79-34173

A nuclear-solar energy strategy
23 p0421 A79-34174

Coupled systems and energy policy - Closing the supply/demand gap: Are there many roads not taken
23 p0421 A79-34175

Economic, political and psychosocial barriers to a change-over to renewable energy resources
23 p0421 A79-34176

Function of economics in energy policy
23 p0422 A79-34179

Energy policy optimization by environmental systems analysis
23 p0422 A79-34180

Solar power space stations - Some issues of law and policy
[AAS 78-199] 23 p0427 A79-34864

Future programs in space --- impact on energy technology problems
[AAS 78-180] 23 p0427 A79-34865

Energy policies in the context of global economics
23 p0433 A79-35228

French solar policy - Its extent, its methods, its objectives
23 p0434 A79-35476

A completely solar power supply for France
23 p0436 A79-35492

A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774

Tidal power - The path to production
23 p0450 A79-37863

Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198

Opportunities for solar thermal energy in Puerto Rico
[AIAA PAPER 79-1028] 23 p0460 A79-38208

The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209

Accounting for intangibles in a present worth comparison of advanced power generation alternatives
23 p0461 A79-38500

A contribution to solution of the energy crisis - Proposed solution: Aerothermal plants
23 p0465 A79-38594

Solar energy utilization in comparison with utilization of other energy types
23 p0465 A79-38598

Further development of the high-speed converter with flapping hinge /Goslich system/ - Plans for application in developing countries --- windmill
23 p0471 A79-38655

Architectural planning - The possibility of using solar energy must be kept open
23 p0473 A79-38665

Energy supply for the Federal Republic on a regenerative basis
23 p0473 A79-38666

Conditions for the use of solar energy
23 p0473 A79-38669

Capital investment for transition to new energy supply systems
23 p0480 A79-39993

Critical comments on energy models
23 p0481 A79-39994

International Symposium on Wind Energy Systems, 2nd, Amsterdam, Netherlands, October 3-6, 1978, Proceedings. Volume 1
23 p0481 A79-40101

Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects
23 p0490 A79-40408

Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/ --- Book
23 p0493 A79-40699

Role of intermediate markets in P/V industry development
23 p0516 A79-41052

The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology
23 p0516 A79-41053

Energy consumption structures in the year 2000
23 p0523 A79-41241

Solar energy - Principal directions of research
23 p0524 A79-41805

Constraints on a policy of evaluating recoverable energy
23 p0524 A79-41811

Long term perspectives in energy resources
23 p0525 A79-41820

Rational utilization of electricity in order to satisfy the general objectives of the national energy policy
23 p0525 A79-41821

Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822

Energy on the horizon
23 p0529 A79-42458

The capital stake in the transition to new energy systems. II
23 p0535 A79-43522

Remarks on economic growth and energy requirements
23 p0535 A79-43523

Energy management up to the turn of the century - Options and constraints
23 p0536 A79-43525

Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy
23 p0536 A79-43575

Lead agency designation and proposed licensing procedures for ocean thermal energy conversion facilities
24 p0621 A79-45809

The race for unlimited energy --- Book
24 p0639 A79-47071

Market penetration characteristics for energy production and atmospheric carbon dioxide growth
24 p0643 A79-47812

The 'Facility Data Base' or data bank on energy facilities
24 p0644 A79-48021

R&D programmes in the field of hydrogen economy
24 p0648 A79-49227

The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300

The Eppler scenario - A critical analysis --- German energy politics
24 p0649 A79-49330

Dialectical discussion on optimal order structures for an integrated energy supply system
24 p0649 A79-49331

A few considerations on new energy source
24 p0652 A79-49514

Coal yesterday and tomorrow --- coal utilization forecasting
24 p0652 A79-49516

Energy, development and diplomacy --- international relations among petroleum producers and consumers
24 p0652 A79-49518

The economic and political conditions of access to resources of natural gas
24 p0652 A79-49519

The international energy agency - The way ahead
24 p0652 A79-49520

Energy savings
24 p0653 A79-49521

Chances for a low energy profile society
24 p0653 A79-49522

Energy and society
24 p0653 A79-49523

Solar potential inventory and modeling
24 p0657 A79-50219

Environmental implications for geothermal energy development
24 p0659 A79-50351

Impact of H2S emission abatement on geothermal power costs
24 p0659 A79-50352

Applicability of energy model techniques to an analysis of impacts of SO2 emissions from the U.S. electric utilities and control policies
24 p0659 A79-50362

The Department of Energy electric vehicle battery program - An overview
24 p0683 A79-51825

A European view of the solar satellite power system
24 p0694 A79-51942

The energy reformation --- waste energy utilization for heating and electricity
24 p0698 A79-51969

Reference Energy Systems as applied to regional energy policy
24 p0698 A79-51973

Feasibility of energy self sufficiency through decentralized use of renewable resources in Iran
24 p0698 A79-51974

Solar power satellites for Europe
[IAF PAPER 79-173] 24 p0710 A79-53334

Solar energy bank for mankind in contemporary international space law
[IAF PAPER 79-IISL-47] 24 p0711 A79-53482

Legal norm creation concerning solar energy in contemporary international space law
24 p0713 A79-53680

The legal aspect concerning solar energy
24 p0713 A79-53681

Some observations of the legal implications relating to the use of solar energy
24 p0713 A79-53682

Energy conservation - Focal point for energy efficient operations
24 p0714 A79-53805

Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179

Methane generation from human, animal, and agricultural wastes
[PB-276469/4] 21 p0171 N79-10240

Biomass utilization in Minnesota
[PB-282531/3] 21 p0171 N79-10241

Indoor test for thermal performance evaluation on the Northrup concentrating solar collector
[NASA-CR-150804] 21 p0172 N79-10515

Preliminary design package for solar heating and hot water system
[NASA-CR-150619] 21 p0173 N79-10520

Thermal performance evaluation of the Calmac (liquid) solar collector
[NASA-CR-150819] 21 p0173 N79-10521

Design package for concentrating solar collector panels
[NASA-CR-150788] 21 p0173 N79-10523

Rankine cycle machines for solar cooling
[NASA-TM-78196] 21 p0173 N79-10524

Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

Geothermal Reservoir Engineering Management Program Plan (GREMP Plan)
[LBL-7000] 21 p0174 N79-10536
National coal utilization assessment: An integrated assessment of increased coal use in the midwest: Impacts and constraints, volume 1
[ANL/AA-11-VOL-1-DRAFT] 21 p0174 N79-10537
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538
Hot dry rock energy project
[LA-UR-77-2744] 21 p0175 N79-10540
Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541
Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543
Status of the DOE photovoltaic concentrator technology development project
[SAND-78-0948C] 21 p0176 N79-10550
Improved Conversion Efficiency Workshop. Volume 2: Summary
[CONF-771003-P2-VOL-2] 21 p0176 N79-10551
Energy conservation: Policies, programs and general studies. A bibliography with abstracts
[NTIS/PS-78/0693/8] 21 p0176 N79-10552
Energy in transportation
[PB-282928/1] 21 p0177 N79-10561
Energy: The new economic development wildcard
[PB-282494/4] 21 p0177 N79-10564
Comprehensive overview of winter energy data bulletins
[PB-282787/1] 21 p0177 N79-10565
Environmental control technology activities of the Department of Energy in FY 1977
[DOE/EV-0030] 21 p0178 N79-10572
Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473
Program THEK energy production units of average power and using thermal conversion of solar radiation
[NASA-TM-75369] 21 p0183 N79-11474
Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481
Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487
Energy information data base. Guide to abstracting and indexing
[TID-4583-R1] 21 p0184 N79-11488
Guide to reducing energy-use budget costs
[HCP/U60505-01] 21 p0184 N79-11489
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494
Annual highlights of the energy technology programs
[BNL-50799] 21 p0185 N79-11499
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500
Solar heating and cooling demonstration project summaries
[DOE/CS-0009] 21 p0186 N79-11503
Biomimetic approach to solar energy conversion: Artificial photosynthesis
[CONF-780222-5] 21 p0186 N79-11506
Advanced secondary batteries for electric vehicle propulsion
[CONF-780426-2] 21 p0186 N79-11508
Need for and deployment of inexhaustible energy resource technologies: Report of Technology Study Panel inexhaustible energy resources study
[TID-28202] 21 p0186 N79-11510
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511
Energy analysis
[NP-23145] 21 p0187 N79-11513
National Geothermal Information Resource
[LBL-7803] 21 p0187 N79-11515
High performance GaAs photovoltaic cells for concentrator applications
[SAND-78-7018] 21 p0187 N79-11521
Environmental Development Plan (EDP): Solar thermal power systems, 1977
[DOE/EDP-0004] 21 p0187 N79-11522
Fixed mirror solar concentrator for power generation
[GA-A-14883] 21 p0187 N79-11526
Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527
Energy situation in the Mid-Atlantic region
[BNL-50703] 21 p0188 N79-11528
Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529
Environmental Development Plan (EDP): Ocean thermal energy conversion, 1977
[DOE/EDP-006] 21 p0188 N79-11531
Energy and the economy
[EPRI-EA-620-VOL-1] 21 p0189 N79-11539
Federal Energy Data System (FEDS) technical documentation
[PB-281815/1] 21 p0189 N79-11542
The Federal Government should establish and meet energy conservation goals
[PB-283066/9] 21 p0190 N79-11546
Application of solar technology to today's energy needs, volume 1
[PB-283770/6] 21 p0190 N79-11548
Energy policy and research planning, volume 2. A bibliography with abstracts
[NTIS/PS-78/0961/9] 21 p0191 N79-11552
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-78/0962/7] 21 p0191 N79-11553
Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283171/7] 21 p0191 N79-11554
Renewable ocean energy sources. Part 1: Ocean thermal energy conversion
[PB-283104/8] 21 p0191 N79-11556
Renewable ocean energy sources. Part 1: Working papers. Ocean thermal energy conversion
[PB-283103/0] 21 p0191 N79-11557
Committee on the challenges of modern society rational use of energy pilot study modular integrated utility system project. Volume 2: Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11558
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[PE-2025-3] 21 p0192 N79-11607
Parameters for legislative consideration of bioconversion technologies
[PB-284742/4] 21 p0194 N79-12250
Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543
Microprocessor control of a wind turbine generator
[NASA-TM-79021] 21 p0195 N79-12548
Prototype solar heating and cooling systems
[NASA-CR-150828] 21 p0196 N79-12552
MSFC hot air collectors
[NASA-TM-78206] 21 p0196 N79-12556
US Navy energy plan and program, 1978
[AD-A058054] 21 p0197 N79-12560
Army energy plan
[AD-A057987] 21 p0197 N79-12562
The department of Defense's alternate energy policy
[AD-A058200] 21 p0197 N79-12563
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565
Energy information data base: Serial titles
[TID-4579-R10] 21 p0197 N79-12566
National photovoltaic program plan
[DOE/ET-0035(78)] 21 p0197 N79-12567
Thermal stress cracking and the enhancement of heat extraction from fractured geothermal reservoirs
[LA-7235-MS] 21 p0198 N79-12568
Energy supply and environmental impacts: Conventional sources, study module 3-A, technical appendix
[PB-283787/0] 21 p0198 N79-12573

ENERGY POLICY CONTD

A Kentucky energy resource utilization program
[PB-283796/1] 21 p0198 N79-12574

Energy and environment: An intergovernmental perspective
[PB-283733/4] 21 p0198 N79-12575

Energy future Northwest: Northwest Energy Policy project
[PB-284697/0] 21 p0199 N79-12578

The energy dilemma: A challenge for Maryland. Proceedings Maryland General Assembly/AISLE Conference
[PB-284703/6] 21 p0199 N79-12579

Technical and environmental aspects of oil shale processing
21 p0199 N79-12581

Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics
[NASA-CR-157953] 21 p0200 N79-12970

Status of alcohol fuels utilization technology for highway transportation
[HCP/M2923-01] 21 p0201 N79-13190

Technical notes for the conceptual design for an atmospheric fluidized-bed direct combustion power generating plant
[HCP/T2583-01/2] 21 p0203 N79-13280

Impact of electric passenger automobiles on utility system loads, 1985 - 2000
[EPRI-EA-623] 21 p0203 N79-13281

Application of multispectral scanner data to the study of an abandoned surface coal mine
[NASA-TM-78912] 21 p0204 N79-13472

A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0204 N79-13474

Instrumentation at the Decade 80 solar house in Tucson, Arizona
[NASA-CR-150851] 21 p0204 N79-13491

Largo hot water system long range thermal performance test report, addendum
[NASA-CR-150842] 21 p0204 N79-13492

Long-term weathering effects on the thermal performance of the Lennox/Honeywell (liquid) solar collector
[NASA-CR-150818] 21 p0204 N79-13493

Libbey-Owens-Ford solar collector static load test
[NASA-CR-150852] 21 p0205 N79-13494

Prototype solar-heated hot water systems and double-walled heat exchangers
[NASA-CR-150854] 21 p0205 N79-13495

Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150850] 21 p0205 N79-13498

SIMS prototype system 4 - performance test report
[NASA-CR-150820] 21 p0205 N79-13499

LARGO hot water system thermal performance test report
[NASA-CR-150841] 21 p0205 N79-13500

Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

Industrial international data base: Energy analysis methodology. Rational use of energy program pilot study
[NATO/CCMS-75] 21 p0206 N79-13508

The definition of a national program in energy-efficient pump utilization, volume 1
[HCP/W1260-01/1] 21 p0207 N79-13514

The definition of a national program in energy-efficient pump utilization. Volume 2: Appendices
[HCP/W1260-01/2] 21 p0207 N79-13515

Program information notice --- technologies relevant to u.s. electric energy systems
[DOE/ET-0059] 21 p0207 N79-13517

Solar thermal power systems program: Program summary
[DOE/ET-0018/1] 21 p0207 N79-13518

Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520

Component-based simulator for solar systems
[LA-UR-78-1494] 21 p0208 N79-13521

Concentrating solar collector test results, Collector Module Test Facility
[SAND-78-0815] 21 p0208 N79-13522

Energy systems studies program
[BNL-50822] 21 p0209 N79-13526

Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

Photovoltaic program: Program summary
[DOE/ET-0019/1] 21 p0209 N79-13529

Solar Irrigation Program Data Base Management System (SIPDBMS)
[SAND-78-0641] 21 p0209 N79-13532

Solar energy
[DOE/ET-0062] 21 p0210 N79-13535

Planning program to accelerate energy conservation in municipalities
[HCP/M05017-01/1] 21 p0210 N79-13536

Analysis of federal incentives used to stimulate energy production
[PNL-2410] 21 p0210 N79-13539

Solar pilot plant, phase 1
[SAN-1109-77-7] 21 p0210 N79-13542

Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

Candidate chemical systems for air cooled, solar powered, absorption air conditioner design. Part 2: Solid absorbents, high latent heat refrigerants
[SAN-1587-2] 21 p0211 N79-13544

EPA program status report: Oil shale
[PB-284480/1] 21 p0211 N79-13548

Solar space heating and air conditioning, volume 2. Citations from the engineering index data base
[NTIS/PS-78/1016/1] 21 p0212 N79-13550

Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-78/0840/5] 21 p0212 N79-13551

An annotated compilation of the sources of information related to the usage of electricity in non-industrial applications
[PB-285260/6] 21 p0212 N79-13552

Environmental control implications of generating electric power from coal. Appendix A, part 2: Coal preparation and cleaning assessment study appendix
[ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571

Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572

Requirements for environmental monitoring assessment, and controls for nonnuclear energy demonstration projects. Report to Congress, prepared in fulfillment of Public Law 95-39, section 113
[DOE/EV-0014] 21 p0213 N79-13573

Coal loan guarantee program (PL 94-163)
[DOE/EIS-0004] 21 p0213 N79-13574

Proposed standby gasoline rationing plan. Economic and regulatory analysis draft
[DOE/ERA-0009] 21 p0214 N79-13934

Accuracy analysis of pointing control system of solar power station
[NASA-CR-150880] 21 p0215 N79-14143

Primary reflector for solar energy collection systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529

Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566

Thermochemical energy storage and transport program
[SAND-78-8056] 21 p0221 N79-14570

Recommendations for the conceptual design of the Barstow, California, solar central receiver pilot plant: Executive summary
[SAND-77-8035] 21 p0221 N79-14571

Energy information: Report to Congress
[NTISUB/C/027-001] 21 p0221 N79-14576

Harnessing tidal energy
[PB-286671/3] 21 p0222 N79-14581

Water related constraints in energy production
[PB-285713/4] 21 p0222 N79-14582

Region at the crossroads: The Pacific Northwest searches for new sources of electric energy
[PB-284691/3] 21 p0222 N79-14583

The ground water and energy supply situation for Great Plains irrigation
[PB-286002/1] 21 p0222 N79-14586

Summary of atmospheric wind design criteria for wind energy conversion system development
[NASA-TP-1389] 21 p0223 N79-14678

Development of an Air Force facilities energy information system
[AD-A059309] 21 p0223 N79-14918

Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

The 25 kW power module updated baseline system --- for space transportation system payloads
[NASA-TM-78212] 21 p0226 N79-15247

Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379

The national energy plan: Options under assumptions of national security threat --- economic impact procurement policy, and resources management
[H-PRINT-95-48] 21 p0228 N79-15398

The national energy plan: Options under assumptions of national security threat or energy policy as if it really mattered
[H-PRINT-95-42] 21 p0228 N79-15399

US energy demand and supply, 1976-1985: Limited options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400

Passive thermosyphon solar heating and cooling module with supplementary heating
[NASA-CR-150849] 21 p0229 N79-15402

Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403

Design data brochure for the Owens-Illinois Sunpak (TM) air-cooled solar collector
[NASA-CR-150868] 21 p0229 N79-15404

Solar hot water system installed at Anderson, South Carolina
[NASA-CR-150856] 21 p0229 N79-15405

Solar heating and hot water system installed at Listerhill, Alabama
[NASA-CR-150870] 21 p0229 N79-15406

Preliminary design package for prototype solar heating and cooling systems
[NASA-CR-150853] 21 p0229 N79-15409

Energy conservation and the rural home: Economic considerations for the nation and the individual
[PB-286222/5] 21 p0230 N79-15425

Energy education training: Feasibility study
[PB-285910/6] 21 p0230 N79-15428

Amended Oregon State energy conservation plan, 1978 Prepared in response to the Energy Policy and Conservation Act of 1975 (PL 94-163), and the Energy Conservation and Production Act of 1976 (PL 94-385)
[PB-286078/1] 21 p0231 N79-15430

The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432

Coal research: Data systems and information transfer
[ORAU-133] 21 p0232 N79-15830

Phase one/base data for the development of energy performance standards for new buildings: Sample design
[PB-286903/0] 22 p0331 N79-16150

Energy and economic analysis of industrial process heat recovery with heat pumps
22 p0331 N79-16210

Northern Alaska hydrocarbon resources
[PB-287394/1] 22 p0332 N79-16342

Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497

Direction of gas supply research in the US
22 p0340 N79-17320

Energy today and tomorrow
22 p0341 N79-17326

Energy conservation: Policy issues and end-use scenarios of savings potential. Part 1: Summary
[LBL-7896] 22 p0341 N79-17329

Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

Water/energy management and evaluation model for Pennsylvania
[PB-287577/1] 22 p0343 N79-17353

Life-cycle costing. A guide for selecting energy conservation projects for public buildings --- computing the cost effectiveness of retrofitting and new buildings
[PB-287804/9] 22 p0345 N79-17744

Energy environment III
[EPA-600/9-78-022] 22 p0346 N79-18352

Identification of wood energy resources in central Michigan
[NASA-CR-158130] 22 p0347 N79-18424

Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447

Block 4 solar cell module design and test specification for residential applications
[NASA-CR-158117] 22 p0348 N79-18453

Installation package for a solar heating system
[NASA-CR-150876] 22 p0349 N79-18454

Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463

The development of a laser Doppler velocimetry system for unsteady separated flow research: Preliminary results
[AD-A061724] 22 p0352 N79-19305

Energy analyses applied to ocean thermal energy conversion and an offshore wind power system
22 p0353 N79-19442

The good news about energy
22 p0355 N79-19461

Phase one/base data for the development of energy performance standard for new buildings. Task report: Building classification
[PB-286904/8] 22 p0355 N79-19468

Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492

Thermal storage technologies for solar industrial process heat applications
[NASA-TM-79130] 22 p0360 N79-20498

Venture analysis case study for on-site fuel cell energy systems
[FCR-0783-VOL-1] 22 p0361 N79-20505

Measuring energy conservation
[DOE/EIA-0103/18] 22 p0362 N79-20509

Economic impacts of a transition to higher oil prices --- estimation and budget allocations
[BNL-50971] 22 p0364 N79-20927

Development, testing, and certification of Owens-Illinois model SEC-601 solar energy collector system
[NASA-TM-78223] 22 p0371 N79-21620

Energy conservation through source reduction
[PB-290126/2] 22 p0372 N79-21626

Satellite Power Systems (SPS) concept definition study exhibit C. Volume 3: Experimental verification definition
[NASA-CR-161214] 23 p0543 N79-22632

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies
[NASA-CR-161215] 23 p0543 N79-22633

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation
[NASA-CR-161216] 23 p0543 N79-22634

Transportation energy conservation in the Federal Government
[PB-291697/1] 23 p0544 N79-22646

Primary reflector for solar energy collection systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432

Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433

Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442

Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444

Redox flow cell development and demonstration project, calendar year 1977
[NASA-TM-79067] 23 p0558 N79-24445

Electric and hybrid vehicle program
[DOE/CS-0068] 23 p0567 N79-24900

Solar heating system final design package
[NASA-CR-161228] 23 p0572 N79-25503

Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513

Energy Tax Act of 1978
[PUB-LAW-95-618] 23 p0576 N79-25926
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147
Coal liquefaction test center
[FE-1517-67] 23 p0577 N79-26226
Executive energy documents
[GPO-24-112] 23 p0582 N79-26507
Energy: Fiscal year 1980 budget request
[GPO-42-886] 23 p0582 N79-26508
The National Energy Act
[GPO-36-956] 23 p0582 N79-26509
Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies
[COO-4636-11] 23 p0582 N79-26511
LLL wind energy studies (OAHU)
[UCRL-82171] 23 p0582 N79-26514
Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area --- energy technology
[P/51/77/21] 23 p0584 N79-26536
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537
Department of Energy policy for fusion energy
[DOE/ER-0018] 23 p0586 N79-26952
Enthalpy measurement of coal-derived liquids
[FE-2035-12] 23 p0588 N79-27282
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327
Coal gasification, commercial concepts, gas cost guidelines, revision 1
[FE-2240-100] 23 p0589 N79-27331
Methane production from beef cattle feedlots
[CONF-7806107-2] 23 p0589 N79-27333
Investigation of flow phenomena in pulverized coal gasification for the new process
[BMFT-FB-T-78-27] 23 p0590 N79-27341
Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report)
[BMFT-FB-T-78-15] 23 p0590 N79-27345
Diesel organic rankine cycle compound engine (Bottoming Cycle) program plan
[DOE/CS-0052] 23 p0590 N79-27521
On fossil fuel reserves and resources
[IIASA-RM-78-35] 23 p0593 N79-27628
Re-examination of undiscovered oil resources in the United States
[DOE/EIA-0103/9] 23 p0593 N79-27643
A review of energy models. Part 4: July 1978
[IIASA-RR-78-11-PT-4] 23 p0594 N79-27652
The comparison and coordination of national policies and programs in the energy research and development sector
[EUR-5911] 23 p0594 N79-27653
Performance prediction evaluation of ceramic materials in point-focusing solar receivers
[NASA-CR-158774] 23 p0594 N79-27654
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660
Solar energy system installed at Mount Rushmore National Visitor Center in Keystone, South Dakota
[NASA-CR-161238] 23 p0595 N79-27661
Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665
Environmental readiness document. Solar: Hot water and passive, commercialization phase 3 planning
[DOE/ERD-0010] 23 p0597 N79-27690
Impacts of new energy technologies as measured against reference energy systems --- conferences
[BNL-25475] 23 p0597 N79-27694
Locational response to regulatory policy: A regional analysis of energy facility location --- conferences
[BNL-23597] 23 p0598 N79-27695
Federal photovoltaic utilization program. Planning resource document
[HCP/M50081-01] 23 p0599 N79-27706
Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0599 N79-27712
Some aspects of the mechanism and kinetics of coal liquefaction
24 p0717 N79-28343
Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPO-26-349] 24 p0717 N79-28346
Replacing oil and natural gas with coal: Prospects in the manufacturing industries
24 p0718 N79-28351
Estimation methodology for energy supply from natural resources
[EPRI-EA-788] 24 p0718 N79-28355
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels
[FE-2307-34] 24 p0718 N79-28358
Hydrogen from existing falling-water sites: An initial feasibility assessment (summary)
[CONF-781142-8] 24 p0718 N79-28360
High-efficiency electric motors: Focus group results
[DOE/TIC-10005] 24 p0719 N79-28441
Solar heating and hot water system installed at Cherry Hill, New Jersey
[NASA-CR-161235] 24 p0723 N79-28729
The gas turbine/steam turbine cycle with coal gasification
24 p0723 N79-28737
Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28738
Power generation with binary cycles
24 p0724 N79-28740
Magnetohydrodynamics
24 p0724 N79-28741
Thermionic conversion
24 p0724 N79-28742
OTEC platform configuration and integration study. Volume 3: Project plan
[DOE/ET/4063-1-VOL-3] 24 p0725 N79-28750
Trombe wall vs direct gain: A comparative analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
Performance and cost of a hybrid passive/active solar house
[LA-UR-78-2209] 24 p0725 N79-28756
Barriers and incentives to solar energy development. An analysis of legal and institutional issues in the Northeast
[NESEC-1] 24 p0726 N79-28765
Application of resource allocation models to the problems of regional energy policy in large developing countries --- conferences
[BNL-25537] 24 p0728 N79-28779
Energy and urban policies/programs: Official transcript of public briefing and addendum, 27 April 1978, Washington, D. C.
[DOE/IR-0042] 24 p0728 N79-28782
Report to the President by the Interagency Review Group on Nuclear Waste Management --- as part of the National Energy Plan
[TID-29442] 24 p0729 N79-29021
The Congress needs to redirect the federal electric vehicle program
[PB-293977/5] 24 p0731 N79-29120
Solar power satellite
[GPO-45-997] 24 p0731 N79-29212
Technical and economic feasibility study for the industrial utilization of waste derived fuel gas
[SAN-2092-T1] 24 p0733 N79-29372
Assessment of potential increased oil production by polymer-waterflood in northern and southern mid-continent oil fields
[BETC-0026-4] 24 p0735 N79-29579
Energy research and development programme
[EUR-5889] 24 p0736 N79-29596
Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599
Solar energy
[GPO-36-957] 24 p0737 N79-29609

Role of government in solar energy development: A
view from the northwest --- economic feasibility
of solar heating
[PNL-2784] 24 p0738 N79-29621
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
Electricity in lieu of natural gas and oil for
industrial thermal energy: A preliminary survey
[ORNL/TM-5937] 24 p0739 N79-29630
Implications of the fusion power source to the
electric utility industry
[EPRI-ER-943-54] 24 p0740 N79-29642
Low head hydropower: Focus group results
[DOE/TIC-10017] 24 p0740 N79-29645
Systems approach to energy planning
[BNL-25523] 24 p0741 N79-29657
Proceedings of the 2nd Workshop on
Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658
International energy evaluation system. Volume 1:
Executive summary
[HCP/I8602-01/1] 24 p0742 N79-29662
Non-electrical uses of thermal energy generated in
the production of fissile fuel in fusion-fission
reactors: A comparative economic parametric
analysis for hybrid with or without synthetic
fuel production
[LA-UR-79-574] 24 p0742 N79-29666
Problems and prospectives on solar energy
utilization
[ISS-P-78/1] 24 p0742 N79-29667
Alternative energy sources: An analysis of their
role in energy policy
24 p0743 N79-29668
Solar cells made from polycrystalline silicon
[LRP-78/519-679-D] 24 p0743 N79-29669
Energy Research Information System, volume 3, no.
1 (Proj. nos. 00001061 through 00001224) ---
bibliographies
[PB-294342/1] 24 p0743 N79-29671
Rural development initiatives: Energy for rural
America
[PB-295234/9] 24 p0743 N79-29674
Environmental readiness document: Urban waste
energy recovery. Commercialization phase 3
planning
[DOE/ERD-0002] 24 p0745 N79-30102
Electric hybrid vehicles focus group research
[DOE/TIC-10009] 24 p0745 N79-30107
Cooperative extension service: Energy resource
notes
24 p0745 N79-30394
Coal liquefaction advanced research digest
[ORNL/FE-2] 24 p0746 N79-30398
National coal model: Coal supply curves
[DOE/EIA-0103/2] 24 p0746 N79-30400
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Proceedings of a Symposium on the Utilization of
Methane Generated in Landfills
[CONF-780340] 24 p0747 N79-30410
Methane and methanol as alternative energy
sources: A comparative profitability study
[BMFT-FB-77-84] 24 p0747 N79-30412
Technical aspects of the Resource Conservation and
Recovery Act upon coal combustion and conversion
systems
[ORNL/OEPA-10] 24 p0748 N79-30687
Unique helium resources are wasting: A new
conservation policy is needed
[PB-293751/4] 24 p0748 N79-30701
Comprehensive community energy planning. Volume
2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713
Thermal power systems small power systems
applications project. Volume 2: Detailed report
[NASA-CR-162104] 24 p0749 N79-30718
Solar energy retrofit for Clarksville Middle
School, Clarksville, Indiana
[NASA-CR-161272] 24 p0749 N79-30721
Comprehensive community energy planning. Volume
1: A workbook
[HCP/M0023-01-VOL-1] 24 p0750 N79-30722
Solar Power Satellite Research, Development, and
Demonstration Program Act of 1978
[GPO-35-994] 24 p0750 N79-30726
Energy and labor intensities projected to the year
2010
[COO-4629-2] 24 p0750 N79-30727
Photovoltaic generators in space --- conference,
ESTEC, Netherlands, Sep. 1978
[SP-140] 24 p0751 N79-30730
A study on solar arrays for programmes leading
from the extension of Spacelab towards space
platforms
24 p0751 N79-30748
Solar cells for solar power satellites
24 p0751 N79-30749
Solar power satellites: The Engineering Challenges
24 p0752 N79-30750
Interface problems on an SPS solar array blanket
24 p0752 N79-30751
MOSGFN: A potential European contribution in
developing large solar generators suitable for
growing power levels up to SPS-systems
24 p0752 N79-30752
Small wind energy: Focus group results
[DOE/TIC-10018] 24 p0752 N79-30771
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
Fusion energy for alternative applications: The
generation of synthetic gaseous fuels ---
approach to high temperature fusion reactor design
[ANL/FPP-TM-117] 24 p0755 N79-30790
International energy evaluation system. Volume 2:
Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796
Energy sector capital requirements, 1978-1985
[DOE/EIA-0103/24] 24 p0755 N79-30797
Short-term projections of the energy supply and
demand in the United States from the EIA report
to Congress, 1977
[DOE/EIA-0102/37] 24 p0755 N79-30799
Energy use and conservation in industrialized
countries
[LBL-7872] 24 p0756 N79-30802
Evaluation of selected near-term
energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803
Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807
Effects of the proposed new source performance
standards: A comparative assessment of the
energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808
Energy conservation opportunities in commercial
appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810
International energy conservation: Comparative
law and policy. Proceedings from the 1978
International Conference on Energy conservation
[CONF-780274] 24 p0757 N79-30811
Comprehensive program and plan for federal energy
education, extension and information activities
[DOE/CS-0071] 24 p0757 N79-30814
Role of the states in energy
[DOE/PE-0009] 24 p0758 N79-30816
Multiobjective analysis in a national energy
system model --- conferences
[BNL-24371] 24 p0758 N79-30823
Status of energy-management academic programs in
US institutions of higher education: Executive
summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824
Energy from urban wastes: Report on a focus group
discussion
[DOE/TIC-10022] 24 p0759 N79-30825
Energy analysis of the helio-thermal-electric
conversion
[P-77/P40/242] 24 p0759 N79-30831
Rational energy utilization in coke-oven-plant
operations
[BMFT-FB-T-77-72] 24 p0759 N79-30832
Statement and comparison between different studies
on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833
Photolytic decomposition of water into oxygen and
hydrogen as an alternative energy source for
households and small consumers
[DLR-FB-78-17] 24 p0760 N79-30836
Environmental control implications of increased
coal utilization under the National Energy Plan
--- regulatory and control technology issues
[ANL/EES-CP-10] 24 p0760 N79-30846
Resource-allocation methodology for establishing
RD and D budgetary priorities
[OPO-5474-T1] 24 p0761 N79-31067

ENERGY POLICY CONTD

Conceptual design study of an Improved Gas Turbine (IGT) powertrain
[NASA-CR-159604] 24 p0762 N79-31087

Supersonic transport vis-a-vis energy savings
[NASA-TM-75464] 24 p0763 N79-31163

JT9D-70/59 improved high pressure turbine active clearance control system --- for specific fuel consumption improvement
[NASA-CR-159661] 24 p0763 N79-31208

Biomass conversion --- congressional reports agriculture technology assessment
[GPO-32-317] 24 p0765 N79-31404

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410

Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416

Ethanol/gasoline blends as automotive fuel
[BETC/RI-79/2] 24 p0767 N79-31423

Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432

True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741

Rocky mountain coal for southern California's coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745

Energy conservation with fired heaters
[TREE-1308] 24 p0772 N79-31783

Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0772 N79-31788

Long-term strategic analysis (towards an energy doctrine)
[BNL-25250] 24 p0772 N79-31791

Department of Energy FY 1980 obligations
[DOE/CR-0005] 24 p0773 N79-31792

Solar thermal power systems, program summary
[DOE/ET-0078] 24 p0773 N79-31794

Analysis of investment alternatives to stimulate development and technology transfer for energy technologies, solar photovoltaics, a case study
[TID-28968] 24 p0773 N79-31795

Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796

Domestic policy review of solar energy
[TID-28834] 24 p0773 N79-31797

Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798

Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801

Assessment of national consequences of increased coal utilization, executive summary, volume 2
[TID-29425-VOL-2] 24 p0774 N79-31802

Passive solar design: A survey of monitored buildings
[HCP/CS-4113-2] 24 p0774 N79-31803

Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805

Passive solar energy focus group results
[DOE/TIC-10016] 24 p0774 N79-31807

Implementation of state solar incentives: State testing and certification
[SERI/TR-51-162] 24 p0774 N79-31808

Passive solar energy planning aid kit for building design architects and planners
[CONF-780337-P1] 24 p0775 N79-31813

Passive solar energy planning aid kit for the business community and general public
[CONF-780337-P2] 24 p0775 N79-31814

Thermal and mechanical energy storage program
[DOE/ET-0091] 24 p0775 N79-31817

Briefing related to Executive Order 12003 and the National Energy Act
[DOE/TIC-10065] 24 p0775 N79-31818

Analysis of Federal incentives used to stimulate energy production --- with emphasis on solar energy
[PNL-2410-1-REV] 24 p0775 N79-31819

Recommended changes to Executive Order 12003 and related authorities --- for lighting and heating standards in buildings
[DOE/TIC-10066] 24 p0775 N79-31820

Energy policy and mathematics
[ORAU/IEA(O)-79-5] 24 p0775 N79-31821

Analysis and update of roles and responsibilities derived from Executive Order 12003 and related authorities
[DOE/TIC-10064] 24 p0776 N79-31823

Managerial plan: Executive order 12003 and the National Energy Act, proposed, synopsis
[DOE/TIC-10062] 24 p0776 N79-31826

Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils
[ORNL/SUB-79/14274/1] 24 p0776 N79-31827

Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829

Role of refined product imports in the domestic fuel market
[DOE/EIA-0102/53] 24 p0778 N79-32372

Recent developments in coal liquefaction in the United States --- conferences
[CONF-790213-5] 24 p0779 N79-32383

Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32384

Research and development work for hydrogasification of coal with nuclear processing heat done in the framework of the prototype nuclear processing heater project
[BMFT-FB-T-78-25] 24 p0780 N79-32393

Strategic petroleum reserve
[DOE/TIC-10107] 24 p0781 N79-32617

Comparison of alternate fuels for aircraft --- liquid hydrogen, liquid methane, and synthetic aviation kerosene
[NASA-TM-80155] 24 p0782 N79-32637

Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

The future of hot dry rock geothermal energy systems
[LA-UR-79-683] 24 p0786 N79-32679

Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680

Stratified thermal storage in residential Solar energy applications
[COO-4523-1] 24 p0786 N79-32682

Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis
[EPRI-ER-808-SY] 24 p0787 N79-32687

Federal hot dry rock geothermal energy development program: An overview
[LA-UR-79-670] 24 p0787 N79-32690

Systems analysis of solar thermal power systems. Report on task 1: Determination and characterization of solar thermal conversion options
[PNL-2693] 24 p0788 N79-32692

Thermal energy storage for advanced solar central receiver power systems
[SAND-78-8221] 24 p0788 N79-32694

Demonstration of the capabilities of the Livermore energy policy model
[UCRL-52508] 24 p0788 N79-32695

Fossil energy program summary document
[DOE/ET-0087] 24 p0788 N79-32696

Potential prediction needs in support of energy systems --- solar-terrestrial interactions
[LA-UR-79-673] 24 p0788 N79-32698

Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699

Field tests of photovoltaic power systems
[COO-4094-32] 24 p0788 N79-32700

Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

Experimental performance study of a series solar heat pump
[BNL-25928] 24 p0789 N79-32704

Status review of the technology assessment of solar energy program
[LA-UR-79-1369] 24 p0790 N79-32714

Application and system design study for cost-effective solar photovoltaic systems at Federal installations
[HCP/M2522-01] 24 p0790 N79-32715

Systems framework for energy analysis in developing countries
[BNL-25933] 24 p0791 N79-32722
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730
Investigations on the aeroelastic stability of large wind turbines
[NPL-MP-78014-U] 24 p0792 N79-32731
The use of the heat pumps to raise temperatures in an economical and ecological way --- domestic heating via industrial waste energy
[BMFT-FB-T-78-35] 24 p0792 N79-32732
Assessment of hydropower restoration and expansion in New York State, volume 1
[PB-295782/7] 24 p0792 N79-32734
Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341
Alcohol fuels, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0713/2] 24 p0795 N79-33342
The potential for hydrogen as an energy source
[PB-295317/2] 24 p0795 N79-33345
The United States refining policy in a changing world oil environment
[PB-297136/4] 24 p0796 N79-33349
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 1: Technical studies for solar point-focusing, distributed collector system, with energy conversion at the collector, category C
[NASA-CR-162369] 24 p0799 N79-33573
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 2: Appendix A - D
[NASA-CR-162370] 24 p0799 N79-33574
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 3: Appendix E - N
[NASA-CR-162371] 24 p0799 N79-33575
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33584
Analysis of battery storage for commercial buildings, phase 1
[COO-4556-2] 24 p0800 N79-33586
Regional profile, energy-impacted communities: Regional 8
[DOE/TIC-10001] 24 p0800 N79-33588
Transportation Energy Conservation (TEC) environmental development plan
[ANL/EES/CP-11] 24 p0801 N79-33589
Impact of national energy and environmental policies on industry location dynamics: A methodological review
[DOE/TIC-10129] 24 p0801 N79-33591
Solar energy policy
[PB-296193/6] 24 p0802 N79-33603
A report on the development of a model energy management program for New York state schools, phase 2
[PB-295452/7] 24 p0802 N79-33607
State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts
[NTIS/PS-79/0639/9] 24 p0802 N79-33608
Federal facilities for storing spent nuclear fuel; Are they needed
[PB-297071/3] 24 p0804 N79-34006
Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074

ENERGY REQUIREMENTS

Advanced wind furnace systems for residential and agricultural heating and electrical supply applications
21 p0028 A79-10237
Toroidal Accelerator Rotor Platforms for wind energy conversion
21 p0029 A79-10240
Energy efficiency in the transport sector
21 p0054 A79-13574
Fuel cell on-site integrated energy system parametric analysis of a residential complex
21 p0081 A79-14947
Market penetration for OTEC
21 p0094 A79-15903
Energy utilization analysis of buildings
21 p0103 A79-16462
Input-output method applied to energy planning
21 p0112 A79-16737
Energy requirements of a limestone FGD system --- Flue Gas Desulfurization
21 p0114 A79-16747
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649
Energy requirements of the rail mode
[ASME PAPER 78-RT-1] 21 p0150 A79-18085
Modeling energy and power requirements of electric vehicles
21 p0153 A79-18465
Heat pulses required to quench a potted superconducting magnet
22 p0236 A79-20538
An energy analysis of a wind energy conversion system for fuel displacement
23 p0406 A79-34054
The potential of alternative energy sources in meeting Air Force requirements --- electrical and thermal ground power systems
23 p0420 A79-34169
Rationing energy to industries - Priorities and input-output dependence
23 p0423 A79-34278
Performance estimation of a total energy domestic heat pump
23 p0449 A79-37854
Heat pump application to single family dwellings - An analysis by computer model
23 p0449 A79-37855
Functional solar energy applications based on an improved insulation model
23 p0452 A79-37883
Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822
Remarks on economic growth and energy requirements
23 p0535 A79-43523
Energy management up to the turn of the century - Options and constraints
23 p0536 A79-43525
Prospecting for meteorological energy in Hawaii
23 p0536 A79-43615
Modern ammonia synthesis use of hydrogen
24 p0612 A79-45581
Economics of small user hydrogen --- future requirements and predicted costs for industrial use
24 p0613 A79-45583
Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants
24 p0629 A79-46228
Coal yesterday and tomorrow --- coal utilization forecasting
24 p0652 A79-49516
Distributed parameter modelling of urban residential energy demand --- using remotely sensed imagery
24 p0657 A79-50218
Cogeneration with digester gas
24 p0676 A79-51773
Which alcohol fuel for Brasil - Methanol or ethanol
24 p0676 A79-51774
A DOD space energy module
24 p0691 A79-51898
Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946
Historical and projected power requirements
21 p0169 N79-10125
An economical approach to space power systems
21 p0170 N79-10139
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500
Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152
Some measures of regional-industrial interfuel substitution potentials
[BNL-24368] 21 p0208 N79-13525
Pulsed power supplied for large laser systems
[UCRL-80113] 21 p0217 N79-14377
Calculation of backup requirements
21 p0218 N79-14533

Energy requirements of present pollution control
technology
[PB-286231/6] 21 p0223 N79-14643
US energy demand and supply, 1976-1985: Limited
options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400
Energy and the economy: The economic impact of
alternative energy supply-demand assumptions
[H-PRINT-95-51] 22 p0333 N79-16352
Energy requirements for producing steel in the
Republic of South Africa
22 p0340 N79-17322
Energy conservation: Policy issues and end-use
scenarios of savings potential. Part 1: Summary
[LBL-7896] 22 p0341 N79-17329
The world balance for energy needs in view of year
2000: Development of the problem and areas
involved, part 2
[BLL-RISLEY-TR-3395-(9091.9F)] 22 p0347 N79-18442
Bioconversion study conducted by JPL
[NASA-CR-158228] 22 p0354 N79-19450
Satellite Power System (SPS) resource requirements
(critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
National Energy Peak-Leveling Program (NEPLP)
[HCP/R1152-01] 23 p0551 N79-23534
Evaluation of available MHD seed-regeneration
processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519
Electric energy demand and supply prospects for
California
23 p0591 N79-27601
Coal's role in California's energy needs
23 p0591 N79-27602
Energy supply and demand in California
23 p0591 N79-27603
Coal supply for California
23 p0592 N79-27607
A review of energy models. Part 4: July 1978
[IIASA-RR-78-11-PT-4] 23 p0594 N79-27652
Underground storage of natural gas by interstate
pipeline companies for 1976 and winter 1976 - 1977
[DOE/EIA-0151] 23 p0597 N79-27684
Comprehensive areal model of residential heating
demands
[BNL-24998] 23 p0597 N79-27692
Natural gas shortage --- Congressional reports
[GPO-86-231] 24 p0717 N79-28347
Cost study application of the guidebook on
integrated community energy systems: Indirect
economic and energy impacts
[ANL/ICES-TM-17] 24 p0727 N79-28777
Energy intensity and related parameters of
selected transportation modes: Passenger
movements
[ORNL-5506] 24 p0731 N79-29115
Forecast of future aviation fuels. Part 1:
Scenarios
[NASA-CR-159871] 24 p0732 N79-29354
Assessment of potential US petroleum supply
shortfalls, 1979
[DOE/EIA-0102/38] 24 p0734 N79-29376
Workshop on Energy Sources and Electric Power
Generation for High School Students ---
Coal-fueled systems were studied in similar
fashion but enriched by visits to strip mining
[TID-28975] 24 p0740 N79-29643
Further development and use of the transportation
energy conservation network (TECNET)
[HCP/W2101-2] 24 p0741 N79-29648
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Comprehensive community energy planning. Volume
2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713
Comprehensive community energy planning. Volume
1: A workbook
[HCP/M0023-01-VOL-1] 24 p0750 N79-30722
Improved energy contingency planning is needed to
manage future energy shortages more effectively
[EMD-78-106] 24 p0750 N79-30729
Energy utilization analysis of buildings
[LBL-7826] 24 p0753 N79-30779
International energy evaluation system. Volume 2:
Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796
Energy sector capital requirements, 1978-1985
[DOE/EIA-0103/24] 24 p0755 N79-30797
Short-term projections of the energy supply and
demand in the United States from the EIA report
to Congress, 1977
[DOE/EIA-0102/37] 24 p0755 N79-30799
Energy conservation opportunities in commercial
appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810
Statement and comparison between different studies
on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833
Environmental control implications of increased
coal utilization under the National Energy Plan
--- regulatory and control technology issues
[ANL/EES-CP-10] 24 p0760 N79-30846
Regional residential sector energy price forecasts
for 1978: Electricity, natural gas, number 2
fuel oil, and propane
[DOE/EIA-0102/46] 24 p0762 N79-31083
Economics of the ANFLOW process for municiple
sewage treatment
[ORNL/TM-6574] 24 p0762 N79-31093
End-use energy-consumption data base. Version 10:
User's manual
[DOE/EIA-0175] 24 p0772 N79-31790
Analysis of Federal incentives used to stimulate
energy production --- with emphasis on solar
energy
[PNL-2410-1-REV] 24 p0775 N79-31819
Assessment of potential US petroleum supply
shortfalls, 1978 - 1980
[DOE/EIA-0102/13] 24 p0781 N79-32619
Energy requirements of the US pulp and paper
industry
[ANL/EES/TM-42] 24 p0800 N79-33587
Regional profile, energy-impacted communities:
Regional 8
[DOE/TIC-10001] 24 p0800 N79-33588

ENERGY SOURCES
A theoretical method for the prediction of monthly
mean solar radiation parameters
21 p0022 A79-10183
The utilization of European space techniques for
energy production
[IAF PAPER 78-190] 21 p0035 A79-11287
Low-grade thermal energy-conversion Joule effect
heat engines
[ASME PAPER 78-ENAS-7] 21 p0048 A79-12556
Potential and technical utilization of renewable
energy sources
21 p0058 A79-13655
The wind as a potential energy source in future
hydrogen technology
21 p0059 A79-13661
Saudi Arabia looks at the sun
21 p0063 A79-13900
A survey of energy information systems and its
implications for industrial energy management
21 p0072 A79-14685
Forest residues as an alternate energy source
21 p0072 A79-14689
A systems study of our energy problems
21 p0074 A79-14704
Economics and net energy analysis - Is a new
analytical technique needed for energy decision
making
21 p0074 A79-14706
Wind, waves, and tides --- as future energy sources
21 p0074 A79-14719
Conservation as an energy source
21 p0077 A79-14769
Energy sources and conventional magnets --- for
tokamak experiment Power Reactor toroidal field
21 p0079 A79-14791
Source emissions factors for refuse derived fuels
21 p0082 A79-15084
Hot dry rock - A new geothermal energy source
21 p0087 A79-15673
History of solar energy applications - Solar
energy yesterday, today and tomorrow
21 p0089 A79-15852
Time, technology and capital - Do we have enough
to solve the energy crisis
21 p0097 A79-16100
A multivariate-utility approach for selection of
energy sources
21 p0098 A79-16120
A comparative analysis of three of ERDA's major R
& D programs
21 p0099 A79-16121

Solar electricity production
21 p0104 A79-16467

The effects of different energy strategies on the atmospheric CO2 concentration and climate
21 p0106 A79-16523

The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736

Input-output method applied to energy planning
21 p0112 A79-16737

Urban wastes as an energy source
21 p0115 A79-17220

Sun: Mankind's future source of energy; Proceedings of the International Solar Energy Congress, New Delhi, India, January 16-21, 1978. Volumes 1, 2 & 3
21 p0116 A79-17276

Prospects for harnessing renewable energy sources in developing countries
21 p0117 A79-17286

Cost of solar energy
21 p0118 A79-17291

A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas
21 p0143 A79-17514

The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634

Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/ --- Book
21 p0147 A79-17646

Wind power and other energy options --- Book
21 p0153 A79-18346

Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401

Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

Wind power potential in the Pacific Northwest
22 p0244 A79-21334

Recent advances in Na/S cell development - A review
22 p0246 A79-21488

Energy for the long run - Fission or fusion
22 p0256 A79-22760

A theoretical study of wood gasification processes
22 p0257 A79-22923

Optimizing the conversion mode for solar energy
22 p0259 A79-23125

East Mesa geothermal test site
22 p0259 A79-23458

A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis
22 p0263 A79-23777

Risk with energy from conventional and nonconventional sources
22 p0266 A79-24151

Energy for Europe from space
22 p0273 A79-25605

Energy development --- for future global demand
22 p0282 A79-26402

Fuels of the future. I --- demand and proposed sources
22 p0282 A79-26404

Limits to wind power utilization
22 p0302 A79-29601

The impact of alternate energy resources on the future supply of electric power
[IEEE PAPER F 78 672-8] 22 p0304 A79-29939

Energy, resources, and policy --- Book
22 p0304 A79-30175

Two-dimensional analyses related to wave-energy extraction by submerged resonant ducts
22 p0312 A79-31099

Renewable alternatives; Proceedings of the Fourth Annual Conference, University of Western Ontario, London, Canada, August 20-24, 1978. Volumes 1 & 2
22 p0316 A79-31401

The Energy Research and Development Program of the United States
22 p0325 A79-31909

Solar energy - Four sites demonstrate potential
22 p0328 A79-32194

Observations on the production of methanol and anhydrous ammonia from wood
23 p0386 A79-33230

Principal sources of electric power generation in Brazil
23 p0388 A79-33255

New energy sources - An option for the energy crisis
23 p0388 A79-33256

Subsidies for a formulation of a plan of action for alternative energy sources and forms
23 p0388 A79-33258

World energy scene and Brazil's alternatives
23 p0388 A79-33259

Some economic considerations in the rush toward alternate energy sources
23 p0389 A79-33268

Geothermal energy coupled with solar energy is the future energy in Saudi Arabia
23 p0408 A79-34071

Small hydropower - Promise and reality in New York State and the northeast
23 p0410 A79-34083

Energy from sea and air by large-span tensioned foils
23 p0410 A79-34084

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 8 - Hydrogen energy
23 p0413 A79-34106

Production economics for hydrogen, ammonia, and methanol during the 1930-2000 period
23 p0413 A79-34107

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 9 - Energy delivery, conservation, and environment
23 p0416 A79-34131

Remote new energy sources utilization in on-site non-polluting power plant - Liquid air as energy carrier concept and final conversion plant design
23 p0416 A79-34141

A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143

Alternative energy sources and conservation technologies - Optimal systems
23 p0418 A79-34150

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy
23 p0419 A79-34158

Energy use and society in the 21st century --- development cost effects on growing GNP economy
23 p0420 A79-34165

The inexhaustible energy resources study --- U.S. R and D to meet future requirements
23 p0420 A79-34166

Survey and appraisal of primary future energy sources
23 p0420 A79-34167

The potential of alternative energy sources in meeting Air Force requirements --- electrical and thermal ground power systems
23 p0420 A79-34169

Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources
23 p0420 A79-34170

Strategies for alternative energy sources
23 p0421 A79-34173

A nuclear-solar energy strategy
23 p0421 A79-34174

Coupled systems and energy policy - Closing the supply/demand gap: Are there many roads not taken
23 p0421 A79-34175

Renewable energy supplies for developing countries
23 p0422 A79-34178

Energy, helium, and the future --- U.S. He demand projection and conservation program
23 p0422 A79-34181

Energy sources of the future - A challenge to man's ingenuity
23 p0423 A79-34389

Solid waste as a source of energy for industry - An overview
23 p0424 A79-34461

Ocean Thermal Energy Conversion /OTEC/ power plant instrumentation and measurement
23 p0430 A79-35059
Energy policies in the context of global economics
23 p0433 A79-35228
Bioconversion - Energy and agriculture
23 p0435 A79-35489
Solar options in central Europe - A synthesis of solar possibilities in technological terms according to present-day /1978/ criteria
23 p0435 A79-35490
Solar energy as the basis of an energetic system
23 p0435 A79-35491
A completely solar power supply for France
23 p0436 A79-35492
Solar energy use through biology - Past, present and future
23 p0439 A79-36627
Wave power - Some practical considerations
23 p0449 A79-37861
Tidal and river current energy systems
23 p0449 A79-37862
Tidal power - The path to production
23 p0450 A79-37863
Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866
Hydrogen energy system concept and engineering applications
23 p0451 A79-37874
Options and constraints in the use of wave power
23 p0454 A79-37914
Energy analysis of wave and tidal power
23 p0455 A79-37918
Solar energy utilization in comparison with utilization of other energy types
23 p0465 A79-38598
Guaranteed power /capacity effect/ and total power as defining parameters of wind conversion system energy production
23 p0472 A79-38663
Capital investment for transition to new energy supply systems
23 p0480 A79-39993
Experience with solid waste as a supplementary fuel
23 p0488 A79-40388
Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390
Chemistry for energy; Proceedings of the Symposium, Winnipeg, Manitoba, Canada, June 5-7, 1978
23 p0493 A79-40736
Energy consumption structures in the year 2000
23 p0523 A79-41241
INOVA: Industrial innovation; Conference, Paris, France, June 13-17, 1977, Proceedings. Volume 2 - New energy
23 p0523 A79-41801
Constraints on a policy of evaluating recoverable energy
23 p0524 A79-41811
Development of the oil sands of Canada
23 p0524 A79-41812
Oil shale technologies and the potential for oil shale development
23 p0525 A79-41813
In situ coal gasification - New energy source for Europe
23 p0525 A79-41815
Substitute fuels and development of recovery methods
23 p0525 A79-41818
Long term perspectives in energy resources
23 p0525 A79-41820
A practical regional scale air quality simulation model for energy resource development in the four corners area
23 p0535 A79-43430
Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy
23 p0536 A79-43575
Future energy alternatives
24 p0602 A79-44276
Renewable energy sources --- overview of West German options
24 p0606 A79-44958
Concepts for solar production of hydrogen
24 p0614 A79-45593
Waves, salinity gradients and ocean currents - Alternative energy sources
24 p0616 A79-45780
Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries
24 p0626 A79-45854
The race for unlimited energy --- Book
24 p0638 A79-47071
European technology for obtaining energy from solid waste --- Book
24 p0638 A79-47072
The Eppler scenario - A critical analysis --- German energy politics
24 p0649 A79-49330
Review - Thermophysical properties of oil shales
24 p0651 A79-49401
Biomass - The self-replacing energy resource
24 p0651 A79-49425
A few considerations on new energy source
24 p0652 A79-49514
The economic and political conditions of access to resources of natural gas
24 p0652 A79-49519
Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant
24 p0654 A79-50007
Exploiting wave power --- electric energy source from ocean waves
24 p0660 A79-50400
Development of coalbed methane as an energy source
24 p0660 A79-50452
Biomethanation of Minnesota reed sedge peat
24 p0662 A79-50560
The efficiency of resource recovery from solid waste
24 p0662 A79-50561
The 'effectiveness' of waste treatment systems
24 p0662 A79-50563
Environmental aspects of wood fuel
24 p0665 A79-50884
Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volumes 1 & 2
24 p0670 A79-51726
Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere
[IAF PAPER 79-A-16] 24 p0711 A79-53419
Coal classification and characterization
24 p0714 A79-53777
Rates of coal pyrolysis and gasification reactions
24 p0714 A79-53778
Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541
Energy availabilities for state and local development: 1974 data volume
[ORNL/TM-5890-S3] 21 p0175 N79-10542
Projects to expand energy sources in the western states
[PB-283706/0] 21 p0190 N79-11547
Future aviation fuels fuel suppliers views
21 p0202 N79-13194
Symposium on Energy Today and Tomorrow
[CSIR-S-145] 22 p0340 N79-17316
Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463
Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464
Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492
Low Btu coal gasification processes. Volume 1: Summary, screening, and comparisons
[ORNL/ENG/TM-13-VOL-1] 23 p0555 N79-24188
Estimation methodology for energy supply from natural resources
[EPRI-EA-788] 24 p0718 N79-28355
Workshop on Energy Sources and Electric Power Generation for High School Students --- Coal-fueled systems were studied in similar fashion but enriched by visits to strip mining
[TID-28975] 24 p0740 N79-29643

Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
Energy-intensive industry for Alaska. Volume 3: Background data
[TID-29025-3] 24 p0755 N79-30788
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB-296217/3] 24 p0802 N79-33602

ENERGY STORAGE

A new power cycle that combines power generation with energy storage
21 p0004 A79-10040
A critical review and evaluation of published electric-vehicle performance data
21 p0009 A79-10091
High efficiency thermal energy storage system for utility applications
21 p0012 A79-10102
Recent advances in thermochemical energy storage and transport
21 p0012 A79-10104
A thermochemical energy storage system and heat pump
21 p0012 A79-10105
NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106
Form-stable, crystalline polymer pellets for thermal energy storage
21 p0013 A79-10107
Storage systems for solar thermal power
21 p0013 A79-10108
Ejector augmentation of the air supply in a compressed air energy storage plant
21 p0013 A79-10109
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110
A method for the comparative economic assessment of storage systems
[BNL-24473] 21 p0013 A79-10111
Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132
Liquid desiccant solar air conditioner and energy storage system
21 p0021 A79-10176
SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241
The propulsion of vehicles by a flywheel
21 p0031 A79-10452
Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776
Semiconductor electrodes for conversion and storage of solar energy
21 p0036 A79-11777
Hydrogen storage by LaNi5 - Fundamentals and applications
21 p0038 A79-11803
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
New alloy systems for hydrogen storage
21 p0038 A79-11806
Batteries for transportation and load-leveling applications
21 p0041 A79-11837
A practical electrochemical transport equation for non-dilute solutions --- for energy storage application
21 p0041 A79-11841
The ion fly-wheel effect on the electro-thermal instability in non-equilibrium MHD Hall disc generators
21 p0046 A79-12270
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Selection of method for calculating the parameters of wind and solar power station storage facilities
21 p0054 A79-13293
Metal hydride solar heat pump and power system /HYCSOS/
[AIAA PAPER 78-1762] 21 p0061 A79-13863
Modelling energy storage systems for electric utility applications Preliminary considerations
21 p0081 A79-14960
Storage as an energy strategy for utilities
21 p0093 A79-15891
Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901
Thermal storage of solar energy
21 p0103 A79-16459
Solar thermal conversion
21 p0104 A79-16466
Application of electron beams in space for energy storage and optical beam generation
21 p0108 A79-16606
Energy '78; Annual Conference, Tulsa, Okla., April 16-18, 1978, Record of Conference Papers
21 p0111 A79-16726
Energy storage for tokamak reactor cycles --- during downtime for periodic plasma quench and reignition
21 p0111 A79-16727
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
Bibliographic and numeric data bases for fiber composites and matrix materials
21 p0114 A79-16984
Energy storage requirements for autonomous and hybrid solar thermal electric power plants
21 p0120 A79-17315
Mechanical energy storage system for a 10 KWe solar power pack
21 p0121 A79-17329
Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370
Some studies on an experimental solar pond
21 p0131 A79-17416
Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822
Energy storage by the use of high temperature electrochemical systems
21 p0148 A79-17992
Solar fuels --- photochemical reaction kinetics and energy storage
21 p0149 A79-18009
Properties optimization for phase-change energy storage in air-based solar heating systems
21 p0149 A79-18018
Studies in retiming tidal energy
21 p0152 A79-18115
The role of tidal power stations in future scenarios for electricity storage in U.K.
21 p0152 A79-18116
Integrating wave power into the electricity supply system
21 p0152 A79-18117
Optimal control of on-board and station flywheel storage for rail transit systems
[ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771
On vibration of a thick flexible ring rotating at high speed --- for flywheel energy storage
22 p0235 A79-20511
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555
Universal generator storer curves --- Economic and relative size optimization of solar photovoltaic energy
22 p0238 A79-20799
Flywheel energy accumulators for road vehicles
22 p0241 A79-20845
Current status of composite flywheel development
22 p0241 A79-20853
Energy storage requirements for spacecraft
22 p0246 A79-21486
Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977
22 p0247 A79-21676

Survey of the different types of hydrides --- for hydrogen energy storage
22 p0247 A79-21678

Structural studies of hydrides by neutron diffraction
22 p0248 A79-21681

Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682

Nuclear magnetic resonance studies of metal hydrides
22 p0248 A79-21683

Electronic structure and physical properties of Ti-H and Zr-H using NMR
22 p0248 A79-21685

Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686

Kinetics of hydrogen absorption and desorption --- for energy storage
22 p0248 A79-21687

The storage and release of hydrogen from magnesium alloy hydrides for vehicular applications
22 p0249 A79-21688

Calculated heats of formation of metal and metal alloy hydrides
22 p0249 A79-21690

Acoustic emissions during hydride formation
22 p0249 A79-21691

Magnetic and electrical properties of rare earth and rare earth intermetallic hydrides
22 p0249 A79-21692

Metal hydride electrodes for electrochemical energy storage
22 p0249 A79-21695

Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697

The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700

Hydride formation of C14-type Ti alloy
22 p0250 A79-21701

Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

The metallurgy and production of rechargeable hydrides --- for hydrogen storage
22 p0250 A79-21703

Hydrogen storage electrode systems
22 p0251 A79-21710

Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711

Mixing effects of two different types of hydrides --- phase behaviors and energy storage applications
22 p0251 A79-21714

Applications of metal hydrides --- emphasizing use as energy storage media
22 p0251 A79-21715

HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716

The hydrogen/hydride energy concept
22 p0252 A79-21717

A hybrid chemical concept for solar energy storage
22 p0254 A79-22271

Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272

Energy storage efficiency for the ammonia/hydrogen-nitrogen thermochemical energy transfer system
22 p0261 A79-23718

Synthetic chloroplasts --- for photosynthetic solar energy conversion
22 p0262 A79-23721

Solar energy storage as hydrogen and bromine from hydrogen bromide
22 p0265 A79-24045

The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311

Storage peak gas-turbine power plant --- compressor for electric energy storage
22 p0268 A79-24507

Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190

Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems
22 p0280 A79-26191

Analysis of energy storage by phase change with an array of cylindrical tubes
22 p0281 A79-26207

Heat transfer and calorimetric studies of a direct contact-latent heat energy storage system
22 p0281 A79-26210

Superbatteries - A progress report --- for utility energy storage and electric vehicles
22 p0286 A79-27207

An overview of the STOR hydrogen energy program
22 p0289 A79-27655

Air Force applications of lightweight superconducting machinery --- in airborne power sources
22 p0290 A79-27666

A general design method for closed-loop solar energy systems
22 p0295 A79-28359

Application of kinetic energy storage to transportation systems --- flywheels
22 p0299 A79-29337

A flywheel energy storage and conversion system for solar photovoltaic applications
[ASME PAPER 79-SOL-1] 22 p0307 A79-30539

Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

Distributed energy storage for solar applications
22 p0317 A79-31410

Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962

Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses
23 p0387 A79-33245

Design of a mechanical energy storage unit --- flywheel
23 p0387 A79-33246

The minimization of drag torque for rotating disks
23 p0387 A79-33247

Hydrogen storage in the form of metal hydrides
23 p0388 A79-33251

Modelling of a domestic wind power system including storage
23 p0396 A79-33764

An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0397 A79-33836

Heat extraction from a salt gradient solar pond
23 p0410 A79-34085

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 8 - Hydrogen energy
23 p0413 A79-34106

State-of-the-art summary of the technical problems involved in the storage of hydrogen via metal hydrides
23 p0414 A79-34120

A survey of the hydrogen storage properties of nickel-copper-mischmetal-calcium alloys
23 p0414 A79-34121

The potential of zeolite molecular sieves as hydrogen storage media
23 p0415 A79-34123

Hydrogen Homestead --- replacement fuel for homes
23 p0415 A79-34125

Optimum design of automotive vehicles employing alternate energy sources of low energy density - Impact on selection of an energy-carrier for future urban vehicle transportation systems
23 p0415 A79-34128

Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130

Experimental study of thermal energy storage by use of reversible chemical reactions
23 p0416 A79-34137

Energy storage by flywheels - A new flywheel concept
23 p0416 A79-34139
Eighty atmospheres in reserve --- compressed air storage in caverns for peaking power source
23 p0436 A79-35800
Large scale energy storage - Batteries for transport and stationary applications
23 p0451 A79-37875
Compressed air storage --- off-peak energy storage by power plants
23 p0451 A79-37876
Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878
High temperature batteries --- energy stores using Na and sulfur electrodes
23 p0451 A79-37881
Wind energy conversion and hydrogen production - A feasibility study for South Africa
23 p0452 A79-37892
Redox flow cell energy storage systems
[AIAA PAPER 79-0989] 23 p0458 A79-38191
Storage of solar energy at low temperatures through chemical processes
23 p0469 A79-38637
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O
23 p0470 A79-38641
Boltzmann simulation of a storage ring laser
23 p0487 A79-40381
Photochemical aspects of solar energy conversion and storage
23 p0495 A79-40746
Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage
23 p0495 A79-40747
Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries
23 p0495 A79-40749
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079
Production, transport, and storage of hydrogen
23 p0523 A79-41802
Large superconducting magnets for new energy technologies
24 p0604 A79-44527
Energy storage --- survey of recent R and D
24 p0606 A79-44959
Role of hydrogen in Eco Energy
24 p0612 A79-45578
Hydrogen storage technology for metal hydrides
24 p0615 A79-45599
DOE program on hydrogen energy systems
24 p0615 A79-45605
Midwest Energy Conference, Chicago, Ill., November 19-21, 1978, Proceedings
24 p0630 A79-46301
Design of optimum compressed air energy-storage systems
24 p0631 A79-46308
Superconductive magnetic energy storage --- using superfluid helium for large scale cooling
24 p0631 A79-46309
Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807
Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136
Storage and distribution of cryogenic fuels --- for transportation
24 p0650 A79-49378
Storage and distribution of synthetic fuels
24 p0650 A79-49379
Undergound pumped hydro storage - An overview
24 p0660 A79-50451
Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545
Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557
Technology overview of energy storage systems
24 p0666 A79-50892
Environmental considerations in R&D planning and evaluation of energy storage systems
24 p0666 A79-50893
Pumped storage projects and their environmental impacts - An overview
24 p0666 A79-50894
Environmental concerns related to compressed air energy storage
24 p0666 A79-50895
Turbine sizing of a solar thermal power plant
24 p0673 A79-51751
The design of photovoltaic systems for intermediate-sized applications
24 p0675 A79-51762
The application of wind energy to a system with an inherent energy storage medium
24 p0677 A79-51778
Regenerative flywheel energy storage system
24 p0678 A79-51783
Low cost flywheel energy storage system demonstration
24 p0678 A79-51788
Novel flywheel energy storage system
24 p0678 A79-51789
Energy storage and conversion in conjunction with photovoltaic energy systems
24 p0679 A79-51790
Flywheel energy storage interface unit for photovoltaic applications
24 p0679 A79-51791
Residential flywheel with turbine supply
24 p0679 A79-51792
Underground pumped hydro storage - An evaluation of the concept
24 p0679 A79-51793
Turbomachinery options for an underground pumped hydroelectric storage plant
24 p0679 A79-51794
Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment
24 p0679 A79-51796
Incremental cost analysis for advanced compressed air energy storage concepts
24 p0679 A79-51797
On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns
24 p0680 A79-51798
Analysis of mass cycling in porous rock reservoirs for compressed air energy storage
24 p0680 A79-51799
Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800
Study of turbomachinery options for compressed air energy storage plants
24 p0680 A79-51801
Superconducting Magnetic Energy Storage for electric power system stabilization
24 p0681 A79-51804
Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system
24 p0681 A79-51806
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809
The role of fuel cells in NASA's space power systems
24 p0681 A79-51810
The effect of mechanical energy storage systems on the characteristics of electric vehicles
24 p0683 A79-51820
Advanced flywheel energy storage unit for a high power energy source for vehicular use
24 p0683 A79-51821
A zinc-bromine battery for energy storage
24 p0684 A79-51832
Dow sodium-sulfur battery for energy storage
24 p0684 A79-51834
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836
Recent advances in Redox flow cell storage systems
24 p0684 A79-51837
Orbital antenna farm power systems challenges
24 p0690 A79-51892
The military space power program
24 p0691 A79-51893
Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

Prediction of the performance of solar heating systems over a range of storage capacities
24 p0712 A79-53492

On the calculation of the temperature distribution in a packed bed for solar energy applications
24 p0712 A79-53495

Optical and thermal analysis of a Cassegrainian solar concentrator
24 p0713 A79-53498

Battery workshop
21 p0170 N79-10143

Rotatable mass for a flywheel
[NASA-CASE-MFS-23051-1] 21 p0172 N79-10422

Thermal energy storage subsystems
[NASA-CR-150812] 21 p0172 N79-10517

Hydrogen energy storage program: Five-year plan
[DOE/ET-0046] 21 p0175 N79-10544

Study of flywheel energy storage. Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555

Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556

Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557

Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558

Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559

A study of flywheel energy storage for urban transit vehicles
[PB-282929/9] 21 p0177 N79-10563

Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473

Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479

Preliminary design and analysis of a total energy system for Massachusetts Institute of Technology
[AD-A057289] 21 p0184 N79-11486

Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1] 21 p0184 N79-11490

Development of sodium-sulfur batteries for utility application
[EPRI-EM-683] 21 p0186 N79-11502

Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 3: Wind conversion systems with energy storage
[HCP/T22221-01/3] 21 p0189 N79-11535

Evaluated physical properties data for materials used in energy storage systems
[UCRL-81159] 21 p0189 N79-11536

Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537

Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283171/7] 21 p0191 N79-11554

Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283170/9] 21 p0191 N79-11555

A feasibility study of inorganic oxide-fluoride compositions for thermal energy storage applications
[AD-A059001] 21 p0196 N79-12559

Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565

An assessment of thermal energy storage and waste heat dissipation with total energy systems for MIT
[AD-A059061] 21 p0205 N79-13502

Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 2: Photovoltaic systems with energy storage
[HCP/T22221-01/2-2] 21 p0207 N79-13510

Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 1: Study summary and concept screening
[HCP/T22221-01/1-VOL-1] 21 p0207 N79-13511

Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors --- Kevlar/epoxy and glass/epoxy composites
[UCRL-80116-PT-A] 21 p0215 N79-14165

Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565

Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

Thermochemical energy storage and transport program
[SAND-78-8056] 21 p0221 N79-14570

Development of a high energy storage flywheel module
[AD-A060351] 21 p0230 N79-15413

Bioconversion study conducted by JPL
[NASA-CR-158228] 22 p0354 N79-19450

Thermal storage technologies for solar industrial process heat applications
[NASA-TM-79130] 22 p0360 N79-20498

Thin film battery/fuel cell power generating system
[CONS/1197-9] 22 p0369 N79-21556

Wayside energy storage summary. Volume 1: Summary
[DOT-TSC-FRA-79-7-1-VOL-1] 22 p0370 N79-21563

The 25 kW space station
22 p0371 N79-21604

Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB-290226/0] 23 p0544 N79-22645

Cost-effective potential of optimumly designed heat pumps for the collection, storage, and distribution of solar energy
[BNL-25195] 23 p0556 N79-24307

Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442

Thermal Storage Applications Workshop. Volume 1: Plenary Session Analysis
[NASA-CR-158643] 23 p0559 N79-24460

Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes
[PNL-2871] 23 p0562 N79-24487

Evaluation of a flywheel-powered shuttle car
[FE-8890] 23 p0562 N79-24488

Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492

Basic research on ceramic materials for energy storage and conversion system
[COO-2564-4] 23 p0564 N79-24506

Design of optimum compressed air energy storage systems
[CONF-7811101-1] 23 p0565 N79-24508

Method for the comparative economic assessment of energy storage systems
[BNL-25291] 23 p0565 N79-24509

Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

Inventory of underground energy storage sites in California
[PB-290835/8] 23 p0566 N79-24519

Liquefied energy gases safety. Volume 1: Executive summary and main text
[EMD-78-28-VOL-1] 23 p0572 N79-25508

Liquefied energy gases safety. Volume 2: Appendixes
[EMD-78-28-VOL-2] 23 p0573 N79-25509

Liquefied energy gases safety. Volume 3: Federal agency comments
[EMD-78-28-VOL-3] 23 p0573 N79-25510

Recent advances in redox flow cell storage systems
[NASA-TM-79186] 23 p0581 N79-26505

Hydrogen storage devices for automobiles
[BNL-25263] 23 p0583 N79-26518

Proceedings of the Workshop on Mechanical Storage of Wind Energy
[SAND-79-0001] 23 p0584 N79-26528

Geologic assessment of compressed air storage
sites in Kansas
[EPRI-EM-877] 23 p0597 N79-27689
Improvements in the lead-acid battery for load
leveling applications
[AD-A068990] 24 p0724 N79-28744
Urban areas as energy flow systems
24 p0736 N79-29592
Technology development for phosphoric acid fuel
cell powerplant, phase 2
[NASA-CR-159572] 24 p0737 N79-29604
Design and installation manual for thermal energy
storage
[ANL-79-15] 24 p0740 N79-29636
Assessment of the technoeconomic feasibility or
Seasonal Thermal Energy Storage systems (STES)
[ANL/EES-TM-35] 24 p0740 N79-29637
DOE/STOR bibliography for flywheel energy systems,
1977
[UCRL-52637] 24 p0742 N79-29665
Applications of thermal energy storage to process
heat storage and recovery in the paper and pulp
industry
[NASA-CR-159398] 24 p0756 N79-30801
Preliminary evaluation of the use of hydraulic air
compressors in water-compensated reservoir
compressed air storage power plants ---
conferences
[CONF-780599-2] 24 p0758 N79-30822
Study of system implications of high speed
flywheels as energy storage devices on
satellites, volume 1
[REPT-30/1020-VOL-1] 24 p0759 N79-30834
Study of system implications of high speed
flywheels as energy storage devices on
satellites, volume 2
[REPT-30/1020-VOL-2] 24 p0760 N79-30835
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784
Thermal and mechanical energy storage program
[DOE/ET-0091] 24 p0775 N79-31817
Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075
Energy conservation opportunities in appliances
using energy storage
[ORNL/SUB-7303/1] 24 p0782 N79-32629
Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680
Corrosion in molten salts used for solar thermal
storage applications
[SAND-79-0246C] 24 p0786 N79-32683
Thermal energy storage for advanced solar central
receiver power systems
[SAND-78-8221] 24 p0788 N79-32694
Heat pump/rock bed storage systems --- computer
program for economic analysis
[COO-4704-2] 24 p0789 N79-32705
Conceptual design of thermal energy storage
systems for near term electric utility
applications
[NASA-CR-159577] 24 p0797 N79-33560
Analysis of battery storage for commercial
buildings, phase 1
[COO-4556-2] 24 p0800 N79-33586
Testing of pebble-bed and phase-change thermal
energy storage devices according to ASHRAE
standard 94-77
[PB-295898/1] 24 p0801 N79-33596
An expanded system simulation model for solar
energy storage (technical report), volume 1
[NASA-CR-159601] 24 p0804 N79-33881
An expanded system simulation model for solar
energy storage (UNIVAC operation manual
revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882
SIMWEST: A simulation model for wind and
photovoltaic energy storage systems (CDC user's
manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883
SIMWEST: A simulation model for wind and
photovoltaic energy storage systems (cdc program
descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884

ENERGY TECHNOLOGY

Intersociety Energy Conversion Engineering
Conference, 13th, San Diego, Calif., August
20-25, 1978, Proceedings. Volumes 1, 2 & 3
21 p0001 A79-10001
Satellite power systems /SPS/ overview
21 p0002 A79-10022
Colorado's oil-shale resource for vertical
modified in-situ processes
21 p0005 A79-10046
Comparison of shale oils from different sources
produced by controlled-state retort
21 p0005 A79-10047
Permeability enhancement using explosive techniques
--- georesources recovery techniques
21 p0005 A79-10048
Design considerations for an in situ gasification
test of eastern bituminous coals
21 p0005 A79-10049
Underground thermal generation of hydrocarbons
from dry, southwestern coals
21 p0005 A79-10050
Status of the DOE underground coal conversion
program
21 p0005 A79-10052
Operation of the Ft. Lewis, Washington Solvent
Refined Coal /SRC/ Pilot Plant in the SRC I and
SRC II processing modes
21 p0006 A79-10054
Coal conversion by flash hydropyrolysis and
hydrogasification
21 p0006 A79-10055
Synthane - A process for the gasification of
caking and noncaking coals
21 p0006 A79-10057
Process development for the Westinghouse advanced
fluidized-bed coal gasification system
21 p0006 A79-10058
Gasification of coal liquefaction residues
21 p0006 A79-10059
Exxon Donor Solvent coal liquefaction process
development
21 p0007 A79-10060
Exploratory research in coal conversion
21 p0007 A79-10061
Coal liquefaction - Status and new directions
21 p0007 A79-10062
Novel technology for conversion of methanol and
synthesis gas to hydrocarbons
21 p0007 A79-10064
Alternatives for coal based power generation - An
international overview
21 p0008 A79-10074
Fossil superheating in geothermal steam power plants
21 p0014 A79-10122
Heat exchanger design for geothermal power plants
21 p0015 A79-10123
Hydrogen production from high temperature
electrolysis and fusion reactor
21 p0015 A79-10126
Progress report on hydrogen production and
utilization for community and automotive power
21 p0016 A79-10132
Preliminary design of the solar total energy-large
scale experiment at Shenandoah, Georgia
21 p0019 A79-10159
Conceptual design of the Fort Hood Solar Total
Energy-Large Scale Experiment
21 p0019 A79-10160
JPL - Small Power Systems Applications Project ---
for solar thermal power plant development and
commercialization
21 p0019 A79-10161
Enhanced solar energy options using earth-orbiting
mirrors
21 p0019 A79-10162
Design, construction, and testing of a Fixed
Mirror Solar Concentrator field
21 p0020 A79-10164
Design of a preprototype Stirling Laboratory
Research Engine
21 p0024 A79-10203
The matching of a free piston Stirling engine
coupled with a free piston linear compressor for
a heat pump application
21 p0024 A79-10204
A Stirling engine heat pump system
21 p0024 A79-10206
Experimental demonstration of the Diffuser
Augmented Wind Turbine concept
21 p0029 A79-10238

Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776

Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965

Coal desulfurization: Chemical and physical methods; Proceedings of the Symposium, New Orleans, La., March 23, 1977
21 p0044 A79-12114

German Solar Energy Forum, 1st, Hamburg, West Germany, September 26-28, 1977, Proceedings. Volume 2
21 p0055 A79-13619

Passive solar heating and cooling
[AIAA PAPER 78-1756] 21 p0060 A79-13857

Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869

Optimum selection of a wind turbine generator system
[AIAA PAPER 78-1774] 21 p0062 A79-13871

Design of a second generation concentrating tracking solar collector
[AIAA PAPER 78-1775] 21 p0062 A79-13872

Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106

A standard procedure of economic evaluation for energy-producing and pollution-abatement operations
21 p0064 A79-14109

Advanced processes for generation of electric power - Solvent refining of coal and combined cycle plants
21 p0064 A79-14110

State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes
21 p0064 A79-14111

Pollution perspective for geothermal energy development
21 p0064 A79-14114

Long-term availability of water resources for energy development in the Central United States
21 p0065 A79-14118

Summary of international energy research and development activities 1974-1976 --- Book
21 p0068 A79-14400

Annual Conference on Energy, 4th, University of Missouri-Rolla, Rolla, Mo., October 11-13, 1977, Proceedings. Volume 4
21 p0071 A79-14676

Recovery of oil from oil shale - An overall technological perspective
21 p0073 A79-14698

Annual review of energy. Volume 3 --- Book
21 p0074 A79-14718

Energy technologies and natural environments - The search for compatibility
21 p0074 A79-14721

Seminar on Geothermal Energy, 1st, Brussels, Belgium, December 6-8, 1977, Proceedings. Volumes 1 & 2
21 p0075 A79-14726

Miami International Conference on Alternative Energy Sources, Miami Beach, Fla., December 5-7, 1977, Proceedings of Condensed Papers
21 p0076 A79-14760

Results of a tilt-tilt low profile heliostat test program
21 p0076 A79-14761

Basic technical and economical aspects of the use of solar energy for pumping irrigation water
21 p0076 A79-14763

Solar energy - Past and present developments
21 p0076 A79-14764

Feature review of some advanced and innovative design concepts in wind energy conversion systems
21 p0077 A79-14771

Salinity power station at the Swedish west-coast - Possibilities and energy-price for a 200 MW-plant
21 p0077 A79-14772

Useful power from ocean waves
21 p0077 A79-14773

A challenging role for the assurance sciences --- in energy conversion technology
21 p0086 A79-15396

Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826

Energy technology V: Challenges to technology; Proceedings of the Fifth Conference, Washington, D.C., February 27-March 1, 1978
21 p0091 A79-15879

Biomimetic approach to solar energy conversion - Artificial photosynthesis
21 p0094 A79-15899

OTEC program status and plans
21 p0094 A79-15902

Power generation using thermal vapor pumping and hydro-pumped storage - Thermal gradient utilization cycle /TGUC/
21 p0095 A79-15914

New concepts in waste utilization and biomass
21 p0095 A79-15915

Energy from urban waste
21 p0096 A79-15917

Advanced processes for more efficient use of forest products residual material
21 p0096 A79-15919

Coal-based electricity and air pollution control - A case for solvent refined coal
21 p0096 A79-15922

Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924

Energy/environment technology areas to be developed
21 p0097 A79-16077

A comparative analysis of three of ERDA's major R & D programs
21 p0099 A79-16121

A methodological note on the evaluation of new technologies - The case of coal gasification
21 p0099 A79-16122

Technology transfer at Department of Energy laboratories - Selected case studies from the Lawrence Livermore Laboratory
21 p0099 A79-16130

Ocean thermal energy conversion; Proceedings of the Energy Technology Conference and Exhibition, Houston, Tex., November 6-9, 1978
21 p0100 A79-16245

Some early and recent novel OTEC systems
21 p0100 A79-16246

OTEC power systems
21 p0101 A79-16248

International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 16-22, 1978, Symposium Lectures
21 p0102 A79-16451

The economics and policy of alternative energy sources - A review
21 p0103 A79-16454

Solar-hydrogen energy system and solar-hydrogen production methods
21 p0104 A79-16463

Prospects for ambient energy and cogeneration utilization in urban and regional planning
21 p0104 A79-16465

Open-cycle magnetohydrodynamic electrical power generation --- Book
21 p0104 A79-16478

MHD generators --- Faraday, Hall and diagonal generator designs
21 p0105 A79-16484

Materials --- for high temperature MHD technology
21 p0106 A79-16491

Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1978, Technical Papers
21 p0107 A79-16601

A search for space energy alternatives
21 p0108 A79-16608

Energy '78; Annual Conference, Tulsa, Okla., April 16-18, 1978, Record of Conference Papers
21 p0111 A79-16726

The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736

Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741

Energy systems: An analysis for engineers and policy makers --- Book
21 p0114 A79-17218

Potential research problems in energy systems analysis
21 p0115 A79-17221

Energy economics - A research analysis --- considering OPEC Cartel impact
21 p0115 A79-17222

The solar energy R & D programme of the European Communities
21 p0116 A79-17278

Solar energy in Latin America - An overview
21 p0116 A79-17279

Report on the development of solar energy in France
21 p0117 A79-17280

The accomplishments of the United States Federal Solar Energy Program
21 p0117 A79-17281

Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282

Solar energy activities in Austria
21 p0117 A79-17283

Solar energy R&D in Iran - The approach and the philosophy
21 p0117 A79-17284

Solar energy in Southern Africa
21 p0117 A79-17287

Solar electrification and rural electrification - A techno-economic review
21 p0118 A79-17289

The relationship between diffuse and total solar radiation in computer simulation of solar energy systems
21 p0119 A79-17304

Energy through solar aided bio-gas systems
21 p0125 A79-17367

Bio-mass energy for rural areas
21 p0126 A79-17373

Status report on selective surfaces --- solar collector absorbers
21 p0126 A79-17374

Cost effective optimum design of solar air heaters
21 p0127 A79-17386

Optimum collection geometries for copper tube - copper sheet flat plate collectors
21 p0127 A79-17387

Solar energy use in Denmark /56 deg N/ and higher latitudes in Scandinavia
21 p0128 A79-17393

Double-exposure collector system for solar heating applications
[CONF-780114-6] 21 p0131 A79-17411

Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415

A report on the various heat collection and heat storage systems evolved under the solar energy programme at R. I. T. S.
21 p0132 A79-17423

Liquid solar collector --- low cost assemblage with black water working fluid
21 p0133 A79-17433

P.E.P.I.C.L.E.S. - Design of a stationary spherical collector --- solar energy application
21 p0134 A79-17441

Performance of solar heating and cooling systems used in the national solar heating and cooling demonstration program
21 p0139 A79-17478

Application of turbopack in solar energy systems
21 p0141 A79-17504

Coal technology '78; International Coal Utilization Convention, Houston, Tex., October 17-19, 1978, Conference Papers. Volumes 1 & 2
21 p0145 A79-17631

The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634

The H-Coal project --- catalytic hydrogenation of coal
21 p0145 A79-17635

Synthetic fuels from coal
21 p0145 A79-17636

A summary of R&D programs --- for coal utilization
21 p0146 A79-17639

Coal - Meeting the energy challenge
21 p0147 A79-17647

Solar energy --- conversion technologies
21 p0147 A79-17648

Solar power satellites - An AIAA position paper
21 p0148 A79-17872

Two thermodynamic optima in the design of sensible heat units for energy storage
21 p0150 A79-18091

Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems
21 p0150 A79-18092

The theoretical analysis of an air turbine generation system --- for waterwave energy conversion
21 p0151 A79-18106

Energy related mathematical models - Annotated bibliography
21 p0154 A79-18472

Recent developments in pressurized fluidized bed coal combustion research
[AIAA PAPER 79-0190] 21 p0157 A79-19589

Program to establish ceramic technology readiness for large combustion turbine utility application
[ASME PAPER 78-WA/GT-8] 21 p0160 A79-19796

Development of compact heat exchangers for Ocean Thermal Energy Conversion /OTEC/ systems
[ASME PAPER 78-WA/HT-34] 21 p0161 A79-19815

Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

The sodium/sulfur battery - A storage battery for peak load adjustment and electric traction
21 p0165 A79-20244

Tidal power in the Bay of Fundy
22 p0237 A79-20729

Selective application of materials for products and energy; Proceedings of the Twenty-third National Symposium and Exhibition, Anaheim, Calif., May 2-4, 1978
22 p0239 A79-20801

An evolutionary solar power satellite program
[AAS PAPER 78-153] 22 p0243 A79-21265

Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977
22 p0247 A79-21676

The prospects of hydrogen as an energy carrier for the future
22 p0247 A79-21677

International Conference on Thermoelectric Energy Conversion, 2nd, University of Texas, Arlington, Tex., March 22-24, 1978, Proceedings and Supplement
22 p0259 A79-23603

Synthetic chloroplasts --- for photosynthetic solar energy conversion
22 p0262 A79-23721

Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776

Oil shale in the U.S. - Current state of technology and research
22 p0265 A79-23830

Industrial cogeneration - Problems and promise --- waste heat utilization from electricity production
22 p0265 A79-24047

Risk with energy from conventional and nonconventional sources
22 p0266 A79-24151

Tropospheric conduits --- for pollution abatement and energy production
22 p0266 A79-24275

Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309

Stormy development of wind energy --- German technology utilization
22 p0268 A79-24323

The solar power satellite concept - The past decade and the next decade
[AIAA PAPER 79-0534] 22 p0273 A79-25854

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978 22 p0278 A79-26176

Radiation regime of inclined surfaces --- Russian book on solar energy engineering and microclimatology 22 p0282 A79-26353

Energy development --- for future global demand 22 p0282 A79-26402

Contribution to the development of wind energy systems using static power electronic converters 22 p0286 A79-26958

No ill winds for New Mexico utility --- windpower utilization in municipal electric power system 22 p0286 A79-27208

Principles of solar engineering --- Book 22 p0287 A79-27372

Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978 22 p0289 A79-27651

Hydrogen via gasification - Today and tomorrow 22 p0289 A79-27652

Progress in solid polymer electrolyte water electrolysis --- for large-scale hydrogen production 22 p0289 A79-27653

Hydrogen via thermochemistry and future water-splitting technologies 22 p0289 A79-27654

An overview of the STOR hydrogen energy program 22 p0289 A79-27655

An overview of liquid metal MHD --- for power generation 22 p0289 A79-27660

Status of the U.S./U.S.S.R. cooperative program for the development of open-cycle MHD power generators 22 p0290 A79-27661

Superconducting magnet systems for MHD generator facilities 22 p0290 A79-27662

Doublet III --- tokamak program review 22 p0290 A79-27667

Status report on TFTR --- Toroidal Fusion Test Reactor 22 p0290 A79-27669

Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978 22 p0293 A79-28140

Energy conversion engineering --- Book 22 p0302 A79-29575

Heat pump technology for saving energy --- Book 22 p0302 A79-29624

Some recent developments in wind and ocean power systems 22 p0303 A79-29797

The impact of alternate energy resources on the future supply of electric power [IEEE PAPER F 78 672-8] 22 p0304 A79-29939

The potential for solar energy development 22 p0304 A79-30172

Energy, resources, and policy --- Book 22 p0304 A79-30175

Refrigeration requirements for future superconductive energy related applications 22 p0311 A79-31019

Renewable alternatives; Proceedings of the Fourth Annual Conference, University of Western Ontario, London, Canada, August 20-24, 1978. Volumes 1 & 2 22 p0316 A79-31401

Energy and aerospace; Proceedings of the Anglo/American Conference, London, England, December 5-7, 1978 22 p0325 A79-31908

Energy research and development - A U.K. view 22 p0325 A79-31910

Design and application of large wind turbine generators 22 p0326 A79-31916

Solar Power Satellite systems definition 22 p0326 A79-31920

Photovoltaics and solar thermal conversion to electricity - Status and prospects 22 p0326 A79-31924

Pressurized fluidized bed pilot electric plant - A technology status [ASME PAPER 79-GT-193] 23 p0379 A79-32451

Mississippi County Community College solar photovoltaic total energy project [ASME PAPER 79-SOL-13] 23 p0380 A79-32463

MHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591

First steps to the Solar Power Satellite 23 p0382 A79-32721

Brazilian Conference on Energy, 1st, Rio de Janeiro, Brazil, December 12-14, 1978, Proceedings. Volumes A, B, & C 23 p0384 A79-33212

Energy recovery from urban solid waste 23 p0386 A79-33233

Dimensioning of energy-production systems - The use of geometric programming --- solar cell array application 23 p0388 A79-33254

World energy scene and Brazil's alternatives 23 p0388 A79-33259

Energy projects at the Sao Paulo State Institute of Technological Research 23 p0389 A79-33261

The cost of hydrogen from coal 23 p0396 A79-33766

Design and experimental testing of a fully-submerged model wave-power convertor 23 p0396 A79-33767

Measurement of the performance of domestic air-to-air heat pumps 23 p0397 A79-33768

Selected areas of aerospace technical applications to civil engineering 23 p0397 A79-33925

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 1 - Solar energy 1 23 p0398 A79-33984

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 2 - Solar energy 2 23 p0400 A79-34002

Solar energy in California industry - Applications, characteristics and potential 23 p0402 A79-34019

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 3 - Solar Energy 3 23 p0402 A79-34022

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy 23 p0404 A79-34036

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 6 - Geothermal energy and hydropower 23 p0408 A79-34067

Harnessing geothermal energy in Rotorua, New Zealand 23 p0408 A79-34068

Geothermal systems in the Hauraki Rift zone /New Zealand/ - An example for geothermal systems over an inferred upper mantle swell 23 p0408 A79-34069

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 7 - Hydrocarbon conversion technology 23 p0410 A79-34086

The Synthane process - A technical and economic assessment --- of coal gasification 23 p0410 A79-34089

In situ gasification - Recovery of inaccessible coal reserves 23 p0411 A79-34093

COIL process - First generation commercial coal liquefaction plant 23 p0412 A79-34101

State-of-the-art summary of the technical problems involved in the storage of hydrogen via metal hydrides 23 p0414 A79-34120

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 9 - Energy delivery, conservation, and environment 23 p0416 A79-34131

Multiple section Minto Wheel driven by heat recovery from flue, steam, and return pipes of household heating systems /plus solar heat/ 23 p0417 A79-34146

Alternative energy sources and conservation technologies - Optimal systems 23 p0418 A79-34150

Assessment of energy conservation by using alternate energy sources in Kansas 23 p0418 A79-34151

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy 23 p0419 A79-34158

A unified methodology for cost analysis of energy production 23 p0419 A79-34159

Estimating the commercial potential and energy benefits of ERDA electric energy research 23 p0419 A79-34161

The impact of oil price increases on the competitiveness of non-conventional energy technologies 23 p0419 A79-34162

Technical-economic modeling in energy planning 23 p0419 A79-34164

Energy use and society in the 21st century --- development cost effects on growing GNP economy 23 p0420 A79-34165

The inexhaustible energy resources study --- U.S. R and D to meet future requirements 23 p0420 A79-34166

Survey and appraisal of primary future energy sources 23 p0420 A79-34167

Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future 23 p0420 A79-34168

Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources 23 p0420 A79-34170

A nuclear-solar energy strategy 23 p0421 A79-34174

Introducing new technologies for alternative energy sources - The economic, social, and environmental considerations for developing countries 23 p0421 A79-34177

Renewable energy supplies for developing countries 23 p0422 A79-34178

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 11 - Index 23 p0422 A79-34182

Effects of energy conservation research, development, and demonstration on residential energy use 23 p0422 A79-34276

Three modes of energy cost analysis - Then-current, base-year, and perpetual-constant dollar 23 p0422 A79-34277

Rationing energy to industries - Priorities and input-output dependence 23 p0423 A79-34278

Energy sources of the future - A challenge to man's ingenuity 23 p0423 A79-34389

American Power Conference, Illinois Institute of Technology, Chicago, Ill., April 24-26, 1978, Proceedings. Volume 40 23 p0423 A79-34451

Synchronous orbit power technology needs [AIAA 79-0916] 23 p0425 A79-34739

Future programs in space --- impact on energy technology problems [AAS 78-180] 23 p0427 A79-34865

Solar cells from inexpensive silicon ribbons - State of the art and trends 23 p0435 A79-35487

The development of solar power satellites 23 p0435 A79-35488

Solar options in central Europe - A synthesis of solar possibilities in technological terms according to present-day /1978/ criteria 23 p0435 A79-35490

Use of fluidized media in thermal power systems 23 p0436 A79-35525

Solar energy conversion: Solid-state physics aspects --- Book 23 p0437 A79-36144

International Conference on Future Energy Concepts, London, England, January 30-February 1, 1979, Proceedings 23 p0448 A79-37842

Influence of technological advances on potential tidal power development 23 p0450 A79-37865

Marine structures for energy conversion 23 p0450 A79-37867

Low cost Darrieus vertical-axis wind turbine design [AIAA PAPER 79-0966] 23 p0456 A79-38174

Integrated coal conversion utilization program [AIAA PAPER 79-0997] 23 p0459 A79-38195

A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems [AIAA PAPER 79-1006] 23 p0459 A79-38199

Solar total energy - Large scale experiment --- supply of factory energy needs [AIAA PAPER 79-1025] 23 p0460 A79-38207

Converting coal to liquid/gaseous fuels 23 p0461 A79-38376

International Solar Forum, 2nd, Hamburg, West Germany, July 12-14, 1978, Reports. Volumes 1, 2 & 3 23 p0463 A79-38576

European solar collector development and testing - A commercial view 23 p0470 A79-38645

Aspects of solar energy use in the Federal Republic of Germany 23 p0473 A79-38668

Aluminum in solar technology 23 p0481 A79-40024

International Symposium on Wind Energy Systems, 2nd, Amsterdam, Netherlands, October 3-6, 1978, Proceedings. Volume 1 23 p0481 A79-40101

Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/ 23 p0490 A79-40413

Design criteria to achieve industrial power plant reliability in solid waste processing plants with energy recovery 23 p0491 A79-40417

Chemistry for energy; Proceedings of the Symposium, Winnipeg, Manitoba, Canada, June 5-7, 1978 23 p0493 A79-40736

The AOSTRA role in developing energy from Alberta oil sands 23 p0494 A79-40738

Status of the DOE Photovoltaic Systems Engineering and Analysis Project 23 p0519 A79-41075

Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona 23 p0521 A79-41089

Design of the Natural Bridges National Monument 100 kW PV power system 23 p0521 A79-41090

Description and status of NASA-LeRC/DOE photovoltaic applications systems experiments 23 p0521 A79-41091

Integrated solar energy installations for isolated operation 23 p0522 A79-41239

An information approach to examining developments in an energy technology - Coal gasification 23 p0523 A79-41375

INOVA: Industrial innovation; Conference, Paris, France, June 13-17, 1977, Proceedings. Volume 2 - New energy 23 p0523 A79-41801

Solar energy - Principal directions of research 23 p0524 A79-41805

Ocean thermal energy 23 p0524 A79-41810

Long term perspectives in energy resources 23 p0525 A79-41820
Engineering of microwave relays --- microwave radio equipment engineering aspects and impact on energy technology 23 p0526 A79-41931
Ocean and energy --- French book 23 p0529 A79-42350
Materials, problems and research in German coal conversion projects 23 p0529 A79-42425
Energy on the horizon 23 p0529 A79-42458
Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution 23 p0531 A79-42900
International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 4 - Process and industrial heat transfer, heat transfer in energy utilization, heat exchangers 23 p0532 A79-42973
The enigma of the eighties: Environment, economics, energy; Proceedings of the Twenty-fourth National Symposium and Exhibition, San Francisco, Calif., May 8-10, 1979. Books 1 & 2 23 p0533 A79-43228
Program overview for the Wind Characteristics Program Element of the United States Federal Wind Energy Program 23 p0534 A79-43376
Crystallographic contributions to the energy problem 23 p0535 A79-43466
The capital stake in the transition to new energy systems. II 23 p0535 A79-43522
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/ [AIAA PAPER 79-1000] 24 p0601 A79-44225
Fusion - Its status and outlook 24 p0601 A79-44241
The future of methane supply 24 p0601 A79-44242
Ocean thermal energy for the 80's 24 p0602 A79-44273
Future energy alternatives 24 p0602 A79-44276
Coal usage --- review of current technologies 24 p0606 A79-44957
Energy storage --- survey of recent R and D 24 p0606 A79-44959
Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978 24 p0612 A79-45576
Hydrogen in the U.S. energy picture 24 p0612 A79-45577
Commodity hydrogen production and marketing 24 p0613 A79-45582
Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volumes 1 & 2 24 p0616 A79-45776
Midwest Energy Conference, Chicago, Ill., November 19-21, 1978, Proceedings 24 p0630 A79-46301
Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings 24 p0633 A79-46526
Status of the Southern California Edison Company 3 MW wind turbine generator /WTG/ demonstration project 24 p0635 A79-46541
The race for unlimited energy --- Book 24 p0638 A79-47071
The comparison of energy chains --- different electrical energy production processes 24 p0644 A79-48023
A WELMM comparison of energy scenarios --- evaluation of different energy production systems in France 24 p0645 A79-48025
Small-scale coal-gasification plants 24 p0647 A79-49158
Utilization of alternative fuels for transportation; Proceedings of the Symposium, University of Santa Clara, Santa Clara, Calif., June 19-23, 1978 24 p0650 A79-49376
A quantitative comparison of energy costing methods 24 p0651 A79-49475
Environmental impacts of contemporary fossil energy systems 24 p0659 A79-50363
Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings 24 p0664 A79-50876
Environmental aspects of the Department of Energy's underground coal conversion program 24 p0664 A79-50882
High-grade fuels from biomass farming - Potentials and constraints 24 p0669 A79-51194
Intersociety Energy Conversion Engineering Conference, 14th, Boston, Mass., August 5-10, 1979, Proceedings. Volumes 1 & 2 24 p0670 A79-51726
Energy research and development at the Canada Centre for Mineral and Energy Technology /CANMET/ 24 p0698 A79-51971
Reducing institutional barriers to solar energy through the use of cooperatively-owned solar energy systems 24 p0707 A79-52573
European technology applicable to Solar Power Satellite Systems /SPS/ [IAF PAPER 79-174] 24 p0710 A79-53335
Coal conversion technology --- Book 24 p0714 A79-53776
Methane generation from human, animal, and agricultural wastes [PB-276469/4] 21 p0171 N79-10240
Thermal energy storage subsystems [NASA-CR-150812] 21 p0172 N79-10517
Solar system installation at Louisville, Kentucky [NASA-CR-150814] 21 p0172 N79-10518
Development of surfaces optically suitable for flat solar panels [NASA-CR-150831] 21 p0173 N79-10522
Direct heat applications of geothermal energy in the geysers/Clear Lake Region, volume 2: Environmental assessment [SAN-1326-1-2] 21 p0174 N79-10532
Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980 [DSE/2426-19] 21 p0174 N79-10535
System for projecting the utilization of renewable resources. SPURR methodology [ERHQ/2322-77/4] 21 p0174 N79-10538
Solar powered irrigation: Present status and future outlook [SAND-78-0016C] 21 p0175 N79-10539
Environmental development Plan (EDP). Oil supply, FY 1977 [DOE/EDP-0024] 21 p0175 N79-10545
Solar energy concentrator design and operation. Citations from the NTIS data base [NTIS/PS-78/0838/9] 21 p0178 N79-10566
Technology assessment, volume 2. A bibliography with abstracts [NTIS/PS-78/0830/6] 21 p0179 N79-10951
Surfactant-assisted liquefaction of particulate carbonaceous substances [NASA-CASE-NPO-13904-1] 21 p0179 N79-11152
Preliminary design and analysis of a total energy system for Massachusetts Institute of Technology [AD-A057289] 21 p0184 N79-11486
Electric batteries. A bibliography [TID-3361] 21 p0184 N79-11491
Design guide for shallow solar ponds [UCRL-52385] 21 p0185 N79-11497
Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation [EPRI-AF-753] 21 p0185 N79-11498
Annual highlights of the energy technology programs [BNL-50799] 21 p0185 N79-11499
Biomimetic approach to solar energy conversion: Artificial photosynthesis [CONF-780222-5] 21 p0186 N79-11506

Fundamental data needs for coal conversion technology appendices
[TID-28152-APP] 21 p0187 N79-11512
Solar irrigation program plan: Second revision
[SAND-78-0308-REV] 21 p0187 N79-11525
Integrating technologies to produce energy conservation
[CONF-780109-6] 21 p0189 N79-11541
International project catalog of modular integrated utility systems
[PB-283477/8] 21 p0190 N79-11544
Committee on the Challenges of Modern Society Rational use of Energy Pilot Study Modular Integrated Utility Systems Project. Volume 1: Description, activities, and products
[PB-283428/1] 21 p0190 N79-11549
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568
Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887
Assessment of SEPS solar array technology for orbital service module application
[NASA-CR-151859] 21 p0194 N79-12136
Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555
Satellite Power System (SPS) environmental impacts, preliminary assessment
[NASA-CR-157952] 21 p0196 N79-12557
Satellite Power System (SPS) microwave subsystem impacts and benefits
[NASA-CR-157951] 21 p0196 N79-12558
Energy information data base: Serial titles
[TID-4579-R10] 21 p0197 N79-12566
Environmental Development Plan (EDP): Photovoltaics, 1977
[DOE/EDP-0003] 21 p0198 N79-12569
Combined photovoltaic thermal collector testing
[SAND-78-1191C] 21 p0198 N79-12570
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576
Technical and environmental aspects of oil shale processing
21 p0199 N79-12581
Status of alcohol fuels utilization technology for highway transportation
[HCP/M2923-01] 21 p0201 N79-13190
IAPGO hot water system thermal performance test report
[NASA-CR-150841] 21 p0205 N79-13500
Improved anodes for liquid hydrocarbon fuel cell
[AD-A058456] 21 p0206 N79-13504
Program information notice --- technologies relevant to u.s. electric energy systems
[DOE/ET-0059] 21 p0207 N79-13517
Analytical framework for the assessment of energy resource and technology options for developing countries
[BNL-50800] 21 p0208 N79-13524
Photovoltaic program: Program summary
[DOE/ET-0019/1] 21 p0209 N79-13529
Solar evacuated tube collector: Absorption chiller systems simulation
[COO-2577-13] 21 p0209 N79-13530
Heat pump technology: A survey of technical developments, market prospects and research needs
[HCP/M2121-01] 21 p0210 N79-13540
Noise-control needs in the developing energy technologies
[COO-4389-1] 21 p0213 N79-13569
Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants
[UCRL-52000-78-6] 21 p0215 N79-14168
Naval Air Systems Command-Naval Research Laboratory Workshop on Basic Research Needs for Synthetic Hydrocarbon Jet Aircraft Fuels
[AD-A060081] 21 p0216 N79-14235
High energy MHD fuels development program
[AD-A060156] 21 p0216 N79-14239
Technology and Use of Lignite --- conferences
[GFERC/IC-77/1] 21 p0216 N79-14241
Back wall solar cell
[NASA-CASE-LEW-12236-2] 21 p0217 N79-14528
Application of solar technology to today's energy needs, volume 2 --- systems analysis and analytical methods
[OTA-E-77-VOL-2] 21 p0218 N79-14530
Conceptual approach study 200 watt per kilogram solar array, phase 3
[NASA-CR-158046] 21 p0219 N79-14551
Design and installation package for solar hot water system
[NASA-CR-150859] 21 p0220 N79-14556
Preliminary design package for prototype solar heating system
[NASA-CR-150858] 21 p0220 N79-14557
Water related constraints in energy production
[PB-285713/4] 21 p0222 N79-14582
Combined cycle power generation. Citations from the NTIS data base
[NTIS/PS-78/1156/5] 21 p0222 N79-14587
Combined cycle power generation. Citations from the Engineering Index data base
[NTIS/PS-78/1157/3] 21 p0222 N79-14588
Statement of Ivan Bekey, Director of Advanced Mission Studies, Aerospace Corporation
21 p0224 N79-15107
Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108
Design data brochure for the Owens-Illinois Sunpak (TM) air-cooled solar collector
[NASA-CR-150868] 21 p0229 N79-15404
Proceedings of Energy Resource 5th Conference
[PB-286246/4] 21 p0230 N79-15423
Fundamental combustion studies of emulsified fuels for diesel applications
[PB-287386/7] 22 p0330 N79-16138
An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380
The effects of resource impact factors on energy conservation standards for buildings
[PB-286909/7] 22 p0335 N79-16384
The AGARD propulsion and energetics panel, 1952-1977
[AGARD-AR-111] 22 p0337 N79-16848
Energy environment III
[EPA-600/9-78-022] 22 p0346 N79-18352
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
Ecological effects of coal-fired steam-electric generating stations
22 p0346 N79-18358
Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359
Technology assessment of western energy resource development
22 p0347 N79-18368
Austrian 10kWE solar power plant. A project of the Federal Ministry for Science and Research
22 p0349 N79-18460
Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464
Energy analyses applied to ocean thermal energy conversion and an offshore wind power system
22 p0353 N79-19442
Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-158172] 22 p0354 N79-19459
Energy/environment 1978: Symposium on energy development impacts
[PB-288578/8] 22 p0355 N79-19470
Automated array assembly, phase 2
[NASA-CR-158360] 22 p0358 N79-20480
Automated array assembly, phase 2. Low-cost solar array project, task 4
[NASA-CR-158365] 22 p0358 N79-20481
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485

Utility operational experience on the NASA/DOE MOD-0A 200-kW wind turbine
[NASA-TM-79084] 22 p0360 N79-20498
MHD balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500
Material growth and characterization directed toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543
Active heat exchange system development for latent heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554
Liquid-fluidized-bed heat exchanger flow distribution models
[ICP-1151] 22 p0369 N79-21559
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564
Development, testing, and certification of Owens-Illinois model SEC-601 solar energy collector system
[NASA-TM-78223] 22 p0371 N79-21620
Long term weathering effects on the thermal performance of the solaron (air) solar collector
[NASA-CR-161166] 22 p0371 N79-21621
An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640
Hydrogen energy. A bibliography with abstracts
[NASA-CR-157962] 23 p0540 N79-22613
Satellite Power Systems (SPS) concept definition study exhibit C. Volume 3: Experimental verification definition
[NASA-CR-161214] 23 p0543 N79-22632
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies
[NASA-CR-161215] 23 p0543 N79-22633
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation
[NASA-CR-161216] 23 p0543 N79-22634
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503
European Scientific notes, volume 32, number 4
[AD-A065399] 23 p0552 N79-23886
Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433
Solar technology in the Federal Republic of Germany
[NASA-TM-75634] 23 p0558 N79-24439
Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444
LSA: Low-cost Solar Array project
[NASA-CR-158533] 23 p0559 N79-24459
Thermal Storage Applications Workshop. Volume 1: Plenary Session Analysis
[NASA-CR-159643] 23 p0559 N79-24460
Thermal Storage Applications Workshop. Volume 2: Contributed Papers
[NASA-CP-159644] 23 p0559 N79-24461
HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers --- solving the heat transfer problem
[NASA-CR-159640] 23 p0560 N79-24466
Solar project cost report: Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/60] 23 p0561 N79-24480
Solar project description: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/50] 23 p0561 N79-24481
Solar project description: Aratex Services, Incorporated, industrial laundry, Fresno, California
[SOLAR/2008-78/50] 23 p0562 N79-24485
Energy Materials Coordinating Committee (EMACC)
[DOE/US-002] 23 p0563 N79-24490
A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives --- economic analysis
23 p0567 N79-24813
Translations on USSR science and technology: Physical sciences and technology, no. 67
[JPRS-73388] 23 p0568 N79-24946
Power industry application of MHD technology
23 p0568 N79-24949
Solar heating system final design package
[NASA-CR-161228] 23 p0572 N79-25503
Certification and verification for Northrup model NSC-01-0732 fresnel lens concentrating solar collector
[NASA-CR-161164] 23 p0572 N79-25504
Solar technology transfer program
[DOE/CS-0027/1] 23 p0574 N79-25521
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 3: Appendices, September 1977
[HCP/M70066-01/3-VOL-3] 23 p0574 N79-25523
Forecasts of energy technology. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0337/0] 23 p0575 N79-25531
National gas survey: Synthesized gaseous hydrocarbon fuels
[DOE/PERC-0008] 23 p0577 N79-26228
Executive energy documents
[GPO-24-112] 23 p0582 N79-26507
A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption
[AD-A067165] 23 p0582 N79-26510
System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530
Analysis of helio-thermoelectrical energy conversion efficiency
[REPT-77/HP-40-241] 23 p0584 N79-26534
Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953
Enthalpy measurements for coal-derived liquids
23 p0587 N79-26997
Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018
SERTAP: A new technology transfer network to link business and industry with Federal research and development --- energy technology
[PB-292882/8] 23 p0587 N79-27026
Methane production from beef cattle feedlots
[CONF-7806107-2] 23 p0589 N79-27333
Proceedings of the Conference on Coal Use for California
[NASA-CR-158770] 23 p0591 N79-27597
Proceedings of the Distribution Automation and Control Working Group. Volume 2: Proceedings
[NASA-CR-158769] 23 p0595 N79-27655
Solar energy system installed at Mount Rushmore National Visitor Center in Keystone, South Dakota
[NASA-CR-161238] 23 p0595 N79-27661
Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665
Photovoltaic-powered irrigation experiments in the United States --- crop drying and irrigating in Nebraska
[COO-4094-28] 23 p0596 N79-27673
Environmental readiness document. Small scale low head hydro: Commercialization, phase 3 planning
[DOE/ERD-0009] 23 p0597 N79-27686
Environmental readiness document. Solar: Hot water and passive, commercialization phase 3 planning
[DOE/ERD-0010] 23 p0597 N79-27690
Grid-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2
[COO-4337-2/2] 23 p0598 N79-27701
Citizens' solar program: State reports on barriers and strategies to renewable energy development
[HCP/U6308-01] 23 p0598 N79-27703
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0599 N79-27730
Alternative, semi-automated method for performing multiobjective analyses
[BNL-50892] 23 p0599 N79-27921
Review of selected solar market studies and techniques
[SERI/PR-52-076] 23 p0600 N79-28056
Some aspects of the mechanism and kinetics of coal liquefaction
24 p0717 N79-28343

Research and development of rapid hydrogenation
for coal conversion to synthetic motor fuels
[FE-2307-30] 24 p0718 N79-28358
Hydrogen from existing falling-water sites: An
initial feasibility assessment (summary)
[CONF-781102-8] 24 p0718 N79-28360
Applied research and evaluation of process
concepts for liquefaction and gasification of
western coals
[FE-2006-9] 24 p0719 N79-28363
Enhanced recovery of unconventional gas: The
methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654
Multiphase flow analysis of oil shale retorting
[UCRL-81717-REV-1] 24 p0721 N79-28656
Challenge of efficiently retorting very nonuniform
beds of oil shale rubble
[UCRL-81721-REV-1] 24 p0721 N79-28657
Program report for FY 1978: Atmospheric and
Geophysical Sciences Division of the Physics
Department
[UCRL-51444-78] 24 p0722 N79-28668
Future thrusts of the NASA space power program ---
with emphasis on electrochemical energy
conversion and storage
24 p0722 N79-28670
OTEC platform configuration and integration study.
Volume 3: Project plan
[DOE/ET/4063-1-VOL-3] 24 p0725 N79-28750
Trombe wall vs direct gain: A comparative
analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754
Applications of DOE-1 to passive solar heating of
commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
Performance and cost of a hybrid passive/active
solar house
[LA-UR-78-2209] 24 p0725 N79-28756
Barriers and incentives to solar energy
development. An analysis of legal and
institutional issues in the Northeast
[NPSEC-1] 24 p0726 N79-28765
Electricity from hot dry rock geothermal energy:
Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773
Guidebook on integrated community energy systems:
Indirect economic and energy impacts
[ANL/ICES-TM-16] 24 p0728 N79-28778
Energy research and development in Sweden, 1978-1981
[DFE-13] 24 p0728 N79-28781
Solar collector manufacturing activity
[DOE/EIA-0174] 24 p0728 N79-28787
Solar heating and cooling results for the Los
Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790
Comparison of atmospheric fluidized bed combustion
conceptual designs for utility steam generation
[HCP/T2314] 24 p0729 N79-28792
Environmental control technology activities of
the Department of Energy in FY 1978
[DOE/EV-0031] 24 p0729 N79-28812
Hierarchial decomposition approach to
environmental policy analysis
[BNL-24444] 24 p0729 N79-28814
Ford/DOE sodium-sulfur battery electric vehicle
development and demonstration, phase 1
[COO-2566-37] 24 p0731 N79-29118
In-situ combustion models for the steam plateau
and for fieldwide oil recovery
24 p0732 N79-29353
Investigation of mechanisms of hydrogen transfer
in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368
Technical and economic feasibility study for the
industrial utilization of waste derived fuel gas
[SAN-2092-T1] 24 p0733 N79-29372
Coal-to-gasoline conceptual design and market
evaluation of methanol fuel and methanol-derived
gasoline
[FE-2416-37] 24 p0734 N79-29378
Laser and energetics of the future
[UCRL-TRANS-11467] 24 p0734 N79-29513
Technology assessment of geothermal pumping
equipment
[ALO-4162-2] 24 p0735 N79-29524
Sources and delivery of carbon dioxide for
enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
An assessment of wind characteristics and wind
energy systems applications to electric
utilities in Wisconsin and sections of
Minnesota, Iowa and Illinois
24 p0736 N79-29593
Energy research and development programme
[EUR-5889] 24 p0736 N79-29596
European waste-to-energy systems: Case study of
Rennes, France
[HCP/M2103-0008] 24 p0737 N79-29605
Automated aray assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607
Solar energy
[GPO-36-957] 24 p0737 N79-29609
Department of the Navy energy fact book
[AD-A069138] 24 p0738 N79-29614
Geothermal power plants of New Zealand,
Philippines, and Indonesia: A technical survey
of existing and planned installations
[COO-4051-23] 24 p0738 N79-29622
Geothermal power plants of Mexico and Central
America: A technical survey of existing and
planned installations
[COO-4051-26] 24 p0740 N79-29638
Introduction to electric energy conversion systems
for geothermal energy resources
[COO-4051-28] 24 p0740 N79-29639
Potential application of Madison formation waters
for community heating in South Dakota
[APL/JHU-QM-78-042R] 24 p0740 N79-29640
Low head hydropower: Focus group results
[DOE/TIC-10017] 24 p0740 N79-29645
Problems and prospectives on solar energy
utilization
[ISS-P-78/1] 24 p0742 N79-29667
Alternative energy sources: An analysis of their
role in energy policy
24 p0743 N79-29668
Energy Research Information System, volume 3, no.
1 (Proj. nos. 00001081 through 00001224) ---
bibliographies
[PB-294342/1] 24 p0743 N79-29671
Energy Research Information System, volume 3, no.
2 (Project nos. 00001225 through 00001362)
[PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no.
3: Projects report cumulative indexes
[PB-294952/7] 24 p0743 N79-29673
Energy information data base. Serial titles,
supplement 3 --- bibliographies
[TID-4579-R10-SUPPL-3] 24 p0745 N79-30088
Bioconversion
[GPO-37-136] 24 p0745 N79-30393
Coal liquefaction advanced research digest
[ORNL/FE-2] 24 p0746 N79-30398
Flow-induced vibration in shell-and-tube heat
exchangers for Ocean Thermal Energy Conversion
(OTEC)
[ANL-OTEC-78-3] 24 p0747 N79-30522
Solar energy retrofit for Clarksville Middle
School, Clarksville, Indiana
[NASA-CR-161272] 24 p0749 N79-30721
Energy and labor intensities projected to the year
2010
[COO-4628-2] 24 p0750 N79-30727
Small wind energy: Focus group results
[DOE/TIC-10018] 24 p0752 N79-30771
Status of the DOE photovoltaic systems engineering
and analysis project
[SAND-78-0955C] 24 p0754 N79-30780
Geothermal/hydrothermal energy. Group interview
[DOE/TIC-10030] 24 p0755 N79-30791
Energy use and conservation in industrialized
countries
[LBL-7872] 24 p0756 N79-30802
Methodology for the analysis of investment
alternatives to stimulate development and
technology transfer for energy technologies
[TID-28971] 24 p0757 N79-30809
Energy from urban wastes: Report on a focus group
discussion
[DOE/TIC-10022] 24 p0759 N79-30825
International Forum on Appropriate Industrial
Technology. Appropriate technology for rural
energy supply in developing countries
[PB-294602/8] 24 p0760 N79-30840

Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research
[FE-2202-39] 24 p0765 N79-31411
Combined shift-methanation processes
[FE-2240-97] 24 p0766 N79-31414
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-12] 24 p0766 N79-31415
Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416
Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419
Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741
High efficiency, high density terrestrial panel --- for solar cell modules
[NASA-CR-162167] 24 p0770 N79-31765
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773
Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780
Opportunities for energy conservation in finished concrete products
[HCP/CS-1549] 24 p0772 N79-31782
Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0772 N79-31788
Solar energy program
[ANL-79-16] 24 p0772 N79-31789
Department of Energy FY 1980 obligations
[DOE/CR-0005] 24 p0773 N79-31792
High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793
Analysis of investment alternatives to stimulate development and technology transfer for energy technologies, solar photovoltaics, a case study
[TID-28968] 24 p0773 N79-31795
Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796
Domestic policy review of solar energy
[TID-28934] 24 p0773 N79-31797
Implementation of state solar incentives: Research, Development, and demonstration programs
[SERI/TR-51-161] 24 p0773 N79-31799
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800
Passive solar design: An extensive bibliography
[HCP/CS-4113-3] 24 p0774 N79-31804
Social assessment of on-site solar energy technologies
[HCP/R-4040-02] 24 p0775 N79-31810
Passive solar energy planning aid kit for the business community and general public
[CONF-780337-P2] 24 p0775 N79-31814
Analysis of Federal incentives used to stimulate energy production --- with emphasis on solar energy
[PNL-2410-1-REV] 24 p0775 N79-31819
Energy policy and mathematics
[ORAU/IEA(0)-79-5] 24 p0775 N79-31821
Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829
Wind power, volume 2. Citations from the NTIS data base --- bibliographies
[NTIS/PS-79/0534/2] 24 p0777 N79-31836
Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837
Wind power, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0536/7] 24 p0777 N79-31838
National environmental impact projection no. 1 --- impacts of energy projections
[HCP/P-6119] 24 p0777 N79-31844
Problems of technology transfer to industry --- government sponsored solar energy technology development
[SAND-79-0096] 24 p0778 N79-32131
Fuels from magma: A potential energy source --- producing hydrogen, carbon monoxide, and methane
[SAND-78-0191] 24 p0778 N79-32373
Review of current research on hydrocarbon production by plants
[SERI/TR-33-129] 24 p0779 N79-32374
Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379
Metal hydride technology --- hydrogen bonding with intermetallics
[BNL-26047] 24 p0780 N79-32387
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0780 N79-32390
Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620
Available work in geothermal energy
[COO-4051-25] 24 p0787 N79-32685
Solar thermal test facilities users association
[SERI/PR-13-154] 24 p0787 N79-32688
Solar Repowering Workshop
[SERI/TP-35-57] 24 p0787 N79-32689
Potential prediction needs in support of energy systems --- solar-terrestrial interactions
[LA-UR-79-673] 24 p0788 N79-32698
Field tests of photovoltaic power systems
[COO-4094-32] 24 p0788 N79-32700
Wind turbines
[ANL/CES-TE-78-9] 24 p0790 N79-32711
Status review of the technology assessment of solar energy program
[LA-UR-79-1369] 24 p0790 N79-32714
Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PC-1] 24 p0790 N79-32717
Energy information data base. Serial titles
[TID-4579-R-10-SUPPL-1] 24 p0791 N79-32721
Proposed industrial energy data base for technical evaluation of alternative energy systems
[CONF-781244-1] 24 p0791 N79-32725
Energy and technology review --- tunable laser system for the ultraviolet, visible, and infrared regions
[UCRL-52000-79-3] 24 p0791 N79-32727
Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients
[PB-295876/7] 24 p0792 N79-32735
Energy programs at the Johns Hopkins University Applied Physics Lab. --- geothermal, hydroelectric, and ocean thermal energy
[PB-295439/4] 24 p0793 N79-32739
Environmental development plan, fossil fuel utilization program
[DOE/EDP-0046] 24 p0793 N79-32746
Water related environmental effects in fuel conversion. 1: Summary volume --- water requirements for synthetic fuel technologies
[FE-2445-1-VOL-1] 24 p0793 N79-32747
Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549
Shelter design and energy usage: A methodology for evaluating the impacts of residential space conditioning technologies on the consumer, the electric utility, and society
24 p0797 N79-33557

Conceptual design of thermal energy storage systems for near term electric utility applications [NASA-CR-159577] 24 p0797 N79-33560

Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 3: Appendix E - N [NASA-CR-162371] 24 p0799 N79-33575

Regional profile, energy-impacted communities: Regional 8 [DOE/TIC-10001] 24 p0800 N79-33588

Storage of heat: A survey of efforts and possibilities [PB-295936/9] 24 p0801 N79-33592

Technology for solar energy utilization [PB-296572/1] 24 p0802 N79-33598

Dielectric development for GaAs solar cells [PB-295837/9] 24 p0802 N79-33600

State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts [NTIS/PS-79/0639/9] 24 p0802 N79-33608

ENERGY TRANSFER

The efficiencies of thermochemical energy transfer 21 p0054 A79-13575

Solar thermal conversion 21 p0104 A79-16466

Energy exchanger technology applied to laser heated engines 21 p0110 A79-16631

Alternative forms of energy transmission from OTEC plants 21 p0141 A79-17505

The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator [ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814

Screening reversible reactions for thermochemical energy transfer 22 p0285 A79-26823

The effect of thermo-electric forces on the density profiles in a thermonuclear plasma surrounded by a cold blanket 22 p0292 A79-27886

Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium 23 p0383 A79-32963

Alternative forms of energy carriers from ocean thermal energy plants 23 p0405 A79-34042

A profile of power transmission by microwaves 23 p0427 A79-34987

Fixed-focal-axis solar concentrators with a curvature determined by gravity 23 p0523 A79-41254

How a wall uses solar energy 24 p0603 A79-44295

Energy budget of the volcano Stromboli, Italy 24 p0639 A79-47360

Thermonuclear energy from ball lightning 24 p0696 A79-51957

The energy exchanger in advanced power cycle systems 24 p0702 A79-52002

The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator 24 p0708 A79-52957

Laser power conversion system analysis, volume 1 [NASA-CR-159523-VOL-1] 22 p0366 N79-21334

Laser power conversion system analysis, volume 2 [NASA-CR-159523-VOL-2] 22 p0366 N79-21335

Urban areas as energy flow systems 24 p0736 N79-29592

Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies --- mass and energy balance for two phase flow in porous media [LBL-8802] 24 p0786 N79-32684

ENGINE CONTROL

Powerplant integration - The application of current experience to future developments [ASME PAPER 78-GT-113] 21 p0032 A79-10788

A multivariable controller for an automotive gas turbine [ASME PAPER 79-GT-73] 22 p0307 A79-30537

A variable angle wobble plate drive for a stroke controlled Stirling engine 24 p0690 A79-51890

ENGINE DESIGN

A review of the PFBC combined cycle and its influence on gas turbine design parameters --- Pressurized Fluidized Bed Combustion 21 p0007 A79-10067

Some problems and benefits from the hydrogen fueled spark ignition engine 21 p0016 A79-10130

Combined cycle gas turbine for an automobile application 21 p0019 A79-10157

Balanced compounding of Stirling machines 21 p0024 A79-10200

Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine 21 p0024 A79-10202

Design of a preprototype Stirling Laboratory Research Engine 21 p0024 A79-10203

The matching of a free piston Stirling engine coupled with a free piston linear compressor for a heat pump application 21 p0024 A79-10204

Conceptual design of a variable displacement Stirling engine for automotive propulsion 21 p0025 A79-10207

Mechanical efficiency of the Stirling cycle machine with rhombic drive 21 p0025 A79-10208

Development of a 1 kW/e/ isotope fueled Stirling cycle power system 21 p0025 A79-10210

Potential of the Stirling engine for stationary power applications in the 500-2000 HP range 21 p0025 A79-10211

Status of free-piston Stirling engine/linear alternator power conversion system development 21 p0025 A79-10212

Nitinol heat engines for economical conversion of low grade thermal density 21 p0027 A79-10230

Research on the sodium heat engine 21 p0028 A79-10231

Quasi-equilibrium Air Standard heat balanced cycle analysis 21 p0028 A79-10232

Development of gas turbine performance seeking logic [ASME PAPER 78-GT-13] 21 p0031 A79-10257

Evaluation program for new industrial gas turbine materials [ASME PAPER 78-GT-145] 21 p0031 A79-10269

Powerplant integration - The application of current experience to future developments [ASME PAPER 78-GT-113] 21 p0032 A79-10788

Development of a compact gas turbine combuster to give extended life and acceptable exhaust emissions [ASME PAPER 78-GT-146] 21 p0033 A79-10799

Advanced turbofan engines for low fuel consumption [ASME PAPER 78-GT-192] 21 p0033 A79-10816

Making turbofan engines more energy efficient [ASME PAPER 78-GT-198] 21 p0033 A79-10818

Current problems in the development and production of small gas turbine engines 21 p0048 A79-12529

Reliability and durability of ceramic regenerators for gas turbine applications 21 p0050 A79-12823

Designing and testing Si3N4 turbine components at Mercedes-Benz 21 p0050 A79-12830

Development of ceramic parts for a truck gas turbine at MTU 21 p0050 A79-12831

Preliminary design of a subscale ceramic helical-rotor expander 21 p0050 A79-12849

Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design 21 p0050 A79-12850

Energy exchanger technology applied to laser heated engines 21 p0110 A79-16631

Quasi-isentropic laser engines 21 p0111 A79-16632

Technology evolution in the Allison Model 250 engine --- for helicopter propulsion 21 p0155 A79-18681

The Stirling engine, an energy converter for cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777

Design and development of a monorotor gas turbine auxiliary power unit
[ASME PAPER 78-WA/GT-2] 21 p0160 A79-19791

Fuel conservative aircraft engine technology
21 p0164 A79-20078

Ceramic materials for vehicular gas turbine applications
21 p0165 A79-20085

Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

Digital or analog modelling in the design of hydrostatic vehicular systems
22 p0264 A79-23808

Optimization of a novel hydrostatic drive performance using hybrid computing technique --- for automobile engines
22 p0264 A79-23809

Engine technology for production turbofan engines
22 p0270 A79-24827

Wind power distribution, control, and conversion in vortex augmentors --- influence on turbomachinery design and development
22 p0278 A79-26180

Some flow analyses for Tornado-type wind turbines
22 p0279 A79-26181

Diffuser designs for improved wind energy conversion
22 p0279 A79-26182

High efficiency wave engine --- featuring rotor blade exit nozzle design for high efficiency
22 p0279 A79-26187

Working fluids and turbines for OTEC power systems
22 p0280 A79-26192

Operational characteristics of MHD turbine with air-core superconducting rotor
22 p0297 A79-28924

Solar Rankine engines - Examples and projected costs
[ASME PAPER 79-SOL-3] 22 p0307 A79-30541

Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356

Some design considerations of automotive gas turbines
[SAE PAPER 790128] 22 p0314 A79-31360

Field experience with the Detroit Diesel Allison 404/505 industrial gas turbine engines
[SAE PAPER 790129] 22 p0314 A79-31361

Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374

A new combustion system in the three-valve stratified charge engine
[SAE PAPER 790439] 22 p0316 A79-31376

A hybrid wind turbine suitable for developing regions
22 p0323 A79-31455

The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912

Application of the Centaur industrial gas turbine to the central receiver concept for solar electric power
[ASME PAPER 79-GT-45] 23 p0375 A79-32345

An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32348

Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370

Mechanical reliability considerations in the modern high temperature industrial gas turbine
[ASME PAPER 79-GT-101] 23 p0377 A79-32377

A hybrid cyclogiro-Darrieus-rotor wind turbine
23 p0387 A79-33243

Free-wheeling hydraulic power mills --- wind or water current driven electric plants
23 p0387 A79-33244

Manufacturers developing fuel-efficient engines
23 p0438 A79-36380

Windpower generation on a large scale
23 p0452 A79-37891

The design construction and proving of a low cost 5kW wind powered turbine for isolated applications
23 p0452 A79-37893

The aerodynamic design and testing of a vertical axis windmill
23 p0452 A79-37895

The design and construction of the Aldborough aerogenerator
23 p0453 A79-37900

A novel thermal engine using metal hydride
23 p0479 A79-39844

Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552

Garrett ATF 3
23 p0535 A79-43469

Annular diffuser performance for an automotive gas turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790

Design and development of a low emission combustor for a car gas turbine
[ASME PAPER 78-GT-155] 24 p0605 A79-44793

Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918

Characterization of a swept-strut hydrogen fuel-injector for scramjet applications
24 p0649 A79-49345

Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526

An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705

A thermal energy storage system for a Stirling engine powered highway vehicle
24 p0680 A79-51803

Hydride engines
24 p0685 A79-51841

Elementary design guidelines for Stirling engines
24 p0689 A79-51874

DOE stationary external combustion engine program - Status report
24 p0689 A79-51882

Advances in Stirling engine technology
24 p0690 A79-51888

Design characteristics of an advanced Stirling engine concept
24 p0690 A79-51889

A variable angle wobble plate drive for a stroke controlled Stirling engine
24 p0690 A79-51890

Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005

Energy efficient engine preliminary design and integration study
[NASA-CR-135396] 21 p0194 N79-12084

Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050

Aircraft Engine Future Fuels and Energy Conservation
[AGARD-LS-96] 21 p0201 N79-13192

Low energy consumption engines
21 p0202 N79-13199

Fluidized bed gas turbine experimental unit for MIUS applications
[CRNL/HUD/MIUS-32] 21 p0220 N79-14564

The rotary combustion engine: A candidate for general aviation --- conferences
[NASA-CP-2067] 22 p0329 N79-15961

Development status of rotary engine at Toyo Kogyo --- for general aviation aircraft
22 p0329 N79-15964

Update of development on the new Audi NSU rotary engine generation --- for application to aircraft engines
22 p0329 N79-15965

Review of the Rhein-Flugzeugbau Wankel powered aircraft program --- ducted fan engines
22 p0329 N79-15966

Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential --- with direct chamber injection
22 p0329 N79-15967

Engine requirements for future general aviation aircraft
22 p0329 N79-15968

New initiatives in high altitude aircraft
22 p0338 N79-17000

Conceptual design study of an automotive Stirling reference engine system
[NASA-CR-159605] 24 p0730 N79-29110
Solar engine --- Flat plate type
[NASA-CASE-LAR-12148-1] 24 p0737 N79-29608
Conceptual design study of an Improved Gas Turbine (IGT) powertrain
[NASA-CR-159604] 24 p0762 N79-31087
Conceptual design study of improved automotives gas turbine powertrain
[NASA-CR-159580] 24 p0762 N79-31088
JT9D-70/59 improved high pressure turbine active clearance control system --- for specific fuel consumption improvement
[NASA-CR-159661] 24 p0763 N79-31208
Single shaft automotive gas turbine engine characterization test
[NASA-CR-159654] 24 p0778 N79-32129

ENGINE PARTS
Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823
Development of ceramic parts for a truck gas turbine at MTU
21 p0050 A79-12831
Ceramic applications in the advanced Stirling automotive engine
21 p0051 A79-12851
Ceramic materials for vehicular gas turbine applications
21 p0165 A79-20085
Free-wheeling hydraulic power mills --- wind or water current driven electric plants
23 p0387 A79-33244
Handbook of data on selected engine components for solar thermal applications
[NASA-TM-79027] 23 p0579 N79-26476
Brayton-cycle component characteristics
23 p0580 N79-26479

ENGINE STARTERS
Testing to assess the affect of degraded fuel specifications on the cold start ability of a T63-A-700 engine
[AIAA 79-7009] 22 p0300 A79-29384
Integrated power unit
[AD-A066543] 23 p0569 N79-25396

ENGINE TESTING LABORATORIES
System analysis, design and proof-of-concept experiment of a total energy system, phase 2
[COO-2947-5] 24 p0742 N79-29660

ENGINE TESTS
Status of free-piston Stirling engine/linear alternator power conversion system development
21 p0025 A79-10212
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791
Modern engine development test techniques --- for helicopters
21 p0155 A79-18680
Testing to assess the affect of degraded fuel specifications on the cold start ability of a T63-A-700 engine
[AIAA 79-7009] 22 p0300 A79-29384
Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533
Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356
Field experience with the Detroit Diesel Allison 404/505 industrial gas turbine engines
[SAE PAPER 790129] 22 p0314 A79-31361
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370
The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375
A review of Curtiss-Wright rotary engine developments with respect to general aviation potential
[SAE PAPER 790621] 23 p0440 A79-36749
The aerodynamic design and testing of a vertical axis windmill
23 p0452 A79-37895
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898
Regenerator matrices for automotive gas turbines
23 p0532 A79-42981
Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability
24 p0628 A79-45996
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435
Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V --- fuel consumption and exhaust gases
[PB-286076/5] 21 p0227 N79-15306
Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I. --- fuel consumption and exhaust gases
[PB-286077/3] 21 p0227 N79-15307
Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V --- fuel consumption and exhaust gases
[PB-286299/3] 21 p0227 N79-15313
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721
Tests of Wisconsin S12D engine running on natural gas with addition of carbon dioxide
[AD-A058486] 22 p0339 N79-17230
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions
[AD-A062751] 22 p0366 N79-21406
Performance characteristics of automotive engines in the United States. Third series: Report no. 2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411
Single shaft automotive gas turbine engine characterization test
[NASA-CR-159654] 24 p0778 N79-32129

ENGINEERING DRAWINGS
Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783
Comparison of atmospheric fluidized bed combustion conceptual designs for utility steam generation
[HCP/T2314] 24 p0729 N79-28792

ENGINEERING MANAGEMENT
Geothermal Reservoir Engineering Management Program Plan (GREMP Plan)
[LBL-7000] 21 p0174 N79-10536
Econometric-engineering analysis of Federal energy conservation programs in the commercial sector
[ORNL/CON-30] 23 p0562 N79-24489

ENGINES
Stirling engines for automobiles
[NASA-TM-79222] 24 p0723 N79-28726

ENTHALPY
Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961
Open-cycle disk generator studies --- enthalpy extration performance of open-cycle MHD channels
23 p0391 A79-33386
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution
23 p0415 A79-34124
Enthalpy measurements for coal-derived liquids
23 p0587 N79-26997
Enthalpy measurement of coal-derived liquids
[FE-2035-12] 23 p0588 N79-27282

ENTRAINMENT
Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213
Entrainment coal gasification modeling
24 p0704 A79-52028

ENTROPY
Solar energy and the second law of thermodynamics
21 p0118 A79-17292

ENVIRONMENT EFFECTS

Environmental considerations for the microwave beam from a solar power satellite
21 p0003 A79-10030

Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106

Energy technologies and natural environments - The search for compatibility
21 p0074 A79-14721

Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722

Environmental effects of burning solid waste as fuel
21 p0082 A79-15115

A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin
21 p0093 A79-15893

Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101

A multivariate-utility approach for selection of energy sources
21 p0098 A79-16120

The MHD power plant and its environmental aspects - Introduction
21 p0105 A79-16479

SPS microwave subsystem potential impacts and benefits --- environmental and societal effects of Solar Power System construction and operation
21 p0107 A79-16603

Solar power satellites - An AIAA position paper
21 p0148 A79-17872

Mercury in some New Zealand geothermal discharges
22 p0257 A79-22925

Factors affecting bitumen recovery by the hot water process
22 p0282 A79-26463

Climatic change in connection with energy growth --- resource consumption effects
22 p0284 A79-26623

Environmental considerations for siting an ocean thermal conversion early ocean testing platform at four proposed areas
22 p0287 A79-27377

Energy conversion engineering --- Book
22 p0302 A79-29575

Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922

Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155

Introducing new technologies for alternative energy sources - The economic, social, and environmental considerations for developing countries
23 p0421 A79-34177

The development of solar power satellites
23 p0435 A79-35488

Selected results from the technology assessment of solar energy program
[AIAA PAPER 79-0984] 23 p0458 A79-38187

Which is the true solar house
23 p0463 A79-38578

Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949

Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107

Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/ --- Book
23 p0493 A79-40699

Electrical power distribution subsystem --- electromagnetic environment effects on orbiter and Spacelab payload
23 p0493 A79-40719

Measuring dirt on photovoltaic modules
23 p0533 A79-43283

Practical schemes for reducing cold water pipe loads --- for OTEC plants
24 p0621 A79-45814

Environmental impact assessment for OTEC-1
24 p0626 A79-45857

Environmental issues assessment --- for large wind turbine systems
24 p0633 A79-46530

Stability of SnO2/n-Si solar cells
24 p0655 A79-50187

Special considerations in the environmental study program for coal gasification plants
24 p0659 A79-50350

Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings
24 p0664 A79-50876

Resolving the environmental issues in developing fuels from biomass
24 p0664 A79-50877

A review of the environmental effects and benefits of selected solar energy technologies
24 p0664 A79-50878

Environmental investigations of in situ coal gasification experiments
24 p0664 A79-50880

Environmental aspects of the Department of Energy's underground coal conversion program
24 p0664 A79-50882

Environmental aspects of wood fuel
24 p0665 A79-50884

Some environmental impacts of resource recovery systems
24 p0665 A79-50885

Primary impacts of growing aquatic plants for energy
24 p0665 A79-50886

The status of oil shale development
24 p0665 A79-50887

Environmental aspects of the Syncrude tar sands project
24 p0665 A79-50889

Projected impacts of a very large windpower complex
24 p0665 A79-50890

Wave power, progress and prospects
24 p0666 A79-50891

Environmental considerations in R&D planning and evaluation of energy storage systems
24 p0666 A79-50893

Pumped storage projects and their environmental impacts - An overview
24 p0666 A79-50894

Environmental concerns related to compressed air energy storage
24 p0666 A79-50895

Environmental aspects of geysers geothermal operations
24 p0666 A79-50896

Environmental considerations and the geothermal energy resource in Louisiana
24 p0667 A79-50898

Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California
24 p0667 A79-50899

Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project
24 p0667 A79-50900

Direct heat applications of geothermal energy in the geysers/Clear Lake Region, volume 2: Environmental assessment
[SAN-1326-1-2] 21 p0174 N79-10532

National coal utilization assessment: An integrated assessment of increased coal use in the midwest: Impacts and constraints, volume 1
[ANL/AA-11-VOL-1-DRAFT] 21 p0174 N79-10537

Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574

Pollution control guidance for geothermal energy development
[PB-282546/1] 21 p0178 N79-10604

Environmental assessment of solid residues from fluidized-bed fuel processing
[PB-282940/6] 21 p0179 N79-10968

Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B
[PB-282924/0] 21 p0181 N79-11446

Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report
[PB-282923/2] 21 p0181 N79-11447

Environmental Development Plan (EDP): Solar thermal power systems, 1977 [DOE/EDP-0004] 21 p0187 N79-11522

Energy situation in the Mid-Atlantic region [BNL-50703] 21 p0188 N79-11528

Environmental Development Plan (EDP): Ocean thermal energy conversion, 1977 [DOE/EDP-006] 21 p0188 N79-11531

Environmental Development Plan (EDP): Underground coal conversion program, FY 1977 [DOE/EDP-0011] 21 p0192 N79-11569

A literature review-problem definition studies on selected toxic chemicals. Volume 8: Environmental aspects of diesel fuel and fog oils SGF number 1 and SGF number 2 and smoke screens generated from them [AD-A056021] 21 p0193 N79-11688

Satellite Power System (SPS) environmental impacts, preliminary assessment [NASA-CR-157952] 21 p0196 N79-12557

Environmental Development Plan (EDP): Photovoltaics, 1977 [DOE/EDP-0003] 21 p0198 N79-12569

Energy supply and environmental impacts: Conventional sources, study module 3-A, technical appendix [PB-283787/0] 21 p0198 N79-12573

A Kentucky energy resource utilization program [PB-283796/1] 21 p0198 N79-12574

Energy and environment: An intergovernmental perspective [PB-283733/4] 21 p0198 N79-12575

Technical and environmental aspects of oil shale processing 21 p0199 N79-12581

Energy systems studies program [BNL-50822] 21 p0209 N79-13526

Noise-control needs in the developing energy technologies [COO-4389-1] 21 p0213 N79-13569

Environmental effects of increased coal utilization ecological effects of gaseous emission from coal combustion [PB-285440/4] 21 p0213 N79-13591

An assessment of mercury emissions from fossil fueled power plants [PB-285227/5] 21 p0213 N79-13592

Source assessment: Water pollutants from coal storage areas [PB-285420/6] 21 p0223 N79-14635

Energy requirements of present pollution control technology [PB-286231/6] 21 p0223 N79-14643

Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes [PB-287799/1] 22 p0344 N79-17364

Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes [PB-287800/7] 22 p0344 N79-17365

Environmental assessment of the Alaskan Continental Shelf. Volume 1: Biological studies [PB-289154/7] 22 p0344 N79-17366

Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies [PB-289155/4] 22 p0344 N79-17367

Environmental assessment of the Alaskan Continental Shelf. Volume 3: Biological studies [PB-289156/2] 22 p0344 N79-17368

Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement [NASA-TM-79719] 22 p0345 N79-17897

Energy environment III [EPA-600/9-78-022] 22 p0346 N79-18352

Ecological effects of coal-fired steam-electric generating stations 22 p0346 N79-18358

Methods for the control of environmental damage caused by mining energy producing materials 22 p0347 N79-18359

Impact prediction manual for geothermal development [PB-288128/2] 22 p0349 N79-18462

Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion [PB-288602/6] 22 p0350 N79-18487

Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C [PB-288603/4] 22 p0350 N79-18488

Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F [PB-288604/2] 22 p0350 N79-18489

Water-related environmental effects in fuel conversion, volume 1. Summary [PB-288313/0] 22 p0351 N79-18834

Energy/environment 1978: Symposium on energy development impacts [PB-288578/8] 22 p0355 N79-19470

Water-related environmental effects in fuel conversion. Volume 2: Appendices [PB-288874/1] 22 p0356 N79-19496

Environmental impact determination of action to be taken under the Energy Supply and Environmental Coordination Act for powerplants 1, 2, 3, and 4, Portsmouth Generating Station, Portsmouth, Virginia [DOE/EA-0033] 22 p0362 N79-20514

Preliminary environmental assessment of biomass conversion to synthetic fuels [PB-289775/9] 22 p0365 N79-21224

An inventory of environmental impact models related to energy technologies [ORNL/EIS-147] 22 p0372 N79-21640

Assessing the impact of nuclear-power plants on the environment [PB-290858/0] 23 p0545 N79-22662

Conventional combustion on environmental assessment program [PB-291401/8] 23 p0545 N79-22668

Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming 23 p0551 N79-23551

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 1: Executive summary [NASA-TM-80354] 23 p0557 N79-24435

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 2: Detailed assessment [NASA-TM-80355] 23 p0557 N79-24436

General-equilibrium approach to energy/environmental economic analysis [BNL-24781] 23 p0564 N79-24504

Environmental development plan for transportation energy conservation. FY 1979 update [ANL/EES-TM-33] 23 p0567 N79-24899

Compendium reports on oil shale technology [PB-293279/6] 23 p0578 N79-26237

Environmental management and energy facility siting in the coastal zone [PB-292947/9] 23 p0585 N79-26539

An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California [PB-293031/1] 23 p0585 N79-26562

Inventory of data bases, graphics packages, and models in Department of Energy laboratories [ORNL/EIS-144] 23 p0587 N79-27018

Solvent Refined Coal (SRC) process: Environmental program. Volume 3: Pilot plant development work, part 5 [FE-0496-T8] 23 p0588 N79-27329

Possible environmental effects of increased coal use in California 23 p0592 N79-27604

Environmental factors of power satellites [SAMSO-TR-79-66] 24 p0717 N79-28213

Program report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department [UCRL-51444-78] 24 p0722 N79-28668

Hierarchial decomposition approach to environmental policy analysis [BNL-24444] 24 p0729 N79-28814

The direct use of coal: Prospects and problems of production and combustion [PB-295797/5] 24 p0734 N79-29381

Water and energy resource development in the Tongue River Basin, southeastern Montana 24 p0735 N79-29566

Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability [PB-294338/9] 24 p0744 N79-29709

Environmental readiness document: Urban waste energy recovery. Commercialization phase 3 planning [DOE/ERD-0002] 24 p0745 N79-30102

Pollution and environmental aspects of fuel conversion. A bibliography with abstracts [NTIS/PS-79/0378] 24 p0761 N79-30857

Assessment of national consequences of increased coal utilization, executive summary, volume 1 [TID-29425-VOL-1] 24 p0774 N79-31801

Assessment of national consequences of increased coal utilization, executive summary, volume 2 [TID-29425-VOL-2] 24 p0774 N79-31802

National environmental impact projection no. 1 --- impacts of energy projections [HCP/P-6119] 24 p0777 N79-31844

Assessing the impact of nuclear-power plants on the environment [NUREG-CR-0552] 24 p0777 N79-31845

Water related environmental effects in fuel conversion. 1: Summary volume --- water requirements for synthetic fuel technologies [PE-2445-1-VCL-1] 24 p0793 N79-32747

EPA program status report: Oil shale, 1979 update [PB-294998/0] 24 p0796 N79-33538

Regional profile, energy-impacted communities: Regional 8 [DOE/TIC-10001] 24 p0800 N79-33588

Transportation Energy Conservation (TEC) environmental development plan [ANL/EES/CP-11] 24 p0801 N79-33589

ENVIRONMENT MANAGEMENT

Environmental development Plan (EDP). Oil supply, FY 1977 [DOE/EDP-0024] 21 p0175 N79-10545

Environmental management and energy facility siting in the coastal zone [PB-292947/9] 23 p0585 N79-26539

ENVIRONMENT MODELS

Coupled heat and organic wastes stream pollution 21 p0086 A79-15602

Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft [AIAA PAPER 79-0186] 21 p0157 A79-19585

An inventory of environmental impact models related to energy technologies [ORNL/EIS-147] 22 p0372 N79-21640

ENVIRONMENT POLLUTION

Pollution perspective for geothermal energy development 21 p0064 A79-14114

Energy technologies and natural environments - The search for compatibility 21 p0074 A79-14721

Fuel technology and the environment --- nuclear reactor caused radiation effects and transmutation 21 p0079 A79-14787

Joint Conference on Sensing of Environmental Pollutants, 4th, New Orleans, La., November 6-11, 1977, Proceedings 21 p0082 A79-15023

Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft [AIAA PAPER 79-0186] 21 p0157 A79-19585

Some environmental and safety aspects of using hydrogen as a fuel 22 p0238 A79-20774

Emissions from pressurized fluidized-bed combustion processes 22 p0261 A79-23640

Fusion energy - The iceberg beneath the tip 23 p0406 A79-34057

Heavy duty diesel particulate emission factors 23 p0461 A79-38481

Methods of reducing harmful emissions from thermal power stations 23 p0474 A79-38863

30 years of refuse-fired boiler experience 23 p0523 A79-41374

The rough road to making oil and gas from coal 24 p0651 A79-49423

Environmental impacts of contemporary fossil energy systems 24 p0659 A79-50363

Environmental concerns related to compressed air energy storage 24 p0666 A79-50995

Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project 24 p0667 A79-50900

Equipment and strategy for environmental sampling of complex coal gasification process streams 24 p0688 A79-51862

Environmental assessment of a coal-fired open-cycle MHD power plant 24 p0701 A79-51993

MHD emissions and their controls 24 p0709 A79-52968

The natural and perturbed troposphere 21 p0179 N79-10636

Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards [CONF-780121-2] 21 p0192 N79-11568

Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5 [PB-287180/4] 22 p0339 N79-17026

Ecological effects of coal-fired steam-electric generating stations 22 p0346 N79-18358

Methods for the control of environmental damage caused by mining energy producing materials 22 p0347 N79-18359

Environmental impact determination of action to be taken under the Energy Supply and Environmental Coordination Act for powerplants 1, 2, 3, and 4, Portsmouth Generating Station, Portsmouth, Virginia [DOE/EA-0033] 22 p0362 N79-20514

A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats [PB-291330/9] 22 p0373 N79-21679

Pollution and environmental aspects of fuel conversion. A bibliography with abstracts [NTIS/PS-79/0378] 24 p0761 N79-30857

EPA program status report: Oil shale, 1979 update [PB-294998/0] 24 p0796 N79-33538

Technology overview reports for eight shale oil recovery processes --- for evaluation of pollution control and environmental impact technologies [PB-295665/4] 24 p0797 N79-33552

ENVIRONMENT PROTECTION

Risk control in the development of energy processes --- environment, worker and capital considerations in coal gasification 21 p0085 A79-15372

Energy/environment technology areas to be developed 21 p0097 A79-16077

Clean Air Act amendments of 1977 and the impact on control efforts 21 p0097 A79-16091

Protection of the biosphere --- MHD power stations pollution reduction 21 p0105 A79-16483

Energy systems: An analysis for engineers and policy makers --- Book 21 p0114 A79-17218

Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/ --- Book 21 p0147 A79-17646

Toward a materials-conservation ethic 21 p0167 A79-20438

Cogeneration in Europe and the combined cycle gas turbine 22 p0297 A79-28988

Energy policy optimization by environmental systems analysis 23 p0422 A79-34180

Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling 23 p0498 A79-40389

The enigma of the eighties: Environment, economics, energy; Proceedings of the Twenty-fourth National Symposium and Exhibition, San Francisco, Calif., May 8-10, 1979. Books 1 & 2 23 p0533 A79-43228

Lead agency designation and proposed licensing procedures for ocean thermal energy conversion facilities 24 p0621 A79-45809

Results of a near field physical model study ---
OTEC plant interaction with ocean environment
24 p0626 A79-45856
Pollutant protection for the case of strip mining
in the Rhine area
24 p0714 A79-53804
Environmental control technology activities of the
Department of Energy in FY 1977
[DOE/EV-0030] 21 p0178 N79-10572
Technology assessment, volume 2. A bibliography
with abstracts
[NTIS/PS-78/0830/6] 21 p0179 N79-10951
EPA program status report: Oil shale
[PB-284480/1] 21 p0211 N79-13548
Environmental and radiological safety studies.
Interaction of (Pu-238)O2 heat sources with
terrestrial and aquatic environments --- soil
and water analysis
[LA-7033-PR] 21 p0232 N79-15783
Environmental conservation concerns in
transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868
Environmental effects of offshore oil production
22 p0336 N79-16389
Research and development needs to merge
environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339
Energy environment III
[EPA-600/9-78-022] 22 p0346 N79-18352
Status of bioscreening of emissions and effluents
from energy technologies
22 p0346 N79-18353
The development of a laser Doppler velocimetry
system for unsteady separated flow research:
Preliminary results
[AD-A061724] 22 p0352 N79-19305
Transportation energy conservation: An
environmental overview
[CONF-781109-16] 24 p0742 N79-29661
Technical aspects of the Resource Conservation and
Recovery Act upon coal combustion and conversion
systems
[ORNL/OEPA-10] 24 p0748 N79-30687
Environmental control implications of increased
coal utilization under the National Energy Plan
--- regulatory and control technology issues
[ANL/EES-CP-10] 24 p0760 N79-30846
Environmental development plan, fossil fuel
utilization program
[DOE/EDP-0046] 24 p0793 N79-32746
Impact of national energy and environmental
policies on industry location dynamics: A
methodological review
[DOE/TIC-10129] 24 p0801 N79-33591

ENVIRONMENT SIMULATION
Solar radiation simulation by means of solar
simulator for the indoor testing of solar
collectors
21 p0055 A79-13620
Simulated hail impact testing of photovoltaic
solar panels
21 p0098 A79-16116
Modelling of a domestic wind power system
including storage
23 p0396 A79-33764
Laboratory simulation of in-situ coal gasification
23 p0494 A79-40740
Indoor test for thermal performance evaluation on
the Northrup concentrating solar collector
[NASA-CR-150804] 21 p0172 N79-10515

ENVIRONMENT SIMULATORS
Collector testing in the MSFC simulator --- for
solar collector performance
24 p0611 A79-45230

ENVIRONMENTAL CONTROL
Evaluation of control options for solar climate
control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859
Energy consumption of environmental controls -
Fossil fuel, steam electric generating industry
21 p0064 A79-14112
Assessing environmental costs of energy procurement
21 p0071 A79-14682
A microprocessor-based control system for solar
heating and cooling
21 p0107 A79-16565
Synthetic fuels at the crossroads --- coal
gasification technology
24 p0645 A79-48049
Environmental control implications of generating
electric power from coal. Appendix A, part 2:
Coal preparation and cleaning assessment study
appendix
[ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571
Energy Materials Coordinating Committee (EMACC)
[DOE/US-002] 23 p0563 N79-24490
Environemental control technology activities of
the Department of Energy in FY 1978
[DOE/EV-0031] 24 p0729 N79-28812

ENVIRONMENTAL ENGINEERING
Simultaneous nitrogen oxides and sulfur dioxide
removal by absorption-reduction scrubbing
21 p0066 A79-14125
Combined environments: Technology interrelations;
Proceedings of the Twenty-fourth Annual
Technical Meeting, Fort Worth, Tex., April
18-20, 1978
21 p0097 A79-16076
Proceedings of the 2nd Workshop on
Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658
The use of the heat pumps to raise temperatures in
an economical and ecological way --- domestic
heating via industrial waste energy
[BMFT-FB-T-78-35] 24 p0792 N79-32732

ENVIRONMENTAL MONITORING
Stabilization of power plant scrubbing slurries
and fine coal refuse with the additive Calcilox
21 p0063 A79-14107
Potential agricultural uses of fluidized bed
combustion waste
21 p0064 A79-14108
Energy and remote sensing applications
22 p0255 A79-22516
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
Requirements for environmental monitoring
assessment, and controls for nonnuclear energy
demonstration projects. Report to Congress,
prepared in fulfillment of Public Law 95-39,
section 113
[DOE/EV-0014] 21 p0213 N79-13573
Guidelines for preparing environmental test plans
for coal gasification plants
[PB-286659/8] 21 p0232 N79-15479
Energy-related air quality monitoring in the
western energy resource development area
[PB-293160/8] 23 p0599 N79-27730
Hierarchial decomposition approach to
environmental policy analysis
[BNL-24444] 24 p0729 N79-28814
Technology overview reports for eight shale oil
recovery processes --- for evaluation of
pollution control and environmental impact
technologies
[PB-295665/4] 24 p0797 N79-33552
Management of fuel and nonfuel minerals in federal
land: Current status and issues --- and its
environmental impact
[PB-295788/4] 24 p0797 N79-33554

ENVIRONMENTAL QUALITY
An inventory of environmental impact models
related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640

ENVIRONMENTAL RESEARCH SATELLITES
Synchronous meteorological and geostationary
operational environmental satellites battery and
power system design
22 p0370 N79-21571

ENVIRONMENTAL SURVEYS
Underground coal gasification research at the
University of New Mexico
21 p0032 A79-10523
Physical planning aspects of large-scale wind
energy exploitation in the Netherlands
23 p0482 A79-40107
Environmental Development Plan (EDP): Solar
thermal power systems, 1977
[DOE/EDP-0004] 21 p0187 N79-11522
Nonproliferation Alternative Systems Assessment
Program (NASAP): Preliminary environmental
assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570
Coal loan guarantee program (PL 94-163)
[DOE/EIS-0004] 21 p0213 N79-13574
Texas lignite: Environmental planning opportunities
[PB-286970/1] 21 p0231 N79-15438

Compilation of level 1 environmental assessment data
[PB-286924/6] 22 p0336 N79-16439
Environmental assessment for residual oil
utilization
[PB-286982/4] 22 p0336 N79-16446
Impact prediction manual for geothermal development
[PB-288128/2] 22 p0349 N79-18462
A biologist's manual for the evaluation of impacts
of coal-fired power plants on fish, wildlife and
their habitats
[PB-291330/9] 22 p0373 N79-21679
SRC (solvent refined coal) site, specific
pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific
pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319
Draft environmental statement of the Island Park
geothermal area, Idaho, Montana, Wyoming
23 p0551 N79-23551
Photovoltaics and environmental impact
considerations
23 p0571 N79-25496
Workshop on Ecological Impacts of Solar Energy
Conversion
[COO-4339-4] 23 p0583 N79-26522
The Mississippi, Alabama, Florida, outer
continental shelf baseline environmental survey,
MAFLA. 1977/1978. Volume 1-E: Executive
summary report
[PB-294228/2] 24 p0744 N79-29783
Motor gasoline deregulation and the gasoline tilt
[DOE/EIS-0039-VOL-1] 24 p0746 N79-30399
Motor gasoline deregulation and the gasoline tilt.
Volume 2: Public comments
[DOE/EIS-0039-VOL-2] 24 p0746 N79-30401
Strategic petroleum reserve: Expansion of
reserve. Final supplement to final
environmental impact statement
[DOE/EIS-0034] 24 p0746 N79-30407
National environmental impact projection no. 1 ---
impacts of energy projections
[HCP/P-6119] 24 p0777 N79-31844

ENVIRONMENTAL TESTS
Some aspects towards the performance evaluation
and ensuing design components of solar collector
systems
21 p0130 A79-17404
Environmental testing of flat plate solar cell
modules
23 p0428 A79-35039
Optical properties of materials under simulated
operating environments --- selective coatings
for solar thermal conversion
23 p0431 A79-35071
Field testing and evaluation of PV module
performance
23 p0496 A79-40885
Real-time environmental and performance testing of
concentrating photovoltaic arrays
23 p0496 A79-40887
Testing of ultra-thin solar cells
23 p0503 A79-40952
Environmental qualification testing of terrestrial
solar cell modules
23 p0512 A79-41021
Endurance testing of first generation /Block I/
commercial solar cell modules
23 p0512 A79-41022
Environmental requirements for flat plate
photovoltaic modules for terrestrial applications
24 p0658 A79-50342
Long-term weathering effects on the thermal
performance of the Libbey-Owens-Ford (liquid)
solar collector
[NASA-CR-161093] 22 p0348 N79-18450
Environmental testing of block 2 solar cell modules
[NASA-CR-158521] 23 p0542 N79-22628
Develop silicone encapsulation systems for
terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471
DOE photovoltaic tests and applications project
23 p0571 N79-25492
Solar photovoltaic field tests and applications
project
23 p0571 N79-25493

ENZYMES
Material and energy balances in the production of
ethanol from wood
23 p0495 A79-40745

EPITAXY
Solar cells fabricated by ionised-cluster beam
technology
23 p0441 A79-36785
Gallium arsenide solar cells
23 p0448 A79-37848
Comparison between epitaxial and diffused solar
cells on crystalline substrates grown from
metallurgical-grade silicon
23 p0504 A79-40958
Proton and electron irradiations of liquid phase
epitaxial GaAlAs solar cells
23 p0506 A79-40972
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758

EPOXY RESINS
Composite material flywheel for the
electric-powered passenger vehicle
22 p0240 A79-20842
Composite-rim flywheels - Spin tests
23 p0423 A79-34281
Comparative properties of fiber composites for
energy-storage flywheels part A. Evaluation of
fibers for flywheel rotors --- Kevlar/epoxy and
glass/epoxy composites
[UCRL-80116-PT-A] 21 p0215 N79-14165
Outgassing tests of fiber-epoxy composite materials
[SAND-78-7075] 23 p0552 N79-24071

EQUATIONS OF MOTION
Nonlinear dynamic response of wind turbine rotors
[NASA-TM-78324] 21 p0195 N79-12542

EQUILIBRIUM EQUATIONS
Equilibrium relations in the presence of arbitrary
plasma diffusion in axisymmetric configurations
22 p0257 A79-22979

EQUILIBRIUM FLOW
MHD equilibrium and stability --- in tokamak devices
21 p0078 A79-14779

EQUIPMENT SPECIFICATIONS
Important specification of pyranometers for solar
energy applications /Survey article/
23 p0468 A79-38627
Environmental qualification testing of terrestrial
solar cell modules
23 p0512 A79-41021
Instrumentation at the Decade 80 solar house in
Tucson, Arizona
[NASA-CR-150851] 21 p0204 N79-13491
Digest of equipment for converting solar, wind,
and geothermal energy into electric power for
USN application ashore
[AD-A066221] 23 p0561 N79-24475

EQUIVALENT CIRCUITS
A new three-dimensional equivalent circuit of
diagonal type MHD generator
24 p0605 A79-44914
A device model for the tandem junction solar cell
24 p0714 A79-53938

EROSION
Study of metals erosion in high temperature coal
gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Erosion study of different materials affected by
coal ash particles
24 p0646 A79-48864
State of the art and science report on design of
alloys resistant to high-temperature
corrosion-erosion in coal conversion environments
[EPRI-FP-557] 21 p0200 N79-13149
Application of remote sensing to state and
regional problems
[E79-10196] 23 p0569 N79-25446
Erosion testing of potential valve materials for
coal gasification systems
[PB-293308/3] 24 p0720 N79-28592

ERROR ANALYSIS
Measurement of solar radiation for energy conversion
21 p0119 A79-17305
Accuracy of empirical relations for flat plate
collector performance prediction
23 p0398 A79-33987
A source of error in cusp plasma leak measurements
23 p0446 A79-37265

Critique on the solar rehabilitation procedures used in SOLMET-2
24 p0708 A79-52956

ESA SATELLITES

The ESA lightweight hybrid solar array
23 p0500 A79-40916

ESKIMOS

Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems --- eskimos
[PB-291918/1] 23 p0546 N79-22972

ESTERS

Reclamation of synthetic turbine engine oil mixtures
[AD-A071813] 24 p0795 N79-33211

ESTIMATING

A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997

Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels
21 p0218 N79-14532

Parameter estimation and validation of a solar assisted heat pump model
22 p0332 N79-16349

Economic impacts of a transition to higher oil prices --- estimation and budget allocations
[BNL-50871] 22 p0364 N79-20927

ESTUARIES

Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289

ETCHING

Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512

The development of a method of producing etch resistant wax patterns on solar cells
[NASA-CR-158563] 23 p0550 N79-23527

ETHANE

Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189

ETHYL ALCOHOL

On future carburants. II --- alternative fuels from alcohols and hydrogen
22 p0296 A79-28439

The development of alternate combustibles for diesel engines
23 p0385 A79-33227

The gasification of ethyl alcohol
23 p0386 A79-33228

Small mills for producing alcohol from sugar cane
23 p0386 A79-33229

Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745

Dehydration of ethanol - New approach gives positive energy balance
24 p0643 A79-47813

A general history of the Nebraska Grain Alcohol and Gasohol Program
24 p0651 A79-49383

Which alcohol fuel for Brasil - Methanol or ethanol
24 p0676 A79-51774

Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952

Gasohol for energy production --- Book
24 p0713 A79-53724

Denaturants for ethanol/gasoline blends
[HCP/M2098-01] 21 p0180 N79-11237

Parameters for legislative consideration of bioconversion technologies
[PB-284742/4] 21 p0194 N79-12250

The production of ethanol from agricultural waste: An economic evaluation
[PB-292552/7] 23 p0577 N79-26233

Material and energy balances in the production of ethanol from wood --- conferences
[CONF-7806139-1] 23 p0589 N79-27338

Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0796 N79-33346

ETHYLENE COMPOUNDS

The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution --- fuel cell electrocatalysis
21 p0037 A79-11795

EUROPE

Energy policy of the European Economic Community
22 p0282 A79-26403

Total wind energy over Central Europe and its maximum utilization through optimal degree of development of solar wind conversion plants
23 p0472 A79-38657

In situ coal gasification - New energy source for Europe
23 p0525 A79-41815

Solar energy commercialization for European countries, volume 2
[HCP/CS-4250-VOL-2] 23 p0563 N79-24493

The comparison and coordination of national policies and programs in the energy research and development sector
[EUR-5911] 23 p0594 N79-27653

Energy research and development programme
[EUR-5889] 24 p0736 N79-29596

Recent energy consumption trends in European Economic Community countries
[DOE/EIA-0103/16] 24 p0758 N79-30817

EUROPEAN SPACE PROGRAMS

The utilization of European space techniques for energy production
[IAF PAPER 78-190] 21 p0035 A79-11287

Energy for Europe from space
22 p0273 A79-25605

A review of some critical aspects of satellite power systems
22 p0326 A79-31921

European aspects of Solar Satellite Power systems
22 p0326 A79-31923

A European view of the solar satellite power system
24 p0694 A79-51942

Solar power satellites for Europe
[IAF PAPER 79-173] 24 p0710 A79-53334

European technology applicable to Solar Power Satellite Systems /SPS/
[IAF PAPER 79-174] 24 p0710 A79-53335

A power transmission concept for a European SPS system
24 p0712 A79-53487

Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708

Photovoltaic generators in space --- conference, ESTEC, Netherlands, Sep. 1978
[SP-140] 24 p0751 N79-30730

Review of European solar array technology and potential future developments
24 p0751 N79-30747

A study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
24 p0751 N79-30748

MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems
24 p0752 N79-30752

EUTECTICS

Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961

Study on room heating utilizing eutectic salt mixture
23 p0470 A79-38638

Eutectic and cellular solar cells
23 p0502 A79-40928

EVALUATION

Methodology for solar-thermal power plant evaluation
[EPRI-ER-869] 24 p0739 N79-29631

Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341

EVAPORATION

Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft
[AIAA PAPER 79-0186] 21 p0157 A79-19585

EVAPORATION RATE

Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411

EVAPORATIVE COOLING
The ClearView Solar Collector system and
associated one and two stage evaporative cooling
- Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860
Soil cooling for geothermal electric power plants
in the Western United States - The Raft River
experiment
22 p0266 A79-24240

EVAPORATORS
Heat exchangers for Ocean Thermal Energy
Conversion plants
21 p0142 A79-17506
Thermal performance of integrated solar collector
evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182
Heat transfer of absorbing evaporator in CDE
engine system --- Concentration Difference
Energy system working on enriched acqueous
inorganic salt solution
23 p0531 A79-42900
Solar collector as heat pump evaporator
24 p0672 A79-51744

EXCHANGERS
Energy exchanger technology applied to laser
heated engines
21 p0110 A79-16631
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

EXCLUSION
Findings and views concerning the exemption of
kerojet fuels from the mandatory petroleum
allocation and price regulations
[DOE/ERA-0023] 23 p0600 N79-28058

EXHAUST DIFFUSERS
Annular diffuser performance for an automotive gas
turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790

EXHAUST EMISSION
Hydrocarbons in ambient air. I - A statistical
estimation of automobile hydrocarbons by factor
analysis
24 p0646 A79-48376
The role of corrosion in modern gas turbines
24 p0647 A79-48912

EXHAUST GASES
Development of a compact gas turbine combuster to
give extended life and acceptable exhaust
emissions
[ASME PAPER 78-GT-146] 21 p0033 A79-10799
Simultaneous nitrogen oxides and sulfur dioxide
removal by absorption-reduction scrubbing
21 p0066 A79-14125
Source emissions factors for refuse derived fuels
21 p0082 A79-15084
Motor vehicle lead emissions in the United States
- An analysis of important determinants,
geographic patterns and future trends
21 p0113 A79-16745
Advanced emissions control and test facility of
the Electric Power Research Institute
21 p0115 A79-17249
The influence of lead compounds on automotive
exhaust catalysts
21 p0116 A79-17253
Assessment of current flue gas desulfurization
technology
21 p0145 A79-17637
Operating experience with three 20 MW prototype
flue gas desulfurization processes
[ASME PAPER 78-JPGC-PWR-12] 21 p0150 A79-18098
Emissions of nitrogen dioxide from a large
gas-turbine power station
21 p0152 A79-18344
Real-time, continuous measurement of automotive
sulfuric acid emissions
21 p0156 A79-19359
Combustion modification pollutant control
techniques for industrial boilers - The
influence of fuel oil properties and atomization
parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
Corrosion and deposits from combustion of solid
waste. VI - Processed refuse as a supplementary
fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788
Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
Hydrogen enrichment for low-emission jet combustion
22 p0244 A79-21347
Influences on exhaust emissions from automotive
gas turbines
[ASME PAPER 78-GT-85] 22 p0255 A79-22338
Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533
The influence of fuel composition on smoke
emission from gas-turbine-type combustors -
Effect of combustor design and operating
conditions
22 p0323 A79-31510
Operation of a GT-225 diffusion-flame combustor on
alternative fuels performance, durability and
emissions
[ASME PAPER 79-GT-138] 23 p0378 A79-32407
Application of a power recovery system to gas
turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429
Assessment of hot gas clean-up systems and turbine
erosion/corrosion problems in PFBC combined
cycle systems --- Pressurized Fluidized Bed
Combustion
[ASME PAPER 79-GT-195] 23 p0380 A79-32453
Concepts for reducing exhaust emissions and fuel
consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737
Investigating the formation of oxides of nitrogen
when burning solid fuel --- air pollution by
industrial exhaust gases
23 p0474 A79-38864
An investigation of the formation of oxides of
nitrogen in a pulverised coal flame
23 p0474 A79-38865
Flue gas emissions from a
shredded-municipal-refuse-fired steam generator
23 p0489 A79-40399
Methanol decomposition bottoming cycle for IC
engines
[SAE PAPER 790427] 23 p0495 A79-40774
Gaseous, particulate, and smoke emissions from a
heavy duty automotive gas turbine engine
23 p0522 A79-41154
Impact of coal fired power plant emissions on the
air quality in Huntington Canyon, Utah
23 p0534 A79-43371
Vehicle evaluation of neat methanol - Compromises
among exhaust emissions, fuel economy and
driveability
24 p0628 A79-45996
Reduction of particulate carryover from a
pressurized fluidized bed
24 p0653 A79-49527
A literature review-problem definition studies on
selected toxic chemicals. Volume 1:
Occupational health and safety aspects of diesel
fuel and white smoke generated from it
[AD-A056018] 21 p0192 N79-11686
National Emissions Data System (NEDS) fuel use
report (1974)
[PB-284658/2] 21 p0194 N79-12251
Nitrogen oxide air pollution. Volume 2, part 1:
Control technology. A bibliography with abstracts
[NTIS/PS-78/0971/8] 21 p0199 N79-12591
Flue gas desulfurization system capabilities for
coal-fired stream generators, volume 1.
Executive summary
[PB-284045/2] 21 p0200 N79-12606
Utilization of waste heat in trucks for increased
fuel economy
[NASA-TM-79966] 21 p0215 N79-13937
Effect of swirler-mounted mixing venturi on
emissions of flame-tube combustor using jet A fuel
[NASA-TP-1393] 21 p0215 N79-14099
Air quality assessment of particulate emissions
from diesel-powered vehicles
[PB-286172/2] 21 p0223 N79-14641
Performance characteristics of automotive engines
in the United States. First Series: Report No.
14 1975 Mazda Rotary 79 CID (1.1 Liters), 4V ---
fuel consumption and emissions
[PB-286074/0] 21 p0226 N79-15304
Performance characteristics of automotive engines
in the United States. First series: Report no.
15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305

Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V --- fuel consumption and exhaust gases
[PB-286076/5] 21 p0227 N79-15306

Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I. --- fuel consumption and exhaust gases
[PB-286077/3] 21 p0227 N79-15307

Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311

Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V --- fuel consumption and exhaust gases
[PB-286299/3] 21 p0227 N79-15313

Performance characteristics of automotive engines in the United States. First series, report no. 19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-15314

Effects of low ambient temperature on the exhaust emissions and fuel economy of 84 automobiles in Chicago
[PB-288400/5] 22 p0355 N79-19488

Health effects associated with diesel exhaust emissions, literature review and evaluation
[PB-289817/9] 22 p0364 N79-20727

Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

Exhaust emissions and fuel economy from automobiles using alcohol/gasoline blends under high-altitude conditions
[PB-290612/1] 23 p0555 N79-24191

Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results
[PB-290514/9] 23 p0566 N79-24534

An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249

Air pollutant emission factors for military and civil aircraft
[PB-292520/4] 23 p0575 N79-25567

Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 427 cubic inch 1977 California GMC 6500
[PB-293530/2] 23 p0578 N79-26410

Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412

Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 361 cubic inch 1966 Ford F-600
[PB-293529/4] 23 p0586 N79-26567

Solvent Refined Coal (SRC) process: Environmental program. Volume 3: Pilot plant development work, part 5
[FE-0496-T8] 23 p0588 N79-27329

Fluidized combustion of coal --- to limit SO2 and NOx emissions
23 p0593 N79-27613

Second Annual Combustion and Fuels Technology Program Contractor Review Meeting
[CONF-7809103] 24 p0731 N79-29271

EXHAUST SYSTEMS

Recent operating experience of the Wellman-Lord FGD process on a coal-fired boiler --- flue gas desulfurization
21 p0065 A79-14120

The Research-Cottrell/Bahco SO2 and particulate removal system at Rickenbacker Air Force Base
21 p0065 A79-14122

Oven curing: Energy conservation and emission control in coil coating
[TID-28705] 24 p0750 N79-30723

EXOTHERMIC REACTIONS

A stoichiometric analysis of coal gasification
23 p0492 A79-40456

Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

EXPECTANCY HYPOTHESIS

The impact of price expectations on the demand for electrical energy in the United States
23 p0447 A79-37286

EXPERIMENTAL DESIGN

Acceleration of solar heating application via improved data evaluation
21 p0087 A79-15829

Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410

Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

The performance of an experimental solar heating system
[AD-A066699] 23 p0573 N79-25516

Phase-one experiment test plan solar photovoltaic/thermal residential experiment
[COO-4577-6] 24 p0739 N79-29625

System analysis, design and proof-of-concept experiment of a total energy system, phase 2
[COO-2947-5] 24 p0742 N79-29660

EXPLORATION

Exploration and exploitation techniques for geothermal resources
23 p0525 A79-41819

Microcrack technology for geothermal exploration and assessment
[PB-290173/4] 22 p0367 N79-21530

Geothermal ground noise measurements at Roosevelt Hot Springs and Cove Fort, Utah
[PB-291624/5] 23 p0545 N79-22648

Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747

Evaluation of intermediate-period seismic waves as a geothermal exploration tool
24 p0744 N79-29716

Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes
[SAND-79-0746C] 24 p0769 N79-31744

EXPLOSIONS

Air classify first, then shred --- solid waste processing to reduce danger of explosions
23 p0489 A79-40404

EXPLOSIVES

Permeability enhancement using explosive techniques --- georesources recovery techniques
21 p0005 A79-10048

EXPONENTS

Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348

EXPOSURE

Long term weathering effects on the thermal performance of the sunworks (liquid) solar collector
[NASA-CR-150899] 22 p0341 N79-17328

EXTERNAL COMBUSTION ENGINES

The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100

DOE stationary external combustion engine program - Status report
24 p0689 A79-51882

Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883

EXTRATERRESTRIAL RESOURCES

Commercial prospects for extraterrestrial materials
23 p0395 A79-33748

The construction of satellite solar power stations from nonterrestrial materials - Feasibility and economics
23 p0403 A79-34028

Excavation costs for lunar materials
[AIAA PAPER 79-1376] 23 p0425 A79-34828

Development of space manufacturing systems concepts utilizing lunar resources
[AIAA PAPER 79-1411] 23 p0426 A79-34844

Lunar resources utilization - An economic assessment --- of manufacturing and construction of large structures in space
[AIAA PAPER 79-1412]
23 p0426 A79-34845
Energy for the year 2000 - The SPS concept
24 p0645 A79-48026
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115]
24 p0709 A79-53302
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere
[IAF PAPER 79-A-16]
24 p0711 A79-53419

EXTREMUM VALUES
Theoretical upper limit to the conversion efficiency of solar energy
21 p0042 A79-11876

EXTRUDING
Continuous extrusion of coal --- plastic fluidizing process
22 p0282 A79-26372
Design, fabrication and test of a hydrogen heat pipe --- extruding and grooving 6063-T6 aluminum tubes for cryogenic heat pipes
[NASA-CR-152267]
23 p0556 N79-24298

EYE PROTECTION
Health and safety hazards associated with solar concentration systems
23 p0439 A79-36628

F

FABRICATION
On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192]
21 p0035 A79-11288
Preparation and ionic conductivity of H3O/+/ beta alumina --- for hydrogen-oxygen fuel cells
21 p0040 A79-11821
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352
Design fabrication and testing of three meter diameter parabolic dish heliostat system
21 p0135 A79-17447
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534
Recent developments in low cost silicon solar cells for terrestrial applications --- sheet production methods
22 p0239 A79-20821
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829
New techniques for fabricating silicon solar cells
23 p0394 A79-32969
Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785
Sputtered thin film solar cells
23 p0448 A79-37843
The Netherlands research program on wind energy
23 p0481 A79-40102
The design, construction, testing and manufacturing of vertical axis wind turbines
23 p0484 A79-40124
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902
Analysis of ID saw slicing of silicon for low cost solar cells
23 p0499 A79-40903
Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions
23 p0501 A79-40922
Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003
Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004
Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056
Characteristics of semicrystalline silicon solar cells
23 p0518 A79-41065
Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171
Fabrication and characterization of SnO2/n-Si solar cells
24 p0642 A79-47802
Silicon solar cells, volume 3. Citations from the NTIS data base
[NTIS/PS-78/1115/1]
21 p0212 N79-13555
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1116/9]
21 p0212 N79-13556
Fabrication and testing of silver-hydrogen cells
[NASA-CR-159431]
22 p0334 N79-16374
An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1]
22 p0348 N79-18445
Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556]
23 p0550 N79-23515
Design, fabrication and test of a hydrogen heat pipe --- extruding and grooving 6063-T6 aluminum tubes for cryogenic heat pipes
[NASA-CR-152267]
23 p0556 N79-24298
LSA: low-cost Solar Array project
[NASA-CR-158533]
23 p0559 N79-24459
Cuprous oxide photovoltaic cells --- fabricating schottky barrier devices
[PB-290529/7]
23 p0565 N79-24514
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158700]
23 p0572 N79-25505
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158740]
23 p0580 N79-26490
Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157]
24 p0770 N79-31763
Shallow-homojunction GaAs solar cells
24 p0785 N79-32666

FABRICS
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775]
24 p0796 N79-33352

FACILITIES
Solar thermal test facility experiment manual
[SAND-77-1173]
21 p0221 N79-14568

FACTOR ANALYSIS
Acceleration of solar heating application via improved data evaluation
21 p0087 A79-15829
Hydrocarbons in ambient air. I - A statistical estimation of automobile hydrocarbons by factor analysis
24 p0646 A79-48376

FAILURE ANALYSIS
Evaluation of methods for analyzing silver-zinc cells
21 p0010 A79-10085
Optics in adverse environments; Proceedings of the Seminar, San Diego, Calif., August 25, 26, 1977
21 p0084 A79-12037
A status of the 'Alpha-ply' composite flywheel concept development
22 p0241 A79-20843
Failure analysis in coal conversion systems --- pilot plant for liquefaction
22 p0266 A79-24137

Materials problems experienced at the Synthane
coal-gasification pilot plant
23 p0478 A79-39788

Study of the interface changes during operation of
a CdTe-electrolyte solar cells
24 p0637 A79-47054

MOD-2 failure mode and effects analysis
[NASA-CR-159632] 24 p0747 N79-30415

FAILURE MODES

User experience with on-road electric vehicles in
the U.S.A. and Canada
21 p0009 A79-10080

Performance degradation mechanisms and modes in
terrestrial photovoltaic arrays and technology
for their diagnosis
23 p0512 A79-41019

Some failure modes and analysis techniques for
terrestrial solar cell modules
23 p0512 A79-41020

MOD-2 failure mode and effects analysis
[NASA-CR-159632] 24 p0747 N79-30415

FAR INFRARED RADIATION

A study of waveguides for far infrared
interferometers measuring electron density of
tokamak plasmas
23 p0526 A79-41842

Proposed non-interferometric FIR electron density
measuring scheme for tokamaks
24 p0707 A79-52667

FAR ULTRAVIOLET RADIATION

Application of electron beams in space for energy
storage and optical beam generation
21 p0108 A79-16606

Vacuum ultraviolet spectroscopic apparatus for
space- and time-resolved measurements on a
single tokamak plasma discharge
24 p0706 A79-52537

FARADAY EFFECT

Comparison of results of calculation of flow in an
MHD generator with experimental data obtained on
the U-25 device
22 p0306 A79-30392

FARM CROPS

Farm-scale generation of bio-gas
24 p0631 A79-46312

FARMLANDS

Selling solar energy as a cash crop
21 p0049 A79-12725

FAST NUCLEAR REACTORS

The fast power cycle for fusion reactors
21 p0018 A79-10152

FATIGUE TESTS

Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827

Some fatigue characteristics of nickel battery
plaque
[AD-A060370] 21 p0230 N79-15415

Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784

FEASIBILITY ANALYSIS

Evolution of satellite power system /SPS/ concepts
21 p0002 A79-10023

High temperature thermal energy storage in moving
sand
21 p0012 A79-10103

Status of free-piston Stirling engine/linear
alternator power conversion system development
21 p0025 A79-10212

Engineering analysis of in situ liquefaction of coal
21 p0032 A79-10521

Feasibility of rocket propellant production on Mars
21 p0047 A79-12324

A standard procedure of economic evaluation for
energy-producing and pollution-abatement
operations
21 p0064 A79-14109

Solar energy for residential housing
21 p0090 A79-15857

Solar power satellites revisited
21 p0093 A79-15898

Impacts of the National Energy Plan on solar
economics
[CONF-771203-6] 21 p0118 A79-17294

Investigation on the feasibility of using a
two-phase thermosyphon for solar storage, space
heating and cooking
21 p0121 A79-17330

The feasibility of constructing a photoelectric
unit utilizing effluent heat
21 p0125 A79-17358

Technical and economic feasibility of making
fertilizer from wind energy, water, and air
21 p0142 A79-17512

Solar power satellites - An AIAA position paper
21 p0148 A79-17872

Model systems in photoelectrochemical energy
conversion
21 p0149 A79-18021

Energy storage using the reversible oxidation of
barium oxide
22 p0242 A79-21169

Space reflector technology and its system
implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

Economic feasibility of solar water and space
heating
22 p0292 A79-27899

Solar absorption cooling feasibility
22 p0295 A79-28358

Fusion power demonstration study at ORNL
23 p0407 A79-34059

An evaluation of integrated coal
gasification/water-splitting processes
23 p0411 A79-34094

Medium-power /100 to 1000 kWe/ heat and
electricity production from solar sources
23 p0435 A79-35484

Satellite solar power stations - Current status
and prospects
23 p0448 A79-37844

Wind energy conversion and hydrogen production - A
feasibility study for South Africa
23 p0452 A79-37892

A preliminary feasibility study into the use of
solar energy to provide year-round heating for a
factory unit
23 p0471 A79-38647

A 1982 low cost photovoltaic module factory study
23 p0501 A79-40921

Potential for stand-alone photovoltaic on-site
total-energy residential systems
23 p0516 A79-41050

Feasibility of retrofitting health care and
correctional institutions in Florida with solar
water heating systems
24 p0608 A79-45207

Distribution of gaseous hydrogen - Technology
evaluation
24 p0615 A79-45598

An overview of the Japanese OTEC development
24 p0616 A79-45779

Design considerations on 100MWe commercial scale
OTEC power plant and a 1MWe class engineering
test plant
24 p0619 A79-45797

A feasibility study of an OTEC guyed tower concept
24 p0619 A79-45798

The rough road to making oil and gas from coal
24 p0651 A79-49423

Testing for commercialization of the central power
tower --- pilot plant for megawatt solar power
generation
24 p0660 A79-50460

Analysis of geological limitations to underground
coal gasification
24 p0668 A79-51025

Feasibility study of transporting offshore
OTEC-produced energy to shore by thermal media.
Project 8980
[DSE/2426-19] 21 p0174 N79-10535

Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478

Evaluation of urethane for feasibility of use in
wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497

Feasibility study of solar dome encapsulation of
photovoltaic arrays
[NASA-CR-158368] 22 p0367 N79-21545

Evaluation of the technical feasibility and
effective cost of various wafer thicknesses for
the manufacture of solar cells
[NASA-CR-158588] 23 p0549 N79-23507

Elements for technological and economic modeling
of tower-type solar power plants
[P/51/76/17] 23 p0584 N79-26535

Small low-head hydroelectric power --- conferences [IDO-10076] 24 p0738 N79-29617

Analysis of collectors for process heat applications [SAND-78-1977] 24 p0756 N79-30806

Study of system implications of high speed flywheels as energy storage devices on satellites, volume 1 [REPT-30/1020-VOL-1] 24 p0759 N79-30834

Study of system implications of high speed flywheels as energy storage devices on satellites, volume 2 [REPT-30/1020-VOL-2] 24 p0760 N79-30835

Feasibility of district heating of northern US cities by cogeneration [ANL/EES-CP-18] 24 p0776 N79-31829

FEATHERING

Tilting wing overspeed control for vertical axis wind turbines [AIAA PAPER 79-0967] 23 p0456 A79-38175

FEDERAL BUDGETS

Financial/management scenarios for a satellite power system program [AAS PAPER 78-144] 22 p0243 A79-21259

The NASA budget - Fiscal years 1979-80 23 p0535 A79-43448

Statement of Doctor Robert A. Frosch, Administrator, National Aeronautics and Space Administration 21 p0224 N79-15111

Authorizing appropriations to the National Aeronautics and Space Administration [H-REPT-96-52] 22 p0364 N79-20928

Energy: Fiscal year 1980 budget request [GPO-42-886] 23 p0582 N79-26508

NASA authorization, 1980, volume 1, part 2 [GPO-46-134] 24 p0730 N79-29105

Energy conservation and regulation in the President's budget [GPO-25-418] 24 p0736 N79-29597

NASA authorization, 1980, volume 1, part 4 [GPO-46-423] 24 p0762 N79-31085

Department of Energy FY 1980 obligations [DOE/CR-0005] 24 p0773 N79-31792

FEED SYSTEMS

LSA large area silicon sheet task continuous liquid feed Czochralski growth [NASA-CR-158366] 22 p0357 N79-20281

Silicon web process development --- for solar cell fabrication [NASA-CR-162181] 24 p0770 N79-31762

FEEDBACK CONTROL

On-line control of a large horizontal axis wind energy conversion system and its performance in a turbulent wind environment 21 p0028 A79-10236

Dynamics and feedback control of ISX tokamak 21 p0107 A79-16559

Optimizing solar energy systems using continuous flow control 21 p0138 A79-17477

A digital control system for superconducting magnet 22 p0268 A79-24508

A general design method for closed-loop solar energy systems 22 p0295 A79-28359

Control strategy for a variable-speed wind energy conversion system 22 p0303 A79-29800

Feedback control of a class of plasma instabilities 23 p0422 A79-34253

Solar thermal systems long-term performance predictions using closed-form solutions 24 p0672 A79-51740

FERMENTATION

Petroleum plantations --- hydrocarbon fuels from artificial photosynthesis and plants 21 p0095 A79-15910

Small mills for producing alcohol from sugar cane 23 p0386 A79-33229

Sweet sorghum - A renewable source for alcohol production 23 p0389 A79-33263

Photosynthetic pathway and biomass energy production 24 p0605 A79-44580

FERMI SURFACES

The change in the interface-state Fermi level of MIS solar cells when going from dark to illuminated conditions 23 p0456 A79-38101

FERRITIC STAINLESS STEELS

Transmission of gaseous hydrogen - A preliminary technology evaluation 24 p0614 A79-45597

FERTILIZERS

Technical and economic feasibility of making fertilizer from wind energy, water, and air 21 p0142 A79-17512

Solar energy conversion in marine biological systems 23 p0402 A79-34021

FIBER COMPOSITES

Bibliographic and numeric data bases for fiber composites and matrix materials 21 p0114 A79-16984

Rotating strength of glass-carbon fiber-reinforced hybrid composite discs 21 p0165 A79-20273

Current status of composite flywheel development 22 p0241 A79-20853

Dynamic analysis of pipeline system for thermal power generation facility 24 p0627 A79-45863

FIBER OPTICS

Solar irradiance measurements by means of optical fibers and silicon detectors 24 p0638 A79-47198

FIBERS

Dual membrane hollow fiber fuel cell and method of operating same [NASA-CASE-NPO-13732-1] 21 p0172 N79-10513

FIELD INTENSITY METERS

A time domain survey of the Los Alamos Region, New Mexico [LA-7657-MS] 22 p0365 N79-21248

FIGHTER AIRCRAFT

An analysis of operational procedures and design modifications for aircraft fuel conservation [AIAA 79-1656] 24 p0611 A79-45328

FIGURE OF MERIT

Modified silicon-germanium alloys with improved performance --- thermoelectric material 21 p0027 A79-10225

FILAMENT WINDING

Large filament wound structures for energy and transportation systems --- turbine blades for windpowered energy systems 21 p0086 A79-15507

Wind-turbine-generator rotor-blade concepts with low-cost potential 22 p0240 A79-20828

FILM BOILING

Use of fluidized media in thermal power systems 23 p0436 A79-35525

FILM COOLING

Slag transport models for radiant heater of an MHD system [ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808

Water-cooled gas turbine technology development - Fuels flexibility [ASME PAPER 79-GT-72] 22 p0307 A79-30536

FILM THICKNESS

Thin-film solar cells produced by physical vapour deposition 23 p0441 A79-36787

FILTRATION

Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency [EPRI-FP-775] 24 p0796 N79-33352

FINANCE

Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy [AIAA PAPER 78-1767] 21 p0061 A79-13866

Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects 23 p0490 A79-40408

A case study of OTEC financing for the Middle South Utilities 24 p0621 A79-45610

Coal loan guarantee program (PL 94-163) [DOE/EIS-0004] 21 p0213 N79-13574

Energy supply and demand balances and financing requirements in non-OPEC developing nations [HCP/H6407] 24 p0741 N79-29650

FINANCIAL MANAGEMENT
Risk control in the development of energy processes --- environment, worker and capital considerations in coal gasification 21 p0085 A79-15372
Costs and impacts of financial incentives for solar energy systems 21 p0119 A79-17296
Financial/management scenarios for a satellite power system program [AAS PAPER 78-144] 22 p0243 A79-21259
Subsidies for a formulation of a plan of action for alternative energy sources and forms 23 p0388 A79-33258
The crucial role of financial institutions in solar heating installations 23 p0403 A79-34031
Financing alternatives for space industrialization [AIAA PAPER 79-1389] 23 p0426 A79-34836
Capital investment for transition to new energy supply systems 23 p0480 A79-39993
The capital stake in the transition to new energy systems. II 23 p0535 A79-43522

FINITE DIFFERENCE THEORY
Heliostat survivability and structural stability for wind loading 23 p0400 A79-34001

FINITE ELEMENT METHOD
Three-dimensional effects of electrode configuration on diagonal MHD generator performance 22 p0283 A79-26523
Application of finite element method to analysis of MHD generators 24 p0653 A79-50001
Frequency analysis of a thick-rim flywheel [ORNL/TM-5804] 24 p0781 N79-32555

FINNED BODIES
Optimal profile of solar energy collectors 21 p0130 A79-17408
Optimal distribution of heat conducting material in the finned pipe solar energy collector 22 p0242 A79-21163
Transient analysis and optimization of an extended surface thermal storage unit which utilizes a phase change material 23 p0400 A79-34006

FINS
Radiant exchange for a fin and tube solar collector 22 p0271 A79-25066

FIRE EXTINGUISHERS
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale [AD-A058586] 21 p0201 N79-13182

FISHERIES
Reservoir ecosystems and western coal development in the upper Missouri River Basin [PB-287363/6] 22 p0339 N79-17309

FISHES
Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies [PB-289155/4] 22 p0344 N79-17367
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats [PB-291330/9] 22 p0373 N79-21679

FISSILE FUELS
Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production [LA-UR-79-574] 24 p0742 N79-29666
Optimization of the fission-fusion hybrid concept [ORNL/PPA-79/3] 24 p0778 N79-32113

FISSION
Energy for the long run - Fission or fusion 22 p0256 A79-22760

FISSIONABLE MATERIALS
Integrated safeguards information System (ISIS), executive summary --- nuclear power plant and fissionable materials security [PB-286869/3] 21 p0223 N79-14934

FLAME PROPAGATION
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines 23 p0461 A79-38387
Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front 23 p0486 A79-40251
Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire 24 p0706 A79-52368
Coal combustion 24 p0714 A79-53779

FLAME STABILITY
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors 21 p0052 A79-12982

FLAMES
Flame emissivities - Alternative fuels 21 p0052 A79-12984
An investigation of the formation of oxides of nitrogen in a pulverised coal flame 23 p0474 A79-38865

FLASH LAMPS
Simmer-enhanced flashlamp-pumped dye laser 23 p0384 A79-32981

FLASHING (VAPORIZING)
MHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591
An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants 23 p0487 A79-40369

FLAT CONDUCTORS
Energy losses in a flat transposed cable --- superconducting cable [LA-7635-MS] 24 p0781 N79-32481

FLAT PLATES
Jet impingement solar air heater [AIAA PAPER 78-1760] 21 p0061 A79-13861
Solar energy and the flat plate collector - An annotated bibliography 21 p0090 A79-15858
A graphical approach to the efficiency of flat-plate collectors 21 p0102 A79-16422
Solar radiation studies for utilization of flat-plate collectors in an equatorial region 21 p0119 A79-17311
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors 21 p0127 A79-17380
Optimum collection geometries for copper tube - copper sheet flat plate collectors 21 p0127 A79-17387
Flat plate collector dynamic evaluation 21 p0128 A79-17390
A parametric investigation on flat-plate solar collectors 21 p0128 A79-17391
A comparison among various flat plate collectors with honeycomb structures 21 p0128 A79-17392
Comparative outdoor measurements on flat-plate solar collectors in a metropolitan area in Western Germany 21 p0128 A79-17394
Performance of flat plate solar collector with fluid undergoing phase change 21 p0129 A79-17397
Effect of dust on flat plate collectors 21 p0129 A79-17399
Convective effects in 'slat collectors' 21 p0129 A79-17400
Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection 21 p0129 A79-17401
Some aspects towards the performance evaluation and ensuing design components of solar collector systems 21 p0130 A79-17404
Comparative performance testing of flat-plate solar water heaters 21 p0130 A79-17405

Thermal performance testing of flat-plate solar collectors 21 p0130 A79-17407

A channelled solar flat-plate booster --- reflector-absorber system for optimum collector insolation 21 p0131 A79-17413

Design and optimization of a flat plate collector for cooling application 21 p0132 A79-17419

Anticonvective antiradiative systems --- for solar collectors 21 p0132 A79-17420

Honeycomb type flat plate collectors - Experiments leading to drinking straw --- heat retention material for solar steam generation 21 p0132 A79-17424

Flat plate collector - Experimental studies and design data for India 21 p0132 A79-17425

Optimum tilt for the flat plate collector 21 p0132 A79-17426

Evacuated solar flat-plate collectors for economic applications 21 p0133 A79-17435

Theoretical and experimental yields of a solar heater with flat plate collectors 21 p0134 A79-17437

Comparative performance of tracking type and non-tracking type solar collectors 21 p0136 A79-17454

Heat transfer analysis of flat plate type domestic solar water heater 21 p0140 A79-17489

Calculation of flat-plate collector utilizability 21 p0149 A79-18020

A wave power machine using free floating vertical plates 21 p0151 A79-18104

Some aspects of the transient response of a flat-plate solar energy collector 21 p0153 A79-18466

Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses 21 p0164 A79-19949

Comparison of transient heat transfer models for flat plate collectors 22 p0242 A79-21168

Experiments with a flat plate solar water heating system in thermosyphonic flow 22 p0262 A79-23755

Analysis and design of air heating unglazed flat plate solar collectors 22 p0280 A79-26202

Heat loss characteristics of an evacuated plate-in-tube collector 22 p0285 A79-26818

Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors 22 p0295 A79-28356

Ranking and evaluation of flat-plate collectors - Two new approaches --- for seasonal storage solar-heating systems 22 p0316 A79-31402

Performance analysis of a flat-plate solar collector using 'forge-fin' tubes 22 p0316 A79-31404

Dimensional relations for free convective heat transfer in flat-plate collectors --- solar collector heat loss 22 p0316 A79-31406

Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector 22 p0317 A79-31408

The honeycomb heat trap - Its application in flat plate solar collectors 22 p0322 A79-31447

System data on flat-plate collectors and its optimization 23 p0385 A79-33217

Accuracy of empirical relations for flat plate collector performance prediction 23 p0398 A79-33987

Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation 23 p0398 A79-33990

Test results of a moderately focusing flat-plate solar collector 23 p0399 A79-33995

Environmental testing of flat plate solar cell modules 23 p0428 A79-35039

An oil company expresses interest in solar energy 23 p0434 A79-35478

The significance of longwave radiation in flat plate solar collector testing 23 p0448 A79-37847

Transient behaviour of solar flat plate collectors 23 p0467 A79-38612

Investigations of glass collectors with radiation absorbing heat carrier 23 p0470 A79-38644

A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors 23 p0530 A79-42895

An efficient optical window for flat-plate solar energy collectors 23 p0536 A79-43591

Transient plate temperature in flat plate solar collectors 24 p0603 A79-44294

An optical valve for flat-plate solar energy collectors 24 p0607 A79-45154

Cover systems for high temperature flat-plate solar collectors 24 p0642 A79-47799

Environmental requirements for flat plate photovoltaic modules for terrestrial applications 24 p0658 A79-50342

Performance of flat plate solar collector with fluid undergoing phase change 24 p0661 A79-50544

Calorimetric emissivities for solar-selective coatings on flat sheet 24 p0706 A79-52536

Analytical methods for evaluating two-dimensional effects in flat-plate solar collectors 21 p0181 N79-11462

Methods for reducing heat losses from flat plate solar collectors, phase 2 [COO-2597-4] 21 p0188 N79-11533

Provisional flat plate solar collector testing procedures [PB-283721/9] 21 p0198 N79-12571

Flat plate solar collector design and performance. Citations from the NTIS data base [NTIS/PS-78/0840/5] 21 p0212 N79-13551

Proposal for a representation of the quasisteady-state performance of flat-plate collectors [ASSA-SE-521/77] 22 p0349 N79-19461

Solar engine --- Flat plate type [NASA-CASE-LAR-12148-1] 24 p0737 N79-29608

Bismarck, North Dakota, office commercial solar demonstration design and construction report [COO-4228-1] 24 p0739 N79-29633

FLAT SURFACES

Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results 22 p0242 A79-21166

Spectral-selective surfaces for the thermal conversion of solar energy --- Thesis 23 p0523 A79-41732

FLEXIBILITY

Study of a flexible solar array generator for a remote sensing satellite. Volume 1: Technical report [ESS/SS-909-VOL-1] 23 p0599 N79-27709

FLEXIBLE BODIES

Transient attitude dynamics of satellites with deploying flexible appendages 21 p0047 A79-12325

Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells 23 p0500 A79-40913

FLEXIBLE WINGS

A new concept - The flexible blade windmill /FBW/ 23 p0485 A79-40126

FLIGHT CONTROL

Fuel conservative subsonic transport --- control surfaces activated by computers 22 p0337 N79-16874

FLIGHT OPERATIONS

- Energy conservation in general aviation and operation and maintenance of Avco Lycoming piston engines 21 p0048 A79-12381
- Economy in flight operations 21 p0048 A79-12383

FLIGHT PATHS

- Procedure for flight guidance in the terminal maneuvering area for an experimental program employing a flying test device 21 p0147 A79-17680

FLIGHT SAFETY

- Energy conservation in general aviation and operation and maintenance of Avco Lycoming piston engines 21 p0048 A79-12381

FLIGHT TESTS

- Flight performance evaluation of heat pipe solar collector in a spin environment [AIAA PAPER 79-1061] 23 p0455 A79-38041
- Turbine engine altitude chamber and flight testing with liquid hydrogen [NASA-TM-79196] 23 p0587 N79-27140

FLOATS

- A wave power machine using free floating vertical plates 21 p0151 A79-18104
- Experiences with a hydropneumatic wave power device 21 p0151 A79-18105
- The oscillating water column wave-energy device 22 p0252 A79-22223

FLOODS

- Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289
- Sources and delivery of carbon dioxide for enhanced oil recovery [FE-2515-24] 24 p0735 N79-29575

FLORIDA

- Structuring a small national or state solar energy program 22 p0262 A79-23751
- The Florida Solar Energy Standards Act of 1976 [AIAA PAPER 79-1018] 23 p0460 A79-38203
- Solar project cost report [SOLAR/2018-78/60] 24 p0728 N79-28788
- The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report [PB-294228/2] 24 p0744 N79-29783

FLOW CHARACTERISTICS

- Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device 22 p0306 A79-30392
- Model of fluid flow in boilers with helicoidal coil --- for spherical solar collectors 23 p0383 A79-32959
- Wind tunnel corrections for Savonius rotors 23 p0485 A79-40127
- Free vortices from a wing for wind turbine systems 23 p0537 A79-43693
- Evaluation of flow properties of dilute aqueous polymer solutions for enhanced oil recovery applications 23 p0556 N79-24408
- Stability of coal-oil mixtures --- conferences [CONF-7805152-1] 23 p0589 N79-27332
- Magnetogasdynamic phenomena in pulsed MHD flows [AD-A070590] 24 p0794 N79-33042

FLOW DISTRIBUTION

- Vortex sheet analysis of the Giromill 21 p0031 A79-10278
- Regional analysis of potential water power 21 p0148 A79-17825
- The interaction of the wind field with a horizontal axis wind turbine 22 p0278 A79-26177
- Vortex sheet analysis of the Giromill --- vertical axis wind turbine with straight blades 22 p0278 A79-26179
- Performance of magnetohydrodynamic generator in the inlet region 23 p0397 A79-33769
- The distributed flow, below atmospheric pressure solar collector 24 p0631 A79-46314
- Preliminary results of a field experiment to characterize wind flow through a vertical plane [PNL-2518] 21 p0203 N79-13322
- Liquid-fluidized-bed heat exchanger flow distribution models [ICP-1151] 22 p0369 N79-21559
- Investigation of flow phenomena in pulverized coal gasification for the new process [BMFT-FB-T-78-27] 23 p0590 N79-27341
- Isothermal flow distribution in solar collectors and collector manifolds [ALO-5319-1] 24 p0789 N79-32708

FLOW EQUATIONS

- VKI Short Course on Magnetohydrodynamic Accelerators and Generators [VKI-LECTURE-SERIES-8] 23 p0545 N79-22891

FLOW GEOMETRY

- Some effects of flow curvature on the performance of Darrieus wind turbines [AIAA PAPER 79-0112] 21 p0156 A79-19538
- Optimization of the flow passage geometry for air heating solar collectors 22 p0316 A79-31403
- Evaluation of the expected diffuser performance for a large MHD generator 23 p0393 A79-33408

FLOW MEASUREMENT

- Effects of test fluid, flow rate, and flow regime on solar collector thermal performance measurements 22 p0268 A79-24317
- Flowfield measurements in the vicinity of the rotor of a 10 kw windmill [AIAA PAPER 79-0969] 23 p0475 A79-38889
- Diagnostic techniques in combustion MHD flows 23 p0478 A79-39508
- Boundary layer velocity measurements in combustion MHD channels 24 p0647 A79-49037
- Measurement of high-temperature, high-pressure processes [PB-284041/1] 21 p0195 N79-12424

FLOW REGULATORS

- The Arbonia control concept - Does flow regulation in the solar system cycle make sense --- working fluid regulation in solar heating facility 21 p0056 A79-13632
- A heat operated mechanical device to control the temperature and flow of water entering a hot water storage tank in a solar water heating system 21 p0140 A79-17487

FLOW STABILITY

- Viscosity stabilized solar ponds 21 p0133 A79-17430
- Testing of central receiver for central thermal power systems 23 p0428 A79-35045
- Laminar flow stabilization by surface cooling on hydrogen fueled aircraft [AIAA PAPER 79-1863] 24 p0643 A79-47920
- Stability criteria for saturated solar ponds 24 p0671 A79-51736
- A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines 24 p0794 N79-33158

FLOW THEORY

- Performance prediction methods for horizontal axis wind turbines 21 p0045 A79-12244
- Three dimensional mathematical model of flow stratification in thermocline storage tanks 24 p0609 A79-45214
- Development of mechanistic theory for drying of porous media using two-fluid, two-phase flow theory [UCRL-81604] 24 p0720 N79-28521

FLOW VELOCITY

- Flow rate calibration for solar heating and cooling system evaluation 21 p0089 A79-15845
- On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid 21 p0156 A79-19445

Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183

Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344

FLOW VISUALIZATION

Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion
21 p0008 A79-10070

FLUES

Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458

Options for treating and disposing of scrubber sludge
23 p0424 A79-34460

Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

FLUID BOUNDARIES

Conditions for absolute stability of salt gradient solar ponds
21 p0133 A79-17431

Heat transfer simulation in underground coal liquefaction
23 p0555 N79-24292

FLUID DYNAMICS

Controlled utilization of coal slag in the MHD topping cycle
21 p0081 A79-14936

Closed cycle gas turbines, volume 1
[VKI-LECTURE-SERIES-100-VOL-1] 22 p0331 N79-16260

Large closed-cycle gas turbine plant
[GA-A-14311] 22 p0331 N79-16261

FLUID FILMS

Energy conservation through sealing technology
22 p0237 A79-20700

Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204

Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991

FLUID FILTERS

A model for coal fly ash filtration
22 p0296 A79-28389

FLUID FLOW

Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392

MHD generator duct flow with cross stream dependent fluid properties
22 p0336 N79-16668

Transient flow of non-Newtonian power-law fluids in porous media
[SAN-1265-9] 24 p0781 N79-32516

FLUID INJECTION

The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100

A numerical model of underground coal gasification for air-water injection into a permeable bed
24 p0689 A79-51867

Analytical modelling of oil recovery by steam injection
22 p0358 N79-20434

North Stanley Polymer Demonstration Project
[BETC/RI-78/19] 23 p0588 N79-27313

FLUID MECHANICS

Heat transfer - A review of 1977 literature
21 p0155 A79-18973

Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems
22 p0280 A79-26191

Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0391 A79-33391

Development of mechanistic theory for drying of porous media using two-fluid, two-phase flow theory
[UCRL-81604] 24 p0720 N79-28521

FLUID POWER

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0278 A79-26176

Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429

FLUIDICS

An air-modulated fluidic fuel-injection system --- automobile fuel management
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766

An initial model for the finite displacement response characteristics of a fluidyne pump --- thermodynamic efficiency
[AD-A069159] 24 p0734 N79-29521

FLUIDIZED BED PROCESSORS

Process development for the Westinghouse advanced fluidized-bed coal gasification system
21 p0006 A79-10058

Theoretical studies of coal pyrolysis in an entrained bed flow reactor
21 p0007 A79-10063

Fluidized-bed combustion of low-quality fuels
21 p0007 A79-10066

A review of the PFBC combined cycle and its influence on gas turbine design parameters --- Pressurized Fluidized Bed Combustion
21 p0007 A79-10067

Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant
21 p0008 A79-10068

Factors limiting limestone utilization efficiency in fluidized-bed combustors --- in determining sulfur dioxide emission level
21 p0008 A79-10069

Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion
21 p0008 A79-10070

Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071

Preliminary controller evaluation for the MERC/CTIU using a mathematical process model --- of Component Test and Integration Unit in fluidized bed combustion
21 p0008 A79-10073

Pressurized fluidized-bed combustion/component test and integration unit preliminary design report
21 p0008 A79-10076

Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077

Heat exchanger designs for coal-fired fluidized beds
21 p0009 A79-10079

Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies --- Process Development Unit
21 p0045 A79-12121

Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121

Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931

Corrosion of superalloys, inconels, and stainless steels by the products from fluidized-bed coal combustion
21 p0080 A79-14932

Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923

Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924

Advances in fluidized bed gasification process development
21 p0145 A79-17633

Recent developments in pressurized fluidized bed coal combustion research
[AIAA PAPER 79-0190] 21 p0157 A79-19589

A theoretical study of wood gasification processes
22 p0257 A79-22923

Emissions from pressurized fluidized-bed combustion processes
22 p0261 A79-23640

Failure analysis in coal conversion systems --- pilot plant for liquefaction
22 p0266 A79-24137

Burn coal cleanly in a fluidized bed - The key is in the controls
22 p0282 A79-26374

A regenerative process for fluidized-bed combustion of coal with lime additives
22 p0297 A79-28984

The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations
[ASME PAPER 79-GT-16] 22 p0306 A79-30510

High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249

The optimization of heat exchanger solidity for coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357

Development progress on the atmospheric fluidized bed coal combustor for cogeneration gas turbine system for industrial cogeneration plants
[ASME PAPER 79-GT-104] 23 p0377 A79-32380

Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428

Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449

Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451

Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems --- Pressurized Fluidized Bed Combustion
[ASME PAPER 79-GT-195] 23 p0380 A79-32453

Fluidised bed combustion of high ash Brazilian coals
23 p0385 A79-33225

Fluidized bed combustion of Brazilian coals
23 p0385 A79-33226

Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385

Status and future promise of fluidized-bed coal combustion
23 p0412 A79-34103

Moving bed heat transfer for advanced power reactor applications
23 p0416 A79-34133

Fluid bed combustion coal fired steam locomotive
23 p0453 A79-37903

The potential application of rotating fluidised beds to power generating schemes
23 p0454 A79-37906

Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908

Fluidised combustion for power generation
23 p0454 A79-37909

The Grimethorpe Experimental Pressurised Fluidised Bed Combustor
23 p0454 A79-37910

Waste disposal by fluid bed incineration and energy recovery modes
23 p0487 A79-40387

Utilization of fluidized bed combustion in energy recovery from solid wastes
23 p0490 A79-40416

Application of fluidization techniques to the combustion of coal - The state of the art
23 p0528 A79-42250

Gasification of solid waste - Potential and application of co-current moving bed gasifiers
23 p0536 A79-43574

Combustion of single coal particles in a jet --- fluidized bed simulation
24 p0632 A79-46319

Heat transfer between a fluidized bed and an immersed vertical U-tube --- in pilot plants
24 p0632 A79-46320

Reduction of particulate carryover from a pressurized fluidized bed
24 p0653 A79-49527

Energy storage in fluidized beds
24 p0657 A79-50211

Manufacture of fuel gas for power generation by fluidized bed gasification of coal
24 p0657 A79-50212

Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment
24 p0679 A79-51796

IGT U-GAS pilot plant developments --- of fluidized-bed gasification
24 p0688 A79-51861

New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863

Multistage fluidised coal combustor
24 p0688 A79-51864

Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543

Environmental assessment of solid residues from fluidized-bed fuel processing
[PB-282940/6] 21 p0179 N79-10968

Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier
[EPRI-AF-782] 21 p0180 N79-11238

Technical notes for the conceptual design for an atmospheric fluidized-bed direct combustion power generating plant
[HCP/T2583-01/2] 21 p0203 N79-13280

Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-32] 21 p0220 N79-14564

Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-33] 21 p0221 N79-14575

Modelling and control of a fluidized bed gasifier
22 p0332 N79-16345

Compilation of level 1 environmental assessment data
[PB-286924/6] 22 p0336 N79-16439

Fluidized-bed combustion
22 p0347 N79-18365

Simulation of fluidized bed coal combustors
[NASA-CR-159529] 22 p0359 N79-20487

Liquid-fluidized-bed heat exchanger flow distribution models
[ICP-1151] 22 p0369 N79-21559

Preliminary comparison of theory and experiment for a conical, pressurized-fluidized-bed coal combustor
[NASA-TM-79137] 23 p0542 N79-22623

Improved techniques for gasifying coal
[PE-2340-7] 23 p0554 N79-24186

Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0590 N79-27342

Fluidized combustion of coal --- to limit SO2 and NOx emissions
23 p0593 N79-27613

Comparison of atmospheric fluidized bed combustion conceptual designs for utility steam generation
[HCP/T2314] 24 p0729 N79-28792

Evaluation of selected chemical processes for production of low-cost silicon, phase 3 --- using a fluidized bed reactor
[NASA-CR-162168] 24 p0769 N79-31756

FLUORESCENCE

Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372

Thermal energy conversion with fluorescent collector-concentrators
23 p0477 A79-39103

FLUORIDES

A feasibility study of inorganic oxide-fluoride compositions for thermal energy storage applications
[AD-A059001] 21 p0196 N79-12559

FLUOROHYDROCARBONS

The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483

FLUTTER

Aeroelastic wind energy converter
21 p0047 A79-12275

FLUTTER ANALYSIS

The aeroelastic behaviour of large Darrieus-type wind energy converters derived from the behaviour of a 5,5 m rotor 23 p0483 A79-40118

FLYWHEELS

Laboratory evaluation of a composite flywheel energy storage system 21 p0013 A79-10110

The propulsion of vehicles by a flywheel 21 p0031 A79-10452

Flywheels for vehicles --- auxiliary power in electric automobiles 21 p0092 A79-15885

Flywheel energy storage system for JT-60 toroidal field coil 21 p0112 A79-16729

Mechanical energy storage system for a 10 KWe solar power pack 21 p0121 A79-17329

Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control 21 p0148 A79-17792

Optimal control of on-board and station flywheel storage for rail transit systems 21 p0148 A79-17822

Optimal control of on-board and station flywheel storage for rail transit systems [ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771

On vibration of a thick flexible ring rotating at high speed --- for flywheel energy storage 22 p0235 A79-20511

A composite-rim flywheel design 22 p0240 A79-20840

Composite material flywheel for the electric-powered passenger vehicle 22 p0240 A79-20842

A status of the 'Alpha-ply' composite flywheel concept development 22 p0241 A79-20843

Flywheel energy accumulators for road vehicles 22 p0241 A79-20845

Composite material flywheels for energy storage on electricity supply systems 22 p0241 A79-20852

Current status of composite flywheel development 22 p0241 A79-20853

An introduction to the variable inertia flywheel /VIF/ [ASME PAPER 79-APM-5] 22 p0298 A79-29064

Application of kinetic energy storage to transportation systems --- flywheels 22 p0299 A79-29337

A flywheel energy storage and conversion system for solar photovoltaic applications [ASME PAPER 79-SOL-1] 22 p0307 A79-30539

Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses 23 p0387 A79-33245

Design of a mechanical energy storage unit --- flywheel 23 p0387 A79-33246

The minimization of drag torque for rotating disks 23 p0387 A79-33247

Energy storage by flywheels - A new flywheel concept 23 p0416 A79-34139

Composite-rim flywheels - Spin tests 23 p0423 A79-34281

Regenerative flywheel energy storage system 24 p0678 A79-51783

High-energy-density flywheel --- rotor design and fabrication 24 p0678 A79-51784

Development of a low loss flywheel magnetic bearing 24 p0678 A79-51785

Performance of retainerless bearings for flywheels 24 p0678 A79-51786

Design of flywheel rotors utilizing cellulosic materials 24 p0678 A79-51787

Low cost flywheel energy storage system demonstration 24 p0678 A79-51788

Novel flywheel energy storage system 24 p0678 A79-51789

Flywheel energy storage interface unit for photovoltaic applications 24 p0679 A79-51791

Residential flywheel with turbine supply 24 p0679 A79-51792

The effect of mechanical energy storage systems on the characteristics of electric vehicles 24 p0683 A79-51820

Advanced flywheel energy storage unit for a high power energy source for vehicular use 24 p0683 A79-51821

Ball screw type wave power generator --- with flywheel drive 24 p0701 A79-51996

Rotatable mass for a flywheel [NASA-CASE-MFS-23051-1] 21 p0172 N79-10422

Study of flywheel energy storage Volume 1: Executive summary [PB-282652/7] 21 p0176 N79-10555

Study of flywheel energy storage. Volume 2: Systems analysis [PB-282653/5] 21 p0176 N79-10556

Study of flywheel energy storage. Volume 3: System mechanization [PB-282654/3] 21 p0177 N79-10557

Study of flywheel energy storage. Volume 4: Life-cycle costs [PB-282655/0] 21 p0177 N79-10558

Study of flywheel energy storage. Volume 5: Vehicle tests [PB-282656/8] 21 p0177 N79-10559

A study of flywheel energy storage for urban transit vehicles [PB-282929/9] 21 p0177 N79-10563

Study of heat engine/flywheel: Hybrid propulsion configuration with electrical transmission system. Phase 2: Design definition [ALO-41/2] 21 p0185 N79-11493

Design and applications of flywheels. Citations from the NTIS data base [NTIS/PS-78/0997/3] 21 p0190 N79-11550

Design and applications of flywheels. Citations from the engineering index data base [NTIS/PS-78/0998/1] 21 p0190 N79-11551

Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors --- Kevlar/epoxy and glass/epoxy composites [UCRL-80116-PT-A] 21 p0215 N79-14165

Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants [UCRL-52000-78-6] 21 p0215 N79-14168

Flywheel components for satellite applications [AD-A060586] 21 p0226 N79-15145

Development of a high energy storage flywheel module [AD-A060351] 21 p0230 N79-15413

Development of a satellite flywheel family operating on one active axis magnetic bearings 22 p0366 N79-21392

Wayside energy storage summary. Volume 1: Summary [DOT-TSC-FRA-79-7-1-VOL-1] 22 p0370 N79-21563

Outgassing tests of fiber-epoxy composite materials [SAND-78-7075] 23 p0552 N79-24071

Evaluation of a flywheel-powered shuttle car [FE-8890] 23 p0562 N79-24488

General-purpose aluminum-air/flywheel electric vehicles [UCRL-82003] 23 p0564 N79-24503

Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel [UCRL-52623] 23 p0576 N79-26121

DOE/STOR bibliography for flywheel energy systems, 1977 [UCRL-52637] 24 p0742 N79-29665

Study of system implications of high speed flywheels as energy storage devices on satellites, volume 1 [REPT-30/1020-VOL-1] 24 p0759 N79-30834

Study of system implications of high speed flywheels as energy storage devices on satellites, volume 2 [REPT-30/1020-VOL-2] 24 p0760 N79-30835

Frequency analysis of a thick-rim flywheel [ORNL/TM-5804] 24 p0781 N79-32555

FOAMING

Recent developments in the foam OTEC system 24 p0623 A79-45832

Description and status report of a program to define sea water-surfactant interactions in relation to the foam system --- OTEC power plant 24 p0623 A79-45833

FOCI
Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design 22 p0263 A79-23764

FOCUSING
Five MW solar thermal test facility heliostat focus and alignment system 21 p0043 A79-11972
Nonimaging solar concentrators 21 p0043 A79-11973
Development of energetic neutral beams to the megawatt power level for controlled thermonuclear research 21 p0054 A79-13439
An analysis of a cylindrical parabolic focussing collector for distributed collector power system 21 p0134 A79-17442
Solar thermal electric power systems - Comparison of line-focus collectors 22 p0263 A79-23758
Test results of a moderately focusing flat-plate solar collector 23 p0399 A79-33995
Structural optimization of SMC line focusing collectors 23 p0534 A79-43295
Elastically deformed, linear focusing solar reflector 24 p0670 A79-51728

FOIL BEARINGS
Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences [SAE PAPER 790109] 22 p0314 A79-31356

FOILS (MATERIALS)
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation 23 p0466 A79-38603

FOKKER-PLANCK EQUATION
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks 24 p0606 A79-44979

FOLDING STRUCTURES
Flexible roll-out solar generators - Energy sources for future high-power space missions [DGLR PAPER 78-165] 21 p0063 A79-14056
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite [S-1267-CA/81-VOL-1] 23 p0599 N79-27708

FOOD
Practical aspects and applications of bioconversion 23 p0467 A79-38617
The production of ethanol from agricultural waste: An economic evaluation [PB-292552/7] 23 p0577 N79-26233

FORCE DISTRIBUTION
Effect of force field nonuniformity on flow in an MHD channel 21 p0101 A79-16365

FORCED CONVECTION
Buoyancy effects in a solar regenerator --- for air dehumidifier absorbent solutions 22 p0262 A79-23752
A generalized correlation of critical heat flux for the forced convection boiling in vertical uniformly heated round tubes - A supplementary report 23 p0487 A79-40301
International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 2 - Heat transfer in energy conversion, natural convection, combined heat and mass transfer, condensation, and forced convection 23 p0530 A79-42886

FORCED VIBRATION
A theory for wave-power absorption by two independently oscillating bodies 22 p0259 A79-23307
Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/ 24 p0618 A79-45790

FORECASTING
Energy impact on economic activity and long-term trend forecast 23 p0419 A79-34163
The regulation of an electricity supply system including wind energy generators 23 p0485 A79-40130
Future transportation fuels 24 p0650 A79-49377
What will be the price for energy tomorrow. I - Coal price 24 p0652 A79-49515
Coal yesterday and tomorrow --- coal utilization forecasting 24 p0652 A79-49516
The economic and political conditions of access to resources of natural gas 24 p0652 A79-49519
The international energy agency - The way ahead 24 p0652 A79-49520
Chances for a low energy profile society 24 p0653 A79-49522
Toward the renewables - A natural gas/solar energy transition strategy 24 p0686 A79-51851
Hydrogen program at Electric Power Research Institute 24 p0687 A79-51854
Today's geothermal power economics and risks 24 p0689 A79-51869
Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels 21 p0218 N79-14532
Historic and forecasted energy prices by US Department of Energy region and fuel type for three macroeconomic scenarios and one imported oil price escalation scenario [DOE/EIA-0102/27] 24 p0725 N79-28751
Alternative energy sources: An analysis of their role in energy policy 24 p0743 N79-29668
Fact sheet: Forecasted automobile gasoline consumption [DOE/EIA-0102/1] 24 p0746 N79-30402
Evaluation of future world oil prices [DOE/EIA-0102/4] 24 p0762 N79-31082
Regional residential sector energy price forecasts for 1978: Electricity, natural gas, number 2 fuel oil, and propane [DOE/EIA-0102/46] 24 p0762 N79-31083

FOREIGN TRADE
Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980 [DOE/EIA-0102/20] 24 p0718 N79-28356
Role of refined product imports in the domestic fuel market [DOE/EIA-0102/53] 24 p0778 N79-32372

FOREST MANAGEMENT
Forest residues as an alternate energy source 21 p0072 A79-14689
An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier 23 p0381 A79-32592
Potential for biomass utilization in Canada 23 p0494 A79-40744
FLAME: Forestry Lands Allocated for Managing energy. Feasibility study [AD-A059993] 21 p0217 N79-14507
Identification of wood energy resources in central Michigan [NASA-CR-158130] 22 p0347 N79-18424

FORESTS
Advanced processes for more efficient use of forest products residual material 21 p0096 A79-15919
Biomass - The self-replacing energy resource 24 p0651 A79-49425
Short notice on a grand forest: Tropical land converting sunlight to energy [NP-23278] 24 p0741 N79-29653

FOSSIL FUELS
Permeability enhancement using explosive techniques --- georesources recovery techniques 21 p0005 A79-10048
Geothermal preheating in fossil-fired steam power plants 21 p0014 A79-10118
Fossil superheating in geothermal steam power plants 21 p0014 A79-10122
The fossil fuel cost of solar heating 21 p0022 A79-10180
Prospects of thermionic power systems 21 p0026 A79-10220
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry 21 p0064 A79-14112
A systems study of our energy problems 21 p0074 A79-14704
Hybrid fossil-geothermal power plants 21 p0096 A79-15920
High-temperature oxidizer preheater --- for fossil fuel MHD energy conversion 21 p0106 A79-16487
Fuels and combustion --- for open cycle MHD system 21 p0106 A79-16488
Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/ --- Book 21 p0147 A79-17646
Coal - Meeting the energy challenge 21 p0147 A79-17647
Lignite - Abundant raw material of the future 22 p0296 A79-28438
Electrical induction heating of solid fossil fuels in situ - Some estimates 22 p0304 A79-30215
Benefits of solar/fossil hybrid gas turbine systems [ASME PAPER 79-GT-38] 22 p0309 A79-30554
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications [ASME PAPER 79-GT-94] 23 p0377 A79-32370
Synthetic natural gas production from peat 23 p0411 A79-34092
Solar energy and heat pumps - A possible substitute for fossil fuels for heating private households 23 p0434 A79-35464
The problem of carbon dioxide --- fossil fuel consumption effect on air pollution 23 p0438 A79-36201
Fuel release from solid fossil-fuel deposits by electrical induction heating 23 p0446 A79-37285
Fossil fuel heat pumps for domestic, commercial and industrial space heating 23 p0449 A79-37852
Performance estimation of a total energy domestic heat pump 23 p0449 A79-37854
Open cycle MHD generation in the United Kingdom - A reappraisal 23 p0453 A79-37904
Substitute fuels and development of recovery methods 23 p0525 A79-41818
Market penetration characteristics for energy production and atmospheric carbon dioxide growth 24 p0643 A79-47812
Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings 24 p0664 A79-50876
A combined cycle for solar-fossil hybrid power generation 24 p0674 A79-51760
Synthetic fuels from peat gasification 24 p0687 A79-51856
Net energy analysis of five energy systems [ORAU/IEA(R)-77-12] 21 p0174 N79-10534
Comprehensive overview of winter energy data bulletins [PB-282787/1] 21 p0177 N79-10565
Ceramic technology readiness program [FE-2664-7] 21 p0180 N79-11223
An assessment of mercury emissions from fossil fueled power plants [PB-285227/5] 21 p0213 N79-13592
Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics [PB-284743/2] 21 p0217 N79-14521
Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels 21 p0218 N79-14532
SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion [PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices [PB-291496/8] 23 p0539 N79-22319
A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption [AD-A067165] 23 p0582 N79-26510
On fossil fuel reserves and resources [IIASA-RM-78-35] 23 p0593 N79-27628
Pollution and environmental aspects of fuel conversion. A bibliography with abstracts [NTIS/PS-79/0378] 24 p0761 N79-30857
Fossil energy program summary document [DOE/ET-0087] 24 p0788 N79-32696
Environmental development plan, fossil fuel utilization program [DOE/EDP-0046] 24 p0793 N79-32746
Uncertainties associated with global effects of atmospheric carbon dioxide [ORAU/IEA-79-6(0)] 24 p0803 N79-33699

FOSSILS
Conventional combustion on environmental assessment program [PB-291401/8] 23 p0545 N79-22668

FOULING
OTEC biofouling and corrosion testing program --- for heat exchangers 23 p0429 A79-35057
The problem of fouling in the utilisation of geothermal energy 23 p0449 A79-37853
Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978 --- for OTEC 24 p0620 A79-45803
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico 24 p0620 A79-45806
The effects of biofouling and corrosion on heat transfer measurements --- for OTEC 24 p0623 A79-45829
Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger 24 p0623 A79-45835
Application of the Cathelco system for control of fouling in OTEC systems 24 p0627 A79-45870

FOURIER TRANSFORMATION
Specularity measurements by Fourier transform examination --- for scattering properties of solar mirrors 23 p0431 A79-35069

FRACTIONATION
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids [CONF-790334-2] 24 p0748 N79-30689

FRACTURE MECHANICS
Fracture research in Canada 21 p0144 A79-17530
On design requisites for hydrogen energy systems 24 p0685 A79-51844

FRACTURE STRENGTH
Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks 24 p0604 A79-44537
Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy 24 p0604 A79-44549
Fracture toughness of cryogenic alloys 24 p0604 A79-44550

FRACTURES (MATERIALS)
Bibliography of subsidence and related topics for in situ coal gasification [LETC/BL-71316-1] 24 p0733 N79-29373

FRACTURING

Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization 21 p0076 A79-14744

FRAGMENTATION

The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants 21 p0009 A79-10078

Plan to demonstrate oil shale mining and rubblizing for a modified in situ retorting process [UCRL-13979] 24 p0721 N79-28655

FRANCE

Improvement of direct-current electrical prospecting methods for the geothermal investigation of the Rhine Graben 21 p0075 A79-14734

Underground gasification of coal at deep levels - Perspectives and problems 21 p0156 A79-19401

Solar houses in Blagnac /Blagnac, Haute-Garonne, France/ 22 p0276 A79-25937

French solar policy - Its extent, its methods, its objectives 23 p0434 A79-35476

Industrial applications of solar heat 23 p0434 A79-35477

A completely solar power supply for France 23 p0436 A79-35492

Determination and interpretation of the geothermal flux at Bournac /Haute-Loire/ 23 p0480 A79-39850

Rational utilization of electricity in order to satisfy the general objectives of the national energy policy 23 p0525 A79-41821

European waste-to-energy systems: Case study of Rennes, France [HCP/M2103-0008] 24 p0737 N79-29605

Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study [E79-10294] 24 p0796 N79-33526

FREE BOUNDARIES

The effect of limiters and current profile on elliptic free-boundary MHD equilibria 22 p0291 A79-27881

FREE CONVECTION

Convective effects in 'slat collectors' 21 p0129 A79-17400

Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection 21 p0129 A79-17401

Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors 22 p0281 A79-26206

Dimensional relations for free convective heat transfer in flat-plate collectors --- solar collector heat loss 22 p0316 A79-31406

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 2 - Heat transfer in energy conversion, natural convection, combined heat and mass transfer, condensation, and forced convection 23 p0530 A79-42886

On the stability of the natural circulation solar heater 23 p0531 A79-42896

An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures 23 p0531 A79-42908

Natural convection in porous media and geothermal systems 23 p0533 A79-43014

Enhancement of heat transfer 23 p0533 A79-43016

FREE ELECTRONS

New methods for the conversion of solar energy to R. F. and laser power [AIAA PAPER 79-1416] 23 p0426 A79-34846

Boltzmann simulation of a storage ring laser 23 p0487 A79-40381

Measurement of free carrier lifetime in an illuminated solar cell from capacitance measurements 23 p0497 A79-40891

Contactless measurement of lifetime by free carrier infrared absorption --- in solar cells 23 p0497 A79-40892

FREEZING

Design and evaluation of aircraft heat source systems for use with high-freezing point fuels [NASA-CR-159568] 23 p0553 N79-24172

Reliability and maintainability evaluation of freezing in solar systems [ANL/SDP-TM-78-3] 23 p0596 N79-27674

FREON

A small solar power plant with a freon turbine 21 p0141 A79-17501

Design of a freon jet pump for use in a solar cooling system [ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847

Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop --- for low temperature geothermal sources 23 p0408 A79-34074

Ocean Thermal Energy Conversion plant with Freon 22 24 p0619 A79-45795

FREQUENCY DISTRIBUTION

Frequency distribution of wind speed near the surface 21 p0165 A79-20139

FREQUENCY MULTIPLIERS

Frequency doubling of a solar pumped Nd:YAG laser 21 p0044 A79-12062

FREQUENCY SYNCHRONIZATION

On the use of eddy-current couplings in wind-driven synchronous machines 21 p0113 A79-16742

Induction-generator/synchronous-condenser system for wind-turbine power 22 p0286 A79-27219

FRESNEL LENSES

Photovoltaic concentrating array 21 p0021 A79-10172

Tracking high temperature collectors 21 p0090 A79-15856

High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator 21 p0135 A79-17448

Design, construction and performance of Fresnel lens for solar energy collection 21 p0136 A79-17456

Efficient Fresnel lens for solar concentration 22 p0285 A79-26816

Cast acrylic Fresnel lenses for solar energy concentration 23 p0432 A79-35076

Solar eyeball - An automatic sun-tracking concentrator for use with photovoltaic generators 23 p0442 A79-36792

Fresnel optics for solar concentration on photovoltaic cells 23 p0508 A79-40994

Solar energy concentrator design and operation. Citations from the NTIS data base [NTIS/PS-78/0838/9] 21 p0178 N79-10566

Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator [NASA-TM-78222] 22 p0360 N79-20495

Certification and verification for Northrup model NSC-01-0732 fresnel lens concentrating solar collector [NASA-CR-161164] 23 p0572 N79-25504

A 10-kilowatt photovoltaic concentrator array [SAND-78-7024] 23 p0598 N79-27699

FRESNEL REFLECTORS

Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design 22 p0263 A79-23764

FUEL CAPSULES

Cryogenic pellets for laser-fusion research - Theoretical and practical considerations 21 p0085 A79-15334

Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335
Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034
Advanced-fuel pellet approaches to inertial fusion
24 p0630 A79-46303

FUEL CELLS
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091
Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092
The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution --- fuel cell electrocatalysis
21 p0037 A79-11795
Recent advances in electrocatalysis and their implications for fuel cells
21 p0038 A79-11807
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates --- in fuel cell electrodes
21 p0038 A79-11808
O2 reduction kinetics in concentrated acids --- in fuel cells
21 p0038 A79-11809
Fuel cell electrocatalysis - Where have we failed
21 p0039 A79-11810
Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures --- for fuel cells
21 p0039 A79-11812
Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813
ERDA fuel cell programs
21 p0039 A79-11814
The state-of-the-art of hydrogen-air phosphoric acid electrolyte fuel cells
21 p0039 A79-11815
Analysis of electrolyte shunt currents in fuel cell powerplants
21 p0039 A79-11816
Molten carbonate fuel cell systems - Status and potential
21 p0039 A79-11817
Effects of sintering on porous fuel cell electrodes
21 p0039 A79-11818
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819
Thin film high temperature solid electrolyte fuel cells
21 p0040 A79-11820
Molten-carbonate CO2 concentrator - Preliminary experiments
[ASME PAPER 78-ENAS-2] 21 p0048 A79-12551
Fuel-cell power plants
21 p0068 A79-14398
Fuel cell on-site integrated energy system parametric analysis of a residential complex
21 p0081 A79-14947
Role and status of dispersed electric utility fuel cell power plants
21 p0093 A79-15894
Development of central station power plants integrated with coal gasifiers --- utilizing molten-carbonate fuel cells
21 p0093 A79-15895
Compatibility of direct energy storage devices with ac. processing power system components
21 p0111 A79-16728
Development of a 1 kW fuel cell aggregate with acid electrolyte
21 p0148 A79-17994
Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products --- in fuel cell
21 p0164 A79-19851
Steady-state composition profiles in mixed molten salt electrochemical devices. II - Molten carbonate fuel cell analogs
22 p0305 A79-30333
Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130
Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Migrational polarization in high current density molten salt battery and fuel cell analogs
23 p0446 A79-37273
Batteries, fuel cells, a hydrogen economy - Keynote address
23 p0451 A79-37873
A thermoanalytical investigation of nickel catalysts for fuel cells
23 p0481 A79-40008
Fuels cells - Their development and potential
23 p0495 A79-40750
Development and thermodynamic layout of a fuel cell component
23 p0528 A79-42227
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896
The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization
24 p0652 A79-49489
Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809
The role of fuel cells in NASA's space power systems
24 p0681 A79-51810
A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming
24 p0681 A79-51811
Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812
Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813
Molten carbonate fuel cell systems development program
24 p0682 A79-51814
Solid electrolyte fuel cell for electric utility power generation
24 p0682 A79-51815
Molten carbonate fuel cell based, coal fired power plants for electric power generation
24 p0682 A79-51816
Molten carbonate fuel cell performance model for cycle studies
24 p0682 A79-51817
Effect of temperature and pressure on molten carbonate fuel cell fuels and performance
24 p0682 A79-51818
Technology status: Batteries and fuel cells
21 p0170 N79-10132
Technology status: Fuel cells and electrolysis cells
21 p0170 N79-10133
Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483
High energy metal hydride fuel cell power source
[AD-A056491] 21 p0184 N79-11485
Fuel cell on-site integrated energy system parametric analysis of a residential complex
[NASA-TM-78996] 21 p0193 N79-11955
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A058795] 21 p0206 N79-13503
Improved anodes for liquid hydrocarbon fuel cell
[AD-A058456] 21 p0206 N79-13504

- Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells [AD-A058380] 21 p0206 N79-13505
- Materials for fuel cells [PB-285360/4] 21 p0212 N79-13553
- Optimization of PtDoped KOCITE (trade name) electrodes in H3PO4 fuel cells [AD-A061242] 22 p0342 N79-17340
- Development of high temperature fuel cell battery [BMFT-FB-T-77-17] 22 p0342 N79-17344
- Venture analysis case study for on-site fuel cell energy systems [PCR-0783-VOL-1] 22 p0361 N79-20505
- Thin film battery/fuel cell power generating system [CONS/1197-9] 22 p0369 N79-21556
- Multistack nickel-hydrogen units 22 p0371 N79-21610
- Solid Polymer Electrolyte (SPE) fuel cell technology program [NASA-CR-160159] 22 p0371 N79-21622
- Analysis of a fuel cell on-site integrated energy system for a residential complex [NASA-TM-79161] 23 p0542 N79-22624
- Fundamental solid electrode studies related to corrosion prevention, fuel cells and batteries [AD-A064554] 23 p0544 N79-22641
- The role of fuel cells in NASA's space power systems [NASA-TM-79182] 23 p0546 N79-23133
- Commercial phosphoric acid fuel cell system technology development [NASA-TM-79169] 23 p0571 N79-25500
- Recent advances in redox flow cell storage systems [NASA-TM-79186] 23 p0581 N79-26505
- Advanced technology fuel cell program --- molten carbonate and phosphoric acid fuel cells and coal utilization in power plants [EPRI-EM-956] 23 p0598 N79-27702
- Market assessment of fuel cell total energy systems [ORNL/CCN-36] 23 p0598 N79-27704
- Technology development for phosphoric acid fuel cell powerplant, phase 2 [NASA-CR-159572] 24 p0737 N79-29604
- Development program for 3.0 KW inverter: Militarized inverter for use with fuel cell or battery power plants [AD-A068433] 24 p0738 N79-29612
- Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker [AD-A068452] 24 p0738 N79-29616
- Fuel cells: Applied research fuel cell materials and electrocatalysis [BNL-50951] 24 p0750 N79-30728
- Ultrafine polybenzimidazole (PBI) fibers --- separators for alkaline batteries and dfuel cells [NASA-CR-159644] 24 p0764 N79-31350
- Assessment of short and medium term improvements to the Spacelab power system [ESA-CR(P)-1193-VOL-2] 24 p0768 N79-31513
- Fuel cell catalyst sintering studies --- platinum catalysts in phosphoric acid fuel cells [EPRI-EM-833] 24 p0776 N79-31828
- Advanced technology light weight fuel cell program --- for space power applications [NASA-CR-159653] 24 p0800 N79-33581
- Improvement of phosphoric acid fuel cell stacks [AD-A070881] 24 p0800 N79-33582

FUEL COMBUSTION

- Fluidized-bed combustion of low-quality fuels 21 p0007 A79-10066
- A review of the PFBC combined cycle and its influence on gas turbine design parameters --- Pressurized Fluidized Bed Combustion 21 p0007 A79-10067
- Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion 21 p0008 A79-10070
- Aspects of pulsating combustion --- gaseous methane burning system 21 p0008 A79-10072
- LAG-Process, some results of utilization in transport and mechanical engineering 21 p0030 A79-10248
- Characteristics and combustion of future hydrocarbon fuels 21 p0036 A79-11599
- Impact of future fuel properties on aircraft engines and fuel systems 21 p0036 A79-11600
- Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers 21 p0051 A79-12977
- Alternative fuels and combustion problems 21 p0051 A79-12978
- Future fuels in gas turbine engines 21 p0051 A79-12979
- Use of alternative fuels in stationary combustors 21 p0052 A79-12981
- Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors 21 p0052 A79-12982
- Combustion of droplets and sprays of some alternative fuels 21 p0052 A79-12983
- Flame emissivities - Alternative fuels 21 p0052 A79-12984
- Combustion chemistry of chain hydrocarbons 21 p0052 A79-12986
- Liquid-phase reactions of vaporizing hydrocarbon fuels 21 p0052 A79-12987
- Role of aromatics in soot formation 21 p0053 A79-12988
- Kinetics of nitric oxide formation in combustion 21 p0053 A79-12989
- Emission control techniques for alternative fuel combustion 21 p0053 A79-12990
- Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization 21 p0065 A79-14121
- The fate of fuel nitrogen - Implications for combustor design and operation 21 p0080 A79-14927
- Environmental effects of burning solid waste as fuel 21 p0082 A79-15115
- Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures --- derived from shale oil retorting and coal gasification 21 p0083 A79-15245
- Commercialization of fluidized-bed combustion systems by the State of Ohio 21 p0096 A79-15923
- Fuels and combustion --- for open cycle MHD system 21 p0106 A79-16488
- The atmospheric CO2 consequences of heavy dependence on coal 21 p0107 A79-16524
- Selection of a characteristic quantity defining the self-ignition of a fuel in a stream 21 p0114 A79-16786
- A characteristic time correlation for combustion inefficiency from alternative fuels [AIAA PAPER 79-0357] 21 p0158 A79-19687
- Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures [ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735
- Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility [ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741
- Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler [ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788
- Hydrogen enrichment for low-emission jet combustion 22 p0244 A79-21347
- Electrochemical use of biomass 22 p0254 A79-22273
- Effects of fuel properties on soot formation in turbine combustion [SAE PAPER 781026] 22 p0274 A79-25899
- A regenerative process for fluidized-bed combustion of coal with lime additives 22 p0297 A79-28984
- A new combustion system in the three-valve stratified charge engine [SAE PAPER 790439] 22 p0316 A79-31376
- Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity 22 p0324 A79-31845

The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
Mechanistic modeling of pulverized coal combustion --- in MHD generators
23 p0390 A79-33380
Coal combustor technology development
23 p0390 A79-33381
Sensitivities of outputs to variations of inputs in MHD combustors
23 p0390 A79-33382
A two-dimensional pulverized coal combustor model --- for MHD generators
23 p0390 A79-33383
Behavior of eastern and western coals in fuel-rich reaction conditions --- gasification behavior of Montana Rosebud and Pittsburgh seam bituminous coals for MHD generators
23 p0390 A79-33384
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 7 - Hydrocarbon conversion technology
23 p0410 A79-34086
Status and future promise of fluidized-bed coal combustion
23 p0412 A79-34103
Use of fluidized media in thermal power systems
23 p0436 A79-35525
Fossil fuel heat pumps for domestic, commercial and industrial space heating
23 p0449 A79-37852
Fluid bed combustion coal fired steam locomotive
23 p0453 A79-37903
Open cycle MHD generation in the United Kingdom - A reappraisal
23 p0453 A79-37904
Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908
Fluidised combustion for power generation
23 p0454 A79-37909
Characterization and formation of submicron particles in coal-fired plants
23 p0460 A79-38316
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines
23 p0461 A79-38387
Methods of reducing harmful emissions from thermal power stations
23 p0474 A79-38863
Investigating the formation of oxides of nitrogen when burning solid fuel --- air pollution by industrial exhaust gases
23 p0474 A79-38864
An investigation of the formation of oxides of nitrogen in a pulverised coal flame
23 p0474 A79-38865
Heat transfer in a high temperature combustion chamber with premixing --- in MHD generators
23 p0474 A79-38869
Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes --- Book
23 p0474 A79-38871
Diagnostic techniques in combustion MHD flows
23 p0478 A79-39508
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment
23 p0479 A79-39807
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220
The exergy of fuels --- energy conversion factors
24 p0611 A79-45500
Fuel uses of hydrogen in the residential/commercial/industrial sectors
24 p0615 A79-45602
Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures
24 p0632 A79-46318
The indirect Brayton energy recovery system
24 p0696 A79-51958
The concept of available work as applied to the conservation of fuel resources
24 p0698 A79-51970
Coal combustion
24 p0714 A79-53779
Coal gasification for high and low Btu fuels
24 p0714 A79-53780
Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543
The role of fundamental combustion in the future aviation fuels program --- carbon formation in gas turbine primary zones
21 p0202 N79-13195
Characteristics and combustion of future hydrocarbon fuels
21 p0202 N79-13196
Effect of swirler-mounted mixing venturi on emissions of flame-tube combustor using jet A fuel
[NASA-TP-1393] 21 p0215 N79-14099
Evaluation of future jet fuel combustion characteristics
[AD-A060218] 21 p0216 N79-14231
Alternative hydrocarbon fuels: Combustion and chemical kinetics --- synthetic aircraft fuels
[AD-A061050] 22 p0338 N79-17011
An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249
Second Annual Combustion and Fuels Technology Program Contractor Review Meeting
[CONF-7809103] 24 p0731 N79-29271

FUEL CONSUMPTION
H-coal products for direct application to power generation --- coal liquefaction derived fuels
21 p0006 A79-10056
A technical analysis for cogeneration systems with potential applications in twelve California industrial plants --- energy saving heat-electricity utility systems
21 p0011 A79-10099
The fossil fuel cost of solar heating
21 p0022 A79-10180
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398
Advanced turbofan engines for low fuel consumption
[ASME PAPER 78-GT-192] 21 p0033 A79-10816
Making turbofan engines more energy efficient
[ASME PAPER 78-GT-198] 21 p0033 A79-10818
Energy conservation aircraft design and operational procedures
[ONERA, TP NO. 1978-107] 21 p0036 A79-11572
National Conference on Energy Conservation in General Aviation, 1st, Kalamazoo, Mich., October 10, 11, 1977, Proceedings
21 p0047 A79-12376
Economy in flight operations
21 p0048 A79-12383
Technology for aircraft energy efficiency
21 p0066 A79-14136
Federal automobile fuel economy standards - A status report
21 p0073 A79-14693
Energy storage - Economics and fuel conservation
21 p0153 A79-18464
Role of fuel management --- for airlines
21 p0155 A79-18521
Fuel conservative aircraft engine technology
21 p0164 A79-20078
Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581
Fuels of the future. I --- demand and proposed sources
22 p0282 A79-26408
Ways of improving steam-gas power plants --- fuel economy
22 p0299 A79-29298
Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374

The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375

Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911

The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912

The impact of aeronautical sciences on other modes of transport
22 p0325 A79-31915

Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331

Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396

Comparative economics of alternative fuels for intermediate services, combined cycle power plant
23 p0419 A79-34160

The problem of carbon dioxide --- fossil fuel consumption effect on air pollution
23 p0438 A79-36201

Manufacturers developing fuel-efficient engines
23 p0438 A79-36380

Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192

An analysis of operational procedures and design modifications for aircraft fuel conservation
[AIAA 79-1656] 24 p0611 A79-45328

Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability
24 p0628 A79-45996

Market penetration characteristics for energy production and atmospheric carbon dioxide growth
24 p0643 A79-47812

Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918

Alternative fuels in aviation
24 p0651 A79-49381

Reductions in vehicle fuel consumption due to refinements in aerodynamic design --- for trailer trucks
24 p0658 A79-50335

The design impact of power-augmented ram technology on large energy efficient aircraft
[AIAA PAPER 79-1864] 24 p0669 A79-51250

An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705

Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies
24 p0714 A79-54278

End use energy consumption data base: Series 1 tables
[PB-281817/7] 21 p0177 N79-10560

Energy in transportation
[PB-282928/1] 21 p0177 N79-10561

Automotive Stirling engine development program
[NASA-CR-159436] 21 p0181 N79-11406

Federal Energy Data System (FEDS) technical documentation
[PB-281815/1] 21 p0189 N79-11542

Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570

Energy efficient engine preliminary design and integration study
[NASA-CR-135396] 21 p0194 N79-12084

National Emissions Data System (NEDS) fuel use report (1974)
[PB-284650/2] 21 p0194 N79-12251

Aircraft Engine Future Fuels and Energy Conservation
[AGARD-LS-96] 21 p0201 N79-13192

Future aviation fuels fuel suppliers views
21 p0202 N79-13194

Engine component improvement and performance retention
21 p0202 N79-13198

Low energy consumption engines
21 p0202 N79-13199

Energy conservation aircraft design and operational procedures
21 p0202 N79-13200

The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370

Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538

A detailed analysis of the impact of onsite equipment on utility costs --- marginal costs of providing backup power for solar energy systems
21 p0218 N79-14535

Performance characteristics of automotive engines in the United States. First Series: Report No. 14 1975 Mazda Rotary 79 CID (1.1 Liters), 4V --- fuel consumption and emissions
[PB-286074/0] 21 p0226 N79-15304

Performance characteristics of automotive engines in the United States. First series: Report no. 15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305

Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V --- fuel consumption and exhaust gases
[PB-286076/5] 21 p0227 N79-15306

Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I. --- fuel consumption and exhaust gases
[PB-286077/3] 21 p0227 N79-15307

Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), IV
[PB-286294/4] 21 p0227 N79-15308

Performance characteristics of automotive engines in the United States. Second series, report no. 6: 1976 Nissan diesel 198 CID (3.2 liters), F. I.
[PB-286295/1] 21 p0227 N79-15309

Performance characteristics of automotive engines in the United States. Second series, report no. 7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310

Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311

Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312

Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V --- fuel consumption and exhaust gases
[PB-286299/3] 21 p0227 N79-15313

Performance characteristics of automotive engines in the United States. First series, report no. 19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-15314

Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315

LPG in Missouri
[PB-286329/8] 21 p0230 N79-15421

Total energy consumption for municipal wastewater treatment
[PB-286688/7] 21 p0231 N79-15439

Energy efficient engine: Propulsion system-aircraft integration evaluation
[NASA-CR-159488] 22 p0337 N79-16850

The planning and economic aspects of energy supply and demand in South Africa
22 p0341 N79-17325

An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft. Volume 1: Executive summary
[AD-A061746] 22 p0351 N79-18969

Effects of low ambient temperature on the exhaust emissions and fuel economy of 84 automobiles in Chicago
[PB-288400/5] 22 p0355 N79-19488

An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft, volume 2
[AD-A062609] 22 p0356 N79-20109
Transportation energy conservation data book, edition 3
[ORNL-5493] 22 p0369 N79-21562
National Emissions Data Systems (NEDS) fuel use report (1975)
[PB-290162/7] 22 p0373 N79-21670
Adaptation for the economy or adaptation for energy conservation --- passenger aircraft design
[AAAF-NT-77-23] 23 p0551 N79-23537
Minnesota coal study
[PB-292106/2] 23 p0575 N79-25538
Energy Tax Act of 1978
[PUB-LAW-95-618] 23 p0576 N79-25926
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236
Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 427 cubic inch 1977 California GMC 6500
[PB-293530/2] 23 p0578 N79-26410
Performance characteristics of automotive engines in the United States. Third series: Report no. 2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411
Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412
Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 361 cubic inch 1966 Ford F-600
[PB-293529/4] 23 p0586 N79-26567
Energy efficient aircraft engines
[NASA-TM-79204] 23 p0587 N79-27141
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337
Energy use and supply in the Lake Champlain Basin
[PB-293437/0] 23 p0599 N79-27713
Evaluation of automobile drivetrain components to improve fuel economy
[PB-293728/2] 24 p0720 N79-28594
Alternate engines: State of the art study
[PB-293940/3] 24 p0720 N79-28596
Assessment of potential US petroleum supply shortfalls, 1978
[DOE/EIA-0102/38] 24 p0734 N79-29376
International energy evaluation system. Volume 1: Executive summary
[HCP/I8602-01/1] 24 p0742 N79-29662
Fact sheet: Forecasted automobile gasoline consumption
[DOE/EIA-0102/1] 24 p0746 N79-30402
Diesel bus performance simulation program
[PB-295524/3] 24 p0763 N79-31110
JT9D-70/59 improved high pressure turbine active clearance control system --- for specific fuel consumption improvement
[NASA-CR-159661] 24 p0763 N79-31208
Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests
[PB-295478/2] 24 p0778 N79-32135

FUEL CONTROL
An air-modulated fluidic fuel-injection system --- automobile fuel management
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766
An air/fuel control system for the Stirling engine
[SAE PAPER 790328] 22 p0315 A79-31369

FUEL CORROSION
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536
Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems --- Pressurized Fluidized Bed Combustion
[ASME PAPER 79-GT-195] 23 p0380 A79-32453
The chemical stability of kerosene fractions
23 p0529 A79-42275

FUEL FLOW
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream
21 p0114 A79-16786
Comparison of two hydrogen production methods for nuclear-hydrogen conversion
23 p0413 A79-34108
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft
[AIAA PAPER 79-1863] 24 p0643 A79-47920

FUEL INJECTION
An air-modulated fluidic fuel-injection system --- automobile fuel management
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines
23 p0461 A79-38387
Characterization of a swept-strut hydrogen fuel-injector for scramjet applications
24 p0649 A79-49345
Effect of swirler-mounted mixing venturi on emissions of flame-tube combustor using jet A fuel
[NASA-TP-1393] 21 p0215 N79-14099
Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential --- with direct chamber injection
22 p0329 N79-15967

FUEL OILS
Scaling up coal liquids
21 p0031 A79-10475
SRC-II - Review of development and status --- Solvent Refined Coal process for fuel oil production
21 p0092 A79-15887
Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility
[ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390
The development of alternate combustibles for diesel engines
23 p0385 A79-33227
Effect of operating variables on reactor performance in the Synthoil coal conversion process
23 p0412 A79-34099
COIL process - First generation commercial coal liquefaction plant
23 p0412 A79-34101
Residual shale oil as a boiler fuel
23 p0412 A79-34105
The impact of oil price increases on the competitiveness of non-conventional energy technologies
23 p0419 A79-34162
Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749
A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming
24 p0681 A79-51811
Environmental assessment of solid residues from fluidized-bed fuel processing
[PB-282940/6] 21 p0179 N79-10968
Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446
Water-related environmental effects in fuel conversion. Volume 2: Appendices
[PB-288874/1] 22 p0356 N79-19496
Re-examination of undiscovered oil resources in the United States
[DOE/EIA-0103/9] 23 p0593 N79-27643
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689
Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432

Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348

FUEL PUMPS
A canister fuel pump for general aviation aircraft
[SAE PAPER 790624] 23 p0440 A79-36752

FUEL SPRAYS
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983

FUEL SYSTEMS
Impact of future fuel properties on aircraft engines and fuel systems
21 p0036 A79-11600
Effect of broadened-specification fuels on aircraft engines and fuel systems
[AIAA 79-7008] 22 p0300 A79-29383
Study of integrated gasification combined cycle plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530
An air/fuel control system for the Stirling engine
[SAE PAPER 790328] 22 p0315 A79-31369
Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
Pulverised fuel non-return flap valve
[TDB-317] 23 p0578 N79-26408

FUEL TANKS
Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507
The hydrogen/hydride energy concept
22 p0252 A79-21717
Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks
[PB-290579/2] 23 p0566 N79-24537
Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413

FUEL TESTS
Some aspects of aircraft jet engine fuels
21 p0035 A79-11368
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983
Liquid-phase reactions of vaporizing hydrocarbon fuels
21 p0052 A79-12987
Kinetics of nitric oxide formation in combustion
21 p0053 A79-12989
A characteristic time correlation for combustion inefficiency from alternative fuels
[AIAA PAPER 79-0357] 21 p0158 A79-19687
Effects of fuel properties on soot formation in turbine combustion
[SAE PAPER 781026] 22 p0274 A79-25899
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
22 p0274 A79-25917
Testing to assess the affect of degraded fuel specifications on the cold start ability of a T63-A-700 engine
[AIAA 79-7009] 22 p0300 A79-29384
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
Operation of a GT-225 diffusion-flame combustor on alternative fuels performance, durability and emissions
[ASME PAPER 79-GT-138] 23 p0378 A79-32407
Residual shale oil as a boiler fuel
23 p0412 A79-34105
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

FUEL VALVES
Pulverised fuel non-return flap valve
[TDB-317] 23 p0578 N79-26408

FUEL-AIR RATIO
An air-modulated fluidic fuel-injection system --- automobile fuel management
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766
An air/fuel control system for the Stirling engine
[SAE PAPER 790328] 22 p0315 A79-31369
Heat transfer in a high temperature combustion chamber with premixing --- in MHD generators
23 p0474 A79-38869

FUELS
Forest residues as an alternate energy source
21 p0072 A79-14689
Use of low grade fuel derived from domestic and trade wastes
23 p0454 A79-37912
Heating value of refuse derived fuel
23 p0490 A79-40412
Public policy
21 p0179 N79-11011
Alcohol fuels program plan
[DOE/US-0001/2] 21 p0180 N79-11242
The emissions and fuel economy of a Detroit diesel 6-71 engine burning a 10-percent water-in-fuel emulsion
[AD-A058550] 21 p0203 N79-13375
Proceedings of symposium on water-in-fuel emulsions in combustion --- marine diesels, boilers, and gas turbine engines
[AD-A061503] 22 p0338 N79-17019
Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167
Synthetic fuels: Methane. Citations from the Engineering Index data base
[NTIS/PS-79/0030/1] 22 p0365 N79-21223
Sooting characteristics of liquid pool diffusion flames
[AD-A064111] 23 p0539 N79-22252
Conventional combustion on environmental assessment program
[PB-291401/8] 23 p0545 N79-22668
Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180
Inventory of underground energy storage sites in California
[PB-290835/8] 23 p0566 N79-24519
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667
Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPO-26-349] 24 p0717 N79-28346
Historic and forecasted energy prices by US Department of Energy region and fuel type for three macroeconomic scenarios and one imported oil price escalation scenario
[DOE/EIA-0102/27] 24 p0725 N79-28751
Department of the Navy energy fact book
[AD-A069138] 24 p0738 N79-29614
Spent fuel handling and packaging program
[RHO-LD-78-4-AUG] 24 p0777 N79-32081
Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385
Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner
[FE-2489-36] 24 p0795 N79-33340
Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0796 N79-33346

FULL SCALE TESTS
Designing reliability into high-effectiveness industrial gas turbine regenerators
[ASME PAPER 79-GT-199] 23 p0380 A79-32456
Electro/mechanical aspects of the Mauritius 'passive' type wave energy project
23 p0449 A79-37856

Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798

FURANS

A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332

FURNACES

The Garrett Energy Research biomass gasification process
21 p0004 A79-10037

Advanced wind furnace systems for residential and agricultural heating and electrical supply applications
21 p0028 A79-10237

Use of alternative fuels in stationary combustors
21 p0052 A79-12981

Conceptual design of a pulverized coal furnace for a utility size closed-cycle, gas-turbine power plant
[ASME PAPER 79-GT-158] 23 p0378 A79-32420

Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538

Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330

Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces
[PB-293238/2] 24 p0731 N79-29249

Energy conservation with fired heaters
[TREE-1308] 24 p0772 N79-31783

FUSELAGES

Aeroelastic response and stability of a coupled rotor/support system with application to large horizontal axis with turbines
22 p0332 N79-16346

FUSION

Economics of fusion research
[COO-4181-] 21 p0193 N79-11990

FUSION (MELTING)

A passive integrated unit for the collection, thermal storage in fusion materials and distribution of solar energy for home heating and other applications
21 p0121 A79-17322

Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961

Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132

Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136

FUSION REACTORS

Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126

Doublet III design and construction --- Tokamak fusion research device
21 p0018 A79-10145

Demonstration and commercial prototype tokamak reactors
21 p0018 A79-10146

The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147

Mirror fusion reactors
21 p0018 A79-10148

Overview of inertial confinement fusion reactor designs
21 p0018 A79-10149

CO2-laser fusion
21 p0018 A79-10150

Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151

The fast power cycle for fusion reactors
21 p0018 A79-10152

A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153

Commercial applications of thermionic conversion using a fusion reactor energy source - A preliminary assessment
21 p0026 A79-10219

Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

Direct energy converters - Efficiency and cost estimates for two electrostatic concepts
21 p0046 A79-12266

Liquid metal heat pipe performance in the presence of a transverse magnetic field --- for fusion reactors
[ASME PAPER 78-ENAS-20] 21 p0048 A79-12569

Development of energetic neutral beams to the megawatt power level for controlled thermonuclear research
21 p0054 A79-13439

Fusion reactor problems --- plasma confinement and interface engineering
21 p0071 A79-14468

Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program --- Book
21 p0077 A79-14776

Philosophy and physics of predemonstration fusion devices
21 p0078 A79-14783

Materials problems and possible solutions for near term tokamak fusion reactors
21 p0079 A79-14790

The impact of servicing requirements on tokamak fusion reactor design
21 p0079 A79-14793

Large-scale cryopumping for controlled fusion
21 p0085 A79-15330

Stimulated Raman scatter in laser fusion target chambers
21 p0155 A79-18794

Nuclear characteristics of D-D fusion reactor blankets - Technical data
21 p0162 A79-19826

The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541

Problems in the development of high-service-life capacitative accumulators --- for fusion reactors
22 p0243 A79-21249

An overview of design space for small fusion targets
22 p0253 A79-22241

Energy for the long run - Fission or fusion
22 p0256 A79-22760

The potential of fusion reactors as process heat source
22 p0284 A79-26624

Pellet X-ray spectra for laser fusion reactor designs
22 p0291 A79-27878

Homopolar generator energy storage for fusion reactors
22 p0304 A79-29942

Interpretation of cyclotron radiation spectra from runaway discharges in TFR
22 p0313 A79-31185

MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192

Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766

The JET project - A step towards the production of power by nuclear fusion
22 p0326 A79-31918

Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062

Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34989

Progress in tokamak and stellarator experiments
23 p0443 A79-36878

Impurity behaviour in real and simulated tokamak plasmas
23 p0444 A79-36885

First wall and divertor plate material selection in fusion reactors
23 p0444 A79-36886

Fusion research - The temperature rises 23 p0445 A79-37000

Fusion - Its status and outlook 24 p0601 A79-44241

Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors 24 p0604 A79-44545

CO/H2 production using fusion reactor heat 24 p0695 A79-51949

Engineering aspects of demonstration fusion power reactors 24 p0695 A79-51950

Tritium permeation through steam generator materials 24 p0695 A79-51952

A high temperature fusion reactor design 24 p0696 A79-51954

Fusion-supported decentralized nuclear energy system 24 p0696 A79-51956

Thermonuclear energy from ball lightning 24 p0696 A79-51957

Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies [COO-4636-1] 23 p0582 N79-26511

Electric power from laser fusion: The HYLIFE concept [UCRL-81259-REV-1] 23 p0583 N79-26524

Fusion power program [ANL/FPP-78-2] 23 p0586 N79-26953

Optimization of the fission-fusion hybrid concept [ORNL/PPA-79/3] 24 p0778 N79-32113

FUSION-FISSION HYBRID REACTORS

Fusion-Fission Energy Systems 21 p0017 A79-10144

Mirror fusion reactors 21 p0018 A79-10148

Progress in laser-fusion research 21 p0070 A79-14464

Perspective on the fusion-fission energy concept 21 p0095 A79-15913

The synergetics of the catalytic D-D-fusion-fission breeder 22 p0252 A79-22236

Controlled thermonuclear fusion 22 p0287 A79-27339

The fusion hybrid 23 p0434 A79-35461

Performance parameters for fusion-fission power systems 24 p0627 A79-45974

Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems 24 p0629 A79-46236

Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production [LA-UR-79-574] 24 p0742 N79-29666

Optimization of the fission-fusion hybrid concept [ORNL/PPA-79/3] 24 p0778 N79-32113

G

GALLIUM

Effect of dopants on annealing performance of silicon solar cells 24 p0785 N79-32661

GALLIUM ARSENIDE LASERS

Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C --- for space applications 24 p0668 A79-51008

GALLIUM ARSENIDES

n-CdS/n-GaAs photoanode --- electrochemical solar cells 21 p0037 A79-11784

Performance of a tilted solar cell under various atmospheric conditions 21 p0066 A79-14261

Grain-boundary edge passivation of GaAs films by selective anodization --- shorting effect in solar cells 21 p0154 A79-18487

/SN/x-GaAs polymer-semiconductor solar cells 21 p0154 A79-18504

Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell 22 p0256 A79-22768

A two-junction cascade solar-cell structure 22 p0256 A79-22856

High-efficiency AlGaAs/GaAs concentrator solar cells 22 p0261 A79-23710

Series resistance effects in /GaAl/As/GaAs concentrator solar cells 22 p0273 A79-25745

Diffusion length measurements in Schottky barrier GaAs solar cells 22 p0281 A79-26243

Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure --- heterostructure solar cell fabrication 22 p0305 A79-30258

Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode --- for solar cells 22 p0317 A79-31411

Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters --- for gallium arsenide solar photovoltaic arrays 23 p0416 A79-34140

Photovoltaic cells and their future 23 p0435 A79-35486

Ion-implanted laser-annealed GaAs solar cells 23 p0447 A79-37685

Gallium arsenide solar cells 23 p0448 A79-37848

Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide 23 p0480 A79-39944

An overview of photovoltaics for space applications 23 p0503 A79-40950

Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells 23 p0505 A79-40966

Air Force High Efficiency Solar Panel - GaAs cell development --- or military satellites 23 p0506 A79-40971

Electron and proton degradation in /AlGa/As-GaAs solar cells 23 p0506 A79-40973

High-efficiency GaAs shallow-homojunction solar cells 23 p0515 A79-41041

Large area thin film gallium arsenide solar cells 23 p0515 A79-41042

The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion 23 p0515 A79-41043

Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells 23 p0515 A79-41044

Solar cells based on GaP/x/As/1-x/ compounds 23 p0515 A79-41045

Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra 23 p0528 A79-42170

Gallium arsenide films and solar cells on graphite substrates 24 p0667 A79-50937

Application of a GaAs photovoltaic solar system in a utility substation 24 p0676 A79-51770

Potential of GaAlAs solar cells for the global positioning system missions 24 p0691 A79-51901

The potential of np GaAs solar cells for high efficiency concentrator applications 24 p0705 A79-52325

High performance GaAs photovoltaic cells for concentrator applications [SAND-78-7018] 21 p0187 N79-11521

Present status of GaAs --- including space processing and solid state applications [NASA-CR-3093] 21 p0215 N79-14192

GaAs solar cell development [NASA-CR-158090] 22 p0334 N79-16366

High-efficiency thin-film GaAs solar cells [NASA-CR-158641] 23 p0560 N79-24463

High efficiency GaAs solar cell development [AD-A066616] 23 p0573 N79-25514

Langley program of GaAs solar cells --- emphasizing energy conversion efficiency and radiation resistance 24 p0783 N79-32644

Radiation damage in GaAs solar cells
24 p0785 N79-32663
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664
Shallow-homojunction GaAs solar cells
24 p0785 N79-32666
Studies of AlGaAs-GaAs solar cells
24 p0797 N79-33558
Dielectric development for GaAs solar cells
[PB-295837/9] 24 p0802 N79-33600

GALLIUM PHOSPHIDES
Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode --- for solar cells
22 p0317 A79-31411
A computer model of a heterojunction solar cell with application to GaP/Si
24 p0654 A79-50030

GALLIUM SELENIDES
Photovoltaic effect in Cu/CuGaSe2 Schottky barriers
24 p0605 A79-44721
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176

GAMMA RAYS
Optimization of radioisotope thermoelectric generators with gamma-radiation protection
23 p0433 A79-35176

GAPS
Analysis of an edge-illuminated graded-gap solar cell
23 p0442 A79-36793

GARBAGE
Chloride corrosion and its inhibition in refuse firing
21 p0080 A79-14930
ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148
RDF storage and retrieval problems: Cause - effect - options --- Refuse Derived Fuel
23 p0489 A79-40402
Economic factors in refuse derived fuel utilization
23 p0490 A79-40407

GAS ANALYSIS
Behavior of eastern and western coals in fuel-rich reaction conditions --- gasification behavior of Montana Rosebud and Pittsburgh seam bituminous coals for MHD generators
23 p0390 A79-33384
A steam process for coal gasification
24 p0632 A79-46321
Measurement of high-temperature, high-pressure processes
[PB-284041/1] 21 p0195 N79-12424
Pollutants from synthetic fuels production: Facility construction and preliminary tests --- coal gasification plant effluents
[PB-287730/6] 22 p0339 N79-17027
Solvent selectivity for purification of natural cases
24 p0717 N79-28252

GAS BEARINGS
Air bearing development for a GM automotive gas turbine
[SAE PAPER 790107] 22 p0314 A79-31355
Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356

GAS CHROMATOGRAPHY
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
22 p0274 A79-25917
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
[NASA-TM-79035] 22 p0338 N79-16930

GAS COMPOSITION
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520
Study of the applicability of the geochemistry of gases in geothermal prospection
21 p0075 A79-14736
A mass and energy balance of a Wellman-Galusha gasifier --- bituminous coal conversion
22 p0283 A79-26467
Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458
A method of iteration for calculating the gasification gas composition of hydrocarbons and coal dust at low temperatures and high pressure
23 p0528 A79-42228
The natural and perturbed troposphere
21 p0179 N79-10636

GAS COOLED REACTORS
Nuclear closed-cycle gas turbine (GT-HTGR): A utility power plant for the year 2000
[GA-A-15184] 23 p0582 N79-26515

GAS DENSITY
Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873

GAS DISCHARGES
Recent results from the PLT tokamak
21 p0069 A79-14453
Measurements of plasma rotation in tokamak LT-3
22 p0252 A79-22238
Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762
Recycling processes in tokamaks
23 p0443 A79-36882
Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges
23 p0478 A79-39676
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758

GAS DISSOCIATION
Screening reversible reactions for thermochemical energy transfer
22 p0285 A79-26823
Ammonia dissociation for solar thermochemical absorbers
23 p0396 A79-33765

GAS DYNAMICS
Quasi-isentropic laser engines
21 p0111 A79-16632
CO/H2 production using fusion reactor heat
24 p0695 A79-51949

GAS EVOLUTION
The atmospheric CO2 consequences of heavy dependence on coal
21 p0107 A79-16524
Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119
Application of long-range transport modeling to assess coal development --- for impact on air quality
23 p0535 A79-43429

GAS EXCHANGE
A gas absorption cycle for electric power generation
23 p0418 A79-34154

GAS EXPANSION
Preliminary design of a subscale ceramic helical-rotor expander
21 p0050 A79-12849

GAS FLOW
'Local' breakdown criterion in highly ionized gas flow
21 p0049 A79-12683
Gas-cycle solar refrigeration system performance
21 p0153 A79-18471
Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188
Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552
Sandia laboratory combustion simulation facility --- for analyzing the flow of high temperature combustion products
[SAND-78-2240] 23 p0576 N79-26146

GAS GENERATORS
Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077
The combined reheat gas turbine/steam turbine cycle. I - A critical analysis of the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-7] 22 p0306 A79-30505

The combined reheat gas turbine/steam turbine cycle. II - The LM 5000 gas generator applied to the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-8] 22 p0306 A79-30506
Mobile electrolytic hydrogen generators 24 p0649 A79-49228
Integrated power unit
[AD-A066543] 23 p0569 N79-25396
Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker
[AD-A068452] 24 p0738 N79-29616
Generator gas: The Swedish experience from 1939-1945
[SERI/SP-33-140] 24 p0775 N79-31816
Research and development work for hydrogasification of coal with nuclear processing heat done in the framework of the prototype nuclear processing heater project
[BMFT-FB-T-78-25] 24 p0780 N79-32393
Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat
[BMFT-FB-T-78-29] 24 p0780 N79-32394

GAS HEATING
Analysis and application of the heat pipe heat exchanger 21 p0014 A79-10117
Cost effective optimum design of solar air heaters 21 p0127 A79-17386
Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor 23 p0395 A79-33428
Investigation of the aerodynamic resistance of solar air heaters 24 p0648 A79-49185

GAS IONIZATION
Application of finite element method to analysis of MHD generators 24 p0653 A79-50001

GAS LASERS
A new concept for solar pumped lasers 21 p0110 A79-16624
Progress in nuclear-pumped lasers 21 p0110 A79-16627

GAS MIXTURES
LAG-Process, some results of utilization in transport and mechanical engineering 21 p0030 A79-10248
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures --- derived from shale oil retorting and coal gasification 21 p0083 A79-15245
Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products --- in fuel cell 21 p0164 A79-19851
Wilson parameters for the system H2, N2, CO, CO2, CH4, H2S, CH3OH, and H2O --- for cold methanol absorption in coal gasification 22 p0282 A79-26462
A development program for hydrogen burners 23 p0386 A79-33232
Solar-radiation-excited CO2-Br2-He gas laser 23 p0397 A79-33887

GAS PIPES
Problems, status, and prospects of a solar hydrogen economy 21 p0059 A79-13658
Suitability of gas distribution equipment in hydrogen service 24 p0685 A79-51845

GAS POCKETS
Proceedings of a Symposium on the Utilization of Methane Generated in Landfills
[CONF-780340] 24 p0747 N79-30410
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0780 N79-32390

GAS PRESSURE
Thermodynamics of pressure plateaus in metal-hydrogen systems 22 p0238 A79-20772

GAS RECOVERY
Options for treating and disposing of scrubber sludge 23 p0424 A79-34460
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607
Study of hydrogen recovery systems for gas vented while refueling liquid-hydrogen fueled aircraft
[NASA-CR-158991] 22 p0346 N79-18057
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28650
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0780 N79-32390

GAS STREAMS
Gas stream composition and temperature determination in a coal-fired MHD simulation facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810
Energy storage in fluidized beds 24 p0657 A79-50211

GAS TEMPERATURE
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques 21 p0032 A79-10520

GAS TRANSPORT
Transport fuels from natural gas 22 p0292 A79-27897
Transmission of gaseous hydrogen - A preliminary technology evaluation 24 p0614 A79-45597

GAS TURBINE ENGINES
Closed Cycle Gas Turbine power generation opportunities 21 p0004 A79-10039
Advanced industrial gas turbine cooling and high pressure compressor technology 21 p0004 A79-10041
A review of the PFBC combined cycle and its influence on gas turbine design parameters --- Pressurized Fluidized Bed Combustion 21 p0007 A79-10067
The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants 21 p0009 A79-10078
Combined cycle gas turbine for an automobile application 21 p0019 A79-10157
Heat pipe central solar receiver gas turbine plant 21 p0022 A79-10178
Development of gas turbine performance seeking logic
[ASME PAPER 78-GT-13] 21 p0031 A79-10257
Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778
Development of a compact gas turbine combuster to give extended life and acceptable exhaust emissions
[ASME PAPER 78-GT-146] 21 p0033 A79-10799
Making turbofan engines more energy efficient
[ASME PAPER 78-GT-198] 21 p0033 A79-10818
Effect of inlet temperature on the performance of a catalytic reactor 21 p0035 A79-11542
Alternative aviation turbine fuels 21 p0047 A79-12378
Current problems in the development and production of small gas turbine engines 21 p0048 A79-12529
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds 21 p0049 A79-12821
Reliability and durability of ceramic regenerators for gas turbine applications 21 p0050 A79-12823
Designing and testing Si3N4 turbine components at Mercedes-Benz 21 p0050 A79-12830
Development of ceramic parts for a truck gas turbine at MTU 21 p0050 A79-12831
Development of multi-density silicon nitride turbine rotors 21 p0050 A79-12832

Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design
21 p0050 A79-12950

Future fuels in gas turbine engines
21 p0051 A79-12979

Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982

Flame emissivities - Alternative fuels
21 p0052 A79-12984

Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine
21 p0114 A79-16800

Technology evolution in the Allison Model 250 engine --- for helicopter propulsion
21 p0155 A79-18681

Design and development of a monorotor gas turbine auxiliary power unit
[ASME PAPER 78-WA/GT-2] 21 p0160 A79-19791

Ceramic materials for vehicular gas turbine applications
21 p0165 A79-20085

Influences on exhaust emissions from automotive gas turbines
[ASME PAPER 78-GT-85] 22 p0255 A79-22338

Environmental factors affecting the installation and operation of gas turbine engines in agricultural aircraft
[SAE PAPER 781010] 22 p0274 A79-25892

Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395

Cogeneration in Europe and the combined cycle gas turbine
22 p0297 A79-28988

Gas turbine operating and maintenance experience in Saudi Arabia
22 p0298 A79-28989

Measured effects of flow leakage on the performance of the GT-225 automotive gas turbine engine
[ASME PAPER 79-GT-3] 22 p0306 A79-30502

The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations
[ASME PAPER 79-GT-16] 22 p0306 A79-30510

Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533

A multivariable controller for an automotive gas turbine
[ASME PAPER 79-GT-73] 22 p0307 A79-30537

Air bearing development for a GM automotive gas turbine
[SAE PAPER 790107] 22 p0314 A79-31355

Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356

Some design considerations of automotive gas turbines
[SAE PAPER 790128] 22 p0314 A79-31360

Field experience with the Detroit Diesel Allison 404/505 industrial gas turbine engines
[SAE PAPER 790129] 22 p0314 A79-31361

The influence of fuel composition on smoke emission from gas-turbine-type combustors - Effect of combustor design and operating conditions
22 p0323 A79-31510

Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331

Repowering of a small utility - A unique solution to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332

The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344

An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32348

Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines
[ASME PAPER 79-GT-54] 23 p0376 A79-32349

A simple solar gas turbine plant
[ASME PAPER 79-GT-90] 23 p0377 A79-32367

Mechanical reliability considerations in the modern high temperature industrial gas turbine
[ASME PAPER 79-GT-101] 23 p0377 A79-32371

Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-3239

Operation of a GT-225 diffusion-flame combustor on alternative fuels performance, durability and emissions
[ASME PAPER 79-GT-138] 23 p0378 A79-32407

Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416

DD-963 Class waste heat recovery system experience
[ASME PAPER 79-GT-159] 23 p0378 A79-32421

A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-3243

The self-propelled hydrogen-powered refrigerator car
23 p0415 A79-34126

The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines
23 p0461 A79-38387

Gaseous, particulate, and smoke emissions from a heavy duty automotive gas turbine engine
23 p0522 A79-41154

Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552

Regenerator matrices for automotive gas turbines
23 p0532 A79-42981

Turning to the sun for power
24 p0601 A79-44239

Annular diffuser performance for an automotive gas turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790

Design and development of a low emission combustor for a car gas turbine
[ASME PAPER 78-GT-155] 24 p0605 A79-44793

Study of heat-pipe heat exchanger in the small gas turbine engine system
24 p0646 A79-48511

Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526

Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050

Future fuels for aviation
21 p0201 N79-13193

Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-32] 21 p0220 N79-14564

Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance
[NASA-TM-78993] 22 p0345 N79-17859

Tests of NASA ceramic thermal barrier coating for gas-turbine engines
[NASA-TM-79116] 22 p0357 N79-20118

Evaluation of ceramics for stator application: Gas turbine engine report
[NASA-CR-159533] 22 p0364 N79-21075

Brayton-cycle component characteristics
23 p0580 N79-26479

Combined gas/steam turbine power plants with supplementary firing
24 p0723 N79-28736

The gas turbine/steam turbine cycle with coal gasification
24 p0723 N79-28737

Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28738

Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles
24 p0724 N79-28739

Conceptual design study of improved automotive gas turbine powertrain
[NASA-CR-159580] 24 p0762 N79-31088

Single shaft automotive gas turbine engine characterization test
[NASA-CR-159654] 24 p0778 N79-32129

GAS TURBINES
Coal-fired gas turbine power cycles with steam injection
21 p0004 A79-10042
The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100
Evaluation program for new industrial gas turbine materials
[ASME PAPER 78-GT-145] 21 p0031 A79-10269
Ceramic components for vehicular gas turbines
21 p0034 A79-11150
A small solar power plant with a freon turbine
21 p0141 A79-17501
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509
Emissions of nitrogen dioxide from a large gas-turbine power station
21 p0152 A79-18344
A cavity receiver design for solar heated gas turbine generating systems
[ONERA, TP NO. 1978-137] 21 p0155 A79-18560
The nuclear closed-cycle gas turbine /GT-HTGR/ - A utility power plant for the year 2000
[AIAA PAPER 79-0191] 21 p0157 A79-19590
Using N204 in a solar gas-turbine plant
21 p0167 A79-20357
Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448
Storage peak gas-turbine power plant --- compressor for electric energy storage
22 p0268 A79-24507
Ways of improving steam-gas power plants --- fuel economy
22 p0299 A79-29298
The combined reheat gas turbine/steam turbine cycle. I - A critical analysis of the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-7] 22 p0306 A79-30505
The combined reheat gas turbine/steam turbine cycle. II - The LM 5000 gas generator applied to the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-8] 22 p0306 A79-30506
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536
Benefits of solar/fossil hybrid gas turbine systems
[ASME PAPER 79-GT-38] 22 p0309 A79-30554
MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192
Application of the Centaur industrial gas turbine to the central receiver concept for solar electric power
[ASME PAPER 79-GT-45] 23 p0375 A79-32345
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors
[ASME PAPER 79-GT-81] 23 p0376 A79-32360
Utilization of the cold by LNG vaporization with closed-cycle gas turbine
[ASME PAPER 79-GT-84] 23 p0376 A79-32361
Application of gas turbine/compressors in LNG plants
[ASME PAPER 79-GT-85] 23 p0376 A79-32362
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Application of recuperative gas cycles with a bypass heat generator to solar energy power plants
[ASME PAPER 79-GT-89] 23 p0376 A79-32366
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370
The relationship of power and heat production with closed cycle gas turbines
[ASME PAPER 79-GT-103] 23 p0377 A79-32379
Development progress on the atmospheric fluidized bed coal combustor for cogeneration gas turbine system for industrial cogeneration plants
[ASME PAPER 79-GT-104] 23 p0377 A79-32380
The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381
GUD - An unfired combined cycle approach to energy utilization --- in turbine power plant gas and steam waste heat recovery system
[ASME PAPER 79-GT-131] 23 p0377 A79-32400
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
Conceptual design of a pulverized coal furnace for a utility size closed-cycle, gas-turbine power plant
[ASME PAPER 79-GT-158] 23 p0378 A79-32420
Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware
[ASME PAPER 79-GT-160] 23 p0378 A79-32422
Combined cycles for pipeline compressor drives using heat
[ASME PAPER 79-GT-162] 23 p0378 A79-32424
Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428
Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429
Development of an industrial gas turbine combustor burning a variety of coal-derived low Btu fuels and distillate
[ASME PAPER 79-GT-172] 23 p0379 A79-32433
Laser-particulate control for open-cycle, coal fired gas turbines
[ASME PAPER 79-GT-177] 23 p0379 A79-32437
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems --- Pressurized Fluidized Bed Combustion
[ASME PAPER 79-GT-195] 23 p0380 A79-32453
Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455
Designing reliability into high-effectiveness industrial gas turbine regenerators
[ASME PAPER 79-GT-199] 23 p0380 A79-32456
Alternate ways of using bottoming cycle power in pipeline gas compressor stations
[ASME PAPER 79-GT-201] 23 p0380 A79-32458
Closed cycle gas turbines, an ECAS update. I
[ASME PAPER 79-GT-204] 23 p0380 A79-32461
A 2500 HP addition to the Ruston range --- gas turbines
[ASME PAPER 79-GT-205] 23 p0380 A79-32462
Aspects of meeting complex industrial energy demand patterns using recuperated gas turbines
23 p0454 A79-37905
The potential application of rotating fluidised beds to power generating schemes
23 p0454 A79-37906
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193
Integrated coal conversion utilization program
[AIAA PAPER 79-0997] 23 p0459 A79-38195
Brayton engines for dispersed solar power
23 p0477 A79-38950
Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/
24 p0636 A79-46757
Thermodynamic analysis of combined GTP-TEG solar energy converter --- Gas Turbine power Plants - Thermoelectric Generators
24 p0636 A79-46758
Manufacture of fuel gas for power generation by fluidized bed gasification of coal
24 p0657 A79-50212
The indirect Brayton energy recovery system
24 p0696 A79-51958
Increasing gas turbine efficiency through the use of a waste heat methanol reactor
24 p0702 A79-52000
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system
24 p0703 A79-52010
Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-33] 21 p0221 N79-14575
Combined cycle power generation. Citations from the NTIS data base
[NTIS/PS-78/1156/5] 21 p0222 N79-14587
Combined cycle power generation. Citations from the Engineering Index data base
[NTIS/PS-78/1157/3] 21 p0222 N79-14588
Benefits of solar/fossil hybrid gas turbine systems
[NASA-TM-79083] 21 p0229 N79-15410
Closed cycle gas turbines, volume 1
[VKI-LECTURE-SERIES-100-VOL-1] 22 p0331 N79-16260
Large closed-cycle gas turbine plant
[GA-A-14311] 22 p0331 N79-16261
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268
Proceedings of symposium on water-in-fuel emulsions in combustion --- marine diesels, boilers, and gas turbine engines
[AD-A061503] 22 p0338 N79-17019
Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171
Feasibility and economics of cogeneration in California's thermal enhanced oil recovery operations
[PB-291794/6] 23 p0566 N79-24517
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498
Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224
Nuclear closed-cycle gas turbine (GT-HTGR): A utility power plant for the year 2000
[GA-A-15184] 23 p0582 N79-26515
Gas-steam turbine combined cycle power plants
[ANL/CES-TE-78-4] 24 p0727 N79-28775
Conceptual design study of an Improved Gas Turbine (IGT) powertrain
[NASA-CR-159604] 24 p0762 N79-31087
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832

GAS VALVES
Effects of air damper leaks on solar energy system performance
[SOLAR/0012-78/29] 23 p0563 N79-24497

GAS-LIQUID INTERACTIONS
Two-phase LMMHD mixer-development experiments --- Liquid-Metal MHD generator flow characteristics
23 p0394 A79-33422
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120

GAS-METAL INTERACTIONS
Thermophoresis - Enhanced deposition rates in combustion turbine blade passages
[ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697
Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Hydrogen storage in the form of metal hydrides
23 p0388 A79-33251
Numerical modeling of impurity effects --- on energy balance in tokamak experiments
23 p0445 A79-36945
Oxygen adsorption on stainless steel --- in tokamak reactors
23 p0445 A79-36965
Laser-induced desorption experiments with technical metal surfaces --- carbon monoxide and hydrogen interaction with Ni
23 p0445 A79-36969

GASDYNAMIC LASERS
Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space
21 p0110 A79-16623

GASEOUS DIFFUSION
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684
Hydrogen storage electrode systems
22 p0251 A79-21710
Aerodynamic separation of gases and isotopes: Recent advances --- conferences, Belgium, May-Jun. 1978
[VKI-LEC-SER-1978-8] 24 p0720 N79-28506
Refrigerant-114 Rankine cycle energy recovery technology from the gaseous diffusion industry
[GAT-916] 24 p0750 N79-30724

GASEOUS FISSION REACTORS
Temperature profile and power calculations in gas core reactors
24 p0702 A79-51998
Gaseous fuel reactor applications
24 p0715 A79-54351

GASEOUS FUELS
There is a lot of energy in digester gas . . . use it --- in municipal waste water plants
21 p0035 A79-11448
Integrated low Btu gasification, combined cycle plant considerations and control
21 p0094 A79-15905
Production and use of low and medium Btu gas
21 p0095 A79-15912
Energy through solar aided bio-gas systems
21 p0125 A79-17367
Development of the combustion chamber of an experimental MHD generator
22 p0327 A79-32105
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors
[ASME PAPER 79-GT-81] 23 p0376 A79-32360
Development of an industrial gas turbine combustor burning a variety of coal-derived low Btu fuels and distillate
[ASME PAPER 79-GT-172] 23 p0379 A79-32433
Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455
An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier
23 p0381 A79-32592
Fuel gas production from animal residue. I - Technical perspective
23 p0381 A79-32593
Fuel gas production from animal residue. II - An economic assessment
23 p0381 A79-32594
Kinetics of desulfurization of hot fuel gas with calcium oxide Reaction between carbonyl sulfide and calcium oxide
23 p0381 A79-32697
A development program for hydrogen burners
23 p0386 A79-33232
HYGAS - A process ready for commercial demonstration --- coal gasification
23 p0411 A79-34090
A comparison of coal and biomass as feedstocks for synthetic fuel production
23 p0412 A79-34097
Dynagas Process
23 p0412 A79-34098
Fossil fuel heat pumps for domestic, commercial and industrial space heating
23 p0449 A79-37852
Converting coal to liquid/gaseous fuels
23 p0461 A79-38376
Manufacture of fuel gas for power generation by fluidized bed gasification of coal
24 p0657 A79-50212
Advanced synfuel production with fusion
24 p0695 A79-51947

Modeling the performance of gas-fired heat pump systems 24 p0657 A79-51963

Gaseous fuel reactor applications 24 p0715 A79-54351

Gaseous fuel reactors for power systems [LA-UR-78-1437] 21 p0214 N79-13844

National gas survey: Synthesized gaseous hydrocarbon fuels [DOE/FERC-0008] 23 p0577 N79-26228

GASES

Conversion of biomass materials into gaseous products, phase 1 [SAN-1241-77-1] 21 p0171 N79-10237

Inventory of underground energy storage sites in California [PB-290835/8] 23 p0566 N79-24519

Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner [FE-2489-36] 24 p0795 N79-33340

GASIFICATION

The Garrett Energy Research biomass gasification process 21 p0004 A79-10037

Gasification of coal liquefaction residues 21 p0006 A79-10059

Steam raising with low-Btu gas generators and potential for other applications 21 p0072 A79-14690

Utilization of the cold by LNG vaporization with closed-cycle gas turbine [ASME PAPER 79-GT-84] 23 p0376 A79-32361

An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier 23 p0381 A79-32592

The gasification of ethyl alcohol 23 p0386 A79-33228

Synthetic natural gas production from peat 23 p0411 A79-34092

Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/ 23 p0490 A79-40413

Gasification of solid waste - Potential and application of co-current moving bed gasifiers 23 p0536 A79-43574

Synthetic fuels from peat gasification 24 p0687 A79-51856

Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels 21 p0179 N79-11150

Investigation of gasification of biomass in the presence of catalysts [CONF-7809125-1] 23 p0588 N79-27327

Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock [SERI/TR-33-151] 24 p0766 N79-31413

Peat gasification: An experimental study [CONF-780611-8] 24 p0780 N79-32391

GASOHOL (FUEL)

The development of alternate combustibles for diesel engines 23 p0385 A79-33227

Storage and distribution of synthetic fuels 24 p0650 A79-49379

A general history of the Nebraska Grain Alcohol and Gasohol Program 24 p0651 A79-49383

Synthetic fuels program --- in California for automotive transportation 24 p0651 A79-49385

Improving octane values of unleaded gasoline via gasohol 24 p0676 A79-51775

Gasohol for energy production --- Book 24 p0713 A79-53724

Rural development initiatives: Energy for rural America [PB-295234/9] 24 p0743 N79-29674

Cooperative extension service: Energy resource notes 24 p0745 N79-30394

Ethanol/gasoline blends as automotive fuel [BETC/RI-79/2] 24 p0767 N79-31423

GASOLINE

Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor 23 p0492 A79-40454

Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis 24 p0669 A79-51196

Improving octane values of unleaded gasoline via gasohol 24 p0676 A79-51775

The synfuels scenario 24 p0709 A79-52967

Gasohol for energy production --- Book 24 p0713 A79-53724

Automotive Stirling engine development program [NASA-CR-159436] 21 p0181 N79-11406

Proposed standby gasoline rationing plan. Economic and regulatory analysis draft [DOE/ERA-0009] 21 p0214 N79-13934

Economic impacts of a transition to higher oil prices --- estimation and budget allocations [BNL-50871] 22 p0364 N79-20927

Motor gasolines, summer 1978 [BETC/PPS-79/1] 23 p0555 N79-24189

Fluid bed process studies on selective conversion of methanol to high octane gasoline [FE-2490-15] 23 p0555 N79-24190

Exhaust emissions and fuel economy from automobiles using alcohol/gasoline blends under high-altitude conditions [PB-290612/1] 23 p0555 N79-24191

Automotive Fuel Economy Contractor's Coordination Meeting [PB-290516/4] 23 p0556 N79-24358

National motor gasoline surveys: A key source of fuel trend data [BETC/RI-78/16] 23 p0568 N79-25248

Alcohol fuels [GPO-22-334] 23 p0588 N79-27322

Coal gasification, commercial concepts, gas cost guidelines, revision 1 [FE-2240-100] 23 p0589 N79-27331

The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12 [DOE/EIA-0102/32] 23 p0589 N79-27337

Diesel Fuel and Gasoline Conservation Act of 1977 --- congressional reports [GPO-34-986] 24 p0718 N79-28348

Motor gasoline deregulation and the gasoline tilt [DOE/EIS-0039-VOL-1] 24 p0746 N79-30399

Motor gasoline deregulation and the gasoline tilt. Volume 2: Public comments [DOE/EIS-0039-VOL-2] 24 p0746 N79-30401

Fact sheet: Forecasted automobile gasoline consumption [DOE/EIA-0102/1] 24 p0746 N79-30402

GEARS

Gears for wind power plants 23 p0484 A79-40119

GENERAL AVIATION AIRCRAFT

National Conference on Energy Conservation in General Aviation, 1st, Kalamazoo, Mich., October 10, 11, 1977, Proceedings 21 p0047 A79-12376

Automotive engines - A viable alternative for aircraft 21 p0047 A79-12379

Turbine engines in light aircraft 21 p0047 A79-12380

Energy conservation in general aviation and operation and maintenance of Avco Lycoming piston engines 21 p0048 A79-12381

Economy in flight operations 21 p0048 A79-12383

Flying angle of attack 21 p0048 A79-12384

Impact of fuel availability and other cost trends on general aviation 21 p0053 A79-13078

Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine [SAE PAPER 790605] 23 p0440 A79-36737

A review of Curtiss-Wright rotary engine developments with respect to general aviation potential [SAE PAPER 790621] 23 p0440 A79-36749

A canister fuel pump for general aviation aircraft
[SAE PAPER 790624] 23 p0440 A79-36752
Garrett ATF 3
23 p0535 A79-43469
An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0194 N79-12086
The rotary combustion engine: A candidate for general aviation --- conferences
[NASA-CP-2067] 22 p0329 N79-15961
General aviation energy-conservation research programs
22 p0329 N79-15963
Development status of rotary engine at Toyo Kogyo --- for general aviation aircraft
22 p0329 N79-15964
Update of development on the new Audi NSU rotary engine generation --- for application to aircraft engines
22 p0329 N79-15965
Review of the Rhein-Flugzeugbau Wankel powered aircraft program --- ducted fan engines
22 p0329 N79-15966
Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential --- with direct chamber injection
22 p0329 N79-15967
Engine requirements for future general aviation aircraft
22 p0329 N79-15968

GEOCHEMISTRY
Study of the applicability of the geochemistry of gases in geothermal prospection
21 p0075 A79-14736
Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs
21 p0075 A79-14737
Surtrace - An airborne geochemical system --- for earth surface micro-layer exploration
22 p0255 A79-22557
Evaluation and targeting of geothermal energy resources in the southeastern United States
[VPI-SU-5648-1] 21 p0204 N79-13478

GEOELECTRICITY
Improvement of direct-current electrical prospecting methods for the geothermal investigation of the Rhine Graben
21 p0075 A79-14734
Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948

GEOLE SATELLITES
High accuracy off-shore position finding using the GEOLE satellite based system
22 p0329 N79-15932

GEOLOGICAL FAULTS
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289
Status of the offshore technology program --- conferences
[SAND-78-0665] 24 p0761 N79-30908

GEOLOGICAL SURVEYS
Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs
21 p0075 A79-14737
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948
A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0204 N79-13474
Evaluation and targeting of geothermal energy resources in the southeastern United States
[VPI-SU-5648-1] 21 p0204 N79-13478
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592
Geologic assessment of compressed air storage sites in Kansas
[EPRI-EM-877] 23 p0597 N79-27689
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609
Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes
[SAND-79-0746C] 24 p0769 N79-31744
Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming
[E79-10279] 24 p0796 N79-33518
Telluric sounding and mapping in the vicinity of the Salton Sea geothermal area, Imperial Valley, California
[PB-296081/3] 24 p0797 N79-33553

GEOLOGY
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany
[E79-10102] 22 p0339 N79-17291

GEOMAGNETISM
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

GEOMETRY
Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489

GEOPHYSICS
Volcanology --- geophysical study
24 p0632 A79-46432
Evaluation and targeting of geothermal energy resources in the southeastern United States
[VPI-SU-5648-1] 21 p0204 N79-13478
Program report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department
[UCRL-51444-78] 24 p0722 N79-28668
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

GEOPOTENTIAL
Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948

GEORGIA
Novel approaches to industrial energy conservation in Georgia
24 p0698 A79-51972

GEOS SATELLITES (ESA)
Experiences related to GEOS thermal control
24 p0763 N79-31269

GEOSYNCHRONOUS ORBITS
Nickel-cadmium battery reconditioning and long term performance in geosynchronous orbit spacecraft
21 p0029 A79-10242
Solar energy via satellites and international cooperation
22 p0310 A79-30952
Synchronous orbit power technology needs
[AIAA 79-0916] 23 p0425 A79-34739
Towards an adequate legal regulation of the geostationary orbit
24 p0663 A79-50855
Long-term prediction of power system performance for geosynchronous spacecraft
24 p0691 A79-51899
A power transmission concept for a European SPS system
24 p0712 A79-53487
Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis
[NASA-CR-150295] 23 p0541 N79-22618
Space-based solar power conversion and delivery systems study. Volume 3: Microwave power transmission studies
[NASA-CR-150296] 23 p0541 N79-22619
Space-based solar power conversion and delivery systems study. Volume 5: Economic analysis
[NASA-CR-150298] 23 p0541 N79-22621

GEOTHERMAL ENERGY CONVERSION
Geothermal preheating in fossil-fired steam power plants 21 p0014 A79-10118
Performance of a 10 MW geothermal energy conversion test facility 21 p0014 A79-10119
Geothermal power from salt domes 21 p0014 A79-10120
Fossil superheating in geothermal steam power plants 21 p0014 A79-10122
Heat exchanger design for geothermal power plants 21 p0015 A79-10123
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle 21 p0015 A79-10124
Effect of noncondensable gases on geothermal power generation 21 p0015 A79-10125
Pollution perspective for geothermal energy development 21 p0064 A79-14114
Seminar on Geothermal Energy, 1st, Brussels, Belgium, December 6-8, 1977, Proceedings. Volumes 1 & 2 21 p0075 A79-14726
Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates 21 p0075 A79-14739
Preliminary results of the new geothermal domestic heating system at Creil 21 p0075 A79-14740
Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity 21 p0076 A79-14741
Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization 21 p0076 A79-14744
Hot dry rock - A new geothermal energy source 21 p0087 A79-15673
Geothermal energy from a utility perspective --- Imperial Valley of Southern California 21 p0091 A79-15880
Hybrid fossil-geothermal power plants 21 p0096 A79-15920
Opportunities for direct use of geoheat in Central America and other tropical countries 21 p0097 A79-16074
Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems 21 p0150 A79-18092
History and development of condensers at the Geysers geothermal power plant [ASME PAPER 78-JPGC-PWR-18] 21 p0150 A79-18099
Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant [ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775
A comparison of the performance of steam turbine cycles using gas contaminated geothermal steam [ASME PAPER 78-WA/ENER-3] 21 p0159 A79-19776
Geothermal power and water production studies at the University of California [ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778
Geothermal energy: Its past, present and future contributions to the energy needs of man --- Book 22 p0252 A79-21825
The economics of geothermal energy development at the regional level 22 p0256 A79-22756
Mining earth's heat - Hot dry rock geothermal energy 22 p0258 A79-23280
East Mesa geothermal test site 22 p0259 A79-23458
Hot dry rock - A new potential for energy 22 p0265 A79-23832
The geothermal power station at Ahuachapan, El Salvador 22 p0266 A79-24239
Soil cooling for geothermal electric power plants in the Western United States - The Raft River experiment 22 p0266 A79-24240
Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems 22 p0304 A79-30123
MHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 6 - Geothermal energy and hydropower 23 p0408 A79-34067
Harnessing geothermal energy in Rotorua, New Zealand 23 p0408 A79-34068
Geothermal systems in the Hauraki Rift zone /New Zealand/ - An example for geothermal systems over an inferred upper mantle swell 23 p0408 A79-34069
The Puchuldiza geothermal field --- hot springs in Chilean Andes mountains 23 p0408 A79-34070
Geothermal energy coupled with solar energy is the future energy in Saudi Arabia 23 p0408 A79-34071
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop --- for low temperature geothermal sources 23 p0408 A79-34074
The optimization of alternative energy cycles using program GEOTHM 23 p0409 A79-34075
Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets --- application to geothermal sources 23 p0409 A79-34076
Heat transfer consideration in utilizing solar and geothermal energy 23 p0409 A79-34080
A retrofitted geothermal heating system 23 p0425 A79-34602
The problem of fouling in the utilisation of geothermal energy 23 p0449 A79-37853
Thermodynamic considerations for the energy conversion process in geothermal power plants 23 p0476 A79-38947
Utilizing geothermal resources below 150 C /300 F/ 23 p0486 A79-40196
Electrical production from moderate temperature geothermal brines 23 p0486 A79-40197
An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants 23 p0487 A79-40369
Exploration and exploitation techniques for geothermal resources 23 p0525 A79-41819
The influence of rough terrain on pollutant dispersion and transport from a geothermal power complex 23 p0534 A79-43372
The Geysers geothermal area emissions and aerometric data base and air quality analysis 23 p0534 A79-43373
Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain 23 p0536 A79-43645
Geothermal systems and their energy resources 24 p0632 A79-46433
A quantitative comparison of energy costing methods 24 p0651 A79-49475
Impact of H_2S emission abatement on geothermal power costs 24 p0659 A79-50352
The consumptive use of water in geothermal energy applications 24 p0667 A79-50897
Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project 24 p0667 A79-50900
Effect of noncondensables on the performance of geothermal steam power plants 24 p0689 A79-51868
Today's geothermal power economics and risks 24 p0689 A79-51869

Low temperature geothermal energy use in existing institutional power plants
24 p0689 A79-51870

Hot dry rock energy project
[LA-UR-77-2744] 21 p0175 N79-10540

Pollution control guidance for geothermal energy development
[PB-282546/1] 21 p0178 N79-10604

Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283170/9] 21 p0191 N79-11555

Non-electric applications of geothermal energy in six Alaskan towns
[IDO-1622-4] 21 p0208 N79-13523

OTEC thermal resource report for Central Gulf of Mexico
[TID-27951] 21 p0209 N79-13533

Comparative cost analyses: Total flow vs other power conversion systems for the Salton Sea Geothermal Resource
[UCRL-52589] 22 p0342 N79-17337

Impact prediction manual for geothermal development
[PB-288128/2] 22 p0349 N79-18462

Geothermal resources for aquaculture
[PB-290345/8] 22 p0356 N79-19563

Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508

Demonstration of a rotary separator for two-phase brine and steam flows
[TID-28519] 22 p0365 N79-21309

Digest of equipment for converting solar, wind, and geothermal energy into electric power for USN application ashore
[AD-A066221] 23 p0561 N79-24475

Geothermal heating with heat pumps
23 p0584 N79-26531

Exploration of volcanic geothermal energy resources based on rheological techniques
[DOE/ET/28453-3] 23 p0596 N79-27676

Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

Materials selection guidelines for geothermal power systems, first edition
[ALO-3904-1] 24 p0727 N79-28772

Electricity from hot dry rock geothermal energy: Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773

Technology assessment of geothermal pumping equipment
[ALO-4162-2] 24 p0735 N79-29524

Water and energy resource development in the Tongue River Basin, southeastern Montana
24 p0735 N79-29566

Geothermal power plants of New Zealand, Philippines, and Indonesia: A technical survey of existing and planned installations
[COO-4051-23] 24 p0738 N79-29622

Geothermal power plants of Mexico and Central America: A technical survey of existing and planned installations
[COO-4051-26] 24 p0740 N79-29638

Introduction to electric energy conversion systems for geothermal energy resources
[COO-4051-28] 24 p0740 N79-29639

Geothermal/hydrothermal energy. Group interview
[DOE/TIC-10030] 24 p0755 N79-30791

Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807

Computer design and optimization of cryogenic refrigeration systems --- conferences
[LBL-7934] 24 p0768 N79-31439

Energy extraction operations: Some preliminary results --- thermal energy from granitic rocks by water injection
[LA-UR-79-679] 24 p0786 N79-32678

The future of hot dry rock geothermal energy systems
[LA-UR-79-683] 24 p0786 N79-32679

Available work in geothermal energy
[COO-4051-25] 24 p0787 N79-32685

Geothermal power plants of the Soviet Union. A technical survey of existing and planned installations
[COO-4051-41] 24 p0787 N79-32686

Federal hot dry rock geothermal energy development program: An overview
[LA-UR-79-670] 24 p0787 N79-32690

Performance tests of the radial outflow reaction turbine for geothermal applications
[UCID-17902] 24 p0788 N79-32693

Energy programs at the Johns Hopkins University Applied Physics Lab. --- geothermal, hydroelectric, and ocean thermal energy
[PB-295439/4] 24 p0793 N79-32739

GEOTHERMAL RESOURCES

Optimum design conditions for a power plant at a vapor dominated geothermal resource, Pacific Gas and Electric's The Geysers Power Plant Unit 16
21 p0014 A79-10121

A thermodynamic study of heating with geothermal energy
[ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253

Potential and technical utilization of renewable energy sources
21 p0058 A79-13655

Projecting energy resource utilization - The geothermal case
21 p0068 A79-14321

Seminar on Geothermal Energy, 1st, Brussels, Belgium, December 6-8, 1977, Proceedings. Volumes 1 & 2
21 p0075 A79-14726

Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727

Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

Improvement of direct-current electrical prospecting methods for the geothermal investigation of the Rhine Graben
21 p0075 A79-14734

Study of the applicability of the geochemistry of gases in geothermal prospection
21 p0075 A79-14736

Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs
21 p0075 A79-14737

Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739

Hot dry rock - A new geothermal energy source
21 p0087 A79-15673

Opportunities for direct use of geoheat in Central America and other tropical countries
21 p0097 A79-16074

A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0097 A79-16075

Hot dry rock, an abundant clean energy resource
21 p0098 A79-16106

A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262

Remote sensing use in hydraulic planification in Mexico
22 p0255 A79-22522

Surtrace - An airborne geochemical system --- for earth surface micro-layer exploration
22 p0255 A79-22557

Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620

Mercury in some New Zealand geothermal discharges
22 p0257 A79-22925

Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280

East Mesa geothermal test site
22 p0259 A79-23458

A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis
22 p0263 A79-23777

Hot dry rock - A new potential for energy
22 p0265 A79-23832

Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations
22 p0265 A79-24046

Continental geotherms during the Archaean --- heat production in ancient earth crust 22 p0269 A79-24620

Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems 22 p0304 A79-30123

Fansade geothermal energy --- underground storage systems 23 p0408 A79-34072

Hot dry rock energy project 23 p0408 A79-34073

An exploration of the applicability field of geothermal water-fed heat pumps 23 p0409 A79-34077

Geothermal community heating systems 23 p0409 A79-34078

Conserving electric power by geothermal refrigeration - Cooling and freezing 23 p0409 A79-34079

The economics of upgrading geothermal steam by adiabatic compression 23 p0409 A79-34081

Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources 23 p0420 A79-34170

Evaluation of the geothermal potential of Kirishima by resistivity sounding curves 23 p0476 A79-38948

Determination and interpretation of the geothermal flux at Bournac /Haute-Loire/ 23 p0480 A79-39850

Exploration and exploitation techniques for geothermal resources 23 p0525 A79-41819

Rippled silica deposits in heat exchanger tubes --- heat removal from geothermal water 23 p0532 A79-42984

Natural convection in porous media and geothermal systems 23 p0533 A79-43014

Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain 23 p0536 A79-43645

Geothermal systems and their energy resources 24 p0632 A79-46433

Advances in heat transfer. Volume 14 --- Book 24 p0638 A79-47255

Heat transfer in geothermal systems 24 p0638 A79-47256

Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan 24 p0640 A79-47506

Environmental implications for geothermal energy development 24 p0659 A79-50351

Environmental aspects of geysers geothermal operations 24 p0666 A79-50896

The consumptive use of water in geothermal energy applications 24 p0667 A79-50897

Environmental considerations and the geothermal energy resource in Louisiana 24 p0667 A79-50898

Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California 24 p0667 A79-50899

Today's geothermal power economics and risks 24 p0689 A79-51869

System aspects of geothermal resources utilization - The case of Castelnuovo Val di Cecina as an example 24 p0689 A79-51871

Cost study of superheating geothermal steam 24 p0707 A79-52572

Direct heat applications of geothermal energy in the geysers/Clear Lake Region, volume 2: Environmental assessment [SAN-1326-1-2] 21 p0174 N79-10532

Geothermal Reservoir Engineering Management Program Plan (GREMP Plan) [LBL-7000] 21 p0174 N79-10536

National Geothermal Information Resource [LBL-7803] 21 p0187 N79-11515

Definition of engineering development and research problems relating to the use of geothermal fluids for electric power generation and nonelectric heating [LBL-7025] 21 p0188 N79-11534

Energy programs at The Johns Hopkins University Applied Physics Laboratory [PB-283171/7] 21 p0191 N79-11554

Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin [PB-2025-3] 21 p0192 N79-11607

Thermal stress cracking and the enhancement of heat extraction from fractured geothermal reservoirs [LA-7235-MS] 21 p0198 N79-12568

Evaluation and targeting of geothermal energy resources in the southeastern United States [VPI-SU-5648-1] 21 p0204 N79-13478

Geothermal emissions data base: Cerro Prieto geothermal field [UCID-4033] 21 p0204 N79-13480

Non-electric applications of geothermal energy in six Alaskan towns [IDO-1622-4] 21 p0208 N79-13523

OTEC thermal resource report for Central Gulf of Mexico [TID-27951] 21 p0209 N79-13533

Geothermal element, Imperial County, California [PB-287115/0] 22 p0335 N79-16385

Impact prediction manual for geothermal development [PB-288128/2] 22 p0349 N79-18462

Seismological investigations in geothermal regions 22 p0356 N79-19506

Geothermal resources for aquaculture [PB-290345/8] 22 p0356 N79-19563

Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey [LA-7656-MS] 22 p0358 N79-20458

Research on the physical properties of geothermal reservoir rock [COO-2908-4] 22 p0358 N79-20459

Methodology for modeling geothermal district heating for residential markets [BNL-50905] 22 p0361 N79-20502

A time domain survey of the Los Alamos Region, New Mexico [LA-7657-MS] 22 p0365 N79-21248

An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells [NVO-1531-2] 22 p0366 N79-21523

Microcrack technology for geothermal exploration and assessment [PB-290173/4] 22 p0367 N79-21530

A computerized reporting and monitoring system for geothermal energy development [LBL-8483] 22 p0369 N79-21555

Heat flow and radiogenic heat production in Brazil with implications for thermal evolution of continents 22 p0373 N79-21689

Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB-290226/0] 23 p0544 N79-22645

Geothermal ground noise measurements at Roosevelt Hot Springs and Cove Fort, Utah [PB-291624/5] 23 p0545 N79-22648

Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming 23 p0551 N79-23551

Self-starting manual for direct use applications of geothermal resources [PB-290872/1] 23 p0556 N79-24423

An evaluation of the hydrothermal resources of the Desert Hot Springs Region, California [PB-290942/2] 23 p0575 N79-25536

An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California [PB-293031/1] 23 p0585 N79-26562

A micrometeorological network for study of transport and diffusion of pollutants in two Apennine Valleys 23 p0586 N79-26638

Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
Sampling and analysis methods for geothermal fluids and gases
[PNL-MA-572-APP] 23 p0596 N79-27679
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747
Testing and sampling procedures for geothermal-compressed wells
[UT/CES-GR-2] 24 p0726 N79-28770
Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784
The direct use of coal: Prospects and problems of production and combustion
[PB-295797/5] 24 p0734 N79-29381
Geothermal power plants of Mexico and Central America: A technical survey of existing and planned installations
[COO-4051-26] 24 p0740 N79-29638
Introduction to electric energy conversion systems for geothermal energy resources
[COO-4051-28] 24 p0740 N79-29639
Potential application of Madison formation waters for community heating in South Dakota
[APL/JHU-QM-78-042R] 24 p0740 N79-29640
Evaluation of intermediate-period seismic waves as a geothermal exploration tool
24 p0744 N79-29716
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609
Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792
Geothermal pump test facility
[ALO-3715-1] 24 p0755 N79-30793
Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10273] 24 p0768 N79-31730
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10274] 24 p0768 N79-31731
Fuels from magma: A potential energy source --- producing hydrogen, carbon monoxide, and methane
[SAND-78-0191] 24 p0778 N79-32373
The future of hot dry rock geothermal energy systems
[LA-UR-79-683] 24 p0786 N79-32679
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies --- mass and energy balance for two phase flow in porous media
[LBL-8802] 24 p0786 N79-32684
Available work in geothermal energy
[COO-4051-25] 24 p0787 N79-32685
Federal hot dry rock geothermal energy development program: An overview
[LA-UR-79-670] 24 p0787 N79-32690
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526
Telluric sounding and mapping in the vicinity of the Salton Sea geothermal area, Imperial Valley, California
[PB-296081/3] 24 p0797 N79-33553
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB-296217/3] 24 p0802 N79-33602

GERMANIUM
Black germanium solar selective absorber surfaces
22 p0327 A79-31970
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50701

GERMANIUM ALLOYS
Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy
22 p0259 A79-23604
High temperature solar thermoelectric generator
23 p0447 A79-37299

GERMANY
Dornier/RWE solar house in Essen, FRG
22 p0276 A79-25933
Experience with the MBB-solar testing house at Otterfing and relevant consequences on the commercial product
22 p0276 A79-25934
Energy supply for the Federal Republic on a regenerative basis
23 p0473 A79-38666
Aspects of solar energy use in the Federal Republic of Germany
23 p0473 A79-38668
Status and future development of photovoltaic research in the Federal Republic of Germany
23 p0501 A79-40918
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany
[E79-10102] 22 p0339 N79-17291
Solar technology in the Federal Republic of Germany
[NASA-TM-75634] 23 p0558 N79-24439
Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0599 N79-27712
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: principles, engineering systems, economy
[[illegible]-SPEZ-25] 24 p0738 N79-29624
Methane and methanol as alternative energy sources: A comparative profitability study
[BMFT-FB-77-84] 24 p0747 N79-30412
Rational energy utilization in coke-oven-plant operations
[BMFT-FB-T-77-72] 24 p0759 N79-30832
Statement and comparison between different studies on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833

GEYSERS
The Geysers geothermal area emissions and aerometric data base and air quality analysis
23 p0534 A79-43373
Environmental aspects of geysers geothermal operations
24 p0666 A79-50896
Direct heat applications of geothermal energy in the geysers/Clear Lake Region, volume 2: Environmental assessment
[SAN-1326-1-2] 21 p0174 N79-10532

GLACIERS
Power from glaciers - The hydropower potential of Greenland's glacial water
21 p0087 A79-15672

GLASS
Requirements and new materials for fusion laser systems
21 p0082 A79-15138
Review of theories for predicting n2 in glasses and crystals --- refractive index of fusion laser materials
21 p0083 A79-15139
A survey of laser glasses --- for fusion studies
21 p0083 A79-15140
Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551
Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644
Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004

GLASS FIBER REINFORCED PLASTICS
  Filon panels - A technical report --- fiberglass reinforced plastics for solar collectors
    21 p0031 A79-10403
  Application of composite materials in the solar energy domain
    21 p0034 A79-11195
  Rotating strength of glass-carbon fiber-reinforced hybrid composite discs
    21 p0165 A79-20273
  Composite material flywheel for the electric-powered passenger vehicle
    22 p0240 A79-20842
  A status of the 'Alpha-ply' composite flywheel concept development
    22 p0241 A79-20843
  Characteristics of GRP for applications in solar energy collectors
    23 p0385 A79-33218
  A low cost composite blade for a 300 foot diameter wind turbine
    24 p0677 A79-51781
  Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors --- Kevlar/epoxy and glass/epoxy composites
  [UCRL-80116-PT-A] 21 p0215 N79-14165
GLASS FIBERS
  Extraterrestrial fiberglass production using solar energy --- lunar plants or space manufacturing facilities
    24 p0778 N79-32237
GLAZES
  Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle
    24 p0655 A79-50184
GLOBAL POSITIONING SYSTEM
  Potential of GaAlAs solar cells for the global positioning system missions
    24 p0691 A79-51901
GLYCOLS
  The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution --- fuel cell electrocatalysis
    21 p0037 A79-11795
  Recent advances in electrocatalysis and their implications for fuel cells
    21 p0038 A79-11807
GOLD
  The dependence of optical properties on the structural composition of solar absorbers - Gold black
    22 p0242 A79-21162
  Thin film solar absorber consisting of Au-particles in SiO2
    23 p0465 A79-38599
GOLD COATINGS
  Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode --- for solar cells
    22 p0317 A79-31411
  Optical properties of aggregated gold or aluminum
    24 p0669 A79-51181
GOVERNMENT PROCUREMENT
  Venture analysis of a proposed federal photovoltaic eight-year procurement plan
  [AIAA PAPER 78-1766] 21 p0061 A79-13865
  Financial/management scenarios for a satellite power system program
  [AAS PAPER 78-144] 22 p0243 A79-21259
  The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology
    23 p0516 A79-41053
  Econometric-engineering analysis of Federal energy conservation programs in the commercial sector
  [ORNL/CON-30] 23 p0562 N79-24489
  Application and system design study for cost-effective solar photovoltaic systems at Federal installations
  [HCP/M2522-01] 24 p0790 N79-32715
GOVERNMENT/INDUSTRY RELATIONS
  10-megawatt solar central receiver pilot plant
    21 p0094 A79-15906
  An economist looks at solar energy - The government's role
    21 p0099 A79-16132
  The need for closed service areas in a supply economy based on line networks --- for German gas and electric utilities
    21 p0168 A79-20447
  The commercialization of OTEC - Problems and opportunities
    23 p0405 A79-34043
  Commercial potential of the Space Shuttle
  [AAS PAPER 79-058] 23 p0438 A79-36548
  Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics
  [NASA-CR-157953] 21 p0200 N79-12970
  Electric utilities and solar energy: The service contract in a new social context
  [ORAU/IEA(O)-79-3] 23 p0597 N79-27685
  Ford/DOE sodium-sulfur battery electric vehicle development and demonstration, phase 1
  [COO-2566-37] 24 p0731 N79-29118
  Role of government in solar energy development: A view from the northwest --- economic feasibility of solar heating
  [PNL-2784] 24 p0738 N79-29621
  Environmental control implications of increased coal utilization under the National Energy Plan --- regulatory and control technology issues
  [ANL/EES-CP-10] 24 p0760 N79-30846
  Problems of technology transfer to industry --- government sponsored solar energy technology development
  [SAND-79-0096] 24 p0778 N79-32131
GOVERNMENTS
  The role of the local authority in waste reclamation
    23 p0395 A79-33752
  Planning program to accelerate energy conservation in municipalities
  [HCP/M05017-01/1] 21 p0210 N79-13536
  Cooking with offshore oil: A handbook for California local government --- regional planning
  [PB-288656/2] 22 p0331 N79-16140
  Satellite Power System (SPS) centralization/decentralization
  [NASA-CR-157434] 23 p0548 N79-23498
  The Congress needs to redirect the federal electric vehicle program
  [PB-293977/5] 24 p0731 N79-29120
  Improved energy contingency planning is needed to manage future energy shortages more effectively
  [EMD-78-106] 24 p0750 N79-30729
  Implementation of state solar incentives: Research, Development, and demonstration programs
  [SERI/TR-51-161] 24 p0773 N79-31799
GRAIN BOUNDARIES
  Grain-boundary edge passivation of GaAs films by selective anodization --- shorting effect in solar cells
    21 p0154 A79-18487
  Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
    22 p0252 A79-21807
  Thin-film GaAs solar cells with grain-boundary edge passivation
    23 p0436 A79-35749
  Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
    23 p0446 A79-37159
  Structure and electrical activity of planar defects in EFG ribbons
  [NASA-CR-158572] 23 p0551 N79-23806
GRAINS (FOOD)
  Sweet sorghum - A renewable source for alcohol production
    23 p0389 A79-33263
GRANITE
  Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain
    23 p0536 A79-43645
  Energy extraction operations: Some preliminary results --- thermal energy from granitic rocks by water injection
  [LA-UR-79-679] 24 p0786 N79-32678
GRAPHITE
  Spectral emissivity of porous graphite heated in air
    23 p0433 A79-35380

Sputtering yields of graphite and carbides and their potential use as first wall materials --- in Tokamak reactor
23 p0444 A79-36892

Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide --- tokamak wall materials
23 p0444 A79-36893

Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703

Gallium arsenide films and solar cells on graphite substrates
24 p0667 A79-50937

GRAPHITE-EPOXY COMPOSITE MATERIALS

High-energy-density flywheel --- rotor design and fabrication
24 p0678 A79-51784

Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121

GRAPHS (CHARTS)

A graphical approach to the efficiency of flat-plate collectors
21 p0102 A79-16422

Graphical representation of solar collector performance
24 p0609 A79-45216

GRATINGS (SPECTRA)

Optical characterization of high energy laser components
23 p0447 A79-37668

GRAVIMETRY

Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983

GRAVITATIONAL EFFECTS

Fixed-focal-axis solar concentrators with a curvature determined by gravity
23 p0523 A79-41254

GRAVITY WAVES

A theory for wave-power absorption by two independently oscillating bodies
22 p0259 A79-23307

GREAT BRITAIN

Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain
23 p0536 A79-43645

Alternative energy sources: An analysis of their role in energy policy
24 p0743 N79-29668

GREAT PLAINS CORRIDOR (NORTH AMERICA)

The ground water and energy supply situation for Great Plains irrigation
[PB-286002/1] 21 p0222 N79-14586

Evaluation of selected near-term energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803

GREENHOUSE EFFECT

An earth-wrapped solar greenhouse house --- partially buried structure
21 p0140 A79-17493

Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585

Passive solar heating for buildings
24 p0603 A79-44504

GRIDS

Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970

GRINDING (COMMINUTION)

Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes --- Book
23 p0474 A79-38871

Investigation of flow phenomena in pulverized coal gasification for the new process
[BMFT-FB-T-78-27] 23 p0590 N79-27341

GROOVING

Design, fabrication and test of a hydrogen heat pipe --- extruding and grooving 6063-T6 aluminum tubes for cryogenic heat pipes
[NASA-CR-152267] 23 p0556 N79-24298

GROSS NATIONAL PRODUCT

Energy use and society in the 21st century --- development cost effects on growing GNP economy
23 p0420 A79-34165

GROUND EFFECT

Energy effectiveness of arbitrary arrays of wind turbines
[AIAA PAPER 79-0114] 21 p0156 A79-19540

GROUND EFFECT (AERODYNAMICS)

The design impact of power-augmented ram technology on large energy efficient aircraft
[AIAA PAPER 79-1864] 24 p0669 A79-51250

GROUND STATIONS

Solar energy Measuring stations in Austria: Results and experiences
[ASSA-SE-INFO-6/78] 23 p0574 N79-25527

Comparison of two total energy systems for a diesel power generation plant --- deep space network
24 p0745 N79-30262

GROUND SUPPORT EQUIPMENT

Airport power supply --- Russian book
24 p0660 A79-50499

GROUND SUPPORT SYSTEMS

The potential of alternative energy sources in meeting Air Force requirements --- electrical and thermal ground power systems
23 p0420 A79-34169

GROUND TRUTH

Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379

Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373

GROUND WATER

The ground water and energy supply situation for Great Plains irrigation
[PB-286002/1] 21 p0222 N79-14586

GROUND WIND

Run duration analysis of surface wind speeds for wind energy application
22 p0287 A79-27345

Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy
24 p0713 A79-53545

GROUP 4A COMPOUNDS

Laser development for laser fusion applications
[SAND-78-2306] 24 p0720 N79-28540

GROUP 4B COMPOUNDS

Laser development for laser fusion applications
[SAND-78-2306] 24 p0720 N79-28540

GROUP 6A COMPOUNDS

Photovoltaic effects in II-VI heterojunctions
21 p0042 A79-11967

GROWTH

Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650

GULF OF MEXICO

Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC
24 p0617 A79-45782

Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants
24 p0621 A79-45816

Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

OTEC thermal resource report for Central Gulf of Mexico
[TID-27951] 21 p0209 N79-13533

An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells
[NVO-1531-2] 22 p0366 N79-21523

Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977
[PB-293733/2] 23 p0586 N79-26759

GULFS

A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine
22 p0323 A79-31554

GUST LOADS
Wind energy - Heat generation
23 p0486 A79-40133
Wind energy conversion system transient performance analysis
24 p0635 A79-46545

GYPSUM
Experimental study of a heatpipe with an active porous medium --- for solar application
23 p0400 A79-34007

H

HABITABILITY
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere
[IAF PAPER 79-A-16] 24 p0711 A79-53419

HABITATS
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446

HAIL
Hail risk model for solar collectors
21 p0098 A79-16103
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116

HALIDES
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480

HALL EFFECT
The ion fly-wheel effect on the electro-thermal instability in non-equilibrium MHD Hall disc generators
21 p0046 A79-12270
Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators
21 p0153 A79-18469
The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity
21 p0167 A79-20415
Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
Hall effect in an induction discharge
23 p0442 A79-36806
Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717

HALL GENERATORS
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment
23 p0479 A79-39807

HALLEY'S COMET
Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169

HALOGENATION
Electrogenerative and voltameiotic processes
24 p0703 A79-52026

HALOGENS
Thermodynamic and kinetic considerations on zinc-halogen batteries
21 p0040 A79-11822
Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960
Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492

HANDBOOKS
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development
[NASA-TP-1359] 21 p0223 N79-14679

HANDICAPS
Modification and evaluation of a small station wagon designed for transportation of the handicapped
[PB-295106/9] 24 p0763 N79-31107

HARDWARE UTILIZATION LISTS
Solar energy in developing countries: An overview and buyers' guide for solar scientists and engineers --- Book
22 p0327 A79-32139

HARMONIC GENERATIONS
Generation of the new coherent radiation by harmonic conversion and nonlinear mixing for certain applications --- optical interactions
21 p0111 A79-16639

HARMONIC OSCILLATION
Prediction of stresses and natural frequencies for high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177

HARMONIC RADIATION
Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940

HARTMANN FLOW
Hartmann flows in the MHD generator configuration
[AD-A070080] 24 p0793 N79-33036

HAWAII
Prospecting for meteorological energy in Hawaii
23 p0536 A79-43615
Electric utility application of WECS in an island location --- Wind Energy Conversion System in Hawaii
24 p0634 A79-46534
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382

HEALTH PHYSICS
Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems
24 p0608 A79-45207
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
Avoiding future health problems related to solar energy (photovoltaic) technology
[BNL-25935] 24 p0790 N79-32718

HEAT
The economics of upgrading geothermal steam by adiabatic compression
23 p0409 A79-34081
A primer on the rejection of waste heat from power plants
[PB-292529/5] 23 p0575 N79-25570

HEAT BALANCE
Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232
On the ion energy balance in TFR with and without neutral injection heating
21 p0069 A79-14452
Review of results from DITE tokamak
21 p0069 A79-14456
Numerical modeling of impurity effects --- on energy balance in tokamak experiments
23 p0445 A79-36945

HEAT CAPACITY MAPPING MISSION
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10273] 24 p0768 N79-31730
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10274] 24 p0768 N79-31731
Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming
[E79-10279] 24 p0796 N79-33518
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

HEAT EXCHANGERS
Heat exchanger designs for coal-fired fluidized beds
21 p0009 A79-10079
Analysis and application of the heat pipe heat exchanger
21 p0014 A79-10117
Geothermal power from salt domes
21 p0014 A79-10120
Thermionic power plant design point selection - The economic impact
21 p0025 A79-10214
Thermal energy storage heat exchanger design
[ASME PAPER 78-ENAS-30] 21 p0049 A79-12579
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826
OTEC program status and plans
21 p0094 A79-15902

OTEC power systems
21 p0101 A79-16248

The El Camino Real Solar Cooling Demonstration Project
21 p0102 A79-16425

Energy storage for tokamak reactor cycles --- during downtime for periodic plasma quench and reignition
21 p0111 A79-16727

Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine
21 p0114 A79-16800

Performance studies of a finned heat pipe latent thermal energy storage system
21 p0121 A79-17325

A heat pipe collector for low temperatures
21 p0127 A79-17395

Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems
21 p0150 A79-18092

Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808

Conceptual design of large heat exchangers for ocean thermal energy conversion
[ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813

Development of compact heat exchangers for Ocean Thermal Energy Conversion /OTEC/ systems
[ASME PAPER 78-WA/HT-34] 21 p0161 A79-19815

The analysis of heat transfer with and without condensation in a heat pipe heat exchanger
[ASME PAPER 78-WA/HT-59] 21 p0161 A79-19824

The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

A ceramic heat exchanger for a Brayton cycle solar electric power plant
22 p0239 A79-20822

Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819

Measured effects of flow leakage on the performance of the GT-225 automotive gas turbine engine
[ASME PAPER 79-GT-3] 22 p0306 A79-30502

Control system for solar hot water system
22 p0321 A79-31442

The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381

Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428

Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962

Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector
23 p0398 A79-33989

Modular stackable hot water storage/heat exchanger system for solar installations
23 p0400 A79-34004

Major factors in OTEC heat exchanger design
23 p0404 A79-34039

Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132

Sandia Laboratories' Midtemperature Systems Test Facility
23 p0429 A79-35049

OTEC biofouling and corrosion testing program --- for heat exchangers
23 p0429 A79-35057

The problem of fouling in the utilisation of geothermal energy
23 p0449 A79-37853

Domestic hot water heating using hot air solar collectors
[AIAA PAPER 79-0973] 23 p0457 A79-38180

Progress on high temperature air heater development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188

Ceramic receivers for solar power conversion
[AIAA PAPER 79-1008] 23 p0459 A79-38200

Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591

Influence of storage tank heat exchanger and mass flow rate on collector efficiency of solar heating units
23 p0468 A79-38625

Direct-contact heat exchange-storage tank in solar houses
23 p0468 A79-38626

Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 4 - Process and industrial heat transfer, heat transfer in energy utilization, heat exchangers
23 p0532 A79-42973

Design study of coal-fired cored brick regenerative heat exchangers --- for MHD generator
23 p0532 A79-42983

Rippled silica deposits in heat exchanger tubes --- heat removal from geothermal water
23 p0532 A79-42984

Enhancement of heat transfer
23 p0533 A79-43016

A review of current R&D in thermal energy storage and heat exchange in solar applications
24 p0608 A79-45211

OTEC goes to sea /A review of Mini-OTEC/
24 p0617 A79-45784

Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787

Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978 --- for OTEC
24 p0620 A79-45803

Ammonia vaporization and condensation investigations related to OTEC heat exchangers
24 p0622 A79-45819

The modeling of thin film heat exchangers --- for OTEC
24 p0622 A79-45820

Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821

Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826

Oxygen, temperature and pH effects on corrosion of aluminum in seawater --- for OTEC heat exchanger tubes
24 p0623 A79-45827

Qualification of a duplex, clad material for OTEC --- heat exchangers
24 p0623 A79-45828

The effects of biofouling and corrosion on heat transfer measurements --- for OTEC
24 p0623 A79-45829

Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger
24 p0623 A79-45835

Environmental impact assessment for OTEC-1
24 p0626 A79-45857

Experimental and analytical OTEC studies at ORNL
24 p0626 A79-45859

Use of the new stainless alloys for OTEC heat exchangers
24 p0627 A79-45864

Energy conservation via heat transfer enhancement --- in heat exchangers
24 p0630 A79-46307

Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems
24 p0640 A79-47573

Study of heat-pipe heat exchanger in the small gas turbine engine system
24 p0646 A79-48511

A solid-state solar-powered heat transfer device
24 p0667 A79-50932

Ceramic solar receivers
24 p0670 A79-51731

Conversion of solar energy to chemical energy using ammonia dissociation 24 p0672 A79-51746
A new solar thermal receiver utilizing a small particle heat exchanger 24 p0674 A79-51754
Analysis of a heat exchanger - Thermoelectric generator system 24 p0699 A79-51978
On the calculation of the temperature distribution in a packed bed for solar energy applications 24 p0712 A79-53495
Prototype solar-heated hot water systems and double-walled heat exchangers [NASA-CR-150854] 21 p0205 N79-13495
Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing [NASA-CR-158038] 21 p0219 N79-14540
State-of-the-art study of heat exchangers used with solar assisted domestic hot water systems (potential contamination of potable water supply) [PB-287410/5] 22 p0343 N79-17351
Thermal energy transformer [NASA-CASE-NPO-14058-1] 22 p0348 N79-18443
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation [NASA-CR-159465] 22 p0354 N79-19454
An improved solar energy receiver for a stirling engine [NASA-CASE-NPO-14619-1] 22 p0362 N79-20513
Active heat exchange system development for latent heat thermal energy storage [NASA-CR-159479] 22 p0368 N79-21554
Liquid-fluidized-bed heat exchanger flow distribution models [ICP-1151] 22 p0369 N79-21559
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3 [NASA-CR-162182] 24 p0771 N79-31775

HEAT FLUX
Reduction of the heat loss flux of collectors by infrared reflecting coatings on cover plates 21 p0058 A79-13649
Periodic heating/cooling by solar radiation --- through concrete slab buildings 21 p0140 A79-17491
Detailed characterization of MHD generator operating parameters 23 p0393 A79-33409
The real time aperture flux system as part of the Solar Thermal Test Facility 23 p0429 A79-35050
Determination and interpretation of the geothermal flux at Bournac /Haute-Loire/ 23 p0480 A79-39850
A generalized correlation of critical heat flux for the forced convection boiling in vertical uniformly heated round tubes - A supplementary report 23 p0487 A79-40301
Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems 23 p0530 A79-42893
On the problem of heat transfer in low-temperature heat pipes 23 p0532 A79-42938

HEAT GENERATION
Development and application of techniques to evaluate cogeneration impacts --- simultaneous electric energy and process heat production in electric power plants 22 p0303 A79-29795
Application of recuperative gas cycles with a bypass heat generator to solar energy power plants [ASME PAPER 79-GT-89] 23 p0376 A79-32366
The relationship of power and heat production with closed cycle gas turbines [ASME PAPER 79-GT-103] 23 p0377 A79-32379
Wind energy - Heat generation 23 p0486 A79-40133
The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation 24 p0696 A79-51955
Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles 24 p0724 N79-28739
Feasibility of district heating of northern US cities by cogeneration [ANL/EES-CP-18] 24 p0776 N79-31829

HEAT MEASUREMENT
Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator 21 p0020 A79-10166
The application of thermography to large arrays of solar energy collectors 22 p0242 A79-21171
Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells 22 p0246 A79-21487
Instrumenting hybrid passive/active solar systems --- for building heating 24 p0610 A79-45223
A method for measuring the photothermal conversion efficiency of solar energy 24 p0642 A79-47806
Calorimetric emissivities for solar-selective coatings on flat sheet 24 p0706 A79-52536
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results [PB-290160/1] 22 p0364 N79-21167

HEAT OF COMBUSTION
Coal combustion 24 p0714 A79-53779
Coal gasification for high and low Btu fuels 24 p0714 A79-53780
Energy conservation with fired heaters [TREE-1308] 24 p0772 N79-31783

HEAT OF FORMATION
Calculated heats of formation of metal and metal alloy hydrides 22 p0249 A79-21690
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies 22 p0250 A79-21697

HEAT OF VAPORIZATION
Clean energy from humid air --- conversion into electric power 23 p0406 A79-34053

HEAT PIPES
Lithium and potassium heat pipes for thermionic converters 21 p0013 A79-10113
Liquid metal heat pipes for the central solar receiver 21 p0014 A79-10114
Cost effective solar collectors using heat pipes 21 p0014 A79-10115
Analysis and application of the heat pipe heat exchanger 21 p0014 A79-10117
Heat pipe central solar receiver gas turbine plant 21 p0022 A79-10178
Copper/water axially-grooved heat pipes for RTG applications 21 p0023 A79-10188
Liquid metal heat pipe performance in the presence of a transverse magnetic field --- for fusion reactors [ASME PAPER 78-ENAS-20] 21 p0048 A79-12569
Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine 21 p0114 A79-16800
Performance studies of a finned heat pipe latent thermal energy storage system 21 p0121 A79-17325
A heat pipe collector for low temperatures 21 p0127 A79-17385
The analysis of heat transfer with and without condensation in a heat pipe heat exchanger [ASME PAPER 78-WA/HT-59] 21 p0161 A79-19824

Experimental study of the characteristics of heat
and mass transfer in a two-component
low-temperature heat pipe
22 p0246 A79-21585
Design of a heat pipe with separate channels for
vapor and liquid
22 p0268 A79-24486
Investigation of the thermophysical
characteristics of cryogenic heat pipes with a
metal-fiber wick
22 p0288 A79-27529
Experimental study of a heatpipe with an active
porous medium --- for solar application
23 p0400 A79-34007
Hydrogen energy transport systems and nuclear heat
- A promising way to conserve fossil energy
resources
23 p0415 A79-34127
Investigation of the maximal heat-transmitting
power of heat pipes with metal-fiber wicks
23 p0447 A79-37661
Development and testing of two- and three-stage
heat pipe radiators
[AIAA PAPER 79-1060] 23 p0455 A79-38040
Flight performance evaluation of heat pipe solar
collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041
Externally pumped Rankine cycle thermal transport
devices
[AIAA PAPER 79-1091] 23 p0456 A79-38060
Evaluation of a sodium heat pipe/thermal energy
storage unit utilizing LiF-MgF2-KF phase change
material
[AIAA PAPER 79-1095] 23 p0462 A79-38565
Performance analysis of phase change thermal
energy storage/heat pipe systems
[AIAA PAPER 79-1096] 23 p0462 A79-38566
Influence of emissivity and pipe size on thermal
losses of linear collectors measured under
different vacuum conditions
23 p0464 A79-38588
A generalized correlation of critical heat flux
for the forced convection boiling in vertical
uniformly heated round tubes - A supplementary
report
23 p0487 A79-40301
Choice of optimal parameters for a heat exchanger
with heat pipes for a gas turbine engine
23 p0529 A79-42552
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937
On the problem of heat transfer in low-temperature
heat pipes
23 p0532 A79-42938
Gravity opposed heat pipe --- for OTEC
24 p0624 A79-45842
An evacuated glass tube solar collector and its
application to a solar cooling, heating and hot
water supply system for the hospital in Kinki
University
24 p0641 A79-47797
Study of heat-pipe heat exchanger in the small gas
turbine engine system
24 p0646 A79-48511
Performance limits for liquid-metal heat pipes
containing long adiabatic sections
24 p0694 A79-51937
Copper/water axially-grooved heat pipes -
Fabrication and performance testing
24 p0694 A79-51938
NEP heat pipe radiators --- Nuclear Electric
Propulsion
24 p0700 A79-51985
A cesium vapor source based on a gas-regulated
heat pipe for thermionic energy transducers
24 p0704 A79-52166
Evacuated heat pipe solar collector
24 p0708 A79-52954
Transient shutdown analysis of low-temperature
thermal diodes
[NASA-TP-1369] 22 p0346 N79-18287
Recovery of waste heat from propellant forced-air
dry house
[AD-A064108] 23 p0543 N79-22638
Heat pipe technology. A bibliography with abstracts
[NASA-CR-158005] 23 p0546 N79-23364
Design, fabrication and test of a hydrogen heat pipe
--- extruding and grooving 6063-T6 aluminum
tubes for cryogenic heat pipes
[NASA-CR-152267] 23 p0556 N79-24298
Heat pipes, volume 3. Citations from the
Engineering Index data base
[NTIS/PS-79/0299/2] 23 p0569 N79-25360
Heat pipes volume 3. Citations from the NTIS data
base
[NTIS/PS-79/0298/4] 23 p0569 N79-25361
Cryogenic thermal diode heat pipes
[NASA-CR-152268] 24 p0719 N79-28470
Development of cryogenic thermal control heat pipes
--- of stainless steels
[NASA-CR-152302] 24 p0747 N79-30499
Heat pipe technology for spacecraft thermal control
24 p0764 N79-31274
Development of a heat pipe cooled 200 watt TWT
with improved efficiency
24 p0764 N79-31275
A heat pipe radiator for shunt electronics:
Development and test results
24 p0764 N79-31276
Heat pipes in the thermal control of communication
satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278
Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332] 24 p0781 N79-32518
Recent advances in thermochemical energy storage
and transport
[SAND-78-8505] 24 p0791 N79-32720

HEAT PUMPS

Performance of a Stirling engine powered heat
activated heat pump --- gas heating-cooling system
21 p0011 A79-10098
A thermochemical energy storage system and heat pump
21 p0012 A79-10105
Analysis and design of an 18-ton solar-powered
heating and cooling system
21 p0019 A79-10156
The matching of a free piston Stirling engine
coupled with a free piston linear compressor for
a heat pump application
21 p0024 A79-10204
A Stirling engine heat pump system
21 p0024 A79-10206
Metal hydride solar heat pump and power system
/HYCSOS/
[AIAA PAPER 78-1762] 21 p0061 A79-13863
Heat pumps without supplemental heat
21 p0073 A79-14695
Theory of solar assisted heat pumps
21 p0090 A79-15864
Controls for heat reclaim with thermal storage
coupled with solar heating
21 p0102 A79-16420
Solar pumping --- thermal and electrical water
pumping
21 p0104 A79-16469
A solar energy system with a dual-source heat pump
and long-term storage
21 p0119 A79-17312
Chemically driven heat pumps for solar thermal
storage
21 p0120 A79-17316
Design problems of air source solar boosted heat
pumps
21 p0138 A79-17472
Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834
Efficiency improvement by means of multicomponent
processes - Improvement of the efficiency of
heat-power transformation by means of an
employment of Clausius-Rankine sorption processes
21 p0164 A79-19975
Some applications of LaNi5-type hydrides --- using
reversible reaction with hydrogen working fluid
for heat storage
22 p0249 A79-21694
HYCSOS - A system for evaluation of hydrides as
chemical heat pumps
22 p0252 A79-21716
Solar heating using a heat pump and cold collectors
22 p0254 A79-22268
Estimating heat loads on multistage thermoelectric
heat pumps
22 p0260 A79-23614

Stability of work and sensitivity of semiconductor
thermoelectric systems under automatic control
22 p0261 A79-23624

Sulfuric acid-water - Chemical heat pump/energy
storage system demonstration
22 p0281 A79-26209

Performance of combined solar-heat pump systems
22 p0285 A79-26817

Heat pump technology for saving energy --- Book
22 p0302 A79-29624

Regulation and control concepts for the
possibilities of a utilization of solar energy
in the low-temperature range
22 p0305 A79-30345

Review of liquid piston pumps and their operation
with solar energy
[ASME PAPER 79-SOL-4] 22 p0308 A79-30542

Heat pump design - Cost effectiveness in the
collection, storage and distribution of solar
energy
22 p0313 A79-31316

WATSUN - A simulation program for solar-assisted
heating systems
22 p0321 A79-31439

Measurement of the performance of domestic
air-to-air heat pumps
23 p0397 A79-33768

An exploration of the applicability field of
geothermal water-fed heat pumps
23 p0409 A79-34077

Seasonal heat pump performance for a typical
northern United States environment
23 p0418 A79-34153

Energy resources for tomorrow - The possible role
of non-nuclear and non-fossil energy resources
23 p0420 A79-34170

Design study - Solar systems for commercial
buildings
23 p0425 A79-34601

Aspects of the supply potential of the heat pump
--- economic analysis
23 p0433 A79-35229

Solar energy and heat pumps - A possible
substitute for fossil fuels for heating private
households
23 p0434 A79-35464

Domestic space and water heating for existing
dwellings using a heat pump and conventional
roofs as energy absorbers
23 p0449 A79-37851

Fossil fuel heat pumps for domestic, commercial
and industrial space heating
23 p0449 A79-37852

Performance estimation of a total energy domestic
heat pump
23 p0449 A79-37854

Heat pump application to single family dwellings -
An analysis by computer model
23 p0449 A79-37855

Thermal performance of integrated solar collector
evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182

LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624

A case study of a solar assisted heat pump system
- 1977
23 p0469 A79-38634

Solar-assisted heat pump heating with tube
collectors
23 p0469 A79-38635

Uncovered absorber combined with flatroof
collectors and heatpump
23 p0469 A79-38636

The LN solar/heat pump house at Skive, Denmark
23 p0471 A79-38652

Heat storage in crushed limestone
24 p0609 A79-45215

Solar-powered Rankine heat pump for heating and
cooling
24 p0610 A79-45219

Rankine cycle solar driven heat pump development
24 p0610 A79-45221

The HYCSOS solar energy driven heat pump
24 p0610 A79-45222

Sophisticated solar heating controllers - Are they
cost effective
24 p0644 A79-47946

Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545

Solar collector as heat pump evaporator
24 p0672 A79-51744

Design study and cost-effectiveness of the metal
hydride solar heat pump and power system /HYCSOS/
24 p0672 A79-51745

Methanol based heat pumps for storage of solar
thermal energy
24 p0681 A79-51805

Development and testing of the sulfuric acid-water
chemical heat pump/chemical energy storage system
24 p0681 A79-51806

District heating and cooling with heat pump systems
24 p0696 A79-51960

Feasibility of a heat-actuated heat-pump-centered
integrated community energy system
24 p0696 A79-51961

System performance of a Stirling engine powered
heat activated heat pump
24 p0697 A79-51962

Modeling the performance of gas-fired heat pump
systems
24 p0697 A79-51963

Heat pump system for process steam generation
24 p0697 A79-51964

Thermodynamic evaluation of heat pumps working
with high temperatures
24 p0697 A79-51965

Technology impact study of a high efficiency
industrial heat pump
24 p0697 A79-51966

Storage assisted heat pumps using phase change
materials
24 p0697 A79-51967

Effective application of thermoelectric heat pumps
24 p0699 A79-51980

An assessment of thermal energy storage in
conjunction with heat pumps for residential
heating and cooling
24 p0707 A79-52574

Solar assisted heat pump study for heating of
military facilities
[AD-A058626] 21 p0206 N79-13506

Heat pump technology: A survey of technical
developments, market prospects and research needs
[HCP/M2121-01] 21 p0210 N79-13540

Energy and economic analysis of industrial process
heat recovery with heat pumps
22 p0331 N79-16210

Development of thermal prime movers for heat pump
drive
22 p0332 N79-16263

Parameter estimation and validation of a solar
assisted heat pump model
22 p0332 N79-16349

Certification report for the CALMAC solar powered
pump
[NASA-CR-150872] 22 p0341 N79-17331

Development, testing, and certification of Calmac
Mfg. Corp. solar collector and solar operated pump
[NASA-TM-78218] 22 p0342 N79-17338

Modeling and verification of heat pump performance
for industrial energy conservation
23 p0556 N79-24293

Cost-effective potential of optimumly designed
heat pumps for the collection, storage, and
distribution of solar energy
[BNL-25195] 23 p0556 N79-24307

A cooling system for an aircraft having a cruise
range from Mach 2 to Mach 8
[NASA-CASE-LAR-12406-1] 23 p0568 N79-24980

HYCSOS chemical heat pump and energy conversion
system
[CONF-781142-7] 23 p0584 N79-26529

Geothermal heating with heat pumps
23 p0584 N79-26531

Metal hydride solar heat pump and power system
(HYCSOS)
[CONF-781133-5] 23 p0596 N79-27675

Photovoltaic/thermal collectors and heat pumps ---
solar heating system efficiency
[COO-4577-2] 24 p0726 N79-28757

Role of the vapor compression cycle in solar
energy utilization
[BNL-24573] 24 p0753 N79-30776

Experimental performance study of a series solar
heat pump
[BNL-25928] 24 p0789 N79-32704

Heat pump/rock bed storage systems --- computer program for economic analysis
[COO-4704-2] 24 p0789 N79-32705
The use of the heat pumps to raise temperatures in an economical and ecological way --- domestic heating via industrial waste energy
[BMFT-FB-T-78-35] 24 p0792 N79-32732

HEAT RADIATORS
Ultralightweight structures for space power --- solar energy collection for transmission to earth
21 p0108 A79-16609
Development and testing of two- and three-stage heat pipe radiators
[AIAA PAPER 79-1060] 23 p0455 A79-38040
Thermal radiation from conducting surfaces
24 p0657 A79-50328
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519

HEAT RESISTANT ALLOYS
High-temperature alloys in high-technology systems
24 p0647 A79-48911
The role of corrosion in modern gas turbines
24 p0647 A79-48912
State of the art and science report on design of alloys resistant to high-temperature corrosion-erosion in coal conversion environments
[EPRI-FP-557] 21 p0200 N79-13149
Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels
[FE-1784-39] 24 p0719 N79-28364

HEAT SINKS
Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998
The use of liquid natural gas as heat sink for power cycles
22 p0332 N79-16262

HEAT SOURCES
Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112
Selenide isotope generator for the Galileo mission
21 p0022 A79-10185
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727
Industrial cogeneration - Problems and promise --- waste heat utilization from electricity production
22 p0265 A79-24047
The potential of fusion reactors as process heat source
22 p0284 A79-26624
Waste heat as an alternative heat source
23 p0417 A79-34144
Multiple section Minto Wheel driven by heat recovery from flue, steam, and return pipes of household heating systems /plus solar heat/
23 p0417 A79-34146
Utilizing geothermal resources below 150 C /300 F/
23 p0486 A79-40196
Use of modular heat source stack in RTGs --- Radioisotope Thermoelectric Generator
24 p0693 A79-51933
Alternative power-generation systems
21 p0169 N79-10129
Renewable ocean energy sources. Part 1: Ocean thermal energy conversion
[PB-283104/8] 21 p0191 N79-11556
Renewable ocean energy sources. Part 1: Working papers. Ocean thermal energy conversion
[PB-283103/0] 21 p0191 N79-11557
Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937
Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments --- soil and water analysis
[LA-7033-PR] 21 p0232 N79-15783
Development of thermal prime movers for heat pump drive
22 p0332 N79-16263
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268
Design and evaluation of aircraft heat source systems for use with high-freezing point fuels
[NASA-CR-159568] 23 p0553 N79-24172
Comparative evaluation of recent reports on the energy conservation potential from cogeneration
[ORNL/TM-6602] 24 N79-28776

HEAT STORAGE
Thermal energy storage for industrial waste heat recovery
21 p0012 A79-10101
High efficiency thermal energy storage system for utility applications
21 p0012 A79-10102
High temperature thermal energy storage in moving sand
21 p0012 A79-10103
NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106
Form-stable, crystalline polymer pellets for thermal energy storage
21 p0013 A79-10107
Storage systems for solar thermal power
21 p0013 A79-10108
Hybrid air to water solar collector design
21 p0021 A79-10174
Central solar heat stations and the Studsvik Demonstration Plant
21 p0021 A79-10175
Basic physical and chemical processes for storage of heat
21 p0038 A79-11805
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Thermal energy storage heat exchanger design
[ASME PAPER 78-ENAS-30] 21 p0049 A79-12579
The economic performance of passive solar heating - A preliminary analysis --- thermal storage wall for family home design
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691
Heat pumps without supplemental heat
21 p0073 A79-14695
Boosting the performance of solar HVAC systems by improving component interactions --- Heating, Ventilating and Air Conditioning
21 p0089 A79-15851
Passive solar heating of buildings
[LA-UR-77-1162] 21 p0090 A79-15859
Residential and commercial thermal storage --- for solar heating and cooling systems
21 p0090 A79-15865
Large-scale thermal energy storage for cogeneration and solar systems --- in aquifers
21 p0092 A79-15886
Controls for heat reclaim with thermal storage coupled with solar heating
21 p0102 A79-16420
Thermal storage of solar energy
21 p0103 A79-16459
Quasi-isentropic laser engines
21 p0111 A79-16632
A solar energy system with a dual-source heat pump and long-term storage
21 p0119 A79-17312
Long-term thermal storage in solar architecture in northern latitudes, with reference to typical single family dwellings
21 p0119 A79-17313
Long-term storage of solar energy in native rock
21 p0120 A79-17314
Chemically driven heat pumps for solar thermal storage
21 p0120 A79-17316
Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317
A simulation study of phase change energy store
21 p0120 A79-17318

Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319

Phase change thermal storage for a solar total energy system
21 p0120 A79-17321

A passive integrated unit for the collection, thermal storage in fusion materials and distribution of solar energy for home heating and other applications
21 p0121 A79-17322

Theoretical and experimental analysis of a latent heat storage system --- solar energy absorbers
21 p0121 A79-17323

A thermal storage analysis on packed bed of alumina spheres --- in solar houses
21 p0121 A79-17324

Performance studies of a finned heat pipe latent thermal energy storage system
21 p0121 A79-17325

Stratification effects in the short and long term storage of solar heat
21 p0121 A79-17326

Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327

A passive rock bed - Design, construction, and performance
21 p0121 A79-17328

Investigation on the feasibility of using a two-phase thermosyphon for solar storage, space heating and cooking
21 p0121 A79-17330

A study for optimum use of metallic plates for thermal storage in solar processes
21 p0122 A79-17331

Analysis of thermal storage unit for solar energy
21 p0122 A79-17332

An analytical and experimental study of pumped solar water heaters
21 p0128 A79-17389

Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415

A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S.
21 p0132 A79-17423

Two thermodynamic optima in the design of sensible heat units for energy storage
21 p0150 A79-18091

A theoretical analysis of solar collector/storage panels
[ASME PAPER 78-WA/SOL-11] 21 p0163 A79-19843

Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SOL-13] 21 p0163 A79-19845

Energy storage using the reversible oxidation of barium oxide
22 p0242 A79-21169

Thermal storage for industrial process and reject heat
22 p0243 A79-21300

Some applications of LaNi5-type hydrides --- using reversible reaction with hydrogen working fluid for heat storage
22 p0249 A79-21694

Storage efficiency in a solar plant
22 p0254 A79-22270

Prediction of the behavior of a solar storage system by means of recurrent stochastic models --- of insolation
22 p0258 A79-23295

Prediction of the performance of solar heating systems utilizing annual storage
22 p0263 A79-23760

Effects of low solar input and amount of storage on thermosyphon hot water system performance
22 p0267 A79-24312

Solar storage unit with built-in oil-gas boiler
22 p0268 A79-24322

Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0280 A79-26201

Analysis of energy storage by phase change with an array of cylindrical tubes
22 p0281 A79-26207

Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26208

Sulfuric acid-water - Chemical heat pump/energy storage system demonstration
22 p0281 A79-26209

Heat transfer and calorimetric studies of a direct contact-latent heat energy storage system
22 p0281 A79-26210

Thermal energy storage
22 p0310 A79-31000

Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409

Distributed energy storage for solar applications
22 p0317 A79-31410

Collector and storage efficiencies in solar heating systems
22 p0320 A79-31432

Measured and modeled passive performance in Montana --- for solar heating and thermal storage
22 p0322 A79-31445

Integration of a passive and active solar heated, low density, multiple dwelling with atrium
22 p0322 A79-31446

Sensible heat storage for solar energy applications
22 p0322 A79-31449

Alternate energy installations on the Jordan College Campus
22 p0323 A79-31454

Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457

A simple solar gas turbine plant
[ASME PAPER 79-GT-90] 23 p0377 A79-32367

Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961

Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963

Application of a simplified Markov model to the study of a solar power plant storage system
23 p0383 A79-32964

Design construction and short term performance of a solar pond
23 p0385 A79-33220

Latent heat storage --- using paraffin
23 p0388 A79-33249

Computer modelling of solar energy collection
23 p0398 A79-33986

New concept in solar thermal collectors
23 p0398 A79-33988

Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system
23 p0399 A79-33994

Experimental investigation of a fused salt energy storage system
23 p0400 A79-34003

Modular stackable hot water storage/heat exchanger system for solar installations
23 p0400 A79-34004

Solar energy storage via liquid filled cans - Test data and analysis
23 p0400 A79-34005

Transient analysis and optimization of an extended surface thermal storage unit which utilizes a phase change material
23 p0400 A79-34006

Manmade geothermal energy --- underground storage systems
23 p0408 A79-34072

Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132

A thermoeconomic analysis of thermal energy storage
23 p0416 A79-34138

Sandia Laboratories' Midtemperature Systems Test Facility
23 p0429 A79-35049

Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051

Sizing phase-change energy storage units for air-based solar heating systems
23 p0439 A79-36632

Thermal energy storage using hot liquids
23 p0451 A79-37879

Complex static mirror solar concentration arrays
23 p0452 A79-37886

Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

Evaluation of a sodium heat pipe/thermal energy storage unit utilizing NaF-MgF2-KF phase change material
[AIAA PAPER 79-1095] 23 p0462 A79-38565

Performance analysis of phase change thermal energy storage/heat pipe systems
[AIAA PAPER 79-1096] 23 p0462 A79-38566

Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575

A 'real life' solar air conditioned house project
23 p0463 A79-38577

Direct-contact heat exchange-storage tank in solar houses
23 p0468 A79-38626

Study on room heating utilizing eutectic salt mixture
23 p0470 A79-38638

The development of a storage system based on encapsulated p.c.m.-materials --- phase change materials for solar thermal storage
23 p0470 A79-38639

An experimental study of walls with latent heat for residences
23 p0470 A79-38640

Transport, distribution and storage of heat by water - Status and developments
23 p0524 A79-41803

Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930

Stratification in thermal storage during charging --- in cylindrical tank
23 p0532 A79-42974

Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976

An overview of intermediate temperature solar collector and energy storage technology
23 p0533 A79-43018

Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate
24 p0602 A79-44263

A review of current R&D in thermal energy storage and heat exchange in solar applications
24 p0608 A79-45211

Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213

Heat storage in crushed limestone
24 p0609 A79-45215

Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones
24 p0630 A79-46306

Thermal storage of off-peak electrical energy in solar heating and cooling systems
24 p0644 A79-47945

Method of calculating heat storages for solar heating systems
24 p0648 A79-49184

Lateral flow concept for rock bed systems --- of solar heating
24 p0654 A79-50174

Energy storage in fluidized beds
24 p0657 A79-50211

Solar pond concepts - Old and new
24 p0671 A79-51734

Solar central receiver program
24 p0674 A79-51756

Electric utility applications of thermal energy storage and transport
24 p0680 A79-51802

A thermal energy storage system for a Stirling engine powered highway vehicle
24 p0680 A79-51803

Methanol based heat pumps for storage of solar thermal energy
24 p0681 A79-51805

Hybrid thermal storage subroutine for transient simulation
24 p0681 A79-51807

A simplified algorithm for the evaluation of hybrid thermal storage with water systems
24 p0681 A79-51808

New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863

Storage assisted heat pumps using phase change materials
24 p0697 A79-51967

An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling
24 p0707 A79-52574

Optimization of a fixed solar thermal collector
24 p0712 A79-53490

Passive solar heating of buildings using a transwall structure
24 p0712 A79-53493

Thermal performance evaluation of the Calmac (liquid) solar collector
[NASA-CR-150819] 21 p0173 N79-10521

Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980
[DSE/2426-19] 21 p0174 N79-10535

Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481

Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts
[NASA-CR-159411-VOL-1] 21 p0205 N79-13496

The role of thermal energy storage in industrial energy conservation
[NASA-TM-79122] 22 p0368 N79-21550

Active heat exchange system development for latent heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554

Research on energy storage for solar thermal conversion
[NASA-CR-159427] 23 p0542 N79-22631

Thermal Storage Applications Workshop. Volume 2: Contributed Papers
[NASA-CR-158644] 23 p0559 N79-24461

Storage systems analysis --- Solar Thermal Power Program
[SERI/PR-35-101] 23 p0599 N79-27705

Solar heating, cooling, and hot water systems installed at Richland, Washington
[NASA-CR-161237] 24 p0722 N79-28721

Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783

Bismarck, North Dakota, office commercial solar demonstration design and construction report
[COO-4228-1] 24 p0739 N79-29633

Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782

Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801

Energy conservation via heat transfer enhancement --- bibliographies
[COO-4649-3] 24 p0758 N79-30819

Stratified thermal storage in residential Solar energy applications
[COO-4523-1] 24 p0786 N79-32682

Thermal energy storage for advanced solar central receiver power systems
[SAND-78-8221] 24 p0788 N79-32694

Recent advances in thermochemical energy storage and transport
[SAND-78-8505] 24 p0791 N79-32720

Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560

Storage of heat: A survey of efforts and possibilities
[PB-295936/9] 24 p0801 N79-33592

HEAT TRANSFER
Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071
Transient energy removal in cylindrical parabolic collector systems
21 p0020 A79-10168
Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine
21 p0024 A79-10201
Collisional transport --- particle diffusion and heat transport in tokamak
21 p0078 A79-14780
Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402
Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489
Heat transfer - A review of 1977 literature
21 p0155 A79-18973
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
[ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814
The analysis of heat transfer with and without condensation in a heat pipe heat exchanger
[ASME PAPER 78-WA/HT-59] 21 p0161 A79-19824
Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585
Collisional transport --- of plasmas in plane and toroidal geometry
22 p0257 A79-22980
Design of a heat pipe with separate channels for vapor and liquid
22 p0268 A79-24486
Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859
Radiant exchange for a fin and tube solar collector
22 p0271 A79-25066
Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0280 A79-26201
Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204
Heat transfer and calorimetric studies of a direct contact-latent heat energy storage system
22 p0281 A79-26210
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532
Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764
Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429
Optimization of the heat transfer circuit of solar power plants using distributed solar thermal converters - Application to collectors of the THEK type
23 p0382 A79-32953
Thermal radiation - Transient heat transfer in plates with selective surfaces
23 p0389 A79-33266
Major factors in OTEC heat exchanger design
23 p0404 A79-34039
Heat transfer consideration in utilizing solar and geothermal energy
23 p0409 A79-34080
Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132
Moving bed heat transfer for advanced power reactor applications
23 p0416 A79-34133
Externally pumped Rankine cycle thermal transport devices
[AIAA PAPER 79-1091] 23 p0456 A79-38060
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193
Performance analysis of phase change thermal energy storage/heat pipe systems
[AIAA PAPER 79-1096] 23 p0462 A79-38566
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592
Heat transfer in a high temperature combustion chamber with premixing --- in MHD generators
23 p0474 A79-38869
Electrical production from moderate temperature geothermal brines
23 p0486 A79-40197
Estimating heat loss in residential structures using aerial infrared imagery
23 p0522 A79-41125
International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 2 - Heat transfer in energy conversion, natural convection, combined heat and mass transfer, condensation, and forced convection
23 p0530 A79-42886
Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems
23 p0530 A79-42893
Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution
23 p0531 A79-42900
Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930
International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 4 - Process and industrial heat transfer, heat transfer in energy utilization, heat exchangers
23 p0532 A79-42973
International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 6 - Keynote papers
23 p0532 A79-43012
Enhancement of heat transfer
23 p0533 A79-43016
A review of current R&D in thermal energy storage and heat exchange in solar applications
24 p0608 A79-45211
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821
Qualification of a duplex, clad material for OTEC --- heat exchangers
24 p0623 A79-45828
Land-based application of an OTEC open-cycle power system
24 p0627 A79-45871
Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants
24 p0629 A79-46228
Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305
Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526
Multistage fluidised coal combustor
24 p0688 A79-51864
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883
Evacuated heat pipe solar collector
24 p0708 A79-52954
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267
Environmental and safety considerations for solar heating and cooling applications
[PB-287772/8] 22 p0343 N79-17350
Thermal performance evaluation of MSFC hot air collectors with various flow channel depth
[NASA-CR-150900] 22 p0348 N79-18449
MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500
Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638

Heat transfer simulation in underground coal liquefaction
23 p0555 N79-24292

Study of heat transfer through refractory lined gasifier vessel walls
[FE-2210-29] 23 p0556 N79-24306

HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers --- solving the heat transfer problem
[NASA-CR-158640] 23 p0560 N79-24466

Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(OP)] 23 p0564 N79-24505

Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649

Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792

Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801

Energy conservation via heat transfer enhancement --- bibliographies
[COO-4649-3] 24 p0758 N79-30819

Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332] 24 p0781 N79-32518

Energy extraction operations: Some preliminary results --- thermal energy from granitic rocks by water injection
[LA-UR-79-679] 24 p0786 N79-32678

HEAT TRANSFER COEFFICIENTS

A simulation study of phase change energy store
21 p0120 A79-17318

A thermal storage analysis on packed bed of alumina spheres --- in solar houses
21 p0121 A79-17324

An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398

The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

Determination of thermal contact resistances --- for solar thermoelectric generators
21 p0166 A79-20351

Comparison of transient heat transfer models for flat plate collectors
22 p0242 A79-21168

Heat transfer characteristics of porous metallic matrix metal-hydrides
22 p0251 A79-21706

Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator
22 p0260 A79-23616

Investigation of the thermophysical characteristics of cryogenic heat pipes with a metal-fiber wick
22 p0288 A79-27529

The optimization of heat exchanger solidity for coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357

Thermal performance of integrated solar collector evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182

Transient response of a solar regenerator
23 p0526 A79-41935

Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution
23 p0531 A79-42900

Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787

Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

Heat transfer between a fluidized bed and an immersed vertical U-tube --- in pilot plants
24 p0632 A79-46320

Advances in heat transfer. Volume 14 --- Book
24 p0638 A79-47255

Heating characteristics of concentrator/receiver systems using selective absorption surfaces
24 p0646 A79-48739

Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire
24 p0706 A79-52368

Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14282

Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649

Condensation of refrigerants on vertical fluted tubes
[ORNL/TM-5848] 24 p0781 N79-32515

HEAT TRANSMISSION

An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678

Investigation of the maximal heat-transmitting power of heat pipes with metal-fiber wicks
23 p0447 A79-37661

Transport, distribution and storage of heat by water - Status and developments
23 p0524 A79-41803

Regional air pollution study: Heat emission inventory
[PB-284081/7] 21 p0200 N79-12602

Heat flow and radiogenic heat production in Brazil with implications for thermal evolution of continents
22 p0373 N79-21689

Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils
[ORNL/SUB-79/14274/1] 24 p0776 N79-31827

HEAT TREATMENT

Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321
24 p0662 A79-50548

Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771

HEATERS

Progress in the testing of materials and design concepts for directly-fired MHD air heater service
21 p0017 A79-10141

Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670

Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers
22 p0297 A79-28671

Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909

Operability and materials testing for MHD air heaters
24 p0701 A79-51994

HEATING

Geothermal preheating in fossil-fired steam power plants
21 p0014 A79-10118

Oil shale retorting - A correlation of selected infrared absorbance bands with process heating rates and oil yield
22 p0304 A79-29975

An evaluation of the potential for district heating in the United States
23 p0417 A79-34142

A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143

An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling
24 p0707 A79-52574

Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days
[PB-289204/0] 22 p0355 N79-19467

Geothermal resources for aquaculture
[PB-290345/8] 22 p0356 N79-19563

Methodology for modeling geothermal district heating for residential markets
[BNL-50905] 22 p0361 N79-20502
Simulation and design of solar thermal processes
[COO-2588-2] 24 p0741 N79-29655
Standards applicable to performance measurement of solar heating and cooling systems --- conferences
[COO-4142-2] 24 p0741 N79-29656
Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829

HEATING EQUIPMENT

A technical analysis for cogeneration systems with potential applications in twelve California industrial plants --- energy saving heat-electricity utility systems
21 p0011 A79-10099
A thermodynamic study of heating with geothermal energy
[ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253
Return flow solar air-heater
21 p0055 A79-13609
Control of solar energy systems, heat storage, and heat utilization
21 p0056 A79-13630
Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13631
The Arbonia control concept - Does flow regulation in the solar system cycle make sense --- working fluid regulation in solar heating facility
21 p0056 A79-13632
Solar heating and safety techniques
21 p0056 A79-13633
Safety requirements for solar heating systems - Practical considerations
21 p0056 A79-13634
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652
Design of a direct wind energy converter to heat water by agitation in a closed tank
21 p0067 A79-14290
Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292
Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691
Heat recovery devices for building HVAC systems --- Heating Ventilating and Air Conditioning
21 p0073 A79-14697
Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739
Preliminary results of the new geothermal domestic heating system at Creil
21 p0075 A79-14740
Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826
Acceleration of solar heating applications via improved data evaluation
21 p0087 A79-15829
System performance measurements for a packaged solar space heating system equipped with air-heating collectors
21 p0088 A79-15835
Materials problems and opportunities in coal conversion systems
21 p0094 A79-15900
Inexpensive solar energy utilization in human settlements
21 p0104 A79-16470
High-temperature oxidizer preheater --- for fossil fuel MHD energy conversion
21 p0106 A79-16487
The status of solar energy --- for domestic water heating and thermal electric power generation
21 p0115 A79-17219
Economic evaluation and optimization of solar heating systems
21 p0118 A79-17293
A solar energy system with a dual-source heat pump and long-term storage
21 p0119 A79-17312
Cheap packed bed absorbers for solar air heaters
21 p0128 A79-17388
An analytical and experimental study of pumped solar water heaters
21 p0128 A79-17389
Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402
Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467
The interface with solar - Alternative auxiliary supply systems --- for solar space heating
21 p0137 A79-17468
Design problems of air source solar boosted heat pumps
21 p0138 A79-17472
Heattube, a universal electrical solar heat equipment for building, community and agricultural purposes
21 p0138 A79-17473
Properties optimization for phase-change energy storage in air-based solar heating systems
21 p0149 A79-18018
Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809
Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832
Performance evaluation of the New Mexico State University Solar House
[ASME PAPER 78-WA/SOL-8] 21 p0163 A79-19840
Heat pump technology for saving energy --- Book
22 p0302 A79-29624
Report on a survey of operational solar systems
22 p0318 A79-31418
NRC solar monitoring program
22 p0318 A79-31419
Measured and predicted performance of solar domestic water heaters
22 p0319 A79-31422
Allowable costs for alternative domestic heating systems using utility supplied electricity for backup or charging energy
22 p0319 A79-31428
Component cost of solar energy systems
22 p0319 A79-31429
Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009
Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010
Design, performance, and economics of solar heating and cooling systems for single and multi-family residences
23 p0401 A79-34011
Moving bed heat transfer for advanced power reactor applications
23 p0416 A79-34133
Extraction of sensible heat from waste water for domestic heating applications
23 p0418 A79-34152
A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894
Flight performance evaluation of heat pipe solar collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041
Solar energy utilization in comparison with utilization of other energy types
23 p0465 A79-38598
System selection and optimization of a solar thermal installation for cooling, heating, and warm water heating
23 p0466 A79-38609
The air-water collector - Operating experience and utilization possibilities --- for solar heating
23 p0467 A79-38615
The performance of solar water heating systems with flat plate collectors
23 p0468 A79-38620
Central receiver solar heating system
23 p0468 A79-38621
Design of solar heated warm water heating facilities from an economic viewpoint
23 p0468 A79-38622

One year's experience with a do-it-yourself gravity-driven solar domestic hot water unit
23 p0468 A79-38623
Influence of storage tank heat exchanger and mass flow rate on collector efficiency of solar heating units
23 p0468 A79-38625
A preliminary feasibility study into the use of solar energy to provide year-round heating for a factory unit
23 p0471 A79-38647
Retrofitting strategies for a housing cooperative --- solar water heating installation
23 p0473 A79-38671
Design study of coal-fired cored brick regenerative heat exchangers --- for MHD generator
23 p0532 A79-42983
Renewable energy sources --- overview of West German options
24 p0606 A79-44958
Economic evaluation and optimization of solar heating systems
24 p0660 A79-50537
Preliminary design package for solar heating and hot water system
[NASA-CR-150619] 21 p0173 N79-10520
Elemental characteristics of aerosols emitted from a coal-fired heating plant
[NASA-TM-78749] 21 p0191 N79-11560
SIMS prototype system 4 - performance test report
[NASA-CR-150820] 21 p0205 N79-13499
Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-33] 21 p0221 N79-14575
System design package for SIMS prototype system 3, solar heating and domestic hot water
[NASA-CR-150840] 22 p0333 N79-16359
Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497
Verification test report on a solar heating and hot water system
[NASA-CR-161165] 22 p0360 N79-20493
Installation package for the Solaron solar subsystem
[NASA-CR-161190] 23 p0548 N79-23491
Prototype solar heating and cooling systems
[NASA-CR-161204] 23 p0557 N79-24437
Geothermal heating with heat pumps
23 p0584 N79-26531
Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDF-TM-78-3] 23 p0596 N79-27674
Development of retrofit energy conservation and solar heating systems, phase 1
[PB-295847/8] 24 p0801 N79-33593

HEAVING
A limiting mechanism for the heave induced Mathieu type instability of a cold water pipe --- for OTEC plant
24 p0621 A79-45813

HEAVY IONS
Heavy-ion beam inertial-confinement fusion
21 p0054 A79-13448

HEAVY LIFT LAUNCH VEHICLES
Satellite Power Systems (SPS) concept definition study. Volume 5: Transportation and operations analysis --- heavy lift launch and orbit transfer vehicles for orbital assembly
[NASA-CR-158067] 21 p0225 N79-15139
Satellite power system: Concept development and evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

HELICAL FLOW
Model of fluid flow in boilers with helicoidal coil --- for spherical solar collectors
23 p0383 A79-32959

HELICAL INDUCERS
Preliminary design of a subscale ceramic helical-rotor expander
21 p0050 A79-12849

HELICAL WINDINGS
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

HELICOPTER ENGINES
Modern engine development test techniques --- for helicopters
21 p0155 A79-18680
Technology evolution in the Allison Model 250 engine --- for helicopter propulsion
21 p0155 A79-18681

HELICOPTER PERFORMANCE
Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620

HELIOSTATS
Specular mirrors for solar energy application
21 p0034 A79-11147
Five MW solar thermal test facility heliostat focus and alignment system
21 p0043 A79-11972
Predicted performance of heliostats for ERDA's 10 MWe power plant
21 p0044 A79-12045
Solar power plants in the U.S.A.
21 p0057 A79-13640
Flexed beams in central receiver heliostat drives
[AIAA PAPER 78-1755] 21 p0060 A79-13856
Results of a tilt-tilt low profile heliostat test program
21 p0076 A79-14761
Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101
A status report on the Solar Thermal Test Facility
21 p0112 A79-16731
Design fabrication and testing of three meter diameter parabolic dish heliostat system
21 p0135 A79-17447
The design and evaluation of a hydraulic-solar powered tracking device
21 p0136 A79-17458
Efficiency degradation due to tracking errors for point focusing solar collectors
[ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839
Composite heliostats of large solar plants
21 p0166 A79-20350
Analysis and design of a field of heliostats for a solar power plant
22 p0242 A79-21161
Optical analysis of solar facility heliostats
22 p0296 A79-28360
Design considerations of small solar collector systems using plane heliostats
[ASME PAPER 79-SOL-2] 22 p0307 A79-30540
Solar-tower power plants - Optimization of the mirror field and application to the field scale effect
23 p0382 A79-32951
Contribution to the study of optimal conditions for optical concentration in solar power plant designs - Reduction of the radiation spot provided by a field of heliostats by use of optimized conical mirrors
23 p0382 A79-32952
Control of a heliostat field by distributed microcomputer technique
23 p0389 A79-33269
Design of an indirect-drive heliostat
23 p0390 A79-33270
Heliostat survivability and structural stability for wind loading
23 p0400 A79-34001
White Sands solar test facility
23 p0429 A79-35048
Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067
Solar power plants. I - Present programs and outlooks
23 p0434 A79-35481
Solar eyeball - An automatic sun-tracking concentrator for use with photovoltaic generators
23 p0442 A79-36792
Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198
Accuracy and energy characteristics of paraboloidal heliostat system
24 p0602 A79-44261
Principles for the calculation of heliostat fields of a solar power plant
24 p0646 A79-48738

Calculation of the optical characteristics of high-power two-mirror solar furnaces 24 p0648 A79-49183
User's guide for MIRVAL: A computer code for comparing designs of heliostat-receiver optics for central receiver solar power plants [SAND-77-8280] 24 p0729 N79-28932

HELIUM
Energy, helium, and the future --- U.S. He demand projection and conservation program 23 p0422 A79-34181
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL) [NASA-TM-79023] 21 p0226 N79-15267
Unique helium resources are wasting: A new conservation policy is needed [PB-293751/4] 24 p0748 N79-30701

HELIUM-NEON LASERS
Verification of wedge concentration using a helium neon laser --- solar collector design 21 p0098 A79-16104

HEMISPHERES
A novel design of evacuated-concentrating spherical collector 23 p0399 A79-33998

HENRY LAW
Solvent selectivity for purification of natural cases 24 p0717 N79-28252

HERMETIC SEALS
Integral glass encapsulation for solar arrays [NASA-CR-162361] 24 p0798 N79-33564

HETERODYNING
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas 24 p0640 A79-47452

HETEROJUNCTION DEVICES
Recent progress in thin film polycrystalline solar cells based on cadmium sulfide 21 p0042 A79-11966
Photovoltaic effects in II-VI heterojunctions 21 p0042 A79-11967
High efficiency solar cells based on indium phosphide 21 p0042 A79-11968
The photovoltaic effect in CdS/Cu2S solar cells 21 p0091 A79-15871
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells 21 p0123 A79-17346
A high-efficiency GaAlAs double-heterostructure photovoltaic detector --- with antireflection coating 21 p0154 A79-18489
Photoelectric properties of pCdTe-nCdS film heterojunctions 21 p0166 A79-20347
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells 21 p0166 A79-20354
High-efficiency AlGaAs/GaAs concentrator solar cells 22 p0261 A79-23710
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells 22 p0272 A79-25069
Series resistance effects in /GaAl/As/GaAs concentrator solar cells 22 p0273 A79-25745
Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure --- heterostructure solar cell fabrication 22 p0305 A79-30258
Heterojunction phenomena and interfacial defects in photovoltaic converters 23 p0438 A79-36150
Order-disorder transformations and the nature of the copper-sulphide layer in Cu/x/S/CdS solar cells 23 p0442 A79-36789
p-InP/n-CdS heterojunction solar cells 23 p0442 A79-36791
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells 23 p0499 A79-40907
Cuprous oxide photovoltaic cells 23 p0499 A79-40908
The performance of copper-ternary based thin-film solar cells 23 p0500 A79-40910
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells 23 p0500 A79-40911
Recent investigations of metal oxide/CdTe heterojunction solar cells 23 p0502 A79-40926
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells 23 p0503 A79-40949
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films 23 p0505 A79-40963
Barrier heights and interfacial effects in SnO2/Si solar cells 23 p0505 A79-40965
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells 23 p0505 A79-40966
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide 23 p0505 A79-40967
Photovoltaic properties of In2O3/semiconductor heterojunction solar cells 23 p0505 A79-40968
Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide 23 p0505 A79-40969
Experimental and theoretical study of silicon MOS solar cells with different barrier metals 23 p0507 A79-40985
Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base 23 p0513 A79-41031
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance 23 p0528 A79-42171
Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis 24 p0616 A79-45745
Efficient electron-beam-deposited ITO/n-Si solar cells 24 p0629 A79-46152
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications 24 p0629 A79-46249
Fabrication and characterization of SnO2/n-Si solar cells 24 p0642 A79-47802
Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells 24 p0646 A79-48737
Studies of CdSiAs2 for photovoltaic applications 24 p0654 A79-50027
A computer model of a heterojunction solar cell with application to GaP/Si 24 p0654 A79-50030
Crystal growth and properties of CdGa/x/In/1-x/Se2 chalcopyrite compound 24 p0654 A79-50176
CuInS2 films prepared by spray pyrolysis 24 p0657 A79-50197
An anomalous photocurrent in SnO2-Si heterojunction solar cells 24 p0668 A79-50950
Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C --- for space applications 24 p0668 A79-51008
A study of oxide-based heterostructure photoelectrodes --- for solar cells 24 p0705 A79-52314
Material growth and characterization directed toward improving III-V heterojunction solar cells [NASA-CR-158476] 22 p0367 N79-21543

HEXAGONAL CELLS
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution 23 p0415 A79-34124

HEXAGONS
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974

HF LASERS
Laser development for laser fusion applications
[SAND-78-2306] 24 p0720 N79-28540

HIGH ALTITUDE
NACA research on hydrogen for high altitude aircraft
22 p0338 N79-16999
New initiatives in high altitude aircraft
22 p0338 N79-17000
Exhaust emissions and fuel economy from automobiles using alcohol/gasoline blends under high-altitude conditions
[PB-290612/1] 23 p0555 N79-24191

HIGH ASPECT RATIO
Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480

HIGH CURRENT
Superconducting magnets --- for MHD applications
21 p0105 A79-16485
High-current Al-TiNb composite conductor for large energy storage magnets
24 p0604 A79-44546
Synthetic test methods of high-direct-current circuit breaker --- used with ohmic heating power supply for tokamak device
24 p0716 A79-54504

HIGH ENERGY ELECTRONS
Application of electron beams in space for energy storage and optical beam generation
21 p0108 A79-16606
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852
Radiation energy conversion in space
22 p0284 A79-26595
On the motion of runaway electrons in momentum space --- analysis for multi-component plasma in tokamaks
22 p0291 A79-27880
Prospects of generating power with particle-beam-drive inertial confinement fusion
23 p0407 A79-34063

HIGH ENERGY FUELS
High-grade fuels from biomass farming - Potentials and constraints
24 p0669 A79-51194
Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis
24 p0669 A79-51196
High energy MHD fuels development program
[AD-A060156] 21 p0216 N79-14239

HIGH FIELD MAGNETS
Energy sources and conventional magnets --- for tokamak experiment Power Reactor toroidal field
21 p0079 A79-14791
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
Design of a D-shaped toroidal field coil
21 p0156 A79-19083
Superconducting magnets - Present status and problems
22 p0311 A79-31009
All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906

HIGH FREQUENCIES
Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front
23 p0486 A79-40251

HIGH POWER LASERS
Power from space by laser
22 p0284 A79-26596
Optical characterization of high energy laser components
23 p0447 A79-37668
High-energy laser mirror thermal distortion testing techniques
23 p0447 A79-37670
High power iodine atom laser
24 p0707 A79-52644
Large aperture components for solid state laser fusion systems
24 p0713 A79-53522
Lasers: Their applications and operational requirements
23 p0590 N79-27494

HIGH PRESSURE
Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041
High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249

HIGH SPEED
NACA research on hydrogen for high altitude aircraft
22 p0338 N79-16999
High Speeds and aerotrain
23 p0551 N79-23836

HIGH SPEED CAMERAS
Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940

HIGH STRENGTH STEELS
Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826

HIGH TEMPERATURE
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448
Energy storage by the use of high temperature electrochemical systems
21 p0148 A79-17992
The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature --- for hydrogen production
23 p0382 A79-32875
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344
A low cost high temperature sun tracking solar energy collector
22 p0366 N79-21390

HIGH TEMPERATURE AIR
High-temperature oxidizer preheater --- for fossil fuel MHD energy conversion
21 p0106 A79-16487
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465
Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467
Combustion of pulverized coal in high temperature preheated air
[AIAA PAPER 79-0298] 21 p0158 A79-19654
Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809
Optimization of the flow passage geometry for air heating solar collectors
22 p0316 A79-31403
Progress on high temperature air heater development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188
Cost analysis of new and retrofit hot-air type solar assisted heating systems
[NASA-TM-78186] 21 p0173 N79-10519
MSFC hot air collectors
[NASA-TM-78206] 21 p0196 N79-12556
Thermal performance evaluation of MSFC hot air collectors with various flow channel depth
[NASA-CR-150900] 22 p0348 N79-18449
Effects of air damper leaks on solar energy system performance
[SOLAR/0012-78/29] 23 p0563 N79-24497

HIGH TEMPERATURE ENVIRONMENTS
A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613
Differential pressure measurements in high temperature environments
21 p0144 A79-17599
Corrosion of metals in coal-gasification environments
[CONF-790145-2] 24 p0732 N79-29305
HIGH TEMPERATURE FLUIDS
Heat transfer in geothermal systems
24 p0638 A79-47256
HIGH TEMPERATURE GAS COOLED REACTORS
The nuclear closed-cycle gas turbine /GT-HTGR/ - A utility power plant for the year 2000
[AIAA PAPER 79-0191] 21 p0157 A79-19590
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828
High-temperature nuclear heat source for hydrogen production
23 p0437 A79-36049
HIGH TEMPERATURE GASES
Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine
21 p0024 A79-10201
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Mechanical reliability considerations in the modern high temperature industrial gas turbine
[ASME PAPER 79-GT-101] 23 p0377 A79-32377
Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396
A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434
Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems --- Pressurized Fluidized Bed Combustion
[ASME PAPER 79-GT-195] 23 p0380 A79-32453
Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552
Sandia laboratory combustion simulation facility --- for analyzing the flow of high temperature combustion products
[SAND-78-2240] 23 p0576 N79-26146
Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649
HIGH TEMPERATURE NUCLEAR REACTORS
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127
A high temperature fusion reactor design
24 p0696 A79-51954
Nuclear closed-cycle gas turbine (GT-HTGR): A utility power plant for the year 2000
[GA-A-15184] 23 p0582 N79-26515
Fusion energy for alternative applications: The generation of synthetic gaseous fuels --- approach to high temperature fusion reactor design
[ANL/FPP-TM-117] 24 p0755 N79-30790
HIGH TEMPERATURE PLASMAS
The TELEC - A plasma type of direct energy converter --- Thermo-Electronic Laser Energy Converter for electric power generation
21 p0110 A79-16629
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917
Interpretation of cyclotron radiation spectra from runaway discharges in TFR
22 p0313 A79-31185
A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915
Effect of scrape-off on tokamak radial transport
24 p0640 A79-47427
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452
Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47804
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337
HIGH TEMPERATURE RESEARCH
Materials --- for high temperature MHD technology
21 p0106 A79-16491
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002
HIGH TEMPERATURE TESTS
Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191
New instrumentation for high temperature and hemispherical measurements of selective surfaces --- for solar energy conversion
22 p0294 A79-28152
High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249
High temperature materials study --- for thermal insulation in solar furnaces
23 p0431 A79-35070
Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330
High-temperature lifetesting of Al/SiOx/p-Si contacts for MIS solar cells
23 p0536 A79-43569
HIGH VOLTAGES
Large-scale cryopumping for controlled fusion
21 p0085 A79-15330
Large space system - Charged particle environment interaction technology --- effects on high voltage solar array performance
[AIAA 79-0913] 23 p0425 A79-34775
Major electrical equipment proposed for tidal power plants in the Bay of Fundy
24 p0707 A79-52799
HIGHWAYS
Status of alcohol fuels utilization technology for highway transportation
[HCP/M2923-01] 21 p0201 N79-13190
Technology assessment of changes in the future use and characteristics of the automobile transportation system. Summary and findings
[PB-293645/8] 24 p0762 N79-31105
Technology assessment of changes in the future use and characteristics of the automobile transportation system, volume 2
[PB-293646/6] 24 p0762 N79-31106
HISTORIES
History of solar energy applications - Solar energy yesterday, today and tomorrow
21 p0089 A79-15852
Historical and projected power requirements
21 p0169 N79-10125
Historic and forecasted energy prices by US Department of Energy region and fuel type for three macroeconomic scenarios and one imported oil price escalation scenario
[DOE/EIA-0102/27] 24 p0725 N79-28751
HOLLOW
Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513
HOLOGRAPHIC INTERFEROMETRY
An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures
23 p0531 A79-42908

HOMEOSTASIS
Designing thermally efficient buildings for the U.S. Midwest
23 p0397 A79-33951

HOMOPOLAR GENERATORS
Homopolar generator energy storage for fusion reactors
22 p0304 A79-29942
Directly driven generators for wave energy conversion
23 p0449 A79-37858

HONEYCOMB STRUCTURES
An approximate equation for predicting the solar transmittance of transparent honeycombs
21 p0042 A79-11877
Performance of a honeycomb type flat plate collector with serpentine tube
21 p0054 A79-13579
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327
A comparison among various flat plate collectors with honeycomb structures
21 p0128 A79-17392
An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398
Anticonvective antiradiative systems --- for solar collectors
21 p0132 A79-17420
Honeycomb type flat plate collectors - Experiments leading to drinking straw --- heat retention material for solar steam generation
21 p0132 A79-17424
The honeycomb heat trap - Its application in flat plate solar collectors
22 p0322 A79-31447
Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector
23 p0398 A79-33989

HOSPITALS
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436

HOT CATHODES
Properties and test results of super-hot wall electrode materials --- for MHD generators
23 p0394 A79-33415

HOT ELECTRONS
Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876

HOUSINGS
NASA Tech House: An early evaluation
[NASA-TM-80751] 24 p0798 N79-33571

HUBS
A small horizontal axis wind turbine feeding power into the utility grid
21 p0074 A79-14703
High-energy-density flywheel --- rotor design and fabrication
24 p0678 A79-51784

HULLS (STRUCTURES)
Limit analysis and design of a semi-submerged concrete hull for an ocean thermal differences power plant
23 p0486 A79-40195
Tuned Sphere Stable OTEC Platform
24 p0620 A79-45802

HUMAN FACTORS ENGINEERING
Inexpensive solar energy utilization in human settlements
21 p0104 A79-16470

HUMAN WASTES
The natural and perturbed troposphere
21 p0179 N79-10636

HUMIDITY
Clean energy from humid air --- conversion into electric power
23 p0406 A79-34053

HYBRID PROPULSION
Fiat Research Center hybrid vehicle prototype
[SAE PAPER 790014] 22 p0313 A79-31351
Study of heat engine/flywheel: Hybrid propulsion configuration with electrical transmission system. Phase 2: Design definition
[ALO-41/2] 21 p0185 N79-11493

HYBRID STRUCTURES
Combined photovoltaic and thermal hybrid collector systems
[COO-4577-3] 23 p0583 N79-26525

HYDRATION
Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878
Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

HYDRAULIC CONTROL
The application of hydraulics in the 2,000 kW wind turbine generator
22 p0288 A79-27400
Flap-cone control of windmill speed
23 p0405 A79-34046
Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants --- conferences
[CONF-780599-2] 24 p0758 N79-30822

HYDRAULIC EQUIPMENT
The brake system for the DOE/Sandia 17-meter vertical axis wind turbine
21 p0067 A79-14289
Solar engines - The thermal wheel and beyond
21 p0095 A79-15909
The design and evaluation of a hydraulic-solar powered tracking device
21 p0136 A79-17458
Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190
Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems
22 p0280 A79-26191
Review of liquid piston pumps and their operation with solar energy
[ASME PAPER 79-SOL-4] 22 p0308 A79-30542
Free-wheeling hydraulic power mills --- wind or water current driven electric plants
23 p0387 A79-33244
The development of the wave contouring raft
23 p0450 A79-37869
The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station
24 p0641 A79-47700
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274
Design package for programmable controller and hydronic subsystem
[NASA-CR-161151] 22 p0371 N79-21619
Underground hydroelectric pumped storage: An evaluation of the concept
[TID-29412] 24 p0742 N79-29664

HYDRAULIC JETS
Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets --- application to geothermal sources
23 p0409 A79-34076

HYDRAULICS
New energy from an old source - Hydrogen from falling water
21 p0015 A79-10129

HYDRIDES
Survey of the different types of hydrides --- for hydrogen energy storage
22 p0247 A79-21678
Mixing effects of two different types of hydrides --- phase behaviors and energy storage applications
22 p0251 A79-21714
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716
A survey of the hydrogen storage properties of nickel-copper-mischmetal-calcium alloys
23 p0414 A79-34121
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution
23 p0415 A79-34124
High energy metal hydride fuel cell power source
[AD-A056491] 21 p0184 N79-11485

HYDROCARBON COMBUSTION

Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers
21 p0051 A79-12977

Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986

Correlations of catalytic combustor performance parameters
21 p0081 A79-14956

Combustion of pulverized coal in high temperature preheated air
[AIAA PAPER 79-0298] 21 p0158 A79-19654

Burn coal cleanly in a fluidized bed - The key is in the controls
22 p0282 A79-26374

Fluidised bed combustion of high ash Brazilian coals
23 p0385 A79-33225

Fluidized bed combustion of Brazilian coals
23 p0385 A79-33226

Status and future promise of fluidized-bed coal combustion
23 p0412 A79-34103

Application of fluidization techniques to the combustion of coal - The state of the art
23 p0528 A79-42250

Combustion of single coal particles in a jet --- fluidized bed simulation
24 p0632 A79-46319

Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels
21 p0179 N79-11150

Combustion kinetics of selected aromatic hydrocarbons
[AD-A059381] 21 p0215 N79-14184

Sandia laboratory combustion simulation facility --- for analyzing the flow of high temperature combustion products
[SAND-78-2240] 23 p0576 N79-26146

HYDROCARBON FUEL PRODUCTION

Energy from biomass through hydrolysis of wood
21 p0003 A79-10036

Colorado's oil-shale resource for vertical modified in-situ processes
21 p0005 A79-10046

Comparison of shale oils from different sources produced by controlled-state retort
21 p0005 A79-10047

Underground thermal generation of hydrocarbons from dry, southwestern coals
21 p0005 A79-10050

Exploratory research in coal conversion
21 p0007 A79-10061

Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064

An overview of coal preparation --- for producing clean fuel through desulfurization
21 p0044 A79-12115

Catalysis in coal conversion --- Book
21 p0051 A79-12873

Liquid fuels from biomass
[AIAA PAPER 78-1781] 21 p0063 A79-13876

Recovery of oil from oil shale - An overall technological perspective
21 p0073 A79-14698

SRC-II - Review of development and status --- Solvent Refined Coal process for fuel oil production
21 p0092 A79-15887

H-Coal pilot plant project and status of commercial development at Ashland --- coal gasification producing hydrogen and hydrocarbons
21 p0092 A79-15888

Status and outlook of the Exxon Donor Solvent coal liquefaction process development
21 p0092 A79-15889

SNG production by the Bockgas process
21 p0093 A79-15896

Petroleum plantations --- hydrocarbon fuels from artificial photosynthesis and plants
21 p0095 A79-15910

Production and use of low and medium Btu gas
21 p0095 A79-15912

An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing
22 p0264 A79-23780

Evaluation of commercial catalysts for the Fischer-Tropsch reaction --- for coal conversion to liquid fuel or chemical feedstock
22 p0272 A79-25124

Wilson parameters for the system H2, N2, CO, CO2, CH4, H2S, CH3OH, and H2O --- for cold methanol absorption in coal gasification
22 p0282 A79-26462

Factors affecting bitumen recovery by the hot water process
22 p0282 A79-26463

Moessbauer spectroscopy of iron in coal and coal hydrogenation products
22 p0282 A79-26464

Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies
22 p0282 A79-26465

Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source
22 p0283 A79-26466

Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470

Electrical induction heating of solid fossil fuels in situ - Some estimates
22 p0304 A79-30215

Gasification of raw lignite in the tube-furnace gasifier
22 p0310 A79-30996

Aviation fuels from coal
22 p0325 A79-31913

The gasification of ethyl alcohol
23 p0386 A79-33228

Small mills for producing alcohol from sugar cane
23 p0386 A79-33229

Observations on the production of methanol and anhydrous ammonia from wood
23 p0386 A79-33230

Simple methane digestors
23 p0386 A79-33234

Sweet sorghum - A renewable source for alcohol production
23 p0389 A79-33263

Production of synthetic fuels - An important civilian application of laser fusion
23 p0408 A79-34066

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 7 - Hydrocarbon conversion technology
23 p0410 A79-34086

Synthetic natural gas production from peat
23 p0411 A79-34092

Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096

A comparison of coal and biomass as feedstocks for synthetic fuel production
23 p0412 A79-34097

Effect of operating variables on reactor performance in the Synthoil coal conversion process
23 p0412 A79-34099

The H-Coal pilot plant - History, description, and present status
23 p0412 A79-34100

COIL process - First generation commercial coal liquefaction plant
23 p0412 A79-34101

Coal liquefaction - The H-Coal process
23 p0412 A79-34102

Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147

Fuel release from solid fossil-fuel deposits by electrical induction heating
23 p0446 A79-37285

A solar assisted economy --- system for peak electrical generation and off-peak storage or fuel production
23 p0469 A79-38632

Prospects for coal conversion in Canada
23 p0494 A79-40737

The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739

Methane production from manure
23 p0494 A79-40741
Liquid fuels from carbonates by a microbial system
23 p0494 A79-40742
Potential of biomass to substitute for petroleum in Canada
23 p0494 A79-40743
Potential for biomass utilization in Canada
23 p0494 A79-40744
Oil shale technologies and the potential for oil shale development
23 p0525 A79-41813
Classification and energy evaluation of urban wastes
23 p0525 A79-41817
A method of iteration for calculating the gasification gas composition of hydrocarbons and coal dust at low temperatures and high pressure
23 p0528 A79-42228
Gasification of solid waste - Potential and application of co-current moving bed gasifiers
23 p0536 A79-43574
Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability
24 p0628 A79-45996
Small scale gasification of biomass - The case of corn cob gasifiers
24 p0631 A79-46311
Fuels and chemicals from biomass
24 p0631 A79-46313
Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591
The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300
The Seattle experience - Conversion of solid waste to fuels or chemicals
24 p0651 A79-49384
Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis
24 p0669 A79-51196
Which alcohol fuel for Brasil - Methanol or ethanol
24 p0676 A79-51774
An overview of in situ oil shale technology and recent advances in true in situ retort modeling
24 p0688 A79-51865
The synfuels scenario
24 p0709 A79-52967
National gas survey: Synthesized gaseous hydrocarbon fuels
[DOE/FERC-0008] 23 p0577 N79-26228
The H-Coal processes: A status report
23 p0593 N79-27617
Coal-to-gasoline conceptual design and market evaluation of methanol fuel and methanol-derived gasoline
[FE-2416-37] 24 p0734 N79-29378
Coal liquefaction advanced research digest
[ORNL/FE-2] 24 p0746 N79-30398
Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413
Combined shift-methanation processes
[FE-2240-97] 24 p0766 N79-31414
Review of current research on hydrocarbon production by plants
[SERI/TR-33-129] 24 p0779 N79-32374

HYDROCARBON FUELS
The status of alcohol fuels utilization technology for highway transportation
21 p0003 A79-10035
H-coal products for direct application to power generation --- coal liquefaction derived fuels
21 p0006 A79-10056
Characteristics and combustion of future hydrocarbon fuels
21 p0036 A79-11599
Impact of future fuel properties on aircraft engines and fuel systems
21 p0036 A79-11600
Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers
21 p0051 A79-12977
Alternative fuels and combustion problems
21 p0051 A79-12978
Future fuels in gas turbine engines
21 p0051 A79-12979
Alternative fuels for reciprocating internal combustion engines
21 p0051 A79-12980
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983
Liquid-phase reactions of vaporizing hydrocarbon fuels
21 p0052 A79-12987
Role of aromatics in soot formation
21 p0053 A79-12988
Kinetics of nitric oxide formation in combustion
21 p0053 A79-12989
The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity
21 p0167 A79-20415
On future carburants. II --- alternative fuels from alcohols and hydrogen
22 p0296 A79-28439
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536
The use of non-fossil-derived hydrogen in coal conversion processes
23 p0451 A79-37882
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197
Hydrocarbons in ambient air. I - A statistical estimation of automobile hydrocarbons by factor analysis
24 p0646 A79-48376
Storage and distribution of synthetic fuels
24 p0650 A79-49379
A general history of the Nebraska Grain Alcohol and Gasohol Program
24 p0651 A79-49383
Advances in H-Coal --- coal liquefaction process
24 p0687 A79-51855
Fundamental data needs for coal conversion technology appendices
[TID-28152-APP] 21 p0187 N79-11512
Characteristics and combustion of future hydrocarbon fuels
21 p0202 N79-13196
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels
[AD-A060322] 21 p0226 N79-15203
Alternative hydrocarbon fuels: Combustion and chemical kinetics --- synthetic aircraft fuels
[AD-A061050] 22 p0338 N79-17011
EXXON donor solvent coal liquefaction process
23 p0593 N79-27618
Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker
[AD-A068452] 24 p0738 N79-29616
Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683
Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419
Hydrocarbon fuel cells. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0718/1] 24 p0801 N79-33595

HYDROCARBONS
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124

Dynagas Process 23 p0412 A79-34098
The isotopic composition of carbon in the Alberta oil sand 24 p0650 A79-49357
Specific heat variations in oil energy storage media and their economic implications [SAND-78-8672] 21 p0189 N79-11537
Improved anodes for liquid hydrocarbon fuel cell [AD-A058456] 21 p0206 N79-13504
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images [E79-10099] 22 p0347 N79-18373
Sooting characteristics of liquid pool diffusion flames [AD-A064111] 23 p0539 N79-22252
Hydrocarbons and energy from plants [LBL-8596] 23 p0564 N79-24507
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials [CONF-781039-9] 23 p0576 N79-26147
Enthalpy measurements for coal-derived liquids 23 p0587 N79-26997
Viscosity reduction of coal liquids by dissolved carbon dioxide [SAND-79-7027] 24 p0732 N79-29365

HYDRODYNAMIC EQUATIONS
A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model 23 p0410 A79-34087

HYDRODYNAMICS
The absorption of energy from ocean waves 23 p0449 A79-37859
Review of hydrodynamics and heat transfer for large helium cooling systems 23 p0481 A79-40073
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL) [NASA-TM-79023] 21 p0226 N79-15267

HYDROELECTRIC POWER STATIONS
Hydropower from a national point of view --- projects for future energy production 21 p0059 A79-13656
Wave driven power generating system 21 p0059 A79-13657
Development of industrial owned, small hydroelectric facilities 21 p0073 A79-14699
Low head power generation with bulb turbines --- hydroelectric installations 21 p0074 A79-14705
Power from glaciers - The hydropower potential of Greenland's glacial water 21 p0087 A79-15672
A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin 21 p0093 A79-15893
Power generation using thermal vapor pumping and hydro-pumped storage - Thermal gradient utilization cycle /TGUC/ 21 p0095 A79-15914
A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system 21 p0098 A79-16107
Regional analysis of potential water power 21 p0148 A79-17825
Studies in retiming tidal energy 21 p0152 A79-18115
Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production 22 p0237 A79-20730
Optimal decisions for long-term operation of hydropower systems 22 p0245 A79-21473
Free-wheeling hydraulic power mills --- wind or water current driven electric plants 23 p0387 A79-33244
Development of Brazilian hydroelectric potential - Future prospects and planning options 23 p0389 A79-33267
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 6 - Geothermal energy and hydropower 23 p0408 A79-34067
Low-head hydroelectric power - A realizable alternative 23 p0409 A79-34082
Small hydropower - Promise and reality in New York State and the northeast 23 p0410 A79-34083
Influence of technological advances on potential tidal power development 23 p0450 A79-37865
Studies of tidal power from the Bay of Fundy 23 p0450 A79-37866
Characteristics of a fully reversible axial pump-turbine for application in tidal power plants 23 p0450 A79-37868
Wind/hydro generation assessment 24 p0634 A79-46535
The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station 24 p0641 A79-47700
Effect of pressure head on the characteristics of hydroelectric stations with underwater lower reservoirs 24 p0646 A79-48827
Undergound pumped hydro storage - An overview 24 p0660 A79-50451
Pumped storage projects and their environmental impacts - An overview 24 p0666 A79-50894
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants 24 p0669 A79-51274
Underground pumped hydro storage - An evaluation of the concept 24 p0679 A79-51793
Turbomachinery options for an underground pumped hydroelectric storage plant 24 p0679 A79-51794
Geologic issues related to underground pumped hydroelectric and compressed air energy storage 24 p0680 A79-51800
Feasibility and economics of salinity power using Osmo-Hydro Power 24 p0701 A79-51997
Hydroelectric power generation and mineral recovery in the Qattara Depression of Egypt 24 p0707 A79-52575
Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB-290226/0] 23 p0544 N79-22645
Potential use of small dams to produce power for low-income communities [PB-292745/7] 23 p0575 N79-25535
Environmental readiness document. Small scale low head hydro: Commercialization, phase 3 planning [DOE/ERD-0009] 23 p0597 N79-27686
Small low-head hydroelectric power --- conferences [IDO-10076] 24 p0738 N79-29617
Low head hydropower: Focus group results [DOE/TIC-10017] 24 p0740 N79-29645
Underground hydroelectric pumped storage: An evaluation of the concept [TID-29412] 24 p0742 N79-29664
Rural development initiatives: Energy for rural America [PB-295234/9] 24 p0743 N79-29674
Comparison of two total energy systems for a diesel power generation plant --- deep space network 24 p0745 N79-30262
Assessment of hydropower restoration and expansion in New York State, volume 1 [PB-295782/7] 24 p0792 N79-32734
Energy programs at the Johns Hopkins University Applied Physics Lab. --- geothermal, hydroelectric, and ocean thermal energy [PB-295439/4] 24 p0793 N79-32739
Developing small hydroelectric dam potential [PB-296238/9] 24 p0802 N79-33601
Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB-296217/3] 24 p0802 N79-33602

HYDROFOILS
Energy from sea and air by large-span tensioned foils 23 p0410 A79-34084

HYDROGEN
Thermodynamics of pressure plateaus in metal-hydrogen systems 22 p0238 A79-20772
Hydrogen enrichment for low-emission jet combustion 22 p0244 A79-21347
Hydrogen production at reduced cost through electrolysis and buoyancy 23 p0414 A79-34116
Demand and supply of hydrogen as chemical feedstock in USA 24 p0612 A79-45580
Modern ammonia synthesis use of hydrogen 24 p0612 A79-45581
Economics of small user hydrogen --- future requirements and predicted costs for industrial use 24 p0613 A79-45583
Hydrogen from falling water --- hydraulic energy conversion to chemical energy 24 p0614 A79-45594
Distribution of gaseous hydrogen - Technology evaluation 24 p0615 A79-45598
DOE program on hydrogen energy systems 24 p0615 A79-45605
Selectivity improvement in the SRC process --- Solvent Refined Coal hydrodesulfurization over hydrogenation 24 p0628 A79-45992
Mobile electrolytic hydrogen generators 24 p0649 A79-49228
Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells 24 p0708 A79-52960
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient [ANL/CEN-FE-77-5] 21 p0216 N79-14242
Hydrogen technology from thermonuclear research 22 p0338 N79-16997
NACA research on hydrogen for high altitude aircraft 22 p0338 N79-16999
Rate of desulfurization from liquid iron and iron alloys with hydrogen [NRC/CNR-TT-1930] 23 p0553 N79-24120
Hydropyrolysis of coal derived liquids and related model compounds 23 p0553 N79-24171
Systems studies of coal conversion processes using a reference simulator [FE-2275-8] 23 p0554 N79-24187
Design, fabrication and test of a hydrogen heat pipe --- extruding and grooving 6063-T6 aluminum tubes for cryogenic heat pipes [NASA-CR-152267] 23 p0556 N79-24298
Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker [AD-A068452] 24 p0738 N79-29616
The potential for hydrogen as an energy source [PB-295317/2] 24 p0795 N79-33345
HYDROGEN BONDS
Metal hydride technology --- hydrogen bonding with intermetallics [BNL-26047] 24 p0780 N79-32387
HYDROGEN COMPOUNDS
Solar energy storage as hydrogen and bromine from hydrogen bromide 22 p0265 A79-24045
HYDROGEN EMBRITTLEMENT
Transmission of gaseous hydrogen - A preliminary technology evaluation 24 p0614 A79-45597
On design requisites for hydrogen energy systems 24 p0685 A79-51844
Hydrogen embrittlement and its control in hydrogen-fueled engine systems 22 p0366 N79-21429
HYDROGEN ENGINES
Some problems and benefits from the hydrogen fueled spark ignition engine 21 p0016 A79-10130
The self-propelled hydrogen-powered refrigerator car 23 p0415 A79-34126
Hydride engines 24 p0685 A79-51841
Hydrogen embrittlement and its control in hydrogen-fueled engine systems 22 p0366 N79-21429
Hydrogen-fueled postal vehicle performance evaluation [NASA-CR-158811] 24 p0730 N79-29106
HYDROGEN FUELS
Utility fuel cells for biomass fuel 21 p0016 A79-10131
Alternative fuels for reciprocating internal combustion engines 21 p0051 A79-12980
Hydrogen economy - An alternative 21 p0096 A79-15925
Solar fuels --- photochemical reaction kinetics and energy storage 21 p0149 A79-18009
Drag reduction by cooling in hydrogen fueled aircraft 21 p0165 A79-20084
The potential of liquid hydrogen as a military aircraft fuel 22 p0238 A79-20773
Some environmental and safety aspects of using hydrogen as a fuel 22 p0238 A79-20774
The hydrogen/hydride energy concept 22 p0252 A79-21717
Cryohydrogen-fuel for tomorrow's commercial aircraft 22 p0289 A79-27656
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction 22 p0312 A79-31156
The influence of fuel composition on smoke emission from gas-turbine-type combustors - Effect of combustor design and operating conditions 22 p0323 A79-31510
Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity 22 p0324 A79-31845
A development program for hydrogen burners 23 p0386 A79-33232
Hydrogen from the wind - A clean energy system 23 p0413 A79-34112
Hydrogen fuel production by wind energy conversion 23 p0413 A79-34113
State-of-the-art summary of the technical problems involved in the storage of hydrogen via metal hydrides 23 p0414 A79-34120
The potential of zeolite molecular sieves as hydrogen storage media 23 p0415 A79-34123
Hydrogen Homestead --- replacement fuel for homes 23 p0415 A79-34125
Hydrogen as a mid-term gaseous fuel supplement by blending with natural gas 23 p0415 A79-34129
A technological and economic study of the distribution of hydrogen for motor vehicles 23 p0447 A79-37774
Hydrogen energy system concept and engineering applications 23 p0451 A79-37874
The use of non-fossil-derived hydrogen in coal conversion processes 23 p0451 A79-37882
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines 23 p0461 A79-38387
Liquid hydrogen fueled commercial aircraft 24 p0615 A79-45600
Assessment of hydrogen-fueled intercity trucking and rail transportation 24 p0615 A79-45601
Fuel uses of hydrogen in the residential/commercial/industrial sectors 24 p0615 A79-45602
How safe is hydrogen 24 p0615 A79-45604
A steam process for coal gasification 24 p0632 A79-46321
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft [AIAA PAPER 79-1863] 24 p0643 A79-47920
Lockheed urges hydrogen fuel 24 p0648 A79-49224

Characterization of a swept-strut hydrogen fuel-injector for scramjet applications
24 p0649 A79-49345
Drag reduction by cooling in hydrogen-fueled aircraft
24 p0653 A79-49921
Comparison of alternate fuels for aircraft
24 p0668 A79-51100
Prediction of vehicle performance and its sensitivity to component improvements Application to electric and H2-fueled vehicles
24 p0677 A79-51782
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297
NACA research on hydrogen for high altitude aircraft
22 p0338 N79-16999
New initiatives in high altitude aircraft
22 p0338 N79-17000
Hydrogen embrittlement and its control in hydrogen-fueled engine systems
22 p0366 N79-21429
Hydrogen energy. A bibliography with abstracts
[NASA-CR-157962] 23 p0540 N79-22613
Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224
Hydrogen storage devices for automobiles
[BNL-25263] 23 p0583 N79-26518
Energy research and development programme
[EUR-5889] 24 p0736 N79-29596
Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207
Hydrogen use as a fuel. Citations from the NTIS data base
[NTIS/PS-79/0779/3] 24 p0796 N79-33347

HYDROGEN IONS
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide --- tokamak wall materials
23 p0444 A79-36893

HYDROGEN ISOTOPES
Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34989
Surface processes in plasma wall interactions --- in tokamak experiments
23 p0442 A79-36877

HYDROGEN OXYGEN ENGINES
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
Hydrogen/oxygen steam generation - An example of aerospace technology transfer
24 p0613 A79-45585
Supplementary steam - A viable hydrogen power generation concept
24 p0686 A79-51848

HYDROGEN OXYGEN FUEL CELLS
Preparation and ionic conductivity of H3O/+/ beta alumina --- for hydrogen-oxygen fuel cells
21 p0040 A79-11821
Generation of electrical energy from hydrogen and oxygen by means of fuel cells
21 p0059 A79-13662
Hydrogen-electric power drives
23 p0386 A79-33231
Fuels cells - Their development and potential
23 p0495 A79-40750
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553
The use of fuel cell ion exchange membranes in electrolytic cells
[P/539/77/23] 23 p0584 N79-26532
Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium
[P/539/77/20] 23 p0588 N79-27284
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784
Fuel Cells, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0717/3] 24 p0801 N79-33594

HYDROGEN PEROXIDE
Development and evaluation of a 600-kWh lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095

HYDROGEN PLASMA
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428
Stabilization of drift loss-cone instability /DCI/ by addition of cold ions --- in collisional hydrogen plasma confinement
22 p0291 A79-27882
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345
Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880
Recycling processes in tokamaks
23 p0443 A79-36882
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724
Plasma-surface interactions in tokamaks
23 p0527 A79-41942
Lower hybrid heating experiments in JFT-2 tokamak
24 p0607 A79-45030

HYDROGEN PRODUCTION
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127
A copper oxide-copper sulfate water-splitting cycle
21 p0015 A79-10128
New energy from an old source - Hydrogen from falling water
21 p0015 A79-10129
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132
Hydrogen production in a solar-hydrogen economy
21 p0037 A79-11796
Advanced electrolysis in alkaline solution --- for hydrogen production
21 p0037 A79-11798
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
Electrocatalysis, charge-transfer and the states of H adsorption in the hydrogen evolution reaction
21 p0038 A79-11801
Problems, status, and prospects of a solar hydrogen economy
21 p0059 A79-13658
Hydrogen production by conventional and modified water electrolysis
21 p0059 A79-13659
On the thermal and thermo-electrolytical generation of hydrogen by solar energy
21 p0059 A79-13660
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13874
H-Coal pilot plant project and status of commercial development at Ashland --- coal gasification producing hydrogen and hydrocarbons
21 p0092 A79-15888
Solar-hydrogen energy system and solar-hydrogen production methods
21 p0104 A79-16463
Solar hydrogen production at high temperatures
21 p0104 A79-16464
Technical and economic feasibility of making fertilizer from wind energy, water, and air
21 p0142 A79-17512
Development of a 1 kW fuel cell aggregate with acid electrolyte
21 p0148 A79-17994
Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water
21 p0167 A79-20360

The thermochemical decomposition of water using
bromine and iodine
22 p0238 A79-20770
Problems around Fe-Cl cycles --- thermochemical
decomposition of water hydrogen production
22 p0238 A79-20771
Photoelectrolysis of water with semiconductors
22 p0259 A79-23343
Applications of cryogenic technology. Volume 7 -
Proceedings of the Conference on Cryogenic
Energy Systems, Oak Brook, Ill., May 16-18, 1978
22 p0289 A79-27651
Hydrogen via gasification - Today and tomorrow
22 p0289 A79-27652
Progress in solid polymer electrolyte water
electrolysis --- for large-scale hydrogen
production
22 p0289 A79-27653
Hydrogen via thermochemistry and future
water-splitting technologies
22 p0289 A79-27654
An overview of the STOP hydrogen energy program
22 p0289 A79-27655
The economics of hydrogen and carbon monoxide
separation with cuprous ammonium lactate solutions
--- hydrogen production from coal
22 p0299 A79-29313
A new thermochemical process for hydrogen production
22 p0312 A79-31153
Direct thermomagnetic splitting of water
22 p0312 A79-31154
Thermodynamic method of studying and optimizing
thermochemical cycles of water decomposition at
high temperature --- for hydrogen production
23 p0382 A79-32875
Production of hydrogen by a thermo-electrochemical
cycle using solar energy
23 p0383 A79-32966
The gasification of ethyl alcohol
23 p0386 A79-33228
Development of a unipolar electrolysis unit ---
for hydrogen fuel production
23 p0386 A79-33235
The cost of hydrogen from coal
23 p0396 A79-33766
Solar energy conversion in marine biological systems
23 p0402 A79-34021
Dual purpose solar-electric power plants
23 p0403 A79-34027
Production of synthetic fuels - An important
civilian application of laser fusion
23 p0408 A79-34066
Alternative energy sources; Proceedings of the
Miami International Conference, Miami Beach,
Fla., December 5-7, 1977. Volume 8 - Hydrogen
energy
23 p0413 A79-34106
Production economics for hydrogen, ammonia, and
methanol during the 1980-2000 period
23 p0413 A79-34107
Comparison of two hydrogen production methods for
nuclear-hydrogen conversion
23 p0413 A79-34108
Water splitting - The chemistry of the I2-SO2-H2O
reaction and the processing of H2SO4 and HI
products
23 p0413 A79-34109
Thermochemical water splitting process using
iron-copper-chlorine cycle
23 p0413 A79-34110
Hydrogen from the wind - A clean energy system
23 p0413 A79-34112
State of development in the area of water
electrolysis /near term/ --- hydrogen production
technology
23 p0414 A79-34114
A new electrolytic cell type for hydrogen
production in hybrid cycles
23 p0414 A79-34115
Liquid hydrogen from solar energy now
23 p0414 A79-34117
A self-consistent process of producing hydrogen
from sea water
23 p0414 A79-34118
Biocatalytic production of hydrogen by an in vitro
system
23 p0414 A79-34119
High-temperature nuclear heat source for hydrogen
production
23 p0437 A79-36049
Hydrogen production from coal, water and electrons
23 p0445 A79-37072
Wind energy conversion and hydrogen production - A
feasibility study for South Africa
23 p0452 A79-37892
Hydrogen production with the ELOFLUX electrolysis
cell
23 p0469 A79-38631
A solar assisted economy --- system for peak
electrical generation and off-peak storage or
fuel production
23 p0469 A79-38632
Electrolytic hydrogen production by means of solar
and wind energy
23 p0469 A79-38633
Photoelectrolysis of aqueous solutions to hydrogen
- An approach to solar energy storage
23 p0495 A79-40747
Production, transport, and storage of hydrogen
23 p0523 A79-41802
Thermodynamic analysis of water thermolysis in a
solar furnace to obtain hydrogen
24 p0602 A79-44265
Hydrogen for energy distribution; Proceedings of
the Symposium, Chicago, Ill., July 24-28, 1978
24 p0612 A79-45576
Hydrogen in the U.S. energy picture
24 p0612 A79-45577
International developments in hydrogen technologies
--- research cooperation for new hydrogen
production methods
24 p0612 A79-45579
Modern ammonia synthesis use of hydrogen
24 p0612 A79-45581
Commodity hydrogen production and marketing
24 p0613 A79-45582
Hydrogen production via the K-T gas gasification
process - Current economic and technological
aspects
24 p0613 A79-45586
Developmental hydrogen via coal gasification
processes
24 p0613 A79-45587
Alkaline electrolysis - Past, present and future
24 p0613 A79-45588
Water electrolysis using solid polymer electrolytes
24 p0613 A79-45589
Hydrogen via thermochemical and other advanced
water-splitting technologies
24 p0614 A79-45590
The Westinghouse Sulfur Cycle Hydrogen Production
Process
24 p0614 A79-45591
Dedicated nuclear facilities for electrolytic
hydrogen production
24 p0614 A79-45592
Concepts for solar production of hydrogen
24 p0614 A79-45593
Status of solid polymer electrolyte
electrochemical cell technology for electrolytic
hydrogen generation and fuel cell power generation
24 p0625 A79-45849
Energy production by photoelectrochemical processes
24 p0633 A79-46521
R&D programmes in the field of hydrogen economy
24 p0648 A79-49227
The impracticability of large-scale generation of
hydrogen from water photolysis by utilization of
solar radiation
24 p0649 A79-49231
Some thermodynamic considerations on the
photodecomposition of water mediated by redox
reactions and their relation to solar energy
utilization
24 p0660 A79-50538
Process design of the LASL bismuth sulfate
thermochemical hydrogen cycle
24 p0685 A79-51839
Development of a sulfur-iodine thermochemical
water-splitting cycle for hydrogen production
24 p0685 A79-51840
High efficiency alkaline electrolysis technology
--- for hydrogen production
24 p0685 A79-51842

Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process
24 p0685 A79-51843

Solid polymer electrolyte water electrolysis status for large scale hydrogen production
24 p0686 A79-51847

Thermochemical hydrogen production by the Mark-13 process - A status report
24 p0686 A79-51849

Hydrogen from coal using pressurized gasification
24 p0687 A79-51853

Hydrogen program at Electric Power Research Institute
24 p0687 A79-51854

Computer analysis of coal gasification combined cycle plants
24 p0687 A79-51858

Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946

Advanced synfuel production with fusion
24 p0695 A79-51947

CO/H2 production using fusion reactor heat
24 p0695 A79-51949

Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316

The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294

Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296

Thermochemical production of hydrogen from water
[LA-UR-78-652] 21 p0180 N79-11236

Catalytic conversion of coal energy to hydrogen
[FE-2206-14] 21 p0180 N79-11239

Photoproduction of hydrogen by marine blue-green algae
[PB-287508/6] 22 p0343 N79-17354

Comparison of different techniques for producing hydrogen: Production costs analysis
[P/51/76/14] 23 p0578 N79-26240

Hydrogen from existing falling-water sites: An initial feasibility assessment (summary)
[CONF-781142-8] 24 p0718 N79-28360

Hydrogen production, volume 1. A bibliography with abstracts
[NTIS/PS-79/0540/9] 24 p0765 N79-31406

Hydrogen production, volume 2. A bibliography with abstracts --- by electrolysis and coal gasification
[NTIS/PS-79/0541/7] 24 p0765 N79-31407

Photobiological production of hydrogen: A solar energy conversion option --- hydrogen metabolism in photosynthetic bacteria and algae
[SERI/TR-33-122] 24 p0767 N79-31422

Fuels from magma: A potential energy source --- producing hydrogen, carbon monoxide, and methane
[SAND-78-0191] 24 p0778 N79-32373

Advanced synfuel production with fusion
[BNL-26130] 24 p0780 N79-32388

HYDROGEN RECOMBINATIONS

Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367

HYDROGEN SULFIDE

Desulfurization and sulfidation of coal and coal char
21 p0045 A79-12120

A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262

Wilson parameters for the system H2, N2, CO, CO2, CH4, H2S, CH3OH, and H2O --- for cold methanol absorption in coal gasification
22 p0282 A79-26462

H2S emissions in the domain of chemical industry and means of suppressing emissions
23 p0481 A79-40068

H2S associated with mineral oil refineries and natural gas processing plants - Emissions and absorptions
23 p0481 A79-40069

The influence of rough terrain on pollutant dispersion and transport from a geothermal power complex
23 p0534 A79-43372

The Geysers geothermal area emissions and aerometric data base and air quality analysis
23 p0534 A79-43373

Impact of H2S emission abatement on geothermal power costs
24 p0659 A79-50352

HYDROGEN-BASED ENERGY

Silver-hydrogen, a long life light weight energy storage system --- design for spacecraft
21 p0001 A79-10012

Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132

Model predictions for the stability of ternary metallic hydrides
21 p0038 A79-11802

Hydrogen storage by LaNi5 - Fundamentals and applications
21 p0038 A79-11803

Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804

New alloy systems for hydrogen storage
21 p0038 A79-11806

Problems, status, and prospects of a solar hydrogen economy
21 p0059 A79-13658

The wind as a potential energy source in future hydrogen technology
21 p0059 A79-13661

Hydrogen economy - An alternative
21 p0096 A79-15925

Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977
22 p0247 A79-21676

The prospects of hydrogen as an energy carrier for the future
22 p0247 A79-21677

Survey of the different types of hydrides --- for hydrogen energy storage
22 p0247 A79-21678

Structure and bonding in metal hydrides
22 p0247 A79-21679

Thermodynamics of metal, alloy and intermetallic/hydrogen systems
22 p0248 A79-21680

Structural studies of hydrides by neutron diffraction
22 p0248 A79-21681

Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682

Nuclear magnetic resonance studies of metal hydrides
22 p0248 A79-21683

NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684

Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686

Kinetics of hydrogen absorption and desorption --- for energy storage
22 p0248 A79-21687

The storage and release of hydrogen from magnesium alloy hydrides for vehicular applications
22 p0249 A79-21688

High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy
22 p0249 A79-21689

Calculated heats of formation of metal and metal alloy hydrides
22 p0249 A79-21690

Acoustic emissions during hydride formation
22 p0249 A79-21691

Magnetic and electrical properties of rare earth and rare earth intermetallic hydrides
22 p0249 A79-21692

Hydrogen absorption in rare earth intermetallic compounds
22 p0249 A79-21693

Some applications of LaNi5-type hydrides --- using reversible reaction with hydrogen working fluid for heat storage
22 p0249 A79-21694

Metal hydride electrodes for electrochemical energy storage
22 p0249 A79-21695

The plateau pressure of RE Ni5 and RE Co5 hydrides --- in hydride formation
22 p0250 A79-21698

Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory
22 p0250 A79-21699

The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700

Hydride formation of C14-type Ti alloy
22 p0250 A79-21701

Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

The metallurgy and production of rechargeable hydrides --- for hydrogen storage
22 p0250 A79-21703

A new rationale for the hysteresis effects observed in metal-hydrogen systems
22 p0250 A79-21704

Heat transfer characteristics of porous metallic matrix metal-hydrides
22 p0251 A79-21706

The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707

Electrochemical utilization of metal hydrides
22 p0251 A79-21709

Hydrogen storage electrode systems
22 p0251 A79-21710

Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711

Mixing effects of two different types of hydrides --- phase behaviors and energy storage applications
22 p0251 A79-21714

Applications of metal hydrides --- emphasizing use as energy storage media
22 p0251 A79-21715

The hydrogen/hydride energy concept
22 p0252 A79-21717

Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719

An overview of the STOR hydrogen energy program
22 p0289 A79-27655

Hydrogen - Potential key to tomorrow's energy utility
22 p0289 A79-27657

The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020

Hydrogen-electric power drives
23 p0386 A79-33231

A development program for hydrogen burners
23 p0386 A79-33232

Hydrogen storage in the form of metal hydrides
23 p0388 A79-33251

An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0397 A79-33836

Direct Solar Energy Conversion at Sea /DSECAS/ - Characteristics of a baseline concept
23 p0402 A79-34026

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 8 - Hydrogen energy
23 p0413 A79-34106

A survey of the hydrogen storage properties of nickel-copper-mischmetal-calcium alloys
23 p0414 A79-34121

Hydrogen Homestead --- replacement fuel for homes
23 p0415 A79-34125

Hydrogen energy transport systems and nuclear heat - A promising way to conserve fossil energy resources
23 p0415 A79-34127

A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774

Batteries, fuel cells, a hydrogen economy - Keynote address
23 p0451 A79-37873

Hydrogen energy system concept and engineering applications
23 p0451 A79-37874

Production, transport, and storage of hydrogen
23 p0523 A79-41802

The HYCSOS solar energy driven heat pump
24 p0610 A79-45222

Hydrogen for energy distribution; Proceedings of the Symposium, Chicago, Ill., July 24-28, 1978
24 p0612 A79-45576

Hydrogen in the U.S. energy picture
24 p0612 A79-45577

Role of hydrogen in Eco Energy
24 p0612 A79-45578

International developments in hydrogen technologies --- research cooperation for new hydrogen production methods
24 p0612 A79-45579

Transmission of gaseous hydrogen - A preliminary technology evaluation
24 p0614 A79-45597

Distribution of gaseous hydrogen - Technology evaluation
24 p0615 A79-45598

Hydrogen storage technology for metal hydrides
24 p0615 A79-45599

How safe is hydrogen
24 p0615 A79-45604

R&D programmes in the field of hydrogen economy
24 p0648 A79-49227

On design requisites for hydrogen energy systems
24 p0685 A79-51844

Suitability of gas distribution equipment in hydrogen service
24 p0685 A79-51845

Cryogenic hydrogen storage and refueling for automobiles
24 p0686 A79-51846

Supplementary steam - A viable hydrogen power generation concept
24 p0686 A79-51848

Survey of liquid hydrogen container technology for highway vehicle fuel system applications
24 p0686 A79-51850

Hydrogen as the solar energy translator --- in photochemical and photovoltaic processes
24 p0686 A79-51852

Institutional issues in international solar energy utilization
[IAF PAPER 79-IISL-02] 24 p0711 A79-53453

Hydrogen energy storage program: Five-year plan
[DOE/ET-0046] 21 p0175 N79-10544

Fabrication and testing of silver-hydrogen cells
[NASA-CR-159431] 22 p0334 N79-16374

Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492

Comparison of different techniques for producing hydrogen: Production costs analysis
[P/51/76/14] 23 p0578 N79-26240

HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels
[FE-2307-34] 24 p0718 N79-28358

Hydrogen from existing falling-water sites: An initial feasibility assessment (summary)
[CONF-781142-8] 24 p0718 N79-28360

Hydrogen technology: An overview --- conferences
[BNL-25760] 24 p0734 N79-29379

Behavior of gas distribution equipment in hydrogen service --- conferences
[CONF-790512-2] 24 p0747 N79-30408

HYDROGENATION

Prerefining true in situ shale oil
21 p0004 A79-10044

Coal conversion by flash hydropyrolysis and hydrogasification
21 p0006 A79-10055

H-coal products for direct application to power generation --- coal liquefaction derived fuels
21 p0006 A79-10056

Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies --- Process Development Unit
21 p0045 A79-12121

The H-Coal project --- catalytic hydrogenation of coal
21 p0145 A79-17635

Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697

The plateau pressure of RE Ni5 and RE Co5 hydrides --- in hydride formation
22 p0250 A79-21698

Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory
22 p0250 A79-21699

Hydride formation of C14-type Ti alloy
22 p0250 A79-21701

The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707

Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713

Evaluation of commercial catalysts for the Fischer-Tropsch reaction --- for coal conversion to liquid fuel or chemical feedstock
22 p0272 A79-25124

Coal gasification studies. II - Reduction in the presence of I2 with H2, and H2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors
22 p0283 A79-26468

Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470

The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study
22 p0285 A79-26947

Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

Liquefaction of high ash Brazilian coals
23 p0385 A79-33224

Dynagas Process
23 p0412 A79-34098

Coal liquefaction - The H-Coal process
23 p0412 A79-34102

Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434

The effect of coal characteristics on the catalytic liquefaction of Utah coals
24 p0628 A79-45991

Changes within tin-containing catalysts under hydrorefining conditions --- for coal liquefaction
24 p0628 A79-45993

A survey of methods of coal hydrogenation for the production of liquids
24 p0628 A79-45994

Electrogenerative and voltameiotic processes
24 p0703 A79-52026

Evaluation of use of syngas for coal liquefaction
24 p0703 A79-52027

Coal liquefaction
24 p0714 A79-53781

Phase equilibria in coal hydrogenation systems
[FE-2334-6] 21 p0171 N79-10238

The H-Coal processes: A status report
23 p0593 N79-27617

EXXON donor solvent coal liquefaction process
23 p0593 N79-27618

Catalyst deactivation in the hydroprocessing of coal-derived liquids
24 p0731 N79-29234

Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367

Converting Green River shale oil to transportation fuels --- conferences
[CONF-780460-3] 24 p0745 N79-30396

Hydrogasifier development for the hydrane process
[FE-2518-17] 24 p0745 N79-30397

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410

Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research
[FE-2202-39] 24 p0765 N79-31411

Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation
[EPRI-AP-913] 24 p0795 N79-33344

HYDROGEOLOGY

Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727

Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs
21 p0075 A79-14737

Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800

HYDROGRAPHY

Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico
24 p0622 A79-45817

Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment
24 p0622 A79-45818

HYDROLOGY

Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289

Self-starting manual for direct use applications of geothermal resources
[PB-290872/1] 23 p0556 N79-24423

An evaluation of the hydrothermal resources of the Desert Hot Springs Region, California
[PB-290942/2] 23 p0575 N79-25536

Bibliography of subsidence and related topics for in situ coal gasification
[LETC/BL-71316-1] 24 p0733 N79-29373

HYDROLYSIS

Energy from biomass through hydrolysis of wood
21 p0003 A79-10036

Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119

A new thermochemical process for hydrogen production
22 p0312 A79-31153

Direct thermomagnetic splitting of water
22 p0312 A79-31154

An evaluation of integrated coal gasification/water-splitting processes
23 p0411 A79-34094

Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109

State of development in the area of water electrolysis /near term/ --- hydrogen production technology
23 p0414 A79-34114

A new electrolytic cell type for hydrogen production in hybrid cycles
23 p0414 A79-34115

Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119

Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745

Material and energy balances in the production of ethanol from wood --- conferences
[CONF-7806139-1] 23 p0589 N79-27338

HYDROSTATIC PRESSURE

The use of ocean energy - A hydrostatic motor
22 p0288 A79-27391

Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

HYDROXIDES

An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc
21 p0035 A79-11546

Experimental study of thermal energy storage by use of reversible chemical reactions
23 p0416 A79-34137

Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878

HYPERSONIC AIRCRAFT
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087
A cooling system for an aircraft having a cruise range from Mach 2 to Mach 8
[NASA-CASE-LAR-12406-1] 23 p0568 N79-24980
HYPERVELOCITY GUNS
Electromagnetic launchers
24 p0702 A79-52006
HYSTERESIS
A new rationale for the hysteresis effects observed in metal-hydrogen systems
22 p0250 A79-21704
Calculation of hysteresis losses in superconducting coils
23 p0432 A79-35174

I

ICE FLOES
Power from glaciers - The hydropower potential of Greenland's glacial water
21 p0087 A79-15672
ICE NUCLEI
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant --- for weather modification studies
23 p0438 A79-36432
ICE REPORTING
Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720
ICEBERGS
Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057
IDEAL GAS
Analysis of a cylindrical imploding shock wave
21 p0155 A79-18846
IDENTIFYING
Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-29366
IGNEOUS ROCKS
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280
IGNITION
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures --- derived from shale oil retorting and coal gasification
21 p0083 A79-15245
IGNITION LIMITS
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream
21 p0114 A79-16786
IGNITION SYSTEMS
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297
Four ignition TNS Tokamak reactor systems: Design summary
[ORNL/SUB-7117/25] 21 p0193 N79-11889
IGNITION TEMPERATURE
Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940
ILLUMINANCE
Performance of a new high-intensity silicon solar cell
22 p0257 A79-22862
Dependence of the photoelectric parameters of photovoltaic cells on illuminance
24 p0647 A79-49181
ILLUMINATING
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353
More use should be made of energy-saving products in federal buildings
[PB-291692/2] 23 p0544 N79-22647
IMAGE ENHANCEMENT
Landsat - Developing techniques and applications in mineral and petroleum exploration
21 p0111 A79-16725
IMAGE PROCESSING
A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0204 N79-13474
IMAGING TECHNIQUES
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas --- during implosions for laser fusion
22 p0296 A79-28366
Selected areas of aerospace technical applications to civil engineering
23 p0397 A79-33925
Distributed parameter modelling of urban residential energy demand --- using remotely sensed imagery
24 p0657 A79-50218
IMPACT PREDICTION
Hail risk model for solar collectors
21 p0098 A79-16103
IMPACT RESISTANCE
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116
IMPACT TESTS
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116
IMPERIAL VALLEY (CA)
A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262
Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations
22 p0265 A79-24046
Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792
IMPLOSIONS
Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479
Analysis of a cylindrical imploding shock wave
21 p0155 A79-18846
An overview of design space for small fusion targets
22 p0253 A79-22241
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas --- during implosions for laser fusion
22 p0296 A79-28366
Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993
Computer simulation of laser implosive compression of ACT target and analytic solutions on the shock waves and thermal waves
24 p0629 A79-46254
Theta-pinch description from classical electrodynamics
24 p0640 A79-47602
IMPURITIES
Ash deposits and corrosion due to impurities in combustion gases; Proceedings of the International Conference, New England College, Henniker, N.H., June 26-July 1, 1977
21 p0080 A79-14926
Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524
The effects of wall temperature on light impurities in Alcator --- tokamak device
22 p0313 A79-31188
Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418
Surface effects and impurity production in tokamak machines
23 p0443 A79-36884
Impurity behaviour in real and simulated tokamak plasmas
23 p0444 A79-36885
Numerical modeling of impurity effects --- on energy balance in tokamak experiments
23 p0445 A79-36945
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960

Effect of copper impurity on polycrystalline silicon solar cells 23 p0504 A79-40962
Response of defects to illumination in silicon solar cells 23 p0521 A79-41084
Analysis of the effects of impurities in silicon [NASA-CR-157439] 23 p0559 N79-24456

INCENTIVE TECHNIQUES
Analysis of federal incentives used to stimulate energy production [PNL-2410] 21 p0210 N79-13539
Implementation of state solar incentives: State testing and certification [SERI/TR-51-162] 24 p0774 N79-31808
Analysis of Federal incentives used to stimulate energy production --- with emphasis on solar energy [PNL-2410-1-REV] 24 p0775 N79-31819

INCENTIVES
Costs and impacts of financial incentives for solar energy systems 21 p0119 A79-17296
Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics [NASA-CR-157953] 21 p0200 N79-12970
Energy Tax Act of 1978 [PUB-LAW-95-618] 23 p0576 N79-25926

INCIDENCE
Calculation of solar energy incident on non-horizontal surfaces over Turkey 22 p0253 A79-22266
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells 22 p0272 A79-25069

INCIDENT RADIATION
Measurement and modelling of shortwave radiation on inclined surfaces 22 p0242 A79-21062
Radiation regime of inclined surfaces --- Russian book on solar energy engineering and microclimatology 22 p0282 A79-26353
Study of photocell characteristics dependence on solar ray incidence angle and intensity 24 p0601 A79-44255
Contribution to the study of the solar radiation climate of Lisbon 24 p0661 A79-50543

INCINERATORS
Disposal of industrial wastes by combustion: Present state-of-the-art. Volume 3 --- Book 21 p0036 A79-11675
Waste disposal by fluid bed incineration and energy recovery modes 23 p0487 A79-40387
Practice of heat utilization from refuse 23 p0488 A79-40393
Flue gas emissions from a shredded-municipal-refuse-fired steam generator 23 p0489 A79-40399
The economics of energy recovery from industrial waste incineration 23 p0490 A79-40406
Utilization of fluidized bed combustion in energy recovery from solid wastes 23 p0490 A79-40416
30 years of refuse-fired boiler experience 23 p0523 A79-41374
Energy recovery from domestic refuse by means of incineration and pyrolysis [CSIR-SR-WAT-54] 23 p0560 N79-24468

INCLINATION
Inclination dependence of pyranometer sensitivity --- for solar collector testing 22 p0295 A79-28154

INCONEL (TRADEMARK)
Characteristics of combustion-heated thermionic diodes 21 p0026 A79-10215

INDEPENDENT VARIABLES
Electrolysis of zinc. Statistical model of the process parameters for an industrial cell [BLL-RTS-11317] 22 p0345 N79-17984

INDEXES (DOCUMENTATION)
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 11 - Index 23 p0422 A79-34182
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362) [PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes [PB-294952/7] 24 p0743 N79-29673
National solar heating and cooling commercial demonstration program: Key personnel directory [DOE/CS-0057] 24 p0754 N79-30785
Energy information data base. Serial titles [TID-4579-R-10-SUPPL-1] 24 p0791 N79-32721

INDIA
Prospects of MHD power generation in India using coal 23 p0454 A79-37907

INDICATING INSTRUMENTS
Development of sensitized pick coal interface detector system [NASA-CR-161225] 23 p0556 N79-24417
Solvent selectivity for purification of natural cases 24 p0717 N79-28252

INDIUM ARSENIDES
Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra 23 p0528 A79-42170

INDIUM COMPOUNDS
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells 21 p0122 A79-17338
Preparation and properties of pure and tin doped indium oxide selective coatings 21 p0127 A79-17381
Photovoltaic effect in InSe - Application to solar energy conversion 23 p0384 A79-32976
Photovoltaic properties of In2O3/semiconductor heterojunction solar cells 23 p0505 A79-40968
Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide 23 p0505 A79-40969
Efficient electron-beam-deposited ITO/n-Si solar cells 24 p0629 A79-46152

INDIUM PHOSPHIDES
High efficiency solar cells based on indium phosphide 21 p0042 A79-11968
p-InP/n-CdS heterojunction solar cells 23 p0442 A79-36791
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide 23 p0480 A79-39944
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells 23 p0499 A79-40907
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells 23 p0505 A79-40966
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications 24 p0629 A79-46249

INDIUM SULFIDES
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells 24 p0705 A79-52317

INDUCTION HEATING
Electrical induction heating of solid fossil fuels in situ - Some estimates 22 p0304 A79-30215
Fuel release from solid fossil-fuel deposits by electrical induction heating 23 p0446 A79-37285
Electrical induction heating - A new approach to underground coal gasification 24 p0708 A79-52953

INDUCTION MOTORS
Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798
INDUCTORS
Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges
22 p0298 A79-29286
Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor
24 p0663 A79-50776
INDUSTRIAL AREAS
H2S emissions in the domain of chemical industry and means of suppressing emissions
23 p0481 A79-40068
Impact of national energy and environmental policies on industry location dynamics: A methodological review
[DOE/TIC-10129] 24 p0801 N79-33591
INDUSTRIAL ENERGY
Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112
Potential of the Stirling engine for stationary power applications in the 500-2000 HP range
21 p0025 A79-10211
Scaling up coal liquids
21 p0031 A79-10475
Future solar total energy markets for the U.S. industrial sector
[AIAA PAPER 78-1773] 21 p0062 A79-13870
Preliminary design of solar total energy - Large scale experiment at Shenandoah, Georgia
[AIAA PAPER 78-1776] 21 p0062 A79-13873
Development of industrial owned, small hydroelectric facilities
21 p0073 A79-14699
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722
Market penetration for CTEC
21 p0094 A79-15903
Production and use of low and medium Btu gas
21 p0095 A79-15912
Solid waste and coal firing in industrial boilers
21 p0096 A79-15918
Advanced processes for more efficient use of forest products residual material
21 p0096 A79-15919
Opportunities for direct use of geoheat in Central America and other tropical countries
21 p0097 A79-16074
Input-output method applied to energy planning
21 p0112 A79-16737
A solar heating and cooling system for an industrial plant located in southern Europe
21 p0139 A79-17480
Use of solar energy for industrial process heat
21 p0143 A79-17524
Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448
Thermal storage for industrial process and reject heat
22 p0243 A79-21300
Industrial aspects in solar energy instruction
22 p0254 A79-22274
Industrial cogeneration - Problems and promise --- waste heat utilization from electricity production
22 p0265 A79-24047
Solar energy for industrial process steam
22 p0267 A79-24315
Medium-power /100-1000 kWe/ solar power plants using distributed collectors
22 p0269 A79-24622
Current status and prospects for low-temperature solar energy
22 p0269 A79-24623
Control system for solar hot water system
22 p0321 A79-31442
Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331
A simple solar gas turbine plant
[ASME PAPER 79-GT-90] 23 p0377 A79-32367
Mechanical reliability considerations in the modern high temperature industrial gas turbine
[ASME PAPER 79-GT-101] 23 p0377 A79-32377
Development progress on the atmospheric fluidized bed coal combustor for cogeneration gas turbine system for industrial cogeneration plants
[ASME PAPER 79-GT-104] 23 p0377 A79-32380
Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416
Designing reliability into high-effectiveness industrial gas turbine regenerators
[ASME PAPER 79-GT-199] 23 p0380 A79-32456
New policy for electrical energy
23 p0388 A79-33260
Solar energy in California industry - Applications, characteristics and potential
23 p0402 A79-34019
Economic prospects for solar energy for industrial process heat
23 p0403 A79-34033
Analysis of various OTEC missions --- market potential of applications
23 p0404 A79-34037
Coal gasification as applied to MHD power cycle
23 p0411 A79-34095
Net energy from municipal solid waste
23 p0418 A79-34149
Energy utilization in industry - The case of Israel
23 p0421 A79-34171
Rationing energy to industries - Priorities and input-output dependence
23 p0423 A79-34278
Energy conserving cogeneration plant benefits utility and industrial companies
23 p0423 A79-34452
What is the true cost of electric power from a cogeneration plant
23 p0424 A79-34453
Solid waste as a source of energy for industry - An overview
23 p0424 A79-34461
Industrial applications of solar heat
23 p0434 A79-35477
Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888
Aspects of meeting complex industrial energy demand patterns using recuperated gas turbines
23 p0454 A79-37905
Solar total energy - Large scale experiment --- supply of factory energy needs
[AIAA PAPER 79-1025] 23 p0460 A79-38207
Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States
23 p0470 A79-38646
Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648
Utilization of solar-derived heat in industrial processes
23 p0471 A79-38649
Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822
International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 4 - Process and industrial heat transfer, heat transfer in energy utilization, heat exchangers
23 p0532 A79-42973
Enhancement of heat transfer
23 p0533 A79-43016
An overview of intermediate temperature solar collector and energy storage technology
23 p0533 A79-43018
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225
Commodity hydrogen production and marketing
24 p0613 A79-45582
Economics of small user hydrogen --- future requirements and predicted costs for industrial use
24 p0613 A79-45583

Conserving energy via cogeneration
24 p0636 A79-46660
What will be the price for energy tomorrow. I - Coal price
24 p0652 A79-49515
The advance of natural gas --- historical demand increases
24 p0652 A79-49517
Technology overview of energy storage systems
24 p0666 A79-50892
A distributed microcomputer-based control system for a large scale solar total energy system
24 p0672 A79-51741
Solar production of industrial process steam
24 p0673 A79-51748
Heat pump system for process steam generation
24 p0697 A79-51964
Waste heat as an alternate fuel - Its opportunities and potential
24 p0698 A79-51968
Novel approaches to industrial energy conservation in Georgia
24 p0698 A79-51972
Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473
Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481
Energy analysis
[NP-23145] 21 p0187 N79-11513
Some measures of regional-industrial interfuel substitution potentials
[BNL-24368] 21 p0208 N79-13525
Energy use in Japan and the United States
[BNL-23101] 21 p0221 N79-14578
Energy and economic analysis of industrial process heat recovery with heat pumps
22 p0331 N79-16210
Industrial energy conservation
[GPO-24-067] 22 p0333 N79-16353
Electrolysis of zinc. Statistical model of the process parameters for an industrial cell
[BLL-RTS-11317] 22 p0345 N79-17984
Thermal storage technologies for solar industrial process heat applications
[NASA-TM-79130] 22 p0360 N79-20498
The role of thermal energy storage in industrial energy conservation
[NASA-TM-79122] 22 p0368 N79-21550
Industrial energy efficiency improvement program
[DOE/CS-0033/1] 23 p0540 N79-22332
Modeling and verification of heat pump performance for industrial energy conservation
23 p0556 N79-24293
Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444
General-equilibrium approach to energy/environmental economic analysis
[BNL-24781] 23 p0564 N79-24504
Contextual analysis for industrial energy conservation R and D
[PB-290981/0] 23 p0575 N79-25537
Energy Tax Act of 1978
[PUB-LAW-95-618] 23 p0576 N79-25926
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658
Replacing oil and natural gas with coal: Prospects in the manufacturing industries
24 p0718 N79-28351
Power generation with binary cycles
24 p0724 N79-28740
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369
Electricity in lieu of natural gas and oil for industrial thermal energy: A preliminary survey
[ORNL/TM-5937] 24 p0739 N79-29630
Energy and materials in three sectors of the economy: A dynamic model with technological change as an endogenous variable
24 p0748 N79-30710
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
Energy intensive industry for Alaska. Volume 2: Case analysis
[TID-29025-2] 24 p0754 N79-30787
Energy-intensive industry for Alaska. Volume 3: Background data
[TID-29025-3] 24 p0755 N79-30788
Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801
Opportunities for energy conservation in finished concrete products
[HCP/CS-1549] 24 p0772 N79-31782
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707
Proposed industrial energy data base for technical evaluation of alternative energy systems
[CONF-781244-1] 24 p0791 N79-32725

INDUSTRIAL MANAGEMENT
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
Role of hydrogen in Eco Energy
24 p0612 A79-45578
Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580
Toward the renewables - A natural gas/solar energy transition strategy
24 p0686 A79-51851
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658

INDUSTRIAL PLANTS
A technical analysis for cogeneration systems with potential applications in twelve California industrial plants --- energy saving heat-electricity utility systems
21 p0011 A79-10099
Disposal of industrial wastes by combustion: Present state-of-the-art. Volume 3 --- Book
21 p0036 A79-11675
Aspects of meeting complex industrial energy demand patterns using recuperated gas turbines
23 p0454 A79-37905
Solar total energy - Large scale experiment --- supply of factory energy needs
[AIAA PAPER 79-1025] 23 p0460 A79-38207
Characterization and formation of submicron particles in coal-fired plants
23 p0460 A79-38316
Mass production of solar collectors and components
23 p0467 A79-38614
A preliminary feasibility study into the use of solar energy to provide year-round heating for a factory unit
23 p0471 A79-38647
H2S associated with mineral oil refineries and natural gas processing plants - Emissions and absorptions
23 p0481 A79-40069
A 1982 low cost photovoltaic module factory study
23 p0501 A79-40921
Alkaline electrolysis - Past, present and future
24 p0613 A79-45588
Numerical modeling of the thermal boundary layer near a synthetic crude oil plant
24 p0628 A79-46065
Small-scale coal-gasification plants
24 p0647 A79-49158
Special considerations in the environmental study program for coal gasification plants
24 p0659 A79-50350
Conservation where it counts: Energy management systems
[PB-289837/7] 22 p0372 N79-21628
Conceptual design for advanced coal liquefaction commercial plant
[FE-2251-52] 23 p0554 N79-24182
Considerations in sizing coal gasification plants
[FE-2240-40] 24 p0766 N79-31417
Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724

INDUSTRIAL SAFETY

A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it [AD-A056018] 21 p0192 N79-11686

INDUSTRIAL WASTES

New processes for the recovery of resource materials from coal combustion wastes 21 p0007 A79-10065

Thermal energy storage for industrial waste heat recovery 21 p0012 A79-10101

Disposal of industrial wastes by combustion: Present state-of-the-art. Volume 3 --- Book 21 p0036 A79-11675

Industrial wastes to energy 21 p0096 A79-15916

The fate of trace elements in coal after combustion 21 p0116 A79-17250

Weak points of our prediction models for raw materials strategy --- waste materials and scrap recycling 22 p0265 A79-24040

Factors affecting bitumen recovery by the hot water process 22 p0282 A79-26463

Sampling and analysis of synthetic fuel processes --- coal gasification and liquefaction effluent analysis 22 p0284 A79-26538

Utilisation of solid waste 22 p0304 A79-30204

Energy conservation through waste utilization; Proceedings of the Eighth Biennial National Waste Processing Conference, Chicago, Ill., May 7-10, 1978 23 p0487 A79-40386

Experience with solid waste as a supplementary fuel 23 p0488 A79-40388

Case study energy recovery from wastes from an automobile assembly plant 23 p0489 A79-40394

Properties and operating experience with bagasse as a boiler fuel --- raw sugarcane processing waste 23 p0489 A79-40395

308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city 23 p0489 A79-40397

The economics of energy recovery from industrial waste incineration 23 p0490 A79-40406

Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant 24 p0654 A79-50007

Proceedings of the Engineering Foundation Conference on Clean Combustion of Coal [PB-282949/7] 21 p0171 N79-10243

Nitrogen oxide air pollution. Volume 2, part 1: Control technology. A bibliography with abstracts [NTIS/PS-78/0971/8] 21 p0199 N79-12591

Regional air pollution study: Heat emission inventory [PB-284081/7] 21 p0200 N79-12602

Pollutants from synthetic fuels production: Facility construction and preliminary tests --- coal gasification plant effluents [PB-287730/6] 22 p0339 N79-17027

A primer on the rejection of waste heat from power plants [PB-292529/5] 23 p0575 N79-25570

Program report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department [UCRL-51444-78] 24 p0722 N79-28668

Water and energy resource development in the Tongue River Basin, southeastern Montana 24 p0735 N79-29566

Recuperative system for high and ultra-high temperature flue gases [IDO-1672-2] 24 p0741 N79-29649

Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability [PB-294338/9] 24 p0744 N79-29709

Enhanced oil recovery chemicals from renewable wood resources [ORNL-5525] 24 p0764 N79-31363

Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base [NTIS/PS-79/0545/8] 24 p0767 N79-31433

Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base [NTIS/PS-79/0546/6] 24 p0767 N79-31434

INDUSTRIES

Industrial international data base: Energy analysis methodology. Rational use of energy program pilot study [NATO/CCMS-75] 21 p0206 N79-13508

Prospective needs for physical property data in the chemical and allied industries during the next decade [NPL-CHEM-84] 23 p0546 N79-23185

Lasers: Their applications and operational requirements 23 p0590 N79-27494

Improved energy contingency planning is needed to manage future energy shortages more effectively [EMD-78-106] 24 p0750 N79-30729

Economic structure and behavior in the natural gas production industry [PB-294610/1] 24 p0760 N79-30839

Status of SEASAT Commercial Demonstration Program [E79-10260] 24 p0768 N79-31720

Published patent applications and patents resulting from German government sponsored research and development [BMFT-FB-T-78-31] 24 p0794 N79-33151

Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner [FE-2489-36] 24 p0795 N79-33340

The United States refining policy in a changing world oil environment [PB-297136/4] 24 p0796 N79-33349

Energy requirements of the US pulp and paper industry [ANL/EES/TM-42] 24 p0800 N79-33587

INERTIA PRINCIPLE

An introduction to the variable inertia flywheel /VIF/ [ASME PAPER 79-APM-5] 22 p0298 A79-29064

INERTIAL FUSION (REACTOR)

Fusion power with particle beams 21 p0034 A79-11121

Heavy-ion beam inertial-confinement fusion 21 p0054 A79-13448

Prospects of generating power with particle-beam-drive inertial confinement fusion 23 p0407 A79-34063

Advanced-fuel pellet approaches to inertial fusion 24 p0630 A79-46303

On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors 24 p0705 A79-52352

INERTIAL PLATFORMS

Space platforms for building large space structures 21 p0032 A79-10511

INFESTATION

Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289

INFORMATION DISSEMINATION

The Coal Information Center of the Foundation for Science and Technology --- for energy technology dissemination 23 p0389 A79-33262

Coal research: Data systems and information transfer [ORAU-133] 21 p0232 N79-15830

Satellite Power System (SPS) public acceptance [NASA-CR-157429] 23 p0548 N79-23493

Comprehensive program and plan for federal energy education, extension and information activities [DOE/CS-0071] 24 p0757 N79-30814

Status of SEASAT Commercial Demonstration Program [E79-10260] 24 p0768 N79-31720

INFORMATION FLOW

Role of education and training programs in the commercialization and diffusion of solar energy technologies [SERI/RR-53-128] 24 p0773 N79-31800

INFORMATION MANAGEMENT
Energy information data base. Guide to abstracting and indexing
[TID-4583-R1] 21 p0184 N79-11488
INFORMATION RETRIEVAL
How to tap NASA developed technology
21 p0164 A79-19896
A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051
INFORMATION SYSTEMS
A survey of energy information systems and its implications for industrial energy management
21 p0072 A79-14685
A planning and information system for strategic energy policy assessment --- Book
22 p0259 A79-23600
The CCMS solar energy pilot study system performance reporting format
22 p0275 A79-25930
The 'Facility Data Base' or data bank on energy facilities
24 p0644 A79-48021
Industrial international data base: Energy analysis methodology. Rational use of energy program pilot study
[NATO/CCMS-75] 21 p0206 N79-13508
Integrated safeguards information System (ISIS), executive summary --- nuclear power plant and fissionable materials security
[PB-286869/3] 21 p0223 N79-14934
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555
Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224) --- bibliographies
[PB-294342/1] 24 p0743 N79-29671
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362)
[PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes
[PB-294952/7] 24 p0743 N79-29673
Proposed industrial energy data base for technical evaluation of alternative energy systems
[CONF-781244-1] 24 p0791 N79-32725
INFORMATION THEORY
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800
INFRARED ABSORPTION
Studies on the selective absorption surface on stainless steel --- for flat type solar collectors
21 p0127 A79-17378
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors
21 p0127 A79-17380
Selective absorption of solar energy by ultrafine metal particles
21 p0127 A79-17382
Oil shale retorting - A correlation of selected infrared absorbance bands with process heating rates and oil yield
22 p0304 A79-29975
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600
Contactless measurement of lifetime by free carrier infrared absorption --- in solar cells
23 p0497 A79-40892
INFRARED DETECTORS
Regional-scale sea surface temperature determination from the geostationary environmental operational satellite
24 p0617 A79-45781
INFRARED IMAGERY
Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620
Estimating heat loss in residential structures using aerial infrared imagery
23 p0522 A79-41125
Evaluation of a thermographic scanning device for solar energy and conservation applications
24 p0611 A79-45229
INFRARED INSPECTION
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33584
INFRARED INTERFEROMETERS
A study of waveguides for far infrared interferometers measuring electron density of tokamak plasmas
23 p0526 A79-41842
Proposed non-interferometric FIR electron density measuring scheme for tokamaks
24 p0707 A79-52667
INFRARED LASERS
A new concept for solar pumped lasers
21 p0110 A79-16624
The TELEC - A plasma type of direct energy converter --- Thermo-Electronic Laser Energy Converter for electric power generation
21 p0110 A79-16629
Solar power satellites - The laser option
22 p0284 A79-26599
Optical characterization of high energy laser components
23 p0447 A79-37668
Energy and technology review --- tunable laser system for the ultraviolet, visible, and infrared regions
[UCRL-52000-79-3] 24 p0791 N79-32727
INFRARED RADIATION
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874
Computation of IR sky temperature and comparison with surface temperature --- for solar collector energy budgets
21 p0042 A79-11875
Selective covers for natural cooling devices --- in space
22 p0272 A79-25522
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation
23 p0466 A79-38603
Thermal radiation from conducting surfaces
24 p0657 A79-50328
Thermal vacuum testing of solarpanels by solar simulation and infrared simulation
24 p0658 A79-50345
INFRARED REFLECTION
Reduction of the heat loss flux of collectors by infrared reflecting coatings on cover plates
21 p0058 A79-13649
Colored stainless steel - A new type of selective absorber --- for solar thermal conversion
22 p0294 A79-28150
Electromagnetic radiation energy arrangement --- coatings for solar energy absorption and infrared reflection
[NASA-CASE-WOO-00428-1] 22 p0352 N79-19186
INFRARED SCANNERS
Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507
INFRARED SPECTRA
Oil shale retorting - A correlation of selected infrared absorbance bands with process heating rates and oil yield
22 p0304 A79-29975
INGOTS
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3
[NASA-CR-162182] 24 p0771 N79-31775
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots
[NASA-CR-162359] 24 p0798 N79-33567
INGREDIENTS
Dependence of the pour point of diesel fuels on the properties of the initial components
[NASA-TM-75424] 22 p0364 N79-21217

INHOMOGENEITY
Diffusion length inhomogeneities in silicon solar cells
23 p0497 A79-40894
INJECTION LASERS
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
INJECTORS
Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants
[CONF-780599-1] 24 p0776 N79-31830
INLET FLOW
Effect of inlet temperature on the performance of a catalytic reactor
21 p0035 A79-11542
The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260
Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
21 p0153 A79-18468
Performance of magnetohydrodynamic generator in the inlet region
23 p0397 A79-33769
INOCULATION
Ionizing seed --- for open cycle MHD power generation
21 p0106 A79-16490
INORGANIC COMPOUNDS
Experimental investigation of a fused salt energy storage system
23 p0400 A79-34003
INORGANIC SULFIDES
Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434
INPUT/OUTPUT ROUTINES
Economic performance: Evaluations for solar energy
[LA-UR-79-901] 24 p0759 N79-30828
INSOLATION
Annual available radiation for fixed and tracking collectors
21 p0042 A79-11880
General principles of multielement concentrating system design --- solar collectors
21 p0054 A79-13291
Results of measurements of solar radiation on surfaces of different orientations
21 p0055 A79-13622
Measurement of radiation intensity by means of a pyrheliometer
21 p0055 A79-13623
Irradiances on inclined surfaces --- from solar and sky radiation and earth albedo
21 p0055 A79-13624
The use of a sort of slide rule for the quick determination of solar irradiation of surfaces and through double glazing of arbitrary orientation and different inclination
21 p0055 A79-13625
Sun-position diagrams using examples from Flensburg to Mittenwald
21 p0055 A79-13626
Total solar irradiance at Table Mtn, California 1926-77
21 p0067 A79-14269
Estimating hourly solar radiation for one-axis tracking focusing collectors
21 p0071 A79-14678
Calibration standards and field instruments for the precision measurement of insolation
21 p0076 A79-14765
A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766
Solar energy and the flat plate collector - An annotated bibliography
21 p0090 A79-15858
The use and limitations of ASHRAE solar algorithms in solar energy utilization studies
21 p0101 A79-16416
Use of satellites in solar applications --- for insolation mapping and space power stations
21 p0104 A79-16468
The relationship between diffuse and total solar radiation in computer simulation of solar energy systems
21 p0119 A79-17304
Solar radiation studies for utilization of flat-plate collectors in an equatorial region
21 p0119 A79-17311
Flat plate collector dynamic evaluation
21 p0128 A79-17390
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
Optimum tilt for the flat plate collector
21 p0132 A79-17426
Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428
Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464
Experimental investigation on solar house heating in northern India
21 p0140 A79-17495
Total solar radiation in Mexico using sunshine hours and meteorological data
21 p0150 A79-18026
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839
Differential insolation and turbidity measurements --- solar radiation attenuation by aerosols
22 p0241 A79-21056
Hourly vs daily method of computing insolation on inclined surfaces
22 p0242 A79-21164
Calculation of solar energy incident on non-horizontal surfaces over Turkey
22 p0253 A79-22266
Solar energy diagrams --- combining position and insolation data
22 p0253 A79-22267
Prediction of the behavior of a solar storage system by means of recurrent stochastic models --- of insolation
22 p0258 A79-23295
Isotropic distribution approximation in solar energy estimations --- diffuse insolation on tilted surface
22 p0262 A79-23753
Solar radiation charts --- monthly average insolation
22 p0263 A79-23763
Selected ordinates for total solar radiant property evaluation from spectral data
22 p0271 A79-25060
Radiation regime of inclined surfaces --- Russian book on solar energy engineering and microclimatology
22 p0282 A79-26353
Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978
22 p0293 A79-28140
A comparison of solar thermal energy collection using fixed and tracking collectors
22 p0293 A79-28146
Direct solar transmittance for a clear sky --- for insolation of solar conversion systems
22 p0296 A79-28361
Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452
Hawaii solar radiation summary
23 p0398 A79-33985
A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997
Solar spectral irradiance at ground level
23 p0429 A79-35053
Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056
Large scale solar thermal power generation
23 p0452 A79-37890
Active and passive solar energy utilization in urban construction
23 p0463 A79-38582

Important specification of pyranometers for solar energy applications /Survey article/ 23 p0468 A79-38627
Fast spectral radiometer --- for solar radiation spectral composition 23 p0469 A79-38629
Performance of silicon and gallium arsenide concentration cells --- under high sunlight concentration 23 p0511 A79-41017
Variation of solar cell sensitivity and solar radiation on tilted surfaces 23 p0512 A79-41023
Solar radiation data in the southeastern United States 24 p0608 A79-45204
Collection, processing and dissemination of data for the national solar demonstration program 24 p0608 A79-45208
Use of meteorological data in system evaluation --- of solar energy collection efficiency 24 p0610 A79-45225
Stochastic simulation of hourly global radiation sequences 24 p0661 A79-50541
Contribution to the study of the solar radiation climate of Lisbon 24 p0661 A79-50543
A comparison of some simple models used to predict solar irradiance on a horizontal surface 24 p0661 A79-50546
Statistical correlation between daily and monthly averages of solar-radiation data 24 p0668 A79-51022
Predicting solar energy fluxes in polluted urban areas 24 p0671 A79-51732
Sede Boqer - Shallow solar ponds project 24 p0671 A79-51738
Critique on the solar rehabilitation procedures used in SOLMET-2 24 p0708 A79-52956
Evaluation of models to predict insolation on tilted surfaces 24 p0712 A79-53491
Passive solar heating of buildings using a transwall structure 24 p0712 A79-53493
Insolation modeling overview [SAND-78-0963] 24 p0726 N79-28768
Deterministic insolation model program description and user's guide --- for approximate analysis of solar systems [SAND-78-7044] 24 p0744 N79-29743

INSTALLATION MANUALS
Installation package for a solar heating system [NASA-CR-150876] 22 p0349 N79-18454

INSTALLING
Alternate ways of using bottoming cycle power in pipeline gas compressor stations [ASME PAPER 79-GT-201] 23 p0380 A79-32458
Solar system installation at Louisville, Kentucky [NASA-CR-150814] 21 p0172 N79-10518
Installation package for the Solaron solar subsystem [NASA-CR-161190] 23 p0548 N79-23491

INSTRUMENT ERRORS
Measurement of solar radiation for energy conversion 21 p0119 A79-17305

INSTRUMENT PACKAGES
Transient attitude dynamics of satellites with deploying flexible appendages 21 p0047 A79-12325
Final system instrumentation design package for Decade 80 solar house [NASA-CR-150869] 22 p0354 N79-19455

INSULATION
Development, characterization and evaluation of materials for open cycle MHD [PNL-2004-9] 22 p0361 N79-20504
Insulating wall boundary layer in a Faraday MHD generator [FE-23417] 22 p0365 N79-21310

INSULATORS
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator 23 p0392 A79-33397
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment 23 p0440 A79-36680
Critical contributions in MHD power generation [FE-2215-11] 22 p0362 N79-20511
Development, characterization and evaluation of materials for open cycle MHD [PNL-2004-8] 22 p0369 N79-21557
Development, testing and evaluation of MHD materials and component designs --- electrode and insulator systems for mhd generators [FE-2248-19] 22 p0369 N79-21558

INTEGRAL CALCULUS
Analytical modelling of oil recovery by steam injection 22 p0358 N79-20434

INTEGRATED ENERGY SYSTEMS
Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system 24 p0703 A79-52010
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 1: Technical studies for solar point-focusing, distributed collector system, with energy conversion at the collector, category C [NASA-CR-162369] 24 p0799 N79-33573
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 2: Appendix A - D [NASA-CR-162370] 24 p0799 N79-33574
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 3: Appendix E - N [NASA-CR-162371] 24 p0799 N79-33575

INTELSAT 5 SATELLITE
Intelsat V solar array design and development summary 21 p0002 A79-10018
INTELSAT 5 solar array 24 p0752 N79-30757

INTERFACES
On the role of interface states in MOS solar cells 21 p0122 A79-17337
Interface properties and stability of Schottky barriers and MIS solar cells 21 p0123 A79-17342

INTERFACIAL ENERGY
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide 23 p0480 A79-39944

INTERFEROMETRY
Interferometry of a gas-puff z-pinch plasma 24 p0648 A79-49210

INTERLAYERS
The role of the interfacial layer in Schottky barrier solar cells 23 p0438 A79-36241
Influence of the interface upon the properties of ITO/silicon SIS solar cells 23 p0510 A79-41011

INTERMETALLICS
Model predictions for the stability of ternary metallic hydrides 21 p0038 A79-11802
Hydrogen storage by LaNi5 - Fundamentals and applications 21 p0038 A79-11803
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures 21 p0038 A79-11804
Calcium/iron sulfide secondary cells 21 p0041 A79-11835
Thermodynamics of metal, alloy and intermetallic/hydrogen systems 22 p0248 A79-21680
Magnetic and electrical properties of rare earth and rare earth intermetallic hydrides 22 p0249 A79-21692
Hydrogen absorption in rare earth intermetallic compounds 22 p0249 A79-21693

Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory
22 p0250 A79-21699

The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700

Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

The metallurgy and production of rechargeable hydrides --- for hydrogen storage
22 p0250 A79-21703

Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711

Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713

Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion
22 p0260 A79-23615

FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364

Metal hydride technology --- hydrogen bonding with intermetallics
[BNL-26047] 24 p0780 N79-32387

INTERNAL COMBUSTION ENGINES

Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine
21 p0024 A79-10202

Alternative fuels for reciprocating internal combustion engines
21 p0051 A79-12980

Flame emissivities - Alternative fuels
21 p0052 A79-12984

Road vehicles with combined, at least partly electrical driving systems and energy supplies
22 p0301 A79-29494

Methanol decomposition bottoming cycle for IC engines
[SAE PAPER 790427] 23 p0495 A79-40774

Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability
24 p0628 A79-45996

Performance characteristics of automotive engines in the United States. First series: Report no. 15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305

Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V --- fuel consumption and exhaust gases
[PB-286076/5] 21 p0227 N79-15306

Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I. --- fuel consumption and exhaust gases
[PB-286077/3] 21 p0227 N79-15307

Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), IV
[PB-286294/4] 21 p0227 N79-15308

Performance characteristics of automotive engines in the United States. Second series, report no. 7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310

Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312

Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V --- fuel consumption and exhaust gases
[PB-286299/3] 21 p0227 N79-15313

Performance characteristics of automotive engines in the United States. First series, report no. 19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-15314

Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315

An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249

Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 427 cubic inch 1977 California GMC 6500
[PB-293530/2] 23 p0578 N79-26410

Performance characteristics of automotive engines in the United States. Third series: Report no. 2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411

Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 361 cubic inch 1966 Ford F-600
[PB-293529/4] 23 p0586 N79-26567

Alternate engines: State of the art study
[PB-293940/3] 24 p0720 N79-28596

Demonstration of a free piston Stirling engine driven linear alternator system
[COO-2764-002] 24 p0790 N79-32713

INTERNATIONAL COOPERATION

Summary of international energy research and development activities 1974-1976 --- Book
21 p0068 A79-14400

Analysis of alternatives for U.S. international cooperation in solar energy
21 p0116 A79-17277

The solar energy R & D programme of the European Communities
21 p0116 A79-17278

Energy policy of the European Economic Community
22 p0282 A79-26403

Status of the U.S./U.S.S.R. cooperative program for the development of open-cycle MHD power generators
22 p0290 A79-27661

Solar energy via satellites and international cooperation
22 p0310 A79-30952

Joint Soviet-American studies in the domain of plasma diagnostics
23 p0529 A79-42853

International developments in hydrogen technologies --- research cooperation for new hydrogen production methods
24 p0612 A79-45579

Eurocean OTEC project
24 p0616 A79-45777

Energy, development and diplomacy --- international relations among petroleum producers and consumers
24 p0652 A79-49518

The international energy agency - The way ahead
24 p0652 A79-49520

Energy and society
24 p0653 A79-49523

Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418

Institutional issues in international solar energy utilization
[IAF PAPER 79-IISL-02] 24 p0711 A79-53453

INTERNATIONAL LAW

Solar power space stations - Some issues of law and policy
[AAS 78-199] 23 p0427 A79-34864

Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries
24 p0626 A79-45854

Legal aspects of solar power satellites - Focus on microwave exposure standards
[IAF PAPER 79-IISL-01] 24 p0711 A79-53452

Satellite Power System (SPS) international agreements
[NASA-CR-157433] 23 p0548 N79-23497

INTERNATIONAL RELATIONS

Energy policies in the context of global economics
23 p0433 A79-35228

International energy evaluation system. Volume 1: Executive summary
[HCP/I8602-01/1] 24 p0742 N79-29662

INTERNATIONAL TRADE

Energy economics - A research analysis --- considering OPEC Cartel impact
21 p0115 A79-17222

Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40] 24 p0746 N79-30403

INTERPLANETARY SPACECRAFT

The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187

INVENTORIES

Energy information: Report to Congress
[NTISUB/C/027-001] 21 p0221 N79-14576

An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640

Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018

INVERTED CONVERTERS (DC TO AC)

Inverter systems --- for MHD power stations
21 p0106 A79-16486

Solar-cell panel simulator
22 p0265 A79-23867

Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters --- for gallium arsenide solar photovoltaic arrays
23 p0416 A79-34140

INVERTERS

Inverter systems --- for MHD power stations
21 p0106 A79-16486

An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047

INVESTMENTS

Capital investment for transition to new energy supply systems
23 p0480 A79-39993

Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics
[NASA-CR-157953] 21 p0200 N79-12970

Methodology for the analysis of investment alternatives to stimulate development and technology transfer for energy technologies
[TID-28971] 24 p0757 N79-30809

INVISCID FLOW

A two dimensional vortex sheet model of a Savonius Rotor
22 p0278 A79-26178

Two-dimensional analysis of vertical axis windmills
22 p0353 N79-19446

IODIDES

Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127

Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109

IODINE

The thermochemical decomposition of water using bromine and iodine
22 p0238 A79-20770

Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54293

IODINE LASERS

High power iodine atom laser
24 p0707 A79-52644

Laser development for laser fusion applications
[SAND-78-2306] 24 p0720 N79-28540

ION ACCELERATORS

Superconducting magnets - Present status and problems
22 p0311 A79-31009

Pulsed-power research and development in the USSR
[AD-A056635] 21 p0193 N79-11859

ION BEAMS

Heavy-ion beam inertial-confinement fusion
21 p0054 A79-13448

Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466

Effect of electrode shielding on beamlet-beamlet interaction in multiaperture sources
21 p0154 A79-18481

Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817

Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760

Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785

Pulsed-power research and development in the USSR
[AD-A056635] 21 p0193 N79-11859

ION CURRENTS

Preparation and ionic conductivity of H3O/+/ beta alumina --- for hydrogen-oxygen fuel cells
21 p0040 A79-11821

Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480

ION CYCLOTRON RADIATION

Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma
21 p0071 A79-14467

Cyclotron-wave spectrum in a plasma with two ion species
22 p0245 A79-21443

Magneto-acoustic resonance heating in the ion-cyclotron frequency domain --- cf tokamak plasmas
22 p0271 A79-24866

ION DISTRIBUTION

Auxiliary heating in breakeven tokamaks
21 p0079 A79-14792

ION EMISSION

Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395

ION EXCHANGE MEMBRANE ELECTROLYTES

Polyelectrolyte electrets for electrical energy storage
24 p0632 A79-46316

Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960

The use of fuel cell ion exchange membranes in electrolytic cells
[P/539/77/23] 23 p0584 N79-26532

ION EXCHANGE RESINS

The use of fuel cell ion exchange membranes in electrolytic cells
[P/539/77/23] 23 p0584 N79-26532

ION IMPACT

Superthermal alpha transport and wall bombardment in tokamaks
23 p0444 A79-36927

ION IMPLANTATION

Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685

Analysis of ion-implanted solar cells
23 p0508 A79-40991

Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000

Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001

Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002

Development of pulsed processes for the manufacture of solar cells
[NASA-CR-158706] 23 p0570 N79-25484

Automated array assembly, phase 2 --- making ion implanted and furnace annealed solar cells
[NASA-CR-162176] 24 p0770 N79-31759

Analysis and evalaution in the production process and equipment area of the low-cost solar array project --- including modifying gaseous diffusion and using ion implantation
[NASA-CR-162163] 24 p0770 N79-31769

Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648

ION INJECTION
Magnetic multipole line-cusp plasma generator for neutral beam injectors
22 p0238 A79-20746
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

ION MOTION
Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity --- in tokamaks
22 p0269 A79-24814
Superthermal alpha transport and wall bombardment in tokamaks
23 p0444 A79-36927

ION PROPULSION
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897
Earth orbital assessment of solar electric and solar sail propulsion systems
[NASA-CR-158167] 22 p0345 N79-17898
Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1] 22 p0357 N79-20179
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029
Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257] 24 p0795 N79-33253

ION SOURCES
The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470
Effect of electrode shielding on beamlet-beamlet interaction in multiaperture sources
21 p0154 A79-18481

ION TEMPERATURE
On the ion energy balance in TFR with and without neutral injection heating
21 p0069 A79-14452
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877
A source of error in cusp plasma leak measurements
23 p0446 A79-37265
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915
Ion heating in the LT-3 tokamak
24 p0639 A79-47399

IONIC REACTIONS
Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

IONIC WAVES
Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity --- in tokamaks
22 p0269 A79-24814
Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution
23 p0478 A79-39566

IONIZATION
Contribution to the theory of the pulsed mode of operation of the thermionic energy converter. II
22 p0246 A79-21542
Theory of the pulsed operation of a thermionic converter. II - Ionization stage
23 p0442 A79-36815
Power output of an MHD generator - Effect of ionization instability and boundary layer
24 p0708 A79-52958

IONIZED GASES
'Local' breakdown criterion in highly ionized gas flow
21 p0049 A79-12683
Power generation experiments of a linear MHD generator with fully ionized seed
23 p0394 A79-33421

IONIZERS
Ionizing seed --- for open cycle MHD power generation
21 p0106 A79-16490

IONOSPHERE
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897

IONOSPHERIC DISTURBANCES
Solar Power Satellite beam disturbance of the upper ionosphere
[AIAA PAPER 79-1422] 23 p0426 A79-34848

IONOSPHERIC PROPAGATION
Solar Power Satellite (SPS) pilot beam and communication link subsystem investigation study, phase 1 --- ionospheric propagation, radio frequency interference, and microwave transmission
[NASA-CR-161161] 22 p0345 N79-17896
Space-based solar power conversion and delivery systems study. Volume 3: Microwave power transmission studies
[NASA-CR-150296] 23 p0541 N79-22619

IOWA
Solar project description: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/50] 23 p0561 N79-24481

IRAN
Computer simulation of the performance of a solar pond in the southern part of Iran
21 p0133 A79-17432
Solar thermal electrical power plants for Iran
22 p0295 A79-28352
Solar collector development in Iran
23 p0493 A79-40675
Feasibility of energy self sufficiency through decentralized use of renewable resources in Iran
24 p0698 A79-51974
Analysis of the energy and economic effects of Iranian oil shortfall
[PB-292634/3] 23 p0575 N79-25540

IRAQ
Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428
Experimental project on the utilization of solar energy in domestic hot water heating in Iraq
23 p0465 A79-38597

IRON
Moessbauer spectroscopy of iron in coal and coal hydrogenation products
22 p0282 A79-26464
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996
Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479
Design and cost study of a nickel-iron oxide battery for electric vehicles. Volume 2: Public report
[ANL-K-3723-VOL-1] 21 p0222 N79-14579
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364

IRON ALLOYS
New alloy systems for hydrogen storage
21 p0038 A79-11806
The metallurgy and production of rechargeable hydrides --- for hydrogen storage
22 p0250 A79-21703
The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study
22 p0285 A79-26947
Formation of protective layers on alloys developed for use in coal gasification environments
[SAND-78-8277] 24 p0765 N79-31383

IRON CHLORIDES
Problems around Fe-Cl cycles --- thermochemical decomposition of water hydrogen production
22 p0238 A79-20771

IRON COMPOUNDS
Calcium/iron sulfide secondary cells
21 p0041 A79-11835
The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700

IRON OXIDES
- Iron oxide semiconductor electrodes in photoassisted electrolysis of water 21 p0037 A79-11781
- Developmental hydrogen via coal gasification processes 24 p0613 A79-45587

IRRADIANCE
- Irradiances on inclined surfaces --- from solar and sky radiation and earth albedo 21 p0055 A79-13624
- Total solar irradiance at Table Mtn, California 1926-77 21 p0067 A79-14269
- Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator 21 p0130 A79-17406
- Solar irradiance measurements by means of optical fibers and silicon detectors 24 p0638 A79-47198
- A comparison of some simple models used to predict solar irradiance on a horizontal surface 24 p0661 A79-50546

IRRADIATION
- Results of measurements of solar radiation on surfaces of different orientations 21 p0055 A79-13622
- The use of a sort of slide rule for the quick determination of solar irradiation of surfaces and through double glazing of arbitrary orientation and different inclination 21 p0055 A79-13625
- The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells 23 p0498 A79-40897

IRREVERSIBLE PROCESSES
- On an irreversible thermodynamic analysis of thermoelectric devices 22 p0260 A79-23609

IRRIGATION
- Solar energy installations for pumping irrigation water 21 p0066 A79-14260
- Historical developments of the use of solar energy for pumping irrigation water 21 p0076 A79-14762
- Basic technical and economical aspects of the use of solar energy for pumping irrigation water 21 p0076 A79-14763
- A comparison between sun and wind as energy sources in irrigation plants 21 p0118 A79-17295
- 25 kilowatt photovoltaic powered irrigation and grain drying experiment 21 p0143 A79-17519
- Solar irrigation program status 21 p0143 A79-17520
- The development of a 37 kW solar-powered irrigation system 21 p0144 A79-17525
- Solar powered irrigation systems 23 p0403 A79-34030
- Solar powered irrigation: Present status and future outlook [SAND-78-0016C] 21 p0175 N79-10539
- Solar irrigation program plan: Second revision [SAND-78-0309-REV] 21 p0187 N79-11525
- Solar Irrigation Program Data Base Management System (SIPDBMS) [SAND-78-0641] 21 p0209 N79-13532
- Solar irrigation program [SAND-78-0049] 21 p0210 N79-13537
- Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations [SAND-77-1403] 21 p0220 N79-14566
- The ground water and energy supply situation for Great Plains irrigation [PB-286002/1] 21 p0222 N79-14586
- Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289
- Resource analysis: Water and energy as linked resources [PB-288046/6] 22 p0349 N79-18463
- Photovoltaic-powered irrigation experiments in the United States --- crop drying and irrigating in Nebraska [COO-4094-28] 23 p0596 N79-27673
- Economics of solar photovoltaic energy systems for crop irrigation in the United States [COO-4094-29] 24 p0726 N79-28769
- Overview of waste heat utilization techniques --- spray irrigation, soil heating, aquiculture and biomass production [CONF-790443-2] 24 p0791 N79-32726

ISOTHERMAL FLOW
- Isothermal flow distribution in solar collectors and collector manifolds [ALO-5319-1] 24 p0789 N79-32708

ISOTHERMAL PROCESSES
- The Pseudo Stirling cycle - A suitable performance criterion 21 p0023 A79-10196
- Balanced compounding of Stirling machines 21 p0024 A79-10200

ISOTOPE EFFECT
- Tritium permeation through steam generator materials 24 p0695 A79-51952

ISOTOPE SEPARATION
- A collisional plasma rotating between two cylinders 21 p0049 A79-12694
- Lasers: Their applications and operational requirements 23 p0590 N79-27494
- Aerodynamic separation of gases and isotopes: Recent advances --- conferences, Belgium, May-Jun. 1978 [VKI-LEC-SER-1978-8] 24 p0720 N79-28506

ISOTOPES
- Dynamic Isotope Power Systems /DIPS/ --- for space applications 24 p0692 A79-51928
- Application of the Dynamic Isotope Power System to a multimission spacecraft 24 p0692 A79-51929
- Mini-BRU/BIPS 1300 watt (sub)e dynamic power conversion system development: Executive summary [NASA-CR-159440] 21 p0173 N79-10526

ITALY
- Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas 21 p0075 A79-14727
- Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/ 21 p0075 A79-14732
- Study of the applicability of the geochemistry of gases in geothermal prospection 21 p0075 A79-14736
- Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs 21 p0075 A79-14737
- Problems and prospectives on solar energy utilization [ISS-P-78/1] 24 p0742 N79-29667

J

JAPAN
- The development of wind power plants in Japan 23 p0482 A79-40105
- Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan 24 p0640 A79-47506
- R and D on Rankine cycle engines in Japan 24 p0702 A79-52007
- R & D on advanced heat exchangers in Japan 24 p0702 A79-52008
- Research and development on ocean thermal energy conversion in Japan 24 p0703 A79-52009
- Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system 24 p0703 A79-52010
- Energy use in Japan and the United States [BNL-23101] 21 p0221 N79-14578

JET AIRCRAFT
Flying angle of attack
21 p0048 A79-12384
JET ENGINE FUELS
Jet fuels from shale oil - A near term technology
21 p0005 A79-10045
Alternative aircraft fuels
21 p0033 A79-10824
Some aspects of aircraft jet engine fuels
21 p0035 A79-11368
Alternative aviation turbine fuels
21 p0047 A79-12378
Future fuels in gas turbine engines
21 p0051 A79-12979
Hydrogen enrichment for low-emission jet combustion
22 p0244 A79-21347
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900
Effect of broadened-specification fuels on aircraft engines and fuel systems
[AIAA 79-7008] 22 p0300 A79-29383
Testing to assess the affect of degraded fuel specifications on the cold start ability of a T63-A-700 engine
[AIAA 79-7009] 22 p0300 A79-29384
High-freezing-point fuels used for aviation turbine engines
[ASME PAPER 79-GT-141] 22 p0309 A79-30555
The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375
Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911
Aviation fuels from coal
22 p0325 A79-31913
The chemical stability of kerosene fractions
23 p0529 A79-42275
Lockheed urges hydrogen fuel
24 p0648 A79-49224
Alternative fuels in aviation
24 p0651 A79-49381
Comparison of alternate fuels for aircraft
24 p0668 A79-51100
Aircraft Engine Future Fuels and Energy Conservation
[AGARD-LS-96] 21 p0201 N79-13192
Future fuels for aviation
21 p0201 N79-13193
Future aviation fuels fuel suppliers views
21 p0202 N79-13194
The role of fundamental combustion in the future aviation fuels program --- carbon formation in gas turbine primary zones
21 p0202 N79-13195
Characteristics and combustion of future hydrocarbon fuels
21 p0202 N79-13196
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
Evaluation of future jet fuel combustion characteristics
[AD-A060218] 21 p0216 N79-14231
Naval Air Systems Command-Naval Research Laboratory Workshop on Basic Research Needs for Synthetic Hydrocarbon Jet Aircraft Fuels
[AD-A060081] 21 p0216 N79-14235
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels
[AD-A060322] 21 p0226 N79-15203
Effect of broadened-specification fuels on aircraft engines and fuel systems
[NASA-TM-79086] 22 p0330 N79-16136
Parametric performance of a turbojet engine combustor using jet A and A diesel fuel
[NASA-TM-79089] 22 p0357 N79-20114
Integrated power unit
[AD-A066543] 23 p0569 N79-25396
Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224
Findings and views concerning the exemption of kerojet fuels from the mandatory petroleum allocation and price regulations
[DOE/ERA-0023] 23 p0600 N79-28058
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28349
Analysis of the emissions from storage tanks during JP-4 fuel transfer operations. Phase 1: Warm weather conditions
[AD-A069339] 24 p0732 N79-29364
Comparison of the properties of some synthetic crudes with petroleum crudes
[NASA-TM-79220] 24 p0765 N79-31405
Jet Fuel Thermal Stability
[NASA-TM-79231] 24 p0795 N79-33336
JET FLOW
Aerodynamic separation of gases and isotopes: Recent advances --- conferences, Belgium, May-Jun. 1978
[VKI-LEC-SER-1978-8] 24 p0720 N79-28506
JET IMPINGEMENT
Jet impingement solar air heater
[AIAA PAPER 78-1760] 21 p0061 A79-13861
JET MIXING FLOW
Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213
JET NOZZLES
Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188
JET PUMPS
Design of a freon jet pump for use in a solar cooling system
[ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847
JETTISONING
Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft
[AIAA PAPER 79-0186] 21 p0157 A79-19585
JIGS
Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447
JOINTS (JUNCTIONS)
Blending of hydrogen in natural gas distribution systems. Volume 3: Gas blends leakage tests of selected distribution system components
[COMS/2925-3] 23 p0577 N79-26229
JOSEPHSON JUNCTIONS
Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690
JP-4 JET FUEL
Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft
[AIAA PAPER 79-0186] 21 p0157 A79-19585
JP-5 JET FUEL
Effects of fuel properties on soot formation in turbine combustion
[SAE PAPER 781026] 22 p0274 A79-25899
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
22 p0274 A79-25917
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182
JUNCTION DIODES
Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480
Integrated tandem solar cells
23 p0439 A79-36635
Characterization of vertical-junction silicon solar cells
23 p0504 A79-40955
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967

Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications
24 p0629 A79-46249
JUNCTION TRANSISTORS
A device model for the tandem junction solar cell
24 p0714 A79-53938
JUPITER PROJECT
Selenide technology evaluation program at JPL
21 p0026 A79-10222

K

KANSAS
Geologic assessment of compressed air storage sites in Kansas
[EPRI-EM-877] 23 p0597 N79-27689
Solar heating and hot water system installed at Southeast of Saline, Unified School District 306, Mentor, Kansas
[NASA-CR-161271] 24 p0737 N79-29602
KENTUCKY
Solar system installation at Louisville, Kentucky
[NASA-CR-150814] 21 p0172 N79-10518
A Kentucky energy resource utilization program
[PB-283796/1] 21 p0198 N79-12574
A Kentucky energy resource utilization program
[PB-292949/5] 23 p0585 N79-26538
KEROGEN
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522
Review - Thermophysical properties of oil shales
24 p0651 A79-49401
KEROSENE
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream
21 p0114 A79-16786
Laser aircraft --- using kerosene
22 p0284 A79-26597
Toxic component concentration in kerosene-air mixture combustion products
22 p0291 A79-27733
The influence of fuel composition on smoke emission from gas-turbine-type combustors - Effect of combustor design and operating conditions
22 p0323 A79-31510
The chemical stability of kerosene fractions
23 p0529 A79-42275
Comparison of alternate fuels for aircraft --- liquid hydrogen, liquid methane, and synthetic aviation kerosene
[NASA-TM-80155] 24 p0782 N79-32637
KEVLAR (TRADEMARK)
Composite material flywheel for the electric-powered passenger vehicle
22 p0240 A79-20842
A status of the 'Alpha-ply' composite flywheel concept development
22 p0241 A79-20843
Composite-rim flywheels - Spin tests
23 p0423 A79-34281
Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors --- Kevlar/epoxy and glass/epoxy composites
[UCRL-80116-PT-A] 21 p0215 N79-14165
KINETIC ENERGY
Mechanical energy storage system for a 10 KWe solar power pack
21 p0121 A79-17329
Novel flywheel energy storage system
24 p0678 A79-51789
KINETIC EQUATIONS
Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764
KINETICS
Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels
21 p0179 N79-11150
Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650
KLYSTRONS
New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34846
KOREA
Some experimental investigations on solar space heating in Korea
21 p0138 A79-17470

L

L-1011 AIRCRAFT
Fuel conservative subsonic transport --- control surfaces activated by computers
22 p0337 N79-16874
LABOR
Assessment of economic factors affecting the satellite power system. Volume 1: System cost factors
[NASA-CR-161185] 22 p0368 N79-21551
LABORATORY EQUIPMENT
Sandia Laboratories' Midtemperature Systems Test Facility
23 p0429 A79-35049
LAKE CHAMPLAIN BASIN (NY-VT)
Energy use and supply in the Lake Champlain Basin
[PB-293437/0] 23 p0599 N79-27713
LAKES
Wave power experiments at Loch Ness
23 p0450 A79-37871
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6] 22 p0339 N79-17309
LAMINAR FLOW
Buoyancy effects in a solar regenerator --- for air dehumidifier absorbent solutions
22 p0262 A79-23752
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft
[AIAA PAPER 79-1863] 24 p0643 A79-47920
MHD generator duct flow with cross stream dependent fluid properties
22 p0336 N79-16668
LAMINAR HEAT TRANSFER
Fully developed laminar heat transfer in passages of triangular cross section for application to solar collector plate design
[AIAA PAPER 79-0974] 23 p0458 A79-38189
LAMINATES
The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate
22 p0239 A79-20824
LAND MANAGEMENT
Environmental aspects of the Syncrude tar sands project
24 p0665 A79-50889
Pollutant protection for the case of strip mining in the Rhine area
24 p0714 A79-53804
Management of fuel and nonfuel minerals in federal land: Current status and issues --- and its environmental impact
[PB-295788/4] 24 p0797 N79-33554
LAND USE
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany
[E79-10102] 22 p0339 N79-17291
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311
Satellite Power System (SPS) resource requirements (critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming
23 p0551 N79-23551
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446
Management of fuel and nonfuel minerals in federal land: Current status and issues --- and its environmental impact
[PB-295788/4] 24 p0797 N79-33554

LANDSAT SATELLITES
Landsat - Developing techniques and applications in mineral and petroleum exploration
21 p0111 A79-16725
NASA takes stock
23 p0461 A79-38375
LANTHANUM COMPOUNDS
Hydrogen storage by LaNi5 - Fundamentals and applications
21 p0038 A79-11803
Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682
Some applications of LaNi5-type hydrides --- using reversible reaction with hydrogen working fluid for heat storage
22 p0249 A79-21694
Metal hydride electrodes for electrochemical energy storage
22 p0249 A79-21695
Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316
LARGE SPACE STRUCTURES
The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024
Space platforms for building large space structures
21 p0032 A79-10511
On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288
New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298
Advanced composites - Future space applications
21 p0086 A79-15504
A technology program for large area space systems
21 p0100 A79-16145
Overview of future programs - USA --- manned orbital space missions
21 p0116 A79-17275
A development strategy for the solar power satellite
[AAS PAPER 78-154] 22 p0243 A79-21266
Space will be the next big construction site
22 p0268 A79-24450
Solar power satellite
22 p0287 A79-27375
Large space system - Charged particle environment interaction technology --- effects on high voltage solar array performance
[AIAA 79-0913] 23 p0425 A79-34775
Lunar resources utilization - An economic assessment --- of manufacturing and construction of large structures in space
[AIAA PAPER 79-1412] 23 p0426 A79-34845
Superlight rotating reflectors in space
[IAF PAPER 79-112] 24 p0709 A79-53301
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302
Orbital demonstration - The prelude to large operational structures in space
[IAF PAPER 79-207] 24 p0710 A79-53357
Future large space systems opportunities: A case for space-to-space power? --- spacecraft power supplies microwave and laser transmission
21 p0169 N79-10095
Environmental interaction implications for large space systems
23 p0552 N79-24027
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
LASER ANEMOMETERS
Boundary layer velocity measurements in combustion MHD channels
24 p0647 A79-49037
LASER APPLICATIONS
Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971
Five MW solar thermal test facility heliostat focus and alignment system
21 p0043 A79-11972
Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292
Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1978, Technical Papers
21 p0107 A79-16601
Laser aircraft propulsion
21 p0109 A79-16618
Laser-powered aircraft and rocket systems with laser energy relay units
21 p0109 A79-16619
The use of lasers for the transmission of power
21 p0109 A79-16621
New candidate lasers for power beaming and discussion of their applications --- solar powered space lasers
21 p0110 A79-16622
Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space
21 p0110 A79-16623
Quasi-isentropic laser engines
21 p0111 A79-16632
Status and summary of laser energy conversion --- for space power transmission systems
21 p0111 A79-16635
Laser ray trace tester for parabolic trough solar collectors
21 p0144 A79-17619
Laser aircraft --- using kerosene
22 p0284 A79-26597
Solar power satellites - The laser option
22 p0284 A79-26599
Laser-particulate control for open-cycle, coal fired gas turbines
[ASME PAPER 79-GT-177] 23 p0379 A79-32437
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202
New energy conversion techniques in space, applicable to propulsion --- powering of aircraft with laser energy from SPS
[AIAA PAPER 79-1338] 23 p0493 A79-40490
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083
Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210
Future large space systems opportunities: A case for space-to-space power? --- spacecraft power supplies microwave and laser transmission
21 p0169 N79-10095
Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner
[SAND-78-0700] 21 p0185 N79-11496
Potential of laser for SPS power transmission
[NASA-CR-157432] 23 p0548 N79-23496
Laser development for laser fusion applications
[SAND-78-2306] 24 p0720 N79-28540
Laser and energetics of the future
[UCRL-TRANS-11467] 24 p0734 N79-29513
LASER DAMAGE
Techniques for preventing damage to high power laser components --- Shiva laser fusion experiments
21 p0083 A79-15145
Prepulse damage to targets and alignment verification
22 p0258 A79-23027
LASER FUSION
Overview of inertial confinement fusion reactor designs
21 p0018 A79-10149
CO2-laser fusion
21 p0018 A79-10150
Commercial applications of thermionic conversion using a fusion reactor energy source - A preliminary assessment
21 p0026 A79-10219

Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249

The laser fusion scientific feasibility experiment
21 p0030 A79-10250

Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

Progress in laser-fusion research
21 p0070 A79-14464

DOE programs in material development for fusion laser systems
21 p0082 A79-15137

Requirements and new materials for fusion laser systems
21 p0082 A79-15138

Review of theories for predicting n2 in glasses and crystals --- refractive index of fusion laser materials
21 p0083 A79-15139

Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171

A new method for producing cryogenic laser fusion targets
21 p0085 A79-15332

Development of cryogenic targets for laser fusion
21 p0085 A79-15333

Cryogenic pellets for laser-fusion research - Theoretical and practical considerations
21 p0085 A79-15334

Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335

Self-adjusting laser-target system for laser fusion
21 p0086 A79-15625

Stimulated Raman scatter in laser fusion target chambers
21 p0155 A79-18794

An overview of design space for small fusion targets
22 p0253 A79-22241

Prepulse damage to targets and alignment verification
22 p0258 A79-23027

Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034

Diagnostics of Shiva Nova high-yield thermonuclear events --- in laser fusion
22 p0285 A79-26747

Pellet X-ray spectra for laser fusion reactor designs
22 p0291 A79-27878

Self-consistent analysis of alpha-particle heating of a fast-solenoid plasma --- in laser fusion
22 p0291 A79-27879

Two-dimensional monochromatic X-ray imaging of laser-produced plasmas --- during implosions for laser fusion
22 p0296 A79-28366

Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

Production of synthetic fuels - An important civilian application of laser fusion
23 p0408 A79-34066

Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-34192

Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171

An optical evaluation laboratory for laser fusion
23 p0447 A79-37667

Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

Advanced lasers for fusion applications
24 p0669 A79-51405

High power iodine atom laser
24 p0707 A79-52644

Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

Large aperture components for solid state laser fusion systems
24 p0713 A79-53522

Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439

Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

LASER HEATING

The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants
21 p0009 A79-10078

The TELEC - A plasma type of direct energy converter --- Thermo-Electronic Laser Energy Converter for electric power generation
21 p0110 A79-16629

Energy exchanger technology applied to laser heated engines
21 p0110 A79-16631

Quasi-isentropic laser engines
21 p0111 A79-16632

Analysis of a cylindrical imploding shock wave
21 p0155 A79-18846

Laser-induced desorption experiments with technical metal surfaces --- carbon monoxide and hydrogen interaction with Ni
23 p0445 A79-36969

Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

LASER MATERIALS

DOE programs in material development for fusion laser systems
21 p0082 A79-15137

Requirements and new materials for fusion laser systems
21 p0082 A79-15138

Review of theories for predicting n2 in glasses and crystals --- refractive index of fusion laser materials
21 p0083 A79-15139

A survey of laser glasses --- for fusion studies
21 p0083 A79-15140

Mechanical deflection analysis of diamond turned reflective optics --- for laser fusion
21 p0083 A79-15143

Techniques for preventing damage to high power laser components --- Shiva laser fusion experiments
21 p0083 A79-15145

Large aperture components for solid state laser fusion systems
24 p0713 A79-53522

LASER MODE LOCKING

Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171

LASER OUTPUTS

Progress in nuclear-pumped lasers
21 p0110 A79-16627

Space Laser Power System --- for satellite solar power station transmission to earth
[AIAA PAPER 79-1013] 23 p0459 A79-38201

LASER PLASMA INTERACTIONS

Prepulse damage to targets and alignment verification
22 p0258 A79-23027

Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

Computer simulation of laser implosive compression of ADT target and analytic solutions on the shock waves and thermal waves
24 p0629 A79-46254

LASER PLASMAS

Progress in laser-fusion research
21 p0070 A79-14464

Self-adjusting laser-target system for laser fusion
21 p0086 A79-15625

Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479

Stimulated Raman scatter in laser fusion target chambers
21 p0155 A79-18794

Diagnostics of Shiva Nova high-yield thermonuclear events --- in laser fusion
22 p0285 A79-26747
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas --- during implosions for laser fusion
22 p0296 A79-28366
Effects of nonlinear decay of backscattered light on the anomalous reflectivity --- in laser plasmas
22 p0310 A79-30742
Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400
An optical evaluation laboratory for laser fusion
23 p0447 A79-37667
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337

LASER SPECTROSCOPY
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430

LASER TARGETS
Self-adjusting laser-target system for laser fusion
21 p0086 A79-15625
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479
Diagnostics of Shiva Nova high-yield thermonuclear events --- in laser fusion
22 p0285 A79-26747
Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993
Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940
Computer simulation of laser implosive compression of ADT target and analytic solutions on the shock waves and thermal waves
24 p0629 A79-46254
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

LASERS
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384

LASING
DOE programs in material development for fusion laser systems
21 p0082 A79-15137
Requirements and new materials for fusion laser systems
21 p0082 A79-15138
A survey of laser glasses --- for fusion studies
21 p0083 A79-15140
A new concept for solar pumped lasers
21 p0110 A79-16624
Direct conversion of solar energy into laser radiation
22 p0311 A79-31086
New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1016] 23 p0426 A79-34846
Advanced lasers for fusion applications
24 p0669 A79-51405

LATTICE PARAMETERS
A new rationale for the hysteresis effects observed in metal-hydrogen systems
22 p0250 A79-21704

LAUNCHERS
Electromagnetic launchers
24 p0702 A79-52006

LAW (JURISPRUDENCE)
The need for closed service areas in a supply economy based on line networks --- for German gas and electric utilities
21 p0168 A79-20447
Legal and institutional aspects --- of OTEC commercialization
24 p0621 A79-45808
National Aeronautics and Space Act of 1958, as amended, and related legislation
[GPO-34-175] 21 p0214 N79-13932
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494
International energy conservation: Comparative law and policy. Proceedings from the 1978 International Conference on Energy conservation
[CONF-780274] 24 p0757 N79-30811
Briefing related to Executive Order 12003 and the National Energy Act
[DOE/TIC-10065] 24 p0775 N79-31818
Analysis and update of roles and responsibilities derived from Executive Order 12003 and related authorities
[DOE/TIC-10064] 24 p0776 N79-31823

LAYOUTS
Layout and design characteristics of MHD power stations
21 p0105 A79-16481

LEACHING
Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals --- through chemical leaching
21 p0044 A79-12117
Coal desulfurization test plant status - July 1977 --- utilizing Meyers leach process
21 p0044 A79-12118

LEAD (METAL)
Motor vehicle lead emissions in the United States - An analysis of important determinants, geographic patterns and future trends
21 p0113 A79-16745

LEAD ACID BATTERIES
Rapid, efficient charging of lead-acid and nickel-zinc traction cells --- for electric vehicles
21 p0009 A79-10084
Response of lead-acid batteries to chopper-controlled discharge --- for electric vehicles
21 p0011 A79-10097
Effect of electrolyte impurity on the electrochemical performance of the lead/tetrafluoroboric acid/lead dioxide cell
22 p0246 A79-21485
Prospects for improvements in lead-acid batteries --- for electric vehicles
22 p0300 A79-29488
Electric vehicle battery development
[SAE PAPER 790158] 22 p0314 A79-31363
A high energy tubular battery for a 1800 kg payload electric delivery van
[SAE PAPER 790162] 22 p0315 A79-31367
Evaluation of battery performance using computer controlled test equipment
24 p0683 A79-51828
A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558
Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565
Improvements in the lead-acid battery for load leveling applications
[AD-A068990] 24 p0724 N79-28744
Preliminary design analysis of the quasi-electric drive vehicle --- with an improved lead acid battery for extended range
[UCRL-52613] 24 p0731 N79-29116

LEAD COMPOUNDS
The influence of lead compounds on automotive exhaust catalysts
21 p0116 A79-17253

LEAD SULFIDES
High absorptivity Al-PbS selective surfaces for solar photothermal conversion
24 p[illegible] A79-52319

LEAKAGE
Measured effects of flow leakage on the performance of the GT-225 automotive gas turbine engine
[ASME PAPER 79-GT-3] 22 p0306 A79-30502
Effects of air damper leaks on solar energy system performance
[SOLAR/0012-78/29] 23 p0563 N79-24497

Blending of hydrogen in natural gas distribution systems. Volume 3: Gas blends leakage tests of selected distribution system components [CONS/2925-3] 23 p0577 N79-26229

LEAST SQUARES METHOD
Analysis of conduction responses during an underground coal gasification experiment 23 p0531 A79-42898

LEGAL LIABILITY
Legal and economic aspects of engineering design in solar water heating systems 23 p0473 A79-38664
Legal barriers to solar heating and cooling of buildings [HCP/M2528-1] 21 p0209 N79-13534
Liquefied energy gases, part 2 --- safety factors and legal liabilities [GPO-39-305] 24 p0732 N79-29356

LENS DESIGN
Solar concentrators --- using cheap refractive lenses 21 p0136 A79-17455
Design, construction and performance of Fresnel lens for solar energy collection 21 p0136 A79-17456
Efficient Fresnel lens for solar concentration 22 p0285 A79-26816

LIAPUNOV FUNCTIONS
Construction of Lur'e type Lyapunov function with effect of magnetic flux decay 24 p0606 A79-44916

LIBRATIONAL MOTION
Transient attitude dynamics of satellites with deploying flexible appendages 21 p0047 A79-12325

LICENSING
Lead agency designation and proposed licensing procedures for ocean thermal energy conversion facilities 24 p0621 A79-45809
Energy conservation and regulation in the President's budget [GPO-25-418] 24 p0736 N79-29597

LIFE (DURABILITY)
Design features of the TDRSS solar array --- Tracking and Data Relay Satellites 21 p0002 A79-10019
Recent advances in electrocatalysis and their implications for fuel cells 21 p0038 A79-11807
Cast acrylic Fresnel lenses for solar energy concentration 23 p0432 A79-35076
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay 23 p0438 A79-36610
Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells 24 p0606 A79-44919
Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements 24 p0705 A79-52321

LIFE CYCLE COSTS
User experience with on-road electric vehicles in the U.S.A. and Canada 21 p0009 A79-10080
Nickel-zinc vs. silver-zinc battery - A comparative study of baseline characteristics 21 p0009 A79-10083
Collection of data for estimating the probable life cycle costs of solar energy systems 21 p0087 A79-15828
Economic evaluation and optimization of solar heating systems 21 p0118 A79-17293
Some aspects towards the performance evaluation and ensuing design components of solar collector systems 21 p0130 A79-17404
A unified methodology for cost analysis of energy production 23 p0419 A79-34159
Solar energy systems and life cycle cost 23 p0474 A79-38672
Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems 24 p0608 A79-45207
The economics of solar domestic hot water systems in state university and community college buildings 24 p0610 A79-45227
Economic evaluation and optimization of solar heating systems 24 p0660 A79-50537
Study of flywheel energy storage Volume 1: Executive summary [PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis [PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization [PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 4: Life-cycle costs [PB-282655/0] 21 p0177 N79-10558
Sodium-antimony trichloride battery development program for load leveling [EPRI-EM-751] 21 p0186 N79-11501
Results of systems analysis --- effectiveness of integrated solar energy systems 21 p0218 N79-14534
Life-cycle costing. A guide for selecting energy conservation projects for public buildings --- computing the cost effectiveness of retrofitting and new buildings [PB-287804/9] 22 p0345 N79-17744
Market assessment of fuel cell total energy systems [ORNL/CON-36] 23 p0598 N79-27704

LIFT
An inverse problem of vertical-axis wind turbines 22 p0239 A79-20800

LIFT AUGMENTATION
Diffuser designs for improved wind energy conversion 22 p0279 A79-26182
The design impact of power-augmented ram technology on large energy efficient aircraft [AIAA PAPER 79-1864] 24 p0669 A79-51250

LIGHT (VISIBLE RADIATION)
Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions 23 p0433 A79-35383
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation 23 p0466 A79-38603
Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions 24 p0663 A79-50706
Energy and technology review --- tunable laser system for the ultraviolet, visible, and infrared regions [UCRL-52000-79-3] 24 p0791 N79-32727

LIGHT AIRCRAFT
Turbine engines in light aircraft 21 p0047 A79-12380

LIGHT BEAMS
New candidate lasers for power beaming and discussion of their applications --- solar powered space lasers 21 p0110 A79-16622

LIGHT EMISSION
Solar energy conversion: The solar cell --- Book 23 p0423 A79-34449

LIGHT SCATTERING
Self-adjusting laser-target system for laser fusion 21 p0086 A79-15625
Stimulated Raman scatter in laser fusion target chambers 21 p0155 A79-18794
Effects of nonlinear decay of backscattered light on the anomalous reflectivity --- in laser plasmas 22 p0310 A79-30742
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak 23 p0390 A79-33345
Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution 23 p0478 A79-39566

Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47804
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

LIGHT SOURCES
Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259

LIGHT TRANSMISSION
Laser-powered aircraft and rocket systems with laser energy relay units
21 p0109 A79-16619
The use of lasers for the transmission of power
21 p0109 A79-16621

LIGHT WATER BREEDER REACTORS
Exploring future energy options - An economic analysis
21 p0068 A79-14324
Electric utility applications of thermal energy storage and transport
24 p0680 A79-51802

LIGHTING EQUIPMENT
Market definition studies for photovoltaic highway applications
[NASA-CR-159477] 22 p0354 N79-19451

LIGHTNING
Lightning protection for the vertical axis wind turbine
[SAND-77-1241] 21 p0221 N79-14567

LIGNIN
Gasification of raw lignite in the tube-furnace gasifier
22 p0310 A79-30996
Texas lignite: Environmental planning opportunities
[PB-286870/1] 21 p0231 N79-15438

LIGNITE
Analysis of geological limitations to underground coal gasification
24 p0668 A79-51025
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357
Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces
[PB-293238/2] 24 p0731 N79-29249
Bituminous coal and lignite distribution, January - September 1978
[DOE/EIA-0125/3-78] 24 p0748 N79-30688

LIMESTONE
Factors limiting limestone utilization efficiency in fluidized-bed combustors --- in determining sulfur dioxide emission level
21 p0008 A79-10069
Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108
Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121
Recent ooids from different environments - Relationship between petrophysical properties and microstructure
23 p0529 A79-42424
Heat storage in crushed limestone
24 p0609 A79-45215

LIMITER CIRCUITS
The effect of limiters and current profile on elliptic free-boundary MHD equilibria
22 p0291 A79-27881

LIMNOLOGY
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6] 22 p0339 N79-17309

LINE SPECTRA
Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges
23 p0478 A79-39676

LINEAR ACCELERATORS
Electromagnetic launchers
24 p0702 A79-52006

LINEAR ARRAYS
Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998

LINEAR CIRCUITS
Limit of formation of counterflows in plane linear induction MHD machines
22 p0298 A79-29288
Limit of the formation of counterparallel flows in plane-parallel induction MHD machines
24 p0663 A79-50778

LINEAR EQUATIONS
Equations of a conduction MHD ejector
22 p0298 A79-29289
Equations of a conduction-type MHD linkage
24 p0663 A79-50779

LINEAR PROGRAMMING
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564

LINEARIZATION
Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717

LININGS
Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
Study of heat transfer through refractory lined gasifier vessel walls
[FE-2210-29] 23 p0556 N79-24306
Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces
[PB-293238/2] 24 p0731 N79-29249

LIOUVILLE THEOREM
Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372

LIQUEFACTION
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413

LIQUEFIED GASES
Comparison of alternate fuels for aircraft
24 p0668 A79-51100

LIQUEFIED NATURAL GAS
Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507
Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324
Mathematical models of direct initiation of unconfined gas phase detonations --- hazards of LNG/air clouds from spills
[AIAA PAPER 79-0289] 21 p0157 A79-19649
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020
Utilization of the cold by LNG vaporization with closed-cycle gas turbine
[ASME PAPER 79-GT-84] 23 p0376 A79-32361
Application of gas turbine/compressors in LNG plants
[ASME PAPER 79-GT-85] 23 p0376 A79-32362
Storage and distribution of cryogenic fuels --- for transportation
24 p0650 A79-49378
The advance of natural gas --- historical demand increases
24 p0652 A79-49517
Liquefied natural gas wind tunnel simulation and instrumentation assessments
[SAN-W1364-01] 21 p0195 N79-12256
The use of liquid natural gas as heat sink for power cycles
22 p0332 N79-16262
Liquefied natural gas safety research overview
[AD-A063714] 22 p0365 N79-21233
Liquefied energy gases safety. Volume 1: Executive summary and main text
[EMD-78-28-VOL-1] 23 p0572 N79-25508
Liquefied energy gases safety. Volume 2: Appendixes
[EMD-78-28-VOL-2] 23 p0573 N79-25509

Liquefied energy gases safety. Volume 3: Federal agency comments
[EMD-78-28-VOL-3] 23 p0573 N79-25510
Liquefied energy gases, part 2 --- safety factors and legal liabilities
[GPO-39-305] 24 p0732 N79-29356
Methane and methanol as alternative energy sources: A comparative profitability study
[BMFT-FB-77-84] 24 p0747 N79-30412

LIQUID AIR
Remote new energy sources utilization in on-site non-polluting power plant - Liquid air as energy carrier concept and final conversion plant design
23 p0416 A79-34141

LIQUID AMMONIA
Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479
Solar ammonia-water absorption system for cold storage application
21 p0143 A79-17521
Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091
Ammonia vaporization and condensation investigations related to OTEC heat exchangers
24 p0622 A79-45819

LIQUID COOLING
Drag reduction by cooling in hydrogen fueled aircraft
21 p0165 A79-20084
The Alcator liquid nitrogen-cooled tokamaks
22 p0290 A79-27668
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536
Solar cooling in the tropics
23 p0397 A79-33950
Conceptual design of sodium-cooled central receiver solar power plant
[AIAA PAPER 79-0994] 23 p0459 A79-38194

LIQUID FILLED SHELLS
Solar energy storage via liquid filled cans - Test data and analysis
23 p0400 A79-34005
Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213

LIQUID FLOW
Liquid desiccant solar air conditioner and energy storage system
21 p0021 A79-10176
A practical electrochemical transport equation for non-dilute solutions --- for energy storage application
21 p0041 A79-11841
Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0358 A79-33991

LIQUID HELIUM
Review of hydrodynamics and heat transfer for large helium cooling systems
23 p0481 A79-40073
Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems
23 p0530 A79-42893

LIQUID HELIUM 2
Superconductive magnetic energy storage --- using superfluid helium for large scale cooling
24 p0631 A79-46309

LIQUID HYDROGEN
Alternate aircraft fuels prospects and operational implications
21 p0066 A79-14138
The potential of liquid hydrogen as a military aircraft fuel
22 p0238 A79-20773
Cryohydrogen-fuel for tomorrow's commercial aircraft
22 p0289 A79-27656
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020
Liquid hydrogen fueled commercial aircraft
24 p0615 A79-45600
Storage and distribution of cryogenic fuels --- for transportation
24 p0650 A79-49378
Cryogenic hydrogen storage and refueling for automobiles
24 p0686 A79-51846
Survey of liquid hydrogen container technology for highway vehicle fuel system applications
24 p0686 A79-51850
Study of hydrogen recovery systems for gas vented while refueling liquid-hydrogen fueled aircraft
[NASA-CR-158991] 22 p0346 N79-18057
Hydrogen storage devices for automobiles
[BNL-25263] 23 p0583 N79-26518
Turbine engine altitude chamber and flight testing with liquid hydrogen
[NASA-TM-79196] 23 p0587 N79-27140
Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413
Comparison of alternate fuels for aircraft --- liquid hydrogen, liquid methane, and synthetic aviation kerosene
[NASA-TM-80155] 24 p0782 N79-32637
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

LIQUID INJECTION
Assessment of potential increased oil production by polymer-waterflood in northern and southern mid-continent oil fields
[BETC-0026-4] 24 p0735 N79-29579

LIQUID LITHIUM
Lithium and potassium heat pipes for thermionic converters
21 p0013 A79-10113
Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951
The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0696 A79-51955

LIQUID METALS
Liquid metal heat pipes for the central solar receiver
21 p0014 A79-10114
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
Liquid metal heat pipe performance in the presence of a transverse magnetic field --- for fusion reactors
[ASME PAPER 78-ENAS-20] 21 p0048 A79-12569
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
[ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814
Calculation and design of liquid-metal MHD induction machines --- Russian book
22 p0286 A79-27302
An overview of liquid metal MHD --- for power generation
22 p0289 A79-27660
Two-phase LMMHD mixer-development experiments --- Liquid-Metal MHD generator flow characteristics
23 p0394 A79-33422
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
24 p0708 A79-52957
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120

LIQUID NITROGEN
The Alcator liquid nitrogen-cooled tokamaks
22 p0290 A79-27668

Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems
23 p0530 A79-42893

LIQUID PHASES

Liquid-phase reactions of vaporizing hydrocarbon fuels
21 p0052 A79-12987

Changes within tin-containing catalysts under hydrorefining conditions --- for coal liquefaction
24 p0628 A79-45993

Performance of flat plate solar collector with fluid undergoing phase change
24 p0661 A79-50544

Improved anodes for liquid hydrocarbon fuel cell
[AD-A058456] 21 p0206 N79-13504

LIQUID ROCKET PROPELLANTS

Feasibility of rocket propellant production on Mars
21 p0047 A79-12324

LIQUID SODIUM

Conceptual design of sodium-cooled central receiver solar power plant
[AIAA PAPER 79-0994] 23 p0459 A79-38194

Performance limits for liquid-metal heat pipes containing long adiabatic sections
24 p0694 A79-51937

LIQUID-GAS MIXTURES

Mathematical models of direct initiation of unconfined gas phase detonations --- hazards of LNG/air clouds from spills
[AIAA PAPER 79-0289] 21 p0157 A79-19649

Toxic component concentration in kerosene-air mixture combustion products
22 p0291 A79-27733

An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423

Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030

Solvent selectivity for purification of natural cases
24 p0717 N79-28252

LIQUID-SOLID INTERFACES

Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation
21 p0037 A79-11783

Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132

Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136

LIQUID-VAPOR EQUILIBRIUM

Phase equilibria in coal hydrogenation systems
[FE-2334-6] 21 p0171 N79-10238

LIQUID-VAPOR INTERFACES

The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
[ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814

Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585

The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
24 p0708 A79-52957

LIQUIDS

A liquid solar energy storage tank model. I - Formulation of a mathematical model
22 p0267 A79-24314

Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(OP)] 23 p0564 N79-24505

Enthalpy measurements for coal-derived liquids
23 p0587 N79-26997

Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPO-26-349] 24 p0717 N79-28346

LITHIUM

Development and evaluation of a 600-kWh lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095

Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249

The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838

Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells
22 p0246 A79-21491

Primary lithium battery technology and its application to NASA missions
[NASA-CR-158229] 22 p0354 N79-19449

Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

Applications and safety data
24 p0722 N79-28718

LITHIUM CHLORIDES

The lithium-thionyl chloride battery - A review
23 p0487 A79-40370

Experimental study of mass exchange in glazed solar solution regenerator
24 p0602 A79-44264

LITHIUM COMPOUNDS

Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629

LITHIUM SULFUR BATTERIES

Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells
22 p0246 A79-21487

Low voltage behavior of lithium/metal dichalcogenide topochemical cells
22 p0286 A79-26995

Discharge reaction mechanisms in Li/SOCl2 cells
22 p0305 A79-30331

A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332

Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366

Migrational polarization in high current density molten salt battery and fuel cell analogs
23 p0446 A79-37273

Solid state electrodes for high energy batteries
24 p0611 A79-45479

Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829

A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

NASA's lithium cell technology program
24 p0722 N79-28709

LITHOLOGY

Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599

Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

LOADING MOMENTS

Field testing of 5-kW commercial wind generator with an automatic load-matching device for utilizing its output
21 p0143 A79-17515

LOADS (FORCES)
  Load criteria for OTEC riser cable design 24 p0620 A79-45801
LOCOMOTIVES
  Fluid bed combustion coal fired steam locomotive 23 p0453 A79-37903
  Wayside energy storage summary. Volume 1: Summary [DOT-TSC-FRA-79-7-1-VCL-1] 22 p0370 N79-21563
LOGIC DESIGN
  Development of gas turbine performance seeking logic [ASME PAPER 78-GT-13] 21 p0031 A79-10257
LOGISTICS
  Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future 23 p0420 A79-34168
LOGISTICS MANAGEMENT
  The need for closed service areas in a supply economy based on line networks --- for German gas and electric utilities 21 p0168 A79-20447
  International energy evaluation system. Volume 1: Executive summary [HCP/I8602-01/1] 24 p0742 N79-29662
LONG TERM EFFECTS
  Asymptotic behaviour as a guide to the long term performance of solar water heating systems 21 p0041 A79-11872
  Long-term average performance of the Sunpak evacuated-tube collector 21 p0089 A79-15854
  Energy impact on economic activity and long-term trend forecast 23 p0419 A79-34163
  Solar thermal systems long-term performance predictions using closed-form solutions 24 p0672 A79-51740
  Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes [PNL-2871] 23 p0562 N79-24487
  Long-term weathering effects on the thermal performance of the solargenics (liquid) solar collector at outdoor conditions --- Marshall Space Flight Center Solar test facility [NASA-CR-150523] 24 p0737 N79-29601
  Indoor test and long-term weathering effects on the thermal performance of the solar energy system (liquid) solar collector --- Marshall Space Flight Center solar test facility and solar simulator [NASA-CR-150794] 24 p0749 N79-30715
  Potential prediction needs in support of energy systems --- solar-terrestrial interactions [LA-UR-79-673] 24 p0788 N79-32698
LONG WAVE RADIATION
  The significance of longwave radiation in flat plate solar collector testing 23 p0448 A79-37847
LORENTZ FORCE
  Effect of force field nonuniformity on flow in an MHD channel 21 p0101 A79-16365
LOSSES
  Calculation of hysteresis losses in superconducting coils 23 p0432 A79-35174
LOSSLESS MATERIALS
  Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat 23 p0478 A79-39695
LOUISIANA
  Environmental considerations and the geothermal energy resource in Louisiana 24 p0667 A79-50898
  An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells [NVO-1531-2] 22 p0366 N79-21523
LOW ASPECT RATIO
  An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine [ASME PAPER 79-GT-53] 23 p0375 A79-32348
LOW COST
  Iron-air batteries for electric vehicles 21 p0011 A79-10094
  Low-cost concept for energy supply from the wind 21 p0058 A79-13651
  Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells 21 p0122 A79-17338
  Solar concentrators --- using cheap refractive lenses 21 p0136 A79-17455
  An evaluation of the strategy of low cost horizontal axis windmills 21 p0143 A79-17517
  General view of low cost solar cell development in Japan 21 p0149 A79-17997
  Recent developments in low cost silicon solar cells for terrestrial applications --- sheet production methods 22 p0239 A79-20821
  Wind-turbine-generator rotor-blade concepts with low-cost potential 22 p0240 A79-20828
  Materials for low-cost solar cells 22 p0252 A79-22099
  Encapsulant materials for $2/watt terrestrial photovoltaic arrays 22 p0266 A79-24138
  System designs for low cost-low ratio solar concentrators 22 p0293 A79-28142
  Low cost thin-film CdS-based solar cells progress and promise [ASME PAPER 79-SOL-15] 22 p0309 A79-30549
  A simple solar gas turbine plant [ASME PAPER 79-GT-90] 23 p0377 A79-32367
  Low-cost encapsulation materials for terrestrial solar cell modules 23 p0439 A79-36636
  Approaches to low-cost solar cells 23 p0441 A79-36784
  The design construction and proving of a low cost 5kW wind powered turbine for isolated applications 23 p0452 A79-37893
  A low cost wind energy conversion system for heating of domestic premises 23 p0452 A79-37894
  Low cost Darrieus vertical-axis wind turbine design [AIAA PAPER 79-0966] 23 p0456 A79-38174
  Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells 23 p0475 A79-38877
  Spray deposited Cd/1-x/Zn/x/S films for low cost solar cells 23 p0500 A79-40912
  A candidate low-cost processing sequence for terrestrial silicon solar cell panel 23 p0501 A79-40919
  A 1982 low cost photovoltaic module factory study 23 p0501 A79-40921
  Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions 23 p0501 A79-40922
  Silicon solar cell arrays - Technical status, terrestrial applications, and future developments for low cost production 23 p0501 A79-40923
  High efficiency, low cost processes for 3 in. diameter silicon solar cells 23 p0501 A79-40924
  Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon 23 p0504 A79-40959
  Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays 23 p0507 A79-40982
  A low cost, durable anti-reflective film for solar collectors 23 p0507 A79-40983
  Epitaxial solar cells on low-cost silicon substrates 23 p0519 A79-41068
  Encapsulation materials for photovoltaic arrays 23 p0534 A79-43294
  Elastically deformed, linear focusing solar reflector 24 p0670 A79-51728
  Performance of a large, salt-gradient solar pond 24 p0671 A79-51735

A low cost composite blade for a 300 foot diameter wind turbine
24 p0677 A79-51781
Low cost flywheel energy storage system demonstration
24 p0678 A79-51788
Phase 1 of the automated array assembly task of the low cost silicon solar array project
[NASA-CR-158120] 22 p0348 N79-18451
Automated array assembly, phase 2. Low-cost solar array project, task 4
[NASA-CR-158365] 22 p0358 N79-20481
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484
Solar space heaters for low-income families
[PB-289244/6] 22 p0363 N79-20526
A low cost high temperature sun tracking solar energy collector
22 p0366 N79-21390
The array automated assembly task for the low cost solar array project, phase 2
[NASA-CR-158538] 23 p0560 N79-24469
Low-cost solar array project
23 p0570 N79-25489
LSA engineering status
23 p0570 N79-25490
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots
[NASA-CR-162359] 24 p0798 N79-33567

LOW TEMPERATURE
Theoretical and experimental analysis of a latent heat storage system --- solar energy absorbers
21 p0121 A79-17323
A heat pipe collector for low temperatures
21 p0127 A79-17385
Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585
Current status and prospects for low-temperature solar energy
22 p0269 A79-24623
Superconductivity in antenna engineering
22 p0311 A79-31008
Use of fluidized media in thermal power systems
23 p0436 A79-35525
Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167
Low-temperature application of solar energy in South Africa
22 p0340 N79-17324

LOW TEMPERATURE ENVIRONMENTS
Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624

LOW TEMPERATURE TESTS
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419
On the problem of heat transfer in low-temperature heat pipes
23 p0532 A79-42938
Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy
24 p0604 A79-44549

LUBRICANTS
High sulfur fuel effects in a two-cycle high speed army diesel engine
[AD-A059534] 21 p0216 N79-14232

LUBRICATING OILS
US Army/Environmental Protection Agency re-refined engine oil program
[AD-A056806] 21 p0171 N79-10216
Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432

LUMINAIRES
A novel low-cost photovoltaic concentrator
23 p0508 A79-40996
The optimum voltage for batteries used in standby lighting systems
[BLL-RTS-11512] 22 p0347 N79-18439

LUMINESCENCE
Luminescent solar concentrators
23 p0509 A79-40997

LUMINOUS INTENSITY
Overview of novel photovoltaic conversion techniques at high intensity levels
21 p0108 A79-16610

LUNAR BASES
Energy conversion at a lunar polar site
21 p0108 A79-16607
Commercial prospects for extraterrestrial materials
23 p0395 A79-33748
The polar lunar base - A viable alternative to L-5
[AAS 78-191] 23 p0427 A79-34862
Extraterrestrial fiberglass production using solar energy --- lunar plants or space manufacturing facilities
24 p0778 N79-32237

LUNAR CRUST
Excavation costs for lunar materials
[AIAA PAPER 79-1376] 23 p0425 A79-34828

LUNAR ENVIRONMENT
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere
[IAF PAPER 79-A-16] 24 p0711 A79-53419

LUNAR LAUNCH
Electromagnetic propulsion alternatives --- in mass drivers
[AIAA PAPER 79-1400] 23 p0426 A79-34840

LUNAR SOIL
Development of space manufacturing systems concepts utilizing lunar resources
[AIAA PAPER 79-1411] 23 p0426 A79-34844
Lunar resources utilization - An economic assessment --- of manufacturing and construction of large structures in space
[AIAA PAPER 79-1412] 23 p0426 A79-34845
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302

M

MAGMA
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727
Fuels from magma: A potential energy source --- producing hydrogen, carbon monoxide, and methane
[SAND-78-0191] 24 p0778 N79-32373

MAGNESIUM ALLOYS
The storage and release of hydrogen from magnesium alloy hydrides for vehicular applications
22 p0249 A79-21688
Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion
22 p0260 A79-23615

MAGNESIUM SULFATES
Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966

MAGNET COILS
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
Design of a D-shaped toroidal field coil
21 p0156 A79-19083
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536
Superconducting energy storage magnets
22 p0236 A79-20537
Heat pulses required to quench a potted superconducting magnet
22 p0236 A79-20538

The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557
Design and development of the US-TESPE toroidal coil
22 p0311 A79-31014
Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44545

MAGNETIC ANOMALIES
Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

MAGNETIC CIRCUITS
Superconducting magnets --- for MHD applications
21 p0105 A79-16485

MAGNETIC COILS
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309
Calculation of hysteresis losses in superconducting coils
23 p0432 A79-35174

MAGNETIC CONTROL
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program --- Book
21 p0077 A79-14776
Magnetic divertors --- in large tokamak plasma confinement experiments
21 p0078 A79-14781
Fusion power by magnetic confinement - Program plan
21 p0080 A79-14794
Magnetically confined plasma solar collector --- satellite based system in space
21 p0109 A79-16617
Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881
First wall and divertor plate material selection in fusion reactors
23 p0444 A79-36886

MAGNETIC DIPOLES
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533
A source of error in cusp plasma leak measurements
23 p0446 A79-37265

MAGNETIC EFFECTS
Desulfurization of coals by high-intensity high-gradient magnetic separation - Conceptual process design and cost estimation
21 p0044 A79-12116
Liquid metal heat pipe performance in the presence of a transverse magnetic field --- for fusion reactors
[ASME PAPER 78-ENAS-20] 21 p0048 A79-12569
Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

MAGNETIC FIELD CONFIGURATIONS
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459
Magnetic divertors --- in large tokamak plasma confinement experiments
21 p0078 A79-14781
The 'FINTOR 1' design - A minimum size tokamak experimental reactor
21 p0078 A79-14782
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429
Accounting for the effect of a yoke in an MHD linear induction machine by stipulating boundary conditions of a new kind
22 p0247 A79-21627
Minimum-average-B wells in linked magnetic mirror fields --- for plasma control in fusion reactors
22 p0252 A79-22237
Local theory of finite-beta, collisional drift modes --- plasma stability analysis
22 p0253 A79-22244
Wave reflection from the lower hybrid surface - A toroidal effect --- in tokamaks
22 p0255 A79-22427
Equilibrium relations in the presence of arbitrary plasma diffusion in axisymmetric configurations
22 p0257 A79-22979
Collisional transport --- of plasmas in plane and toroidal geometry
22 p0257 A79-22980
MHD stability for a spherator with a purely poloidal magnetic field
22 p0271 A79-24863
Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876
Theory of dissipative drift instabilities in sheared magnetic fields --- in confined toroidal plasmas
22 p0292 A79-27884
Design and development of the US-TESPE toroidal coil
22 p0311 A79-31014
MHD stability of Spheromak
22 p0313 A79-31189
Plasma behavior near the neutral line between parallel currents --- in planar zeta pinch
22 p0324 A79-31754
Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346
The ELMO Bumpy Torus - An alternative fusion reactor concept
23 p0407 A79-34060
Conceptual design study of a doublet fusion ignition test reactor
23 p0407 A79-34065
Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881
Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887
A source of error in cusp plasma leak measurements
23 p0446 A79-37265
Measurements of plasma shape in a tokamak
23 p0527 A79-41944
Tearing mode instabilities and their suppression by lower hybrid fields --- in tokamaks
24 p0606 A79-45004
Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor
24 p0630 A79-46302
Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419
Effect of scrape-off on tokamak radial transport
24 p0640 A79-47427
Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump
24 p0706 A79-52372
Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188

MAGNETIC FIELDS
Attenuating the transverse edge effect in MHD generators
21 p0063 A79-13985
Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432
Cyclotron-wave spectrum in a plasma with two ion species
22 p0245 A79-21443

Integral invariants and quasi-MHD nonlinear dissipation --- in magnetized toroidal plasmas
22 p0270 A79-24862

Electromechanical conversion of energy during the deceleration of a piston in a uniform magnetic field
22 p0309 A79-30599

Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

High-gradient magnetic separation for removal of sulfur from coal
[PB-290945/5] 23 p0569 N79-25469

MAGNETIC FLUX

Construction of Lur'e type Lyapunov function with effect of magnetic flux decay
24 p0606 A79-44916

MAGNETIC INDUCTION

Accounting for the effect of a yoke in an MHD linear induction machine by stipulating boundary conditions of a new kind
22 p0247 A79-21627

Calculation and design of liquid-metal MHD induction machines --- Russian book
22 p0286 A79-27302

Optimality criteria in the compensation of the longitudinal boundary effect in induction MHD machines
22 p0298 A79-29277

Two asymptotic solutions for analyzing the transverse edge effect in induction MHD machines
22 p0298 A79-29287

Limit of formation of counterflows in plane linear induction MHD machines
22 p0298 A79-29288

Fuel release from solid fossil-fuel deposits by electrical induction heating
23 p0446 A79-37285

Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373

Two limiting solutions for the analysis of transverse edge effects in MHD induction machines
24 p0663 A79-50777

Limit of the formation of counterparallel flows in plane-parallel induction MHD machines
24 p0663 A79-50778

MAGNETIC LENSES

Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466

MAGNETIC MIRRORS

The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147

Mirror fusion reactors
21 p0018 A79-10148

The mirror machine program in the USA --- controlled fusion experiments and research facilities
21 p0070 A79-14461

Fusion power by magnetic confinement - Program plan
21 p0080 A79-14794

Superconductivity for mirror fusion
22 p0236 A79-20542

Minimum-average-B wells in linked magnetic mirror fields --- for plasma control in fusion reactors
22 p0252 A79-22237

Particle orbits in field-reversed mirrors --- for plasma confinement in fusion reactor
22 p0253 A79-22239

Stabilization of drift loss-cone instability /DCI/ by addition of cold ions --- in collisional hydrogen plasma confinement
22 p0291 A79-27882

Evidence for neutral-beam-injected oxygen impurities in 2XIIB --- mirror confined plasma
22 p0292 A79-27887

Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184

MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192

A scheme for direct conversion of plasma thermal energy into electrical energy
22 p0324 A79-31765

Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887

Complex static mirror solar concentration arrays
23 p0452 A79-37886

Warm plasma effects on drift cyclotron loss cone mode --- in mirror machines
23 p0478 A79-39568

Spectrally split tandem cell converter studies
23 p0513 A79-41028

A possible route to small, flexible fusion units --- fusion reactor design
24 p0630 A79-46304

High-frequency convective loss-cone instability in short mirror machines
24 p0639 A79-47421

Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177

Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887

MAGNETIC PROBES

Structure of the current shell in a Z pinch
22 p0245 A79-21434

MAGNETIC SHIELDING

Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026

MAGNETIC SURVEYS

Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey
[LA-7656-MS] 22 p0358 N79-20458

Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

MAGNETIC SUSPENSION

Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785

MAGNETIC VARIATIONS

Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473

MAGNETICALLY TRAPPED PARTICLES

Characteristics of a predemonstration fusion device
21 p0078 A79-14784

Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces --- in toroidal plasmas
22 p0270 A79-24855

MAGNETOACOUSTIC WAVES

Magneto-acoustic resonance heating in the ion-cyclotron frequency domain --- of tokamak plasmas
22 p0271 A79-24866

Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766

Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188

MAGNETOHYDRODYNAMIC FLOW

Supersonic flow in an MHD channel with a downwash flow at the inlet
21 p0085 A79-15342

Effect of force field nonuniformity on flow in an MHD channel
21 p0101 A79-16365

On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid
21 p0156 A79-19445

Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626

Optimization of a diagonal MHD channel 22 p0247 A79-21628

On the diffusive instability of some simple steady magnetohydrodynamic flows 22 p0278 A79-26163

Two-dimensional MHD channel design --- for energy performance improvement at lower wall temperature 22 p0279 A79-26183

Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows 22 p0279 A79-26184

Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device 22 p0306 A79-30392

Thermoelectric magnetohydrodynamics 22 p0312 A79-31098

Tokamak plasma diagnosis by surface physics techniques 23 p0443 A79-36883

Diagnostic techniques in combustion MHD flows 23 p0478 A79-39508

Turbulence dynamics in MHD plasmas [AIAA PAPER 79-1538] 24 p0636 A79-46717

Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria 24 p0645 A79-48226

Numerical codes for MHD flows [SAND-78-1954] 24 p0730 N79-29061

Magnetogasdynamic phenomena in pulsed MHD flows [AD-A070590] 24 p0794 N79-33042

MAGNETOHYDRODYNAMIC GENERATORS

Economic optimization of the coal-fired MHD Steam Power Plant 21 p0016 A79-10134

Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants 21 p0016 A79-10135

Considerations for MHD power generation development 21 p0016 A79-10136

A proposed 40 MWe MHD pilot plant 21 p0017 A79-10137

Thermal modeling of coal-fired MHD plant components 21 p0017 A79-10138

Controlling NOx from a coal-fired MHD process 21 p0017 A79-10139

A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute 21 p0017 A79-10140

Progress in the testing of materials and design concepts for directly-fired MHD air heater service 21 p0017 A79-10141

Design studies and trade-off analyses for a superconducting magnet/MHD power generator system 21 p0017 A79-10142

The ion fly-wheel effect on the electro-thermal instability in non-equilibrium MHD Hall disc generators 21 p0046 A79-12270

Magnetohydrodynamic/steam power plant modeling and control 21 p0046 A79-12274

'Local' breakdown criterion in highly ionized gas flow 21 p0049 A79-12683

Stability of combustion in the combustion chamber of an MHD generator 21 p0049 A79-12691

U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields 21 p0049 A79-12692

Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields 21 p0049 A79-12693

A collisional plasma rotating between two cylinders 21 p0049 A79-12694

Combustion of porous particles --- coal for MHD generators 21 p0049 A79-12708

Attenuating the transverse edge effect in MHD generators 21 p0063 A79-13985

Coal slag effects in MHD generators 21 p0080 A79-14934

Corrosion and deposits in MHD generator systems 21 p0081 A79-14935

Controlled utilization of coal slag in the MHD topping cycle 21 p0081 A79-14936

The MHD interaction and plasma properties in a shock tube driven disk generator with swirl 21 p0083 A79-15260

Commercial realization of MHD - A challenge for superconducting magnets 21 p0084 A79-15302

Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research 21 p0084 A79-15303

Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research 21 p0084 A79-15304

Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator 21 p0084 A79-15305

Design of superconducting magnets for full-scale MHD generators 21 p0084 A79-15306

Supersonic flow in an MHD channel with a downwash flow at the inlet 21 p0085 A79-15342

Materials and economics of energy systems 21 p0095 A79-15911

Effect of force field nonuniformity on flow in an MHD channel 21 p0101 A79-16365

Open-cycle magnetohydrodynamic electrical power generation --- Book 21 p0104 A79-16478

The MHD power plant and its environmental aspects - Introduction 21 p0105 A79-16479

MHD power plant characteristics 21 p0105 A79-16480

Layout and design characteristics of MHD power stations 21 p0105 A79-16481

Technical and economic aspects of open-cycle MHD power plants 21 p0105 A79-16482

Protection of the biosphere --- MHD power stations pollution reduction 21 p0105 A79-16483

MHD generators --- Faraday, Hall and diagonal generator designs 21 p0105 A79-16484

Superconducting magnets --- for MHD applications 21 p0105 A79-16485

Inverter systems --- for MHD power stations 21 p0106 A79-16486

High-temperature oxidizer preheater --- for fossil fuel MHD energy conversion 21 p0106 A79-16487

Fuels and combustion --- for open cycle MHD system 21 p0106 A79-16488

Steam generator and turbomachines --- MHD power plant design and Soviet operational experience 21 p0106 A79-16489

Ionizing seed --- for open cycle MHD power generation 21 p0106 A79-16490

Materials --- for high temperature MHD technology 21 p0106 A79-16491

Plasma diagnostics in an MHD installation 21 p0106 A79-16492

MHD conversion of solar energy --- space electric power system 21 p0109 A79-16614

MHD power generation 21 p0146 A79-17638

Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator 21 p0153 A79-18468

Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators 21 p0153 A79-18469

Transport phenomena in MHD generators - Effect of boundary layers 21 p0156 A79-19098

On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid 21 p0156 A79-19445

National program for the development of commercial MHD
[AIAA PAPER 79-0168] 21 p0157 A79-19587

Slag deposition and its effect on the performance of MHD channels --- in electric generators
[AIAA PAPER 79-0189] 21 p0157 A79-19588

Combustion of pulverized coal in high temperature preheated air
[AIAA PAPER 79-0298] 21 p0158 A79-19654

Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808

Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809

Gas stream composition and temperature determination in a coal-fired MHD simulation facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810

The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
[ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814

Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411

Subsonic flow in the channel of an MHD-generator
21 p0167 A79-20413

The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity
21 p0167 A79-20415

Mathematical model of interelectrode breakdown in MHD generator
21 p0167 A79-20418

Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419

Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531

Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility --- SuperConducting Magnet System
22 p0235 A79-20532

A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534

Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535

Experimental studies of a linear MHD generator with fully ionized seed
22 p0238 A79-20796

Preliminary analysis of advanced ceramic magnetohydrodynamic /MHD/ combustor design concepts
22 p0240 A79-20838

Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532

Turbulence of a combustion product plasma in an MHD channel
22 p0246 A79-21538

Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626

Accounting for the effect of a yoke in an MHD linear induction machine by stipulating boundary conditions of a new kind
22 p0247 A79-21627

Optimization of a diagonal MHD channel
22 p0247 A79-21628

Dynamic characteristics of a free-piston diesel engine combined with a MHD generator
22 p0258 A79-23137

Construction of a mathematical model for MHD generator electrodes in the arc regime of operation
22 p0258 A79-23138

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0278 A79-26176

Subsonic diffusers for MHD generators
22 p0279 A79-26185

On supersonic and subsonic diffusers for magnetohydrodynamic generator applications
22 p0279 A79-26186

Three-dimensional effects of electrode configuration on diagonal MHD generator performance
22 p0283 A79-26523

Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524

Calculation and design of liquid-metal MHD induction machines --- Russian book
22 p0286 A79-27302

Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978
22 p0289 A79-27651

Open-cycle MHD development --- for power generation
22 p0289 A79-27659

An overview of liquid metal MHD --- for power generation
22 p0289 A79-27660

Status of the U.S./U.S.S.R. cooperative program for the development of open-cycle MHD power generators
22 p0290 A79-27661

Superconducting magnet systems for MHD generator facilities
22 p0290 A79-27662

Air Force applications of lightweight superconducting machinery --- in airborne power sources
22 p0290 A79-27666

Operational characteristics of MHD turbine with air-core superconducting rotor
22 p0297 A79-28924

Optimality criteria in the compensation of the longitudinal boundary effect in induction MHD machines
22 p0298 A79-29277

Calculation of the external electromagnetic field of closely spaced MHD machines
22 p0298 A79-29285

Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges
22 p0298 A79-29286

Two asymptotic solutions for analyzing the transverse edge effect in induction MHD machines
22 p0298 A79-29287

Limit of formation of counterflows in plane linear induction MHD machines
22 p0298 A79-29288

Equations of a conduction MHD ejector
22 p0298 A79-29289

Feasibility of MHD-ac induction electric power plant --- using tokamak reactor exhaust plasma
22 p0303 A79-29794

Control problems of the magnetohydrodynamic electrical power generation in power station cooperating with electrical power system
22 p0303 A79-29798

Mechanism of erosion of metal electrodes of the channel of a MHD generator
22 p0306 A79-30391

Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392

MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192

Development of the combustion chamber of an experimental MHD generator
22 p0327 A79-32105

Application of a hot air turbine for efficiency improvement in MHD/steam power plants
[ASME PAPER 79-GT-36] 23 p0375 A79-32341

Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines
[ASME PAPER 79-GT-54] 23 p0376 A79-32349

Symposium on the Engineering Aspects of Magnetohydrodynamics, 17th, Stanford University, Stanford, Calif., March 27-29, 1978, Proceedings
23 p0390 A79-33379
Mechanistic modeling of pulverized coal combustion --- in MHD generators
23 p0390 A79-33380
Coal combustor technology development
23 p0390 A79-33381
Sensitivities of outputs to variations of inputs in MHD combustors
23 p0390 A79-33382
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385
Open-cycle disk generator studies --- enthalpy extraction performance of open-cycle MHD channels
23 p0391 A79-33386
Compositional modeling of MHD channel slag, with preliminary vapor pressure data
23 p0391 A79-33390
Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0391 A79-33391
Discharge characteristics of slagging metal electrodes --- magnetohydrodynamic generators
23 p0391 A79-33392
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393
MHD slag electrical conductivity studies
23 p0391 A79-33394
Electrode development for coal fired MHD generators
23 p0392 A79-33396
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397
Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
Thermal properties of MHD electrode materials
23 p0392 A79-33400
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
Diagonal frame MHD channel of the U-25 power plant --- MHD generators
23 p0393 A79-33407
Evaluation of the expected diffuser performance for a large MHD generator
23 p0393 A79-33408
Detailed characterization of MHD generator operating parameters
23 p0393 A79-33409
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
Design and operation of the Westinghouse electrode systems test facility /WESTF/ --- for MHD generator
23 p0393 A79-33411
Properties and test results of super-hot wall electrode materials --- for MHD generators
23 p0394 A79-33415
Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420
Power generation experiments of a linear MHD generator with fully ionized seed
23 p0394 A79-33421
Two-phase LMMHD mixer-development experiments --- Liquid-Metal MHD generator flow characteristics
23 p0394 A79-33422
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423
Dynamics of a free-piston Diesel- MHD generator
23 p0395 A79-33424
Consolidation and local control of power in an MHD generator
23 p0395 A79-33425
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426
Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor
23 p0395 A79-33428
Performance of magnetohydrodynamic generator in the inlet region
23 p0397 A79-33769
Coal gasification as applied to MHD power cycle
23 p0411 A79-34095
Engineering studies of open-cycle coal-fired MHD for power generation
23 p0424 A79-34456
Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601
Hall effect in an induction discharge
23 p0442 A79-36806
Combustion-products turbulence in the channel of an MHD generator
23 p0442 A79-36812
Open cycle MHD generation in the United Kingdom - A reappraisal
23 p0453 A79-37904
Prospects of MHD power generation in India using coal
23 p0454 A79-37907
Progress on high temperature air heater development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197
Heat transfer in a high temperature combustion chamber with premixing --- in MHD generators
23 p0474 A79-38869
Diagnostic techniques in combustion MHD flows
23 p0478 A79-39508
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment
23 p0479 A79-39807
Effect of diffusion on electron density across the nonequilibrium MHD channel
23 p0479 A79-39839
Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030
Joint Soviet-American studies in the domain of plasma diagnostics
23 p0529 A79-42853
Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854
Study of the thermal inertia of an electrode microarc
23 p0530 A79-42869
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875
Design study of coal-fired cored brick regenerative heat exchangers --- for MHD generator
23 p0532 A79-42983
Heat transfer in a high-power MHD channel
23 p0533 A79-43171
Large superconducting magnets for new energy technologies
24 p0604 A79-44527
A new three-dimensional equivalent circuit of diagonal type MHD generator
24 p0605 A79-44914
Construction of Lur'e type Lyapunov function with effect of magnetic flux decay
24 p0606 A79-44916
Combustion of coal particles in wall-burning swirl combustors --- for MHD generators
24 p0632 A79-46317

MAGNETOHYDRODYNAMIC GENERATORS CONTD

Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems
24 p0640 A79-47573
Boundary layer velocity measurements in combustion MHD channels
24 p0647 A79-49037
Effect of load factor on the characteristics of series MHD generators
24 p0650 A79-49372
Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373
Characteristics of series channels with a reduced electrode commutation angle in the connecting section --- MHD generators
24 p0650 A79-49374
Application of finite element method to analysis of MHD generators
24 p0653 A79-50001
Calculation of the external electromagnetic field of closely spaced MHD machines
24 p0663 A79-50775
Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor
24 p0663 A79-50776
Two limiting solutions for the analysis of transverse edge effects in MHD induction machines
24 p0663 A79-50777
Limit of the formation of counterparallel flows in plane-parallel induction MHD machines
24 p0663 A79-50778
Equations of a conduction-type MHD linkage
24 p0663 A79-50779
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991
Considerations for adapting an MHD baseload power plant for intermediate and peaking duty
24 p0701 A79-51992
Environmental assessment of a coal-fired open-cycle MHD power plant
24 p0701 A79-51993
Operability and materials testing for MHD air heaters
24 p0701 A79-51994
Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995
Inhomogeneity of the transverse current in an MHD channel and its effect on the local characteristics of an MHD generator
24 p0706 A79-52369
Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371
Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump
24 p0706 A79-52372
Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field
24 p0708 A79-52955
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
24 p0708 A79-52957
Power output of an MHD generator - Effect of ionization instability and boundary layer
24 p0708 A79-52958
MHD emissions and their controls
24 p0709 A79-52968
Optimisation of powerful energy supply systems for application in space
[IAF PAPER 79-169] 24 p0710 A79-53333
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564
High energy MHD fuels development program
[AD-A060156] 21 p0216 N79-14239
Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414
MHD generator duct flow with cross stream dependent fluid properties
22 p0336 N79-16668
Evaluation of the ECAS open cycle MHD power plant design
[NASA-TM-79012] 22 p0341 N79-17335
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-79-E-79] 22 p0350 N79-18758
Evaluation of the use of oxygen as oxidant in fossil fuel fired open cycle MHD-steam energy conversion processes
22 p0353 N79-19444
MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500
Parametric study of the performance of a CDIF 1-B coal-fired MHD generator
[ANL-MHD-79-3] 22 p0361 N79-20503
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-9] 22 p0361 N79-20504
Technical support for open-cycle MHD program
[ANL-MHD-78-8] 22 p0361 N79-20507
Critical contributions in MHD power generation
[FE-2215-11] 22 p0362 N79-20511
Axial field limitations in MHD generators
[FE-2341-8] 22 p0362 N79-20512
MHD-ETF program. Volume 1: Executive summary
[FE-2613-6-VOL-1] 22 p0362 N79-20515
MHD-ETF program. Volume 2A, parts 1 and 2: Reference design description
[FE-2613-6-VOL-2A] 22 p0363 N79-20516
MHD power generation: Research, development and engineering
[FE-2524-8] 22 p0363 N79-20517
MHD power generation: Research, development and engineering
[FE-3087-2] 22 p0363 N79-20518
Insulating wall boundary layer in a Faraday MHD generator
[FE-23417] 22 p0365 N79-21310
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557
Development, testing and evaluation of MHD materials and component designs --- electrode and insulator systems for mhd generators
[FE-2248-19] 22 p0369 N79-21558
Engineering test facility conceptual design, part 1
[FE-2614-2-PT-1] 22 p0369 N79-21560
Engineering test facility conceptual design, part 2
[FE-2614-2-PT-2] 22 p0369 N79-21561
High power magnetohydrodynamic system, volume 1
[AD-A064796] 23 p0543 N79-22639
High power magnetohydrodynamic system, volume 2
[AD-A064435] 23 p0544 N79-22640
VKI Short Course on Magnetohydrodynamic Accelerators and Generators
[VKI-LECTURE-SERIES-8] 23 p0545 N79-22891
Instrumentation --- plasma accelerators and magnetohydrodynamic generators; plasma diagnostics
23 p0545 N79-22894
Performance optimization of an MHD generator with physical constraints
[NASA-TM-79172] 23 p0558 N79-24446
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499
Evaluation of available MHD seed-regeneration processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546
Numerical codes for MHD flows
[SAND-78-1954] 24 p0730 N79-29061
Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model
[CONF-780941-6] 24 p0744 N79-30036
Performance characteristics of a slagging gasifier for MHD combustor systems
[NASA-TM-79195] 24 p0749 N79-30720
Hartmann flows in the MHD generator configuration
[AD-A070080] 24 p0793 N79-33036
Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

MAGNETOHYDRODYNAMIC STABILITY

The ion fly-wheel effect on the electro-thermal instability in non-equilibrium MHD Hall disc generators
21 p0046 A79-12270

Review of tokamak theory results
21 p0069 A79-14454

Progress in tokamak experimental research in the Soviet Union
21 p0069 A79-14455

The mirror machine program in the USA --- controlled fusion experiments and research facilities
21 p0070 A79-14461

New results in high-beta stellarator and belt-pinch research
21 p0070 A79-14463

Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma
21 p0071 A79-14467

Review of experimental results. I, II --- MHD instability effects on tokamak confinement with ohmic heating
21 p0077 A79-14778

MHD equilibrium and stability --- in tokamak devices
21 p0078 A79-14779

Magnetic divertors --- in large tokamak plasma confinement experiments
21 p0078 A79-14781

Characteristics of a predemonstration fusion device
21 p0078 A79-14784

Predemonstration fusion devices - Research and development needs
21 p0078 A79-14785

Dynamics and feedback control of ISX tokamak
21 p0107 A79-16559

Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators
21 p0153 A79-18469

Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

Local theory of finite-beta, collisional drift modes --- plasma stability analysis
22 p0253 A79-22244

Non-linear numerical algorithms for studying tearing modes --- in tokamaks
22 p0257 A79-22981

MHD instabilities
22 p0259 A79-23599

Stability criteria for current-driven drift wave eigenmodes --- in tokamaks
22 p0269 A79-24813

Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity --- in tokamaks
22 p0269 A79-24814

Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817

Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852

Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces --- in toroidal plasmas
22 p0270 A79-24855

Theory of anomalous transport due to electrostatic fluctuations --- low frequency plasma instabilities of drift wave type
22 p0270 A79-24858

Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859

Integral invariants and quasi-MHD nonlinear dissipation --- in magnetized toroidal plasmas
22 p0270 A79-24862

MHD stability for a spherator with a purely poloidal magnetic field
22 p0271 A79-24863

On the diffusive instability of some simple steady magnetohydrodynamic flows
22 p0278 A79-26163

Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876

The effect of limiters and current profile on elliptic free-boundary MHD equilibria
22 p0291 A79-27881

Stabilization of drift loss-cone instability /DCI/ by addition of cold ions --- in collisional hydrogen plasma confinement
22 p0291 A79-27882

Theory of dissipative drift instabilities in sheared magnetic fields --- in confined toroidal plasmas
22 p0292 A79-27884

Theory of the striated corona in a theta pinch
22 p0295 A79-28315

MHD stability of Spheromak
22 p0313 A79-31189

Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760

Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762

A scheme for direct conversion of plasma thermal energy into electrical energy
22 p0324 A79-31765

Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766

The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103

Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473

The ELMO Bumpy Torus - An alternative fusion reactor concept
23 p0407 A79-34060

Feedback control of a class of plasma instabilities
23 p0422 A79-34253

Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

Stability properties of an anisotropic guiding center plasma and relation with the Suydam function
23 p0438 A79-36411

Drift wave propagation and convective wave growth in tokamaks
23 p0446 A79-37262

Warm plasma effects on drift cyclotron loss cone mode --- in mirror machines
23 p0478 A79-39568

Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939

Construction of Lur'e type Lyapunov function with effect of magnetic flux decay
24 p0606 A79-44916

Tearing mode instabilities and their suppression by lower hybrid fields --- in tokamaks
24 p0606 A79-45004

Lower hybrid heating experiments in JFT-2 tokamak
24 p0607 A79-45030

Ion heating in the LT-3 tokamak
24 p0639 A79-47399

High-frequency convective loss-cone instability in short mirror machines
24 p0639 A79-47421

Stability of tokamaks with elongated cross section
24 p0639 A79-47422

Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

MAGNETOHYDRODYNAMIC WAVES

Finite beta trapped electron fluid mode
23 p0478 A79-39561

Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

MAGNETOHYDRODYNAMICS

Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564
High pressure MHD coal combustors investigation
[FE-2706-08] 22 p0362 N79-20510
Power industry application of MHD technology
23 p0568 N79-24949
Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28738
Magnetohydrodynamics
24 p0724 N79-28741

MAGNETOSPHERE
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897

MAINTAINABILITY
Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDP-TM-78-3] 23 p0596 N79-27674

MAINTENANCE
The impact of servicing requirements on tokamak fusion reactor design
21 p0075 A79-14793
Is there repair after failure --- reliability of repairable vs. nonrepairable engines
21 p0086 A79-15378
Gas turbine operating and maintenance experience in Saudi Arabia
22 p0298 A79-28989
Major factors in OTEC heat exchanger design
23 p0404 A79-34039

MAN ENVIRONMENT INTERACTIONS
Energy/environment technology areas to be developed
21 p0097 A79-16077
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant --- for weather modification studies
23 p0438 A79-36432
The conversion of SO2 to sulfate particles in coal fired power plant plumes
23 p0535 A79-43391
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538

MAN MACHINE SYSTEMS
Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement
23 p0421 A79-34172

MANAGEMENT INFORMATION SYSTEMS
Power management battery storage systems
[AIAA PAPER 79-0982] 23 p0457 A79-38186
Federal Energy Data System (FEDS) technical documentation
[PB-281815/1] 21 p0189 N79-11542
Geothermal emissions data base: Cerro Prieto geothermal field
[UCID-4033] 21 p0204 N79-13480
Development of an Air Force facilities energy information system
[AD-A059309] 21 p0223 N79-14918
Design development and implementation of data acquisition systems for photovoltaic tests and applications project
[COO-4094-24] 23 p0596 N79-27672
Energy Emergency Management Information System (EEMIS): Program plan
[DOE/EIA-0135] 24 p0791 N79-32723

MANAGEMENT METHODS
Strategies for applied research management
[PB-284741/6] 21 p0214 N79-13913
Thermal power systems small power systems applications project. Decision analysis for evaluating and ranking small solar thermal power system technologies. Volume 1: A brief introduction to multiattribute decision analysis --- explanation of multiattribute decision analysis methods used in evaluating alternatives for small powered systems
[NASA-CR-158425] 22 p0368 N79-21548
Conservation where it counts: Energy management systems
[PB-289837/7] 22 p0372 N79-21628
More use should be made of energy-saving products in federal buildings
[PB-291692/2] 23 p0544 N79-22647
Satellite Power System (SPS) financial management scenarios
[NASA-CR-157438] 23 p0549 N79-23502
A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives --- economic analysis
23 p0567 N79-24813
Assessment of load management on the electric power system --- conferences
[CONF-781102-3] 23 p0590 N79-27412
Alternative, semi-automated method for performing multiobjective analyses
[BNL-50892] 23 p0599 N79-27921
Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824
Implementation of state solar incentives: State testing and certification
[SERI/TR-51-162] 24 p0774 N79-31808
Managerial plan: Executive order 12003 and the National Energy Act, proposed, synopsis
[DOE/TIC-10062] 24 p0776 N79-31826
Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075
Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074

MANAGEMENT PLANNING
Development of industrial owned, small hydroelectric facilities
21 p0073 A79-14699
A planning and information system for strategic energy policy assessment --- Book
22 p0259 A79-23600
Environmental considerations in R&D planning and evaluation of energy storage systems
24 p0666 A79-50893
Environmental development Plan (EDP). Oil supply, FY 1977
[DOE/EDP-0024] 21 p0175 N79-10545
Solid waste and biomass. Their potential as energy sources in Illinois, 1977
[PB-281649/4] 21 p0177 N79-10562
US Navy energy plan and program, 1978
[AD-A056054] 21 p0197 N79-12560
Army energy plan
[AD-A057987] 21 p0197 N79-12562
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part A: Options and strategies. Volume 1: Executive summary
[HCP/M70065-01/1] 21 p0207 N79-13512
Assessment of economic factors affecting the satellite power system. Volume 1: System cost factors
[NASA-CR-161185] 22 p0360 N79-21551
Opportunities for energy conservation in transportation planning and systems management
[PB-291743/3] 23 p0544 N79-22643
National Energy Peak-Leveling Program (NEPLP)
[HCP/W1152-01] 23 p0551 N79-23534
Research at Sandia Laboratories for Solar Thermal Large Power Systems Program
[SAND-78-8051] 23 p0565 N79-24510
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 1: Executive summary, September 1977
[HCP/M70066-01/1-VOL-1] 23 p0574 N79-25522
Federal photovoltaic utilization program. Planning resource document
[HCP/M50081-01] 23 p0599 N79-27706
Report to the President by the Interagency Review Group on Nuclear Waste Management --- as part of the National Energy Plan
[TID-29442] 24 p0729 N79-29021
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354
Systems approach to energy planning
[BNL-25523] 24 p0741 N79-29657

Comprehensive community energy planning. Volume
1: A workbook
[HCP/M0023-01-VOL-1] 24 p0750 N79-30722
Improved energy contingency planning is needed to
manage future energy shortages more effectively
[EMD-78-106] 24 p0750 N79-30729
Buildings energy management program workshop design
[CONS-8630-T1] 24 p0776 N79-31824
Managerial plan: Executive order 12003 and the
National Energy Act, proposed, synopsis
[DOE/TIC-10062] 24 p0776 N79-31826
Requirements for the development, management and
implementation of research in support of the
Department of Energy enhanced oil recovery program
[BETC-2025-1] 24 p0776 N79-31831
Systems framework for energy analysis in
developing countries
[BNL-25933] 24 p0791 N79-32722
A report on the development of a model energy
management program for New York state schools,
phase 2
[PB-295452/7] 24 p0802 N79-33607
MANAGEMENT SYSTEMS
Army facility energy conservation
21 p0028 A79-10233
MANGANESE
Modification of hydriding properties of AB5 type
hexagonal alloys through manganese substitution
23 p0415 A79-34124
MANNED SPACE FLIGHT
Overview of future programs - USA --- manned
orbital space missions
21 p0116 A79-17275
FY 1978 scientific and technical reports,
articles, papers, and presentations ---
bibliography
[NASA-TM-78203] 21 p0214 N79-13915
MANNED SPACECRAFT
Manned remote work station development article
[NASA-CR-151871] 22 p0330 N79-16057
MANOMETERS
Heat transfer between a fluidized bed and an
immersed vertical U-tube --- in pilot plants
24 p0632 A79-46320
MANUALS
Standards of Practice Manual for the solvent
refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595
MANUFACTURING
Manufacture of curved glass mirrors for linear
concentrators
21 p0136 A79-17459
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
Silicon sheet growth development for the large
area sheet task of the low cost solar array
project. Heat exchanger method - ingot casting
fixed abrasive method - multi-wire slicing
[NASA-CR-158038] 21 p0219 N79-14540
Pilot line report: Development of a high
efficiency thin silicon solar cell
[NASA-CR-158028] 21 p0219 N79-14548
Evaluation of the technical feasibility and
effective cost of various wafer thicknesses for
the manufacture of solar cells
[NASA-CR-158095] 22 p0334 N79-16368
A normative price for a manufactured product: The
SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504
A normative price for a manufactured product: The
SAMICS methodology. Volume 2: Analysis
[NASA-CR-158503] 23 p0549 N79-23505
The establishment of a production-ready
manufacturing process utilizing thin silicon
substrates for solar cells
[NASA-CR-158566] 23 p0550 N79-23523
Transparent heat mirrors for passive solar heating
applications
[LBL-7829] 23 p0561 N79-24476
The production of ethanol from agricultural waste:
An economic evaluation
[PB-292552/7] 23 p0577 N79-26233
Replacing oil and natural gas with coal:
Prospects in the manufacturing industries
24 p0718 N79-28351
Cell design and manufacturing changes during the
past decade
24 p0722 N79-28674
Solar collector manufacturing activity
[DOE/EIA-0174] 24 p0728 N79-28787
MAPPING
Use of electrical geophysical techniques to map
and monitor in situ oil shale recovery processes
[SAND-79-0746C] 24 p0769 N79-31744
Telluric sounding and mapping in the vicinity of
the Salton Sea geothermal area, Imperial Valley,
California
[PB-296081/3] 24 p0797 N79-33553
MARINE BIOLOGY
The effects of oil on marine life --- water
pollution effects on ocean biology
23 p0434 A79-35463
Marine biological effects of OCS petroleum
development
[PB-288935/0] 22 p0344 N79-17374
An evaluation of the effects of geothermal energy
development on aquatic biota in the geysers area
of California
[PB-293031/1] 23 p0585 N79-26562
Assessing the impact of nuclear-power plants on
the environment
[NUREG-CR-0552] 24 p0777 N79-31845
MARINE CHEMISTRY
Organic geochemical studies on kerogen precursors
in recently deposited algal mats and oozes
21 p0031 A79-10419
MARINE ENVIRONMENTS
Prefabricated caissons for tidal power development
21 p0152 A79-18113
Determining the reliability of radioisotope
thermoelectric generators /RTGs/ designed for
terrestrial and undersea applications
22 p0261 A79-23622
Oceans '78: The ocean challenge; Proceedings of
the Fourth Annual Combined Conference,
Washington, D.C., September 6-8, 1978
22 p0287 A79-27376
Environmental considerations for siting an ocean
thermal conversion early ocean testing platform
at four proposed areas
22 p0287 A79-27377
Legal and institutional aspects --- of OTEC
commercialization
24 p0621 A79-45808
Lead agency designation and proposed licensing
procedures for ocean thermal energy conversion
facilities
24 p0621 A79-45809
Oil pollution reports, volume 5, number 2 ---
bibliographies
[PB-287071/5] 22 p0336 N79-16437
MARINE METEOROLOGY
Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720
MARINE PROPULSION
Sail power for the world's cargo ships
22 p0305 A79-30374
Conceptual design of an 80,000-shp fossil-fired
closed-cycle helium turbine propulsion system
for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370
DD-963 Class waste heat recovery system experience
[ASME PAPER 79-GT-159] 23 p0378 A79-32421
Proceedings of symposium on water-in-fuel
emulsions in combustion --- marine diesels,
boilers, and gas turbine engines
[AD-A061503] 22 p0338 N79-17019
MARINE RESOURCES
Solar energy conversion in marine biological systems
23 p0402 A79-34021
MARINE TECHNOLOGY
Principles of design and construction for marine
structures for wave/tidal/ocean thermal energy
21 p0152 A79-18114
Selected areas of aerospace technical applications
to civil engineering
23 p0397 A79-33925
Preliminary selection of anchor systems for ocean
thermal energy conversion
23 p0437 A79-35846
MARKET RESEARCH
An overview of solar markets
21 p0092 A79-15884
Factors influencing solar energy commercialization
21 p0093 A79-15897
Market penetration for OTEC
21 p0094 A79-15903

An economist looks at solar energy - The government's role
21 p0099 A79-16132

Factors affecting market initiation of solar total energy
21 p0112 A79-16732

Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741

Use of solar energy for industrial process heat
21 p0143 A79-17524

Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

Commercial prospects for extraterrestrial materials
23 p0395 A79-33748

Regional viability and solar commitment - An early adopter study
23 p0404 A79-34034

Analysis of various OTEC missions --- market potential of applications
23 p0404 A79-34037

An update of OTEC baseline design --- cost estimates and market potential
23 p0404 A79-34038

The commercialization of OTEC - Problems and opportunities
23 p0405 A79-34043

Strategies for alternative energy sources
23 p0421 A79-34173

European solar collector development and testing - A commercial view
23 p0470 A79-38645

Potential for use of solar energy in private households to the year 2000
23 p0473 A79-38667

Commercialisation of solar energy devices in developing countries - Problems and prospects
23 p0477 A79-39105

Market penetration characteristics for energy production and atmospheric carbon dioxide growth
24 p0643 A79-47812

Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies
24 p0714 A79-54278

Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part B: Analysis of market development, volume 2
[HCP/M70066-01/2] 21 p0207 N79-13513

Heat pump technology: A survey of technical developments, market prospects and research needs
[HCP/M2121-01] 21 p0210 N79-13540

Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565

Engine requirements for future general aviation aircraft
22 p0329 N79-15968

Market definition studies for photovoltaic highway applications
[NASA-CR-159477] 22 p0354 N79-19451

Methodology for modeling geothermal district heating for residential markets
[BNL-50905] 22 p0361 N79-20502

Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 3: Appendices, September 1977
[HCP/M70066-01/3-VOL-3] 23 p0574 N79-25523

Review of selected solar market studies and techniques
[SERI/PR-52-076] 23 p0600 N79-28056

Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369

Commercialization focus group interview: Medium and low Btu coal gasification
[DOE/TIC-10029] 24 p0733 N79-29371

Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375

Role of refined product imports in the domestic fuel market
[DOE/EIA-0102/53] 24 p0778 N79-32372

MARKETING

Role of intermediate markets in P/V industry development
23 p0516 A79-41052

The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology
23 p0516 A79-41053

Reducing institutional barriers to solar energy through the use of cooperatively-owned solar energy systems
24 p0707 A79-52573

Coal preparation design for export markets, with particular reference to South African and Canadian coals
22 p0340 N79-17318

Influence of marketing requirements on definition of coal resources
22 p0340 N79-17319

Shale oil: Focus group results
[DOE/TIC-10019] 23 p0593 N79-27644

High-efficiency electric motors: Focus group results
[DOE/TIC-10005] 24 p0719 N79-28441

Oil shale: Report on a focus group discussion
[DOE/TIC-10032] 24 p0735 N79-29576

Enhanced oil recovery: Report on a focus group discussion
[DOE/TIC-10021] 24 p0735 N79-29577

Passive solar energy focus group results
[DOE/TIC-10016] 24 p0774 N79-31807

Solar Repowering Workshop
[SERI/TP-35-57] 24 p0787 N79-32689

MARKING

Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-29366

MARKOV CHAINS

A Markov model of solar energy systems
21 p0138 A79-17476

A Markov model of solar energy space and hot water heating systems
22 p0295 A79-28353

MARKOV PROCESSES

Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272

Application of a simplified Markov model to the study of a solar power plant storage system
23 p0383 A79-32964

MARS SURFACE

Feasibility of rocket propellant production on Mars
21 p0047 A79-12324

MARYLAND

The energy dilemma: A challenge for Maryland. Proceedings Maryland General Assembly/AISLE Conference
[PB-284703/6] 21 p0199 N79-12579

Cooperative extension service: Energy resource notes
24 p0745 N79-30394

MASER OUTPUTS

Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

MASS BALANCE

Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems
24 p0629 A79-46236

MASS DRIVERS (PAYLOAD DELIVERY)

Electromagnetic propulsion alternatives --- in mass drivers
[AIAA PAPER 79-1400] 23 p0426 A79-34840

Electromagnetic launchers
24 p0702 A79-52006

MASS FLOW

The optimization of heat exchanger solidity for coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357

MASS RATIOS

Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

MASS TRANSFER

Rate of desorption in a solar regenerator
21 p0055 A79-13611

Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products --- in fuel cell
21 p0164 A79-19851

Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585

Transient response of a solar regenerator
23 p0526 A79-41935

International Heat Transfer Conference, 6th, Toronto, Canada, August 7-11, 1978, General Papers. Volume 2 - Heat transfer in energy conversion, natural convection, combined heat and mass transfer, condensation, and forced convection
23 p0530 A79-42886

Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930

Char gasification. I - Transport model
24 p0667 A79-50913

Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792

Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620

Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies --- mass and energy balance for two phase flow in porous media
[LBL-8802] 24 p0786 N79-32684

MATERIAL ABSORPTION

Wilson parameters for the system H_2, N_2, CO, CO_2, CH_4, H_2S, CH_3OH, and H_2O --- for cold methanol absorption in coal gasification
22 p0282 A79-26462

A gas absorption cycle for electric power generation
23 p0418 A79-34154

MATERIAL BALANCE

Weak points of our prediction models for raw materials strategy --- waste materials and scrap recycling
22 p0265 A79-24040

MATERIALS

Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553

MATERIALS HANDLING

An incremental model for conversion of solar energy in agricultural systems
23 p0479 A79-39840

Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391

Methane production from manure
23 p0494 A79-40741

Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344

Report on capital requirements for transportation of energy materials
[TID-28599] 23 p0545 N79-22965

Liquefied energy gases, part 2 --- safety factors and legal liabilities
[GPO-39-305] 24 p0732 N79-29356

Analysis of the emissions from storage tanks during JP-4 fuel transfer operations. Phase 1: Warm weather conditions
[AD-A069339] 24 p0732 N79-29364

Behavior of gas distribution equipment in hydrogen service --- conferences
[CONF-790512-2] 24 p0747 N79-30408

Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075

Spent fuel handling and packaging program
[RHO-LD-78-4-AUG] 24 p0777 N79-32081

MATERIALS RECOVERY

New processes for the recovery of resource materials from coal combustion wastes
21 p0007 A79-10065

Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115

Energy from urban waste
21 p0096 A79-15917

Toward a materials-conservation ethic
21 p0167 A79-20438

Weak points of our prediction models for raw materials strategy --- waste materials and scrap recycling
22 p0265 A79-24040

Development of specifications for recycled products
22 p0295 A79-28182

Modern technology for recovering energy and materials from urban wastes - Its applicability in developing countries
22 p0295 A79-28183

Utilisation of solid waste
22 p0304 A79-30204

The role of the local authority in waste reclamation
23 p0395 A79-33752

ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148

Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects
23 p0490 A79-40408

Research and development facilities at the Ontario Center for Resource Recovery
23 p0490 A79-40410

An overview of San Diego County's resource recovery plant
23 p0491 A79-40418

A technical and economic evaluation of the Baltimore Landgard demonstration --- municipal solid waste processing plant for energy and materials recovery
23 p0491 A79-40420

Planning for resource recovery in the 'Big Apple' --- New York City plans for refuse utilization
23 p0491 A79-40424

Some environmental impacts of resource recovery systems
24 p0665 A79-50885

Resource recovery and recycling --- Book
24 p0706 A79-52570

A methodology for evaluating the potential materials and energy recovery from municipal solid waste
21 p0215 N79-13935

Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics
[PB-284743/2] 21 p0217 N79-14521

Trace element characterization and removal/recovery from coal and coal wastes
[LA-7048-PR] 21 p0222 N79-14602

Hydrogen technology: An overview --- conferences
[BNL-25760] 24 p0734 N79-29379

Energy recovery and conservation by recycling municipal solid waste
[NZERDC-P7] 24 p0745 N79-30105

Status of the offshore technology program --- conferences
[SAND-78-0665] 24 p0761 N79-30908

Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743

Fossil energy program summary document
[DOE/ET-0087] 24 p0788 N79-32696

Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724

Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0796 N79-33352

MATERIALS SCIENCE

The enigma of the eighties: Environment, economics, energy; Proceedings of the Twenty-fourth National Symposium and Exhibition, San Francisco, Calif., May 8-10, 1979. Books 1 & 2
23 p0533 A79-43228

Thin film solar collectors for material science experiments in space
[IAF PAPER 79-202] 24 p0710 A79-53353

MATERIALS TESTS

Progress in the testing of materials and design concepts for directly-fired MHD air heater service
21 p0017 A79-10141

Evaluation program for new industrial gas turbine materials
[ASME PAPER 78-GT-145] 21 p0031 A79-10269

Designing and testing Si3N4 turbine components at Mercedes-Benz
21 p0050 A79-12830

Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428

Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

Seminar on Testing Solar Energy Materials and Systems, Gaithersburg, Md., May 22-24, 1978, Proceedings
23 p0427 A79-35038

Exposure test results for reflective materials --- used in solar concentrators
23 p0430 A79-35068

Parameters, measurement and criteria of solar materials testing
23 p0431 A79-35072

Solar energy systems - Survey of materials performance
23 p0431 A79-35073

Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806

Operability and materials testing for MHD air heaters
24 p0701 A79-51994

Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

Evaluated physical properties data for materials used in energy storage systems
[UCRL-81159] 21 p0189 N79-11536

Materials technology for coal-conversion processes
[ANL-79-2] 24 p0719 N79-28362

MATHEMATICAL MODELS

Preliminary controller evaluation for the METC/CTIU using a mathematical process model --- of Component Test and Integration Unit in fluidized bed combustion
21 p0008 A79-10073

Transient energy removal in cylindrical parabolic collector systems
21 p0020 A79-10168

Analysis of electrolyte shunt currents in fuel cell powerplants
21 p0039 A79-11816

A numerical solar radiation model based on standard meteorological observations --- for energy system application
21 p0041 A79-11871

Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899

A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766

Modelling energy storage systems for electric utility applications Preliminary considerations
21 p0081 A79-14960

Control of wind turbine generators connected to power systems
21 p0086 A79-15574

Temperature dependent parameter analysis of thermoelectric devices
21 p0113 A79-16740

Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741

Determining the terrestrial, incident solar flux on an arbitrarily oriented surface using available solar/weather data
21 p0119 A79-17310

Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317

A parametric investigation on flat-plate solar collectors
21 p0128 A79-17391

The analysis by stochastic modelling of solar systems for space and water heating
21 p0137 A79-17466

Stochastic simulation experiments on solar air conditioning systems
21 p0138 A79-17474

A Markov model of solar energy systems
21 p0138 A79-17476

Modeling energy and power requirements of electric vehicles
21 p0153 A79-18465

The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470

Energy related mathematical models - Annotated bibliography
21 p0154 A79-18472

Fundamentals of mathematical modeling of solar-radiation regime energy structure
21 p0166 A79-20352

Mathematical model of interelectrode breakdown in MHD generator
21 p0167 A79-20418

Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

Prediction of the behavior of a solar storage system by means of recurrent stochastic models --- of insolation
22 p0258 A79-23295

Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776

A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis
22 p0263 A79-23777

A liquid solar energy storage tank model. I - Formulation of a mathematical model
22 p0267 A79-24314

The interaction of the wind field with a horizontal axis wind turbine
22 p0278 A79-26177

A two dimensional vortex sheet model of a Savonius Rotor
22 p0278 A79-26178

Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189

Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190

Direct solar transmittance for a clear sky --- for insolation of solar conversion systems
22 p0296 A79-28361

Study of integrated gasification combined cycle plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530

Fiat Research Center hybrid vehicle prototype
[SAE PAPER 790014] 22 p0313 A79-31351

Mathematical modelling of passive solar systems
22 p0321 A79-31441

Measured and modeled passive performance in Montana --- for solar heating and thermal storage
22 p0322 A79-31445

A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine
22 p0323 A79-31554

A hybrid cyclogiro-Darrieus-rotor wind turbine
23 p0387 A79-33243

Mechanistic modeling of pulverized coal combustion --- in MHD generators
23 p0390 A79-33380

A two-dimensional pulverized coal combustor model --- for MHD generators
23 p0390 A79-33383

Further modeling of a solar collector based on linear clipped-V channels
23 p0399 A79-33993

System studies for a tokamak fusion power plant
23 p0407 A79-34061

Technical-economic modeling in energy planning
23 p0419 A79-34164

Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056

The aerodynamic design and testing of a vertical axis windmill
23 p0452 A79-37895

Analytical and experimental evaluation of Cycloturbine aerodynamic performance --- vertical-axis windmill [AIAA PAPER 79-0968] 23 p0456 A79-38176

Which is the true solar house 23 p0463 A79-38578

Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes --- Book 23 p0474 A79-38871

Offshore wind power model estimates 23 p0482 A79-40110

Wake interaction in an array of windmills - Theory and preliminary results 23 p0483 A79-40112

A numerical study of the effects of complex terrain on dynamics of airflow and pollutant dispersion 23 p0535 A79-43383

Orientation studies for single-axis concentrating collectors 23 p0537 A79-43677

Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate 24 p0602 A79-44263

Three dimensional mathematical model of flow stratification in thermocline storage tanks 24 p0609 A79-45214

Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements 24 p0612 A79-45532

The conceptual basis of the electric utility sub-model of Project Independence Evaluation System 24 p0616 A79-45764

Steady-state and dynamic performance of an OTEC plant 24 p0624 A79-45838

Modeling the intermediate field of ocean thermal energy conversion discharges 24 p0626 A79-45858

Numerical modeling of the thermal boundary layer near a synthetic crude oil plant 24 p0628 A79-46065

Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants 24 p0629 A79-46228

Wind energy conversion system transient performance analysis 24 p0635 A79-46545

Realistic Vlasov slab equilibria with magnetic shear 24 p0639 A79-47419

High-frequency convective loss-cone instability in short mirror machines 24 p0639 A79-47421

An analysis of the terminal concentrator concept for solar central receiver systems 24 p0641 A79-47792

Toward optimal control of solar energy systems 24 p0643 A79-47944

Wind and solar energies in the tornado type wind energy system 24 p0645 A79-48068

A parameter sensitivity analysis of the rectified superconducting alternator model 24 p0646 A79-48654

A comparison of some simple models used to predict solar irradiance on a horizontal surface 24 p0661 A79-50546

Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system 24 p0670 A79-51729

A numerical model of underground coal gasification for air-water injection into a permeable bed 24 p0689 A79-51867

Feasibility and economics of salinity power using Osmo-Hydro Power 24 p0701 A79-51997

Performance characteristics of a type of electrohydrodynamic generator 24 p0702 A79-51999

Entrainment coal gasification modeling 24 p0704 A79-52028

Power output of an MHD generator - Effect of ionization instability and boundary layer 24 p0708 A79-52958

Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels 21 p0179 N79-11150

Computer modeling of automotive engine combustion [UCRL-80451] 21 p0181 N79-11412

Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility [COO-2857-1] 21 p0184 N79-11490

Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part A: Options and strategies. Volume 1: Executive summary [HCP/M70065-01/1] 21 p0207 N79-13512

Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part B: Analysis of market development, volume 2 [HCP/M70066-01/2] 21 p0207 N79-13513

Development of a model and computer code to describe solar grade silicon production processes --- phase changes in chemical reactors [NASA-CR-158037] 21 p0219 N79-14555

Parameter estimation and validation of a solar assisted heat pump model 22 p0332 N79-16349

Water/energy management and evaluation model for Pennsylvania [PB-287577/1] 22 p0343 N79-17353

Electrolysis of zinc. Statistical model of the process parameters for an industrial cell [BLL-RTS-11317] 22 p0345 N79-17984

Two-dimensional analysis of vertical axis windmills 22 p0353 N79-19446

Analytical modelling of oil recovery by steam injection 22 p0358 N79-20434

Simulation of fluidized bed coal combustors [NASA-CR-159529] 22 p0359 N79-20487

Methodology for modeling geothermal district heating for residential markets [BNL-50905] 22 p0361 N79-20502

Insulating wall boundary layer in a Faraday MHD generator [FE-23417] 22 p0365 N79-21310

Numerical simulation of the compaction-subsidence phenomena in a reservoir for two-phase nonisothermal flow 23 p0540 N79-22401

Analysis of coke combustion during in-situ oil recovery 23 p0553 N79-24095

Development of a model and computer code to describe solar grade silicon production processes [NASA-CR-158679] 23 p0558 N79-24448

Method for the comparative economic assessment of energy storage systems [BNL-25291] 23 p0565 N79-24509

Inventory of data bases, graphics packages, and models in Department of Energy laboratories [ORNL/EIS-144] 23 p0587 N79-27018

Air monitoring network design for power plant siting 23 p0591 N79-27590

Comprehensive areal model of residential heating demands [PNL-24998] 23 p0597 N79-27692

Deterministic insolation model program description and user's guide --- for approximate analysis of solar systems [SAND-78-7044] 24 p0744 N79-29743

Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model [CONF-780941-6] 24 p0744 N79-30036

National coal model: Coal supply curves [DOE/EIA-0103/2] 24 p0746 N79-30400

Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California [LBL-8784] 24 p0755 N79-30792

International energy evaluation system. Volume 2: Technical documentation, September 1, 1978 [HCP/L8602-01/2] 24 p0755 N79-30796

Modeling of stationary air pollution sources in the central and western Kern County oil Fields. Task Report. Volume 2: Appendices [PB-294813/1] 24 p0761 N79-30856

Addition of devolatilization equations to synthane computerized mathematical model [COO-0277-1] 24 p0766 N79-31418
Mathematical model of forward combustion retorting of oil shale [LETC/TPR-78/1] 24 p0779 N79-32375
Reexamination of the estimation of undiscovered oil resources in the US [DOE/EIA-0103/31] 24 p0781 N79-32618
Modeling of thin, back-wall silicon solar cells 24 p0784 N79-32650
Computer modeling of a two-junction, monolithic cascade solar cell 24 p0785 N79-32672
Meteorological data for solar energy applications 24 p0792 N79-32733

MATHEMATICAL PROGRAMMING
Dimensioning of energy-production systems - The use of geometric programming --- solar cell array application 23 p0388 A79-33254

MATRIX METHODS
Frequency analysis of a thick-rim flywheel [ORNL/TM-5804] 24 p0781 N79-32555

MAXIMA
Maximum power trackers for photovoltaic arrays 23 p0516 A79-41049

MAXIMUM LIKELIHOOD ESTIMATES
Reexamination of the estimation of undiscovered oil resources in the US [DOE/EIA-0103/31] 24 p0781 N79-32618

MEASURING INSTRUMENTS
Instrumentation development for in situ coal gasification 21 p0006 A79-10053
Technique and instrumentation for measuring the performance of integrated solar heating/cooling systems 21 p0087 A79-15830
Sensor selection and placement in the National Solar Data Program 21 p0089 A79-15844
Plasma diagnostics in an MHD installation 21 p0106 A79-16492
International Instrumentation Symposium, 24th, Albuquerque, N. Mex., May 1-5, 1978, Proceedings. Parts 1 & 2 21 p0144 A79-17576
Instrumenting hybrid passive/active solar systems --- for building heating 24 p0610 A79-45223
Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner [SAND-78-0700] 21 p0185 N79-11496
Solar energy Measuring stations in Austria: Results and experiences [ASSA-SE-INFO-6/78] 23 p0574 N79-25527

MECHANICAL DEVICES
The effect of mechanical energy storage systems on the characteristics of electric vehicles 24 p0683 A79-51820

MECHANICAL DRIVES
Mechanical efficiency of the Stirling cycle machine with rhombic drive 21 p0025 A79-10208
Torque ripple in a vertical axis wind turbine 21 p0029 A79-10239
A small horizontal axis wind turbine feeding power into the utility grid 21 p0074 A79-14703
The Power Wheel - Elimination of energy-consuming drive components 21 p0112 A79-16734
Flywheel energy accumulators for road vehicles 22 p0241 A79-20845
Production of mechanical energy by thermodynamic conversion of solar energy 22 p0310 A79-30999
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors [ASME PAPER 79-GT-81] 23 p0376 A79-32360
Hydrogen-electric power drives 23 p0386 A79-33231
Gears for wind power plants 23 p0484 A79-40119
Cuttyhunk Island installation, WTG Energy Systems, Inc., MP1-200 control system design --- Wind Turbine Generator 24 p0634 A79-46539
A variable angle wobble plate drive for a stroke controlled Stirling engine 24 p0690 A79-51890
Performance characteristics of automotive engines in the United States. First Series: Report No. 14 1975 Mazda Rotary 79 CID (1.1 Liters), 4V --- fuel consumption and emissions [PB-286074/0] 21 p0226 N79-15304
The rotary combustion engine: A candidate for general aviation --- conferences [NASA-CP-2067] 22 p0329 N79-15961
Development status of rotary engine at Toyo Kogyo --- for general aviation aircraft 22 p0329 N79-15964
Update of development on the new Audi NSU rotary engine generation --- for application to aircraft engines 22 p0329 N79-15965
Review of the Rhein-Flugzeugbau Wankel powered aircraft program --- ducted fan engines 22 p0329 N79-15966
Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential --- with direct chamber injection 22 p0329 N79-15967
Engine requirements for future general aviation aircraft 22 p0329 N79-15968
Power train analysis for the DOE/NASA 100-kW wind turbine generator [NASA-TM-78997] 22 p0333 N79-16355
Characterization study of an electric motor-transmission system for electric vehicles [HCP/M2835-01] 22 p0351 N79-18817
Evaluation of automobile drivetrain components to improve fuel economy [PB-293728/2] 24 p0720 N79-28594

MECHANICAL ENGINEERING
Design of a mechanical energy storage unit --- flywheel 23 p0387 A79-33246
Development and thermodynamic layout of a fuel cell component 23 p0528 A79-42227
The Otto-engine-equivalent vehicle concept [NASA-CR-157840] 21 p0203 N79-13370
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development [NASA-TP-1359] 21 p0223 N79-14679

MECHANICAL PROPERTIES
An operating 200 kW horizontal axis wind turbine 22 p0240 A79-20829
Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors --- Kevlar/epoxy and glass/epoxy composites [UCRL-80116-PT-A] 21 p0215 N79-14165
Development and evaluation of elastomeric materials for geothermal applications [NASA-CR-158813] 24 p0717 N79-28314

MECHANIZATION
Study of flywheel energy storage. Volume 3: System mechanization [PB-282654/3] 21 p0177 N79-10557

MEDICAL ELECTRONICS
Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications 22 p0263 A79-23776

MELTING
Study of the dynamics of the materials melting process for a solar furnace 21 p0167 A79-20359
Potential applications of solar furnaces in materials industry 23 p0471 A79-38654

MELTING POINTS
Possibilities of new materials for solar photovoltaic cells
24 p0655 A79-50178

MELTS (CRYSTAL GROWTH)
Silicon web process development --- for solar cell fabrication
[NASA-CR-162181] 24 p0770 N79-31762

MEMBRANES
Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997
Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513

MERCURY (METAL)
Mercury in some New Zealand geothermal discharges
22 p0257 A79-22925
Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste
[PB-285196/2] 21 p0213 N79-13590
An assessment of mercury emissions from fossil fueled power plants
[PB-285227/5] 21 p0213 N79-13592

MERCURY ION ENGINES
Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257] 24 p0795 N79-33253

MERCURY SPACECRAFT
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738

MESOMETEOROLOGY
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

METABOLISM
Photobiological production of hydrogen: A solar energy conversion option --- hydrogen metabolism in photosynthetic bacteria and algae
[SERI/TR-33-122] 24 p0767 N79-31422

METAL AIR BATTERIES
Mechanically rechargeable, metal-air batteries for automotive propulsion
[CONF-780801-8] 21 p0011 A79-10093
Iron-air batteries for electric vehicles
21 p0011 A79-10094
A comparison of metal-air batteries for electric vehicle propulsion
24 p0683 A79-51827
Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538

METAL COATINGS
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates --- in fuel cell electrodes
21 p0038 A79-11808
Selective solar absorbers --- coatings for solar collector applications
21 p0057 A79-13646
Selective coatings for aluminum and steel solar absorbers
21 p0058 A79-13647
Solaronyx - Selective coating for solar energy absorbers
21 p0058 A79-13648
Selective coatings for solar energy conversion
21 p0126 A79-17376
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379
Casing materials for sodium/sulfur cells
22 p0245 A79-21481
Selective absorption of solar energy in ultrafine metal particles - Model calculations
22 p0273 A79-25746
Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407
Metallurgical coatings 1978; Proceedings of the Fifth International Conference, San Francisco, Calif., April 3-7, 1978. Volumes 1 & 2
22 p0327 A79-31951
Ultrafine nickel particles for photothermal conversion of solar energy
24 p0638 A79-47062
The role of corrosion in modern gas turbines
24 p0647 A79-48912
The surface microstructure optical properties relationship in solar absorbers - Black chrome
24 p0655 A79-50181
Microstructure of a black chrome solar selective absorber
24 p0655 A79-50182
Spectrally selective solar absorber coatings
24 p0704 A79-52150
Coatings for enhanced photothermal energy collection. I - Selective absorbers
24 p0704 A79-52307
CVD molybdenum thin films in photothermal solar converters
24 p0704 A79-52309
Electromagnetic radiation energy arrangement --- coatings for solar energy absorption and infrared reflection
[NASA-CASE-WOO-00428-1] 22 p0352 N79-19186
Oven curing: Energy conservation and emission control in coil coating
[TID-28705] 24 p0750 N79-30723
Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780

METAL COMPOUNDS
Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes
21 p0040 A79-11832
High energy metal hydride fuel cell power source
[AD-A056491] 21 p0184 N79-11485

METAL FIBERS
Development of cryogenic targets for laser fusion
21 p0085 A79-15333
Investigation of the maximal heat-transmitting power of heat pipes with metal-fiber wicks
23 p0447 A79-37661

METAL FILMS
The dependence of optical properties on the structural composition of solar absorbers - Gold black
22 p0242 A79-21162
Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors
22 p0256 A79-22855
Microstructure dependence of the optical properties of solar-absorbing black chrome
22 p0256 A79-22858
Study of the spectral characteristics of metallized polymer films for production of solar concentrators
22 p0297 A79-28672
Selective-black absorbers using sputtered cermet films
22 p0327 A79-31969

METAL FOILS
Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191
Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

METAL HALIDES
Coal gasification studies. II - Reduction in the presence of I2 with H2, and H2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors
22 p0283 A79-26468
Coal gasification studies. III - Reduction in the presence of some metal iodides and iron halides
22 p0299 A79-29318

METAL HYDRIDES
Model predictions for the stability of ternary metallic hydrides
21 p0038 A79-11802
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
New alloy systems for hydrogen storage
21 p0038 A79-11806

Metal hydride solar heat pump and power system /HYCSOS/ [AIAA PAPER 78-1762] 21 p0061 A79-13863
Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977 22 p0247 A79-21676
Structure and bonding in metal hydrides 22 p0247 A79-21679
Thermodynamics of metal, alloy and intermetallic/hydrogen systems 22 p0248 A79-21680
Structural studies of hydrides by neutron diffraction 22 p0248 A79-21681
Localization and diffusion of hydrogen in lanthanum-nickel compounds 22 p0248 A79-21682
Nuclear magnetic resonance studies of metal hydrides 22 p0248 A79-21683
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/ 22 p0248 A79-21684
Electronic structure and physical properties of Ti-H and Zr-H using NMR 22 p0248 A79-21685
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements 22 p0248 A79-21686
The storage and release of hydrogen from magnesium alloy hydrides for vehicular applications 22 p0249 A79-21688
Calculated heats of formation of metal and metal alloy hydrides 22 p0249 A79-21690
Acoustic emissions during hydride formation 22 p0249 A79-21691
Magnetic and electrical properties of rare earth and rare earth intermetallic hydrides 22 p0249 A79-21692
Hydrogen absorption in rare earth intermetallic compounds 22 p0249 A79-21693
Some applications of LaNi5-type hydrides --- using reversible reaction with hydrogen working fluid for heat storage 22 p0249 A79-21694
Metal hydride electrodes for electrochemical energy storage 22 p0249 A79-21695
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies 22 p0250 A79-21697
The plateau pressure of RE Ni5 and RE Co5 hydrides --- in hydride formation 22 p0250 A79-21698
Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory 22 p0250 A79-21699
The use of FeTi-hydride for production and storage of suprapure hydrogen 22 p0250 A79-21700
Hydride formation of C14-type Ti alloy 22 p0250 A79-21701
Hydrogen sorption properties in binary and pseudobinary intermetallic compounds 22 p0250 A79-21702
The metallurgy and production of rechargeable hydrides --- for hydrogen storage 22 p0250 A79-21703
A new rationale for the hysteresis effects observed in metal-hydrogen systems 22 p0250 A79-21704
Heat transfer characteristics of porous metallic matrix metal-hydrides 22 p0251 A79-21706
The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo 22 p0251 A79-21707
Electrochemical utilization of metal hydrides 22 p0251 A79-21709
Hydrogen electrochemical storage by substituted LaNi5 compounds 22 p0251 A79-21711
Applications of metal hydrides --- emphasizing use as energy storage media 22 p0251 A79-21715
The hydrogen/hydride energy concept 22 p0252 A79-21717
The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study 22 p0285 A79-26947
Hydrogen storage in the form of metal hydrides 23 p0388 A79-33251
State-of-the-art summary of the technical problems involved in the storage of hydrogen via metal hydrides 23 p0414 A79-34120
A novel thermal engine using metal hydride 23 p0479 A79-39844
The HYCSOS solar energy driven heat pump 24 p0610 A79-45222
Hydrogen storage technology for metal hydrides 24 p0615 A79-45599
Design study and cost-effectiveness of the metal hydride solar heat pump and power system /HYCSOS/ 24 p0672 A79-51745
Hydride engines 24 p0685 A79-51841
Hydrogen storage devices for automobiles [BNL-25263] 23 p0583 N79-26518
Metal hydride solar heat pump and power system (HYCSOS) [CONF-781133-5] 23 p0596 N79-27675
Metal hydride technology --- hydrogen bonding with intermetallics [BNL-26047] 24 p0780 N79-32387

METAL MATRIX COMPOSITES
Heat pulses required to quench a potted superconducting magnet 22 p0236 A79-20538

METAL OXIDE SEMICONDUCTORS
Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells 21 p0042 A79-11955
On the role of interface states in MOS solar cells 21 p0122 A79-17337
On the role of interface states in MOS solar cells 21 p0156 A79-19092
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment 23 p0440 A79-36680
Recent investigations of metal oxide/CdTe heterojunction solar cells 23 p0502 A79-40926
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide 23 p0505 A79-40967
Photovoltaic properties of In2O3/semiconductor heterojunction solar cells 23 p0505 A79-40968
Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide 23 p0505 A79-40969
Experimental and theoretical study of silicon MOS solar cells with different barrier metals 23 p0507 A79-40985
Large area thin film gallium arsenide solar cells 23 p0515 A79-41042

METAL OXIDES
Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures --- for fuel cells 21 p0039 A79-11812
A method for measuring the photothermal conversion efficiency of solar energy 24 p0642 A79-47806
Tritium permeation through steam generator materials 24 p0695 A79-51952
A study of oxide-based heterostructure photoelectrodes --- for solar cells 24 p0705 A79-52314
Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium [P/539/77/20] 23 p0588 N79-27284
Fuel cells: Applied research fuel cell materials and electrocatalysis [BNL-50951] 24 p0750 N79-30728

METAL PARTICLES
  Selective absorption of solar energy by ultrafine metal particles 21 p0127 A79-17382
  Selective absorption of solar energy in ultrafine metal particles - Model calculations 22 p0273 A79-25746
  Thin film solar absorber consisting of Au-particles in SiO2 23 p0465 A79-38599
  Ultrafine nickel particles for photothermal conversion of solar energy 24 p0638 A79-47062

METAL PLATES
  A study for optimum use of metallic plates for thermal storage in solar processes 21 p0122 A79-17331
  A wave power machine using free floating vertical plates 21 p0151 A79-18104

METAL POWDER
  Heat transfer characteristics of porous metallic matrix metal-hydrides 22 p0251 A79-21706
  Application of extruded porous materials from sintered nickel powder as fuel cell electrodes 24 p0637 A79-46896

METAL SHEETS
  Optimum collection geometries for copper tube - copper sheet flat plate collectors 21 p0127 A79-17387

METAL SURFACES
  High reliability contacts for miniature thermoelectric converters 21 p0027 A79-10228
  Chloride corrosion and its inhibition in refuse firing 21 p0080 A79-14930
  Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems 21 p0080 A79-14931
  Corrosion of superalloys, inconels, and stainless steels by the products from fluidized-bed coal combustion 21 p0080 A79-14932
  Status report on selective surfaces --- solar collector absorbers 21 p0126 A79-17374
  Investigation and perspectives on iron oxide, zinc conversion coating, zinc oxide, cobalt oxide and tungsten oxide as spectral selective solar absorber surfaces 21 p0126 A79-17375
  The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments --- for flat plate solar collectors 21 p0127 A79-17384
  Mechanism of erosion of metal electrodes of the channel of a MHD generator 22 p0306 A79-30391
  Laser-induced desorption experiments with technical metal surfaces --- carbon monoxide and hydrogen interaction with Ni 23 p0445 A79-36969
  NASCAP modelling of high-voltage power system interactions with space charged-particle environments --- particle impact on solar satellite surfaces 23 p0479 A79-39806
  Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation 24 p0622 A79-45826
  Oxygen, temperature and pH effects on corrosion of aluminum in seawater --- for OTEC heat exchanger tubes 24 p0623 A79-45827
  Thermal emissivity of selective surfaces - New lower limits 24 p0648 A79-49207
  Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector 24 p0704 A79-52167

METAL VAPORS
  Absorption of solar radiation by alkali vapors --- for efficient high temperature energy converters 21 p0108 A79-16612
  Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems 24 p0640 A79-47573

METAL-GAS SYSTEMS
  Hydrogen storage by LaNi5 - Fundamentals and applications 21 p0038 A79-11803
  Thermodynamics of pressure plateaus in metal-hydrogen systems 22 p0238 A79-20772
  Hydrogen storage electrode systems 22 p0251 A79-21710
  Applications of metal hydrides --- emphasizing use as energy storage media 22 p0251 A79-21715
  The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study 22 p0285 A79-26947
  Hydrogen storage in the form of metal hydrides 23 p0388 A79-33251

METALLIZING
  The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells 23 p0506 A79-40979
  Development of economical improved thick film solar cell contact [NASA-CR-158358] 22 p0359 N79-20486
  Metallization of large silicon wafers [NASA-CR-158575] 23 p0550 N79-23517

METALLOGRAPHY
  The metallurgy and production of rechargeable hydrides --- for hydrogen storage 22 p0250 A79-21703
  Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977 24 p0603 A79-44526

METALLURGY
  Metallurgical coatings 1978; Proceedings of the Fifth International Conference, San Francisco, Calif., April 3-7, 1978. Volumes 1 & 2 22 p0327 A79-31951
  Potential applications of solar furnaces in materials industry 23 p0471 A79-38654
  High-temperature alloys in high-technology systems 24 p0647 A79-48911
  Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics [PB-284743/2] 21 p0217 N79-14521

METALS
  Solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 21 p0182 N79-11467
  Energy use patterns for metal recycling [PB-284855/4] 21 p0201 N79-13152
  Demetallization catalyst tests on heavy residual oils [PB-285937/9] 21 p0232 N79-15864
  Measurement techniques for trace metals in coal-plant effluents: A brief review [NASA-RP-1047] 24 p0803 N79-33611

METEOROLOGICAL BALLOONS
  Mobile electrolytic hydrogen generators 24 p0649 A79-49228

METEOROLOGICAL CHARTS
  Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models 21 p0065 A79-14117
  Solar radiation charts --- monthly average insolation 22 p0263 A79-23763
  On the use of synoptic weather map typing to define solar radiation regimes 22 p0272 A79-25392

METEOROLOGICAL PARAMETERS
  A numerical solar radiation model based on standard meteorological observations --- for energy system application 21 p0041 A79-11871
  Power extracted from the wind 21 p0058 A79-13650

Total solar radiation in Mexico using sunshine hours and meteorological data
21 p0150 A79-18026
Stochastic predictions of solar cooling system performance
[ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848
Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272
The role of applied meteorology in the Canadian energy programme
22 p0317 A79-31414
Wind energy assessment
23 p0406 A79-34051
Wind energy utilization by means of aerogenerators
23 p0522 A79-41220
Prospecting for meteorological energy in Hawaii
23 p0536 A79-43615
Use of meteorological data in system evaluation --- of solar energy collection efficiency
24 p0610 A79-45225
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022
Meteorological measurement data for solar energy utilization
[ASSA-PA-5] 23 p0574 N79-25524
Meteorological data for solar energy applications
24 p0792 N79-32733

METEOROLOGICAL SATELLITES
Use of satellites in solar applications --- for insolation mapping and space power stations
21 p0104 A79-16468
Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571

METEOROLOGY
Meteorology for solar energy applications; Proceedings of the Conference, Royal Institution of Great Britain, London, England, January 24, 1979
24 p0604 A79-44551

METHANE
Aspects of pulsating combustion --- gaseous methane burning system
21 p0008 A79-10072
Feasibility of rocket propellant production on Mars
21 p0047 A79-12324
Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713
Simple methane digestors
23 p0386 A79-33234
Methane production from manure
23 p0494 A79-40741
Potential for biomass utilization in Canada
23 p0494 A79-40744
Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371
The future of methane supply
24 p0601 A79-44242
Farm-scale generation of bio-gas
24 p0631 A79-46312
A steam process for coal gasification
24 p0632 A79-46321
Development of coalbed methane as an energy source
24 p0660 A79-50452
Methane generation from human, animal, and agricultural wastes
[PB-276469/4] 21 p0171 N79-10240
Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189
Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286395/0] 21 p0226 N79-15177
Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171
Synthetic fuels: Methane. Citations from the Engineering Index data base
[NTIS/PS-79/0030/1] 22 p0365 N79-21223
Methane drainage study in the Sunnyside coalbed, Utah
[PB-289772/6] 23 p0540 N79-22606
Methane production from beef cattle feedlots
[CONF-7806107-2] 23 p0589 N79-27333
Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665
Proceedings of a Symposium on the Utilization of Methane Generated in Landfills
[CONF-780340] 24 p0747 N79-30410
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
Combined shift-methanation processes
[FE-2240-97] 24 p0766 N79-31410
Fuels from magma: A potential energy source --- producing hydrogen, carbon monoxide, and methane
[SAND-78-0191] 24 p0778 N79-32373
Fixed bed methanation processes
[FE-2240-96] 24 p0779 N79-32382
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0790 N79-32390
Comparison of alternate fuels for aircraft --- liquid hydrogen, liquid methane, and synthetic aviation kerosene
[NASA-TM-80155] 24 p0782 N79-32637

METHODOLOGY
A unified methodology for cost analysis of energy production
23 p0419 A79-34159
A methodology for evaluating the potential materials and energy recovery from municipal solid waste
21 p0215 N79-13935
Methodology for modeling geothermal district heating for residential markets
[PNL-50905] 22 p0361 N79-20502
Comparison of three experimental methods used in determining the thermal performance of flat-plate solar collectors
23 p0557 N79-24436
Comprehensive community energy planning. Volume 1: A workbook
[HCP/M0023-01-VOL-1] 24 p0750 N79-30722
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067

METHYL ALCOHOLS
Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064
Development of a 1 kW fuel cell aggregate with acid electrolyte
21 p0148 A79-17994
Wilson parameters for the system H_2, N_2, CO, CO_2, CH_4, H_2S, CH_3OH, and H_2O --- for cold methanol absorption in coal gasification
22 p0282 A79-26462
On future carburants. II --- alternative fuels from alcohols and hydrogen
22 p0296 A79-28439
Observations on the production of methanol and anhydrous ammonia from wood
23 p0386 A79-33230
Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor
23 p0492 A79-40454
Potential of biomass to substitute for petroleum in Canada
23 p0494 A79-40743
Potential for biomass utilization in Canada
23 p0494 A79-40744
Methanol decomposition bottoming cycle for IC engines
[SAE PAPER 790427] 23 p0495 A79-40774
Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability
24 p0628 A79-45996
The Seattle experience - Conversion of solid waste to fuels or chemicals
24 p0651 A79-49384
Synthetic fuels program --- in California for automotive transportation
24 p0651 A79-49385
Which alcohol fuel for Brasil - Methanol or ethanol
24 p0676 A79-51774
Methanol based heat pumps for storage of solar thermal energy
24 p0681 A79-51805
Increasing gas turbine efficiency through the use of a waste heat methanol reactor
24 p0702 A79-52000

Gasohol for energy production --- Book 24 p0713 A79-53724
Methanol from wood waste: A technical and economic study [FPL-12] 21 p0194 N79-12239
Fluid bed process studies on selective conversion of methanol to high octane gasoline [FE-2490-15] 23 p0555 N79-24190
Methanol from coal 23 p0593 N79-27619
Methane and methanol as alternative energy sources: A comparative profitability study [BMFT-FB-77-04] 24 p0747 N79-30412
Screening of zeolite catalysts for methanol conversion to light hydrocarbons [COO-4691-1] 24 p0780 N79-32386

METHYLENE BLUE
Photochemical energy conversion studies in systems containing methylene blue 24 p0628 A79-45995

MEXICO
Total solar radiation in Mexico using sunshine hours and meteorological data 21 p0150 A79-18026
Geothermal power plants of Mexico and Central America: A technical survey of existing and planned installations [COO-4051-26] 24 p0740 N79-29638

MICHIGAN
Identification of wood energy resources in central Michigan [NASA-CR-158130] 22 p0347 N79-18424

MICROCLIMATOLOGY
Radiation regime of inclined surfaces --- Russian book on solar energy engineering and microclimatology 22 p0282 A79-26353

MICROCOMPUTERS
A digital control system for superconducting magnet 22 p0268 A79-24508
The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications 23 p0402 A79-34020
A distributed microcomputer-based control system for a large scale solar total energy system 24 p0672 A79-51741
A general purpose electroanalytical system based on a microcomputer controlled coulostatic generator 24 p0744 N79-29798

MICROCRACKS
Microcrack technology for geothermal exploration and assessment [PB-290173/4] 22 p0387 N79-21530

MICROMETEOROLOGY
A micrometeorological network for study of transport and diffusion of pollutants in two Apennine Valleys 23 p0586 N79-26638

MICROMINIATURIZATION
Optimization method of isotopic thermoelectric microgenerator geometry 22 p0260 A79-23613
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project [NASA-CR-158732] 23 p0586 N79-26979

MICROORGANISMS
The microbial production of methane from the putrescible fractions of sorted household waste 23 p0396 A79-33753
Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978 --- for OTEC 24 p0620 A79-45803
The effects of biofouling and corrosion on heat transfer measurements --- for OTEC 24 p0623 A79-45829
Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger 24 p0623 A79-45835
Aquatic microcosms for assessment of effluent effects [EPRI-EA-936] 24 p0803 N79-33614

MICROPARTICLES
Selective absorption of solar energy by ultrafine metal particles 21 p0127 A79-17382

MICROPLASMAS
Study of the thermal inertia of an electrode microarc 23 p0530 A79-42869

MICROPROCESSORS
A microprocessor based solar controller 21 p0082 A79-14979
A microprocessor based solar monitoring system 21 p0088 A79-15838
A microprocessor compatible temperature measuring system --- for solar house energy monitoring 21 p0088 A79-15839
A microprocessor monitoring system for a solar energy installation 21 p0088 A79-15840
Low-cost monitoring of solar system performance 21 p0088 A79-15843
A microprocessor-based control system for solar heating and cooling 21 p0107 A79-16565
Microprocessor control of a wind turbine generator 22 p0244 A79-21302
The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications 23 p0402 A79-34020
Suntrack-systems for solar concentrators 23 p0464 A79-38587
Toward optimal control of solar energy systems 24 p0643 A79-47944
Microprocessor control of a wind turbine generator [NASA-TM-79021] 21 p0195 N79-12548
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning [COO-4094-34] 24 p0789 N79-32702

MICROSEISMS
Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization 21 p0076 A79-14744

MICROSTRUCTURE
Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion 21 p0054 A79-13290
The dependence of optical properties on the structural composition of solar absorbers - Gold black 22 p0242 A79-21162
Structure and bonding in metal hydrides 22 p0247 A79-21679
Structural studies of hydrides by neutron diffraction 22 p0248 A79-21681
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies 22 p0250 A79-21697
Microstructure dependence of the optical properties of solar-absorbing black chrome 22 p0256 A79-22858
The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study 22 p0285 A79-26947
Microstructural characterization of a black chrome solar selective absorber 22 p0294 A79-28151
Surface effects and impurity production in tokamak machines 23 p0443 A79-36884
The surface microstructure optical properties relationship in solar absorbers - Black chrome 24 p0655 A79-50181
Microstructure of a black chrome solar selective absorber 24 p0655 A79-50182
Gallium arsenide films and solar cells on graphite substrates 24 p0667 A79-50937
Structure and electrical activity of planar defects in EFG ribbons [NASA-CR-158572] 23 p0551 N79-23806
Corrosion of stainess steel, volume 2. A bibliography with abstracts [NTIS/PS-79/0208/3] 23 p0553 N79-24143

MICROWAVE ANTENNAS

Microwave phased array design considerations for SPS --- Solar Powered Satellites 21 p0003 A79-10031

Large active retrodirective arrays for solar power satellites 21 p0107 A79-16604

Attitude and pointing control system for the microwave antenna of the solar power satellite 21 p0113 A79-16739

Applications of free-space microwave power transmission 24 p0652 A79-49487

MICROWAVE ATTENUATION

Atmospheric attenuation of centimeter microwaves [AIAA PAPER 79-1423] 23 p0427 A79-34849

MICROWAVE COUPLING

Electron cyclotron heating in Bumpy Torus Program 24 p0607 A79-45033

MICROWAVE EQUIPMENT

Engineering of microwave relays --- microwave radio equipment engineering aspects and impact on energy technology 23 p0526 A79-41931

Applications of free-space microwave power transmission 24 p0652 A79-49487

Applicability of solid state microwave technology to solar power satellites 24 p0695 A79-51945

MICROWAVE OSCILLATORS

The advanced thermionic converter with microwave power as an auxiliary ionization source 21 p0153 A79-18470

MICROWAVE PLASMA PROBES

Instrumentation --- plasma accelerators and magnetohydrodynamic generators; plasma diagnostics 23 p0545 N79-22894

MICROWAVE SENSORS

Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness 23 p0395 A79-33690

MICROWAVE TRANSMISSION

A microwave power transmission system for space satellite power 21 p0002 A79-10025

Environmental considerations for the microwave beam from a solar power satellite 21 p0003 A79-10030

A 5-GWe nuclear satellite power system conceptual design 21 p0003 A79-10033

Solar power satellite developments [AAS PAPER 78-022] 21 p0035 A79-11558

Technology and development requirements of the solar power satellite 21 p0046 A79-12267

An aperture-augmented prototype power satellite 21 p0046 A79-12268

SPS microwave subsystem potential impacts and benefits --- environmental and societal effects of Solar Power System construction and operation 21 p0107 A79-16603

A search for space energy alternatives 21 p0108 A79-16608

Design considerations for solar power satellites 21 p0113 A79-16738

A development strategy for the solar power satellite [AAS PAPER 78-154] 22 p0243 A79-21266

Solar power satellites - The laser option 22 p0284 A79-26599

Status of the SPS concept development and evaluation program --- Solar Power Satellite 22 p0326 A79-31919

Solar Power Satellite systems definition 22 p0326 A79-31920

A review of some critical aspects of satellite power systems 22 p0326 A79-31921

Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/ 22 p0326 A79-31922

Solar Power Satellite beam disturbance of the upper ionosphere [AIAA PAPER 79-1422] 23 p0426 A79-34848

The polar lunar base - A viable alternative to L-5 [AAS 78-191] 23 p0427 A79-34862

A profile of power transmission by microwaves 23 p0427 A79-34987

Solar power satellites - Microwaves deliver the power 23 p0460 A79-38374

Energy for the year 2000 - The SPS concept 24 p0645 A79-48026

Applications of free-space microwave power transmission 24 p0652 A79-49487

Legal considerations on the development and use of satellite solar power stations 24 p0664 A79-50860

Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering 24 p0669 A79-51570

The technology base for the microwave power transmission system in the SPS 24 p0694 A79-51943

Microwave system performance for a solar power satellite during startup/shutdown operations 24 p0694 A79-51944

Applicability of solid state microwave technology to solar power satellites 24 p0695 A79-51945

Solar thermal aerostat research station /STARS/ [IAF PAPER 79-35] 24 p0709 A79-53261

Legal aspects of solar power satellites - Focus on microwave exposure standards [IAF PAPER 79-IISL-01] 24 p0711 A79-53452

Future large space systems opportunities: A case for space-to-space power? --- spacecraft power supplies microwave and laser transmission 21 p0169 N79-10095

Achievable flatness in a large microwave power antenna study [NASA-CR-151831] 21 p0171 N79-10272

Satellite Power System (SPS) environmental impacts, preliminary assessment [NASA-CR-157952] 21 p0196 N79-12557

Satellite Power System (SPS) microwave subsystem impacts and benefits [NASA-CR-157951] 21 p0196 N79-12558

Initial assessment: Electromagnetic compatibility aspects of proposed SPS Microwave Power Transmission System (MPTS) operations [PNL-2482] 21 p0202 N79-13252

Microwave power transmitting phased array antenna research project [NASA-CR-157843] 21 p0202 N79-13263

Satellite Power Systems (SPS) concept definition study. Volume 6: SPS technology requirements and verification [NASA-CR-150685] 21 p0225 N79-15140

Microwave systems analysis, solar power satellite --- alignment of the antenna array [NASA-CR-160091] 22 p0337 N79-16892

Solar Power Satellite (SPS) pilot beam and communication link subsystem investigation study, phase 1 --- ionospheric propagation, radio frequency interference, and microwave transmission [NASA-CR-161161] 22 p0345 N79-17896

Space-based solar power conversion and delivery systems study. Volume 3: Microwave power transmission studies [NASA-CR-150296] 23 p0541 N79-22619

Satellite Power Systems (SPS) concept definition study exhibit C. Volume 3: Experimental verification definition [NASA-CR-161214] 23 p0543 N79-22632

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies [NASA-CR-161215] 23 p0543 N79-22633

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation [NASA-CR-161216] 23 p0543 N79-22634

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 1: Executive summary [NASA-TM-80354] 23 p0557 N79-24435

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 2: Detailed assessment [NASA-TM-80355] 23 p0557 N79-24436

Satellite Power System (SPS) resource requirements (critical materials, energy, and land)
[NASA-CR-162310] 24 p0763 N79-31251

MICROWAVES
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243

MILITARY AIR FACILITIES
Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506

MILITARY AIRCRAFT
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900
Very large vehicles - To be or --- aircraft design concepts
22 p0306 A79-30484
Large-vehicle concepts --- aircraft design
22 p0306 A79-30485
Nuclear aircraft innovations and applications
[AIAA PAPER 79-0846] 23 p0526 A79-41913

MILITARY OPERATIONS
Military needs for orbital power
21 p0169 N79-10127
Satellite Power System (SPS) military applications
[NASA-CR-158109] 22 p0337 N79-16895

MILITARY SPACECRAFT
Air Force High Efficiency Solar Panel - GaAs cell development --- or military satellites
23 p0506 A79-40971
The military space power program
24 p0691 A79-51893
Thermal management for future Air Force high power spacecraft
24 p0692 A79-51923
Dynamic Isotope Power Systems /DIPS/ --- for space applications
24 p0692 A79-51928

MILITARY TECHNOLOGY
Militarized thermoelectric power sources
21 p0027 A79-10227
The potential of liquid hydrogen as a military aircraft fuel
22 p0238 A79-20773
Air Force applications of lightweight superconducting machinery --- in airborne power sources
22 p0290 A79-27666
Army energy plan
[AD-A057987] 21 p0197 N79-12562
Satellite Power System (SPS) military applications
[NASA-CR-158109] 22 p0337 N79-16895
Military applications of photovoltaic systems
23 p0571 N79-25494
Lasers: Their applications and operational requirements
23 p0590 N79-27494

MILITARY VEHICLES
High sulfur fuel effects in a two-cycle high speed army diesel engine
[AD-A059534] 21 p0216 N79-14232

MIM (SEMICONDUCTORS)
Merocyanine organic solar cells
21 p0165 A79-20216

MINERAL DEPOSITS
Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599

MINERAL EXPLORATION
Permeability enhancement using explosive techniques --- georesources recovery techniques
21 p0005 A79-10048
Future programs and prospects for resource exploration from space by the year 2000
[AAS PAPER 78-182] 22 p0243 A79-21275
Energy and remote sensing applications
22 p0255 A79-22516
Remote sensing use in hydraulic planification in Mexico
22 p0255 A79-22522
Surtrace - An airborne geochemical system --- for earth surface micro-layer exploration
22 p0255 A79-22557
Hydroelectric power generation and mineral recovery in the Qattara Depression of Egypt
24 p0707 A79-52575
Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics
[PB-284743/2] 21 p0217 N79-14521
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany
[E79-10102] 22 p0339 N79-17291
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526
Management of fuel and nonfuel minerals in federal land: Current status and issues --- and its environmental impact
[PB-295788/4] 24 p0797 N79-33554

MINERAL OILS
H2S associated with mineral oil refineries and natural gas processing plants - Emissions and absorptions
23 p0481 A79-40069

MINERALS
Management of fuel and nonfuel minerals in federal land: Current status and issues --- and its environmental impact
[PB-295788/4] 24 p0797 N79-33554

MINES
The direct use of coal: Prospects and problems of production and combustion
[PB-295797/5] 24 p0734 N79-29381

MINES (EXCAVATIONS)
Instrumentation development for in situ coal gasification
21 p0006 A79-10053
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta
23 p0438 A79-36505
Evaluation of a flywheel-powered shuttle car
[FE-8890] 23 p0562 N79-24488
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0780 N79-32390

MINICOMPUTERS
Moderate cost, calculator-based data acquisition for solar HVAC systems
21 p0088 A79-15837
Design of the data acquisition system at Solar One --- home energy monitoring via minicomputers
21 p0088 A79-15841
A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing
21 p0144 A79-17617
Real time computer control of 5 megawatts of solar thermal energy
21 p0144 A79-17621
Solar energy system testing - Some experiences with minicomputers
23 p0432 A79-35082

MINING
An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871
The AOSTRA role in developing energy from Alberta oil sands
23 p0494 A79-40738
Coal yesterday and tomorrow --- coal utilization forecasting
24 p0652 A79-49516
The status of oil shale development
24 p0665 A79-50887
Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics
[PB-284743/2] 21 p0217 N79-14521
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6] 22 p0339 N79-17309
Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429

Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608

Development of sensitized pick coal interface detector system
[NASA-CR-161225] 23 p0556 N79-24417

A Kentucky energy resource utilization program
[PB-292949/5] 23 p0585 N79-26538

Plan to demonstrate oil shale mining and rubblizing for a modified in situ retorting process
[UCRL-13979] 24 p0721 N79-28655

Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549

MINNESOTA

Biomass utilization in Minnesota
[PB-292531/3] 21 p0171 N79-10241

Minnesota coal study
[PB-292106/2] 23 p0575 N79-25538

MINORITY CARRIERS

Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807

Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells
22 p0313 A79-31347

Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610

The change in the interface-state Fermi level of MIS solar cells when going from dark to illuminated conditions
23 p0456 A79-38101

Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889

Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890

Minority carrier diffusion length from spectral response measurements --- for solar cells
23 p0497 A79-40893

Diffusion length inhomogeneities in silicon solar cells
23 p0497 A79-40894

Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells
24 p0606 A79-44919

Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements
24 p0705 A79-52321

MIRRORS

Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166

Specular mirrors for solar energy application
21 p0034 A79-11147

Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974

Large, lightweight, replicated mirrors
21 p0043 A79-11976

Mechanical deflection analysis of diamond turned reflective optics --- for laser fusion
21 p0083 A79-15143

Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605

Performance of optimal geometry three step compound wedge stationary concentrator --- solar collector using flat side mirrors
21 p0134 A79-17438

A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446

Manufacture of curved glass mirrors for linear concentrators
21 p0136 A79-17459

Optimal geometries for one- and two-faced symmetric side-wall booster mirrors --- for solar collectors
21 p0149 A79-18019

Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system
23 p0399 A79-33994

High-energy laser mirror thermal distortion testing techniques
23 p0447 A79-37670

Critical study of energy parameters of solar energy /illumination and concentration/ - Application to catoptric collectors
23 p0463 A79-38584

Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system
24 p0670 A79-51729

Fixed mirror solar concentrator for power generation
[GA-A-14883] 21 p0187 N79-11526

Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615

Transparent heat mirrors for passive solar heating applications
[LBL-7829] 23 p0561 N79-24476

Performance testing of the General Atomic Fixed mirror solar concentrator
[SAND-78-0624] 23 p0573 N79-25519

Analysis of flat mirror V-trough solar concentrator
23 p0579 N79-26472

Conceptual design study of concentrator enhanced solar arrays for space applications Volume 1: Study overview and summary
[NASA-CR-162328] 24 p0782 N79-32638

MIS (SEMICONDUCTORS)

Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342

Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343

Reliability studies on MIS solar cells
21 p0148 A79-17950

The interfacial layer in MIS amorphous silicon solar cells
22 p0258 A79-23039

The short-wavelength response of MIS solar cells
22 p0273 A79-25748

Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells
22 p0313 A79-31347

Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971

Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778

Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159

655 mV open-circuit voltage, 17.6% efficient silicon MIS solar cells
23 p0447 A79-37686

The change in the interface-state Fermi level of MIS solar cells when going from dark to illuminated conditions
23 p0456 A79-38101

Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels
23 p0507 A79-40986

Formation and stability of MS or MIS Schottky solar cells
23 p0507 A79-40987

Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988

The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989

An MIS photovoltaic cell with silicon nitride insulator
23 p0508 A79-40990

M-I-S solar cells on amorphous silicon
23 p0510 A79-41008

Polysilicon MIS solar cells with low work function metals
23 p0510 A79-41010

Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012

High-temperature lifetesting of Al/SiOx/p-Si contacts for MIS solar cells
23 p0536 A79-43569

Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715

Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0648 A79-49213

Current conduction in Cr-MIS solar cells on single-crystal p-silicon
24 p0648 A79-49215

On the design and operation of electrochemical solar cells
24 p0712 A79-53494

Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0158 N79-12572

Investigation of low cost solar cells based on Cu2O --- MIS solar cell theory
[PB-295888/2] 24 p0792 N79-32737

MISSILE CONTROL

Nickel-zinc battery for aircraft and missile applications
[AD-A059295] 21 p0220 N79-14561

MISSION PLANNING

Roll-out solar arrays - Candidate power sources for future space missions
[IAF PAPER 78-39] 21 p0034 A79-11216

Overview of future programs - USA --- manned orbital space missions
21 p0116 A79-17275

An evolutionary solar power satellite program
[AAS PAPER 78-153] 22 p0243 A79-21265

A development strategy for the solar power satellite
[AAS PAPER 78-154] 22 p0243 A79-21266

Future programs and prospects for resource exploration from space by the year 2000
[AAS PAPER 78-182] 22 p0243 A79-21275

The NASA budget - Fiscal years 1979-80
23 p0535 A79-43448

Symposium on the Future of Space Science and Space Applications
[GPO-23-876] 21 p0224 N79-15105

Statement of Ivan Bekey, Director of Advanced Mission Studies, Aerospace Corporation
21 p0224 N79-15107

Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108

Statement of Doctor Klaus Heiss, President, ECON, Incorporated, Princeton, New Jersey
21 p0224 N79-15110

Statement of Doctor Robert A. Frosch, Administrator, National Aeronautics and Space Administration
21 p0224 N79-15111

OAST Space Theme Workshop. Volume 1: Summary report. 1: Introduction. 2: General observations and some key findings. 3: Follow-on activity. Quick-look comments and working papers
[NASA-TM-80001] 21 p0224 N79-15113

OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action
[NASA-TM-80002] 21 p0225 N79-15114

OAST Space Theme Workshop. Volume 3: Working group summary. 6: Power (P-2). A. Statement. B. Technology needs (form 1). C. Priority assessment (form 2)
[NASA-TM-80013] 21 p0225 N79-15125

Manned remote work station development article
[NASA-CR-151871] 22 p0330 N79-16057

The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans
[NASA-CR-161146] 22 p0345 N79-17890

Authorizing appropriations to the National Aeronautics and Space Administration
[H-REPT-96-52] 22 p0364 N79-20928

Photovoltaic mission analysis
23 p0570 N79-25486

Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385

MISSISSIPPI

Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446

The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report
[PB-294228/2] 24 p0744 N79-29783

MISSOURI

Regional air pollution study: Heat emission inventory
[PB-284081/7] 21 p0200 N79-12602

LPG in Missouri
[PB-286329/8] 21 p0230 N79-15421

Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289

MIST

The mist-transport cycle - Progress in economic and experimental studies --- OTEC power plant
24 p0624 A79-45841

MIXERS

Two-phase LMMHD mixer-development experiments --- Liquid-Metal MHD generator flow characteristics
23 p0394 A79-33422

Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030

MIXTURES

Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures
24 p0632 A79-46318

Stability of coal-oil mixtures --- conferences
[CONF-7805152-1] 23 p0589 N79-27332

Reclamation of synthetic turbine engine oil mixtures
[AD-A071813] 24 p0795 N79-33211

MODAL RESPONSE

Satellite Power System (SPS) centralization/decentralization
[NASA-CR-157434] 23 p0548 N79-23498

MODELS

A review of energy models. Part 4: July 1978
[IIASA-RR-78-11-PT-4] 23 p0594 N79-27652

Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648

Energy supply and demand modeling. A bibliography with abstracts
[NTIS/PS-79/0665] 24 p0802 N79-33605

MODERATION (ENERGY ABSORPTION)

Perspective on the fusion-fission energy concept
21 p0095 A79-15913

MODULAR INTEGRATED UTILITY SYSTEM

A technical analysis for cogeneration systems with potential applications in twelve California industrial plants --- energy saving heat-electricity utility systems
21 p0011 A79-10099

International project catalog of modular integrated utility systems
[PB-283477/8] 21 p0190 N79-11544

Committee on the Challenges of Modern Society Rational use of Energy Pilot Study Modular Integrated Utility Systems Project. Volume 1: Description, activities, and products
[PB-283428/1] 21 p0190 N79-11549

Committee on the challenges of modern society rational use of energy pilot study modular integrated utility system project. Volume 2: Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11558

Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-32] 21 p0220 N79-14564

MODULES

Solar system modeling using a modular approach with generalized programs for working fluid properties
22 p0266 A79-24310

Development of a shingle-type solar cell module
23 p0499 A79-40906

Preliminary designs of 10 MWe and 50 MWe power modules --- for OTEC
24 p0618 A79-45791
Block 4 solar cell module design and test specification for residential applications
[NASA-CR-158117] 22 p0348 N79-18453
Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447
Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454
MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems
24 p0752 N79-30752
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632

MOJAVE DESERT (CA)
A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766

MOLDS
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828

MOLECULAR CHAINS
Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986

MOLECULAR EXCITATION
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-34192

MOLECULAR IONS
Preparation and ionic conductivity of H3O/+/ beta alumina --- for hydrogen-oxygen fuel cells
21 p0040 A79-11821

MOLECULAR SPECTRA
Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation
24 p0669 A79-51178

MOLTEN SALT ELECTROLYTES
Migrational polarization in high-current density molten salt electrochemical devices
21 p0039 A79-11811
Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes
21 p0040 A79-11832
Molten-carbonate CO2 concentrator - Preliminary experiments
[ASME PAPER 78-ENAS-2] 21 p0048 A79-12551
Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479
Steady-state composition profiles in mixed molten salt electrochemical devices. II - Molten carbonate fuel cell analogs
22 p0305 A79-30333
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
Migrational polarization in high current density molten salt battery and fuel cell analogs
23 p0446 A79-37273
Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries
23 p0495 A79-40749
Molten carbonate fuel cell systems development program
24 p0682 A79-51814
Molten carbonate fuel cell based, coal fired power plants for electric power generation
24 p0682 A79-51816
Molten carbonate fuel cell performance model for cycle studies
24 p0682 A79-51817
Effect of temperature and pressure on molten carbonate fuel cell fuels and performance
24 p0682 A79-51818

MOLTEN SALT NUCLEAR REACTORS
Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951

MOLTEN SALTS
Molten carbonate fuel cell systems - Status and potential
21 p0039 A79-11817
Effects of sintering on porous fuel cell electrodes
21 p0039 A79-11818
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819
Alternative central receiver solar power plant using salt as a heat transfer and storage medium
[AIAA PAPER 78-1753] 21 p0060 A79-13855
Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961
Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962
Experimental investigation of a fused salt energy storage system
23 p0400 A79-34003
Study on room heating utilizing eutectic salt mixture
23 p0470 A79-38638
Solar pond concepts - Old and new
24 p0671 A79-51734
Corrosion in molten salts used for solar thermal storage applications
[SAND-79-0246C] 24 p0786 N79-32683

MOLYBDENUM
Chemical vapor deposited molybdenum films for use in photothermal conversion
22 p0294 A79-28148
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254
CVD molybdenum thin films in photothermal solar converters
24 p0704 A79-52309
Treatment of molybdenite ore using a 2 kW solar furnace
[LA-UR-79-6] 23 p0561 N79-24478

MOLYBDENUM COMPOUNDS
Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material
24 p0656 A79-50193

MOMENTUM THEORY
On the motion of runaway electrons in momentum space --- analysis for multi-component plasma in tokamaks
22 p0291 A79-27880

MONITORS
Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826
Considerations in choosing solar energy monitoring systems
21 p0087 A79-15831
Experience gained and lessons learned from monitoring the solar Building, Albuquerque
21 p0088 A79-15833
Instrumentation, data acquisition and monitoring system for an air heating solar system
21 p0088 A79-15836
A microprocessor based solar monitoring system
21 p0088 A79-15838
A microprocessor compatible temperature measuring system --- for solar house energy monitoring
21 p0088 A79-15839
A microprocessor monitoring system for a solar energy installation
21 p0088 A79-15840
Design of the data acquisition system at Solar One --- home energy monitoring via minicomputers
21 p0088 A79-15841
A low cost approach to performance monitoring for the evaluation of a solar domestic hot water system
21 p0088 A79-15842
Low-cost monitoring of solar system performance
21 p0088 A79-15843

An inexpensive multiplexer temperature measuring system for monitoring and evaluation of solar collectors 21 p0089 A79-15847

Theoretical considerations in the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs 23 p0439 A79-36630

Initial experimental tests on the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs 23 p0439 A79-36631

Standards applicable to performance measurement of solar heating and cooling systems --- conferences [COO-4142-2] 24 p0741 N79-29656

MONOMOLECULAR FILMS

Photoelectric conversion in monomolecular layer formations 23 p0464 A79-38589

MONTANA

Water and energy resource development in the Tongue River Basin, southeastern Montana 24 p0735 N79-29566

MONTE CARLO METHOD

Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation 21 p0020 A79-10163

User's guide for MIRVAL: A computer code for comparing designs of heliostat-receiver optics for central receiver solar power plants [SAND-77-8280] 24 p0729 N79-28932

MOSSBAUER EFFECT

Moessbauer spectroscopy of iron in coal and coal hydrogenation products 22 p0282 A79-26464

MOTOR VEHICLES

The storage and release of hydrogen from magnesium alloy hydrides for vehicular applications 22 p0249 A79-21688

The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12 [DOE/EIA-0102/32] 23 p0589 N79-27337

Hydrogen-fueled postal vehicle performance evaluation [NASA-CR-158811] 24 p0730 N79-29106

Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests [PB-295478/2] 24 p0778 N79-32135

Hydrogen use as a fuel. Citations from the NTIS data base [NTIS/PS-79/0779/3] 24 p0796 N79-33347

MULTIENGINE VEHICLES

Comparative automotive engine operation when fueled with ethanol and methanol [HCP/W1737-01] 21 p0201 N79-13189

MULTILAYER INSULATION

Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System 21 p0023 A79-10191

Experiences related to GEOS thermal control 24 p0763 N79-31269

MULTIMISSION MODULAR SPACECRAFT

Application of the Dynamic Isotope Power System to a multimission spacecraft 24 p0692 A79-51929

MULTIPHASE FLOW

Multiphase flow analysis of oil shale retorting [UCRL-81717-REV-1] 24 p0721 N79-28656

Multiphase flow analysis of oil shale retorting [UCRL-81717] 24 p0721 N79-28658

MULTIPLEXING

An inexpensive multiplexer temperature measuring system for monitoring and evaluation of solar collectors 21 p0089 A79-15847

MULTIPOLES

Magnetic multipole line-cusp plasma generator for neutral beam injectors 22 p0238 A79-20746

MULTISPECTRAL BAND SCANNERS

Application of multispectral scanner data to the study of an abandoned surface coal mine [NASA-TM-78912] 21 p0204 N79-13472

MULTISPECTRAL PHOTOGRAPHY

Landsat - Developing techniques and applications in mineral and petroleum exploration 21 p0111 A79-16725

The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta 23 p0438 A79-36505

Solar potential inventory and modeling 24 p0657 A79-50219

MUSCOVITE

Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil [E79-10238] 24 p0747 N79-30599

MUTATIONS

Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards [CONF-780121-2] 21 p0192 N79-11568

Mutagenic components of alternate energy sources [CONF-780636-8] 24 p0761 N79-30923

N

N-P-N JUNCTIONS

Thin tandem junction solar cell 23 p0521 A79-41092

N-TYPE SEMICONDUCTORS

Iron oxide semiconductor electrodes in photoassisted electrolysis of water 21 p0037 A79-11781

n-CdS/n-GaAs photoanode --- electrochemical solar cells 21 p0037 A79-11784

Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy 22 p0259 A79-23604

Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion 22 p0260 A79-23615

Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator 22 p0260 A79-23616

Meteorological effects on Schottky-barrier solar cells 23 p0441 A79-36781

Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage 23 p0495 A79-40747

Study of the interface changes during operation of n CdTe-electrolyte solar cells 24 p0637 A79-47054

NASA PROGRAMS

NASA's thermionic technology program 21 p0026 A79-10217

Technology for aircraft energy efficiency 21 p0066 A79-14136

Large wind turbine generators --- NASA program status and potential costs 21 p0092 A79-15881

Space power for space 21 p0100 A79-16143

A technology program for large area space systems 21 p0100 A79-16145

Overview of future programs - USA --- manned orbital space missions 21 p0116 A79-17275

How to tap NASA developed technology 21 p0164 A79-19896

Engine technology for production turbofan engines 22 p0270 A79-24827

Some perspectives on research into the biological response to non-ionizing electromagnetic radiation --- relation to SETI, SPS, and other government projects 22 p0271 A79-24879

The NASA Aircraft Energy Efficiency program 22 p0325 A79-31912

Solar Power Satellite systems definition 22 p0326 A79-31920

First steps to the Solar Power Satellite 23 p0382 A79-32721

Development of space manufacturing systems concepts utilizing lunar resources [AIAA PAPER 79-1411] 23 p0426 A79-34844

The future United States space program;
Proceedings of the Twenty-fifth Anniversary
Conference, Houston, Tex., October 30-November
2, 1978. Parts 1 & 2

NASA takes stock 23 p0427 A79-34860

Family of solar array design options 23 p0461 A79-38375

The NASA budget - Fiscal years 1979-80 23 p0500 A79-40914

Large horizontal axis wind turbine development 23 p0535 A79-43448

Utility operational experience on the NASA/DOE 24 p0633 A79-46527
Mod-OA 200 kW Wind Turbine

Lewis Research Center studies of multiple large 24 p0634 A79-46537
wind turbine generators on a utility network

Space technology spinoffs --- Book 24 p0635 A79-46547

Control and stabilization of the DOE/NASA Mod-1 24 p0639 A79-47260
two megawatt wind turbine generator

The role of fuel cells in NASA's space power systems 24 p0677 A79-51780

Results from Symposium on Future Orbital Power 24 p0681 A79-51810
Systems Technology Requirements

The NASA Space Power Technology Program 24 p0650 A79-51891

OAST space power technology program 24 p0691 A79-51894

Satellite power systems program 21 p0169 N79-10123

NASA research on general aviation power plants 21 p0169 N79-10128
[NASA-TM-79031]
FY 1978 scientific and technical reports, 21 p0194 N79-12086
articles, papers, and presentations ---
bibliography
[NASA-TM-78203]
National Aeronautics and Space Act of 1958, as 21 p0214 N79-13915
amended, and related legislation
[GPO-34-175]
Symposium on the Future of Space Science and Space 21 p0214 N79-13932
Applications
[GPO-23-876]
Statement of Ivan Bekey, Director of Advanced 21 p0224 N79-15105
Mission Studies, Aerospace Corporation

Statement of Doctor Robert A. Frosch, 21 p0224 N79-15107
Administrator, National Aeronautics and Space
Administration

OAST Space Theme Workshop. Volume 1: Summary 21 p0224 N79-15111
report. 1: Introduction. 2: General
observations and some key findings. 3:
Follow-on activity. Quick-look comments and
working papers
[NASA-TM-80001]
OAST Space Theme Workshop. Volume 3: Working 21 p0224 N79-15113
group summary. 6: Power (P-2). A. Statement.
B. Technology needs (form 1). C. Priority
assessment (form 2)
[NASA-TM-80013]
United States civilian space programs: An overview 21 p0225 N79-15125
[GPO-35-823]
General aviation energy-conservation research 21 p0232 N79-15815
programs

LSA Low-cost Solar Array project 22 p0329 N79-15963
[NASA-CR-158250]
Tests of NASA ceramic thermal barrier coating for 22 p0355 N79-19462
gas-turbine engines
[NASA-TM-79116]
Authorizing appropriations to the National 22 p0357 N79-20118
Aeronautics and Space Administration
[H-REPT-96-52]
NASA's OAST program: An overview 22 p0364 N79-20928

Effort of the Jet Propulsion Laboratory 22 p0370 N79-21574

Lewis Research Center program 22 p0370 N79-21575

Accelerated test program 22 p0370 N79-21576

Environmental testing of block 2 solar cell modules 22 p0370 N79-21577
[NASA-CR-158521]
23 p0542 N79-22628
The role of fuel cells in NASA's space power systems
[NASA-TM-79182]
23 p0546 N79-23133
Future thrusts of the NASA space power program ---
with emphasis on electrochemical energy
conversion and storage

NASA authorization, 1980, volume 1, part 2 24 p0722 N79-28670
[GPO-46-134]
Spinoff 1979 24 p0730 N79-29105
[NASA-TM-80481]
The NASA space power technology program 24 p0730 N79-29108

NASA authorization, 1980, volume 1, part 4 24 p0751 N79-30746
[GPO-46-423]
Aeronautics and space report of the President, 24 p0762 N79-31085
1978 activities

NATIONS 24 p0794 N79-33115
Summary of national and international radioactive
waste management programs
[PNL-2941]
NATURAL GAS 24 p0793 N79-32995
Aspects of pulsating combustion --- gaseous
methane burning system

Performance of a Stirling engine powered heat 21 p0008 A79-10072
activated heat pump --- gas heating-cooling system
Study of the applicability of the geochemistry of 21 p0011 A79-10098
gases in geothermal prospection

Shock-tube measurements of induction and 21 p0075 A79-14736
post-induction rates for low-Btu gas mixtures
--- derived from shale oil retorting and coal
gasification

Production and use of low and medium Btu gas 21 p0083 A79-15245
Transport fuels from natural gas 21 p0095 A79-15912

Hydrogen as a mid-term gaseous fuel supplement by 22 p0292 A79-27897
blending with natural gas

Recent ooids from different environments - 23 p0415 A79-34129
Relationship between petrophysical properties
and microstructure

The future of methane supply 23 p0529 A79-42424

The advance of natural gas --- historical demand 24 p0601 A79-44242
increases

The economic and political conditions of access to 24 p0652 A79-49517
resources of natural gas

Mixed fuel gas - A technically, economically and 24 p0652 A79-49519
environmentally superior way to supplement
natural gas supplies

Toward the renewables - A natural gas/solar energy 24 p0664 A79-50881
transition strategy

The indirect Brayton energy recovery system 24 p0686 A79-51851
Environmentally induced cracking of natural gas 24 p0696 A79-51958
and liquid pipelines. Volume 2: Appendices A
and B
[PB-282924/0]
Environmentally induced cracking of natural gas 21 p0181 N79-11446
and liquid pipelines. Volume 1: Technical report
[PB-282923/2]
Potential producibility and recovery of natural 21 p0181 N79-11447
gas from geopressured aquifers of the Cenozoic
sediments of the Gulf Coast Basin
[PB-2025-3]
Proceedings of Energy Resource 5th Conference 21 p0192 N79-11607
[PB-286246/4]
GAO work involving title V of the Energy Policy 21 p0230 N79-15423
and Conservation Act of 1975
[PB-286400/7]
Northern Alaska hydrocarbon resources 21 p0230 N79-15424
[PB-287394/1]
Tests of Wisconsin S12D engine running on natural 22 p0332 N79-16342
gas with addition of carbon dioxide
[AD-A058486]
Direction of gas supply research in the US 22 p0339 N79-17230
22 p0340 N79-17320

Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373
Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171
Economic impacts of a transition to higher oil prices --- estimation and budget allocations
[BNL-50871] 22 p0364 N79-20927
Development of combustion data to utilize low-Btu gases as industrial process fuels
[FE-2489-30] 23 p0576 N79-26143
Blending of hydrogen in natural gas distribution systems. Volume 3: Gas blends leakage tests of selected distribution system components
[CONS/2925-3] 23 p0577 N79-26229
Synthetic natural gas in California: When and why --- from coal
23 p0593 N79-27615
Underground storage of natural gas by interstate pipeline companies for 1976 and winter 1976 - 1977
[DOE/EIA-0151] 23 p0597 N79-27684
Midterm oil and gas supply modeling system methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059
Solvent selectivity for purification of natural gases
24 p0717 N79-28252
Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPO-26-349] 24 p0717 N79-28346
Natural gas shortage --- Congressional reports
[GPO-86-231] 24 p0717 N79-28347
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654
Hydrogen technology: An overview --- conferences
[BNL-25760] 24 p0734 N79-29379
Electricity in lieu of natural gas and oil for industrial thermal energy: A preliminary survey
[ORNL/TM-5937] 24 p0739 N79-29630
The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report
[PB-294228/2] 24 p0744 N79-29783
Behavior of gas distribution equipment in hydrogen service --- conferences
[CONF-790512-2] 24 p0747 N79-30408
Unique helium resources are wasting: A new conservation policy is needed
[PB-293751/4] 24 p0748 N79-30701
Oven curing: Energy conservation and emission control in coil coating
[TID-28705] 24 p0750 N79-30723
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/6] 24 p0760 N79-30837
Economic structure and behavior in the natural gas production industry
[PB-294610/1] 24 p0760 N79-30839

NAVIGATION AIDS
Economic analysis of solar photovoltaics for low-power lighted aids to navigation
[AD-A068365] 24 p0738 N79-29615

NAVIGATION SATELLITES
The NTS-2 satellite solar cell experiment
21 p0001 A79-10016

NAVIGATION TECHNOLOGY SATELLITES
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895
An interim report on the NTS-2 solar cell experiment
24 p0784 N79-32656

NAVY
US Navy energy plan and program, 1978
[AD-A058054] 21 p0157 N79-12560
Naval Air Systems Command-Naval Research Laboratory Workshop on Basic Research Needs for Synthetic Hydrocarbon Jet Aircraft Fuels
[AD-A060081] 21 p0216 N79-14235
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667
Department of the Navy energy fact book
[AD-A069138] 24 p0738 N79-29614

NEAR FIELDS
Results of a near field physical model study --- OTEC plant interaction with ocean environment
24 p0626 A79-45856

NEAR WAKES
Flowfield measurements in the vicinity of the rotor of a 10 kw windmill
[AIAA PAPER 79-0969] 23 p0475 A79-38889

NEBRASKA
Photovoltaic-powered irrigation experiments in the United States --- crop drying and irrigating in Nebraska
[COO-4094-28] 23 p0596 N79-27673
Mead 25 kilowatt photovoltaic system --- conferences
[COO-4094-19] 23 p0596 N79-27677

NEGATIVE IONS
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

NEODYMIUM COMPOUNDS
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-34192

NEODYMIUM LASERS
Frequency doubling of a solar pumped Nd:YAG laser
21 p0044 A79-12062
DOE programs in material development for fusion laser systems
21 p0082 A79-15137
Requirements and new materials for fusion laser systems
21 p0082 A79-15138
A survey of laser glasses --- for fusion studies
21 p0083 A79-15140
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

NEON
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

NETHERLANDS
The performance of the heating system in the solar house of the Eindhoven University of Technology
22 p0276 A79-25938
The Netherlands research program on wind energy
23 p0481 A79-40102
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107
Implications of large scale introduction of power from large wind energy conversion systems into the existing electric power supply system in the Netherlands
23 p0485 A79-40132

NETWORK ANALYSIS
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426

NETWORK SYNTHESIS
Depletion of available wind power by a large network of wind generators
23 p0453 A79-37899
Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029
Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038
GaAs solar cells for high solar concentration applications
23 p0514 A79-41039
High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040
Large area thin film gallium arsenide solar cells
23 p0515 A79-41042
The design of photovoltaic systems for intermediate-sized applications
24 p0675 A79-51762

Application of a GaAs photovoltaic solar system in a utility substation
24 p0676 A79-51770
On the design and operation of electrochemical solar cells
24 p0712 A79-53494
Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648

NEUTRAL BEAMS
Development of energetic neutral beams to the megawatt power level for controlled thermonuclear research
21 p0054 A79-13439
Magnetic multipole line-cusp plasma generator for neutral beam injectors
22 p0238 A79-20746
Evidence for neutral-beam-injected oxygen impurities in 2XIIB --- mirror confined plasma
22 p0292 A79-27887
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979

NEUTRAL GASES
Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764

NEUTRAL PARTICLES
A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a
22 p0255 A79-22379
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

NEUTRON DIFFRACTION
Structural studies of hydrides by neutron diffraction
22 p0248 A79-21681
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

NEUTRON EMISSION
Optimum properties of a noncylindrical pinch --- neutron energy yield in fusion plasma
22 p0244 A79-21433

NEUTRON IRRADIATION
Materials problems and possible solutions for near term tokamak fusion reactors
21 p0079 A79-14790

NEUTRON SOURCES
On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors
24 p0705 A79-52352

NEUTRON SPECTRA
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

NEW HAMPSHIRE
Solar project cost report: Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/60] 23 p0562 N79-24484
Solar project description. Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/50] 23 p0564 N79-24499

NEW JERSEY
Solar heating and hot water system installed at Cherry Hill, New Jersey
[NASA-CR-161235] 24 p0723 N79-28729

NEW MEXICO
Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey
[LA-7656-MS] 22 p0358 N79-20458
A time domain survey of the Los Alamos Region, New Mexico
[LA-7657-MS] 22 p0365 N79-21248
Estimates of New Mexico's future oil production including reserves of the 50 largest pools
[PB-291780/5] 23 p0540 N79-22597
Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784
Performance testing of the Del concentrating solar collector
[SAND-79-0515] 24 p0786 N79-32681

NEW YORK
Planning for resource recovery in the 'Big Apple' --- New York City plans for refuse utilization
23 p0491 A79-40424
Assessment of hydropower restoration and expansion in New York State, volume 1
[PB-295782/7] 24 p0792 N79-32734
New York State solar energy atlas
[PB-295453/5] 24 p0802 N79-33599

NEW ZEALAND
Harnessing geothermal energy in Rotorua, New Zealand
23 p0408 A79-34068
Geothermal systems in the Hauraki Rift zone /New Zealand/ - An example for geothermal systems over an inferred upper mantle swell
23 p0408 A79-34069
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543
Energy recovery and conservation by recycling municipal solid waste
[NZERDC-P7] 24 p0745 N79-30105

NICKEL
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Laser-induced desorption experiments with technical metal surfaces --- carbon monoxide and hydrogen interaction with Ni
23 p0445 A79-36969
A thermoanalytical investigation of nickel catalysts for fuel cells
23 p0481 A79-40008
Spectrally selective surfaces of Ni-pigmented anodic Al2O3 --- solar energy absorbers
24 p0629 A79-46202
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896
Ultrafine nickel particles for photothermal conversion of solar energy
24 p0638 A79-47062
Ni cermet selective absorbers for solar photothermal conversion
24 p0641 A79-47790
Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal
22 p0364 N79-21215

NICKEL ALLOYS
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395
A survey of the hydrogen storage properties of nickel-copper-mischmetal-calcium alloys
23 p0414 A79-34121
Formation of protective layers on alloys developed for use in coal gasification environments
[SAND-78-8277] 24 p0765 N79-31383

NICKEL CADMIUM BATTERIES
Nickel-cadmium battery reconditioning and long term performance in geosynchronous orbit spacecraft
21 p0029 A79-10242
Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489
Study of the characteristics of Ni-Cd storage batteries for space applications
22 p0304 A79-30207
Some fatigue characteristics of nickel battery plaque
[AD-A060370] 21 p0230 N79-15415
The 100 kW space station --- regenerative fuel cells and nickel hydrogen and nickel cadmium batteries for solar arrays
22 p0371 N79-21603

NICKEL COATINGS
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber
21 p0127 A79-17383

Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417
'Ultra-black' coating for high absorptance of solar energy
24 p0658 A79-50329

NICKEL COMPOUNDS
Hydrogen storage by LaNi5 - Fundamentals and applications
21 p0038 A79-11803
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682
Some applications of LaNi5-type hydrides --- using reversible reaction with hydrogen working fluid for heat storage
22 p0249 A79-21694
Metal hydride electrodes for electrochemical energy storage
22 p0249 A79-21695
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697

NICKEL HYDROGEN BATTERIES
The 100 kW space station --- regenerative fuel cells and nickel hydrogen and nickel cadmium batteries for solar arrays
22 p0371 N79-21603
Multistack nickel-hydrogen units
22 p0371 N79-21610

NICKEL OXIDES
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
Design and cost study of a nickel-iron oxide battery for electric vehicles. Volume 2: Public report
[ANL-K-3723-VOL-1] 21 p0222 N79-14579

NICKEL PLATE
The fabrication of Schottky-barrier solar cells by electroless nickel plating
23 p0436 A79-35746

NICKEL STEELS
Qualification of a duplex, clad material for OTEC --- heat exchangers
24 p0623 A79-45828

NICKEL ZINC BATTERIES
Nickel-zinc vs. silver-zinc battery - A comparative study of baseline characteristics
21 p0009 A79-10083
Rapid, efficient charging of lead-acid and nickel-zinc traction cells --- for electric vehicles
21 p0009 A79-10084
An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc
21 p0035 A79-11546
The zinc electrode in sealed alkaline cells
21 p0040 A79-11823
Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826
Nickel-zinc battery for aircraft and missile applications
[AD-A059295] 21 p0220 N79-14561
Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215] 24 p0723 N79-28728
Discharge characteristics of 300 ampere-hour Ni-Zn traction cells
[NASA-TM-79244] 24 p0772 N79-31781

NIGHT
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519

NITINOL ALLOYS
Nitinol thermodynamic state surfaces --- heat engine material
21 p0045 A79-12264

NITRIC OXIDE
Kinetics of nitric oxide formation in combustion
21 p0053 A79-12989
Nitrogen fixation with fusion heat
24 p0695 A79-51948

NITRIDES
/SN/x-GaAs polymer-semiconductor solar cells
21 p0154 A79-18508

NITROGEN COMPOUNDS
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927

NITROGEN DIOXIDE
Emissions of nitrogen dioxide from a large gas-turbine power station
21 p0152 A79-18344

NITROGEN OXIDES
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791
Simultaneous nitrogen oxides and sulfur dioxide removal by absorption-reduction scrubbing
21 p0066 A79-14125
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers
[ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738
Investigating the formation of oxides of nitrogen when burning solid fuel --- air pollution by industrial exhaust gases
23 p0474 A79-38864
An investigation of the formation of oxides of nitrogen in a pulverised coal flame
23 p0474 A79-38865
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610
Nitrogen oxide air pollution. Volume 2, part 1: Control technology. A bibliography with abstracts
[NTIS/PS-78/0971/8] 21 p0199 N79-12591
Nitrogen oxide air pollution. Part 3: Atmospheric chemistry. A bibliography with abstracts
[NTIS/PS-78/0973/4] 21 p0199 N79-12593
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474
Combustion modification effects on NOx emissions from gas-, oil-, and coal-fired utility boilers
[PB-289878/1] 23 p0545 N79-22661
Status of NO sub x control for coal-fired power plants
23 p0592 N79-27609
Fluidized combustion of coal --- to limit SO2 and NOx emissions
23 p0593 N79-27613
Polymeric interfaces for stack monitoring
[PB-294997/2] 24 p0761 N79-30866

NITROGEN TETROXIDE
Using N2O4 in a solar gas-turbine plant
21 p0167 A79-20357

NOISE POLLUTION
Noise-control needs in the developing energy technologies
[COO-4389-1] 21 p0213 N79-13569
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868

NOISE REDUCTION
Supersonic transport vis-a-vis energy savings
[NASA-TM-75464] 24 p0763 N79-31163

NONAQUEOUS ELECTROLYTES
Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813
The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838
Low voltage behavior of lithium/metal dichalcogenide topochemical cells
22 p0286 A79-26995
Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries
23 p0495 A79-40749

Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation
24 p0625 A79-45849

Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813

Solid electrolyte fuel cell for electric utility power generation
24 p0682 A79-51815

Solid polymer electrolyte water electrolysis status for large scale hydrogen production
24 p0686 A79-51847

Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298

NONCONDENSABLE GASES

Effect of noncondensable gases on geothermal power generation
21 p0015 A79-10125

NONDESTRUCTIVE TESTS

Evaluation of methods for analyzing silver-zinc cells
21 p0010 A79-10085

Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507

NONEQUILIBRIUM IONIZATION

Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
21 p0153 A79-18468

Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators
21 p0153 A79-18469

NONEQUILIBRIUM PLASMAS

The ion fly-wheel effect on the electro-thermal instability in non-equilibrium MHD Hall disc generators
21 p0046 A79-12270

On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid
21 p0156 A79-19445

Effect of diffusion on electron density across the nonequilibrium MHD channel
23 p0479 A79-39839

Application of finite element method to analysis of MHD generators
24 p0653 A79-50001

NONEQUILIBRIUM THERMODYNAMICS

Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232

NONGRAY GAS

Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation
23 p0398 A79-33990

NONLINEAR EQUATIONS

Non-linear numerical algorithms for studying tearing modes --- in tokamaks
22 p0257 A79-22981

Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity --- in tokamaks
22 p0269 A79-24814

Integral invariants and quasi-MHD nonlinear dissipation --- in magnetized toroidal plasmas
22 p0270 A79-24862

Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939

Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41941

Nonlinear effects in propagation of lower hybrid waves in a plasma
24 p0706 A79-52381

NONLINEAR OPTICS

Review of theories for predicting n2 in glasses and crystals --- refractive index of fusion laser materials
21 p0083 A79-15139

Generation of the new coherent radiation by harmonic conversion and nonlinear mixing for certain applications --- optical interactions
21 p0111 A79-16639

Effects of nonlinear decay of backscattered light on the anomalous reflectivity --- in laser plasmas
22 p0310 A79-30742

NONNEWTONIAN FLUIDS

Transient flow of non-Newtonian power-law fluids in porous media
[SAN-1265-9] 24 p0781 N79-32516

NONUNIFORM FLOW

Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841

NONUNIFORM PLASMAS

A source of error in cusp plasma leak measurements
23 p0446 A79-37265

Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424

Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188

NORTH ATLANTIC TREATY ORGANIZATION (NATO)

The AGARD propulsion and energetics panel, 1952-1977
[AGARD-AR-111] 22 p0337 N79-16848

NOSE CONES

Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821

NOZZLE DESIGN

Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188

NOZZLE FLOW

Evaluation of the expected diffuser performance for a large MHD generator
23 p0393 A79-33408

NUCLEAR DEVICES

Nuclear Science Symposium, 25th, and Symposium on Nuclear Power Systems, 10th, Washington, D.C., October 18-20, 1978, Proceedings
22 p0297 A79-28901

NUCLEAR ELECTRIC POWER GENERATION

Energy conversion engineering --- Book
22 p0302 A79-29575

Rational utilization of electricity in order to satisfy the general objectives of the national energy policy
23 p0525 A79-41821

Dedicated nuclear facilities for electrolytic hydrogen production
24 p0614 A79-45592

A WELMM comparison of energy scenarios --- evaluation of different energy production systems in France
24 p0645 A79-48025

Application of the Dynamic Isotope Power System to a multimission spacecraft
24 p0692 A79-51929

Coal and nuclear: A comparison of the cost of generating baseload electricity by region
[PB-289585/2] 22 p0355 N79-19469

Systems definition space-based power conversion systems --- for satellite power transmission to earth
[NASA-CR-150268] 23 p0546 N79-23483

Nuclear powered satellite studies
[COO-4045-3] 23 p0588 N79-27221

A control system analysis of the energy growth model: Coal
24 p0736 N79-29595

Implications of the fusion power source to the electric utility industry
[EPRI-ER-943-54] 24 p0740 N79-29642

NUCLEAR ELECTRIC PROPULSION

NASA's thermionic technology program
21 p0026 A79-10217

NEP heat pipe radiators --- Nuclear Electric Propulsion
24 p0700 A79-51985

Power coupling alternatives for the NEP thermionic power system
[NASA-CR-158372] 22 p0367 N79-21547

NUCLEAR ENERGY

A systems study of our energy problems
21 p0074 A79-14704

Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901

Energy for the long run - Fission or fusion
22 p0256 A79-22760
Nuclear Science Symposium, 25th, and Symposium on Nuclear Power Systems, 10th, Washington, D.C., October 18-20, 1978, Proceedings
22 p0297 A79-28901
A nuclear-solar energy strategy
23 p0421 A79-34174
Remarks on economic growth and energy requirements
23 p0535 A79-43523
The Westinghouse Sulfur Cycle Hydrogen Production Process
24 p0614 A79-45591
Nuclear power today and tomorrow
22 p0340 N79-17317
Laser and energetics of the future
[UCRL-TRANS-11467] 24 p0734 N79-29513

NUCLEAR FISSION
Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/ --- Book
21 p0147 A79-17646
Controlled thermonuclear fusion
22 p0287 A79-27339
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337
Some aspects of a fission-based plasma engine
24 p0715 A79-54350

NUCLEAR FUEL BURNUP
A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives --- economic analysis
23 p0567 N79-24813

NUCLEAR FUEL REPROCESSING
Proliferation-resistant nuclear fuel cycles
[ORNL/TM-6392] 21 p0214 N79-13849
Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0793 N79-32995

NUCLEAR FUELS
Fuel technology and the environment --- nuclear reactor caused radiation effects and transmutation
21 p0079 A79-14787
Development of cryogenic targets for laser fusion
21 p0085 A79-15333
Cryogenic pellets for laser-fusion research - Theoretical and practical considerations
21 p0085 A79-15334
Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335
Pellet X-ray spectra for laser fusion reactor designs
22 p0291 A79-27878
Energy, helium, and the future --- U.S. He demand projection and conservation program
23 p0422 A79-34181
Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34589
Status report of the dynamic isotope power system
24 p0692 A79-51927
Dynamic Isotope Power Systems /DIPS/ --- for space applications
24 p0692 A79-51928
Gaseous fuel reactor applications
24 p0715 A79-54351
Proliferation-resistant nuclear fuel cycles
[ORNL/TM-6392] 21 p0214 N79-13849
Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels
21 p0218 N79-14532
Nuclear power today and tomorrow
22 p0340 N79-17317
Fusion energy for alternative applications: The generation of synthetic gaseous fuels --- approach to high temperature fusion reactor design
[ANL/FPP-TM-117] 24 p0755 N79-30790
Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075
Federal facilities for storing spent nuclear fuel; Are they needed
[PB-297071/3] 24 p0804 N79-34006

NUCLEAR FUSION
A new method for producing cryogenic laser fusion targets
21 p0085 A79-15332
Controlled thermonuclear fusion
22 p0287 A79-27339
Fusion - Its status and outlook
24 p0601 A79-44241
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979
Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14876] 21 p0214 N79-13871
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14946] 21 p0214 N79-13872
Department of Energy policy for fusion energy
[DOE/ER-0018] 23 p0586 N79-26952
Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953
Lasers: Their applications and operational requirements
23 p0590 N79-27494
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051
Implications of the fusion power source to the electric utility industry
[EPRI-ER-943-54] 24 p0740 N79-29642
Advanced synfuel production with fusion
[BNL-26130] 24 p0780 N79-32388
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

NUCLEAR HEAT
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096
Hydrogen energy transport systems and nuclear heat - A promising way to conserve fossil energy resources
23 p0415 A79-34127
Energy conservation by waste heat utilization
23 p0417 A79-34145
Research and development work for hydrogasification of coal with nuclear processing heat done in the framework of the prototype nuclear processing heater project
[BMFT-FB-T-78-25] 24 p0780 N79-32393
Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat
[BMFT-FB-T-78-29] 24 p0780 N79-32394

NUCLEAR MAGNETIC RESONANCE
Nuclear magnetic resonance studies of metal hydrides
22 p0248 A79-21683
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684
Electronic structure and physical properties of Ti-H and Zr-H using NMR
22 p0248 A79-21685

NUCLEAR POWER PLANTS
A 5-GWe nuclear satellite power system conceptual design
21 p0003 A79-10033
Radioisotope-powered free-piston Stirling engine for space applications
[IAF PAPER 78-42] 21 p0034 A79-11217
Comparison of nuclear and coal power plants using Net Energy Analysis
21 p0073 A79-14692
The nuclear closed-cycle gas turbine /GT-HTGR/ - A utility power plant for the year 2000
[AIAA PAPER 79-0191] 21 p0157 A79-19590
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827
Comparison of two hydrogen production methods for nuclear-hydrogen conversion
23 p0413 A79-34108
Energy conservation by waste heat utilization
23 p0417 A79-34145
The fusion hybrid
23 p0434 A79-35461
Thermal energy storage using hot liquids
23 p0451 A79-37879

Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/ --- Book
23 p0493 A79-40699
Performance parameters for fusion-fission power systems
24 p0627 A79-45974
Temperature profile and power calculations in gas core reactors
24 p0702 A79-51998
A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14876] 21 p0214 N79-13871
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14946] 21 p0214 N79-13872
Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses
[ORNL-TM-4483] 21 p0221 N79-14574
Integrated safeguards information System (ISIS), executive summary --- nuclear power plant and fissionable materials security
[PB-286869/3] 21 p0223 N79-14934
OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action
[NASA-TM-80002] 21 p0225 N79-15114
Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662
Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment
23 p0551 N79-23539
Use of waste heat from nuclear power plants
[CONF-7811109-4] 23 p0583 N79-26527
Total generating costs: Coal and nuclear plants
[NUREG-0248] 24 p0742 N79-29663
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845

NUCLEAR POWER REACTORS
High-temperature nuclear heat source for hydrogen production
23 p0437 A79-36049
Reactor design for nuclear electric propulsion
24 p0693 A79-51931

NUCLEAR PROPULSION
Nuclear aircraft innovations and applications
[AIAA PAPER 79-0846] 23 p0526 A79-41913

NUCLEAR PUMPED LASERS
Progress in nuclear-pumped lasers
21 p0110 A79-16627
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337

NUCLEAR RADIATION
Hazards from radioactive waste in perspective --- comparison with wastes from burning coal
[CONF-790204-9] 24 p0761 N79-31024

NUCLEAR REACTIONS
Nuclear characteristics of D-D fusion reactor blankets - Technical data
21 p0162 A79-19826

NUCLEAR REACTORS
Fuel technology and the environment --- nuclear reactor caused radiation effects and transmutation
21 p0079 A79-14787
Fusion-supported decentralized nuclear energy system
24 p0696 A79-51956
Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887
Fusion reactors for synthetic fuels
[BNL-25634] 24 p0767 N79-31421

NUCLEAR RESEARCH
Fusion-Fission Energy Systems
21 p0017 A79-10144
Doublet III design and construction --- Tokamak fusion research device
21 p0018 A79-10145
The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147
CO2-laser fusion
21 p0018 A79-10150
Progress in tokamak experimental research in the Soviet Union
21 p0069 A79-14455
The mirror machine program in the USA --- controlled fusion experiments and research facilities
21 p0070 A79-14461
Progress in laser-fusion research
21 p0070 A79-14464
Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466
Fusion reactor problems --- plasma confinement and interface engineering
21 p0071 A79-14468
Predemonstration fusion devices - Research and development needs
21 p0078 A79-14785
Fusion research - The temperature rises
23 p0445 A79-37003
Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051

NUCLEATE BOILING
Studies of cryogenic liquid boiling in centrifugal acceleration fields --- heat transfer and critical heat flux densities in superconducting power cooling systems
23 p0530 A79-42893

NUMERICAL ANALYSIS
Performance studies of a finned heat pipe latent thermal energy storage system
21 p0121 A79-17325
An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442
The analysis of heat transfer with and without condensation in a heat pipe heat exchanger
[ASME PAPER 78-WA/HT-59] 21 p0161 A79-19824
Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes
[ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836
Subsonic flow in the channel of an MHD-generator
21 p0167 A79-20413
Optimum properties of a noncylindrical pinch --- neutron energy yield in fusion plasma
22 p0244 A79-21433
Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489
Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity
22 p0324 A79-31845
Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541
Application of solar technology to today's energy needs, volume 2 --- systems analysis and analytical methods
[OTA-E-77-VOL-2] 21 p0218 N79-14530
Analytical methods
21 p0218 N79-14531
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539
Numerical codes for MHD flows
[SAND-78-1954] 24 p0730 N79-29061
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620
A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines
24 p0794 N79-33158

NUMERICAL CONTROL
Computer aided optimization of integrated coal gasification combined cycle power plants
21 p0008 A79-10075
Five MW solar thermal test facility heliostat focus and alignment system
21 p0043 A79-11972

The use of computer-controlled data acquisition systems in determining solar heating and cooling system performance 21 p0088 A79-15834

A microprocessor based solar monitoring system 21 p0088 A79-15838

A microprocessor monitoring system for a solar energy installation 21 p0088 A79-15840

Design of the data acquisition system at Solar One --- home energy monitoring via minicomputers 21 p0088 A79-15841

Low-cost monitoring of solar system performance 21 p0088 A79-15843

A microprocessor-based control system for solar heating and cooling 21 p0107 A79-16565

Real time computer control of 5 megawatts of solar thermal energy 21 p0144 A79-17621

Microprocessor control of a wind turbine generator 22 p0244 A79-21302

A digital control system for superconducting magnet 22 p0268 A79-24508

Control of a heliostat field by distributed microcomputer technique 23 p0389 A79-33269

The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications 23 p0402 A79-34020

A computerized reporting and monitoring system for geothermal energy development [LBL-8483] 22 p0369 N79-21555

NUMERICAL FLOW VISUALIZATION

A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model 23 p0410 A79-34087

A numerical model of underground coal gasification for air-water injection into a permeable bed 24 p0689 A79-51867

NUMERICAL INTEGRATION

Transient analysis of the rectified superconducting alternator 23 p0462 A79-38529

NUMERICAL WEATHER FORECASTING

System performance predictions for solar cooling using regional stochastic weather models 22 p0264 A79-23781

NUSSELT NUMBER

Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters [ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809

Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors 22 p0281 A79-26206

Fully developed laminar heat transfer in passages of triangular cross section for application to solar collector plate design [AIAA PAPER 79-0974] 23 p0458 A79-38189

An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures 23 p0531 A79-42908

NUTATION DAMPERS

Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control 21 p0148 A79-17792

O

OCEAN CURRENTS

Waves, salinity gradients and ocean currents - Alternative energy sources 24 p0616 A79-45780

Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC 24 p0617 A79-45782

Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants 24 p0621 A79-45816

Ocean thermal and current velocity data requirements for design of an OTEC plant - An update 24 p0622 A79-45822

Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients [PB-295876/7] 24 p0792 N79-32735

OCEAN DATA ACQUISITIONS SYSTEMS

Use of satellite-derived sea surface temperatures by cruising OTEC plants 24 p0625 A79-45845

Status of SEASAT Commercial Demonstration Program [E79-10260] 24 p0768 N79-31720

Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies [NASA-CR-162162] 24 p0768 N79-31737

OCEAN MODELS

A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine 22 p0323 A79-31554

Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column 23 p0480 A79-39845

Modeling the intermediate field of ocean thermal energy conversion discharges 24 p0626 A79-45858

OCEAN SURFACE

Wave energy conversion in a random sea 21 p0030 A79-10252

A wave activated electric generator --- waterwave energy conversion 22 p0288 A79-27389

Regional-scale sea surface temperature determination from the geostationary environmental operational satellite 24 p0617 A79-45781

OTEC goes to sea /A review of Mini-OTEC/ 24 p0617 A79-45784

Use of satellite-derived sea surface temperatures by cruising OTEC plants 24 p0625 A79-45845

Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries 24 p0626 A79-45854

OCEAN THERMAL ENERGY CONVERSION

The National Program for Solar Energy 21 p0072 A79-14688

An introduction to ocean thermal energy conversion /OTEC/ power plants 21 p0091 A79-15869

OTEC program status and plans 21 p0094 A79-15902

Market penetration for OTEC 21 p0094 A79-15903

Ocean thermal energy conversion; Proceedings of the Energy Technology Conference and Exhibition, Houston, Tex., November 6-9, 1978 21 p0100 A79-16245

Some early and recent novel OTEC systems 21 p0100 A79-16246

An overview of the U.S. OTEC development program 21 p0100 A79-16247

OTEC power systems 21 p0101 A79-16248

Capital cost system optimization of OTEC power modules 21 p0101 A79-16249

Advances in ocean engineering aspects of ocean thermal energy conversion 21 p0101 A79-16250

Power cables to accommodate the motions of an OTEC plant 21 p0101 A79-16251

Alternative forms of energy transmission from OTEC plants 21 p0141 A79-17505

Heat exchangers for Ocean Thermal Energy Conversion plants 21 p0142 A79-17506

OTEC in Europe --- economic aspects of Ocean Thermal Energy Conversion 21 p0152 A79-18109

Principles of design and construction for marine structures for wave/tidal/ocean thermal energy 21 p0152 A79-18114

Conceptual design of large heat exchangers for ocean thermal energy conversion [ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813

Development of compact heat exchangers for Ocean Thermal Energy Conversion /OTEC/ systems [ASME PAPER 78-WA/HT-34]
21 p0161 A79-19815

The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants [ASME PAPER 78-WA/HT-65]
21 p0162 A79-19825

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0278 A79-26176

Working fluids and turbines for OTEC power systems
22 p0280 A79-26192

Environmental considerations for siting an ocean thermal conversion early ocean testing platform at four proposed areas
22 p0287 A79-27377

Optimum power plant capacity of ocean-based ocean thermal energy conversion systems
22 p0297 A79-28922

An ocean thermal difference power plant in the Canadian Arctic
22 p0318 A79-31415

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy
23 p0404 A79-34036

Analysis of various OTEC missions --- market potential of applications
23 p0404 A79-34037

An update of OTEC baseline design --- cost estimates and market potential
23 p0404 A79-34038

Major factors in OTEC heat exchanger design
23 p0404 A79-34039

Ocean thermal energy conversion /OTEC/ plant working fluid study
23 p0404 A79-34040

Major factors in OTEC power cycle design
23 p0404 A79-34041

Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042

The commercialization of OTEC - Problems and opportunities
23 p0405 A79-34043

OTEC biofouling and corrosion testing program --- for heat exchangers
23 p0429 A79-35057

Testing the OTEC cold water pipe using the 'Deep Oil X-1' platform
23 p0430 A79-35058

Ocean Thermal Energy Conversion /OTEC/ power plant instrumentation and measurement
23 p0430 A79-35059

OTEC-1 test conductor program
23 p0430 A79-35060

Preliminary selection of anchor systems for ocean thermal energy conversion
23 p0437 A79-35846

Limit analysis and design of a semi-submerged concrete hull for an ocean thermal differences power plant
23 p0486 A79-40195

Ocean thermal energy
23 p0524 A79-41810

Ocean thermal energy for the 80's
24 p0602 A79-44273

Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873

Overview of solar energy programs and activities in the Southeast
24 p0607 A79-45202

Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595

Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volumes 1 & 2
24 p0616 A79-45776

Eurocean OTEC project
24 p0616 A79-45777

French OTEC program
24 p0616 A79-45778

An overview of the Japanese OTEC development
24 p0616 A79-45779

Waves, salinity gradients and ocean currents - Alternative energy sources
24 p0616 A79-45780

Regional-scale sea surface temperature determination from the geostationary environmental operational satellite
24 p0617 A79-45781

Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC
24 p0617 A79-45782

OTEC ocean engineering progress report
24 p0617 A79-45783

OTEC goes to sea /A review of Mini-OTEC/
24 p0617 A79-45784

Development of a Test Program for OTEC-1
24 p0617 A79-45785

Analysis of prospects for OTEC commercialization for baseload power
24 p0617 A79-45786

Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787

Core unit testing of the APL/JHU shell-less folded tube heat exchanger --- for OTEC
24 p0618 A79-45788

Compact heat exchanger design progress --- for OTEC plants
24 p0618 A79-45789

Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/
24 p0618 A79-45790

Preliminary designs of 10 MWe and 50 MWe power modules --- for OTEC
24 p0618 A79-45791

TRW PSD-I power system design --- for OTEC
24 p0618 A79-45792

Performance optimization of an OTEC turbine
24 p0618 A79-45793

Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid --- for OTEC
24 p0619 A79-45794

Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

Conceptual designs and costs of OTEC 10/40 MW spar platforms
24 p0619 A79-45796

Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797

A feasibility study of an OTEC guyed tower concept
24 p0619 A79-45798

Land-based OTEC plants - Cold water pipe
24 p0620 A79-45799

A single insulated sodium conductor for HVDC underwater power transmission
24 p0620 A79-45800

Load criteria for OTEC riser cable design
24 p0620 A79-45801

Tuned Sphere Stable OTEC Platform
24 p0620 A79-45802

Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978 --- for OTEC
24 p0620 A79-45803

Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805

Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806

Ultrasonic detection of microbial slime films --- on OTEC heat exchanger tubes
24 p0620 A79-45807

Legal and institutional aspects --- of OTEC commercialization
24 p0621 A79-45808

Lead agency designation and proposed licensing procedures for ocean thermal energy conversion facilities
24 p0621 A79-45809

A case study of OTEC financing for the Middle South Utilities
24 p0621 A79-45810

Cold water pipe verification test --- for OTEC
24 p0621 A79-45811

Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads --- Cold Water Pipe
24 p0621 A79-45812

A limiting mechanism for the heave induced Mathieu type instability of a cold water pipe --- for OTEC plant
24 p0621 A79-45813

Practical schemes for reducing cold water pipe loads --- for OTEC plants
24 p0621 A79-45814

Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants
24 p0621 A79-45816

Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico
24 p0622 A79-45817

Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment
24 p0622 A79-45818

Ammonia vaporization and condensation investigations related to OTEC heat exchangers
24 p0622 A79-45819

The modeling of thin film heat exchangers --- for OTEC
24 p0622 A79-45820

Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821

Ocean thermal and current velocity data requirements for design of an OTEC plant - An update
24 p0622 A79-45822

Development of a lightweight concrete for OTEC cold water pipes
24 p0622 A79-45823

Oscillations of and drift force acting on an OTEC-CWP structure --- Cold Water Pipe
24 p0622 A79-45824

Vortex excited oscillations of marine structures with application to the OTEC cold water pipe
24 p0622 A79-45825

Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826

Oxygen, temperature and pH effects on corrosion of aluminum in seawater --- for OTEC heat exchanger tubes
24 p0623 A79-45827

Qualification of a duplex, clad material for OTEC --- heat exchangers
24 p0623 A79-45828

The effects of biofouling and corrosion on heat transfer measurements --- for OTEC
24 p0623 A79-45829

OTEC 100-MWe alternate power systems study
24 p0623 A79-45831

Recent developments in the foam OTEC system
24 p0623 A79-45832

Description and status report of a program to define sea water-surfactant interactions in relation to the foam system --- OTEC power plant
24 p0623 A79-45833

Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger
24 p0623 A79-45835

Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837

Steady-state and dynamic performance of an OTEC plant
24 p0624 A79-45838

Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839

Multiple staging of the cold water in the open cycle OTEC Systems
24 p0624 A79-45840

The mist-transport cycle - Progress in economic and experimental studies --- OTEC power plant
24 p0624 A79-45841

Gravity opposed heat pipe --- for OTEC
24 p0624 A79-45842

Thermoelectric OTEC
24 p0624 A79-45843

Hybrid OTEC cycle avoids indirect heat exchangers
24 p0625 A79-45844

Use of satellite-derived sea surface temperatures by cruising OTEC plants
24 p0625 A79-45845

An overview of the OTEC-1 design --- including mooring, anchoring, site selection, installation, manufacturing, etc
24 p0625 A79-45846

System design considerations for a floating OTEC modular experiment platform
24 p0625 A79-45847

Electric utility system planning studies for OTEC power integration
24 p0625 A79-45848

Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation
24 p0625 A79-45849

OTEC system response and control analysis --- optimization of thermal cycle with seawater pumps
24 p0625 A79-45850

Station keeping subsystem designs for modular experiment OTEC plants
24 p0626 A79-45851

Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries
24 p0626 A79-45854

Potential for ocean thermal energy conversion electric power generation in the Southeast region
24 p0626 A79-45855

Results of a near field physical model study --- OTEC plant interaction with ocean environment
24 p0626 A79-45856

Environmental impact assessment for OTEC-1
24 p0626 A79-45857

Modeling the intermediate field of ocean thermal energy conversion discharges
24 p0626 A79-45858

Experimental and analytical OTEC studies at ORNL
24 p0626 A79-45859

Dynamic analysis of pipeline system for thermal power generation facility
24 p0627 A79-45863

Use of the new stainless alloys for OTEC heat exchangers
24 p0627 A79-45864

Application of the Cathelco system for control of fouling in OTEC systems
24 p0627 A79-45870

Land-based application of an OTEC open-cycle power system
24 p0627 A79-45871

Thermal energy conversion - Tapping the sea depths
24 p0628 A79-45979

Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796

Preliminary design of a cruising OTEC modular experiment
24 p0674 A79-51758

An open cycle approach to ocean thermal energy conversion
24 p0674 A79-51759

Solar thermoelectric energy conversion
24 p0699 A79-51976

Analysis of a heat exchanger - Thermoelectric generator system
24 p0699 A79-51978

Research and development on ocean thermal energy conversion in Japan
24 p0703 A79-52009

Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

Environmental Development Plan (EDP): Ocean thermal energy conversion, 1977
[DOE/EDP-006] 21 p0188 N79-11531

Renewable ocean energy sources. Part 1: Ocean thermal energy conversion
[PB-283104/8] 21 p0191 N79-11556

Renewable ocean energy sources. Part 1: Working papers. Ocean thermal energy conversion
[PB-283103/0] 21 p0191 N79-11557

Energy analyses applied to ocean thermal energy conversion and an offshore wind power system
22 p0353 N79-19442

Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977 [PB-293733/2] 23 p0586 N79-26759

OTEC platform configuration and integration study. Volume 1: Systems engineering and integration [DOE/ET/4063-1-VOL-1] 24 p0724 N79-28749

OTEC platform configuration and integration study. Volume 3: Project plan [DOE/ET/4063-1-VOL-3] 24 p0725 N79-28750

Flow-induced vibration in shell-and-tube heat exchangers for Ocean Thermal Energy Conversion (OTEC) [ANL-OTEC-78-3] 24 p0747 N79-30522

Geothermal/hydrothermal energy. Group interview [DOE/TIC-10030] 24 p0755 N79-30791

Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients [PB-295876/7] 24 p0792 N79-32735

Energy programs at the Johns Hopkins University Applied Physics Lab. --- geothermal, hydroelectric, and ocean thermal energy [PB-295439/4] 24 p0793 N79-32739

OCEANOGRAPHIC PARAMETERS

Oceans '78: The ocean challenge; Proceedings of the Fourth Annual Combined Conference, Washington, D.C., September 6-8, 1978 22 p0287 A79-27376

Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico 24 p0622 A79-45817

Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment 24 p0622 A79-45818

OCEANOGRAPHY

Gas concentration cells for the conversion of ocean wave energy 24 p0605 A79-44873

ERDA'S oceanographic program for the mid-Atlantic coastal region --- impact of offshore energy development on coastal ecology [BNL-24016] 21 p0192 N79-11641

Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies [NASA-CR-162162] 24 p0768 N79-31737

OCEANS

Direct Solar Energy Conversion at Sea /DSECAS/ - Characteristics of a baseline concept 23 p0402 A79-34026

Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution [PB-297467/3] 24 p0803 N79-33648

OCTANE NUMBER

Improving octane values of unleaded gasoline via gasohol 24 p0676 A79-51775

Fluid bed process studies on selective conversion of methanol to high octane gasoline [FE-2490-15] 23 p0555 N79-24190

OFFSHORE ENERGY SOURCES

Salinity power station at the Swedish west-coast - Possibilities and energy-price for a 200 MW-plant 21 p0077 A79-14772

Useful power from ocean waves 21 p0077 A79-14773

OTEC program status and plans 21 p0094 A79-15902

Ocean energy unlimited --- water wave conversion 21 p0095 A79-15908

Ocean thermal energy conversion; Proceedings of the Energy Technology Conference and Exhibition, Houston, Tex., November 6-9, 1978 21 p0100 A79-16245

Some early and recent novel OTEC systems 21 p0100 A79-16246

An overview of the U.S. OTEC development program 21 p0100 A79-16247

Power plant systems based on solar energy --- powered by sea water evaporation-produced osmotic pressure head mechanical energy 21 p0142 A79-17508

OTEC in Europe --- economic aspects of Ocean Thermal Energy Conversion 21 p0152 A79-18109

Oceans '78: The ocean challenge; Proceedings of the Fourth Annual Combined Conference, Washington, D.C., September 6-8, 1978 22 p0287 A79-27376

Technology considerations in the design of a commerical offshore energy conversion /OTEC/ plant 22 p0288 A79-27378

A wave activated electric generator --- waterwave energy conversion 22 p0288 A79-27389

Energy from sea waves - System optimization by diffraction theory 22 p0288 A79-27390

The use of ocean energy - A hydrostatic motor 22 p0288 A79-27391

Some recent developments in wind and ocean power systems 22 p0303 A79-29797

Off-shore multi-MW size wind turbine system development is the key to cost-effective wind energy for Sweden 22 p0326 A79-31917

Solar energy conversion in marine biological systems 23 p0402 A79-34021

An update of OTEC baseline design --- cost estimates and market potential 23 p0404 A79-34038

A self-consistent process of producing hydrogen from sea water 23 p0414 A79-34118

Offshore wind energy systems for the U.K. 23 p0453 A79-37901

Offshore wind power model estimates 23 p0482 A79-40110

Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study 23 p0527 A79-41946

Ocean and energy --- French book 23 p0529 A79-42350

Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volumes 1 & 2 24 p0616 A79-45776

French OTEC program 24 p0616 A79-45778

Analysis of prospects for OTEC commercialization for baseload power 24 p0617 A79-45786

Preliminary designs of 10 MWe and 50 MWe power modules --- for OTEC 24 p0618 A79-45791

Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii 24 p0620 A79-45805

Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries 24 p0626 A79-45854

Thermal energy conversion - Tapping the sea depths 24 p0628 A79-45979

Primary impacts of growing aquatic plants for energy 24 p0665 A79-50886

Preliminary design of a cruising OTEC modular experiment 24 p0674 A79-51758

Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980 [DSE/2426-19] 21 p0174 N79-10535

ERDA'S oceanographic program for the mid-Atlantic coastal region --- impact of offshore energy development on coastal ecology [BNL-24016] 21 p0192 N79-11641

Cooking with offshore oil: A handbook for California local government --- regional planning [PB-288656/2] 22 p0331 N79-16140

Environmental effects of offshore oil production 22 p0336 N79-16389

Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska [PB-291916/5] 23 p0546 N79-22970

Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts [PB-291917/3] 23 p0546 N79-22971

Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems --- eskimos [PB-291918/1] 23 p0546 N79-22972
Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977 [PB-293733/2] 23 p0586 N79-26759
The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-E: Executive summary report [PB-294228/2] 24 p0744 N79-29783
Status of the offshore technology program --- conferences [SAND-78-0665] 24 p0761 N79-30908
Status of SEASAT Commercial Demonstration Program [E79-10260] 24 p0768 N79-31720

OFFSHORE PLATFORMS
OTEC power systems 21 p0101 A79-16248
Advances in ocean engineering aspects of ocean thermal energy conversion 21 p0101 A79-16250
Power cables to accommodate the motions of an OTEC plant 21 p0101 A79-16251
Environmental considerations for siting an ocean thermal conversion early ocean testing platform at four proposed areas 22 p0287 A79-27377
Technology considerations in the design of a commerical offshore energy conversion /OTEC/ plant 22 p0288 A79-27378
Testing the OTEC cold water pipe using the 'Deep Oil X-1' platform 23 p0430 A79-35058
Marine structures for energy conversion 23 p0450 A79-37867
Development of a Test Program for OTEC-1 24 p0617 A79-45785
Conceptual designs and costs of OTEC 10/40 MW spar platforms 24 p0619 A79-45796
A feasibility study of an OTEC guyed tower concept 24 p0619 A79-45798
Tuned Sphere Stable OTEC Platform 24 p0620 A79-45802
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico 24 p0620 A79-45806
Ocean thermal and current velocity data requirements for design of an OTEC plant - An update 24 p0622 A79-45822
The mist-transport cycle - Progress in economic and experimental studies --- OTEC power plant 24 p0624 A79-45841
Energy/environment 1978: Symposium on energy development impacts [PB-288578/8] 22 p0355 N79-19470
OTEC platform configuration and integration study. Volume 1: Systems engineering and integration [DOE/ET/4063-1-VOL-1] 24 p0724 N79-28749

OHIO RIVER (US)
Energy and environment: An intergovernmental perspective [PB-283733/4] 21 p0198 N79-12575

OHMIC DISSIPATION
Ohmic heating experiments in the W VII A stellarator 21 p0069 A79-14458
Ohmic heating experiments in the L-2 stellarator 21 p0070 A79-14460
Empirical scaling laws for energy confinement in ohmically-heated tokamaks 22 p0253 A79-22240

OIL EXPLORATION
Future programs and prospects for resource exploration from space by the year 2000 [AAS PAPER 78-182] 22 p0243 A79-21275
Fuel release from solid fossil-fuel deposits by electrical induction heating 23 p0446 A79-37285
Recent ooids from different environments - Relationship between petrophysical properties and microstructure 23 p0529 A79-42424
Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy 23 p0536 A79-43575
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska [PB-291916/5] 23 p0546 N79-22970
Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts [PB-291917/3] 23 p0546 N79-22971
Underwater seismic source --- for petroleum exploration [NASA-CASE-NPO-14255-1] 23 p0551 N79-23555
Compendium reports on oil shale technology [PB-293279/6] 23 p0578 N79-26237
North Stanley Polymer Demonstration Project [BETC/RI-78/19] 23 p0588 N79-27313
Re-examination of undiscovered oil resources in the United States [DOE/EIA-0103/9] 23 p0593 N79-27643
The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-E: Executive summary report [PB-294228/2] 24 p0744 N79-29783
Analysis of the productivity of domestic petroleum exploration activities [DOE/EIA-0102/7] 24 p0748 N79-30691

OIL FIELDS
Outlook for world oil into the 21st century with emphasis on the period to 1990 [EPRI-EA-745] 21 p0181 N79-11454
Environmental effects of offshore oil production 22 p0336 N79-16389
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images [E79-10099] 22 p0347 N79-18373
Estimates of New Mexico's future oil production including reserves of the 50 largest pools [PB-291780/5] 23 p0540 N79-22597
Factors affecting the decline rate of old oil production [DOE/EIA-0102/29] 24 p0720 N79-28652
Assessment of potential increased oil production by polymer-waterflood in northern and southern mid-continent oil fields [BETC-0026-4] 24 p0735 N79-29579
Modeling of stationary air pollution sources in the central and western Kern County oil Fields. Task Report. Volume 2: Appendices [PB-294813/1] 24 p0761 N79-30856
Reexamination of the estimation of undiscovered oil resources in the US [DOE/EIA-0103/31] 24 p0781 N79-32618
Oil mining: A technical and economic feasibility study of oil production by mining methods [PB-297134/9] 24 p0797 N79-33549
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text [PB-294812/3] 24 p0803 N79-33639

OIL POLLUTION
Environmental impacts of industrial energy systems in the coastal zone 21 p0075 A79-14722
The effects of oil on marine life --- water pollution effects on ocean biology 23 p0434 A79-35463
Managing oil and gas activities in coastal environments [PB-283677/3] 21 p0199 N79-12576
Oil pollution reports, volume 5, number 2 --- bibliographies [PB-287071/5] 22 p0336 N79-16437
Environmental assessment of the Alaskan Continental Shelf. Volume 1: Biological studies [PB-289154/7] 22 p0344 N79-17366
Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies [PB-289155/4] 22 p0344 N79-17367
Environmental assessment of the Alaskan Continental Shelf. Volume 3: Biological studies [PB-289156/2] 22 p0344 N79-17368

Marine biological effects of OCS petroleum development
[PB-288935/0] 22 p0344 N79-17374
Research summary--oil spills
[PB-293597/1] 23 p0585 N79-26558

OIL RECOVERY
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043
Prerefining true in situ shale oil
21 p0004 A79-10044
Jet fuels from shale oil - A near term technology
21 p0005 A79-10045
Colorado's oil-shale resource for vertical modified in-situ processes
21 p0005 A79-10046
Comparison of shale oils from different sources produced by controlled-state retort
21 p0005 A79-10047
Permeability enhancement using explosive techniques --- georesources recovery techniques
21 p0005 A79-10048
Recovery of oil from oil shale - An overall technological perspective
21 p0073 A79-14698
Factors affecting bitumen recovery by the hot water process
22 p0282 A79-26463
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor
23 p0492 A79-40452
Development of the oil sands of Canada
23 p0524 A79-41812
Assisted recovery of new oil reserves
23 p0525 A79-41814
Ocean and energy --- French book
23 p0529 A79-42350
Results of computer simulation of in situ oil shale retorting
24 p0668 A79-51024
An overview of in situ oil shale technology and recent advances in true in situ retort modeling
24 p0688 A79-51865
Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants
[UCRL-52000-78-6] 21 p0215 N79-14168
Analytical modelling of oil recovery by steam injection
22 p0358 N79-20434
Analysis of coke combustion during in-situ oil recovery
23 p0553 N79-24095
Evaluation of flow properties of dilute aqueous polymer solutions for enhanced oil recovery applications
23 p0556 N79-24408
Feasibility and economics of cogeneration in California's thermal enhanced oil recovery operations
[PB-291794/6] 23 p0566 N79-24517
Challenge of efficiently retorting very nonuniform beds of oil shale rubble
[UCRL-81721-REV-1] 24 p0721 N79-28657
In-situ combustion models for the steam plateau and for fieldwide oil recovery
24 p0732 N79-29353
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
Enhanced oil recovery: Report on a focus group discussion
[DOE/TIC-10021] 24 p0735 N79-29577
Enhance oil recovery: Focus group results
[DOE/TIC-100200] 24 p0735 N79-29578
Assessment of potential increased oil production by polymer-waterflood in northern and southern mid-continent oil fields
[BETC-0026-4] 24 p0735 N79-29579
Modeling of stationary air pollution sources in the central and western Kern County oil Fields. Task Report. Volume 2: Appendices
[PB-294813/1] 24 p0761 N79-30856
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363
Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741
Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes
[SAND-79-0746C] 24 p0769 N79-31744
Energy from in situ processing of Antrim oil shale
[FE-2346-29] 24 p0769 N79-31746
Requirements for the development, management and implementation of research in support of the Department of Energy enhanced oil recovery program
[BETC-2025-1] 24 p0776 N79-31831
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620
Reclamation of synthetic turbine engine oil mixtures
[AD-A071813] 24 p0795 N79-33211
Technology overview reports for eight shale oil recovery processes --- for evaluation of pollution control and environmental impact technologies
[PB-295665/4] 24 p0797 N79-33552

OIL SLICKS
Research summary--oil spills
[PB-293597/1] 23 p0585 N79-26558

OILS
Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962
Thermal energy storage using hot liquids
23 p0451 A79-37879
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242
Kinetics of coal liquefaction to preasphaltenes, asphaltenes and oils
23 p0588 N79-27320
Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils
[CRNL/SUB-79/14274/1] 24 p0776 N79-31827

OKLAHOMA
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373

ONBOARD EQUIPMENT
A critical review and evaluation of published electric-vehicle performance data
21 p0009 A79-10081

OPEN CHANNEL FLOW
Technical support for open-cycle MHD program
[ANL-MHD-78-8] 22 p0361 N79-20507

OPERATING TEMPERATURE
Operating experience at the DOE/Sandia midtemperature Solar Systems Test Facility
21 p0022 A79-10182
Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures --- for fuel cells
21 p0039 A79-11812
A comparison among various flat plate collectors with honeycomb structures
21 p0128 A79-17392
Optimum design parameters of horizontal coaxial cylinders for a solar energy collector
21 p0134 A79-17444
Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844
Sandia Laboratories' Midtemperature Systems Test Facility
23 p0429 A79-35049
Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184

A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors 23 p0530 A79-42895

OPERATIONAL HAZARDS

Health maintenance and health surveillance considerations for an SPS space construction base community [AAS PAPER 78-176] 22 p0243 A79-21273

Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells 22 p0246 A79-21487

How safe is hydrogen 24 p0615 A79-45604

OPERATIONAL PROBLEMS

History and development of condensers at the Geysers geothermal power plant [ASME PAPER 78-JPGC-PWR-18] 21 p0150 A79-18099

Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility --- SuperConducting Magnet System 22 p0235 A79-20532

Environmental factors affecting the installation and operation of gas turbine engines in agricultural aircraft [SAE PAPER 781010] 22 p0274 A79-25892

Transport fuels from natural gas 22 p0292 A79-27897

OPERATIONS RESEARCH

Control problems of the magnetohydrodynamic electrical power generation in power station cooperating with electrical power system 22 p0303 A79-29798

Utility operational experience on the NASA/DOE MOD-0A 200-kW wind turbine [NASA-TM-79084] 22 p0360 N79-20494

OPERATOR PERFORMANCE

Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement 23 p0421 A79-34172

OPTICAL COMMUNICATION

Optical coatings for a space laser communications system 22 p0292 A79-28028

OPTICAL EQUIPMENT

Optics in adverse environments; Proceedings of the Seminar, San Diego, Calif., August 25, 26, 1977 21 p0044 A79-12037

Historical review of adaptive optics technology 21 p0114 A79-17171

10 kW photovoltaic concentrator system design 23 p0519 A79-41070

Relation between concentration and acceptance in solar collectors 24 p0641 A79-47795

OPTICAL FILTERS

On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors 21 p0127 A79-17380

UV blocking filters for polymeric films 24 p0668 A79-51103

OPTICAL MEASUREMENT

Optical evaluation techniques for reflecting solar concentrators 21 p0043 A79-11971

Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models 21 p0065 A79-14117

Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators 24 p0646 A79-48735

Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon 24 p0704 A79-52312

Measurement techniques for solar cells [PB-287519/3] 22 p0343 N79-17352

Analysis of flat mirror V-trough solar concentrator 23 p0579 N79-26472

OPTICAL MEASURING INSTRUMENTS

An optical evaluation laboratory for laser fusion 23 p0447 A79-37667

Optical characterization of high energy laser components 23 p0447 A79-37668

OPTICAL PROPERTIES

An approximate equation for predicting the solar transmittance of transparent honeycombs 21 p0042 A79-11877

Requirements and new materials for fusion laser systems 21 p0082 A79-15138

A survey of laser glasses --- for fusion studies 21 p0083 A79-15140

Analysis of optical behavior and collector performance of a solar concentrator 21 p0107 A79-16545

Transparent conducting coatings for solar cells 21 p0124 A79-17350

Selective coatings for solar energy conversion 21 p0126 A79-17376

Selective absorption of solar energy by ultrafine metal particles 21 p0127 A79-17382

Solar concentrators --- using cheap refractive lenses 21 p0136 A79-17455

Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses 21 p0164 A79-19949

Suitable optical materials for solar collector applications 22 p0239 A79-20823

The dependence of optical properties on the structural composition of solar absorbers - Gold black 22 p0242 A79-21162

Microstructure dependence of the optical properties of solar-absorbing black chrome 22 p0256 A79-22858

First-order design variables for concentrating solar collectors 22 p0293 A79-28141

A flat plate multiple pass solar collector using aqueous optical properties 22 p0293 A79-28144

Optical analysis of solar facility heliostats 22 p0296 A79-28360

Parameters, measurement and criteria of solar materials testing 23 p0431 A79-35072

Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies 23 p0432 A79-35079

Investigation of the optical properties of transparent materials for solar energy applications 23 p0434 A79-35384

Relationship of optical degradation to surface morphology changes in solar absorbers 23 p0446 A79-37158

Thin-film coatings in solar water heating systems 23 p0452 A79-37887

Ni cermet selective absorbers for solar photothermal conversion 24 p0641 A79-47790

Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity 24 p0647 A79-49182

Calculation of the optical characteristics of high-power two-mirror solar furnaces 24 p0648 A79-49183

Optical properties and structure of amorphous silicon films prepared by CVD 24 p0654 A79-50177

The surface microstructure optical properties relationship in solar absorbers - Black chrome 24 p0655 A79-50181

Chromium black coatings for photothermal conversion of solar energy. II - Optical properties 24 p0656 A79-50189

Investigation into the optical characteristics of transparent solar-energy materials 24 p0663 A79-50707

CVD molybdenum thin films in photothermal solar converters 24 p0704 A79-52309

Structure identification and optical and electrical properties of cuprous sulphide layers in relation with solar energy application
24 p0704 A79-52311

Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon
24 p0704 A79-52312

Inhomogeneous surfaces as selective solar absorbers
24 p0704 A79-52313

Development of surfaces optically suitable for flat solar panels
[NASA-CR-150831] 21 p0173 N79-10522

Optical coatings for solar cells and solar collectors. Citations from the NTIS data base
[NTIS/PS-78/1341/3] 22 p0350 N79-18465

Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base
[NTIS/PS-78/1342/1] 22 p0350 N79-18466

Helios model for the optical behavior of reflecting solar concentrators
[SAND-76-0347] 24 p0774 N79-31806

OPTICAL PUMPING

Frequency doubling of a solar pumped Nd:YAG laser
21 p0044 A79-12062

Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space
21 p0110 A79-16623

A new concept for solar pumped lasers
21 p0110 A79-16624

Optical coatings for a space laser communications system
22 p0292 A79-28028

Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981

Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202

Blackbody optical pumping of carbon dioxide laser mixtures
21 p0203 N79-13343

OPTICAL REFLECTION

General principles of multielement concentrating system design --- solar collectors
21 p0054 A79-13291

Reflecting horizontal collector
21 p0128 A79-17395

Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138

Cavity-type surfaces for solar collectors
22 p0283 A79-26497

A novel design of evacuated-concentrating spherical collector
23 p0359 A79-33998

Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372

An optical valve for flat-plate solar energy collectors
24 p0607 A79-45154

Optical properties of aggregated gold on aluminum
24 p0669 A79-51181

Helios model for the optical behavior of reflecting solar concentrators
[SAND-76-0347] 24 p0774 N79-31806

OPTIMAL CONTROL

A microprocessor based solar controller
21 p0082 A79-14979

Operation and control of wind-electric systems
21 p0086 A79-15575

Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477

Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822

An optimal standard for solar heating systems
[ASME PAPER 78-WA/DSC-19] 21 p0159 A79-19765

Optimal control of on-board and station flywheel storage for rail transit systems
[ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771

Control problems of the magnetohydrodynamic electrical power generation in power station cooperating with electrical power system
22 p0303 A79-29798

Control strategy for a variable-speed wind energy conversion system
22 p0303 A79-29800

Optimal control of sun tracking solar concentrators
23 p0526 A79-41831

OTEC system response and control analysis --- optimization of thermal cycle with seawater pumps
24 p0625 A79-45850

Toward optimal control of solar energy systems
24 p0643 A79-47944

Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946

Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

Singular optimal control of solar space heating systems
24 p0644 A79-48009

The application of optimal control theory hybrid electric transit systems
[AD-A059365] 21 p0220 N79-14559

Design of optimum compressed air energy storage systems
[CONF-7811101-1] 23 p0565 N79-24508

A control system analysis of the energy growth model: Coal
24 p0736 N79-29595

OPTIMIZATION

Computer aided optimization of integrated coal gasification combined cycle power plants
21 p0008 A79-10075

Optimum design conditions for a power plant at a vapor dominated geothermal resource, Pacific Gas and Electric's The Geysers Power Plant Unit 16
21 p0014 A79-10121

Economic optimization of the coal-fired MHD Steam Power Plant
21 p0016 A79-10134

Cost minimization of photovoltaic power supplies
21 p0021 A79-10171

Development of gas turbine performance seeking logic
[ASME PAPER 78-GT-13] 21 p0031 A79-10257

A vacuum solar thermal collector with optimal concentration
21 p0043 A79-11970

Optimum selection of a wind turbine generator system
[AIAA PAPER 78-1774] 21 p0062 A79-13871

Optimal sizing of solar collectors by the method of relative areas
21 p0066 A79-14263

Design optimization for solar array of multiple collector types
21 p0071 A79-14677

Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739

Determining optimal angles of nonconvex solar battery panel mounting
21 p0080 A79-14837

Capital cost system optimization of OTEC power modules
21 p0101 A79-16249

A study for optimum use of metallic plates for thermal storage in solar processes
21 p0122 A79-17331

Cost effective optimum design of solar air heaters
21 p0127 A79-17386

Optimum collection geometries for copper tube - copper sheet flat plate collectors
21 p0127 A79-17387

Optimal profile of solar energy collectors
21 p0130 A79-17408

Solar thermal collectors using planar reflector
21 p0131 A79-17412

Solar collector optimization
21 p0132 A79-17418

Design and optimization of a flat plate collector for cooling application
21 p0132 A79-17419

Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422

Two thermodynamic optima in the design of sensible heat units for energy storage
21 p0150 A79-18091

Review of optimization and economic evaluation of potential tidal power developments in the Bay of Fundy
21 p0152 A79-18111

On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SCL-13] 21 p0163 A79-19845

Universal generator storer curves --- Economic and relative size optimization of solar photovoltaic energy
22 p0238 A79-20799

Optimization of an ideal thermionic converter
22 p0241 A79-20941

Optimal decisions for long-term operation of hydropower systems
22 p0245 A79-21473

Optimization of a diagonal MHD channel
22 p0247 A79-21628

Optimizing the conversion mode for solar energy
22 p0258 A79-23125

Optimization method of isotopic thermoelectric microgenerator geometry
22 p0260 A79-23613

Optimum collector slope for residential heating in adverse climates
22 p0263 A79-23761

Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819

Optimality criteria in the compensation of the longitudinal boundary effect in induction MHD machines
22 p0258 A79-29277

Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551

Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature --- for hydrogen production
23 p0382 A79-32875

A practical technique for basic windmill design
23 p0387 A79-33238

Optimization of a fixed solar thermal collector
23 p0400 A79-34000

Wind site selection for optimum wind power systems
23 p0406 A79-34049

The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075

Energy policy optimization by environmental systems analysis
23 p0422 A79-34180

Performance matching and optimization of wind powered water pumping systems
23 p0479 A79-39842

Gears for wind power plants
23 p0484 A79-40119

Optimization of power absorption from sea waves
23 p0486 A79-40199

An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants
23 p0487 A79-40369

Optimization of terrestrial photovoltaic power systems
23 p0520 A79-41076

Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822

Optimal value of the rated speed of a wind generator
23 p0527 A79-41948

Structural optimization of SMC line focusing collectors
23 p0534 A79-43295

Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate
24 p0602 A79-44263

Design of optimum compressed air energy-storage systems
24 p0631 A79-46308

The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station
24 p0641 A79-47700

An optimized grid design for a sun-concentrator solar cell
24 p0645 A79-48273

Optimum grid design for a nonuniformly illuminated sun-concentrator solar cell
24 p0645 A79-48274

Hydrogen from coal using pressurized gasification
24 p0687 A79-51853

Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995

Adaptation for the economy or adaptation for energy conservation --- passenger aircraft design
[AAAF-NT-77-23] 23 p0551 N79-23537

Performance optimization of an MHD generator with physical constraints
[NASA-TM-79172] 23 p0558 N79-24446

Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121

Multiobjective analysis in a national energy system model --- conferences
[BNL-24371] 24 p0758 N79-30823

ORBIT CALCULATION

Particle orbits in field-reversed mirrors --- for plasma confinement in fusion reactor
22 p0253 A79-22239

Alpha transport and blistering in tokamaks
22 p0253 A79-22243

Single-particle behaviour in plasmas
22 p0257 A79-22977

ORBIT PERTURBATION

Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control
21 p0148 A79-17792

ORBIT TRANSFER VEHICLES

Satellite Power Systems (SPS) concept definition study. Volume 5: Transportation and operations analysis --- heavy lift launch and orbit transfer vehicles for orbital assembly
[NASA-CR-158067] 21 p0225 N79-15139

ORBITAL ASSEMBLY

Construction of a 10GWe solar power satellite
21 p0003 A79-10029

Space platforms for building large space structures
21 p0032 A79-10511

Structures for solar power satellites
21 p0032 A79-10513

On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288

Technology and development requirements of the solar power satellite
21 p0046 A79-12267

Health maintenance and health surveillance considerations for an SPS space construction base community
[AAS PAPER 78-176] 22 p0243 A79-21273

Lunar resources utilization - An economic assessment --- of manufacturing and construction of large structures in space
[AIAA PAPER 79-1412] 23 p0426 A79-34845

Orbital demonstration - The prelude to large operational structures in space
[IAF PAPER 79-207] 24 p0710 A79-53357

Satellite Power Systems (SPS) concept definition study. Volume 5: Transportation and operations analysis --- heavy lift launch and orbit transfer vehicles for orbital assembly
[NASA-CR-158067] 21 p0225 N79-15139

The array automated assembly task for the low cost solar array project, phase 2
[NASA-CR-158538] 23 p0560 N79-24469

ORBITAL MECHANICS

New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298

ORBITAL SPACE STATIONS

Space platforms for building large space structures
21 p0032 A79-10511

Overview of future programs - USA --- manned orbital space missions
21 p0116 A79-17275

Orbital demonstration - The prelude to large operational structures in space
[IAF PAPER 79-207] 24 p0710 A79-53357

Military needs for orbital power
21 p0169 N79-10127

An economic analysis of a commercial approach to the design and fabrication of a space power system
[NASA-TM-79153] 23 p0539 N79-22193

ORBITAL WORKERS

Manned remote work station development article
[NASA-CR-151871] 22 p0330 N79-16057

ORBITER PROJECT

The 25 kW power module updated baseline system --- for space transportation system payloads
[NASA-TM-78212] 21 p0226 N79-15247

ORDER-DISORDER TRANSFORMATIONS

Order-disorder transformations and the nature of the copper-sulphide layer in Cu/x/S/CdS solar cells
23 p0442 A79-36789

OREGON

Amended Oregon State energy conservation plan, 1978 Prepared in response to the Energy Policy and Conservation Act of 1975 (PL 94-163), and the Energy Conservation and Production Act of 1976 (PL 94-385)
[PB-286078/1] 21 p0231 N79-15430

Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0585 N79-26539

Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747

ORGANIC CHEMISTRY

Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419

ORGANIC COMPOUNDS

An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678

Chemical characterization of shale oil and related fuels
24 p0665 A79-50888

Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298

The anaerobic attached film expanded bed reactor for the treatment of dilute organic wastes
22 p0356 N79-19928

Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0756 N79-33346

ORGANIC LIQUIDS

Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124

Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324

Use of organic fluids in solar turbines
22 p0269 A79-24621

Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/
24 p0636 A79-46757

ORGANIC MATERIALS

Performance tests of organic dyes in a planar solar concentrator with ribbon photovoltaic cells
23 p0519 A79-41074

Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391

ORGANIC WASTES (FUEL CONVERSION)

The Garrett Energy Research biomass gasification process
21 p0004 A79-10037

Liquid fuels from biomass
[AIAA PAPER 78-1781] 21 p0063 A79-13876

Source emissions factors for refuse derived fuels
21 p0082 A79-15084

Coupled heat and organic wastes stream pollution
21 p0086 A79-15602

Biomass and wastes as energy resources - 1977 update
21 p0091 A79-15868

Industrial wastes to energy
21 p0096 A79-15916

Energy from urban waste
21 p0096 A79-15917

Co-disposal of sewage sludge using refuse-derived fuel
21 p0097 A79-16098

Urban wastes as an energy source
21 p0115 A79-17220

Energy through solar aided bio-gas systems
21 p0125 A79-17367

Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility
[ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741

An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier
23 p0381 A79-32592

Fuel gas production from animal residue. I - Technical perspective
23 p0381 A79-32593

Fuel gas production from animal residue. II - An economic assessment
23 p0381 A79-32594

The microbial production of methane from the putrescible fractions of sorted household waste
23 p0396 A79-33753

The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754

Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147

ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148

Net energy from municipal solid waste
23 p0418 A79-34149

Solid waste as a source of energy for industry - An overview
23 p0424 A79-34461

Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908

Electricity from municipal wastes
23 p0454 A79-37911

Use of low grade fuel derived from domestic and trade wastes
23 p0454 A79-37912

Evaluation of densified refuse derived fuels for use in pulverized coal-fired steam generators
23 p0491 A79-40422

Planning for resource recovery in the 'Big Apple' --- New York City plans for refuse utilization
23 p0491 A79-40424

Methane production from manure
23 p0494 A79-40741

Potential of biomass to substitute for petroleum in Canada
23 p0494 A79-40743

Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371

Classification and energy evaluation of urban wastes
23 p0525 A79-41817

Gasification of solid waste - Potential and application of co-current moving bed gasifiers
23 p0536 A79-43574

Bio-electrochemical conversion of refuse to energy
24 p0659 A79-50353

Biomethanation of Minnesota reed sedge peat
24 p0662 A79-50560

Resource recovery and recycling --- Book
24 p0706 A79-52570

Conversion of biomass materials into gaseous products, phase 1
[SAN-1241-77-1] 21 p0171 N79-10237

Biomass utilization in Minnesota
[PB-282531/3] 21 p0171 N79-10241

Parameters for legislative consideration of bioconversion technologies
[PB-284742/4] 21 p0194 N79-12250

Emergence of biotechnology
[TID-28983] 23 p0567 N79-24626

Technical and economic feasibility study for the industrial utilization of waste derived fuel gas
[SAN-2092-T1] 24 p0733 N79-29372

Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433

Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0546/6] 24 p0767 N79-31434

ORGANIZATIONS
Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555
ORIFICE FLOW
Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344
ORTHO HYDROGEN
Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806
ORTHO PARA CONVERSION
Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806
OSCILLATING CYLINDERS
A theory for wave-power absorption by two independently oscillating bodies
21 p0151 A79-18103
OSCILLATING FLOW
Review of liquid piston pumps and their operation with solar energy
[ASME PAPER 79-SOL-4] 22 p0308 A79-30542
Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column
23 p0480 A79-39845
OSMOSIS
Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133
Power plant systems based on solar energy --- powered by sea water evaporation-produced osmotic pressure head mechanical energy
21 p0142 A79-17508
The use of wave powered systems for desalination - A new opportunity --- seawater pumping for reverse osmosis
21 p0151 A79-18108
Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997
Conceptual design and cost study for a dual-purpose nuclear-electric reverse osmosis seawater conversion plant
[ORNL/TM-6821] 24 p0768 N79-31438
OSO-8
Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017
OTTO CYCLE
The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370
OUTER SPACE TREATY
Solar energy and the 'Common Heritage of Mankind' --- international agreements regarding usage
[IAF PAPER 78-SL-45] 21 p0035 A79-11356
Satellite Power System (SPS) international agreements
[NASA-CR-157437] 23 p0549 N79-23501
OUTGASSING
Outgassing tests of fiber-epoxy composite materials
[SAND-78-7075] 23 p0552 N79-24071
OUTPUT
Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527
OXIDATION
The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution --- fuel cell electrocatalysis
21 p0037 A79-11795
Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986
The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant
21 p0076 A79-14757
Energy storage using the reversible oxidation of barium oxide
22 p0242 A79-21169
Oxidation of SO_2 on the surface of fly ash particles under low relative humidity conditions
22 p0277 A79-26038
Char gasification. II - Oxidation results
24 p0667 A79-50914
Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442
Redox flow cell development and demonstration project, calendar year 1977
[NASA-TM-79067] 23 p0558 N79-24445
OXIDATION RESISTANCE
Selective coatings for aluminum and steel solar absorbers
21 p0058 A79-13647
Relationship of optical degradation to surface morphology changes in solar absorbers
23 p0446 A79-37158
The chemical stability of kerosene fractions
23 p0529 A79-42275
OXIDATION-REDUCTION REACTIONS
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates --- in fuel cell electrodes
21 p0038 A79-11808
Redox flow cell energy storage systems
[AIAA PAPER 79-0989] 23 p0458 A79-38191
Problems in the redox flow cell power system for bulk energy storage
24 p0659 A79-50354
Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization
24 p0660 A79-50538
Recent advances in Redox flow cell storage systems
24 p0684 A79-51837
Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479
Treatment of molybdenite ore using a 2 kW solar furnace
[LA-UR-79-6] 23 p0561 N79-24478
Recent advances in redox flow cell storage systems
[NASA-TM-79186] 23 p0581 N79-26505
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728
OXIDE FILMS
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343
Transparent conducting coatings for solar cells
21 p0124 A79-17350
Thin-film coatings in solar water heating systems
23 p0452 A79-37887
Thin film solar absorber consisting of Au-particles in SiO_2
23 p0465 A79-38599
The photovoltaic properties of thin copper oxide films
23 p0499 A79-40909
Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191
Properties of chemically sprayed SnO_2 antireflecting films on Si solar cells
24 p0656 A79-50196
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311
OXIDIZERS
Evaluation of the use of oxygen as oxidant in fossil fuel fired open cycle MHD-steam energy conversion processes
22 p0353 N79-19444
OXYGEN
Study of the interaction of H_2O and O_2 with the surface of TiO_2 by electron stimulated desorption and Auger and characteristic loss spectroscopies
21 p0037 A79-11793
O_2 reduction kinetics in concentrated acids --- in fuel cells
21 p0038 A79-11809
The effects of wall temperature on light impurities in Alcator --- tokamak device
22 p0313 A79-31188
Hydrogen production at reduced cost through electrolysis and buoyancy
23 p0414 A79-34116
Oxygen adsorption on stainless steel --- in tokamak reactors
23 p0445 A79-36965

Evaluation of the use of oxygen as oxidant in fossil fuel fired open cycle MHD-steam energy conversion processes
22 p0353 N79-19444
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499
Development of combustion data to utilize low-Btu gases as industrial process fuels
[FE-2489-30] 23 p0576 N79-26143

OXYGEN COMPOUNDS
Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation
[EPRI-AF-913] 24 p0795 N79-33344

OXYGEN IONS
Evidence for neutral-beam-injected oxygen impurities in 2XIIB --- mirror confined plasma
22 p0292 A79-27887

OZONE
On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052

P

P-I-N JUNCTIONS
Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904

P-N JUNCTIONS
Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349
Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768
A two-junction cascade solar-cell structure
22 p0256 A79-22856
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242
An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610
Silicon solar cells for operation in concentrated sunlight
23 p0441 A79-36780
Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785
Analysis of an edge-illuminated graded-gap solar cell
23 p0442 A79-36793
Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890
Analysis of ion-implanted solar cells
23 p0508 A79-40991
Defect free very shallow p+/n junction and associated photovoltaic effect
23 p0520 A79-41082
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
Variation of photovoltaic effect in vertical n/p-junction solar cells
24 p0629 A79-46157
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications
24 p0629 A79-46249
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054
Dependence of the photoelectric parameters of photovoltaic cells on illuminance
24 p0647 A79-49181
Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity
24 p0647 A79-49182
Extension of a theorem used in the investigation of P-N junctions with the scanning electron microscope to arbitrary geometries and arbitrarily inhomogeneous material
24 p0648 A79-49211
Possibilities of new materials for solar photovoltaic cells
24 p0655 A79-50178
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186
Back wall solar cell
[NASA-CASE-LEW-12236-2] 21 p0217 N79-14528
Modeling of thin, back-wall silicon solar cells
24 p0784 N79-32650
High efficiency cell geometry
24 p0784 N79-32653

P-N-P JUNCTIONS
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180

P-TYPE SEMICONDUCTORS
Suppression of vaporization in copper-silver-selenide thermoelectric materials
21 p0027 A79-10224
Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy
22 p0259 A79-23604
Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion
22 p0260 A79-23615
Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator
22 p0260 A79-23616
Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992

PACIFIC NORTHWEST (US)
Wind power potential in the Pacific Northwest
22 p0244 A79-21334
Region at the crossroads: The Pacific Northwest searches for new sources of electric energy
[PB-284691/3] 21 p0222 N79-14583

PACKAGING
Status of wraparound contact solar cells and arrays --- for spacecraft electric propulsion
21 p0001 A79-10014
Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482
Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075
Spent fuel handling and packaging program
[RHO-LD-78-4-AUG] 24 p0777 N79-32081

PACKING DENSITY
High efficiency, high density terrestrial solar panels
23 p0499 A79-40905
High efficiency, high density terrestrial panel --- for solar cell modules
[NASA-CR-162167] 24 p0770 N79-31765

PALEONTOLOGY
Continental geotherms during the Archaean --- heat production in ancient earth crust
22 p0269 A79-24620

PALLADIUM ALLOYS
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686

High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy
22 p0249 A79-21689

PANELS

Filon panels - A technical report --- fiberglass reinforced plastics for solar collectors
21 p0031 A79-10403

Cooling applications of thermic diode panels
[ASME PAPER 78-WA/SOL-10] 21 p0163 A79-19842

A theoretical analysis of solar collector/storage panels
[ASME PAPER 78-WA/SOL-11] 21 p0163 A79-19843

Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

High efficiency, high density terrestrial solar panels
23 p0499 A79-40905

A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919

Weight minimization of sandwich type solar collector panels
24 p0670 A79-51727

Monolithic solar cell panel of amorphous silicon
24 p0712 A79-53496

An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445

PAPER (MATERIAL)

Energy requirements of the US pulp and paper industry
[ANL/EES/TM-42] 24 p0800 N79-33587

PAPERS

Passive solar energy planning aid kit for solar energy systems engineers
[CONF-780337-P3] 24 p0775 N79-31815

PARA HYDROGEN

Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806

PARABOLAS

Performance testing of the Hexcel Parabolic Trough Solar Collector
[SAND-76-0381] 21 p0221 N79-14569

PARABOLIC BODIES

Evaluation of a plastic parabolic concentrator for terrestial photovoltaic applications
23 p0508 A79-40995

PARABOLIC REFLECTORS

Effects of pointing errors on receiver performance for parabolic dish solar concentrators
21 p0020 A79-10167

Transient energy removal in cylindrical parabolic collector systems
21 p0020 A79-10168

Performance of evacuated solar collectors with compound parabolic concentrators
21 p0089 A79-15855

A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439

Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440

An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442

Geometrical aspects of a cylindrical parabolic collector
21 p0134 A79-17443

Design fabrication and testing of three meter diameter parabolic dish heliostat system
21 p0135 A79-17447

Distribution of beam radiation of the receiver plane of a CPC solar concentrator --- Compound Parabolic Concentrators
21 p0135 A79-17451

Performance of solar concentrators - A theoretical study
21 p0135 A79-17453

Manufacture of curved glass mirrors for linear concentrators
21 p0136 A79-17459

Laser ray trace tester for parabolic trough solar collectors
21 p0144 A79-17619

A comparison of compound parabolic and simple parabolic concentrating solar collectors
22 p0262 A79-23754

A parabolic solar reflector for accurate and economic producibility
22 p0293 A79-28145

Analysis of a Cassegrain solar furnace
22 p0293 A79-28147

Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354

Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector
22 p0317 A79-31408

Cylindrical parabolic collector optimization for interfacing with steam turbine generators
22 p0322 A79-31448

A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997

Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024

Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206

Critical study of energy parameters of solar energy /illumination and concentration/ - Application to catoptric collectors
23 p0463 A79-38584

Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585

Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593

Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259

Concentration of a cassegrain solar furnace
24 p0658 A79-50344

Solar parabolic dish thermal power systems - Technology and applications
24 p0674 A79-51755

The parabolic concentrating collector: A tutorial
[NASA-CR-158426] 22 p0359 N79-20491

Horizontally mounted solar collector
[NASA-CASE-MFS-23349-1] 23 p0546 N79-23481

Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764

PARABOLOID MIRRORS

Design, construction, and testing of a Fixed Mirror Solar Concentrator field
21 p0020 A79-10164

Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971

Nonimaging solar concentrators
21 p0043 A79-11973

Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292

Large-aperture radiant solar energy concentrators
21 p0135 A79-17452

Shading and spacing in paraboloidal collector arrays
21 p0150 A79-18025

Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

Contribution to the study of optimal conditions for optical concentration in solar power plant designs - Reduction of the radiation spot provided by a field of heliostats by use of optimized conical mirrors
23 p0382 A79-32952

Practical design considerations for CPC solar collectors --- Compound Parabolic Concentrator
23 p0439 A79-36634

Solar radiation concentrator for uniform irradiation of flat energy receivers and converters
24 p0602 A79-44260

Accuracy and energy characteristics of paraboloidal heliostat system
24 p0602 A79-44261
Composite paraboloidal radiant energy concentrators
24 p0602 A79-44262
Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183
Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner
[SAND-78-0700] 21 p0185 N79-11496
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 2: Technical
[MAC-REP-E3256-VOL-2] 24 p0782 N79-32639

PARAFFINS
Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319
Theoretical and experimental analysis of a latent heat storage system --- solar energy absorbers
21 p0121 A79-17323
Latent heat storage --- using paraffin
23 p0388 A79-33249
Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386

PARALLEL PLATES
An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398
Wave-tank experiments on an immersed parallel-plate duct --- for testing performance of sub-sea wave energy converter
22 p0258 A79-23306

PARAMETERIZATION
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14876] 21 p0214 N79-13871
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14946] 21 p0214 N79-13872
Computerized simulation and parameterization of a new high-performance tubular solar collector
23 p0539 N79-22163

PARKS
Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming
23 p0551 N79-23551

PARTICLE ACCELERATOR TARGETS
Fusion power with particle beams
21 p0034 A79-11121
A new method for producing cryogenic laser fusion targets
21 p0085 A79-15332
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39538

PARTICLE ACCELERATORS
Fusion power with particle beams
21 p0034 A79-11121

PARTICLE BEAMS
Fusion power with particle beams
21 p0034 A79-11121

PARTICLE COLLISIONS
Collisional transport --- particle diffusion and heat transport in tokamak
21 p0078 A79-14780
Calculation of the Q factor for a two-component tokamak
22 p0324 A79-31763

PARTICLE DIFFUSION
Thermophoresis - Enhanced deposition rates in combustion turbine blade passages
[ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790

PARTICLE FLUX DENSITY
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

PARTICLE INTERACTIONS
Effect of electrode shielding on beamlet-beamlet interaction in multiaperture sources
21 p0154 A79-18481

PARTICLE MOTION
Single-particle behaviour in plasmas
22 p0257 A79-22977
On the motion of runaway electrons in momentum space --- analysis for multi-component plasma in tokamaks
22 p0291 A79-27880
Theta-pinch description from classical electrodynamics
24 p0640 A79-47602

PARTICLE SIZE DISTRIBUTION
Characterization and formation of submicron particles in coal-fired plants
23 p0460 A79-38316
Particle size variation in the solvent refined coal process
23 p0492 A79-40451
Electrostatic separation of coal macerals
24 p0603 A79-44525
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231
Evaluations of novel particulate control devices
[PB-283973/6] 21 p0199 N79-12601
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654

PARTICLE TRAJECTORIES
Particle orbits in field-reversed mirrors --- for plasma confinement in fusion reactor
22 p0253 A79-22239
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

PARTICLES
Surfactant-assisted liquefaction of particulate carbonaceous substances
[NASA-CASE-NPO-13904-1] 21 p0179 N79-11152

PARTICULATE SAMPLING
Particulate and sulfur oxide control options for conventional coal combustion
21 p0092 A79-15883
The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil
21 p0156 A79-19219
Heavy duty diesel particulate emission factors
23 p0461 A79-38481
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231
Air quality assessment of particulate emissions from diesel-powered vehicles
[PB-286172/2] 21 p0223 N79-14641
Low-sulfur western coal use in existing small and intermediate size boilers --- particulate sampling and combustion efficiency
[PB-287937/7] 22 p0346 N79-18061
Balloon-borne particulate sampling for monitoring power plant emissions
[PB-290873/8] 23 p0566 N79-24543
Solvent Refined Coal (SRC) process: Environmental program. Volume 3: Pilot plant development work, part 5
[FE-0496-T8] 23 p0588 N79-27329

PASSENGER AIRCRAFT
The improved rigid airship --- design characteristics and cost analysis
21 p0086 A79-15572
Adaptation for the economy or adaptation for energy conservation --- passenger aircraft design
[AAAF-NT-77-23] 23 p0551 N79-23537
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040

PATENT POLICY
- Published patent applications and patents resulting from German government sponsored research and development [BMFT-FB-T-78-31] 24 p0794 N79-33151

PATTERN METHOD (FORECASTING)
- Projections of energy supply and demand for the 1978-1979 winter heating season [DOE/EIA-0102/33] 24 p0758 N79-30815

PAYLOAD MASS RATIO
- Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space 21 p0110 A79-16623

PEBBLE BED REACTORS
- Moving bed heat transfer for advanced power reactor applications 23 p0416 A79-34133
- Nitrogen fixation with fusion heat 24 p0695 A79-51948
- Fusion energy for alternative applications: The generation of synthetic gaseous fuels --- approach to high temperature fusion reactor design [ANL/FPP-TM-117] 24 p0755 N79-30790

PELLETS
- Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma 22 p0255 A79-22369
- Pellet X-ray spectra for laser fusion reactor designs 22 p0291 A79-27878
- On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors 24 p0705 A79-52352

PELTIER EFFECTS
- A solid-state solar-powered heat transfer device 24 p0667 A79-50932

PENETROMETERS
- Coal-shale interface detection [NASA-CASE-MFS-23720-3] 23 p0569 N79-25443

PENNSYLVANIA
- Water/energy management and evaluation model for Pennsylvania [PB-287577/1] 22 p0343 N79-17353
- Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum [DOE/EIA-0102/22] 24 p0725 N79-28752
- Clean energy from coal [PETC-1000] 24 p0733 N79-29370

PERFORMANCE
- Interim performance criteria for solar heating and cooling systems in residential buildings, second edition [PB-289967/2] 22 p0372 N79-21630
- Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants [CONF-780599-1] 24 p0776 N79-31830

PERFORMANCE PREDICTION
- Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance 21 p0001 A79-10017
- Intelsat V solar array design and development summary 21 p0002 A79-10018
- Preliminary controller evaluation for the MERC/CTIU using a mathematical process model --- of Component Test and Integration Unit in fluidized bed combustion 21 p0008 A79-10073
- Thermal modeling of coal-fired MHD plant components 21 p0017 A79-10138
- Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation 21 p0020 A79-10163
- Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine 21 p0024 A79-10202
- Analytical predictions of selenide RTG power degradation 21 p0026 A79-10223
- Modified silicon-germanium alloys with improved performance --- thermoelectric material 21 p0027 A79-10225
- Toroidal Accelerator Rotor Platforms for wind energy conversion 21 p0029 A79-10240
- Ultra-thin silicon solar cells for high performance panel applications 21 p0029 A79-10243
- Asymptotic behaviour as a guide to the long term performance of solar water heating systems 21 p0041 A79-11872
- Predicted performance of heliostats for ERDA's 10 MWe power plant 21 p0044 A79-12045
- Performance prediction methods for horizontal axis wind turbines 21 p0045 A79-12244
- Predicting the performance of passive solar-heated buildings 21 p0063 A79-13899
- Long-term average performance of the Sunpak evacuated-tube collector 21 p0089 A79-15854
- Simple procedure for predicting long term average performance of nontracking and of tracking solar collectors 21 p0091 A79-15873
- A graphical approach to the efficiency of flat-plate collectors 21 p0102 A79-16422
- Performance of vacuum tube solar collector systems 21 p0102 A79-16424
- The El Camino Real Solar Cooling Demonstration Project 21 p0102 A79-16425
- Thermionics and its application to the SPS --- solar power satellite for energy conversion 21 p0109 A79-16616
- Energy and input-output analysis --- for predicting impact on U.S. economy 21 p0115 A79-17223
- Flat plate collector dynamic evaluation 21 p0128 A79-17390
- A parametric investigation on flat-plate solar collectors 21 p0128 A79-17391
- Design, construction and performance of Fresnel lens for solar energy collection 21 p0136 A79-17456
- Solar receiver performance of point focusing collector system [ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838
- Stochastic predictions of solar cooling system performance [ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848
- Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results 22 p0242 A79-21166
- Prediction of the behavior of a solar storage system by means of recurrent stochastic models --- of insolation 22 p0258 A79-23295
- Prediction of the performance of solar heating systems utilizing annual storage 22 p0263 A79-23760
- System performance predictions for solar cooling using regional stochastic weather models 22 p0264 A79-23781
- Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978 22 p0266 A79-24309
- Modeling two-phase flow in a swirl combustor 22 p0280 A79-26189
- Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems 22 p0280 A79-26191
- Performance of combined solar-heat pump systems 22 p0285 A79-26817
- A Markov model of solar energy space and hot water heating systems 22 p0295 A79-28353
- Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors 22 p0295 A79-28356
- Optical analysis of solar facility heliostats 22 p0296 A79-28360

A flywheel energy storage and conversion system for solar photovoltaic applications
[ASME PAPER 79-SOL-1] 22 p0307 A79-30539
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
Mathematical modelling of passive solar systems
22 p0321 A79-31441
Measured and modeled passive performance in Montana --- for solar heating and thermal storage
22 p0322 A79-31445
A practical technique for basic windmill design
23 p0387 A79-33238
A hybrid cyclogiro-Darrieus-rotor wind turbine
23 p0387 A79-33243
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385
Accuracy of empirical relations for flat plate collector performance prediction
23 p0398 A79-33987
A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997
A novel design of evacuated-concentrating spherical collector
23 p0399 A79-33998
Effect of operating variables on reactor performance in the Synthoil coal conversion process
23 p0412 A79-34099
A life prediction methodology for encapsulated solar cells
23 p0428 A79-35041
Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056
Fossil fuel heat pumps for domestic, commercial and industrial space heating
23 p0449 A79-37852
Windpower generation on a large scale
23 p0452 A79-37891
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898
Solar collector sizing and design - An overview
[AIAA PAPER 79-0975] 23 p0457 A79-38181
Thermal performance of integrated solar collector evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182
Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183
Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607
The performance of solar water heating systems with flat plate collectors
23 p0468 A79-38620
Central receiver solar heating system
23 p0468 A79-38621
The design of four solar houses in Zoetermeer, The Netherlands
23 p0471 A79-38651
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653
Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659
Wind turbines for electric utilities - Development status and economics
[AIAA PAPER 79-0965] 23 p0475 A79-38888
Flowfield measurements in the vicinity of the rotor of a 10 kw windmill
[AIAA PAPER 79-0969] 23 p0475 A79-38889
Performance of a collector/storage solar water heater
23 p0479 A79-39843
Program overview for the wind characteristics program element of the United States Federal Wind Energy Program
23 p0482 A79-40108
Offshore wind power model estimates
23 p0482 A79-40110
The interaction of windmill wakes
23 p0482 A79-40111
Wake interaction in an array of windmills - Theory and preliminary results
23 p0483 A79-40112
Performance evaluation of wind power units
23 p0483 A79-40115
Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033
Dynamic modeling of water- and air-heating solar collectors
23 p0531 A79-42897
Estimation of wind characteristics at potential wind energy conversion sites
23 p0534 A79-43377
Parametric performance analysis of a Darrieus wind turbine system
23 p0536 A79-43676
Orientation studies for single-axis concentrating collectors
23 p0537 A79-43677
Performance of windmills in a closely spaced array
23 p0537 A79-43681
Free vortices from a wing for wind turbine systems
23 p0537 A79-43683
The influence of environmental parameters on flat plate solar collector performance
24 p0604 A79-44557
A new three-dimensional equivalent circuit of diagonal type MHD generator
24 p0605 A79-44914
Graphical representation of solar collector performance
24 p0609 A79-45216
Collector testing in the MSFC simulator --- for solar collector performance
24 p0611 A79-45230
Dedicated nuclear facilities for electrolytic hydrogen production
24 p0614 A79-45592
Experimental and analytical OTEC studies at ORNL
24 p0626 A79-45859
Design of optimum compressed air energy-storage systems
24 p0631 A79-46308
The distributed flow, below atmospheric pressure solar collector
24 p0631 A79-46314
Requirements assessment of wind power plants in electric utility systems
24 p0633 A79-46531
A simple theory of back-surface-field /BSF/ solar cells
24 p0637 A79-47051
Analysis of an evacuated cylindrical solar collector
24 p0642 A79-47800
Air buoyant vehicles - Energy efficient aircraft
[AIAA PAPER 79-1862] 24 p0643 A79-47919
A parameter sensitivity analysis of the rectified superconducting alternator model
24 p0646 A79-48654
Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system
24 p0670 A79-51729
Performance of a large, salt-gradient solar pond
24 p0671 A79-51735
Solar thermal systems long-term performance predictions using closed-form solutions
24 p0672 A79-51740
Prediction of vehicle performance and its sensitivity to component improvements Application to electric and H2-fueled vehicles
24 p0677 A79-51782
Elementary design guidelines for Stirling engines
24 p0689 A79-51874
Analysis of a heat exchanger - Thermoelectric generator system
24 p0699 A79-51978
The effects of electron thermal conductivity on thermionic energy converters
24 p0700 A79-51990
Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995
Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

Operation of self-excited generators for windmill application 24 p0706 A79-52538

Evaluation of models to predict insolation on tilted surfaces 24 p0712 A79-53491

Prediction of the performance of solar heating systems over a range of storage capacities 24 p0712 A79-53492

Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), 1V [PB-286294/4] 21 p0227 N79-15308

Performance characteristics of automotive engines in the United States. Second series, report no. 6: 1976 Nissan diesel 198 CID (3.2 liters), F. I. [PB-286295/1] 21 p0227 N79-15309

Performance characteristics of automotive engines in the United States. Second series, report no. 7: 1977 Ford 171 CID (2.8 liters), 2V [PB-286296/9] 21 p0227 N79-15310

Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V [PB-286298/5] 21 p0227 N79-15312

Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system [PB-286301/7] 21 p0228 N79-15315

Initial comparison of single cylinder Stirling engine computer model predictions with test results [NASA-TM-79044] 22 p0337 N79-16721

Phase one/base data for the development of energy performance standard for new buildings. Task report: Building classification [PB-286904/8] 22 p0355 N79-19468

Simulation of fluidized bed coal combustors [NASA-CR-159529] 22 p0359 N79-20487

Systematic computation of the performance of photovoltaic based on first principles [UCID-1804-PT-1] 23 p0567 N79-24877

The performance of an experimental solar heating system [AD-A066699] 23 p0573 N79-25516

Performance characteristics of a slagging gasifier for MHD combustor systems [NASA-TM-79195] 24 p0749 N79-30720

Computer modeling of a two-junction, monolithic cascade solar cell 24 p0785 N79-32672

PERFORMANCE TESTS

Pressurized fluidized-bed combustion/component test and integration unit preliminary design report 21 p0008 A79-10076

Heat exchanger designs for coal-fired fluidized beds 21 p0009 A79-10079

Evaluation of methods for analyzing silver-zinc cells 21 p0010 A79-10085

High performance lithium/iron disulfide cells --- for electric vehicle propulsion 21 p0010 A79-10087

Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries 21 p0010 A79-10088

Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries 21 p0010 A79-10089

Bipolar lithium/iron disulfide cells --- for electric vehicle propulsion 21 p0010 A79-10090

Advances in lower cost phosphoric acid fuel cells 21 p0010 A79-10092

Iron-air batteries for electric vehicles 21 p0011 A79-10094

Performance of a Stirling engine powered heat activated heat pump --- gas heating-cooling system 21 p0011 A79-10098

Performance of a 10 MW geothermal energy conversion test facility 21 p0014 A79-10119

Progress in the testing of materials and design concepts for directly-fired MHD air heater service 21 p0017 A79-10141

Design, construction, and testing of a Fixed Mirror Solar Concentrator field 21 p0020 A79-10164

Copper/water axially-grooved heat pipes for RTG applications 21 p0023 A79-10188

Solar furnace type high power density thermoelectric generator 21 p0027 A79-10229

Development and testing of the ULP solar array 21 p0029 A79-10245

Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen [ASME PAPER 78-GT-126] 21 p0033 A79-10791

Electric automobiles - Yes 21 p0046 A79-12265

Performance of a honeycomb type flat plate collector with serpentine tube 21 p0054 A79-13579

Solar radiation simulation by means of solar simulator for the indoor testing of solar collectors 21 p0055 A79-13620

Testing the efficiency of solar collectors 21 p0056 A79-13627

Performance testing of a three ton solar absorption chiller [AIAA PAPER 78-1757] 21 p0060 A79-13858

Analysis of data user's needs for performance evaluation of solar heating and cooling systems 21 p0087 A79-15827

Technique and instrumentation for measuring the performance of integrated solar heating/cooling systems 21 p0087 A79-15830

System performance measurements for a packaged solar space heating system equipped with air-heating collectors 21 p0088 A79-15835

Performance of evacuated solar collectors with compound parabolic concentrators 21 p0089 A79-15855

Passive solar heating of buildings [LA-UR-77-1162] 21 p0090 A79-15859

Testing of solar collectors according to ASHRAE Standard 93-77 21 p0101 A79-16417

The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors 21 p0102 A79-16423

Comparative outdoor measurements on flat-plate solar collectors in a metropolitan area in Western Germany 21 p0128 A79-17394

Comparative performance testing of flat-plate solar water heaters 21 p0130 A79-17405

Thermal performance testing of flat-plate solar collectors 21 p0130 A79-17407

The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I. 21 p0130 A79-17409

Testing of water-heating collectors according to ASHRAE Standard 93-77 21 p0130 A79-17410

Field performance of certain selective and neutral surfaces in solar collectors 21 p0131 A79-17417

Flat plate collector - Experimental studies and design data for India 21 p0132 A79-17425

A contribution to evaluation of flat-plate solar collectors performance 21 p0133 A79-17427

Construction and test of a test apparatus for determining the efficiency of solar collectors with the ASE-test method 21 p0134 A79-17436

Design fabrication and testing of three meter diameter parabolic dish heliostat system 21 p0135 A79-17447

Performance of solar heating and cooling systems used in the national solar heating and cooling demonstration program 21 p0139 A79-17478

Preliminary results from the Georgia Tech 400 kWth Solar Thermal Test Facility
21 p0141 A79-17499

A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing
21 p0144 A79-17617

Performance testing of solar collectors
21 p0155 A79-18875

Performance evaluation of the New Mexico State University Solar House
[ASME PAPER 78-WA/SOL-8] 21 p0163 A79-19840

Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479

Wave-tank experiments on an immersed parallel-plate duct --- for testing performance of sub-sea wave energy converter
22 p0258 A79-23306

Effects of test fluid, flow rate, and flow regime on solar collector thermal performance measurements
22 p0268 A79-24317

Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939

Performance of a 5 MWt solar steam generator
22 p0288 A79-27399

Latest developments in sponsored test programs for electric vehicles in France
22 p0302 A79-29497

A Variable Speed Constant Frequency /VSCF/ wind generator for low power applications
22 p0303 A79-29799

Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545

EPRI/TVA pilot electric vehicle demonstration program
[SAE PAPER 790110] 22 p0314 A79-31357

A solar collector thermal performance test for developmental programs
22 p0317 A79-31413

Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444

Measured and modeled passive performance in Montana --- for solar heating and thermal storage
22 p0322 A79-31445

The first year of solar collector testing at Ontario Research
22 p0322 A79-31450

Studies on solar collector performance at NBC
22 p0322 A79-31451

First year performance data and lessons learned in the NBC 14 house solar demonstration program
22 p0323 A79-31453

Discharge characteristics of slagging metal electrodes --- magnetohydrodynamic generators
23 p0391 A79-33392

Evaluation of the expected diffuser performance for a large MHD generator
23 p0393 A79-33408

Detailed characterization of MHD generator operating parameters
23 p0393 A79-33409

Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410

Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418

Consolidation and local control of power in an MHD generator
23 p0395 A79-33425

Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

Performance of magnetohydrodynamic generator in the inlet region
23 p0397 A79-33769

Test results of a moderately focusing flat-plate solar collector
23 p0399 A79-33995

An approach for development of performance criteria and test standards in photovoltaics
23 p0428 A79-35043

Concentrating solar collector test results from DOE/Sandia Collector Module Test Facility
23 p0428 A79-35044

Testing of central receiver for central thermal power systems
23 p0428 A79-35045

White Sands solar test facility
23 p0429 A79-35048

OTEC-1 test conductor program
23 p0430 A79-35060

Air collector testing utilizing ASHRAE 93-77 --- standards for testing of solar collectors using air as heat transfer medium
23 p0430 A79-35062

Cost effective solar collector performance testing under combined indoor and outdoor conditions
23 p0430 A79-35063

Problems in collector testing --- for solar system thermal performance
23 p0430 A79-35064

Solar energy systems - Survey of materials performance
23 p0431 A79-35073

SERI solar energy standards activities
23 p0431 A79-35075

A canister fuel pump for general aviation aircraft
[SAE PAPER 790624] 23 p0440 A79-36752

Optical characterization of high energy laser components
23 p0447 A79-37668

Prediction and measurement of aerogenerator performance
23 p0453 A79-37898

Analytical and experimental evaluation of Cycloturbine aerodynamic performance --- vertical-axis windmill
[AIAA PAPER 79-0968] 23 p0456 A79-38176

Prediction of stresses and natural frequencies for high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177

Testing and evaluation methods to determine an optimal air-flow rate in flat-plate solar collectors
[AIAA PAPER 79-0972] 23 p0456 A79-38179

Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184

Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642

Solar collector tests in Rwanda
23 p0470 A79-38643

European solar collector development and testing - A commercial view
23 p0470 A79-38645

Flowfield measurements in the vicinity of the rotor of a 10 kw windmill
[AIAA PAPER 79-0969] 23 p0475 A79-38889

Analysis, development and testing of a fixed tilt solar collector employing reversible Vee-Trough reflectors and vacuum tube receivers
23 p0477 A79-39101

Recent developments in wind energy
23 p0482 A79-40104

The development of wind power plants in Japan
23 p0482 A79-40105

Investigations on the aeroelastic stability of large wind turbines
23 p0483 A79-40116

Measurements of performance and structural response of the Danish 200kW Gedser windmill
23 p0484 A79-40121

A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123

The design, construction, testing and manufacturing of vertical axis wind turbines
23 p0484 A79-40124

Real-time environmental and performance testing of concentrating photovoltaic arrays
23 p0496 A79-40887

Flash X-ray tests of solar cells
23 p0498 A79-40899

Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight
23 p0511 A79-41018

Performance tests of organic dyes in a planar solar concentrator with ribbon photovoltaic cells
23 p0519 A79-41074

Annular diffuser performance for an automotive gas turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790

Collector testing in the MSFC simulator --- for solar collector performance 24 p0611 A79-45230

Development of a Test Program for OTEC-1 24 p0617 A79-45785

Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC 24 p0618 A79-45787

Core unit testing of the APL/JHU shell-less folded tube heat exchanger --- for OTEC 24 p0618 A79-45788

Cold water pipe verification test --- for OTEC 24 p0621 A79-45811

The distributed flow, below atmospheric pressure solar collector 24 p0631 A79-46314

Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine 24 p0634 A79-46537

Magdalen Islands VAWT field test --- Vertical Axis Wind Turbines 24 p0635 A79-46543

A mobile apparatus for solar collector testing [ASME PAPER 79-DE-5] 24 p0641 A79-47651

Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant 24 p0654 A79-50007

Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility 24 p0658 A79-50343

Performance of retainerless bearings for flywheels 24 p0678 A79-51786

Design of flywheel rotors utilizing cellulosic materials 24 p0678 A79-51787

IGT U-GAS pilot plant developments --- cf fluidized-bed gasification 24 p0688 A79-51861

Equipment and strategy for environmental sampling of complex coal gasification process streams 24 p0688 A79-51862

Non-uniform power distribution in linear induction motors due to end effects 24 p0707 A79-52798

Development of a DC linear motor. II 24 p0707 A79-52800

US Army/Environmental Projection Agency re-refined engine oil program [AD-A056806] 21 p0171 N79-10216

Indoor test for thermal performance evaluation on the Northrup concentrating solar collector [NASA-CR-150804] 21 p0172 N79-10515

Recommended performance standards for electric and hybrid vehicles [SAN-1335-1] 21 p0195 N79-12450

Provisional flat plate solar collector testing procedures [PB-283721/9] 21 p0198 N79-12571

Comparative automotive engine operation when fueled with ethanol and methanol [HCP/W1737-01] 21 p0201 N79-13189

Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment [BNL-50816] 21 p0210 N79-13538

Performance testing of the Hexcel Parabolic Trough Solar Collector [SAND-76-0381] 21 p0221 N79-14569

Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V --- fuel consumption and exhaust gases [PB-286076/5] 21 p0227 N79-15306

Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I. --- fuel consumption and exhaust gases [PB-286077/3] 21 p0227 N79-15307

Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V --- fuel consumption and exhaust gases [PB-286299/3] 21 p0227 N79-15313

Thermal performance evaluation of the Solargenics solar collector at outdoor conditions [NASA-CR-150857] 21 p0228 N79-15401

Parametric performance of a turbojet engine combustor using jet A and A diesel fuel [NASA-TM-79089] 22 p0357 N79-20114

Parametric study of the performance of a CDIF 1-B coal-fired MHD generator [ANL-MHD-79-3] 22 p0361 N79-20503

High pressure MHD coal combustors investigation [FE-2706-08] 22 p0362 N79-20510

Experimental verification of a standard test procedure for solar collectors [PB-289912/8] 22 p0372 N79-21632

Performance testing of the McDonnell Douglas fresnel lens solar collector [SAND-78-0625] 23 p0565 N79-24512

Performance testing of the General Atomic Fixed mirror solar concentrator [SAND-78-0624] 23 p0573 N79-25519

Concentrating solar collector test results from DOE/Sandia collector module test facility [SAND-78-0881C] 23 p0573 N79-25520

Baseline tests of the Sebring Citi-Van electric delivery truck [AD-A066582] 23 p0576 N79-25930

Rankine-cycle component characteristics 23 p0579 N79-26478

Thermal performance evaluation of the Semco (liquid) solar collector [NASA-CR-161230] 23 p0594 N79-27656

Indoor test for thermal performance evaluation of seven Elcam fin-tube solar collector configurations [NASA-CR-161236] 23 p0594 N79-27657

Aerodynamic performance of the 17-metre-diameter Darrieus wind turbine [SAND-78-1737] 23 p0595 N79-27670

Hydrogen-fueled postal vehicle performance evaluation [NASA-CR-158811] 24 p0730 N79-29106

INTELSAT 5 solar array 24 p0752 N79-30757

Cost and performance evaluation of passive solar systems [ANL/EES-TM-34] 24 p0753 N79-30774

Three state-of-the-art individual electric and hybrid vehicle test reports, volume 2 [NASA-CR-162311] 24 p0778 N79-32130

Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests [PB-295478/2] 24 p0778 N79-32135

Performance tests of the radial outflow reaction turbine for geothermal applications [UCID-17902] 24 p0788 N79-32693

Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector [NASA-CR-161306] 24 p0797 N79-33561

Indoor test for thermal performance of the GE TC-100 liquid solar collector eight- and ten-tube configuration --- Marshall Space Flight Center solar simulator [NASA-CR-161305] 24 p0798 N79-33568

PERIODIC VARIATIONS

Output power variations with solar power satellites 21 p0067 A79-14267

Periodic heating/cooling by solar radiation --- through concrete slab buildings 21 p0140 A79-17491

PERIODICALS

Energy information data base. Serial titles [TID-4579-R-10-SUPPL-1] 24 p0791 N79-32721

PERMEABILITY

Permeability enhancement using explosive techniques --- georesources recovery techniques 21 p0005 A79-10048

Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones 24 p0630 A79-46306

PERSONNEL

National solar heating and cooling commercial demonstration program: Key personnel directory [DOE/CS-0057] 24 p0754 N79-30785

PERSONNEL MANAGEMENT

European Scientific notes, volume 32, number 4 [AD-A065399] 23 p0552 N79-23886

PERTURBATION THEORY

Lag damping in autorotation by a perturbation method --- for rigid rotor blades [AHS 78-25] 21 p0152 A79-18151

PETROGRAPHY
Coal classification and characterization
24 p0714 A79-53777
PETROLEUM PRODUCTS
Prerefining true in situ shale oil
21 p0004 A79-10044
Recovery of oil from oil shale - An overall technological perspective
21 p0073 A79-14698
The department of Defense's alternate energy policy
[AD-A058200]
21 p0197 N79-12563
LPG in Missouri
[PB-286329/8]
21 p0230 N79-15421
Stimulated biodegradation of waste petroleum
22 p0336 N79-16388
Sooting characteristics of liquid pool diffusion flames
[AD-A064111]
23 p0539 N79-22252
Crude and product storage: State-of-the-art review and assessment
[AD-A066605]
23 p0568 N79-25243
Findings and views concerning the exemption of kerojet fuels from the mandatory petroleum allocation and price regulations
[DOE/ERA-0023]
23 p0600 N79-28058
Liquefied energy gases, part 2 --- safety factors and legal liabilities
[GPO-39-305]
24 p0732 N79-29356
Assessment of potential US petroleum supply shortfalls, 1978
[DOE/EIA-0102/38]
24 p0734 N79-29376
Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40]
24 p0746 N79-30403
Role of refined product imports in the domestic fuel market
[DOE/EIA-0102/53]
24 p0778 N79-32372
PETROLOGY
Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems
22 p0304 A79-30123
Recent ooids from different environments - Relationship between petrophysical properties and microstructure
23 p0529 A79-42424
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294]
24 p0796 N79-33526
PHASE CONTROL
Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898
Automatic phase control in solar power satellite systems
[NASA-CR-151856]
21 p0194 N79-12130
PHASE DIAGRAMS
The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707
Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983
PHASE MODULATION
Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1]
22 p0357 N79-20179
PHASE TRANSFORMATIONS
A simulation study of phase change energy store
21 p0120 A79-17318
Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319
Phase change thermal storage for a solar total energy system
21 p0120 A79-17321
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
Properties optimization for phase-change energy storage in air-based solar heating systems
21 p0149 A79-18018
Thermodynamics of pressure plateaus in metal-hydrogen systems
22 p0238 A79-20772
Mixing effects of two different types of hydrides --- phase behaviors and energy storage applications
22 p0251 A79-21714
Analysis of energy storage by phase change with an array of cylindrical tubes
22 p0281 A79-26207
Transient analysis and optimization of an extended surface thermal storage unit which utilizes a phase change material
23 p0400 A79-34006
Performance analysis of phase change thermal energy storage/heat pipe systems
[AIAA PAPER 79-1096]
23 p0462 A79-38566
The development of a storage system based on encapsulated p.c.m.-materials --- phase change materials for solar thermal storage
23 p0470 A79-38639
An experimental study of walls with latent heat for residences
23 p0470 A79-38640
Performance of flat plate solar collector with fluid undergoing phase change
24 p0661 A79-50544
Fundamental data needs for coal conversion technology appendices
[TID-28152-APP]
21 p0187 N79-11512
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240]
21 p0197 N79-12564
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039]
21 p0218 N79-14537
Development of a model and computer code to describe solar grade silicon production processes --- phase changes in chemical reactors
[NASA-CR-158037]
21 p0219 N79-14555
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465]
22 p0354 N79-19454
Testing of pebble-bed and phase-change thermal energy storage devices according to ASHRAE standard 94-77
[PB-295898/1]
24 p0801 N79-33596
PHASED ARRAYS
Microwave phased array design considerations for SPS --- Solar Powered Satellites
21 p0003 A79-10031
Microwave power transmitting phased array antenna research project
[NASA-CR-157843]
21 p0202 N79-13263
PHENOLIC RESINS
Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159572]
24 p0737 N79-29604
PHENOMENOLOGY
Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1]
21 p0184 N79-11490
PHOSPHATES
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0]
22 p0340 N79-17311
PHOSPHIDES
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
PHOSPHORIC ACID
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091
Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092
Fuel cell electrocatalysis - Where have we failed
21 p0039 A79-11810
The state-of-the-art of hydrogen-air phosphoric acid electrolyte fuel cells
21 p0039 A79-11815
Generation of electrical energy from hydrogen and oxygen by means of fuel cells
21 p0059 A79-13662
Fuel cell on-site integrated energy system parametric analysis of a residential complex
21 p0081 A79-14947
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809

Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812

Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813

Commercial phosphoric acid fuel cell system technology development
[NASA-TM-79169] 23 p0571 N79-25500

Advanced technology fuel cell program --- molten carbonate and phosphoric acid fuel cells and coal utilization in power plants
[EPRI-EM-956] 23 p0598 N79-27702

Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159572] 24 p0737 N79-29604

Fuel cell catalyst sintering studies --- platinum catalysts in phosphoric acid fuel cells
[EPRI-EM-833] 24 p0776 N79-31828

Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

PHOSPHORUS COMPOUNDS

Solar cells based on GaP/x/As/1-x/ compounds
23 p0515 A79-41045

PHOTOABSORPTION

Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

A method for measuring the photothermal conversion efficiency of solar energy
24 p0642 A79-47806

PHOTOCATHODES

A study of oxide-based heterostructure photoelectrodes --- for solar cells
24 p0705 A79-52314

PHOTOCHEMICAL OXIDANTS

Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683

PHOTOCHEMICAL REACTIONS

Methods for the photochemical utilization of solar energy
21 p0111 A79-16641

Solar fuels --- photochemical reaction kinetics and energy storage
21 p0149 A79-18009

Synthetic chloroplasts --- for photosynthetic solar energy conversion
22 p0262 A79-23721

The prospects of a biological-photochemical approach for the utilization of solar energy
23 p0448 A79-37850

Theoretical and experimental study of a cylindrical solar photochemical reactor
23 p0467 A79-38618

Photochemical aspects of solar energy conversion and storage
23 p0495 A79-40746

Photochemical energy conversion studies in systems containing methylene blue
24 p0628 A79-45995

Photoelectrochemistry and solar energy conversion
24 p0654 A79-50153

Hydrogen as the solar energy translator --- in photochemical and photovoltaic processes
24 p0686 A79-51852

Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952

The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294

Nitrogen oxide air pollution. Part 3: Atmospheric chemistry. A bibliography with abstracts
[NTIS/PS-78/0973/4] 21 p0199 N79-12593

PHOTOCONDUCTIVITY

Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters
21 p0053 A79-13288

Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289

Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination
24 p0656 A79-50195

PHOTODECOMPOSITION

Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780

Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization
24 p0660 A79-50538

Photolytic decomposition of water into oxygen and hydrogen as an alternative energy source for households and small consumers
[DLR-FB-78-17] 24 p0760 N79-30836

PHOTODETACHMENT

Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

PHOTODIODES

The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967

Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide
23 p0505 A79-40969

Solar irradiance measurements by means of optical fibers and silicon detectors
24 p0638 A79-47198

PHOTODISSOCIATION

Ammonia dissociation for solar thermochemical absorbers
23 p0396 A79-33765

PHOTOELECTRIC CELLS

Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters
21 p0053 A79-13288

Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289

Activities in the field of solar cells in the Federal Republic of Germany
21 p0056 A79-13636

Methods for the photochemical utilization of solar energy
21 p0111 A79-16641

The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358

Model systems in photoelectrochemical energy conversion
21 p0149 A79-18021

Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347

Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354

Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361

Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes --- for solar energy conversion
22 p0273 A79-25548

Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666

Optimization of exponential alloying impurity distribution in semiconductor photoconverter base
24 p0636 A79-46759

Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760

Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904

Photoelectrochemistry and solar energy conversion
24 p0654 A79-50153

Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316

Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527

PHOTOELECTRIC EFFECT

Photoelectric conversion in monomolecular layer formations
23 p0464 A79-38589

The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967

Photovoltaic properties of In2O3/semiconductor heterojunction solar cells
23 p0505 A79-40968

Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide
23 p0505 A79-40969

Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985

Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels
23 p0507 A79-40986

Formation and stability of MS or MIS Schottky solar cells
23 p0507 A79-40987

Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988

The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989

Energy production by photoelectrochemical processes
24 p0633 A79-46521

Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490

Dependence of the photoelectric parameters of photovoltaic cells on illuminance
24 p0647 A79-49191

Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191

PHOTOELECTRIC EMISSION

An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871

Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012

An anomalous photocurrent in SnO2-Si heterojunction solar cells
24 p0668 A79-50950

PHOTOELECTRIC GENERATORS

Solar photovoltaic energy --- research and development
24 p0667 A79-50909

PHOTOELECTRIC MATERIALS

Progress and trends in the development of terrestrial photoelectric conversion
21 p0056 A79-13635

The photovoltaic effect in CdS/Cu2S solar cells
21 p0091 A79-15871

Trends in silicon solar-photovoltaic cells - An invited talk
21 p0122 A79-17333

A new fabrication process for single crystal silicon solar cells
21 p0122 A79-17335

On the role of interface states in MOS solar cells
21 p0122 A79-17337

Characterisation of amorphous semiconductor materials for solar cell applications
21 p0123 A79-17341

DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces --- for photothermal solar energy conversion
21 p0126 A79-17377

Reliability studies on MIS solar cells
21 p0148 A79-17950

New models of solar cells and prospects for their optimization
21 p0166 A79-20346

Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349

Photoelectrolysis of water with semiconductors
22 p0259 A79-23343

Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952

Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
24 p0713 A79-53725

PHOTOELECTRICITY

The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964

PHOTOELECTROCHEMICAL DEVICES

Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776

Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780

Iron oxide semiconductor electrodes in photoassisted electrolysis of water
21 p0037 A79-11781

Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation
21 p0037 A79-11783

n-CdS/n-GaAs photoanode --- electrochemical solar cells
21 p0037 A79-11784

Polycrystalline CdSe-based photo-electrochemical cells
21 p0037 A79-11785

Hydrogen production in a solar-hydrogen economy
21 p0037 A79-11796

The photogalvanovoltaic cell
21 p0066 A79-14264

Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370

Model systems in photoelectrochemical energy conversion
21 p0149 A79-18021

Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-22320

Photoelectrolysis of water with semiconductors
22 p0259 A79-23343

Solar photoelectrolysis with semiconductor electrodes
23 p0437 A79-36147

Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage
23 p0495 A79-40747

Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy
23 p0495 A79-40748

Photoelectrochemistry and solar energy conversion
24 p0654 A79-50153

Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

PHOTOGEOLOGY

Landsat - Developing techniques and applications in mineral and petroleum exploration
21 p0111 A79-16725

Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599

Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10274] 24 p0768 N79-31731

Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

PHOTOGRAPHIC PROCESSING

Solar project description: Iris Images, Incorporated, film laboratory, Mill Valley, California
[SOLAR/2005-78/50] 23 p0562 N79-24486

PHOTOGRAPHIC RECORDING
Landsat - Developing techniques and applications in mineral and petroleum exploration 21 p0111 A79-16725

PHOTOIONIZATION
Radiatively sustained cesium plasmas for solar electric conversion 21 p0109 A79-16615

PHOTOLYSIS
Solar hydrogen production at high temperatures 21 p0104 A79-16464
Biocatalytic production of hydrogen by an in vitro system 23 p0414 A79-34119
The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation 24 p0649 A79-49231
Hydrogen as the solar energy translator --- in photochemical and photovoltaic processes 24 p0686 A79-51852
Solar photolysis of water [NASA-CASE-NPO-14126-1] 21 p0182 N79-11470
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy source for households and small consumers [DLR-FB-78-17] 24 p0760 N79-30836

PHOTOMAPPING
Current and potential uses of aerospace technology by the U.S. Department of the Interior [AIAA PAPER 78-1716] 21 p0060 A79-13833

PHOTOMETERS
Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics 21 p0054 A79-13292
Calibration standards and field instruments for the precision measurement of insolation 21 p0076 A79-14765

PHOTOMETRY
Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators 24 p0646 A79-48735

PHOTON BEAMS
Low cost solar array project: Composition measurements by analytical photo catalysis [NASA-CR-158598] 23 p0550 N79-23513

PHOTONS
Temperature dependence of the optical properties of silicon 23 p0437 A79-35820

PHOTOPRODUCTION
Photoproduction of hydrogen by marine blue-green algae [PB-287508/6] 22 p0343 N79-17354

PHOTOSENSITIVITY
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices 21 p0125 A79-17360
Photovoltaic cell with bilateral sensitivity 24 p0647 A79-49179
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination 24 p0647 A79-49180
Dependence of the photoelectric parameters of photovoltaic cells on illuminance 24 p0647 A79-49181
Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity 24 p0647 A79-49182

PHOTOSYNTHESIS
Compartmental model for agricultural conversion of solar energy into fixed biomass 21 p0022 A79-10181
Biomimetic approach to solar energy conversion - Artificial photosynthesis 21 p0094 A79-15899
Petroleum plantations --- hydrocarbon fuels from artificial photosynthesis and plants 21 p0095 A79-15910
Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes --- for solar energy conversion 22 p0273 A79-25548
Biological conversion of solar energy 22 p0312 A79-31146
Solar energy use through biology - Past, present and future 23 p0439 A79-36627
The prospects of a biological-photochemical approach for the utilization of solar energy 23 p0448 A79-37850
Photoelectric conversion in monomolecular layer formations 23 p0464 A79-38589
Practical aspects and applications of bioconversion 23 p0467 A79-38617
Liquid fuels from carbonates by a microbial system 23 p0494 A79-40742
Bioconversion of solar energy 23 p0524 A79-41808
Photosynthetic pathway and biomass energy production 24 p0605 A79-44580
Towards the design of contrived photosynthesizers 24 p0655 A79-50185
Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system 24 p0676 A79-51772
Biological solar energy conversion approaches to overcome yield stability and product limitations [PB-284823/2] 21 p0199 N79-12577
Algal growth kinetics in bioconversion of solar energy 23 p0594 N79-27650
Photobiological production of hydrogen: A solar energy conversion option --- hydrogen metabolism in photosynthetic bacteria and algae [SERI/TR-33-122] 24 p0767 N79-31422

PHOTOVOLTAGES
Photovoltage in concentrator cells 23 p0511 A79-41013

PHOTOVOLTAIC CELLS
Evolution of satellite power system /SPS/ concepts 21 p0002 A79-10023
Construction of a 10GWe solar power satellite 21 p0003 A79-10029
Perspectives on utility central station photovoltaic applications 21 p0041 A79-11873
Cu2S-CdS thin-film solar cells 21 p0057 A79-13637
Practical applications of silicon solar cells in appliances and installations 21 p0057 A79-13638
The photogalvanovoltaic cell 21 p0066 A79-14264
Overview of novel photovoltaic conversion techniques at high intensity levels 21 p0108 A79-16610
Methods for the photochemical utilization of solar energy 21 p0111 A79-16641
Trends in silicon solar-photovoltaic cells - An invited talk 21 p0122 A79-17333
Simulation and cost of photovoltaic generators 21 p0122 A79-17334
Role of high performance solar cells in practical photovoltaic systems 21 p0122 A79-17336
Characterisation of amorphous semiconductor materials for solar cell applications 21 p0123 A79-17341
Photovoltaic effect in metal-insulator-semiconductor structure 21 p0123 A79-17343
On the design of CPC photovoltaic solar collectors --- Compound Parabolic Concentrator [CONF-780114-8] 21 p0124 A79-17355
Transcell, a novel approach for improving static photovoltaic concentration 21 p0124 A79-17356
Efficiency of conventional silicon solar cells 21 p0125 A79-17362
The development of photovoltaic conversion systems with sunlight concentration 21 p0148 A79-17995
Merocyanine organic solar cells 21 p0165 A79-20216
New models of solar cells and prospects for their optimization 21 p0166 A79-20346
Characteristics of silicon photoconverters with inversion layer 21 p0166 A79-20349

Recent developments in low cost silicon solar cells for terrestrial applications --- sheet production methods
22 p0239 A79-20821

Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883

Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768

Performance of a new high-intensity silicon solar cell
22 p0257 A79-22862

An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871

Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure --- heterostructure solar cell fabrication
22 p0305 A79-30258

The limiting efficiency of an edge-illuminated multigap solar cell
22 p0305 A79-30259

Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543

Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545

Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551

Mississippi County Community College solar photovoltaic total energy project
[ASME PAPER 79-SOL-13] 23 p0380 A79-32463

A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723

Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970

Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters --- for gallium arsenide solar photovoltaic arrays
23 p0416 A79-34140

Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042

An approach for development of performance criteria and test standards in photovoltaics
23 p0428 A79-35043

Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385

Photovoltaic cells and their future
23 p0435 A79-35486

Carrier lifetime in silicon and its impact on solar cell characteristics
23 p0437 A79-36148

Heterojunction phenomena and interfacial defects in photovoltaic converters
23 p0438 A79-36150

Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777

Analysis of an edge-illuminated graded-gap solar cell
23 p0442 A79-36793

Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272

The developing role of photovoltaic generation
23 p0448 A79-37845

Solar electric generator for developing nations
23 p0452 A79-37885

Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184

A method to increase the efficiency of solar photovoltaic devices by secondary emission
[AIAA PAPER 79-0981] 23 p0457 A79-38185

Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation
23 p0466 A79-38603

Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642

Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945

The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883

Status of the photovoltaic concentrator applications experiments
23 p0496 A79-40884

Field testing and evaluation of PV module performance
23 p0496 A79-40885

Real-time environmental and performance testing of concentrating photovoltaic arrays
23 p0496 A79-40887

A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919

Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920

A 1982 low cost photovoltaic module factory study
23 p0501 A79-40921

Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927

An overview of photovoltaics for space applications
23 p0503 A79-40950

Silicon foil cells
23 p0503 A79-40954

Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982

An MIS photovoltaic cell with silicon nitride insulator
23 p0508 A79-40990

Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

Spectrally split tandem cell converter studies
23 p0513 A79-41028

Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029

Concepts for rheotaxially-grown thin-film tandem III-V solar cells
23 p0513 A79-41030

Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base
23 p0513 A79-41031

Product pricing in the Solar Array Manufacturing Industry - An executive summary of SAMICS
23 p0513 A79-41032

Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033

Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells
23 p0514 A79-41034

Model for comparing cost of flat-array and concentrator photovoltaic solar-cell systems
23 p0514 A79-41035

Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036

Lifetime Cost and Performance model for photovoltaic power systems
23 p0514 A79-41037

High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040

The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

Solar cells based on GaP/x/As/1-x/ compounds
23 p0515 A79-41045

A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046

An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047

Maximum power trackers for photovoltaic arrays
23 p0516 A79-41049

Role of intermediate markets in P/V industry development 23 p0516 A79-41052

The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology 23 p0516 A79-41053

The effect of solar cell parameter variation on array power output 23 p0517 A79-41059

Performance of a one kilowatt concentrator photovoltaic array utilizing active cooling 23 p0519 A79-41069

10 kW photovoltaic concentrator system design 23 p0519 A79-41070

Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station 23 p0519 A79-41071

Combined photovoltaic thermal collector testing 23 p0519 A79-41072

Combined photovoltaic and thermal hybrid collector systems 23 p0519 A79-41073

Status of the DOE Photovoltaic Systems Engineering and Analysis Project 23 p0519 A79-41075

Optimization of terrestrial photovoltaic power systems 23 p0520 A79-41076

Regional analysis of residential photovoltaic system concepts 23 p0520 A79-41077

Satellite power for the 1980s --- from geosynchronous space stations with photovoltaic solar cell arrays 23 p0522 A79-41208

Spacecraft power systems 23 p0533 A79-43199

Measuring dirt on photovoltaic modules 23 p0533 A79-43283

Encapsulation materials for photovoltaic arrays 23 p0534 A79-43294

Study of photocell characteristics dependence on solar ray incidence angle and intensity 24 p0601 A79-44255

Variation of photovoltaic effect in vertical n/p-junction solar cells 24 p0629 A79-46157

Energy production by photoelectrochemical processes 24 p0633 A79-46521

Photovoltaic cell with bilateral sensitivity 24 p0647 A79-49179

Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination 24 p0647 A79-49180

Dependence of the photoelectric parameters of photovoltaic cells on illuminance 24 p0647 A79-49181

Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity 24 p0647 A79-49182

Studies of CdSiAs2 for photovoltaic applications 24 p0654 A79-50027

Photoelectrochemistry and solar energy conversion 24 p0654 A79-50153

Efficiency of tandem solar cell systems as a function of temperature and solar energy concentration ratio 24 p0656 A79-50194

Environmental requirements for flat plate photovoltaic modules for terrestrial applications 24 p0658 A79-50342

Static concentrators for two-sided photovoltaic solar cells 24 p0661 A79-50542

Analysis of the efficiency of a varizone photoelectric converter 24 p0663 A79-50708

A review of the environmental effects and benefits of selected solar energy technologies 24 p0664 A79-50878

The design of photovoltaic systems for intermediate-sized applications 24 p0675 A79-51762

Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation 24 p0675 A79-51763

Photovoltaic concentrator system for Roxborough Park 24 p0675 A79-51767

Hybrid alternate energy system --- wind-photovoltaic system for desert regions 24 p0675 A79-51768

A combined photovoltaic/thermal electric central power plant 24 p0675 A79-51769

Application of a GaAs photovoltaic solar system in a utility substation 24 p0676 A79-51770

Flywheel energy storage interface unit for photovoltaic applications 24 p0679 A79-51791

Materials aspects of photo-electrochemical systems 24 p0704 A79-52308

Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells 24 p0705 A79-52317

Satellite power systems /SPS/ and semiconductor photovoltaic cells /SPC/
[IAF PAPER 79-166] 24 p0709 A79-53330

Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book 24 p0713 A79-53725

Solar array systems 21 p0169 N79-10131

Status of the DOE photovoltaic concentrator technology development project
[SAND-78-0948C] 21 p0176 N79-10550

Solar cells having integral collector grids
[NASA-CASE-LEW-12819-1] 21 p0182 N79-11467

High performance GaAs photovoltaic cells for concentrator applications
[SAND-78-7018] 21 p0187 N79-11521

Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529

National photovoltaic program plan
[DOE/ET-0035(78)] 21 p0197 N79-12567

Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572

Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics
[NASA-CR-157953] 21 p0200 N79-12970

Design of low-cost structures for photovoltaic arrays. Task 1: Survey of array structural characteristics
[SAND-78-7021] 21 p0206 N79-13509

Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1114/4] 21 p0212 N79-13554

Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1116/9] 21 p0212 N79-13556

Solar electric power generation, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1108/6] 21 p0212 N79-13557

Improved semiconductors for photovoltaic solar cells
[DSE/2459-2] 21 p0221 N79-14577

Industrialization study, phase 2 --- assessment of advanced photovoltaic technologies for commerical development
[NASA-CR-158015] 22 p0333 N79-16351

Photovoltaic tests and applications project
[NASA-TM-79018] 22 p0342 N79-17336

Silicon Schottky photovoltaic diodes for sclar energy conversion
[PB-287417/0] 22 p0343 N79-17349

Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352

V-groove multijunction solar cells 22 p0353 N79-19445

Market definition studies for photovoltaic highway applications
[NASA-CR-159477] 22 p0354 N79-19451

Thermal and other tests of photovoltaic modules performed in natural sunlight
[NASA-CR-158174] 22 p0354 N79-19460

Feasibility study of solar dome encapsulation of photovoltaic arrays
[NASA-CR-158368] 22 p0367 N79-21545

Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443

Photovoltaic concentrator system technology and applications experiments
[SAND-78-2184] 23 p0565 N79-24511
Cuprous oxide photovoltaic cells --- fabricating schottky barrier devices
[PB-290529/7] 23 p0565 N79-24514
Systematic computation of the performance of photovoltaic based on first principles
[UCID-1804-PT-1] 23 p0567 N79-24877
Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482
Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513
Performance of photovoltaic cells in an undersea environment
[AD-A066385] 23 p0573 N79-25517
Principal conclusions of the American Physical Society study group on solar photovoltaic energy
[PB-292164/1] 23 p0575 N79-25533
Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23540-1] 23 p0579 N79-26475
Combined photovoltaic and thermal hybrid collector systems
[COO-4577-3] 23 p0583 N79-26525
Mead 25 kilowatt photovoltaic system --- conferences
[COO-4094-19] 23 p0596 N79-27677
Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599
Phase-one experiment test plan solar photovoltaic/thermal residential experiment
[COO-4577-6] 24 p0739 N79-29625
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 --- congressional reports
[GPO-36-187] 24 p0750 N79-30725
Photovoltaic generators in space --- conference, ESTEC, Netherlands, Sep. 1978
[SP-140] 24 p0751 N79-30730
INTELSAT 5 solar array
24 p0752 N79-30757
Cuprous oxide photovoltaic cells
[CONF-780619-16] 24 p0753 N79-30777
Status of the DOE photovoltaic systems engineering and analysis project
[SAND-78-0955C] 24 p0754 N79-30780
Solar module curve tracer --- for evaluation of a photovolatic power system
[COO-4094-35] 24 p0759 N79-30826
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
Analysis and evalaution in the production process and equipment area of the low-cost solar array project --- including modifying gaseous diffusion and using ion implantation
[NASA-CR-162163] 24 p0770 N79-31769
Analysis of investment alternatives to stimulate development and technology transfer for energy technologies, solar photovoltaics, a case study
[TID-28968] 24 p0773 N79-31795
Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796
Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-32671
Combined photovoltaic/thermal system studies
[SAND-78-7031] 24 p0787 N79-32691
Field tests of photovoltaic power systems
[COO-4094-32] 24 p0788 N79-32700
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702
Application and system design study for cost-effective solar photovoltaic systems at Federal installations
[HCP/M2522-01] 24 p0790 N79-32715
Avoiding future health problems related to solar energy (photovoltaic) technology
[BNL-25935] 24 p0790 N79-32718

PHOTOVOLTAIC CONVERSION

Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Cost minimization of photovoltaic power supplies
21 p0021 A79-10171
Photovoltaic concentrating array
21 p0021 A79-10172
Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965
Analysis of a direct coupling d.c. motor and a photovoltaic converter
21 p0046 A79-12272
Progress and trends in the development of terrestrial photoelectric conversion
21 p0056 A79-13635
Photovoltaic overview
[AIAA PAPER 78-1763] 21 p0061 A79-13864
Venture analysis of a proposed federal photovoltaic eight-year procurement plan
[AIAA PAPER 78-1766] 21 p0061 A79-13865
Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy
[AIAA PAPER 78-1767] 21 p0061 A79-13866
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867
Solar total energy systems
21 p0090 A79-15863
Solar power satellites revisited
21 p0093 A79-15898
Status of photovoltaic systems and applications
21 p0095 A79-15907
Overview of novel photovoltaic conversion techniques at high intensity levels
21 p0108 A79-16610
Amorphous semiconductors in photovoltaic and solar thermal conversion
[BNL-24216] 21 p0122 A79-17339
Large area silicon sheet by EFG --- Edge-defined Film-fed Growth
21 p0123 A79-17340
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
The photovoltaic effects in CdS/Cu2S solar cells
21 p0123 A79-17347
Concentrator photovoltaic systems for economical electricity and heat
21 p0124 A79-17354
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446
Solar retrofitting of existing residence with almost zero delta TE system
21 p0139 A79-17485
25 kilowatt photovoltaic powered irrigation and grain drying experiment
21 p0143 A79-17519
The development of photovoltaic conversion systems with sunlight concentration
21 p0148 A79-17995
A high-efficiency GaAlAs double-heterostructure photovoltaic detector --- with antireflection coating
21 p0154 A79-18489
Photoacoustic determination of photovoltaic energy conversion efficiency
21 p0154 A79-18503
Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859
Encapsulant materials for $2/watt terrestrial photovoltaic arrays
22 p0266 A79-24138
Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131

Radiation energy conversion in space
22 p0284 A79-26595

A proposed thermophotovoltaic solar energy conversion system
22 p0287 A79-27317

Solar power satellite
22 p0287 A79-27375

A flywheel energy storage and conversion system for solar photovoltaic applications
[ASME PAPER 79-SOL-1] 22 p0307 A79-30539

Photovoltaic concentrator system technology and applications experiments
[ASME PAPER 79-SOL-9] 22 p0308 A79-30544

Solar photovoltaic power for residential use
[ASME PAPER 79-SOL-11] 22 p0308 A79-30546

An overview of photovoltaic power systems
[ASME PAPER 79-SOL-12] 22 p0308 A79-30547

Unique aspects of terrestrial photovoltaic system design
[ASME PAPER 79-SOL-14] 22 p0308 A79-30548

Photovoltaic electric power generation from a utility perspective
[ASME PAPER 79-SOL-18] 22 p0309 A79-30552

Photovoltaic properties of metal-free phthalocyanines - Al/H2Pc Schottky barrier solar cells
22 p0317 A79-31412

Photovoltaics and solar thermal conversion to electricity - Status and prospects
22 p0326 A79-31924

New techniques for fabricating silicon solar cells
23 p0384 A79-32969

Photovoltaic conversion in Cu2O
23 p0384 A79-32973

Perspectives on solar electric power for small homes
23 p0401 A79-34016

Solar thermal photovoltaic electric power generator
23 p0402 A79-34023

Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024

Photovoltaic conversion - Can its efficiency be improved through the application of color response data
23 p0402 A79-34025

Sandia's photovoltaic test experience
23 p0428 A79-35040

Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480

Extension of the Hottel-Whillier model to the analysis of combined photovoltaic/thermal flat plate collectors
23 p0439 A79-36633

Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782

Solar eyeball - An automatic sun-tracking concentrator for use with photovoltaic generators
23 p0442 A79-36792

Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583

Analysis of a 1 kW photovoltaic generator with concentration
23 p0466 A79-38604

Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells
23 p0475 A79-38877

Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891

Parametric cost analysis of photovoltaic systems
23 p0477 A79-39102

Performance analysis of dc-motor-photovoltaic converter system. I - Separately excited motor
23 p0477 A79-39104

Spatial uniformity of quantum efficiency of a silicon photovoltaic detector
23 p0478 A79-39593

Photovoltaic Specialists Conference, 13th, Washington, D.C., June 5-8, 1978, Conference Record
23 p0496 A79-40881

Trends in photovoltaic development outside the United States
23 p0496 A79-40882

Procedure for developing experimental designs for accelerated tests for service-life prediction --- for solar cell modules
23 p0496 A79-40886

Directional solidification of crack-free silicon ingots by heat exchanger method
23 p0498 A79-40901

High efficiency, high density terrestrial solar panels
23 p0499 A79-40905

The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907

Cuprous oxide photovoltaic cells
23 p0499 A79-40908

The photovoltaic properties of thin copper oxide films
23 p0499 A79-40909

The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910

Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911

Status and future development of photovoltaic research in the Federal Republic of Germany
23 p0501 A79-40918

Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions --- Indium Tin Oxide
23 p0505 A79-40969

Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992

Design of a 10kW photovoltaic 200/1 concentrator
23 p0508 A79-40993

Fresnel optics for solar concentration on photovoltaic cells
23 p0508 A79-40994

Evaluation of a plastic parabolic concentrator for terrestial photovoltaic applications
23 p0508 A79-40995

A novel low-cost photovoltaic concentrator
23 p0508 A79-40996

Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998

Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight
23 p0509 A79-40999

A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003

Optimized solar module design
23 p0510 A79-41005

A novel photovoltaic panel for low cost power
23 p0510 A79-41006

M-I-S solar cells on amorphous silicon
23 p0510 A79-41008

Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011

Photovoltage in concentrator cells
23 p0511 A79-41013

Open circuit voltage of high intensity silicon solar cells
23 p0511 A79-41014

The V-Groove Multijunction solar cell
23 p0511 A79-41015

Optimization of the geometrical parameters for arrays of tracking solar collectors to give minimum energy cost
23 p0511 A79-41016

Performance of silicon and gallium arsenide concentration cells --- under high sunlight concentration
23 p0511 A79-41017

Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight
23 p0511 A79-41018

Some failure modes and analysis techniques for terrestrial solar cell modules
23 p0512 A79-41020

Environmental qualification testing of terrestrial solar cell modules
23 p0512 A79-41021

Endurance testing of first generation /Block I/ commercial solar cell modules
23 p0512 A79-41022
Increased photovoltaic conversion efficiency through use of spectrum splitting and multiple cells
23 p0512 A79-41024
Analysis of multiple-cell concentrator/photovoltaic systems
23 p0513 A79-41026
Potential for stand-alone photovoltaic on-site total-energy residential systems
23 p0516 A79-41050
Solar photovoltaic intermediate power system operating strategies and economic considerations
23 p0516 A79-41051
Status of the DOE Photovoltaic Concentrator Technology Development Project
23 p0517 A79-41054
Design, technology and cost of Si cells for concentrator applications
23 p0517 A79-41055
Large-area concentrator solar cells
23 p0517 A79-41057
Photovoltaic design optimization for terrestrial applications
23 p0517 A79-41060
A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061
An experimental study of series combination of solar cells
23 p0518 A79-41062
Solar cells on R.A.D. polycrystalline silicon
23 p0518 A79-41066
Defect free very shallow p^+/n junction and associated photovoltaic effect
23 p0520 A79-41082
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083
Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089
Design of the Natural Bridges National Monument 100 kW PV power system
23 p0521 A79-41090
Description and status of NASA-LeRC/DOE photovoltaic applications systems experiments
23 p0521 A79-41091
Solar photovoltaic energy
23 p0524 A79-41809
Photovoltaic effect in $Cu/CuGaSe_2$ Schottky barriers
24 p0605 A79-44721
Overview of solar energy programs and activities in the Southeast
24 p0607 A79-45202
Photovoltaic properties of metal-free phthalocyanines. I - Al/H_2Pc Schottky barrier solar cells
24 p0637 A79-47019
The physics of solar cells
24 p0637 A79-47050
Fabrication and characterization of SnO_2/n-Si solar cells
24 p0642 A79-47802
Possibilities of new materials for solar photovoltaic cells
24 p0655 A79-50178
Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle
24 p0655 A79-50184
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186
Role of gap states in discharge produced a-SiH_x in determining carrier transport and recombination
24 p0656 A79-50195
Solar potential inventory and modeling
24 p0657 A79-50219
Energy storage and conversion in conjunction with photovoltaic energy systems
24 p0679 A79-51790
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
24 p0713 A79-53725
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 3: Wind conversion systems with energy storage
[HCP/T22221-01/3] 21 p0189 N79-11535
Environmental Development Plan (EDP): Photovoltaics, 1977
[DOE/EDP-0003] 21 p0198 N79-12569
Combined photovoltaic thermal collector testing
[SAND-78-1191C] 21 p0198 N79-12570
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 2: Photovoltaic systems with energy storage
[HCP/T22221-01/2-2] 21 p0207 N79-13510
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 1: Study summary and concept screening
[HCP/T22221-01/1-VOL-1] 21 p0207 N79-13511
Photovoltaic program: Program summary
[DOE/ET-0019/1] 21 p0209 N79-13529
Satellite Power Systems (SPS) concept definition study. Volume 3: SPS concept evolution
[NASA-CR-158066] 21 p0225 N79-15138
Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411
Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512
Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513
Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443
LSA: Low-cost Solar Array project
[NASA-CR-158533] 23 p0559 N79-24459
Systematic computation of the performance of photovoltaic based on first principles
[UCID-1804-PT-1] 23 p0567 N79-24877
Proceedings of the US DOE Photovoltaics Technology Development and Applications Program Review
[NASA-CR-158682] 23 p0570 N79-25485
Photovoltaic mission analysis
23 p0570 N79-25486
Planning and analysis for development of photovoltaic energy conversion systems
23 p0570 N79-25487
A summary of systems definition project activities
23 p0570 N79-25488
Status of the DOE photovoltaic concentrator development project
23 p0571 N79-25491
DOE photovoltaic tests and applications project
23 p0571 N79-25492
Solar photovoltaic field tests and applications project
23 p0571 N79-25493
Military applications of photovoltaic systems
23 p0571 N79-25494
Photovoltaic research and development status
23 p0571 N79-25495
Photovoltaics and environmental impact considerations
23 p0571 N79-25496
Characteristics of a typical village in the solar belt of the developing countries of Asia, Africa, and Latin America
23 p0571 N79-25497
Principal conclusions of the American Physical Society study group on solar photovoltaic energy
[PB-292164/1] 23 p0575 N79-25533
Design development and implementation of data acquisition systems for photovoltaic tests and applications project
[COO-4094-24] 23 p0596 N79-27672
Mead 25 kilowatt photovoltaic system --- conferences
[COO-4094-19] 23 p0596 N79-27677
A 10-kilowatt photovoltaic concentrator array
[SAND-78-7024] 23 p0598 N79-27699
Federal photovoltaic utilization program. Planning resource document
[HCP/M50081-01] 23 p0599 N79-27706
Photovoltaic/thermal collectors and heat pumps --- solar heating system efficiency
[COO-4577-2] 24 p0726 N79-28757
Economics of solar photovoltaic energy systems for crop irrigation in the United States
[COO-4094-29] 24 p0726 N79-28769

Regional conceptual design and analysis studies for residential photovoltaic systems. Volume 1: Executive summary
[SAND-78-7039] 24 p0741 N79-29651

Solar module curve tracer --- for evaluation of a photovolatic power system
[COO-4094-35] 24 p0759 N79-30826

Vacuum die casting of silicon sheet for photovoltaic applications
[NASA-CR-162360] 24 p0798 N79-33566

Standards for photovoltaic energy conversion systems
[PB-296274/4] 24 p0801 N79-33597

An expanded system simulation model for solar energy storage (technical report), volume 1
[NASA-CR-159601] 24 p0804 N79-33881

SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884

PHOTOVOLTAIC EFFECT

Photovoltaic effects in II-VI heterojunctions
21 p0042 A79-11967

The photovoltaic effect in CdS/Cu2S solar cells
21 p0091 A79-15871

Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976

Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610

A solid-state solar-powered heat transfer device
24 p0667 A79-50932

Photovoltaic-powered irrigation experiments in the United States --- crop drying and irrigating in Nebraska
[COO-4094-28] 23 p0596 N79-27673

PHTHALOCYANIN

Photovoltaic properties of metal-free phthalocyanines - Al/H2Pc Schottky barrier solar cells
22 p0317 A79-31412

Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells
24 p0637 A79-47019

PHYSICAL FACTORS

Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995

PHYSICAL PROPERTIES

Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319

CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197

Coal classification and characterization
24 p0714 A79-53777

Evaluated physical properties data for materials used in energy storage systems
[UCRL-81159] 21 p0189 N79-11536

Prospective needs for physical property data in the chemical and allied industries during the next decade
[NPL-CHEM-84] 23 p0546 N79-23185

PILOT PERFORMANCE

Pilot's view of the evolving air transport
21 p0053 A79-13085

PILOT PLANTS

Operation of the Ft. Lewis, Washington Solvent Refined Coal /SRC/ Pilot Plant in the SRC I and SRC II processing modes
21 p0006 A79-10054

Synthane - A process for the gasification of caking and noncaking coals
21 p0006 A79-10057

Gasification of coal liquefaction residues
21 p0006 A79-10059

Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077

A proposed 40 MWe MHD pilot plant
21 p0017 A79-10137

Central solar heat stations and the Studsvik Demonstration Plant
21 p0021 A79-10175

Predicted performance of heliostats for ERDA's 10 MWe power plant
21 p0044 A79-12045

Coal desulfurization test plant status - July 1977 --- utilizing Meyers leach process
21 p0044 A79-12118

Solar One - A 10-megawatt solar thermal central receiver pilot plant project
[AIAA PAPER 78-1750] 21 p0060 A79-13853

Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854

Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690

Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity
21 p0076 A79-14741

H-Coal pilot plant project and status of commercial development at Ashland --- coal gasification producing hydrogen and hydrocarbons
21 p0092 A79-15888

Development of central station power plants integrated with coal gasifiers --- utilizing molten-carbonate fuel cells
21 p0093 A79-15895

SNG production by the Rockgas process
21 p0093 A79-15896

10-megawatt solar central receiver pilot plant
21 p0094 A79-15906

A status report on the Solar Thermal Test Facility
21 p0112 A79-16731

The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634

The H-Coal project --- catalytic hydrogenation of coal
21 p0145 A79-17635

Failure analysis in coal conversion systems --- pilot plant for liquefaction
22 p0266 A79-24137

Performance of a 5 MWt solar steam generator
22 p0288 A79-27399

Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428

Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451

Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop --- for low temperature geothermal sources
23 p0408 A79-34074

The Synthane process - A technical and economic assessment --- of coal gasification
23 p0410 A79-34089

HYGAS - A process ready for commercial demonstration --- coal gasification
23 p0411 A79-34090

The H-Coal pilot plant - History, description, and present status
23 p0412 A79-34100

A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0449 A79-34156

Materials problems experienced at the Synthane coal-gasification pilot plant
23 p0478 A79-39788

Design and construction of a pilot plant for a shrouded wind turbine
23 p0485 A79-40128

Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling
23 p0488 A79-40389

Practice of heat utilization from refuse
23 p0488 A79-40393

An overview of San Diego County's resource recovery plant
23 p0491 A79-40418

Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455

A stoichiometric analysis of coal gasification
23 p0492 A79-40456

Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371
Eurocean OTEC project
24 p0616 A79-45777
French OTEC program
24 p0616 A79-45778
OTEC ocean engineering progress report
24 p0617 A79-45783
Heat transfer between a fluidized bed and an immersed vertical U-tube --- in pilot plants
24 p0632 A79-46320
European technology for obtaining energy from solid waste --- Book
24 p0638 A79-47072
Solar One Project - A 10-megawatt solar thermal central receiver pilot plant
24 p0674 A79-51757
Advances in H-Coal --- coal liquefaction process
24 p0687 A79-51855
IGT U-GAS pilot plant developments --- of fluidized-bed gasification
24 p0688 A79-51861
Equipment and strategy for environmental sampling of complex coal gasification process streams
24 p0688 A79-51862
Solar pilot plant, phase 1
[SAN-1109-77-7] 21 p0210 N79-13542
Requirements for environmental monitoring assessment, and controls for nonnuclear energy demonstration projects. Report to Congress, prepared in fulfillment of Public Law 95-39, section 113
[DOE/EV-0014] 21 p0213 N79-13573
Recommendations for the conceptual design of the Barstow, California, solar central receiver pilot plant: Executive summary
[SAND-77-8035] 21 p0221 N79-14571
Engineering test facility conceptual design, part 1
[FE-2614-2-PT-1] 22 p0369 N79-21560
Engineering test facility conceptual design, part 2
[FE-2614-2-PT-2] 22 p0369 N79-21561
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181
In situ coal gasification modeling
[UCRL-82269] 23 p0561 N79-24479
Solvent Refined Coal (SRC) process: Environmental program. Volume 3: Pilot plant development work, part 5
[FE-0496-T8] 23 p0588 N79-27329
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0590 N79-27342
Status report the SRC-1 and SRC-2 processes
23 p0593 N79-27616
Conceptual design and cost study for a dual-purpose nuclear-electric reverse osmosis seawater conversion plant
[ORNL/TM-6821] 24 p0768 N79-31438
Fixed bed methanation processes
[FE-2240-96] 24 p0779 N79-32382

PIONEER PROJECT
SNAP 19 performance update for Pioneer and Viking missions
24 p0694 A79-51940

PIPE FLOW
Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402
Heat exchangers for Ocean Thermal Energy Conversion plants
21 p0142 A79-17506
Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787
Experimental and analytical OTEC studies at ORNL
24 p0626 A79-45859

PIPELINES
Problems, status, and prospects of a solar hydrogen economy
21 p0059 A79-13658
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors
[ASME PAPER 79-GT-81] 23 p0376 A79-32360
Combined cycles for pipeline compressor drives using heat
[ASME PAPER 79-GT-162] 23 p0378 A79-32424
Alternate ways of using bottoming cycle power in pipeline gas compressor stations
[ASME PAPER 79-GT-201] 23 p0380 A79-32458
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096
Comparison of two hydrogen production methods for nuclear-hydrogen conversion
23 p0413 A79-34108
Hydrogen energy transport systems and nuclear heat - A promising way to conserve fossil energy resources
23 p0415 A79-34127
Production, transport, and storage of hydrogen
23 p0523 A79-41802
Transmission of gaseous hydrogen - A preliminary technology evaluation
24 p0614 A79-45597
Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805
Dynamic analysis of pipeline system for thermal power generation facility
24 p0627 A79-45863
Suitability of gas distribution equipment in hydrogen service
24 p0685 A79-51845
Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B
[PB-282924/0] 21 p0181 N79-11446
Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report
[PB-282923/2] 21 p0181 N79-11447
Pipeline gas from coal-hydrogenation: IGT hydrogasification process, project 9000
[FE-2434-29] 23 p0554 N79-24184
Prospects for coal slurry pipelines in California
23 p0592 N79-27608
Behavior of gas distribution equipment in hydrogen service --- conferences
[CONF-790512-2] 24 p0747 N79-30408
Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils
[ORNL/SUB-79/14274/1] 24 p0776 N79-31827

PIPES (TUBES)
Optimum collection geometries for copper tube - copper sheet flat plate collectors
21 p0127 A79-17387
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825
Testing the OTEC cold water pipe using the 'Deep Oil X-1' platform
23 p0430 A79-35058
Rippled silica deposits in heat exchanger tubes --- heat removal from geothermal water
23 p0532 A79-42984
Ultrasonic detection of microbial slime films --- on OTEC heat exchanger tubes
24 p0620 A79-45807
Cold water pipe verification test --- for OTEC
24 p0621 A79-45811
A limiting mechanism for the heave induced Mathieu type instability of a cold water pipe --- for OTEC plant
24 p0621 A79-45813
Practical schemes for reducing cold water pipe loads --- for OTEC plants
24 p0621 A79-45814
Development of a lightweight concrete for OTEC cold water pipes
24 p0622 A79-45823
Oscillations of and drift force acting on an OTEC-CWP structure --- Cold Water Pipe
24 p0622 A79-45824
Vortex excited oscillations of marine structures with application to the OTEC cold water pipe
24 p0622 A79-45825
Analysis and experimental tests of a high-performance evacuated tubular collector
[NASA-CR-150874] 22 p0334 N79-16370
Condensation of refrigerants on vertical fluted tubes
[ORNL/TM-5848] 24 p0781 N79-32515

PISTON ENGINES
Balanced compounding of Stirling machines
21 p0024 A79-10200

Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine 21 p0024 A79-10201
Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine 21 p0024 A79-10202
Design of a preprototype Stirling Laboratory Research Engine 21 p0024 A79-10203
The matching of a free piston Stirling engine coupled with a free piston linear compressor for a heat pump application 21 p0024 A79-10204
A free-piston Stirling engine for small solar power plants 21 p0024 A79-10205
Conceptual design of a variable displacement Stirling engine for automotive propulsion 21 p0025 A79-10207
Radioisotope-powered free-piston Stirling engine for space applications [IAF PAPER 78-42] 21 p0034 A79-11217
Energy conservation in general aviation and operation and maintenance of Avco Lycoming piston engines 21 p0048 A79-12381
Alternative fuels for reciprocating internal combustion engines 21 p0051 A79-12980
The Stirling engine, an energy converter for cogeneration applications [ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator 22 p0258 A79-23137
A one-dimensional combustion model for a dual chamber stratified charge spark ignition engine [SAE PAPER 790355] 22 p0315 A79-31371
Liquid hydrogen from solar energy now 23 p0414 A79-34117
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine [SAE PAPER 790605] 23 p0440 A79-36737
A novel thermal engine using metal hydride 23 p0479 A79-39844
Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept 24 p0673 A79-51750
Advances in Stirling engine technology 24 p0690 A79-51888
Design characteristics of an advanced Stirling engine concept 24 p0690 A79-51889
A variable angle wobble plate drive for a stroke controlled Stirling engine 24 p0690 A79-51890
Tests of Wisconsin S12D engine running on natural gas with addition of carbon dioxide [AD-A058486] 22 p0339 N79-17230
Stirling engine characteristics 23 p0580 N79-26480
Solar engine --- Flat plate type [NASA-CASE-LAR-12148-1] 24 p0737 N79-29608
Demonstration of a free piston Stirling engine driven linear alternator system [COO-2764-002] 24 p0750 N79-32713

PISTON THEORY
Electromagnetic excitation of a moving conducting piston 22 p0237 A79-20658
Electromechanical conversion of energy during the deceleration of a piston in a uniform magnetic field 22 p0309 A79-30599
Dynamics of a free-piston Diesel- MHD generator 23 p0395 A79-33424
Effect of friction on motion of a piston driven by combustion products 23 p0436 A79-35656

PISTONS
Review of liquid piston pumps and their operation with solar energy [ASME PAPER 79-SOL-4] 22 p0308 A79-30542

PITCH (INCLINATION)
Optimum tube pitch in solar collectors 21 p0132 A79-17421
Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration 21 p0132 A79-17422

PLANAR STRUCTURES
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results [LA-7041] 21 p0185 N79-11494

PLANETARY ATMOSPHERES
Advances in heat transfer. Volume 14 --- Book 24 p0638 A79-47255

PLANETARY ENVIRONMENTS
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine --- operating in planetary environment 21 p0166 A79-20348

PLANTS (BOTANY)
Design, operation, and economics of the Energy Plantation as an alternate source of fuels 23 p0467 A79-38616
Primary impacts of growing aquatic plants for energy 24 p0665 A79-50886
Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis 24 p0669 A79-51196
Biomass utilization in Minnesota [PB-282531/3] 21 p0171 N79-10241
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations [PB-286487/4] 21 p0230 N79-15422
Hydrocarbons and energy from plants [LBL-8596] 23 p0564 N79-24507
Review of current research on hydrocarbon production by plants [SERI/TR-33-129] 24 p0779 N79-32374

PLASMA ACCELERATORS
Instrumentation --- plasma accelerators and magnetohydrodynamic generators; plasma diagnostics 23 p0545 N79-22894

PLASMA CHEMISTRY
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators 23 p0391 A79-33393

PLASMA COMPOSITION
Cyclotron-wave spectrum in a plasma with two ion species 22 p0245 A79-21443
Performance of a closed-cycle MHD generator with molecular impurities 22 p0283 A79-26524
On the motion of runaway electrons in momentum space --- analysis for multi-component plasma in tokamaks 22 p0291 A79-27880
The effects of wall temperature on light impurities in Alcator --- tokamak device 22 p0313 A79-31188
Calculation of the Q factor for a two-component tokamak 22 p0324 A79-31763
Impurity behaviour in real and simulated tokamak plasmas 23 p0444 A79-36885
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak 24 p0649 A79-49254

PLASMA CONDUCTIVITY
Radiatively sustained cesium plasmas for solar electric conversion 21 p0109 A79-16615
The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity 21 p0167 A79-20415
Experimental studies of a linear MHD generator with fully ionized seed 22 p0238 A79-20796
Power generation experiments of a linear MHD generator with fully ionized seed 23 p0394 A79-33421
Investigation of plasma electroconductivity on the U-25 facility 23 p0530 A79-42854
The measurement of plasma electrical conductivity by the electromagnetic transmission method 23 p0530 A79-42875

Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field
24 p0708 A79-52955

Power output of an MHD generator - Effect of ionization instability and boundary layer
24 p0708 A79-52958

PLASMA CONTROL

Doublet III design and construction --- Tokamak fusion research device
21 p0018 A79-10145

Demonstration and commercial prototype tokamak reactors
21 p0018 A79-10146

The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147

Mirror fusion reactors
21 p0018 A79-10148

Overview of inertial confinement fusion reactor designs
21 p0018 A79-10149

A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153

Heavy-ion beam inertial-confinement fusion
21 p0054 A79-13448

Recent results from the PLT tokamak
21 p0069 A79-14453

Review of tokamak theory results
21 p0069 A79-14454

Progress in tokamak experimental research in the Soviet Union
21 p0069 A79-14455

Review of results from DITE tokamak
21 p0069 A79-14456

Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457

Ohmic heating experiments in the W VII A stellarator
21 p0069 A79-14458

Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

Ohmic heating experiments in the L-2 stellarator
21 p0070 A79-14460

The mirror machine program in the USA --- controlled fusion experiments and research facilities
21 p0070 A79-14461

Toroidal high-beta systems
21 p0070 A79-14462

New results in high-beta stellarator and belt-pinch research
21 p0070 A79-14463

Fusion reactor problems --- plasma confinement and interface engineering
21 p0071 A79-14468

Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program --- Book
21 p0077 A79-14776

Review of experimental results. I, II --- MHD instability effects on tokamak confinement with ohmic heating
21 p0077 A79-14778

MHD equilibrium and stability --- in tokamak devices
21 p0078 A79-14779

Magnetic divertors --- in large tokamak plasma confinement experiments
21 p0078 A79-14781

The 'FINTOR 1' design - A minimum size tokamak experimental reactor
21 p0078 A79-14782

Philosophy and physics of predemonstration fusion devices
21 p0078 A79-14783

Characteristics of a predemonstration fusion device
21 p0078 A79-14784

Predemonstration fusion devices - Research and development needs
21 p0078 A79-14785

Compact experiments for alpha-particle heating --- of confined D-T plasma in tokamak
21 p0078 A79-14786

Superconducting magnets - Some fundamentals and their state of the art
21 p0079 A79-14788

The impact of servicing requirements on tokamak fusion reactor design
21 p0079 A79-14793

Fusion power by magnetic confinement - Program plan
21 p0080 A79-14794

Dynamics and feedback control of ISX tokamak
21 p0107 A79-16559

Magnetically confined plasma solar collector --- satellite based system in space
21 p0109 A79-16617

Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729

Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak --- safety factor
21 p0155 A79-18830

Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

Optimum properties of a noncylindrical pinch --- neutron energy yield in fusion plasma
22 p0244 A79-21433

Minimum-average-B wells in linked magnetic mirror fields --- for plasma control in fusion reactors
22 p0252 A79-22237

Particle orbits in field-reversed mirrors --- for plasma confinement in fusion reactor
22 p0253 A79-22239

Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240

An overview of design space for small fusion targets
22 p0253 A79-22241

Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

Local theory of finite-beta, collisional drift modes --- plasma stability analysis
22 p0253 A79-22244

Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034

Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces --- in toroidal plasmas
22 p0270 A79-24855

Theory of anomalous transport due to electrostatic fluctuations --- low frequency plasma instabilities of drift wave type
22 p0270 A79-24858

MHD stability for a spherator with a purely poloidal magnetic field
22 p0271 A79-24863

Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876

The effect of limiters and current profile on elliptic free-boundary MHD equilibria
22 p0291 A79-27881

Stabilization of drift loss-cone instability /DCI/ by addition of cold ions --- in collisional hydrogen plasma confinement
22 p0291 A79-27882

Theory of dissipative drift instabilities in sheared magnetic fields --- in confined toroidal plasmas
22 p0292 A79-27884

Evidence for neutral-beam-injected oxygen impurities in 2XIIB --- mirror confined plasma
22 p0292 A79-27887

Theory of the striated corona in a theta pinch
22 p0295 A79-28315

Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003

Design and development of the US-TESPF toroidal coil
22 p0311 A79-31014

Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184

MHD stability of Spheromak
22 p0313 A79-31189

Plasma behavior near the neutral line between parallel currents --- in planar zeta pinch
22 p0324 A79-31754

Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762

A scheme for direct conversion of plasma thermal energy into electrical energy
22 p0324 A79-31765
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058
Fusion power demonstration study at ORNL
23 p0407 A79-34059
The ELMO Bumpy Torus - An alternative fusion reactor concept
23 p0407 A79-34060
Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062
Prospects of generating power with particle-beam-drive inertial confinement fusion
23 p0407 A79-34063
Feedback control of a class of plasma instabilities
23 p0422 A79-34253
Stability properties of an anisotropic guiding center plasma and relation with the Suydam function
23 p0438 A79-36411
Review of plasma wall interactions in tokamaks
23 p0443 A79-36879
Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881
Impurity behaviour in real and simulated tokamak plasmas
23 p0444 A79-36885
First wall and divertor plate material selection in fusion reactors
23 p0444 A79-36886
Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887
Sputtering yields of graphite and carbides and their potential use as first wall materials --- in Tokamak reactor
23 p0444 A79-36892
Superthermal alpha transport and wall bombardment in tokamaks
23 p0444 A79-36927
Fusion research - The temperature rises
23 p0445 A79-37000
Drift wave propagation and convective wave growth in tokamaks
23 p0446 A79-37262
A source of error in cusp plasma leak measurements
23 p0446 A79-37265
An optical evaluation laboratory for laser fusion
23 p0447 A79-37667
Finite beta trapped electron fluid mode
23 p0478 A79-39561
Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939
Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940
Tearing mode instabilities and their suppression by lower hybrid fields --- in tokamaks
24 p0606 A79-45004
Heating of current-free stellarators
24 p0607 A79-45037
Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor
24 p0630 A79-46302
High-frequency convective loss-cone instability in short mirror machines
24 p0639 A79-47421
Effect of scrape-off on tokamak radial transport
24 p0640 A79-47427
Theta-pinch description from classical electrodynamics
24 p0640 A79-47602
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226
On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors
24 p0705 A79-52352
Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188
Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887

PLASMA CORE REACTORS
Gaseous fuel reactors for power systems
[LA-UR-78-1437] 21 p0214 N79-13844

PLASMA CYLINDERS
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457
Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037
Self-consistent analysis of alpha-particle heating of a fast-solenoid plasma --- in laser fusion
22 p0291 A79-27879
Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766
Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188

PLASMA DENSITY
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479
Stimulated Raman scatter in laser fusion target chambers
21 p0155 A79-18794
Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma
22 p0255 A79-22369
A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a
22 p0255 A79-22379
The effect of thermo-electric forces on the density profiles in a thermonuclear plasma surrounded by a cold blanket
22 p0292 A79-27886
Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762
Warm plasma effects on drift cyclotron loss cone mode --- in mirror machines
23 p0478 A79-39568
A study of waveguides for far infrared interferometers measuring electron density of tokamak plasmas
23 p0526 A79-41842
Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor
24 p0630 A79-46302

PLASMA DIAGNOSTICS
Plasma diagnostics in an MHD installation
21 p0106 A79-16492
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430
Structure of the current shell in a Z pinch
22 p0245 A79-21434
Investigation of a staged plasma-focus apparatus --- pinch construction and current sheet dynamics investigation
22 p0255 A79-22365
Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma
22 p0255 A79-22369
Diagnostics of Shiva Nova high-yield thermonuclear events --- in laser fusion
22 p0285 A79-26747
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419

Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400
Tokamak plasma diagnosis by surface physics techniques
23 p0443 A79-36883
Diagnostic techniques in combustion MHD flows
23 p0478 A79-39508
Measurements of plasma shape in a tokamak
23 p0527 A79-41944
Joint Soviet-American studies in the domain of plasma diagnostics
23 p0529 A79-42853
Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452
Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47804
Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge
24 p0706 A79-52537
Proposed non-interferometric FIR electron density measuring scheme for tokamaks
24 p0707 A79-52667
VKI Short Course on Magnetohydrodynamic Accelerators and Generators
[VKI-LECTURE-SERIES-8] 23 p0545 N79-22891
Instrumentation --- plasma accelerators and magnetohydrodynamic generators; plasma diagnostics
23 p0545 N79-22894

PLASMA DIFFUSION
On the ion energy balance in TFR with and without neutral injection heating
21 p0069 A79-14452
Collisional transport --- particle diffusion and heat transport in tokamak
21 p0078 A79-14780
Equilibrium relations in the presence of arbitrary plasma diffusion in axisymmetric configurations
22 p0257 A79-22979
Collisional transport --- of plasmas in plane and toroidal geometry
22 p0257 A79-22980
Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859
On the diffusive instability of some simple steady magnetohydrodynamic flows
22 p0278 A79-26163
Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943

PLASMA DIODES
Contribution to the theory of the pulsed mode of operation of the thermionic energy converter. II
22 p0246 A79-21542
Theory of the pulsed operation of a thermionic converter. II - Ionization stage
23 p0442 A79-36815

PLASMA DYNAMICS
Transport phenomena in MHD generators - Effect of boundary layers
21 p0156 A79-19098
Diagonal frame RM channel of the U-25 power plant --- MHD generators
23 p0393 A79-33407

PLASMA ELECTRODES
Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
21 p0153 A79-18468
Effect of electrode shielding on beamlet-beamlet interaction in multiaperture sources
21 p0154 A79-18481
Construction of a mathematical model for MHD generator electrodes in the arc regime of operation
22 p0258 A79-23138
Three-dimensional effects of electrode configuration on diagonal MHD generator performance
22 p0283 A79-26523
Discharge characteristics of slagging metal electrodes --- magnetohydrodynamic generators
23 p0391 A79-33392
Electrode development for coal fired MHD generators
23 p0392 A79-33396
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
Thermal properties of MHD electrode materials
23 p0392 A79-33400
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402
Design and operation of the Westinghouse electrode systems test facility /WESTF/ --- for MHD generator
23 p0393 A79-33411
Properties and test results of super-hot wall electrode materials --- for MHD generators
23 p0394 A79-33415
Consolidation and local control of power in an MHD generator
23 p0395 A79-33425
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426
Study of the thermal inertia of an electrode microarc
23 p0530 A79-42869
A new three-dimensional equivalent circuit of diagonal type MHD generator
24 p0605 A79-44914
Characteristics of series channels with a reduced electrode commutation angle in the connecting section --- MHD generators
24 p0650 A79-49374

PLASMA ENGINES
Some aspects of a fission-based plasma engine
24 p0715 A79-54350

PLASMA EQUILIBRIUM
Equilibrium relations in the presence of arbitrary plasma diffusion in axisymmetric configurations
22 p0257 A79-22979
MHD instabilities
22 p0259 A79-23599
MHD stability for a spherator with a purely poloidal magnetic field
22 p0271 A79-24863
Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876
The effect of limiters and current profile on elliptic free-boundary MHD equilibria
22 p0291 A79-27881
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103
Stability properties of an anisotropic guiding center plasma and relation with the Suydam function
23 p0438 A79-36411
Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939
Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41941
Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943
Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419
Stability of tokamaks with elongated cross section
24 p0639 A79-47422
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

PLASMA FOCUS

Development of energetic neutral beams to the megawatt power level for controlled thermonuclear research
21 p0054 A79-13439

Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466

Investigation of a staged plasma-focus apparatus --- pinch construction and current sheet dynamics investigation
22 p0255 A79-22365

Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817

Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

PLASMA FREQUENCIES

Non-thermal emission at the plasma frequency --- spectra obtained on tokamak fusion reactors
22 p0270 A79-24854

PLASMA GENERATORS

Radiatively sustained cesium plasmas for solar electric conversion
21 p0109 A79-16615

The TELEC - A plasma type of direct energy converter --- Thermo-Electronic Laser Energy Converter for electric power generation
21 p0110 A79-16629

Magnetic multipole line-cusp plasma generator for neutral beam injectors
22 p0238 A79-20746

Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

PLASMA HEATING

Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151

The fast power cycle for fusion reactors
21 p0018 A79-10152

On the ion energy balance in TFR with and without neutral injection heating
21 p0069 A79-14452

Recent results from the PLT tokamak
21 p0069 A79-14453

Progress in tokamak experimental research in the Soviet Union
21 p0069 A79-14455

Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457

Ohmic heating experiments in the W VII A stellarator
21 p0069 A79-14458

Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

Ohmic heating experiments in the L-2 stellarator
21 p0070 A79-14460

Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma
21 p0071 A79-14467

Review of experimental results. I, II --- MHD instability effects on tokamak confinement with ohmic heating
21 p0077 A79-14778

Compact experiments for alpha-particle heating --- of confined D-T plasma in tokamak
21 p0078 A79-14786

Auxiliary heating in breakeven tokamaks
21 p0079 A79-14792

The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470

Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432

The synergetics of the catalytic D-D-fusion-fission breeder
22 p0252 A79-22236

Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240

Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037

RF-heating in stationary systems --- of toroidal plasma in tokamaks
22 p0271 A79-24864

Lower hybrid resonance heating --- of tokamak plasma
22 p0271 A79-24865

Magneto-acoustic resonance heating in the ion-cyclotron frequency domain --- of tokamak plasmas
22 p0271 A79-24866

Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device --- microwave heating of tokamak plasma
22 p0271 A79-24867

Self-consistent analysis of alpha-particle heating of a fast-solenoid plasma --- in laser fusion
22 p0291 A79-27879

Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27885

200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186

MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192

Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345

Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346

Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

Surface processes in plasma wall interactions --- in tokamak experiments
23 p0442 A79-36877

Review of plasma wall interactions in tokamaks
23 p0443 A79-36879

Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880

Surface effects and impurity production in tokamak machines
23 p0443 A79-36884

Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887

Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940

Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

Tearing mode instabilities and their suppression by lower hybrid fields --- in tokamaks
24 p0606 A79-45004

The theory of lower hybrid heating of tokamak plasmas
24 p0606 A79-45028

Lower hybrid heating experiments in JFT-2 tokamak
24 p0607 A79-45030

Electron cyclotron heating in Bumpy Torus Program
24 p0607 A79-45033

Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

Heating of current-free stellarators
24 p0607 A79-45037

Ion heating in the LT-3 tokamak
24 p0639 A79-47399

Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424

Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426

Supplementary RF plasma heating in tokamaks
24 p0668 A79-50999

Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337

Synthetic test methods of high-direct-current circuit breaker --- used with ohmic heating power supply for tokamak device
24 p0716 A79-54504

PLASMA INTERACTIONS

Slag deposition and its effect on the performance of MHD channels --- in electric generators [AIAA PAPER 79-0189]
21 p0157 A79-19588

Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34052

Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876

Review of plasma wall interactions in tokamaks
23 p0443 A79-36879

Plasma-surface interactions in tokamaks
23 p0527 A79-41942

Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026

Environmental interaction implications for large space systems
23 p0552 N79-24027

Space environmental effects and the solar power satellite
23 p0552 N79-24028

Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

PLASMA JETS

Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532

Hall effect in an induction discharge
23 p0442 A79-36806

PLASMA LIFETIME

Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

PLASMA OSCILLATIONS

Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457

Finite beta trapped electron fluid mode
23 p0478 A79-39561

Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188

PLASMA PHYSICS

Philosophy and physics of predemonstration fusion devices
21 p0078 A79-14783

Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473

Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401

Inhomogeneity of the transverse current in an MHD channel and its effect on the local characteristics of an MHD generator
24 p0706 A79-52369

Trends of plasma physics and nuclear fusion research life cycle and research effort curve [IPPJ-396]
24 p0730 N79-29051

PLASMA PINCH

Toroidal high-beta systems
21 p0070 A79-14462

New results in high-beta stellarator and belt-pinch research
21 p0070 A79-14463

Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480

Optimum properties of a noncylindrical pinch --- neutron energy yield in fusion plasma
22 p0244 A79-21433

Structure of the current shell in a Z pinch
22 p0245 A79-21434

Investigation of a staged plasma-focus apparatus --- pinch construction and current sheet dynamics investigation
22 p0255 A79-22365

Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41941

PLASMA POTENTIALS

Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

The effects of electron thermal conductivity on thermionic energy converters
24 p0700 A79-51990

PLASMA PROBES

A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915

VKI Short Course on Magnetohydrodynamic Accelerators and Generators [VKI-LECTURE-SERIES-8]
23 p0545 N79-22891

PLASMA RADIATION

An experimental determination of the parallel electron velocity distribution during strong turbulence --- in Texas Turbulent Torus
23 p0446 A79-37264

Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940

PLASMA RESONANCE

Lower hybrid resonance heating --- of tokamak plasma
22 p0271 A79-24865

Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges
23 p0478 A79-39676

The theory of lower hybrid heating of tokamak plasmas
24 p0606 A79-45028

PLASMA SHEATHS

Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880

Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419

Plasma sheath effects and voltage distributions of large high-power satellite solar arrays
23 p0552 N79-24024

PLASMA SLABS

Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419

PLASMA SPECTRA

Measurements of plasma rotation in tokamak LT-3
22 p0252 A79-22238

The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
22 p0312 A79-31183

Interpretation of cyclotron radiation spectra from runaway discharges in TFR
22 p0313 A79-31185

PLASMA TEMPERATURE

Transport phenomena in MHD generators - Effect of boundary layers
21 p0156 A79-19098

Warm plasma effects on drift cyclotron loss cone mode --- in mirror machines
23 p0478 A79-39568

A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915

PLASMA TURBULENCE

Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432

Turbulence of a combustion product plasma in an MHD channel
22 p0246 A79-21538

Combustion-products turbulence in the channel of an MHD generator
23 p0442 A79-36812

An experimental determination of the parallel electron velocity distribution during strong turbulence --- in Texas Turbulent Torus
23 p0446 A79-37264
Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426
Thermonuclear energy from ball lightning
24 p0696 A79-51957

PLASMA WAVES
Cyclotron-wave spectrum in a plasma with two ion species
22 p0245 A79-21443
Single-particle behaviour in plasmas
22 p0257 A79-22977
Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity --- in tokamaks
22 p0269 A79-24814
Effects of nonlinear decay of backscattered light on the anomalous reflectivity --- in laser plasmas
22 p0310 A79-30742
Drift wave propagation and convective wave growth in tokamaks
23 p0446 A79-37262
The theory of lower hybrid heating of tokamak plasmas
24 p0606 A79-45028
Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424
Nonlinear effects in propagation of lower hybrid waves in a plasma
24 p0706 A79-52381

PLASMA-ELECTROMAGNETIC INTERACTION
On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid
21 p0156 A79-19445
Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432
Single-particle behaviour in plasmas
22 p0257 A79-22977
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution
23 p0478 A79-39566
Nonlinear effects in propagation of lower hybrid waves in a plasma
24 p0706 A79-52381
Electrical power loss from high-voltage power circuits through plasma leakage
21 p0169 N79-10113

PLASMA-PARTICLE INTERACTIONS
Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466
Single-particle behaviour in plasmas
22 p0257 A79-22977
Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

PLASMAS (PHYSICS)
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

PLASTIC COATINGS
Protection of solar collector materials from UV
24 p0609 A79-45217

PLASTIC FLOW
Continuous extrusion of coal --- plastic fluidizing process
22 p0282 A79-26372

PLASTICS
Use of plastics in solar energy applications
21 p0067 A79-14268
Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492

PLATFORMS
System design considerations for a floating OTEC modular experiment platform
24 p0625 A79-45847

PLATING
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979

PLATINUM
Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813
Fuel cell catalyst sintering studies --- platinum catalysts in phosphoric acid fuel cells
[EPRI-EM-833] 24 p0776 N79-31828

PLUMES
The impact of a coal fired power plant on ambient sulfur dioxide levels
21 p0082 A79-15032
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant --- for weather modification studies
23 p0438 A79-36432
The conversion of SO2 to sulfate particles in coal fired power plant plumes
23 p0535 A79-43391
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements
24 p0612 A79-45532
The extent of catalytic SO2 reactions in smoke plumes
24 p0616 A79-45748
Results of a near field physical model study --- OTEC plant interaction with ocean environment
24 p0626 A79-45856

PLUTONIUM OXIDES
Status report of the dynamic isotope power system
24 p0692 A79-51927
Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments --- soil and water analysis
[LA-7033-PR] 21 p0232 N79-15783

PLUTONIUM 238
Mini-Brayton heat source assembly development
[NASA-CR-159447] 21 p0196 N79-12554
Proliferation-resistant nuclear fuel cycles
[ORNL/TM-6392] 21 p0214 N79-13849
Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments --- soil and water analysis
[LA-7033-PR] 21 p0232 N79-15783

PLYWOOD
Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396

PNEUMATIC EQUIPMENT
Experiences with a hydropneumatic wave power device
21 p0151 A79-18105

POINTING CONTROL SYSTEMS
Effects of pointing errors on receiver performance for parabolic dish solar concentrators
21 p0020 A79-10167
Attitude and pointing control system for the microwave antenna of the solar power satellite
21 p0113 A79-16739
A simple solar tracking system --- manually adjusted rotating shaft for solar concentrator positioning
21 p0136 A79-17457
Computer based sun following system
22 p0242 A79-21165
Optimal control of sun tracking solar concentrators
23 p0526 A79-41831
Accuracy analysis of pointing control system of solar power station
[NASA-CR-150880] 21 p0215 N79-14143

Solar tracking system --- with pointing control circuits
[NASA-CASE-MFS-23999-1] 24 p0721 N79-28667
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632

POLAR REGIONS
Energy conversion at a lunar polar site
21 p0108 A79-16607
The polar lunar base - A viable alternative to L-5
[AAS 78-191] 23 p0427 A79-34862

POLARIMETRY
Proposed non-interferometric FIR electron density measuring scheme for tokamaks
24 p0707 A79-52667

POLARIZATION (CHARGE SEPARATION)
Migrational polarization in high-current density molten salt electrochemical devices
21 p0039 A79-11811

POLARIZATION CHARACTERISTICS
Migrational polarization in high current density molten salt battery and fuel cell analogs
23 p0446 A79-37273

POLICIES
Public policy
21 p0179 N79-11011
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0793 N79-32995

POLITICS
Economic, political and psychosocial barriers to a change-over to renewable energy resources
23 p0421 A79-34176
The Eppler scenario - A critical analysis --- German energy politics
24 p0649 A79-49330
Satellite Power System (SPS) international agreements
[NASA-CR-157433] 23 p0548 N79-23497

POLLUTION CONTROL
Factors limiting limestone utilization efficiency in fluidized-bed combustors --- in determining sulfur dioxide emission level
21 p0008 A79-10069
Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071
Pressurized fluidized-bed combustion/component test and integration unit preliminary design report
21 p0008 A79-10076
Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139
Emission control techniques for alternative fuel combustion
21 p0053 A79-12990
A standard procedure of economic evaluation for energy-producing and pollution-abatement operations
21 p0064 A79-14109
State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes
21 p0064 A79-14111
Pollution perspective for geothermal energy development
21 p0064 A79-14114
Recent operating experience of the Wellman-Lord FGD process on a coal-fired boiler --- flue gas desulfurization
21 p0065 A79-14120
The Research-Cottrell/Bahco SO2 and particulate removal system at Rickenbacker Air Force Base
21 p0065 A79-14122
Particulate control for coal-fired industrial boilers
21 p0065 A79-14123
The direct reduction of sulfur dioxide
21 p0065 A79-14124
Simultaneous nitrogen oxides and sulfur dioxide removal by absorption-reduction scrubbing
21 p0066 A79-14125
Correlations of catalytic combustor performance parameters
21 p0081 A79-14956
Environmental effects of burning solid waste as fuel
21 p0082 A79-15115
Shock tube studies of coal devolatilization
21 p0083 A79-15247
Particulate and sulfur oxide control options for conventional coal combustion
21 p0092 A79-15883
Coal-based electricity and air pollution control - A case for solvent refined coal
21 p0096 A79-15922
Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923
Clean Air Act amendments of 1977 and the impact on control efforts
21 p0097 A79-16091
Protection of the biosphere --- MHD power stations pollution reduction
21 p0105 A79-16483
The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736
Energy requirements of a limestone FGD system --- Flue Gas Desulfurization
21 p0114 A79-16747
Reducing inefficiency and emissions of large steam generators in the United States
21 p0114 A79-17075
An analysis of air pollution control costs in N.S.W. --- New South Wales, Australia
21 p0115 A79-17228
Advanced emissions control and test facility of the Electric Power Research Institute
21 p0115 A79-17249
The influence of lead compounds on automotive exhaust catalysts
21 p0116 A79-17253
Advances in fluidized bed gasification process development
21 p0145 A79-17633
Assessment of current flue gas desulfurization technology
21 p0145 A79-17637
MHD power generation
21 p0146 A79-17638
A survey of particulate collection devices for coal-fired boilers
21 p0147 A79-17645
Emission control for SO2 - An update
[ASME PAPER 78-JPGC-PWR-11] 21 p0150 A79-18097
Operating experience with three 20 MW prototype flue gas desulfurization processes
[ASME PAPER 78-JPGC-PWR-12] 21 p0150 A79-18098
Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735
Modification of electrostatic precipitator performance by use of fly-ash conditioning agents
[ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers
[ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
Hydrogen enrichment for low-emission jet combustion
22 p0244 A79-21347
Tropospheric conduits --- for pollution abatement and energy production
22 p0266 A79-24275
A model for coal fly ash filtration
22 p0296 A79-28389
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390
The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations
[ASME PAPER 79-GT-16] 22 p0306 A79-30510
Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533

Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374

A new combustion system in the three-valve stratified charge engine
[SAE PAPER 790439] 22 p0316 A79-31376

The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344

Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

Methods of reducing harmful emissions from thermal power stations
23 p0474 A79-38863

H2S emissions in the domain of chemical industry and means of suppressing emissions
23 p0481 A79-40068

Air pollution control --- Book
23 p0486 A79-40134

Particle size variation in the solvent refined coal process
23 p0492 A79-40451

NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

Coal desulfurization --- for reduction of pollution emissions
23 p0533 A79-43200

Application of long-range transport modeling to assess coal development --- for impact on air quality
23 p0535 A79-43429

A practical regional scale air quality simulation model for energy resource development in the four corners area
23 p0535 A79-43430

Design and development of a low emission combustor for a car gas turbine
[ASME PAPER 78-GT-155] 24 p0605 A79-44793

Reduction of particulate carryover from a pressurized fluidized bed
24 p0653 A79-49527

Impact of H2S emission abatement on geothermal power costs
24 p0659 A79-50352

Applicability of energy model techniques to an analysis of impacts of SO2 emissions from the U.S. electric utilities and control policies
24 p0659 A79-50362

Cogeneration with digester gas
24 p0676 A79-51773

MHD emissions and their controls
24 p0709 A79-52968

Pollutant protection for the case of strip mining in the Rhine area
24 p0714 A79-53804

Particulate control mobile test units: Third year's operation
[PB-283657/5] 21 p0178 N79-10603

Pollution control guidance for geothermal energy development
[PB-282546/1] 21 p0178 N79-10604

Nitrogen oxide air pollution. Volume 2, part 1: Control technology. A bibliography with abstracts
[NTIS/PS-78/0971/8] 21 p0199 N79-12591

Evaluations of novel particulate control devices
[PB-283973/6] 21 p0199 N79-12601

Investigation of turbo-dyne energy chamber (G:R: value trademark): An air bleed device
[PB-285381/0] 21 p0217 N79-14397

Energy requirements of present pollution control technology
[PB-286231/6] 21 p0223 N79-14643

Assessment of coal cleaning technology
[PB-287091/3] 22 p0330 N79-16139

Oil pollution reports, volume 5, number 2 --- bibliographies
[PB-287071/5] 22 p0336 N79-16437

Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446

Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359

Interagency coal cleaning technology development
22 p0347 N79-18361

Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion
[PB-288602/6] 22 p0350 N79-18487

Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F
[PB-288604/2] 22 p0350 N79-18489

Water-related environmental effects in fuel conversion, volume 1. Summary
[PB-288313/0] 22 p0351 N79-18834

Water-related environmental effects in fuel conversion. Volume 2: Appendices
[PB-288874/1] 22 p0356 N79-19496

Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

Environmental assessment: Source test and evaluation report, Chapman low-Btu gasification
[PB-289940/9] 22 p0373 N79-21662

Pollution control guidelines for coal refuse piles and slurry ponds
[PB-291369/7] 22 p0373 N79-21682

Sooting characteristics of liquid pool diffusion flames
[AD-A064111] 23 p0539 N79-22252

Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results
[PB-290514/9] 23 p0566 N79-24534

An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249

Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234

Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412

Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546

Research summary--oil spills
[PB-293597/1] 23 p0585 N79-26558

Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575

Status of NO sub x control for coal-fired power plants
23 p0592 N79-27609

Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610

Fluidized combustion of coal --- to limit SO2 and NOx emissions
23 p0593 N79-27613

Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement)
[PB-293731/6] 24 p0743 N79-29670

Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683

Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709

Oven curing: Energy conservation and emission control in coil coating
[TID-28705] 24 p0750 N79-30723

Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808

Environmental control implications of increased coal utilization under the National Energy Plan --- regulatory and control technology issues
[ANL/EES-CP-10] 24 p0760 N79-30846

Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751

EPA program status report: Oil shale, 1979 update
[PB-294998/0] 24 p0796 N79-33538

Technology overview reports for eight shale oil recovery processes --- for evaluation of pollution control and environmental impact technologies
[PB-295665/4] 24 p0797 N79-33552

POLLUTION MONITORING
- Ambient air quality assessment of the Synthane coal gasification pilot plant, six month study /August 1976-January 1977/ 21 p0064 A79-14113
- Joint Conference on Sensing of Environmental Pollutants, 4th, New Orleans, La., November 6-11, 1977, Proceedings 21 p0082 A79-15023
- The impact of a coal fired power plant on ambient sulfur dioxide levels 21 p0082 A79-15032
- On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin 21 p0082 A79-15052
- The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion 21 p0082 A79-15077
- Coupled heat and organic wastes stream pollution 21 p0086 A79-15602
- A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley 21 p0116 A79-17262
- The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil 21 p0156 A79-19219
- Real-time, continuous measurement of automotive sulfuric acid emissions 21 p0156 A79-19359
- Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility [ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741
- Emissions from pressurized fluidized-bed combustion processes 22 p0261 A79-23640
- H2S associated with mineral oil refineries and natural gas processing plants - Emissions and absorptions 23 p0481 A79-40069
- Gaseous, particulate, and smoke emissions from a heavy duty automotive gas turbine engine 23 p0522 A79-41154
- Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah 23 p0534 A79-43371
- The influence of rough terrain on pollutant dispersion and transport from a geothermal power complex 23 p0534 A79-43372
- The Geysers geothermal area emissions and aerometric data base and air quality analysis 23 p0534 A79-43373
- Environmental investigations of in situ coal gasification experiments 24 p0664 A79-50880
- Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards [CONF-780121-2] 21 p0192 N79-11568
- EPA program status report: Oil shale [PB-284480/1] 21 p0211 N79-13548
- Balloon-borne particulate sampling for monitoring power plant emissions [PB-290473/8] 23 p0566 N79-24543
- A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions 23 p0590 N79-27546
- Air monitoring network design for power plant siting 23 p0591 N79-27590
- Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement) [PB-293731/6] 24 p0743 N79-29670
- Polymeric interfaces for stack monitoring [PB-294997/2] 24 p0761 N79-30866
- Measurement techniques for trace metals in coal-plant effluents: A brief review [NASA-RP-1047] 24 p0803 N79-33611
- Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution [PB-297467/3] 24 p0803 N79-33648

POLYBENZIMIDAZOLE
- Ultrafine polybenzimidazole (PBI) fibers --- separators for alkaline batteries and dfuel cells [NASA-CR-159644] 24 p0764 N79-31350

POLYCRYSTALS
- Polycrystalline CdSe-based photo-electrochemical cells 21 p0037 A79-11785
- Recent progress in thin film polycrystalline solar cells based on cadmium sulfide 21 p0042 A79-11966
- High efficiency solar cells based on indium phosphide 21 p0042 A79-11968
- A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell 21 p0125 A79-17361
- Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon 23 p0504 A79-40959
- Effect of copper impurity on polycrystalline silicon solar cells 23 p0504 A79-40962
- Poly- vs single-crystal silicon solar cells 23 p0518 A79-41064
- Thin film polycrystalline silicon solar cells 23 p0518 A79-41067
- Solar cells made from polycrystalline silicon [LEP-78/519-679-D] 24 p0743 N79-29669

POLYESTER RESINS
- Filon panels - A technical report --- fiberglass reinforced plastics for solar collectors 21 p0031 A79-10403
- Characteristics of GRP for applications in solar energy collectors 23 p0385 A79-33218

POLYETHYLENES
- Form-stable, crystalline polymer pellets for thermal energy storage 21 p0013 A79-10107
- Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions 23 p0433 A79-35383
- Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions 24 p0663 A79-50706

POLYMER CHEMISTRY
- Solid polymer electrolyte water electrolysis status for large scale hydrogen production 24 p0686 A79-51847

POLYMER PHYSICS
- Progress in solid polymer electrolyte water electrolysis --- for large-scale hydrogen production 22 p0289 A79-27653

POLYMERIC FILMS
- /SN/x-GaAs polymer-semiconductor solar cells 21 p0154 A79-18504
- The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate 22 p0239 A79-20824
- Study of the spectral characteristics of metallized polymer films for production of solar concentrators 22 p0297 A79-28672
- Investigation of the optical properties of transparent materials for solar energy applications 23 p0434 A79-35384
- Protection of solar collector materials from UV 24 p0609 A79-45217
- Investigation of the spectral characteristics of metallized polymer films for making solar concentrators 24 p0637 A79-46910
- Investigation into the optical characteristics of transparent solar-energy materials 24 p0663 A79-50707
- UV blocking filters for polymeric films 24 p0668 A79-51103
- Polymeric interfaces for stack monitoring [PB-294997/2] 24 p0761 N79-30866

POLYMERIZATION
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314
Semiconductor grade, solar silicon purification project --- photovoltaic solar energy conversion
[NASA-CR-158868] 24 p0736 N79-29598
POLYMERS
Water electrolysis using solid polymer electrolytes
24 p0613 A79-45589
Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation
24 p0625 A79-45849
Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells
[AD-A058380] 21 p0206 N79-13505
Evaluation of flow properties of dilute aqueous polymer solutions for enhanced oil recovery applications
23 p0556 N79-24408
North Stanley Polymer Demonstration Project
[BETC/RI-78/19] 23 p0588 N79-27313
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620
POLYMETHYL METHACRYLATE
Degradation of polymethylmethacrylate by radiation --- solar collector cover material
23 p0431 A79-35074
Cast acrylic Fresnel lenses for solar energy concentration
23 p0432 A79-35076
POLYSULFIDES
Behavior of a sodium-sulfur cell with a dynamic sulfur electrode
23 p0487 A79-40372
PONDS
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-81764] 24 p0725 N79-28753
Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680
POPULATION INVERSION
Progress in nuclear-pumped lasers
21 p0110 A79-16627
POROSITY
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies --- mass and energy balance for two phase flow in porous media
[LBL-8802] 24 p0786 N79-32684
POROUS BOUNDARY LAYER CONTROL
Transient flow of non-Newtonian power-law fluids in porous media
[SAN-1265-9] 24 p0781 N79-32516
POROUS MATERIALS
Combustion of porous particles --- coal for MHD generators
21 p0049 A79-12708
Experimental study of a heatpipe with an active porous medium --- for solar application
23 p0400 A79-34007
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Natural convection in porous media and geothermal systems
23 p0533 A79-43014
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896
Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703
Char gasification. I - Transport model
24 p0667 A79-50913
Char gasification. II - Oxidation results
24 p0667 A79-50914
Development of mechanistic theory for drying of porous media using two-fluid, two-phase flow theory
[UCRL-81604] 24 p0720 N79-28521
PORTABLE EQUIPMENT
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
Geothermal pump test facility
[ALO-3715-1] 24 p0755 N79-30793
PORTUGAL
Contribution to the study of the solar radiation climate of Lisbon
24 p0661 A79-50543
POSITION (LOCATION)
Fixed-focal-axis solar concentrators with a curvature determined by gravity
23 p0523 A79-41254
High accuracy off-shore position finding using the GEOLE satellite based system
22 p0329 N79-15932
Locational response to regulatory policy: A regional analysis of energy facility location --- conferences
[BNL-23597] 23 p0598 N79-27695
Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPO-26-349] 24 p0717 N79-28346
POSITION ERRORS
Effects of pointing errors on receiver performance for parabolic dish solar concentrators
21 p0020 A79-10167
Efficiency degradation due to tracking errors for point focusing solar collectors
[ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837
POSITION INDICATORS
Radiation shadow indicator
[NASA-CASE-NPS-23546-2] 24 p0730 N79-29037
POSITIONING DEVICES (MACHINERY)
Flexed beams in central receiver heliostat drives
[AIAA PAPER 78-1755] 21 p0060 A79-13856
A simple solar tracking system --- manually adjusted rotating shaft for solar concentrator positioning
21 p0136 A79-17457
POTABLE WATER
Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150850] 21 p0205 N79-13498
POTASSIUM
Lithium and potassium heat pipes for thermionic converters
21 p0013 A79-10113
Catalytic gasification predevelopment research
21 p0029 A79-10246
Absorption of solar radiation by alkali vapors --- for efficient high temperature energy converters
21 p0108 A79-16612
Compositional modeling of MHD channel slag, with preliminary vapor pressure data
23 p0391 A79-33390
Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model
[CONF-780941-6] 24 p0744 N79-30036
POTASSIUM COMPOUNDS
Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal
22 p0364 N79-21215
POTASSIUM HYDROXIDES
Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium
[P/539/77/20] 23 p0588 N79-27284
POTENTIAL ENERGY
Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752

POTENTIAL FIELDS
Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
21 p0153 A79-18468
Three-dimensional effects of electrode configuration on diagonal MHD generator performance
22 p0283 A79-26523
POTENTIAL FLOW
The interaction of the wind field with a horizontal axis wind turbine
22 p0278 A79-26177
POWDER (PARTICLES)
Study of the dynamics of the materials melting process for a solar furnace
21 p0167 A79-20359
Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330
POWER CONDITIONING
Power distribution study for a 5-GW space power satellite
21 p0002 A79-10026
Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229
Proposals for power conditioning systems of high power communication satellites
21 p0033 A79-10897
Space power technology - Current status and future development trends --- for powering spacecraft
[DGLR PAPER 78-167] 21 p0063 A79-14054
Progress in laser-fusion research
21 p0070 A79-14464
Energy sources and conventional magnets --- for tokamak experiment Power Reactor toroidal field
21 p0079 A79-14791
Control of wind turbine generators connected to power systems
21 p0086 A79-15574
Operation and control of wind-electric systems
21 p0086 A79-15575
Inverter systems --- for MHD power stations
21 p0106 A79-16486
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
Optimizing the conversion mode for solar energy
22 p0258 A79-23125
Contribution to the development of wind energy systems using static power electronic converters
22 p0286 A79-26958
Consolidation and local control of power in an MHD generator
23 p0395 A79-33425
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426
Load matching effects on wind energy converter performance
23 p0455 A79-37917
Power management battery storage systems
[AIAA PAPER 79-0582] 23 p0457 A79-38186
Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight
23 p0509 A79-40999
Peak period of household load in the different stages of electrical power supply
23 p0528 A79-42226
Spacecraft power systems
23 p0533 A79-43199
Computer-Aided Power System Design
24 p0646 A79-48632
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838
Operation of self-excited generators for windmill application
24 p0706 A79-52538
Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798
Alternative power-generation systems
21 p0169 N79-10129
Satellite Power Systems (SPS) concept definition study. Volume 3: SPS concept evolution
[NASA-CR-158066] 21 p0225 N79-15136
Satellite Power Systems (SPS) concept definition study. Volume 2: SPS system requirements
[NASA-CR-150681] 22 p0330 N79-16037
Comparative cost analyses: Total flow vs other power conversion systems for the Salton Sea Geothermal Resource
[UCRL-52589] 22 p0342 N79-17337
Power coupling alternatives for the NEP thermionic power system
[NASA-CR-158372] 22 p0367 N79-21547
A method for correlating performance data of a terrestrial solar cell array
[NASA-TM-79163] 23 p0581 N79-26503
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257] 24 p0795 N79-33253
Analysis of battery storage for commercial buildings, phase 1
[COO-4556-2] 24 p0800 N79-33586
POWER EFFICIENCY
Coal-fired gas turbine power cycles with steam injection
21 p0004 A79-10042
Mechanical efficiency of the Stirling cycle machine with rhombic drive
21 p0025 A79-10208
The influence of blade camber on the output of vertical-axis wind turbines
21 p0045 A79-12242
Output power variations with solar power satellites
21 p0067 A79-14267
Generalized wind characteristics and their effect on wind turbine output
21 p0068 A79-14254
Generic power performance estimates for wind turbines
21 p0068 A79-14295
MHD power plant characteristics
21 p0105 A79-16480
Technical and economic aspects of open-cycle MHD power plants
21 p0105 A79-16482
Efficiency of conventional silicon solar cells
21 p0125 A79-17362
Efficiency improvement by means of multicomponent processes - Improvement of the efficiency of heat-power transformation by means of an employment of Clausius-Rankine sorption processes
21 p0154 A79-19975
The effect of the dispersion of the characteristics of solar cells in large systems
22 p0285 A79-26822
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352
The relationship of power and heat production with closed cycle gas turbines
[ASME PAPER 79-GT-103] 23 p0377 A79-32379
A 2500 HP addition to the Ruston range --- gas turbines
[ASME PAPER 79-GT-205] 23 p0380 A79-32462
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties
23 p0433 A79-35301
Manufacturers developing fuel-efficient engines
23 p0438 A79-36380
The absorption of energy from ocean waves
23 p0449 A79-37859
Test report and power measurement on a 200-watt wind generator
23 p0472 A79-38658
Performance evaluation of wind power units
23 p0483 A79-40115

An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants
23 p0487 A79-40369
The alpha factor - Controlling solar cell absorptance
23 p0502 A79-40935
Testing of ultra-thin solar cells
23 p0503 A79-40952
The effect of solar cell parameter variation on array power output
23 p0517 A79-41059
Performance optimization of an OTEC turbine
24 p0618 A79-45793
Variation of photovoltaic effect in vertical n/p-junction solar cells
24 p0629 A79-46157
Magdalen Islands VAWT field test --- Vertical Axis Wind Turbines
24 p0635 A79-46543
The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station
24 p0641 A79-47700
Optimum grid design for a nonuniformly illuminated sun-concentrator solar cell
24 p0645 A79-48274
Effect of pressure head on the characteristics of hydroelectric stations with underwater lower reservoirs
24 p0646 A79-48827
Effect of load factor on the characteristics of series MHD generators
24 p0650 A79-49372
The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization
24 p0652 A79-49489
Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50028
A computer model of a heterojunction solar cell with application to GaP/Si
24 p0654 A79-50030
Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties
24 p0663 A79-50704
Advanced lasers for fusion applications
24 p0669 A79-51405
Thermionic energy converter investigations
24 p0699 A79-51981
Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499
CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

POWER GAIN
Concentration augmentation of power in a Savonius-type wind rotor
23 p0527 A79-41947

POWER LINES
Power cables to accommodate the motions of an OTEC plant
21 p0101 A79-16251
Load criteria for OTEC riser cable design
24 p0620 A79-45801
High voltage insulation and bushing design for flexible superconducting cables
[BNL-25351] 24 p0719 N79-28439
Thermoelastic analysis of a superconducting cable
[LA-7465-MS] 24 p0781 N79-32477

POWER MODULES (STS)
A power extension package /PEP/ for the Shuttle Orbiter
24 p0691 A79-51897
A DOD space energy module
24 p0691 A79-51898

POWER PLANTS
Geothermal preheating in fossil-fired steam power plants
21 p0014 A79-10118
Powerplant integration - The application of current experience to future developments
[ASME PAPER 78-GT-113] 21 p0032 A79-10788
Development of solar thermal power plants
21 p0057 A79-13641
Solar thermal power stations
21 p0057 A79-13644
Stabilization of power plant scrubbing slurries and fine coal refuse with the additive Calcilox
21 p0063 A79-14107
The Research-Cottrell/Bahco SO2 and particulate removal system at Rickenbacker Air Force Base
21 p0065 A79-14122
Integrated low Btu gasification, combined cycle plant considerations and control
21 p0094 A79-15905
Cycle optimization for a solar turbopack --- turbine water pump utilizing Rankine cycle
21 p0141 A79-17500
Medium capacity heliothermal power stations
21 p0142 A79-17507
History and development of condensers at the Geysers geothermal power plant
[ASME PAPER 78-JPGC-PWR-18] 21 p0150 A79-18099
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358
An ocean thermal difference power plant in the Canadian Arctic
22 p0318 A79-31415
Application of recuperative gas cycles with a bypass heat generator to solar energy power plants
[ASME PAPER 79-GT-89] 23 p0376 A79-32366
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075
Remote new energy sources utilization in on-site non-polluting power plant - Liquid air as energy carrier concept and final conversion plant design
23 p0416 A79-34141
American Power Conference, Illinois Institute of Technology, Chicago, Ill., April 24-26, 1978, Proceedings. Volume 40
23 p0423 A79-34451
Energy conserving cogeneration plant benefits utility and industrial companies
23 p0423 A79-34452
What is the true cost of electric power from a cogeneration plant
23 p0424 A79-34453
The Powerton gasification combined-cycle test facility - A preview
23 p0424 A79-34454
A central receiver solar thermal power system
23 p0424 A79-34455
Ocean Thermal Energy Conversion /OTEC/ power plant instrumentation and measurement
23 p0430 A79-35059
Solar power plants. II - Economic aspects of solar power towers
23 p0435 A79-35482
Solar power towers
23 p0435 A79-35483
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant --- for weather modification studies
23 p0438 A79-36432
A new approach for solar energy systems design by means of the sensitivity theory
23 p0448 A79-37849
A contribution to solution of the energy crisis - Proposed solution: Aerothermal plants
23 p0465 A79-38594
Post mortem assessment - Coal gasification plant
23 p0480 A79-39909
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071
Description and status report of a program to define sea water-surfactant interactions in relation to the foam system --- OTEC power plant
24 p0623 A79-45833
Principles for the calculation of heliostat fields of a solar power plant
24 p0646 A79-48738

Determination of the design states of a complex system in evaluating the reliability of electrical power supply
24 p0646 A79-48826
High-temperature alloys in high-technology systems
24 p0647 A79-48911
Study of turbomachinery options for compressed air energy storage plants
24 p0680 A79-51801
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883
A solar-Stirling small power system
24 p0690 A79-51884
Preliminary summary of the PTF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478
An assessment of thermal energy storage and waste heat dissipation with total energy systems for MIT
[AD-A059061] 21 p0205 N79-13502
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems
23 p0545 N79-22950
Grip-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2
[COO-4337-2/2] 23 p0598 N79-27701

POWER SPECTRA
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268

POWER SUPPLIES
Satellite Power Systems (SPS) concept definition study. Volume 2: SPS system requirements
[NASA-CR-150681] 22 p0330 N79-16037
Power industry application of MHD technology
23 p0568 N79-24949
Integrated power unit
[AD-A066543] 23 p0569 N79-25396
Assessment of potential US petroleum supply shortfalls, 1978
[DOE/EIA-0102/38] 24 p0734 N79-29376
Oil and gas supply curves for the administrator's annual report
[DOE/EIA-0103/4] 24 p0746 N79-30406
Improved energy contingency planning is needed to manage future energy shortages more effectively
[EMD-78-106] 24 p0750 N79-30729

POWER SUPPLY CIRCUITS
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318
Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1] 22 p0357 N79-20179
Assessment of short and medium term improvements to the Spacelab power system
[ESA-CR(P)-1193-VOL-2] 24 p0768 N79-31513

POWER TRANSMISSION
The use of lasers for the transmission of power
21 p0109 A79-16621
A profile of power transmission by microwaves
23 p0427 A79-34987

PRECAMBRIAN PERIOD
Continental geotherms during the Archaean --- heat production in ancient earth crust
22 p0269 A79-24620

PRECIPITATION (CHEMISTRY)
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

PRECIPITATORS
Advanced emissions control and test facility of the Electric Power Research Institute
21 p0115 A79-17249

PRECONDITIONING
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

PREDICTION ANALYSIS TECHNIQUES
A theoretical method for the prediction of monthly mean solar radiation parameters
21 p0022 A79-10183
Wave energy conversion in a random sea
21 p0030 A79-10252
Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models
21 p0065 A79-14117
A methodology for evaluating the effectiveness of energy conservation programs
21 p0072 A79-14684
Critical comments on energy models
23 p0481 A79-39994
Numerical modeling of the thermal boundary layer near a synthetic crude oil plant
24 p0628 A79-46065
Distributed parameter modelling of urban residential energy demand --- using remotely sensed imagery
24 p0657 A79-50218
Contribution to the study of the solar radiation climate of Lisbon
24 p0661 A79-50543
Predicting solar energy fluxes in polluted urban areas
24 p0671 A79-51732
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28349
Estimation methodology for energy supply from natural resources
[EPRI-EA-788] 24 p0718 N79-28355
International energy evaluation system. Volume 2: Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796
Energy sector capital requirements, 1978-1985
[DOE/EIA-0103/24] 24 p0755 N79-30797

PREDICTIONS
Energy and the economy
[EPRI-EA-620-VOL-1] 21 p0189 N79-11539

PREMIXED FLAMES
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691
Influences on exhaust emissions from automotive gas turbines
[ASME PAPER 78-GT-85] 22 p0255 A79-22338
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

PRESIDENTIAL REPORTS
Report to the President by the Interagency Review Group on Nuclear Waste Management --- as part of the National Energy Plan
[TID-29442] 24 p0729 N79-29021
Aeronautics and space report of the President, 1978 activities
24 p0794 N79-33115

PRESSURE CHAMBERS
Preliminary comparison of theory and experiment for a conical, pressurized-fluidized-bed coal combustor
[NASA-TM-79137] 23 p0542 N79-22623

PRESSURE EFFECTS
Toroidal high-beta systems
21 p0070 A79-14462
The plateau pressure of RE Ni5 and RE Co5 hydrides --- in hydride formation
22 p0250 A79-21698
Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939
Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943

PRESSURE GRADIENTS
The use of ocean energy - A hydrostatic motor
22 p0288 A79-27391

PRESSURE HEADS
Power plant systems based on solar energy --- powered by sea water evaporation-produced osmotic pressure head mechanical energy
21 p0142 A79-17508

PRESSURE MEASUREMENTS
Differential pressure measurements in high temperature environments
21 p0144 A79-17599

Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034

Pressure measurements on wind tunnel models of the Aylesbury experimental house
22 p0300 A79-29372

PRESSURE OSCILLATIONS

The oscillating water column wave-energy device
22 p0252 A79-22223

PRESSURE RECOVERY

On supersonic and subsonic diffusers for magnetohydrodynamic generator applications
22 p0279 A79-26186

PRESSURIZING

Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133

Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451

Hydrogen from coal using pressurized gasification
24 p0687 A79-51853

PRETREATMENT

Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091

PRIMARY BATTERIES

Evaluation of methods for analyzing silver-zinc cells
21 p0010 A79-10085

Discharge reaction mechanisms in Li/SOCl2 cells
22 p0305 A79-30331

The lithium-thionyl chloride battery - A review
23 p0487 A79-40370

PRINTED CIRCUITS

Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977

PRISMS

Ideal prism solar concentrators
21 p0149 A79-18023

PROBABILITY THEORY

Hail risk model for solar collectors
21 p0098 A79-16103

PROCESS CONTROL (INDUSTRY)

Coal desulfurization test plant status - July 1977 --- utilizing Meyers leach process
21 p0044 A79-12118

Dynamic model of an industrial plant manufacturing a variety of products
21 p0051 A79-12957

Status and outlook of the Exxon Donor Solvent coal liquefaction process development
21 p0092 A79-15889

Solar Total Energy Control Data Acquisition System
21 p0144 A79-17618

Master control and data system for the 5MW Solar Thermal Test Facility
21 p0144 A79-17620

Burn coal cleanly in a fluidized bed - The key is in the controls
22 p0282 A79-26374

Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies
22 p0282 A79-26465

Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source
22 p0283 A79-26466

Sampling and analysis of synthetic fuel processes --- coal gasification and liquefaction effluent analysis
22 p0284 A79-26538

Economic prospects for solar energy for industrial process heat
23 p0403 A79-34033

Evaluation of options for process sequences --- in solar cell manufacturing
23 p0501 A79-40925

Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595

Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541

Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

PROCUREMENT POLICY

Assessing environmental costs of energy procurement
21 p0071 A79-14682

The national energy plan: Options under assumptions of national security threat --- economic impact procurement policy, and resources management
[H-PRINT-95-48] 21 p0228 N79-15398

Findings and views concerning the exemption of aviation gasoline from the mandatory petroleum allocation and price regulations
[DOE/ERA-0024] 23 p0589 N79-27336

PRODUCT DEVELOPMENT

Review of industrial participation in the ANL lithium/iron sulfide battery development program --- for electric vehicles
21 p0010 A79-10086

Recent advances in Na/S cell development - A review
22 p0246 A79-21488

A solar collector thermal performance test for developmental programs
22 p0317 A79-31413

Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198

Wind turbines for electric utilities - Development status and economics
[AIAA PAPER 79-0965] 23 p0475 A79-38888

Solar collector development in Iran
23 p0493 A79-40675

Engineering of microwave relays --- microwave radio equipment engineering aspects and impact on energy technology
23 p0526 A79-41931

Large horizontal axis wind turbine development
24 p0633 A79-46527

The MOD-2 wind turbine
24 p0635 A79-46542

Advances in H-Coal --- coal liquefaction process
24 p0687 A79-51855

Industrialization study --- impact of government incentives and barriers on decision making in the industrial production of photovoltaics
[NASA-CR-157953] 21 p0200 N79-12970

Industrialization study, phase 2 --- assessment of advanced photovoltaic technologies for commerical development
[NASA-CR-158015] 22 p0333 N79-16351

Preliminary design package for residential heating/cooling system: Rankine air conditioner redesign
[NASA-CR-150871] 22 p0354 N79-19453

Multistack nickel-hydrogen units
22 p0371 N79-21610

Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515

Low-cost Solar Array (LSA) project
[NASA-CR-158650] 23 p0559 N79-24457

Low-cost Solar Array (LSA) project
[NASA-CR-158651] 23 p0559 N79-24458

Development of pulsed processes for the manufacture of solar cells
[NASA-CR-158706] 23 p0570 N79-25484

Status of the DOE photovoltaic concentrator development project
23 p0571 N79-25491

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158700] 23 p0572 N79-25505

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158736] 23 p0580 N79-26488

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158740] 23 p0580 N79-26490

Development of a process for a high capacity arc heater production of silicon for solar arrays
[NASA-CR-158745] 23 p0581 N79-26499

Cell design and manufacturing changes during the past decade
24 p0722 N79-28674

Energy conservation opportunities in commercial appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810

Automated array assembly, phase 2 --- making ion implanted and furnace annealed solar cells
[NASA-CR-162176] 24 p0770 N79-31759
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Analysis and evaluation in the production process and equipment area of the low-cost solar array project --- including modifying gaseous diffusion and using ion implantation
[NASA-CR-162163] 24 p0770 N79-31769
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
Problems of technology transfer to industry --- government sponsored solar energy technology development
[SAND-79-0096] 24 p0778 N79-32131

PRODUCTION
LSA engineering status
23 p0570 N79-25490

PRODUCTION ENGINEERING
Engineering analysis of in situ liquefaction of coal
21 p0032 A79-10521
Large, lightweight, replicated mirrors
21 p0043 A79-11976
Feasibility of rocket propellant production on Mars
21 p0047 A79-12324
Dynamic model of an industrial plant manufacturing a variety of products
21 p0051 A79-12957
Status and outlook of the Exxon Donor Solvent coal liquefaction process development
21 p0092 A79-15889
Production and use of low and medium Btu gas
21 p0095 A79-15912
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535
Mass production of solar collectors and components
23 p0467 A79-38614
A high volume cost efficient production macrostructuring process --- for silicon solar cell surface treatment
23 p0499 A79-40904
A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919
Silicon solar cell arrays - Technical status, terrestrial applications, and future developments for low cost production
23 p0501 A79-40923
Evaluation of options for process sequences --- in solar cell manufacturing
23 p0501 A79-40925
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
Solar cell collector and method for producing same
[NASA-CASE-LEW-12552-2] 21 p0182 N79-11472
Program THEK energy production units of average power and using thermal conversion of solar radiation
[NASA-TM-75369] 21 p0183 N79-11474
Energy analysis
[NP-23145] 21 p0187 N79-11513
Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541
Pilot line report: Development of a high efficiency thin silicon solar cell
[NASA-CR-158028] 21 p0219 N79-14548
Automated array assembly, phase 2
[NASA-CR-158360] 22 p0358 N79-20480
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485
Development, testing, and certification of the Northrop, Inc., NL series concentrating solar collector model NSC-01-0732
[NASA-TM-78219] 22 p0371 N79-21618
Development, testing, and certification of Owens-Illinois model SEC-601 solar energy collector system
[NASA-TM-78223] 22 p0371 N79-21620
A normative price for a manufactured product: The SAMICS methodology. Volume 2: Analysis
[NASA-CR-158503] 23 p0549 N79-23505
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158580] 23 p0550 N79-23519
Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158679] 23 p0558 N79-24448
Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454
Automated solar panel assembly line. LSA task: production processes and equipment
[NASA-CR-158671] 23 p0559 N79-24455
Material and energy balances in the production of ethanol from wood --- conferences
[CONF-7806139-1] 23 p0589 N79-27338
Midterm oil and gas supply modeling system methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059
Challenge of efficiently retorting very nonuniform beds of oil shale rubble
[UCRL-81721-REV-1] 24 p0721 N79-28657
Office of Naval Petroleum and Oil Shale Reserve. Report of operations, 1 October 1978
[DOE/RA-0011] 24 p0748 N79-30686
Economic structure and behavior in the natural gas production industry
[PB-294610/1] 24 p0760 N79-30839
Energy from in situ processing of Antrim oil shale
[FE-2346-29] 24 p0769 N79-31746
Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157] 24 p0770 N79-31763
Recent developments in coal liquefaction in the United States --- conferences
[CONF-790213-5] 24 p0779 N79-32383
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664
Energy and cost calculations. 1: Optimization of electrochemical processes to achieve minimum product cost and the impact on energy consumption
[ANL/OEPM-78-2] 24 p0788 N79-32697
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707

PRODUCTION MANAGEMENT
Material growth and characterization directed toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543
Production of hot water with the aid of solar energy: Conditions and costs
[SIB-R-83-1978] 23 p0598 N79-27700

PRODUCTIVITY
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28389
Factors affecting the decline rate of old oil production
[DOE/EIA-0102/29] 24 p0720 N79-28652

PROFILE METHOD (FORECASTING)
Outlook for world oil into the 21st century with emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-11454
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Oil and gas supply curves for the administrator's annual report
[DOE/EIA-0103/4] 24 p0746 N79-30406
International energy evaluation system. Volume 2: Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796

PROGRAM VERIFICATION (COMPUTERS)
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721

PROGRAMMED INSTRUCTION
Design package for programmable controller and hydronic subsystem
[NASA-CR-161151] 22 p0371 N79-21619
PROGRAMS
The comparison and coordination of national policies and programs in the energy research and development sector
[EUR-5911] 23 p0594 N79-27653
Energy and urban policies/programs: Official transcript of public briefing and addendum, 27 April 1978, Washington, D. C.
[DOE/IR-0042] 24 p0728 N79-28782
Solar energy program
[ANL-79-16] 24 p0772 N79-31789
PROJECT MANAGEMENT
Prospects of MHD power generation in India using coal
23 p0454 A79-37907
The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209
The Netherlands research program on wind energy
23 p0481 A79-40102
The Swedish Wind Energy Programme
23 p0482 A79-40103
Recent developments in wind energy
23 p0482 A79-40104
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107
Program overview for the wind characteristics program element of the United States Federal Wind Energy Program
23 p0482 A79-40108
Wind energy prospecting in Prince Edward Island - A program overview and status report
23 p0482 A79-40109
A technical and economic evaluation of the Baltimore Landgard demonstration --- municipal solid waste processing plant for energy and materials recovery
23 p0491 A79-40420
Program overview for the Wind Characteristics Program Element of the United States Federal Wind Energy Program
23 p0534 A79-43376
International project catalog of modular integrated utility systems
[PB-283477/8] 21 p0190 N79-11544
Committee on the challenges of modern society rational use of energy pilot study modular integrated utility system project. Volume 2: Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11558
LSA Low-cost Solar Array project
[NASA-CR-158250] 22 p0355 N79-19462
Evaluation of four energy conservation programs--fiscal year 1977
[PB-288825/3] 22 p0355 N79-19472
Solar project description. Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/50] 23 p0564 N79-24499
Electric and hybrid vehicle program
[DOE/CS-0068] 23 p0567 N79-24900
A summary of systems definition project activities
23 p0570 N79-25488
Low-cost solar array project
23 p0570 N79-25489
DOE photovoltaic tests and applications project
23 p0571 N79-25492
Photovoltaic research and development status
23 p0571 N79-25495
The Congress needs to redirect the federal electric vehicle program
[PB-293977/5] 24 p0731 N79-29120
Guide to solar energy programs
[DOE/ET-0036/1] 24 p0738 N79-29620
Implementation of state solar incentives: Research, Development, and demonstration programs
[SERI/TR-51-161] 24 p0773 N79-31799
Strategic petroleum reserve
[DOE/TIC-10107] 24 p0781 N79-32617
Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0793 N79-32995
PROJECT PLANNING
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869
Southern regional solar energy center planning
24 p0608 A79-45203
OAST space power technology program
21 p0169 N79-10123
Satellite power systems program
21 p0169 N79-10128
An economical approach to space power systems
21 p0170 N79-10139
Environmental Development Plan (EDP): Solar thermal power systems, 1977
[DOE/EDP-0004] 21 p0187 N79-11522
OAST Space Theme Workshop. Volume 1: Summary report. 1: Introduction. 2: General observations and some key findings. 3: Follow-on activity. Quick-look comments and working papers
[NASA-TM-80001] 21 p0224 N79-15113
Satellite Power Systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis
[NASA-CR-158068] 21 p0225 N79-15141
Satellite power systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis, appendixes
[NASA-CR-150702] 21 p0225 N79-15142
Satellite Power System (SPS) program summary
[DOE/ER-0022] 22 p0337 N79-16893
The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans
[NASA-CR-161146] 22 p0345 N79-17890
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB-290226/0] 23 p0544 N79-22645
Solar project cost report: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/60] 23 p0562 N79-24482
Solar project description. Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/50] 23 p0563 N79-24496
Planning and analysis for development of photovoltaic energy conversion systems
23 p0570 N79-25487
Contextual analysis for industrial energy conservation R and D
[PB-290981/0] 23 p0575 N79-25537
Using coal inside California for electric power
23 p0591 N79-27598
A large scale wind energy program for the state of California
23 p0594 N79-27648
Plan to demonstrate oil shale mining and rubblizing for a modified in situ retorting process
[UCRL-13979] 24 p0721 N79-28655
Environmental readiness document: Urban waste energy recovery. Commercialization phase 3 planning
[DOE/ERD-0002] 24 p0745 N79-30102
Passive solar energy planning aid kit for solar energy systems engineers
[CONF-780337-P3] 24 p0775 N79-31815
Thermal and mechanical energy storage program
[DOE/ET-0091] 24 p0775 N79-31817
Spent fuel handling and packaging program
[RHO-LD-78-4-AUG] 24 p0777 N79-32081
Environmental development plan, fossil fuel utilization program
[DOE/EDP-0046] 24 p0793 N79-32746
Transportation Energy Conservation (TEC) environmental development plan
[ANL/EES/CP-11] 24 p0801 N79-33589
Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074
PROPAGATION MODES
Stability criteria for current-driven drift wave eigenmodes --- in tokamaks
22 p0269 A79-24813
Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

PROPELLANTS
Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638
PROPORTIONAL CONTROL
Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant
24 p0673 A79-51747
PROPULSION
Advanced secondary batteries for electric vehicle propulsion
[CONF-780426-2] 21 p0186 N79-11508
The AGARD propulsion and energetics panel, 1952-1977
[AGARD-AR-111] 22 p0337 N79-16848
Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492
PROPULSION SYSTEM CONFIGURATIONS
Impact of future fuel properties on aircraft engines and fuel systems
21 p0036 A79-11600
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0194 N79-12086
PROPULSION SYSTEM PERFORMANCE
Road vehicles with combined, at least partly electrical driving systems and energy supplies
22 p0301 A79-29494
Developing electric vehicles
22 p0302 A79-29496
An electric propulsion system for a town and city bus
22 p0302 A79-29499
Measured effects of flow leakage on the performance of the GT-225 automotive gas turbine engine
[ASME PAPER 79-GT-3] 22 p0306 A79-30502
Development of a DC linear motor. II
24 p0707 A79-52800
Study of flywheel energy storage Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559
Engine component improvement and performance retention
21 p0202 N79-13198
Energy efficient engine: Propulsion system-aircraft integration evaluation
[NASA-CR-159488] 22 p0337 N79-16850
Earth orbital assessment of solar electric and solar sail propulsion systems
[NASA-CR-158167] 22 p0345 N79-17898
PROPULSIVE EFFICIENCY
The design impact of power-augmented ram technology on large energy efficient aircraft
[AIAA PAPER 79-1864] 24 p0669 A79-51250
Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798
PROTECTIVE COATINGS
Controlled utilization of coal slag in the MHD topping cycle
21 p0081 A79-14936
Metallurgical coatings 1978; Proceedings of the Fifth International Conference, San Francisco, Calif., April 3-7, 1978. Volumes 1 & 2
22 p0327 A79-31951
Protection of solar collector materials from UV
24 p0609 A79-45217
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276
Formation of protective layers on alloys developed for use in coal gasification environments
[SAND-78-8277] 24 p0765 N79-31383
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386
PROTON IMPACT
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715
PROTON IRRADIATION
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
Low energy proton radiation damage to (AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507
Radiation damage in GaAs solar cells
24 p0785 N79-32663
PROTONS
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298
PROTOTYPES
Demonstration and commercial prototype tokamak reactors
21 p0018 A79-10146
An aperture-augmented prototype power satellite
21 p0046 A79-12268
The Swedish Wind Energy Programme
23 p0482 A79-40103
Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150861] 22 p0334 N79-16372
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121
PROVING
Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520
SAMICS validation. SAMICS support study, phase 3
[NASA-CR-158746] 23 p0581 N79-26491
PUBLIC HEALTH
Risk with energy from conventional and nonconventional sources
22 p0266 A79-24151
A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it
[AD-A056018] 21 p0192 N79-11686
Health effects associated with diesel exhaust emissions, literature review and evaluation
[PB-289817/9] 22 p0364 N79-20727
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923
PUBLIC LAW
Electric and Hybrid Vehicle Act, Public Law 94-413 demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810
Energy Tax Act of 1978
[PUB-LAW-95-618] 23 p0576 N79-25926
Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724
PUBLIC RELATIONS
Public policy
21 p0179 N79-11011
Satellite Power System (SPS) public acceptance
[NASA-CR-157429] 23 p0548 N79-23493
Motor gasoline deregulation and the gasoline tilt. Volume 2: Public comments
[DOE/EIS-0039-VOL-2] 24 p0746 N79-30401
PUERTO RICO
Opportunities for solar thermal energy in Puerto Rico
[AIAA PAPER 79-1028] 23 p0460 A79-38208
Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico
24 p0622 A79-45817
PULLING
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900

PULSE DURATION
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm 23 p0537 A79-43718

PULSE GENERATORS
Problems in the development of high-service-life capacitative accumulators --- for fusion reactors 22 p0243 A79-21249
Characteristics of co-axial Marx generator and its application to electron beam fusion 24 p0642 A79-47805
Pulsed-power research and development in the USSR [AD-A056635] 21 p0193 N79-11859

PULSED LASERS
Hybrid reactor based on laser-induced thermonuclear fusion 21 p0032 A79-10658
Prepulse damage to targets and alignment verification 22 p0258 A79-23027
Diagnostics of Shiva Nova high-yield thermonuclear events --- in laser fusion 22 p0285 A79-26747
Laser-particulate control for open-cycle, coal fired gas turbines [ASME PAPER 79-GT-177] 23 p0379 A79-32437
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media 23 p0422 A79-34192
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm 23 p0537 A79-43718
High power iodine atom laser 24 p0707 A79-52644
Pulsed power supplied for large laser systems [UCRL-80113] 21 p0217 N79-14377

PUMPING
Historical developments of the use of solar energy for pumping irrigation water 21 p0076 A79-14762
Basic technical and economical aspects of the use of solar energy for pumping irrigation water 21 p0076 A79-14763
Solar pumping --- thermal and electrical water pumping 21 p0104 A79-16469
Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity 23 p0387 A79-33241
Performance matching and optimization of wind powered water pumping systems 23 p0479 A79-39842

PUMPS
Analysis of a direct coupling d.c. motor and a photovoltaic converter 21 p0046 A79-12272
Solar energy installations for pumping irrigation water 21 p0066 A79-14260
Solar water pumping 21 p0066 A79-14266
25 kilowatt photovoltaic powered irrigation and grain drying experiment 21 p0143 A79-17519
Solar irrigation program status 21 p0143 A79-17520
The development of a 37 kW solar-powered irrigation system 21 p0144 A79-17525
The use of wave powered systems for desalination - A new opportunity --- seawater pumping for reverse osmosis 21 p0151 A79-18108
Production of mechanical energy by thermodynamic conversion of solar energy 22 p0310 A79-30999
Pumped storage battery with 100 percent efficiency 24 p0679 A79-51795
The definition of a national program in energy-efficient pump utilization, volume 1 [HCP/M1260-01/1] 21 p0207 N79-13514
The definition of a national program in energy-efficient pump utilization. Volume 2: Appendices [HCP/M1260-01/2] 21 p0207 N79-13515
Solar water pumps. Citations from the Engineering Index data base [NTIS/PS-78/1288/6] 22 p0343 N79-17348
An initial model for the finite displacement response characteristics of a fluidyne pump --- thermodynamic efficiency [AD-A069159] 24 p0734 N79-29521
Technology assessment of geothermal pumping equipment [ALO-4162-2] 24 p0735 N79-29524
Underground hydroelectric pumped storage: An evaluation of the concept [TID-29412] 24 p0742 N79-29664
Geothermal pump test facility [ALO-3715-1] 24 p0755 N79-30793

PURIFICATION
The use of FeTi-hydride for production and storage of suprapure hydrogen 22 p0250 A79-21700
The gas turbine/steam turbine cycle with coal gasification 24 p0723 N79-28737

PYRAMIDAL BODIES
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones 21 p0043 A79-11974

PYRANOMETERS
Inclination dependence of pyranometer sensitivity --- for solar collector testing 22 p0295 A79-28154
Important specification of pyranometers for solar energy applications /Survey article/ 23 p0468 A79-38627

PYRITES
Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals --- through chemical leaching 21 p0044 A79-12117

PYRHELIOMETERS
Measurement of radiation intensity by means of a pyrheliometer 21 p0055 A79-13623
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning [COO-4094-34] 24 p0789 N79-32702

PYROHYDROLYSIS
Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen 24 p0602 A79-44265

PYROLYSIS
Coal conversion by flash hydropyrolysis and hydrogasification 21 p0006 A79-10055
Theoretical studies of coal pyrolysis in an entrained bed flow reactor 21 p0007 A79-10063
A copper oxide-copper sulfate water-splitting cycle 21 p0015 A79-10128
Recovery of oil from oil shale - An overall technological perspective 21 p0073 A79-14698
Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water 21 p0167 A79-20360
A theoretical study of wood gasification processes 22 p0257 A79-22923
Methane formation during the hydrogasification and the gas phase pyrolysis of defined aromatics 22 p0265 A79-23829
Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant 23 p0417 A79-34147
Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling 23 p0488 A79-40389
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/ 23 p0490 A79-40413
An overview of San Diego County's resource recovery plant 23 p0491 A79-40418
A technical and economic evaluation of the Baltimore Landgard demonstration --- municipal solid waste processing plant for energy and materials recovery 23 p0491 A79-40420

Pyrolysis of Western Kentucky heavy oil using a transfer line reactor
23 p0492 A79-40452
CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197
The pyrolysis route to gasification
24 p0688 A79-51860
An overview of in situ oil shale technology and recent advances in true in situ retort modeling
24 p0688 A79-51865
Field performance of underground coal gasification
24 p0688 A79-51866
Rates of coal pyrolysis and gasification reactions
24 p0714 A79-53778
Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials --- converting wood waste char to clean fuels
21 p0179 N79-11150
Thermal and kinetic analysis of the pyrolysis of coals
22 p0336 N79-16704
Hydropyrolysis of coal derived liquids and related model compounds
23 p0553 N79-24171
Energy recovery from domestic refuse by means of incineration and pyrolysis
[CSIR-SR-WAT-54] 23 p0560 N79-24468
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222
Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743
Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377
Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-12] 24 p0766 N79-31415
Mathematical model of forward combustion retorting of oil shale
[LETC/TPR-78/1] 24 p0779 N79-32375

Q

Q DEVICES
Feedback control of a class of plasma instabilities
23 p0422 A79-34253
Q FACTORS
Calculation of the Q factor for a two-component tokamak
22 p0324 A79-31763
Q SWITCHED LASERS
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171
QUADRANTS
Solar energy conversion system - Four quadrant, two dimension linear solar concentrators
23 p0399 A79-33999
QUALITATIVE ANALYSIS
Enhanced oil recovery: Report on a focus group discussion
[DOE/TIC-10021] 24 p0735 N79-29577
QUALITY CONTROL
National motor gasoline surveys: A key source of fuel trend data
[BETC/RI-78/16] 23 p0568 N79-25248
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158700] 23 p0572 N79-25505
QUANTITATIVE ANALYSIS
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 1: Executive summary, September 1977
[HCP/M70066-01/1-VOL-1] 23 p0574 N79-25522
QUARTZ
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599
QUEBEC
The performance of a site built, air heating, vertical collector with snow reflector in Quebec
22 p0319 A79-31423
QUENCHING (COOLING)
Heat pulses required to quench a potted superconducting magnet
22 p0236 A79-20538

R

RADIAL DISTRIBUTION
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430
RADIAL FLOW
Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626
Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184
RADIANT COOLING
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine --- operating in planetary environment
21 p0166 A79-20348
RADIANT FLUX DENSITY
Receiver designs for tower-top solar collector
21 p0135 A79-17450
Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486
Controlling the radiant flux of a high-temperature solar energy conversion system over two parameters
22 p0296 A79-28669
Control of the radiant flux of high-temperature solar-energy installations with respect to two parameters
24 p0637 A79-46907
Predicting solar energy fluxes in polluted urban areas
24 p0671 A79-51732
Radiation regime of inclined surfaces
[WMO-467] 21 p0192 N79-11613
RADIANT HEATING
Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808
Radiant exchange for a fin and tube solar collector
22 p0271 A79-25066
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937
RADIATION ABSORPTION
Absorption of solar radiation by alkali vapors --- for efficient high temperature energy converters
21 p0108 A79-16612
Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354
Method for making an aluminum or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-1] 21 p0182 N79-11469
Solar evacuated tube collector: Absorption chiller systems simulation
[COO-2577-13] 21 p0209 N79-13530
Proposal for a representation of the quasisteady-state performance of flat-plate collectors
[ASSA-SE-B21/77] 22 p0349 N79-18461
RADIATION DAMAGE
The NTS-2 satellite solar cell experiment
21 p0001 A79-10016
Materials problems and possible solutions for near term tokamak fusion reactors
21 p0079 A79-14790
Degradation of polymethylmethacrylate by radiation --- solar collector cover material
23 p0431 A79-35074
Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895

Space environment damage to solar cell coverslide assemblies
23 p0498 A79-40896

The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells
23 p0498 A79-40897

Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973

Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545

Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706

Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C --- for space applications
24 p0668 A79-51008

Low energy proton radiation damage to (AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507

Radiation damage in GaAs solar cells
24 p0785 N79-32663

Annealing of radiation damage in 0.1- and 2-ohm-centimeter Silicon solar cells
[NASA-TP-1559] 24 p0758 N79-33572

RADIATION DETECTORS

Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

RADIATION DISTRIBUTION

Fundamentals of mathematical modeling of solar-radiation regime energy structure
21 p0166 A79-20352

Isotropic distribution approximation in solar energy estimations --- diffuse insolation on tilted surface
22 p0262 A79-23753

Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design
22 p0263 A79-23764

On the use of synoptic weather map typing to define solar radiation regimes
22 p0272 A79-25392

Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259

RADIATION DOSAGE

Exposure test results for reflective materials --- used in solar concentrators
23 p0430 A79-35068

Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment
23 p0551 N79-23539

RADIATION EFFECTS

Fuel technology and the environment --- nuclear reactor caused radiation effects and transmutation
21 p0079 A79-14787

Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357

Calculation of the external electromagnetic field of closely spaced MHD machines
22 p0298 A79-29285

Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690

Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715

Calculation of the external electromagnetic field of closely spaced MHD machines
24 p0663 A79-50775

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 1: Executive summary
[NASA-TM-80354] 23 p0557 N79-24435

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 2: Detailed assessment
[NASA-TM-80355] 23 p0557 N79-24436

Langley program of GaAs solar cells --- emphasizing energy conversion efficiency and radiation resistance
24 p0783 N79-32644

RADIATION HARDENING

Solar photovoltaic research and development program of the Air Force Aero Propulsion Laboratory --- silicon solar cell applicable to satellite power systems
24 p0783 N79-32642

RADIATION HAZARDS

Some perspectives on research into the biological response to non-ionizing electromagnetic radiation --- relation to SETI, SPS, and other government projects
22 p0271 A79-24879

Health and safety hazards associated with solar concentration systems
23 p0439 A79-36628

Hazards from radioactive waste in perspective --- comparison with wastes from burning coal
[CONF-790204-9] 24 p0761 N79-31024

RADIATION MEASUREMENT

The use of a sort of slide rule for the quick determination of solar irradiation of surfaces and through double glazing of arbitrary orientation and different inclination
21 p0055 A79-13625

Calibration standards and field instruments for the precision measurement of insolation
21 p0076 A79-14765

Measurement of solar radiation for energy conversion
21 p0119 A79-17305

Design of radiometer for measurement of total and net exchange solar radiation
21 p0119 A79-17307

Measurement and modelling of shortwave radiation on inclined surfaces
22 p0242 A79-21062

Thermal converters with transverse thermoelectromotive forces
22 p0256 A79-22847

Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056

Solar radiation data in the southeastern United States
24 p0608 A79-45204

A comparison of some simple models used to predict solar irradiance on a horizontal surface
24 p0661 A79-50546

RADIATION MEASURING INSTRUMENTS

Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292

Results of measurements of solar radiation on surfaces of different orientations
21 p0055 A79-13622

Measurement of radiation intensity by means of a pyrheliometer
21 p0055 A79-13623

New instrumentation for high temperature and hemispherical measurements of selective surfaces --- for solar energy conversion
22 p0294 A79-28152

Specularity measurements for solar materials
22 p0294 A79-28153

RADIATION SHIELDING

Optimization of radioisotope thermoelectric generators with gamma-radiation protection
23 p0433 A79-35176

Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire
24 p0706 A79-52368

RADIATION TOLERANCE

Large aperture components for solid state laser fusion systems
24 p0713 A79-53522

Solar Cell High Efficiency and Radiation Damage, 1979
[NASA-CP-2097] 24 p0783 N79-32640

Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648

Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

RADIATIVE HEAT TRANSFER

Flame emissivities - Alternative fuels
21 p0052 A79-12984

On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SCL-13] 21 p0163 A79-19845

Estimating heat loads on multistage thermoelectric heat pumps
22 p0260 A79-23614

Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084

Cavity-type surfaces for solar collectors
22 p0283 A79-26497

Theoretical and practical aspects of heat transfer in the window-absorber cavity of a flat plate collector
23 p0383 A79-32957

Combined radiant-flux controller for a high-temperature solar energy system
23 p0433 A79-35382

Effects of nonuniform distribution of the absorber temperature on radiation losses of a flat-plate solar collector
23 p0530 A79-42894

Heat transfer in a high-power MHD channel
23 p0533 A79-43171

Advances in heat transfer. Volume 14 --- Book
24 p0638 A79-47255

Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

New ideal concentrators for distant radiation sources
24 p0661 A79-50547

Combination radiant-flux radiator for high-temperature solar plant
24 p0663 A79-50705

Temperature profile and power calculations in gas core reactors
24 p0702 A79-51998

RADIATIVE TRANSFER

Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963

RADIATORS

Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937

RADIO EQUIPMENT

Engineering of microwave relays --- microwave radio equipment engineering aspects and impact on energy technology
23 p0526 A79-41931

RADIO FREQUENCIES

New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34846

RADIO FREQUENCY HEATING

Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma
21 p0071 A79-14467

The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470

RF-heating in stationary systems --- of toroidal plasma in tokamaks
22 p0271 A79-24864

Lower hybrid resonance heating --- of tokamak plasma
22 p0271 A79-24865

Lower hybrid heating experiments in JFT-2 tokamak
24 p0607 A79-45030

Electron cyclotron heating in Bumpy Torus Program
24 p0607 A79-45033

Heating of current-free stellarators
24 p0607 A79-45037

Supplementary RF plasma heating in tokamaks
24 p0668 A79-50999

RADIO FREQUENCY INTERFERENCE

Solar Power Satellite (SPS) pilot beam and communication link subsystem investigation study, phase 1 --- ionospheric propagation, radio frequency interference, and microwave transmission
[NASA-CR-161161] 22 p0345 N79-17896

RADIO RECEIVERS

A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452

RADIO TRANSMITTERS

Power supplies for Arctic radio repeater systems
[AD-A061609] 22 p0339 N79-17118

RADIOACTIVE ISOTOPES

Selenide isotope generator for the Galileo mission
21 p0022 A79-10185

Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10186

Selenide technology evaluation program at JPL
21 p0026 A79-10222

Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223

Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
21 p0027 A79-10226

Radioisotope-powered free-piston Stirling engine for space applications
[IAF PAPER 78-42] 21 p0034 A79-11217

Use of modular heat source stack in RTGs --- Radioisotope Thermoelectric Generator
24 p0693 A79-51933

Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936

Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator
24 p0699 A79-51979

Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire
24 p0706 A79-52368

Analysis of radioactive contaminants in by-products from coal-fired power plant operations
[PB-286365/2] 21 p0232 N79-15473

Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662

RADIOACTIVE WASTES

A waste management strategy for nuclear fusion power systems from a regulatory perspective
23 p0407 A79-34064

Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

Report to the President by the Interagency Review Group on Nuclear Waste Management --- as part of the National Energy Plan
[TID-29442] 24 p0729 N79-29021

Hazards from radioactive waste in perspective --- comparison with wastes from burning coal
[CONF-790204-9] 24 p0761 N79-31024

Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0793 N79-32995

Federal facilities for storing spent nuclear fuel; Are they needed
[PB-297071/3] 24 p0804 N79-34006

RADIOGRAPHY

Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

RADIOISOTOPE BATTERIES

Copper/water axially-grooved heat pipes for RTG applications
21 p0023 A79-10188

Brayton Isotope Power System - The versatile dynamic power converter --- for spacecraft
21 p0023 A79-10190

Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191

Development of a 1 kW/e/ isotope fueled Stirling cycle power system
21 p0025 A79-10210

Determining the reliability of radioisotope thermoelectric generators /RTGs/ designed for terrestrial and undersea applications
22 p0261 A79-23622

Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
22 p0261 A79-23623

Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

Optimization of radioisotope thermoelectric generators with gamma-radiation protection
23 p0433 A79-35176
Design optimization of RTG for Solar-Polar Mission --- Radioisotope Thermoelectric Generator
24 p0693 A79-51935

RADIOMETERS
Design of radiometer for measurement of total and net exchange solar radiation
21 p0119 A79-17307

RAFTS
The development of the wave contouring raft
23 p0450 A79-37869

RAIL TRANSPORTATION
Energy efficiency in the transport sector
21 p0054 A79-13574
Breakdown of rapid rail energy costs - A study of three systems
21 p0068 A79-14323
Total energy and labor requirements for an electric commuter railroad
21 p0068 A79-14325
Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822
Energy requirements of the rail mode
[ASME PAPER 78-RT-1] 21 p0150 A79-18085
Optimal control of on-board and station flywheel storage for rail transit systems
[ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771
The influence of systems and operations on rapid rail energy utilization
22 p0299 A79-29338
The impact of aeronautical sciences on other modes of transport
22 p0325 A79-31915
The self-propelled hydrogen-powered refrigerator car
23 p0415 A79-34126
Electromagnetic propulsion alternatives --- in mass drivers
[AIAA PAPER 79-1400] 23 p0426 A79-34840
Assessment of hydrogen-fueled intercity trucking and rail transportation
24 p0615 A79-45601
High Speeds and aerotrain
23 p0551 N79-23836

RAMAN SPECTRA
Stimulated Raman scatter in laser fusion target chambers
21 p0155 A79-18794

RANDOM SAMPLING
Phase one/base data for the development of energy performance standards for new buildings: Sample design
[PB-286903/0] 22 p0331 N79-16150

RANK TESTS
Coal classification and characterization
24 p0714 A79-53777

RANKINE CYCLE
Analysis and design of an 18-ton solar-powered heating and cooling system
21 p0019 A79-10156
Combined cycle gas turbine for an automobile application
21 p0019 A79-10157
Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179
Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191
A Stirling engine heat pump system
21 p0024 A79-10206
A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613
Cycle optimization for a solar turbopack --- turbine water pump utilizing Rankine cycle
21 p0141 A79-17500
Design and performance of 1/4 H.P. solar power unit
21 p0141 A79-17503
Application of turbopack in solar energy systems
21 p0141 A79-17504
Conceptual design of large heat exchangers for ocean thermal energy conversion
[ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813
Efficiency improvement by means of multicomponent processes - Improvement of the efficiency of heat-power transformation by means of an employment of Clausius-Rankine sorption processes
21 p0164 A79-19975
Use of organic fluids in solar turbines
22 p0269 A79-24621
Optimum power plant capacity of ocean-based ocean thermal energy conversion systems
22 p0297 A79-28922
The combined reheat gas turbine/steam turbine cycle. I - A critical analysis of the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-7] 22 p0306 A79-30505
Solar Rankine engines - Examples and projected costs
[ASME PAPER 79-SOL-3] 22 p0307 A79-30541
Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429
Alternate ways of using bottoming cycle power in pipeline gas compressor stations
[ASME PAPER 79-GT-201] 23 p0380 A79-32458
Major factors in OTEC power cycle design
23 p0404 A79-34041
Externally pumped Rankine cycle thermal transport devices
[AIAA PAPER 79-1091] 23 p0456 A79-38060
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212
Solar-powered Rankine heat pump for heating and cooling
24 p0610 A79-45219
Rankine cycle solar driven heat pump development
24 p0610 A79-45221
Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/
24 p0636 A79-46757
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
24 p0673 A79-51752
A combined cycle for solar-fossil hybrid power generation
24 p0674 A79-51760
Status report of the dynamic isotope power system
24 p0692 A79-51927
Technology impact study of a high efficiency industrial heat pump
24 p0697 A79-51966
Increasing gas turbine efficiency through the use of a waste heat methanol reactor
24 p0702 A79-52000
R and D on Rankine cycle engines in Japan
24 p0702 A79-52007
Rankine cycle machines for solar cooling
[NASA-TM-78196] 21 p0173 N79-10524
Preliminary design package for residential heating/cooling system: Rankine air conditioner redesign
[NASA-CR-150871] 22 p0354 N79-19453
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems
23 p0545 N79-22950
Rankine-cycle component characteristics
23 p0579 N79-26478
Candidate power-conversion system cycles, appendix A
23 p0580 N79-26484
Diesel organic rankine cycle compound engine (Bottoming Cycle) program plan
[DOE/CS-0052] 23 p0590 N79-27521
Power generation with binary cycles
24 p0724 N79-28740
Refrigerant-114 Rankine cycle energy recovery technology from the gaseous diffusion industry
[GAT-916] 24 p0750 N79-30724

RANKINE-HUGONIOT RELATION
Mathematical models of direct initiation of unconfined gas phase detonations --- hazards of LNG/air clouds from spills
[AIAA PAPER 79-0289] 21 p0157 A79-19649

RAPID TRANSIT SYSTEMS
Breakdown of rapid rail energy costs - A study of three systems
21 p0068 A79-14323
Optimal control of on-board and station flywheel storage for rail transit systems
[ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771

Application of kinetic energy storage to transportation systems --- flywheels
22 p0299 A79-29337
The influence of systems and operations on rapid rail energy utilization
22 p0299 A79-29338
The application of optimal control theory hybrid electric transit systems
[AD-A059365] 21 p0220 N79-14559
High Speeds and aerotrain
23 p0551 N79-23836
RARE EARTH ALLOYS
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution
23 p0415 A79-34124
RARE EARTH COMPOUNDS
Magnetic and electrical properties of rare earth and rare earth intermetallic hydrides
22 p0249 A79-21692
Hydrogen absorption in rare earth intermetallic compounds
22 p0249 A79-21693
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697
The plateau pressure of RE Ni5 and RE Co5 hydrides --- in hydride formation
22 p0250 A79-21698
Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713
RARE GASES
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419
Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan
24 p0640 A79-47506
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758
RAREFIED PLASMAS
Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852
RATIONS
Proposed standby gasoline rationing plan. Economic and regulatory analysis draft
[DOE/ERA-0009] 21 p0214 N79-13934
RAY TRACING
Laser ray trace tester for parabolic trough solar collectors
21 p0144 A79-17619
Wave reflection from the lower hybrid surface - A toroidal effect --- in tokamaks
22 p0255 A79-22427
A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186
Drift wave propagation and convective wave growth in tokamaks
23 p0446 A79-37262
Solar concentrator flux distributions using backward ray tracing
24 p0603 A79-44365
RAYLEIGH DISTRIBUTION
A comparison of the Weibull and Rayleigh distributions for estimating wind power potential
21 p0045 A79-12243
An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720
REACTION KINETICS
Catalytic gasification predevelopment research
21 p0029 A79-10246
Catalytic coal gasification exploratory research program
21 p0030 A79-10247
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
O2 reduction kinetics in concentrated acids --- in fuel cells
21 p0038 A79-11809
Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986
Kinetics of nitric oxide formation in combustion
21 p0053 A79-12989
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures --- derived from shale oil retorting and coal gasification
21 p0083 A79-15245
Solar fuels --- photochemical reaction kinetics and energy storage
21 p0149 A79-18009
Energy storage using the reversible oxidation of barium oxide
22 p0242 A79-21169
Kinetics of hydrogen absorption and desorption --- for energy storage
22 p0248 A79-21687
Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983
Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398
Comparison of two hydrogen production methods for nuclear-hydrogen conversion
23 p0413 A79-34108
Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution
23 p0415 A79-34124
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-34192
Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes --- Book
23 p0474 A79-38871
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor
23 p0492 A79-40452
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453
A stoichiometric analysis of coal gasification
23 p0492 A79-40456
Char gasification. II - Oxidation results
24 p0667 A79-50914
Coal combustion
24 p0714 A79-53779
Coal gasification for high and low Btu fuels
24 p0714 A79-53780
Coal liquefaction
24 p0714 A79-53781
Combustion kinetics of selected aromatic hydrocarbons
[AD-A059381] 21 p0215 N79-14184
Thermal and kinetic analysis of the pyrolysis of coals
22 p0336 N79-16704
Alternative hydrocarbon fuels: Combustion and chemical kinetics --- synthetic aircraft fuels
[AD-A061050] 22 p0338 N79-17011
Analysis of coke combustion during in-situ oil recovery
23 p0553 N79-24095
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120
Kinetics of coal liquefaction to preasphaltenes, asphaltenes and oils
23 p0588 N79-27320
Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691
Some aspects of the mechanism and kinetics of coal liquefaction
24 p0717 N79-28343
Reaction kinetics for remodeling oil shale retorting
[UCRL-81622] 24 p0720 N79-28653
Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research
[FE-2202-39] 24 p0765 N79-31411

Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation [EPRI-AF-913] 24 p0795 N79-33344

REACTION WHEELS
Design and applications of flywheels. Citations from the NTIS data base [NTIS/PS-78/0997/3] 21 p0190 N79-11550
Design and applications of flywheels. Citations from the engineering index data base [NTIS/PS-78/0998/1] 21 p0190 N79-11551

REACTIVITY
Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization 21 p0065 A79-14121
The effect of coal characteristics on the catalytic liquefaction of Utah coals 24 p0628 A79-45991

REACTOR DESIGN
Fusion-Fission Energy Systems 21 p0017 A79-10144
Doublet III design and construction --- Tokamak fusion research device 21 p0018 A79-10145
Demonstration and commercial prototype tokamak reactors 21 p0018 A79-10146
Mirror fusion reactors 21 p0018 A79-10148
Overview of inertial confinement fusion reactor designs 21 p0018 A79-10149
CO2-laser fusion 21 p0018 A79-10150
Compact fusion reactors using controlled imploding liners 21 p0018 A79-10151
The fast power cycle for fusion reactors 21 p0018 A79-10152
Commercial applications of thermionic conversion using a fusion reactor energy source - A preliminary assessment 21 p0026 A79-10219
The efficiencies of thermochemical energy transfer 21 p0054 A79-13575
On the ion energy balance in TFR with and without neutral injection heating 21 p0069 A79-14452
Recent results from the PLT tokamak 21 p0069 A79-14453
Progress in tokamak experimental research in the Soviet Union 21 p0069 A79-14455
Fusion reactor problems --- plasma confinement and interface engineering 21 p0071 A79-14468
Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program --- Book 21 p0077 A79-14776
The 'FINTOR 1' design - A minimum size tokamak experimental reactor 21 p0078 A79-14782
Philosophy and physics of predemonstration fusion devices 21 p0078 A79-14783
Characteristics of a predemonstration fusion device 21 p0078 A79-14784
Predemonstration fusion devices - Research and development needs 21 p0078 A79-14785
Superconducting magnets - Some fundamentals and their state of the art 21 p0079 A79-14788
Superconducting magnet systems in EPR designs --- Experimental Power Reactor 21 p0079 A79-14789
Materials problems and possible solutions for near term tokamak fusion reactors 21 p0079 A79-14790
Energy sources and conventional magnets --- for tokamak experiment Power Reactor toroidal field 21 p0079 A79-14791
Auxiliary heating in breakeven tokamaks 21 p0079 A79-14792
The impact of servicing requirements on tokamak fusion reactor design 21 p0079 A79-14793
High-current power leads for tokamak fusion reactor superconducting magnets 21 p0085 A79-15318
Self-adjusting laser-target system for laser fusion 21 p0086 A79-15625
Energy storage for tokamak reactor cycles --- during downtime for periodic plasma quench and reignition 21 p0111 A79-16727
Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak --- safety factor 21 p0155 A79-18830
Design of a D-shaped toroidal field coil 21 p0156 A79-19083
Nuclear characteristics of D-D fusion reactor blankets - Technical data 21 p0162 A79-19826
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA' 22 p0236 A79-20543
SLPX - Superconducting Long-Pulse Tokamak Experiment 22 p0237 A79-20557
Minimum-average-B wells in linked magnetic mirror fields --- for plasma control in fusion reactors 22 p0252 A79-22237
Particle orbits in field-reversed mirrors --- for plasma confinement in fusion reactor 22 p0253 A79-22239
An overview of design space for small fusion targets 22 p0253 A79-22241
Energy for the long run - Fission or fusion 22 p0256 A79-22760
The potential of fusion reactors as process heat source 22 p0284 A79-26624
Pellet X-ray spectra for laser fusion reactor designs 22 p0291 A79-27878
Characteristics of electron-cyclotron-resonance-heated tokamak power reactors 22 p0292 A79-27885
Design and development of the US-TESPE toroidal coil 22 p0311 A79-31014
Thermoelectric magnetohydrodynamics 22 p0312 A79-31098
Large tokamak experiments - Report on the Third IAEA Technical Committee Meeting, Paris, 1-6 September 1978 22 p0313 A79-31193
Report on a simple fusion reactor model that is already in operation 23 p0407 A79-34058
Fusion power demonstration study at ORNL 23 p0407 A79-34059
The ELMO Bumpy Torus - An alternative fusion reactor concept 23 p0407 A79-34060
Conceptual design study of a doublet fusion ignition test reactor 23 p0407 A79-34065
Progress in tokamak and stellarator experiments 23 p0443 A79-36878
Solar chemical reactors 23 p0462 A79-38572
Performance parameters for fusion-fission power systems 24 p0627 A79-45974
A possible route to small, flexible fusion units --- fusion reactor design 24 p0630 A79-46304
Electrogenerative chemical reactors 24 p0631 A79-46310
High-frequency convective loss-cone instability in short mirror machines 24 p0639 A79-47421
Characteristics of co-axial Marx generator and its application to electron beam fusion 24 p0642 A79-47805
Reactor design for nuclear electric propulsion 24 p0693 A79-51931
Baseline design of the thermoelectric reactor space power system 24 p0693 A79-51932
Design optimization of RTG for Solar-Polar Mission --- Radioisotope Thermoelectric Generator 24 p0693 A79-51935
Engineering aspects of demonstration fusion power reactors 24 p0695 A79-51950

A high temperature fusion reactor design
24 p0656 A79-51954

Fusion-supported decentralized nuclear energy system
24 p0696 A79-51956

Temperature profile and power calculations in gas core reactors
24 p0702 A79-51998

Some aspects of a fission-based plasma engine
24 p0715 A79-54350

Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887

Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439

Fusion energy for alternative applications: The generation of synthetic gaseous fuels --- approach to high temperature fusion reactor design
[ANL/FPP-TM-117] 24 p0755 N79-30790

REACTOR MATERIALS

Liquid metal heat pipe performance in the presence of a transverse magnetic field --- for fusion reactors
[ASME PAPER 78-ENAS-20] 21 p0048 A79-12569

Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876

First wall and divertor plate material selection in fusion reactors
23 p0444 A79-36886

Corrosion of stainess steel, volume 2. A bibliography with abstracts
[NTIS/PS-79/0208/3] 23 p0553 N79-24143

Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953

REACTOR PHYSICS

The synergetics of the catalytic D-D-fusion-fission breeder
22 p0252 A79-22236

Large tokamak experiments - Report on the Third IAEA Technical Committee Meeting, Paris, 1-6 September 1978
22 p0313 A79-31193

Performance parameters for fusion-fission power systems
24 p0627 A79-45974

Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems
24 p0629 A79-46236

Gaseous fuel reactors for power systems
[LA-UR-78-1437] 21 p0214 N79-13844

REACTOR SAFETY

Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants
[UCRL-52000-78-6] 21 p0215 N79-14168

Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments --- soil and water analysis
[LA-7033-PR] 21 p0232 N79-15783

REACTOR TECHNOLOGY

Heavy-ion beam inertial-confinement fusion
21 p0054 A79-13448

Large tokamak experiments - Report on the Third IAEA Technical Committee Meeting, Paris, 1-6 September 1978
22 p0313 A79-31193

Moving bed heat transfer for advanced power reactor applications
23 p0416 A79-34133

Fusion research - The temperature rises
23 p0445 A79-37000

Gaseous fuel reactor applications
24 p0715 A79-54351

Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies
[COO-4636-1] 23 p0582 N79-26511

Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368

Optimization of the fission-fusion hybrid concept
[ORNL/PPA-79/3] 24 p0778 N79-32113

REAL TIME OPERATION

Real time computer control of 5 megawatts of solar thermal energy
21 p0144 A79-17621

The real time aperture flux system as part of the Solar Thermal Test Facility
23 p0429 A79-35050

Suntrack-systems for solar concentrators
23 p0464 A79-38587

Alternative, semi-automated method for performing multiobjective analyses
[BNL-50892] 23 p0599 N79-27921

RECEIVERS

Receiver designs for tower-top solar collector
21 p0135 A79-17450

Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

Central receiver thermal power system
[AED-CONF-78-212-008] 23 p0582 N79-26513

Thermal energy storage for advanced solar central receiver power systems
[SAND-78-8221] 24 p0788 N79-32694

RECIRCULATIVE FLUID FLOW

Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products --- in fuel cell
21 p0164 A79-19851

RECLAMATION

The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta
23 p0438 A79-36505

Solid waste and biomass. Their potential as energy sources in Illinois, 1977
[PB-281649/4] 21 p0177 N79-10562

Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379

RECOMBINATION COEFFICIENT

Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289

RECORDING INSTRUMENTS

Data acquisition using a modular data logger --- for solar heated building monitoring
21 p0088 A79-15832

RECTANGULAR PANELS

High efficiency, high density terrestrial panel --- for solar cell modules
[NASA-CR-162167] 24 p0770 N79-31765

RECTENNAS

Solar power satellites - Microwaves deliver the power
23 p0460 A79-38374

RECTIFIERS

Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898

RECYCLING

The need for materials recycling
21 p0047 A79-12340

Energy conservation by means of recycling
21 p0112 A79-16735

Development of specifications for recycled products
22 p0295 A79-28182

The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754

Recycling processes in tokamaks
23 p0443 A79-36882

Summary results from the NASA Tech House one year live-in
[AIAA PAPER 79-0987] 23 p0475 A79-38892

Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling
23 p0488 A79-40389

Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390

Recycle energy system - City of Akron, Ohio
23 p0488 A79-40392

Resource recovery and recycling --- Book
24 p0706 A79-52570

US Army/Environmental Projection Agency re-refined engine oil program
[AD-A056806] 21 p0171 N79-10216

Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152
A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives --- economic analysis
23 p0567 N79-24813
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363
REDUCTION (CHEMISTRY)
O2 reduction kinetics in concentrated acids --- in fuel cells
21 p0038 A79-11809
The direct reduction of sulfur dioxide
21 p0065 A79-14124
Coal gasification studies. III - Reduction in the presence of some metal iodides and iron halides
22 p0299 A79-29314
Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442
Redox flow cell development and demonstration project, calendar year 1977
[NASA-TM-79067] 23 p0558 N79-24445
Viscosity reduction of coal liquids by dissolved carbon dioxide
[SAND-79-7027] 24 p0732 N79-29365
REFERENCE SYSTEMS
Impacts of new energy technologies as measured against reference energy systems --- conferences
[BNL-25475] 23 p0597 N79-27694
REFINING
Operation of the Ft. Lewis, Washington Solvent Refined Coal /SRC/ Pilot Plant in the SRC I and SRC II processing modes
21 p0006 A79-10054
Potential applications of solar furnaces in materials industry
23 p0471 A79-38654
Particle size variation in the solvent refined coal process
23 p0492 A79-40451
Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455
Changes within tin-containing catalysts under hydrorefining conditions --- for coal liquefaction
24 p0628 A79-45993
Chemicals from coal. Report based on HRI H-coal product
[FE-1534-50] 21 p0180 N79-11166
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-38] 23 p0554 N79-24181
US refining capacity: How much is enough
[PB-291437/2] 23 p0555 N79-24192
Status report the SRC-1 and SRC-2 processes
23 p0593 N79-27616
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28349
Converting Green River shale oil to transportation fuels --- conferences
[CONF-780460-3] 24 p0745 N79-30396
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689
Utilization of used oil
[ATR-78(7388)-1] 24 p0767 N79-31432
The United States refining policy in a changing world oil environment
[PB-297136/4] 24 p0796 N79-33349
REFLECTANCE
Specular mirrors for solar energy application
21 p0034 A79-11147
Ideal prism solar concentrators
21 p0149 A79-18023
Colored stainless steel - A new type of selective absorber --- for solar thermal conversion
22 p0294 A79-28150
Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067
Exposure test results for reflective materials --- used in solar concentrators
23 p0430 A79-35068
Temperature dependence of the optical properties of silicon
23 p0437 A79-35820
Spatial uniformity of quantum efficiency of a silicon photovoltaic detector
23 p0478 A79-39593
New ideal concentrators for distant radiation sources
24 p0661 A79-50547
Inhomogeneous surfaces as selective solar absorbers
24 p0704 A79-52313
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494
Structure of a black chrome solar selective surface
[LBL-6691-REV] 24 p0753 N79-30778
REFLECTED WAVES
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177
REFLECTOMETERS
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443
Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780
REFLECTORS
Large, lightweight, replicated mirrors
21 p0043 A79-11976
Analysis, development and testing of a fixed tilt solar collector employing reversible Vee-Trough reflectors and vacuum tube receivers
23 p0477 A79-39101
An optical valve for flat-plate solar energy collectors
24 p0607 A79-45154
Elastically deformed, linear focusing solar reflector
24 p0670 A79-51728
REFRACTION
Linear echelon refractor/reflector solar concentrators
22 p0293 A79-28143
REFRACTIVITY
Review of theories for predicting n2 in glasses and crystals --- refractive index of fusion laser materials
21 p0083 A79-15139
Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372
Thermal emissivity of selective surfaces - New lower limits
24 p0648 A79-49207
Design of selective surfaces for solar energy collection
24 p0655 A79-50180
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183
REFRACTORY MATERIALS
Materials --- for high temperature MHD technology
21 p0106 A79-16491
Ceramic materials for vehicular gas turbine applications
21 p0165 A79-20085
The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381
Thermal properties of MHD electrode materials
23 p0392 A79-33400
High temperature materials study --- for thermal insulation in solar furnaces
23 p0431 A79-35070
Operability and materials testing for MHD air heaters
24 p0701 A79-51994
MHD power generation: Research, development and engineering
[FE-3087-2] 22 p0363 N79-20518
Study of heat transfer through refractory lined gasifier vessel walls
[FE-2210-29] 23 p0556 N79-24306
Materials technology for coal-conversion processes
[ANL-79-2] 24 p0719 N79-28362
Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces
[PB-293238/2] 24 p0731 N79-29249

REFRACTORY METAL ALLOYS

High-temperature contacts for silicon solar cells
23 p0502 A79-40934

REFRACTORY METALS

Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures --- for fuel cells
21 p0039 A79-11812

REFRIGERANTS

Solar absorption cooling
21 p0050 A79-15861

Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid --- for OTEC
24 p0619 A79-45794

Candidate chemical systems for air cooled, solar powered, absorption air conditioner design. Part 2: Solid absorbents, high latent heat refrigerants
[SAN-1587-2] 21 p0211 N79-13544

Condensation of refrigerants on vertical fluted tubes
[ORNL/TM-5848] 24 p0781 N79-32515

REFRIGERATING

Solar ammonia-water absorption system for cold storage application
21 p0143 A79-17521

Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003

Refrigeration requirements for future superconductive energy related applications
22 p0311 A79-31019

Conserving electric power by geothermal refrigeration - Cooling and freezing
23 p0409 A79-34079

Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648

REFRIGERATING MACHINERY

Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422

The self-propelled hydrogen-powered refrigerator car
23 p0415 A79-34126

Solar refrigeration utilizing zeolites
24 p0703 A79-52014

Cryogenic refrigeration, volume 2. A bibliography with abstracts
[NTIS/PS-78/1261/3] 22 p0331 N79-16144

Cryogenic refrigeration, volume 3. A bibliography with abstracts
[NTIS/PS-78/1262/1] 22 p0331 N79-16145

REFRIGERATORS

Performance testing of a three ton solar absorption chiller
[AIAA PAPER 78-1757] 21 p0060 A79-13858

Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523

Gas-cycle solar refrigeration system performance
21 p0153 A79-18471

Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819

Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607

Solar air conditioning and refrigeration in arid regions
23 p0466 A79-38608

Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545

REFUELING

Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma
22 p0255 A79-22369

Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538

REGENERATION (ENGINEERING)

Simulations of the performance of open cycle desiccant systems using solar energy
21 p0066 A79-14262

A regenerative process for fluidized-bed combustion of coal with lime additives
22 p0297 A79-28984

An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0397 A79-33836

Experimental study of mass exchange in glazed solar solution regenerator
24 p0602 A79-44264

Methane generation from human, animal, and agricultural wastes
[PB-276469/4] 21 p0171 N79-10240

Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

Evaluation of available MHD seed-regeneration processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519

REGENERATIVE FUEL CELLS

The 100 kW space station --- regenerative fuel cells and nickel hydrogen and nickel cadmium batteries for solar arrays
22 p0371 N79-21603

REGENERATORS

Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823

Rate of desorption in a solar regenerator
21 p0055 A79-13611

Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine
21 p0114 A79-16800

Buoyancy effects in a solar regenerator --- for air dehumidifier absorbent solutions
22 p0262 A79-23752

Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396

Designing reliability into high-effectiveness industrial gas turbine regenerators
[ASME PAPER 79-GT-199] 23 p0380 A79-32456

Aspects of meeting complex industrial energy demand patterns using recuperated gas turbines
23 p0454 A79-37905

Transient response of a solar regenerator
23 p0526 A79-41935

Regenerator matrices for automotive gas turbines
23 p0532 A79-42981

Study of heat-pipe heat exchanger in the small gas turbine engine system
24 p0646 A79-48511

Regenerative flywheel energy storage system
24 p0678 A79-51783

Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649

REGIONAL PLANNING

Prospects for ambient energy and cogeneration utilization in urban and regional planning
21 p0104 A79-16465

Regional analysis of potential water power
21 p0148 A79-17825

The economics of geothermal energy development at the regional level
22 p0256 A79-22756

Structuring a small national or state solar energy program
22 p0262 A79-23751

Solutions to energy conservation in northern climates
22 p0321 A79-31443

A practical regional scale air quality simulation model for energy resource development in the four corners area
23 p0535 A79-43430

Wind resource assessment status --- regional differences
24 p0633 A79-46529

Wind energy systems application to regional utilities
24 p0634 A79-46532

Reference Energy Systems as applied to regional energy policy
24 p0698 A79-51973

Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[CRNL/TM-5890/S4] 21 p0186 N79-11511

Urbanism and energy in developing regions
[LBL-7808] 21 p0189 N79-11540

Projects to expand energy sources in the western states
[PB-283706/0] 21 p0190 N79-11547
Energy supply and environmental impacts: Conventional sources, study module 3-A, technical appendix
[PB-283787/0] 21 p0198 N79-12573
Energy and environment: An intergovernmental perspective
[PB-283733/4] 21 p0198 N79-12575
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576
Energy future Northwest: Northwest Energy Policy project
[PB-284697/0] 21 p0199 N79-12578
Cooking with offshore oil: A handbook for California local government --- regional planning
[PB-288656/2] 22 p0331 N79-16140
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289
Self-starting manual for direct use applications of geothermal resources
[PB-290872/1] 23 p0556 N79-24423
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446
Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0585 N79-26539
Locational response to regulatory policy: A regional analysis of energy facility location --- conferences
[BNL-23597] 23 p0598 N79-27695
Role of the states in energy
[DOE/PE-0009] 24 p0758 N79-30816
Regional residential sector energy price forecasts for 1978: Electricity, natural gas, number 2 fuel oil, and propane
[DOE/EIA-0102/46] 24 p0762 N79-31083

REGULATIONS
Proposed standby gasoline rationing plan. Economic and regulatory analysis draft
[DOE/ERA-0009] 21 p0214 N79-13934
Integrated safeguards information System (ISIS), executive summary --- nuclear power plant and fissionable materials security
[PB-286869/3] 21 p0223 N79-14934
Interagency coal cleaning technology development
22 p0347 N79-18361
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
Solar building regulatory study, volume 1
[PB-289823/7] 22 p0365 N79-21235
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494
Findings and views concerning the exemption of kerojet fuels from the mandatory petroleum allocation and price regulations
[DOE/ERA-0023] 23 p0600 N79-28058
Replacing oil and natural gas with coal: Prospects in the manufacturing industries
24 p0718 N79-28351
Energy conservation and regulation in the President's budget
[GPO-25-418] 24 p0736 N79-29597
Briefing related to Executive Order 12003 and the National Energy Act
[DOE/TIC-10065] 24 p0775 N79-31818

REINFORCED PLASTICS
Large, lightweight, replicated mirrors
21 p0043 A79-11976
Dynamic analysis of pipeline system for thermal power generation facility
24 p0627 A79-45863

REINFORCEMENT (STRUCTURES)
Structural optimization of SMC line focusing collectors
23 p0534 A79-43295
Structural optimization of sheet molding compound line focusing collectors
[SAND-79-0215C] 24 p0790 N79-32710

REINFORCING FIBERS
Outgassing tests of fiber-epoxy composite materials
[SAND-78-7075] 23 p0552 N79-24071

RELATIVISTIC ELECTRON BEAMS
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

RELATIVISTIC PARTICLES
Radiation energy conversion in space
22 p0284 A79-26595
Prospects of generating power with particle-beam-drive inertial confinement fusion
23 p0407 A79-34063

RELAXATION (MECHANICS)
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684

RELAXATION TIME
Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760

RELAY SATELLITES
The TDRSS solar array --- Tracking and Data Relay Satellite System
23 p0500 A79-40917

RELIABILITY
Safety considerations in the design and operation of large wind turbines
[NASA-TM-79193] 24 p0723 N79-28725

RELIABILITY ANALYSIS
User experience with on-road electric vehicles in the U.S.A. and Canada
21 p0009 A79-10080
Nickel-zinc vs. silver-zinc battery - A comparative study of baseline characteristics
21 p0009 A79-10083
Is there repair after failure --- reliability of repairable vs. nonrepairable engines
21 p0086 A79-15378
A challenging role for the assurance sciences --- in energy conversion technology
21 p0086 A79-15396
Combined environments: Technology interrelations; Proceedings of the Twenty-fourth Annual Technical Meeting, Fort Worth, Tex., April 18-20, 1978
21 p0097 A79-16076
Reliability studies on MIS solar cells
21 p0148 A79-17950
Determining the reliability of radioisotope thermoelectric generators /RTGs/ designed for terrestrial and undersea applications
22 p0261 A79-23622
Accelerated tests for coatings --- for solar concentrators
22 p0296 A79-28668
The London Electric Delivery Van Assessment Scheme
[SAE PAPER 790111] 22 p0314 A79-31358
Report on a survey of operational solar systems
22 p0318 A79-31418
Heliostat survivability and structural stability for wind loading
23 p0400 A79-34001
SERI solar energy standards activities
23 p0431 A79-35075
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019
Some failure modes and analysis techniques for terrestrial solar cell modules
23 p0512 A79-41020
Reliability analysis of contracts to silicon solar cells for use in concentrated sunlight
23 p0517 A79-41058
Accelerated tests of coatings --- for solar concentrators
24 p0637 A79-46906
Reliability of wind power from dispersed sites: A preliminary assessment
[LBL-6889] 21 p0176 N79-10547
Verification test report on a solar heating and hot water system
[NASA-CR-161165] 22 p0360 N79-20493
Evaluation of ceramics for stator application: Gas turbine engine report
[NASA-CR-159533] 22 p0364 N79-21075

RELIABILITY ENGINEERING
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536

Unique aspects of terrestrial photovoltaic system design
[ASME PAPER 79-SOL-14] 22 p0308 A79-30548
Repowering of a small utility - A unique solution to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332
Mechanical reliability considerations in the modern high temperature industrial gas turbine
[ASME PAPER 79-GT-101] 23 p0377 A79-32377
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
System reliability studies for wave energy generation
23 p0450 A79-37872
Operating systems for solar electric energy supplies
23 p0466 A79-38606
Determination of the design states of a complex system in evaluating the reliability of electrical power supply
24 p0646 A79-48826

REMOTE HANDLING
The impact of servicing requirements on tokamak fusion reactor design
21 p0079 A79-14793
Manned remote work station development article
[NASA-CR-151871] 22 p0330 N79-16057

REMOTE REGIONS
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867
An overview of photovoltaic power systems
[ASME PAPER 79-SOL-12] 22 p0308 A79-30547

REMOTE SENSORS
Instrumentation development for in situ coal gasification
21 p0006 A79-10053
Joint Conference on Sensing of Environmental Pollutants, 4th, New Orleans, La., November 6-11, 1977, Proceedings
21 p0082 A79-15023
Future programs and prospects for resource exploration from space by the year 2000
[AAS PAPER 78-182] 22 p0243 A79-21275
Energy and remote sensing applications
22 p0255 A79-22516
Remote sensing use in hydraulic planification in Mexico
22 p0255 A79-22522
Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974
The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta
23 p0438 A79-36505
Distributed parameter modelling of urban residential energy demand --- using remotely sensed imagery
24 p0657 A79-50218
Application of multispectral scanner data to the study of an abandoned surface coal mine
[NASA-TM-78912] 21 p0204 N79-13472
Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379
A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining
[PB-294299/3] 24 p0735 N79-29584
Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River
[NASA-TM-80124] 24 p0777 N79-31839

REMOTELY PILOTED VEHICLES
Nickel-zinc battery for aircraft and missile applications
[AD-A059295] 21 p0220 N79-14561

REPLENISHMENT
Need for and deployment of inexhaustible energy resource technologies: Report of Technology Study Panel inexhaustible energy resources study
[TID-28202] 21 p0186 N79-11510

REPORTS
LSA Low-cost Solar Array project
[NASA-CR-158250] 22 p0355 N79-19462
MHD power generation: Research, development and engineering
[FE-2524-8] 22 p0363 N79-20517
Transportation systems center bibliography of technical reports
[PB-296342/9] 24 p0794 N79-33107

REQUIREMENTS
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 7: System/subsystem requirements data book
[NASA-CR-161223] 23 p0547 N79-23489
Requirements for the development, management and implementation of research in support of the Department of Energy enhanced oil recovery program
[BETC-2025-1] 24 p0776 N79-31831

RESEARCH
Strategies for applied research management
[PB-284741/6] 21 p0214 N79-13913
Hydrogen technology from thermonuclear research
22 p0338 N79-16997
NACA research on hydrogen for high altitude aircraft
22 p0338 N79-16999
MHD power generation: Research, development and engineering
[FE-3087-2] 22 p0363 N79-20518
Basic research on ceramic materials for energy storage and conversion system
[COO-2564-4] 23 p0564 N79-24506

RESEARCH AND DEVELOPMENT
Intersociety Energy Conversion Engineering Conference, 13th, San Diego, Calif., August 20-25, 1978, Proceedings. Volumes 1, 2 & 3
21 p0001 A79-10001
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043
Exxon Donor Solvent coal liquefaction process development
21 p0007 A79-10060
Exploratory research in coal conversion
21 p0007 A79-10061
JPL - Small Power Systems Applications Project --- for solar thermal power plant development and commercialization
21 p0019 A79-10161
Evaluation program for new industrial gas turbine materials
[ASME PAPER 78-GT-145] 21 p0031 A79-10269
ERDA fuel cell programs
21 p0039 A79-11814
Summary of international energy research and development activities 1974-1976 --- Book
21 p0068 A79-14400
Predemonstration fusion devices - Research and development needs
21 p0078 A79-14785
Biomimetic approach to solar energy conversion - Artificial photosynthesis
21 p0094 A79-15899
Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924
The solar energy R & D programme of the European Communities
21 p0116 A79-17278
Solar energy in Latin America - An overview
21 p0116 A79-17279
Report on the development of solar energy in France
21 p0117 A79-17280
The accomplishments of the United States Federal Solar Energy Program
21 p0117 A79-17281
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282
Solar energy activities in Austria
21 p0117 A79-17283
Solar energy R&D in Iran - The approach and the philosophy
21 p0117 A79-17284

Plans and prospects for solar energy utilisation in Malawi
21 p0117 A79-17285
Solar energy in Southern Africa
21 p0117 A79-17287
Fracture research in Canada
21 p0144 A79-17530
Coal technology '78; International Coal Utilization Convention, Houston, Tex., October 17-19, 1978, Conference Papers. Volumes 1 & 2
21 p0145 A79-17631
A summary of R&D programs --- for coal utilization
21 p0146 A79-17639
General view of low cost solar cell development in Japan
21 p0149 A79-17997
Transport fuels from natural gas
22 p0292 A79-27897
Lignite - Abundant raw material of the future
22 p0296 A79-28438
Recent developments in power sources with special emphasis on alkaline batteries --- for electric vehicles
22 p0301 A79-29490
Developing electric vehicles
22 p0302 A79-29496
Latest developments in sponsored test programs for electric vehicles in France
22 p0302 A79-29497
NRC's wind energy program
22 p0319 A79-31426
Energy and aerospace; Proceedings of the Anglo/American Conference, London, England, December 5-7, 1978
22 p0325 A79-31908
The Energy Research and Development Program of the United States
22 p0325 A79-31909
Energy research and development - A U.K. view
22 p0325 A79-31910
The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344
Energy projects at the Sao Paulo State Institute of Technological Research
23 p0389 A79-33261
Estimating the commercial potential and energy benefits of ERDA electric energy research
23 p0419 A79-34161
The inexhaustible energy resources study --- U.S. R and D to meet future requirements
23 p0420 A79-34166
Effects of energy conservation research, development, and demonstration on residential energy use
23 p0422 A79-34276
Financing alternatives for space industrialization
[AIAA PAPER 79-1389] 23 p0426 A79-34836
Future programs in space --- impact on energy technology problems
[AAS 78-180] 23 p0427 A79-34865
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171
A review of Curtiss-Wright rotary engine developments with respect to general aviation potential
[SAE PAPER 790621] 23 p0440 A79-36749
The Florida Solar Energy Standards Act of 1976
[AIAA PAPER 79-1018] 23 p0460 A79-38203
European solar collector development and testing - A commercial view
23 p0470 A79-38645
Research and development facilities at the Ontario Center for Resource Recovery
23 p0490 A79-40410
The AOSTRA role in developing energy from Alberta oil sands
23 p0494 A79-40738
Fuels cells - Their development and potential
23 p0495 A79-40750
Status and future development of photovoltaic research in the Federal Republic of Germany
23 p0501 A79-40918
Materials, problems and research in German coal conversion projects
23 p0529 A79-42425
Energy storage --- survey of recent R and D
24 p0606 A79-44959
A review of current R&D in thermal energy storage and heat exchange in solar applications
24 p0608 A79-45211
International developments in hydrogen technologies --- research cooperation for new hydrogen production methods
24 p0612 A79-45579
Development of coalbed methane as an energy source
24 p0660 A79-50452
Environmental considerations in R&D planning and evaluation of energy storage systems
24 p0666 A79-50893
Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785
Energy research and development at the Canada Centre for Mineral and Energy Technology /CANMET/
24 p0698 A79-51971
R and D on Rankine cycle engines in Japan
24 p0702 A79-52007
R & D on advanced heat exchangers in Japan
24 p0702 A79-52008
Research and development on ocean thermal energy conversion in Japan
24 p0703 A79-52009
Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system
24 p0703 A79-52010
Electric batteries. A bibliography
[TID-3361] 21 p0184 N79-11491
Annual highlights of the energy technology programs
[ENI-50799] 21 p0185 N79-11499
Coal research: Data systems and information transfer
[ORAU-133] 21 p0232 N79-15830
Electric and Hybrid Vehicle Act, Public Law 94-413 demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810
Critical contributions in MHD power generation
[FE-2215-11] 22 p0362 N79-20511
MHD power generation: Research, development and engineering
[FE-2524-8] 22 p0363 N79-20517
Vertical axis wind turbine status
[SAND-78-0397C] 23 p0582 N79-26512
North Stanley Polymer Demonstration Project
[BETC/RI-78/19] 23 p0588 N79-27313
The comparison and coordination of national policies and programs in the energy research and development sector
[EUR-5911] 23 p0594 N79-27653
Energy research and development in Sweden, 1978-1981
[DFE-13] 24 p0728 N79-28781
NASA authorization, 1980, volume 1, part 2
[GPO-46-134] 24 p0730 N79-29105
Clean energy from coal
[PETC-1000] 24 p0733 N79-29370
Enhance oil recovery: Focus group results
[DOE/TIC-100200] 24 p0735 N79-29578
Energy research and development programme
[EUR-5889] 24 p0736 N79-29596
Department of the Navy energy fact book
[AD-A069138] 24 p0738 N79-29614
Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978 --- congressional reports
[GPO-36-187] 24 p0750 N79-30725
Interface problems on an SPS solar array blanket
24 p0752 N79-30751
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067
Implementation of state solar incentives: Research, Development, and demonstration programs
[SERI/TR-51-161] 24 p0773 N79-31799
Published patent applications and patents resulting from German government sponsored research and development
[BMFT-FB-T-78-31] 24 p0794 N79-33151

RESEARCH FACILITIES

The mirror machine program in the USA --- controlled fusion experiments and research facilities
21 p0070 A79-14461
Effort of the Jet Propulsion Laboratory
22 p0370 N79-21575

Lewis Research Center program 22 p0370 N79-21576
Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment 23 p0551 N79-23539
Solar heating and cooling results for the Los Alamos study center [LA-UR-78-2588] 24 p0729 N79-28790
Solar energy program [ANL-79-16] 24 p0772 N79-31789

RESEARCH MANAGEMENT
Potential research problems in energy systems analysis 21 p0115 A79-17221
Some perspectives on research into the biological response to non-ionizing electromagnetic radiation --- relation to SETI, SPS, and other government projects 22 p0271 A79-24879
Financing alternatives for space industrialization [AIAA PAPER 79-1389] 23 p0426 A79-34836
The Netherlands research program on wind energy 23 p0481 A79-40102
International developments in hydrogen technologies --- research cooperation for new hydrogen production methods 24 p0612 A79-45579
Energy conservation via heat transfer enhancement --- in heat exchangers 24 p0630 A79-46307
Energy policy and research planning, volume 2. A bibliography with abstracts [NTIS/PS-78/0961/9] 21 p0191 N79-11552
Energy policy and research planning, volume 3. A bibliography with abstracts [NTIS/PS-78/0962/7] 21 p0191 N79-11553
Strategies for applied research management [PB-284741/6] 21 p0214 N79-13913
General aviation energy-conservation research programs 22 p0329 N79-15963
Public hearing transcript: Federal non-nuclear energy research and development program [PB-287910/4] 22 p0349 N79-18464
Industrial energy efficiency improvement program [DOE/CS-0033/1] 23 p0540 N79-22332
Energy Materials Coordinating Committee (EMACC) [DOE/US-002] 23 p0563 N79-24490
Photovoltaic research and development status 23 p0571 N79-25495
Contextual analysis for industrial energy conservation R and D [PB-290981/0] 23 p0575 N79-25537
Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies [COO-4636-1] 23 p0582 N79-26511
Research summary--oil spills [PB-293597/1] 23 p0585 N79-26558
The Congress needs to redirect the federal electric vehicle program [PB-293977/5] 24 p0731 N79-29120
Resource-allocation methodology for establishing RD and D budgetary priorities [ORO-5474-T1] 24 p0761 N79-31067
Requirements for the development, management and implementation of research in support of the Department of Energy enhanced oil recovery program [BETC-2025-1] 24 p0776 N79-31831
Solar thermal test facilities users association [SERI/PR-13-154] 24 p0787 N79-32688

RESEARCH PROJECTS
Underground coal gasification research at the University of New Mexico 21 p0032 A79-10523
Summary of international energy research and development activities 1974-1976 --- Book 21 p0068 A79-14400
Fusion power by magnetic confinement - Program plan 21 p0080 A79-14794
Trends in photovoltaic development outside the United States 23 p0496 A79-40882
Status of the photovoltaic concentrator applications experiments 23 p0496 A79-40884
Status of the DOE Photovoltaic Concentrator Technology Development Project 23 p0517 A79-41054
Southern regional solar energy center planning 24 p0608 A79-45203
Solar heating and cooling. Research and development: Project summaries [DOE/CS-0010] 21 p0208 N79-13519
FY 1978 scientific and technical reports, articles, papers, and presentations --- bibliography [NASA-TM-78203] 21 p0214 N79-13915
Wind engineering research digest, volume 3, 1978 --- a bibliography of ongoing research projects [PB-290694/9] 23 p0567 N79-24621
A Kentucky energy resource utilization program [PB-292949/5] 23 p0585 N79-26538
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362) [PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes [PB-294952/7] 24 p0743 N79-29673

RESERVES
On fossil fuel reserves and resources [IIASA-RM-78-35] 23 p0593 N79-27628
Strategic petroleum reserve: Expansion of reserve. Final supplement to final environmental impact statement [DOE/EIS-0034] 24 p0746 N79-30407
Strategic petroleum reserve [DOE/TIC-10107] 24 p0781 N79-32617
Reexamination of the estimation of undiscovered oil resources in the US [DOE/EIA-0103/31] 24 p0781 N79-32618

RESERVOIRS
Optimal decisions for long-term operation of hydropower systems 22 p0245 A79-21473
A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis 22 p0263 A79-23777
Thermal stress cracking and the enhancement of heat extraction from fractured geothermal reservoirs [LA-7235-MS] 21 p0198 N79-12568
Research on the physical properties of geothermal reservoir rock [COO-2908-4] 22 p0358 N79-20459
Numerical simulation of the compaction-subsidence phenomena in a reservoir for two-phase nonisothermal flow 23 p0540 N79-22401

RESIDENTIAL AREAS
Residential energy design 21 p0073 A79-14694
Fuel cell on-site integrated energy system parametric analysis of a residential complex 21 p0081 A79-14947
Conceptual development of a solar town in Iran 21 p0138 A79-17469
Solar photovoltaic power for residential use [ASME PAPER 79-SOL-11] 22 p0308 A79-30546
Passive solar heating - Results from two Saskatchewan residences 22 p0322 A79-31444
Effects of energy conservation research, development, and demonstration on residential energy use 23 p0422 A79-34276
Regional analysis of residential photovoltaic system concepts 23 p0520 A79-41077
Analysis of photovoltaic total energy system concepts for single-family residential applications 23 p0520 A79-41078
An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling 24 p0707 A79-52574
Solar heating and cooling demonstration project summaries [DOE/CS-0009] 21 p0186 N79-11503
Solar space heaters for low-income families [PB-289244/6] 22 p0363 N79-20526

Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
Analysis of a fuel cell on-site integrated energy system for a residential complex
[NASA-TM-79161] 23 p0542 N79-22624
Comprehensive areal model of residential heating demands
[BNL-24998] 23 p0597 N79-27692
Proceedings of the 2nd Workshop on Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798

RESIDUAL GAS
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

RESIDUES
Gasification of coal liquefaction residues
21 p0006 A79-10059
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574
Environmental assessment of solid residues from fluidized-bed fuel processing
[PB-282940/6] 21 p0179 N79-10968
Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5
[PB-287180/4] 22 p0339 N79-17026

RESINS
The chemical stability of kerosene fractions
23 p0529 A79-42275

RESISTANCE HEATING
Ohmic heating experiments in the W VII A stellarator
21 p0069 A79-14458
Ohmic heating experiments in the L-2 stellarator
21 p0070 A79-14460
Review of experimental results. I, II --- MHD instability effects on tokamak confinement with ohmic heating
21 p0077 A79-14778
Heattube, a universal electrical solar heat equipment for building, community and agricultural purposes
21 p0138 A79-17473
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428
Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426
Thermal storage of off-peak electrical energy in solar heating and cooling systems
24 p0644 A79-47945
Synthetic test methods of high-direct-current circuit breaker --- used with ohmic heating power supply for tokamak device
24 p0716 A79-54504

RESONANT FREQUENCIES
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-O wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727
Frequency analysis of a thick-rim flywheel
[ORNL/TM-5804] 24 p0781 N79-32555

RESONANT VIBRATION
Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/
24 p0618 A79-45790

RESOURCE ALLOCATION
Economics and net energy analysis - Is a new analytical technique needed for energy decision making
21 p0074 A79-14706
Survey and appraisal of primary future energy sources
23 p0420 A79-34167
Strategies for alternative energy sources
23 p0421 A79-34173
Rationing energy to industries - Priorities and input-output dependence
23 p0423 A79-34278
The economic and political conditions of access to resources of natural gas
24 p0652 A79-49519
The international energy agency - The way ahead
24 p0652 A79-49520
Industrial international data base: Energy analysis methodology. Rational use of energy program pilot study
[NATO/CCMS-75] 21 p0206 N79-13508
Proposed standby gasoline rationing plan. Economic and regulatory analysis draft
[DOE/ERA-0009] 21 p0214 N79-13934
Energy information: Report to Congress
[NTISUB/C/027-001] 21 p0221 N79-14576
The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432
Findings and views concerning the exemption of aviation gasoline from the mandatory petroleum allocation and price regulations
[DOE/ERA-0024] 23 p0589 N79-27336
Application of resource allocation models to the problems of regional energy policy in large developing countries --- conferences
[BNL-25537] 24 p0728 N79-28779
Recent energy consumption trends in European Economic Community countries
[DOE/EIA-0103/16] 24 p0758 N79-30817
The potential for hydrogen as an energy source
[PB-295317/2] 24 p0795 N79-33345

RESOURCES MANAGEMENT
Current and potential uses of aerospace technology by the U.S. Department of the Interior
[AIAA PAPER 78-1716] 21 p0060 A79-13833
Quantification of energy resource consumption
21 p0073 A79-14701
Time, technology and capital - Do we have enough to solve the energy crisis
21 p0097 A79-16100
Remote sensing use in hydraulic planification in Mexico
22 p0255 A79-22522
Weak points of our prediction models for raw materials strategy --- waste materials and scrap recycling
22 p0265 A79-24040
The energy and resource implications associated with the widespread use of electric vehicles
22 p0301 A79-29489
Coupled systems and energy policy - Closing the supply/demand gap: Are there many roads not taken
23 p0421 A79-34175
Research and development facilities at the Ontario Center for Resource Recovery
23 p0490 A79-40410
Planning for resource recovery in the 'Big Apple' --- New York City plans for refuse utilization
23 p0491 A79-40424
Constraints on a policy of evaluating recoverable energy
23 p0524 A79-41811
Assisted recovery of new oil reserves
23 p0525 A79-41814
Energy management up to the turn of the century - Options and constraints
23 p0536 A79-43525
Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy
23 p0536 A79-43575
Legal and institutional aspects --- of OTEC commercialization
24 p0621 A79-45808
Some environmental impacts of resource recovery systems
24 p0665 A79-50885

The status of oil shale development 24 p0665 A79-50887
Environmental aspects of the Syncrude tar sands project 24 p0665 A79-50889
Resource recovery and recycling --- Book 24 p0706 A79-52570
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere [IAF PAPER 79-A-16] 24 p0711 A79-53419
Energy conservation - Focal point for energy efficient operations 24 p0714 A79-53805
Energy needs, uses, and resources in developing countries [BNL-50784] 21 p0185 N79-11500
Analytical framework for the assessment of energy resource and technology options for developing countries [BNL-50800] 21 p0208 N79-13524
The national energy plan: Options under assumptions of national security threat --- economic impact proctrement policy, and resources management [H-PRINT-95-48] 21 p0228 N79-15398
The effects of resource impact factors on energy conservation standards for buildings [PB-286909/7] 22 p0335 N79-16384
Technology assessment of western energy resource development 22 p0347 N79-18368
Baltimore applications project [NASA-TM-79667] 22 p0351 N79-18815
Unique helium resources are wasting: A new conservation policy is needed [PB-293751/4] 24 p0748 N79-30701
Community systems program --- for effective energy conservation [DOE/CS-0072] 24 p0757 N79-30813
Resource-allocation methodology for establishing RD and D budgetary priorities [ORO-5474-T1] 24 p0761 N79-31067
Briefing related to Executive Order 12003 and the National Energy Act [DOE/TIC-10065] 24 p0775 N79-31818

RETRIEVAL
RDF storage and retrieval problems: Cause - effect - options --- Refuse Derived Fuel 23 p0489 A79-40402

RETROFITTING
A solar energy system for space heating and space cooling --- retrofitting aged buildings 21 p0072 A79-14686
Solar retrofitting of existing residence with almost zero delta TE system 21 p0139 A79-17485
The performance of a site built, air heating, vertical collector with snow reflector in Quebec 22 p0319 A79-31423
Solar energy retrofit system for an older-type building - The Williamstown Museum project 22 p0320 A79-31434
Determination of the potential for solar retrofitting in Edmonton --- pilot systems for single family dwellings 22 p0323 A79-31456
Retrofitting strategies for a housing cooperative --- solar water heating installation 23 p0473 A79-38671
Economy of a retrofit solar system [CONF-790213-2] 24 p0755 N79-30795
Development of retrofit energy conservation and solar heating systems, phase 1 [PB-295847/8] 24 p0801 N79-33593

RETROREFLECTION
Large active retrodirective arrays for solar power satellites 21 p0107 A79-16604

REUSE
Reclamation of synthetic turbine engine oil mixtures [AD-A071813] 24 p0795 N79-33211

RHEOLOGY
Exploration of volcanic geothermal energy resources based on rheological techniques [DOE/ET/28453-3] 23 p0596 N79-27676

RHODESIA
Description of hydro-electric development and proposal for future development on the Zambezi 22 p0340 N79-17323

RIBBONS
Multiple silicon ribbon growth by EFG 23 p0502 A79-40939
Structure and electrical activity of planar defects in EFG ribbons [NASA-CR-158572] 23 p0551 N79-23806
Silicon solar cell process development, fabrication and analysis [NASA-CR-158735] 23 p0581 N79-26495

RIGID ROTORS
The Netherlands experimental vertical axis wind turbine 21 p0114 A79-17120
A vertical-axis bicycle rotor turbine. I - Rotor design. II - Aerodynamic aspects --- windmill 23 p0386 A79-33237
The Savonius rotor - Theory and optimization 23 p0387 A79-33242
Mechanical and vibrational problems of a vertical axis wind turbine 23 p0389 A79-33265

RIGID STRUCTURES
The improved rigid airship --- design characteristics and cost analysis 21 p0086 A79-15572

RIMS
Composite-rim flywheels - Spin tests 23 p0423 A79-34281

RING LASERS
Boltzmann simulation of a storage ring laser 23 p0487 A79-40381

RING STRUCTURES
On vibration of a thick flexible ring rotating at high speed --- for flywheel energy storage 22 p0235 A79-20511
Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design 22 p0263 A79-23764

RISK
Risk control in the development of energy processes --- environment, worker and capital considerations in coal gasification 21 p0085 A79-15372
Risk with energy from conventional and nonconventional sources 22 p0266 A79-24151
Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects 23 p0490 A79-40408

RIVER BASINS
A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin 21 p0093 A79-15893
Water and energy resource development in the Tongue River Basin, southeastern Montana 24 p0735 N79-29566
Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming [E79-10279] 24 p0796 N79-33518

RIVERS
Tidal and river current energy systems 23 p0449 A79-37862
Description of hydro-electric development and proposal for future development on the Zambezi 22 p0340 N79-17323

ROCKET EXHAUST
Environmental factors of power satellites [SAMSO-TR-79-66] 24 p0717 N79-28213

ROCKS
Hot dry rock - A new geothermal energy source 21 p0087 A79-15673
Hot dry rock, an abundant clean energy resource 21 p0098 A79-16106
Long-term storage of solar energy in native rock 21 p0120 A79-17314
A passive rock bed - Design, construction, and performance 21 p0121 A79-17328
Hot dry rock - A new potential for energy 22 p0265 A79-23832

Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems 22 p0304 A79-30123

Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications 22 p0317 A79-31409

Sensible heat storage for solar energy applications 22 p0322 A79-31449

Alternate energy installations on the Jordan College Campus 22 p0323 A79-31454

Hot dry rock energy project 23 p0408 A79-34073

Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets --- application to geothermal sources 23 p0409 A79-34076

Heat storage in crushed limestone 24 p0609 A79-45215

Hot dry rock energy project [LA-UR-77-2744] 21 p0175 N79-10540

Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images [E79-10099] 22 p0347 N79-18373

Research on the physical properties of geothermal reservoir rock [COO-2908-4] 22 p0358 N79-20459

Electricity from hot dry rock geothermal energy: Technical and economic issues [LA-7603-MS] 24 p0727 N79-28773

Coal-rock interface detector [NASA-CASE-MFS-23725-1] 24 p0768 N79-31706

Heat pump/rock bed storage systems --- computer program for economic analysis [COO-4704-2] 24 p0789 N79-32705

ROOFS

Development of a shingle-type solar cell module 23 p0499 A79-40906

ROOM TEMPERATURE

New alloy systems for hydrogen storage 21 p0038 A79-11806

ROTARY STABILITY

Rotating strength of glass-carbon fiber-reinforced hybrid composite discs 21 p0165 A79-20273

ROTARY WINGS

Lag damping in autorotation by a perturbation method --- for rigid rotor blades [AHS 78-25] 21 p0152 A79-18151

Aeroelastic response and stability of a coupled rotor/support system with application to large horizontal axis with turbines 22 p0332 N79-16346

ROTATING BODIES

On vibration of a thick flexible ring rotating at high speed --- for flywheel energy storage 22 p0235 A79-20511

Rotatable mass for a flywheel [NASA-CASE-MFS-23051-1] 21 p0172 N79-10422

Demonstration of a rotary separator for two-phase brine and steam flows [TID-28519] 22 p0365 N79-21309

ROTATING CYLINDERS

The Madaras Rotor Power Plant - An alternate method for extracting large amounts of power from the wind [AIAA PAPER 79-0115] 21 p0157 A79-19541

ROTATING DISKS

Rotating strength of glass-carbon fiber-reinforced hybrid composite discs 21 p0165 A79-20273

Design of a mechanical energy storage unit --- flywheel 23 p0387 A79-33246

The minimization of drag torque for rotating disks 23 p0387 A79-33247

ROTATING FLUIDS

On the diffusive instability of some simple steady magnetohydrodynamic flows 22 p0278 A79-26163

ROTATING MIRRORS

Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge 24 p0706 A79-52537

ROTATING PLASMAS

A collisional plasma rotating between two cylinders 21 p0049 A79-12694

Investigation of the Hall effect in a discharge with a rotational electric field 22 p0246 A79-21532

Measurements of plasma rotation in tokamak LT-3 22 p0252 A79-22238

Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma 22 p0255 A79-22369

Theory of the striated corona in a theta pinch 22 p0295 A79-28315

Hall effect in an induction discharge 23 p0442 A79-36806

Theta-pinch description from classical electrodynamics 24 p0640 A79-47602

ROTATING SHAFTS

A simple solar tracking system --- manually adjusted rotating shaft for solar concentrator positioning 21 p0136 A79-17457

Mechanical reliability considerations in the modern high temperature industrial gas turbine [ASME PAPER 79-GT-101] 23 p0377 A79-32377

Commercial synchronous alternating-current generators 23 p0580 N79-26482

ROTOR AERODYNAMICS

Airfoil data for use of wind turbine designers 21 p0073 A79-14702

A two dimensional vortex sheet model of a Savonius Rotor 22 p0278 A79-26178

A vertical-axis bicycle rotor turbine. I - Rotor design. II - Aerodynamic aspects --- windmill 23 p0386 A79-33237

A method for calculating the induced velocity for windmills with application to the optimization of the aerodynamic design 23 p0387 A79-33239

The IAE 30-kW wind turbine - A review of the aerodynamic design 23 p0387 A79-33240

The Savonius rotor - Theory and optimization 23 p0387 A79-33242

Windpower generation on a large scale 23 p0452 A79-37891

Further development of the high-speed converter with flapping hinge /Goslich system/ - Plans for application in developing countries --- windmill 23 p0471 A79-38655

Wind tunnel corrections for Savonius rotors 23 p0485 A79-40127

Cretan windmills 23 p0536 A79-43576

Performance of windmills in a closely spaced array 23 p0537 A79-43681

Design and performance of bicycle wind turbine rotors 24 p0677 A79-51777

Design, instrumentation, and calibration of a vertical axis wind turbine rotor [TID-27754] 21 p0174 N79-10533

ROTOR BLADES

A small horizontal axis wind turbine feeding power into the utility grid 21 p0074 A79-14703

High efficiency wave engine --- featuring rotor blade exit nozzle design for high efficiency 22 p0279 A79-26187

A hybrid cyclogiro-Darrieus-rotor wind turbine 23 p0387 A79-33243

Materials for windmill blades 23 p0453 A79-37897

A new concept - The flexible blade windmill /FBW/ 23 p0485 A79-40126

Composite rotor blades for large wind energy installations 23 p0522 A79-41235

Scattered EM field due to rotating blades of horizontal-axis wind machines [SAND-79-0434] 24 p0719 N79-28398

ROTOR BLADES (TURBOMACHINERY)

Airfoil data for use of wind turbine designers 21 p0073 A79-14702

Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828

An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829

A method for calculating the induced velocity for windmills with application to the optimization of the aerodynamic design
23 p0387 A79-33239

Measurements of performance and structural response of the Danish 200kW Gedser windmill
23 p0484 A79-40121

Concentration augmentation of power in a Savonius-type wind rotor
23 p0527 A79-41947

Design and performance of bicycle wind turbine rotors
24 p0677 A79-51777

A low cost composite blade for a 300 foot diameter wind turbine
24 p0677 A79-51781

Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525

Evaluation of urethane for feasibility of use in wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497

ROTOR LIFT

A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines
24 p0794 N79-33158

ROTOR SPEED

A small horizontal axis wind turbine feeding power into the utility grid
21 p0074 A79-14703

Air bearing development for a GM automotive gas turbine
[SAE PAPER 790107] 22 p0314 A79-31355

Refuse shredding - Performance, testing and evaluation data
23 p0491 A79-40419

Optimal value of the rated speed of a wind generator
23 p0527 A79-41948

ROTORS

Toroidal Accelerator Rotor Platforms for wind energy conversion
21 p0029 A79-10240

Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821

Preliminary design of a subscale ceramic helical-rotor expander
21 p0050 A79-12849

Development of vertical-axis wind-energy converters - Darrieus design
23 p0447 A79-37744

Design of flywheel rotors utilizing cellulosic materials
24 p0678 A79-51787

Giromill wind tunnel test and analysis, volume 2. Technical discussion
[COO-2617-4/2] 21 p0204 N79-13378

RURAL AREAS

On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052

Solar electrification and rural electrification - A techno-economic review
21 p0118 A79-17289

Bio-mass energy for rural areas
21 p0126 A79-17373

Development of small solar power plants for rural areas in India
21 p0141 A79-17502

A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas
21 p0143 A79-17514

Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131

An overview of photovoltaic power systems
[ASME PAPER 79-SOL-12] 22 p0308 A79-30547

Wind energy conversion systems /WECS/ for central station and dispersed power applications
23 p0406 A79-34052

Integrated solar energy installations for isolated operation
23 p0522 A79-41239

Perspectives on developing country solar energy applications
24 p0672 A79-51743

Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411

Energy conservation and the rural home: Economic considerations for the nation and the individual
[PB-286222/5] 21 p0230 N79-15425

Impact of solar energy on rural housing
[GPO-31-641] 23 p0560 N79-24467

Characteristics of a typical village in the solar belt of the developing countries of Asia, Africa, and Latin America
23 p0571 N79-25497

Rural development initiatives: Energy for rural America
[PB-295234/9] 24 p0743 N79-29674

International Forum on Appropriate Industrial Technology. Appropriate technology for rural energy supply in developing countries
[PB-294602/8] 24 p0760 N79-30840

S

S WAVES

Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

Evaluation of intermediate-period seismic waves as a geothermal exploration tool
24 p0744 N79-29716

SAFETY

How safe is hydrogen
24 p0615 A79-45604

Safety considerations in the design and operation of large wind turbines
[NASA-TM-79193] 24 p0723 N79-28725

SAFETY DEVICES

Status of the offshore technology program --- conferences
[SAND-78-0665] 24 p0761 N79-30908

SAFETY FACTORS

Problems, status, and prospects of a solar hydrogen economy
21 p0059 A79-13658

Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak --- safety factor
21 p0155 A79-18830

Some environmental and safety aspects of using hydrogen as a fuel
22 p0238 A79-20774

Liquefied natural gas: Safety, siting, and policy concerns --- congressional reports
[GPC-26-349] 24 p0717 N79-28346

Liquefied energy gases, part 2 --- safety factors and legal liabilities
[GPO-39-305] 24 p0732 N79-29356

SAFETY MANAGEMENT

Solar heating and safety techniques
21 p0056 A79-13633

Safety requirements for solar heating systems - Practical considerations
21 p0056 A79-13634

Risk control in the development of energy processes --- environment, worker and capital considerations in coal gasification
21 p0085 A79-15372

Air classify first, then shred --- solid waste processing to reduce danger of explosions
23 p0489 A79-40404

Liquefied natural gas safety research overview
[AD-A063714] 22 p0365 N79-21233

Liquefied energy gases safety. Volume 1: Executive summary and main text
[EMD-78-28-VOL-1] 23 p0572 N79-25508

Liquefied energy gases safety. Volume 2: Appendixes
[EMD-78-28-VOL-2] 23 p0573 N79-25509

Liquefied energy gases safety. Volume 3: Federal agency comments
[EMD-78-28-VOL-3] 23 p0573 N79-25510

SAILS
The design and testing of a vertical-axis wind turbine using sails 21 p0153 A79-18467
Sail power for the world's cargo ships 22 p0305 A79-30374
Wind energy ships - Potential for modern wind-driven sea transport systems 23 p0472 A79-38661

SALINITY
Geothermal power from salt domes 21 p0014 A79-10120
Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems 21 p0016 A79-10133
Solar pond stability experiments 21 p0042 A79-11878
Salinity power station at the Swedish west-coast - Possibilities and energy-price for a 200 MW-plant 21 p0077 A79-14772
Waves, salinity gradients and ocean currents - Alternative energy sources 24 p0616 A79-45780
Stability criteria for saturated solar ponds 24 p0671 A79-51736
Economic and performance comparisons of salty and saltless solar ponds 24 p0671 A79-51737
Feasibility and economics of salinity power using Osmo-Hydro Power 24 p0701 A79-51997
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

SALTS
Heat transfer of absorbing evaporator in CDE engine system --- Concentration Difference Energy system working on enriched acqueous inorganic salt solution 23 p0531 A79-42900

SAMARIUM COMPOUNDS
Development of a satellite flywheel family operating on one active axis magnetic bearings 22 p0366 N79-21392

SAMPLERS
Measurement of high-temperature, high-pressure processes
[PB-284041/1] 21 p0195 N79-12424
Balloon-borne particulate sampling for monitoring power plant emissions
[PB-290473/8] 23 p0566 N79-24543

SAMPLING
Sampling and analysis of synthetic fuel processes --- coal gasification and liquefaction effluent analysis 22 p0284 A79-26538
Motor gasolines, summer 1978
[BETC/PPS-79/1] 23 p0555 N79-24189
Sampling and analysis methods for geothermal fluids and gases
[PNL-MA-572-APP] 23 p0596 N79-27679

SAN JOAQUIN VALLEY (CA)
Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PO-1] 24 p0790 N79-32717

SANDS
High temperature thermal energy storage in moving sand 21 p0012 A79-10103

SANDSTONES
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones 24 p0630 A79-46306

SANDWICH STRUCTURES
Weight minimization of sandwich type solar collector panels 24 p0670 A79-51727

SATELLITE ANTENNAS
Advanced composites - Future space applications 21 p0086 A79-15504
Large active retrodirective arrays for solar power satellites 21 p0107 A79-16604
Space will be the next big construction site 22 p0268 A79-24450
Solar power satellites - Microwaves deliver the power 23 p0460 A79-38374
Orbital antenna farm power systems challenges 24 p0690 A79-51892

SATELLITE ATTITUDE CONTROL
Transient attitude dynamics of satellites with deploying flexible appendages 21 p0047 A79-12325
Attitude and pointing control system for the microwave antenna of the solar power satellite 21 p0113 A79-16739
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 1
[REPT-30/1020-VOL-1] 24 p0759 N79-30834
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 2
[REPT-30/1020-VOL-2] 24 p0760 N79-30835

SATELLITE DESIGN
Intelsat V solar array design and development summary 21 p0002 A79-10018
Structures for solar power satellites 21 p0032 A79-10513
Solar power satellites revisited 21 p0093 A79-15898
Design considerations for solar power satellites 21 p0113 A79-16738
An evolutionary solar power satellite program
[AAS PAPER 78-153] 22 p0243 A79-21265
Latest developments in solar array technology at AEG-Telefunken 23 p0500 A79-40915
The ESA lightweight hybrid solar array 23 p0500 A79-40916
Thermal vacuum testing of solarpanels by solar simulation and infrared simulation 24 p0658 A79-50345
Satellite solar power station designs with concentrators and radiating control
[IAF PAPER 79-176] 24 p0710 A79-53336
Satellite Power Systems (SPS) concept definition study (exhibit C)
[NASA-CR-150827] 21 p0183 N79-11475
Solar power satellite rectenna design study: Directional receiving elements and parallel-series combining analysis
[NASA-CR-151866] 22 p0330 N79-16039

SATELLITE OBSERVATION
Current and potential uses of aerospace technology by the U.S. Department of the Interior
[AIAA PAPER 78-1716] 21 p0060 A79-13833
Use of satellites in solar applications --- for insolation mapping and space power stations 21 p0104 A79-16468
Landsat - Developing techniques and applications in mineral and petroleum exploration 21 p0111 A79-16725
Future programs and prospects for resource exploration from space by the year 2000
[AAS PAPER 78-182] 22 p0243 A79-21275
Regional-scale sea surface temperature determination from the geostationary environmental operational satellite 24 p0617 A79-45781
Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC 24 p0617 A79-45782
Use of satellite-derived sea surface temperatures by cruising OTEC plants 24 p0625 A79-45845
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712
Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies
[NASA-CR-162162] 24 p0768 N79-31737

SATELLITE ORIENTATION

A problem of optimizing the setting angle of sun-battery panels of concave shape --- onboard satellite
21 p0045 A79-12186

SATELLITE POWER TRANSMISSION (TO EARTH)

Satellite power systems /SPS/ overview
21 p0002 A79-10022

A microwave power transmission system for space satellite power
21 p0002 A79-10025

Power distribution study for a 5-GW space power satellite
21 p0002 A79-10026

From sunlight in space to 60 Hz on earth - The losses along the way --- satellite solar power transmission efficiency
21 p0003 A79-10027

Environmental considerations for the microwave beam from a solar power satellite
21 p0003 A79-10030

A 5-GWe nuclear satellite power system conceptual design
21 p0003 A79-10033

Solar power satellite developments
[AAS PAPER 78-022] 21 p0035 A79-11558

An aperture-augmented prototype power satellite
21 p0046 A79-12268

Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1978, Technical Papers
21 p0107 A79-16601

SPS microwave subsystem potential impacts and benefits --- environmental and societal effects of Solar Power System construction and operation
21 p0107 A79-16603

Large active retrodirective arrays for solar power satellites
21 p0107 A79-16604

Application of electron beams in space for energy storage and optical beam generation
21 p0108 A79-16606

Laser aircraft propulsion
21 p0109 A79-16618

Laser-powered aircraft and rocket systems with laser energy relay units
21 p0109 A79-16619

The use of lasers for the transmission of power
21 p0109 A79-16621

New candidate lasers for power beaming and discussion of their applications --- solar powered space lasers
21 p0110 A79-16622

Status and summary of laser energy conversion --- for space power transmission systems
21 p0111 A79-16635

Design considerations for solar power satellites
21 p0113 A79-16738

Financial/management scenarios for a satellite power system program
[AAS PAPER 78-144] 22 p0243 A79-21259

A development strategy for the solar power satellite
[AAS PAPER 78-154] 22 p0243 A79-21266

Power from space by laser
22 p0284 A79-26596

Solar power satellite
22 p0287 A79-27375

Status of the SPS concept development and evaluation program --- Solar Power Satellite
22 p0326 A79-31919

Solar Power Satellite systems definition
22 p0326 A79-31920

A review of some critical aspects of satellite power systems
22 p0326 A79-31921

Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922

New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34846

Solar Power Satellite beam disturbance of the upper ionosphere
[AIAA PAPER 79-1422] 23 p0426 A79-34848

Atmospheric attenuation of centimeter microwaves
[AIAA PAPER 79-1423] 23 p0427 A79-34849

The polar lunar base - A viable alternative to L-5
[AAS 78-191] 23 p0427 A79-34862

A profile of power transmission by microwaves
23 p0427 A79-34987

The development of solar power satellites
23 p0435 A79-35488

Space Laser Power System --- for satellite solar power station transmission to earth
[AIAA PAPER 79-1013] 23 p0459 A79-38201

Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202

Solar power satellites - Microwaves deliver the power
23 p0460 A79-38374

Satellite power for the 1980s --- from geosynchronous space stations with photovoltaic solar cell arrays
23 p0522 A79-41208

Energy for the year 2000 - The SPS concept
24 p0645 A79-48026

Legal considerations on the development and use of satellite solar power stations
24 p0664 A79-50860

Computer modeling for a space power transmission system
24 p0694 A79-51941

The technology base for the microwave power transmission system in the SPS
24 p0694 A79-51943

Solar power satellites for Europe
[IAF PAPER 79-173] 24 p0710 A79-53334

A power transmission concept for a European SPS system
24 p0712 A79-53487

Satellite Power System (SPS) environmental impacts, preliminary assessment
[NASA-CR-157952] 21 p0196 N79-12557

Satellite Power System (SPS) microwave subsystem impacts and benefits
[NASA-CR-157951] 21 p0196 N79-12558

Microwave power transmitting phased array antenna research project
[NASA-CR-157843] 21 p0202 N79-13263

Accuracy analysis of pointing control system of solar power station
[NASA-CR-150880] 21 p0215 N79-14143

Satellite power systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis, appendixes
[NASA-CR-150702] 21 p0225 N79-15142

Satellite power systems (SPS) concept definition study. Volume 1: Executive summary
[NASA-CR-150700] 22 p0329 N79-16036

Satellite Power System (SPS) program summary
[DOE/ER-0022] 22 p0337 N79-16893

Satellite Power System (SPS) military applications
[NASA-CR-158109] 22 p0337 N79-16895

Solar Power Satellite (SPS) pilot beam and communication link subsystem investigation study, phase 1 --- ionospheric propagation, radio frequency interference, and microwave transmission
[NASA-CR-161161] 22 p0345 N79-17896

Satellite Power System (SPS) concept definition study (exhibit C)
[NASA-CR-161173] 22 p0352 N79-19071

Satellite power system: Concept development and evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

Assessment of economic factors affecting the satellite power system. Volume 1: System cost factors
[NASA-CR-161185] 22 p0368 N79-21551

Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615

Space-based solar power conversion and delivery systems study. Volume 1: Executive summary
[NASA-CR-150294] 23 p0541 N79-22617

Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis
[NASA-CR-150295] 23 p0541 N79-22618

Space-based solar power conversion and delivery systems study. Volume 3: Microwave power transmission studies
[NASA-CR-150296] 23 p0541 N79-22619

Space-based solar power conversion and delivery systems study. Volume 4: Energy conversion systems studies [NASA-CR-150297] 23 p0541 N79-22620

Space-based solar power conversion and delivery systems study. Volume 5: Economic analysis [NASA-CR-150298] 23 p0541 N79-22621

Satellite Power Systems (SPS) concept definition study exhibit C. Volume 3: Experimental verification definition [NASA-CR-161214] 23 p0543 N79-22632

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies [NASA-CR-161215] 23 p0543 N79-22633

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation [NASA-CR-161216] 23 p0543 N79-22634

Systems definition space-based power conversion systems --- for satellite power transmission to earth [NASA-CR-150268] 23 p0546 N79-23483

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 1: Executive summary [NASA-CR-161218] 23 p0547 N79-23484

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 1: System engineering [NASA-CR-161219] 23 p0547 N79-23485

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics [NASA-CR-161220] 23 p0547 N79-23486

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics, appendixes [NASA-CR-161221] 23 p0547 N79-23487

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 4: Transportation analysis [NASA-CR-161222] 23 p0547 N79-23488

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 7: System/subsystem requirements data book [NASA-CR-161223] 23 p0547 N79-23489

Satellite Power System (SPS) resource requirements (critical materials, energy and land) [NASA-CR-158680] 23 p0548 N79-23492

Satellite Power System (SPS) public acceptance [NASA-CR-157429] 23 p0548 N79-23493

Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities [NASA-CR-157430] 23 p0548 N79-23494

Satellite Power System (SPS) student participation [NASA-CR-157431] 23 p0548 N79-23495

Potential of laser for SPS power transmission [NASA-CR-157432] 23 p0548 N79-23496

Satellite Power System (SPS) international agreements [NASA-CR-157433] 23 p0548 N79-23497

Satellite Power System (SPS) centralization/decentralization [NASA-CR-157434] 23 p0548 N79-23498

Satellite Power System (SPS) mapping of exclusion areas for rectenna sites [NASA-CR-157435] 23 p0548 N79-23499

Satellite Power System (SPS) military implications [NASA-CR-157436] 23 p0549 N79-23500

Satellite Power System (SPS) international agreements [NASA-CR-157437] 23 p0549 N79-23501

Satellite Power System (SPS) financial management scenarios [NASA-CR-157438] 23 p0549 N79-23502

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 1: Executive summary [NASA-TM-80354] 23 p0557 N79-24435

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 2: Detailed assessment [NASA-TM-80355] 23 p0557 N79-24436

Powersat: An evaluation [TUB-LRT-TE-22/2] 23 p0599 N79-27707

Environmental factors of power satellites [SAMSO-TR-79-66] 24 p0717 N79-28213

Solar Power Satellite Research, Development, and Demonstration Program Act of 1978 [GPO-35-994] 24 p0750 N79-30726

Solar cells for solar power satellites 24 p0751 N79-30749

Solar power satellites: The Engineering Challenges 24 p0752 N79-30750

Interface problems on an SPS solar array blanket 24 p0752 N79-30751

MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems 24 p0752 N79-30752

Economic and demographic issues related to deployment of the Satellite Power System (SPS) [NASA-CR-158886] 24 p0788 N79-32699

SATELLITE SOLAR ENERGY CONVERSION

Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance 21 p0001 A79-10017

The application of solar thermoelectric generators in near-sun missions 21 p0023 A79-10187

Structures for solar power satellites 21 p0032 A79-10513

A problem of optimizing the setting angle of sun-battery panels of concave shape --- onboard satellite 21 p0045 A79-12186

Technology and development requirements of the solar power satellite 21 p0046 A79-12267

Determining optimal angles of nonconvex solar battery panel mounting 21 p0080 A79-14837

A search for space energy alternatives 21 p0108 A79-16608

Ultralightweight structures for space power --- solar energy collection for transmission to earth 21 p0108 A79-16609

Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space 21 p0110 A79-16623

Radiation energy conversion in space 22 p0284 A79-26595

Solar power satellites - The laser option 22 p0284 A79-26599

Dynamics of stepping of the Hermes flexible solar array 22 p0323 A79-31615

Solar thermoelectric power generation for Mercury orbiter missions [AIAA 79-0915] 23 p0425 A79-34738

New energy conversion techniques in space, applicable to propulsion --- powering of aircraft with laser energy from SPS [AIAA PAPER 79-1338] 23 p0493 A79-40490

Satellite power systems /SPS/ and semiconductor photovoltaic cells /SPC/ [IAF PAPER 79-166] 24 p0709 A79-53330

European technology applicable to Solar Power Satellite Systems /SPS/ [IAF PAPER 79-174] 24 p0710 A79-53335

Legal aspects of solar power satellites - Focus on microwave exposure standards [IAF PAPER 79-IISL-01] 24 p0711 A79-53452

Solar cell workshop 21 p0170 N79-10141

Solar array workshop 21 p0170 N79-10142

Satellite Power System (SPS) concept definition study (exhibit C) [NASA-CR-150733] 21 p0225 N79-15137

Satellite Power Systems (SPS) concept definition study. Volume 3: SPS concept evolution [NASA-CR-158066] 21 p0225 N79-15138

Satellite Power Systems (SPS) concept definition study. Volume 6: SPS technology requirements and verification [NASA-CR-150685] 21 p0225 N79-15140

Satellite Power Systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis [NASA-CR-158068] 21 p0225 N79-15141

Satellite power systems (SPS) concept definition study. Volume 1: Executive summary [NASA-CR-150700] 22 p0329 N79-16036

Satellite Power Systems (SPS) concept definition study. Volume 2: SPS system requirements
[NASA-CR-150681] 22 p0330 N79-16037
Space-based solar power conversion and delivery systems study. Volume 1: Executive summary
[NASA-CR-150294] 23 p0541 N79-22617
Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis
[NASA-CR-150295] 23 p0541 N79-22618
Space-based solar power conversion and delivery systems study. Volume 4: Energy conversion systems studies
[NASA-CR-150297] 23 p0541 N79-22620
Space-based solar power conversion and delivery systems study. Volume 5: Economic analysis
[NASA-CR-150298] 23 p0541 N79-22621
Satellite Power Systems (SPS) concept definition study exhibit C. Volume 3: Experimental verification definition
[NASA-CR-161214] 23 p0543 N79-22632
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies
[NASA-CR-161215] 23 p0543 N79-22633
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation
[NASA-CR-161216] 23 p0543 N79-22634
Systems definition space-based power conversion systems --- for satellite power transmission to earth
[NASA-CR-150268] 23 p0546 N79-23483
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 1: System engineering
[NASA-CR-161219] 23 p0547 N79-23485
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics
[NASA-CR-161220] 23 p0547 N79-23486
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics, appendixes
[NASA-CR-161221] 23 p0547 N79-23487
Satellite Power System (SPS) resource requirements (critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
Satellite Power System (SPS) public acceptance
[NASA-CR-157429] 23 p0548 N79-23493
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495
Potential of laser for SPS power transmission
[NASA-CR-157432] 23 p0548 N79-23496
Satellite Power System (SPS) international agreements
[NASA-CR-157433] 23 p0548 N79-23497
Satellite Power System (SPS) centralization/decentralization
[NASA-CR-157434] 23 p0548 N79-23498
Satellite Power System (SPS) mapping of exclusion areas for rectenna sites
[NASA-CR-157435] 23 p0548 N79-23499
Satellite Power System (SPS) military implications
[NASA-CR-157436] 23 p0545 N79-23500
Satellite Power System (SPS) international agreements
[NASA-CR-157437] 23 p0545 N79-23501
Satellite Power System (SPS) financial management scenarios
[NASA-CR-157438] 23 p0549 N79-23502
Solar Power Satellite Research, Development, and Demonstration Program Act of 1978
[GPO-35-994] 24 p0750 N79-30726
Satellite Power System (SPS) resource requirements (critical materials, energy, and land)
[NASA-CR-162310] 24 p0763 N79-31251
The NASA Lewis Research Center program in space solar cell research and technology --- efficient silicon solar cell development program
24 p0783 N79-32641
Solar photovoltaic research and development program of the Air Force Aero Propulsion Laboratory --- silicon solar cell applicable to satellite power systems
24 p0783 N79-32642

SATELLITE SOLAR POWER STATIONS
Satellite power systems /SPS/ overview
21 p0002 A79-10022
Evolution of satellite power system /SPS/ concepts
21 p0002 A79-10023
The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024
A microwave power transmission system for space satellite power
21 p0002 A79-10025
Power distribution study for a 5-GW space power satellite
21 p0002 A79-10026
From sunlight in space to 60 Hz on earth - The losses along the way --- satellite solar power transmission efficiency
21 p0003 A79-10027
Solar Power Satellite thermal analysis
21 p0003 A79-10028
Construction of a 10GWe solar power satellite
21 p0003 A79-10029
Environmental considerations for the microwave beam from a solar power satellite
21 p0003 A79-10030
Microwave phased array design considerations for SPS --- Solar Powered Satellites
21 p0003 A79-10031
Development and testing of the ULP solar array
21 p0029 A79-10245
Structures for solar power satellites
21 p0032 A79-10513
Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11210
The utilization of European space techniques for energy production
[IAF PAPER 78-190] 21 p0035 A79-11287
Solar energy and the 'Common Heritage of Mankind' --- international agreements regarding usage
[IAF PAPER 78-SL-45] 21 p0035 A79-11356
Solar power satellite developments
[AAS PAPER 78-022] 21 p0035 A79-11558
Technology and development requirements of the solar power satellite
21 p0046 A79-12267
An aperture-augmented prototype power satellite
21 p0046 A79-12268
Output power variations with solar power satellites
21 p0067 A79-14267
Solar power satellites revisited
21 p0093 A79-15898
Future space transportation systems
21 p0100 A79-16146
Use of satellites in solar applications --- for insolation mapping and space power stations
21 p0104 A79-16468
Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1978, Technical Papers
21 p0107 A79-16601
The solar power satellite concept evaluation program
21 p0107 A79-16602
SPS microwave subsystem potential impacts and benefits --- environmental and societal effects of Solar Power System construction and operation
21 p0107 A79-16603
MHD conversion of solar energy --- space electric power system
21 p0109 A79-16614
Thermionics and its application to the SPS --- solar power satellite for energy conversion
21 p0109 A79-16616
Magnetically confined plasma solar collector --- satellite based system in space
21 p0109 A79-16617
The use of lasers for the transmission of power
21 p0109 A79-16621
New candidate lasers for power beaming and discussion of their applications --- solar powered space lasers
21 p0110 A79-16622
Design considerations for solar power satellites
21 p0113 A79-16738
Attitude and pointing control system for the microwave antenna of the solar power satellite
21 p0113 A79-16739
Solar power satellites - An AIAA position paper
21 p0148 A79-17872

Financial/management scenarios for a satellite
power system program
[AAS PAPER 78-144] 22 p0243 A79-21259
An evolutionary solar power satellite program
[AAS PAPER 78-153] 22 p0243 A79-21265
A development strategy for the solar power satellite
[AAS PAPER 78-154] 22 p0243 A79-21266
Costing the satellite power system
[AAS PAPER 78-166] 22 p0243 A79-21270
Health maintenance and health surveillance
considerations for an SPS space construction
base community
[AAS PAPER 78-176] 22 p0243 A79-21273
Reversible thermoelectric power conversion of
energy fluctuations
22 p0261 A79-23619
Space will be the next big construction site
22 p0268 A79-24450
Energy for Europe from space
22 p0273 A79-25605
Space reflector technology and its system
implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852
The solar power satellite concept - The past
decade and the next decade
[AIAA PAPER 79-0534] 22 p0273 A79-25854
Solar power satellite
22 p0287 A79-27375
Space solar power - An energy alternative
22 p0303 A79-29796
Solar energy via satellites and international
cooperation
22 p0310 A79-30952
Status of the SPS concept development and
evaluation program --- Solar Power Satellite
22 p0326 A79-31919
Solar Power Satellite systems definition
22 p0326 A79-31920
A review of some critical aspects of satellite
power systems
22 p0326 A79-31921
Preliminary assessment of the environmental
impacts of the Satellite Power System /SPS/
22 p0326 A79-31922
European aspects of Solar Satellite Power systems
22 p0326 A79-31923
The Solar Power Satellite concept - Towards the
future
22 p0327 A79-31925
First steps to the Solar Power Satellite
23 p0382 A79-32721
Commercial prospects for extraterrestrial materials
23 p0395 A79-33748
SOLARES - A new hope for solar energy
23 p0399 A79-33992
The construction of satellite solar power stations
from nonterrestrial materials - Feasibility and
economics
23 p0403 A79-34028
Financing alternatives for space industrialization
[AIAA PAPER 79-1309] 23 p0426 A79-34836
Development of space manufacturing systems
concepts utilizing lunar resources
[AIAA PAPER 79-1411] 23 p0426 A79-34844
Solar Power Satellite beam disturbance of the
upper ionosphere
[AIAA PAPER 79-1422] 23 p0426 A79-34848
The polar lunar base - A viable alternative to L-5
[AAS 78-191] 23 p0427 A79-34862
Solar power space stations - Some issues of law
and policy
[AAS 78-199] 23 p0427 A79-34864
Future programs in space --- impact on energy
technology problems
[AAS 78-180] 23 p0427 A79-34865
The development of solar power satellites
23 p0435 A79-35488
Satellite solar power stations - Current status
and prospects
23 p0448 A79-37844
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202
Solar power satellites - Microwaves deliver the
power
23 p0460 A79-38374
NASCAP modelling of high-voltage power system
interactions with space charged-particle
environments --- particle impact on solar
satellite surfaces
23 p0479 A79-39806
Satellite power for the 1980s --- from
geosynchronous space stations with photovoltaic
solar cell arrays
23 p0522 A79-41208
Solar power satellite - Putting it together ---
fabrication, composite materials, and building
site considerations
24 p0659 A79-50399
Towards an adequate legal regulation of the
geostationary orbit
24 p0663 A79-50855
Legal considerations on the development and use of
satellite solar power stations
24 p0664 A79-50860
Results from Symposium on Future Orbital Power
Systems Technology Requirements
24 p0690 A79-51891
Computer modeling for a space power transmission
system
24 p0694 A79-51941
A European view of the solar satellite power system
24 p0694 A79-51942
The technology base for the microwave power
transmission system in the SPS
24 p0694 A79-51943
Microwave system performance for a solar power
satellite during startup/shutdown operations
24 p0694 A79-51944
Applicability of solid state microwave technology
to solar power satellites
24 p0695 A79-51945
Superlight rotating reflectors in space
[IAF PAPER 79-112] 24 p0709 A79-53301
Satellite power systems /SPS/ and semiconductor
photovoltaic cells /SPC/
[IAF PAPER 79-166] 24 p0709 A79-53330
Satellite solar power station designs with
concentrators and radiating control
[IAF PAPER 79-176] 24 p0710 A79-53336
A space power station without movable parts
[IAF PAPER 79-177] 24 p0710 A79-53337
Structuring the international marketplace for
maximum socio-economic benefits from space
industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418
Satellite Power Systems (SPS) concept definition
study (exhibit C)
[NASA-CR-150827] 21 p0183 N79-11475
Automatic phase control in solar power satellite
systems
[NASA-CR-151856] 21 p0194 N79-12130
Statement of Doctor Klaus Heiss, President, ECON,
Incorporated, Princeton, New Jersey
21 p0224 N79-15110
Satellite Power System (SPS) concept definition
study (exhibit C)
[NASA-CR-150733] 21 p0225 N79-15137
Satellite Power Systems (SPS) concept definition
study. Volume 3: SPS concept evolution
[NASA-CR-158066] 21 p0225 N79-15138
Satellite Power Systems (SPS) concept definition
study. Volume 5: Transportation and operations
analysis --- heavy lift launch and orbit
transfer vehicles for orbital assembly
[NASA-CR-158067] 21 p0225 N79-15139
Satellite Power Systems (SPS) concept definition
study. Volume 6: SPS technology requirements
and verification
[NASA-CR-150685] 21 p0225 N79-15140
Microwave systems analysis, solar power satellite
--- alignment of the antenna array
[NASA-CR-160091] 22 p0337 N79-16892
Results from Symposium on Future Orbital power
systems technology requirements
[NASA-TM-79125] 23 p0539 N79-22191
An economic analysis of a commercial approach to
the design and fabrication of a space power system
[NASA-TM-79153] 23 p0539 N79-22193
Satellite Power Systems (SPS) concept definition
study exhibit C. Volume 3: Experimental
verification definition
[NASA-CR-161214] 23 p0543 N79-22632

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies
[NASA-CR-161215] 23 p0543 N79-22633
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation
[NASA-CR-161216] 23 p0543 N79-22634
Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026
Space environmental effects and the solar power satellite
23 p0552 N79-24028
Powersat: An evaluation
[TUM-LRT-TB-22/2] 23 p0599 N79-27707
Solar Power Satellite Research, Development, and Demonstration Program Act of 1978
[GPO-35-994] 24 p0750 N79-30726

SATELLITE TEMPERATURE
Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272

SATELLITE TRANSMISSION
Conservation of satellite transmitter energy with propagation and demand variations
23 p0493 A79-40587

SATELLITE-BORNE INSTRUMENTS
A heat pipe radiator for shunt electronics: Development and test results
24 p0764 N79-31276

SATELLITES
Achievable flatness in a large microwave power antenna study
[NASA-CR-151831] 21 p0171 N79-10272

SAUDI ARABIA
Saudi Arabia looks at the sun
21 p0063 A79-13900
The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209

SAWS
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902
Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158588] 23 p0549 N79-23507

SCALE (CORROSION)
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395
Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826
Preliminary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669

SCALE MODELS
Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility
24 p0658 A79-50343

SCALING LAWS
Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240
Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940

SCANNERS
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738

SCHLIEREN PHOTOGRAPHY
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

SCHOOLS
Application of solar cooling for a school building in subtropics
21 p0103 A79-16461
Solar project description: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/50] 23 p0561 N79-24481
A report on the development of a model energy management program for New York state schools, phase 2
[PB-295452/7] 24 p0802 N79-33607

SCHOTTKY DIODES
Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360
Grain-boundary edge passivation of GaAs films by selective anodization --- shorting effect in solar cells
21 p0154 A79-18487
Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859
The interfacial layer in MIS amorphous silicon solar cells
22 p0258 A79-23039
The short-wavelength response of MIS solar cells
22 p0273 A79-25748
Diffusion length measurements in Schottky barrier GaAs solar cells
22 p0281 A79-26243
Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode --- for solar cells
22 p0317 A79-31411
Photovoltaic properties of metal-free phthalocyanines - Al/H2Pc Schottky barrier solar cells
22 p0317 A79-31412
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971
Photovoltaic conversion in Cu2O
23 p0384 A79-32973
The fabrication of Schottky-barrier solar cells by electroless nickel plating
23 p0436 A79-35746
The role of the interfacial layer in Schottky barrier solar cells
23 p0438 A79-36241
Meteorological effects on Schottky-barrier solar cells
23 p0441 A79-36781
Schottky-barrier versus homojunction silicon solar cells - A status report
23 p0441 A79-36783
Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785
Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels
23 p0507 A79-40986
Formation and stability of MS or MIS Schottky solar cells
23 p0507 A79-40987
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988
The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989
Analysis of ion-implanted solar cells
23 p0508 A79-40991
Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992
Schottky effect and photovoltaic devices on the texturized surfaces
23 p0522 A79-41100
Photovoltaic effect in Cu/CuGaSe2 Schottky barriers
24 p0605 A79-44721

Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells
24 p0637 A79-47019
Collection efficiency measurements on a-Si:H solar cells
24 p0638 A79-47063
Possibilities of new materials for solar photovoltaic cells
24 p0655 A79-50178
Solar cells having integral collector grids
[NASA-CASE-LEW-12819-1] 21 p0182 N79-11467
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572
Back wall solar cell
[NASA-CASE-LEW-12236-2] 21 p0217 N79-14528
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-287417/0] 22 p0343 N79-17349
Cuprous oxide photovoltaic cells --- fabricating schottky barrier devices
[PB-290529/7] 23 p0565 N79-24514
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311
Preparation and properties of Au-(-n) A sub X Ga sub 1 minus X aS-(n)GaAs Schottky-Barrier solar cells
23 p0579 N79-26473

SCINTILLATION
Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

SCOTLAND
Wave power experiments at Loch Ness
23 p0450 A79-37871

SCRAP
Weak points of our prediction models for raw materials strategy --- waste materials and scrap recycling
22 p0265 A79-24040
Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152

SCREENS
Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers
22 p0297 A79-28671
Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909

SCRUBBERS
Stabilization of power plant scrubbing slurries and fine coal refuse with the additive Calcilox
21 p0063 A79-14107
Simultaneous nitrogen oxides and sulfur dioxide removal by absorption-reduction scrubbing
21 p0066 A79-14125
Options for treating and disposing of scrubber sludge
23 p0424 A79-34460
Particulate control mobile test units: Third year's operation
[PB-283657/5] 21 p0178 N79-10603
Evaluations of novel particulate control devices
[PB-283973/6] 21 p0199 N79-12601
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751

SEA WATER
Sea water desalination by means of solar energy
21 p0057 A79-13645
Power plant systems based on solar energy --- powered by sea water evaporation-produced osmotic pressure head mechanical energy
21 p0142 A79-17508
A self-consistent process of producing hydrogen from sea water
23 p0414 A79-34118
Electro/mechanical aspects of the Mauritius 'passive' type wave energy project
23 p0449 A79-37856
The absorption of energy from ocean waves
23 p0449 A79-37859
Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978 --- for OTEC
24 p0620 A79-45803
Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment
24 p0622 A79-45818
Oxygen, temperature and pH effects on corrosion of aluminum in seawater --- for OTEC heat exchanger tubes
24 p0623 A79-45827
Description and status report of a program to define sea water-surfactant interactions in relation to the foam system --- OTEC power plant
24 p0623 A79-45833
Multiple staging of the cold water in the open cycle OTEC Systems
24 p0624 A79-45840
OTEC system response and control analysis --- optimization of thermal cycle with seawater pumps
24 p0625 A79-45850
Conceptual design and cost study for a dual-purpose nuclear-electric reverse osmosis seawater conversion plant
[ORNL/TM-6821] 24 p0768 N79-31438

SEALING
Energy conservation through sealing technology
22 p0237 A79-20700

SEASAT PROGRAM
Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies
[NASA-CR-162162] 24 p0768 N79-31737

SEASAT-A SATELLITE
Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720
Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies
[NASA-CR-162162] 24 p0768 N79-31737

SECONDARY EMISSION
A method to increase the efficiency of solar photovoltaic devices by secondary emission
[AIAA PAPER 79-0981] 23 p0457 A79-38185

SECONDARY FLOW
Limit of formation of counterflows in plane linear induction MHD machines
22 p0298 A79-29288
Limit of the formation of counterparallel flows in plane-parallel induction MHD machines
24 p0663 A79-50778

SECURITY
Integrated safeguards information System (ISIS), executive summary --- nuclear power plant and fissionable materials security
[PB-286869/3] 21 p0223 N79-14934
The national energy plan: Options under assumptions of national security threat --- economic impact procurement policy, and resources management
[H-PRINT-95-48] 21 p0228 N79-15398
The national energy plan: Options under assumptions of national security threat or energy policy as if it really mattered
[H-PRINT-95-42] 21 p0228 N79-15399

SEDIMENTS
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375
Jet Fuel Thermal Stability
[NASA-TM-79231] 24 p0795 N79-33336

SEEBECK EFFECT
Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy
22 p0259 A79-23604

SEEPAGE
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373

SEISMIC ENERGY
Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants
[UCRL-52000-78-6] 21 p0215 N79-14168

SEISMIC WAVES
Underwater seismic source --- for petroleum exploration
[NASA-CASE-NPO-14255-1] 23 p0551 N79-23555
Evaluation of intermediate-period seismic waves as a geothermal exploration tool 24 p0744 N79-29716
Modal analysis of seismic guided waves in coal seams 24 p0803 N79-33664

SEISMOGRAPHS
Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring 22 p0304 A79-29974

SEISMOLOGY
Seismological investigations in geothermal regions 22 p0356 N79-19506

SELECTIVITY
Selective solar absorbers --- coatings for solar collector applications 21 p0057 A79-13646
Colored stainless steel - A new type of selective absorber --- for solar thermal conversion 22 p0294 A79-28150
Microstructural characterization of a black chrome solar selective absorber 22 p0294 A79-28151
New instrumentation for high temperature and hemispherical measurements of selective surfaces --- for solar energy conversion 22 p0294 A79-28152
Optical properties of materials under simulated operating environments --- selective coatings for solar thermal conversion 23 p0431 A79-35071
Spectrally selective surfaces and their impact on photothermal solar energy conversion 23 p0437 A79-36145
Spectral selectivity of composite materials --- as solar energy absorbers 23 p0437 A79-36146
Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat 23 p0478 A79-39695

SELENIDES
Selenide isotope generator for the Galileo mission 21 p0022 A79-10195
Selenide thermoelectric converter technology 21 p0026 A79-10221
Selenide technology evaluation program at JPL 21 p0026 A79-10222
Analytical predictions of selenide RTG power degradation 21 p0026 A79-10223
Low voltage behavior of lithium/metal dichalcogenide topochemical cells 22 p0286 A79-26995
Photovoltaic effect in InSe - Application to solar energy conversion 23 p0384 A79-32976
Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material 24 p0656 A79-50193

SELENIUM COMPOUNDS
Silver selenate and silver tellurate as positive materials for lithium primary power sources 22 p0245 A79-21484

SELF CONSISTENT FIELDS
The 'FINTOR 1' design - A minimum size tokamak experimental reactor 21 p0078 A79-14782
Self-consistent analysis of alpha-particle heating of a fast-solenoid plasma --- in laser fusion 22 p0251 A79-27879

SELF EXCITATION
Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields 23 p0423 A79-34400
Operation of self-excited generators for windmill application 24 p0706 A79-52538

SELF FOCUSING
Self-adjusting laser-target system for laser fusion 21 p0086 A79-15625
Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838
Nonlinear effects in propagation of lower hybrid waves in a plasma 24 p0706 A79-52381

SEMICONDUCTING FILMS
Large area silicon sheet by EFG --- Edge-defined Film-fed Growth 21 p0123 A79-17340
Transparent conducting coatings for solar cells 21 p0124 A79-17350
A pilot line for the production of large area Cu/x/S-CdS solar cells 21 p0124 A79-17351
A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell 21 p0125 A79-17361
Preparation and properties of pure and tin doped indium oxide selective coatings 21 p0127 A79-17381
Grain-boundary edge passivation of GaAs films by selective anodization --- shorting effect in solar cells 21 p0154 A79-18487
Merocyanine organic solar cells 21 p0165 A79-20216
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells 21 p0166 A79-20354
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications 22 p0272 A79-25084
High-efficiency thin-film polycrystalline-silicon solar cells 22 p0273 A79-25744
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency 22 p0300 A79-29428
Black germanium solar selective absorber surfaces 22 p0327 A79-31970
Cadmium-sulphide/copper-sulphide thin-film solar cells - Review of methods of producing the CdS and Cu2S layers 23 p0441 A79-36786
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques 23 p0445 A79-37156
Technique to determine the growth rate and resistivity of evaporated CdS thin films 23 p0445 A79-37157
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells 23 p0499 A79-40907
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells 23 p0500 A79-40911
Spray deposited Cd/1-x/Zn/x/S films for low cost solar cells 23 p0500 A79-40912
Multiple silicon ribbon growth by EFG 23 p0502 A79-40939
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells 23 p0503 A79-40949
Silicon foil cells 23 p0503 A79-40954
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films 23 p0505 A79-40963
The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells 23 p0505 A79-40964
The dependence of solar cell characteristics on the electronic properties of discharge produced, hydrogenated amorphous silicon 23 p0510 A79-41007
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon 23 p0510 A79-41009
Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells 23 p0515 A79-41044

Thin film polycrystalline silicon solar cells
23 p0518 A79-41067
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177
Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190
Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination
24 p0656 A79-50195
CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197
Gallium arsenide films and solar cells on graphite substrates
24 p0667 A79-50937
Spectrally selective solar absorber coatings
24 p0704 A79-52150

SEMICONDUCTOR DEVICES
High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228
Semiconductor electrodes for conversion and storage of solar energy
21 p0036 A79-11777
Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780
Progress and trends in the development of terrestrial photoelectric conversion
21 p0056 A79-13635
A new amorphous silicon-based alloy for electronic applications
21 p0100 A79-16226
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells
21 p0122 A79-17338
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361
Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-22320
Stability of work and sensitivity of semiconductor thermoelectric systems under automatic control
22 p0261 A79-23624
An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
New techniques for fabricating silicon solar cells
23 p0384 A79-32969
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379
Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385
Solar photoelectrolysis with semiconductor electrodes
23 p0437 A79-36147
The role of the interfacial layer in Schottky barrier solar cells
23 p0438 A79-36241
Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159
Sputtered thin film solar cells
23 p0448 A79-37843
Gallium arsenide solar cells
23 p0448 A79-37848
Performance analysis of dc-motor-photovoltaic converter system. I - Separately excited motor
23 p0477 A79-39104
Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy
23 p0495 A79-40748
A novel photovoltaic panel for low cost power
23 p0510 A79-41006
Open circuit voltage of high intensity silicon solar cells
23 p0511 A79-41014
The V-Groove Multijunction solar cell
23 p0511 A79-41015
Performance of silicon and gallium arsenide concentration cells --- under high sunlight concentration
23 p0511 A79-41017
Increased photovoltaic conversion efficiency through use of spectrum splitting and multiple cells
23 p0512 A79-41024
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025
Two-junction cascade solar cell characteristics under 1000 concentration ratio and AM 0-AM 5 spectral conditions
23 p0513 A79-41027
Design, technology and cost of Si cells for concentrator applications
23 p0517 A79-41055
Optimization of exponential alloying impurity distribution in semiconductor photoconverter base
24 p0636 A79-46759
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490
Stability of SnO2/n-Si solar cells
24 p0655 A79-50187
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50701
Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702
Analysis of the efficiency of a varizone photoelectric converter
24 p0663 A79-50708
Solar photovoltaic energy --- research and development
24 p0667 A79-50909
Monolithic solar cell panel of amorphous silicon
24 p0712 A79-53496
Improved semiconductors for photovoltaic solar cells
[DSE/2459-2] 21 p0221 N79-14577
Semiconductor technology program, progress briefs
[PB-292681/4] 23 p0569 N79-25337
Computer modeling of a two-junction, monolithic cascade solar cell
24 p0785 N79-32672

SEMICONDUCTOR DIODES
Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13631

SEMICONDUCTOR JUNCTIONS
Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation
21 p0037 A79-11783
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344
/SN/x-GaAs polymer-semiconductor solar cells
21 p0154 A79-18504
New models of solar cells and prospects for their optimization
21 p0166 A79-20346
Photovoltaic conversion in Cu2O
23 p0384 A79-32973
Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976
Solar energy conversion: The solar cell --- Book
23 p0423 A79-34449
Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272

Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967
Photovoltaic properties of In2O3/semiconductor heterojunction solar cells
23 p0505 A79-40968
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003
Optimized solar module design
23 p0510 A79-41005
Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011
Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029
Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base
23 p0513 A79-41031
High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041
Solar cells on R.A.D. polycrystalline silicon
23 p0518 A79-41066
Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093
The physics of solar cells
24 p0637 A79-47050
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317
Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352
Limiting process in shallow junction solar cells
24 p0783 N79-32646
Design considerations for the Tandem Junction Solar Cell
24 p0784 N79-32651
Shallow-homojunction GaAs solar cells
24 p0785 N79-32666
Intercell ohmic contacts for high efficiency multijunction solar converters
24 p0786 N79-32673

SEMICONDUCTORS (MATERIALS)
Photoelectrolysis of water with semiconductors
22 p0259 A79-23343
Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters --- for gallium arsenide solar photovoltaic arrays
23 p0416 A79-34140
Development of thermoelectricity studies in the USSR --- Russian book
24 p0601 A79-43848
Studies of CdSiAs2 for photovoltaic applications
24 p0654 A79-50027
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183
Towards the design of contrived photosynthesizers
24 p0655 A79-50185
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
24 p0713 A79-53725
Semiconductor technology program, progress briefs
[PB-292681/4] 23 p0569 N79-25337
Semiconductor grade, solar silicon purification project --- photovoltaic solar energy conversion
[NASA-CR-158868] 24 p0736 N79-29598

SENSITIVITY
Inclination dependence of pyranometer sensitivity --- for solar collector testing
22 p0295 A79-28154
Variation of solar cell sensitivity and solar radiation on tilted surfaces
23 p0512 A79-41023

SEPARATION
Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434

SEPARATORS
Nickel-zinc vs. silver-zinc battery - A comparative study of baseline characteristics
21 p0009 A79-10083
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423
Electrostatic separation of coal macerals
24 p0603 A79-44525
High-gradient magnetic separation for removal of sulfur from coal
[PB-290945/5] 23 p0569 N79-25469
Ultrafine polybenzimidazole (PBI) fibers --- separators for alkaline batteries and dfuel cells
[NASA-CR-159644] 24 p0764 N79-31350

SERVICE LIFE
Silver-hydrogen, a long life light weight energy storage system --- design for spacecraft
21 p0001 A79-10012
Nickel-cadmium battery reconditioning and long term performance in geosynchronous orbit spacecraft
21 p0029 A79-10242
Development of a compact gas turbine combuster to give extended life and acceptable exhaust emissions
[ASME PAPER 78-GT-146] 21 p0033 A79-10799
Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823
Problems in the development of high-service-life capacitative accumulators --- for fusion reactors
22 p0243 A79-21249
Electrode development for coal fired MHD generators
23 p0392 A79-33396
A life prediction methodology for encapsulated solar cells
23 p0428 A79-35041
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Procedure for developing experimental designs for accelerated tests for service-life prediction --- for solar cell modules
23 p0496 A79-40886
Environmental qualification testing of terrestrial solar cell modules
23 p0512 A79-41021
Endurance testing of first generation /Block I/ commercial solar cell modules
23 p0512 A79-41022
Encapsulation materials for photovoltaic arrays
23 p0534 A79-43294
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553
Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215] 24 p0723 N79-28728

SET THEORY
Conference on Decision and Control, and Symposium on Adaptive Processes, 16th, and Special Symposium on Fuzzy Set Theory and Applications, New Orleans, La., December 7-9, 1977, Proceedings. Volumes 1 & 2
21 p0081 A79-14957

SEWAGE
Co-disposal of sewage sludge using refuse-derived fuel
21 p0097 A79-16098
Net energy from municipal solid waste
23 p0418 A79-34149

SEWAGE TREATMENT
Waste disposal by fluid bed incineration and energy recovery modes
23 p0467 A79-40387
Utilization of sewage skimmings as fuel to generate process steam
23 p0492 A79-40426
Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772
Cogeneration with digester gas
24 p0676 A79-51773
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States
[PB-286940/2] 21 p0231 N79-15440
Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463
Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650
Economics of the ANFLOW process for municiple sewage treatment
[ORNL/TM-6574] 24 p0762 N79-31093
SHADOWS
Tilt, orientation and overshadowing of solar collectors in the Netherlands
21 p0131 A79-17414
Radiation shadow indicator
[NASA-CASE-MFS-23546-2] 24 p0730 N79-29037
SHALE OIL
Prerefining true in situ shale oil
21 p0004 A79-10044
Jet fuels from shale oil - A near term technology
21 p0005 A79-10045
Colorado's oil-shale resource for vertical modified in-situ processes
21 p0005 A79-10046
Comparison of shale oils from different sources produced by controlled-state retort
21 p0005 A79-10047
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522
Alternative aircraft fuels
21 p0033 A79-10824
Recovery of oil from oil shale - An overall technological perspective
21 p0073 A79-14698
An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing
22 p0264 A79-23780
Oil shale in the U.S. - Current state of technology and research
22 p0265 A79-23830
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900
Oil shale retorting - A correlation of selected infrared absorbance bands with process heating rates and oil yield
22 p0304 A79-29975
Residual shale oil as a boiler fuel
23 p0412 A79-34105
An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678
Oil shale technologies and the potential for oil shale development
23 p0525 A79-41813
Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy
23 p0536 A79-43575
The isotopic composition of carbon in the Alberta oil sand
24 p0650 A79-49357
Review - Thermophysical properties of oil shales
24 p0651 A79-49401
The status of oil shale development
24 p0665 A79-50887
Chemical characterization of shale oil and related fuels
24 p0665 A79-50888
Results of computer simulation of in situ oil shale retorting
24 p0668 A79-51024
An overview of in situ oil shale technology and recent advances in true in situ retort modeling
24 p0688 A79-51865
The synfuels scenario
24 p0709 A79-52967
Technical and environmental aspects of oil shale processing
21 p0199 N79-12581
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182
EPA program status report: Oil shale
[PB-284480/1] 21 p0211 N79-13548
Energy and Technology Review, June 1978 --- composite materials for flywheels, shale oil recovery, and seismic safety at nuclear power plants
[UCRL-52000-78-6] 21 p0215 N79-14168
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels
[AD-A060322] 21 p0226 N79-15203
Water-related environmental effects in fuel conversion, volume 1. Summary
[PB-288313/0] 22 p0351 N79-18834
Aging behavior of crude shale oil
[AD-A062420] 22 p0357 N79-20272
A study of the physical and chemical properties of oil shale relevant to physical concentration processes
23 p0569 N79-25445
Compendium reports on oil shale technology
[PB-293279/6] 23 p0578 N79-26237
Shale oil: Focus group results
[DOE/TIC-10019] 23 p0593 N79-27644
Reaction kinetics for remodeling oil shale retorting
[UCRL-81622] 24 p0720 N79-28653
Plan to demonstrate oil shale mining and rubblizing for a modified in situ retorting process
[UCRL-13979] 24 p0721 N79-28655
Multiphase flow analysis of oil shale retorting
[UCRL-81717-REV-1] 24 p0721 N79-28656
Multiphase flow analysis of oil shale retorting
[UCRL-81717] 24 p0721 N79-28658
Oil shale: Report on a focus group discussion
[DOE/TIC-10032] 24 p0735 N79-29576
Rural development initiatives: Energy for rural America
[PB-295234/9] 24 p0743 N79-29674
Converting Green River shale oil to transportation fuels --- conferences
[CONF-780460-3] 24 p0745 N79-30396
Office of Naval Petroleum and Oil Shale Reserve. Report of operations, 1 October 1978
[DOE/RA-0011] 24 p0748 N79-30686
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741
Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes
[SAND-79-0746C] 24 p0769 N79-31744
Energy from in situ processing of Antrim oil shale
[FE-2346-29] 24 p0769 N79-31746
Mathematical model of forward combustion retorting of oil shale
[LETC/TPR-78/1] 24 p0779 N79-32375
EPA program status report: Oil shale, 1979 update
[PB-294998/0] 24 p0796 N79-33538
Technology overview reports for eight shale oil recovery processes --- for evaluation of pollution control and environmental impact technologies
[PB-295665/4] 24 p0797 N79-33552
SHALES
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443
SHALLOW WATER
Liquid desiccant solar air conditioner and energy storage system
21 p0021 A79-10176

Sede Boqer - Shallow solar ponds project
24 p0671 A79-51738
Design guide for shallow solar ponds
[UCRL-52385-REV-1] 24 p0727 N79-28774

SHEAR FLOW
Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717

SHEETS
Recent developments in low cost silicon solar cells for terrestrial applications --- sheet production methods
22 p0239 A79-20821

SHIPS
Progress towards 100-knot nonconventional ocean ships. II
21 p0155 A79-18519
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370
DD-963 Class waste heat recovery system experience
[ASME PAPER 79-GT-159] 23 p0378 A79-32421
An overview of the OTEC-1 design --- including mooring, anchoring, site selection, installation, manufacturing, etc
24 p0625 A79-45846
System design considerations for a floating OTEC modular experiment platform
24 p0625 A79-45847
Technology requirements and readiness for very large vehicles
[NASA-TM-80127] 23 p0587 N79-27086

SHIVA LASER SYSTEM
Techniques for preventing damage to high power laser components --- Shiva laser fusion experiments
21 p0083 A79-15145
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171
Diagnostics of Shiva Nova high-yield thermonuclear events --- in laser fusion
22 p0285 A79-26747
Large aperture components for solid state laser fusion systems
24 p0713 A79-53522

SHOCK HEATING
New results in high-beta stellarator and belt-pinch research
21 p0070 A79-14463
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures --- derived from shale oil retorting and coal gasification
21 p0083 A79-15245

SHOCK TESTS
Shock and vibration test program for the MH-W75/A/ radioisotope thermoelectric generator
24 p0699 A79-51979

SHOCK TUBES
Shock tube studies of coal devolatilization
21 p0083 A79-15247
The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260

SHOCK TUNNELS
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

SHOCK WAVE INTERACTION
Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines
[ASME PAPER 79-GT-54] 23 p0376 A79-32349

SHOCK WAVE PROPAGATION
Analysis of a cylindrical imploding shock wave
21 p0155 A79-18846
Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626

SHORT CIRCUITS
Determination of the minority carrier diffusion length in silicon solar cells
23 p0528 A79-42248
Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells
24 p0606 A79-44919

SHORT WAVE RADIATION
Measurement and modelling of shortwave radiation on inclined surfaces
22 p0242 A79-21062

SHREDDING
Air classify first, then shred --- solid waste processing to reduce danger of explosions
23 p0489 A79-40404
Refuse shredding - Performance, testing and evaluation data
23 p0491 A79-40419

SHROUDED TURBINES
Design and construction of a pilot plant for a shrouded wind turbine
23 p0485 A79-40128

SIGNAL DISTORTION
High-energy laser mirror thermal distortion testing techniques
23 p0447 A79-37670

SIGNAL GENERATORS
Underwater seismic source --- for petroleum exploration
[NASA-CASE-NPO-14255-1] 23 p0551 N79-23555

SIGNAL MEASUREMENT
Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974

SIGNAL MIXING
Generation of the new coherent radiation by harmonic conversion and nonlinear mixing for certain applications --- optical interactions
21 p0111 A79-16639

SIGNAL PROCESSING
Data acquisition and signal processing for a vertical axis wind energy conversion system
23 p0432 A79-35078
Data acquisition and signal processing for a vertical axis wind energy conversion system
[SAND-78-1000C] 21 p0187 N79-11517
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738

SIGNAL RECEPTION
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494

SIGNAL REFLECTION
Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front
23 p0486 A79-40251

SIGNAL STABILIZATION
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531

SILANES
New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798
Low-cost solar array project. Feasibility of the silane process for producing semiconductor-grade silicon
[NASA-CR-162172] 24 p0771 N79-31777

SILICA GEL
Solid desiccant air conditioning with silica gel using solar energy
21 p0181 N79-11464

SILICIDES
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces --- for photothermal solar energy conversion
21 p0126 A79-17377

SILICON
Possibility of production of low cost solar grade silicon by trichlorosilane process
21 p0125 A79-17363
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149

Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666

Cast semicrystalline silicon for solar cells
[ASME PAPER 79-SOL-16] 22 p0309 A79-30550

New techniques for fabricating silicon solar cells
23 p0384 A79-32969

Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971

Photovoltaic cells and their future
23 p0435 A79-35486

Solar cells from inexpensive silicon ribbons - State of the art and trends
23 p0435 A79-35487

Temperature dependence of the optical properties of silicon
23 p0437 A79-35820

Carrier lifetime in silicon and its impact on solar cell characteristics
23 p0437 A79-36148

655 mV open-circuit voltage, 17.6% efficient silicon MIS solar cells
23 p0447 A79-37686

Minority carrier diffusion length from spectral response measurements --- for solar cells
23 p0497 A79-40893

Diffusion length inhomogeneities in silicon solar cells
23 p0497 A79-40894

Flash X-ray tests of solar cells
23 p0498 A79-40899

Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900

Directional solidification of crack-free silicon ingots by heat exchanger method
23 p0498 A79-40901

Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902

Analysis of ID saw slicing of silicon for low cost solar cells
23 p0499 A79-40903

Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936

Multiple silicon ribbon growth by EFG
23 p0502 A79-40939

Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940

Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon
23 p0504 A79-40959

Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960

The dependence of solar cell characteristics on the electronic properties of discharge produced, hydrogenated amorphous silicon
23 p0510 A79-41007

M-I-S solar cells on amorphous silicon
23 p0510 A79-41008

Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009

Polysilicon MIS solar cells with low work function metals
23 p0510 A79-41010

Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025

Design, technology and cost of Si cells for concentrator applications
23 p0517 A79-41055

Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056

Poly- vs single-crystal silicon solar cells
23 p0518 A79-41064

Characteristics of semicrystalline silicon solar cells
23 p0518 A79-41065

Solar cells on R.A.D. polycrystalline silicon
23 p0518 A79-41066

Thin film polycrystalline silicon solar cells
23 p0518 A79-41067

Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068

New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798

A computer model of a heterojunction solar cell with application to GaP/Si
24 p0654 A79-50030

Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177

Stability of SnO2/n-Si solar cells
24 p0655 A79-50187

Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination
24 p0656 A79-50195

High temperature, low mass solar blanket development
24 p0691 A79-51902

High efficiency ultrathin silicon solar cells
24 p0692 A79-51903

Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529

Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572

Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing
[NASA-CR-158038] 21 p0219 N79-14540

Pilot line report: Development of a high efficiency thin silicon solar cell
[NASA-CR-158028] 21 p0219 N79-14548

Development of a model and computer code to describe solar grade silicon production processes --- phase changes in chemical reactors
[NASA-CR-158037] 21 p0219 N79-14555

Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158082] 22 p0333 N79-16365

Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158095] 22 p0334 N79-16368

LSA large area silicon sheet task continuous liquid feed Czochralski growth
[NASA-CR-158366] 22 p0357 N79-20281

Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282

The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

Large area silicon sheet by EFG
[NASA-CR-158379] 22 p0359 N79-20483

Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486

Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508

Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513

Metallization of large silicon wafers
[NASA-CR-158575] 23 p0550 N79-23517

Structure and electrical activity of planar defects in EFG ribbons
[NASA-CR-158572] 23 p0551 N79-23806

Analysis of the effects of impurities in silicon
[NASA-CR-157439] 23 p0559 N79-24456

Low-cost Solar Array (LSA) project
[NASA-CR-158650] 23 p0559 N79-24457

Low-cost Solar Array (LSA) project
[NASA-CR-158651] 23 p0559 N79-24458

Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158700] 23 p0572 N79-25505
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495
Development of a process for a high capacity arc heater production of silicon for solar arrays
[NASA-CR-158745] 23 p0581 N79-26499
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project
[NASA-CR-158732] 23 p0586 N79-26979
Silicon web process development --- for low cost solar cells
[NASA-CR-158852] 24 p0722 N79-28722
Semiconductor grade, solar silicon purification project --- photovoltaic solar energy conversion
[NASA-CR-158868] 24 p0736 N79-29598
Automated array assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607
Evaluation of selected chemical processes for production of low-cost silicon, phase 3 --- using a fluidized bed reactor
[NASA-CR-162168] 24 p0769 N79-31756
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758
Automated array assembly, phase 2 --- making ion implanted and furnace annealed solar cells
[NASA-CR-162176] 24 p0770 N79-31759
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Analysis and evaluation in the production process and equipment area of the low-cost solar array project --- including modifying gaseous diffusion and using ion implantation
[NASA-CR-162163] 24 p0770 N79-31769
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Quantitative analysis of defects in silicon --- to predict energy conversion efficiency of silicon samples for solar cells
[NASA-CR-162173] 24 p0771 N79-31772
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3
[NASA-CR-162182] 24 p0771 N79-31775
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
Low-cost solar array project. Feasibility of the silane process for producing semiconductor-grade silicon
[NASA-CR-162172] 24 p0771 N79-31777
The NASA Lewis Research Center program in space solar cell research and technology --- efficient silicon solar cell development program
24 p0783 N79-32641
Solar photovoltaic research and development program of the Air Force Aero Propulsion Laboratory --- silicon solar cell applicable to satellite power systems
24 p0783 N79-32642
The JPL space photovoltaic program --- energy efficient sol silicon solar cells for space applications
24 p0783 N79-32643
Updating the limit efficiency of silicon solar cells
24 p0783 N79-32645
Limiting process in shallow junction solar cells
24 p0783 N79-32646
Design of high efficiency BLE solar cells for space and terrestrial applications
24 p0783 N79-32647
Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648
Vacuum die casting of silicon sheet for photovoltaic applications
[NASA-CR-162360] 24 p0798 N79-33566
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots
[NASA-CR-162359] 24 p0798 N79-33567

SILICON ALLOYS
Modified silicon-germanium alloys with improved performance --- thermoelectric material
21 p0027 A79-10225
A new amorphous silicon-based alloy for electronic applications
21 p0100 A79-16226
Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy
22 p0259 A79-23604
Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion
22 p0260 A79-23615
High temperature solar thermoelectric generator
23 p0447 A79-37299

SILICON CARBIDES
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254
Ceramic solar receivers
24 p0670 A79-51731
Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332] 24 p0781 N79-32518

SILICON COMPOUNDS
Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541
Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158679] 23 p0558 N79-24448
Silicon web process development --- for solar cell fabrication
[NASA-CR-162181] 24 p0770 N79-31762

SILICON DIOXIDE
Thin film solar absorber consisting of Au-particles in SiO2
23 p0465 A79-38599
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889
Rippled silica deposits in heat exchanger tubes --- heat removal from geothermal water
23 p0532 A79-42984
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

SILICON FILMS
Ultra-thin silicon solar cells for high performance panel applications
21 p0029 A79-10243
Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters
21 p0053 A79-13288
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Solar photovoltaic energy --- research and development
24 p0667 A79-50909
Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon
24 p0704 A79-52312
The establishment of a production-ready manufacturing process utilizing thin silicon substrates for solar cells
[NASA-CR-158566] 23 p0550 N79-23523
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773

SILICON JUNCTIONS
  Vertical junction silicon solar cell --- for spacecraft power sources 21 p0001 A79-10013
  Trends in silicon solar-photovoltaic cells - An invited talk 21 p0122 A79-17333
  A new fabrication process for single crystal silicon solar cells 21 p0122 A79-17335
  Large area silicon sheet by EFG --- Edge-defined Film-fed Growth 21 p0123 A79-17340
  Design and fabrication of silicon solar cells for concentrated light 21 p0124 A79-17352
  Efficiency of conventional silicon solar cells 21 p0125 A79-17362
  On the role of interface states in MOS solar cells 21 p0156 A79-19092
  Characteristics of silicon photoconverters with inversion layer 21 p0166 A79-20349
  Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency 22 p0252 A79-21807
  Performance of a new high-intensity silicon solar cell 22 p0257 A79-22862
  The interfacial layer in MIS amorphous silicon solar cells 22 p0258 A79-23039
  The short-wavelength response of MIS solar cells 22 p0273 A79-25748
  Concentrated silicon solar cells: Basic design - Application example 23 p0384 A79-32970
  Doped amorphous silicon and its application in photovoltaic devices 23 p0440 A79-36777
  Amorphous-silicon m.i.s. solar cells 23 p0441 A79-36778
  Doping of sputtered amorphous-silicon solar cells 23 p0441 A79-36779
  Silicon solar cells for operation in concentrated sunlight 23 p0441 A79-36780
  Silicon terrestrial solar photovoltaic installations 23 p0441 A79-36782
  Schottky-barrier versus homojunction silicon solar cells - A status report 23 p0441 A79-36783
  Approaches to low-cost solar cells 23 p0441 A79-36784
  Theoretical efficiency of SnO2/Si solar cells 23 p0480 A79-39945
  Eutectic and cellular solar cells 23 p0502 A79-40928
  Silicon foil cells 23 p0503 A79-40954
  Characterization of vertical-junction silicon solar cells 23 p0504 A79-40955
  Growth, evaluation and modeling of silicon-on-ceramic solar cells 23 p0504 A79-40957
  Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon 23 p0504 A79-40958
  The effects of copper and titanium on silicon solar cells 23 p0504 A79-40961
  Effect of copper impurity on polycrystalline silicon solar cells 23 p0504 A79-40962
  Barrier heights and interfacial effects in SnO2/Si solar cells 23 p0505 A79-40965
  Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels 23 p0507 A79-40986
  Formation and stability of MS or MIS Schottky solar cells 23 p0507 A79-40987
  An MIS photovoltaic cell with silicon nitride insulator 23 p0508 A79-40990
  Design considerations for silicon BLE solar cells 23 p0521 A79-41094
  Determination of the minority carrier diffusion length in silicon solar cells 23 p0528 A79-42248
  Photon-degradation effects in terrestrial silicon solar cells 23 p0529 A79-42545
  High-temperature lifetesting of Al/SiOx/p-Si contacts for MIS solar cells 23 p0536 A79-43565
  Efficient electron-beam-deposited ITO/n-Si solar cells 24 p0629 A79-46152
  Spray-deposited high-efficiency SnO2/n-Si solar cells 24 p0629 A79-46201
  Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters 24 p0637 A79-46904
  Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels 24 p0640 A79-47490
  Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination 24 p0647 A79-49180
  Dependence of the photoelectric parameters of photovoltaic cells on illuminance 24 p0647 A79-49181
  Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity 24 p0647 A79-49182
  Temperature dependence of the current-voltage characteristics of silicon MIS solar cells 24 p0648 A79-49213
  An anomalous photocurrent in SnO2-Si heterojunction solar cells 24 p0668 A79-50950
  Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements 24 p0705 A79-52321
  A device model for the tandem junction solar cell 24 p0714 A79-53938
  Solar cells made from polycrystalline silicon [LEP-78/519-679-D] 24 p0743 N79-29669
SILICON NITRIDES
  Designing and testing Si3N4 turbine components at Mercedes-Benz 21 p0050 A79-12830
  Development of multi-density silicon nitride turbine rotors 21 p0050 A79-12832
  Preliminary design of a subscale ceramic helical-rotor expander 21 p0050 A79-12849
  Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design 21 p0050 A79-12850
  An MIS photovoltaic cell with silicon nitride insulator 23 p0508 A79-40990
SILICON OXIDES
  Thermionic emission properties of some synthetic coal slags 23 p0392 A79-33395
SILICON POLYMERS
  Semiconductor grade, solar silicon purification project --- photovoltaic solar energy conversion [NASA-CR-158868] 24 p0736 N79-29598
SILICON RADIATION DETECTORS
  Spatial uniformity of quantum efficiency of a silicon photovoltaic detector 23 p0478 A79-39593
  Solar irradiance measurements by means of optical fibers and silicon detectors 24 p0638 A79-47198
SILVER
  Contact resistance of silver ink on solar cell 23 p0506 A79-40978
  Fabrication and testing of silver-hydrogen cells [NASA-CR-159431] 22 p0334 N79-16374

SILVER COMPOUNDS
Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484
On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells
22 p0246 A79-21491
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317
SILVER OXIDES
Silver-hydrogen, a long life, light weight energy storage system --- design for spacecraft
21 p0001 A79-10012
SILVER ZINC BATTERIES
Nickel-zinc vs. silver-zinc battery - A comparative study of baseline characteristics
21 p0009 A79-10083
Evaluation of methods for analyzing silver-zinc cells
21 p0010 A79-10085
An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc
21 p0035 A79-11546
SIMULATION
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691
SIMULATORS
Sandia laboratory combustion simulation facility --- for analyzing the flow of high temperature combustion products
[SAND-78-2240] 23 p0576 N79-26146
SINGLE CRYSTALS
High efficiency solar cells based on indium phosphide
21 p0042 A79-11968
A new fabrication process for single crystal silicon solar cells
21 p0122 A79-17335
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352
Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions
23 p0501 A79-40922
High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041
Poly- vs single-crystal silicon solar cells
23 p0518 A79-41064
Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715
Current conduction in Cr-MIS solar cells on single-crystal p-silicon
24 p0648 A79-49215
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge
24 p0706 A79-52537
Silicon web process development --- for low cost solar cells
[NASA-CR-158852] 24 p0722 N79-28722
Quantitative analysis of defects in silicon --- to predict energy conversion efficiency of silicon samples for solar cells
[NASA-CR-162173] 24 p0771 N79-31772
SINTERING
Effects of sintering on porous fuel cell electrodes
21 p0039 A79-11818
Fuel cell catalyst sintering studies --- platinum catalysts in phosphoric acid fuel cells
[EPRI-EM-833] 24 p0776 N79-31828
SITE DATA PROCESSORS
Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing
22 p0257 A79-22924
SITES
Wind energy conversion --- review discussing sites and machinery
21 p0091 A79-15870
A technique for longitudinal correlation of wind data - Theory and its application to siting of wind power plants
21 p0143 A79-17518
Tidal power plants - Sites, history and geographical distribution
21 p0150 A79-18102
Selection of optimum sites for tidal power development in the Bay of Fundy
21 p0152 A79-18110
Review of optimization and economic evaluation of potential tidal power developments in the Bay of Fundy
21 p0152 A79-18111
Solar energy - Four sites demonstrate potential
22 p0328 A79-32194
Wind site selection for optimum wind power systems
23 p0406 A79-34049
The use of a complex-terrain wind model for the siting and design of wind generators
[AIAA PAPER 79-0971] 23 p0456 A79-38178
Program overview for the wind characteristics program element of the United States Federal Wind Energy Program
23 p0482 A79-40108
Wind energy prospecting in Prince Edward Island - A program overview and status report
23 p0482 A79-40109
Wind resource assessment status --- regional differences
24 p0633 A79-46529
Environmental issues assessment --- for large wind turbine systems
24 p0633 A79-46530
Wind energy central station power generation in the Southwest and Southeast
24 p0634 A79-46533
Electric utility application of WECS in an island location --- Wind Energy Conversion System in Hawaii
24 p0634 A79-46534
A fully interconnected wind system
24 p0635 A79-46540
Siting considerations for solar thermal electric generating plants
24 p0664 A79-50879
Reliability of wind power from dispersed sites: A preliminary assessment
[LBL-6889] 21 p0176 N79-10547
Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552
LLL wind energy studies (OAHU)
[UCRL-82171] 23 p0582 N79-26514
Air monitoring network design for power plant siting
23 p0591 N79-27590
Geologic assessment of compressed air storage sites in Kansas
[EPRI-EM-877] 23 p0597 N79-27689
Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724
SIZE DETERMINATION
Optimal sizing of solar collectors by the method of relative areas
21 p0066 A79-14263
Universal generator storer curves --- Economic and relative size optimization of solar photovoltaic energy
22 p0238 A79-20799
Considerations in sizing coal gasification plants
[FE-2240-40] 24 p0766 N79-31417
SKIN FRICTION
Drag reduction by cooling in hydrogen-fueled aircraft
24 p0653 A79-49921
SKIN RESISTANCE
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426

SKY RADIATION
Computation of IR sky temperature and comparison with surface temperature --- for solar collector energy budgets 21 p0042 A79-11875
Irradiances on inclined surfaces --- from solar and sky radiation and earth albedo 21 p0055 A79-13624
Diffuse solar radiation on a horizontal surface for a clear sky 22 p0242 A79-21167
Isotropic distribution approximation in solar energy estimations --- diffuse insolation on tilted surface 22 p0262 A79-23753
Evaluation of models to predict insolation on tilted surfaces 24 p0712 A79-53491

SLABS
Periodic heating/cooling by solar radiation --- through concrete slab buildings 21 p0140 A79-17491

SLAGS
Coal slag effects in MHD generators 21 p0080 A79-14934
Controlled utilization of coal slag in the MHD topping cycle 21 p0081 A79-14936
Slag deposition and its effect on the performance of MHD channels --- in electric generators [AIAA PAPER 79-0189] 21 p0157 A79-19588
Slag transport models for radiant heater of an MHD system [ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808
Compositional modeling of MHD channel slag, with preliminary vapor pressure data 23 p0391 A79-33390
Fluid mechanics and thermal behavior of MHD channel slag layers 23 p0391 A79-33391
Discharge characteristics of slagging metal electrodes --- magnetohydrodynamic generators 23 p0391 A79-33392
MHD slag electrical conductivity studies 23 p0391 A79-33394
Thermionic emission properties of some synthetic coal slags 23 p0392 A79-33395
Electrochemical corrosion of MHD electrodes in slags 23 p0392 A79-33398
Chemical solutions to problems encountered in the gasification of coal 23 p0410 A79-34088
Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces [PB-293238/2] 24 p0731 N79-29249
Performance characteristics of a slagging gasifier for MHD combustor systems [NASA-TM-79195] 24 p0749 N79-30720

SLICING
Effect of multiblade slurry saw induced damage on silicon solar cells 23 p0498 A79-40902
Analysis of ID saw slicing of silicon for low cost solar cells 23 p0499 A79-40903
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the Low Cost Silicon Solar Array project [NASA-CR-158082] 22 p0333 N79-16365
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project [NASA-CR-158744] 23 p0580 N79-26485
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project [NASA-CR-158732] 23 p0586 N79-26979
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3 [NASA-CR-162182] 24 p0771 N79-31775
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots [NASA-CR-162359] 24 p0798 N79-33567

SLIDING FRICTION
Effect of friction on motion of a piston driven by combustion products 23 p0436 A79-35656

SLOPES
Optimum collector slope for residential heating in adverse climates 22 p0263 A79-23761
Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner [SAND-78-0700] 21 p0185 N79-11496
Radiation regime of inclined surfaces [WMO-467] 21 p0192 N79-11613

SLUDGE
Co-disposal of sewage sludge using refuse-derived fuel 21 p0097 A79-16098
Options for treating and disposing of scrubber sludge 23 p0424 A79-34460
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States [PB-286940/2] 21 p0231 N79-15440

SLURRIES
Stabilization of power plant scrubbing slurries and fine coal refuse with the additive Calcilox 21 p0063 A79-14107
Prospects for coal slurry pipelines in California 23 p0592 N79-27608

SMOKE
A literature review-problem definition studies on selected toxic chemicals. Volume 8: Environmental aspects of diesel fuel and fog oils SGF number 1 and SGF number 2 and smoke screens generated from them [AD-A056021] 21 p0193 N79-11688
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3 [BMFT-FB-T-78-28] 24 p0793 N79-32751

SMOKE ABATEMENT
Advanced emissions control and test facility of the Electric Power Research Institute 21 p0115 A79-17249

SNAP 19
SNAP 19 performance update for Pioneer and Viking missions 24 p0694 A79-51940

SNOW
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289

SOCIAL FACTORS
A multivariate-utility approach for selection of energy sources 21 p0098 A79-16120
SPS microwave subsystem potential impacts and benefits --- environmental and societal effects of Solar Power System construction and operation 21 p0107 A79-16603
Energy use and society in the 21st century --- development cost effects on growing GNP economy 23 p0420 A79-34165
Economic, political and psychosocial barriers to a change-over to renewable energy resources 23 p0421 A79-34176
Introducing new technologies for alternative energy sources - The economic, social, and environmental considerations for developing countries 23 p0421 A79-34177
Selected results from the technology assessment of solar energy program [AIAA PAPER 79-0984] 23 p0458 A79-38187
Windpower programmes in Tanzania 23 p0482 A79-40106
Energy and society 24 p0653 A79-49523
Structuring the international marketplace for maximum socio-economic benefits from space industrialization [IAF PAPER 79-A-14] 24 p0711 A79-53418
Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies 24 p0714 A79-54278

Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108

Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970

Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0599 N79-27712

Social assessment of on-site solar energy technologies
[HCP/R-4040-02] 24 p0775 N79-31810

Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

Fossil energy program summary document
[DOE/ET-0087] 24 p0788 N79-32696

Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699

Environmental, socioeconomic, and consumer protection aspects of selected decentralized solar energy applications
24 p0803 N79-33609

SODIUM

Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479

A single insulated sodium conductor for HVDC underwater power transmission
24 p0620 A79-45800

Sodium-antimony trichloride battery development program for load leveling
[EPRI-EM-751] 21 p0186 N79-11501

SODIUM COMPOUNDS

Electrochemical determinations of the chemical potential and diffusivity of sodium in Na/x/TaS2 at 300 K
21 p0040 A79-11830

SODIUM HYDROXIDES

NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106

Phase change thermal storage for a solar total energy system
21 p0120 A79-17321

Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454

SODIUM NITRATES

Phase change thermal storage for a solar total energy system
21 p0120 A79-17321

SODIUM SULFATES

The role of corrosion in modern gas turbines
24 p0647 A79-48912

SODIUM SULFUR BATTERIES

A critical review and evaluation of published electric-vehicle performance data
21 p0009 A79-10081

Pulse characteristics of sodium sulfur cells for electric vehicle propulsion
21 p0009 A79-10082

Advanced batteries --- sodium sulfur batteries for electric motor vehicles
21 p0067 A79-14270

The sodium/sulfur battery - A storage battery for peak load adjustment and electric traction
21 p0165 A79-20244

Casing materials for sodium/sulfur cells
22 p0245 A79-21481

Recent advances in Na/S cell development - A review
22 p0246 A79-21488

Superbatteries - A progress report --- for utility energy storage and electric vehicles
22 p0286 A79-27207

High temperature batteries --- energy stores using Na and sulfur electrodes
23 p0451 A79-37881

Behavior of a sodium-sulfur cell with a dynamic sulfur electrode
23 p0487 A79-40372

Dow sodium-sulfur battery for energy storage
24 p0684 A79-51834

Reproducibility and performance of large prototype Na/S cells
24 p0684 A79-51835

Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836

Development of sodium-sulfur batteries for utility application
[EPRI-EM-683] 21 p0186 N79-11502

Ford/DOE sodium-sulfur battery electric vehicle development and demonstration, phase 1
[COO-2566-37] 24 p0731 N79-29118

SODIUM VAPOR

Research on the sodium heat engine
21 p0028 A79-10231

SOIL MAPPING

Surtrace - An airborne geochemical system --- for earth surface micro-layer exploration
22 p0255 A79-22557

Satellite Power System (SPS) mapping of exclusion areas for rectenna sites
[NASA-CR-157435] 23 p0548 N79-23499

SOIL MOISTURE

An incremental model for conversion of solar energy in agricultural systems
23 p0479 A79-39840

Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305

SOILS

Soil cooling for geothermal electric power plants in the Western United States - The Raft River experiment
22 p0266 A79-24240

Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930

Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments --- soil and water analysis
[LA-7033-PR] 21 p0232 N79-15783

Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289

Overview of waste heat utilization techniques --- spray irrigation, soil heating, aquiculture and biomass production
[CONF-790443-2] 24 p0791 N79-32726

SOLAR ARRAYS

Status of wraparound contact solar cells and arrays --- for spacecraft electric propulsion
21 p0001 A79-10014

Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017

Intelsat V solar array design and development summary
21 p0002 A79-10018

Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169

Cost minimization of photovoltaic power supplies
21 p0021 A79-10171

Photovoltaic concentrating array
21 p0021 A79-10172

Development and testing of the ULP solar array
21 p0029 A79-10245

Advancements in the design of solar array to battery charge current regulators
21 p0033 A79-10902

Roll-out solar arrays - Candidate power sources for future space missions
[IAF PAPER 78-39] 21 p0034 A79-11216

New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298

Design optimization for solar array of multiple collector types
21 p0071 A79-14677

Determining optimal angles of nonconvex solar battery panel mounting
21 p0080 A79-14837

Practical considerations for 'capturing the sun'
21 p0089 A79-15853

Status of photovoltaic systems and applications
21 p0095 A79-15907

Shading and spacing in paraboloidal collector arrays
21 p0150 A79-18025

Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
The application of thermography to large arrays of
solar energy collectors
22 p0242 A79-21171
Energy storage requirements for spacecraft
22 p0246 A79-21486
Solar thermal electric power systems - Comparison
of line-focus collectors
22 p0263 A79-23758
Solar-cell panel simulator
22 p0265 A79-23867
Encapsulant materials for $2/watt terrestrial
photovoltaic arrays
22 p0266 A79-24138
Enhanced power generation by optical solar
reflectors on geostationary spinners
22 p0272 A79-25138
The effect of the dispersion of the
characteristics of solar cells in large systems
22 p0285 A79-26822
Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543
Photovoltaic concentrator system technology and
applications experiments
[ASME PAPER 79-SOL-9] 22 p0308 A79-30544
Structural cost optimization of photovoltaic
central power station modules and support
structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551
Dynamics of stepping of the Hermes flexible solar
array
22 p0323 A79-31615
Solar-tower power plants - Optimization of the
mirror field and application to the field scale
effect
23 p0382 A79-32951
Optimization of the heat transfer circuit of solar
power plants using distributed solar thermal
converters - Application to collectors of the
THEK type
23 p0382 A79-32953
Dimensioning of energy-production systems - The
use of geometric programming --- solar cell
array application
23 p0388 A79-33254
Control of a heliostat field by distributed
microcomputer technique
23 p0389 A79-33269
Design of an indirect-drive heliostat
23 p0390 A79-33270
Advanced semiconductor technology for alternate
energy sources - D-C to A-C inverters --- for
gallium arsenide solar photovoltaic arrays
23 p0416 A79-34140
Large space system - Charged particle environment
interaction technology --- effects on high
voltage solar array performance
[AIAA 79-0913] 23 p0425 A79-34775
Sandia's photovoltaic test experience
23 p0428 A79-35040
Integrated tandem solar cells
23 p0439 A79-36635
Complex static mirror solar concentration arrays
23 p0452 A79-37886
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Field testing and evaluation of PV module
performance
23 p0496 A79-40885
Real-time environmental and performance testing of
concentrating photovoltaic arrays
23 p0496 A79-40897
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895
High efficiency, high density terrestrial solar
panels
23 p0499 A79-40905
Ultra-low-mass flexible planar solar arrays using
50-micron-thick solar cells
23 p0500 A79-40913
Family of solar array design options
23 p0500 A79-40914
Latest developments in solar array technology at
AEG-Telefunken
23 p0500 A79-40915
The ESA lightweight hybrid solar array
23 p0500 A79-40916
The TDRSS solar array --- Tracking and Data Relay
Satellite System
23 p0500 A79-40917
Silicon solar cell arrays - Technical status,
terrestrial applications, and future
developments for low cost production
23 p0501 A79-40923
High efficiency solar panel /HESP/
23 p0503 A79-40951
Air Force High Efficiency Solar Panel - GaAs cell
development --- or military satellites
23 p0506 A79-40971
Optimizing solar cell performance by simultaneous
consideration of grid pattern design and
interconnect configuration
23 p0507 A79-40981
Evaluations of candidate encapsulation designs and
materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982
Design of a 10kW photovoltaic 200/1 concentrator
23 p0508 A79-40993
Terrestrial solar arrays with integral glass
construction
23 p0509 A79-41004
Performance degradation mechanisms and modes in
terrestrial photovoltaic arrays and technology
for their diagnosis
23 p0512 A79-41019
Product pricing in the Solar Array Manufacturing
Industry - An executive summary of SAMICS
23 p0513 A79-41032
Model for comparing cost of flat-array and
concentrator photovoltaic solar-cell systems
23 p0514 A79-41035
An inverter/controller subsystem optimized for
photovoltaic applications
23 p0516 A79-41047
Maximum power trackers for photovoltaic arrays
23 p0516 A79-41049
The effect of solar cell parameter variation on
array power output
23 p0517 A79-41059
An experimental study of series combination of
solar cells
23 p0518 A79-41062
Performance of a one kilowatt concentrator
photovoltaic array utilizing active cooling
23 p0519 A79-41069
Project of the 'Ramon Areces' Concentrated
Photovoltaic Power Station
23 p0519 A79-41071
Status of the DOE Photovoltaic Systems Engineering
and Analysis Project
23 p0519 A79-41075
Regional analysis of residential photovoltaic
system concepts
23 p0520 A79-41077
Effects of design on cost of flat-plate solar
photovoltaic arrays for terrestrial central
station power applications
23 p0520 A79-41081
Satellite power for the 1980s --- from
geosynchronous space stations with photovoltaic
solar cell arrays
23 p0522 A79-41208
Encapsulation materials for photovoltaic arrays
23 p0534 A79-43294
Solar power for telecommunications
24 p0628 A79-46050
An optimized grid design for a sun-concentrator
solar cell
24 p0645 A79-48273
Flywheel energy storage interface unit for
photovoltaic applications
24 p0679 A79-51791
A power extension package /PEP/ for the Shuttle
Orbiter
24 p0691 A79-51897
Long-term prediction of power system performance
for geosynchronous spacecraft
24 p0691 A79-51899
Enhancement of solar arrays in space through the
use of concentrators
24 p0692 A79-51905
Satellite solar power station designs with
concentrators and radiating control
[IAF PAPER 79-176] 24 p0710 A79-53336
A space power station without movable parts
[IAF PAPER 79-177] 24 p0710 A79-53337

Evaluation of models to predict insolation on tilted surfaces
24 p0712 A79-53491

Solar array systems
21 p0169 N79-10131

Solar array workshop
21 p0170 N79-10142

Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527

Assessment of SEPS solar array technology for orbital service module application
[NASA-CR-151859] 21 p0194 N79-12136

Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544

Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

Design of low-cost structures for photovoltaic arrays. Task 1: Survey of array structural characteristics
[SAND-78-7021] 21 p0206 N79-13509

Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing
[NASA-CR-158038] 21 p0219 N79-14540

Concentrator enhanced solar arrays design study
[NASA-CR-158032] 21 p0219 N79-14546

Conceptual approach study 200 watt per kilogram solar array, phase 3
[NASA-CR-158046] 21 p0219 N79-14551

The 25 kW power module updated baseline system --- for space transportation system payloads
[NASA-TM-78212] 21 p0226 N79-15247

Continuous Czochralski growth: Silicon sheet growth development of the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158096] 22 p0334 N79-16369

Analysis and evaluation of process and equipment in tasks 2 and 4 of the Low Cost Solar Array project
[NASA-CR-158089] 22 p0335 N79-16378

Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379

An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445

Phase 1 of the automated array assembly task of the low cost silicon sclar array project
[NASA-CR-158120] 22 p0348 N79-18451

LSA Low-cost Solar Array project
[NASA-CR-158250] 22 p0355 N79-19462

Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1] 22 p0357 N79-20179

Automated array assembly, phase 2
[NASA-CR-158360] 22 p0358 N79-20480

Automated array assembly, phase 2. Low-cost solar array project, task 4
[NASA-CR-158365] 22 p0358 N79-20481

Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

Feasibility study of solar dome encapsulation of photovoltaic arrays
[NASA-CR-158368] 22 p0367 N79-21545

The 100 kW space station --- regenerative fuel cells and nickel hydrogen and nickel cadmium batteries for solar arrays
22 p0371 N79-21603

The 25 kW space station
22 p0371 N79-21604

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 1: Executive summary
[NASA-CR-161218] 23 p0547 N79-23484

A normative price for a manufactured product: The SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504

A normative price for a manufactured product: The SAMICS methodology. Volume 2: Analysis
[NASA-CR-158503] 23 p0549 N79-23505

Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512

Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158580] 23 p0550 N79-23519

Plasma sheath effects and voltage distributions of large high-power satellite solar arrays
23 p0552 N79-24024

Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026

Space environmental effects and the solar power satellite
23 p0552 N79-24028

Low-cost Solar Array (LSA) project
[NASA-CR-158650] 23 p0559 N79-24457

Low-cost Solar Array (LSA) project
[NASA-CR-158651] 23 p0559 N79-24458

LSA: Low-cost Solar Array project
[NASA-CR-158533] 23 p0559 N79-24459

The array automated assembly task for the low cost solar array project, phase 2
[NASA-CR-158538] 23 p0560 N79-24469

Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471

Solar project cost report: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/60] 23 p0562 N79-24482

Solar project description: Iris Images, Incorported, film laboratory, Mill Valley, California
[SOLAR/2005-78/50] 23 p0562 N79-24486

Performance testing of the McDonnell Douglas fresnel lens solar collector
[SAND-78-0625] 23 p0565 N79-24512

Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482

Low-cost solar array project
23 p0570 N79-25489

LSA engineering status
23 p0570 N79-25490

Status of the DOE photovoltaic concentrator development project
23 p0571 N79-25491

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506

Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23540-1] 23 p0579 N79-26475

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158744] 23 p0580 N79-26485

SAMICS validation. SAMICS support study, phase 3
[NASA-CR-158746] 23 p0581 N79-26491

Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498

Development of a process for a high capacity arc heater production of silicon for solar arrays
[NASA-CR-158745] 23 p0581 N79-26499

A method for correlating performance data of a terrestrial solar cell array
[NASA-TM-79163] 23 p0581 N79-26503

Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project
[NASA-CR-158732] 23 p0586 N79-26979

Study of a flexible solar array generator for a remote sensing satellite. Volume 1: Technical report
[ESS/SS-909-VOL-1] 23 p0599 N79-27709

Automated aray assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607

Regional conceptual design and analysis studies for residential photovoltaic systems. Volume 1: Executive summary
[SAND-78-7039] 24 p0741 N79-29651

Photovoltaic generators in space --- conference, ESTEC, Netherlands, Sep. 1978
[SP-140] 24 p0751 N79-30730

Some current developments in solar array technology at AEG-Telefunken
24 p0751 N79-30736

A European low-cost solution for Spacelab Power augmentation
24 p0751 N79-30745
Review of European solar array technology and potential future developments
24 p0751 N79-30747
A study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
24 p0751 N79-30748
Solar cells for solar power satellites
24 p0751 N79-30749
Automated array assembly, phase 2 --- making ion implanted and furnace annealed solar cells
[NASA-CR-162176] 24 p0770 N79-31759
Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157] 24 p0770 N79-31763
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
Analysis and evalaution in the production process and equipment area of the low-cost solar array project --- including modifying gaseous diffusion and using ion implantation
[NASA-CR-162163] 24 p0770 N79-31769
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773
Low-cost solar array project. Feasibility of the silane process for producing semiconductor-grade silicon
[NASA-CR-162172] 24 p0771 N79-31777
LSA project technology development update
[NASA-CR-162301] 24 p0782 N79-32633
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 1: Study overview and summary
[NASA-CR-162328] 24 p0782 N79-32638
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 2: Technical
[HAC-REF-E3256-VOL-2] 24 p0782 N79-32639
Silicon solar cells for space use: Present performance and trends
24 p0784 N79-32654
An interim report on the NTS-2 solar cell experiment
24 p0784 N79-32656
Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257] 24 p0795 N79-33253
Integral glass encapsulation for solar arrays
[NASA-CR-162361] 24 p0798 N79-33564
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots
[NASA-CR-162359] 24 p0798 N79-33567

SOLAR AUXILIARY POWER UNITS
Technical and economic assessment of solar hybrid repowering
[SAN-1608-4-1] 24 p0729 N79-28791

SOLAR CELLS
Vertical junction silicon solar cell --- for spacecraft power sources
21 p0001 A79-10013
Status of wraparound contact solar cells and arrays --- for spacecraft electric propulsion
21 p0001 A79-10014
The NTS-2 satellite solar cell experiment
21 p0001 A79-10016
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Photovoltaic concentrating array
21 p0021 A79-10172
Ultra-thin silicon solar cells for high performance panel applications
21 p0029 A79-10243
Semiconductor electrodes for conversion and storage of solar energy
21 p0036 A79-11777
Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation
21 p0037 A79-11783
n-CdS/n-GaAs photoanode --- electrochemical solar cells
21 p0037 A79-11784
Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells
21 p0042 A79-11955
Recent progress in thin film polycrystalline solar cells based on cadmium sulfide
21 p0042 A79-11966
High efficiency solar cells based on indium phosphide
21 p0042 A79-11968
High efficiency low cost solar cell power
21 p0048 A79-12471
Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters
21 p0053 A79-13288
Progress and trends in the development of terrestrial photoelectric conversion
21 p0056 A79-13635
Activities in the field of solar cells in the Federal Republic of Germany
21 p0056 A79-13636
Cu2S-CdS thin-film solar cells
21 p0057 A79-13637
Practical applications of silicon solar cells in appliances and installations
21 p0057 A79-13638
Photovoltaic overview
[AIAA PAPER 78-1763] 21 p0061 A79-13864
Electricity from sunlight --- low cost silicon for solar cells
21 p0065 A79-14116
Performance of a tilted solar cell under various atmospheric conditions
21 p0066 A79-14261
Partial energy supply to electric vehicles through solar cell system
21 p0077 A79-14767
Overview of novel photovoltaic conversion techniques at high intensity levels
21 p0108 A79-16610
Multicolor solar cell power system for space
21 p0108 A79-16611
Trends in silicon solar-photovoltaic cells - An invited talk
21 p0122 A79-17333
A new fabrication process for single crystal silicon solar cells
21 p0122 A79-17335
Role of high performance solar cells in practical photovoltaic systems
21 p0122 A79-17336
On the role of interface states in MOS solar cells
21 p0122 A79-17337
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells
21 p0122 A79-17338
Amorphous semiconductors in photovoltaic and solar thermal conversion
[BNL-24216] 21 p0122 A79-17339
Characterisation of amorphous semiconductor materials for solar cell applications
21 p0123 A79-17341
Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342
Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346
The photovoltaic effects in CdS/Cu2S solar cells
21 p0123 A79-17347
Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348
Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349

Transparent conducting coatings for solar cells
21 p0124 A79-17350
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353
Transcell, a novel approach for improving static photovoltaic concentration
21 p0124 A79-17356
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360
A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell
21 p0125 A79-17361
Efficiency of conventional silicon solar cells
21 p0125 A79-17362
Possibility of production of low cost solar grade silicon by trichlorosilane process
21 p0125 A79-17363
Saur vidyut kosh - The solar cell --- reversible charging electrolytic batteries
21 p0126 A79-17371
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446
Reliability studies on MIS solar cells
21 p0148 A79-17950
Progress in batteries and solar cells. Volume 1 --- Book
21 p0148 A79-17989
The development of photovoltaic conversion systems with sunlight concentration
21 p0148 A79-17995
Solar cell modules for terrestrial use
21 p0149 A79-17996
General view of low cost solar cell development in Japan
21 p0149 A79-17997
Econometric analysis of concentrators for solar cells
21 p0149 A79-18017
Grain-boundary edge passivation of GaAs films by selective anodization --- shorting effect in solar cells
21 p0154 A79-18487
Photoacoustic determination of photovoltaic energy conversion efficiency
21 p0154 A79-18503
/SN/x-GaAs polymer-semiconductor solar cells
21 p0154 A79-18504
On the role of interface states in MOS solar cells
21 p0156 A79-19092
Merocyanine organic solar cells
21 p0165 A79-20216
New models of solar cells and prospects for their optimization
21 p0166 A79-20346
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361
Recent developments in low cost silicon solar cells for terrestrial applications --- sheet production methods
22 p0239 A79-20821
Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807
Materials for low-cost solar cells
22 p0252 A79-22099
The Sunship --- solar powered airship design
22 p0254 A79-22324
Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768
A two-junction cascade solar-cell structure
22 p0256 A79-22856
Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859
Performance of a new high-intensity silicon solar cell
22 p0257 A79-22862
The interfacial layer in MIS amorphous silicon solar cells
22 p0258 A79-23039
High-efficiency AlGaAs/GaAs concentrator solar cells
22 p0261 A79-23710
Solar-cell panel simulator
22 p0265 A79-23867
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells
22 p0272 A79-25069
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745
The short-wavelength response of MIS solar cells
22 p0273 A79-25748
A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242
Diffusion length measurements in Schottky barrier GaAs solar cells
22 p0281 A79-26243
The effect of the dispersion of the characteristics of solar cells in large systems
22 p0285 A79-26822
Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428
Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure --- heterostructure solar cell fabrication
22 p0305 A79-30258
The limiting efficiency of an edge-illuminated multigap solar cell
22 p0305 A79-30259
Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543
An overview of photovoltaic power systems
[ASME PAPER 79-SOL-12] 22 p0308 A79-30547
Unique aspects of terrestrial photovoltaic system design
[ASME PAPER 79-SOL-14] 22 p0308 A79-30548
Low cost thin-film CdS-based solar cells progress and promise
[ASME PAPER 79-SOL-15] 22 p0309 A79-30549
Cast semicrystalline silicon for solar cells
[ASME PAPER 79-SOL-16] 22 p0309 A79-30550
Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells
22 p0313 A79-31347
Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode --- for solar cells
22 p0317 A79-31411
Photovoltaic properties of metal-free phthalocyanines - Al/H2Pc Schottky barrier solar cells
22 p0317 A79-31412

A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723

New techniques for fabricating silicon solar cells
23 p0384 A79-32969

Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970

Photovoltaic conversion in Cu2O
23 p0384 A79-32973

Solar thermal photovoltaic electric power generator
23 p0402 A79-34023

Photovoltaic conversion - Can its efficiency be improved through the application of color response data
23 p0402 A79-34025

Solar energy conversion: The solar cell --- Book
23 p0423 A79-34449

Chemical origin of the space-charge layer in cuprous oxide front-wall solar cells
23 p0424 A79-34530

Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610

Environmental testing of flat plate solar cell modules
23 p0428 A79-35039

A life prediction methodology for encapsulated solar cells
23 p0428 A79-35041

Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383

Investigation of the optical properties of transparent materials for solar energy applications
23 p0434 A79-35384

Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385

Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480

Photovoltaic cells and their future
23 p0435 A79-35486

Solar cells from inexpensive silicon ribbons - State of the art and trends
23 p0435 A79-35487

The fabrication of Schottky-barrier solar cells by electroless nickel plating
23 p0436 A79-35746

Thin-film GaAs solar cells with grain-boundary edge passivation
23 p0436 A79-35749

Carrier lifetime in silicon and its impact on solar cell characteristics
23 p0437 A79-36148

Heterojunction phenomena and interfacial defects in photovoltaic converters
23 p0438 A79-36150

The role of the interfacial layer in Schottky barrier solar cells
23 p0438 A79-36241

Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610

Extension of the Hottel-Whillier model to the analysis of combined photovoltaic/thermal flat plate collectors
23 p0439 A79-36633

Integrated tandem solar cells
23 p0439 A79-36635

Low-cost encapsulation materials for terrestrial solar cell modules
23 p0439 A79-36636

Optimization of tapered busses for solar cell contacts
23 p0440 A79-36638

The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680

Comment on a simple measurement of absolute solar cell efficiency
23 p0440 A79-36683

Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777

Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778

Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779

Silicon solar cells for operation in concentrated sunlight
23 p0441 A79-36780

Meteorological effects on Schottky-barrier solar cells
23 p0441 A79-36781

Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782

Schottky-barrier versus homojunction silicon solar cells - A status report
23 p0441 A79-36783

Approaches to low-cost solar cells
23 p0441 A79-36784

Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785

Cadmium-sulphide/copper-sulphide thin-film solar cells - Review of methods of producing the CdS and Cu2S layers
23 p0441 A79-36786

Thin-film solar cells produced by physical vapour deposition
23 p0441 A79-36787

Order-disorder transformations and the nature of the copper-sulphide layer in Cu/x/S/CdS solar cells
23 p0442 A79-36789

p-InP/n-CdS heterojunction solar cells
23 p0442 A79-36791

Analysis of an edge-illuminated graded-gap solar cell
23 p0442 A79-36793

Chemical vapor deposition of spectrally selective surfaces for high-temperature photothermal conversion
23 p0445 A79-37155

Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques
23 p0445 A79-37156

Technique to determine the growth rate and resistivity of evaporated CdS thin films
23 p0445 A79-37157

Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159

Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272

Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685

655 mV open-circuit voltage, 17.6% efficient silicon MIS solar cells
23 p0447 A79-37686

Sputtered thin film solar cells
23 p0448 A79-37843

The developing role of photovoltaic generation
23 p0448 A79-37845

Gallium arsenide solar cells
23 p0448 A79-37848

Solar electric generator for developing nations
23 p0452 A79-37885

The change in the interface-state Fermi level of MIS solar cells when going from dark to illuminated conditions
23 p0456 A79-38101

A method to increase the efficiency of solar photovoltaic devices by secondary emission
[AIAA PAPER 79-0981] 23 p0457 A79-38185

Cu2S-CdS thin-film solar cells
23 p0466 A79-38601

Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation
23 p0466 A79-38603

Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642

Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells
23 p0475 A79-38877

Parametric cost analysis of photovoltaic systems
23 p0477 A79-39102
Performance analysis of dc-motor-photovoltaic converter system. I - Separately excited motor
23 p0477 A79-39104
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945
Photovoltaic Specialists Conference, 13th, Washington, D.C., June 5-8, 1978, Conference Record
23 p0496 A79-40881
Trends in photovoltaic development outside the United States
23 p0496 A79-40882
Procedure for developing experimental designs for accelerated tests for service-life prediction --- for solar cell modules
23 p0496 A79-40886
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889
Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890
Measurement of free carrier lifetime in an illuminated solar cell from capacitance measurements
23 p0497 A79-40891
Contactless measurement of lifetime by free carrier infrared absorption --- in solar cells
23 p0497 A79-40892
Minority carrier diffusion length from spectral response measurements --- for solar cells
23 p0497 A79-40893
Diffusion length inhomogeneities in silicon solar cells
23 p0497 A79-40894
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895
Space environment damage to solar cell coverslide assemblies
23 p0498 A79-40896
The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells
23 p0498 A79-40897
Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells
23 p0498 A79-40898
Flash X-ray tests of solar cells
23 p0498 A79-40899
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900
Directional solidification of crack-free silicon ingots by heat exchanger method
23 p0498 A79-40901
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902
Analysis of ID saw slicing of silicon for low cost solar cells
23 p0499 A79-40903
A high volume cost efficient production macrostructuring process --- for silicon solar cell surface treatment
23 p0499 A79-40904
Development of a shingle-type solar cell module
23 p0499 A79-40906
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
Cuprous oxide photovoltaic cells
23 p0499 A79-40908
The photovoltaic properties of thin copper oxide films
23 p0499 A79-40909
The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911
Spray deposited Cd/1-x/Zn/x/S films for low cost solar cells
23 p0500 A79-40912
Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells
23 p0500 A79-40913
Status and future development of photovoltaic research in the Federal Republic of Germany
23 p0501 A79-40918
A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
A 1982 low cost photovoltaic module factory study
23 p0501 A79-40921
Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions
23 p0501 A79-40922
Silicon solar cell arrays - Technical status, terrestrial applications, and future developments for low cost production
23 p0501 A79-40923
High efficiency, low cost processes for 3 in. diameter silicon solar cells
23 p0501 A79-40924
Evaluation of options for process sequences --- in solar cell manufacturing
23 p0501 A79-40925
Recent investigations of metal oxide/CdTe heterojunction solar cells
23 p0502 A79-40926
Eutectic and cellular solar cells
23 p0502 A79-40928
High-temperature contacts for silicon solar cells
23 p0502 A79-40934
The alpha factor - Controlling solar cell absorptance
23 p0502 A79-40935
Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949
An overview of photovoltaics for space applications
23 p0503 A79-40950
High efficiency solar panel /HESP/
23 p0503 A79-40951
Testing of ultra-thin solar cells
23 p0503 A79-40952
Thin silicon solar cell performance characteristics
23 p0503 A79-40953
Characterization of vertical-junction silicon solar cells
23 p0504 A79-40955
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958
Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon
23 p0504 A79-40959
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960
The effects of copper and titanium on silicon solar cells
23 p0504 A79-40961
Effect of copper impurity on polycrystalline silicon solar cells
23 p0504 A79-40962
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films
23 p0505 A79-40963
The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964

Barrier heights and interfacial effects in SnO2/Si solar cells
23 p0505 A79-40965
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-4096
Photovoltaic properties of In2O3/semiconductor heterojunction solar cells
23 p0505 A79-40968
Air Force High Efficiency Solar Panel - GaAs cell development --- or military satellites
23 p0506 A79-40971
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977
Contact resistance of silver ink on solar cell
23 p0506 A79-40978
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979
Evaluation of thick film materials for use as solar cell contacts
23 p0507 A79-40980
Optimizing solar cell performance by simultaneous consideration of grid pattern design and interconnect configuration
23 p0507 A79-40981
Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985
Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels
23 p0507 A79-40986
Formation and stability of MS or MIS Schottky solar cells
23 p0507 A79-40987
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988
The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989
Analysis of ion-implanted solar cells
23 p0508 A79-40991
Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992
Design of a 10kW photovoltaic 200/1 concentrator
23 p0508 A79-40993
Fresnel optics for solar concentration on photovoltaic cells
23 p0508 A79-40994
Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998
Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight
23 p0509 A79-40999
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003
Optimized solar module design
23 p0510 A79-41005
A novel photovoltaic panel for low cost power
23 p0510 A79-41006
The dependence of solar cell characteristics on the electronic properties of discharge produced, hydrogenated amorphous silicon
23 p0510 A79-41007
M-I-S solar cells on amorphous silicon
23 p0510 A79-41008
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009
Polysilicon MIS solar cells with low work function metals
23 p0510 A79-41010
Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011
Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012
Photovoltage in concentrator cells
23 p0511 A79-41013
Open circuit voltage of high intensity silicon solar cells
23 p0511 A79-41014
The V-Groove Multijunction solar cell
23 p0511 A79-41015
Performance of silicon and gallium arsenide concentration cells --- under high sunlight concentration
23 p0511 A79-41017
Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight
23 p0511 A79-41018
Some failure modes and analysis techniques for terrestrial solar cell modules
23 p0512 A79-41020
Environmental qualification testing of terrestrial solar cell modules
23 p0512 A79-41021
Endurance testing of first generation /Block I/ commercial solar cell modules
23 p0512 A79-41022
Variation of solar cell sensitivity and solar radiation on tilted surfaces
23 p0512 A79-41023
Increased photovoltaic conversion efficiency through use of spectrum splitting and multiple cells
23 p0512 A79-41024
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025
Analysis of multiple-cell concentrator/photovoltaic systems
23 p0513 A79-41026
Two-junction cascade solar cell characteristics under 1000 concentration ratio and AM 0-AM 5 spectral conditions
23 p0513 A79-41027
Spectrally split tandem cell converter studies
23 p0513 A79-41028
Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029
Concepts for rheotaxially-grown thin-film tandem III-V solar cells
23 p0513 A79-41030
Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base
23 p0513 A79-41031
Product pricing in the Solar Array Manufacturing Industry - An executive summary of SAMICS
23 p0513 A79-41032
Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033
Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells
23 p0514 A79-41034
Model for comparing cost of flat-array and concentrator photovoltaic solar-cell systems
23 p0514 A79-41035
Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036

Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038

GaAs solar cells for high solar concentration applications
23 p0514 A79-41039

High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040

High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041

Large area thin film gallium arsenide solar cells
23 p0515 A79-41042

The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells
23 p0515 A79-41044

Solar cells based on GaP/x/As/1-x/ compounds
23 p0515 A79-41045

A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046

Solar photovoltaic intermediate power system operating strategies and economic considerations
23 p0516 A79-41051

Role of intermediate markets in P/V industry development
23 p0516 A79-41052

The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology
23 p0516 A79-41053

Status of the DOE Photovoltaic Concentrator Technology Development Project
23 p0517 A79-41054

Design, technology and cost of Si cells for concentrator applications
23 p0517 A79-41055

Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056

Large-area concentrator solar cells
23 p0517 A79-41057

Reliability analysis of contracts to silicon solar cells for use in concentrated sunlight
23 p0517 A79-41058

Photovoltaic design optimization for terrestrial applications
23 p0517 A79-41060

A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061

An experimental study of series combination of solar cells
23 p0518 A79-41062

Poly- vs single-crystal silicon solar cells
23 p0518 A79-41064

Characteristics of semicrystalline silicon solar cells
23 p0518 A79-41065

Solar cells on R.A.D. polycrystalline silicon
23 p0518 A79-41066

Thin film polycrystalline silicon solar cells
23 p0518 A79-41067

Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068

Analysis of photovoltaic total energy system concepts for single-family residential applications
23 p0520 A79-41078

Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079

Central station power plant applications for photovoltaic solar energy conversion
23 p0520 A79-41080

Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications
23 p0520 A79-41081

Defect free very shallow p+/n junction and associated photovoltaic effect
23 p0520 A79-41082

Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

Response of defects to illumination in silicon solar cells
23 p0521 A79-41084

Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086

Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089

Design of the Natural Bridges National Monument 100 kW PV power system
23 p0521 A79-41090

Description and status of NASA-LeRC/DOE photovoltaic applications systems experiments
23 p0521 A79-41091

Thin tandem junction solar cell
23 p0521 A79-41092

Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093

Design considerations for silicon HLE solar cells
23 p0521 A79-41094

Schottky effect and photovoltaic devices on the texturized surfaces
23 p0522 A79-41100

Solar photovoltaic energy
23 p0524 A79-41809

Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra
23 p0528 A79-42170

Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171

Determination of the minority carrier diffusion length in silicon solar cells
23 p0528 A79-42248

Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545

Measuring dirt on photovoltaic modules
23 p0533 A79-43283

High-temperature lifetesting of Al/SiCx/p-Si contacts for MIS solar cells
23 p0536 A79-43569

Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715

Photovoltaic effect in Cu/CuGaSe2 Schottky barriers
24 p0605 A79-44721

Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells
24 p0606 A79-44919

Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis
24 p0616 A79-45745

Photochemical energy conversion studies in systems containing methylene blue
24 p0628 A79-45995

Solar power for telecommunications
24 p0628 A79-46050

Efficient electron-beam-deposited ITO/n-Si solar cells
24 p0629 A79-46152

Variation of photovoltaic effect in vertical n/p-junction solar cells
24 p0629 A79-46157

Spray-deposited high-efficiency SnO2/n-Si solar cells
24 p0629 A79-46201

Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence --- for solar cell applications
24 p0629 A79-46249

Optimization of exponential alloying impurity distribution in semiconductor photoconverter base
24 p0636 A79-46759

Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760

Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

Photovoltaic properties of metal-free
phthalocyanines. I - Al/H2Pc Schottky barrier
solar cells
24 p0637 A79-47019
The physics of solar cells
24 p0637 A79-47050
A simple theory of back-surface-field /BSF/ solar
cells
24 p0637 A79-47051
Study of the interface changes during operation of
n CdTe-electrolyte solar cells
24 p0637 A79-47054
Collection efficiency measurements on a-Si:H solar
cells
24 p0638 A79-47363
Photoelectric characteristics of silicon
insulator/semiconductor structures with induced
channels
24 p0640 A79-47490
New technologies for solar energy silicon - Cost
analysis of UCC Silane process
24 p0642 A79-47798
Fabrication and characterization of SnO2/n-Si
solar cells
24 p0642 A79-47802
An optimized grid design for a sun-concentrator
solar cell
24 p0645 A79-48273
Optimum grid design for a nonuniformly illuminated
sun-concentrator solar cell
24 p0645 A79-48274
Large-area silicon photocells for the
investigation of the optical/energetic
characteristics of solar and radiant-energy
concentrators
24 p0646 A79-48735
Thin-film and ceramic cadmium sulfide/cadmium
selenide solar cells
24 p0646 A79-48737
Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179
Wideband graded-band-gap Ga/1-x/Al/x/As-Si
photoelectric cells with n-region illumination
24 p0647 A79-49180
Dependence of the photoelectric parameters of
photovoltaic cells on illuminance
24 p0647 A79-49181
Analysis of the optical characteristics of silicon
photovoltaic cells with bilateral sensitivity
24 p0647 A79-49182
Extension of a theorem used in the investigation
of P-N junctions with the scanning electron
microscope to arbitrary geometries and
arbitrarily inhomogeneous material
24 p0648 A79-49211
Temperature dependence of the current-voltage
characteristics of silicon MIS solar cells
24 p0648 A79-49213
Current conduction in Cr-MIS solar cells on
single-crystal p-silicon
24 p0648 A79-49215
Studies of CdSiAs2 for photovoltaic applications
24 p0654 A79-50027
Considerations for accurately determining the
maximum power output of solar cells
24 p0654 A79-50028
A computer model of a heterojunction solar cell
with application to GaP/Si
24 p0654 A79-50030
Photoelectrochemistry and solar energy conversion
24 p0654 A79-50153
Crystal growth and properties of CuGa/x/In/1-x/Se2
chalcopyrite compound
24 p0654 A79-50176
Possibilities of new materials for solar
photovoltaic cells
24 p0655 A79-50178
Some relations governing major solar cell parameters
24 p0655 A79-50179
Stability of SnO2/n-Si solar cells
24 p0655 A79-50187
Back illuminated high efficiency thin film
Cu2S/CdS solar cells
24 p0656 A79-50190
Electrochemical solar cells based on layer-type
transition metal compounds - Performance of
electrode material
24 p0656 A79-50193
Efficiency of tandem solar cell systems as a
function of temperature and solar energy
concentration ratio
24 p0656 A79-50194
Properties of chemically sprayed SnO2
antireflecting films on Si solar cells
24 p0656 A79-50196
Environmental requirements for flat plate
photovoltaic modules for terrestrial applications
24 p0658 A79-50342
Static concentrators for two-sided photovoltaic
solar cells
24 p0661 A79-50542
Solar conversion by concentration cells with
hydrides
24 p0662 A79-50549
Accelerated investigation of the light resistance
of shaped polyethylene tubes and sheets under
natural climatic conditions
24 p0663 A79-50706
Investigation into the optical characteristics of
transparent solar-energy materials
24 p0663 A79-50707
Analysis of the efficiency of a varizone
photoelectric converter
24 p0663 A79-50708
Solar photovoltaic energy --- research and
development
24 p0667 A79-50909
Gallium arsenide films and solar cells on graphite
substrates
24 p0667 A79-50937
An anomalous photocurrent in SnO2-Si
heterojunction solar cells
24 p0668 A79-50950
Annealing kinetics of electron-irradiated GaAs
heteroface solar cells in the range 175-200 C
--- for space applications
24 p0668 A79-51008
UV blocking filters for polymeric films
24 p0668 A79-51103
Performance of the Mead, Nebraska, 25 kWp
photovoltaic solar energy system and comparison
with simulation
24 p0675 A79-51763
A combined photovoltaic/thermal electric central
power plant
24 p0675 A79-51769
Application of a GaAs photovoltaic solar system in
a utility substation
24 p0676 A79-51770
Potential of GaAlAs solar cells for the global
positioning system missions
24 p0691 A79-51901
High temperature, low mass solar blanket development
24 p0691 A79-51902
High efficiency ultrathin silicon solar cells
24 p0692 A79-51903
Structure identification and optical and
electrical properties of cuprous sulphine layers
in relation with solar energy application
24 p0704 A79-52311
A study of oxide-based heterostructure
photoelectrodes --- for solar cells
24 p0705 A79-52314
Hydrogen and electricity from water and light - A
lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the
pentenary chalcopyrite semiconductor system for
solar photovoltaic cells
24 p0705 A79-52317
Minority carrier lifetimes in silicon solar cells
determined from spectral and transient
measurements
24 p0705 A79-52321
The potential of np GaAs solar cells for high
efficiency concentrator applications
24 p0705 A79-52325
Satellite power systems /SPS/ and semiconductor
photovoltaic cells /SPC/
[IAF PAPER 79-166] 24 p0709 A79-53330
On the design and operation of electrochemical
solar cells
24 p0712 A79-53494
Monolithic solar cell panel of amorphous silicon
24 p0712 A79-53496

Solar cells for photovoltaic generation of
electricity: Materials, devices and applications
--- Book
24 p0713 A79-53725

A device model for the tandem junction solar cell
24 p0714 A79-53938

Solar cell workshop
21 p0170 N79-10141

Development of high-efficiency P(+)-N-N(+)
back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529

Characterization of solar cells for space
applications. Volume 4: Electrical
characteristics of Spectrolab BSF 200-micron
Helios cells as a function of intensity and
temperature
[NASA-CR-157934] 21 p0195 N79-12543

Encapsulation task of the low-cost silicon solar
array project. Investigation of test methods,
material properties, and processes for solar
cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544

Silicon Schottky photovoltaic diodes for solar
energy conversion
[PB-283998/3] 21 p0198 N79-12572

Silicon solar cells, volume 2. Citations from the
NTIS data base
[NTIS/PS-78/1114/4] 21 p0212 N79-13554

Silicon solar cells, volume 3. Citations from the
NTIS data base
[NTIS/PS-78/1115/1] 21 p0212 N79-13555

Silicon solar cells, volume 2. Citations from the
NTIS data base
[NTIS/PS-78/1116/9] 21 p0212 N79-13556

Solar electric power generation, volume 2.
Citations from the NTIS data base
[NTIS/PS-78/1108/6] 21 p0212 N79-13557

Back wall solar cell
[NASA-CASE-LEW-12236-2] 21 p0217 N79-14528

Novel duplex vapor electrochemical method for
silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

Process feasibility study in support of silicon
material task 1
[NASA-CR-158034] 21 p0219 N79-14541

Pilot line report: Development of a high
efficiency thin silicon solar cell
[NASA-CR-158028] 21 p0219 N79-14548

Development of a model and computer code to
describe solar grade silicon production processes
--- phase changes in chemical reactors
[NASA-CR-158037] 21 p0219 N79-14555

Improved semiconductors for photovoltaic solar cells
[DSE/2459-2] 21 p0221 N79-14577

Cadmium sulfide solar cells. Citations from the
NTIS data base
[NTIS/PS-78/1213/4] 21 p0231 N79-15436

Cadmium sulfide solar cells. Citations from the
Engineering Index Data base
[NTIS/PS-78/1214/2] 21 p0231 N79-15437

Industrialization study, phase 2 --- assessment of
advanced photovoltaic technologies for
commerical development
[NASA-CR-158015] 22 p0333 N79-16351

GaAs solar cell development
[NASA-CR-158090] 22 p0334 N79-16366

Continuous Czochralski growth: Silicon sheet
growth development of the large area silicon
sheet task of the Low Cost Silicon Solar Array
project
[NASA-CR-158096] 22 p0334 N79-16369

Analysis and evaluation of process and equipment
in tasks 2 and 4 of the Low Cost Solar Array
project
[NASA-CR-158089] 22 p0335 N79-16378

Study on solar arrays for programmes leading from
the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379

Silicon Schottky photovoltaic diodes for solar
energy conversion
[PB-287417/0] 22 p0343 N79-17345

Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352

Block 4 solar cell module design and test
specification for residential applications
[NASA-CR-158117] 22 p0348 N79-18453

Optical coatings for solar cells and solar
collectors. Citations from the NTIS data base
[NTIS/PS-78/1341/3] 22 p0350 N79-18465

Optical coatings for solar cells and solar
collectors. Citations from the Engineering
index data base
[NTIS/PS-78/1342/1] 22 p0350 N79-18466

V-groove multijunction solar cells
22 p0353 N79-19445

Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447

Market definition studies for photovoltaic highway
applications
[NASA-CR-159477] 22 p0354 N79-19451

Development of an improved high efficiency thin
silicon solar cell
[NASA-CR-158172] 22 p0354 N79-19459

Thermal and other tests of photovoltaic modules
performed in natural sunlight
[NASA-CR-158174] 22 p0354 N79-19460

LSA large area silicon sheet task continuous
liquid feed Czochralski growth
[NASA-CR-158366] 22 p0357 N79-20281

Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282

The production of solar cell grade silicon from
bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

Large area silicon sheet by EFG
[NASA-CR-158379] 22 p0359 N79-20483

Silicon solar cell process development,
fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485

Development of economical improved thick film
solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486

Satellite power system: Concept development and
evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

A study of the effective resistance of the
diffused layer and its effect on solar cell
performance
22 p0367 N79-21541

Material growth and characterization directed
toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543

Space-based solar power conversion and delivery
systems study. Volume 4: Energy conversion
systems studies
[NASA-CR-150297] 23 p0541 N79-22620

Environmental testing of block 2 solar cell modules
[NASA-CR-158521] 23 p0542 N79-22628

High Efficiency Solar Panel (HESP-2)
[AD-A065009] 23 p0544 N79-22642

Evaluation of the technical feasibility and
effective cost of various wafer thicknesses for
the manufacture of solar cells
[NASA-CR-158588] 23 p0549 N79-23507

Process feasibility study in support of silicon
material, task 1
[NASA-CR-158587] 23 p0549 N79-23508

Development of low-cost, high energy-per-unit-area
solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515

Metallization of large silicon wafers
[NASA-CR-158575] 23 p0550 N79-23517

The establishment of a production-ready
manufacturing process utilizing thin silicon
substrates for solar cells
[NASA-CR-158566] 23 p0550 N79-23523

The development of a method of producing etch
resistant wax patterns on solar cells
[NASA-CR-158563] 23 p0550 N79-23527

Development of high efficiency (14%) solar cell
array module
[NASA-CR-158672] 23 p0559 N79-24454

Automated solar panel assembly line. LSA task;
production processes and equipment
[NASA-CR-158671] 23 p0559 N79-24455

Analysis of the effects of impurities in silicon
[NASA-CR-157439] 23 p0559 N79-24456

Low-cost Solar Array (LSA) project
[NASA-CR-158650] 23 p0559 N79-24457

Low-cost Solar Array (LSA) project
[NASA-CR-158651] 23 p0559 N79-24458

High-efficiency thin-film GaAs solar cells
[NASA-CR-158641] 23 p0560 N79-24463

Cuprous oxide photovoltaic cells --- fabricating
schottky barrier devices
[PB-290529/7] 23 p0565 N79-24514

Systematic computation of the performance of
photovoltaic based on first principles
[UCID-1804-PT-1] 23 p0567 N79-24877
Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482
Development of pulsed processes for the
manufacture of solar cells
[NASA-CR-158706] 23 p0570 N79-25484
Silicon solar cell process development,
fabrication and analysis
[NASA-CR-158700] 23 p0572 N79-25505
Analysis and evaluation of processes and equipment
in tasks 2 and 4 of the low-cost solar array
project
[NASA-CR-158681] 23 p0572 N79-25506
Low energy proton radiation damage to
(AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507
High efficiency GaAs solar cell development
[AD-A066616] 23 p0573 N79-25514
Performance of photovoltaic cells in an undersea
environment
[AD-A066385] 23 p0573 N79-25517
Principal conclusions of the American Physical
Society study group on solar photovoltaic energy
[PB-292164/1] 23 p0575 N79-25533
Preparation and properties of Au-(-n) A sub X Ga
sub 1 minus X aS-(n)GaAs Schottky-Barrier solar
cells
23 p0579 N79-26473
Analysis and evaluation of processes and equipment
in tasks 2 and 4 of the low-cost solar array
project
[NASA-CR-158744] 23 p0580 N79-26485
Silicon solar cell process development,
fabrication and analysis
[NASA-CR-158736] 23 p0580 N79-26489
Silicon solar cell process development,
fabrication and analysis
[NASA-CR-158740] 23 p0580 N79-26490
Silicon solar cell process development,
fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495
A 10-kilowatt photovoltaic concentrator array
[SAND-78-7024] 23 p0598 N79-27699
Silicon web process development --- for low cost
solar cells
[NASA-CR-158852] 24 p0722 N79-28722
The use of chlorophyll in a novel solar battery
24 p0736 N79-29594
A theoretical analysis of the current-voltage
characteristics of solar cells
[NASA-CR-158872] 24 p0737 N79-29606
Automated aray assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607
Economic analysis of solar photovoltaics for
low-power lighted aids to navigation
[AD-A068365] 24 p0738 N79-29615
Solar cells made from polycrystalline silicon
[LEP-78/519-679-D] 24 p0743 N79-29669
Space application of large area terrestrial solar
cells for multi-KW-arrays
24 p0751 N79-30732
Some current developments in solar array
technology at AEG-Telefunken
24 p0751 N79-30736
The NASA space power technology program
24 p0751 N79-30746
Solar cells for solar power satellites
24 p0751 N79-30749
Cuprous oxide photovoltaic cells
[CONF-780619-16] 24 p0753 N79-30777
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758
Automated array assembly, phase 2 --- making ion
implanted and furnace annealed solar cells
[NASA-CR-162176] 24 p0770 N79-31759
Silicon web process development --- for solar cell
fabrication
[NASA-CR-162181] 24 p0770 N79-31762
High efficiency, high density terrestrial panel
--- for solar cell modules
[NASA-CR-162167] 24 p0770 N79-31765
Development of an improved high efficiency thin
silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Analysis and evalaution in the production process
and equipment area of the low-cost solar array
project --- including modifying gaseous
diffusion and using ion implantation
[NASA-CR-162163] 24 p0770 N79-31769
Automated array assembly task in-depth study of
silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Quantitative analysis of defects in silicon --- to
predict energy conversion efficiency of silicon
samples for solar cells
[NASA-CR-162173] 24 p0771 N79-31772
Array automated assembly task low cost silicon
solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773
Silicon-on ceramic process: Silicon sheet growth
and device development for the large-area
silicon sheet and cell development tasks of the
low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
Characterization of solar cells for space
applications. Volume 9: Electrical
characteristics of Spectrolab BSF, textured,
10-ohm-cm 200-micron cells as a function of
intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631
LSA project technology development update
[NASA-CR-162301] 24 p0782 N79-32633
Results of the 1978 NASA/JPL balloon flight solar
cell calibration program
[NASA-CR-162298] 24 p0782 N79-32635
Conceptual design study of concentrator enhanced
solar arrays for space applications Volume 1:
Study overview and summary
[NASA-CR-162328] 24 p0782 N79-32638
Conceptual design study of concentrator enhanced
solar arrays for space applications Volume 2:
Technical
[HAC-REF-E3256-VOL-2] 24 p0782 N79-32639
Solar Cell High Efficiency and Radiation Damage,
1979
[NASA-CP-2097] 24 p0783 N79-32640
The NASA Lewis Research Center program in space
solar cell research and technology --- efficient
silicon solar cell development program
24 p0783 N79-32641
Solar photovoltaic research and development
program of the Air Force Aero Propulsion
Laboratory --- silicon solar cell applicable to
satellite power systems
24 p0783 N79-32642
The JPL space photovoltaic program --- energy
efficient sol silicon solar cells for space
applications
24 p0783 N79-32643
Langley program of GaAs solar cells ---
emphasizing energy conversion efficiency and
radiation resistance
24 p0783 N79-32644
Updating the limit efficiency of silicon solar cells
24 p0783 N79-32645
Limiting process in shallow junction solar cells
24 p0783 N79-32646
Design of high efficiency HLE solar cells for
space and terrestrial applications
24 p0783 N79-32647
Applications of ion implantation to high
performance, radiation tolerant silicon solar
cells
24 p0794 N79-32648
Open-circuit voltage improvements in
low-resistivity solar cells
24 p0784 N79-32649
Modeling of thin, back-wall silicon solar cells
24 p0784 N79-32650
Design considerations for the Tandem Junction
Solar Cell
24 p0784 N79-32651
Thin cells for space
24 p0784 N79-32652
High efficiency cell geometry
24 p0784 N79-32653
Silicon solar cells for space use: Present
performance and trends
24 p0784 N79-32654
An interim report on the NTS-2 solar cell experiment
24 p0784 N79-32656

CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659

Effect of dopants on annealing performance of silicon solar cells
24 p0785 N79-32661

Radiation damage in GaAs solar cells
24 p0785 N79-32663

Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

Shallow-homojunction GaAs solar cells
24 p0785 N79-32666

Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-32671

Computer modeling of a two-junction, monolithic cascade solar cell
24 p0785 N79-32672

Intercell ohmic contacts for high efficiency multijunction solar converters
24 p0786 N79-32673

Cadmium sulfide-copper sulfide heterojunction cell research
[SAN-1459-3] 24 p0789 N79-32701

Avoiding future health problems related to solar energy (photovoltaic) technology
[BNL-25935] 24 p0790 N79-32718

Investigation of low cost solar cells based on Cu2O --- MIS solar cell theory
[PB-295888/2] 24 p0792 N79-32737

Studies of AlGaAs-GaAs solar cells
24 p0797 N79-33558

Integral glass encapsulation for solar arrays
[NASA-CR-162361] 24 p0798 N79-33564

Vacuum die casting of silicon sheet for photovoltaic applications
[NASA-CR-162360] 24 p0798 N79-33566

Annealing of radiation damage in 0.1- and 2-ohm-centimeter Silicon solar cells
[NASA-TP-1559] 24 p0798 N79-33572

Dielectric development for GaAs solar cells
[PB-295837/9] 24 p0802 N79-33600

SOLAR COLLECTORS

NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106

Liquid metal heat pipes for the central solar receiver
21 p0014 A79-10114

Cost effective solar collectors using heat pipes
21 p0014 A79-10115

Design, construction, and testing of a Fixed Mirror Solar Concentrator field
21 p0020 A79-10164

Thermal performance trade-offs for point focusing solar collectors
21 p0020 A79-10165

Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166

Effects of pointing errors on receiver performance for parabolic dish solar concentrators
21 p0020 A79-10167

Transient energy removal in cylindrical parabolic collector systems
21 p0020 A79-10168

Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173

Hybrid air to water solar collector design
21 p0021 A79-10174

Central solar heat stations and the Studsvik Demonstration Plant
21 p0021 A79-10175

Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177

Heat pipe central solar receiver gas turbine plant
21 p0022 A79-10178

Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179

The fossil fuel cost of solar heating
21 p0022 A79-10180

Operating experience at the DOE/Sandia midtemperature Solar Systems Test Facility
21 p0022 A79-10182

Filon panels - A technical report --- fiberglass reinforced plastics for solar collectors
21 p0031 A79-10403

Application of composite materials in the solar energy domain
21 p0034 A79-11195

Perspectives on utility central station photovoltaic applications
21 p0041 A79-11873

Computation of IR sky temperature and comparison with surface temperature --- for solar collector energy budgets
21 p0042 A79-11875

An approximate equation for predicting the solar transmittance of transparent honeycombs
21 p0042 A79-11877

Effect of surface curvature on measurement of the absorptance properties of solar coatings
21 p0042 A79-11879

Annual available radiation for fixed and tracking collectors
21 p0042 A79-11880

A vacuum solar thermal collector with optimal concentration
21 p0043 A79-11970

Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971

Nonimaging solar concentrators
21 p0043 A79-11973

Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974

Frequency doubling of a solar pumped Nd:YAG laser
21 p0044 A79-12062

A problem of optimizing the setting angle of sun-battery panels of concave shape --- onboard satellite
21 p0045 A79-12186

High efficiency low cost solar cell power
21 p0048 A79-12471

Selling solar energy as a cash crop
21 p0049 A79-12725

General principles of multielement concentrating system design --- solar collectors
21 p0054 A79-13291

Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292

Selection of method for calculating the parameters of wind and solar power station storage facilities
21 p0054 A79-13293

Performance of a honeycomb type flat plate collector with serpentine tube
21 p0054 A79-13579

Solar radiation simulation by means of solar simulator for the indoor testing of solar collectors
21 p0055 A79-13620

Sun-position diagrams using examples from Flensburg to Mittenwald
21 p0055 A79-13626

Testing the efficiency of solar collectors
21 p0056 A79-13627

Dynamic behaviour of light-weight solar collectors
21 p0056 A79-13628

Electronic components in solar technology
21 p0056 A79-13629

Solar power plants in the U.S.A.
21 p0057 A79-13640

Experimental results and concepts of different solar concentrators
21 p0057 A79-13643

Sea water desalination by means of solar energy
21 p0057 A79-13645

Selective solar absorbers --- coatings for solar collector applications
21 p0057 A79-13646

Reduction of the heat loss flux of collectors by infrared reflecting coatings on cover plates
21 p0058 A79-13649

Flexed beams in central receiver heliostat drives
[AIAA PAPER 78-1755] 21 p0060 A79-13856

The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860

Jet impingement solar air heater
[AIAA PAPER 78-1760] 21 p0061 A79-13861
Design of a second generation concentrating
tracking solar collector
[AIAA PAPER 78-1775] 21 p0062 A79-13872
Simulations of the performance of open cycle
desiccant systems using solar energy
21 p0066 A79-14262
Optimal sizing of solar collectors by the method
of relative areas
21 p0066 A79-14263
Use of plastics in solar energy applications
21 p0067 A79-14268
Estimating hourly solar radiation for one-axis
tracking focusing collectors
21 p0071 A79-14678
An inexpensive multiplexer temperature measuring
system for monitoring and evaluation of solar
collectors
21 p0089 A79-15847
External single pass to superheat receiver --- for
central receiver solar power plant
[AIAA PAPER 78-1751] 21 p0089 A79-15849
Boosting the performance of solar HVAC systems by
improving component interactions --- Heating,
Ventilating and Air Conditioning
21 p0089 A79-15851
Practical considerations for 'capturing the sun'
21 p0089 A79-15853
Long-term average performance of the Sunpak
evacuated-tube collector
21 p0089 A79-15854
Performance of evacuated solar collectors with
compound parabolic concentrators
21 p0089 A79-15855
Tracking high temperature collectors
21 p0090 A79-15856
Solar energy and the flat plate collector - An
annotated bibliography
21 p0090 A79-15858
A central receiver solar thermal power system
21 p0091 A79-15872
Simple procedure for predicting long term average
performance of nontracking and of tracking solar
collectors
21 p0091 A79-15873
10-megawatt solar central receiver pilot plant
21 p0094 A79-15906
Hail risk model for solar collectors
21 p0098 A79-16103
Verification of wedge concentration using a helium
neon laser --- solar collector design
21 p0098 A79-16104
Simulated hail impact testing of photovoltaic
solar panels
21 p0098 A79-16116
American Society of Heating, Refrigerating and
Air-Conditioning Engineers, Annual Meeting,
Albuquerque, N. Mex., June 25-29, 1978,
Technical and Symposium Papers
21 p0101 A79-16415
The use and limitations of ASHRAE solar algorithms
in solar energy utilization studies
21 p0101 A79-16416
Testing of solar collectors according to ASHRAE
Standard 93-77
21 p0101 A79-16417
Controls for residential solar heating
21 p0101 A79-16418
Solar controls and control modifications - New
century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419
Using controls to reduce component size and energy
needs for solar HVAC --- Heating Ventilation,
Air Conditioning
21 p0102 A79-16421
A graphical approach to the efficiency of
flat-plate collectors
21 p0102 A79-16422
The application of ASHRAE Standard 93-77 to the
thermal performance testing of air solar
collectors
21 p0102 A79-16423
Performance of vacuum tube solar collector systems
21 p0102 A79-16424
The El Camino Real Solar Cooling Demonstration
Project
21 p0102 A79-16425
Solar collectors. I - Fundamentals and collectors
of the past and present
21 p0103 A79-16455
Solar collectors. II - Recent developments and
future performance data and economic analysis
21 p0103 A79-16456
Solar thermal conversion
21 p0104 A79-16466
Analysis of optical behavior and collector
performance of a solar concentrator
21 p0107 A79-16545
Radiatively sustained cesium plasmas for solar
electric conversion
21 p0109 A79-16615
Magnetically confined plasma solar collector ---
satellite based system in space
21 p0109 A79-16617
Solar Thermal Electric Program
21 p0112 A79-16730
A status report on the Solar Thermal Test Facility
21 p0112 A79-16731
Factors affecting market initiation of solar total
energy
21 p0112 A79-16732
Non-adaptive optics for solar thermal electric power
21 p0112 A79-16733
Estimation of collector and electrical energy cost
for STEPS in Japan --- Solar Thermal Electric
Power System
21 p0118 A79-17288
Solar radiation studies for utilization of
flat-plate collectors in an equatorial region
21 p0119 A79-17311
Energy storage requirements for autonomous and
hybrid solar thermal electric power plants
21 p0120 A79-17315
A passive integrated unit for the collection,
thermal storage in fusion materials and
distribution of solar energy for home heating
and other applications
21 p0121 A79-17322
Analysis of thermal storage unit for solar energy
21 p0122 A79-17332
Concentrator photovoltaic systems for economical
electricity and heat
21 p0124 A79-17354
On the design of CPC photovoltaic solar collectors
--- Compound Parabolic Concentrator
[CONF-780114-8] 21 p0124 A79-17355
Transcell, a novel approach for improving static
photovoltaic concentration
21 p0124 A79-17356
Status report on selective surfaces --- solar
collector absorbers
21 p0126 A79-17374
Selective coatings for solar energy conversion
21 p0126 A79-17376
Studies on the selective absorption surface on
stainless steel --- for flat type solar collectors
21 p0127 A79-17378
On the use of grating or mesh selective filters to
increase the efficiency of flat plate solar
collectors
21 p0127 A79-17380
The structure and properties of Cu based selective
surfaces formed on an Al-Cu alloy by chemical
brightening and etching treatments --- for flat
plate solar collectors
21 p0127 A79-17384
A heat pipe collector for low temperatures
21 p0127 A79-17385
Optimum collection geometries for copper tube -
copper sheet flat plate collectors
21 p0127 A79-17387
An analytical and experimental study of pumped
solar water heaters
21 p0128 A79-17389
Flat plate collector dynamic evaluation
21 p0128 A79-17390
A parametric investigation on flat-plate solar
collectors
21 p0128 A79-17391
A comparison among various flat plate collectors
with honeycomb structures
21 p0128 A79-17392
Comparative outdoor measurements on flat-plate
solar collectors in a metropolitan area in
Western Germany
21 p0128 A79-17394

Reflecting horizontal collector
21 p0128 A79-17395

Economic use of materials in the design of solar water-heating collector plates of the pipe and fin type
21 p0129 A79-17396

Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397

An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398

Effect of dust on flat plate collectors
21 p0129 A79-17399

Convective effects in 'slat collectors'
21 p0129 A79-17400

Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection
21 p0129 A79-17401

Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402

Thermal performance of solar collectors used in the national solar heating and cooling demonstration program
21 p0130 A79-17403

Some aspects towards the performance evaluation and ensuing design components of solar collector systems
21 p0130 A79-17404

Comparative performance testing of flat-plate solar water heaters
21 p0130 A79-17405

Thermal performance testing of flat-plate solar collectors
21 p0130 A79-17407

Optimal profile of solar energy collectors
21 p0130 A79-17408

The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.P.I.
21 p0130 A79-17409

Testing of water-heating collectors according to ASHRAE Standard 93-77
21 p0130 A79-17410

Double-exposure collector system for solar heating applications
[CONF-780114-6] 21 p0131 A79-17411

Solar thermal collectors using planar reflector
21 p0131 A79-17412

Tilt, orientation and overshadowing of solar collectors in the Netherlands
21 p0131 A79-17414

Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415

Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417

Solar collector optimization
21 p0132 A79-17418

Design and optimization of a flat plate collector for cooling application
21 p0132 A79-17419

Anticonvective antiradiative systems --- for solar collectors
21 p0132 A79-17420

Optimum tube pitch in solar collectors
21 p0132 A79-17421

Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422

A report on the various heat collection and heat storage systems evolved under the solar energy programme at E. I. T. S.
21 p0132 A79-17423

Honeycomb type flat plate collectors - Experiments leading to drinking straw --- heat retention material for solar steam generation
21 p0132 A79-17424

Flat plate collector - Experimental studies and design data for India
21 p0132 A79-17425

Optimum tilt for the flat plate collector
21 p0132 A79-17426

A contribution to evaluation of flat-plate solar collectors performance
21 p0133 A79-17427

Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428

Liquid solar collector --- low cost assemblage with black water working fluid
21 p0133 A79-17433

Evacuated solar flat-plate collectors for economic applications
21 p0133 A79-17435

Construction and test of a test apparatus for determining the efficiency of solar collectors with the ASE-test method
21 p0134 A79-17436

Theoretical and experimental yields of a solar heater with flat plate collectors
21 p0134 A79-17437

Performance of optimal geometry three step compound wedge stationary concentrator --- solar collector using flat side mirrors
21 p0134 A79-17438

A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439

Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440

P.E.R.I.C.L.E.S. - Design of a stationary spherical collector --- solar energy application
21 p0134 A79-17441

An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442

Geometrical aspects of a cylindrical parabolic collector
21 p0134 A79-17443

Optimum design parameters of horizontal coaxial cylinders for a solar energy collector
21 p0134 A79-17444

Development of solar collectors for low temperature level and of concentrators for thermal and photoelectric conversion
21 p0135 A79-17445

A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446

Design fabrication and testing of three meter diameter parabolic dish heliostat system
21 p0135 A79-17447

High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448

The USA 5MW solar thermal test facility
21 p0135 A79-17449

Receiver designs for tower-top solar collector
21 p0135 A79-17450

Distribution of beam radiation of the receiver plane of a CPC solar concentrator --- Compound Parabolic Concentrators
21 p0135 A79-17451

Large-aperture radiant solar energy concentrators
21 p0135 A79-17452

Performance of solar concentrators - A theoretical study
21 p0135 A79-17453

Solar concentrators --- using cheap refractive lenses
21 p0136 A79-17455

Design, construction and performance of Fresnel lens for solar energy collection
21 p0136 A79-17456

A simple solar tracking system --- manually adjusted rotating shaft for solar concentrator positioning
21 p0136 A79-17457

The design and evaluation of a hydraulic-solar powered tracking device
21 p0136 A79-17458

Manufacture of curved glass mirrors for linear concentrators
21 p0136 A79-17459

Design of solar energy concentrators for power generation in residential and nonresidential areas
21 p0136 A79-17460

Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483

Dynamic response of a novel solar water heater --- collector using low-boiling liquid between flat plates
21 p0140 A79-17488

Experimental investigation on solar house heating in northern India
21 p0140 A79-17495

Preliminary results from the Georgia Tech 400 kWth Solar Thermal Test Facility
21 p0141 A79-17499

Design and performance of 1/4 H.P. solar power unit
21 p0141 A79-17503

Medium capacity heliothermal power stations
21 p0142 A79-17507

The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

Laser ray trace tester for parabolic trough solar collectors
21 p0144 A79-17619

The development of photovoltaic conversion systems with sunlight concentration
21 p0148 A79-17995

Econometric analysis of concentrators for solar cells
21 p0149 A79-18017

Optimal geometries for one- and two-faced symmetric side-wall booster mirrors --- for solar collectors
21 p0149 A79-18019

Calculation of flat-plate collector utilizability
21 p0149 A79-18020

Ideal prism solar concentrators
21 p0149 A79-18023

The place of extreme asymmetrical non-focussing concentrators in solar energy utilization
21 p0149 A79-18024

Shading and spacing in paraboloidal collector arrays
21 p0150 A79-18025

Some aspects of the transient response of a flat-plate solar energy collector
21 p0153 A79-18466

Gas-cycle solar refrigeration system performance
21 p0153 A79-18471

Performance testing of solar collectors
21 p0155 A79-18875

Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834

Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes
[ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836

Efficiency degradation due to tracking errors for point focusing solar collectors
[ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837

Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838

1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839

A theoretical analysis of solar collector/storage panels
[ASME PAPER 78-WA/SOL-11] 21 p0163 A79-19843

Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SOL-13] 21 p0163 A79-19845

Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses
21 p0164 A79-19949

Composite heliostats of large solar plants
21 p0166 A79-20350

Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356

Suitable optical materials for solar collector applications
22 p0239 A79-20823

Analysis and design of a field of heliostats for a solar power plant
22 p0242 A79-21161

Optimal distribution of heat conducting material in the finned pipe solar energy collector
22 p0242 A79-21163

Computer based sun following system
22 p0242 A79-21165

Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166

Comparison of transient heat transfer models for flat plate collectors
22 p0242 A79-21168

The application of thermography to large arrays of solar energy collectors
22 p0242 A79-21171

Solar heating using a heat pump and cold collectors
22 p0254 A79-22268

Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269

Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors
22 p0256 A79-22855

Efficiency of a series of thermoelectric generators in a solar wedge concentrator
22 p0260 A79-23618

A comparison of compound parabolic and simple parabolic concentrating solar collectors
22 p0262 A79-23754

Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755

Solar thermal electric power systems - Comparison of line-focus collectors
22 p0263 A79-23758

Optimum collector slope for residential heating in adverse climates
22 p0263 A79-23761

Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design
22 p0263 A79-23764

The cryogenic heat transfer tunnel - A new tool for convective research --- thermal efficiency testing of solar tower receiver
22 p0267 A79-24316

Effects of test fluid, flow rate, and flow regime on solar collector thermal performance measurements
22 p0268 A79-24317

Selected ordinates for total solar radiant property evaluation from spectral data
22 p0271 A79-25060

Radiant exchange for a fin and tube solar collector
22 p0271 A79-25066

A test bed for thermosyphon solar air collectors
[AIAA PAPER 79-0541] 22 p0274 A79-25860

Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939

Analysis and design of air heating unglazed flat plate solar collectors
22 p0280 A79-26202

Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204

Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors
22 p0281 A79-26206

Cavity-type surfaces for solar collectors
22 p0283 A79-26497

Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors
22 p0285 A79-26815

Efficient Fresnel lens for solar concentration
22 p0285 A79-26816

Heat loss characteristics of an evacuated plate-in-tube collector
22 p0285 A79-26818

Economic feasibility of solar water and space heating
22 p0292 A79-27899

Optical coatings for a space laser communications system
22 p0292 A79-28028
Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978
22 p0293 A79-28140
First-order design variables for concentrating solar collectors
22 p0293 A79-28141
System designs for low cost-low ratio solar concentrators
22 p0293 A79-28142
Linear echelon refractor/reflector solar concentrators
22 p0293 A79-28143
A flat plate multiple pass solar collector using aqueous optical properties
22 p0293 A79-28144
A parabolic solar reflector for accurate and economic producibility
22 p0293 A79-28145
A comparison of solar thermal energy collection using fixed and tracking collectors
22 p0293 A79-28146
Specularity measurements for solar materials
22 p0294 A79-28153
Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors
22 p0295 A79-28356
Effect of form errors on the characteristics of ellipsoidal radiant energy concentrators
22 p0296 A79-28667
Accelerated tests for coatings --- for solar concentrators
22 p0296 A79-28668
Controlling the radiant flux of a high-temperature solar energy conversion system over two parameters
22 p0296 A79-28669
Study of the spectral characteristics of metallized polymer films for production of solar concentrators
22 p0297 A79-28672
Symmetrical and asymmetrical ideal cylindrical radiation transformers and concentrators
22 p0303 A79-29647
Space solar power - An energy alternative
22 p0303 A79-29796
Regulation and control concepts for the possibilities of a utilization of solar energy in the low-temperature range
22 p0305 A79-30345
Design considerations of small solar collector systems using plane heliostats
[ASME PAPER 79-SOL-2] 22 p0307 A79-30540
Ranking and evaluation of flat-plate collectors - Two new approaches --- for seasonal storage solar-heating systems
22 p0316 A79-31402
Optimization of the flow passage geometry for air heating solar collectors
22 p0316 A79-31403
Performance analysis of a flat-plate solar collector using 'forge-fin' tubes
22 p0316 A79-31404
Energy analysis of an aluminum solar collector
22 p0316 A79-31405
Dimensional relations for free convective heat transfer in flat-plate collectors --- solar collector heat loss
22 p0316 A79-31406
Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector
22 p0317 A79-31408
A solar collector thermal performance test for developmental programs
22 p0317 A79-31413
Report on a survey of operational solar systems
22 p0318 A79-31418
The performance of a site built, air heating, vertical collector with snow reflector in Quebec
22 p0319 A79-31423
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424
A cost effective vertical air/water solar heating collector
22 p0320 A79-31430
Collector and storage efficiencies in solar heating systems
22 p0320 A79-31432
Solar heating and ventilation using the modified Trombe wall system
22 p0320 A79-31435
South wall solar collector with active collector system
22 p0320 A79-31436
Economic design of a solar domestic water heating system
22 p0321 A79-31438
Mathematical modelling of passive solar systems
22 p0321 A79-31441
The honeycomb heat trap - Its application in flat plate solar collectors
22 p0322 A79-31447
Cylindrical parabolic collector optimization for interfacing with steam turbine generators
22 p0322 A79-31448
The first year of solar collector testing at Ontario Research
22 p0322 A79-31450
Studies on solar collector performance at NRC
22 p0322 A79-31451
Alternate energy installations on the Jordan College Campus
22 p0323 A79-31454
Determination of the potential for solar retrofitting in Edmonton --- pilot systems for single family dwellings
22 p0323 A79-31456
Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457
P.E.I. solar assisted domestic water heat project
22 p0323 A79-31458
A simple solar gas turbine plant
[ASME PAPER 79-GT-90] 23 p0377 A79-32367
Mississippi County Community College solar photovoltaic total energy project
[ASME PAPER 79-SOL-13] 23 p0380 A79-32463
Comparative efficiencies of solar energy collectors
23 p0382 A79-32955
Theoretical and practical aspects of heat transfer in the window-absorber cavity of a flat plate collector
23 p0383 A79-32957
Model of fluid flow in boilers with helicoidal coil --- for spherical solar collectors
23 p0383 A79-32959
Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970
Weightless solar energy collection
23 p0385 A79-33215
System data on flat-plate collectors and its optimization
23 p0385 A79-33217
Characteristics of GRP for applications in solar energy collectors
23 p0385 A79-33218
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 1 - Solar energy 1
23 p0398 A79-33984
Computer modelling of solar energy collection
23 p0398 A79-33986
Accuracy of empirical relations for flat plate collector performance prediction
23 p0398 A79-33987
New concept in solar thermal collectors
23 p0398 A79-33988
Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector
23 p0398 A79-33989
Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation
23 p0398 A79-33990
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991

Further modeling of a solar collector based on linear clipped-V channels
23 p0399 A79-33993
Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system
23 p0399 A79-33994
Test results of a moderately focusing flat-plate solar collector
23 p0399 A79-33995
A combination solar direct electric conversion concentrator and heat collector system
23 p0399 A79-33996
A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997
A novel design of evacuated-concentrating spherical collector
23 p0399 A79-33998
Solar energy conversion system - Four quadrant, two dimension linear solar concentrators
23 p0399 A79-33999
Optimization of a fixed solar thermal collector
23 p0400 A79-34000
An economic comparison between solar and conventional residential air conditioning in Miami, Florida
23 p0401 A79-34013
Complex solar-electrical plant of large capacity
23 p0403 A79-34029
Heat extraction from a salt gradient solar pond
23 p0410 A79-34085
Liquid hydrogen from solar energy now
23 p0414 A79-34117
Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372
A central receiver solar thermal power system
23 p0424 A79-34455
Design study - Solar systems for commercial buildings
23 p0425 A79-34601
The polar lunar base - A viable alternative to L-5
[AAS 78-191] 23 p0427 A79-34862
Concentrating solar collector test results from DOE/Sandia Collector Module Test Facility
23 p0428 A79-35044
Testing of central receiver for central thermal power systems
23 p0428 A79-35045
The DOE 5 MW Solar Thermal Test Facility
23 p0428 A79-35046
White Sands solar test facility
23 p0429 A79-35048
Sandia Laboratories' Midtemperature Systems Test Facility
23 p0429 A79-35049
Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056
Air collector testing utilizing ASHRAE 93-77 --- standards for testing of solar collectors using air as heat transfer medium
23 p0430 A79-35062
Problems in collector testing --- for solar system thermal performance
23 p0430 A79-35064
Correlation of instantaneous and all-day thermal performance of flat-plate solar collectors
23 p0430 A79-35065
Parameters, measurement and criteria of solar materials testing
23 p0431 A79-35072
Degradation of polymethylmethacrylate by radiation --- solar collector cover material
23 p0431 A79-35074
SERI solar energy standards activities
23 p0431 A79-35075
Cast acrylic Fresnel lenses for solar energy concentration
23 p0432 A79-35076
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties
23 p0433 A79-35381
Combined radiant-flux controller for a high-temperature solar energy system
23 p0433 A79-35382
An oil company expresses interest in solar energy
23 p0434 A79-35478
SOLPAC - A total design for energy conservation in housing
23 p0434 A79-35479
Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480
Health and safety hazards associated with solar concentration systems
23 p0439 A79-36628
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629
Extension of the Hottel-Whillier model to the analysis of combined photovoltaic/thermal flat plate collectors
23 p0439 A79-36633
Practical design considerations for CPC solar collectors --- Compound Parabolic Concentrator
23 p0439 A79-36634
Concentrator cost bound for high-efficiency photovoltaic power production --- mathematical model
23 p0440 A79-36637
Silicon solar cells for operation in concentrated sunlight
23 p0441 A79-36780
Relationship of optical degradation to surface morphology changes in solar absorbers
23 p0446 A79-37158
The development and construction of a simulator for the proof testing of solar power devices
23 p0448 A79-37846
The significance of longwave radiation in flat plate solar collector testing
23 p0448 A79-37847
Some practical aspects of the design and installation of domestic solar energy systems in the UK
23 p0452 A79-37884
Complex static mirror solar concentration arrays
23 p0452 A79-37886
Large scale solar thermal power generation
23 p0452 A79-37890
Flight performance evaluation of heat pipe solar collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041
Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38045
Testing and evaluation methods to determine an optimal air-flow rate in flat-plate solar collectors
[AIAA PAPER 79-0972] 23 p0456 A79-38179
Domestic hot water heating using hot air solar collectors
[AIAA PAPER 79-0973] 23 p0457 A79-38180
Solar collector sizing and design - An overview
[AIAA PAPER 79-0975] 23 p0457 A79-38181
Thermal performance of integrated solar collector evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182
Fully developed laminar heat transfer in passages of triangular cross section for application to solar collector plate design
[AIAA PAPER 79-0974] 23 p0458 A79-38189
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193
Ceramic receivers for solar power conversion
[AIAA PAPER 79-1008] 23 p0459 A79-38200
Solar heating and load managed/solar cooling of a small commercial building using flat plate collectors
[AIAA PAPER 79-1020] 23 p0460 A79-38205
The THEK program for solar energy plants with 'distributed' converters
23 p0462 A79-38574
Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575

International Solar Forum, 2nd, Hamburg, West Germany, July 12-14, 1978, Reports. Volumes 1, 2 & 3
23 p0463 A79-38576

Design of the Eichenau solar house --- emphasizing heat insulation and solar collection and conversion
23 p0463 A79-38579

Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583

Critical study of energy parameters of solar energy /illumination and concentration/ - Application to catoptric collectors
23 p0463 A79-38584

The development of a stationary concentrator --- parabolic solar absorber surface effects on energy conversion performance
23 p0464 A79-38586

Suntrack-systems for solar concentrators
23 p0464 A79-38587

Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588

Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591

Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593

System analysis of solar space heating
23 p0465 A79-38595

Active heat insulation through solar low-temperature system that can be integrated into the house wall
23 p0465 A79-38596

Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607

Transient behaviour of solar flat plate collectors
23 p0467 A79-38612

Thermal performance of single-pass solar fluid heaters
23 p0467 A79-38613

Mass production of solar collectors and components
23 p0467 A79-38614

The air-water collector - Operating experience and utilization possibilities --- for solar heating
23 p0467 A79-38615

Influence of storage tank heat exchanger and mass flow rate on collector efficiency of solar heating units
23 p0468 A79-38625

Solar-assisted heat pump heating with tube collectors
23 p0469 A79-38635

Uncovered absorber combined with flatroof collectors and heatpump
23 p0469 A79-38636

Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642

Solar collector tests in Rwanda
23 p0470 A79-38643

Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644

European solar collector development and testing - A commercial view
23 p0470 A79-38645

A low energy house in Sweden heated by a solar energy system with heat pump
23 p0471 A79-38650

The design of four solar houses in Zoetermeer, The Netherlands
23 p0471 A79-38651

Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660

Design of a public exhibition building to demonstrate air, water, and passive solar heating systems
23 p0474 A79-38673

A discrete, stochastic simulation model for the analysis and design of solar energy heating systems
23 p0475 A79-38878

Solar Stirling system development
[AIAA PAPER 79-1009]
23 p0476 A79-38894

Cost reduction using modular installation for solar heating, cooling and water heating at the life clinic in Brandon, Florida
[AIAA PAPER 79-1021]
23 p0476 A79-38895

Analysis, development and testing of a fixed tilt solar collector employing reversible Vee-Trough reflectors and vacuum tube receivers
23 p0477 A79-39101

Thermal energy conversion with fluorescent collector-concentrators
23 p0477 A79-39103

Comparison of 100 per cent solar heated residences using active solar collection systems
23 p0477 A79-39106

Performance of a collector/storage solar water heater
23 p0479 A79-39843

Concentrator for solar air heater
23 p0487 A79-40379

Solar collector development in Iran
23 p0493 A79-40675

Status of the photovoltaic concentrator applications experiments
23 p0496 A79-40884

Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975

A low cost, durable anti-reflective film for solar collectors
23 p0507 A79-40983

Evaluation of a plastic parabolic concentrator for terrestial photovoltaic applications
23 p0508 A79-40995

A novel low-cost photovoltaic concentrator
23 p0508 A79-40996

Luminescent solar concentrators
23 p0509 A79-40997

Optimization of the geometrical parameters for arrays of tracking solar collectors to give minimum energy cost
23 p0511 A79-41016

Model for comparing cost of flat-array and concentrator photovoltaic solar-cell systems
23 p0514 A79-41035

Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036

Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038

GaAs solar cells for high solar concentration applications
23 p0514 A79-41039

High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040

Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056

Large-area concentrator solar cells
23 p0517 A79-41057

10 kW photovoltaic concentrator system design
23 p0519 A79-41070

Combined photovoltaic thermal collector testing
23 p0519 A79-41072

Combined photovoltaic and thermal hybrid collector systems
23 p0519 A79-41073

Performance tests of organic dyes in a planar solar concentrator with ribbon photovoltaic cells
23 p0519 A79-41074

Optimization of terrestrial photovoltaic power systems
23 p0520 A79-41076

Integrated solar energy installations for isolated operation
23 p0522 A79-41239

Fixed-focal-axis solar concentrators with a curvature determined by gravity
23 p0523 A79-41254

Spectral-selective surfaces for the thermal conversion of solar energy --- Thesis
23 p0523 A79-41732

Optimal control of sun tracking solar concentrators
23 p0526 A79-41831
Transient response of a solar regenerator
23 p0526 A79-41935
Effects of nonuniform distribution of the absorber
temperature on radiation losses of a flat-plate
solar collector
23 p0530 A79-42894
A reflecting radiation trap for producing higher
temperatures in flat-plate solar collectors
23 p0530 A79-42895
Dynamic modeling of water- and air-heating solar
collectors
23 p0531 A79-42897
An interferometric study of the local heat
transfer by natural convection in inclined
airfilled enclosures
23 p0531 A79-42908
An overview of intermediate temperature solar
collector and energy storage technology
23 p0533 A79-43018
Structural optimization of SMC line focusing
collectors
23 p0534 A79-43295
An efficient optical window for flat-plate solar
energy collectors
23 p0536 A79-43591
Orientation studies for single-axis concentrating
collectors
23 p0537 A79-43677
Absence of bending effects on solar-receiver-tube
fatigue
23 p0537 A79-43682
Turning to the sun for power
24 p0601 A79-44239
Calculating the radiant field of concentrators
with artificial sources
24 p0602 A79-44259
Solar radiation concentrator for uniform
irradiation of flat energy receivers and
converters
24 p0602 A79-44260
Accuracy and energy characteristics of
paraboloidal heliostat system
24 p0602 A79-44261
Composite paraboloidal radiant energy concentrators
24 p0602 A79-44262
Experimental study of mass exchange in glazed
solar solution regenerator
24 p0602 A79-44264
Transient plate temperature in flat plate solar
collectors
24 p0603 A79-44294
Solar concentrator flux distributions using
backward ray tracing
24 p0603 A79-44365
The influence of environmental parameters on flat
plate solar collector performance
24 p0604 A79-44557
The engineering analysis of solar radiation
24 p0605 A79-44796
An optical valve for flat-plate solar energy
collectors
24 p0607 A79-45154
Application of solar energy; Proceedings of the
Third Southeastern Conference, Huntsville, Ala.,
April 17-19, 1978
24 p0607 A79-45201
Economics of preheating water for commercial use
--- solar collector system
24 p0608 A79-45206
Solar 'Plus' - Huntsville, Alabama
24 p0608 A79-45209
Application of system design techniques to a solar
domestic hot water retrofit and an 87 unit
apartment complex
24 p0608 A79-45210
Graphical representation of solar collector
performance
24 p0609 A79-45216
Protection of solar collector materials from UV
24 p0609 A79-45217
Solar farm buildings collect energy for crop drying
24 p0610 A79-45224
Use of meteorological data in system evaluation
--- of solar energy collection efficiency
24 p0610 A79-45225
On solar energy heating and degree days during the
winter months
24 p0610 A79-45226
Low cost selective surface-carbon particle coating
--- for metal absorbor plates in solar collectors
24 p0611 A79-45228
Collector testing in the MSFC simulator --- for
solar collector performance
24 p0611 A79-45230
The distributed flow, below atmospheric pressure
solar collector
24 p0631 A79-46314
Polyelectrolyte electrets for electrical energy
storage
24 p0632 A79-46316
Solar energy thermoreceiver with selective coating
and vacuum thermoisolation
24 p0636 A79-46761
The effect of errors in their shape on the
characteristics of ellipsoidal concentrators of
radiant energy
24 p0637 A79-46905
Accelerated tests of coatings --- for solar
concentrators
24 p0637 A79-46906
Control of the radiant flux of high-temperature
solar-energy installations with respect to two
parameters
24 p0637 A79-46907
Investigation of the spectral characteristics of
metallized polymer films for making solar
concentrators
24 p0637 A79-46910
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651
Ni cermet selective absorbers for solar
photothermal conversion
24 p0641 A79-47790
An analysis of the terminal concentrator concept
for solar central receiver systems
24 p0641 A79-47792
Thermal analysis in the focal spot of a solar
furnace
24 p0641 A79-47794
Relation between concentration and acceptance in
solar collectors
24 p0641 A79-47795
An evacuated glass tube solar collector and its
application to a solar cooling, heating and hot
water supply system for the hospital in Kinki
University
24 p0641 A79-47797
Cover systems for high temperature flat-plate
solar collectors
24 p0642 A79-47799
Analysis of an evacuated cylindrical solar collector
24 p0642 A79-47800
Wind and solar energies in the tornado type wind
energy system
24 p0645 A79-48068
An optimized grid design for a sun-concentrator
solar cell
24 p0645 A79-48273
Optimum grid design for a nonuniformly illuminated
sun-concentrator solar cell
24 p0645 A79-48274
Large-area silicon photocells for the
investigation of the optical/energetic
characteristics of solar and radiant-energy
concentrators
24 p0646 A79-48735
Principles for the calculation of heliostat fields
of a solar power plant
24 p0646 A79-48738
Heating characteristics of concentrator/receiver
systems using selective absorption surfaces
24 p0646 A79-48739
Calculation of the optical characteristics of
high-power two-mirror solar furnaces
24 p0648 A79-49183
Method of calculating heat storages for solar
heating systems
24 p0648 A79-49184
Solar comes out of the shadows --- energy
conversion technology forecasting
24 p0651 A79-49424
Design of selective surfaces for solar energy
collection
24 p0655 A79-50190

Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization 24 p0656 A79-50188

Solar potential inventory and modeling 24 p0657 A79-50219

Evaluation of solar absorbers, reflectors and transmitters - Physical reflectance standards 24 p0657 A79-50327

Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility 24 p0658 A79-50343

Concentration of a cassegrain solar furnace 24 p0658 A79-50344

Thermal vacuum testing of solarpanels by solar simulation and infrared simulation 24 p0658 A79-50345

Testing for commercialization of the central power tower --- pilot plant for megawatt solar power generation 24 p0660 A79-50460

The steady state salt gradient solar pond 24 p0661 A79-50540

Static concentrators for two-sided photovoltaic solar cells 24 p0661 A79-50542

Performance of flat plate solar collector with fluid undergoing phase change 24 p0661 A79-50544

New ideal concentrators for distant radiation sources 24 p0661 A79-50547

Spectral emissivity of porous graphite heated in an air atmosphere 24 p0662 A79-50703

Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties 24 p0663 A79-50704

Combination radiant-flux radiator for high-temperature solar plant 24 p0663 A79-50705

Siting considerations for solar thermal electric generating plants 24 p0664 A79-50879

Statistical correlation between daily and monthly averages of solar-radiation data 24 p0668 A79-51022

Optical simulation for a fixed spherical solar collector 24 p0668 A79-51177

Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation 24 p0669 A79-51178

Optical properties of aggregated gold on aluminum 24 p0669 A79-51181

Weight minimization of sandwich type solar collector panels 24 p0670 A79-51727

Elastically deformed, linear focusing solar reflector 24 p0670 A79-51728

Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system 24 p0670 A79-51729

A simulation exercise of a cavity-type solar receiver using the HEAP program 24 p0670 A79-51730

Ceramic solar receivers 24 p0670 A79-51731

Projected techno-economic improvements for advanced solar thermal power plants 24 p0671 A79-51733

Solar pond concepts - Old and new 24 p0671 A79-51734

Advanced solar thermal technology - Potential and progress 24 p0671 A79-51739

Solar collector as heat pump evaporator 24 p0672 A79-51744

Solar parabolic dish thermal power systems - Technology and applications 24 p0674 A79-51755

Solar central receiver program 24 p0674 A79-51756

The desiccant/rock bed method of solar cooling with air collectors 24 p0676 A79-51771

A solar-Stirling small power system 24 p0690 A79-51884

Advances in Stirling engine technology 24 p0690 A79-51888

Enhancement of solar arrays in space through the use of concentrators 24 p0692 A79-51905

Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power 24 p0699 A79-51977

Coatings for enhanced photothermal energy collection. I - Selective absorbers 24 p0704 A79-52307

The potential of np GaAs solar cells for high efficiency concentrator applications 24 p0705 A79-52325

Evacuated heat pipe solar collector 24 p0708 A79-52954

Superlight rotating reflectors in space [IAF PAPER 79-112] 24 p0709 A79-53301

Thin film solar collectors for material science experiments in space [IAF PAPER 79-202] 24 p0710 A79-53353

Optimization of a fixed solar thermal collector 24 p0712 A79-53490

On the calculation of the temperature distribution in a packed bed for solar energy applications 24 p0712 A79-53495

Optical and thermal analysis of a Cassegrainian solar concentrator 24 p0713 A79-53498

Alternative power-generation systems 21 p0169 N79-10129

Indoor test for thermal performance evaluation on the Northrup concentrating solar collector [NASA-CR-150804] 21 p0172 N79-10515

Thermal performance evaluation of the Calmac (liquid) solar collector [NASA-CR-150819] 21 p0173 N79-10521

Development of surfaces optically suitable for flat solar panels [NASA-CR-150831] 21 p0173 N79-10522

Design package for concentrating solar collector panels [NASA-CR-150788] 21 p0173 N79-10523

Status of the DOE photovoltaic concentrator technology development project [SAND-78-0948C] 21 p0176 N79-10550

Solar ponds. Citations from the NTIS data base [NTIS/PS-78/0836/3] 21 p0176 N79-10553

Solar ponds. Citations from the engineering index data base [NTIS/PS-78/0837/1] 21 p0176 N79-10554

Solar energy concentrator design and operation. Citations from the NTIS data base [NTIS/PS-78/0838/9] 21 p0178 N79-10566

Analytical methods for evaluating two-dimensional effects in flat-plate solar collectors 21 p0181 N79-11462

Thermal analysis of receivers for solar concentrators and optimization procedure for power production 21 p0182 N79-11465

Solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 21 p0182 N79-11467

Method for making an aluminum or copper substrate panel for selective absorption of solar energy [NASA-CASE-MFS-23518-1] 21 p0182 N79-11469

Non-tracking solar energy collector system [NASA-CASE-NPO-13817-1] 21 p0182 N79-11471

Solar cell collector and method for producing same [NASA-CASE-LEW-12552-2] 21 p0182 N79-11472

Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results [LA-7041] 21 p0185 N79-11494

Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner [SAND-78-0700] 21 p0185 N79-11496

Fixed mirror solar concentrator for power generation [GA-A-14883] 21 p0187 N79-11526

Methods for reducing heat losses from flat plate solar collectors, phase 2 [COO-2597-4] 21 p0188 N79-11533

MSFC hot air collectors
[NASA-TM-78206] 21 p0196 N79-12556
Combined photovoltaic thermal collector testing
[SAND-78-1191C] 21 p0198 N79-12570
Provisional flat plate solar collector testing procedures
[PB-283721/9] 21 p0198 N79-12571
Long-term weathering effects on the thermal performance of the Lennox/Honeywell (liquid) solar collector
[NASA-CR-150818] 21 p0204 N79-13493
Libbey-Owens-Ford solar collector static load test
[NASA-CR-150852] 21 p0205 N79-13494
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507
Design of low-cost structures for photovoltaic arrays. Task 1: Survey of array structural characteristics
[SAND-78-7021] 21 p0206 N79-13509
Concentrating solar collector test results, Collector Module Test Facility
[SAND-78-0815] 21 p0208 N79-13522
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528
Solar evacuated tube collector: Absorption chiller systems simulation
[COO-2577-13] 21 p0209 N79-13530
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-78/0840/5] 21 p0212 N79-13551
Concentrator enhanced solar arrays design study
[NASA-CR-158032] 21 p0219 N79-14546
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568
Performance testing of the Hexcel Parabolic Trough Solar Collector
[SAND-76-0381] 21 p0221 N79-14569
Recommendations for the conceptual design of the Barstow, California, solar central receiver pilot plant: Executive summary
[SAND-77-8035] 21 p0221 N79-14571
Thermal performance evaluation of the Solargenics solar collector at outdoor conditions
[NASA-CR-150857] 21 p0228 N79-15401
Design data brochure for the Owens-Illinois Sunpak (TM) air-cooled solar collector
[NASA-CR-150868] 21 p0229 N79-15404
Qualification test and analysis report: Solar collectors
[NASA-CR-150860] 22 p0333 N79-16360
Analysis and experimental tests of a high-performance evacuated tubular collector
[NASA-CR-150874] 22 p0334 N79-16370
Long term weathering effects on the thermal performance of the sunworks (liquid) solar collector
[NASA-CR-150899] 22 p0341 N79-17328
Preliminary design package for Sunair SEC-601 solar collector
[NASA-CR-150875] 22 p0341 N79-17332
Development, testing, and certification of Calmac Mfg. Corp. solar collector and solar operated pump
[NASA-TM-78218] 22 p0342 N79-17338
An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445
Thermal performance evaluation of MSFC hot air collectors with various flow channel depth
[NASA-CR-150900] 22 p0348 N79-18449
Long-term weathering effects on the thermal performance of the Libbey-Owens-Ford (liquid) solar collector
[NASA-CR-161093] 22 p0348 N79-18450
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457
Proposal for a representation of the quasisteady-state performance of flat-plate collectors
[ASSA-SF-B21/77] 22 p0349 N79-18461
Optical coatings for solar cells and solar collectors. Citations from the NTIS data base
[NTIS/PS-78/1341/3] 22 p0350 N79-18465
Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base
[NTIS/PS-78/1342/1] 22 p0350 N79-18466
A two-dimensional thermal analysis of a new high-performance tubular solar collector
22 p0352 N79-19060
Electromagnetic radiation energy arrangement --- coatings for solar energy absorption and infrared reflection
[NASA-CASE-NOO-00428-1] 22 p0352 N79-19186
A fixed tilt solar collector employing reversible vee-through reflectors and evaluated tube receivers for solar heating and cooling systems
[NASA-CR-158420] 22 p0359 N79-20490
The parabolic concentrating collector: A tutorial
[NASA-CR-158426] 22 p0359 N79-20491
Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator
[NASA-TM-78222] 22 p0360 N79-20495
An improved solar energy receiver for a stirling engine
[NASA-CASE-NPO-14619-1] 22 p0362 N79-20513
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519
Laboratories technically qualified to test solar collectors in accordance with ASHRAE standard 93-77: A summary report
[PB-289729/6] 22 p0363 N79-20524
Solar space heaters for low-income families
[PB-289244/6] 22 p0363 N79-20526
A low cost high temperature sun tracking solar energy collector
22 p0366 N79-21390
Development, testing, and certification of the Northrup, Inc., ML series concentrating solar collector model NSC-01-0732
[NASA-TM-78219] 22 p0371 N79-21618
Design package for programmable controller and hydronic subsystem
[NASA-CR-161151] 22 p0371 N79-21619
Development, testing, and certification of Owens-Illinois model SEC-601 solar energy collector system
[NASA-TM-78223] 22 p0371 N79-21620
Long term weathering effects on the thermal performance of the solaron (air) solar collector
[NASA-CR-161166] 22 p0371 N79-21621
Experimental verification of a standard test procedure for solar collectors
[PB-289912/8] 22 p0372 N79-21632
Computerized simulation and parameterization of a new high-performance tubular solar collector
23 p0539 N79-22163
Horizontally mounted solar collector
[NASA-CASE-MFS-23349-1] 23 p0546 N79-23481
Cost-effective potential of optimumly designed heat pumps for the collection, storage, and distribution of solar energy
[BNL-25195] 23 p0556 N79-24307
Primary reflector for solar energy collection systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432
Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433
Comparison of three experimental methods used in determining the thermal performance of flat-plate solar collectors
23 p0557 N79-24434
Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158679] 23 p0558 N79-24448
Thermal power systems, point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-158534] 23 p0560 N79-24464
HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers --- solving the heat transfer problem
[NASA-CR-158640] 23 p0560 N79-24466
Solar project cost report: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/60] 23 p0562 N79-24482
Solar project description. Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/50] 23 p0563 N79-24496

Solar project description. Terrell F. Moseley Office Building, Lynchburg, Virginia
[SOLAR/2011-78/50] 23 p0563 N79-24498
Solar project description. Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/50] 23 p0564 N79-24499
Photovoltaic concentrator system technology and applications experiments
[SAND-78-2184] 23 p0565 N79-24511
Relative effective solar space heating over the United States obtained from southward-tilted solar collectors
[PB-292963/6] 23 p0565 N79-24513
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311
Certification and verification for Northrup model NSC-01-0732 fresnel lens concentrating solar collector
[NASA-CR-161164] 23 p0572 N79-25504
Performance testing of the General Atomic Fixed mirror solar concentrator
[SAND-78-0624] 23 p0573 N79-25519
Concentrating solar collector test results from DOE/Sandia collector module test facility
[SAND-78-0881C] 23 p0573 N79-25520
Comparison of collector test methods
[ASSA-SE-B24/77] 23 p0574 N79-25526
Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78] 23 p0574 N79-25528
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384
Analysis of flat mirror V-trough solar concentrator
23 p0579 N79-26472
Central receiver thermal power system
[AED-CONF-78-212-008] 23 p0582 N79-26513
Design of a 150 kWe distributed collector solar thermal power station
[AED-CONF-78-212-013] 23 p0583 N79-26517
Combined photovoltaic and thermal hybrid collector systems
[COO-4577-3] 23 p0583 N79-26525
Performance prediction evaluation of ceramic materials in point-focusing solar receivers
[NASA-CR-158774] 23 p0594 N79-27654
Thermal performance evaluation of the Semco (liquid) solar collector
[NASA-CR-161230] 23 p0594 N79-27656
Indoor test for thermal performance evaluation of seven Elcam fin-tube solar collector configurations
[NASA-CR-161236] 23 p0594 N79-27657
Modeling passive solar buildings with hand calculations --- conferences
[LBL-8583] 23 p0596 N79-27683
Solar tracking system --- with pointing control circuits
[NASA-CASE-MFS-23999-1] 24 p0721 N79-28667
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-81764] 24 p0725 N79-28753
Solar collector manufacturing activity
[DOE/EIA-0174] 24 p0728 N79-28787
Long-term weathering effects on the thermal performance of the solargenics (liquid) solar collector at outdoor conditions --- Marshall Space Flight Center Solar test facility
[NASA-CR-150523] 24 p0737 N79-29601
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624
Bismarck, North Dakota, office commercial solar demonstration design and construction report
[COO-4228-1] 24 p0739 N79-29633
Simulation and design of solar thermal processes
[COO-2588-2] 24 p0741 N79-29655
Deterministic insolation model program description and user's guide --- for approximate analysis of solar systems
[SAND-78-7044] 24 p0744 N79-29743
Indoor test and long-term weathering effects on the thermal performance of the solar energy system (liquid) solar collector --- Marshall Space Flight Center solar test facility and solar simulator
[NASA-CR-150794] 24 p0749 N79-30715
Linear concentrating solar collectors: Current technology and applications
[SAND-78-0949] 24 p0754 N79-30784
Economy of a retrofit solar system
[CONF-790213-2] 24 p0755 N79-30795
Development of a low-temperature, low-cost, black-liquid solar collector
[CONF-780983-14] 24 p0756 N79-30805
Analysis of collectors for process heat applications
[SAND-78-1977] 24 p0756 N79-30806
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780
Helios model for the optical behavior of reflecting solar concentrators
[SAND-76-0347] 24 p0774 N79-31806
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680
Performance testing of the Del concentrating solar collector
[SAND-79-0515] 24 p0786 N79-32681
Combined photovoltaic/thermal system studies
[SAND-78-7031] 24 p0787 N79-32691
Isothermal flow distribution in solar collectors and collector manifolds
[ALO-5319-1] 24 p0789 N79-32708
Effects of noncontact cleaners on transparent solar materials
[PNL-2969] 24 p0789 N79-32709
Structural optimization of sheet molding compound line focusing collectors
[SAND-79-0215C] 24 p0790 N79-32710
Small-scale solar simulator for indoor testing of collector modules and materials
[LA-UR-79-1335] 24 p0790 N79-32716
Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector
[NASA-CR-161306] 24 p0797 N79-33561
Indoor test for thermal performance of the GE TC-100 liquid solar collector eight- and ten-tube configuration --- Marshall Space Flight Center solar simulator
[NASA-CR-161305] 24 p0798 N79-33568
Owens-Illinois subsystem design package for the SEC-601 air-cooled solar collector
[NASA-CR-161094] 24 p0798 N79-33570
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 1: Technical studies for solar point-focusing, distributed collector system, with energy conversion at the collector, category C
[NASA-CR-162369] 24 p0799 N79-33573

SOLAR CONSTANT

Total solar irradiance at Table Mtn, California 1926-77
21 p0067 A79-14269
Solar spectral irradiance at ground level
23 p0429 A79-35053

SOLAR COOLING

Can solar energy contribute significantly to the solution of the world's energy famine
21 p0019 A79-10155
Analysis and design of an 18-ton solar-powered heating and cooling system
21 p0019 A79-10156
Liquid desiccant solar air conditioner and energy storage system
21 p0021 A79-10176
The fossil fuel cost of solar heating
21 p0022 A79-10180

Passive solar heating and cooling
[AIAA PAPER 78-1756] 21 p0060 A79-13857

Performance testing of a three ton solar absorption chiller
[AIAA PAPER 78-1757] 21 p0060 A79-13858

Evaluation of control options for solar climate control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859

The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860

Metal hydride solar heat pump and power system /HYCSOS/
[AIAA PAPER 78-1762] 21 p0061 A79-13863

Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687

Passive solar design --- for domestic heating and cooling systems
21 p0074 A79-14720

Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826

Analysis of data user's needs for performance evaluation of solar heating and cooling systems
21 p0087 A79-15827

Technique and instrumentation for measuring the performance of integrated solar heating/cooling systems
21 p0087 A79-15830

The use of computer-controlled data acquisition systems in determining solar heating and cooling system performance
21 p0088 A79-15834

Flow rate calibration for solar heating and cooling system evaluation
21 p0089 A79-15845

Temperature calibration for solar heating and cooling system evaluation
21 p0089 A79-15846

Solar absorption cooling
21 p0090 A79-15861

Solar total energy systems
21 p0090 A79-15863

Residential and commercial thermal storage --- for solar heating and cooling systems
21 p0090 A79-15865

An overview of solar markets
21 p0092 A79-15884

Solar heating and cooling - An electric utility perspective
21 p0093 A79-15890

The Solar Heating and Cooling Commercial Demonstration Program at Marshall Space Flight Center - Some problems and conclusions
21 p0099 A79-16135

Solar controls and control modifications - New century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419

Using controls to reduce component size and energy needs for solar HVAC --- Heating Ventilation, Air Conditioning
21 p0102 A79-16421

The El Camino Real Solar Cooling Demonstration Project
21 p0102 A79-16425

Principles of solar cooling and heating
21 p0103 A79-16457

Solar heating and ventilating by natural means
21 p0103 A79-16458

Application of solar cooling for a school building in subtropics
21 p0103 A79-16461

A microprocessor-based control system for solar heating and cooling
21 p0107 A79-16565

The economics of solar heating and cooling - A cautious view
21 p0119 A79-17297

Thermal performance of solar collectors used in the national solar heating and cooling demonstration program
21 p0130 A79-17403

A channelled solar flat-plate booster --- reflector-absorber system for optimum collector insolation
21 p0131 A79-17413

Design and optimization of a flat plate collector for cooling application
21 p0132 A79-17419

Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422

Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428

Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463

Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464

Stochastic simulation experiments on solar air conditioning systems
21 p0138 A79-17474

Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475

Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477

Performance of solar heating and cooling systems used in the national solar heating and cooling demonstration program
21 p0139 A79-17478

Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479

A solar heating and cooling system for an industrial plant located in southern Europe
21 p0139 A79-17480

An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481

Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483

Solar ammonia-water absorption system for cold storage application
21 p0143 A79-17521

Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523

Solar energy --- conversion technologies
21 p0147 A79-17648

Gas-cycle solar refrigeration system performance
21 p0153 A79-18471

Cooling applications of thermic diode panels
[ASME PAPER 78-WA/SOL-10] 21 p0163 A79-19842

Design of a freon jet pump for use in a solar cooling system
[ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847

Stochastic predictions of solar cooling system performance
[ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848

Buoyancy effects in a solar regenerator --- for air dehumidifier absorbent solutions
22 p0262 A79-23752

System performance predictions for solar cooling using regional stochastic weather models
22 p0264 A79-23781

The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311

A computer simulation model for determining preferred solar heating and cooling systems
22 p0267 A79-24313

International Solar Energy Conference on the Performance of Solar Heating and Cooling Systems, Duesseldorf, West Germany, April 19, 20, 1978, Proceedings
[NATO/CCMS-85] 22 p0275 A79-25926

Prospects for solar heating and cooling in the United States
22 p0275 A79-25929

Solar heating, cooling and hot water production - A critical look at CCMS installations
22 p0275 A79-25931

Solar air heating and nocturnal cooling system /CSU Solar House II/
22 p0275 A79-25932

Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939

Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center
22 p0277 A79-25944

Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors
22 p0285 A79-26815

Performance of combined solar-heat pump systems
22 p0285 A79-26817

Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819

Solar energy application of natural zeolites --- solid absorber-water vapor working fluid system for sorption-refrigeration cycles
22 p0286 A79-27213

Solar absorption cooling feasibility
22 p0295 A79-28358

Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670

Passive solar energy design and materials --- Book
22 p0302 A79-29625

Solar Rankine engines - Examples and projected costs
[ASME PAPER 79-SOL-3] 22 p0307 A79-30541

Heat pump design - Cost effectiveness in the collection, storage and distribution of solar energy
22 p0313 A79-31316

Distributed energy storage for solar applications
22 p0317 A79-31410

Design study on solar energy systems for commercial buildings
22 p0320 A79-31433

Solar energy - Four sites demonstrate potential
22 p0328 A79-32194

Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960

Solar cooling in the tropics
23 p0397 A79-33950

Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009

Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010

Design, performance, and economics of solar heating and cooling systems for single and multi-family residences
23 p0401 A79-34011

Refined model of solar space cooling system
23 p0401 A79-34012

An economic comparison between solar and conventional residential air conditioning in Miami, Florida
23 p0401 A79-34013

Liquid sorbent solar air conditioner
23 p0401 A79-34014

Honeywell General Offices solar HVAC system
23 p0401 A79-34018

Design study - Solar systems for commercial buildings
23 p0425 A79-34601

An oil company expresses interest in solar energy
23 p0434 A79-35478

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629

Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888

Solar heated and cooled house in Winter Springs, Florida - A Florida Gas Company Project
[AIAA PAPER 79-1019] 23 p0460 A79-38204

Solar heating and load managed/solar cooling of a small commercial building using flat plate collectors
[AIAA PAPER 79-1020] 23 p0460 A79-38205

Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206

A 'real life' solar air conditioned house project
23 p0463 A79-38577

Traditional architecture in West Africa and passive methods of cooling in the Tropics
23 p0463 A79-38580

Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607

Solar air conditioning and refrigeration in arid regions
23 p0466 A79-38608

Thermodynamic analysis of a solar heating and cooling system equipped with an absorption refrigerator heat pump operating in winter
23 p0467 A79-38610

LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624

Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648

Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660

Cost reduction using modular installation for solar heating, cooling and water heating at the life clinic in Brandon, Florida
[AIAA PAPER 79-1021] 23 p0476 A79-38895

Solar collector development in Iran
23 p0493 A79-40675

Experimental study of mass exchange in glazed solar solution regenerator
24 p0602 A79-44264

Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201

Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212

Early developments in solar cooling equipment
24 p0609 A79-45218

Solar-powered Rankine heat pump for heating and cooling
24 p0610 A79-45219

Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas
24 p0610 A79-45220

Rankine cycle solar driven heat pump development
24 p0610 A79-45221

Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

Thermodynamic basis for the choice of working fluids for solar absorption cooling systems
24 p0641 A79-47791

An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University
24 p0641 A79-47797

Thermal storage of off-peak electrical energy in solar heating and cooling systems
24 p0644 A79-47945

Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

Computer simulation of a solar energy system
24 p0652 A79-49479

Construction of combined solar installations for heating and cooling
24 p0653 A79-49524

Photovoltaic concentrator system for Roxborough Park
24 p0675 A79-51767

The desiccant/rock bed method of solar cooling with air collectors
24 p0676 A79-51771

Solar refrigeration utilizing zeolites
24 p0703 A79-52014
Solar heating and cooling system design and development
[NASA-CR-150803] 21 p0172 N79-10516
Solar heating and cooling demonstration project summaries
[DOE/CS-0009] 21 p0186 N79-11503
Prototype solar heating and cooling systems
[NASA-CR-150828] 21 p0196 N79-12552
Instrumentation at the Decade 80 solar house in Tucson, Arizona
[NASA-CR-150851] 21 p0204 N79-13491
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507
Solar heating and cooling. Research and development: Project summaries
[DOE/CS-0010] 21 p0208 N79-13519
Legal barriers to solar heating and cooling of buildings
[HCP/M2528-1] 21 p0209 N79-13534
Candidate chemical systems for air cooled, solar powered, absorption air conditioner design. Part 2: Solid absorbents, high latent heat refrigerants
[SAN-1587-2] 21 p0211 N79-13544
System integration of marketable subsystems --- for residential solar heating and cooling
[NASA-CR-161104] 22 p0348 N79-18448
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522
Solar energy pilot study
[PB-289380/8] 22 p0363 N79-20525
Solar building regulatory study, volume 1
[PB-289823/7] 22 p0365 N79-21235
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
Report of the 4th CCMS (Committee on the Challenges of Modern Society) Solar Energy Pilot Study Meeting
[PB-289492/1] 22 p0372 N79-21631
System design package for a solar heating and cooling system installed at Akron, Ohio
[NASA-CR-161192] 23 p0547 N79-23490
Installation package for the Solaron solar subsystem
[NASA-CR-161190] 23 p0548 N79-23491
Prototype solar heating and cooling systems
[NASA-CR-161204] 23 p0557 N79-24437
Solar project cost report: Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/60] 23 p0561 N79-24480
Solar project description. Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/50] 23 p0563 N79-24496
SOLCOST: Space heating handbook with service hot water and heat loads calculations
[DOE/CS-0042/3] 23 p0564 N79-24501
Solar thermal heating and cooling: A bibliography with abstracts
[NASA-CR-158693] 23 p0570 N79-25480
Solar technology transfer program
[DOE/CS-0027/1] 23 p0574 N79-25521
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 1: Executive summary, September 1977
[HCP/M70066-01/1-VOL-1] 23 p0574 N79-25522
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 3: Appendices, September 1977
[HCP/M70066-01/3-VOL-3] 23 p0574 N79-25523
Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis
[EPRI-ER-808-VOL-1] 23 p0597 N79-27687
Solar heating and cooling demonstration project summaries
[DOE/CS-0038/2] 24 p0727 N79-28771
Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790
National solar heating and cooling commercial demonstration program: Key personnel directory
[DOE/CS-0057] 24 p0754 N79-30785
Passive solar design: A survey of monitored buildings
[HCP/CS-4113-2] 24 p0774 N79-31803
Passive solar design: An extensive bibliography
[HCP/CS-4113-3] 24 p0774 N79-31804
Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805
Passive solar energy planning aid kit for building design architects and planners
[CONF-780337-P1] 24 p0775 N79-31813
Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis
[EPRI-ER-808-SY] 24 p0787 N79-32687
Theoretical analysis of a passive heat pipe heating and cool system
[PB-296066/4] 24 p0792 N79-32736

SOLAR ELECTRIC PROPULSION
Status of wraparound contact solar cells and arrays --- for spacecraft electric propulsion
21 p0001 A79-10014
Earth orbital assessment of solar electric and solar sail propulsion systems
[NASA-CR-158167] 22 p0345 N79-17898
Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1] 22 p0357 N79-20179

SOLAR ENERGY
A new power cycle that combines power generation with energy storage
21 p0004 A79-10040
Recent advances in thermochemical energy storage and transport
21 p0012 A79-10104
Storage systems for solar thermal power
21 p0013 A79-10108
Can solar energy contribute significantly to the solution of the world's energy famine
21 p0019 A79-10155
Solar energy and the 'Common Heritage of Mankind' --- international agreements regarding usage
[IAF PAPER 78-SI-45] 21 p0035 A79-11356
Theoretical upper limit to the conversion efficiency of solar energy
21 p0042 A79-11876
Annual available radiation for fixed and tracking collectors
21 p0042 A79-11880
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
German Solar Energy Forum, 1st, Hamburg, West Germany, September 26-28, 1977, Proceedings. Volume 2
21 p0055 A79-13619
Potential and technical utilization of renewable energy sources
21 p0058 A79-13655
Vehicle operation on fuels from solar energy
21 p0059 A79-13663
Saudi Arabia looks at the sun
21 p0063 A79-13900
Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292
A systems study of our energy problems
21 p0074 A79-14704
Solar energy - Past and present developments
21 p0076 A79-14768
Collection of data for estimating the probable life cycle costs of solar energy systems
21 p0087 A79-15828
Considerations in choosing solar energy monitoring systems
21 p0087 A79-15831
Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901
International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 16-22, 1978, Symposium Lectures
21 p0102 A79-16451
Possibilities for solar energy utilization in Egypt
21 p0102 A79-16453

The economics and policy of alternative energy sources - A review
21 p0103 A79-16454
Thermal storage of solar energy
21 p0103 A79-16459
Integrated solar building systems
21 p0103 A79-16460
Solar-hydrogen energy system and solar-hydrogen production methods
21 p0104 A79-16463
Solar hydrogen production at high temperatures
21 p0104 A79-16464
Sun: Mankind's future source of energy; Proceedings of the International Solar Energy Congress, New Delhi, India, January 16-21, 1978. Volumes 1, 2 & 3
21 p0116 A79-17276
Analysis of alternatives for U.S. international cooperation in solar energy
21 p0116 A79-17277
The solar energy R & D programme of the European Communities
21 p0116 A79-17278
Solar energy in Latin America - An overview
21 p0116 A79-17279
Solar energy R&D in Iran - The approach and the philosophy
21 p0117 A79-17284
Solar energy in Southern Africa
21 p0117 A79-17287
Costs and impacts of financial incentives for solar energy systems
21 p0119 A79-17296
Long-term storage of solar energy in native rock
21 p0120 A79-17314
Energy through solar aided bio-gas systems
21 p0125 A79-17367
Conceptual development of a solar town in Iran
21 p0138 A79-17469
Hourly vs daily method of computing insolation on inclined surfaces
22 p0242 A79-21164
Diffuse solar radiation on a horizontal surface for a clear sky
22 p0242 A79-21167
Energy storage using the reversible oxidation of barium oxide
22 p0242 A79-21169
International Conference on Thermoelectric Energy Conversion, 2nd, University of Texas, Arlington, Tex., March 22-24, 1978, Proceedings and Supplement
22 p0259 A79-23603
Solar energy storage as hydrogen and bromine from hydrogen bromide
22 p0265 A79-24045
Energy conversion engineering --- Book
22 p0302 A79-29575
The potential for solar energy development
22 p0304 A79-30172
Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963
Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966
Hawaii solar radiation summary
23 p0398 A79-33985
Solar energy storage via liquid filled cans - Test data and analysis
23 p0400 A79-34005
Transient analysis and optimization of an extended surface thermal storage unit which utilizes a phase change material
23 p0400 A79-34006
Experimental study of a heatpipe with an active porous medium --- for solar application
23 p0400 A79-34007
Assessment of energy conservation by using alternate energy sources in Kansas
23 p0418 A79-34151
Problems in collector testing --- for solar system thermal performance
23 p0430 A79-35064
A completely solar power supply for France
23 p0436 A79-35492
Satellite solar power stations - Current status and prospects
23 p0448 A79-37844
A new approach for solar energy systems design by means of the sensitivity theory
23 p0448 A79-37849
Solar and chemical energy
23 p0462 A79-38573
Design, operation, and economics of the Energy Plantation as an alternate source of fuels
23 p0467 A79-38616
Storage of solar energy at low temperatures through chemical processes
23 p0469 A79-38637
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O
23 p0470 A79-38641
Architectural planning - The possibility of using solar energy must be kept open
23 p0473 A79-38665
Aspects of solar energy use in the Federal Republic of Germany
23 p0473 A79-38668
Conditions for the use of solar energy
23 p0473 A79-38669
Solar energy systems and life cycle cost
23 p0474 A79-38672
Commercialisation of solar energy devices in developing countries - Problems and prospects
23 p0477 A79-39105
Prospecting for meteorological energy in Hawaii
23 p0536 A79-43615
How a wall uses solar energy
24 p0603 A79-44295
Meteorology for solar energy applications; Proceedings of the Conference, Royal Institution of Great Britain, London, England, January 24, 1979
24 p0604 A79-44551
Collection, processing and dissemination of data for the national solar demonstration program
24 p0608 A79-45208
Relation between concentration and acceptance in solar collectors
24 p0641 A79-47795
Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization
24 p0660 A79-50538
A review of the environmental effects and benefits of selected solar energy technologies
24 p0664 A79-50878
The control system for Fort Hood Solar Total Energy System
24 p0672 A79-51742
Perspectives on developing country solar energy applications
24 p0672 A79-51743
Conversion of solar energy to chemical energy using ammonia dissociation
24 p0672 A79-51746
The solar total energy system evaluation program /STESEP/
24 p0673 A79-51749
Methanol based heat pumps for storage of solar thermal energy
24 p0681 A79-51805
Legal norm creation concerning solar energy in contemporary international space law
24 p0713 A79-53680
The legal aspect concerning solar energy
24 p0713 A79-53681
Some observations of the legal implications relating to the use of solar energy
24 p0713 A79-53682
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538
Solar powered irrigation: Present status and future outlook
[SAND-78-0016C] 21 p0175 N79-10539
Solid desiccant air conditioning with silica gel using solar energy
21 p0181 N79-11464

Method for making an aluminum or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-1] 21 p0182 N79-11469

Program THEK energy production units of average power and using thermal conversion of solar radiation
[NASA-TM-75369] 21 p0183 N79-11474

Optimum dry-cooling sub-systems for a solar air conditioner
[NASA-TM-79007] 21 p0183 N79-11477

Environmental Development Plan (EDP): Solar thermal power systems, 1977
[DOE/EDP-0004] 21 p0187 N79-11522

Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543

Application of solar technology to today's energy needs, volume 1
[PB-283770/6] 21 p0190 N79-11548

Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543

Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565

Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150850] 21 p0205 N79-13498

LARGO hot water system thermal performance test report
[NASA-CR-150841] 21 p0205 N79-13500

Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506

Solar Irrigation Program Data Base Management System (SIPDBMS)
[SAND-78-0641] 21 p0209 N79-13532

Solar energy
[DOE/ET-0062] 21 p0210 N79-13535

Solar irrigation program
[SAND-78-0049] 21 p0210 N79-13537

Analysis of federal incentives used to stimulate energy production
[PNL-2410] 21 p0210 N79-13539

Solar pilot plant, phase 1
[SAN-1109-77-7] 21 p0210 N79-13542

Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549

Solar electric power generation, volume 2. Citations from the Engineering Index data base
[NTIS/PS-78/1109/4] 21 p0212 N79-13558

Primary reflector for solar energy collection systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529

Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

Solar hot water system installed at Anderson, South Carolina
[NASA-CR-150856] 21 p0229 N79-15405

Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States
[PB-286940/2] 21 p0231 N79-15440

Parameter estimation and validation of a solar assisted heat pump model
22 p0332 N79-16349

Low-temperature application of solar energy in South Africa
22 p0340 N79-17324

Fluidized-bed combustion
22 p0347 N79-18365

Installation package for a solar heating system
[NASA-CR-150876] 22 p0349 N79-18454

Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464

Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492

Solar thermal power generation. A bibliography with abstracts
[NASA-CR-158004] 23 p0540 N79-22614

Cost-effective potential of optimumly designed heat pumps for the collection, storage, and distribution of solar energy
[BNL-25195] 23 p0556 N79-24307

Solar technology in the Federal Republic of Germany
[NASA-TM-75634] 23 p0558 N79-24439

Impact of solar energy on rural housing
[GPO-31-641] 23 p0560 N79-24467

Energy Materials Coordinating Committee (EMACC)
[DOE/US-002] 23 p0563 N79-24490

Solar energy commercialization for European countries, volume 2
[HCP/CS-4250-VOL-2] 23 p0563 N79-24493

SOLCOST: Space heating handbook with service hot water and heat loads calculations
[DOE/CS-0042/3] 23 p0564 N79-24501

Solar thermal components: A bibliography with abstracts
[NASA-CR-158699] 23 p0570 N79-25479

Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501

Meteorological measurement data for solar energy utilization
[ASSA-FA-5] 23 p0574 N79-25524

Thermal utilization of solar energy in Austria. Part 1: Hot water preparation, swimming pool and space heating
23 p0574 N79-25529

Solar stream in Austria
23 p0574 N79-25530

Principal conclusions of the American Physical Society study group on solar photovoltaic energy
[PB-292164/1] 23 p0575 N79-25533

Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23640-1] 23 p0579 N79-26475

Vertical axis wind turbine status
[SAND-78-0397C] 23 p0582 N79-26512

The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660

Mead 25 kilowatt photovoltaic system --- conferences
[COO-4094-19] 23 p0596 N79-27677

Electric utilities and solar energy: The service contract in a new social context
[ORAU/IEA(O)-79-3] 23 p0597 N79-27685

Production of hot water with the aid of solar energy: Conditions and costs
[SIB-R-83-1978] 23 p0598 N79-27700

Citizens' solar program: State reports on barriers and strategies to renewable energy development
[HCP/U6308-01] 23 p0598 N79-27703

Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0599 N79-27712

Review of selected solar market studies and techniques
[SERI/PB-52-076] 23 p0600 N79-28056

Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752

Barriers and incentives to solar energy development. An analysis of legal and institutional issues in the Northeast
[NESEC-1] 24 p0726 N79-28765

Design guide for shallow solar ponds
[UCRL-52385-REV-1] 24 p0727 N79-28774

Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783

Solar power satellite
[GPO-45-997] 24 p0731 N79-29212

A control system analysis of the energy growth model: Coal
24 p0736 N79-29595

Solar energy
[GPO-36-957] 24 p0737 N79-29609

Guide to solar energy programs
[DOE/ET-0036/1] 24 p0738 N79-29620

Role of government in solar energy development: A view from the northwest --- economic feasibility of solar heating [PNL-2784] 24 p0738 N79-29621
Methodology for solar-thermal power plant evaluation [EPRI-ER-869] 24 p0739 N79-29631
Standards applicable to performance measurement of solar heating and cooling systems --- conferences [COO-4142-2] 24 p0741 N79-29656
Problems and prospectives on solar energy utilization [ISS-P-78/1] 24 p0742 N79-29667
Determination of potential solar power sites in the United States based upon satellite cloud observations [NASA-CR-159944] 24 p0749 N79-30712
Economic performance: Evaluations for solar energy [LA-UR-79-901] 24 p0759 N79-30828
SOAR (solar assisted reactor) power system [BNL-25633] 24 p0772 N79-31787
Solar energy program [ANL-79-16] 24 p0772 N79-31789
Analysis of investment alternatives to stimulate development and technology transfer for energy technologies, solar photovoltaics, a case study [TID-28968] 24 p0773 N79-31795
Macroeconomic and sector implications of installing 2.2 million residential solar units [DOE/EIA-0102/51] 24 p0773 N79-31798
Role of education and training programs in the commercialization and diffusion of solar energy technologies [SERI/RR-53-128] 24 p0773 N79-31800
Passive solar design: An extensive bibliography [HCP/CS-4113-3] 24 p0774 N79-31804
Social assessment of on-site solar energy technologies [HCP/R-4040-02] 24 p0775 N79-31810
Analysis of Federal incentives used to stimulate energy production --- with emphasis on solar energy [PNL-2410-1-REV] 24 p0775 N79-31819
Problems of technology transfer to industry --- government sponsored solar energy technology development [SAND-79-0096] 24 p0778 N79-32131
Stratified thermal storage in residential Solar energy applications [COO-4523-1] 24 p0786 N79-32682
Solar thermal test facilities users association [SERI/PR-13-154] 24 p0787 N79-32688
Meteorological data for solar energy applications 24 p0792 N79-32733
Environmental, socioeconomic, and consumer protection aspects of selected decentralized solar energy applications 24 p0803 N79-33609
An expanded system simulation model for solar energy storage (technical report), volume 1 [NASA-CR-159601] 24 p0804 N79-33881

SOLAR ENERGY ABSORBERS
Effect of surface curvature on measurement of the absorptance properties of solar coatings 21 p0042 A79-11879
Nonimaging solar concentrators 21 p0043 A79-11973
Selective coatings for aluminum and steel solar absorbers 21 p0058 A79-13647
Solaronyx - Selective coating for solar energy absorbers 21 p0058 A79-13648
Performance testing of a three ton solar absorption chiller [AIAA PAPER 78-1757] 21 p0060 A79-13858
The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results [AIAA PAPER 78-1759] 21 p0061 A79-13860
External single pass to superheat receiver --- for central receiver solar power plant [AIAA PAPER 78-1751] 21 p0089 A79-15849
Solar absorption cooling 21 p0090 A79-15861
A new amorphous silicon-based alloy for electronic applications 21 p0100 A79-16226
A graphical approach to the efficiency of flat-plate collectors 21 p0102 A79-16422
MHD conversion of solar energy --- space electric power system 21 p0109 A79-16614
Magnetically confined plasma solar collector --- satellite based system in space 21 p0109 A79-16617
Theoretical and experimental analysis of a latent heat storage system --- solar energy absorbers 21 p0121 A79-17323
Status report on selective surfaces --- solar collector absorbers 21 p0126 A79-17374
Investigation and perspectives on iron oxide, zinc conversion coating, zinc oxide, cobalt oxide and tungsten oxide as spectral selective solar absorber surfaces 21 p0126 A79-17375
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces --- for photothermal solar energy conversion 21 p0126 A79-17377
Studies on the selective absorption surface on stainless steel --- for flat type solar collectors 21 p0127 A79-17378
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath 21 p0127 A79-17379
Preparation and properties of pure and tin doped indium oxide selective coatings 21 p0127 A79-17381
Selective absorption of solar energy by ultrafine metal particles 21 p0127 A79-17382
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber 21 p0127 A79-17383
Cheap packed bed absorbers for solar air heaters 21 p0128 A79-17388
Reflecting horizontal collector 21 p0128 A79-17395
Convective effects in 'slat collectors' 21 p0129 A79-17400
Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator 21 p0130 A79-17406
Optimal profile of solar energy collectors 21 p0130 A79-17408
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I. 21 p0130 A79-17409
Field performance of certain selective and neutral surfaces in solar collectors 21 p0131 A79-17417
Solar collector optimization 21 p0132 A79-17418
Comparative performance of tracking type and non-tracking type solar collectors 21 p0136 A79-17454
Design and performance of 1/4 H.P. solar power unit 21 p0141 A79-17503
Suitable optical materials for solar collector applications 22 p0239 A79-20823
The dependence of optical properties on the structural composition of solar absorbers - Gold black 22 p0242 A79-21162
Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors 22 p0256 A79-22855
Microstructure dependence of the optical properties of solar-absorbing black chrome 22 p0256 A79-22858
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation 22 p0262 A79-23757
Selective absorption of solar energy in ultrafine metal particles - Model calculations 22 p0273 A79-75746
Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate 22 p0281 A79-26204

Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978
22 p0293 A79-28140
Microstructural characterization of a black chrome solar selective absorber
22 p0294 A79-28151
Solar absorption cooling feasibility
22 p0295 A79-28358
Energy analysis of an aluminum solar collector
22 p0316 A79-31405
Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407
Selective-black absorbers using sputtered cermet films
22 p0327 A79-31969
Black germanium solar selective absorber surfaces
22 p0327 A79-31970
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956
Theoretical and practical aspects of heat transfer in the window-absorber cavity of a flat plate collector
23 p0383 A79-32957
Thermal radiation - Transient heat transfer in plates with selective surfaces
23 p0389 A79-33266
Ammonia dissociation for solar thermochemical absorbers
23 p0396 A79-33765
New concept in solar thermal collectors
23 p0398 A79-33988
Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector
23 p0399 A79-33989
Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system
23 p0399 A79-33994
A novel design of evacuated-concentrating spherical collector
23 p0399 A79-33998
Optimization of a fixed solar thermal collector
23 p0400 A79-34000
Testing of central receiver for central thermal power systems
23 p0428 A79-35045
The development of the Advanced Components Test Facility --- for solar powered steam generator system
23 p0429 A79-35047
The real time aperture flux system as part of the Solar Thermal Test Facility
23 p0429 A79-35050
Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051
Correlation of instantaneous and all-day thermal performance of flat-plate solar collectors
23 p0430 A79-35065
Optical properties of materials under simulated operating environments --- selective coatings for solar thermal conversion
23 p0431 A79-35071
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
23 p0432 A79-35079
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties
23 p0433 A79-35381
Spectrally selective surfaces and their impact on photothermal solar energy conversion
23 p0437 A79-36145
Spectral selectivity of composite materials --- as solar energy absorbers
23 p0437 A79-36146
Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38345
Which is the true solar house
23 p0463 A79-38578
Thin film solar absorber consisting of Au-particles in SiO2
23 p0465 A79-38599
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600
LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624
Solar-assisted heat pump heating with tube collectors
23 p0469 A79-38635
Uncovered absorber combined with flatroof collectors and heatpump
23 p0469 A79-38636
Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644
Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat
23 p0478 A79-39695
Aluminum in solar technology
23 p0481 A79-40024
Effects of nonuniform distribution of the absorber temperature on radiation losses of a flat-plate solar collector
23 p0530 A79-42894
Experimental study of mass exchange in glazed solar solution regenerator
24 p0602 A79-44264
Protection of solar collector materials from UV
24 p0609 A79-45217
Low cost selective surface-carbon particle coating --- for metal absorbor plates in solar collectors
24 p0611 A79-45228
Spectrally selective surfaces of Ni-pigmented anodic Al2O3 --- solar energy absorbers
24 p0629 A79-46202
Ni cermet selective absorbers for solar photothermal conversion
24 p0641 A79-47790
Thermodynamic basis for the choice of working fluids for solar absorption cooling systems
24 p0641 A79-47791
A method for measuring the photothermal conversion efficiency of solar energy
24 p0642 A79-47806
Heating characteristics of concentrator/receiver systems using selective absorption surfaces
24 p0646 A79-48739
Investigation of the absorption and emission characteristics of an ideal selective surface --- for solar energy absorbers
24 p0648 A79-49186
Thermal emissivity of selective surfaces - New lower limits
24 p0648 A79-49207
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176
Design of selective surfaces for solar energy collection
24 p0655 A79-50180
The surface microstructure optical properties relationship in solar absorbers - Black chrome
24 p0655 A79-50181
Microstructure of a black chrome solar selective absorber
24 p0655 A79-50182
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183
Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle
24 p0655 A79-50184
Evaluation of solar absorbers, reflectors and transmitters - Physical reflectance standards
24 p0657 A79-50327
Thermal radiation from conducting surfaces
24 p0657 A79-50328
'Ultra-black' coating for high absorptance of solar energy
24 p0658 A79-50329
Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321
24 p0662 A79-50548
Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties
24 p0663 A79-50704

Spectrally selective solar absorber coatings
24 p0704 A79-52150
Coatings for enhanced photothermal energy collection. I - Selective absorbers
24 p0704 A79-52307
Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon
24 p0704 A79-52312
Inhomogeneous surfaces as selective solar absorbers
24 p0704 A79-52313
A study of oxide-based heterostructure photoelectrodes --- for solar cells
24 p0705 A79-52314
High absorptivity Al-PbS selective surfaces for solar photothermal conversion
24 p0705 A79-52319
Calorimetric emissivities for solar-selective coatings on flat sheet
24 p0706 A79-52536
Passive solar heating of buildings using a transwall structure
24 p0712 A79-53493
Electromagnetic radiation energy arrangement --- coatings for solar energy absorption and infrared reflection
[NASA-CASE-WOO-00428-1] 22 p0352 N79-19186
Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(OP)] 23 p0564 N79-24505
Structure of a black chrome solar selective surface
[LBL-6691-REV] 24 p0753 N79-30778
Microstructure and optical properties of black chrome before and after exposure to high temperatures
[LBL-8632] 24 p0756 N79-30804
Development of a low-temperature, low-cost, black-liquid solar collector
[CONF-780983-14] 24 p0756 N79-30805
Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 1: Study overview and summary
[NASA-CR-162328] 24 p0782 N79-32638
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 2: Technical
[HAC-REF-E3256-VOL-2] 24 p0782 N79-32639

SOLAR ENERGY CONVERSION

Design features of the TDRSS solar array --- Tracking and Data Relay Satellites
21 p0002 A79-10019
Evolution of satellite power system /SPS/ concepts
21 p0002 A79-10023
The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024
Preliminary design of the solar total energy-large scale experiment at Shenandoah, Georgia
21 p0019 A79-10159
Conceptual design of the Fort Hood Solar Total Energy-Large Scale Experiment
21 p0019 A79-10160
Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162
Compartmental model for agricultural conversion of solar energy into fixed biomass
21 p0022 A79-10181
Nitinol heat engines for economical conversion of low grade thermal density
21 p0027 A79-10230
Economic methodology for solar power-generating systems
21 p0030 A79-10251
Application of composite materials in the solar energy domain
21 p0034 A79-11195
Semiconductor electrodes for conversion and storage of solar energy
21 p0036 A79-11777
Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780
Iron oxide semiconductor electrodes in photoassisted electrolysis of water
21 p0037 A79-11781
Polycrystalline CdSe-based photo-electrochemical cells
21 p0037 A79-11785
Hydrogen production in a solar-hydrogen economy
21 p0037 A79-11796
Perspectives on utility central station photovoltaic applications
21 p0041 A79-11873
Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965
Photovoltaic effects in II-VI heterojunctions
21 p0042 A79-11967
Options for solar thermal conversion
21 p0043 A79-11969
Five MW solar thermal test facility heliostat focus and alignment system
21 p0043 A79-11972
Nonimaging solar concentrators
21 p0043 A79-11973
Predicted performance of heliostats for ERDA's 10 MWe power plant
21 p0044 A79-12045
Analysis of a direct coupling d.c. motor and a photovoltaic converter
21 p0046 A79-12272
Selling solar energy as a cash crop
21 p0049 A79-12725
Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion
21 p0054 A79-13290
Rate of desorption in a solar regenerator
21 p0055 A79-13611
Practical applications of silicon solar cells in appliances and installations
21 p0057 A79-13638
Solar electric power supplies - Design and layout
21 p0057 A79-13639
Solaronyx - Selective coating for solar energy absorbers
21 p0058 A79-13648
Problems, status, and prospects of a solar hydrogen economy
21 p0059 A79-13658
On the thermal and thermo-electrolytical generation of hydrogen by solar energy
21 p0059 A79-13660
Solar One - A 10-megawatt solar thermal central receiver pilot plant project
[AIAA PAPER 78-1750] 21 p0060 A79-13853
Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854
Alternative central receiver solar power plant using salt as a heat transfer and storage medium
[AIAA PAPER 78-1753] 21 p0060 A79-13855
Photovoltaic overview
[AIAA PAPER 78-1763] 21 p0061 A79-13864
Venture analysis of a proposed federal photovoltaic eight-year procurement plan
[AIAA PAPER 78-1766] 21 p0061 A79-13865
Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy
[AIAA PAPER 78-1767] 21 p0061 A79-13866
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867
Dispersed power systems and total energy --- solar energy conversion for combined mechanical/electrical and thermal loads
[AIAA PAPER 78-1770] 21 p0062 A79-13868
Future solar total energy markets for the U.S. industrial sector
[AIAA PAPER 78-1773] 21 p0062 A79-13870
Preliminary design of solar total energy - Large scale experiment at Shenandoah, Georgia
[AIAA PAPER 78-1776] 21 p0062 A79-13873
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13874
Electricity from sunlight --- low cost silicon for solar cells
21 p0065 A79-14116
Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models
21 p0065 A79-14117

Performance of a tilted solar cell under various atmospheric conditions
21 p0066 A79-14261

Simulations of the performance of open cycle desiccant systems using solar energy
21 p0066 A79-14262

The photogalvanovoltaic cell
21 p0066 A79-14264

Solar water pumping
21 p0066 A79-14266

The National Program for Solar Energy
21 p0072 A79-14688

Passive solar design --- for domestic heating and cooling systems
21 p0074 A79-14720

Results of a tilt-tilt low profile heliostat test program
21 p0076 A79-14761

Historical developments of the use of solar energy for pumping irrigation water
21 p0076 A79-14762

Basic technical and economical aspects of the use of solar energy for pumping irrigation water
21 p0076 A79-14763

The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion
21 p0082 A79-15077

History of solar energy applications - Solar energy yesterday, today and tomorrow
21 p0089 A79-15852

Practical considerations for 'capturing the sun'
21 p0089 A79-15853

Solar energy and the flat plate collector - An annotated bibliography
21 p0090 A79-15858

Design of active solar heating systems
21 p0090 A79-15860

Solar total energy systems
21 p0090 A79-15863

A central receiver solar thermal power system
21 p0091 A79-15872

Simple procedure for predicting long term average performance of nontracking and of tracking solar collectors
21 p0091 A79-15873

An overview of solar markets
21 p0092 A79-15884

Large-scale thermal energy storage for cogeneration and solar systems --- in aquifers
21 p0092 A79-15886

Factors influencing solar energy commercialization
21 p0093 A79-15897

Biomimetic approach to solar energy conversion - Artificial photosynthesis
21 p0094 A79-15899

Solar engines - The thermal wheel and beyond
21 p0095 A79-15909

Petroleum plantations --- hydrocarbon fuels from artificial photosynthesis and plants
21 p0095 A79-15910

Materials and economics of energy systems
21 p0095 A79-15911

Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101

Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings
21 p0099 A79-16126

An economist looks at solar energy - The government's role
21 p0099 A79-16132

Current solar applications and economics
21 p0099 A79-16134

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Annual Meeting, Albuquerque, N. Mex., June 25-29, 1978, Technical and Symposium Papers
21 p0101 A79-16415

The use and limitations of ASHRAE solar algorithms in solar energy utilization studies
21 p0101 A79-16416

Solar thermal conversion
21 p0104 A79-16466

Solar electricity production
21 p0104 A79-16467

Use of satellites in solar applications --- for insolation mapping and space power stations
21 p0104 A79-16468

Solar pumping --- thermal and electrical water pumping
21 p0104 A79-16469

Analysis of optical behavior and collector performance of a solar concentrator
21 p0107 A79-16545

The solar power satellite concept evaluation program
21 p0107 A79-16602

Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605

Energy conversion at a lunar polar site
21 p0108 A79-16607

Ultralightweight structures for space power --- solar energy collection for transmission to earth
21 p0108 A79-16609

Absorption of solar radiation by alkali vapors --- for efficient high temperature energy converters
21 p0108 A79-16612

New candidate lasers for power beaming and discussion of their applications --- solar powered space lasers
21 p0110 A79-16622

Methods for the photochemical utilization of solar energy
21 p0111 A79-16641

Factors affecting market initiation of solar total energy
21 p0112 A79-16732

The status of solar energy --- for domestic water heating and thermal electric power generation
21 p0115 A79-17219

Report on the development of solar energy in France
21 p0117 A79-17280

The accomplishments of the United States Federal Solar Energy Program
21 p0117 A79-17281

Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282

Solar energy activities in Austria
21 p0117 A79-17283

Plans and prospects for solar energy utilisation in Malawi
21 p0117 A79-17285

Estimation of collector and electrical energy cost for STEPS in Japan --- Solar Thermal Electric Power System
21 p0118 A79-17288

Solar electrification and rural electrification - A techno-economic review
21 p0118 A79-17289

Cost of solar energy
21 p0118 A79-17291

Solar energy and the second law of thermodynamics
21 p0118 A79-17292

The relationship between diffuse and total solar radiation in computer simulation of solar energy systems
21 p0119 A79-17304

Measurement of solar radiation for energy conversion
21 p0119 A79-17305

Chemically driven heat pumps for solar thermal storage
21 p0120 A79-17316

Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317

Phase change thermal storage for a solar total energy system
21 p0120 A79-17321

A passive integrated unit for the collection, thermal storage in fusion materials and distribution of solar energy for home heating and other applications
21 p0121 A79-17322

A thermal storage analysis on packed bed of alumina spheres --- in solar houses
21 p0121 A79-17324

Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327

Mechanical energy storage system for a 10 KWe solar power pack
21 p0121 A79-17329

A study for optimum use of metallic plates for thermal storage in solar processes
21 p0122 A79-17331

Analysis of thermal storage unit for solar energy
21 p0122 A79-17332

Efficiency of sugar cane and cowpea as solar energy converters
21 p0125 A79-17368

Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370

Saur vidyut kosh - The solar cell --- reversible charging electrolytic batteries
21 p0126 A79-17371

Harvesting solar energy using biological systems
21 p0126 A79-17372

Selective coatings for solar energy conversion
21 p0126 A79-17376

Cost effective optimum design of solar air heaters
21 p0127 A79-17386

Solar energy use in Denmark /56 deg N/ and higher latitudes in Scandinavia
21 p0128 A79-17393

Some studies on an experimental solar pond
21 p0131 A79-17416

A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S.
21 p0132 A79-17423

Liquid solar collector --- low cost assemblage with black water working fluid
21 p0133 A79-17433

Evacuated solar flat-plate collectors for economic applications
21 p0133 A79-17435

A Markov model of solar energy systems
21 p0138 A79-17476

Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479

A solar heating and cooling system for an industrial plant located in southern Europe
21 p0139 A79-17480

Solar retrofitting of existing residence with almost zero delta TF system
21 p0139 A79-17485

Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489

Exploitation of solar energy via modular power plants and multiple utilization of waste heat
21 p0141 A79-17497

Cycle optimization for a solar turbopack --- turbine water pump utilizing Rankine cycle
21 p0141 A79-17500

Development of small solar power plants for rural areas in India
21 p0141 A79-17502

Application of turbopack in solar energy systems
21 p0141 A79-17504

Power plant systems based on solar energy --- powered by sea water evaporation-produced osmotic pressure head mechanical energy
21 p0142 A79-17508

A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

25 kilowatt photovoltaic powered irrigation and grain drying experiment
21 p0143 A79-17519

Solar irrigation program status
21 p0143 A79-17520

Use of solar energy for industrial process heat
21 p0143 A79-17524

The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

Solar Total Energy Control Data Acquisition System
21 p0144 A79-17618

Master control and data system for the 5MW Solar Thermal Test Facility
21 p0144 A79-17620

Real time computer control of 5 megawatts of solar thermal energy
21 p0144 A79-17621

Solar energy --- conversion technologies
21 p0147 A79-17648

Solar fuels --- photochemical reaction kinetics and energy storage
21 p0149 A79-18009

Model systems in photoelectrochemical energy conversion
21 p0149 A79-18021

Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832

Parametric analysis of power conversion systems for central receiver solar power generation
[ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835

Accelerating the commercialization on new technologies --- free market operation of federal alternate energy sources programs
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356

Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water
21 p0167 A79-20360

Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361

Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production
22 p0237 A79-20730

Analysis and design of a field of heliostats for a solar power plant
22 p0242 A79-21161

Experimental investigations of a physical system capable of using solar energy
22 p0247 A79-21667

Calculation of solar energy incident on non-horizontal surfaces over Turkey
22 p0253 A79-22266

Solar energy diagrams --- combining position and insolation data
22 p0253 A79-22267

Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269

Storage efficiency in a solar plant
22 p0254 A79-22270

A hybrid chemical concept for solar energy storage
22 p0254 A79-22271

Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272

Industrial aspects in solar energy instruction
22 p0254 A79-22274

Optimizing the conversion mode for solar energy
22 p0258 A79-23125

Prediction of the behavior of a solar storage system by means of recurrent stochastic models --- of insolation
22 p0258 A79-23295

Photoelectrolysis of water with semiconductors
22 p0259 A79-23343

Efficiency of a series of thermoelectric generators in a solar wedge concentrator
22 p0260 A79-23618

Reversible thermoelectric power conversion of energy fluctuations
22 p0261 A79-23619

Synthetic chloroplasts --- for photosynthetic solar energy conversion
22 p0262 A79-23721

Structuring a small national or state solar energy program
22 p0262 A79-23751

Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309

Solar system modeling using a modular approach with generalized programs for working fluid properties
22 p0266 A79-24310

A liquid solar energy storage tank model. I - Formulation of a mathematical model
22 p0267 A79-24314

Solar energy for industrial process steam
22 p0267 A79-24315

Medium-power /100-1000 kWe/ solar power plants using distributed collectors
22 p0269 A79-24622

Current status and prospects for low-temperature solar energy
22 p0269 A79-24623

Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes --- for solar energy conversion
22 p0273 A79-25548

Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

International Solar Energy Conference on the Performance of Solar Heating and Cooling Systems, Duesseldorf, West Germany, April 19, 20, 1978, Proceedings
[NATO/CCMS-85] 22 p0275 A79-25926

What and where - Solar active systems or energy conservation in buildings
22 p0275 A79-25927

The CCMS solar energy pilot study system performance reporting format
22 p0275 A79-25930

Passive solar heating system in Turkey
22 p0277 A79-25942

Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131

Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0280 A79-26201

Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26208

Solar energy application of natural zeolites --- solid absorber-water vapor working fluid system for sorption-refrigeration cycles
22 p0286 A79-27213

A proposed thermophotovoltaic solar energy conversion system
22 p0287 A79-27317

Principles of solar engineering --- Book
22 p0287 A79-27372

Performance of a 5 MWt solar steam generator
22 p0288 A79-27399

Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978
22 p0293 A79-28140

Chemical vapor deposited molybdenum films for use in photothermal conversion
22 p0294 A79-28148

Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149

Colored stainless steel - A new type of selective absorber --- for solar thermal conversion
22 p0294 A79-28150

Microstructural characterization of a black chrome solar selective absorber
22 p0294 A79-28151

New instrumentation for high temperature and hemispherical measurements of selective surfaces --- for solar energy conversion
22 p0294 A79-28152

Solar thermal electrical power plants for Iran
22 p0295 A79-28352

A general design method for closed-loop solar energy systems
22 p0295 A79-28359

Direct solar transmittance for a clear sky --- for insolation of solar conversion systems
22 p0296 A79-28361

Controlling the radiant flux of a high-temperature solar energy conversion system over two parameters
22 p0296 A79-28669

Passive solar energy design and materials --- Book
22 p0302 A79-29625

Space solar power - An energy alternative
22 p0303 A79-29796

Regulation and control concepts for the possibilities of a utilization of solar energy in the low-temperature range
22 p0305 A79-30345

A flywheel energy storage and conversion system for solar photovoltaic applications
[ASME PAPER 79-SOL-1] 22 p0307 A79-30539

Design considerations of small solar collector systems using plane heliostats
[ASME PAPER 79-SOL-2] 22 p0307 A79-30540

Review of liquid piston pumps and their operation with solar energy
[ASME PAPER 79-SOL-4] 22 p0308 A79-30542

Photovoltaic concentrator system technology and applications experiments
[ASME PAPER 79-SOL-9] 22 p0308 A79-30544

Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545

Solar photovoltaic power for residential use
[ASME PAPER 79-SOL-11] 22 p0308 A79-30546

Photovoltaic electric power generation from a utility perspective
[ASME PAPER 79-SOL-18] 22 p0309 A79-30552

Benefits of solar/fossil hybrid gas turbine systems
[ASME PAPER 79-GT-38] 22 p0309 A79-30554

Thermodynamics of the conversion of diluted radiation --- solar energy application
22 p0310 A79-30910

Production of mechanical energy by thermodynamic conversion of solar energy
22 p0310 A79-30999

Thermal energy storage
22 p0310 A79-31000

Direct conversion of solar energy into laser radiation
22 p0311 A79-31086

Biological conversion of solar energy
22 p0312 A79-31146

Renewable alternatives; Proceedings of the Fourth Annual Conference, University of Western Ontario, London, Canada, August 20-24, 1978. Volumes 1 & 2
22 p0316 A79-31401

The role of applied meteorology in the Canadian energy programme
22 p0317 A79-31414

Solar power plants --- thermoelectric conversion in Canada
22 p0318 A79-31416

Sensible heat storage for solar energy applications
22 p0322 A79-31449

Photovoltaics and solar thermal conversion to electricity - Status and prospects
22 p0326 A79-31924

Solar energy in developing countries: An overview and buyers' guide for solar scientists and engineers --- Book
22 p0327 A79-32139

Solar energy - Four sites demonstrate potential
22 p0328 A79-32194

Application of the Centaur industrial gas turbine to the central receiver concept for solar electric power
[ASME PAPER 79-GT-45] 23 p0375 A79-32345

Application of recuperative gas cycles with a bypass heat generator to solar energy power plants
[ASME PAPER 79-GT-89] 23 p0376 A79-32366

Mississippi County Community College solar photovoltaic total energy project
[ASME PAPER 79-SOL-13] 23 p0380 A79-32463

First steps to the Solar Power Satellite
23 p0382 A79-32721

Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956

Application of a simplified Markov model to the study of a solar power plant storage system
23 p0383 A79-32964

Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976

The solar still - A new design
23 p0384 A79-33213

Solar distillation in Brasil
23 p0385 A79-33214

Complementary nature of wind and solar energy at a continental mid-latitude station
23 p0396 A79-33763

Solar-radiation-excited CO2-Br2-He gas laser
23 p0397 A79-33887

Designing thermally efficient buildings for the U.S. Midwest
23 p0397 A79-33951

SOLARES - A new hope for solar energy
23 p0399 A79-33992

A combination solar direct electric conversion concentrator and heat collector system
23 p0399 A79-33996

Solar energy conversion system - Four quadrant, two dimension linear solar concentrators
23 p0399 A79-33999

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 2 - Solar energy 2
23 p0400 A79-34002

Analysis of dynamic effects in solar thermal energy conversion systems
23 p0400 A79-34008

Solar energy in California industry - Applications, characteristics and potential
23 p0402 A79-34019

The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications
23 p0402 A79-34020

Solar energy conversion in marine biological systems
23 p0402 A79-34021

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 3 - Solar Energy 3
23 p0402 A79-34022

Direct Solar Energy Conversion at Sea /DSECAS/ - Characteristics of a baseline concept
23 p0402 A79-34026

Solar powered irrigation systems
23 p0403 A79-34030

The role of solar energy in the solution of Turkey's energy predicament
23 p0404 A79-34035

Geothermal energy coupled with solar energy is the future energy in Saudi Arabia
23 p0408 A79-34071

Heat transfer consideration in utilizing solar and geothermal energy
23 p0409 A79-34080

Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters --- for gallium arsenide solar photovoltaic arrays
23 p0416 A79-34140

Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources
23 p0420 A79-34170

A nuclear-solar energy strategy
23 p0421 A79-34174

Solar energy conversion: The solar cell --- Book
23 p0423 A79-34449

Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610

New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34946

Seminar on Testing Solar Energy Materials and Systems, Gaithersburg, Md., May 22-24, 1978, Proceedings
23 p0427 A79-35038

White Sands solar test facility
23 p0429 A79-35048

Solar spectral irradiance at ground level
23 p0429 A79-35053

Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056

Cost effective solar collector performance testing under combined indoor and outdoor conditions
23 p0430 A79-35063

Solar energy systems - Survey of materials performance
23 p0431 A79-35073

SERI solar energy standards activities
23 p0431 A79-35075

Solar energy system testing - Some experiences with minicomputers
23 p0432 A79-35082

Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377

Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379

Solar energy and heat pumps - A possible substitute for fossil fuels for heating private households
23 p0434 A79-35464

French solar policy - Its extent, its methods, its objectives
23 p0434 A79-35476

Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480

Solar power plants. I - Present programs and outlooks
23 p0434 A79-35481

Solar power plants. II - Economic aspects of solar power towers
23 p0435 A79-35482

Solar power towers
23 p0435 A79-35483

Organic synthesis fluids for solar energy systems
23 p0435 A79-35485

Solar options in central Europe - A synthesis of solar possibilities in technological terms according to present-day /1978/ criteria
23 p0435 A79-35490

Solar energy as the basis of an energetic system
23 p0435 A79-35491

Solar energy conversion: Solid-state physics aspects --- Book
23 p0437 A79-36144

Spectrally selective surfaces and their impact on photothermal solar energy conversion
23 p0437 A79-36145

Solar photoelectrolysis with semiconductor electrodes
23 p0437 A79-36147

Solar energy use through biology - Past, present and future
23 p0439 A79-36627

The developing role of photovoltaic generation
23 p0448 A79-37845

The prospects of a biological-photochemical approach for the utilization of solar energy
23 p0448 A79-37850

Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878

Functional solar energy applications based on an improved insulation model
23 p0452 A79-37883

Some practical aspects of the design and installation of domestic solar energy systems in the UK
23 p0452 A79-37884

Complex static mirror solar concentration arrays
23 p0452 A79-37886

Large scale solar thermal power generation
23 p0452 A79-37890

Selected results from the technology assessment of solar energy program
[AIAA PAPER 79-0984] 23 p0458 A79-38187

Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

Conceptual design of sodium-cooled central receiver solar power plant
[AIAA PAPER 79-0994] 23 p0459 A79-38194

Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198

A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199

Ceramic receivers for solar power conversion
[AIAA PAPER 79-1008] 23 p0459 A79-38200

Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202

The Florida Solar Energy Standards Act of 1976
[AIAA PAPER 79-1018] 23 p0460 A79-38203

Solar heated and cooled house in Winter Springs, Florida - A Florida Gas Company Project
[AIAA PAPER 79-1019] 23 p0460 A79-38204

Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206

Solar total energy - Large scale experiment --- supply of factory energy needs
[AIAA PAPER 79-1025] 23 p0460 A79-38207

Opportunities for solar thermal energy in Puerto Rico
[AIAA PAPER 79-1028] 23 p0460 A79-38208
The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209
Solar chemical reactors
23 p0462 A79-38572
The THEK program for solar energy plants with 'distributed' converters
23 p0462 A79-38574
Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575
International Solar Forum, 2nd, Hamburg, West Germany, July 12-14, 1978, Reports. Volumes 1, 2 & 3
23 p0463 A79-38576
Design of the Eichenau solar house --- emphasizing heat insulation and solar collection and conversion
23 p0463 A79-38579
Active and passive solar energy utilization in urban construction
23 p0463 A79-38582
Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585
The development of a stationary concentrator --- parabolic solar absorber surface effects on energy conversion performance
23 p0464 A79-38586
Photoelectric conversion in monomolecular layer formations
23 p0464 A79-38589
The concept of the 1 MW/el/ solar thermal power plant of the European economic community
23 p0464 A79-38590
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592
A contribution to solution of the energy crisis - Proposed solution: Aerothermal plants
23 p0465 A79-38594
System analysis of solar space heating
23 p0465 A79-38595
Experimental project on the utilization of solar energy in domestic hot water heating in Iraq
23 p0465 A79-38597
Theoretical and experimental study of a cylindrical solar photochemical reactor
23 p0467 A79-38618
Fast spectral radiometer --- for solar radiation spectral composition
23 p0469 A79-38629
A solar assisted economy --- system for peak electrical generation and off-peak storage or fuel production
23 p0469 A79-38632
Electrolytic hydrogen production by means of solar and wind energy
23 p0469 A79-38633
The development of a storage system based on encapsulated p.c.m.-materials --- phase change materials for solar thermal storage
23 p0470 A79-38639
An experimental study of walls with latent heat for residences
23 p0470 A79-38640
Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642
Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891
Summary results from the NASA Tech House one year live-in
[AIAA PAPER 79-0987] 23 p0475 A79-38892
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894
Commercialization aspects of solar process hot water systems for the textile industry
[AIAA PAPER 79-1027] 23 p0476 A79-38896
Brayton engines for dispersed solar power
23 p0477 A79-38950
Thermal energy conversion with fluorescent collector-concentrators
23 p0477 A79-39103
An incremental model for conversion of solar energy in agricultural systems
23 p0479 A79-39840
Photochemical aspects of solar energy conversion and storage
23 p0495 A79-40746
Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage
23 p0495 A79-40747
Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy
23 p0495 A79-40748
Spectrally split tandem cell converter studies
23 p0513 A79-41028
Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029
Concepts for rheotaxially-grown thin-film tandem III-V solar cells
23 p0513 A79-41030
Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base
23 p0513 A79-41031
Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033
Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells
23 p0514 A79-41034
Model for comparing cost of flat-array and concentrator photovoltaic solar-cell systems
23 p0514 A79-41035
Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036
Lifetime Cost and Performance model for photovoltaic power systems
23 p0514 A79-41037
Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038
GaAs solar cells for high solar concentration applications
23 p0514 A79-41039
High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040
High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041
Large area thin film gallium arsenide solar cells
23 p0515 A79-41042
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043
Progress towards high efficiency polycrystalline thin-film GaAs MOS solar cells
23 p0515 A79-41044
Solar cells based on GaP/x/As/1-x/ compounds
23 p0515 A79-41045
A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046
An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047
Maximum power trackers for photovoltaic arrays
23 p0516 A79-41049
Fixed angle and seasonably adjustable structural support concepts for solar converters
23 p0518 A79-41063
Status of the DOE Photovoltaic Systems Engineering and Analysis Project
23 p0519 A79-41075
Optimization of terrestrial photovoltaic power systems
23 p0520 A79-41076
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

Analysis of photovoltaic total energy system concepts for single-family residential applications
23 p0520 A79-41078

Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079

Central station power plant applications for photovoltaic solar energy conversion
23 p0520 A79-41080

Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications
23 p0520 A79-41081

Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089

Design of the Natural Bridges National Monument 100 kW PV power system
23 p0521 A79-41090

Description and status of NASA-LeRC/DOE photovoltaic applications systems experiments
23 p0521 A79-41091

Thin tandem junction solar cell
23 p0521 A79-41092

Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093

Design considerations for silicon HLE solar cells
23 p0521 A79-41094

Integrated solar energy installations for isolated operation
23 p0522 A79-41239

Spectral-selective surfaces for the thermal conversion of solar energy --- Thesis
23 p0523 A79-41732

Solar energy - Principal directions of research
23 p0524 A79-41805

Bioconversion of solar energy
23 p0524 A79-41808

Energy analysis of the Solar Power Satellite
24 p0601 A79-44160

Turning to the sun for power
24 p0601 A79-44239

Solar radiation concentrator for uniform irradiation of flat energy receivers and converters
24 p0602 A79-44260

The solar power satellite concept
24 p0603 A79-44277

The engineering analysis of solar radiation
24 p0605 A79-44796

Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201

Overview of solar energy programs and activities in the Southeast
24 p0607 A79-45202

Southern regional solar energy center planning
24 p0608 A79-45203

A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205

Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex
24 p0608 A79-45210

The HYCSOS solar energy driven heat pump
24 p0610 A79-45222

On solar energy heating and degree days during the winter months
24 p0610 A79-45226

The economics of solar domestic hot water systems in state university and community college buildings
24 p0610 A79-45227

Concepts for solar production of hydrogen
24 p0614 A79-45593

Variation of photovoltaic effect in vertical n/p-junction solar cells
24 p0629 A79-46157

Thermodynamic analysis of combined GTP-TEG solar energy converter --- Gas Turbine power Plants - Thermoelectric Generators
24 p0636 A79-46758

Control of the radiant flux of high-temperature solar-energy installations with respect to two parameters
24 p0637 A79-46907

Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells
24 p0637 A79-47019

Ultrafine nickel particles for photothermal conversion of solar energy
24 p0638 A79-47062

Ni cermet selective absorbers for solar photothermal conversion
24 p0641 A79-47790

Toward optimal control of solar energy systems
24 p0643 A79-47944

WELMM analysis and solar energy conversion systems --- economic analysis
24 p0644 A79-48022

A WELMM comparison of energy scenarios --- evaluation of different energy production systems in France
24 p0645 A79-48025

Energy balance of solar thermoelectric generators
24 p0646 A79-48734

Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737

Principles for the calculation of heliostat fields of a solar power plant
24 p0646 A79-48738

Heating characteristics of concentrator/receiver systems using selective absorption surfaces
24 p0646 A79-48739

Solar comes out of the shadows --- energy conversion technology forecasting
24 p0651 A79-49424

Computer simulation of a solar energy system
24 p0652 A79-49479

Studies of CdSiAs2 for photovoltaic applications
24 p0654 A79-50027

Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50028

Photoelectrochemistry and solar energy conversion
24 p0654 A79-50153

Some relations governing major solar cell parameters
24 p0655 A79-50179

Towards the design of contrived photosynthesizers
24 p0655 A79-50185

Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191

Efficiency of tandem solar cell systems as a function of temperature and solar energy concentration ratio
24 p0656 A79-50194

The availability of solar energy for work processes
24 p0658 A79-50346

Solar power satellite - Putting it together --- fabrication, composite materials, and building site considerations
24 p0659 A79-50399

Testing for commercialization of the central power tower --- pilot plant for megawatt solar power generation
24 p0660 A79-50460

Conceptual development of a solar town in Iran
24 p0660 A79-50539

Solar conversion by concentration cells with hydrides
24 p0662 A79-50549

Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

A solid-state solar-powered heat transfer device
24 p0667 A79-50932

Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation
24 p0669 A79-51178

Sandia Laboratories operational experience with small heat engines in solar thermal power systems
24 p0673 A79-51752

A new solar thermal receiver utilizing a small particle heat exchanger
24 p0674 A79-51754
Solar parabolic dish thermal power systems - Technology and applications
24 p0674 A79-51755
Solar One Project - A 10-megawatt solar thermal central receiver pilot plant
24 p0674 A79-51757
A combined cycle for solar-fossil hybrid power generation
24 p0674 A79-51760
Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation
24 p0675 A79-51763
Hybrid alternate energy system --- wind-photovoltaic system for desert regions
24 p0675 A79-51768
Application of a GaAs photovoltaic solar system in a utility substation
24 p0676 A79-51770
Energy storage and conversion in conjunction with photovoltaic energy systems
24 p0679 A79-51790
Toward the renewables - A natural gas/solar energy transition strategy
24 p0686 A79-51851
Hydrogen as the solar energy translator --- in photochemical and photovoltaic processes
24 p0686 A79-51852
Elementary design guidelines for Stirling engines
24 p0689 A79-51874
Solar thermoelectric energy conversion
24 p0699 A79-51976
Solar refrigeration utilizing zeolites
24 p0703 A79-52014
Coatings for enhanced photothermal energy collection. I - Selective absorbers
24 p0704 A79-52307
CVD molybdenum thin films in photothermal solar converters
24 p0704 A79-52309
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311
Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon
24 p0704 A79-52312
Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317
Reducing institutional barriers to solar energy through the use of cooperatively-owned solar energy systems
24 p0707 A79-52573
Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952
Institutional issues in international solar energy utilization
[IAF PAPER 79-IISL-02] 24 p0711 A79-53453
Solar energy bank for mankind in contemporary international space law
[IAF PAPER 79-IISL-47] 24 p0711 A79-53482
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
24 p0713 A79-53725
The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294
Solar tracking control system Sun Chaser
[NASA-TM-78199] 21 p0172 N79-10514
Solar heating and cooling system design and development
[NASA-CR-150803] 21 p0172 N79-10516
Rankine cycle machines for solar cooling
[NASA-TM-78196] 21 p0173 N79-10524
Solar photolysis of water
[NASA-CASE-NPO-14126-1] 21 p0182 N79-11470
Biomimetic approach to solar energy conversion: Artificial photosynthesis
[CONF-780222-5] 21 p0186 N79-11506
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572
Biological solar energy conversion approaches to overcome yield stability and product limitations
[PB-284823/2] 21 p0199 N79-12577
SIMS prototype system 4 - performance test report
[NASA-CR-150820] 21 p0205 N79-13499
Solar heating and cooling. Research and development: Project summaries
[DOE/CS-0010] 21 p0208 N79-13519
Component-based simulator for solar systems
[LA-UR-78-1494] 21 p0208 N79-13521
Application of solar technology to today's energy needs, volume 2 --- systems analysis and analytical methods
[OTA-E-77-VOL-2] 21 p0218 N79-14530
Analytical methods
21 p0218 N79-14531
Calculation of backup requirements
21 p0218 N79-14533
Results of systems analysis --- effectiveness of integrated solar energy systems
21 p0218 N79-14534
A detailed analysis of the impact of onsite equipment on utility costs --- marginal costs of providing backup power for solar energy systems
21 p0218 N79-14535
Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566
OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action
[NASA-TM-80002] 21 p0225 N79-15114
Solar heating and hot water system installed at Listerhill, Alabama
[NASA-CR-150870] 21 p0229 N79-15406
Preliminary design package for prototype solar heating and cooling systems
[NASA-CR-150853] 21 p0229 N79-15409
Benefits of solar/fossil hybrid gas turbine systems
[NASA-TM-79083] 21 p0229 N79-15410
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations
[PB-286487/4] 21 p0230 N79-15422
Satellite Power System (SPS) program summary
[DOE/ER-0022] 22 p0337 N79-16893
Certification report for the CALMAC solar powered pump
[NASA-CR-150872] 22 p0341 N79-17331
Photovoltaic tests and applications project
[NASA-TM-79018] 22 p0342 N79-17336
Development, testing, and certification of Calmac Mfg. Corp. solar collector and solar operated pump
[NASA-TM-78218] 22 p0342 N79-17338
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-287417/0] 22 p0343 N79-17349
Thermal energy transformer
[NASA-CASE-NPO-14058-1] 22 p0348 N79-18443
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457
Austrian 10kWE solar power plant. A project of the Federal Ministry for Science and Research
22 p0349 N79-18460
Large area silicon sheet by EFG
[NASA-CR-158379] 22 p0359 N79-20483
The parabolic concentrating collector: A tutorial
[NASA-CR-158426] 22 p0359 N79-20491
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335
Solar thermal power generation. A bibliography with abstracts
[NASA-CR-158004] 23 p0540 N79-22614
Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615
Systems definition space based power conversion systems: Executive summary
[NASA-CR-150209] 23 p0541 N79-22616
Advanced subsystems development
[NASA-CR-158335] 23 p0542 N79-22627

Research on energy storage for solar thermal conversion
[NASA-CR-159427] 23 p0542 N79-22631
Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443
Thermal Storage Applications Workshop. Volume 1: Plenary Session Analysis
[NASA-CR-158643] 23 p0559 N79-24460
Thermal Storage Applications Workshop. Volume 2: Contributed Papers
[NASA-CR-158644] 23 p0559 N79-24461
Thermal power systems, small power systems application project. Volume 1: Executive summary
[NASA-CR-157441] 23 p0560 N79-24462
High-efficiency thin-film GaAs solar cells
[NASA-CR-158641] 23 p0560 N79-24463
Thermal power systems, point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-158534] 23 p0560 N79-24464
Solar project cost report: Terrell E. Moseley Office Building, Lynchburg, Virginia
[SOLAR/2011-78/60] 23 p0562 N79-24483
Solar project description: Aratex Services, Incorporated, industrial laundry, Fresno, California
[SOLAR/2008-78/50] 23 p0562 N79-24485
Solar project description: Iris Images, Incorported, film laboratory, Mill Valley, California
[SOLAR/2005-78/50] 23 p0562 N79-24486
Effects of air damper leaks on solar energy system performance
[SOLAR/0012-78/29] 23 p0563 N79-24497
Research at Sandia Laboratories for Solar Thermal Large Power Systems Program
[SAND-78-8051] 23 p0565 N79-24510
Performance testing of the McDonnell Douglas fresnel lens solar collector
[SAND-78-0625] 23 p0565 N79-24512
Photovoltaics and environmental impact considerations
23 p0571 N79-25496
Characteristics of a typical village in the solar belt of the developing countries of Asia, Africa, and Latin America
23 p0571 N79-25497
Solar heating system final design package
[NASA-CR-161228] 23 p0572 N79-25503
Certification and verification for Northrup model NSC-01-0732 fresnel lens concentrating solar collector
[NASA-CR-161164] 23 p0572 N79-25504
Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513
High efficiency GaAs solar cell development
[AD-A066616] 23 p0573 N79-25514
Solar energy Measuring stations in Austria: Results and experiences
[ASSA-SE-INFO-6/78] 23 p0574 N79-25527
Handbook of data on selected engine components for solar thermal applications
[NASA-TM-79027] 23 p0579 N79-26476
Solar thermal power-conversion system
23 p0579 N79-26477
Power-conversion system component summation
23 p0580 N79-26483
Workshop on Ecological Impacts of Solar Energy Conversion
[COO-4339-4] 23 p0583 N79-26522
Analysis of helio-thermoelectrical energy conversion efficiency
[REPT-77/HE-40-241] 23 p0584 N79-26534
Elements for technological and economic modeling of tower-type solar power plants
[P/51/76/17] 23 p0584 N79-26535
Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area --- energy technology
[P/51/77/21] 23 p0584 N79-26536
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537
Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650
Performance prediction evaluation of ceramic materials in point-focusing solar receivers
[NASA-CR-158774] 23 p0594 N79-27654
Solar energy system installed at Mount Rushmore National Visitor Center in Keystone, South Dakota
[NASA-CR-161238] 23 p0595 N79-27661
Analysis of the potential of wind energy conversion systems
[SAND-78-2099C] 23 p0595 N79-27668
Metal hydride solar heat pump and power system (HYCSOS)
[CONF-781133-5] 23 p0596 N79-27675
Solar energy for agricultural and industrial . process heat
[DOE/CS-0053] 23 p0597 N79-27688
Environmental readiness document. Solar: Hot water and passive, commercialization phase 3 planning
[DOE/ERD-0010] 23 p0597 N79-27690
Storage systems analysis --- Solar Thermal Power Program
[SERI/PR-35-101] 23 p0599 N79-27705
Powersat: An evaluation
[TUM-IRT-TE-22/2] 23 p0599 N79-27707
Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665
Solar heating, cooling, and hot water systems installed at Richland, Washington
[NASA-CR-161237] 24 p0722 N79-28721
Solar heating and hot water system installed at Cherry Hill, New Jersey
[NASA-CR-161235] 24 p0723 N79-28729
Trombe wall vs direct gain: A comparative analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
Performance and cost of a hybrid passive/active solar house
[LA-UR-78-2209] 24 p0725 N79-28756
Insolation modeling overview
[SAND-78-0963] 24 p0726 N79-28768
Economics of solar photovoltaic energy systems for crop irrigation in the United States
[COO-4094-29] 24 p0726 N79-28769
Solar collector manufacturing activity
[DOE/EIA-0174] 24 p0728 N79-28787
Solar project cost report
[SOLAR/2018-78/60] 24 p0728 N79-28788
Hierarchial decomposition approach to environmental policy analysis
[BNL-24444] 24 p0729 N79-28814
Radiation shadow indicator
[NASA-CASE-MFS-23546-2] 24 p0730 N79-29037
The use of chlorophyll in a novel solar battery
24 p0736 N79-29594
Semiconductor grade, solar silicon purification project --- photovoltaic solar energy conversion
[NASA-CR-158868] 24 p0736 N79-29598
Solar engine --- Flat plate type
[NASA-CASE-LAR-12148-1] 24 p0737 N79-29608
Role of government in solar energy development: A view from the northwest --- economic feasibility of solar heating
[PNL-2784] 24 p0738 N79-29621
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
Bismarck, North Dakota, office commercial solar demonstration design and construction report
[COO-4228-1] 24 p0739 N79-29633
Design and installation manual for thermal energy storage
[ANL-79-15] 24 p0740 N79-29636
Assessment of the technoeconomic feasibility or Seasonal Thermal Energy Storage systems (STES)
[ANL/EES-TM-35] 24 p0740 N79-29637
Short notice on a grand forest: Tropical land converting sunlight to energy
[NP-23278] 24 p0741 N79-29653
Simulation and design of solar thermal processes
[COO-2588-2] 24 p0741 N79-29655

Thermal power systems small power systems
  applications project. Volume 2: Detailed report
  [NASA-CR-162104] 24 p0749 N79-30718
Solar energy retrofit for Clarksville Middle
  School, Clarksville, Indiana
  [NASA-CR-161272] 24 p0749 N79-30721
Solar Photovoltaic Energy Research, Development,
  and Demonstration Act of 1978 --- congressional
  reports
  [GPO-36-187] 24 p0750 N79-30725
Role of the vapor compression cycle in solar
  energy utilization
  [BNL-24573] 24 p0753 N79-30776
Reliability, maintainability, and materials
  performance of solar demonstration systems
  [ANL/EES-CF-14] 24 p0754 N79-30781
Economy of a retrofit solar system
  [CONF-790213-2] 24 p0755 N79-30795
Development of a low-temperature, low-cost,
  black-liquid solar collector
  [CONF-780983-14] 24 p0756 N79-30805
Analysis of collectors for process heat applications
  [SAND-78-1977] 24 p0756 N79-30806
Solar module curve tracer --- for evaluation of a
  photovolatic power system
  [COO-4094-35] 24 p0759 N79-30826
Methodology for determining the economic
  feasibility of residential or commercial solar
  energy systems
  [SAND-78-0931] 24 p0759 N79-30827
Photobiological production of hydrogen: A solar
  energy conversion option --- hydrogen metabolism
  in photosynthetic bacteria and algae
  [SERI/TR-33-122] 24 p0767 N79-31432
Silicon web process development --- for solar cell
  fabrication
  [NASA-CR-162181] 24 p0770 N79-31762
Automated array assembly task in-depth study of
  silicon wafer surface texturizing
  [NASA-CR-162161] 24 p0770 N79-31771
Quantitative analysis of defects in silicon --- to
  predict energy conversion efficiency of silicon
  samples for solar cells
  [NASA-CR-162173] 24 p0771 N79-31772
Array automated assembly task low cost silicon
  solar array project, phase 2
  [NASA-CR-162174] 24 p0771 N79-31773
Summary of application analysis for photovoltaic
  systems
  [SAND-78-0980C] 24 p0773 N79-31796
Domestic policy review of solar energy
  [TID-28834] 24 p0773 N79-31797
Implementation of state solar incentives:
  Research, Development, and demonstration programs
  [SERI/TR-51-161] 24 p0773 N79-31799
Passive solar design: A survey of monitored
  buildings
  [HCP/CS-4113-2] 24 p0774 N79-31803
Classification scheme for the common passive and
  hybrid heating and cooling systems
  [LBL-8814] 24 p0774 N79-31805
Implementation of state solar incentives: State
  testing and certification
  [SERI/TR-51-162] 24 p0774 N79-31808
Passive solar energy planning aid kit for building
  design architects and planners
  [CONF-780337-P1] 24 p0775 N79-31813
Passive solar energy planning aid kit for the
  business community and general public
  [CONF-780337-P2] 24 p0775 N79-31814
Analysis of Federal incentives used to stimulate
  energy production --- with emphasis on solar
  energy
  [PNL-2410-1-REV] 24 p0775 N79-31819
Central receiver design considerations for Brayton
  cycle solar power plants
  [AED-CONF-78-212-016] 24 p0777 N79-31832
A preliminary assessment of small steam Rankine
  and Brayton point-focusing solar modules
  [NASA-CR-162302] 24 p0782 N79-32632
Results of the 1978 NASA/JPL balloon flight solar
  cell calibration program
  [NASA-CR-162298] 24 p0782 N79-32635
The JPL space photovoltaic program --- energy
  efficient sol silicon solar cells for space
  applications
  24 p0783 N79-32643
Intercell ohmic contacts for high efficiency
  multijunction solar converters
  24 p0786 N79-32673
Decentralized solar energy technology assessment
  program: Research plan
  [ORNL/TM-6913] 24 p0786 N79-32677
Solar Repowering Workshop
  [SERI/TP-35-57] 24 p0787 N79-32689
Combined photovoltaic/thermal system studies
  [SAND-78-7031] 24 p0787 N79-32691
Systems analysis of solar thermal power systems.
  Report on task 1: Determination and
  characterization of solar thermal conversion
  options
  [PNL-2693] 24 p0788 N79-32692
Field tests of photovoltaic power systems
  [COO-4094-32] 24 p0788 N79-32700
Experimental performance study of a series solar
  heat pump
  [BNL-25928] 24 p0789 N79-32704
Heat pump/rock bed storage systems --- computer
  program for economic analysis
  [COO-4704-2] 24 p0789 N79-32705
Status review of the technology assessment of
  solar energy program
  [LA-UR-79-1369] 24 p0790 N79-32714
Application and system design study for
  cost-effective solar photovoltaic systems at
  Federal installations
  [HCP/M2522-01] 24 p0790 N79-32715
Development of a prototype 10kW solar power plant
  [BMFT-FB-T-78-33] 24 p0792 N79-32730
Theoretical analysis of a passive heat pipe
  heating and cool system
  [PB-296066/4] 24 p0792 N79-32736
Reduced power processor requirements for the 30-cm
  diameter Hg ion thruster
  [NASA-TM-79257] 24 p0795 N79-33253
Shelter design and energy usage: A methodology
  for evaluating the impacts of residential space
  conditioning technologies on the consumer, the
  electric utility, and society
  24 p0797 N79-33557
Studies of AlGaAs-GaAs solar cells
  24 p0797 N79-33558
Owens-Illinois subsystem design package for the
  SEC-601 air-cooled solar collector
  [NASA-CR-161094] 24 p0798 N79-33570
Phase 1 of the first solar small power system
  experiment (experimental system no. 1). Volume
  1: Technical studies for solar point-focusing,
  distributed collector system, with energy
  conversion at the collector, category C
  [NASA-CR-162369] 24 p0799 N79-33573
Phase 1 of the first solar small power system
  experiment (experimental system no. 1). Volume
  2: Appendix A - D
  [NASA-CR-162370] 24 p0799 N79-33574
Phase 1 of the first solar small power system
  experiment (experimental system no. 1). Volume
  3: Appendix E - N
  [NASA-CR-162371] 24 p0799 N79-33575
Phase 1 of the first small power system experiment
  (engineering experiment no. 1). Volume 1:
  Executive summary --- development and testing of
  a solar thermal power plant
  [NASA-CR-162372] 24 p0799 N79-33576
Phase 1 of the first small power system experiment
  (engineering experiment no. 1). Volume 2:
  System concept selection --- development and
  testing of a solar thermal power plant
  [NASA-CR-162373] 24 p0799 N79-33577
Phase 1 of the first small power system experiment
  (engineering experiment no. 1). Volume 3:
  Experimental system descriptions --- development
  and testing of a solar thermal power plant
  [NASA-CR-162374] 24 p0799 N79-33578
Phase 1 of the first small power system experiment
  (engineering experiment no. 1). Volume 4:
  Commercial system definition --- development and
  testing of a solar thermal power plant
  [NASA-CR-162375] 24 p0799 N79-33579
Phase 1 of the first small power system experiment
  (engineering experiment no. 1). Volume 5:
  Supporting analyses and trade studies ---
  development and testing of a solar thermal power
  plant
  [NASA-CR-162376] 24 p0800 N79-33580

Performance evaluation of solar films and screens
[AD-A070636] 24 p0800 N79-33583
Standards for photovoltaic energy conversion systems
[PB-296274/4] 24 p0801 N79-33597
Technology for solar energy utilization
[PB-296572/1] 24 p0802 N79-33598
Solar energy policy
[PB-296193/6] 24 p0802 N79-33603
Environmental, socioeconomic, and consumer protection aspects of selected decentralized solar energy applications
24 p0803 N79-33609
An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883

SOLAR FLARES

Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges
23 p0478 A79-39676

SOLAR FLUX

A numerical solar radiation model based on standard meteorological observations --- for energy system application
21 p0041 A79-11871

SOLAR FLUX DENSITY

Dependence of solar radiation availability on atmospheric turbidity
21 p0119 A79-17308
Determining the terrestrial, incident solar flux on an arbitrarily oriented surface using available solar/weather data
21 p0119 A79-17310
Solar radiation studies for utilization of flat-plate collectors in an equatorial region
21 p0119 A79-17311
Total solar radiation in Mexico using sunshine hours and meteorological data
21 p0150 A79-18026
Composite heliostats of large solar plants
21 p0166 A79-20350
Isotropic distribution approximation in solar energy estimations --- diffuse insolation on tilted surface
22 p0262 A79-23753
Solar concentrator flux distributions using backward ray tracing
24 p0603 A79-44365

SOLAR FURNACES

Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229
Study of the dynamics of the materials melting process for a solar furnace
21 p0167 A79-20359
Flux-redistribution in the focal region of a planar Fresnel ring mirror --- solar furnace design
22 p0263 A79-23764
Analysis of a Cassegrain solar furnace
22 p0293 A79-28147
High temperature materials study --- for thermal insulation in solar furnaces
23 p0431 A79-35070
Potential applications of solar furnaces in materials industry
23 p0471 A79-38654
Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330
Solar radiation concentrator for uniform irradiation of flat energy receivers and converters
24 p0602 A79-44260
Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen
24 p0602 A79-44265
Thermal analysis in the focal spot of a solar furnace
24 p0641 A79-47794
Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183
Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility
24 p0658 A79-50343
Concentration of a cassegrain solar furnace
24 p0658 A79-50344
Treatment of molybdenite ore using a 2 kW solar furnace
[LA-UR-79-6] 23 p0561 N79-24478
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537
Extraterrestrial fiberglass production using solar energy --- lunar plants or space manufacturing facilities
24 p0778 N79-32237

SOLAR GENERATORS

Preliminary design of the solar total energy-large scale experiment at Shenandoah, Georgia
21 p0019 A79-10159
Conceptual design of the Fort Hood Solar Total Energy-Large Scale Experiment
21 p0019 A79-10160
JPL - Small Power Systems Applications Project --- for solar thermal power plant development and commercialization
21 p0019 A79-10161
Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation
21 p0020 A79-10163
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
A free-piston Stirling engine for small solar power plants
21 p0024 A79-10205
Economic methodology for solar power-generating systems
21 p0030 A79-10251
Solar thermal electric power systems - Manufacturing cost estimation and systems optimization
21 p0046 A79-12273
Solar electric power supplies - Design and layout
21 p0057 A79-13639
Solar power plants in the U.S.A.
21 p0057 A79-13640
Development of solar thermal power plants
21 p0057 A79-13641
Small solar power plant with a Freon turbine
21 p0057 A79-13642
Solar thermal power stations
21 p0057 A79-13644
Solar One - A 10-megawatt solar thermal central receiver pilot plant project
[AIAA PAPER 78-1750] 21 p0060 A79-13853
Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854
Alternative central receiver solar power plant using salt as a heat transfer and storage medium
[AIAA PAPER 78-1753] 21 p0060 A79-13855
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869
Preliminary design of solar total energy - Large scale experiment at Shenandoah, Georgia
[AIAA PAPER 78-1776] 21 p0062 A79-13873
Flexible roll-out solar generators - Energy sources for future high-power space missions
[DGLR PAPER 78-165] 21 p0063 A79-14056
Solar energy installations for pumping irrigation water
21 p0066 A79-14260
Exploring future energy options - An economic analysis
21 p0068 A79-14324
MHD conversion of solar energy --- space electric power system
21 p0109 A79-16614
A comparison between sun and wind as energy sources in irrigation plants
21 p0118 A79-17295
Simulation and cost of photovoltaic generators
21 p0122 A79-17334
Design of solar energy concentrators for power generation in residential and nonresidential areas
21 p0136 A79-17460

The attainable efficiency of the solar thermoelectric generators
21 p0140 A79-17496
The French CNRS 1 MW solar power plant
21 p0141 A79-17498
Cycle optimization for a solar turbopack --- turbine water pump utilizing Rankine cycle
21 p0141 A79-17500
A small solar power plant with a freon turbine
21 p0141 A79-17501
Development of small solar power plants for rural areas in India
21 p0141 A79-17502
Design and performance of 1/4 H.P. solar power unit
21 p0141 A79-17503
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine --- operating in planetary environment
21 p0166 A79-20348
Determination of thermal contact resistances --- for solar thermoelectric generators
21 p0166 A79-20351
Using N2O4 in a solar gas-turbine plant
21 p0167 A79-20357
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358
Universal generator storer curves --- Economic and relative size optimization of solar photovoltaic energy
22 p0238 A79-20799
A ceramic heat exchanger for a Brayton cycle solar electric power plant
22 p0239 A79-20822
Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269
Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612
Reversible thermoelectric power conversion of energy fluctuations
22 p0261 A79-23619
Solar thermal electric power systems - Comparison of line-focus collectors
22 p0263 A79-23758
Use of organic fluids in solar turbines
22 p0269 A79-24621
Power from space by laser
22 p0284 A79-26596
Solar power satellites - The laser option
22 p0284 A79-26599
Conceptual design of a solar powered closed-cycle gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532
Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545
Application of the Centaur industrial gas turbine to the central receiver concept for solar electric power
[ASME PAPER 79-GT-45] 23 p0375 A79-32345
First steps to the Solar Power Satellite
23 p0382 A79-32721
Optimization of the heat transfer circuit of solar power plants using distributed solar thermal converters - Application to collectors of the THEK type
23 p0382 A79-32953
A combination solar direct electric conversion concentrator and heat collector system
23 p0399 A79-33996
Solar thermal photovoltaic electric power generator
23 p0402 A79-34023
Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024
Dual purpose solar-electric power plants
23 p0403 A79-34027
Complex solar-electrical plant of large capacity
23 p0403 A79-34029
A central receiver solar thermal power system
23 p0424 A79-34455
Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Solar power plants. I - Present programs and outlooks
23 p0434 A79-35481
Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources
23 p0435 A79-35484
Solar eyeball - An automatic sun-tracking concentrator for use with photovoltaic generators
23 p0442 A79-36792
High temperature solar thermoelectric generator
23 p0447 A79-37299
Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878
Solar electric generator for developing nations
23 p0452 A79-37885
Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193
A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591
Analysis of a 1 kW photovoltaic generator with concentration
23 p0466 A79-38604
Solar system - Solar generator-inverter-asynchronous motor-pump --- for waste water treatment
23 p0466 A79-38605
Operating systems for solar electric energy supplies
23 p0466 A79-38606
New developments and plannings for solar power plants of M.A.N.-Company
23 p0467 A79-38619
A solar assisted economy --- system for peak electrical generation and off-peak storage or fuel production
23 p0469 A79-38632
Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891
Latest developments in solar array technology at AEG-Telefunken
23 p0500 A79-40915
The Odeillo solar electric power plant
23 p0524 A79-41807
Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/
24 p0636 A79-46757
Energy balance of solar thermoelectric generators
24 p0646 A79-48734
Principles for the calculation of heliostat fields of a solar power plant
24 p0646 A79-48738
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50701
Siting considerations for solar thermal electric generating plants
24 p0664 A79-50879
A distributed microcomputer-based control system for a large scale solar total energy system
24 p0672 A79-51741
Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant
24 p0673 A79-51747
Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept
24 p0673 A79-51750
Turbine sizing of a solar thermal power plant
24 p0673 A79-51751
Solar parabolic dish thermal power systems - Technology and applications
24 p0674 A79-51755

Solar One Project - A 10-megawatt solar thermal
central receiver pilot plant
24 p0674 A79-51757
A combined cycle for solar-fossil hybrid power
generation
24 p0674 A79-51760
Solar thermal power plants in small utilities - An
economic impact analysis
24 p0675 A79-51761
Design and performance of bicycle wind turbine
rotors
24 p0677 A79-51777
Institutional issues in international solar energy
utilization
[IAF PAPER 79-IISL-02] 24 p0711 A79-53453
Achievable flatness in a large microwave power
antenna study
[NASA-CR-151831] 21 p0171 N79-10272
Solar irrigation program plan: Second revision
[SAND-78-0308-REV] 21 p0187 N79-11525
Solar thermal power systems program: Program
summary
[DOE/ET-0018/1] 21 p0207 N79-13518
Solar electric power generation, volume 2.
Citations from the NTIS data base
[NTIS/PS-78/1108/6] 21 p0212 N79-13557
Solar electric power generation, volume 2.
Citations from the Engineering Index data base
[NTIS/PS-78/1109/4] 21 p0212 N79-13558
Accuracy analysis of pointing control system of
solar power station
[NASA-CR-150880] 21 p0215 N79-14143
Solar power satellite rectenna design study:
Directional receiving elements and
parallel-series combining analysis
[NASA-CR-151866] 22 p0330 N79-16039
Assessment of the potential of solar thermal small
power systems in small utilities
[NASA-CR-158093] 22 p0335 N79-16377
Solar water pumps. Citations from the Engineering
Index data base
[NTIS/PS-78/1288/6] 22 p0343 N79-17348
Development of a phase-change thermal storage
system using modified anhydrous sodium hydroxide
for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454
Thermal storage technologies for solar industrial
process heat applications
[NASA-TM-79130] 22 p0360 N79-20499
Solar thermal power generation. A bibliography
with abstracts
[NASA-CR-158004] 23 p0540 N79-22614
Thermal power systems small power systems
application project: Siting issues for solar
thermal power plants with small community
applications
[NASA-CR-158520] 23 p0542 N79-22629
Techno-economic projections for advanced small
solar thermal electric power plants to years
1990-2000
[NASA-CR-158519] 23 p0549 N79-23503
Solar photovoltaic field tests and applications
project
23 p0571 N79-25493
Military applications of photovoltaic systems
23 p0571 N79-25494
Design investigation of solar powered lasers for
space applications
[NASA-CR-159554] 23 p0579 N79-26384
A method for correlating performance data of a
terrestrial solar cell array
[NASA-TM-79163] 23 p0581 N79-26503
Design of a 150 kWe distributed collector solar
thermal power station
[AED-CONF-78-212-013] 23 p0583 N79-26517
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537
Demands and effects of solar technology on
electric power storage
[AED-CONF-78-155-047] 23 p0596 N79-27678
Design concept and feasibility study of a flexible
deployable, solar panel generator used on a
teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708
User's guide for MIRVAL: A computer code for
comparing designs of heliostat-receiver optics
for central receiver solar power plants
[SAND-77-8280] 24 p0725 N79-28932
Thermal power systems small power systems
applications project. Volume 2: Detailed report
[NASA-CR-162104] 24 p0749 N79-30718
Some current developments in solar array
technology at AEG-Telefunken
24 p0751 N79-30736
Solar power satellites: The Engineering Challenges
24 p0752 N79-30750
Interface problems on an SPS solar array blanket
24 p0752 N79-30751
MOSGEN: A potential European contribution in
developing large solar generators suitable for
growing power levels up to SPS-systems
24 p0752 N79-30752
INTELSAT 5 solar array
24 p0752 N79-30757
Behavior of solar generators in low orbits
24 p0752 N79-30766
Solar thermal power systems, program summary
[DOE/ET-0078] 24 p0773 N79-31794
Intercell ohmic contacts for high efficiency
multijunction solar converters
24 p0786 N79-32673
Phase 1 of the first solar small power system
experiment (experimental system no. 1). Volume
2: Appendix A - D
[NASA-CR-162370] 24 p0799 N79-33574
Phase 1 of the first solar small power system
experiment (experimental system no. 1). Volume
3: Appendix E - H
[NASA-CR-162371] 24 p0799 N79-33575
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 1:
Executive summary --- development and testing of
a solar thermal power plant
[NASA-CR-162372] 24 p0799 N79-33576
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 2:
System concept selection --- development and
testing of a solar thermal power plant
[NASA-CR-162373] 24 p0799 N79-33577
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 3:
Experimental system descriptions --- development
and testing of a solar thermal power plant
[NASA-CR-162374] 24 p0799 N79-33578
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 4:
Commercial system definition --- development and
testing of a solar thermal power plant
[NASA-CR-162375] 24 p0799 N79-33579
Phase 1 of the first small power system experiment
(engineering experiment no. 1). Volume 5:
Supporting analyses and trade studies ---
development and testing of a solar thermal power
plant
[NASA-CR-162376] 24 p0800 N79-33580
Environmental, socioeconomic, and consumer
protection aspects of selected decentralized
solar energy applications
24 p0803 N79-33609

SOLAR HEATING

Can solar energy contribute significantly to the
solution of the world's energy famine
21 p0019 A79-10155
Analysis and design of an 18-ton solar-powered
heating and cooling system
21 p0019 A79-10156
Conceptual design of the Fort Hood Solar Total
Energy-Large Scale Experiment
21 p0019 A79-10160
Central solar heat stations and the Studsvik
Demonstration Plant
21 p0021 A79-10175
Thermosyphon solar water heating system under
Brasilian conditions
21 p0021 A79-10177
Heat pipe central solar receiver gas turbine plant
21 p0022 A79-10178
The fossil fuel cost of solar heating
21 p0022 A79-10180
Nitinol heat engines for economical conversion of
low grade thermal density
21 p0027 A79-10230
Application of composite materials in the solar
energy domain
21 p0034 A79-11195

Asymptotic behaviour as a guide to the long term performance of solar water heating systems
21 p0041 A79-11872

Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965

Return flow solar air-heater
21 p0055 A79-13609

Control of solar energy systems, heat storage, and heat utilization
21 p0056 A79-13630

Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13631

The Arbonia control concept - Does flow regulation in the solar system cycle make sense --- working fluid regulation in solar heating facility
21 p0056 A79-13632

Solar heating and safety techniques
21 p0056 A79-13633

Safety requirements for solar heating systems - Practical considerations
21 p0056 A79-13634

Sea water desalination by means of solar energy
21 p0057 A79-13645

Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652

Vacation homes near the sea with solar and wind energy utilization - Research done at the Technical University of Hannover: Architectural considerations
21 p0058 A79-13653

On the thermal and thermo-electrolytical generation of hydrogen by solar energy
21 p0059 A79-13660

Passive solar heating and cooling
[AIAA PAPER 78-1756] 21 p0060 A79-13857

Evaluation of control options for solar climate control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859

The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860

Jet impingement solar air heater
[AIAA PAPER 78-1760] 21 p0061 A79-13861

The economic performance of passive solar heating - A preliminary analysis --- thermal storage wall for family home design
[AIAA PAPER 78-1761] 21 p0061 A79-13862

Metal hydride solar heat pump and power system /HYCSOS/
[AIAA PAPER 78-1762] 21 p0061 A79-13863

Preliminary design of solar total energy - Large scale experiment at Shenandoah, Georgia
[AIAA PAPER 78-1776] 21 p0062 A79-13873

A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13878

Optimal sizing of solar collectors by the method of relative areas
21 p0066 A79-14263

Solar and wind energy applications in Hawaii
21 p0066 A79-14265

Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292

Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687

The National Program for Solar Energy
21 p0072 A79-14688

Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691

Passive solar design --- for domestic heating and cooling systems
21 p0074 A79-14720

A microprocessor based solar controller
21 p0082 A79-14979

Conference on Performance Monitoring Techniques for Evaluation of Solar Heating and Cooling Systems, Washington, D.C., April 3, 4, 1978, Proceedings
21 p0087 A79-15826

Analysis of data user's needs for performance evaluation of solar heating and cooling systems
21 p0087 A79-15827

Collection of data for estimating the probable life cycle costs of solar energy systems
21 p0087 A79-15828

Acceleration of solar heating application via improved data evaluation
21 p0087 A79-15829

Technique and instrumentation for measuring the performance of integrated solar heating/cooling systems
21 p0087 A79-15830

Data acquisition using a modular data logger --- for solar heated building monitoring
21 p0088 A79-15832

The use of computer-controlled data acquisition systems in determining solar heating and cooling system performance
21 p0088 A79-15834

System performance measurements for a packaged solar space heating system equipped with air-heating collectors
21 p0088 A79-15835

Instrumentation, data acquisition and monitoring system for an air heating solar system
21 p0088 A79-15836

Flow rate calibration for solar heating and cooling system evaluation
21 p0089 A79-15845

Temperature calibration for solar heating and cooling system evaluation
21 p0089 A79-15846

Boosting the performance of solar HVAC systems by improving component interactions --- Heating, Ventilating and Air Conditioning
21 p0089 A79-15851

Tracking high temperature collectors
21 p0090 A79-15856

Solar energy for residential housing
21 p0090 A79-15857

Passive solar heating of buildings
[LA-UR-77-1162] 21 p0090 A79-15859

Design of active solar heating systems
21 p0090 A79-15860

Solar total energy systems
21 p0090 A79-15863

Theory of solar assisted heat pumps
21 p0090 A79-15864

Residential and commercial thermal storage --- for solar heating and cooling systems
21 p0090 A79-15865

An overview of solar markets
21 p0092 A79-15884

Solar heating and cooling - An electric utility perspective
21 p0093 A79-15890

Solar-earth homes and cities --- in-ground solar heated dwellings
21 p0098 A79-16105

The Solar Heating and Cooling Commercial Demonstration Program at Marshall Space Flight Center - Some problems and conclusions
21 p0099 A79-16135

Controls for residential solar heating
21 p0101 A79-16418

Solar controls and control modifications - New century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419

Controls for heat reclaim with thermal storage coupled with solar heating
21 p0102 A79-16420

Using controls to reduce component size and energy needs for solar HVAC --- Heating Ventilation, Air Conditioning
21 p0102 A79-16421

Principles of solar cooling and heating
21 p0103 A79-16457

A microprocessor-based control system for solar heating and cooling
21 p0107 A79-16565

Economic evaluation and optimization of solar heating systems
21 p0118 A79-17293

The economics of solar heating and cooling - A cautious view
21 p0119 A79-17297

A solar energy system with a dual-source heat pump and long-term storage
21 p0119 A79-17312

Long-term storage of solar energy in native rock
21 p0120 A79-17314

Performance studies of a finned heat pipe latent thermal energy storage system
21 p0121 A79-17325

Stratification effects in the short and long term storage of solar heat
21 p0121 A79-17326

Investigation on the feasibility of using a two-phase thermosyphon for solar storage, space heating and cooking
21 p0121 A79-17330

A study for optimum use of metallic plates for thermal storage in solar processes
21 p0122 A79-17331

Concentrator photovoltaic systems for economical electricity and heat
21 p0124 A79-17354

Cost effective optimum design of solar air heaters
21 p0127 A79-17386

Cheap packed bed absorbers for solar air heaters
21 p0128 A79-17388

An analytical and experimental study of pumped solar water heaters
21 p0128 A79-17389

Economic use of materials in the design of solar water-heating collector plates of the pipe and fin type
21 p0129 A79-17396

Thermal performance of solar collectors used in the national solar heating and cooling demonstration program
21 p0130 A79-17403

Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator
21 p0130 A79-17406

Testing of water-heating collectors according to ASHRAE Standard 93-77
21 p0130 A79-17410

Double-exposure collector system for solar heating applications
[CONF-780114-6] 21 p0131 A79-17411

Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415

A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S.
21 p0132 A79-17423

Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428

Theoretical and experimental yields of a solar heater with flat plate collectors
21 p0134 A79-17437

Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440

Receiver designs for tower-top solar collector
21 p0135 A79-17450

Comparison between simulation and experiment of solar heating
21 p0137 A79-17461

Design, operation and performance of the EBC Solar House
21 p0137 A79-17462

Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463

Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464

Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465

The analysis by stochastic modelling of solar systems for space and water heating
21 p0137 A79-17466

Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467

The interface with solar - Alternative auxiliary supply systems --- for solar space heating
21 p0137 A79-17468

Some experimental investigations on solar space heating in Korea
21 p0138 A79-17470

Design problems of air source solar boosted heat pumps
21 p0138 A79-17472

Heattube, a universal electrical solar heat equipment for building, community and agricultural purposes
21 p0138 A79-17473

Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477

Performance of solar heating and cooling systems used in the national solar heating and cooling demonstration program
21 p0139 A79-17478

A solar heating and cooling system for an industrial plant located in southern Europe
21 p0139 A79-17480

Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486

A heat operated mechanical device to control the temperature and flow of water entering a hot water storage tank in a solar water heating system
21 p0140 A79-17487

Dynamic response of a novel solar water heater --- collector using low-boiling liquid between flat plates
21 p0140 A79-17488

Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489

Optimum insulation with internal and solar heat gains
21 p0140 A79-17490

Periodic heating/cooling by solar radiation --- through concrete slab buildings
21 p0140 A79-17491

Solar heating for a novel dwelling independent of servicing networks
21 p0140 A79-17492

Enhancement of intrinsic solar heating --- thermal performance of house design option
21 p0140 A79-17494

Experimental investigation on solar house heating in northern India
21 p0140 A79-17495

Medium capacity heliothermal power stations
21 p0142 A79-17507

Solar energy --- conversion technologies
21 p0147 A79-17648

Properties optimization for phase-change energy storage in air-based solar heating systems
21 p0149 A79-18018

A cavity receiver design for solar heated gas turbine generating systems
[ONERA, TP NO. 1978-137] 21 p0155 A79-18560

An optimal standard for solar heating systems
[ASME PAPER 78-WA/DSC-19] 21 p0159 A79-19765

Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832

Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834

Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

Investigations of solar heat production for household heating in Turkey
22 p0253 A79-22265

Solar heating using a heat pump and cold collectors
22 p0254 A79-22268

Solar water heaters for a cold climate
22 p0254 A79-22325

Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755

Prediction of the performance of solar heating systems utilizing annual storage
22 p0263 A79-23760

Optimum collector slope for residential heating in adverse climates
22 p0263 A79-23761

Effects of low solar input and amount of storage on thermosyphon hot water system performance 22 p0267 A79-24312

A computer simulation model for determining preferred solar heating and cooling systems 22 p0267 A79-24313

Solar storage unit with built-in oil-gas boiler 22 p0268 A79-24322

A test bed for thermosyphon solar air collectors [AIAA PAPER 79-0541] 22 p0274 A79-25860

International Solar Energy Conference on the Performance of Solar Heating and Cooling Systems, Duesseldorf, West Germany, April 19, 20, 1978, Proceedings [NATO/CCMS-85] 22 p0275 A79-25926

Passive solar heating of buildings 22 p0275 A79-25928

Prospects for solar heating and cooling in the United States 22 p0275 A79-25929

Solar heating, cooling and hot water production - A critical look at CCMS installations 22 p0275 A79-25931

Solar air heating and nocturnal cooling system /CSU Solar House II/ 22 p0275 A79-25932

Dornier/RWE solar house in Essen, FRG 22 p0276 A79-25933

Experience with the MBB-solar testing house at Otterfing and relevant consequences on the commercial product 22 p0276 A79-25934

Mississauga solar house /Mississauga, Ontario, Canada/ 22 p0276 A79-25935

Solar houses in Blagnac /Blagnac, Haute-Garonne, France/ 22 p0276 A79-25937

The performance of the heating system in the solar house of the Eindhoven University of Technology 22 p0276 A79-25938

Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I 22 p0276 A79-25939

Passive solar heating system in Turkey 22 p0277 A79-25942

Passive solar house in Vetlanda - Interim report 22 p0277 A79-25943

Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center 22 p0277 A79-25944

Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors 22 p0285 A79-26815

Performance of combined solar-heat pump systems 22 p0285 A79-26817

Heat loss characteristics of an evacuated plate-in-tube collector 22 p0285 A79-26818

Solar energy application of natural zeolites --- solid absorber-water vapor working fluid system for sorption-refrigeration cycles 22 p0286 A79-27213

Economic feasibility of solar water and space heating 22 p0292 A79-27899

A Markov model of solar energy space and hot water heating systems 22 p0295 A79-28353

Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers 22 p0297 A79-28671

Passive solar energy design and materials --- Book 22 p0302 A79-29625

Regulation and control concepts for the possibilities of a utilization of solar energy in the low-temperature range 22 p0305 A79-30345

Case history - Hybrid passive/active solar system: Performance and cost 22 p0313 A79-31315

Heat pump design - Cost effectiveness in the collection, storage and distribution of solar energy 22 p0313 A79-31316

Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications 22 p0317 A79-31409

Distributed energy storage for solar applications 22 p0317 A79-31410

Report on a survey of operational solar systems 22 p0318 A79-31418

NRC solar monitoring program 22 p0318 A79-31419

Measured and predicted performance of solar domestic water heaters 22 p0319 A79-31422

New approaches for the appropriate use of solar energy in northern climates 22 p0319 A79-31424

Component cost of solar energy systems 22 p0319 A79-31429

A cost effective vertical air/water solar heating collector 22 p0320 A79-31430

Collector and storage efficiencies in solar heating systems 22 p0320 A79-31432

Design study on solar energy systems for commercial buildings 22 p0320 A79-31433

Solar energy retrofit system for an older-type building - The Williamstown Museum project 22 p0320 A79-31434

Solar heating and ventilation using the modified Trombe wall system 22 p0320 A79-31435

Domestic water preheating using solar energy 22 p0321 A79-31437

Economic design of a solar domestic water heating system 22 p0321 A79-31438

WATSUN - A simulation program for solar-assisted heating systems 22 p0321 A79-31439

Validation of an electric circuit model of a solar house 22 p0321 A79-31440

Mathematical modelling of passive solar systems 22 p0321 A79-31441

Control system for solar hot water system 22 p0321 A79-31442

Solutions to energy conservation in northern climates 22 p0321 A79-31443

Passive solar heating - Results from two Saskatchewan residences 22 p0322 A79-31444

Measured and modeled passive performance in Montana --- for solar heating and thermal storage 22 p0322 A79-31445

Integration of a passive and active solar heated, low density, multiple dwelling with atrium 22 p0322 A79-31446

Studies on solar collector performance at NRC 22 p0322 A79-31451

First year performance data and lessons learned in the NRC 14 house solar demonstration program 22 p0323 A79-31453

Alternate energy installations on the Jordan College Campus 22 p0323 A79-31454

Solar heating of domestic hot water at the Confederation Heights Cafeteria 22 p0323 A79-31457

P.E.I. solar assisted domestic water heat project 22 p0323 A79-31458

Solar energy - Four sites demonstrate potential 22 p0328 A79-32194

Performance of a solar space heating system 23 p0385 A79-33223

Computer modelling of solar energy collection 23 p0398 A79-33986

Further modeling of a solar collector based on linear clipped-V channels 23 p0399 A79-33993

Modular stackable hot water storage/heat exchanger system for solar installations 23 p0400 A79-34004

Analysis of dynamic effects in solar thermal energy conversion systems 23 p0400 A79-34008

Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009
Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010
Design, performance, and economics of solar heating and cooling systems for single and multi-family residences
23 p0401 A79-34011
Honeywell General Offices solar HVAC system
23 p0401 A79-34018
Solar energy in California industry - Applications, characteristics and potential
23 p0402 A79-34019
The crucial role of financial institutions in solar heating installations
23 p0403 A79-34031
Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies
23 p0403 A79-34032
Economic prospects for solar energy for industrial process heat
23 p0403 A79-34033
Regional viability and solar commitment - An early adopter study
23 p0404 A79-34034
Heat extraction from a salt gradient solar pond
23 p0410 A79-34085
Solar energy conversion: The solar cell --- Book
23 p0423 A79-34449
Design study - Solar systems for commercial buildings
23 p0425 A79-34601
The DOE 5 MW Solar Thermal Test Facility
23 p0428 A79-35046
The real time aperture flux system as part of the Solar Thermal Test Facility
23 p0429 A79-35050
Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051
The efficiency of solar assisted hot water systems
23 p0430 A79-35061
Solar energy and heat pumps - A possible substitute for fossil fuels for heating private households
23 p0434 A79-35464
Industrial applications of solar heat
23 p0434 A79-35477
An oil company expresses interest in solar energy
23 p0434 A79-35478
SOLPAC - A total design for energy conservation in housing
23 p0434 A79-35479
Theoretical considerations in the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36630
Sizing phase-change energy storage units for air-based solar heating systems
23 p0439 A79-36632
Functional solar energy applications based on an improved insulation model
23 p0452 A79-37883
Some practical aspects of the design and installation of domestic solar energy systems in the UK
23 p0452 A79-37884
Thin-film coatings in solar water heating systems
23 p0452 A79-37887
Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888
Performance and cost of domestic solar water heating in Australia
23 p0452 A79-37889
Domestic hot water heating using hot air solar collectors
[AIAA PAPER 79-0973] 23 p0457 A79-38180
Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183
Solar heated and cooled house in Winter Springs, Florida - A Florida Gas Company Project
[AIAA PAPER 79-1019] 23 p0460 A79-38204
Solar heating and load managed/solar cooling of a small commercial building using flat plate collectors
[AIAA PAPER 79-1020] 23 p0460 A79-38205
Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206
Design of the Eichenau solar house --- emphasizing heat insulation and solar collection and conversion
23 p0463 A79-38579
Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593
System analysis of solar space heating
23 p0465 A79-38595
Active heat insulation through solar low-temperature system that can be integrated into the house wall
23 p0465 A79-38596
Experimental project on the utilization of solar energy in domestic hot water heating in Iraq
23 p0465 A79-38597
Solar energy utilization in comparison with utilization of other energy types
23 p0465 A79-38598
System selection and optimization of a solar thermal installation for cooling, heating, and warm water heating
23 p0466 A79-38609
Thermodynamic analysis of a solar heating and cooling system equipped with an absorption refrigerator heat pump operating in winter
23 p0467 A79-38610
The air-water collector - Operating experience and utilization possibilities --- for solar heating
23 p0467 A79-38615
The performance of solar water heating systems with flat plate collectors
23 p0468 A79-38620
Central receiver solar heating system
23 p0468 A79-38621
Design of solar heated warm water heating facilities from an economic viewpoint
23 p0468 A79-38622
One year's experience with a do-it-yourself gravity-driven solar domestic hot water unit
23 p0468 A79-38623
LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624
Influence of storage tank heat exchanger and mass flow rate on collector efficiency of solar heating units
23 p0468 A79-38625
A case study of a solar assisted heat pump system - 1977
23 p0469 A79-38634
Uncovered absorber combined with flatroof collectors and heatpump
23 p0469 A79-38636
Study on room heating utilizing eutectic salt mixture
23 p0470 A79-38638
The development of a storage system based on encapsulated p.c.m.-materials --- phase change materials for solar thermal storage
23 p0470 A79-38639
An experimental study of walls with latent heat for residences
23 p0470 A79-38640
Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States
23 p0470 A79-38646
A preliminary feasibility study into the use of solar energy to provide year-round heating for a factory unit
23 p0471 A79-38647
Utilization of solar-derived heat in industrial processes
23 p0471 A79-38649
A low energy house in Sweden heated by a solar energy system with heat pump
23 p0471 A79-38650
The design of four solar houses in Zoetermeer, The Netherlands
23 p0471 A79-38651
The LE solar/heat pump house at Skive, Denmark
23 p0471 A79-38652

Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653

Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660

Legal and economic aspects of engineering design in solar water heating systems
23 p0473 A79-38664

Retrofitting strategies for a housing cooperative --- solar water heating installation
23 p0473 A79-38671

Design of a public exhibition building to demonstrate air, water, and passive solar heating systems
23 p0474 A79-38673

A discrete, stochastic simulation model for the analysis and design of solar energy heating systems
23 p0475 A79-38878

Energy conservation and solar energy - Partners in progress --- TVA program overview
[AIAA PAPER 79-0979] 23 p0475 A79-38890

Rough cost estimates of solar thermal/coal or biomass derived fuels
[AIAA PAPER 79-0988] 23 p0476 A79-38893

Cost reduction using modular installation for solar heating, cooling and water heating at the life clinic in Brandon, Florida
[AIAA PAPER 79-1021] 23 p0476 A79-38895

Commercialization aspects of solar process hot water systems for the textile industry
[AIAA PAPER 79-1027] 23 p0476 A79-38896

Performance of a collector/storage solar water heater
23 p0479 A79-39843

Concentrator for solar air heater
23 p0487 A79-40379

Solar collector development in Iran
23 p0493 A79-40675

Combined photovoltaic thermal collector testing
23 p0519 A79-41072

Combined photovoltaic and thermal hybrid collector systems
23 p0519 A79-41073

On the stability of the natural circulation solar heater
23 p0531 A79-42896

Dynamic modeling of water- and air-heating solar collectors
23 p0531 A79-42897

Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976

Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate
24 p0602 A79-44263

Regulation of the water steam cycle in a solar receiver
24 p0603 A79-44296

The use of solar energy to provide heat and hot water for the students' residence of the Ecole des Mines in Ales, France
24 p0603 A79-44298

Passive solar heating for buildings
24 p0603 A79-44504

Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201

Economics of preheating water for commercial use --- solar collector system
24 p0608 A79-45206

Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems
24 p0608 A79-45207

Solar 'Plus' - Huntsville, Alabama
24 p0608 A79-45209

A review of current R&D in thermal energy storage and heat exchange in solar applications
24 p0608 A79-45211

Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213

Three dimensional mathematical model of flow stratification in thermocline storage tanks
24 p0609 A79-45214

Solar-powered Rankine heat pump for heating and cooling
24 p0610 A79-45219

Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas
24 p0610 A79-45220

Instrumenting hybrid passive/active solar systems --- for building heating
24 p0610 A79-45223

On solar energy heating and degree days during the winter months
24 p0610 A79-45226

Evaluation of a thermographic scanning device for solar energy and conservation applications
24 p0611 A79-45229

Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909

An analysis of the terminal concentrator concept for solar central receiver systems
24 p0641 A79-47792

Thermal analysis in the focal spot of a solar furnace
24 p0641 A79-47794

An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University
24 p0641 A79-47797

Thermal storage of off-peak electrical energy in solar heating and cooling systems
24 p0644 A79-47945

Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946

Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

Singular optimal control of solar space heating systems
24 p0644 A79-48009

Method of calculating heat storages for solar heating systems
24 p0648 A79-49184

Investigation of the aerodynamic resistance of solar air heaters
24 p0648 A79-49185

Investigation of the absorption and emission characteristics of an ideal selective surface --- for solar energy absorbers
24 p0648 A79-49186

Computer simulation of a solar energy system
24 p0652 A79-49479

Construction of combined solar installations for heating and cooling
24 p0653 A79-49524

Lateral flow concept for rock bed systems --- of solar heating
24 p0654 A79-50174

Multichannel temperature controller for hot air solar house
24 p0658 A79-50347

Economic evaluation and optimization of solar heating systems
24 p0660 A79-50537

A review of the environmental effects and benefits of selected solar energy technologies
24 p0664 A79-50878

Performance of a large, salt-gradient solar pond
24 p0671 A79-51735

Advanced solar thermal technology - Potential and progress
24 p0671 A79-51739

Solar thermal systems long-term performance predictions using closed-form solutions
24 p0672 A79-51740

Solar collector as heat pump evaporator
24 p0672 A79-51744

Solar production of industrial process steam
24 p0673 A79-51748

Sandia Laboratories operational experience with small heat engines in solar thermal power systems
24 p0673 A79-51752
Photovoltaic concentrator system for Roxborough Park
24 p0675 A79-51767
The desiccant/rock bed method of solar cooling with air collectors
24 p0676 A79-51771
Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system
24 p0681 A79-51806
Prediction of the performance of solar heating systems over a range of storage capacities
24 p0712 A79-53492
Passive solar heating of buildings using a transwall structure
24 p0712 A79-53493
Load optimization in solar space heating systems
24 p0713 A79-53497
Solar heating and cooling system design and development
[NASA-CR-150803] 21 p0172 N79-10516
Solar system installation at Louisville, Kentucky
[NASA-CR-150814] 21 p0172 N79-10518
Cost analysis of new and retrofit hot-air type solar assisted heating systems
[NASA-TM-78186] 21 p0173 N79-10519
Preliminary design package for solar heating and hot water system
[NASA-CR-150619] 21 p0173 N79-10520
Solar heating and cooling demonstration project summaries
[DOE/CS-0009] 21 p0186 N79-11503
Prototype solar heating and cooling systems
[NASA-CR-150828] 21 p0196 N79-12552
MSFC hot air collectors
[NASA-TM-78206] 21 p0196 N79-12556
Instrumentation at the Decade 80 solar house in Tucson, Arizona
[NASA-CR-150851] 21 p0204 N79-13491
Largo hot water system long range thermal performance test report, addendum
[NASA-CR-150842] 21 p0204 N79-13492
Prototype solar-heated hot water systems and double-walled heat exchangers
[NASA-CR-150854] 21 p0205 N79-13495
SIMS prototype system 4 - performance test report
[NASA-CR-150820] 21 p0205 N79-13499
Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part A: Options and strategies. Volume 1: Executive summary
[HCP/M7C065-01/1] 21 p0207 N79-13512
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part B: Analysis of market development, volume 2
[HCP/M70066-01/2] 21 p0207 N79-13513
Solar heating and cooling. Research and development: Project summaries
[DOE/CS-0010] 21 p0208 N79-13519
Legal barriers to solar heating and cooling of buildings
[HCP/M2528-1] 21 p0209 N79-13534
Solar space heating and air conditioning, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1014/6] 21 p0211 N79-13545
Solar space heating and air conditioning volume 3. Citations from the NTIS data base
[NTIS/PS-78/1015/3] 21 p0211 N79-13546
Solar space heating and air conditioning, volume 3. Citations from the engineering index data base
[NTIS/PS-78/1017/9] 21 p0211 N79-13547
Solar space heating and air conditioning, volume 2. Citations from the engineering index data base
[NTIS/PS-78/1016/1] 21 p0212 N79-13550
Design and installation package for solar hot water system
[NASA-CR-150859] 21 p0220 N79-14556
Preliminary design package for prototype solar heating system
[NASA-CR-150858] 21 p0220 N79-14557
Passive thermosyphon solar heating and cooling module with supplementary heating
[NASA-CR-150849] 21 p0229 N79-15402
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States
[PB-286940/2] 21 p0231 N79-15440
System design package for SIMS prototype system 3, solar heating and domestic hot water
[NASA-CR-150840] 22 p0333 N79-16359
System design package for SIMS prototype system 4, solar heating and domestic hot water
[NASA-CR-150839] 22 p0333 N79-16361
Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150861] 22 p0334 N79-16372
Installation package for Hyde Memorial Observatory, Lincoln, Nebraska
[NASA-CR-150867] 22 p0334 N79-16373
State-of-the-art study of heat exchangers used with solar assisted domestic hot water systems (potential contamination of potable water supply)
[PB-287410/5] 22 p0343 N79-17351
System integration of marketable subsystems --- for residential solar heating and cooling
[NASA-CR-161104] 22 p0348 N79-18448
Installation package for a solar heating system
[NASA-CR-150876] 22 p0349 N79-18454
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457
Solar heating of buildings: Design optimization and economic analysis
22 p0353 N79-19439
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
A fixed tilt solar collector employing reversible vee-through reflectors and evaluated tube receivers for solar heating and cooling systems
[NASA-CR-158420] 22 p0359 N79-20490
Verification test report on a solar heating and hot water system
[NASA-CR-161165] 22 p0360 N79-20493
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522
Solar energy pilot study
[PB-289380/8] 22 p0363 N79-20525
Solar space heaters for low-income families
[PB-289244/6] 22 p0363 N79-20526
Solar building regulatory study, volume 1
[PB-289823/7] 22 p0365 N79-21235
Design package for programmable controller and hydronic subsystem
[NASA-CR-161151] 22 p0371 N79-21619
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
Report of the 4th CCMS (Committee on the Challenges of Modern Society) Solar Energy Pilot Study Meeting
[PB-289492/1] 22 p0372 N79-21631
System design package for a solar heating and cooling system installed at Akron, Ohio
[NASA-CR-161192] 23 p0547 N79-23490
Installation package for the Solaron solar subsystem
[NASA-CR-161190] 23 p0548 N79-23491
Prototype solar heating and cooling systems
[NASA-CR-161204] 23 p0557 N79-24437
Transparent heat mirrors for passive solar heating applications
[LBL-7829] 23 p0561 N79-24476
Solar project description: Scattergood School Recreation Center, West Branch, Iowa
[SOLAR/2003-78/50] 23 p0561 N79-24481
Solar project cost report: Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/60] 23 p0562 N79-24484
Solar project cost report. Iris Images, Incorporated, Film Laboratory, Mill Valley, California
[SOLAR/2005-78/60] 23 p0563 N79-24494
Solar project cost report. Aratex Services, Inc., Industrial Laundry, Fresno, California
[SOLAR/2008-78/60] 23 p0563 N79-24495
Solar project description. Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/50] 23 p0563 N79-24496

SOLCOST: Space heating handbook with service hot water and heat loads calculations
[DOE/CS-0042/3] 23 p0564 N79-24501
Relative effective solar space heating over the United States obtained from southward-tilted solar collectors
[PB-292963/6] 23 p0565 N79-24513
Solar thermal heating and cooling: A bibliography with abstracts
[NASA-CR-158693] 23 p0570 N79-25480
Solar heating system final design package
[NASA-CR-161228] 23 p0572 N79-25503
The performance of an experimental solar heating system
[AD-A066699] 23 p0573 N79-25516
Solar technology transfer program
[DOE/CS-0027/1] 23 p0574 N79-25521
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 1: Executive summary, September 1977
[HCP/M70066-01/1-VOL-1] 23 p0574 N79-25522
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 3: Appendices, September 1977
[HCP/M70066-01/3-VOL-3] 23 p0574 N79-25523
Thermal utilization of solar energy in Austria. Part 1: Hot water preparation, swimming pool and space heating
23 p0574 N79-25529
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539
Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis
[EPRI-ER-808-VOL-1] 23 p0597 N79-27687
Solar heating and hot water system installed at Cherry Hill, New Jersey
[NASA-CR-161235] 24 p0723 N79-28729
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-81764] 24 p0725 N79-28753
Trombe wall vs direct gain: A comparative analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
Photovoltaic/thermal collectors and heat pumps --- solar heating system efficiency
[COO-4577-2] 24 p0726 N79-28757
Solar heating and cooling demonstration project summaries
[DOE/CS-0038/2] 24 p0727 N79-28771
Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790
Solar heating and hot water system installed at Southeast of Saline, Unified School District 306, Mentor, Kansas
[NASA-CR-161271] 24 p0737 N79-29602
Role of government in solar energy development: A view from the northwest --- economic feasibility of solar heating
[PNL-2784] 24 p0738 N79-29621
Bismarck, North Dakota, office commercial solar demonstration design and construction report
[COO-4228-1] 24 p0739 N79-29633
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634
Solar energy retrofit for Clarksville Middle School, Clarksville, Indiana
[NASA-CR-161272] 24 p0749 N79-30721
National solar heating and cooling commercial demonstration program: Key personnel directory
[DOE/CS-0057] 24 p0754 N79-30785
Economy of a retrofit solar system
[CONF-790213-2] 24 p0755 N79-30795
Development of a low-temperature, low-cost, black-liquid solar collector
[CONF-780983-14] 24 p0756 N79-30805
Cost effective solar hot water system for Econo-Travel Motor Hotel, Chesapeake, Virginia
[COO-4663-1] 24 p0757 N79-30812
Economic performance: Evaluations for solar energy
[LA-UR-79-901] 24 p0759 N79-30828
Energy analysis of the helio-thermal-electric conversion
[P-77/P40/242] 24 p0759 N79-30831
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798
Passive solar design: A survey of monitored buildings
[HCP/CS-4113-2] 24 p0774 N79-31803
Passive solar design: An extensive bibliography
[HCP/CS-4113-3] 24 p0774 N79-31804
Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805
Passive solar energy planning aid kit for building design architects and planners
[CONF-780337-P1] 24 p0775 N79-31813
Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis
[EPRI-ER-808-SY] 24 p0787 N79-32687
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707
Theoretical analysis of a passive heat pipe heating and cool system
[PB-296066/4] 24 p0792 N79-32736
Storage of heat: A survey of efforts and possibilities
[PB-295936/9] 24 p0801 N79-33592
Development of retrofit energy conservation and solar heating systems, phase 1
[PB-295847/8] 24 p0801 N79-33593

SOLAR HOUSES
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652
Vacation homes near the sea with solar and wind energy utilization - Research done at the Technical University of Hannover: Architectural considerations
21 p0058 A79-13653
Total energy systems --- domestic solar and windpowered facilities
21 p0058 A79-13654
The economic performance of passive solar heating - A preliminary analysis --- thermal storage wall for family home design
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899
A solar energy system for space heating and space cooling --- retrofitting aged buildings
21 p0072 A79-14686
Passive solar design --- for domestic heating and cooling systems
21 p0074 A79-14720
Data acquisition using a modular data logger --- for solar heated building monitoring
21 p0088 A79-15832
Experience gained and lessons learned from monitoring the solar building, Albuquerque
21 p0088 A79-15833
Instrumentation, data acquisition and monitoring system for an air heating solar system
21 p0088 A79-15836
Moderate cost, calculator-based data acquisition for solar HVAC systems
21 p0088 A79-15837
A microprocessor based solar monitoring system
21 p0088 A79-15838
A microprocessor compatible temperature measuring system --- for solar house energy monitoring
21 p0088 A79-15839
A microprocessor monitoring system for a solar energy installation
21 p0088 A79-15840
Design of the data acquisition system at Solar One --- home energy monitoring via minicomputers
21 p0088 A79-15841
A low cost approach to performance monitoring for the evaluation of a solar domestic hot water system
21 p0088 A79-15842

Low-cost monitoring of solar system performance
21 p0088 A79-15843
Solar energy for residential housing
21 p0090 A79-15857
Design of active solar heating systems
21 p0090 A79-15860
Solar heating and cooling - An electric utility perspective
21 p0093 A79-15890
Solar-earth homes and cities --- in-ground solar heated dwellings
21 p0098 A79-16105
Solar controls and control modifications - New century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419
Solar heating and ventilating by natural means
21 p0103 A79-16458
Inexpensive solar energy utilization in human settlements
21 p0104 A79-16470
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294
Long-term thermal storage in solar architecture in northern latitudes, with reference to typical single family dwellings
21 p0119 A79-17313
Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319
A passive integrated unit for the collection, thermal storage in fusion materials and distribution of solar energy for home heating and other applications
21 p0121 A79-17322
A thermal storage analysis on packed bed of alumina spheres --- in solar houses
21 p0121 A79-17324
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327
A passive rock bed - Design, construction, and performance
21 p0121 A79-17328
Investigation on the feasibility of using a two-phase thermosyphon for solar storage, space heating and cooking
21 p0121 A79-17330
Tilt, orientation and overshadowing of solar collectors in the Netherlands
21 p0131 A79-17414
Comparison between simulation and experiment of solar heating
21 p0137 A79-17461
Design, operation and performance of the BRC Solar House
21 p0137 A79-17462
Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465
The analysis by stochastic modelling of solar systems for space and water heating
21 p0137 A79-17466
Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467
Conceptual development of a solar town in Iran
21 p0138 A79-17469
Some experimental investigations on solar space heating in Korea
21 p0138 A79-17470
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0138 A79-17471
Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475
Solar heated and cooled financial building
21 p0139 A79-17484
Solar retrofitting of existing residence with almost zero delta TE system
21 p0139 A79-17485
Solar heating for a novel dwelling independent of servicing networks
21 p0140 A79-17492
An earth-wrapped solar greenhouse house --- partially buried structure
21 p0140 A79-17493
Enhancement of intrinsic solar heating --- thermal performance of house design option
21 p0140 A79-17494
Experimental investigation on solar house heating in northern India
21 p0140 A79-17495
Performance evaluation of the New Mexico State University Solar House
[ASME PAPER 78-WA/SOL-8] 21 p0163 A79-19840
A Thermic Controller for a thermic diode solar panel
[ASME PAPER 78-WA/SOL-9] 21 p0163 A79-19841
The application of thermography to large arrays of solar energy collectors
22 p0242 A79-21171
Investigations of solar heat production for household heating in Turkey
22 p0253 A79-22265
Optimum collector slope for residential heating in adverse climates
22 p0263 A79-23761
Solar energy and heat insulation --- materials for residential buildings
22 p0268 A79-24321
Solar storage unit with built-in oil-gas boiler
22 p0268 A79-24322
What and where - Solar active systems or energy conservation in buildings
22 p0275 A79-25927
Passive solar heating of buildings
22 p0275 A79-25928
The CCMS solar energy pilot study system performance reporting format
22 p0275 A79-25930
Solar heating, cooling and hot water production - A critical look at CCMS installations
22 p0275 A79-25931
Solar air heating and nocturnal cooling system /CSU Solar House II/
22 p0275 A79-25932
Dornier/RWE solar house in Essen, FRG
22 p0276 A79-25933
Experience with the MBB-solar testing house at Otterfing and relevant consequences on the commercial product
22 p0276 A79-25934
Mississauga solar house /Mississauga, Ontario, Canada/
22 p0276 A79-25935
Thomson Solar House I
22 p0276 A79-25936
Solar houses in Blagnac /Blagnac, Haute-Garonne, France/
22 p0276 A79-25937
The performance of the heating system in the solar house of the Eindhoven University of Technology
22 p0276 A79-25938
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939
CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940
The Philips experimental house - A system's performance study --- of solar energy utilization and energy conservation
22 p0277 A79-25941
Passive solar heating system in Turkey
22 p0277 A79-25942
Passive solar house in Vetlanda - Interim report
22 p0277 A79-25943
Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center
22 p0277 A79-25944
Santa Clara Community Center Project, USA --- solar building
22 p0277 A79-25945
The Tritherm test house --- solar heating experiment
22 p0290 A79-27723
Passive solar energy design and materials --- Book
22 p0302 A79-29625

Case history - Hybrid passive/active solar system: Performance and cost
22 p0313 A79-31315

The Saskatchewan Conservation House - Some preliminary performance results
22 p0318 A79-31417

NRC solar monitoring program
22 p0318 A79-31419

Performance of the Meadowvale solar home
22 p0318 A79-31420

Off-peak electrical backup experience in the Meadowvale Solar Experiment
22 p0318 A79-31421

New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424

Component cost of solar energy systems
22 p0319 A79-31429

Energy management through energy conservation in buildings
22 p0320 A79-31431

Design study on solar energy systems for commercial buildings
22 p0320 A79-31433

Solar energy retrofit system for an older-type building - The Williamstown Museum project
22 p0320 A79-31434

South wall solar collector with active collector system
22 p0320 A79-31436

Economic design of a solar domestic water heating system
22 p0321 A79-31438

Validation of an electric circuit model of a solar house
22 p0321 A79-31440

Mathematical modelling of passive solar systems
22 p0321 A79-31441

Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444

Integration of a passive and active solar heated, low density, multiple dwelling with atrium
22 p0322 A79-31446

First year performance data and lessons learned in the NRC 14 house solar demonstration program
22 p0323 A79-31453

Determination of the potential for solar retrofitting in Edmonton --- pilot systems for single family dwellings
22 p0323 A79-31456

Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457

Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009

Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010

Design, performance, and economics of solar heating and cooling systems for single and multi-family residences
23 p0401 A79-34011

Refined model of solar space cooling system
23 p0401 A79-34012

Sunbird I - Utah's first commercial solar home
23 p0401 A79-34015

Perspectives on solar electric power for small homes
23 p0401 A79-34016

The solar house --- overview of French designs
23 p0401 A79-34017

Theoretical considerations in the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36630

Initial experimental tests on the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36631

Domestic hot water heating using hot air solar collectors
[AIAA PAPER 79-0973] 23 p0457 A79-38180

Solar heated and cooled house in Winter Springs, Florida - A Florida Gas Company Project
[AIAA PAPER 79-1019] 23 p0460 A79-38204

A 'real life' solar air conditioned house project
23 p0463 A79-38577

Which is the true solar house
23 p0463 A79-38578

Design of the Eichenau solar house --- emphasizing heat insulation and solar collection and conversion
23 p0463 A79-38579

Traditional architecture in West Africa and passive methods of cooling in the Tropics
23 p0463 A79-38580

Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581

System analysis of solar space heating
23 p0465 A79-38595

Active heat insulation through solar low-temperature system that can be integrated into the house wall
23 p0465 A79-38596

System selection and optimization of a solar thermal installation for cooling, heating, and warm water heating
23 p0466 A79-38609

Direct-contact heat exchange-storage tank in solar houses
23 p0468 A79-38626

Solar-assisted heat pump heating with tube collectors
23 p0469 A79-38635

A low energy house in Sweden heated by a solar energy system with heat pump
23 p0471 A79-38650

The design of four solar houses in Zoetermeer, The Netherlands
23 p0471 A79-38651

The LW solar/heat pump house at Skive, Denmark
23 p0471 A79-38652

Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660

Potential for use of solar energy in private households to the year 2000
23 p0473 A79-38667

Energy analysis of low-temperature solar energy systems
23 p0473 A79-38670

Design of a public exhibition building to demonstrate air, water, and passive solar heating systems
23 p0474 A79-38673

Energy conservation and solar energy - Partners in progress --- TVA program overview
[AIAA PAPER 79-0979] 23 p0475 A79-38890

Comparison of 100 per cent solar heated residences using active solar collection systems
23 p0477 A79-39106

Potential for stand-alone photovoltaic on-site total-energy residential systems
23 p0516 A79-41050

Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

Analysis of photovoltaic total energy system concepts for single-family residential applications
23 p0520 A79-41078

How a wall uses solar energy
24 p0603 A79-44295

Solar 'Plus' - Huntsville, Alabama
24 p0608 A79-45209

Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas
24 p0610 A79-45220

Instrumenting hybrid passive/active solar systems --- for building heating
24 p0610 A79-45223

Solar farm buildings collect energy for crop drying
24 p0610 A79-45224

Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

Singular optimal control of solar space heating systems
24 p0644 A79-48009

Construction of combined solar installations for heating and cooling
24 p0653 A79-49524

Multichannel temperature controller for hot air solar house 24 p0658 A79-50347

Conceptual development of a solar town in Iran 24 p0660 A79-50539

Design study and cost-effectiveness of the metal hydride solar heat pump and power system /HYCSOS/ 24 p0672 A79-51745

The desiccant/rock bed method of solar cooling with air collectors 24 p0676 A79-51771

A simplified algorithm for the evaluation of hybrid thermal storage with water systems 24 p0681 A79-51808

Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1 [COO-2577-14] 21 p0206 N79-13507

Environmental and safety considerations for solar heating and cooling applications [PB-287772/8] 22 p0343 N79-17350

Buildings energy use data book, edition 1 [ORNL-5363] 22 p0348 N79-18447

System integration of marketable subsystems --- for residential solar heating and cooling [NASA-CR-161104] 22 p0348 N79-18448

Preliminary design package for residential heating/cooling system: Rankine air conditioner redesign [NASA-CR-150871] 22 p0354 N79-19453

Final system instrumentation design package for Decade 80 solar house [NASA-CR-150869] 22 p0354 N79-19455

EPRI Methodology for Preferred Solar Systems (EMPSS) computer program documentation. User's guide [EPRI-ER-771] 23 p0543 N79-22635

System design package for a solar heating and cooling system installed at Akron, Ohio [NASA-CR-161192] 23 p0547 N79-23490

Impact of solar energy on rural housing [GPO-31-641] 23 p0560 N79-24467

Solar project cost report: Terrell E. Moseley Office Building, Lynchburg, Virginia [SOLAR/2011-78/60] 23 p0562 N79-24483

Solar project description. Terrell E. Moseley Office Building, Lynchburg, Virginia [SOLAR/2011-78/50] 23 p0563 N79-24498

Solar project description. Kalwall Corporation Warehouse, Manchester, New Hampshire [SOLAR/2015-78/50] 23 p0564 N79-24499

Solar heating, cooling, and hot water systems installed at Richland, Washington [NASA-CR-161237] 24 p0722 N79-28721

Performance and cost of a hybrid passive/active solar house [LA-UR-78-2209] 24 p0725 N79-28756

Solar project cost report [SOLAR/2018-78/60] 24 p0728 N79-28788

Role of government in solar energy development: A view from the northwest --- economic feasibility of solar heating [PNL-2784] 24 p0738 N79-29621

Phase-one experiment test plan solar photovoltaic/thermal residential experiment [COO-4577-6] 24 p0739 N79-29625

Cost effective solar hot water system for Econo-Travel Motor Hotel located at Woodbridge, Virginia [COO-4661-1] 24 p0739 N79-29635

Cost and performance evaluation of passive solar systems [ANL/EES-TM-34] 24 p0753 N79-30774

Comparative economics of passive and active systems [LA-UR-78-1878] 24 p0754 N79-30782

SOLAR INSTRUMENTS

Calibration standards and field instruments for the precision measurement of insolation 21 p0076 A79-14765

Sensor selection and placement in the National Solar Data Program 21 p0089 A79-15844

Testing of solar collectors according to ASHRAE Standard 93-77 21 p0101 A79-16417

Design of radiometer for measurement of total and net exchange solar radiation 21 p0119 A79-17307

SOLAR PONDS (HEAT STORAGE)

Solar pond stability experiments 21 p0042 A79-11878

Some studies on an experimental solar pond 21 p0131 A79-17416

Yield of ground storage of heat in solar ponds 21 p0133 A79-17429

Viscosity stabilized solar ponds 21 p0133 A79-17430

Conditions for absolute stability of salt gradient solar ponds 21 p0133 A79-17431

Computer simulation of the performance of a solar pond in the southern part of Iran 21 p0133 A79-17432

Design construction and short term performance of a solar pond 23 p0385 A79-33220

Heat extraction from a salt gradient solar pond 23 p0410 A79-34085

The steady state salt gradient solar pond 24 p0661 A79-50540

Solar pond concepts - Old and new 24 p0671 A79-51734

Performance of a large, salt-gradient solar pond 24 p0671 A79-51735

Stability criteria for saturated solar ponds 24 p0671 A79-51736

Economic and performance comparisons of salty and saltless solar ponds 24 p0671 A79-51737

Sede Boqer - Shallow solar ponds project 24 p0671 A79-51738

Solar thermoelectric energy conversion 24 p0699 A79-51976

Solar ponds. Citations from the NTIS data base [NTIS/PS-78/0836/3] 21 p0176 N79-10553

Solar ponds. Citations from the engineering index data base [NTIS/PS-78/0837/1] 21 p0176 N79-10554

Design guide for shallow solar ponds [UCRL-52385] 21 p0185 N79-11497

Final system instrumentation design package for Decade 80 solar house [NASA-CR-150869] 22 p0354 N79-19455

Design guide for shallow solar ponds [UCRL-52385-REV-1] 24 p0727 N79-28774

Evaluation of a large nonconvective solar pond [MLM-2606(OP)] 24 p0786 N79-32680

SOLAR POSITION

Sun-position diagrams using examples from Flensburg to Mittenwald 21 p0055 A79-13626

Long-term average performance of the Sunpak evacuated-tube collector 21 p0089 A79-15854

Solar energy diagrams --- combining position and insolation data 22 p0253 A79-22267

SOLAR POWER SATELLITES

New energy conversion techniques in space, applicable to propulsion --- powering of aircraft with laser energy from SPS [AIAA PAPER 79-1338] 23 p0493 A79-40490

Energy analysis of the Solar Power Satellite 24 p0601 A79-44160

The solar power satellite concept 24 p0603 A79-44277

Energy for the year 2000 - The SPS concept 24 p0645 A79-48026

Solar thermal aerostat research station /STARS/ [IAF PAPER 79-35] 24 p0709 A79-53261

Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures [IAF PAPER 79-115] 24 p0709 A79-53302

Solar power satellites for Europe [IAF PAPER 79-173] 24 p0710 A79-53334

European technology applicable to Solar Power Satellite Systems /SPS/ [IAF PAPER 79-174] 24 p0710 A79-53335

A space power station without movable parts [IAF PAPER 79-177] 24 p0710 A79-53337

Legal aspects of solar power satellites - Focus on microwave exposure standards [IAF PAPER 79-IISL-01] 24 p0711 A79-53452

Solar energy bank for mankind in contemporary international space law [IAF PAPER 79-IISL-47] 24 p0711 A79-53482

A power transmission concept for a European SPS system
24 p0712 A79-53487
Legal norm creation concerning solar energy in contemporary international space law
24 p0713 A79-53680
The legal aspect concerning solar energy
24 p0713 A79-53681
Some observations of the legal implications relating to the use of solar energy
24 p0713 A79-53682
Environmental factors of power satellites
[SAMSO-TR-79-66] 24 p0717 N79-28213
Solar power satellite
[GPO-45-997] 24 p0731 N79-29212
Satellite Power System (SPS) resource requirements (critical materials, energy, and land)
[NASA-CR-162310] 24 p0763 N79-31251

SOLAR PROBES
Design optimization of RTG for Solar-Polar Mission --- Radioisotope Thermoelectric Generator
24 p0653 A79-51935

SOLAR PROPULSION
A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384

SOLAR RADIATION
A theoretical method for the prediction of monthly mean solar radiation parameters
21 p0022 A79-10193
Results of measurements of solar radiation on surfaces of different orientations
21 p0055 A79-13622
Measurement of radiation intensity by means of a pyrheliometer
21 p0055 A79-13623
Irradiances on inclined surfaces --- from solar and sky radiation and earth albedo
21 p0055 A79-13624
The use of a sort of slide rule for the quick determination of solar irradiation of surfaces and through double glazing of arbitrary orientation and different inclination
21 p0055 A79-13625
Estimating hourly solar radiation for one-axis tracking focusing collectors
21 p0071 A79-14678
A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766
Measurement of solar radiation for energy conversion
21 p0119 A79-17305
Design of radiometer for measurement of total and net exchange solar radiation
21 p0119 A79-17307
Fundamentals of mathematical modeling of solar-radiation regime energy structure
21 p0166 A79-20352
Differential insolation and turbidity measurements --- solar radiation attenuation by aerosols
22 p0241 A79-21056
Diffuse solar radiation on a horizontal surface for a clear sky
22 p0242 A79-21167
Solar radiation charts --- monthly average insolation
22 p0263 A79-23763
Selected ordinates for total solar radiant property evaluation from spectral data
22 p0271 A79-25060
On the use of synoptic weather map typing to define solar radiation regimes
22 p0272 A79-25392
Radiation regime of inclined surfaces --- Russian book on solar energy engineering and microclimatology
22 p0282 A79-26353
Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452
Hawaii solar radiation summary
23 p0398 A79-33985
Solar radiation data modeling and its role in solar system studies --- for energy conversion systems performance prediction
23 p0429 A79-35056
Functional solar energy applications based on an improved insulation model
23 p0452 A79-37883
Important specification of pyranometers for solar energy applications /Survey article/
23 p0468 A79-38627
Fast spectral radiometer --- for solar radiation spectral composition
23 p0469 A79-38629
The engineering analysis of solar radiation
24 p0605 A79-44796
Solar radiation data in the southeastern United States
24 p0608 A79-45204
Solar irradiance measurements by means of optical fibers and silicon detectors
24 p0638 A79-47198
The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation
24 p0649 A79-49231
The availability of solar energy for work processes
24 p0658 A79-50346
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022
Radiation regime of inclined surfaces
[WMO-467] 21 p0192 N79-11613
Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543
Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78] 23 p0574 N79-25528
Radiation shadow indicator
[NASA-CASE-MFS-23546-2] 24 p0730 N79-29037
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712
New York State solar energy atlas
[PB-295453/5] 24 p0802 N79-33599

SOLAR RADIATION SHIELDING
Selective covers for natural cooling devices --- in space
22 p0272 A79-25522

SOLAR REFLECTORS
Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162
Specular mirrors for solar energy application
21 p0034 A79-11147
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869
Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605
Solar thermal collectors using planar reflector
21 p0131 A79-17412
Performance of optimal geometry three step compound wedge stationary concentrator --- solar collector using flat side mirrors
21 p0134 A79-17438
Comparative performance of tracking type and non-tracking type solar collectors
21 p0136 A79-17454
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509
Optimal geometries for one- and two-faced symmetric side-wall booster mirrors --- for solar collectors
21 p0149 A79-18019
A cavity receiver design for solar heated gas turbine generating systems
[ONERA, TP NO. 1978-137] 21 p0155 A79-18560
The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate
22 p0239 A79-20824
Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

Linear echelon refractor/reflector solar concentrators
22 p0293 A79-28143
A parabolic solar reflector for accurate and economic producibility
22 p0293 A79-28145
Analysis of a Cassegrain solar furnace
22 p0293 A79-28147
Specularity measurements for solar materials
22 p0294 A79-28153
Optical analysis of solar facility heliostats
22 p0296 A79-28360
Solar-tower power plants - Optimization of the mirror field and application to the field scale effect
23 p0382 A79-32951
Contribution to the study of optimal conditions for optical concentration in solar power plant designs - Reduction of the radiation spot provided by a field of heliostats by use of optimized conical mirrors
23 p0382 A79-32952
Comparative efficiencies of solar energy collectors
23 p0382 A79-32955
SOLARES - A new hope for solar energy
23 p0399 A79-33992
Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024
Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067
Exposure test results for reflective materials --- used in solar concentrators
23 p0430 A79-35068
Specularity measurements by Fourier transform examination --- for scattering properties of solar mirrors
23 p0431 A79-35069
Optical properties of materials under simulated operating environments --- selective coatings for solar thermal conversion
23 p0431 A79-35071
A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors
23 p0530 A79-42895
Primary reflector for solar energy collection systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529
The parabolic concentrating collector: A tutorial
[NASA-CR-158426] 22 p0355 N79-20491
Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615
Systems definition space-based power conversion systems --- for satellite power transmission to earth
[NASA-CR-150268] 23 p0546 N79-23483
Primary reflector for solar energy collection systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432
Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 1: Study overview and summary
[NASA-CR-162328] 24 p0782 N79-32638
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 2: Technical
[HAC-REF-E3256-VOL-2] 24 p0782 N79-32639

SOLAR SAILS
Advanced composites - Future space applications
21 p0086 A79-15504
Superlight rotating reflectors in space
[IAF PAPER 79-112] 24 p0709 A79-53301
Earth orbital assessment of solar electric and solar sail propulsion systems
[NASA-CR-158167] 22 p0345 N79-17898

SOLAR SENSORS
Effects of pointing errors on receiver performance for parabolic dish solar concentrators
21 p0020 A79-10167
Computer based sun following system
22 p0242 A79-21165
Suntrack-systems for solar concentrators
23 p0464 A79-38587
Solar tracking control system Sun Chaser
[NASA-TM-78199] 21 p0172 N79-10514
Solar tracking system --- with pointing control circuits
[NASA-CASE-MFS-23999-1] 24 p0721 N79-28667
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

SOLAR SIMULATION
Measurement and modelling of shortwave radiation on inclined surfaces
22 p0242 A79-21062
Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309
Solar system modeling using a modular approach with generalized programs for working fluid properties
22 p0266 A79-24310
A computer simulation model for determining preferred solar heating and cooling systems
22 p0267 A79-24313
Thermal vacuum testing of solarpanels by solar simulation and infrared simulation
24 p0658 A79-50345

SOLAR SIMULATORS
Solar radiation simulation by means of solar simulator for the indoor testing of solar collectors
21 p0055 A79-13620
Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator
21 p0130 A79-17406
The development and construction of a simulator for the proof testing of solar power devices
23 p0448 A79-37846
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177
Small-scale solar simulator for indoor testing of collector modules and materials
[LA-UR-79-1335] 24 p0790 N79-32716
Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector
[NASA-CR-161306] 24 p0797 N79-33561

SOLAR SPECTRA
A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723
Spectrally split tandem cell converter studies
23 p0513 A79-41028
Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation
24 p0669 A79-51178

SOLAR TERRESTRIAL INTERACTIONS
Potential prediction needs in support of energy systems --- solar-terrestrial interactions
[LA-UR-79-673] 24 p0788 N79-32698

SOLAR TOTAL ENERGY SYSTEMS
Turbine sizing of a solar thermal power plant
24 p0673 A79-51751
Solar central receiver program
24 p0674 A79-51756
System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530
Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDP-TM-78-3] 23 p0596 N79-27674
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-81764] 24 p0725 N79-28753
Overview of solar system design and application principles
[SAND-78-2419C] 24 p0726 N79-28762

Deterministic insolation model program description and user's guide --- for approximate analysis of solar systems
[SAND-78-7044] 24 p0744 N79-29743
Passive solar energy focus group results
[DOE/TIC-10016] 24 p0774 N79-31807
Passive solar energy planning aid kit for solar energy systems engineers
[CONF-780337-P3] 24 p0775 N79-31815
Thermal energy storage for advanced solar central receiver power systems
[SAND-78-8221] 24 p0788 N79-32694

SOLAR WIND
Digest of equipment for converting solar, wind, and geothermal energy into electric power for USN application ashore
[AD-A066221] 23 p0561 N79-24475

SOLDERING
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979

SOLENOIDS
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536
Self-consistent analysis of alpha-particle heating of a fast-solenoid plasma --- in laser fusion
22 p0291 A79-27879

SOLID ELECTRODES
Semiconductor electrodes for conversion and storage of solar energy
21 p0036 A79-11777
Iron oxide semiconductor electrodes in photoassisted electrolysis of water
21 p0037 A79-11781
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21460
Casing materials for sodium/sulfur cells
22 p0245 A79-21481
Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712
Solid electrolyte fuel cell for electric utility power generation
24 p0682 A79-51815
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

SOLID PHASES
Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434

SOLID PROPELLANTS
Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180

SOLID SOLUTIONS
High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy
22 p0249 A79-21689
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Dynamic aspects of solid solution cathodes for electrochemical power sources
24 p0636 A79-46665
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

SOLID STATE DEVICES
A solid-state solar-powered heat transfer device
24 p0667 A79-50932
Experimental demonstration of heat-to-electricity conversion within a dielectric
24 p0658 A79-51975
Present status of GaAs --- including space processing and solid state applications
[NASA-CR-3093] 21 p0215 N79-14192

SOLID STATE LASERS
Large aperture components for solid state laser fusion systems
24 p0713 A79-53522

SOLID STATE PHYSICS
Solar energy conversion: Solid-state physics aspects --- Book
23 p0437 A79-36144

SOLID WASTES
Environmental effects of burning solid waste as fuel
21 p0082 A79-15115
Energy from urban waste
21 p0096 A79-15917
Solid waste and coal firing in industrial boilers
21 p0096 A79-15918
Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788
Modern technology for recovering energy and materials from urban wastes - Its applicability in developing countries
22 p0295 A79-28183
Utilisation of solid waste
22 p0304 A79-30204
Sensible heat storage for solar energy applications
22 p0322 A79-31449
Energy recovery from urban solid waste
23 p0386 A79-33233
Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147
ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148
Net energy from municipal solid waste
23 p0418 A79-34149
Solid waste as a source of energy for industry - An overview
23 p0424 A79-34461
Electricity from municipal wastes
23 p0454 A79-37911
Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949
Energy conservation through waste utilization; Proceedings of the Eighth Biennial National Waste Processing Conference, Chicago, Ill., May 7-10, 1978
23 p0487 A79-40386
Experience with solid waste as a supplementary fuel
23 p0488 A79-40388
Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391
Recycle energy system - City of Akron, Ohio
23 p0488 A79-40392
Case study energy recovery from wastes from an automobile assembly plant
23 p0489 A79-40394
Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396
308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city
23 p0489 A79-40397
Integrating an electrostatic precipitator into a municipal solid waste resource recovery system
23 p0489 A79-40398
Flue gas emissions from a shredded-municipal-refuse-fired steam generator
23 p0489 A79-40399
Air classify first, then shred --- solid waste processing to reduce danger of explosions
23 p0489 A79-40404
Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects
23 p0490 A79-40408
Heating value of refuse derived fuel
23 p0490 A79-40412
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413
Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities
23 p0490 A79-40414
Solid waste utilization in integrated community energy systems
23 p0490 A79-40415
Utilization of fluidized bed combustion in energy recovery from solid wastes
23 p0490 A79-40416

Design criteria to achieve industrial power plant reliability in solid waste processing plants with energy recovery 23 p0451 A79-40417

An overview of San Diego County's resource recovery plant 23 p0491 A79-40418

Refuse shredding - Performance, testing and evaluation data 23 p0491 A79-40419

A technical and economic evaluation of the Baltimore Landgard demonstration --- municipal solid waste processing plant for energy and materials recovery 23 p0491 A79-40420

Oceanside Disposal Plant improvement program - Design, construction and operating experience 23 p0451 A79-40425

Classification and energy evaluation of urban wastes 23 p0525 A79-41817

Gasification of solid waste - Potential and application of co-current moving bed gasifiers 23 p0536 A79-43574

European technology for obtaining energy from solid waste --- Book 24 p0638 A79-47072

The Seattle experience - Conversion of solid waste to fuels or chemicals 24 p0651 A79-49384

The efficiency of resource recovery from solid waste 24 p0662 A79-50561

Air emissions from waste to energy systems 24 p0665 A79-50883

Some environmental impacts of resource recovery systems 24 p0665 A79-50885

Assessment of the solid waste impact of the National Energy Plan [BNL-50708] 21 p0213 N79-13572

Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste [PB-285196/2] 21 p0213 N79-13590

A methodology for evaluating the potential materials and energy recovery from municipal solid waste 21 p0215 N79-13935

Engineering and economic analysis of waste to energy systems [PB-285797/7] 21 p0224 N79-14986

Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results [PB-290160/1] 22 p0368 N79-21167

Energy conservation through source reduction [PB-290126/2] 22 p0372 N79-21626

Pollution control guidelines for coal refuse piles and slurry ponds [PB-291369/7] 22 p0373 N79-21682

Energy recovery from domestic refuse by means of incineration and pyrolysis [CSIR-SR-WAT-54] 23 p0560 N79-24468

The production of ethanol from agricultural waste: An economic evaluation [PB-292552/7] 23 p0577 N79-26233

Recovery, processing, and utilization of gas from sanitary landfills [PB-293165/7] 23 p0578 N79-26235

A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption [AD-A067165] 23 p0582 N79-26510

Energy recovery from army ammunition plant solid waste by pyrolysis [AD-A067519] 24 p0728 N79-29783

Energy recovery and conservation by recycling municipal solid waste [NZERDC-P7] 24 p0745 N79-30105

Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base [NTIS/PS-79/0546/6] 24 p0767 N79-31434

Alcohol fuels. Citations from the Engineering Index data base [NTIS/PS-79/0714/0] 24 p0795 N79-33341

Ethanolic fuels from renewable resources in the solar age [PB-295645/6] 24 p0796 N79-33346

SOLID-SOLID INTERFACES

On the role of interface states in MOS solar cells 21 p0156 A79-19092

The interfacial layer in MIS amorphous silicon solar cells 22 p0258 A79-23039

A regenerative process for fluidized-bed combustion of coal with lime additives 22 p0297 A79-28984

Heterojunction phenomena and interfacial defects in photovoltaic converters 23 p0438 A79-36150

Barrier heights and interfacial effects in SnO2/Si solar cells 23 p0505 A79-40955

Schottky barrier cell and method of fabricating it [NASA-CASE-NPO-13689A] 23 p0568 N79-25311

Coal-shale interface detection [NASA-CASE-MFS-23720-3] 23 p0569 N79-25443

Coal-rock interface detector [NASA-CASE-MFS-23725-1] 24 p0768 N79-31706

SOLIDS

Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells [AD-A058340] 21 p0206 N79-13505

SOLIDS FLOW

Continuous extrusion of coal --- plastic fluidizing process 22 p0282 A79-26372

SOLITARY WAVES

Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas 24 p0639 A79-47424

SOLUBILITY

Viscosity reduction of coal liquids by dissolved carbon dioxide [SAND-79-7027] 24 p0732 N79-29365

Sources and delivery of carbon dioxide for enhanced oil recovery [FE-2515-24] 24 p0735 N79-29575

SOLVENT EXTRACTION

Operation of the Ft. Lewis, Washington Solvent Refined Coal /SRC/ Pilot Plant in the SRC I and SRC II processing modes 21 p0006 A79-10054

Exxon Donor Solvent coal liquefaction process development 21 p0007 A79-10060

Coal-based electricity and air pollution control - A case for solvent refined coal 21 p0096 A79-15922

Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system 22 p0283 A79-26469

The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process 23 p0494 A79-40739

Selectivity improvement in the SRC process --- Solvent Refined Coal hydrodesulfurization over hydrogenation 24 p0628 A79-45992

Coal liquefaction 24 p0714 A79-53781

Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant [FE-2270-34] 23 p0554 N79-24181

Status report the SRC-1 and SRC-2 processes 23 p0593 N79-27616

EXXON donor solvent coal liquefaction process 23 p0593 N79-27618

Coal liquefaction advanced research digest [ORNL/FE-2] 24 p0746 N79-30398

SOLVENTS

Particle size variation in the solvent refined coal process 23 p0492 A79-40451

Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes 23 p0492 A79-40453

Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process 23 p0492 A79-40455

Standards of Practice Manual for the solvent refined coal liquefaction process [PB-283028/9] 21 p0178 N79-10595

SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319

SOOT
Role of aromatics in soot formation
21 p0053 A79-12988
Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533
Sooting characteristics of liquid pool diffusion flames
[AD-A064111] 23 p0539 N79-22252

SORBENTS
Liquid sorbent solar air conditioner
23 p0401 A79-34014
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

SORPTION
Efficiency improvement by means of multicomponent processes - Improvement of the efficiency of heat-power transformation by means of an employment of Clausius-Rankine sorption processes
21 p0164 A79-19975
Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

SOUNDING
Telluric sounding and mapping in the vicinity of the Salton Sea geothermal area, Imperial Valley, California
[PB-296081/3] 24 p0757 N79-33553

SOUTH AFRICA
Coal preparation design for export markets, with particular reference to South African and Canadian coals
22 p0340 N79-17319
Coal gasification and South Africa
22 p0340 N79-17321
Energy requirements for producing steel in the Republic of South Africa
22 p0340 N79-17322
Low-temperature application of solar energy in South Africa
22 p0340 N79-17324
The planning and economic aspects of energy supply and demand in South Africa
22 p0341 N79-17325
Energy today and tomorrow
22 p0341 N79-17326

SOUTH AMERICA
Solar energy in Latin America - An overview
21 p0116 A79-17279

SOUTH DAKOTA
Solar energy system installed at Mount Rushmore National Visitor Center in Keystone, South Dakota
[NASA-CR-161238] 23 p0555 N79-27661
Potential application of Madison formation waters for community heating in South Dakota
[APL/JHU-QM-78-042R] 24 p0740 N79-29640

SPACE BASES
Systems definition space based power conversion systems: Executive summary
[NASA-CR-150209] 23 p0581 N79-22616

SPACE CHARGE
Chemical origin of the space-charge layer in cuprous oxide front-wall solar cells
23 p0420 A79-38530

SPACE COLONIES
Statement of Doctor Klaus Heiss, President, ECON, Incorporated, Princeton, New Jersey
21 p0220 N79-15110

SPACE COMMUNICATION
Optical coatings for a space laser communications system
22 p0292 A79-28028

SPACE ENVIRONMENT SIMULATION
Large space system - Charged particle environment interaction technology --- effects on high voltage solar array performance
[AIAA 79-0913] 23 p0425 A79-38775
Space environment damage to solar cell coverslide assemblies
23 p0458 A79-40896
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631

SPACE ERECTABLE STRUCTURES
Construction of a 10GWe solar power satellite
21 p0003 A79-10029
Space platforms for building large space structures
21 p0032 A79-10511
Structures for solar power satellites
21 p0032 A79-10513
Superlight rotating reflectors in space
[IAF PAPER 79-112] 24 p0709 A79-53301
Satellite solar power station designs with concentrators and radiating control
[IAF PAPER 79-176] 24 p0710 A79-53336
A space power station without movable parts
[IAF PAPER 79-177] 24 p0710 A79-53337
Orbital demonstration - The prelude to large operational structures in space
[IAF PAPER 79-207] 24 p0710 A79-53357

SPACE EXPLORATION
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
NASA takes stock
23 p0461 A79-38375

SPACE HEATING (BUILDINGS)
A solar energy system for space heating and space cooling --- retrofitting aged buildings
21 p0072 A79-14686
System performance measurements for a packaged solar space heating system equipped with air-heating collectors
21 p0088 A79-15835
Long-term storage of solar energy in native rock
21 p0120 A79-17314
Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464
Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467
Solar energy and heat insulation --- materials for residential buildings
22 p0268 A79-24321
A test bed for thermosyphon solar air collectors
[AIAA PAPER 79-0541] 22 p0274 A79-25860
Passive solar heating of buildings
22 p0275 A79-25928
Solar air heating and nocturnal cooling system /CSU Solar House II/
22 p0275 A79-25932
Passive solar house in Vetlanda - Interim report
22 p0277 A79-25943
Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center
22 p0277 A79-25944
Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors
22 p0285 A79-26815
The Tritherm test house --- solar heating experiment
22 p0290 A79-27723
Economic feasibility of solar water and space heating
22 p0292 A79-27899
A Markov model of solar energy space and hot water heating systems
22 p0295 A79-28353
Heat pump technology for saving energy --- Book
22 p0302 A79-29624
Case history - Hybrid passive/active solar system: Performance and cost
22 p0313 A79-31315
The Saskatchewan Conservation House - Some preliminary performance results
22 p0318 A79-31417
Off-peak electrical backup experience in the Meadowvale Solar Experiment
22 p0318 A79-31421
The performance of a site built, air heating, vertical collector with snow reflector in Quebec
22 p0319 A79-31423

New approaches for the appropriate use of solar
energy in northern climates
22 p0319 A79-31424
Allowable costs for alternative domestic heating
systems using utility supplied electricity for
backup or charging energy
22 p0319 A79-31428
Energy management through energy conservation in
buildings
22 p0320 A79-31431
Solar heating and ventilation using the modified
Trombe wall system
22 p0320 A79-31435
South wall solar collector with active collector
system
22 p0320 A79-31436
Performance of a solar space heating system
23 p0385 A79-33223
Solar water and space heating systems - Cost
effective choices and economic impact of various
incentive policies
23 p0403 A79-34032
Geothermal community heating systems
23 p0409 A79-34078
Seasonal heat pump performance for a typical
northern United States environment
23 p0418 A79-34153
Design study - Solar systems for commercial
buildings
23 p0425 A79-34601
A retrofitted geothermal heating system
23 p0425 A79-34602
SOLPAC - A total design for energy conservation in
housing
23 p0434 A79-35479
Theoretical considerations in the use of small
passive-solar test-boxes to model the thermal
performance of passively solar-heated building
designs
23 p0439 A79-36630
Initial experimental tests on the use of small
passive-solar test-boxes to model the thermal
performance of passively solar-heated building
designs
23 p0439 A79-36631
Sizing phase-change energy storage units for
air-based solar heating systems
23 p0439 A79-36632
Domestic space and water heating for existing
dwellings using a heat pump and conventional
roofs as energy absorbers
23 p0449 A79-37851
Solar heating and load managed/solar cooling of a
small commercial building using flat plate
collectors
[AIAA PAPER 79-1020] 23 p0460 A79-38205
Solar energy utilization in comparison with
utilization of other energy types
23 p0465 A79-38598
Thermodynamic analysis of a solar heating and
cooling system equipped with an absorption
refrigerator heat pump operating in winter
23 p0467 A79-38610
A case study of a solar assisted heat pump system
- 1977
23 p0469 A79-38634
Uncovered absorber combined with flatroof
collectors and heatpump
23 p0469 A79-38636
Study on room heating utilizing eutectic salt
mixture
23 p0470 A79-38638
Energy analysis of low-temperature solar energy
systems
23 p0473 A79-38670
Design of a public exhibition building to
demonstrate air, water, and passive solar
heating systems
23 p0474 A79-38673
Cost reduction using modular installation for
solar heating, cooling and water heating at the
life clinic in Brandon, Florida
[AIAA PAPER 79-1021] 23 p0476 A79-38895
Comparison of 100 per cent solar heated residences
using active solar collection systems
23 p0477 A79-39106
Concentrator for solar air heater
23 p0487 A79-40379
Dynamic modeling of water- and air-heating solar
collectors
23 p0531 A79-42897
The use of solar energy to provide heat and hot
water for the students' residence of the Ecole
des Mines in Ales, France
24 p0603 A79-44298
Passive solar heating for buildings
24 p0603 A79-44504
Evaluation of a thermographic scanning device for
solar energy and conservation applications
24 p0611 A79-45229
Singular optimal control of solar space heating
systems
24 p0644 A79-48009
Method of calculating heat storages for solar
heating systems
24 p0648 A79-49184
The solar total energy system evaluation program
/STESEP/
24 p0673 A79-51749
District heating and cooling with heat pump systems
24 p0696 A79-51960
Feasibility of a heat-actuated heat-pump-centered
integrated community energy system
24 p0696 A79-51961
Storage assisted heat pumps using phase change
materials
24 p0697 A79-51967
The energy reformation --- waste energy
utilization for heating and electricity
24 p0698 A79-51969
Reducing institutional barriers to solar energy
through the use of cooperatively-owned solar
energy systems
24 p0707 A79-52573
Load optimization in solar space heating systems
24 p0713 A79-53497
More use should be made of energy-saving products
in federal buildings
[PB-291692/2] 23 p0544 N79-22647
Solar project cost report: Radian Corporation
Office Building, Austin, Texas
[SOLAR/2002-78/60] 23 p0561 N79-24480
Solar project description: Scattergood School
Recreation Center, West Branch, Iowa
[SOLAR/2003-78/50] 23 p0561 N79-24481
SOLCOST: Space heating handbook with service hot
water and heat loads calculations
[DOE/CS-0042/3] 23 p0564 N79-24501
Relative effective solar space heating over the
United States obtained from southward-tilted
solar collectors
[PB-292963/6] 23 p0565 N79-24513
Metal hydride solar heat pump and power system
(HYCSOS)
[CONF-781133-5] 23 p0596 N79-27675
Solar heating and hot water system installed at
Southeast of Saline, Unified School District
306, Mentor, Kansas
[NASA-CR-161271] 24 p0737 N79-29602
Potential application of Madison formation waters
for community heating in South Dakota
[APL/JHU-QM-78-042R] 24 p0740 N79-29640
Regional conceptual design and analysis studies
for residential photovoltaic systems. Volume 1:
Executive summary
[SAND-78-7039] 24 p0741 N79-29651
Recommended changes to Executive Order 12003 and
related authorities --- for lighting and heating
standards in buildings
[DOE/TIC-10066] 24 p0775 N79-31820
Managerial plan: Executive order 12003 and the
National Energy Act, proposed, synopsis
[DOE/TIC-10062] 24 p0776 N79-31826
Solar Heating And Cooling Of Buildings (SHACOB):
Requirements definition and impact analysis
[EPRI-ER-808-SY] 24 p0787 N79-32687
Experimental performance study of a series solar
heat pump
[BNL-25928] 24 p0789 N79-32704
The use of the heat pumps to raise temperatures in
an economical and ecological way --- domestic
heating via industrial waste energy
[BMFT-FB-T-78-35] 24 p0792 N79-32732
Theoretical analysis of a passive heat pipe
heating and cool system
[PB-296066/4] 24 p0792 N79-32736

HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project --- for energy use and energy plant operations on a building complex
[PB-294926/1] 24 p0793 N79-32738

Shelter design and energy usage: A methodology for evaluating the impacts of residential space conditioning technologies on the consumer, the electric utility, and society
24 p0797 N79-33557

SPACE INDUSTRIALIZATION

Advanced composites - Future space applications
21 p0086 A79-15504

Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings
21 p0099 A79-16126

Large-scale human benefits from the industrialization of space
21 p0099 A79-16136

Economic opportunities of space enterprise in the next decades
21 p0100 A79-16137

A technology program for large area space systems
21 p0100 A79-16145

Future space transportation systems
21 p0100 A79-16146

Overview of future programs - USA --- manned orbital space missions
21 p0116 A79-17275

Commercial prospects for extraterrestrial materials
23 p0395 A79-33748

Financing alternatives for space industrialization
[AIAA PAPER 79-1389] 23 p0426 A79-34836

Space to benefit mankind - 1980 to 2000
[IAF PAPER 79-206] 24 p0710 A79-53356

Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418

Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108

Statement of Doctor Klaus Heiss, President, ECON, Incorporated, Princeton, New Jersey
21 p0224 N79-15110

SPACE LAW

Solar energy and the 'Common Heritage of Mankind' --- international agreements regarding usage
[IAF PAPER 78-SL-45] 21 p0035 A79-11356

Solar energy via satellites and international cooperation
22 p0310 A79-30952

Solar power space stations - Some issues of law and policy
[AAS 78-199] 23 p0427 A79-34864

Towards an adequate legal regulation of the geostationary orbit
24 p0663 A79-50855

Legal considerations on the development and use of satellite solar power stations
24 p0664 A79-50860

Legal aspects of solar power satellites - Focus on microwave exposure standards
[IAF PAPER 79-IISL-01] 24 p0711 A79-53452

Solar energy bank for mankind in contemporary international space law
[IAF PAPER 79-IISL-47] 24 p0711 A79-53482

Legal norm creation concerning solar energy in contemporary international space law
24 p0713 A79-53680

The legal aspect concerning solar energy
24 p0713 A79-53681

Some observations of the legal implications relating to the use of solar energy
24 p0713 A79-53682

SPACE MAINTENANCE

Health maintenance and health surveillance considerations for an SPS space construction base community
[AAS PAPER 78-176] 22 p0243 A79-21273

Satellite power system: Concept development and evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

SPACE MANUFACTURING

The utilization of European space techniques for energy production
[IAF PAPER 78-190] 21 p0035 A79-11287

On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288

Space will be the next big construction site
22 p0268 A79-24450

The construction of satellite solar power stations from nonterrestrial materials - Feasibility and economics
23 p0403 A79-34028

Development of space manufacturing systems concepts utilizing lunar resources
[AIAA PAPER 79-1411] 23 p0426 A79-34844

Solar power satellite - Putting it together --- fabrication, composite materials, and building site considerations
24 p0659 A79-50399

Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302

Extraterrestrial fiberglass production using solar energy --- lunar plants or space manufacturing facilities
24 p0778 N79-32237

SPACE MISSIONS

Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169

Selenide isotope generator for the Galileo mission
21 p0022 A79-10185

Dynamic Isotope Power Systems /DIPS/ --- for space applications
24 p0692 A79-51928

Application of the Dynamic Isotope Power System to a multimission spacecraft
24 p0692 A79-51929

Selection of power plant elements for future reactor space electric power systems
24 p0693 A79-51930

Symposium on the Future of Space Science and Space Applications
[GPO-23-876] 21 p0224 N79-15105

Statement of Ivan Bekey, Director of Advanced Mission Studies, Aerospace Corporation
21 p0224 N79-15107

Statement of Doctor Klaus Heiss, President, ECON, Incorporated, Princeton, New Jersey
21 p0224 N79-15110

OAST Space Theme Workshop. Volume 1: Summary report. 1: Introduction. 2: General observations and some key findings. 3: Follow-on activity. Quick-look comments and working papers
[NASA-TM-80001] 21 p0224 N79-15113

OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action
[NASA-TM-80002] 21 p0225 N79-15114

OAST Space Theme Workshop. Volume 3: Working group summary. 6: Power (P-2). A. Statement. B. Technology needs (form 1). C. Priority assessment (form 2)
[NASA-TM-80013] 21 p0225 N79-15125

Primary lithium battery technology and its application to NASA missions
[NASA-CR-158229] 22 p0354 N79-19449

SPACE ORIENTATION

Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581

SPACE POWER REACTORS

Space power technology - Current status and future development trends --- for powering spacecraft
[DGLR PAPER 78-167] 21 p0063 A79-14054

Radiation energy conversion in space
22 p0284 A79-26595

Results from Symposium on Future Orbital Power Systems Technology Requirements
24 p0690 A79-51891

The NASA Space Power Technology Program
24 p0691 A79-51894

Selection of power plant elements for future reactor space electric power systems
24 p0693 A79-51930

Baseline design of the thermoelectric reactor space power system
24 p0693 A79-51932

Optimisation of powerful energy supply systems for application in space
[IAF PAPER 79-169] 24 p0710 A79-53333

Mini-Brayton heat source assembly development
[NASA-CR-159447] 21 p0196 N79-12554

The role of fuel cells in NASA's space power systems
[NASA-TM-79182] 23 p0546 N79-23133

SPACE PROCESSING

Feasibility of rocket propellant production on Mars
21 p0047 A79-12324

Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330

Present status of GaAs --- including space processing and solid state applications
[NASA-CR-3093] 21 p0215 N79-14192

SPACE PROGRAMS

Large-scale human benefits from the industrialization of space
21 p0099 A79-16136

Economic opportunities of space enterprise in the next decades
21 p0100 A79-16137

The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2
23 p0427 A79-34860

Symposium on the Future of Space Science and Space Applications
[GPO-23-876] 21 p0224 N79-15105

United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815

Authorizing appropriations to the National Aeronautics and Space Administration
[H-REPT-96-52] 22 p0364 N79-20928

Aeronautics and space report of the President, 1978 activities
24 p0794 N79-33115

SPACE RENDEZVOUS

Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169

SPACE SHUTTLE ORBITERS

Electrical power distribution subsystem --- electromagnetic environment effects on orbiter and Spacelab payload
23 p0493 A79-40719

A power extension package /PEP/ for the Shuttle Orbiter
24 p0691 A79-51897

Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936

Assessment of SEPS solar array technology for orbital service module application
[NASA-CR-151859] 21 p0194 N79-12136

SPACE SHUTTLE PAYLOADS

The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans
[NASA-CR-161146] 22 p0345 N79-17890

SPACE SHUTTLES

Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10186

Roll-out solar arrays - Candidate power sources for future space missions
[IAF PAPER 78-39] 21 p0034 A79-11216

Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218

Flexible roll-out solar generators - Energy sources for future high-power space missions
[DGLR PAPER 78-165] 21 p0063 A79-14056

Space Shuttle - America's wings to the future --- Book
21 p0114 A79-17124

Commercial potential of the Space Shuttle
[AAS PAPER 79-058] 23 p0438 A79-36548

The NASA budget - Fiscal years 1979-80
23 p0535 A79-43448

Legal considerations on the development and use of satellite solar power stations
24 p0664 A79-50860

A DOD space energy module
24 p0691 A79-51898

Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379

Hydrogen embrittlement and its control in hydrogen-fueled engine systems
22 p0366 N79-21429

SPACE STATIONS

Orbital antenna farm power systems challenges
24 p0690 A79-51892

Manned remote work station development article
[NASA-CR-151871] 22 p0330 N79-16057

Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379

The 100 kW space station --- regenerative fuel cells and nickel hydrogen and nickel cadmium batteries for solar arrays
22 p0371 N79-21603

The 25 kW space station
22 p0371 N79-21604

A study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
24 p0751 N79-30748

SPACE STORAGE

A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432

SPACE TRANSPORTATION

Space Congress, 15th, Cocoa Beach, Fla., April 26-28, 1978, Proceedings
21 p0099 A79-16126

The 25 kW power module updated baseline system --- for space transportation system payloads
[NASA-TM-78212] 21 p0226 N79-15247

SPACE TRANSPORTATION SYSTEM

Future space transportation systems
21 p0100 A79-16146

Space Shuttle - America's wings to the future --- Book
21 p0114 A79-17124

Overview of future programs - USA --- manned orbital space missions
21 p0116 A79-17275

NASA takes stock
23 p0461 A79-38375

Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-18] 24 p0711 A79-53418

A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432

Satellite Power Systems (SPS) concept definition study (exhibit C)
[NASA-CR-150827] 21 p0183 N79-11475

Satellite Power Systems (SPS) concept definition study. Volume 5: Transportation and operations analysis --- heavy lift launch and orbit transfer vehicles for orbital assembly
[NASA-CR-158067] 21 p0225 N79-15139

The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans
[NASA-CR-161146] 22 p0345 N79-17890

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 4: Transportation analysis
[NASA-CR-161222] 23 p0547 N79-23488

NASA authorization, 1980, volume 1, part 4
[GPO-46-423] 24 p0762 N79-31085

SPACE-TIME FUNCTIONS

Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution
23 p0478 A79-39566

SPACEBORNE ASTRONOMY

NASA takes stock
23 p0461 A79-38375

SPACEBORNE EXPERIMENTS

Thin film solar collectors for material science experiments in space
[IAF PAPER 79-202] 24 p0710 A79-53353

SPACECRAFT CHARGING

NASCAP modelling of high-voltage power system interactions with space charged-particle environments --- particle impact on solar satellite surfaces
23 p0479 A79-39806

Environmental interaction implications for large space systems
23 p0552 N79-24027

Space environmental effects and the solar power satellite
23 p0552 N79-24028

SPACECRAFT COMMUNICATION
Orbital antenna farm power systems challenges
24 p0650 A79-51892
Long-term prediction of power system performance for geosynchronous spacecraft
24 p0651 A79-51899

SPACECRAFT COMPONENTS
Flight performance evaluation of heat pipe solar collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041
High Efficiency Solar Panel (HESP-2)
[AD-A065009] 23 p0544 N79-22642

SPACECRAFT CONFIGURATIONS
Transient attitude dynamics of satellites with deploying flexible appendages
21 p0047 A79-12325
Technology requirements and readiness for very large vehicles
[NASA-TM-80127] 23 p0587 N79-27086

SPACECRAFT CONSTRUCTION MATERIALS
Advanced composites - Future space applications
21 p0086 A79-15504
The construction of satellite solar power stations from nonterrestrial materials - Feasibility and economics
23 p0403 A79-34028
Solar power satellite - Putting it together --- fabrication, composite materials, and building site considerations
24 p0659 A79-50399
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302

SPACECRAFT CONTROL
Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control
21 p0148 A79-17792
Evaluation of a sodium heat pipe/thermal energy storage unit utilizing LiF-MgF2-KF phase change material
[AIAA PAPER 79-1095] 23 p0462 A79-38565

SPACECRAFT DESIGN
New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298
Space Shuttle - America's wings to the future --- Book
21 p0114 A79-17124
Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells
23 p0500 A79-40913
Family of solar array design options
23 p0500 A79-40914
Study of a flexible solar array generator for a remote sensing satellite. Volume 1: Technical report
[ESS/SS-909-VOL-1] 23 p0599 N79-27709
Heat pipe technology for spacecraft thermal control
24 p0764 N79-31274

SPACECRAFT LAUNCHING
First steps to the Solar Power Satellite
23 p0382 A79-32721

SPACECRAFT MODULES
Use of modular heat source stack in RTGs --- Radioisotope Thermoelectric Generator
24 p0653 A79-51933

SPACECRAFT POWER SUPPLIES
Silver-hydrogen, a long life light weight energy storage system --- design for spacecraft
21 p0001 A79-10012
Vertical junction silicon solar cell --- for spacecraft power sources
21 p0001 A79-10013
The NTS-2 satellite solar cell experiment
21 p0001 A79-10016
Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017
Intelsat V solar array design and development summary
21 p0002 A79-10018
Design features of the TDRSS solar array --- Tracking and Data Relay Satellites
21 p0002 A79-10019
Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169
Selenide isotope generator for the Galileo mission
21 p0022 A79-10185
Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10186
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
Copper/water axially-grooved heat pipes for RTG applications
21 p0023 A79-10188
Brayton Isotope Power System - The versatile dynamic power converter --- for spacecraft
21 p0023 A79-10190
Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191
Prospects of thermionic power systems
21 p0026 A79-10220
Selenide technology evaluation program at JPL
21 p0026 A79-10222
Proposals for power conditioning systems of high power communication satellites
21 p0033 A79-10897
Advancements in the design of solar array to battery charge current regulators
21 p0033 A79-10902
Roll-out solar arrays - Candidate power sources for future space missions
[IAF PAPER 78-39] 21 p0034 A79-11216
Radioisotope-powered free-piston Stirling engine for space applications
[IAF PAPER 78-42] 21 p0034 A79-11217
Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218
A problem of optimizing the setting angle of sun-battery panels of concave shape --- onboard satellite
21 p0045 A79-12186
High efficiency low cost solar cell power
21 p0048 A79-12471
Space power technology - Current status and future development trends --- for powering spacecraft
[DGLR PAPER 78-167] 21 p0063 A79-14054
Flexible roll-out solar generators - Energy sources for future high-power space missions
[DGLR PAPER 78-165] 21 p0063 A79-14056
Space power for space
21 p0100 A79-16143
Energy storage requirements for spacecraft
22 p0246 A79-21486
Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612
Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138
Study of the characteristics of Ni-Cd storage batteries for space applications
22 p0304 A79-30207
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738
Synchronous orbit power technology needs
[AIAA 79-0916] 23 p0425 A79-34739
Large space system - Charged particle environment interaction technology --- effects on high voltage solar array performance
[AIAA 79-0913] 23 p0425 A79-34775
Advanced electrochemical energy sources for space power systems - A review
23 p0487 A79-40371
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895
Family of solar array design options
23 p0500 A79-40914
Latest developments in solar array technology at AEG-Telefunken
23 p0500 A79-40915
The ESA lightweight hybrid solar array
23 p0500 A79-40916
The alpha factor - Controlling solar cell absorptance
23 p0502 A79-40935
An overview of photovoltaics for space applications
23 p0503 A79-40950

Thin silicon solar cell performance characteristics
23 p0503 A79-40953

Air Force High Efficiency Solar Panel - GaAs cell development --- or military satellites
23 p0506 A79-40971

Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972

Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973

Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975

Spacecraft power systems
23 p0533 A79-43199

The role of fuel cells in NASA's space power systems
24 p0681 A79-51810

Long-term prediction of power system performance for geosynchronous spacecraft
24 p0691 A79-51899

Thermal management for future Air Force high power spacecraft
24 p0692 A79-51923

Heat rejection development requirements for orbital power systems
24 p0692 A79-51924

Status report of the dynamic isotope power system
24 p0692 A79-51927

Dynamic Isotope Power Systems /DIPS/ --- for space applications
24 p0692 A79-51928

Application of the Dynamic Isotope Power System to a multimission spacecraft
24 p0692 A79-51929

Selection of power plant elements for future reactor space electric power systems
24 p0693 A79-51930

Reactor design for nuclear electric propulsion
24 p0693 A79-51931

Baseline design of the thermoelectric reactor space power system
24 p0693 A79-51932

Use of modular heat source stack in RTGs --- Radioisotope Thermoelectric Generator
24 p0693 A79-51933

Design optimization of RTG for Solar-Polar Mission --- Radioisotope Thermoelectric Generator
24 p0693 A79-51935

Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936

SNAP 19 performance update for Pioneer and Viking missions
24 p0694 A79-51940

Optimisation of powerful energy supply systems for application in space
[IAF PAPER 79-169]   24 p0710 A79-53333

Future large space systems opportunities: A case for space-to-space power? --- spacecraft power supplies microwave and laser transmission
21 p0169 N79-10095

Future Orbital Power Systems Technology Requirements
[NASA-CP-2058]   21 p0169 N79-10122

OAST space power technology program
21 p0169 N79-10123

Historical and projected power requirements
21 p0169 N79-10125

Military needs for orbital power
21 p0169 N79-10127

Satellite power systems program
21 p0169 N79-10128

Power management and control for space systems
21 p0170 N79-10134

An economical approach to space power systems
21 p0170 N79-10139

Battery workshop
21 p0170 N79-10143

Assessment of SEPS solar array technology for orbital service module application
[NASA-CR-151859]   21 p0194 N79-12136

OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action
[NASA-TM-80002]   21 p0225 N79-15114

OAST Space Theme Workshop. Volume 3: Working group summary. 6: Power (P-2). A. Statement. B. Technology needs (form 1). C. Priority assessment (form 2)
[NASA-TM-80013]   21 p0225 N79-15125

Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878]   22 p0335 N79-16379

The 1977 Goddard Space Flight Center Battery Workshop
[NASA-CP-2041]   22 p0370 N79-21565

Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571

Results from Symposium on Future Orbital power systems technology requirements
[NASA-TM-79125]   23 p0539 N79-22191

An economic analysis of a commercial approach to the design and fabrication of a space power system
[NASA-TM-79153]   23 p0539 N79-22193

Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1]   23 p0599 N79-27708

Future thrusts of the NASA space power program --- with emphasis on electrochemical energy conversion and storage
24 p0722 N79-28670

Photovoltaic generators in space --- conference, ESTEC, Netherlands, Sep. 1978
[SP-140]   24 p0751 N79-30730

Space application of large area terrestrial solar cells for multi-KW-arrays
24 p0751 N79-30732

A European low-cost solution for Spacelab Power augmentation
24 p0751 N79-30745

The NASA space power technology program
24 p0751 N79-30746

Review of European solar array technology and potential future developments
24 p0751 N79-30747

A study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
24 p0751 N79-30748

Behavior of solar generators in low orbits
24 p0752 N79-30766

Assessment of short and medium term improvements to the Spacelab power system
[ESA-CR(P)-1193-VOL-2]   24 p0768 N79-31513

Strip cell test and evaluation program
[NASA-CR-159652]   24 p0772 N79-31784

The JPI space photovoltaic program --- energy efficient sol silicon solar cells for space applications
24 p0783 N79-32643

Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257]   24 p0795 N79-33253

Advanced technology light weight fuel cell program --- for space power applications
[NASA-CR-159653]   24 p0800 N79-33581

SPACECRAFT PROPULSION

A summary of USSR thermionic energy conversion activity
21 p0026 A79-10216

NASA's thermionic technology program
21 p0026 A79-10217

Space power for space
21 p0100 A79-16143

Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1978, Technical Papers
21 p0107 A79-16601

A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613

Laser-powered aircraft and rocket systems with laser energy relay units
21 p0109 A79-16619

Results from Symposium on Future Orbital Power Systems Technology Requirements
24 p0690 A79-51891

The NASA Space Power Technology Program
24 p0691 A79-51894

A power extension package /PEP/ for the Shuttle Orbiter
24 p0691 A79-51897
A DOD space energy module
24 p0691 A79-51898
Long-term prediction of power system performance for geosynchronous spacecraft
24 p0691 A79-51899
Potential of GaAlAs solar cells for the global positioning system missions
24 p0691 A79-51901
Enhancement of solar arrays in space through the use of concentrators
24 p0692 A79-51905
Microwave power transmitting phased array antenna research project
[NASA-CR-157843] 21 p0202 N79-13263

SPACECRAFT RADIATORS
Heat rejection development requirements for orbital power systems
24 p0692 A79-51924
NEP heat pipe radiators --- Nuclear Electric Propulsion
24 p0700 A79-51985
Heat pipes in the thermal control of communication satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278

SPACECRAFT STRUCTURES
Satellite Power System (SPS) concept definition study (exhibit C)
[NASA-CR-150733] 21 p0225 N79-15137

SPACELAB
Flexible roll-out solar generators - Energy sources for future high-power space missions
[DGLR PAPER 78-165] 21 p0063 A79-14056
Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330
Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379
A European low-cost solution for Spacelab Power augmentation
24 p0751 N79-30745
Assessment of short and medium term improvements to the Spacelab power system
[ESA-CR(P)-1193-VOL-2] 24 p0768 N79-31513

SPACELAB PAYLOADS
Electrical power distribution subsystem --- electromagnetic environment effects on orbiter and Spacelab payload
23 p0493 A79-40719

SPACING
Shading and spacing in paraboloidal collector arrays
21 p01[illegible] A79-18025

SPARK IGNITION
Some problems and benefits from the hydrogen fueled spark ignition engine
21 p0016 A79-10130
A one-dimensional combustion model for a dual chamber stratified charge spark ignition engine
[SAE PAPER 790355] 22 p0315 A79-31371
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines
23 p0461 A79-38387
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435
Tests of Wisconsin S12D engine running on natural gas with addition of carbon dioxide
[AD-A058486] 22 p0339 N79-17230

SPARK PLUGS
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297

SPATIAL DEPENDENCIES
Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

SPECIFIC HEAT
Transient energy removal in cylindrical parabolic collector systems
21 p0020 A79-10168
Some aspects of the transient response of a flat-plate solar energy collector
21 p0153 A79-18466
Analysis of a cylindrical imploding shock wave
21 p0155 A79-18846
Heating value of refuse derived fuel
23 p0490 A79-40412
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537

SPECIFICATIONS
Effect of broadened-specification fuels on aircraft engines and fuel systems
[NASA-TM-79086] 22 p0330 N79-16136

SPECTRAL BANDS
Two-junction cascade solar cell characteristics under 1000 concentration ratio and AM 0-AM 5 spectral conditions
23 p0513 A79-41027

SPECTRAL CORRELATION
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531

SPECTRAL EMISSION
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703

SPECTRAL ENERGY DISTRIBUTION
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Multicolor solar cell power system for space
21 p0108 A79-16611
Selected ordinates for total solar radiant property evaluation from spectral data
22 p0271 A79-25060

SPECTRAL LINE WIDTH
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

SPECTRAL REFLECTANCE
Investigation and perspectives on iron oxide, zinc conversion coating, zinc oxide, cobalt oxide and tungsten oxide as spectral selective solar absorber surfaces
21 p0126 A79-17375
Selective absorption of solar energy in ultrafine metal particles - Model calculations
22 p0273 A79-25746
Investigation of the spectral characteristics of metallized polymer films for making solar concentrators
24 p0637 A79-46910
Microstructure of a black chrome solar selective absorber
24 p0655 A79-50182
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183
Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189
Evaluation of solar absorbers, reflectors and transmitters - Physical reflectance standards
24 p0657 A79-50327
Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780

SPECTRAL SENSITIVITY
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874
High efficiency low cost solar cell power
21 p0048 A79-12471
Investigation and perspectives on iron oxide, zinc conversion coating, zinc oxide, cobalt oxide and tungsten oxide as spectral selective solar absorber surfaces
21 p0126 A79-17375
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors
21 p0127 A79-17380
Selective absorption of solar energy by ultrafine metal particles
21 p0127 A79-17382
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber
21 p0127 A79-17383

The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments --- for flat plate solar collectors
21 p0127 A79-17394

Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417

Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors
22 p0256 A79-22955

The short-wavelength response of MIS solar cells
22 p0273 A79-25748

Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956

Thermal radiation - Transient heat transfer in plates with selective surfaces
23 p0389 A79-33266

The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989

Spectral-selective surfaces for the thermal conversion of solar energy --- Thesis
23 p0523 A79-41732

Spectrally selective surfaces of Ni-pigmented anodic Al2O3 --- solar energy absorbers
24 p0629 A79-46202

Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

Investigation of the absorption and emission characteristics of an ideal selective surface --- for solar energy absorbers
24 p0648 A79-49186

Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321
24 p0662 A79-50548

SPECTRAL SIGNATURES

Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10273] 24 p0768 N79-31730

SPECTRORADIOMETERS

Fast spectral radiometer --- for solar radiation spectral composition
23 p0469 A79-38629

SPECTROSCOPIC ANALYSIS

Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
23 p0432 A79-35079

Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086

SPECTROSCOPY

Moessbauer spectroscopy of iron in coal and coal hydrogenation products
22 p0282 A79-26464

SPECTRUM ANALYSIS

Study of the spectral characteristics of metallized polymer films for production of solar concentrators
22 p0297 A79-28672

Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689

SPECULAR REFLECTION

Specular mirrors for solar energy application
21 p0034 A79-11147

Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971

Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974

Reflecting horizontal collector
21 p0128 A79-17395

Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166

Selective absorption of solar energy in ultrafine metal particles - Model calculations
22 p0273 A79-25746

Specularity measurements for solar materials
22 p0294 A79-28153

Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067

Specularity measurements by Fourier transform examination --- for scattering properties of solar mirrors
23 p0431 A79-35069

Inhomogeneous surfaces as selective solar absorbers
24 p0704 A79-52313

Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780

SPEED CONTROL

Response of lead-acid batteries to chopper-controlled discharge --- for electric vehicles
21 p0011 A79-10097

DOE/NASA Mod-OA wind turbine performance
21 p0028 A79-10235

On-line control of a large horizontal axis wind energy conversion system and its performance in a turbulent wind environment
21 p0028 A79-10236

Control of wind turbine generators connected to power systems
21 p0086 A79-15574

Operation and control of wind-electric systems
21 p0086 A79-15575

Controlling a wind generator for increased efficiency
21 p0113 A79-16743

Flap-cone control of windmill speed
23 p0405 A79-34046

SPHERES

P.E.R.I.C.L.E.S. - Design of a stationary spherical collector --- solar energy application
21 p0134 A79-17441

MHD stability of Spheromak
22 p0313 A79-31189

Tuned Sphere Stable OTEC Platform
24 p0620 A79-45802

SPHINX

Radiation energy conversion in space
22 p0284 A79-26595

Power from space by laser
22 p0284 A79-26596

Laser aircraft --- using kerosene
22 p0284 A79-26597

SPIN STABILIZATION

Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138

SPIN TESTS

Composite-rim flywheels - Spin tests
23 p0423 A79-34281

Flight performance evaluation of heat pipe solar collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041

SPIRAL WRAPPING

Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489

SPOILERS

Summary report on the collapse of the Magdalen Islands wind turbine
24 p0635 A79-46544

SPRAYED COATINGS

Transparent conducting coatings for solar cells
21 p0124 A79-17350

Spray deposited Cd/1-x/Zn/x/S films for low cost solar cells
23 p0500 A79-40912

Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films
23 p0505 A79-40963

Spray-deposited high-efficiency SnO2/n-Si solar cells
24 p0629 A79-46201

Properties of chemically sprayed SnO2 antireflecting films on Si solar cells
24 p0656 A79-50196

CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197

Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311

SPRINGS (WATER)
Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs
21 p0075 A79-14737
A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0097 A79-16075

SPUTTERING
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces --- for photothermal solar energy conversion
21 p0126 A79-17377
Alpha transport and blistering in tokamaks
22 p0253 A79-22243
Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779
Sputtering yields of graphite and carbides and their potential use as first wall materials --- in Tokamak reactor
23 p0444 A79-36892
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide --- tokamak wall materials
23 p0444 A79-36893
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques
23 p0445 A79-37156

STABILITY TESTS
Investigations on the aeroelastic stability of large wind turbines
[NPL-NP-78014-0] 24 p0792 N79-32731

STABILIZATION
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780

STABILIZED PLATFORMS
Tuned Sphere Stable CTEC Platform
24 p0620 A79-45802

STACKS
Multistack nickel-hydrogen units
22 p0371 N79-21610
Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment
23 p0551 N79-23539

STAGNATION TEMPERATURE
Performance of a honeycomb type flat plate collector with serpentine tube
21 p0054 A79-13579
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419

STAINLESS STEELS
Studies on the selective absorption surface on stainless steel --- for flat type solar collectors
21 p0127 A79-17378
Colored stainless steel - A new type of selective absorber --- for solar thermal conversion
22 p0294 A79-28150
Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide --- tokamak wall materials
23 p0444 A79-36893
Oxygen adsorption on stainless steel --- in tokamak reactors
23 p0445 A79-36965
Use of the new stainless alloys for OTEC heat exchangers
24 p0627 A79-45864
Erosion study of different materials affected by coal ash particles
24 p0646 A79-48964
Corrosion of stainess steel, volume 2. A bibliography with abstracts
[NTIS/PS-79/0208/3] 23 p0553 N79-24143
Development of cryogenic thermal control heat pipes --- of stainless steels
[NASA-CR-152302] 24 p0747 N79-30499

STANDARDIZATION
Solar energy systems - Survey of materials performance
23 p0431 A79-35073
Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891

STANDARDS
Federal automobile fuel economy standards - A status report
21 p0073 A79-14693
Building energy standards and codes
21 p0073 A79-14696
The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors
21 p0102 A79-16423
An optimal standard for solar heating systems
[ASME PAPER 78-WA/DSC-19] 21 p0159 A79-19765
An approach for development of performance criteria and test standards in photovoltaics
23 p0428 A79-35043
SERI solar energy standards activities
23 p0431 A79-35075
The Florida Solar Energy Standards Act of 1976
[AIAA PAPER 79-1018] 23 p0460 A79-38203
Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543
Phase one/base data for the development of energy performance standards for new buildings. Climatic classification
[PB-286900/6] 22 p0336 N79-16497
Phase one/base data for the development of energy performance standard for new buildings. Task report: Building classification
[PB-286904/8] 22 p0355 N79-19468
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
Solar building regulatory study, volume 1
[PB-289823/7] 22 p0365 N79-21235
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
Comparison of collector test methods
[ASSA-SP-B24/77] 23 p0574 N79-25526
Standards applicable to performance measurement of solar heating and cooling systems --- conferences
[COC-4142-2] 24 p0741 N79-29656
Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808
Standards for photovoltaic energy conversion systems
[PB-296274/4] 24 p0801 N79-33597

STAR TRACKERS
Dynamics of stepping of the Hermes flexible solar array
22 p0323 A79-31615
Solar tracking control system Sun Chaser
[NASA-TM-78199] 21 p0172 N79-10514

STATIC INVERTERS
Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898
Development program for 3.0 KW inverter: Militarized inverter for use with fuel cell or battery power plants
[AD-A068433] 24 p0738 N79-29612

STATIC LOADS
Libbey-Owens-Ford solar collector static load test
[NASA-CR-150852] 21 p0205 N79-13494

STATIONARY ORBITS
Solar power satellites revisited
21 p0093 A79-15898

STATIONKEEPING
Station keeping subsystem designs for modular experiment OTEC plants
24 p0626 A79-45851

STATISTICAL ANALYSIS
On the use of synoptic weather map typing to define solar radiation regimes
22 p0272 A79-25392

Statistical analysis of solar radiation data in Montreal for solar energy utilization 22 p0322 A79-31452
A methodology for evaluating the potential materials and energy recovery from municipal solid waste 21 p0215 N79-13935
Application of solar technology to today's energy needs, volume 2 --- systems analysis and analytical methods [OTA-E-77-VOL-2] 21 p0218 N79-14530
Analytical methods 21 p0218 N79-14531
Transportation energy conservation data book, edition 3 [ORNL-5493] 22 p0369 N79-21562
Some variability statistics of available wind power [SAND-78-1735] 24 p0752 N79-30772

STATISTICAL CORRELATION
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation 22 p0235 A79-20531

STATORS
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds 21 p0049 A79-12821
Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance [NASA-TM-78993] 22 p0345 N79-17959
Evaluation of ceramics for stator application: Gas turbine engine report [NASA-CR-159533] 22 p0364 N79-21075

STEADY FLOW
On the diffusive instability of some simple steady magnetohydrodynamic flows 22 p0278 A79-26163

STEADY STATE
The steady state salt gradient solar pond 24 p0661 A79-50540

STEAM
Energy distribution and storage alternates with a centralized heat source 21 p0013 A79-10112
Solar energy for industrial process steam 22 p0267 A79-24315
Regulation of the water steam cycle in a solar receiver 24 p0603 A79-44296
Developmental hydrogen via coal gasification processes 24 p0613 A79-45587
Solar production of industrial process steam 24 p0673 A79-51748
A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming 24 p0681 A79-51811
Steam gasification of Illinois coal and coke 24 p0687 A79-51857
The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant 24 p0687 A79-51859
Cost study of superheating geothermal steam 24 p0707 A79-52572
Analytical modelling of oil recovery by steam injection 22 p0358 N79-20434
Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils [ORNL/SUB-79/14274/1] 24 p0776 N79-31827
Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat [BMFT-FB-T-79-29] 24 p0780 N79-32394

STEAM FLOW
Circulating-bed boiler concepts for steam and power generation 21 p0008 A79-10071
The external combustion steam injected gas turbine for cogeneration 21 p0012 A79-10100
Steam generator and turbomachines --- MHD power plant design and Soviet operational experience 21 p0106 A79-16499
Performance of a 5 MWt solar steam generator 22 p0288 A79-27399
Testing of central receiver for central thermal power systems 23 p0428 A79-35045
The development of the Advanced Components Test Facility --- for solar powered steam generator system 23 p0429 A79-35047
A steam process for coal gasification 24 p0632 A79-46321
Demonstration of a rotary separator for two-phase brine and steam flows [TID-28519] 22 p0365 N79-21309

STEAM TURBINES
Closed Cycle Gas Turbine power generation opportunities 21 p0004 A79-10039
Coal-fired gas turbine power cycles with steam injection 21 p0004 A79-10042
Geothermal preheating in fossil-fired steam power plants 21 p0014 A79-10118
Economic optimization of the coal-fired MHD Steam Power Plant 21 p0016 A79-10134
Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants 21 p0016 A79-10135
Considerations for MHD power generation development 21 p0016 A79-10136
A proposed 40 MWe MHD pilot plant 21 p0017 A79-10137
Thermal modeling of coal-fired MHD plant components 21 p0017 A79-10138
Prospects of thermionic power systems 21 p0026 A79-10220
Second-generation integrated coal gasification/combined-cycle power systems [ASME PAPER 78-GT-14] 21 p0032 A79-10778
Magnetohydrodynamic/steam power plant modeling and control 21 p0046 A79-12274
A comparison of the performance of steam turbine cycles using gas contaminated geothermal steam [ASME PAPER 78-WA/ENER-3] 21 p0159 A79-19776
The combined reheat gas turbine/steam turbine cycle. I - A critical analysis of the combined reheat gas turbine/steam turbine cycle [ASME PAPER 79-GT-7] 22 p0306 A79-30505
The combined reheat gas turbine/steam turbine cycle. II - The LM 5000 gas generator applied to the combined reheat gas turbine/steam turbine cycle [ASME PAPER 79-GT-8] 22 p0306 A79-30506
Cylindrical parabolic collector optimization for interfacing with steam turbine generators 22 p0322 A79-31448
Repowering of a small utility - A unique solution to a unique problem [ASME PAPER 79-GT-15] 23 p0375 A79-32332
Application of a hot air turbine for efficiency improvement in MHD/steam power plants [ASME PAPER 79-GT-36] 23 p0375 A79-32341
A high temperature turbine for operation on coal-derived fuel [ASME PAPER 79-GT-173] 23 p0379 A79-32434
MHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591
Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor 23 p0395 A79-33428
Hydrogen/oxygen steam generation - An example of aerospace technology transfer 24 p0613 A79-45585
Supplementary steam - A viable hydrogen power generation concept 24 p0686 A79-51848
Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system 24 p0703 A79-52010
Combined cycle power generation. Citations from the NTIS data base [NTIS/PS-78/1156/5] 21 p0222 N79-14587

Combined cycle power generation. Citations from the Engineering Index data base
[NTIS/PS-78/1157/3] 21 p0222 N79-14588
Combined gas/steam turbine power plants with supplementary firing
24 p0723 N79-28736
The gas turbine/steam turbine cycle with coal gasification
24 p0723 N79-28737
Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles
24 p0724 N79-28739
Gas-steam turbine combined cycle power plants
[ANI/CES-TE-78-4] 24 p0727 N79-29775

STEEL STRUCTURES
Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826

STEELS
Energy requirements for producing steel in the Republic of South Africa
22 p0340 N79-17322

STEERABLE ANTENNAS
Accuracy analysis of pointing control system of solar power station
[NASA-CR-150880] 21 p0215 N79-14143

STELLARATORS
Ohmic heating experiments in the W VII A stellarator
21 p0069 A79-14458
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459
Ohmic heating experiments in the L-2 stellarator
21 p0070 A79-14460
New results in high-beta stellarator and belt-pinch research
21 p0070 A79-14463
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428
Progress in tokamak and stellarator experiments
23 p0443 A79-36878
Heating of current-free stellarators
24 p0607 A79-45037

STEREOCHEMISTRY
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375

STILLS
The solar still - A new design
23 p0384 A79-33213
Solar distillation in Brasil
23 p0385 A79-33214
Small mills for producing alcohol from sugar cane
23 p0386 A79-33229

STIMULATED EMISSION
Direct conversion of solar energy into laser radiation
22 p0311 A79-31086

STIRLING CYCLE
Performance of a Stirling engine powered heat activated heat pump --- gas heating-cooling system
21 p0011 A79-10098
A computer and experimental simulation of Stirling cycle machines
21 p0023 A79-10192
The Pseudo Stirling cycle - A suitable performance criterion
21 p0023 A79-10196
Balanced compounding of Stirling machines
21 p0024 A79-10200
Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine
21 p0024 A79-10202
Design of a preprototype Stirling Laboratory Research Engine
21 p0024 A79-10203
The matching of a free piston Stirling engine coupled with a free piston linear compressor for a heat pump application
21 p0024 A79-10204
A free-piston Stirling engine for small solar power plants
21 p0024 A79-10205
A Stirling engine heat pump system
21 p0024 A79-10206
Conceptual design of a variable displacement Stirling engine for automotive propulsion
21 p0025 A79-10207
Mechanical efficiency of the Stirling cycle machine with rhombic drive
21 p0025 A79-10208
Development of a 1 kW/e/ isotope fueled Stirling cycle power system
21 p0025 A79-10210
Potential of the Stirling engine for stationary power applications in the 500-2000 HP range
21 p0025 A79-10211
Status of free-piston Stirling engine/linear alternator power conversion system development
21 p0025 A79-10212
Radioisotope-powered free-piston Stirling engine for space applications
[IAF PAPER 78-42] 21 p0034 A79-11217
Ceramic applications in the advanced Stirling automotive engine
21 p0051 A79-12851
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509
The Stirling engine, an energy converter for cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine --- operating in planetary environment
21 p0166 A79-20348
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
An air/fuel control system for the Stirling engine
[SAE PAPER 790328] 22 p0315 A79-31369
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894
Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept
24 p0673 A79-51750
A thermal energy storage system for a Stirling engine powered highway vehicle
24 p0680 A79-51803
Elementary design guidelines for Stirling engines
24 p0689 A79-51874
DOE stationary external combustion engine program - Status report
24 p0689 A79-51882
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883
A solar-Stirling small power system
24 p0690 A79-51884
Advances in Stirling engine technology
24 p0690 A79-51888
Design characteristics of an advanced Stirling engine concept
24 p0690 A79-51889
A variable angle wobble plate drive for a stroke controlled Stirling engine
24 p0690 A79-51890
System performance of a Stirling engine powered heat activated heat pump
24 p0697 A79-51962
The stirling engine for vehicle propulsion
[NASA-TM-75442] 21 p0195 N79-12547
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721
An improved solar energy receiver for a stirling engine
[NASA-CASE-NPO-14619-1] 22 p0362 N79-20513
Stirling engine characteristics
23 p0580 N79-26480
Candidate power-conversion system cycles, appendix A
23 p0580 N79-26484

- Stirling engines for automobiles [NASA-TM-79222] 24 p0723 N79-28726
- Conceptual design study of an automotive Stirling reference engine system [NASA-CR-159605] 24 p0730 N79-29110
- An initial model for the finite displacement response characteristics of a fluidyne pump --- thermodynamic efficiency [AD-A069159] 24 p0734 N79-29521
- System analysis, design and proof-of-concept experiment of a total energy system, phase 2 [COO-2947-5] 24 p0742 N79-29660

STOCHASTIC PROCESSES
- The analysis by stochastic modelling of solar systems for space and water heating 21 p0137 A79-17466
- Stochastic simulation experiments on solar air conditioning systems 21 p0138 A79-17474
- Stochastic predictions of solar cooling system performance [ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848
- Prediction of the behavior of a solar storage system by means of recurrent stochastic models --- of insolation 22 p0258 A79-23295
- A discrete, stochastic simulation model for the analysis and design of solar energy heating systems 23 p0475 A79-38878
- Stochastic simulation of hourly global radiation sequences 24 p0661 A79-50541
- Stochastic analysis of wind characteristics for energy conversion 22 p0350 N79-18535

STOCKPILING
- Source assessment: Water pollutants from coal storage areas [PB-285420/6] 21 p0223 N79-14635
- Crude and product storage: State-of-the-art review and assessment [AD-A066605] 23 p0568 N79-25243
- Strategic petroleum reserve: Expansion of reserve. Final supplement to final environmental impact statement [DOE/EIS-0034] 24 p0746 N79-30407
- Strategic petroleum reserve [DOE/TIC-10107] 24 p0781 N79-32617

STOICHIOMETRY
- Mathematical models of direct initiation of unconfined gas phase detonations --- hazards of LNG/air clouds from spills [AIAA PAPER 79-0289] 21 p0157 A79-19649
- A stoichiometric analysis of coal gasification 23 p0492 A79-40456

STORAGE
- Federal facilities for storing spent nuclear fuel; Are they needed [PB-297071/3] 24 p0804 N79-34006

STORAGE BATTERIES
- Silver-hydrogen, a long life light weight energy storage system --- design for spacecraft 21 p0001 A79-10012
- Review of industrial participation in the ANL lithium/iron sulfide battery development program --- for electric vehicles 21 p0010 A79-10086
- High performance lithium/iron disulfide cells --- for electric vehicle propulsion 21 p0010 A79-10087
- Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries 21 p0010 A79-10088
- Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries 21 p0010 A79-10089
- Bipolar lithium/iron disulfide cells --- for electric vehicle propulsion 21 p0010 A79-10090
- Mechanically rechargeable, metal-air batteries for automotive propulsion [CONF-780801-8] 21 p0011 A79-10093
- Iron-air batteries for electric vehicles 21 p0011 A79-10094
- Development and evaluation of a 600-kWh lithium-hydrogen peroxide reserve power system 21 p0011 A79-10095
- 100MWh zinc-chlorine peak-shaving battery plants 21 p0011 A79-10096
- Cost minimization of photovoltaic power supplies 21 p0021 A79-10171
- Advancements in the design of solar array to battery charge current regulators 21 p0033 A79-10902
- Thermodynamic and kinetic considerations on zinc-halogen batteries 21 p0040 A79-11822
- Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells 21 p0040 A79-11824
- Electrochemical determinations of the chemical potential and diffusivity of sodium in Na/x/TaS2 at 300 K 21 p0040 A79-11830
- Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes 21 p0040 A79-11832
- Calcium/iron sulfide secondary cells 21 p0041 A79-11835
- Batteries for transportation and load-leveling applications 21 p0041 A79-11837
- Advanced batteries --- sodium sulfur batteries for electric motor vehicles 21 p0067 A79-14270
- Electric vehicles challenge battery technology 21 p0093 A79-15892
- Compatibility of direct energy storage devices with ac. processing power system components 21 p0111 A79-16728
- Controlling a wind generator for increased efficiency 21 p0113 A79-16743
- Saur vidyut kosh - The solar cell --- reversible charging electrolytic batteries 21 p0126 A79-17371
- On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells 22 p0246 A79-21491
- Electrochemical utilization of metal hydrides 22 p0251 A79-21709
- Superbatteries - A progress report --- for utility energy storage and electric vehicles 22 p0286 A79-27207
- The role of the battery electric vehicle 22 p0301 A79-29491
- Support services for electric vehicles 22 p0301 A79-29492
- Road vehicles with combined, at least partly electrical driving systems and energy supplies 22 p0301 A79-29494
- Developing electric vehicles 22 p0302 A79-29496
- An electric propulsion system for a town and city bus 22 p0302 A79-29499
- Study of the characteristics of Ni-Cd storage batteries for space applications 22 p0304 A79-30207
- Large scale energy storage - Batteries for transport and stationary applications 23 p0451 A79-37875
- Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries 23 p0495 A79-40749
- Storage of electricity 23 p0524 A79-41804
- Dynamic aspects of solid solution cathodes for electrochemical power sources 24 p0636 A79-46665
- Battery systems for electric vehicles - A state-of-the-art review 24 p0652 A79-49488
- Operation and analysis of a vertical axis wind turbine 24 p0677 A79-51776
- Pumped storage battery with 100 percent efficiency 24 p0679 A79-51795
- The Department of Energy electric vehicle battery program - An overview 24 p0683 A79-51825

A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

A zinc-bromine battery for energy storage
24 p0684 A79-51832

Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833

Dow sodium-sulfur battery for energy storage
24 p0684 A79-51834

Reproducibility and performance of large prototype Na/S cells
24 p0684 A79-51835

Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836

The zinc-chlorine battery in the BEST facility - 1981
24 p0703 A79-52013

Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960

Advanced secondary batteries for electric vehicle propulsion
[CONF-780426-2] 21 p0186 N79-11508

Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553

Some fatigue characteristics of nickel battery plaque
[AD-A060370] 21 p0230 N79-15415

Fabrication and testing of silver-hydrogen cells
[NASA-CR-159431] 22 p0334 N79-16374

Primary lithium battery technology and its application to NASA missions
[NASA-CR-158229] 22 p0354 N79-19449

The 1977 Goddard Space Flight Center Battery Workshop
[NASA-CP-2041] 22 p0370 N79-21565

Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442

Redox flow cell development and demonstration project, calendar year 1977
[NASA-TM-79067] 23 p0558 N79-24445

Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599

High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793

Analysis of battery storage for commercial buildings, phase 1
[COO-4556-2] 24 p0800 N79-33586

STORAGE RINGS (PARTICLE ACCELERATORS)

Application of electron beams in space for energy storage and optical beam generation
21 p0108 A79-16606

STORAGE STABILITY

Solar pond stability experiments
21 p0042 A79-11878

Energy storage in fluidized beds
24 p0657 A79-50211

On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns
24 p0680 A79-51798

Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes
[PNL-2871] 23 p0562 N79-24487

STORAGE TANKS

Analysis of thermal storage unit for solar energy
21 p0122 A79-17332

A heat operated mechanical device to control the temperature and flow of water entering a hot water storage tank in a solar water heating system
21 p0140 A79-17487

Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272

A liquid solar energy storage tank model. I - Formulation of a mathematical model
22 p0267 A79-24314

Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26208

Application of a simplified Markov model to the study of a solar power plant storage system
23 p0383 A79-32964

Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206

Influence of storage tank heat exchanger and mass flow rate on collector efficiency of solar heating units
23 p0468 A79-38625

Direct-contact heat exchange-storage tank in solar houses
23 p0468 A79-38626

Performance of a collector/storage solar water heater
23 p0479 A79-39843

Stratification in thermal storage during charging --- in cylindrical tank
23 p0532 A79-42974

Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976

Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks
24 p0604 A79-44537

Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy
24 p0604 A79-44549

Fracture toughness of cryogenic alloys
24 p0604 A79-44550

Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213

Three dimensional mathematical model of flow stratification in thermocline storage tanks
24 p0609 A79-45214

Hybrid thermal storage subroutine for transient simulation
24 p0681 A79-51807

A simplified algorithm for the evaluation of hybrid thermal storage with water systems
24 p0681 A79-51808

Analysis of the emissions from storage tanks during JP-4 fuel transfer operations. Phase 1: Warm weather conditions
[AD-A069339] 24 p0732 N79-29364

Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413

STRAIN ENERGY METHODS

Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization
21 p0076 A79-14744

STRAIN RATE

A new rationale for the hysteresis effects observed in metal-hydrogen systems
22 p0250 A79-21704

STRATIFICATION

Stratification effects in the short and long term storage of solar heat
21 p0121 A79-17326

Stratification in thermal storage during charging --- in cylindrical tank
23 p0532 A79-42974

Stratified thermal storage in residential Solar energy applications
[COO-4523-1] 24 p0786 N79-32682

STRATIFIED FLOW

The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375

Three dimensional mathematical model of flow stratification in thermocline storage tanks
24 p0609 A79-45214

STRATIGRAPHY

Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- brazil
[E79-10238] 24 p0747 N79-30599

STREAMS

Coupled heat and organic wastes stream pollution
21 p0086 A79-15602

STRESS ANALYSIS

Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827

STRESS CORROSION
Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels
[FE-1784-39] 24 p0719 N79-29364
STRESS-STRAIN RELATIONSHIPS
On design requisites for hydrogen energy systems
24 p0685 A79-51844
STRIATION
Theory of the striated corona in a theta pinch
22 p0295 A79-28315
STRIP MINING
Excavation costs for lunar materials
[AIAA PAPER 79-1376] 23 p0425 A79-34828
Pollutant protection for the case of strip mining in the Rhine area
24 p0714 A79-53804
Application of multispectral scanner data to the study of an abandoned surface coal mine
[NASA-TM-78912] 21 p0204 N79-13872
Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311
Application of remote sensing to state and regional problems
[E79-10196] 23 p0565 N79-25446
A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining
[PB-294299/3] 24 p0735 N79-29584
STRONTIUM 90
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
21 p0027 A79-10226
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
22 p0261 A79-23623
STRUCTURAL ANALYSIS
Analysis and application of the heat pipe heat exchanger
21 p0014 A79-10117
Mechanical deflection analysis of diamond turned reflective optics --- for laser fusion
21 p0083 A79-15143
Land-based OTEC plants - Cold water pipe
24 p0620 A79-45799
Structural performance of the DOE/Sandia 17 meter vertical axis wind turbine
[SAND-78-0880C] 21 p0187 N79-11516
Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026
Thermoelastic solutions for in-situ gasification of coal
22 p0330 N79-16135
Insulating wall boundary layer in a Faraday MHD generator
[FE-23417] 22 p0365 N79-21310
Wind engineering research digest, volume 3, 1978 --- a bibliography of ongoing research projects
[PB-290694/9] 23 p0567 N79-24621
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727
STRUCTURAL DESIGN
Design features of the TDRSS solar array --- Tracking and Data Relay Satellites
21 p0002 A79-10019
Heat exchanger design for geothermal power plants
21 p0015 A79-10123
Development and testing of the ULP solar array
21 p0029 A79-10245
Structures for solar power satellites
21 p0032 A79-10513
New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298
Superconducting magnet systems in EPR designs --- Experimental Power Reactor
21 p0079 A79-14789
External single pass to superheat receiver --- for central receiver solar power plant
[AIAA PAPER 78-1751] 21 p0089 A79-15849
SPS microwave subsystem potential impacts and benefits --- environmental and societal effects of Solar Power System construction and operation
21 p0107 A79-16603
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327
An earth-wrapped solar greenhouse house --- partially buried structure
21 p0140 A79-17493
Exploitation of solar energy via modular power plants and multiple utilization of waste heat
21 p0141 A79-17497
Development of 1 kW vertical axis wind generator
21 p0142 A79-17511
Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535
The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541
Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826
Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829
A composite-rim flywheel design
22 p0240 A79-20840
A status of the 'Alpha-ply' composite flywheel concept development
22 p0241 A79-20843
Calculation and design of liquid-metal MHD induction machines --- Russian book
22 p0286 A79-27302
Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551
Design analysis of a vertical axis wind turbine
23 p0472 A79-38656
Limit analysis and design of a semi-submerged concrete hull for an ocean thermal differences power plant
23 p0486 A79-40195
Fixed angle and seasonably adjustable structural support concepts for solar converters
23 p0518 A79-41063
Structural optimization of SMC line focusing collectors
23 p0534 A79-43295
Solar 'Plus' - Huntsville, Alabama
24 p0600 A79-45209
The MOD-2 wind turbine
24 p0635 A79-46542
Solar power satellite - Putting it together --- fabrication, composite materials, and building site considerations
24 p0659 A79-50399
Weight minimization of sandwich type solar collector panels
24 p0670 A79-51727
A low cost composite blade for a 300 foot diameter wind turbine
24 p0677 A79-51781
High-energy-density flywheel --- rotor design and fabrication
24 p0678 A79-51784
Design of flywheel rotors utilizing cellulosic materials
24 p0678 A79-51787
Design guide for shallow solar ponds
[UCRL-52385] 21 p0185 N79-11497

Optical design of a solar collector for the
  advanced solar thermal electric
  conversion/process heat program
  [Y/SUB-77/14261] 21 p0205 N79-13528
Design data brochure for the Owens-Illinois Sunpak
  (TM) air-cooled solar collector
  [NASA-CR-150868] 21 p0229 N79-15404
Manned remote work station development article
  [NASA-CR-151871] 22 p0330 N79-16057
Parametric study of the performance of a CDIF 1-B
  coal-fired MHD generator
  [ANL-MHD-79-3] 22 p0361 N79-20503
Multistack nickel-hydrogen units
  22 p0371 N79-21610
Horizontally mounted solar collector
  [NASA-CASE-MFS-23349-1] 23 p0546 N79-23481
Design, fabrication and test of a hydrogen heat pipe
  --- extruding and grooving 6063-T6 aluminum
  tubes for cryogenic heat pipes
  [NASA-CR-152267] 23 p0556 N79-24298
Solar project description. Terrell E. Moseley
  Office Building, Lynchburg, Virginia
  [SOLAR/2011-78/50] 23 p0563 N79-24490
General-purpose aluminum-air/flywheel electric
  vehicles
  [UCRL-82003] 23 p0564 N79-24503
Design of a 150 kWe distributed collector solar
  thermal power station
  [AED-CONF-78-212-013] 23 p0583 N79-26517
Design, fabrication, and initial test of a fixture
  for reducing the natural frequency of the Mod-0
  wind turbine tower
  [NASA-TM-79200] 24 p0723 N79-28727
Design and installation manual for thermal energy
  storage
  [ANL-79-15] 24 p0740 N79-29636
Simulation and design of solar thermal processes
  [COO-2588-2] 24 p0741 N79-29655
Proceedings of the 2nd Workshop on
  Energy-Conserving Site Design Case Studies
  [ANL/ICES-TM-22] 24 p0742 N79-29658
Design considerations for the Tandem Junction
  Solar Cell
  24 p0784 N79-32651
Solar Heating And Cooling Of Buildings (SHACOB):
  Requirements definition and impact analysis
  [EPRI-ER-808-SY] 24 p0787 N79-32687
Structural optimization of sheet molding compound
  line focusing collectors
  [SAND-79-0215C] 24 p0790 N79-32710
NASA Tech House: An early evaluation
  [NASA-TM-80751] 24 p0798 N79-33571

STRUCTURAL DESIGN CRITERIA
Design criteria for multilayer superconductive
  magnets
  22 p0236 A79-20536
Prediction of stresses and natural frequencies for
  high speed wind turbine blades
  [AIAA PAPER 79-0970] 23 p0456 A79-38177
Atmospheric turbulence structure in relation to
  wind generator design
  23 p0483 A79-40114
On design requisites for hydrogen energy systems
  24 p0685 A79-51884
Orbital demonstration - The prelude to large
  operational structures in space
  [IAF PAPER 79-207] 24 p0710 A79-53357
Preliminary summary of the ETF conceptual studies
  [NASA-TM-78999] 21 p0103 N79-11470
Design of low-cost structures for photovoltaic
  arrays. Task 1: Survey of array structural
  characteristics
  [SAND-78-7021] 21 p0206 N79-13509
Phase one/base data for the development of energy
  performance standard for new buildings. Task
  report: Building classification
  [PB-286904/8] 22 p0355 N79-19469
Safety considerations in the design and operation
  of large wind turbines
  [NASA-TM-79193] 24 p0723 N79-28725

STRUCTURAL ENGINEERING
Practical considerations for 'capturing the sun'
  21 p0089 A79-15853
Fracture research in Canada
  21 p0148 A79-17530
Prefabricated caissons for tidal power development
  21 p0152 A79-18113
Selected areas of aerospace technical applications
  to civil engineering
  23 p0397 A79-33925
Marine structures for energy conversion
  23 p0450 A79-37867
Austrian 10kWE solar power plant. A project of
  the Federal Ministry for Science and Research
  22 p0349 N79-18460
Considerations in sizing coal gasification plants
  [FE-2240-40] 24 p0766 N79-31417
Wind power, volume 2. Citations from the NTIS
  data base --- bibliographies
  [NTIS/PS-79/0534/2] 24 p0777 N79-31836

STRUCTURAL FAILURE
Mechanical and vibrational problems of a vertical
  axis wind turbine
  23 p0389 A79-33265
Summary report on the collapse of the Magdalen
  Islands wind turbine
  24 p0635 A79-46544

STRUCTURAL PROPERTIES (GEOLOGY)
Strategic petroleum reserve: Expansion of
  reserve. Final supplement to final
  environmental impact statement
  [DOE/EIS-0034] 24 p0746 N79-30407

STRUCTURAL RELIABILITY
Designing reliability into high-effectiveness
  industrial gas turbine regenerators
  [ASME PAPER 79-GT-199] 23 p0380 A79-32456

STRUCTURAL STABILITY
Heliostat survivability and structural stability
  for wind loading
  23 p0400 A79-34001
Investigations on the aeroelastic stability of
  large wind turbines
  23 p0483 A79-40116
Aeroelastic stability and response of horizontal
  axis wind turbine blades
  23 p0483 A79-40117
The aeroelastic behaviour of large Darrieus-type
  wind energy converters derived from the
  behaviour of a 5,5 m rotor
  23 p0483 A79-40118
Measurements of performance and structural
  response of the Danish 200kW Gedser windmill
  23 p0484 A79-40121
Oscillations of and drift force acting on an
  OTEC-CWP structure --- Cold Water Pipe
  24 p0622 A79-45824

STRUCTURAL STRAIN
Mechanical deflection analysis of diamond turned
  reflective optics --- for laser fusion
  21 p0083 A79-15143

STRUCTURAL VIBRATION
On the dynamics of electrostatically precipitated
  fly ash
  [ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787
On vibration of a thick flexible ring rotating at
  high speed --- for flywheel energy storage
  22 p0235 A79-20511
Oscillations of and drift force acting on an
  OTEC-CWP structure --- Cold Water Pipe
  24 p0622 A79-45824
Vortex excited oscillations of marine structures
  with application to the OTEC cold water pipe
  24 p0622 A79-45825

STRUCTURAL WEIGHT
Ultralightweight structures for space power ---
  solar energy collection for transmission to earth
  21 p0108 A79-16609

SUBMERGED BODIES
Wave-tank experiments on an immersed
  parallel-plate duct --- for testing performance
  of sub-sea wave energy converter
  22 p0258 A79-23306
Two-dimensional analyses related to wave-energy
  extraction by submerged resonant ducts
  22 p0312 A79-31099
Heat transfer between a fluidized bed and an
  immersed vertical U-tube --- in pilot plants
  24 p0632 A79-46320

SUBROUTINE LIBRARIES (COMPUTERS)
An expanded system simulation model for solar
  energy storage (technical report), volume 1
  [NASA-CR-159601] 24 p0804 N79-33881

SUBSIDENCE
Remote sensing and mine subsidence in Pennsylvania
  22 p0303 A79-29936

Numerical simulation of the compaction-subsidence phenomena in a reservoir for two-phase nonisothermal flow 23 p0540 N79-22401

Bibliography of subsidence and related topics for in situ coal gasification [LETC/BL-71316-1] 24 p0733 N79-29373

SUBSONIC FLOW

Subsonic flow in the channel of an MHD-generator 21 p0167 A79-20413

Subsonic diffusers for MHD generators 22 p0279 A79-26185

On supersonic and subsonic diffusers for magnetohydrodynamic generator applications 22 p0279 A79-26186

SUBSONIC SPEED

Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary [NASA-CR-132558] 24 p0794 N79-33207

SUBSTITUTES

Some measures of regional-industrial interfuel substitution potentials [BNL-24368] 21 p0208 N79-13525

SUBSTRATES

Measurement of bandgap narrowing and diffusion length in heavily doped silicon 23 p0497 A79-40889

Epitaxial solar cells on low-cost silicon substrates 23 p0519 A79-41068

The establishment of a production-ready manufacturing process utilizing thin silicon substrates for solar cells [NASA-CR-158566] 23 p0550 N79-23523

SUCTION

Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity 23 p0387 A79-33241

SUGAR CANE

Efficiency of sugar cane and cowpea as solar energy converters 21 p0125 A79-17368

Small mills for producing alcohol from sugar cane 23 p0386 A79-33229

Properties and operating experience with bagasse as a boiler fuel --- raw sugarcane processing waste 23 p0489 A79-40395

SUGARS

Sweet sorghum - A renewable source for alcohol production 23 p0389 A79-33263

SULFATES

The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant 21 p0076 A79-14757

The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil 21 p0156 A79-19219

Liquid fuels from carbonates by a microbial system 23 p0494 A79-40742

The conversion of SO2 to sulfate particles in coal fired power plant plumes 23 p0535 A79-43391

SULFIDES

Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes 21 p0040 A79-11832

SULFUR

The Westinghouse Sulfur Cycle Hydrogen Production Process 24 p0614 A79-45591

Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 24 p0685 A79-51840

High sulfur fuel effects in a two-cycle high speed army diesel engine [AD-A059534] 21 p0216 N79-14232

Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels [AD-A060322] 21 p0226 N79-15203

Low-sulfur western coal use in existing small and intermediate size boilers --- particulate sampling and combustion efficiency [PB-287937/7] 22 p0346 N79-18061

The gas turbine/steam turbine cycle with coal gasification 24 p0723 N79-28737

SULFUR COMPOUNDS

Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic 21 p0015 A79-10127

/SN/x-GaAs polymer-semiconductor solar cells 21 p0154 A79-18504

The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes [AD-A056278] 21 p0184 N79-11483

SULFUR DIOXIDES

Factors limiting limestone utilization efficiency in fluidized-bed combustors --- in determining sulfur dioxide emission level 21 p0008 A79-10069

Recent operating experience of the Wellman-Lord FGD process on a coal-fired boiler --- flue gas desulfurization 21 p0065 A79-14120

Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization 21 p0065 A79-14121

The Research-Cottrell/Bahco SO2 and particulate removal system at Rickenbacker Air Force Base 21 p0065 A79-14122

The direct reduction of sulfur dioxide 21 p0065 A79-14124

Simultaneous nitrogen oxides and sulfur dioxide removal by absorption-reduction scrubbing 21 p0066 A79-14125

The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant 21 p0076 A79-14757

The impact of a coal fired power plant on ambient sulfur dioxide levels 21 p0082 A79-15032

Particulate and sulfur oxide control options for conventional coal combustion 21 p0092 A79-15883

Commercialization of fluidized-bed combustion systems by the State of Ohio 21 p0096 A79-15923

Emission control for SO2 - An update [ASME PAPER 78-JPGC-PWR-11] 21 p0150 A79-18097

Oxidation of SO2 on the surface of fly ash particles under low relative humidity conditions 22 p0277 A79-26038

Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah 23 p0534 A79-43371

The conversion of SO2 to sulfate particles in coal fired power plant plumes 23 p0535 A79-43391

Application of long-range transport modeling to assess coal development --- for impact on air quality 23 p0535 A79-43429

Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements 24 p0611 A79-45531

A study of long range air pollution problems related to coal development in the Northern Great Plains 24 p0612 A79-45538

The extent of catalytic SO2 reactions in smoke plumes 24 p0616 A79-45748

Applicability of energy model techniques to an analysis of impacts of SO2 emissions from the U.S. electric utilities and control policies 24 p0659 A79-50362

Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results [PB-290514/9] 23 p0566 N79-24534

Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal [CONF-781109-18] 23 p0585 N79-26546

A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions 23 p0590 N79-27546

Fluidized combustion of coal --- to limit SO2 and NOx emissions
23 p0593 N79-27613
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text
[PB-294812/3] 24 p0803 N79-33639

SULFUR OXIDES
Particulate and sulfur dioxide emission control costs for large coal-fired boilers
[PB-281271/7] 21 p0178 N79-10591
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0590 N79-27342
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task Report. Volume 2: Appendices
[PB-294813/1] 24 p0761 N79-30856

SULFURIC ACID
The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil
21 p0156 A79-19219
Real-time, continuous measurement of automotive sulfuric acid emissions
21 p0156 A79-19359
Sulfuric acid-water - Chemical heat pump/energy storage system demonstration
22 p0281 A79-26209
Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109
Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745
Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system
24 p0681 A79-51806
Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process
24 p0685 A79-51843
Thermochemical hydrogen production by the Mark-13 process - A status report
24 p0686 A79-51849

SUMMARIES
A normative price for a manufactured product: The SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504

SUNLIGHT
A new concept for solar pumped lasers
21 p0110 A79-16624
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353
Hawaii solar radiation summary
23 p0398 A79-33985
Degradation of polymethylmethacrylate by radiation --- solar collector cover material
23 p0431 A79-35074

SUPERCONDUCTING MAGNETS
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693
Superconducting magnets - Some fundamentals and their state of the art
21 p0079 A79-14788
Superconducting magnet systems in EPR designs --- Experimental Power Reactor
21 p0079 A79-14789
Advances in cryogenic engineering. Volume 23 - Proceedings of the Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
21 p0084 A79-15301
Commercial realization of MHD - A challenge for superconducting magnets
21 p0084 A79-15302
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15310
Superconducting magnets --- for MHD applications
21 p0105 A79-16485
Design of a D-shaped toroidal field coil
21 p0156 A79-19083
Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility --- SuperConducting Magnet System
22 p0235 A79-20532
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536
Superconducting energy storage magnets
22 p0236 A79-20537
Heat pulses required to quench a potted superconducting magnet
22 p0236 A79-20538
The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541
Superconductivity for mirror fusion
22 p0236 A79-20542
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555
SLPE - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557
A digital control system for superconducting magnet
22 p0268 A79-24508
Superconducting magnet systems for MHD generator facilities
22 p0290 A79-27662
High energy physics superconducting magnets and cryogenic systems --- review
22 p0290 A79-27663
Air Force applications of lightweight superconducting machinery --- in airborne power sources
22 p0290 A79-27666
Operational characteristics of MHD turbine with air-core superconducting rotor
22 p0297 A79-28928
ICEC 7; Proceedings of the Seventh International Cryogenic Engineering Conference, London, England, July 4-7, 1978
22 p0311 A79-31001

Cryogenic technology and superconductivity in controlled fusion 22 p0311 A79-31003

Superconducting magnets - Present status and problems 22 p0311 A79-31009

Design and development of the US-TESPE toroidal coil 22 p0311 A79-31014

Conceptual design study of a doublet fusion ignition test reactor 23 p0407 A79-34065

Large superconducting magnets for new energy technologies 24 p0604 A79-44527

High-current Al-TiNb composite conductor for large energy storage magnets 24 p0604 A79-44546

Superconductive magnetic energy storage --- using superfluid helium for large scale cooling 24 p0631 A79-46309

A parameter sensitivity analysis of the rectified superconducting alternator model 24 p0646 A79-48654

Superconductive magnetic energy storage inductor converter units 24 p0654 A79-50072

Superconducting Magnetic Energy Storage for electric power system stabilization 24 p0681 A79-51804

Electromagnetic launchers 24 p0702 A79-52006

SUPERCONDUCTING POWER TRANSMISSION

Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness 23 p0395 A79-33690

Transient analysis of the rectified superconducting alternator 23 p0462 A79-38529

Review of hydrodynamics and heat transfer for large helium cooling systems 23 p0481 A79-40073

Automatic tension control for winding superconducting coils --- conferences [Y/EN-257] 24 p0734 N79-29384

Thermoelastic analysis of a superconducting cable [LA-7465-MS] 24 p0781 N79-32477

Energy losses in a flat transposed cable --- superconducting cable [LA-7635-MS] 24 p0781 N79-32491

SUPERCONDUCTIVITY

Applied Superconductivity Conference, Pittsburgh, Pa., September 25-28, 1978, Proceedings 22 p0235 A79-20526

Superconductivity for mirror fusion 22 p0236 A79-20542

MIT-DOE program to demonstrate an advanced superconducting generator 22 p0236 A79-20549

Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978 22 p0289 A79-27651

Cryogenic technology and superconductivity in controlled fusion 22 p0311 A79-31003

Superconductivity in antenna engineering 22 p0311 A79-31008

Refrigeration requirements for future superconductive energy related applications 22 p0311 A79-31019

SUPERCONDUCTORS

Electric power losses of current input into superconducting devices cooled by supercritical helium 22 p0235 A79-20530

Calculation of hysteresis losses in superconducting coils 23 p0432 A79-35174

Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977 24 p0603 A79-44526

Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL) [NASA-TM-79023] 21 p0226 N79-15267

SUPERCRITICAL FLOW

Electric power losses of current input into superconducting devices cooled by supercritical helium 22 p0235 A79-20530

SUPERHEATING

Fossil superheating in geothermal steam power plants 21 p0014 A79-10122

Development of small solar power plants for rural areas in India 21 p0141 A79-17502

Structural design of a superheater for a central solar receiver [ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832

Experimental researches concerning the use of solar energy in the generation of electric energy 23 p0465 A79-38593

Cost study of superheating geothermal steam 24 p0707 A79-52572

SUPERPOSITION (MATHEMATICS)

Application of the superposition principle to solar-cell analysis 22 p0300 A79-29426

SUPERSONIC COMBUSTION RAMJET ENGINES

Characterization of a swept-strut hydrogen fuel-injector for scramjet applications 24 p0649 A79-49345

SUPERSONIC DIFFUSERS

On supersonic and subsonic diffusers for magnetohydrodynamic generator applications 22 p0279 A79-26186

SUPERSONIC FLOW

Supersonic flow in an MHD channel with a downwash flow at the inlet 21 p0085 A79-15342

Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity 22 p0328 A79-31845

SUPERSONICS

Supersonic transport vis-a-vis energy savings [NASA-TM-75464] 24 p0763 N79-31163

SUPPLYING

Energy and input-output analysis --- for predicting impact on U.S. economy 21 p0115 A79-17223

Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future 23 p0420 A79-34168

Energy availabilities for state and local development: 1973 data volume [ORNL/TM-5890-S2] 21 p0175 N79-10541

Energy availabilities for state and local development: 1974 data volume [ORNL/TM-5890-S3] 21 p0175 N79-10542

Future aviation fuels fuel suppliers views 21 p0202 N79-13194

US energy demand and supply, 1976-1985: Limited options, unlimited constraints [H-PRINT-95-43] 21 p0228 N79-15400

Symposium on Energy Today and Tomorrow [CSIR-S-145] 22 p0340 N79-17316

The planning and economic aspects of energy supply and demand in South Africa 22 p0341 N79-17325

The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12 [DOE/EIA-0102/32] 23 p0589 N79-27337

Energy supply and demand in California 23 p0591 N79-27603

Coal supply for California 23 p0592 N79-27607

Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980 [DOE/EIA-0102/20] 24 p0718 N79-28356

Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979 [DOE/EIA-0102/40] 24 p0746 N79-30403

Projections of energy supply and demand for the 1978-1979 winter heating season [DOE/EIA-0102/33] 24 p0758 N79-30815

Assessment of potential US petroleum supply shortfalls, 1978 - 1980 [DOE/EIA-0102/13] 24 p0781 N79-32619

Energy Emergency Management Information System (EEMIS): Program plan [DOE/EIA-0135] 24 p0791 N79-32723

SUPPORT SYSTEMS

Support services for electric vehicles
22 p0301 A79-29492

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 7: System/subsystem requirements data book
[NASA-CR-161223] 23 p0547 N79-23489

SUPPORTS

Fixed angle and seasonably adjustable structural support concepts for solar converters
23 p0518 A79-41063

Absence of bending effects on solar-receiver-tube fatigue
23 p0537 A79-43682

Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

SURFACE COOLING

Drag reduction by cooling in hydrogen fueled aircraft
21 p0165 A79-20084

Laminar flow stabilization by surface cooling on hydrogen fueled aircraft
[AIAA PAPER 79-1863] 24 p0643 A79-47920

SURFACE DIFFUSION

Defect free very shallow p+/n junction and associated photovoltaic effect
23 p0520 A79-41082

Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

A study of the effective resistance of the diffused layer and its effect on solar cell performance
22 p0367 N79-21541

SURFACE DISTORTION

Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971

SURFACE EFFECT SHIPS

Progress towards 100-knot nonconventional ocean ships. II
21 p0155 A79-18519

SURFACE FINISHING

Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation
21 p0037 A79-11783

Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902

A high volume cost efficient production macrostructuring process --- for silicon solar cell surface treatment
23 p0499 A79-40904

Schottky effect and photovoltaic devices on the texturized surfaces
23 p0522 A79-41100

Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321
24 p0662 A79-50548

Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512

Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272

Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771

SURFACE GEOMETRY

Effect of surface curvature on measurement of the absorptance properties of solar coatings
21 p0042 A79-11879

Optimum collection geometries for copper tube - copper sheet flat plate collectors
21 p0127 A79-17387

Performance of optimal geometry three step compound wedge stationary concentrator --- solar collector using flat side mirrors
21 p0134 A79-17438

Geometrical aspects of a cylindrical parabolic collector
21 p0134 A79-17443

Cavity-type surfaces for solar collectors
22 p0283 A79-26497

The development of a stationary concentrator --- parabolic solar absorber surface effects on energy conversion performance
23 p0464 A79-38586

An experimental study of walls with latent heat for residences
23 p0470 A79-38640

SURFACE LAYERS

Status report on selective surfaces --- solar collector absorbers
21 p0126 A79-17374

Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0391 A79-33391

MHD slag electrical conductivity studies
23 p0391 A79-33394

A study of the effective resistance of the diffused layer and its effect on solar cell performance
22 p0367 N79-21541

SURFACE PROPERTIES

The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments --- for flat plate solar collectors
21 p0127 A79-17384

Radiation regime of inclined surfaces --- Russian book on solar energy engineering and microclimatology
22 p0282 A79-26353

Effect of form errors on the characteristics of ellipsoidal radiant energy concentrators
22 p0296 A79-28667

Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956

Electrode development for coal fired MHD generators
23 p0392 A79-33396

Spectral selectivity of composite materials --- as solar energy absorbers
23 p0437 A79-36146

Relationship of optical degradation to surface morphology changes in solar absorbers
23 p0446 A79-37158

Measuring dirt on photovoltaic modules
23 p0533 A79-43283

The effect of errors in their shape on the characteristics of ellipsoidal concentrators of radiant energy
24 p0637 A79-46905

Investigation of the absorption and emission characteristics of an ideal selective surface --- for solar energy absorbers
24 p0648 A79-49186

Design of selective surfaces for solar energy collection
24 p0655 A79-50180

Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization
24 p0656 A79-50188

R & D on advanced heat exchangers in Japan
24 p0702 A79-52008

Spectrally selective solar absorber coatings
24 p0704 A79-52150

Development of surfaces optically suitable for flat solar panels
[NASA-CR-150831] 21 p0173 N79-10522

A study of the physical and chemical properties of oil shale relevant to physical concentration processes
23 p0569 N79-25445

Structure of a black chrome solar selective surface
[LBL-6691-REV] 24 p0753 N79-30778

SURFACE REACTIONS

Study of the interaction of H2O and O2 with the surface of TiO2 by electron stimulated desorption and Auger and characteristic loss spectroscopies
21 p0037 A79-11793

Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-22320

Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876

Surface processes in plasma wall interactions --- in tokamak experiments
23 p0442 A79-36877

Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880

Tokamak plasma diagnosis by surface physics techniques
23 p0443 A79-36883

Surface effects and impurity production in tokamak machines
23 p0443 A79-36884

Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887

Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581

Plasma-surface interactions in tokamaks
23 p0527 A79-41942

SURFACE ROUGHNESS EFFECTS

The influence of rough terrain on pollutant dispersion and transport from a geothermal power complex
23 p0534 A79-43372

A numerical study of the effects of complex terrain on dynamics of airflow and pollutant dispersion
23 p0535 A79-43383

Development of surfaces optically suitable for flat solar panels --- using a reflectometer which separately evaluates spectral and diffuse reflectivities of surfaces
[NASA-CR-161290] 24 p0771 N79-31780

SURFACE STABILITY

Stability of alumina-base refractories in western lignite-ash slag environments --- linings for metallurgical furnaces
[PB-293238/2] 24 p0731 N79-29249

SURFACE TEMPERATURE

Computation of IR sky temperature and comparison with surface temperature --- for solar collector energy budgets
21 p0042 A79-11875

Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419

Use of satellite-derived sea surface temperatures by cruising OTEC plants
24 p0625 A79-45845

Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909

Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming
[E79-10279] 24 p0756 N79-33518

SURFACE VEHICLES

Bus priority system studies
22 p0299 A79-29339

The fleet operator's viewpoint --- on prototype electric bus development
22 p0302 A79-29495

Advanced flywheel energy storage unit for a high power energy source for vehicular use
24 p0683 A79-51821

A study of flywheel energy storage for urban transit vehicles
[PB-282929/9] 21 p0177 N79-10563

Evaluation of a flywheel-powered shuttle car
[FE-8890] 23 p0562 N79-24488

SURFACTANTS

The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739

Description and status report of a program to define sea water-surfactant interactions in relation to the foam system --- OTEC power plant
24 p0623 A79-45833

Surfactant-assisted liquefaction of particulate carbonaceous substances
[NASA-CASE-NPO-13904-1] 21 p0179 N79-11152

SURVEYS

A time domain survey of the Los Alamos Region, New Mexico
[LA-7657-MS] 22 p0365 N79-21248

SUSPENDING (MIXING)

Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion
21 p0008 A79-10070

SWATH (SHIP)

Progress towards 100-knot nonconventional ocean ships. II
21 p0155 A79-18519

SWEDEN

Large-scale introduction of wind power stations in the Swedish grid A simulation study
22 p0300 A79-29373

The Swedish Wind Energy Programme
23 p0482 A79-40103

Energy research and development in Sweden, 1978-1981
[DPE-13] 24 p0728 N79-28781

Generator gas: The Swedish experience from 1939-1945
[SERI/SP-33-140] 24 p0775 N79-31816

SWIRLING

The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260

Combustion of coal particles in wall-burning swirl combustors --- for MHD generators
24 p0632 A79-46317

SWITCHING CIRCUITS

Electronic components in solar technology
21 p0056 A79-13629

Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells
24 p0606 A79-44919

SYNCHRONOUS MOTORS

Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110

SYNCHRONOUS SATELLITES

Nickel-cadmium battery reconditioning and long term performance in geosynchronous orbit spacecraft
21 p0029 A79-10242

Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138

The TDRSS solar array --- Tracking and Data Relay Satellite System
23 p0500 A79-40917

Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571

Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712

SYNCHROTRON RADIATION

Application of electron beams in space for energy storage and optical beam generation
21 p0108 A79-16606

SYNOPTIC METEOROLOGY

On the use of synoptic weather map typing to define solar radiation regimes
22 p0272 A79-25392

SYNTHANE

Synthane - A process for the gasification of caking and noncaking coals
21 p0006 A79-10057

Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064

SNG production by the Rockgas process
21 p0093 A79-15896

Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

Methane formation during the hydrogasification and the gas phase pyrolysis of defined aromatics
22 p0265 A79-23829

Gasification of raw lignite in the tube-furnace gasifier
22 p0310 A79-30996

The gasification of ethyl alcohol
23 p0386 A79-33228

The microbial production of methane from the putrescible fractions of sorted household waste
23 p0396 A79-33753
The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754
The Synthane process - A technical and economic assessment --- of coal gasification
23 p0410 A79-34089
Synthetic natural gas production from peat
23 p0411 A79-34092
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096
Rough cost estimates of solar thermal/coal or biomass derived fuels
[AIAA PAPER 79-0568] 23 p0476 A79-38893
Thermodynamic considerations in the production of synthetic fuels from coal
24 p0615 A79-45603
Comparison of alternate fuels for aircraft
24 p0668 A79-51100
Synthetic fuels from peat gasification
24 p0687 A79-51856
Steam gasification of Illinois coal and coke
24 p0687 A79-51857
The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant
24 p0687 A79-51859
Chemicals from coal. Report based on HRI H-coal product
[FE-1534-50] 21 p0180 N79-11166
The Texaco coal gasification process for manufacture of medium BTU gas
23 p0593 N79-27614
Synthetic natural gas in California: When and why --- from coal
23 p0593 N79-27615
Coal-to-gasoline conceptual design and market evaluation of methanol fuel and methanol-derived gasoline
[FE-2416-37] 24 p0734 N79-29378
Addition of devolatilization equations to synthane computerized mathematical model
[COO-0277-1] 24 p0766 N79-31418
Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379

YNTHESIS
Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory
22 p0250 A79-21699

YNTHETIC FIBERS
Ultrafine polybenzimidazole (PBI) fibers --- separators for alkaline batteries and dfuel cells
[NASA-CR-159644] 24 p0764 N79-31350

YNTHETIC FUELS
The status of alcohol fuels utilization technology for highway transportation
21 p0003 A79-10035
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
Some problems and benefits from the hydrogen fueled spark ignition engine
21 p0016 A79-10130
Utility fuel cells for biomass fuel
21 p0016 A79-10131
Characteristics and combustion of future hydrocarbon fuels
21 p0036 A79-11599
Catalysis in coal conversion --- Book
21 p0051 A79-12873
Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers
21 p0051 A79-12977
Alternative fuels and combustion problems
21 p0051 A79-12978
Future fuels in gas turbine engines
21 p0051 A79-12979
Alternative fuels for reciprocating internal combustion engines
21 p0051 A79-12980
Use of alternative fuels in stationary combustors
21 p0052 A79-12981
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983
Flame emissivities - Alternative fuels
21 p0052 A79-12984
Role of aromatics in soot formation
21 p0053 A79-12988
Emission control techniques for alternative fuel combustion
21 p0053 A79-12990
Vehicle operation on fuels from solar energy
21 p0059 A79-13663
Alternate aircraft fuels prospects and operational implications
21 p0066 A79-14138
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927
Biomass and wastes as energy resources - 1977 update
21 p0091 A79-15868
Integrated low Btu gasification, combined cycle plant considerations and control
21 p0094 A79-15905
Synthetic fuels from coal
21 p0145 A79-17636
Synthetic fuels from Gulf Coast lignite
21 p0146 A79-17643
The Dow Chemical liquefaction process
21 p0147 A79-17644
A characteristic time correlation for combustion inefficiency from alternative fuels
[AIAA PAPER 79-0357] 21 p0158 A79-19687
Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719
An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing
22 p0264 A79-23780
Effects of fuel properties on soot formation in turbine combustion
[SAE PAPER 781026] 22 p0274 A79-25899
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
22 p0274 A79-25917
Fuels of the future. I --- demand and proposed sources
22 p0282 A79-26404
Sampling and analysis of synthetic fuel processes --- coal gasification and liquefaction effluent analysis
22 p0294 A79-26538
Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware
[ASME PAPER 79-GT-160] 23 p0378 A79-32422
Development of an industrial gas turbine combustor burning a variety of coal-derived low Btu fuels and distillate
[ASME PAPER 79-GT-172] 23 p0379 A79-32433
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395
Production of synthetic fuels - An important civilian application of laser fusion
23 p0408 A79-34066
A comparison of coal and biomass as feedstocks for synthetic fuel production
23 p0412 A79-34097
ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148
Three modes of energy cost analysis - Then-current, base-year, and perpetual-constant dollar
23 p0422 A79-34277
The use of non-fossil-derived hydrogen in coal conversion processes
23 p0451 A79-37882
Design, operation, and economics of the Energy Plantation as an alternate source of fuels
23 p0467 A79-38616
Economic factors in refuse derived fuel utilization
23 p0490 A79-40407

Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor
23 p0492 A79-40454

Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455

Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591

Synthetic fuels at the crossroads --- coal gasification technology
24 p0645 A79-48049

Water for a synthetic fuels industry
24 p0645 A79-48050

Utilization of alternative fuels for transportation; Proceedings of the Symposium, University of Santa Clara, Santa Clara, Calif., June 19-23, 1978
24 p0650 A79-49376

Future transportation fuels
24 p0650 A79-49377

Storage and distribution of synthetic fuels
24 p0650 A79-49379

Outlook for the development of hybrid fuels
24 p0651 A79-49382

Synthetic fuels program --- in California for automotive transportation
24 p0651 A79-49385

Mixed fuel gas - A technically, economically and environmentally superior way to supplement natural gas supplies
24 p0664 A79-50881

Chemical characterization of shale oil and related fuels
24 p0665 A79-50988

Advances in H-Coal --- coal liquefaction process
24 p0667 A79-51855

Synthetic fuels from peat gasification
24 p0687 A79-51856

Computer analysis of coal gasification combined cycle plants
24 p0687 A79-51858

Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946

Advanced synfuel production with fusion
24 p0695 A79-51947

The synfuels scenario
24 p0709 A79-52967

Solid waste and biomass. Their potential as energy sources in Illinois, 1977
[PB-281649/4] 21 p0177 N79-10562

The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483

Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058566] 21 p0201 N79-13182

Identification of probable automotive fuels composition: 1985-2000
[HCP/W3684-01/1] 21 p0201 N79-1319

Naval Air Systems Command-Naval Research Laboratory Workshop on Basic Research Needs for Synthetic Hydrocarbon Jet Aircraft Fuels
[AD-A060081] 21 p0216 N79-14235

Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels
21 p0218 N79-14532

Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
[NASA-TM-79035] 22 p0338 N79-16930

Alternative hydrocarbon fuels: Combustion and chemical kinetics --- synthetic aircraft fuels
[AD-A061050] 22 p0338 N79-17011

Pollutants from synthetic fuels production: Facility construction and preliminary tests --- coal gasification plant effluents
[PB-287730/6] 22 p0339 N79-17027

Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0340 N79-18464

Synthetic fuels: Methane. Citations from the Engineering Index data base
[NTIS/PS-79/0030/1] 22 p0365 N79-21223

Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224

Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224

Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231

The production of ethanol from agricultural waste: An economic evaluation
[PB-292552/7] 23 p0577 N79-26233

Alcohol fuels
[GPO-22-334] 23 p0588 N79-27322

Material and energy balances in the production of ethanol from wood --- conferences
[CONF-7806139-1] 23 p0589 N79-27338

Methanol from coal
23 p0593 N79-27619

Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368

Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369

Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375

Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377

Oil shale: Report on a focus group discussion
[DOE/TIC-10032] 24 p0735 N79-29576

Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production
[LA-UR-79-574] 24 p0742 N79-29666

Coal liquefaction advanced research digest
[ORNL/FE-2] 24 p0746 N79-30398

Methane and methanol as alternative energy sources: A comparative profitability study
[BMFT-FE-77-84] 24 p0747 N79-30412

Fusion energy for alternative applications: The generation of synthetic gaseous fuels --- approach to high temperature fusion reactor design
[ANL/FPP-TM-117] 24 p0755 N79-30790

Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923

Comparison of the properties of some synthetic crudes with petroleum crudes
[NASA-TM-79220] 24 p0765 N79-31405

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410

Fusion reactors for synthetic fuels
[BNL-25634] 24 p0767 N79-31421

Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433

Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0546/6] 24 p0767 N79-31434

Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0547/4] 24 p0767 N79-31435

Recent developments in coal liquefaction in the United States --- conferences
[CONF-790213-5] 24 p0779 N79-32383

Advanced synfuel production with fusion
[BNL-26130] 24 p0780 N79-32388

Water related environmental effects in fuel conversion. 1: Summary volume --- water requirements for synthetic fuel technologies
[FE-2445-1-VOL-1] 24 p0793 N79-32747

Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341

Alcohol fuels, volume 2. Citations from the NTIS data base [NTIS/PS-79/0713/2] 24 p0795 N79-33342
Alcohol fuels, volume 1. Citations from the NTIS data base [NTIS/PS-79/0712/4] 24 p0795 N79-33343
Ethanolic fuels from renewable resources in the solar age [PB-295645/6] 24 p0796 N79-33346
SYSTEM EFFECTIVENESS
A critical review and evaluation of published electric-vehicle performance data 21 p0009 A79-10081
Life cycle costing of energy systems 21 p0072 A79-14683
A methodology for evaluating the effectiveness of energy conservation programs 21 p0072 A79-14684
Considerations in choosing solar energy monitoring systems 21 p0087 A79-15831
Experience gained and lessons learned from monitoring the solar building, Albuquerque 21 p0088 A79-15833
The use of computer-controlled data acquisition systems in determining solar heating and cooling system performance 21 p0088 A79-15834
System performance measurements for a packaged solar space heating system equipped with air-heating collectors 21 p0088 A79-15835
Temperature calibration for solar heating and cooling system evaluation 21 p0089 A79-15846
Incentives and requirements for gasification based power systems 21 p0094 A79-15904
Thermal storage of solar energy 21 p0103 A79-16459
Non-adaptive optics for solar thermal electric power 21 p0112 A79-16733
A study for optimum use of metallic plates for thermal storage in solar processes 21 p0122 A79-17331
Economic evaluation of the ATC/Wellman incandescent two-stage low Btu coal gas producer 21 p0146 A79-17640
Calculation of flat-plate collector utilizability 21 p0149 A79-18020
Gas-cycle solar refrigeration system performance 21 p0153 A79-18471
Energy storage efficiency for the ammonia/hydrogen-nitrogen thermochemical energy transfer system 22 p0261 A79-23718
Solar heating, cooling and hot water production - A critical look at CCMS installations 22 p0275 A79-25931
Solar air heating and nocturnal cooling system /CSU Solar House II/ 22 p0275 A79-25932
The Philips experimental house - A system's performance study --- of solar energy utilization and energy conservation 22 p0277 A79-25941
Evaluation of the effectiveness of electric power systems for transport purposes 22 p0284 A79-26723
Studies on solar collector performance at NRC 22 p0322 A79-31451
First year performance data and lessons learned in the NRC 14 house solar demonstration program 22 p0323 A79-31453
A hybrid wind turbine suitable for developing regions 22 p0323 A79-31455
Performance and cost of domestic solar water heating in Australia 23 p0452 A79-37889
The performance of solar water heating systems with flat plate collectors 23 p0468 A79-38620
A case study of a solar assisted heat pump system - 1977 23 p0469 A79-38634
Thermodynamic considerations for the energy conversion process in geothermal power plants 23 p0476 A79-38947
Collection, processing and dissemination of data for the national solar demonstration program 24 p0608 A79-45208
Evaluation of Rankine cycle air conditioning system hardware by computer simulation 24 p0609 A79-45212
Instrumenting hybrid passive/active solar systems --- for building heating 24 p0610 A79-45223
Use of meteorological data in system evaluation --- of solar energy collection efficiency 24 p0610 A79-45225
Compact heat exchanger design progress --- for OTEC plants 24 p0618 A79-45789
Multiple staging of the cold water in the open cycle OTEC Systems 24 p0624 A79-45840
Low cost flywheel energy storage system demonstration 24 p0678 A79-51788
Enhancement of solar arrays in space through the use of concentrators 24 p0692 A79-51905
Considerations for adapting an MHD baseload power plant for intermediate and peaking duty 24 p0701 A79-51992
Prediction of the performance of solar heating systems over a range of storage capacities 24 p0712 A79-53492
Solar assisted heat pump study for heating of military facilities [AD-A058626] 21 p0206 N79-13506
Results of systems analysis --- effectiveness of integrated solar energy systems 21 p0218 N79-14534
Parameter estimation and validation of a solar assisted heat pump model 22 p0332 N79-16349
Effects of air damper leaks on solar energy system performance [SOLAR/0012-78/29] 23 p0563 N79-24497
Relative effective solar space heating over the United States obtained from southward-tilted solar collectors [PB-292963/6] 23 p0565 N79-24513
SYSTEM FAILURES
Is there repair after failure --- reliability of repairable vs. nonrepairable engines 21 p0086 A79-15378
Failure analysis in coal conversion systems --- pilot plant for liquefaction 22 p0266 A79-24137
Determination of the design states of a complex system in evaluating the reliability of electrical power supply 24 p0646 A79-48826
SYSTEMS
Satellite Power Systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis [NASA-CR-158068] 21 p0225 N79-15141
SYSTEMS ANALYSIS
A thermodynamic study of heating with geothermal energy [ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253
A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin 21 p0093 A79-15893
Potential research problems in energy systems analysis 21 p0115 A79-17221
A solar energy system with a dual-source heat pump and long-term storage 21 p0119 A79-17312
The analysis by stochastic modelling of solar systems for space and water heating 21 p0137 A79-17466
Parametric analysis of power conversion systems for central receiver solar power generation [ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835
NRC solar monitoring program 22 p0318 A79-31419
Energy policy optimization by environmental systems analysis 23 p0422 A79-34180
A retrofitted geothermal heating system 23 p0425 A79-34602

System analysis of solar space heating
23 p0465 A79-38595
A solar assisted economy --- system for peak electrical generation and off-peak storage or fuel production
23 p0469 A79-38632
A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205
Wind energy systems application to regional utilities
24 p0633 A79-46532
System aspects of geothermal resources utilization - The case of Castelnuovo Val di Cecina as an example
24 p0689 A79-51871
A solar-Stirling small power system
24 p0690 A79-51884
Satellite power systems program
21 p0169 N79-10128
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Public policy
21 p0179 N79-11011
Fuel cell on-site integrated energy system parametric analysis of a residential complex
[NASA-TM-78996] 21 p0193 N79-11955
Initial assessment: Electromagnetic compatibility aspects of proposed SPS Microwave Power Transmission System (MPTS) operations
[PNL-2482] 21 p0202 N79-13252
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14876] 21 p0214 N79-13871
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14946] 21 p0214 N79-13872
Application of solar technology to today's energy needs, volume 2 --- systems analysis and analytical methods
[OTA-E-77-VOL-2] 21 p0218 N79-14530
Analytical methods
21 p0218 N79-14531
Calculation of backup requirements
21 p0218 N79-14533
Results of systems analysis --- effectiveness of integrated solar energy systems
21 p0218 N79-14534
Satellite Power Systems (SPS) concept definition study. Volume 3: SPS concept evolution
[NASA-CR-158066] 21 p0225 N79-15138
The 25 kW power module updated baseline system --- for space transportation system payloads
[NASA-TM-78212] 21 p0226 N79-15247
Satellite Power Systems (SPS) concept definition study. Volume 2: SPS system requirements
[NASA-CR-150681] 22 p0330 N79-16037
Qualification test and analysis report: Solar collectors
[NASA-CR-150860] 22 p0333 N79-16360
Preliminary design package for Sunair SEC-601 solar collector
[NASA-CR-150875] 22 p0341 N79-17332
System integration of marketable subsystems --- for residential solar heating and cooling
[NASA-CR-161104] 22 p0348 N79-18448
Satellite Power System (SPS) concept definition study (exhibit C)
[NASA-CR-161173] 22 p0352 N79-19071
Technical support for open-cycle MHD program
[ANL-MHD-78-8] 22 p0361 N79-20507
Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 1: System engineering
[NASA-CR-161219] 23 p0547 N79-23485
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 4: Transportation analysis
[NASA-CR-161222] 23 p0547 N79-23488
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 7: System/subsystem requirements data book
[NASA-CR-161223] 23 p0547 N79-23489
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508
Solar project description. Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/50] 23 p0563 N79-24496
Photovoltaic mission analysis
23 p0570 N79-25486
A summary of systems definition project activities
23 p0570 N79-25488
A systems examination of the opportunities of coal for California
23 p0591 N79-27600
Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784
A control system analysis of the energy growth model: Coal
24 p0736 N79-29595
Large wind energy focus group results
[DOE/TIC-10038] 24 p0738 N79-29623
Phase-one experiment test plan solar photovoltaic/thermal residential experiment
[COO-4577-6] 24 p0739 N79-29625
Methodology for solar-thermal power plant evaluation
[EPRI-ER-869] 24 p0739 N79-29631
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634
Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659
System analysis, design and proof-of-concept experiment of a total energy system, phase 2
[COO-2947-5] 24 p0742 N79-29660
Solar power satellites: The Engineering Challenges
24 p0752 N79-30750
Performance and evaluation of concepts and devices for heat reclamation from air conditioners, heat pumps, and refrigeration equipment
[AD-A069650] 24 p0752 N79-30770
Status of the DOE photovoltaic systems engineering and analysis project
[SAND-78-0955C] 24 p0754 N79-30780
Multiobjective analysis in a national energy system model --- conferences
[BNL-24371] 24 p0758 N79-30823
Methodology for determining the economic feasibility of residential or commercial solar energy systems
[SAND-78-0931] 24 p0759 N79-30827
Technology assessment of changes in the future use and characteristics of the automobile transportation system. Summary and findings
[PB-293645/8] 24 p0762 N79-31105
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680
Stratified thermal storage in residential Solar energy applications
[COO-4523-1] 24 p0786 N79-32682
Systems analysis of solar thermal power systems. Report on task 1: Determination and characterization of solar thermal conversion options
[PNL-2693] 24 p0788 N79-32692
NASA Tech House: An early evaluation
[NASA-TM-80751] 24 p0798 N79-33571
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 5: Supporting analyses and trade studies --- development and testing of a solar thermal power plant
[NASA-CR-162376] 24 p0800 N79-33580

SYSTEMS COMPATIBILITY
Compatibility of direct energy storage devices with ac. processing power system components
21 p0111 A79-16728

SYSTEMS ENGINEERING
A microwave power transmission system for space satellite power
21 p0002 A79-10025
A 5-GWe nuclear satellite power system conceptual design
21 p0003 A79-10033

Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant 21 p0008 A79-10068

Pressurized fluidized-bed combustion/component test and integration unit preliminary design report 21 p0008 A79-10076

Heat exchanger designs for coal-fired fluidized beds 21 p0009 A79-10079

Design studies and trade-off analyses for a superconducting magnet/MHD power generator system 21 p0017 A79-10142

Fusion-Fission Energy Systems 21 p0017 A79-10144

Analysis and design of an 18-ton solar-powered heating and cooling system 21 p0019 A79-10156

Conceptual design of the Fort Hood Solar Total Energy-Large Scale Experiment 21 p0019 A79-10160

Hybrid air to water solar collector design 21 p0021 A79-10174

Design and operating experience on the U.S. Department of Energy Experimental Mod-0 100 kW Wind Turbine 21 p0028 A79-10234

Powerplant integration - The application of current experience to future developments [ASME PAPER 78-GT-113] 21 p0032 A79-10788

Solar thermal electric power systems - Manufacturing cost estimation and systems optimization 21 p0046 A79-12273

The efficiencies of thermochemical energy transfer 21 p0054 A79-13575

Solar heating and safety techniques 21 p0056 A79-13633

Total energy systems --- domestic solar and windpowered facilities 21 p0058 A79-13654

Fusion reactor problems --- plasma confinement and interface engineering 21 p0071 A79-14468

Residential energy design 21 p0073 A79-14694

Heat pumps without supplemental heat 21 p0073 A79-14695

Modelling energy storage systems for electric utility applications Preliminary considerations 21 p0081 A79-14960

Risk control in the development of energy processes --- environment, worker and capital considerations in coal gasification 21 p0085 A79-15372

Solar absorption cooling 21 p0090 A79-15861

Theory of solar assisted heat pumps 21 p0090 A79-15864

SNG production by the Rockgas process 21 p0093 A79-15896

Status of photovoltaic systems and applications 21 p0095 A79-15907

Ocean energy unlimited --- water wave conversion 21 p0095 A79-15908

OTEC power systems 21 p0101 A79-16248

Advances in ocean engineering aspects of ocean thermal energy conversion 21 p0101 A79-16250

Solar collectors. I - Fundamentals and collectors of the past and present 21 p0103 A79-16455

Integrated solar building systems 21 p0103 A79-16460

Energy storage requirements for autonomous and hybrid solar thermal electric power plants 21 p0120 A79-17315

A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells 21 p0135 A79-17446

The interface with solar - Alternative auxiliary supply systems --- for solar space heating 21 p0137 A79-17468

Optimizing solar energy systems using continuous flow control 21 p0138 A79-17477

A solar heating and cooling system for an industrial plant located in southern Europe 21 p0139 A79-17480

An earth-wrapped solar greenhouse house --- partially buried structure 21 p0140 A79-17493

Wind generation of electricity for a novel dwelling independent of servicing networks 21 p0142 A79-17513

The use of wave powered systems for desalination - A new opportunity --- seawater pumping for reverse osmosis 21 p0151 A79-18108

Principles of design and construction for marine structures for wave/tidal/ocean thermal energy 21 p0152 A79-18114

Conceptual design of large heat exchangers for ocean thermal energy conversion [ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813

Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility --- SuperConducting Magnet System 22 p0235 A79-20532

Analysis and design of a field of heliostats for a solar power plant 22 p0242 A79-21161

Experimental investigations of a physical system capable of using solar energy 22 p0247 A79-21667

Encapsulant materials for $2/watt terrestrial photovoltaic arrays 22 p0266 A79-24138

Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors 22 p0285 A79-26815

Principles of solar engineering --- Book 22 p0287 A79-27372

Technology considerations in the design of a commerical offshore energy conversion /OTEC/ plant 22 p0288 A79-27378

System designs for low cost-low ratio solar concentrators 22 p0293 A79-28142

A general design method for closed-loop solar energy systems 22 p0295 A79-28359

Optimum power plant capacity of ocean-based ocean thermal energy conversion systems 22 p0297 A79-28922

Conceptual design of a solar powered closed-cycle gas turbine electric power generation system [ASME PAPER 79-GT-43] 22 p0306 A79-30522

Design considerations of small solar collector systems using plane heliostats [ASME PAPER 79-SOL-2] 22 p0307 A79-30540

Unique aspects of terrestrial photovoltaic system design [ASME PAPER 79-SOL-14] 22 p0308 A79-30548

Integration of a passive and active solar heated, low density, multiple dwelling with atrium 22 p0322 A79-31446

Cylindrical parabolic collector optimization for interfacing with steam turbine generators 22 p0322 A79-31448

Development of the combustion chamber of an experimental MHD generator 22 p0327 A79-32105

Alternate ways of using bottoming cycle power in pipeline gas compressor stations [ASME PAPER 79-GT-201] 23 p0380 A79-32458

A practical technique for basic windmill design 23 p0387 A79-33238

Dimensioning of energy-production systems - The use of geometric programming --- solar cell array application 23 p0388 A79-33254

Symposium on the Engineering Aspects of Magnetohydrodynamics, 17th, Stanford University, Stanford, Calif., March 27-29, 1978, Proceedings 23 p0390 A79-33379

Sunbird I - Utah's first commercial solar home 23 p0401 A79-34015

Honeywell General Offices solar HVAC system 23 p0401 A79-34018

A waste management strategy for nuclear fusion power systems from a regulatory perspective 23 p0407 A79-34064

An evaluation of integrated coal gasification/water-splitting processes 23 p0411 A79-34094
A new approach for solar energy systems design by means of the sensitivity theory 23 p0448 A79-37849
System reliability studies for wave energy generation 23 p0450 A79-37872
Solar heating and cooling systems - Practical experience in design and operation 23 p0452 A79-37888
Fluidised combustion for power generation 23 p0454 A79-37909
The Grimethorpe Experimental Pressurised Fluidised Bed Combustor 23 p0454 A79-37910
Low cost Darrieus vertical-axis wind turbine design [AIAA PAPER 79-0966] 23 p0456 A79-38174
Solar system - Solar generator-inverter-asynchronous motor-pump --- for waste water treatment 23 p0466 A79-38605
System selection and optimization of a solar thermal installation for cooling, heating, and warm water heating 23 p0466 A79-38609
Design of solar heated warm water heating facilities from an economic viewpoint 23 p0468 A79-38622
Photovoltaic systems perspective [AIAA PAPER 79-0983] 23 p0475 A79-38891
Performance matching and optimization of wind powered water pumping systems 23 p0479 A79-39842
Considerations in the design of a shredded municipal refuse burning and heat recovery system 23 p0488 A79-40390
Photovoltaic design optimization for terrestrial applications 23 p0517 A79-41060
Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study 23 p0527 A79-41946
An overview of intermediate temperature solar collector and energy storage technology 23 p0533 A79-43018
The engineering analysis of solar radiation 24 p0605 A79-44796
Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems 24 p0608 A79-45207
Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex 24 p0608 A79-45210
Concepts for solar production of hydrogen 24 p0614 A79-45593
OTEC ocean engineering progress report 24 p0617 A79-45783
Preliminary designs of 10 MWe and 50 MWe power modules --- for OTEC 24 p0618 A79-45791
Practical schemes for reducing cold water pipe loads --- for OTEC plants 24 p0621 A79-45814
An overview of the OTEC-1 design --- including mooring, anchoring, site selection, installation, manufacturing, etc 24 p0625 A79-45846
System design considerations for a floating OTEC modular experiment platform 24 p0625 A79-45847
Electric utility system planning studies for OTEC power integration 24 p0625 A79-45848
Station keeping subsystem designs for modular experiment OTEC plants 24 p0626 A79-45851
Design of optimum compressed air energy-storage systems 24 p0631 A79-46308
Wind/hydro generation assessment 24 p0634 A79-46535
Distributed wind generation assessment 24 p0634 A79-46536
A fully interconnected wind system 24 p0635 A79-46540
Computer-Aided Power System Design 24 p0646 A79-48632
Towards the design of contrived photosynthesizers 24 p0655 A79-50185
Economic and performance comparisons of salty and saltless solar ponds 24 p0671 A79-51737
Preliminary design of a cruising OTEC modular experiment 24 p0674 A79-51758
Toward the renewables - A natural gas/solar energy transition strategy 24 p0686 A79-51851
Low temperature geothermal energy use in existing institutional power plants 24 p0689 A79-51870
The zinc-chlorine battery in the BEST facility - 1981 24 p0703 A79-52013
Four ignition TNS Tokamak reactor systems: Design summary [CRNL/SUB-7117/25] 21 p0193 N79-11889
Alternative energy sources for Federal Aviation Administration facilities [AD-A058681] 21 p0196 N79-12555
Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts [NASA-CR-159411-VOL-1] 21 p0205 N79-13496
Concentrator enhanced solar arrays design study [NASA-CR-158032] 21 p0219 N79-14546
Satellite Power System (SPS) concept definition study (exhibit C) [NASA-CR-150733] 21 p0225 N79-15137
The economics and engineering of large-scale algae biomass energy systems [PB-287868/4] 21 p0226 N79-15207
Development of a high energy storage flywheel module [AD-A060351] 21 p0230 N79-15413
Coal research: Data systems and information transfer [ORAU-133] 21 p0232 N79-15830
Satellite power systems (SPS) concept definition study. Volume 1: Executive summary [NASA-CR-150700] 22 p0329 N79-16036
System design package for SIMS prototype system 3, solar heating and domestic hot water [NASA-CR-150840] 22 p0333 N79-16359
Qualification test and analysis report: Solar collectors [NASA-CR-150860] 22 p0333 N79-16360
System design package for SIMS prototype system 4, solar heating and domestic hot water [NASA-CR-150839] 22 p0333 N79-16361
Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes [PB-287799/1] 22 p0344 N79-17364
Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes [PB-287800/7] 22 p0344 N79-17365
The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans [NASA-CR-161146] 22 p0345 N79-17890
Expert opinion on wind energy conversion systems designed by Hermann Honnef [BMFT-FB-T-77-35] 22 p0349 N79-18456
Satellite Power System (SPS) concept definition study (exhibit C) [NASA-CR-161173] 22 p0352 N79-19071
MHD-ETF program. Volume 1: Executive summary [FE-2613-6-VOL-1] 22 p0362 N79-20515
MHD-ETF program. Volume 2A, parts 1 and 2: Reference design description [FE-2613-6-VOL-2A] 22 p0363 N79-20516
Active heat exchange system development for latent heat thermal energy storage [NASA-CR-159479] 22 p0368 N79-21554
Development, testing and evaluation of MHD materials and component designs --- electrode and insulator systems for mhd generators [FE-2248-19] 22 p0369 N79-21558
Engineering test facility conceptual design, part 1 [FE-2614-2-PT-1] 22 p0369 N79-21560
Engineering test facility conceptual design, part 2 [FE-2614-2-PT-2] 22 p0369 N79-21561

Synchronous meteorological and geostationary operational environmental satellites battery and power system design 22 p0370 N79-21571

Advanced subsystems development [NASA-CR-158335] 23 p0542 N79-22627

Horizontally mounted solar collector [NASA-CASE-MFS-23349-1] 23 p0546 N79-23481

Systems definition space-based power conversion systems --- for satellite power transmission to earth [NASA-CR-150268] 23 p0546 N79-23483

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 1: Executive summary [NASA-CR-161218] 23 p0547 N79-23484

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 1: System engineering [NASA-CR-161219] 23 p0547 N79-23485

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics [NASA-CR-161220] 23 p0547 N79-23486

Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics, appendixes [NASA-CR-161221] 23 p0547 N79-23487

System design package for a solar heating and cooling system installed at Akron, Ohio [NASA-CR-161192] 23 p0547 N79-23490

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project [NASA-CR-158580] 23 p0550 N79-23519

Conceptual design for advanced coal liquefaction commercial plant [FE-2251-52] 23 p0554 N79-24182

Prototype solar heating and cooling systems [NASA-CR-161204] 23 p0557 N79-24437

Thermal power systems, small power systems application project. Volume 1: Executive summary [NASA-CR-157441] 23 p0560 N79-24462

Development of a process for a high capacity arc heater production of silicon for solar arrays [NASA-CR-158745] 23 p0581 N79-26499

Central receiver thermal power system [AED-CONF-78-212-008] 23 p0582 N79-26513

Computer software for planning design of community energy systems [CONF-781182-2] 23 p0600 N79-28063

Overview of solar system design and application principles [SAND-78-2419C] 24 p0726 N79-28762

Solar heating and hot water system installed at Southeast of Saline, Unified School District 306, Mentor, Kansas [NASA-CR-161271] 24 p0737 N79-29602

Design and installation manual for thermal energy storage [ANL-79-15] 24 p0740 N79-29636

Regional conceptual design and analysis studies for residential photovoltaic systems. Volume 1: Executive summary [SAND-78-7039] 24 p0741 N79-29651

Solar power satellites: The Engineering Challenges 24 p0752 N79-30750

Interface problems on an SPS solar array blanket 24 p0752 N79-30751

MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems 24 p0752 N79-30752

Fusion reactors for synthetic fuels [BNL-25634] 24 p0767 N79-31421

Passive solar energy planning aid kit for solar energy systems engineers [CONF-780337-P3] 24 p0775 N79-31815

Generator gas: The Swedish experience from 1939-1945 [SERI/SP-33-140] 24 p0775 N79-31816

Thermal and mechanical energy storage program [DOE/ET-0091] 24 p0775 N79-31817

Combined photovoltaic/thermal system studies [SAND-78-7031] 24 p0787 N79-32691

Thermal energy storage for advanced solar central receiver power systems [SAND-78-8221] 24 p0788 N79-32694

Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning [COO-4094-34] 24 p0789 N79-32702

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 1: Executive summary --- development and testing of a solar thermal power plant [NASA-CR-162372] 24 p0799 N79-33576

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 2: System concept selection --- development and testing of a solar thermal power plant [NASA-CR-162373] 24 p0799 N79-33577

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 3: Experimental system descriptions --- development and testing of a solar thermal power plant [NASA-CR-162374] 24 p0799 N79-33578

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 4: Commercial system definition --- development and testing of a solar thermal power plant [NASA-CR-162375] 24 p0799 N79-33579

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 5: Supporting analyses and trade studies --- development and testing of a solar thermal power plant [NASA-CR-162376] 24 p0800 N79-33580

SYSTEMS MANAGEMENT

OAST space power technology program 21 p0169 N79-10123

Historical and projected power requirements 21 p0169 N79-10125

Power management and control for space systems 21 p0170 N79-10134

Electric utilities and solar energy: The service contract in a new social context [ORAU/IEA(O)-79-3] 23 p0597 N79-27685

Systems approach to energy planning [BNL-25523] 24 p0741 N79-29657

SYSTEMS STABILITY

On the stability of the natural circulation solar heater 23 p0531 A79-42896

The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization 24 p0652 A79-49489

T

T-63 ENGINE

Testing to assess the affect of degraded fuel specifications on the cold start ability of a T63-A-700 engine [AIAA 79-7009] 22 p0300 A79-29384

TABLES (DATA)

Solar spectral irradiance at ground level 23 p0429 A79-35053

A survey of methods of coal hydrogenation for the production of liquids 24 p0628 A79-45994

End use energy consumption data base: Series 1 tables [PB-281817/7] 21 p0177 N79-10560

TAILLESS AIRCRAFT

Very large vehicles - To be or --- aircraft design concepts 22 p0306 A79-30484

Large-vehicle concepts --- aircraft design 22 p0306 A79-30485

TANKER AIRCRAFT

Winglets give USAF KC-135 new look in life 22 p0265 A79-23975

TANZANIA

Windpower programmes in Tanzania 23 p0482 A79-40106

TAR SANDS

Oil recovery from a Utah tar sand deposit by in situ combustion 21 p0004 A79-10043

The AOSTRA role in developing energy from Alberta oil sands 23 p0494 A79-40738

The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739
Development of the oil sands of Canada
23 p0524 A79-41812
Environmental aspects of the Syncrude tar sands project
24 p0665 A79-50889

TAYLOR INSTABILITY
MHD instabilities
22 p0259 A79-23599

TDR SATELLITES
Design features of the TDRSS solar array --- Tracking and Data Relay Satellites
21 p0002 A79-10019

TEARING
Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41941

TECHNOLOGICAL FORECASTING
Energy conversion in the long run
21 p0019 A79-10154
Prospects of thermionic power systems
21 p0026 A79-10220
Advanced turbofan engines for low fuel consumption
[ASME PAPER 78-GT-192] 21 p0033 A79-10816
Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218
Wind, waves, and tides --- as future energy sources
21 p0074 A79-14719
Electric vehicles challenge battery technology
21 p0093 A79-15892
Large-scale human benefits from the industrialization of space
21 p0099 A79-16136
Prospects for ambient energy and cogeneration utilization in urban and regional planning
21 p0104 A79-16465
The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736
Input-output method applied to energy planning
21 p0112 A79-16737
Space Shuttle - America's wings to the future --- Book
21 p0114 A79-17124
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649
Progress towards 100-knot nonconventional ocean ships. II
21 p0155 A79-18519
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535
The prospects of hydrogen as an energy carrier for the future
22 p0247 A79-21677
Energy for the long run - Fission or fusion
22 p0256 A79-22760
Electric vehicle progress in the U.S. - Where to
22 p0269 A79-24611
Wind energy - The long road to commercialization
22 p0265 A79-24612
Energy development --- for future global demand
22 p0282 A79-26402
Fuels of the future. I --- demand and proposed sources
22 p0282 A79-26404
Prospects for improvements in lead-acid batteries --- for electric vehicles
22 p0300 A79-29488
Electric vehicles - Can they be fitted into urban Britain
22 p0301 A79-29493
The impact of alternate energy resources on the future supply of electric power
[IEEE PAPER F 78 672-8] 22 p0304 A79-29939
Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543
Uncoupling of economic growth and energy consumption - A new strategy of energy politics or only a new slogan
22 p0310 A79-30997
The Solar Power Satellite concept - Towards the future
22 p0327 A79-31925
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Optimum design of automotive vehicles employing alternate energy sources of low energy density - Impact on selection of an energy-carrier for future urban vehicle transportation systems
23 p0415 A79-34128
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy
23 p0419 A79-34158
Energy use and society in the 21st century --- development cost effects on growing GNP economy
23 p0420 A79-34165
The inexhaustible energy resources study --- U.S. R and D to meet future requirements
23 p0420 A79-34166
Survey and appraisal of primary future energy sources
23 p0420 A79-34167
Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources
23 p0420 A79-34170
A nuclear-solar energy strategy
23 p0421 A79-34174
Energy, helium, and the future --- U.S. He demand projection and conservation program
23 p0422 A79-34181
Energy sources of the future - A challenge to man's ingenuity
23 p0423 A79-34389
The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2
23 p0427 A79-34860
Future programs in space --- impact on energy technology problems
[AAS 78-180] 23 p0427 A79-34865
High-temperature nuclear heat source for hydrogen production
23 p0437 A79-36049
International Conference on Future Energy Concepts, London, England, January 30-February 1, 1979, Proceedings
23 p0448 A79-37842
Tidal power - The path to production
23 p0450 A79-37863
Influence of technological advances on potential tidal power development
23 p0450 A79-37865
Energy supply for the Federal Republic on a regenerative basis
23 p0473 A79-38666
Potential for use of solar energy in private households to the year 2000
23 p0473 A79-38667
Energy consumption structures in the year 2000
23 p0523 A79-41241
The race for unlimited energy --- Book
24 p0638 A79-47071
All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906
The rough road to making oil and gas from coal
24 p0651 A79-49423
Solar comes out of the shadows --- energy conversion technology forecasting
24 p0651 A79-49424
Projected techno-economic improvements for advanced solar thermal power plants
24 p0671 A79-51733
Prediction of vehicle performance and its sensitivity to component improvements Application to electric and H2-fueled vehicles
24 p0677 A79-51782
Feasibility of energy self sufficiency through decentralized use of renewable resources in Iran
24 p0698 A79-51974
Space to benefit mankind - 1980 to 2000
[IAF PAPER 79-206] 24 p0710 A79-53356
Future large space systems opportunities: A case for space-to-space power? --- spacecraft power supplies microwave and laser transmission
21 p0169 N79-10095

Technology assessment, volume 2. A bibliography with abstracts [NTIS/PS-78/0830/6] 21 p0179 N79-10951

Identification of probable automotive fuels consumption: 1985-2000, executive summary [HCP/W3684-01/2] 21 p0194 N79-12249

Identification of probable automotive fuels composition: 1985-2000 [HCP/W3684-01/1] 21 p0201 N79-13191

The good news about energy 22 p0355 N79-19461

Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000 [NASA-CR-158519] 23 p0549 N79-23503

Forecasts of energy technology. Citations from the International Aerospace Abstracts data base [NTIS/PS-79/0337/0] 23 p0575 N79-25531

Laser and energetics of the future [UCRL-TRANS-11467] 24 p0734 N79-29513

National coal model: Coal supply curves [DOE/EIA-0103/2] 24 p0746 N79-30400

Energy and labor intensities projected to the year 2010 [COO-4628-2] 24 p0750 N79-30727

Short-term projections of the energy supply and demand in the United States from the EIA report to Congress, 1977 [DOE/EIA-0102/37] 24 p0755 N79-30799

Energy and labor intensities projected to the year 2010 [COO-4628-2] 24 p0772 N79-31788

TECHNOLOGY ASSESSMENT

The status of alcohol fuels utilization technology for highway transportation 21 p0003 A79-10035

Coal liquefaction - Status and new directions 21 p0007 A79-10062

Alternatives for coal based power generation - An international overview 21 p0008 A79-10074

Analysis and application of the heat pipe heat exchanger 21 p0014 A79-10117

Progress report on hydrogen production and utilization for community and automotive power 21 p0016 A79-10132

A summary of USSR thermionic energy conversion activity 21 p0026 A79-10216

Selenide thermoelectric converter technology 21 p0026 A79-10221

Militarized thermoelectric power sources 21 p0027 A79-10227

The laser fusion scientific feasibility experiment 21 p0030 A79-10250

Solar power satellite developments [AAS PAPER 78-022] 21 p0035 A79-11558

Energy conservation aircraft design and operational procedures [ONERA, TP NO. 1978-107] 21 p0036 A79-11572

Fuel cell electrocatalysis - Where have we failed 21 p0039 A79-11810

ERDA fuel cell programs 21 p0039 A79-11814

The state-of-the-art of hydrogen-air phosphoric acid electrolyte fuel cells 21 p0039 A79-11815

Molten carbonate fuel cell systems - Status and potential 21 p0039 A79-11817

Options for solar thermal conversion 21 p0043 A79-11969

Technology and development requirements of the solar power satellite 21 p0046 A79-12267

Progress and trends in the development of terrestrial photoelectric conversion 21 p0056 A79-13635

Potential and technical utilization of renewable energy sources 21 p0058 A79-13655

Space power technology - Current status and future development trends --- for powering spacecraft [DGLR PAPER 78-167] 21 p0063 A79-14054

State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes 21 p0064 A79-14111

Electricity from sunlight --- low cost silicon for solar cells 21 p0065 A79-14116

Technology for aircraft energy efficiency 21 p0066 A79-14136

Summary of international energy research and development activities 1974-1976 --- Book 21 p0068 A79-14400

Current state-of-the-art of electrochemical batteries from a users point of view 21 p0071 A79-14681

Recovery of oil from oil shale - An overall technological perspective 21 p0073 A79-14698

Annual review of energy. Volume 3 --- Book 21 p0074 A79-14718

Superconducting magnets - Some fundamentals and their state of the art 21 p0079 A79-14788

History of solar energy applications - Solar energy yesterday, today and tomorrow 21 p0089 A79-15852

Utility applications of wind power plants 21 p0092 A79-15882

Materials and economics of energy systems 21 p0095 A79-15911

Perspective on the fusion-fission energy concept 21 p0095 A79-15913

Energy/environment technology areas to be developed 21 p0097 A79-16077

Solar collectors. I - Fundamentals and collectors of the past and present 21 p0103 A79-16455

Solar collectors. II - Recent developments and future performance data and economic analysis 21 p0103 A79-16456

The solar power satellite concept evaluation program 21 p0107 A79-16602

Progress in nuclear-pumped lasers 21 p0110 A79-16627

Historical review of adaptive optics technology 21 p0114 A79-17171

A pilot line for the production of large area Cu/x/S-CdS solar cells 21 p0124 A79-17351

Assessment of current flue gas desulfurization technology 21 p0145 A79-17637

MHD power generation 21 p0146 A79-17638

Beneficiation of lignites 21 p0146 A79-17642

Current status of composite flywheel development 22 p0241 A79-20853

Oil shale in the U.S. - Current state of technology and research 22 p0265 A79-23830

Status report on TFTR --- Toroidal Fusion Test Reactor 22 p0290 A79-27669

Electric car project of the Eindhoven University of Technology 22 p0302 A79-29498

An overview of photovoltaic power systems [ASME PAPER 79-SOL-12] 22 p0308 A79-30547

Low cost thin-film CdS-based solar cells progress and promise [ASME PAPER 79-SOL-15] 22 p0309 A79-30549

The Stirling engine for automotive application [SAE PAPER 790329] 22 p0315 A79-31370

Status of the SPS concept development and evaluation program --- Solar Power Satellite 22 p0326 A79-31919

Photovoltaics and solar thermal conversion to electricity - Status and prospects 22 p0326 A79-31924

Solar energy in developing countries: An overview and buyers' guide for solar scientists and engineers --- Book 22 p0327 A79-32139

Coal combustor technology development 23 p0390 A79-33381

A review of wind-electric conversion technology 23 p0406 A79-34050

Wind energy assessment 23 p0406 A79-34051

State-of-the-art summary of the technical problems
involved in the storage of hydrogen via metal
hydrides
23 p0414 A79-34120
Estimating the commercial potential and energy
benefits of ERDA electric energy research
23 p0419 A79-34161
Technical-economic modeling in energy planning
23 p0419 A79-34164
Survey and appraisal of primary future energy
sources
23 p0420 A79-34167
The fusion hybrid
23 p0434 A79-35461
Solar cells from inexpensive silicon ribbons -
State of the art and trends
23 p0435 A79-35487
Schottky-barrier versus homojunction silicon solar
cells - A status report
23 p0441 A79-36783
Progress in tokamak and stellarator experiments
23 p0443 A79-36878
Satellite solar power stations - Current status
and prospects
23 p0448 A79-37844
The developing role of photovoltaic generation
23 p0448 A79-37845
Selected results from the technology assessment of
solar energy program
[AIAA PAPER 79-0984] 23 p0458 A79-38187
Progress on high temperature air heater
development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188
New developments and plannings for solar power
plants of M.A.N.-Company
23 p0467 A79-38619
Wind turbines for electric utilities - Development
status and economics
[AIAA PAPER 79-0965] 23 p0475 A79-38888
The Swedish Wind Energy Programme
23 p0482 A79-40103
The lithium-thionyl chloride battery - A review
23 p0487 A79-40370
Advanced electrochemical energy sources for space
power systems - A review
23 p0487 A79-40371
Pyrolysis, thermal gasification, and liquefaction
of solid wastes and residues - Worldwide status
of processes /as of Fall 1977/
23 p0490 A79-40413
Fuels cells - Their development and potential
23 p0495 A79-40750
Trends in photovoltaic development outside the
United States
23 p0496 A79-40882
Latest developments in solar array technology at
AEG-Telefunken
23 p0500 A79-40915
Materials, problems and research in German coal
conversion projects
23 p0529 A79-42425
Energy on the horizon
23 p0529 A79-42458
Crystallographic contributions to the energy problem
23 p0535 A79-43466
Coal usage --- review of current technologies
24 p0606 A79-44957
Renewable energy sources --- overview of West
German options
24 p0606 A79-44958
Energy storage --- survey of recent R and D
24 p0606 A79-44959
Overview of solar energy programs and activities
in the Southeast
24 p0607 A79-45202
Southern regional solar energy center planning
24 p0608 A79-45203
OTEC ocean engineering progress report
24 p0617 A79-45783
Compact heat exchanger design progress --- for
OTEC plants
24 p0618 A79-45789
Recent developments in the foam OTEC system
24 p0623 A79-45832
An overview of the OTEC-1 design --- including
mooring, anchoring, site selection,
installation, manufacturing, etc
24 p0625 A79-45846
Economic overview of vertical axis wind turbines
24 p0633 A79-46528
Wind/hydro generation assessment
24 p0634 A79-46535
Distributed wind generation assessment
24 p0634 A79-46536
MOD-1 wind turbine generator program status report
24 p0634 A79-46538
European technology for obtaining energy from
solid waste --- Book
24 p0638 A79-47072
New technologies for solar energy silicon - Cost
analysis of UCC Silane process
24 p0642 A79-47798
Manned strategic system concepts 1990-2000
[AIAA PAPER 79-1793] 24 p0643 A79-47882
Lockheed urges hydrogen fuel
24 p0648 A79-49224
Future transportation fuels
24 p0650 A79-49377
Outlook for electric road vehicles
24 p0650 A79-49380
The Seattle experience - Conversion of solid waste
to fuels or chemicals
24 p0651 A79-49384
A quantitative comparison of energy costing methods
24 p0651 A79-49475
Battery systems for electric vehicles - A
state-of-the-art review
24 p0652 A79-49488
Advanced solar thermal technology - Potential and
progress
24 p0671 A79-51739
Assessmentt of wind energy systems in a utility
framework
24 p0677 A79-51779
Commercial phosphoric acid fuel cell system
technology development
24 p0681 A79-51809
The role of fuel cells in NASA's space power systems
24 p0681 A79-51810
Hydrogen from coal using pressurized gasification
24 p0687 A79-51853
Hydrogen program at Electric Power Research
Institute
24 p0687 A79-51854
The pyrolysis route to gasification
24 p0688 A79-51860
Equipment and strategy for environmental sampling
of complex coal gasification process streams
24 p0688 A79-51862
Field performance of underground coal gasification
24 p0688 A79-51866
Environmental assessment of a coal-fired
open-cycle MHD power plant
24 p0701 A79-51993
Electromagnetic launchers
24 p0702 A79-52006
The zinc-chlorine battery in the BEST facility -
1981
24 p0703 A79-52013
Future Orbital Power Systems Technology Requirements
[NASA-CP-2058] 21 p0169 N79-10122
Military needs for orbital power
21 p0169 N79-10127
Solar array systems
21 p0169 N79-10131
Technology status: Batteries and fuel cells
21 p0170 N79-10132
Technology status: Fuel cells and electrolysis
cells
21 p0170 N79-10133
Solar cell workshop
21 p0170 N79-10141
Solar array workshop
21 p0170 N79-10142
Battery workshop
21 p0170 N79-10143
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534
Solar powered irrigation: Present status and
future outlook
[SAND-78-0016C] 21 p0175 N79-10539
Status of the DOE photovoltaic concentrator
technology development project
[SAND-78-0948C] 21 p0176 N79-10550
Environmental control technology activities of the
Department of Energy in FY 1977
[DOE/EV-0030] 21 p0178 N79-10572

Technology assessment, volume 2. A bibliography with abstracts
[NTIS/PS-78/0830/6] 21 p0179 N79-10951

Need for and deployment of inexhaustible energy resource technologies: Report of Technology Study Panel inexhaustible energy resources study
[TID-28202] 21 p0186 N79-11510

National Geothermal Information Resource
[LBL-7803] 21 p0187 N79-11515

Integrating technologies to produce energy conservation
[CONF-780109-6] 21 p0189 N79-11541

Application of solar technology to today's energy needs, volume 1
[PB-283770/6] 21 p0190 N79-11548

Pulsed-power research and development in the USSR
[AD-A056635] 21 p0193 N79-11859

Assessment of SEPS solar array technology for orbital service module application
[NASA-CR-151859] 21 p0194 N79-12136

Methanol from wood waste: A technical and economic study
[FPL-12] 21 p0194 N79-12239

Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555

Technical and environmental aspects of oil shale processing
21 p0199 N79-12581

Program information notice --- technologies relevant to u.s. electric energy systems
[DOE/ET-0059] 21 p0207 N79-13517

Energy systems studies program
[BNL-50822] 21 p0209 N79-13526

Heat pump technology: A survey of technical developments, market prospects and research needs
[HCP/M2121-01] 21 p0210 N79-13540

Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549

Environmental control implications of generating electric power from coal. Appendix A, part 2: Coal preparation and cleaning assessment study appendix
[ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571

Present status of GaAs --- including space processing and solid state applications
[NASA-CR-3093] 21 p0215 N79-14192

Technology and Use of Lignite --- conferences
[GFERC/IC-77/1] 21 p0216 N79-14241

OAST Space Theme Workshop. Volume 1: Summary report. 1: Introduction. 2: General observations and some key findings. 3: Follow-on activity. Quick-look comments and working papers
[NASA-TM-80001] 21 p0224 N79-15113

OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action
[NASA-TM-80002] 21 p0225 N79-15114

OAST Space Theme Workshop. Volume 3: Working group summary. 6: Power (P-2). A. Statement. B. Technology needs (form 1). C. Priority assessment (form 2)
[NASA-TM-80013] 21 p0225 N79-15125

Satellite Power Systems (SPS) concept definition study. Volume 6: SPS technology requirements and verification
[NASA-CR-150685] 21 p0225 N79-15140

The economics and engineering of large-scale algae biomass energy systems
[PB-287868/4] 21 p0226 N79-15207

Assessment of coal cleaning technology
[PB-287091/3] 22 p0330 N79-16139

Industrialization study, phase 2 --- assessment of advanced photovoltaic technologies for commerical development
[NASA-CR-158015] 22 p0333 N79-16351

Hydrogen technology from thermonuclear research
22 p0338 N79-16997

New initiatives in high altitude aircraft
22 p0338 N79-17000

Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes
[PB-287799/1] 22 p0344 N79-17364

Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes
[PB-287800/7] 22 p0344 N79-17365

Technology assessment of western energy resource development
22 p0347 N79-18368

Austrian 10kWE solar power plant. A project of the Federal Ministry for Science and Research
22 p0349 N79-18460

MHD power generation: Research, development and engineering
[FE-2524-8] 22 p0363 N79-20517

Satellite power system: Concept development and evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

The 1977 Goddard Space Flight Center Battery Workshop
[NASA-CP-2041] 22 p0370 N79-21565

NASA's OAST program: An overview
22 p0370 N79-21574

Effort of the Jet Propulsion Laboratory
22 p0370 N79-21575

Solid Polymer Electrolyte (SPE) fuel cell technology program
[NASA-CR-160159] 22 p0371 N79-21622

Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625

Results from Symposium on Future Orbital power systems technology requirements
[NASA-TM-79125] 23 p0539 N79-22191

Low-cost Solar Array (LSA) project
[NASA-CR-158650] 23 p0559 N79-24457

Low-cost Solar Array (LSA) project
[NASA-CR-158651] 23 p0559 N79-24458

Thermal power systems, small power systems application project. Volume 1: Executive summary
[NASA-CR-157441] 23 p0560 N79-24462

Thermal power systems, point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-158534] 23 p0560 N79-24464

Impact of solar energy on rural housing
[GPO-31-641] 23 p0560 N79-24467

Energy recovery from domestic refuse by means of incineration and pyrolysis
[CSIR-SR-WAT-54] 23 p0560 N79-24468

Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471

Photovoltaic concentrator system technology and applications experiments
[SAND-78-2184] 23 p0565 N79-24511

Environmental development plan for transportation energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899

Crude and product storage: State-of-the-art review and assessment
[AD-A066605] 23 p0568 N79-25243

Semiconductor technology program, progress briefs
[PB-292681/4] 23 p0569 N79-25337

Proceedings of the US DOE Photovoltaics Technology Development and Applications Program Review
[NASA-CR-158682] 23 p0570 N79-25485

Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498

Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513

Comparison of different techniques for producing hydrogen: Production costs analysis
[P/51/76/14] 23 p0578 N79-26240

LLL wind energy studies (OAHU)
[UCRL-82171] 23 p0582 N79-26514

Analysis of helio-thermoelectrical energy conversion efficiency
[REPT-77/HP-40-241] 23 p0584 N79-26534

Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537

Nuclear powered satellite studies
[COO-4045-3] 23 p0588 N79-27221

Coal liquefaction: Report on a focus group discussion
[DOE/TIC-10039] 23 p0589 N79-27339

Proceedings of the Conference on Coal Use for California
[NASA-CR-158770] 23 p0591 N79-27597

Proceedings of the Distribution Automation and Control Working Group. Volume 2: Proceedings
[NASA-CR-158769] 23 p0595 N79-27659

Demands and effects of solar technology on electric power storage
[AED-CONF-78-155-047] 23 p0596 N79-27678

Environmental readiness document. Small scale low head hydro: Commercialization, phase 3 planning
[DOE/ERD-0009] 23 p0597 N79-27686

Storage systems analysis --- Solar Thermal Power Program
[SERI/PR-35-101] 23 p0599 N79-27705

Powersat: An evaluation
[TUB-LRT-TB-22/2] 23 p0599 N79-27707

Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-9] 24 p0719 N79-28363

Alternate engines: State of the art study
[PB-293940/3] 24 p0720 N79-28596

Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654

Future thrusts of the NASA space power program --- with emphasis on electrochemical energy conversion and storage
24 p0722 N79-28670

Cell design and manufacturing changes during the past decade
24 p0722 N79-28674

NASA's lithium cell technology program
24 p0722 N79-28709

Stirling engines for automobiles
[NASA-TM-79222] 24 p0723 N79-28726

Technical and economic assessment of solar hybrid repowering
[SAN-1608-4-1] 24 p0729 N79-28791

Environmental control technology activities of the Department of Energy in FY 1978
[DOE/EV-0031] 24 p0729 N79-28812

The Congress needs to redirect the federal electric vehicle program
[PB-293977/5] 24 p0731 N79-29120

Second Annual Combustion and Fuels Technology Program Contractor Review Meeting
[CONF-7809103] 24 p0731 N79-29271

Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377

Hydrogen technology: An overview --- conferences
[BNL-25760] 24 p0734 N79-29379

Technology assessment of geothermal pumping equipment
[ALO-4162-2] 24 p0735 N79-29524

Solar energy
[GPO-36-957] 24 p0737 N79-29609

Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624

Assessment of the technoeconomic feasibility or Seasonal Thermal Energy Storage systems (STES)
[ANL/EES-TM-35] 24 p0740 N79-29637

Regional conceptual design and analysis studies for residential photovoltaic systems. Volume 1: Executive summary
[SAND-78-7039] 24 p0741 N79-29651

Underground hydroelectric pumped storage: An evaluation of the concept
[TID-29412] 24 p0742 N79-29664

Environmental readiness document: Urban waste energy recovery. Commercialization phase 3 planning
[DOE/ERD-0002] 24 p0745 N79-30102

Proceedings of a Symposium on the Utilization of Methane Generated in Landfills
[CONF-780340] 24 p0747 N79-30410

Technical aspects of the Resource Conservation and Recovery Act upon coal combustion and conversion systems
[ORNL/CEPA-10] 24 p0748 N79-30687

Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170] 24 [illegible]

Space application of large area terrestrial solar cells for multi-KW-arrays
24 [illegible]

The NASA space power technology program
24 [illegible]

Review of European solar array technology and potential future developments
24 [illegible]

Linear concentrating solar collectors: Current technology and applications
[SAND-78-0949] 24 p0754 [illegible]

Energy conservation via heat transfer enhancement --- bibliographies
[COO-4649-3] 24 p0758 N79-30819

Technology assessment of changes in the future use and characteristics of the automobile transportation system. Summary and findings
[PB-293645/8] 24 p0762 N79-31105

Technology assessment of changes in the future use and characteristics of the automobile transportation system, volume 2
[PB-293646/6] 24 p0762 N79-31106

Solar energy program
[ANL-79-16] 24 p0772 N79-31789

Solar thermal power systems program summary
[DOE/ET-0078] 24 p0773 N79-31794

Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796

Social assessment of on-site solar energy technologies
[HCP/B-4040-02] 24 p0775 N79-31810

Generator gas: The Swedish experience from 1939-1945
[SERI/SP-33-140] 24 p0775 N79-31816

Three state-of-the-art individual electric and hybrid vehicle test reports, volume 2
[NASA-CR-162311] 24 p0779 N79-32130

LSA project technology development update
[NASA-CR-162301] 24 [illegible]

Silicon solar cells for space use: Present performance and trends
24 [illegible]

Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 [illegible]

Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 [illegible]

Status review of the technology assessment of solar energy program
[LA-UR-79-1369] 24 [illegible]

Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 [illegible]

Technology overview reports for eight shale oil recovery processes --- for evaluation of pollution control and environmental impact technologies
[PB-295665/4] 24 [illegible]

TECHNOLOGY TRANSFER

Automotive engines - A viable alternative for aircraft
21 p0047 A79-12379

Technology transfer at Department of Energy laboratories - Selected case studies from the Lawrence Livermore Laboratory
21 p0099 A79-16130

How to tap NASA developed technology
21 p0164 A79-19896

Current status and prospects for low-temperature solar energy
22 p0269 A79-24623

The CCMS solar energy pilot study system performance reporting format
22 p0275 A79-25930

The impact of aeronautical sciences on other modes of transport
22 p0325 A79-31915

The Coal Information Center of the Foundation for Science and Technology --- for energy technology dissemination
23 p0389 A79-33262

Introducing new technologies for alternative
  energy sources - The economic, social, and
  environmental considerations for developing
  countries
                                        23 p0421 A79-34077
Southern regional solar energy center planning
                                        24 p0635 A79-45223
Committee on the Challenges of Modern Society
  Rational Use of Energy Pilot Study Modular
  Integrated Utility Systems Project. Volume 1:
  Description, activities, and products
  [PB-283428/7]   21 p0190 N79-11549
Committee on the challenges of modern society
  rational use of energy pilot study modular
  integrated utility system project. Volume 2:
  Minutes of project meeting
  [PB-283429/5]   21 p0191 N79-11558
Statement of Ivan Bekey, Director of Advanced
  Mission Studies, Aerospace Corporation
                                        21 p0224 N79-15107
Baltimore applications project
  [NASA-TM-79667]   22 p0351 N79-18815
European Scientific notes, volume 32, number 4
  [AD-A065399]   23 p0552 N79-23886
Solar technology transfer program
  [DOE/CS-0027/1]   23 p0574 N79-25521
SENTAP: A new technology transfer network to link
  business and industry with Federal research and
  development --- energy technology
  [PB-292882/9]   23 p0587 N79-27026
Methodology for the analysis of investment
  alternatives to stimulate development and
  technology transfer for energy technologies
  [TID-28971]   24 p0757 N79-30809
Seasat-A ASVT: Commercial demonstration
  experiments. Results analysis methodology for
  the Seasat-A case studies
  [NASA-CR-162162]   24 p0768 N79-31737
Analysis of investment alternatives to stimulate
  development and technology transfer for energy
  technologies, solar photovoltaics, a case study
  [TID-28968]   24 p0773 N79-31795
Generator gas: The Swedish experience from
  1939-1945
  [SERI/SP-33-140]   24 p0775 N79-31816
Problems of technology transfer to industry ---
  government sponsored solar energy technology
  development
  [SAND-79-1096]   24 p0778 N79-32107
Technology for solar energy utilization
  [PB-296572/0]   24 p0802 N79-33598

TECHNOLOGY UTILIZATION

The Department of Energy's thermionic energy
  conversion program
                                        21 p0025 A79-10293
Engineering analysis of in situ liquefaction of coal
                                        21 p0032 A79-10529
Optics applied to solar energy conversion;
  Proceedings of the Seminar, San Diego, Calif.,
  August 23, 24, 1977
                                        21 p0042 A79-11565
Activities in the field of solar cells in the
  Federal Republic of Germany
                                        21 p0056 A79-13636
Current and potential uses of aerospace technology
  by the U.S. Department of the Interior
  [AIAA PAPER 78-1716]   21 p0060 A79-13833
Saudi Arabia looks at the sun
                                        21 p0063 A79-13900
Solar and wind energy applications in Hawaii
                                        21 p0066 A79-14265
Use of plastics in solar energy applications
                                        21 p0067 A79-14268
Projecting energy resource utilization - The
  geothermal case
                                        21 p0068 A79-14321
Combined environments: Technology interrelations;
  Proceedings of the Twenty-fourth Annual
  Technical Meeting, Fort Worth, Tex., April
  18-20, 1978
                                        21 p0097 A79-16076
Co-disposal of sewage sludge using refuse-derived
  fuel
                                        21 p0097 A79-16098
Space Congress, 15th, Cocoa Beach, Fla., April
  26-28, 1978, Proceedings
                                        21 p0099 A79-16126
A technology program for large area space systems
                                        21 p0100 A79-16145
National Computer Conference, Anaheim, Calif.,
  June 5-8, 1978, Proceedings
                                        21 p0100 A79-16177
Possibilities for solar energy utilization in Egypt
                                        21 p0102 A79-16358
Solar pumping --- thermal and electrical water
  pumping
                                        21 p0106 A79-16469
Energy exchanger technology applied to laser
  heated engines
                                        21 p0110 A79-16621
Prospects for harnessing renewable energy sources
  in developing countries
                                        21 p0117 A79-17286
How to tap NASA developed technology
                                        21 p0164 A79-19896
Energy conservation through sealing technology
                                        22 p0237 A79-20700
Energy recovery from urban solid waste
                                        23 p0386 A79-33233
Analysis of various OTEC missions --- market
  potential of applications
                                        23 p0404 A79-34037
Commercial potential of the Space Shuttle
  [AAS PAPER 79-058]   23 p0438 A79-36548
Solar total energy - Large scale experiment ---
  supply of factory energy needs
  [AIAA PAPER 79-1025]   23 p0460 A79-38207
Architectural planning - The possibility of using
  solar energy must be kept open
                                        23 p0473 A79-38665
Aspects of solar energy use in the Federal
  Republic of Germany
                                        23 p0473 A79-38668
Conditions for the use of solar energy
                                        23 p0473 A79-38669
Summary results from the NASA Tech House one year
  live-in
  [AIAA PAPER 79-0987]   23 p0475 A79-38892
Commercialisation of solar energy devices in
  developing countries - Problems and prospects
                                        23 p0477 A79-39105
Role of intermediate markets in P/V industry
  development
                                        23 p0516 A79-41052
Engineering of microwave relays --- microwave
  radio equipment engineering aspects and impact
  on energy technology
                                        23 p0526 A79-41929
Space technology spinoffs --- Book
                                        24 p0628 A79-47260
High-temperature alloys in high-technology systems
                                        24 p0647 A79-48870
Technology overview of energy storage systems
                                        24 p0666 A79-50852
Perspectives on developing country solar energy
  applications
                                        24 p0672 A79-51743
Solar production of industrial process steam
                                        24 p0673 A79-51748
Solar central receiver program
                                        24 p0674 A79-51756
System aspects of geothermal resources utilization
  - The case of Castelnuovo Val di Cecina as an
  example
                                        24 p0689 A79-51871
Technology impact study of a high efficiency
  industrial heat pump
                                        24 p0697 A79-51966
The definition of a national program in
  energy-efficient pump utilization, volume 1
  [HCP/W1260-01/1]   21 p0207 N79-13514
Application of solar technology to today's energy
  needs, volume 2 --- systems analysis and
  analytical methods
  [OTA-E-77-VOL-2]   21 p0218 N79-14530
Statement of Doctor Klaus Heiss, President, ECON,
  Incorporated, Princeton, New Jersey
                                        21 p0224 N79-15110
Photovoltaic power systems for rural areas of
  developing countries
  [NASA-TM-79097]   21 p0229 N79-15411
United States civilian space programs: An overview
  [GPO-35-823]   21 p0232 N79-15815
Primary lithium battery technology and its
  application to NASA missions
  [NASA-CR-158229]   22 p0354 N79-19449

Research at Sandia Laboratories for Solar Thermal Large Power Systems Program
[SAND-78-8657] 23 p0565 N79-24510
Photovoltaic concentrator system technology and applications experiments
[SAND-78-2184] 23 p0565 N79-24511
Commercial phosphoric acid fuel cell system technology development
[NASA-CR-159689] 23 p0571 N79-25500
Lasers: Their applications and operational requirements
23 p0590 N79-27484
Federal photovoltaic utilization program. Planning resource document
[HCP/M50081-01] 23 p0593 N79-27706
Applications and safety data
24 p0722 N79-28718
Spinoff 1979
[NASA-TM-80461] 24 p0730 N79-29108
Stratified thermal storage in residential Solar energy applications
[COO-4523-1] 24 p0786 N79-32682
Meteorological data for solar energy applications
24 p0792 N79-32733
Published patent applications and patents resulting from German government sponsored research and development
[BMFT-FB-T-78-31] 24 p0794 N79-33151
Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074

TECTONICS
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

TELECOMMUNICATION
Solar power for telecommunications
24 p0628 A79-46050
Solar Power Satellite (SPS) pilot beam and communication link subsystem investigation study, phase 1 --- ionospheric propagation, radio frequency interference, and microwave transmission
[NASA-CR-161167] 22 p0345 N79-17896

TELESCOPES
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion
21 p0082 A79-15077

TELEVISION RECEPTION
Electromagnetic interference to television reception caused by horizontal axis windmills
24 p0627 A79-45923

TELEVISION TRANSMISSION
Electromagnetic interference to television reception caused by horizontal axis windmills
24 p0627 A79-45923

TELLURIC CURRENTS
Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732
Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey
[LA-7656-MS] 22 p0358 N79-20458
Telluric sounding and mapping in the vicinity of the Salton Sea geothermal area, Imperial Valley, California
[PB-296081/3] 24 p0757 N79-33553

TELLURIDES
Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion
21 p0054 A79-13290

TELLURIUM COMPOUNDS
Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

TEMPERATE REGIONS
Complementary nature of wind and solar energy at a continental mid-latitude station
23 p0396 A79-33763

TEMPERATURE
Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377

TEMPERATURE CONTROL
Solar Power Satellite thermal analysis
21 p0003 A79-10028
Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants
21 p0016 A79-10125
Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10786
Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13637
Evaluation of control options for solar climate control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859
A microprocessor based solar controller
21 p0082 A79-14979
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318
Controls for residential solar heating
21 p0101 A79-16418
Controls for heat reclaim with thermal storage coupled with solar heating
21 p0102 A79-16420
Using controls to reduce component size and energy needs for solar HVAC --- Heating Ventilation, Air Conditioning
21 p0102 A79-16421
Theoretical and experimental analysis of a latent heat storage system --- solar energy absorbers
21 p0121 A79-17323
A heat operated mechanical device to control the temperature and flow of water entering a hot water storage tank in a solar water heating system
21 p0140 A79-17487
An optimal standard for solar heating systems
[ASME PAPER 78-WA/DSC-19] 21 p0159 A79-19765
A Thermic Controller for a thermic diode solar panel
[ASME PAPER 78-WA/SOL-9] 21 p0163 A79-19841
Study of the dynamics of the materials melting process for a solar furnace
21 p0167 A79-20359
Stability of work and sensitivity of semiconductor thermoelectric systems under automatic control
22 p0261 A79-22628
Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790167] 22 p0275 A79-23268
Passive solar heating - Results from two Saskatchewan residences
22 p0302 A79-26988
Externally pumped Rankine cycle thermal transport devices
[AIAA PAPER 79-1091] 23 p0435 A79-35080
Evaluation of a sodium heat pipe/thermal energy storage unit utilizing LiF-MgF2-KF phase change material
[AIAA PAPER 79-1095] 23 p0462 A79-38565
Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50025
Multichannel temperature controller for hot air solar house
24 p0658 A79-50367
Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant
24 p0673 A79-51747
Thermal management for future Air Force high power spacecraft
24 p0692 A79-51923
Transient shutdown analysis of low-temperature thermal diodes
[NASA-TP-1369] 22 p0346 N79-18287
Development of cryogenic thermal control heat pipes --- of stainless steels
[NASA-CR-152302] 24 p0747 N79-30499
Experiences related to GEOS thermal control
24 p0763 N79-31269
Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272
Heat pipe technology for spacecraft thermal control
24 p0764 N79-31274
Heat pipes in the thermal control of communication satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278

TEMPERATURE DEPENDENCE
Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-22571

TEMPERATURE DISTRIBUTION
A parametric investigation on flat-plate solar collectors
21 p0128 A79-17397
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204
Effects of nonuniform distribution of the absorber temperature on radiation losses of a flat-plate solar collector
23 p0530 A79-42894
Natural convection in porous media and geothermal systems
23 p0533 A79-43014
Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909
Thermal analysis in the focal spot of a solar furnace
24 p0641 A79-47794
A simulation exercise of a cavity-type solar receiver using the HEAP program
24 p0670 A79-51730
On the calculation of the temperature distribution in a packed bed for solar energy applications
24 p0712 A79-53495

TEMPERATURE EFFECTS
Effect of inlet temperature on the performance of a catalytic reactor
21 p0035 A79-11542
Thermionics and its application to the SPS --- solar power satellite for energy conversion
21 p0109 A79-16616
Temperature dependent parameter analysis of thermoelectric devices
21 p0113 A79-16740
The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate
22 p0235 A79-20828
Mixing effects of two different types of hydrides --- phase behaviors and energy storage applications
22 p0251 A79-21704
Temperature dependence of photovoltaic solar energy conversion for GaAs heterojunction solar cell
22 p0256 A79-22768
Collisional transport --- of plasmas in planar and toroidal geometry
22 p0257 A79-22980
Mechanism of erosion of metal electrodes of the channel of a MHD generator
22 p0306 A79-30397
The effects of wall temperature on light impurities in Alcator --- tokamak device
22 p0313 A79-31108
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
A new concept of thermionic converter
23 p0381 A79-32636
Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0351 A79-33391
Designing thermally efficient buildings for the U.S. Midwest
23 p0357 A79-33951
State of development in the area of water electrolysis /near term/ --- hydrogen production technology
23 p0414 A79-34114
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Temperature dependence of the optical properties of silicon
23 p0437 A79-35820
The problem of carbon dioxide --- fossil fuel consumption effect on air pollution
23 p0438 A79-36201
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600
Warm plasma effects on drift cyclotron loss cone mode --- in mirror machines
23 p0478 A79-39560
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760
Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0646 A79-49273
Lateral flow concept for rock bed systems --- of solar heating
24 p0658 A79-50174
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50707
Long-term weathering effects on the thermal performance of the Libbey-Owens-Ford (liquid) solar collector
[NASA-CR-161093] 22 p0348 N79-18450
Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector
[NASA-CR-161306] 24 p0797 N79-33561

TEMPERATURE GRADIENTS
Solar engines - The thermal wheel and beyond
21 p0095 A79-15909
Power generation using thermal vapor pumping and hydro-pumped storage - Thermal gradient utilization cycle /TGUC/
21 p0095 A79-15914
Thermal gradient-hydro generation cycle /TGUC/
21 p0098 A79-16102
Continental geotherms during the Archaean --- heat production in ancient earth crust
22 p0269 A79-24620
Absence of bending effects on solar-receiver-tube fatigue
23 p0537 A79-43682
Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796
The steady state salt gradient solar pond
24 p0667 A79-50540
Temperature profile and power calculations in gas core reactors
24 p0702 A79-52888

TEMPERATURE MEASUREMENT
Instrumentation development for in situ coal gasification
21 p0006 A79-10053
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0052 A79-10520
Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507
A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0057 A79-16075
Transient plate temperature in flat plate solar collectors
24 p0603 A79-44294
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44975
Regional-scale sea surface temperature determination from the geostationary environmental operational satellite
24 p0617 A79-45781
Use of satellite-derived sea surface temperatures by cruising OTEC plants
24 p0625 A79-45845

TEMPERATURE MEASURING INSTRUMENTS
A microprocessor compatible temperature measuring system --- for solar house energy monitoring
21 p0088 A79-15839
Temperature calibration for solar heating and cooling system evaluation
21 p0089 A79-15846
An inexpensive multiplexer temperature measuring system for monitoring and evaluation of solar collectors
21 p0089 A79-15847
Evaluation of a thermographic scanning device for solar energy and conservation applications
24 p0611 A79-45229

TEMPERATURE PROFILES
Dynamic behaviour of light-weight solar collectors
21 p0056 A79-13628
Yield of ground storage of heat in solar ponds
21 p0133 A79-17429
Stratification in thermal storage during charging
--- in cylindrical tank
23 p0532 A79-42974
Temperature variation of the absorption edge of
CVD amorphous and polycrystalline silicon
24 p0704 A79-52312
TEMPERATURE SENSORS
Sensor selection and placement in the National
Solar Data Program
21 p0089 A79-15844
The real time aperture flux system as part of the
Solar Thermal Test Facility
23 p0429 A79-35050
TENNESSEE
Applying NASA remote sensing data to geologically
related regional planning problems in Tennessee
[E79-10095] 22 p0335 N79-17289
TENSILE STRESS
Design criteria for multilayer superconductive
magnets
22 p0236 A79-20536
Load criteria for OTEC riser cable design
24 p0620 A79-45801
A limiting mechanism for the heave induced Mathieu
type instability of a cold water pipe --- for
OTEC plant
24 p0621 A79-45813
TERMINAL FACILITIES
Airport power supply --- Russian book
24 p0660 A79-50499
TERMINAL GUIDANCE
Procedure for flight guidance in the terminal
maneuvering area for an experimental program
employing a flying test device
21 p0147 A79-17680
TERNARY SYSTEMS
Model predictions for the stability of ternary
metallic hydrides
21 p0038 A79-11902
The performance of copper-ternary based thin-film
solar cells
23 p0500 A79-40910
Potassium seed activities in open-cycle MHD
systems: Predictions using a multiphase
multicomponent solution model
[illegible] 24 p0744 N79-30036
Metal hydride technology --- hydrogen bonding with
intermetallics
[illegible] 24 p0780 N79-32387
[illegible]
[illegible] fluids for solar energy systems
23 p0435 A79-35485
TERRAIN ANALYSIS
A numerical study of the effects of complex
terrain on dynamics of airflow and pollutant
dispersion
23 p0535 A79-43383
TEST CHAMBERS
White Sands solar test facility
23 p0429 A79-35048
TEST EQUIPMENT
Construction and test of a test apparatus for
determining the efficiency of solar collectors
with the [illegible]-est method
21 p0134 A79-17436
International Instrumentation Symposium, 24th,
Albuquerque, N. Mex., May 1-5, 1978,
Proceedings. Parts 1 & 2
21 p0144 A79-17576
A test bed for thermosyphon solar air collectors
[AIAA PAPER 79-0541] 22 p0274 A79-25860
TEST FACILITIES
Design considerations for an in situ gasification
test of eastern bituminous coals
21 p0005 A79-10049
Preliminary controller evaluation for the
METC/CTIU using a mathematical process model ---
of Component Test and Integration Unit in
fluidized bed combustion
21 p0008 A79-10073
Progress in the testing of materials and design
concepts for directly-fired MHD air heater service
21 p0017 A79-10141
The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147
Operating experience at the DOE/Sandia
midtemperature Solar Systems Test Facility
21 p0022 A79-10182
Five MW solar thermal test facility heliostat
focus and alignment system
21 p0043 A79-11972
Design study of superconducting magnets for a
combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305
Testing of solar collectors according to ASHRAE
Standard 93-77
21 p0101 A79-16417
A status report on the Solar Thermal Test Facility
21 p0112 A79-16731
Advanced emissions control and test facility of
the Electric Power Research Institute
21 p0115 A79-17249
Testing of water-heating collectors according to
ASHRAE Standard 93-77
21 p0130 A79-17410
The USA 5MW solar thermal test facility
21 p0135 A79-17449
Preliminary results from the Georgia Tech 400 kWth
Solar Thermal Test Facility
21 p0141 A79-17499
International Instrumentation Symposium, 24th,
Albuquerque, N. Mex., May 1-5, 1978,
Proceedings. Parts 1 & 2
21 p0144 A79-17576
Master control and data system for the 5MW Solar
Thermal Test Facility
21 p0144 A79-17620
Gasification Combined Cycle Test Facility at
Pekin, Illinois
21 p0145 A79-17632
Gas stream composition and temperature
determination in a coal-fired MHD simulation
facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810
Superconductivity for mirror fusion
22 p0236 A79-20542
Modeling, simulation, testing, and measurements
for solar energy systems; Proceedings of the
Winter Annual Meeting, San Francisco, Calif.,
December 10-15, 1978
22 p0266 A79-24309
The first year of solar collector testing at
Ontario Research
22 p0322 A79-31450
Studies on solar collector performance at NRC
22 p0322 A79-31451
The U-25B facility for studies in strong
magnetohydrodynamic interaction
23 p0393 A79-33406
Design and operation of the Westinghouse electrode
systems test facility /WESTF/ --- for MHD
generator
23 p0393 A79-33411
The DOE 5 MW Solar Thermal Test Facility
23 p0428 A79-35046
The development of the Advanced Components Test
Facility --- for solar powered steam generator
system
23 p0429 A79-35047
White Sands solar test facility
23 p0429 A79-35048
Sandia Laboratories' Midtemperature Systems Test
Facility
23 p0429 A79-35049
The real time aperture flux system as part of the
Solar Thermal Test Facility
23 p0429 A79-35050
OTEC-1 test conductor program
23 p0430 A79-35060
Air collector testing utilizing ASHRAE 93-77 ---
standards for testing of solar collectors using
air as heat transfer medium
23 p0430 A79-35062
Data acquisition and signal processing for a
vertical axis wind energy conversion system
23 p0432 A79-35078
Solar energy system testing - Some experiences
with minicomputers
23 p0432 A79-35082
High-energy laser mirror thermal distortion
testing techniques
23 p0447 A79-37670

The development and construction of a simulator for the proof testing of solar power devices
23 p0448 A79-37846

Real-time environmental and performance testing of concentrating photovoltaic arrays
23 p0496 A79-40887

Development of a Test Program for OTEC-1
24 p0617 A79-45785

Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797

Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805

A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651

Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility
24 p0658 A79-50343

Operability and materials testing for MHD air heaters
24 p0701 A79-51994

Development of a DC linear motor. II
24 p0707 A79-52800

Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478

Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1] 21 p0184 N79-11490

MHD-ETF program. Volume 1: Executive summary
[FE-2613-6-VOL-1] 22 p0362 N79-20515

MHD-ETF program. Volume 2A, parts 1 and 2: Reference design description
[FE-2613-6-VOL-2A] 22 p0363 N79-20516

Laboratories technically qualified to test solar collectors in accordance with ASHRAE standard 93-77: A summary report
[PB-289729/6] 22 p0363 N79-20524

Engineering test facility conceptual design, part 1
[FE-2614-2-PT-1] 22 p0369 N79-21560

Engineering test facility conceptual design, part 2
[FE-2614-2-PT-2] 22 p0369 N79-21561

Comparison of collector test methods
[ASSA-SE-B24/77] 23 p0574 N79-25526

Sandia laboratory combustion simulation facility --- for analyzing the flow of high temperature combustion products
[SAND-78-2240] 23 p0576 N79-26146

Coal liquefaction test center
[FE-1517-67] 23 p0577 N79-26226

Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627

Geothermal pump test facility
[ALO-3715-1] 24 p0755 N79-30793

Solar thermal test facilities users association
[SERI/PR-13-154] 24 p0787 N79-32688

Small-scale solar simulator for indoor testing of collector modules and materials
[LA-UR-79-1335] 24 p0790 N79-32716

TEST FIRING

High pressure MHD coal combustors investigation
[FE-2706-08] 22 p0362 N79-20510

TEST STANDS

Large-scale cryopumping for controlled fusion
21 p0085 A79-15330

TEST VEHICLES

Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559

TETHERED BALLOONS

Weightless solar energy collection
23 p0385 A79-33215

TEXAS

Texas lignite: Environmental planning opportunities
[PB-286870/1] 21 p0231 N79-15438

Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373

An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells
[NVO-1531-2] 22 p0366 N79-21523

Solar project cost report: Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/60] 23 p0561 N79-24480

THERMAL ABSORPTION

Solar thermal collectors using planar reflector
21 p0131 A79-17412

Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422

Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479

The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311

The honeycomb heat trap - Its application in flat plate solar collectors
22 p0322 A79-31447

Sensible heat storage for solar energy applications
22 p0322 A79-31449

The first year of solar collector testing at Ontario Research
22 p0322 A79-31450

Studies on solar collector performance at NPC
22 p0322 A79-31451

New concept in solar thermal collectors
23 p0398 A79-33988

THERMAL BOUNDARY LAYER

Numerical modeling of the thermal boundary layer near a synthetic crude oil plant
24 p0628 A79-46065

THERMAL CONDUCTIVITY

Modified silicon-germanium alloys with improved performance --- thermoelectric material
21 p0027 A79-10225

Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems
22 p0304 A79-30123

An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678

Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38045

The effects of electron thermal conductivity on thermionic energy converters
24 p0700 A79-51990

Research on the physical properties of geothermal reservoir rock
[COO-2908-4] 22 p0358 N79-20459

THERMAL CONTROL COATINGS

Suppression of vaporization in copper-silver-selenide thermoelectric materials
21 p0027 A79-10224

Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356

Optical coatings for a space laser communications system
22 p0292 A79-28028

Optical coatings for solar cells and solar collectors. Citations from the NTIS data base
[NTIS/PS-78/1341/3] 22 p0350 N79-18465

Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base
[NTIS/PS-78/1342/1] 22 p0350 N79-18466

Transparent heat mirrors for passive solar heating applications
[LBL-7829] 23 p0561 N79-24476

Experiences related to GEOS thermal control
24 p0763 N79-31269

THERMAL CYCLING TESTS

Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184

Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells
23 p0498 A79-40898

THERMAL DECOMPOSITION
Methanol decomposition bottoming cycle for IC engines [SAE PAPER 790427] 23 p0495 A79-40774

THERMAL DEGRADATION
Analytical predictions of selenide RTG power degradation 21 p0026 A79-10223
Suppression of vaporization in copper-silver-selenide thermoelectric materials 21 p0027 A79-10224
Thermal deformations of solar-energy concentrators 21 p0166 A79-20355
High-energy laser mirror thermal distortion testing techniques 23 p0447 A79-37670
Long-term weathering effects on the thermal performance of the Libbey-Owens-Ford (liquid) solar collector [NASA-CR-161093] 22 p0348 N79-18450

THERMAL DIFFUSION
Thermal radiation - Transient heat transfer in plates with selective surfaces 23 p0389 A79-33266
Effect of diffusion on electron density across the nonequilibrium MHD channel 23 p0479 A79-39839

THERMAL DIFFUSIVITY
An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales 23 p0440 A79-36678
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones 24 p0630 A79-46306

THERMAL DISSOCIATION
Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen 24 p0602 A79-44265

THERMAL EMISSION
Thermal emissivity of selective surfaces - New lower limits 24 p0648 A79-49207
Electromagnetic radiation energy arrangement --- coatings for solar energy absorption and infrared reflection [NASA-CASE-WOO-00428-1] 22 p0352 N79-19186

THERMAL ENERGY
Thermal energy storage for industrial waste heat recovery 21 p0012 A79-10101
High efficiency thermal energy storage system for utility applications 21 p0012 A79-10102
High temperature thermal energy storage in moving sand 21 p0012 A79-10103
NaOH-based high temperature heat-of-fusion thermal energy storage device 21 p0012 A79-10106
Form-stable, crystalline polymer pellets for thermal energy storage 21 p0013 A79-10107
Storage systems for solar thermal power 21 p0013 A79-10108
Central solar heat stations and the Studsvik Demonstration Plant 21 p0021 A79-10175
Basic physical and chemical processes for storage of heat 21 p0038 A79-11805
Solar pond stability experiments 21 p0042 A79-11878
Options for solar thermal conversion 21 p0043 A79-11969
A vacuum solar thermal collector with optimal concentration 21 p0043 A79-11970
Solar thermal electric power systems - Manufacturing cost estimation and systems optimization 21 p0046 A79-12273
Low-grade thermal energy-conversion Joule effect heat engines [ASME PAPER 78-ENAS-7] 21 p0048 A79-12556
Thermal energy storage heat exchanger design [ASME PAPER 78-ENAS-30] 21 p0049 A79-12579
Development of solar thermal power plants 21 p0057 A79-13641
Solar thermal power stations 21 p0057 A79-13644
On the thermal and thermo-electrolytical generation of hydrogen by solar energy 21 p0059 A79-13660
Dispersed power systems and total energy --- solar energy conversion for combined mechanical/electrical and thermal loads [AIAA PAPER 78-1770] 21 p0062 A79-13868
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description [AIAA PAPER 78-1771] 21 p0062 A79-13869
Heat recovery devices for building HVAC systems --- Heating Ventilating and Air Conditioning 21 p0073 A79-14697
Solar total energy systems 21 p0090 A79-15863
Hot dry rock, an abundant clean energy resource 21 p0098 A79-16106
A status report on the Solar Thermal Test Facility 21 p0112 A79-16731
The economics of solar heating and cooling - A cautious view 21 p0119 A79-17297
Long-term storage of solar energy in native rock 21 p0120 A79-17314
A simulation study of phase change energy store 21 p0120 A79-17318
Role of high performance solar cells in practical photovoltaic systems 21 p0122 A79-17336
Amorphous semiconductors in photovoltaic and solar thermal conversion [BNL-24216] 21 p0122 A79-17339
The feasibility of constructing a photoelectric unit utilizing effluent heat 21 p0125 A79-17358
Theoretical and experimental yields of a solar heater with flat plate collectors 21 p0134 A79-17437
Development of solar collectors for low temperature level and of concentrators for thermal and photoelectric conversion 21 p0135 A79-17445
The USA 5MW solar thermal test facility 21 p0135 A79-17449
Optimum insulation with internal and solar heat gains 21 p0140 A79-17490
Medium capacity heliothermal power stations 21 p0142 A79-17507
Use of solar energy for industrial process heat 21 p0143 A79-17524
Master control and data system for the 5MW Solar Thermal Test Facility 21 p0144 A79-17620
Real time computer control of 5 megawatts of solar thermal energy 21 p0144 A79-17621
Cooling applications of thermic diode panels [ASME PAPER 78-WA/SOL-10] 21 p0163 A79-19842
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings 21 p0167 A79-20356
Study of the dynamics of the materials melting process for a solar furnace 21 p0167 A79-20359
Heat pulses required to quench a potted superconducting magnet 22 p0236 A79-20538
Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production 22 p0237 A79-20730
Thermal storage for industrial process and reject heat 22 p0243 A79-21300
Effects of test fluid, flow rate, and flow regime on solar collector thermal performance measurements 22 p0268 A79-24317
A comparison of solar thermal energy collection using fixed and tracking collectors 22 p0293 A79-28146

Chemical vapor deposited molybdenum films for use in photothermal conversion 22 p0294 A79-28148

Chemical vapor deposited amorphous silicon for use in photothermal conversion 22 p0294 A79-28149

A scheme for direct conversion of plasma thermal energy into electrical energy 22 p0324 A79-31765

GUD - An unfired combined cycle approach to energy utilization --- in turbine power plant gas and steam waste heat recovery system [ASME PAPER 79-GT-131] 23 p0377 A79-32400

Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow 23 p0383 A79-32962

Analysis of dynamic effects in solar thermal energy conversion systems 23 p0400 A79-34008

Solar energy in California industry - Applications, characteristics and potential 23 p0402 A79-34019

Economic prospects for solar energy for industrial process heat 23 p0403 A79-34033

Hot dry rock energy project 23 p0408 A79-34073

Transmission of energy by open-loop chemical energy pipeline 23 p0411 A79-34096

Experimental study of thermal energy storage by use of reversible chemical reactions 23 p0416 A79-34137

A central receiver solar thermal power system 23 p0424 A79-34455

Industrial applications of solar heat 23 p0434 A79-35477

Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources 23 p0435 A79-35484

The THEK program for solar energy plants with 'distributed' converters 23 p0462 A79-38574

Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States 23 p0470 A79-38646

Rough cost estimates of solar thermal/coal or biomass derived fuels [AIAA PAPER 79-0588] 23 p0476 A79-38893

Thermal energy conversion with fluorescent collector-concentrators 23 p0477 A79-39103

Considerations in the design of a shredded municipal refuse burning and heat recovery system 23 p0488 A79-40390

Practice of heat utilization from refuse 23 p0488 A79-40393

The engineering analysis of solar radiation 24 p0605 A79-44796

Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting [ASME PAPER 78-HT-47] 24 p0647 A79-49136

Technology overview of energy storage systems 24 p0666 A79-50892

Advanced solar thermal technology - Potential and progress 24 p0671 A79-51739

Turbine sizing of a solar thermal power plant 24 p0673 A79-51751

Sandia Laboratories operational experience with small heat engines in solar thermal power systems 24 p0673 A79-51752

A new solar thermal receiver utilizing a small particle heat exchanger 24 p0674 A79-51754

Solar parabolic dish thermal power systems - Technology and applications 24 p0674 A79-51755

Solar thermal power plants in small utilities - An economic impact analysis 24 p0675 A79-51761

A combined photovoltaic/thermal electric central power plant 24 p0675 A79-51769

Nitrogen fixation with fusion heat 24 p0695 A79-51948

The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation 24 p0696 A79-51955

Storage assisted heat pumps using phase change materials 24 p0697 A79-51967

Experimental demonstration of heat-to-electricity conversion within a dielectric 24 p0698 A79-51975

R and D on Rankine cycle engines in Japan 24 p0702 A79-52007

High absorptivity Al-PbS selective surfaces for solar photothermal conversion 24 p0705 A79-52319

Thermal energy storage subsystems [NASA-CR-150812] 21 p0172 N79-10517

Hot dry rock energy project [LA-UR-77-2744] 21 p0175 N79-10540

Mini-Brayton heat source assembly development [NASA-CR-159447] 21 p0196 N79-12554

A feasibility study of inorganic oxide-fluoride compositions for thermal energy storage applications [AD-A059001] 21 p0196 N79-12559

Evaluation and targeting of geothermal energy resources in the southeastern United States [VPI-SU-5648-1] 21 p0204 N79-13478

Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts [NASA-CR-159411-VOL-1] 21 p0205 N79-13496

An assessment of thermal energy storage and waste heat dissipation with total energy systems for MIT [AD-A059061] 21 p0205 N79-13502

Solar thermal test facility experiment manual [SAND-77-1173] 21 p0221 N79-14568

Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses [ORNL-TR-4483] 21 p0221 N79-14574

Thermal energy transformer [NASA-CASE-NPO-14058-1] 22 p0348 N79-18443

Thermal storage technologies for solar industrial process heat applications [NASA-TM-79130] 22 p0360 N79-20498

Advanced subsystems development [NASA-CR-158335] 23 p0542 N79-22627

Thermoelectrochemical cycles for power and hydrogen production [BNL-24387] 23 p0563 N79-24491

Solar thermal components: A bibliography with abstracts [NASA-CR-158699] 23 p0570 N79-25479

Handbook of data on selected engine components for solar thermal applications [NASA-TM-79027] 23 p0579 N79-26476

Solar thermal power-conversion system 23 p0579 N79-26477

Power-conversion system component summation 23 p0580 N79-26483

Combined photovoltaic and thermal hybrid collector systems [COO-4577-3] 23 p0583 N79-26525

System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories [SAND-78-0979] 23 p0584 N79-26530

The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs [NASA-CR-158768] 23 p0595 N79-27660

Modeling passive solar buildings with hand calculations --- conferences [LBL-8583] 23 p0596 N79-27683

Photovoltaic/thermal collectors and heat pumps --- solar heating system efficiency [COO-4577-2] 24 p0726 N79-28757

Phase-one experiment test plan solar photovoltaic/thermal residential experiment [COO-4577-6] 24 p0739 N79-29625

Electricity in lieu of natural gas and oil for industrial thermal energy: A preliminary survey [ORNL/TM-5937] 24 p0739 N79-29630

Methodology for solar-thermal power plant evaluation [EPRI-ER-869] 24 p0739 N79-29631

Design and installation manual for thermal energy storage [ANL-79-15] 24 p0740 N79-29636

Assessment of the technoeconomic feasibility or Seasonal Thermal Energy Storage systems (STES)
[ANL/EES-TM-35] 24 p0740 N79-29637
Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production
[LA-UR-79-574] 24 p0742 N79-29666
Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801
Solar thermal power systems, program summary
[DOE/ET-0078] 24 p0773 N79-31794
Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils
[ORNL/SUB-79/14274/1] 24 p0776 N79-31927
Energy extraction operations: Some preliminary results --- thermal energy from granitic rocks by water injection
[LA-UR-79-679] 24 p0786 N79-32678
Solar thermal test facilities users association
[SERI/PR-13-154] 24 p0787 N79-32686
Combined photovoltaic/thermal system studies
[SAND-78-7031] 24 p0787 N79-32691
Systems analysis of solar thermal power systems. Report on task 1: Determination and characterization of solar thermal conversion options
[PNL-2693] 24 p0788 N79-32692
Recent advances in thermochemical energy storage and transport
[SAND-78-8505] 24 p0791 N79-32720
Testing of pebble-bed and phase-change thermal energy storage devices according to ASHRAE standard 94-77
[PB-295898/1] 24 p0801 N79-33596

THERMAL ENVIRONMENTS
Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057

THERMAL INSULATION
Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System
21 p0023 A79-10191
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
Optimum insulation with internal and solar heat gains
21 p0140 A79-17490
Solar energy and heat insulation --- materials for residential buildings
22 p0268 A79-24321
High temperature materials study --- for thermal insulation in solar furnaces
23 p0431 A79-35070
Ceramic receivers for solar power conversion
[AIAA PAPER 79-1008] 23 p0459 A79-38200
Design of the Eichenau solar house --- emphasizing heat insulation and solar collection and conversion
23 p0463 A79-38579
Active heat insulation through solar low-temperature system that can be integrated into the house wall
23 p0465 A79-38596
Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831
Study of heat transfer through refractory lined gasifier vessel walls
[FE-2210-29] 23 p0556 N79-24306
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
Experiences related to GECS thermal control
24 p0763 N79-31269
Opportunities for energy conservation in finished concrete products
[HCP/CS-1549] 24 p0772 N79-31782
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33584

THERMAL MAPPING
A time domain survey of the Los Alamos Region, New Mexico
[LA-7657-MS] 22 p0365 N79-21248
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias --- Brazil
[E79-10238] 24 p0747 N79-30599
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10273] 24 p0768 N79-31730
Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming
[E79-10279] 24 p0796 N79-33518

THERMAL PLASMAS
Auxiliary heating in breakeven tokamaks
21 p0079 A79-14792
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

THERMAL POLLUTION
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722
Coupled heat and organic wastes stream pollution
21 p0086 A79-15602
Regional air pollution study: Heat emission inventory
[PB-284081/7] 21 p0200 N79-12602
Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River
[NASA-TM-80124] 24 p0777 N79-31839

THERMAL PROTECTION
Review of plasma wall interactions in tokamaks
23 p0443 A79-36879
Tests of NASA ceramic thermal barrier coating for gas-turbine engines
[NASA-TM-79116] 22 p0357 N79-20118
Experiences related to GECS thermal control
24 p0763 N79-31269
Heat pipe technology for spacecraft thermal control
24 p0764 N79-31274

THERMAL RADIATION
A proposed thermophotovoltaic solar energy conversion system
22 p0287 A79-27317
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761
Design package for concentrating solar collector panels
[NASA-CR-150788] 21 p0173 N79-10523

THERMAL REACTORS
Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water
21 p0167 A79-20360

THERMAL RESISTANCE
Selective coatings for aluminum and steel solar absorbers
21 p0058 A79-13687
Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901
Determination of thermal contact resistances --- for solar thermoelectric generators
21 p0166 A79-20351
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395
Gas turbine operating and maintenance experience in Saudi Arabia
22 p0298 A79-28989
Ceramic solar receivers
24 p0670 A79-51731
A study of the effective resistance of the diffused layer and its effect on solar cell performance
22 p0367 N79-21541

THERMAL RESOURCES
Geothermal power plants of New Zealand, Philippines, and Indonesia: A technical survey of existing and planned installations
[COO-4051-23] 24 p0738 N79-29622
THERMAL SIMULATION
Thermal modeling of coal-fired MHD plant components
21 p0017 A79-10138
Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection
21 p0129 A79-17401
Gas stream composition and temperature determination in a coal-fired MHD simulation facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810
Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834
Thermal vacuum testing of solarpanels by solar simulation and infrared simulation
24 p0658 A79-50345
Thermal performance evaluation of the Calmac (liquid) solar collector
[NASA-CR-150819] 21 p0173 N79-10521
THERMAL STABILITY
Some aspects of aircraft jet engine fuels
21 p0035 A79-11368
Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242
Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation
23 p0358 A79-33990
Jet Fuel Thermal Stability
[NASA-TM-79231] 24 p0795 N79-33336
THERMAL STRESSES
Thermal stress cracking and the enhancement of heat extraction from fractured geothermal reservoirs
[LA-7235-MS] 21 p0198 N79-12568
THERMAL VACUUM TESTS
Development and testing of two- and three-stage heat pipe radiators
[AIAA PAPER 79-1060] 23 p0455 A79-38040
Thermal vacuum testing of solarpanels by solar simulation and infrared simulation
24 p0658 A79-50345
THERMIONIC CATHODES
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes
21 p0053 A79-13098
THERMIONIC CONVERTERS
Lithium and potassium heat pipes for thermionic converters
21 p0013 A79-10113
Thermionic power plant design point selection - The economic impact
21 p0025 A79-10214
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
Commercial applications of thermionic conversion using a fusion reactor energy source - A preliminary assessment
21 p0026 A79-10219
Prospects of thermionic power systems
21 p0026 A79-10220
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes
21 p0053 A79-13098
Thermionics and its application to the SPS --- solar power satellite for energy conversion
21 p0109 A79-16616
The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18479
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940
Optimization of an ideal thermionic converter
22 p0241 A79-20941
Contribution to the theory of the pulsed mode of operation of the thermionic energy converter. II
22 p0246 A79-21542
A new concept of thermionic converter
23 p0381 A79-32636
Theory of the pulsed operation of a thermionic converter. II - Ionization stage
23 p0442 A79-36815
Thermionic energy converter investigations
24 p0699 A79-51981
ZEPO - The worlds largest thermionic converter
24 p0699 A79-51982
Recent progress in hybrid mode thermionic converter development
24 p0700 A79-51986
State of cermet electrode development for flame heated thermionic converters
24 p0700 A79-51989
The effects of electron thermal conductivity on thermionic energy converters
24 p0700 A79-51990
A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers
24 p0704 A79-52166
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167
THERMIONIC DIODES
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
A new concept of thermionic converter
23 p0381 A79-32636
Flame-fired thermionic diode development
24 p0700 A79-51988
State of cermet electrode development for flame heated thermionic converters
24 p0700 A79-51989
Cryogenic thermal diode heat pipes
[NASA-CR-152268] 24 p0719 N79-28470
THERMIONIC EMISSION
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395
THERMIONIC EMITTERS
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes
21 p0053 A79-13098
Selective covers for natural cooling devices --- in space
22 p0272 A79-25522
THERMIONIC POWER GENERATION
The Department of Energy's thermionic energy conversion program
21 p0025 A79-10213
A summary of USSR thermionic energy conversion activity
21 p0026 A79-10216
NASA's thermionic technology program
21 p0026 A79-10217
Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921
Design study of a coal-fired thermionic-topped powerplant using an advanced boiler
24 p0700 A79-51983
NEP heat pipe radiators --- Nuclear Electric Propulsion
24 p0700 A79-51985
Optimisation of powerful energy supply systems for application in space
[IAF PAPER 79-169] 24 p0710 A79-53333
Power coupling alternatives for the NEP thermionic power system
[NASA-CR-159372] 22 p0367 N79-21547
Systems definition space-based power conversion systems --- for satellite power transmission to earth
[NASA-CR-150268] 23 p0546 N79-23483
Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28738
Thermionic conversion
24 p0728 N79-28762
THERMOCHEMICAL PROPERTIES
The efficiencies of thermochemical energy transfer
21 p0054 A79-13575
A hybrid chemical concept for solar energy storage
22 p0254 A79-22271
Energy storage efficiency for the ammonia/hydrogen-nitrogen thermochemical energy transfer system
22 p0261 A79-23718
Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545
Thermochemical energy storage and transport program
[SAND-78-8056] 21 p0221 N79-14570
THERMOCHEMISTRY
Recent advances in thermochemical energy storage and transport
21 p0012 A79-10104
A thermochemical energy storage system and heat pump
21 p0012 A79-10105
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127
A copper oxide-copper sulfate water-splitting cycle
21 p0015 A79-10128
Basic physical and chemical processes for storage of heat
21 p0038 A79-11805
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13874
Solar hydrogen production at high temperatures
21 p0104 A79-16464
Chemically driven heat pumps for solar thermal storage
21 p0120 A79-17316
The thermochemical decomposition of water using bromine and iodine
22 p0238 A79-20770
Problems around Fe-Cl cycles --- thermochemical decomposition of water hydrogen production
22 p0238 A79-20771
Screening reversible reactions for thermochemical energy transfer
22 p0285 A79-26823
Hydrogen via thermochemistry and future water-splitting technologies
22 p0289 A79-27654
A new thermochemical process for hydrogen production
22 p0312 A79-31153
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature --- for hydrogen production
23 p0382 A79-32875
Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966
Ammonia dissociation for solar thermochemical absorbers
23 p0396 A79-33765
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110
Storage of solar energy at low temperatures through chemical processes
23 p0469 A79-38637
Hydrogen via thermochemical and other advanced water-splitting technologies
24 p0614 A79-45590
The Westinghouse Sulfur Cycle Hydrogen Production Process
24 p0614 A79-45591
Dedicated nuclear facilities for electrolytic hydrogen production
24 p0614 A79-45592
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
24 p0685 A79-51839
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840
Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process
24 p0685 A79-51843
Thermochemical hydrogen production by the Mark-13 process - A status report
24 p0686 A79-51849
Hydrogen as the solar energy translator --- in photochemical and photovoltaic processes
24 p0686 A79-51852
Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296
Thermochemical production of hydrogen from water
[LA-UR-78-652] 21 p0180 N79-11236
Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32394
Recent advances in thermochemical energy storage and transport
[SAND-78-8505] 24 p0791 N79-32720
THERMOCLINES
Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production
22 p0237 A79-20730
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565
THERMOCOUPLES
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520
The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294
THERMODYNAMIC COUPLING
Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960
THERMODYNAMIC CYCLES
Coal-fired gas turbine power cycles with steam injection
21 p0004 A79-10082
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124
Effect of noncondensable gases on geothermal power generation
21 p0015 A79-10125
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127
Nitinol heat engines for economical conversion of low grade thermal density
21 p0027 A79-10230
Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232
Nitinol thermodynamic state surfaces --- heat engine material
21 p0045 A79-12264
The Arbonia control concept - Does flow regulation in the solar system cycle make sense --- working fluid regulation in solar heating facility
21 p0056 A79-13632
Solar water pumping
21 p0066 A79-14266
Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity
21 p0076 A79-14741
Thermal gradient-hydro generation cycle /TGHC/
21 p0098 A79-16102
Open-cycle magnetohydrodynamic electrical power generation --- Book
21 p0104 A79-16478
MHD power plant characteristics
21 p0105 A79-16480
Technical and economic aspects of open-cycle MHD power plants
21 p0105 A79-16482
Quasi-isentropic laser engines
21 p0111 A79-16632
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17492
Gas-cycle solar refrigeration system performance
21 p0153 A79-18471
A hybrid chemical concept for solar energy storage
22 p0254 A79-22271
The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311
Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819
The combined reheat gas turbine/steam turbine cycle. II - The LM 5000 gas generator applied to the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-8] 22 p0306 A79-30506
Some design considerations of automotive gas turbines
[SAE PAPER 790120] 22 p0314 A79-31360

Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature --- for hydrogen production
23 p0382 A79-32875
Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966
Symposium on the Engineering Aspects of Magnetohydrodynamics, 17th, Stanford University, Stanford, Calif., March 27-29, 1978, Proceedings
23 p0390 A79-33379
Open-cycle disk generator studies --- enthalpy extraction performance of open-cycle MHD channels
23 p0391 A79-33386
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110
Remote new energy sources utilization in on-site non-polluting power plant - Liquid air as energy carrier concept and final conversion plant design
23 p0416 A79-34141
Energy conservation by waste heat utilization
23 p0417 A79-34145
A gas absorption cycle for electric power generation
23 p0418 A79-34154
Comparative economics of alternative fuels for intermediate services, combined cycle power plant
23 p0419 A79-34160
The Powerton gasification combined-cycle test facility - A preview
23 p0424 A79-34454
Engineering studies of open-cycle coal-fired MHD for power generation
23 p0424 A79-34456
Advanced power cycles and their potential for electrical energy generation
23 p0424 A79-34457
Solar power plants. I - Present programs and outlooks
23 p0430 A79-35481
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193
Accounting for intangibles in a present worth comparison of advanced power generation alternatives
23 p0461 A79-38500
Utilizing geothermal resources below 150 C /300 F/
23 p0486 A79-40196
The Odeillo solar electric power plant
23 p0528 A79-41807
Regulation of the water steam cycle in a solar receiver
24 p0603 A79-44296
Hydrogen/oxygen steam generation - An example of aerospace technology transfer
24 p0613 A79-45585
Hydrogen via thermochemical and other advanced water-splitting technologies
24 p0614 A79-45590
OTEC 100-MWe alternate power systems study
24 p0623 A79-45831
Gravity opposed heat pipe --- for OTEC
24 p0624 A79-45842
Hybrid OTEC cycle avoids indirect heat exchangers
24 p0625 A79-45844
OTEC system response and control analysis --- optimization of thermal cycle with seawater pumps
24 p0625 A79-45850
Land-based application of an OTEC open-cycle power system
24 p0627 A79-45871
An open cycle approach to ocean thermal energy conversion
24 p0674 A79-51759
Computer analysis of coal gasification combined cycle plants
24 p0687 A79-51858
Thermodynamic evaluation of heat pumps working with high temperatures
24 p0697 A79-51965
Waste heat as an alternate fuel - Its opportunities and potential
24 p0698 A79-51968
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
24 p0708 A79-52957
The use of liquid natural gas as heat sink for power cycles
22 p0332 N79-16262
Development of thermal prime movers for heat pump drive
22 p0332 N79-16263
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems
23 p0545 N79-22950
Thermoelectrochemical cycles for power and hydrogen production
[BNL-24387] 23 p0563 N79-24491
Combined gas/steam turbine power plants with supplementary firing
24 p0723 N79-28736
Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28738
Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles
24 p0724 N79-28739
Magnetohydrodynamics
24 p0724 N79-28741
Thermionic conversion
24 p0724 N79-28742
Solar engine --- Flat plate type
[NASA-CASE-LAR-12148-1] 24 p0737 N79-29608

THERMODYNAMIC EFFICIENCY

Geothermal preheating in fossil-fired steam power plants
21 p0014 A79-10118
Thermal performance trade-offs for point focusing solar collectors
21 p0020 A79-10165
Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166
The Pseudo Stirling cycle - A suitable performance criterion
21 p0023 A79-10196
Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine
21 p0024 A79-10201
Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine
21 p0024 A79-10202
Research on the sodium heat engine
21 p0028 A79-10231
Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232
The efficiencies of thermochemical energy transfer
21 p0054 A79-13575
Absorption of solar radiation by alkali vapors --- for efficient high temperature energy converters
21 p0108 A79-16612
A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613
Solar energy and the second law of thermodynamics
21 p0118 A79-17292
The French CNRS 1 MW solar power plant
21 p0141 A79-17498
Two thermodynamic optima in the design of sensible heat units for energy storage
21 p0150 A79-18091
Efficiency improvement by means of multicomponent processes - Improvement of the efficiency of heat-power transformation by means of an employment of Clausius-Rankine sorption processes
21 p0164 A79-19975
Problems around Fe-Cl cycles --- thermochemical decomposition of water hydrogen production
22 p0238 A79-20771
Storage efficiency in a solar plant
22 p0254 A79-22270
The cryogenic heat transfer tunnel - A new tool for convective research --- thermal efficiency testing of solar tower receiver
22 p0267 A79-24316
Analysis and design of air heating unglazed flat plate solar collectors
22 p0280 A79-26202

Analysis of energy storage by phase change with an array of cylindrical tubes
22 p0281 A79-26207
Heat loss characteristics of an evacuated plate-in-tube collector
22 p0285 A79-26818
Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819
Screening reversible reactions for thermochemical energy transfer
22 p0285 A79-26823
Thermodynamic basis for combining cycles of heat producing power plants
22 p0298 A79-29297
Ways of improving steam-gas power plants --- fuel economy
22 p0299 A79-29298
Thermodynamics of the conversion of diluted radiation --- solar energy application
22 p0310 A79-30910
A new thermochemical process for hydrogen production
22 p0312 A79-31153
Direct thermomagnetic splitting of water
22 p0312 A79-31154
MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192
Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector
22 p0317 A79-31408
A solar collector thermal performance test for developmental programs
22 p0317 A79-31413
The first year of solar collector testing at Ontario Research
22 p0322 A79-31450
The relationship of power and heat production with closed cycle gas turbines
[ASME PAPER 79-GT-103] 23 p0377 A79-32379
GUD - An unfired combined cycle approach to energy utilization --- in turbine power plant gas and steam waste heat recovery system
[ASME PAPER 79-GT-131] 23 p0377 A79-32400
A 2500 HP addition to the Ruston range --- gas turbines
[ASME PAPER 79-GT-205] 23 p0380 A79-32462
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature --- for hydrogen production
23 p0382 A79-32875
Open-cycle disk generator studies --- enthalpy extration performance of open-cycle MHD channels
23 p0391 A79-33386
Dynamics of a free-piston Diesel- MHD generator
23 p0395 A79-33424
Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor
23 p0395 A79-33428
Designing thermally efficient buildings for the U.S. Midwest
23 p0397 A79-33951
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991
Major factors in OTEC heat exchanger design
23 p0404 A79-34039
Major factors in OTEC power cycle design
23 p0404 A79-34041
A thermoeconomic analysis of thermal energy storage
23 p0416 A79-34138
Correlation of instantaneous and all-day thermal performance of flat-plate solar collectors
23 p0430 A79-35065
Thermal energy storage using hot liquids
23 p0451 A79-37879
Aspects of meeting complex industrial energy demand patterns using recuperated gas turbines
23 p0454 A79-37905
Solar collector sizing and design - An overview
[AIAA PAPER 79-0975] 23 p0457 A79-38181
Thermal performance of integrated solar collector evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592
Transient behaviour of solar flat plate collectors
23 p0467 A79-38612
Thermal performance of single-pass solar fluid heaters
23 p0467 A79-38613
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653
Thermodynamic considerations for the energy conversion process in geothermal power plants
23 p0476 A79-38947
Brayton engines for dispersed solar power
23 p0477 A79-38950
Utilizing geothermal resources below 150 C /300 F/
23 p0486 A79-40196
An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants
23 p0487 A79-40369
Photochemical aspects of solar energy conversion and storage
23 p0495 A79-40746
Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate
24 p0602 A79-44263
Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen
24 p0602 A79-44265
The influence of environmental parameters on flat plate solar collector performance
24 p0604 A79-44557
Graphical representation of solar collector performance
24 p0609 A79-45216
Hydrogen/oxygen steam generation - An example of aerospace technology transfer
24 p0613 A79-45585
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones
24 p0630 A79-46306
Energy conservation via heat transfer enhancement --- in heat exchangers
24 p0630 A79-46307
Thermodynamic analysis of combined GTP-TEG solar energy converter --- Gas Turbine power Plants - Thermoelectric Generators
24 p0636 A79-46758
Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545
Hydride engines
24 p0685 A79-51841
The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant
24 p0687 A79-51859
Multistage fluidised coal combustor
24 p0688 A79-51864
Effect of noncondensables on the performance of geothermal steam power plants
24 p0689 A79-51868
Elementary design guidelines for Stirling engines
24 p0689 A79-51874
DOE stationary external combustion engine program - Status report
24 p0689 A79-51882
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883
A solar-Stirling small power system
24 p0690 A79-51884
Design characteristics of an advanced Stirling engine concept
24 p0690 A79-51889
Increasing gas turbine efficiency through the use of a waste heat methanol reactor
24 p0702 A79-52000
Thermal performance evaluation of the Solargenics solar collector at outdoor conditions
[NASA-CR-150857] 21 p0228 N79-15401
Experimental verification of a standard test procelure for solar collectors
[PB-289912/8] 22 p0372 N79-21632
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems
23 p0545 N79-22950

Comparison of three experimental methods used in determining the thermal performance of flat-plate solar collectors
23 p0557 N79-24434

High-efficiency thin-film GaAs solar cells
[NASA-CR-158641] 23 p0560 N79-24463

Relative effective solar space heating over the United States obtained from southward-tilted solar collectors
[PB-292963/6] 23 p0565 N79-24513

Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539

Combined cycles for power generation, volume 1 --- conferences, Belgium, Apr. 1978
[VKI-LEC-SER-1978-6-VOL-1] 24 p0723 N79-28732

Magnetohydrodynamics
24 p0724 N79-28741

An initial model for the finite displacement response characteristics of a fluidyne pump --- thermodynamic efficiency
[AD-A069159] 24 p0734 N79-29521

Long-term weathering effects on the thermal performance of the solargenics (liquid) solar collector at outdoor conditions --- Marshall Space Flight Center Solar test facility
[NASA-CR-150523] 24 p0737 N79-29601

Indoor test and long-term weathering effects on the thermal performance of the solar energy system (liquid) solar collector --- Marshall Space Flight Center solar test facility and solar simulator
[NASA-CR-150794] 24 p0749 N79-30715

Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379

Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector
[NASA-CR-161306] 24 p0797 N79-33561

Indoor test for thermal performance of the GE TC-100 liquid solar collector eight- and ten-tube configuration --- Marshall Space Flight Center solar simulator
[NASA-CR-161305] 24 p0798 N79-33568

THERMODYNAMIC EQUILIBRIUM

Model predictions for the stability of ternary metallic hydrides
21 p0038 A79-11802

Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983

THERMODYNAMIC PROPERTIES

Solar Power Satellite thermal analysis
21 p0003 A79-10028

Thermodynamic and kinetic considerations on zinc-halogen batteries
21 p0040 A79-11822

Nitinol thermodynamic state surfaces --- heat engine material
21 p0045 A79-12264

Alternative aviation turbine fuels
21 p0047 A79-12378

Dynamic behaviour of light-weight solar collectors
21 p0056 A79-13628

Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523

Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342

Thermodynamics of pressure plateaus in metal-hydrogen systems
22 p0238 A79-20772

Thermodynamics of metal, alloy and intermetallic/hydrogen systems
22 p0248 A79-21680

High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy
22 p0249 A79-21689

Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory
22 p0250 A79-21699

Hydride formation of C14-type Ti alloy
22 p0250 A79-21701

On an irreversible thermodynamic analysis of thermoelectric devices
22 p0260 A79-23609

Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366

High temperature solar thermoelectric generator
23 p0447 A79-37299

Solar and chemical energy
23 p0462 A79-38573

Thermodynamic analysis of a solar heating and cooling system equipped with an absorption refrigerator heat pump operating in winter
23 p0467 A79-38610

Thermodynamic considerations for the energy conversion process in geothermal power plants
23 p0476 A79-38947

Development and thermodynamic layout of a fuel cell component
23 p0528 A79-42227

Thermodynamic considerations in the production of synthetic fuels from coal
24 p0615 A79-45603

Thermodynamic basis for the choice of working fluids for solar absorption cooling systems
24 p0641 A79-47791

Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796

Cover systems for high temperature flat-plate solar collectors
24 p0642 A79-47799

Thermodynamic evaluation of heat pumps working with high temperatures
24 p0697 A79-51965

The concept of available work as applied to the conservation of fuel resources
24 p0698 A79-51970

Analytical methods for evaluating two-dimensional effects in flat-plate solar collectors
21 p0181 N79-11462

Thermal analysis of receivers for solar concentrators and optimization procedure for power production
21 p0182 N79-11465

Long-term weathering effects on the thermal performance of the Lennox/Honeywell (liquid) solar collector
[NASA-CR-150818] 21 p0204 N79-13493

LARGO hot water system thermal performance test report
[NASA-CR-150841] 21 p0205 N79-13500

Thermal and kinetic analysis of the pyrolysis of coals
22 p0336 N79-16704

A two-dimensional thermal analysis of a new high-performance tubular solar collector
22 p0352 N79-19060

Thermal and other tests of photovoltaic modules performed in natural sunlight
[NASA-CR-158174] 22 p0354 N79-19460

Long term weathering effects on the thermal performance of the solaron (air) solar collector
[NASA-CR-161166] 22 p0371 N79-21621

Thermal performance evaluation of the Semco (liquid) solar collector
[NASA-CR-161230] 23 p0594 N79-27656

Indoor test for thermal performance evaluation of seven Elcam fin-tube solar collector configurations
[NASA-CR-161236] 23 p0594 N79-27657

Thermodynamic and transport properties of isobutane: A survey of available data
[COO-4051-35] 24 p0794 N79-33096

THERMODYNAMICS

A thermodynamic study of heating with geothermal energy
[ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253

Relation between concentration and acceptance in solar collectors
24 p0641 A79-47795

THERMOELASTICITY

Thermoelastic solutions for in-situ gasification of coal
22 p0330 N79-16135

Thermoelastic analysis of a superconducting cable
[LA-7465-MS] 24 p0781 N79-32477

THERMOELECTRIC GENERATORS

Selenide isotope generator for the Galileo mission 21 p0022 A79-10185

Cooling radioisotope thermoelectric generators in the Shuttle 21 p0023 A79-10186

The application of solar thermoelectric generators in near-sun missions 21 p0023 A79-10187

Copper/water axially-grooved heat pipes for RTG applications 21 p0023 A79-10188

Development of a 1 kW/e/ isotope fueled Stirling cycle power system 21 p0025 A79-10210

Selenide thermoelectric converter technology 21 p0026 A79-10221

Selenide technology evaluation program at JPL 21 p0026 A79-10222

Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/ 21 p0027 A79-10226

Militarized thermoelectric power sources 21 p0027 A79-10227

High reliability contacts for miniature thermoelectric converters 21 p0027 A79-10228

Solar furnace type high power density thermoelectric generator 21 p0027 A79-10229

Research on the sodium heat engine 21 p0028 A79-10231

An analysis of a cylindrical parabolic focussing collector for distributed collector power system 21 p0134 A79-17442

Development of solar collectors for low temperature level and of concentrators for thermal and photoelectric conversion 21 p0135 A79-17445

The attainable efficiency of the solar thermoelectric generators 21 p0140 A79-17496

Determination of thermal contact resistances --- for solar thermoelectric generators 21 p0166 A79-20351

Thermal converters with transverse thermoelectromotive forces 22 p0256 A79-22847

On an irreversible thermodynamic analysis of thermoelectric devices 22 p0260 A79-23609

Design concepts of solar thermoelectric generators in space applications 22 p0260 A79-23612

Optimization method of isotopic thermoelectric microgenerator geometry 22 p0260 A79-23613

Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator 22 p0260 A79-23616

Efficiency of a series of thermoelectric generators in a solar wedge concentrator 22 p0260 A79-23618

Determining the reliability of radioisotope thermoelectric generators /RTGs/ designed for terrestrial and undersea applications 22 p0261 A79-23622

Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/ 22 p0261 A79-23623

Stability of work and sensitivity of semiconductor thermoelectric systems under automatic control 22 p0261 A79-23624

Solar thermal electric power systems - Comparison of line-focus collectors 22 p0263 A79-23758

Optimization of the heat transfer circuit of solar power plants using distributed solar thermal converters - Application to collectors of the THEK type 23 p0382 A79-32953

Optimization of radioisotope thermoelectric generators with gamma-radiation protection 23 p0433 A79-35176

Development of thermoelectricity studies in the USSR --- Russian book 24 p0601 A79-43848

Thermodynamic analysis of combined GTP-TEG solar energy converter --- Gas Turbine power Plants - Thermoelectric Generators 24 p0636 A79-46758

Energy balance of solar thermoelectric generators 24 p0646 A79-48734

SNAP 19 performance update for Pioneer and Viking missions 24 p0694 A79-51940

Solar thermoelectric energy conversion 24 p0699 A79-51976

Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power 24 p0699 A79-51977

Analysis of a heat exchanger - Thermoelectric generator system 24 p0699 A79-51978

Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator 24 p0699 A79-51979

Effective application of thermoelectric heat pumps 24 p0699 A79-51980

Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire 24 p0706 A79-52368

Market assessment of fuel cell total energy systems [ORNL/CCM-36] 23 p0598 N79-27704

THERMOELECTRIC MATERIALS

Selenide thermoelectric converter technology 21 p0026 A79-10221

Analytical predictions of selenide RTG power degradation 21 p0026 A79-10223

Suppression of vaporization in copper-silver-selenide thermoelectric materials 21 p0027 A79-10224

Modified silicon-germanium alloys with improved performance --- thermoelectric material 21 p0027 A79-10225

Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/ 21 p0027 A79-10226

Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy 22 p0259 A79-23604

Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion 22 p0260 A79-23615

Regenerative burner system for thermoelectric power sources 22 p0261 A79-23621

Determining the reliability of radioisotope thermoelectric generators /RTGs/ designed for terrestrial and undersea applications 22 p0261 A79-23622

High temperature solar thermoelectric generator 23 p0447 A79-37299

Development of thermoelectricity studies in the USSR --- Russian book 24 p0601 A79-43848

THERMOELECTRIC POWER GENERATION

Circulating-bed boiler concepts for steam and power generation 21 p0008 A79-10071

Comparative evaluation of distributed-collector solar thermal electric power plants 21 p0021 A79-10173

Brayton Isotope Power System - The versatile dynamic power converter --- for spacecraft 21 p0023 A79-10190

Melting multifoil insulation for KIPS emergency cooling --- Kilowatt Isotope Power System 21 p0023 A79-10191

Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion 21 p0054 A79-13290

A central receiver solar thermal power system 21 p0091 A79-15872

10-megawatt solar central receiver pilot plant 21 p0094 A79-15906

Temperature dependent parameter analysis of thermoelectric devices 21 p0113 A79-16740

Solar thermal conversion installations in the medium power range - The Thek project 22 p0254 A79-22269

International Conference on Thermoelectric Energy Conversion, 2nd, University of Texas, Arlington, Tex., March 22-24, 1978, Proceedings and Supplement
22 p0259 A79-23603
Estimating heat loads on multistage thermoelectric heat pumps
22 p0260 A79-23614
Reversible thermoelectric power conversion of energy fluctuations
22 p0261 A79-23619
Regenerative burner system for thermoelectric power sources
22 p0261 A79-23621
Thermoelectric magnetohydrodynamics
22 p0312 A79-31098
Solar power plants --- thermoelectric conversion in Canada
22 p0318 A79-31416
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738
High temperature solar thermoelectric generator
23 p0447 A79-37299
Development of thermoelectricity studies in the USSR --- Russian book
24 p0601 A79-43848
Thermoelectric OTEC
24 p0624 A79-45843
Potential for ocean thermal energy conversion electric power generation in the Southeast region
24 p0626 A79-45855
Thermodynamic analysis of combined GTP-TEG solar energy converter --- Gas Turbine Power Plants - Thermoelectric Generators
24 p0636 A79-46758
Baseline design of the thermoelectric reactor space power system
24 p0693 A79-51932
Use of modular heat source stack in RTGs --- Radioisotope Thermoelectric Generator
24 p0693 A79-51933
Design optimization of RTG for Solar-Polar Mission --- Radioisotope Thermoelectric Generator
24 p0693 A79-51935
Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936
Performance limits for liquid-metal heat pipes containing long adiabatic sections
24 p0694 A79-51937
Copper/water axially-grooved heat pipes - Fabrication and performance testing
24 p0694 A79-51938
Optimum combinations of cooling alternatives for steam-electric power plants, volume 2
[PB-290576/8] 23 p0565 N79-24515
Energy analysis of the helio-thermal-electric conversion
[P-77/P40/242] 24 p0759 N79-30931

THERMOELECTRICITY
On an irreversible thermodynamic analysis of thermoelectric devices
22 p0260 A79-23609
The effect of thermo-electric forces on the density profiles in a thermonuclear plasma surrounded by a cold blanket
22 p0292 A79-27886
Development of thermoelectricity studies in the USSR --- Russian book
24 p0601 A79-43848
Heat pipe technology. A bibliography with abstracts
[NASA-CR-158005] 23 p0546 N79-23364

THERMOGRAVIMETRY
Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity
21 p0076 A79-14741
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop --- for low temperature geothermal sources
23 p0408 A79-34074

THERMOHYDRAULICS
Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity
21 p0076 A79-14741
Geothermal power and water production studies at the University of California
[ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778
Model of fluid flow in boilers with helicoidal coil --- for spherical solar collectors
23 p0383 A79-32959
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591

THERMOMAGNETIC EFFECTS
Direct thermomagnetic splitting of water
22 p0312 A79-31154

THERMOMECHANICAL TREATMENT
The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate
22 p0239 A79-20824

THERMOMETERS
A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0097 A79-16075

THERMONUCLEAR POWER GENERATION
Controlled thermonuclear fusion
22 p0287 A79-27339
Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760
A waste management strategy for nuclear fusion power systems from a regulatory perspective
23 p0407 A79-34064
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171
Thermonuclear energy from ball lightning
24 p0696 A79-51957
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209
Department of Energy policy for fusion energy
[DOE/ER-0018] 23 p0586 N79-26952
Optimization of the fission-fusion hybrid concept
[ORNL/PPA-79/3] 24 p0778 N79-32113

THERMONUCLEAR REACTIONS
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264
Hydrogen technology from thermonuclear research
22 p0338 N79-16997

THERMOPHYSICAL PROPERTIES
Investigation of the thermophysical characteristics of cryogenic heat pipes with a metal-fiber wick
22 p0288 A79-27529
Thermal properties of MHD electrode materials
23 p0392 A79-33400
High temperature materials study --- for thermal insulation in solar furnaces
23 p0431 A79-35070
Study of the thermal inertia of an electrode microarc
23 p0530 A79-42869
Dependence of the pour point of diesel fuels on the properties of the initial components
[NASA-TM-75424] 22 p0364 N79-21217

THERMOPILES
Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229
Study of diffusion processes in low-temperature thermopiles --- for solar energy conversion
21 p0054 A79-13290

THERMOREGULATION
A Thermic Controller for a thermic diode solar panel
[ASME PAPER 78-WA/SOL-9] 21 p0163 A79-19841

THERMOSIPHONS
Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177
Passive solar design --- for domestic heating and cooling systems
21 p0074 A79-14720
A passive rock bed - Design, construction, and performance
21 p0121 A79-17328

Investigation on the feasibility of using a two-phase thermosyphon for solar storage, space heating and cooking
21 p0121 A79-17330
A heat operated mechanical device to control the temperature and flow of water entering a hot water storage tank in a solar water heating system
21 p0140 A79-17487
Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems
21 p0150 A79-18092
A theoretical analysis of solar collector/storage panels
[ASME PAPER 78-WA/SOL-11] 21 p0163 A79-19843
Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755
Effects of low solar input and amount of storage on thermosyphon hot water system performance
22 p0267 A79-24312
A test bed for thermosyphon solar air collectors
[AIAA PAPER 79-0541] 22 p0274 A79-25860
On the stability of the natural circulation solar heater
23 p0531 A79-42896

THERMOSTATS
Controls for residential solar heating
21 p0101 A79-16418

THETA PINCH
Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432
Theory of the striated corona in a theta pinch
22 p0295 A79-28315
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058
Theta-pinch description from classical electrodynamics
24 p0640 A79-47602

THICK FILMS
Evaluation of thick film materials for use as solar cell contacts
23 p0507 A79-40980
Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486

THICK WALLS
On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SOL-13] 21 p0163 A79-19845

THICKNESS
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121

THICKNESS RATIO
Thin cells for space
24 p0784 N79-32652
CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659

THIN BODIES
High temperature, low mass solar blanket development
24 p0691 A79-51902
High efficiency ultrathin silicon solar cells
24 p0692 A79-51903

THIN FILMS
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346
Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Chemical vapor deposited molybdenum films for use in photothermal conversion
22 p0294 A79-28148
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428
Low cost thin-film CdS-based solar cells progress and promise
[ASME PAPER 79-SOL-15] 22 p0309 A79-30549
Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610
Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379
Investigation of the optical properties of transparent materials for solar energy applications
23 p0434 A79-35384
Thin-film GaAs solar cells with grain-boundary edge passivation
23 p0436 A79-35749
Cadmium-sulphide/copper-sulphide thin-film solar cells - Review of methods of producing the CdS and Cu2S layers
23 p0441 A79-36786
Thin-film solar cells produced by physical vapour deposition
23 p0441 A79-36787
Chemical vapor deposition of spectrally selective surfaces for high-temperature photothermal conversion
23 p0445 A79-37155
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques
23 p0445 A79-37156
Technique to determine the growth rate and resistivity of evaporated CdS thin films
23 p0445 A79-37157
Sputtered thin film solar cells
23 p0448 A79-37843
Thin-film coatings in solar water heating systems
23 p0452 A79-37887
Cu2S-CdS thin-film solar cells
23 p0466 A79-38601
The photovoltaic properties of thin copper oxide films
23 p0499 A79-40909
The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949
Testing of ultra-thin solar cells
23 p0503 A79-40952
Silicon foil cells
23 p0503 A79-40954
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films
23 p0505 A79-40963
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988
Luminescent solar concentrators
23 p0509 A79-40997
Concepts for rheotaxially-grown thin-film tandem III-V solar cells
23 p0513 A79-41030
Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells
23 p0515 A79-41044
Thin film polycrystalline silicon solar cells
23 p0518 A79-41067
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255
The modeling of thin film heat exchangers --- for OTEC
24 p0622 A79-45820
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760

Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737

Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190

CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197

Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

Investigation into the optical characteristics of transparent solar-energy materials
24 p0663 A79-50707

Spectrally selective solar absorber coatings
24 p0704 A79-52150

Thin film solar collectors for material science experiments in space
[IAF PAPER 79-202] 24 p0710 A79-53353

Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158095] 22 p0334 N79-16368

Thin film battery/fuel cell power generating system
[CONS/1197-9] 22 p0369 N79-21556

High-efficiency thin-film GaAs solar cells
[NASA-CR-158641] 23 p0560 N79-24463

Cadmium sulfide-copper sulfide heterojunction cell research
[SAN-1459-3] 24 p0789 N79-32701

Investigation of low cost solar cells based on Cu2O --- MIS solar cell theory
[PB-295888/2] 24 p0792 N79-32737

THIN PLATES

Development of an improved high efficiency thin silicon solar cell
[NASA-CR-158172] 22 p0354 N79-19459

Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project
[NASA-CR-158732] 23 p0586 N79-26979

THIOLS

Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels --- compatibility of aircraft materials to fuels
[AD-A060322] 21 p0226 N79-15203

THOMSON SCATTERING

Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430

Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345

An experimental determination of the parallel electron velocity distribution during strong turbulence --- in Texas Turbulent Torus
23 p0446 A79-37264

Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution
23 p0478 A79-39566

Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47804

THORIUM

Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570

THREE DIMENSIONAL FLOW

An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32349

Three dimensional mathematical model of flow stratification in thermocline storage tanks
24 p0609 A79-45214

THYRISTORS

Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898

Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744

Superconducting energy storage magnets
22 p0236 A79-20537

TIDAL WAVES

Exploiting wave power --- electric energy source from ocean waves
24 p0660 A79-50400

Wave power, progress and prospects
24 p0666 A79-50891

TIDE POWERED GENERATORS

Tidal power plants - Sites, history and geographical distribution
21 p0150 A79-18102

Selection of optimum sites for tidal power development in the Bay of Fundy
21 p0152 A79-18110

The economics of Fundy tidal power
21 p0152 A79-18112

Principles of design and construction for marine structures for wave/tidal/ocean thermal energy
21 p0152 A79-18114

Studies in retiming tidal energy
21 p0152 A79-18115

The role of tidal power stations in future scenarios for electricity storage in U.K.
21 p0152 A79-18116

Tidal power in the Bay of Fundy
22 p0237 A79-20729

Influence of technological advances on potential tidal power development
23 p0450 A79-37865

Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866

Hydrogen from falling water --- hydraulic energy conversion to chemical energy
24 p0614 A79-45594

Exploiting wave power --- electric energy source from ocean waves
24 p0660 A79-50400

Pumped storage battery with 100 percent efficiency
24 p0679 A79-51795

Major electrical equipment proposed for tidal power plants in the Bay of Fundy
24 p0707 A79-52799

Harnessing tidal energy
[PB-286671/3] 21 p0222 N79-14581

Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients
[PB-295876/7] 24 p0792 N79-32735

TIDE POWERED MACHINES

Characteristics of a fully reversible axial pump-turbine for application in tidal power plants
23 p0450 A79-37868

Tidal current energy conversion
23 p0450 A79-37870

TIDEPOWER

Potential and technical utilization of renewable energy sources
21 p0058 A79-13655

Wind, waves, and tides --- as future energy sources
21 p0074 A79-14719

International Symposium on Wave and Tidal Energy, University of Kent, Canterbury, England, September 27-29, 1978, Proceedings. Volume 1
21 p0150 A79-18101

Review of optimization and economic evaluation of potential tidal power developments in the Bay of Fundy
21 p0152 A79-18111

Prefabricated caissons for tidal power development
21 p0152 A79-18113

Energy from sea and air by large-span tensioned foils
23 p0410 A79-34084

Tidal and river current energy systems
23 p0449 A79-37862

Tidal power - The path to production
23 p0450 A79-37863

Influence of technological advances on potential tidal power development
23 p0450 A79-37865

Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866

Tidal current energy conversion
23 p0450 A79-37870

Energy analysis of wave and tidal power
23 p0455 A79-37918

TIDES

A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine
22 p0323 A79-31554

TILES
Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649
TIMBER INVENTORY
FLAME: Forestry Lands Allocated for Managing energy. Feasibility study
[AD-A059993] 21 p0217 N79-14507
TIME DEPENDENCE
Torque ripple in a vertical axis wind turbine
21 p0029 A79-10239
Yield of ground storage of heat in solar ponds
21 p0133 A79-17429
TIME MEASUREMENT
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610
TIME RESPONSE
Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981
Stochastic simulation of hourly global radiation sequences
24 p0661 A79-50541
TIN
Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296
TIN COMPOUNDS
Changes within tin-containing catalysts under hydrorefining conditions --- for coal liquefaction
24 p0628 A79-45993
TIN OXIDES
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells
21 p0122 A79-17338
Transparent conducting coatings for solar cells
21 p0124 A79-17350
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells
22 p0272 A79-25069
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945
Barrier heights and interfacial effects in SnO2/Si solar cells
23 p0505 A79-40965
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966
Efficient electron-beam-deposited ITO/n-Si solar cells
24 p0629 A79-46152
Fabrication and characterization of SnO2/n-Si solar cells
24 p0642 A79-47802
Properties of chemically sprayed SnO2 antireflecting films on Si solar cells
24 p0656 A79-50196
An anomalous photocurrent in SnO2-Si heterojunction solar cells
24 p0668 A79-50950
TITANIUM
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996
The effects of copper and titanium on silicon solar cells
23 p0504 A79-40961
Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
TITANIUM ALLOYS
New alloy systems for hydrogen storage
21 p0038 A79-11806
Hydride formation of C14-type Ti alloy
22 p0250 A79-21701
The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study
22 p0285 A79-26947
Materials for windmill blades
23 p0453 A79-37897
Erosion study of different materials affected by coal ash particles
24 p0646 A79-48864
TITANIUM COMPOUNDS
Electronic structure and physical properties of Ti-H and Zr-H using NMR
22 p0248 A79-21685
The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700
TITANIUM OXIDES
Study of the interaction of H2O and O2 with the surface of TiO2 by electron stimulated desorption and Auger and characteristic loss spectroscopies
21 p0037 A79-11793
Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191
TITRATION
An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc
21 p0035 A79-11546
TOKAMAK DEVICES
Doublet III design and construction --- Tokamak fusion research device
21 p0018 A79-10145
Demonstration and commercial prototype tokamak reactors
21 p0018 A79-10146
On the ion energy balance in TFR with and without neutral injection heating
21 p0069 A79-14452
Recent results from the PLT tokamak
21 p0069 A79-14453
Review of tokamak theory results
21 p0069 A79-14454
Progress in tokamak experimental research in the Soviet Union
21 p0069 A79-14455
Review of results from DITE tokamak
21 p0069 A79-14456
Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457
Toroidal high-beta systems
21 p0070 A79-14462
Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma
21 p0071 A79-14467
Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program --- Book
21 p0077 A79-14776
Review of experimental results. I, II --- MHD instability effects on tokamak confinement with ohmic heating
21 p0077 A79-14778
MHD equilibrium and stability --- in tokamak devices
21 p0078 A79-14779
Collisional transport --- particle diffusion and heat transport in tokamak
21 p0078 A79-14780
Magnetic divertors --- in large tokamak plasma confinement experiments
21 p0078 A79-14781
The 'FINTOR 1' design - A minimum size tokamak experimental reactor
21 p0078 A79-14782
Philosophy and physics of predemonstration fusion devices
21 p0078 A79-14783
Characteristics of a predemonstration fusion device
21 p0078 A79-14784
Compact experiments for alpha-particle heating --- of confined D-T plasma in tokamak
21 p0078 A79-14786
Superconducting magnet systems in EPR designs --- Experimental Power Reactor
21 p0079 A79-14789
Materials problems and possible solutions for near term tokamak fusion reactors
21 p0079 A79-14790

Energy sources and conventional magnets --- for tokamak experiment Power Reactor toroidal field
21 p0079 A79-14791

Auxiliary heating in breakeven tokamaks
21 p0079 A79-14792

The impact of servicing requirements on tokamak fusion reactor design
21 p0079 A79-14793

Fusion power by magnetic confinement - Program plan
21 p0080 A79-14794

High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318

Large-scale cryopumping for controlled fusion
21 p0085 A79-15330

Dynamics and feedback control of ISX tokamak
21 p0107 A79-16559

Energy storage for tokamak reactor cycles --- during downtime for periodic plasma quench and reignition
21 p0111 A79-16727

Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak --- safety factor
21 p0155 A79-18830

The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541

Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430

Measurements of plasma rotation in tokamak LT-3
22 p0252 A79-22238

Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240

Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

Alpha transport and blistering in tokamaks
22 p0253 A79-22243

A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a
22 p0255 A79-22379

Wave reflection from the lower hybrid surface - A toroidal effect --- in tokamaks
22 p0255 A79-22427

Non-linear numerical algorithms for studying tearing modes --- in tokamaks
22 p0257 A79-22981

MHD instabilities
22 p0259 A79-23599

Stability criteria for current-driven drift wave eigenmodes --- in tokamaks
22 p0269 A79-24813

Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity --- in tokamaks
22 p0269 A79-24814

Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852

Non-thermal emission at the plasma frequency --- spectra obtained on tokamak fusion reactors
22 p0270 A79-24854

Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859

RF-heating in stationary systems --- of toroidal plasma in tokamaks
22 p0271 A79-24864

Lower hybrid resonance heating --- of tokamak plasma
22 p0271 A79-24865

Magneto-acoustic resonance heating in the ion-cyclotron frequency domain --- of tokamak plasmas
22 p0271 A79-24866

The potential of fusion reactors as process heat source
22 p0284 A79-26624

Doublet III --- tokamak program review
22 p0290 A79-27667

The Alcator liquid nitrogen-cooled tokamaks
22 p0290 A79-27668

Status report on TFTR --- Toroidal Fusion Test Reactor
22 p0290 A79-27669

Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

On the motion of runaway electrons in momentum space --- analysis for multi-component plasma in tokamaks
22 p0291 A79-27880

Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27885

200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

Feasibility of MHD-ac induction electric power plant --- using tokamak reactor exhaust plasma
22 p0303 A79-29794

The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
22 p0312 A79-31183

Interpretation of cyclotron radiation spectra from runaway discharges in TFR
22 p0313 A79-31185

A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186

The effects of wall temperature on light impurities in Alcator --- tokamak device
22 p0313 A79-31188

Large tokamak experiments - Report on the Third IAEA Technical Committee Meeting, Paris, 1-6 September 1978
22 p0313 A79-31193

Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760

Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762

Calculation of the Q factor for a two-component tokamak
22 p0324 A79-31763

Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764

The JET project - A step towards the production of power by nuclear fusion
22 p0326 A79-31918

Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473

Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345

Fusion power demonstration study at ORNL
23 p0407 A79-34059

The ELMO Bumpy Torus - An alternative fusion reactor concept
23 p0407 A79-34060

System studies for a tokamak fusion power plant
23 p0407 A79-34061

Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062

Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876

Surface processes in plasma wall interactions --- in tokamak experiments
23 p0442 A79-36877

Progress in tokamak and stellarator experiments
23 p0443 A79-36878

Review of plasma wall interactions in tokamaks
23 p0443 A79-36879

Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880

- Divertor experiments for controlling plasma-wall interactions 23 p0443 A79-36881
- Recycling processes in tokamaks 23 p0443 A79-36882
- Tokamak plasma diagnosis by surface physics techniques 23 p0443 A79-36883
- Surface effects and impurity production in tokamak machines 23 p0443 A79-36884
- Impurity behaviour in real and simulated tokamak plasmas 23 p0444 A79-36885
- Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide --- tokamak wall materials 23 p0444 A79-36893
- Superthermal alpha transport and wall bombardment in tokamaks 23 p0444 A79-36927
- Numerical modeling of impurity effects --- on energy balance in tokamak experiments 23 p0445 A79-36945
- Oxygen adsorption on stainless steel --- in tokamak reactors 23 p0445 A79-36965
- Fusion research - The temperature rises 23 p0445 A79-37000
- Drift wave propagation and convective wave growth in tokamaks 23 p0446 A79-37262
- Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges 23 p0478 A79-39676
- A study of waveguides for far infrared interferometers measuring electron density of tokamak plasmas 23 p0526 A79-41842
- Dynamics of high-beta tokamaks with anisotropic pressure 23 p0526 A79-41939
- Analytic computation of minimum beta at ignition for various transport scaling laws 23 p0526 A79-41940
- Plasma-surface interactions in tokamaks 23 p0527 A79-41942
- Anomalous diffusion and transport beta limits in dense tokamak plasmas 23 p0527 A79-41943
- Measurements of plasma shape in a tokamak 23 p0527 A79-41944
- A realistic alternative for practical fusion power 24 p0602 A79-44275
- Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors 24 p0604 A79-44545
- Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks 24 p0606 A79-44979
- Tearing mode instabilities and their suppression by lower hybrid fields --- in tokamaks 24 p0606 A79-45004
- The theory of lower hybrid heating of tokamak plasmas 24 p0606 A79-45028
- Lower hybrid heating experiments in JFT-2 tokamak 24 p0607 A79-45030
- Gyrotrons for the electron-cyclotron plasma heating in large tokamaks 24 p0607 A79-45034
- Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems 24 p0629 A79-46236
- Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor 24 p0630 A79-46302
- A possible route to small, flexible fusion units --- fusion reactor design 24 p0630 A79-46304
- Ion heating in the LT-3 tokamak 24 p0635 A79-47399
- Stability of tokamaks with elongated cross section 24 p0639 A79-47422
- Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas 24 p0639 A79-47424
- Effects of turbulent heating in the Texas turbulent torus 24 p0640 A79-47426
- Effect of scrape-off on tokamak radial transport 24 p0640 A79-47427
- Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma 24 p0642 A79-47804
- Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria 24 p0645 A79-48226
- Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak 24 p0649 A79-49254
- Supplementary RF plasma heating in tokamaks 24 p0668 A79-50999
- Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering 24 p0669 A79-51570
- Engineering aspects of demonstration fusion power reactors 24 p0695 A79-51950
- A high temperature fusion reactor design 24 p0696 A79-51954
- Fusion-supported decentralized nuclear energy system 24 p0696 A79-51956
- Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge 24 p0706 A79-52537
- Proposed non-interferometric FIR electron density measuring scheme for tokamaks 24 p0707 A79-52667
- Four ignition TNS Tokamak reactor systems: Design summary [ORNL/SUB-7117/25] 21 p0193 N79-11889
- Parametric requirements for noncircular Tokamak commercial fusion plants [GA-A-14876] 21 p0214 N79-13871
- Parametric requirements for noncircular Tokamak commercial fusion plants [GA-A-14946] 21 p0214 N79-13872

TOPOGRAPHY

- Wind resource assessment status --- regional differences 24 p0633 A79-46529
- Atlas of western surface-mined lands: Coal, uranium, and phosphate [PB-287846/0] 22 p0340 N79-17311
- Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming [E79-10279] 24 p0796 N79-33518

TORNADOES

- Some flow analyses for Tornado-type wind turbines 22 p0279 A79-26181

TOROIDAL PLASMAS

- Recent results from the PLT tokamak 21 p0069 A79-14453
- Heating and confinement in the CLEO stellarator 21 p0070 A79-14459
- Toroidal high-beta systems 21 p0070 A79-14462
- New results in high-beta stellarator and belt-pinch research 21 p0070 A79-14463
- Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H. --- Ion Cyclotron Resonant Heating and Lower-Hybrid Resonant Heating of plasma 21 p0071 A79-14467
- MHD equilibrium and stability --- in tokamak devices 21 p0078 A79-14779
- Collisional transport --- particle diffusion and heat transport in tokamak 21 p0078 A79-14780
- The 'FINTOR 1' design - A minimum size tokamak experimental reactor 21 p0078 A79-14782
- Superconducting magnets - Some fundamentals and their state of the art 21 p0079 A79-14788
- Superconducting magnet systems in EPR designs --- Experimental Power Reactor 21 p0079 A79-14789
- Energy sources and conventional magnets --- for tokamak experiment Power Reactor toroidal field 21 p0079 A79-14791

Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729

Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak --- safety factor
21 p0155 A79-18830

Design of a D-shaped toroidal field coil
21 p0156 A79-19083

Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

Measurements of plasma rotation in tokamak LT-3
22 p0252 A79-22238

Wave reflection from the lower hybrid surface - A toroidal effect --- in tokamaks
22 p0255 A79-22427

Equilibrium relations in the presence of arbitrary plasma diffusion in axisymmetric configurations
22 p0257 A79-22979

Collisional transport --- of plasmas in plane and toroidal geometry
22 p0257 A79-22980

MHD instabilities
22 p0259 A79-23599

Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037

Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces --- in toroidal plasmas
22 p0270 A79-24855

Integral invariants and quasi-MHD nonlinear dissipation --- in magnetized toroidal plasmas
22 p0270 A79-24862

MHD stability for a spherator with a purely poloidal magnetic field
22 p0271 A79-24863

RF-heating in stationary systems --- of toroidal plasma in tokamaks
22 p0271 A79-24864

Lower hybrid resonance heating --- of tokamak plasma
22 p0271 A79-24865

Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device --- microwave heating of tokamak plasma
22 p0271 A79-24867

Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876

Theory of dissipative drift instabilities in sheared magnetic fields --- in confined toroidal plasmas
22 p0292 A79-27894

Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27835

200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

Design and development of the US-TESPE toroidal coil
22 p0311 A79-31014

The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
22 p0312 A79-31183

Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184

A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186

Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760

Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762

Calculation of the Q factor for a two-component tokamak
22 p0324 A79-31763

Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766

The JET project - A step towards the production of power by nuclear fusion
22 p0326 A79-31918

The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103

The ELMO Bumpy Torus - An alternative fusion reactor concept
23 p0407 A79-34060

Conceptual design study of a doublet fusion ignition test reactor
23 p0407 A79-34065

Superthermal alpha transport and wall bombardment in tokamaks
23 p0444 A79-36927

Oxygen adsorption on stainless steel --- in tokamak reactors
23 p0445 A79-36965

An experimental determination of the parallel electron velocity distribution during strong turbulence --- in Texas Turbulent Torus
23 p0446 A79-37264

Finite beta trapped electron fluid mode
23 p0478 A79-39561

Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940

Measurements of plasma shape in a tokamak
23 p0527 A79-41944

Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44585

Electron cyclotron heating in Bumpy Torus Program
24 p0607 A79-45033

Ion heating in the LT-3 tokamak
24 p0639 A79-47399

Stability of tokamaks with elongated cross section
24 p0639 A79-47422

Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426

Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

TOROIDS

Toroidal accelerator rotor platforms for wind energy conversion
21 p0077 A79-14770

TORQUE

Torque ripple in a vertical axis wind turbine
21 p0029 A79-10239

Solar engines - The thermal wheel and beyond
21 p0095 A79-15909

Field testing of 5-kW commercial wind generator with an automatic load-matching device for utilizing its output
21 p0143 A79-17515

Wind energy conversion system transient performance analysis
24 p0635 A79-46545

TOWERS

Development of solar thermal power plants
21 p0057 A79-13641

Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826

The development of the Advanced Components Test Facility --- for solar powered steam generator system
23 p0429 A79-35047

Solar power plants. I - Present programs and outlooks
23 p0434 A79-35481

Solar power plants. II - Economic aspects of solar power towers
23 p0435 A79-35482

Solar power towers
23 p0435 A79-35483

Large scale solar thermal power generation
23 p0452 A79-37890

A feasibility study of an OTEC guyed tower concept
24 p0619 A79-45798

TOXIC HAZARDS

A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it
[AD-A056018] 21 p0192 N79-11686

Measured air flow rates through microorifices and flow prediction capability [PB-286868/5] 21 p0217 N79-14344
Mutagenic components of alternate energy sources [CONF-780636-8] 24 p0761 N79-30923
Avoiding future health problems related to solar energy (photovoltaic) technology [BNL-25935] 24 p0790 N79-32718

TOXICITY
Toxic component concentration in kerosene-air mixture combustion products 22 p0291 A79-27733
Hazards from radioactive waste in perspective --- comparison with wastes from burning coal [CONF-790204-9] 24 p0761 N79-31024

TOXICITY AND SAFETY HAZARD
A literature review-problem definition studies on selected toxic chemicals. Volume 8: Environmental aspects of diesel fuel and fog oils SGF number 1 and SGF number 2 and smoke screens generated from them [AD-A056021] 21 p0193 N79-11688

TOXICOLOGY
Health effects associated with diesel exhaust emissions, literature review and evaluation [PB-289817/9] 22 p0364 N79-20727

TRACE CONTAMINANTS
A mass and energy balance of a Wellman-Galusha gasifier --- bituminous coal conversion 22 p0283 A79-26467

TRACE ELEMENTS
The fate of trace elements in coal after combustion 21 p0116 A79-17250
Trace element emissions from coal-fired power plants [ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
Chemical studies of stack fly ash from a coal-fired power plant 22 p0309 A79-30595
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators 24 p0629 A79-46231
Trace element characterization and removal/recovery from coal and coal wastes [LA-7049-PR] 21 p0222 N79-14602
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control [PB-295040/0] 24 p0761 N79-30864
Measurement techniques for trace metals in coal-plant effluents: A brief review [NASA-RP-1047] 24 p0803 N79-33611

TRACKING (POSITION)
Annual available radiation for fixed and tracking collectors 21 p0042 A79-11880
Design of a second generation concentrating tracking solar collector [AIAA PAPER 78-1775] 21 p0062 A79-13872
Tracking high temperature collectors 21 p0090 A79-15856
Simple procedure for predicting long term average performance of nontracking and of tracking solar collectors 21 p0091 A79-15873
The design and evaluation of a hydraulic-solar powered tracking device 21 p0136 A79-17458
Efficiency degradation due to tracking errors for point focusing solar collectors [ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837
Suntrack-systems for solar concentrators 23 p0464 A79-38587
Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight 23 p0509 A79-40999
Optimization of the geometrical parameters for arrays of tracking solar collectors to give minimum energy cost 23 p0511 A79-41016
Optimal control of sun tracking solar concentrators 23 p0526 A79-41831
Solar tracking control system Sun Chaser [NASA-TM-78199] 21 p0172 N79-10514
Solar tracking system --- with pointing control circuits [NASA-CASE-MFS-23999-1] 24 p0721 N79-28667

TRADEOFFS
Thermal power systems small power systems applications project. Decision analysis for evaluating and ranking small solar thermal power system technologies. Volume 1: A brief introduction to multiattribute decision analysis --- explanation of multiattribute decision analysis methods used in evaluating alternatives for small powered systems [NASA-CR-158425] 22 p0368 N79-21548

TRAFFIC CONTROL
Bus priority system studies 22 p0299 A79-29339

TRAILERS
Reductions in vehicle fuel consumption due to refinements in aerodynamic design --- for trailer trucks 24 p0658 A79-50335

TRAINING DEVICES
Application of computer animation for dynamic display in complex energy systems --- for human operator performance improvement 23 p0421 A79-34172

TRANSFORMERS
Symmetrical and asymmetrical ideal cylindrical radiation transformers and concentrators 22 p0303 A79-29647

TRANSIENT HEATING
Transient behaviour of solar flat plate collectors 23 p0467 A79-38612
Transient plate temperature in flat plate solar collectors 24 p0603 A79-44294

TRANSIENT RESPONSE
Transient energy removal in cylindrical parabolic collector systems 21 p0020 A79-10168
Some aspects of the transient response of a flat-plate solar energy collector 21 p0153 A79-18466
Comparison of transient heat transfer models for flat plate collectors 22 p0242 A79-21168
Stability of work and sensitivity of semiconductor thermoelectric systems under automatic control 22 p0261 A79-23624
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel 23 p0392 A79-33402
Transient analysis of the rectified superconducting alternator 23 p0462 A79-38529
Transient response of a solar regenerator 23 p0526 A79-41935
Wind energy conversion system transient performance analysis 24 p0635 A79-46545
Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements 24 p0705 A79-52321
Transient response to three-phase faults on a wind turbine generator 21 p0180 N79-11312

TRANSISTORS
A heat pipe radiator for shunt electronics: Development and test results 24 p0764 N79-31276

TRANSIT TIME
The airport performance model. Volume 1: Extensions, validations, and applications [AD-A062863] 23 p0568 N79-25040

TRANSITION FLOW
Effect of force field nonuniformity on flow in an MHD channel 21 p0101 A79-16365

TRANSITION METALS
Model predictions for the stability of ternary metallic hydrides 21 p0038 A79-11802
Solid state electrodes for high energy batteries 24 p0611 A79-45479
A method for measuring the photothermal conversion efficiency of solar energy 24 p0642 A79-47806

Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177

TRANSITION TEMPERATURE
Screening reversible reactions for thermochemical energy transfer
22 p0285 A79-26823

TRANSMISSION
Critique on the solar rehabilitation procedures used in SCLNET-2
24 p0708 A79-52956

TRANSMISSION EFFICIENCY
Design, construction and performance of Fresnel lens for solar energy collection
21 p0136 A79-17456
Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses
21 p0164 A79-19949
Optical characterization of high energy laser components
23 p0447 A79-37668
Space Laser Power System --- for satellite solar power station transmission to earth
[AIAA PAPER 79-1013] 23 p0459 A79-38201
Solar power satellites - Microwaves deliver the power
23 p0460 A79-38374
Lower hybrid heating experiments in JFT-2 tokamak
24 p0607 A79-45030

TRANSMISSION LINES
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-29917
Initial thoughts on the transmission implications of large wave power complexes
23 p0455 A79-37916
Station keeping subsystem designs for modular experiment OTEC plants
24 p0626 A79-45851
Superconducting Magnetic Energy Storage for electric power system stabilization
24 p0681 A79-51804
Automatic tension control for winding superconducting coils --- conferences
[Y/EN-257] 24 p0734 N79-29384

TRANSMISSION LOSS
From sunlight in space to 60 Hz on earth - The losses along the way --- satellite solar power transmission efficiency
21 p0003 A79-10027
Electrical power loss from high-voltage power circuits through plasma leakage
21 p0169 N79-10113

TRANSMISSIONS (MACHINE ELEMENTS)
Evaluation of automobile drivetrain components to improve fuel economy
[PB-293728/2] 24 p0720 N79-28594
Conceptual design study of improved automotives gas turbine powertrain
[NASA-CR-159580] 24 p0762 N79-31088

TRANSMISSIVITY
Investigation of the spectral characteristics of metallized polymer films for making solar concentrators
24 p0637 A79-46910

TRANSMITTANCE
An approximate equation for predicting the solar transmittance of transparent honeycombs
21 p0042 A79-11877
Direct solar transmittance for a clear sky --- for insolation of solar conversion systems
22 p0296 A79-28361
Analysis of an evacuated cylindrical solar collector
24 p0642 A79-47800
Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle
24 p0655 A79-50194
Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator
[NASA-TM-78222] 22 p0360 N79-20495

TRANSMUTATION
Fuel technology and the environment --- nuclear reactor caused radiation effects and transmutation
21 p0079 A79-14787

TRANSPIRATION
A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434

TRANSPORT AIRCRAFT
Laser aircraft propulsion
21 p0109 A79-16618
Fuel conservative aircraft engine technology
21 p0164 A79-20078
Very large vehicles - To be or --- aircraft design concepts
22 p0306 A79-30484
Large-vehicle concepts --- aircraft design
22 p0306 A79-30485
All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906
Energy conservation aircraft design and operational procedures
21 p0202 N79-13200
Energy efficient engine: Propulsion system-aircraft integration evaluation
[NASA-CR-159488] 22 p0337 N79-16850
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft. Volume 1: Executive summary
[AD-A061746] 22 p0351 N79-18969
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft, volume 2
[AD-A062609] 22 p0356 N79-20109
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

TRANSPORT PROPERTIES
Migrational polarization in high-current density molten salt electrochemical devices
21 p0039 A79-11811
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819
A practical electrochemical transport equation for non-dilute solutions --- for energy storage application
21 p0041 A79-11841
Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348
Transport phenomena in MHD generators - Effect of boundary layers
21 p0156 A79-19098
Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184
Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976
Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960
Improved techniques for gasifying coal
[FE-2340-7] 23 p0554 N79-24186
Thermodynamic and transport properties of isobutane: A survey of available data
[COO-4051-35] 24 p0794 N79-33096

TRANSPORT THEORY
Alpha transport and blistering in tokamaks
22 p0253 A79-22243
Theory of anomalous transport due to electrostatic fluctuations --- low frequency plasma instabilities of drift wave type
22 p0270 A79-24858
Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859
Superthermal alpha transport and wall bombardment in tokamaks
23 p0444 A79-36927

TRANSPORT VEHICLES
Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822

TRANSPORTATION
  Opportunities for energy conservation in transportation planning and systems management [PB-291743/3] 23 p0544 N79-22643
  Transportation energy conservation in the Federal Government [PB-291697/1] 23 p0544 N79-22646
  Report on capital requirements for transportation of energy materials [TID-28599] 23 p0545 N79-22965
  Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts [PB-291917/3] 23 p0546 N79-22971
  Electric and hybrid vehicle program [DOE/CS-0068] 23 p0567 N79-24900
  Prospects for coal slurry pipelines in California 23 p0592 N79-27608
  Technology assessment of changes in the future use and characteristics of the automobile transportation system. Summary and findings [PB-293645/8] 24 p0762 N79-31105
  Technology assessment of changes in the future use and characteristics of the automobile transportation system, volume 2 [PB-293646/6] 24 p0762 N79-31106
  Transportation systems center bibliography of technical reports [PB-296342/9] 24 p0794 N79-33107
  Hydrogen use as a fuel. Citations from the NTIS data base [NTIS/PS-79/0779/3] 24 p0796 N79-33347
TRANSPORTATION ENERGY
  User experience with on-road electric vehicles in the U.S.A. and Canada 21 p0009 A79-10080
  A critical review and evaluation of published electric-vehicle performance data 21 p0009 A79-10081
  Pulse characteristics of sodium sulfur cells for electric vehicle propulsion 21 p0009 A79-10082
  Evaluation of methods for analyzing silver-zinc cells 21 p0010 A79-10085
  Review of industrial participation in the ANL lithium/iron sulfide battery development program --- for electric vehicles 21 p0010 A79-10086
  High performance lithium/iron disulfide cells --- for electric vehicle propulsion 21 p0010 A79-10087
  Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries 21 p0010 A79-10088
  Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries 21 p0010 A79-10089
  Bipolar lithium/iron disulfide cells --- for electric vehicle propulsion 21 p0010 A79-10090
  Mechanically rechargeable, metal-air batteries for automotive propulsion [CONF-780801-8] 21 p0011 A79-10093
  Iron-air batteries for electric vehicles 21 p0011 A79-10094
  Response of lead-acid batteries to chopper-controlled discharge --- for electric vehicles 21 p0011 A79-10097
  Progress report on hydrogen production and utilization for community and automotive power 21 p0016 A79-10132
  Energy efficiency in the transport sector 21 p0054 A79-13574
  Vehicle operation on fuels from solar energy 21 p0059 A79-13663
  Electric vehicles challenge battery technology 21 p0093 A79-15892
  Energy requirements of the rail mode [ASME PAPER 78-RT-1] 21 p0150 A79-18085
  Modeling energy and power requirements of electric vehicles 21 p0153 A79-18465
  Rule of fuel management --- for airlines 21 p0155 A79-18521
  Optimal control of on-board and station flywheel storage for rail transit systems [ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771
  The sodium/sulfur battery - A storage battery for peak load adjustment and electric traction 21 p0165 A79-20244
  Current status of composite flywheel development 22 p0241 A79-20853
  Applications of metal hydrides --- emphasizing use as energy storage media 22 p0251 A79-21715
  Evaluation of the effectiveness of electric power systems for transport purposes 22 p0284 A79-26723
  Metropolitan work-trip energy consumption patterns 22 p0299 A79-29335
  Application of kinetic energy storage to transportation systems --- flywheels 22 p0299 A79-29337
  The influence of systems and operations on rapid rail energy utilization 22 p0299 A79-29338
  International Conference on Electric Vehicle Development, London, England, May 31, June 1, 1977, Proceedings 22 p0300 A79-29487
  Prospects for improvements in lead-acid batteries --- for electric vehicles 22 p0300 A79-29488
  The energy and resource implications associated with the widespread use of electric vehicles 22 p0301 A79-29489
  Recent developments in power sources with special emphasis on alkaline batteries --- for electric vehicles 22 p0301 A79-29490
  The role of the battery electric vehicle 22 p0301 A79-29491
  Support services for electric vehicles 22 p0301 A79-29492
  Electric vehicles - Can they be fitted into urban Britain 22 p0301 A79-29493
  Road vehicles with combined, at least partly electrical driving systems and energy supplies 22 p0301 A79-29494
  The fleet operator's viewpoint --- on prototype electric bus development 22 p0302 A79-29495
  Latest developments in sponsored test programs for electric vehicles in France 22 p0302 A79-29497
  Electric car project of the Eindhoven University of Technology 22 p0302 A79-29498
  An electric propulsion system for a town and city bus 22 p0302 A79-29499
  The impact of aeronautical sciences on other modes of transport 22 p0325 A79-31915
  Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses 23 p0387 A79-33245
  Optimum design of automotive vehicles employing alternate energy sources of low energy density - Impact on selection of an energy-carrier for future urban vehicle transportation systems 23 p0415 A79-34128
  Large scale energy storage - Batteries for transport and stationary applications 23 p0451 A79-37875
  Wind energy ships - Potential for modern wind-driven sea transport systems 23 p0472 A79-38661
  Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants 24 p0614 A79-45595
  Assessment of hydrogen-fueled intercity trucking and rail transportation 24 p0615 A79-45601
  DOE program on hydrogen energy systems 24 p0615 A79-45605
  Utilization of alternative fuels for transportation; Proceedings of the Symposium, University of Santa Clara, Santa Clara, Calif., June 19-23, 1978 24 p0650 A79-49376

Future transportation fuels
24 p0650 A79-49377
Storage and distribution of cryogenic fuels --- for transportation
24 p0650 A79-49378
Outlook for the development of hybrid fuels
24 p0651 A79-49382
Synthetic fuels program --- in California for automotive transportation
24 p0651 A79-49385
Reductions in vehicle fuel consumption due to refinements in aerodynamic design --- for trailer trucks
24 p0658 A79-50335
The effect of mechanical energy storage systems on the characteristics of electric vehicles
24 p0683 A79-51820
Advanced flywheel energy storage unit for a high power energy source for vehicular use
24 p0683 A79-51821
The Department of Energy electric vehicle battery program - An overview
24 p0683 A79-51825
Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826
A comparison of metal-air batteries for electric vehicle propulsion
24 p0683 A79-51827
Evaluation of battery performance using computer controlled test equipment
24 p0683 A79-51828
Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829
A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831
Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833
Cryogenic hydrogen storage and refueling for automobiles
24 p0686 A79-51846
Energy in transportation
[PB-282928/1] 21 p0177 N79-10561
Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487
Energy use in Japan and the United States
[BNL-23101] 21 p0221 N79-14578
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868
Fundamental combustion studies of emulsified fuels for diesel applications
[PB-287386/7] 22 p0330 N79-16138
Liquefied natural gas safety research overview
[AD-A063714] 22 p0365 N79-21233
Transportation energy conservation data book, edition 3
[ORNL-5493] 22 p0369 N79-21562
Environmental development plan for transportation energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899
Diesel Fuel and Gasoline Conservation Act of 1977 --- congressional reports
[GPO-34-986] 24 p0718 N79-28348
Energy intensity and related parameters of selected transportation modes: Passenger movements
[ORNL-5506] 24 p0731 N79-29115
Ten scenarios of transportation energy conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647
Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648
Transportation energy conservation: An environmental overview
[CONF-781109-16] 24 p0742 N79-29661
Converting Green River shale oil to transportation fuels --- conferences
[CONF-780460-3] 24 p0745 N79-30396
JT9D-70/59 improved high pressure turbine active clearance control system --- for specific fuel consumption improvement
[NASA-CR-159661] 24 p0763 N79-31208
Ethanol/gasoline blends as automotive fuel
[BETC/RI-79/2] 24 p0767 N79-31423
High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793
Comparison of alternate fuels for aircraft --- liquid hydrogen, liquid methane, and synthetic aviation kerosene
[NASA-TM-80155] 24 p0782 N79-32637
Transportation Energy Conservation (TEC) environmental development plan
[ANL/EES/CP-11] 24 p0801 N79-33589

TRAPPED PARTICLES
Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859
Feedback control of a class of plasma instabilities
23 p0422 A79-34253
Surface processes in plasma wall interactions --- in tokamak experiments
23 p0442 A79-36877
Finite beta trapped electron fluid mode
23 p0478 A79-39561

TRAVELING WAVE TUBES
Development of a heat pipe cooled 200 watt TWT with improved efficiency
24 p0764 N79-31275

TRAVELING WAVES
VKI Short Course on Magnetohydrodynamic Accelerators and Generators
[VKI-LECTURE-SERIES-8] 23 p0545 N79-22891

TRENDS
Energy impact on economic activity and long-term trend forecast
23 p0419 A79-34163
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051

TRIAXIAL STRESSES
Triaxial tests of coal gasification samples
[UCRL-13968] 24 p0733 N79-29374

TRINITROTOLUENE
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222

TRITIUM
Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806
Advanced-fuel pellet approaches to inertial fusion
24 p0630 A79-46303
Tritium permeation through steam generator materials
24 p0695 A79-51952

TROPICAL REGIONS
Opportunities for direct use of geoheat in Central America and other tropical countries
21 p0097 A79-16074
Solar radiation studies for utilization of flat-plate collectors in an equatorial region
21 p0119 A79-17311
Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960
Solar cooling in the tropics
23 p0397 A79-33950
Traditional architecture in West Africa and passive methods of cooling in the Tropics
23 p0463 A79-38580

TROPOSPHERE
Tropospheric conduits --- for pollution abatement and energy production
22 p0266 A79-24275
The natural and perturbed troposphere
21 p0179 N79-10636

TRUCKS
A high energy tubular battery for a 1800 kg payload electric delivery van
[SAE PAPER 790162] 22 p0315 A79-31367
Reductions in vehicle fuel consumption due to refinements in aerodynamic design --- for trailer trucks
24 p0658 A79-50335
Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

Diesel organic rankine cycle compound engine
(Bottoming Cycle) program plan
[DOE/CS-0052] 23 p0590 N79-27521

TRUSSES

On-orbit fabrication and assembly of large space
structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288

Wind turbine generator application places unique
demands on tower design and materials
22 p0240 A79-20826

TUBE CATHODES

A high energy tubular battery for a 1800 kg
payload electric delivery van
[SAE PAPER 790162] 22 p0315 A79-31367

TUBE HEAT EXCHANGERS

Heat exchanger design for geothermal power plants
21 p0015 A79-10123

Optimising the pitching of tubes in a flat solar
collector for increasing the efficiency for use
in vapour absorption refrigeration
21 p0132 A79-17422

Heat exchangers for Ocean Thermal Energy
Conversion plants
21 p0142 A79-17506

Analysis of energy storage by phase change with an
array of cylindrical tubes
22 p0281 A79-26207

Heat loss characteristics of an evacuated
plate-in-tube collector
22 p0285 A79-26818

Investigation of the heat transfer in cylindrical
receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532

The optimization of heat exchanger solidity for
coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357

Model of fluid flow in boilers with helicoidal coil
--- for spherical solar collectors
23 p0383 A79-32959

Integration of evacuated tubular solar collectors
with lithium bromide absorption cooling systems
23 p0439 A79-36629

Solar-assisted heat pump heating with tube
collectors
23 p0469 A79-38635

Absence of bending effects on solar-receiver-tube
fatigue
23 p0537 A79-43682

Core unit testing of the APL/JHU shell-less folded
tube heat exchanger --- for OTEC
24 p0618 A79-45788

Compact heat exchanger design progress --- for
OTEC plants
24 p0618 A79-45789

Flow-induced vibration in shell-and-tube heat
exchangers for ocean thermal energy conversion
/OTEC/
24 p0618 A79-45790

Ultrasonic detection of microbial slime films ---
on OTEC heat exchanger tubes
24 p0620 A79-45807

R & D on advanced heat exchangers in Japan
24 p0702 A79-52008

Flow-induced vibration in shell-and-tube heat
exchangers for Ocean Thermal Energy Conversion
(OTEC)
[ANL-OTEC-78-3] 24 p0747 N79-30522

TUNGSTEN CARBIDES

Influence of composition on the activity of
tungsten carbide gas diffusion hydrogen electrodes
22 p0245 A79-21482

Tungsten carbide/platinum fuel cell with
phosphoric acid as electrolyte
24 p0682 A79-51813

TUNNEL DIODES

Schottky and MIS tunnel diodes based on
photovoltaic-quality hydrogenated amorphous
silicon prepared by cathodic sputtering -
Electrical characterization on the basis of
capacitative measurements
23 p0384 A79-32971

TURBIDITY

Dependence of solar radiation availability on
atmospheric turbidity
21 p0119 A79-17308

Differential insolation and turbidity measurements
--- solar radiation attenuation by aerosols
22 p0241 A79-21056

TURBINE BLADES

The influence of blade camber on the output of
vertical-axis wind turbines
21 p0045 A79-12242

Airfoil data for use of wind turbine designers
21 p0073 A79-14702

Large filament wound structures for energy and
transportation systems --- turbine blades for
windpowered energy systems
21 p0086 A79-15507

The design and testing of a vertical-axis wind
turbine using sails
21 p0153 A79-18467

Some effects of flow curvature on the performance
of Darrieus wind turbines
[AIAA PAPER 79-0112] 21 p0156 A79-19538

Thermophoresis - Enhanced deposition rates in
combustion turbine blade passages
[ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790

An inverse problem of vertical-axis wind turbines
22 p0239 A79-20800

Vortex sheet analysis of the Giromill --- vertical
axis wind turbine with straight blades
22 p0278 A79-26179

Evaluation of MOSTAS computer code for predicting
dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007

A hybrid wind turbine suitable for developing
regions
22 p0323 A79-31455

A high temperature turbine for operation on
coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434

The Savonius rotor - Theory and optimization
23 p0387 A79-33242

An axial-flow wind-turbine with delta-wing blades
23 p0405 A79-34044

Windmills with increased power output due to
tipvanes
23 p0405 A79-34045

Tilting wing overspeed control for vertical axis
wind turbines
[AIAA PAPER 79-0967] 23 p0456 A79-38175

Prediction of stresses and natural frequencies for
high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177

Aeroelastic stability and response of horizontal
axis wind turbine blades
23 p0483 A79-40117

Tipvane research at the Delft University of
Technology --- auxiliary wings for turbine
blades of windmills
23 p0485 A79-40129

Summary report on the collapse of the Magdalen
Islands wind turbine
24 p0635 A79-46544

The role of corrosion in modern gas turbines
24 p0647 A79-48912

Fundamental mechanisms that influence the estimate
of heat transfer to gas turbine blades
24 p0653 A79-49526

Wind tunnel tests of a 1/30 scale model of a 3.5
megawatt wind turbine
24 p0703 A79-52012

Design, instrumentation, and calibration of a
vertical axis wind turbine rotor
[TID-27754] 21 p0174 N79-10533

Structural performance of the DOE/Sandia 17 meter
vertical axis wind turbine
[SAND-78-0880C] 21 p0187 N79-11516

Nonlinear dynamic response of wind turbine rotors
[NASA-TM-78324] 21 p0195 N79-12542

Giromill wind tunnel test and analysis, volume 2.
Technical discussion
[COO-2617-4/2] 21 p0204 N79-13378

Evaluation of urethane for feasibility of use in
wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497

Evaluation of MOSTAS computer code for predicting
dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

Large horizontal axis wind turbine development
[NASA-TM-79174] 23 p0581 N79-26504

Aerodynamic performance of the 17-metre-diameter
Darrieus wind turbine
[SAND-78-1737] 23 p0595 N79-27670

Economic overview of vertical axis wind turbines
--- conferences
[SAND-79-9733C] 24 p0753 N79-30773

A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines 24 p0794 N79-33158

TURBINE ENGINES

Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen [ASME PAPER 78-GT-126] 21 p0033 A79-10791

Ceramic components for vehicular gas turbines 21 p0034 A79-11150

Turbine engines in light aircraft 21 p0047 A79-12380

Low head power generation with bulb turbines --- hydroelectric installations 21 p0074 A79-14705

Program to establish ceramic technology readiness for large combustion turbine utility application [ASME PAPER 78-WA/GT-8] 21 p0160 A79-19796

The interaction of the wind field with a horizontal axis wind turbine 22 p0278 A79-26177

Wind power distribution, control, and conversion in vortex augmentors --- influence on turbomachinery design and development 22 p0278 A79-26180

Some flow analyses for Tornado-type wind turbines 22 p0279 A79-26181

High efficiency wave engine --- featuring rotor blade exit nozzle design for high efficiency 22 p0279 A79-26187

Working fluids and turbines for OTEC power systems 22 p0280 A79-26192

Operational characteristics of MHD turbine with air-core superconducting rotor 22 p0297 A79-28924

High-freezing-point fuels used for aviation turbine engines [ASME PAPER 79-GT-141] 22 p0309 A79-30555

Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity 23 p0387 A79-33241

Fluidized bed gas turbine experimental unit for MIUS applications [ORNL/HUD/MIUS-33] 21 p0221 N79-14575

Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance [NASA-TM-78993] 22 p0345 N79-17859

Turbine engine altitude chamber and flight testing with liquid hydrogen [NASA-TM-79196] 23 p0587 N79-27140

Reclamation of synthetic turbine engine oil mixtures [AD-A071813] 24 p0795 N79-33211

TURBINE EXHAUST NOZZLES

Demonstration of a rotary separator for two-phase brine and steam flows [TID-28519] 22 p0365 N79-21309

TURBINE INSTRUMENTS

A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing 21 p0144 A79-17617

TURBINE PUMPS

Hydropower from a national point of view --- projects for future energy production 21 p0059 A79-13656

Cycle optimization for a solar turbopack --- turbine water pump utilizing Rankine cycle 21 p0141 A79-17500

Effect of pressure head on the characteristics of hydroelectric stations with underwater lower reservoirs 24 p0646 A79-48827

Undergound pumped hydro storage - An overview 24 p0660 A79-50451

Turbomachinery options for an underground pumped hydroelectric storage plant 24 p0679 A79-51794

TURBINE WHEELS

Designing and testing Si3N4 turbine components at Mercedes-Benz 21 p0050 A79-12830

Development of ceramic parts for a truck gas turbine at MTU 21 p0050 A79-12831

Development of multi-density silicon nitride turbine rotors 21 p0050 A79-12832

Analysis of wind turbine generator rotor response to one-dimensional turbulence 21 p0077 A79-14768

Air bearing development for a GM automotive gas turbine [SAE PAPER 790107] 22 p0314 A79-31355

A vertical-axis bicycle rotor turbine. I - Rotor design. II - Aerodynamic aspects --- windmill 23 p0386 A79-33237

TURBINES

Torque ripple in a vertical axis wind turbine 21 p0029 A79-10239

Vortex sheet analysis of the Giromill 21 p0031 A79-10278

Calculation of wake effects in wind turbine parks 21 p0045 A79-12241

The influence of blade camber on the output of vertical-axis wind turbines 21 p0045 A79-12242

Performance prediction methods for horizontal axis wind turbines 21 p0045 A79-12244

The Netherlands experimental vertical axis wind turbine 21 p0114 A79-17120

Fluid dynamics of diffuser-augmented wind turbines 22 p0238 A79-20798

Cost-effectiveness of the vortex-augmented wind turbine 22 p0266 A79-24048

Wind power for domestic use in the United Kingdom 23 p0453 A79-37902

Design analysis of a vertical axis wind turbine 23 p0472 A79-38656

Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study 23 p0527 A79-41946

Parametric performance analysis of a Darrieus wind turbine system 23 p0536 A79-43676

Free vortices from a wing for wind turbine systems 23 p0537 A79-43683

Operation and analysis of a vertical axis wind turbine 24 p0677 A79-51776

Design and performance of bicycle wind turbine rotors 24 p0677 A79-51777

Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator 24 p0677 A79-51780

A low cost composite blade for a 300 foot diameter wind turbine 24 p0677 A79-51781

Design, fabrication, and test of a composite material wind turbine rotor blade [NASA-CR-135389] 21 p0173 N79-10525

Microprocessor control of a wind turbine generator [NASA-TM-79021] 21 p0195 N79-12548

Lightning protection for the vertical axis wind turbine [SAND-77-1241] 21 p0221 N79-14567

Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines [NASA-TM-79101] 22 p0368 N79-21549

The use of wind data with an operational wind turbine in a research and development environment [NASA-TM-73832] 23 p0581 N79-26502

Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower [NASA-TM-79200] 24 p0723 N79-28727

Performance tests of the radial outflow reaction turbine for geothermal applications [UCID-17902] 24 p0788 N79-32693

Wind turbines [ANL/CES-TE-78-9] 24 p0790 N79-32711

TURBOCOMPRESSORS

Technology evolution in the Allison Model 250 engine --- for helicopter propulsion 21 p0155 A79-18681

Storage peak gas-turbine power plant --- compressor for electric energy storage 22 p0268 A79-24507

High efficiency wave engine --- featuring rotor blade exit nozzle design for high efficiency 22 p0279 A79-26187

Application of a hot air turbine for efficiency improvement in MHD/steam power plants [ASME PAPER 79-GT-36] 23 p0375 A79-32341

Application of gas turbine/compressors in LNG plants [ASME PAPER 79-GT-85] 23 p0376 A79-32362

Combined cycles for pipeline compressor drives using heat [ASME PAPER 79-GT-162] 23 p0378 A79-32424

Alternate ways of using bottoming cycle power in pipeline gas compressor stations [ASME PAPER 79-GT-201] 23 p0380 A79-32458

Closed cycle gas turbines, an ECAS update. I [ASME PAPER 79-GT-204] 23 p0380 A79-32461

A 2500 HP addition to the Ruston range --- gas turbines [ASME PAPER 79-GT-205] 23 p0380 A79-32462

The economics of upgrading geothermal steam by adiabatic compression 23 p0409 A79-34081

Wind turbines for electric utilities: Development status and economics [NASA-TM-79170] 24 p0749 N79-30719

TURBOFAN ENGINES

Advanced turbofan engines for low fuel consumption [ASME PAPER 78-GT-192] 21 p0033 A79-10816

Making turbofan engines more energy efficient [ASME PAPER 78-GT-198] 21 p0033 A79-10818

Engine technology for production turbofan engines 22 p0270 A79-24827

Manufacturers developing fuel-efficient engines 23 p0438 A79-36380

New energy conversion techniques in space, applicable to propulsion --- powering of aircraft with laser energy from SPS [AIAA PAPER 79-1338] 23 p0493 A79-40490

Garrett ATF 3 23 p0535 A79-43469

Energy efficient aircraft engines [AIAA PAPER 79-1861] 24 p0643 A79-47918

Energy efficient engine preliminary design and integration study [NASA-CR-135396] 21 p0154 N79-12084

Energy efficient engine: Propulsion system-aircraft integration evaluation [NASA-CR-159488] 22 p0337 N79-16850

JT9D-70/59 improved high pressure turbine active clearance control system --- for specific fuel consumption improvement [NASA-CR-159661] 24 p0763 N79-31208

TURBOGENERATORS

The external combustion steam injected gas turbine for cogeneration 21 p0012 A79-10100

A proposed 40 MWe MHD pilot plant 21 p0017 A79-10137

JPL - Small Power Systems Applications Project --- for solar thermal power plant development and commercialization 21 p0019 A79-10161

Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation 21 p0020 A79-10163

Heat pipe central solar receiver gas turbine plant 21 p0022 A79-10178

Power extracted from the wind 21 p0058 A79-13650

Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description [AIAA PAPER 78-1771] 21 p0062 A79-13869

Optimum selection of a wind turbine generator system [AIAA PAPER 78-1774] 21 p0062 A79-13871

Low head power generation with bulb turbines --- hydroelectric installations 21 p0074 A79-14705

Large wind turbine generators --- NASA program status and potential costs 21 p0092 A79-15881

10-megawatt solar central receiver pilot plant 21 p0094 A79-15906

Layout and design characteristics of MHD power stations 21 p0105 A79-16481

Steam generator and turbomachines --- MHD power plant design and Soviet operational experience 21 p0106 A79-16489

Design of solar energy concentrators for power generation in residential and nonresidential areas 21 p0136 A79-17460

Exploitation of solar energy via modular power plants and multiple utilization of waste heat 21 p0141 A79-17497

Application of turbopack in solar energy systems 21 p0141 A79-17504

The theoretical analysis of an air turbine generation system --- for waterwave energy conversion 21 p0151 A79-18106

Structural design of a superheater for a central solar receiver [ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832

Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency 21 p0168 A79-20448

Background and system description of the Mod 1 wind turbine generator 22 p0239 A79-20825

Wind turbine generator application places unique demands on tower design and materials 22 p0240 A79-20826

Fatigue impact on Mod-1 wind turbine design 22 p0240 A79-20827

Wind-turbine-generator rotor-blade concepts with low-cost potential 22 p0240 A79-20828

An operating 200 kW horizontal axis wind turbine 22 p0240 A79-20829

Microprocessor control of a wind turbine generator 22 p0244 A79-21302

Cost-effectiveness of the vortex-augmented wind turbine 22 p0266 A79-24048

The geothermal power station at Ahuachapan, El Salvador 22 p0266 A79-24239

Use of organic fluids in solar turbines 22 p0269 A79-24621

Thermodynamic basis for combining cycles of heat producing power plants 22 p0298 A79-29297

Ways of improving steam-gas power plants --- fuel economy 22 p0299 A79-29298

Energy statistics for large wind turbine arrays 22 p0299 A79-29371

NBC's wind energy program 22 p0319 A79-31426

Cylindrical parabolic collector optimization for interfacing with steam turbine generators 22 p0322 A79-31448

Design and application of large wind turbine generators 22 p0326 A79-31916

Off-shore multi-MW size wind turbine system development is the key to cost-effective wind energy for Sweden 22 p0326 A79-31917

Repowering of a small utility - A unique solution to a unique problem [ASME PAPER 79-GT-15] 23 p0375 A79-32332

Application of the Centaur industrial gas turbine to the central receiver concept for solar electric power [ASME PAPER 79-GT-45] 23 p0375 A79-32345

Utilization of the cold by LNG vaporization with closed-cycle gas turbine [ASME PAPER 79-GT-84] 23 p0376 A79-32361

Application of recuperative gas cycles with a bypass heat generator to solar energy power plants [ASME PAPER 79-GT-89] 23 p0376 A79-32366

Major considerations in the design and engineering of cogeneration facilities [ASME PAPER 79-GT-151] 23 p0378 A79-32416

Laser-particulate control for open-cycle, coal fired gas turbines [ASME PAPER 79-GT-177] 23 p0379 A79-32437

MHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591

The IAE 30-kW wind turbine - A review of the aerodynamic design 23 p0387 A79-33240

Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity
23 p0387 A79-33241

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy
23 p0404 A79-34036

Theoretical study of a hybrid wind turbine
23 p0405 A79-34047

Wind site selection for optimum wind power systems
23 p0406 A79-34049

A review of wind-electric conversion technology
23 p0406 A79-34050

Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051

Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources
23 p0435 A79-35484

The potential application of rotating fluidised beds to power generating schemes
23 p0454 A79-37906

Methods of reducing harmful emissions from thermal power stations
23 p0474 A79-38863

Test results from the Swedish 60 kW experimental wind power unit
23 p0484 A79-40120

Operating experience with the Magdalen Islands wind turbine
23 p0484 A79-40122

A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123

The design, construction, testing and manufacturing of vertical axis wind turbines
23 p0484 A79-40124

Design and construction of a pilot plant for a shrouded wind turbine
23 p0485 A79-40128

Utilizing geothermal resources below 150 C /300 F/
23 p0486 A79-40196

Electrical production from moderate temperature geothermal brines
23 p0486 A79-40197

An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants
23 p0487 A79-40369

Concentration augmentation of power in a Savonius-type wind rotor
23 p0527 A79-41947

Hydrogen/oxygen steam generation - An example of aerospace technology transfer
24 p0613 A79-45585

TRW PSD-I power system design --- for OTEC
24 p0618 A79-45792

Performance optimization of an OTEC turbine
24 p0618 A79-45793

Land-based application of an OTEC open-cycle power system
24 p0627 A79-45871

Large horizontal axis wind turbine development
24 p0633 A79-46527

Status of the Southern California Edison Company 3 MW wind turbine generator /WTG/ demonstration project
24 p0635 A79-46541

The MOD-2 wind turbine
24 p0635 A79-46542

Magdalen Islands VAWT field test --- Vertical Axis Wind Turbines
24 p0635 A79-46543

Summary report on the collapse of the Magdalen Islands wind turbine
24 p0635 A79-46544

Lewis Research Center studies of multiple large wind turbine generators on a utility network
24 p0635 A79-46547

Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652

The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station
24 p0641 A79-47700

Turbine sizing of a solar thermal power plant
24 p0673 A79-51751

Effect of noncondensables on the performance of geothermal steam power plants
24 p0689 A79-51868

Low temperature geothermal energy use in existing institutional power plants
24 p0689 A79-51870

The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system
24 p0703 A79-52010

Optimisation of powerful energy supply systems for application in space
[IAF PAPER 79-169] 24 p0710 A79-53333

Transient response to three-phase faults on a wind turbine generator
21 p0180 N79-11312

Solar thermal power systems program: Program summary
[DOE/ET-0018/1] 21 p0207 N79-13518

Combined cycle power generation. Citations from the NTIS data base
[NTIS/PS-78/1156/5] 21 p0222 N79-14587

A 200-kW wind turbine generator conceptual design study
[NASA-TM-79032] 22 p0341 N79-17333

Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171

Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492

Solar thermal power generation. A bibliography with abstracts
[NASA-CR-158004] 23 p0540 N79-22614

Thermal power systems small power systems application project: Siting issues for solar thermal power plants with small community applications
[NASA-CR-158520] 23 p0542 N79-22629

Thermal power systems, point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-158534] 23 p0560 N79-24464

Elements for technological and economic modeling of tower-type solar power plants
[P/51/76/17] 23 p0584 N79-26535

Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area --- energy technology
[P/51/77/21] 23 p0584 N79-26536

Combined cycles for power generation, volume 1 --- conferences, Belgium, Apr. 1978
[VKI-LEC-SEP-1978-6-VOL-1] 24 p0723 N79-28732

Thermal power systems small power systems applications project. Volume 2: Detailed report
[NASA-CR-162104] 24 p0749 N79-30718

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 1: Executive summary --- development and testing of a solar thermal power plant
[NASA-CR-162372] 24 p0799 N79-33576

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 2: System concept selection --- development and testing of a solar thermal power plant
[NASA-CR-162373] 24 p0799 N79-33577

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 3: Experimental system descriptions --- development and testing of a solar thermal power plant
[NASA-CR-162374] 24 p0799 N79-33578

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 4: Commercial system definition --- development and testing of a solar thermal power plant
[NASA-CR-162375] 24 p0799 N79-33579

Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 5: Supporting analyses and trade studies --- development and testing of a solar thermal power plant
[NASA-CR-162376] 24 p0800 N79-33580

TURBOJET ENGINES
An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705
Parametric performance of a turbojet engine combustor using jet A and A diesel fuel
[NASA-TM-79089] 22 p0357 N79-20114

TURBOMACHINE BLADES
A low cost blade design for a Darrieus-type vertical-axis wind turbine
21 p0067 A79-14291

TURBOMACHINERY
Small solar power plant with a Freon turbine
21 p0057 A79-13642
The brake system for the DOE/Sandia 17-meter vertical axis wind turbine
21 p0067 A79-14289
Dynamic response of a wind turbine system and its effect on performance
21 p0067 A79-14293
Generalized wind characteristics and their effect on wind turbine output
21 p0068 A79-14294
Generic power performance estimates for wind turbines
21 p0068 A79-14295
Wind generation of electricity for a novel dwelling independent of servicing networks
21 p0142 A79-17513
Vertical axis wind turbine status
21 p0143 A79-17516
A Variable Speed Constant Frequency /VSCF/ wind generator for low power applications
22 p0303 A79-29799
Windmills with increased power output due to tipvanes
23 p0405 A79-34045
Study of turbomachinery options for compressed air energy storage plants
24 p0680 A79-51801

TURBOPROP ENGINES
Modern engine development test techniques --- for helicopters
21 p0155 A79-18680
Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918

TURBOSHAFTS
Modern engine development test techniques --- for helicopters
21 p0155 A79-18680
An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705
Single shaft automotive gas turbine engine characterization test
[NASA-CR-159654] 24 p0778 N79-32129

TURBULENCE EFFECTS
On-line control of a large horizontal axis wind energy conversion system and its performance in a turbulent wind environment
21 p0028 A79-10236
Analysis of wind turbine generator rotor response to one-dimensional turbulence
21 p0077 A79-14768

TURBULENT BOUNDARY LAYER
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402
Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371
Insulating wall boundary layer in a Faraday MHD generator
[FE-23417] 22 p0365 N79-21310

TURBULENT FLOW
A two-dimensional pulverized coal combustor model --- for MHD generators
23 p0390 A79-33383
A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model
23 p0410 A79-34087
Preliminary results of a field experiment to characterize wind flow through a vertical plane
[PNL-2518] 21 p0203 N79-13322

TURBULENT MIXING
Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213
Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330

TURBULENT WAKES
Energy effectiveness of arbitrary arrays of wind turbines
[AIAA PAPER 79-0114] 21 p0156 A79-19540
The interaction of windmill wakes
23 p0482 A79-40111
Wake interaction in an array of windmills - Theory and preliminary results
23 p0483 A79-40112
Performance of windmills in a closely spaced array
23 p0537 A79-43681

TURKEY
Investigations of solar heat production for household heating in Turkey
22 p0253 A79-22265
Calculation of solar energy incident on non-horizontal surfaces over Turkey
22 p0253 A79-22266
The role of solar energy in the solution of Turkey's energy predicament
23 p0404 A79-34035

TWO DIMENSIONAL FLOW
Solids mixing and fluidization characteristics in a tube filled bed --- of fluidized bed coal combustion
21 p0008 A79-10070
A two dimensional vortex sheet model of a Savonius Rotor
22 p0278 A79-26178
Vortex sheet analysis of the Giromill --- vertical axis wind turbine with straight blades
22 p0278 A79-26179
Two-dimensional MHD channel design --- for energy performance improvement at lower wall temperature
22 p0279 A79-26183
Two-dimensional analyses related to wave-energy extraction by submerged resonant ducts
22 p0312 A79-31099
A two-dimensional pulverized coal combustor model --- for MHD generators
23 p0390 A79-33383
Two-dimensional analysis of vertical axis windmills
22 p0353 N79-19446

TWO FLUID MODELS
A collisional plasma rotating between two cylinders
21 p0049 A79-12694

TWO PHASE FLOW
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
[ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814
Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585
Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189
Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190
Two-phase LMMHD mixer-development experiments --- Liquid-Metal MHD generator flow characteristics
23 p0394 A79-33422
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423
A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model
23 p0410 A79-34087
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030
Core unit testing of the APL/JHU shell-less folded tube heat exchanger --- for OTEC
24 p0618 A79-45788
Heat transfer in geothermal systems
24 p0638 A79-47256

Numerical simulation of the compaction-subsidence phenomena in a reservoir for two-phase nonisothermal flow
23 p0540 N79-22401
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies --- mass and energy balance for two phase flow in porous media
[LBL-8802] 24 p0786 N79-32684

U

U.S.S.R.
Pulsed-power research and development in the USSR
[AD-A056635] 21 p0193 N79-11859
Geothermal power plants of the Soviet Union. A technical survey of existing and planned installations
[COO-4051-41] 24 p0787 N79-32686

ULTRASHORT PULSED LASERS
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171

ULTRASONIC CLEANING
Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger
24 p0623 A79-45835

ULTRASONIC TESTS
Ultrasonic detection of microbial slime films --- on OTEC heat exchanger tubes
24 p0620 A79-45807

ULTRAVIOLET ABSORPTION
Protection of solar collector materials from UV
24 p0609 A79-45217

ULTRAVIOLET LASERS
Advanced lasers for fusion applications
24 p0669 A79-51405
Energy and technology review --- tunable laser system for the ultraviolet, visible, and infrared regions
[UCRL-52000-79-3] 24 p0791 N79-32727

ULTRAVIOLET RADIATION
The short-wavelength response of MIS solar cells
22 p0273 A79-25748
Space environment damage to solar cell coverslide assemblies
23 p0498 A79-40896
Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells
23 p0498 A79-40898
The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989
UV blocking filters for polymeric films
24 p0668 A79-51103

ULTRAVIOLET SPECTROSCOPY
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge
24 p0706 A79-52537

UNDERGROUND STORAGE
Large-scale thermal energy storage for cogeneration and solar systems --- in aquifers
21 p0092 A79-15886
Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317
Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26209
Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409
Manmade geothermal energy --- underground storage systems
23 p0408 A79-34072
Eighty atmospheres in reserve --- compressed air storage in caverns for peaking power source
23 p0436 A79-35800
Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976
Undergound pumped hydro storage - An overview
24 p0660 A79-50451
Underground pumped hydro storage - An evaluation of the concept
24 p0679 A79-51793
Turbomachinery options for an underground pumped hydroelectric storage plant
24 p0679 A79-51794
On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns
24 p0680 A79-51798
Analysis of mass cycling in porous rock reservoirs for compressed air energy storage
24 p0680 A79-51799
Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800
Hybrid thermal storage subroutine for transient simulation
24 p0681 A79-51807
A simplified algorithm for the evaluation of hybrid thermal storage with water systems
24 p0681 A79-51808
Hydrogen energy storage program: Five-year plan
[DOE/ET-0046] 21 p0175 N79-10544
Inventory of underground energy storage sites in California
[PB-290835/8] 23 p0566 N79-24519
Crude and product storage: State-of-the-art review and assessment
[AD-A066605] 23 p0568 N79-25243
Underground storage of natural gas by interstate pipeline companies for 1976 and winter 1976 - 1977
[DOE/EIA-0151] 23 p0597 N79-27684
Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783
Underground hydroelectric pumped storage: An evaluation of the concept
[TID-29412] 24 p0742 N79-29664

UNDERWATER COMMUNICATION
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
21 p0027 A79-10226

UNDERWATER ENGINEERING
Underwater seismic source --- for petroleum exploration
[NASA-CASE-NPO-14255-1] 23 p0551 N79-23555
Performance of photovoltaic cells in an undersea environment
[AD-A066385] 23 p0573 N79-25517
Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels
[FE-1784-39] 24 p0719 N79-28364

UNITED KINGDOM
Some practical aspects of the design and installation of domestic solar energy systems in the UK
23 p0452 A79-37884
Offshore wind energy systems for the U.K.
23 p0453 A79-37901
Wind power for domestic use in the United Kingdom
23 p0453 A79-37902
Open cycle MHD generation in the United Kingdom - A reappraisal
23 p0453 A79-37904

UNITED STATES OF AMERICA
Long-term availability of water resources for energy development in the Central United States
21 p0065 A79-14118
Oil shale in the U.S. - Current state of technology and research
22 p0265 A79-23830
Prospects for solar heating and cooling in the United States
22 p0275 A79-25929
The Energy Research and Development Program of the United States
22 p0325 A79-31909
The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2
23 p0427 A79-34860
The impact of price expectations on the demand for electrical energy in the United States
23 p0447 A79-37286
The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209

Program overview for the wind characteristics program element of the United States Federal Wind Energy Program
23 p0482 A79-40108
Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580
Energy: The new economic development wildcard
[PB-282494/4] 21 p0177 N79-10564
Energy situation in the Mid-Atlantic region
[BNL-50703] 21 p0188 N79-11528
Energy use in Japan and the United States
[BNL-23101] 21 p0221 N79-14578
The national energy plan: Options under assumptions of national security threat or energy policy as if it really mattered
[H-PRINT-95-42] 21 p0228 N79-15399
US energy demand and supply, 1976-1985: Limited options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
Direction of gas supply research in the US
22 p0340 N79-17320
The good news about energy
22 p0355 N79-19461
US refining capacity: How much is enough
[PB-291437/2] 23 p0555 N79-24192
Re-examination of undiscovered oil resources in the United States
[DOE/EIA-0103/9] 23 p0593 N79-27643
Bioconversion
[GPO-37-136] 24 p0745 N79-30393
Role of the states in energy
[DOE/PE-0009] 24 p0758 N79-30816
Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811

UNIVAC 1100 SERIES COMPUTERS
An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882

UNIVERSITIES
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495

UNIVERSITY PROGRAM
MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549
Training energy specialists - A proposal
23 p0388 A79-33257
Energy projects at the Sao Paulo State Institute of Technological Research
23 p0389 A79-33261
A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0419 A79-34156
Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-446[illegible]-EXEC-SUMM] 24 p0759 N79-30824

UPPER IONOSPHERE
Solar Power Satellite beam disturbance of the upper ionosphere
[AIAA PAPER 79-1422] 23 p0426 A79-34848

URANIUM
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337
Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570
Gaseous fuel reactors for power systems
[LA-UR-78-1437] 21 p0214 N79-13844
GAO work involving title V of the Energy Policy and Conservation Act of 1975
[PB-286400/7] 21 p0230 N79-15424
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311

URANIUM OXIDES
Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712

URBAN DEVELOPMENT
Urbanism and energy in developing regions
[LBL-7808] 21 p0189 N79-11540
Proceedings of the 2nd Workshop on Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658
Comprehensive community energy planning. Volume 2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713
Developing small hydroelectric dam potential
[PB-296238/9] 24 p0802 N79-33601

URBAN PLANNING
Prospects for ambient energy and cogeneration utilization in urban and regional planning
21 p0104 A79-16465
Conceptual development of a solar town in Iran
21 p0138 A79-17469
Active and passive solar energy utilization in urban construction
23 p0463 A79-38582
Recycle energy system - City of Akron, Ohio
23 p0488 A79-40392
Planning for resource recovery in the 'Big Apple' --- New York City plans for refuse utilization
23 p0491 A79-40424
Planning program to accelerate energy conservation in municipalities
[HCP/M05017-01/1] 21 p0210 N79-13536
Baltimore applications project
[NASA-TM-79667] 22 p0351 N79-18815
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024
Computer software for planning design of community energy systems
[CONF-781192-2] 23 p0600 N79-28063
Energy and urban policies/programs: Official transcript of public briefing and addendum, 27 April 1978, Washington, D. C.
[DOE/IR-0042] 24 p0728 N79-28782
Urban areas as energy flow systems
24 p0736 N79-29592
Comprehensive community energy planning. Volume 2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713

URBAN RESEARCH
Energy policy optimization by environmental systems analysis
23 p0422 A79-34180
308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city
23 p0489 A79-40397
Solid waste utilization in integrated community energy systems
23 p0490 A79-40415
Solar potential inventory and modeling
24 p0657 A79-50219
Conceptual development of a solar town in Iran
24 p0660 A79-50539
Predicting solar energy fluxes in polluted urban areas
24 p0671 A79-51732
Community application of integrated energy/utility systems
[PB-290675/8] 23 p0566 N79-24520
Comprehensive community energy planning. Volume 2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713

URBAN TRANSPORTATION
The propulsion of vehicles by a flywheel
21 p0031 A79-10452
Electric automobiles - Yes
21 p0046 A79-12265
Energy efficiency in the transport sector
21 p0054 A79-13574
Breakdown of rapid rail energy costs - A study of three systems
21 p0068 A79-14323
Total energy and labor requirements for an electric commuter railroad
21 p0068 A79-14325
Flywheels for vehicles --- auxiliary power in electric automobiles
21 p0092 A79-15885
Metropolitan work-trip energy consumption patterns
22 p0299 A79-29335
Bus priority system studies
22 p0299 A79-29339

Electric vehicles - Can they be fitted into urban Britain
22 p0301 A79-29493
An electric propulsion system for a town and city bus
22 p0302 A79-29499
The London Electric Delivery Van Assessment Scheme
[SAE PAPER 790111] 22 p0314 A79-31358
Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses
23 p0387 A79-33245
Optimum design of automotive vehicles employing alternate energy sources of low energy density - Impact on selection of an energy-carrier for future urban vehicle transportation systems
23 p0415 A79-34128
Study of flywheel energy storage Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558
Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559
A study of flywheel energy storage for urban transit vehicles
[PB-282929/9] 21 p0177 N79-10563
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868
High Speeds and aerotrain
23 p0551 N79-23836
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0567 N79-27024
Hydrogen-fueled postal vehicle performance evaluation
[NASA-CR-158811] 24 p0730 N79-29106
Modification and evaluation of a small station wagon designed for transportation of the handicapped
[PB-295106/9] 24 p0763 N79-31107
Diesel bus performance simulation program
[PB-295524/3] 24 p0763 N79-31110
Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests
[PB-295478/2] 24 p0778 N79-32135
URETHANES
Evaluation of urethane for feasibility of use in wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497
USER MANUALS (COMPUTER PROGRAMS)
Solar Irrigation Program Data Base Management System (SIPDBMS)
[SAND-78-0641] 21 p0209 N79-13532
Simulation of fluidized bed coal combustors
[NASA-CR-159529] 22 p0359 N79-20487
User's guide for MIRVAL: A computer code for comparing designs of heliostat-receiver optics for central receiver solar power plants
[SAND-77-8280] 24 p0729 N79-28932
Deterministic insolation model program description and user's guide --- for approximate analysis of solar systems
[SAND-78-7044] 24 p0744 N79-29743
An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884
USER REQUIREMENTS
Current state-of-the-art of electrochemical batteries from a users point of view
21 p0071 A79-14681
Development of specifications for recycled products
22 p0295 A79-28182
The fleet operator's viewpoint --- on prototype electric bus development
22 p0302 A79-29495
Economics of small user hydrogen --- future requirements and predicted costs for industrial use
24 p0613 A79-45583
Wind energy systems application to regional utilities
24 p0633 A79-46532
Meteorological measurement data for solar energy utilization
[ASSA-PA-5] 23 p0574 N79-25524
Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720
Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies
[NASA-CR-162162] 24 p0768 N79-31737
UTAH
A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0097 A79-16075
Sunbird I - Utah's first commercial solar home
23 p0401 A79-34015
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380
UTILITIES
High efficiency thermal energy storage system for utility applications
21 p0012 A79-10102
Optimum design conditions for a power plant at a vapor dominated geothermal resource, Pacific Gas and Electric's The Geysers Power Plant Unit 16
21 p0014 A79-10121
Perspectives on utility central station photovoltaic applications
21 p0041 A79-11873
Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy
[AIAA PAPER 78-1767] 21 p0061 A79-13866
Development of industrial owned, small hydroelectric facilities
21 p0073 A79-14699
Modelling energy storage systems for electric utility applications Preliminary considerations
21 p0081 A79-14960
Geothermal energy from a utility perspective --- Imperial Valley of Southern California
21 p0091 A79-15880
Utility applications of wind power plants
21 p0092 A79-15882
Solar heating and cooling - An electric utility perspective
21 p0093 A79-15890
Storage as an energy strategy for utilities
21 p0093 A79-15891
Role and status of dispersed electric utility fuel cell power plants
21 p0093 A79-15894
The need for closed service areas in a supply economy based on line networks --- for German gas and electric utilities
21 p0168 A79-20447
No ill winds for New Mexico utility --- windpower utilization in municipal electric power system
22 p0286 A79-27208
Hydrogen - Potential key to tomorrow's energy utility
22 p0289 A79-27657
Wind power and electric utilities - A review of the problems and prospects
22 p0300 A79-29374
Photovoltaic electric power generation from a utility perspective
[ASME PAPER 79-SOL-18] 22 p0309 A79-30552
An evaluation of the potential for district heating in the United States
23 p0417 A79-34142
A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143
Waste heat as an alternative heat source
23 p0417 A79-34144

Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future 23 p0420 A79-34168

Coal gasification for electric utilities 23 p0436 A79-35799

The integration of a complex of wind-driven generators into a power system 23 p0454 A79-37913

Wind energy prospecting in Prince Edward Island - A program overview and status report 23 p0482 A79-40109

Transport, distribution and storage of heat by water - Status and developments 23 p0524 A79-41803

Peak period of household load in the different stages of electrical power supply 23 p0528 A79-42226

The conceptual basis of the electric utility sub-model of Project Independence Evaluation System 24 p0616 A79-45764

A case study of OTEC financing for the Middle South Utilities 24 p0621 A79-45810

Economic overview of vertical axis wind turbines 24 p0633 A79-46528

Requirements assessment of wind power plants in electric utility systems 24 p0633 A79-46531

Wind energy systems application to regional utilities 24 p0633 A79-46532

Wind energy central station power generation in the Southwest and Southeast 24 p0634 A79-46533

Electric utility application of WECS in an island location --- Wind Energy Conversion System in Hawaii 24 p0634 A79-46534

Distributed wind generation assessment 24 p0634 A79-46536

Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine 24 p0634 A79-46537

A fully interconnected wind system 24 p0635 A79-46540

Field experience with wind turbine generator operation in utility systems 24 p0635 A79-46548

Conserving energy via cogeneration 24 p0636 A79-46660

Dialectical discussion on optimal order structures for an integrated energy supply system 24 p0649 A79-49331

Applicability of energy model techniques to an analysis of impacts of SO2 emissions from the U.S. electric utilities and control policies 24 p0659 A79-50362

Assessmentt of wind energy systems in a utility framework 24 p0677 A79-51779

Electric utility applications of thermal energy storage and transport 24 p0680 A79-51802

Solid electrolyte fuel cell for electric utility power generation 24 p0682 A79-51815

Sodium/sulfur batteries for peak power generation 24 p0684 A79-51836

Electricity rate systems and energy conservation 24 p0696 A79-51959

Development of sodium-sulfur batteries for utility application [EPRI-EM-683] 21 p0186 N79-11502

Impact of electric passenger automobiles on utility system loads, 1985 - 2000 [EPRI-EA-623] 21 p0203 N79-13281

Assessment of the solid waste impact of the National Energy Plan [BNL-50708] 21 p0213 N79-13572

Current and projected fuel costs --- electric rate schedules and projected costs of fossil, synthetic, and nuclear fuels 21 p0218 N79-14532

A detailed analysis of the impact of onsite equipment on utility costs --- marginal costs of providing backup power for solar energy systems 21 p0218 N79-14535

Photovoltaic power systems for rural areas of developing countries [NASA-TM-79097] 21 p0229 N79-15411

Assessment of the potential of solar thermal small power systems in small utilities [NASA-CR-158093] 22 p0335 N79-16377

Utility operational experience on the NASA/DOE MOD-0A 200-kW wind turbine [NASA-TM-79084] 22 p0360 N79-20494

Venture analysis case study for on-site fuel cell energy systems [PCR-0783-VOL-1] 22 p0361 N79-20505

Thermal power systems, small power systems application project. Volume 1: Executive summary [NASA-CR-157441] 23 p0560 N79-24462

Research at Sandia Laboratories for Solar Thermal Large Power Systems Program [SAND-78-8051] 23 p0565 N79-2451

Community application of integrated energy/utility systems [PB-290675/8] 23 p0566 N79-24520

Large horizontal axis wind turbine development [NASA-TM-79174] 23 p0581 N79-26504

Assessment of load management on the electric power system --- conferences [CONF-781182-3] 23 p0590 N79-27412

Electric utilities and solar energy: The service contract in a new social context [ORAU/IEA(O)-79-3] 23 p0597 N79-27685

Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis [EPRI-ER-808-VOL-1] 23 p0597 N79-27687

Grip-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2 [COO-4337-2/2] 23 p0598 N79-27701

Gas-steam turbine combined cycle power plants [ANL/CES-TE-78-4] 24 p0727 N79-28775

Comparative evaluation of recent reports on the energy conservation potential from cogeneration [ORNL/TM-6602] 24 N79-28776

Cost effective solar hot water system for Econo-Travel Motor Hotel located at Woodbridge, Virginia [COO-4661-1] 24 p0739 N79-29635

Implications of the fusion power source to the electric utility industry [EPRI-ER-943-54] 24 p0740 N79-29642

Study of electrostatic precipitators installed on oil-fired burners --- for use in the utility industry [EPRI-FP-792-VOL-2] 24 p0760 N79-30848

Developing small hydroelectric dam potential [PB-296238/9] 24 p0802 N79-33601

Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning [NASA-CR-162331] 24 p0804 N79-34074

UTILITY AIRCRAFT

Environmental factors affecting the installation and operation of gas turbine engines in agricultural aircraft [SAE PAPER 781010] 22 p0274 A79-25892

UTILIZATION

System for projecting the utilization of renewable resources. SPURR methodology [ERHQ/2322-77/4] 21 p0174 N79-10538

Overview of solar system design and application principles [SAND-78-2419C] 24 p0726 N79-28762

A control system analysis of the energy growth model: Coal 24 p0736 N79-29595

Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry [NASA-CR-159398] 24 p0756 N79-30801

SOAR (solar assisted reactor) power system [BNL-25633] 24 p0772 N79-31787

V

VACUUM CHAMBERS

Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems 21 p0139 A79-17483

Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes [ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836

VACUUM DEPOSITION
Stoichiometric Cu2S thin films for solar cells 21 p0123 A79-17349
Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors 22 p0256 A79-22855
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment 23 p0440 A79-36680
Chemical vapor deposition of spectrally selective surfaces for high-temperature photothermal conversion 23 p0445 A79-37155
Efficient electron-beam-deposited ITO/n-Si solar cells 24 p0629 A79-46152

VACUUM EFFECTS
Evacuated solar flat-plate collectors for economic applications 21 p0133 A79-17435

VACUUM MELTING
Vacuum die casting of silicon sheet for photovoltaic applications [NASA-CR-162360] 24 p0798 N79-33566

VACUUM PUMPS
Problems in the use of cryogenic pumps in thermonuclear synthesis 22 p0305 A79-30264

VACUUM SYSTEMS
A vacuum solar thermal collector with optimal concentration 21 p0043 A79-11970
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O 23 p0470 A79-38641

VACUUM TESTS
Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells 23 p0498 A79-40898

VACUUM TUBES
Performance of vacuum tube solar collector systems 21 p0102 A79-16424
Analysis, development and testing of a fixed tilt solar collector employing reversible Vee-Trough reflectors and vacuum tube receivers 23 p0477 A79-39101
A two-dimensional thermal analysis of a new high-performance tubular solar collector 22 p0352 N79-19060

VALLEYS
Application of LANDSAT data and digital image processing --- Ruhr Valley, Germany [E79-10102] 22 p0339 N79-17291

VALUE ENGINEERING
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development [NASA-TP-1359] 21 p0223 N79-14679

VALVES
Investigation of turbo-dyne energy chamber (G:R: value trademark): An air bleed device [PB-285381/0] 21 p0217 N79-14397
Erosion testing of potential valve materials for coal gasification systems [PB-293308/3] 24 p0720 N79-28592

VAPOR DEPOSITION
Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures --- for fuel cells 21 p0039 A79-11812
Chemical vapor deposited molybdenum films for use in photothermal conversion 22 p0294 A79-28148
Chemical vapor deposited amorphous silicon for use in photothermal conversion 22 p0294 A79-28149
Thin-film solar cells produced by physical vapour deposition 23 p0441 A79-36787
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems 24 p0640 A79-47573
Optical properties and structure of amorphous silicon films prepared by CVD 24 p0654 A79-50177
Thin film battery/fuel cell power generating system [CONS/1197-9] 22 p0369 N79-21556
Chemical vapor deposition of wear-resistant coatings [EM-RI-8348] 24 p0732 N79-29276

VAPOR JETS
Design of a freon jet pump for use in a solar cooling system [ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847

VAPOR PHASES
Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society [CONF-780902-16] 24 p0734 N79-29377

VAPOR PRESSURE
Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane 21 p0085 A79-15324
Compositional modeling of MHD channel slag, with preliminary vapor pressure data 23 p0391 A79-33390

VAPORIZERS
Evaluation of selected chemical processes for production of low-cost silicon, phase 3 --- using a fluidized bed reactor [NASA-CR-162168] 24 p0769 N79-31756

VAPORIZING
Suppression of vaporization in copper-silver-selenide thermoelectric materials 21 p0027 A79-10224
Liquid-phase reactions of vaporizing hydrocarbon fuels 21 p0052 A79-12987
Ammonia vaporization and condensation investigations related to OTEC heat exchangers 24 p0622 A79-45819

VAPORS
Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks [PB-290579/2] 23 p0566 N79-24537
Analysis of the emissions from storage tanks during JP-4 fuel transfer operations. Phase 1: Warm weather conditions [AD-A069339] 24 p0732 N79-29364

VARIABLE GEOMETRY STRUCTURES
Development of gas turbine performance seeking logic [ASME PAPER 78-GT-13] 21 p0031 A79-10257
Tilting wing overspeed control for vertical axis wind turbines [AIAA PAPER 79-0967] 23 p0456 A79-38175
Development of the Variable Geometry Vertical Axis Windmill 23 p0484 A79-40125
Fixed angle and seasonably adjustable structural support concepts for solar converters 23 p0518 A79-41063

VARIABLE MASS SYSTEMS
Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems 24 p0629 A79-46236

VEGETATION
Atlas of western surface-mined lands: Coal, uranium, and phosphate [PB-287846/0] 22 p0340 N79-17311

VEGETATION GROWTH
Hydrocarbons and energy from plants [LBL-8596] 23 p0564 N79-24507
Overview of waste heat utilization techniques --- spray irrigation, soil heating, aquiculture and biomass production [CONF-790443-2] 24 p0791 N79-32726

VELOCITY DISTRIBUTION
A comparison of the Weibull and Rayleigh distributions for estimating wind power potential 21 p0045 A79-12243
An analytical expression for the specific output of wind turbine generators 22 p0273 A79-25720
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows 22 p0279 A79-26184
Energy statistics for large wind turbine arrays 22 p0299 A79-29371

An experimental determination of the parallel electron velocity distribution during strong turbulence --- in Texas Turbulent Torus
23 p0446 A79-37264

Depletion of available wind power by a large network of wind generators
23 p0453 A79-37899

Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841

Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371

VELOCITY MEASUREMENT

Measurements of plasma rotation in tokamak LT-3
22 p0252 A79-22238

Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382

VENTILATION

Heat recovery devices for building HVAC systems --- Heating Ventilating and Air Conditioning
21 p0073 A79-14697

Boosting the performance of solar HVAC systems by improving component interactions --- Heating, Ventilating and Air Conditioning
21 p0089 A79-15851

Using controls to reduce component size and energy needs for solar HVAC --- Heating Ventilation, Air Conditioning
21 p0102 A79-16421

Solar heating and ventilating by natural means
21 p0103 A79-16458

Solar heating and ventilation using the modified Trombe wall system
22 p0320 A79-31435

Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608

VENTURI TUBES

Effect of swirler-mounted mixing venturi on emissions of flame-tube combustor using jet A fuel
[NASA-TP-1393] 21 p0215 N79-14099

VIBRATION MODE

Spatial oscillations of a solid body carrying a low-power flywheel motor --- dual spin spacecraft motion control
21 p0148 A79-17792

VIBRATION TESTS

Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator
24 p0699 A79-51979

VIKING SPACECRAFT

SNAP 19 performance update for Pioneer and Viking missions
24 p0694 A79-51940

VIRGIN ISLANDS

Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment
24 p0622 A79-45818

VIRGINIA

Solar project cost report: Terrell F. Moseley Office Building, Lynchburg, Virginia
[SOLAR/2011-78/60] 23 p0562 N79-24483

Solar project description. Terrell F. Moseley Office Building, Lynchburg, Virginia
[SOLAR/2011-78/50] 23 p0563 N79-24498

Cost effective solar hot water system for Econo-Travel Motor Hotel located at Woodbridge, Virginia
[COO-4661-1] 24 p0739 N79-29635

Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River
[NASA-TM-80124] 24 p0777 N79-31839

VISCOSITY

Viscosity stabilized solar ponds
21 p0133 A79-17430

Viscosity reduction of coal liquids by dissolved carbon dioxide
[SAND-79-7027] 24 p0732 N79-29365

VISCOUS DRAG

Tipvane research at the Delft University of Technology --- auxiliary wings for turbine blades of windmills
23 p0485 A79-40129

VISCOUS FLOW

An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32348

VITREOUS MATERIALS

Study of the electrochemical activity of a porous vitreous carbon
23 p0389 A79-33264

VLASOV EQUATIONS

Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419

VOLATILITY

Shock tube studies of coal devolatilization
21 p0083 A79-15247

VOLCANOES

Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey
[LA-7656-MS] 22 p0358 N79-20458

Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

VOLCANOLOGY

Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948

Volcanology --- geophysical study
24 p0632 A79-46432

Exploration of volcanic geothermal energy resources based on rheological techniques
[DOE/ET/28453-3] 23 p0596 N79-27676

VOLT-AMPERE CHARACTERISTICS

Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells
21 p0040 A79-11824

Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348

Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349

Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353

Grain-boundary edge passivation of GaAs films by selective anodization --- shorting effect in solar cells
21 p0154 A79-18487

A high-efficiency GaAlAs double-heterostructure photovoltaic detector --- with antireflection coating
21 p0154 A79-18489

On the role of interface states in MOS solar cells
21 p0156 A79-19092

A two-junction cascade solar-cell structure
22 p0256 A79-22856

A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242

The effect of the dispersion of the characteristics of solar cells in large systems
22 p0285 A79-26822

Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996

An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871

Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426

Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells
22 p0313 A79-31347

Photovoltaic conversion in Cu2O
23 p0384 A79-32973

Detailed characterization of MHD generator operating parameters
23 p0393 A79-33409

Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690

Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601

The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680

Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777

Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779

Meteorological effects on Schottky-barrier solar cells
23 p0441 A79-36781

Schottky-barrier versus homojunction silicon solar cells - A status report
23 p0441 A79-36783

655 mV open-circuit voltage, 17.6% efficient silicon MIS solar cells
23 p0447 A79-37686

Open circuit voltage of high intensity silicon solar cells
23 p0511 A79-41014

Schottky effect and photovoltaic devices on the texturized surfaces
23 p0522 A79-41100

Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171

Encapsulation materials for photovoltaic arrays
23 p0534 A79-43294

Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904

The physics of solar cells
24 p0637 A79-47050

A simple theory of back-surface-field /BSF/ solar cells
24 p0637 A79-47051

Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179

Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0648 A79-49213

Current conduction in Cr-MIS solar cells on single-crystal p-silicon
24 p0648 A79-49215

Application of finite element method to analysis of MHD generators
24 p0653 A79-50001

Gallium arsenide films and solar cells on graphite substrates
24 p0667 A79-50937

An anomalous photocurrent in SnO2-Si heterojunction solar cells
24 p0668 A79-50950

Discharge characteristics of 300 ampere-hour Ni-Zn traction cells
[NASA-TM-79244] 24 p0772 N79-31781

VOLTAGE CONVERTERS (DC TO DC)

Contribution to the development of wind energy systems using static power electronic converters
22 p0286 A79-26958

VORTEX GENERATORS

Subsonic diffusers for MHD generators
22 p0279 A79-26185

VORTEX SHEETS

Vortex sheet analysis of the Giromill
21 p0031 A79-10278

A two dimensional vortex sheet model of a Savonius Rotor
22 p0278 A79-26178

Vortex sheet analysis of the Giromill --- vertical axis wind turbine with straight blades
22 p0278 A79-26179

VORTICES

Cost-effectiveness of the vortex-augmented wind turbine
22 p0266 A79-24048

Wind power distribution, control, and conversion in vortex augmentors --- influence on turbomachinery design and development
22 p0278 A79-26180

Wind power from a vortex chamber
22 p0319 A79-31425

Theoretical study of a hybrid wind turbine
23 p0405 A79-34047

Free vortices from a wing for wind turbine systems
23 p0537 A79-43683

Vortex excited oscillations of marine structures with application to the OTEC cold water pipe
24 p0622 A79-45825

Wind and solar energies in the tornado type wind energy system
24 p0645 A79-48068

A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines
24 p0794 N79-33158

W

WAFERS

Pilot line report: Development of a high efficiency thin silicon solar cell
[NASA-CR-158028] 21 p0219 N79-14548

Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158095] 22 p0334 N79-16368

Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158588] 23 p0549 N79-23507

Metallization of large silicon wafers
[NASA-CR-158575] 23 p0550 N79-23517

LSA: Low-cost Solar Array project
[NASA-CR-158533] 23 p0559 N79-24459

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158744] 23 p0580 N79-26485

High efficiency cell geometry
24 p0784 N79-32653

Vacuum die casting of silicon sheet for photovoltaic applications
[NASA-CR-162360] 24 p0798 N79-33566

WAKES

Calculation of wake effects in wind turbine parks
21 p0045 A79-12241

Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539

WALL FLOW

Combustion of coal particles in wall-burning swirl combustors --- for MHD generators
24 p0632 A79-46317

WALL TEMPERATURE

Two-dimensional MHD channel design --- for energy performance improvement at lower wall temperature
22 p0279 A79-26183

Three-dimensional effects of electrode configuration on diagonal MHD generator performance
22 p0283 A79-26523

The effects of wall temperature on light impurities in Alcator --- tokamak device
22 p0313 A79-31188

Surface processes in plasma wall interactions --- in tokamak experiments
23 p0442 A79-36877

Review of plasma wall interactions in tokamaks
23 p0443 A79-36879

Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880

Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881

Surface effects and impurity production in tokamak machines
23 p0443 A79-36884

First wall and divertor plate material selection in fusion reactors
23 p0444 A79-36886

Active heat insulation through solar low-temperature system that can be integrated into the house wall
23 p0465 A79-38596

How a wall uses solar energy
24 p0603 A79-44295

WALLS

Solar heating and ventilation using the modified Trombe wall system
22 p0320 A79-31435

South wall solar collector with active collector system
22 p0320 A79-31436
Sputtering yields of graphite and carbides and their potential use as first wall materials --- in Tokamak reactor
23 p0444 A79-36892
Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581
An experimental study of walls with latent heat for residences
23 p0470 A79-38640
Insulating wall boundary layer in a Faraday MHD generator
[FE-23417] 22 p0365 N79-21310
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634

WANKEL ENGINES
A review of Curtiss-Wright rotary engine developments with respect to general aviation potential
[SAE PAPER 790621] 23 p0440 A79-36749

WARPAGE
Mechanical deflection analysis of diamond turned reflective optics --- for laser fusion
21 p0083 A79-15143

WASHINGTON
Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0585 N79-26539
Solar heating, cooling, and hot water systems installed at Richland, Washington
[NASA-CR-161237] 24 p0722 N79-28721

WASTE DISPOSAL
Disposal of industrial wastes by combustion: Present state-of-the-art. Volume 3 --- Book
21 p0036 A79-11675
Stabilization of power plant scrubbing slurries and fine coal refuse with the additive Calcilox
21 p0063 A79-14107
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115
Environmental effects of burning solid waste as fuel
21 p0082 A79-15115
Solid waste and coal firing in industrial boilers
21 p0096 A79-15918
Co-disposal of sewage sludge using refuse-derived fuel
21 p0097 A79-16098
A waste management strategy for nuclear fusion power systems from a regulatory perspective
23 p0407 A79-34064
Options for treating and disposing of scrubber sludge
23 p0424 A79-34460
Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949
Waste disposal by fluid bed incineration and energy recovery modes
23 p0487 A79-40387
Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391
Properties and operating experience with bagasse as a boiler fuel --- raw sugarcane processing waste
23 p0489 A79-40395
308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city
23 p0489 A79-40397
Integrating an electrostatic precipitator into a municipal solid waste resource recovery system
23 p0489 A79-40398
RDF storage and retrieval problems: Cause - effect - options --- Refuse Derived Fuel
23 p0489 A79-40402
The economics of energy recovery from industrial waste incineration
23 p0490 A79-40406
A technical and economic evaluation of the Baltimore Landgard demonstration --- municipal solid waste processing plant for energy and materials recovery
23 p0491 A79-40420
A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432
Solid waste and biomass. Their potential as energy sources in Illinois, 1977
[PB-281689/4] 21 p0177 N79-10562
Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572
A methodology for evaluating the potential materials and energy recovery from municipal solid waste
21 p0215 N79-13935
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946
Stimulated biodegradation of waste petroleum
22 p0336 N79-16388
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224
An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells
[NVO-1531-2] 22 p0366 N79-21523
Pollution control guidelines for coal refuse piles and slurry ponds
[PB-291369/7] 22 p0373 N79-21682
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575
Report to the President by the Interagency Review Group on Nuclear Waste Management --- as part of the National Energy Plan
[TID-29442] 24 p0729 N79-29021
Hazards from radioactive waste in perspective --- comparison with wastes from burning coal
[CONF-790204-5] 24 p0761 N79-31024
Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075
Spent fuel handling and packaging program
[RHO-LD-78-4-AUG] 24 p0777 N79-32081
Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0793 N79-32995

WASTE ENERGY UTILIZATION
Thermal energy storage for industrial waste heat recovery
21 p0012 A79-10101
The Department of Energy's thermionic energy conversion program
21 p0025 A79-10213
The utilization of European space techniques for energy production
[IAF PAPER 78-190] 21 p0035 A79-11287
Low-grade thermal energy-conversion Joule effect heat engines
[ASME PAPER 78-ENAS-7] 21 p0048 A79-12556
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826
Dispersed power systems and total energy --- solar energy conversion for combined mechanical/electrical and thermal loads
[AIAA PAPER 78-1770] 21 p0062 A79-13868
State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes
21 p0064 A79-14111
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115
Heat recovery devices for building HVAC systems --- Heating Ventilating and Air Conditioning
21 p0073 A79-14697

Solar total energy systems
21 p0090 A79-15863

Large-scale thermal energy storage for cogeneration and solar systems --- in aquifers
21 p0092 A79-15886

Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921

Inexpensive solar energy utilization in human settlements
21 p0104 A79-16470

The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358

Exploitation of solar energy via modular power plants and multiple utilization of waste heat
21 p0141 A79-17497

The Koppelman process --- to upgrade lignite and some waste energy sources
21 p0145 A79-17634

The Stirling engine, an energy converter for cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777

Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448

Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

Industrial cogeneration - Problems and promise --- waste heat utilization from electricity production
22 p0265 A79-24047

Medium-power /100-1000 kWe/ solar power plants using distributed collectors
22 p0269 A79-24622

Feasibility of MHD-ac induction electric power plant --- using tokamak reactor exhaust plasma
22 p0303 A79-29794

Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331

Repowering of a small utility - A unique solution to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332

Development progress on the atmospheric fluidized bed coal combustor for cogeneration gas turbine system for industrial cogeneration plants
[ASME PAPER 79-GT-104] 23 p0377 A79-32380

The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381

GUD - An unfired combined cycle approach to energy utilization --- in turbine power plant gas and steam waste heat recovery system
[ASME PAPER 79-GT-131] 23 p0377 A79-32400

Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416

DD-963 Class waste heat recovery system experience
[ASME PAPER 79-GT-159] 23 p0378 A79-32421

Combined cycles for pipeline compressor drives using heat
[ASME PAPER 79-GT-162] 23 p0378 A79-32424

Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429

Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455

The self-propelled hydrogen-powered refrigerator car
23 p0415 A79-34126

A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143

Waste heat as an alternative heat source
23 p0417 A79-34144

Energy conservation by waste heat utilization
23 p0417 A79-34145

Extraction of sensible heat from waste water for domestic heating applications
23 p0418 A79-34152

Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

Effect of friction on motion of a piston driven by combustion products
23 p0436 A79-35656

The problem of fouling in the utilisation of geothermal energy
23 p0449 A79-37853

Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192

Energy supply for the Federal Republic on a regenerative basis
23 p0473 A79-38666

A novel thermal engine using metal hydride
23 p0479 A79-39844

Energy conservation through waste utilization; Proceedings of the Eighth Biennial National Waste Processing Conference, Chicago, Ill., May 7-10, 1978
23 p0487 A79-40386

Waste disposal by fluid bed incineration and energy recovery modes
23 p0487 A79-40387

Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling
23 p0488 A79-40389

Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390

Recycle energy system - City of Akron, Ohio
23 p0488 A79-40392

Practice of heat utilization from refuse
23 p0488 A79-40393

Case study energy recovery from wastes from an automobile assembly plant
23 p0489 A79-40394

Integrating an electrostatic precipitator into a municipal solid waste resource recovery system
23 p0489 A79-40398

Flue gas emissions from a shredded-municipal-refuse-fired steam generator
23 p0489 A79-40399

The economics of energy recovery from industrial waste incineration
23 p0490 A79-40406

Solid waste utilization in integrated community energy systems
23 p0490 A79-40415

A technical and economic evaluation of the Baltimore Landgard demonstration --- municipal solid waste processing plant for energy and materials recovery
23 p0491 A79-40420

Methanol decomposition bottoming cycle for IC engines
[SAE PAPER 790427] 23 p0495 A79-40774

A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046

Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930

Gasification of solid waste - Potential and application of co-current moving bed gasifiers
23 p0536 A79-43574

Renewable energy sources --- overview of West German options
24 p0606 A79-44958

Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839

Conserving energy via cogeneration
24 p0636 A79-46660

Conceptual development of a solar town in Iran
24 p0660 A79-50539

New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863

Heat rejection development requirements for orbital power systems
24 p0692 A79-51924

The indirect Brayton energy recovery system
24 p0696 A79-51958

District heating and cooling with heat pump systems
24 p0696 A79-51960

System performance of a Stirling engine powered heat activated heat pump
24 p0697 A79-51962

Heat pump system for process steam generation
24 p0697 A79-51964

Thermodynamic evaluation of heat pumps working with high temperatures
24 p0697 A79-51965

Technology impact study of a high efficiency industrial heat pump
24 p0697 A79-51966

Waste heat as an alternate fuel - Its opportunities and potential
24 p0698 A79-51968

The energy reformation --- waste energy utilization for heating and electricity
24 p0698 A79-51969

Increasing gas turbine efficiency through the use of a waste heat methanol reactor
24 p0702 A79-52000

Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005

R and D on Rankine cycle engines in Japan
24 p0702 A79-52007

An evaluation of wood-waste energy conversion systems
21 p0174 N79-10528

Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473

Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481

Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

Energy and economic analysis of industrial process heat recovery with heat pumps
22 p0331 N79-16210

Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171

MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500

Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290150/1] 22 p0364 N79-21167

The role of thermal energy storage in industrial energy conservation
[NASA-TM-79122] 22 p0368 N79-21550

Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638

Energy recovery from domestic refuse by means of incineration and pyrolysis
[CSIR-SR-WAT-54] 23 p0560 N79-24468

Community application of integrated energy/utility systems
[PB-290675/8] 23 p0566 N79-24520

Use of waste heat from nuclear power plants
[CONF-7811109-4] 23 p0583 N79-26527

Power generation with binary cycles
24 p0724 N79-28740

Thermochemical conversion: Biomass gasification
[TID-29391] 24 p0726 N79-28766

Second Annual Combustion and Fuels Technology Program Contractor Review Meeting
[CONF-7809103] 24 p0731 N79-29271

Technical and economic feasibility study for the industrial utilization of waste derived fuel gas
[SAN-2092-T1] 24 p0733 N79-29372

European waste-to-energy systems: Case study of Rennes, France
[HCP/M2103-0008] 24 p0737 N79-29605

Environmental readiness document: Urban waste energy recovery. Commercialization phase 3 planning
[DOE/ERD-0002] 24 p0745 N79-30102

Oven curing: Energy conservation and emission control in coil coating
[TID-28705] 24 p0750 N79-30723

Refrigerant-114 Rankine cycle energy recovery technology from the gaseous diffusion industry
[GAT-916] 24 p0750 N79-30724

Performance and evaluation of concepts and devices for heat reclamation from air conditioners, heat pumps, and refrigeration equipment
[AD-A069650] 24 p0752 N79-30770

Energy conservation via heat transfer enhancement --- bibliographies
[COO-4649-3] 24 p0758 N79-30819

Energy from urban wastes: Report on a focus group discussion
[DOE/TIC-10022] 24 p0759 N79-30825

Rational energy utilization in coke-oven-plant operations
[BMFT-FB-T-77-72] 24 p0759 N79-30832

Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432

Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433

Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0547/4] 24 p0767 N79-31435

Energy conservation with fired heaters
[TREE-1308] 24 p0772 N79-31783

Research and development work for hydrogasification of coal with nuclear processing heat done in the framework of the prototype nuclear processing heater project
[BMFT-FB-T-78-25] 24 p0780 N79-32393

Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat
[BMFT-FB-T-78-29] 24 p0780 N79-32394

Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PO-1] 24 p0790 N79-32717

Overview of waste heat utilization techniques --- spray irrigation, soil heating, aquiculture and biomass production
[CONF-790443-2] 24 p0791 N79-32726

The use of the heat pumps to raise temperatures in an economical and ecological way --- domestic heating via industrial waste energy
[BMFT-FB-T-78-35] 24 p0792 N79-32732

WASTE TREATMENT

The efficiency of resource recovery from solid waste
24 p0662 A79-50561

The 'effectiveness' of waste treatment systems
24 p0662 A79-50563

Some environmental impacts of resource recovery systems
24 p0665 A79-50885

WASTE UTILIZATION

New processes for the recovery of resource materials from coal combustion wastes
21 p0007 A79-10065

Fluidized-bed combustion of low-quality fuels
21 p0007 A79-10066

The need for materials recycling
21 p0047 A79-12340

Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

Forest residues as an alternate energy source
21 p0072 A79-14689

Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690

Source emissions factors for refuse derived fuels
21 p0082 A79-15084

Biomass and wastes as energy resources - 1977 update
21 p0091 A79-15868

New concepts in waste utilization and biomass
21 p0095 A79-15915

Industrial wastes to energy
21 p0096 A79-15916

Energy from urban waste
21 p0096 A79-15917

Advanced processes for more efficient use of forest products residual material
21 p0096 A79-15919

Co-disposal of sewage sludge using refuse-derived fuel
21 p0097 A79-16098

Energy conservation by means of recycling
21 p0112 A79-16735

Urban wastes as an energy source
21 p0115 A79-17220

Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735

Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788

Weak points of our prediction models for raw materials strategy --- waste materials and scrap recycling
22 p0265 A79-24040

Development of specifications for recycled products
22 p0295 A79-28182

Modern technology for recovering energy and materials from urban wastes - Its applicability in developing countries
22 p0295 A79-28183

Utilisation of solid waste
22 p0304 A79-30204

Sensible heat storage for solar energy applications
22 p0322 A79-31449

Energy recovery from urban solid waste
23 p0386 A79-33233

The role of the local authority in waste reclamation
23 p0395 A79-33752

The microbial production of methane from the putrescible fractions of sorted household waste
23 p0396 A79-33753

Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147

ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148

Net energy from municipal solid waste
23 p0418 A79-34149

Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908

Electricity from municipal wastes
23 p0454 A79-37911

Use of low grade fuel derived from domestic and trade wastes
23 p0454 A79-37912

Summary results from the NASA Tech House one year live-in
[AIAA PAPER 79-0987] 23 p0475 A79-38892

Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949

Energy conservation through waste utilization; Proceedings of the Eighth Biennial National Waste Processing Conference, Chicago, Ill., May 7-10, 1978
23 p0487 A79-40386

Experience with solid waste as a supplementary fuel
23 p0488 A79-40388

Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391

Properties and operating experience with bagasse as a boiler fuel --- raw sugarcane processing waste
23 p0489 A79-40395

Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396

308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city
23 p0489 A79-40397

RDF storage and retrieval problems: Cause - effect - options --- Refuse Derived Fuel
23 p0489 A79-40402

Economic factors in refuse derived fuel utilization
23 p0490 A79-40407

Research and development facilities at the Ontario Center for Resource Recovery
23 p0490 A79-40410

Heating value of refuse derived fuel
23 p0490 A79-40412

Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413

Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities
23 p0490 A79-40414

Utilization of fluidized bed combustion in energy recovery from solid wastes
23 p0490 A79-40416

Design criteria to achieve industrial power plant reliability in solid waste processing plants with energy recovery
23 p0491 A79-40417

An overview of San Diego County's resource recovery plant
23 p0491 A79-40418

Refuse shredding - Performance, testing and evaluation data
23 p0491 A79-40419

Evaluation of densified refuse derived fuels for use in pulverized coal-fired steam generators
23 p0491 A79-40422

Planning for resource recovery in the 'Big Apple' --- New York City plans for refuse utilization
23 p0491 A79-40424

Oceanside Disposal Plant improvement program - Design, construction and operating experience
23 p0491 A79-40425

Utilization of sewage skimmings as fuel to generate process steam
23 p0492 A79-40426

Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371

30 years of refuse-fired boiler experience
23 p0523 A79-41374

Classification and energy evaluation of urban wastes
23 p0525 A79-41817

European technology for obtaining energy from solid waste --- Book
24 p0638 A79-47072

The Seattle experience - Conversion of solid waste to fuels or chemicals
24 p0651 A79-49384

Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant
24 p0654 A79-50007

The efficiency of resource recovery from solid waste
24 p0662 A79-50561

The 'effectiveness' of waste treatment systems
24 p0662 A79-50563

Air emissions from waste to energy systems
24 p0665 A79-50883

Some environmental impacts of resource recovery systems
24 p0665 A79-50885

Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772

Cogeneration with digester gas
24 p0676 A79-51773

Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system
24 p0703 A79-52010

Resource recovery and recycling --- Book
24 p0706 A79-52570

Conversion of biomass materials into gaseous products, phase 1
[SAN-1241-77-1] 21 p0171 N79-10237

Methane generation from human, animal, and agricultural wastes
[PB-276469/4] 21 p0171 N79-10240

Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574

Methanol from wood waste: A technical and economic study
[FPI-12] 21 p0194 N79-12239

Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste
[PB-285196/2] 21 p0213 N79-13590

The anaerobic attached film expanded bed reactor for the treatment of dilute organic wastes
22 p0356 N79-19928

A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives --- economic analysis 23 p0567 N79-24813
Recovery, processing, and utilization of gas from sanitary landfills [PB-293165/7] 23 p0578 N79-26235
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes [PB-293210/1] 23 p0578 N79-26236
Proceedings of a Symposium on the Utilization of Methane Generated in Landfills [CONF-780340] 24 p0747 N79-30410
Energy from urban wastes: Report on a focus group discussion [DOE/TIC-10022] 24 p0759 N79-30825
Enhanced oil recovery chemicals from renewable wood resources [ORNL-5525] 24 p0764 N79-31363
Utilization of used oil [ATR-78(7384)-1] 24 p0767 N79-31432
Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base [NTIS/PS-79/0546/6] 24 p0767 N79-31434

WASTE WATER
Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant 23 p0417 A79-34147
Solar system - Solar generator-inverter-asynchronous motor-pump --- for waste water treatment 23 p0466 A79-38605
Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants 24 p0629 A79-46228
Solar energy fixation and conversion with algal bacterial systems 24 p0721 N79-28665
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability [PB-294338/9] 24 p0744 N79-29709
Enhanced oil recovery chemicals from renewable wood resources [ORNL-5525] 24 p0764 N79-31363
Water related environmental effects in fuel conversion. 1: Summary volume --- water requirements for synthetic fuel technologies [FE-2445-1-VOL-1] 24 p0793 N79-32747

WATER
A copper oxide-copper sulfate water-splitting cycle 21 p0015 A79-10128
Iron oxide semiconductor electrodes in photoassisted electrolysis of water 21 p0037 A79-11781
Study of the interaction of H_2O and O_2 with the surface of TiO_2 by electron stimulated desorption and Auger and characteristic loss spectroscopies 21 p0037 A79-11793
Hydrogen production by conventional and modified water electrolysis 21 p0059 A79-13659
Solar pumping --- thermal and electrical water pumping 21 p0104 A79-16469
Solar ammonia-water absorption system for cold storage application 21 p0143 A79-17521
The thermochemical decomposition of water using bromine and iodine 22 p0238 A79-20770
Problems around Fe-Cl cycles --- thermochemical decomposition of water hydrogen production 22 p0238 A79-20771
Sulfuric acid-water - Chemical heat pump/energy storage system demonstration 22 p0281 A79-26209
Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source 22 p0283 A79-26466
A flat plate multiple pass solar collector using aqueous optical properties 22 p0293 A79-28144
Water-cooled gas turbine technology development - Fuels flexibility [ASME PAPER 79-GT-72] 22 p0307 A79-30536
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature --- for hydrogen production 23 p0382 A79-32875
Thermochemical water splitting process using iron-copper-chlorine cycle 23 p0413 A79-34110
Hydrogen fuel production by wind energy conversion 23 p0413 A79-34113
Hydrogen production from coal, water and electrons 23 p0445 A79-37072
Water electrolysis using solid polymer electrolytes 24 p0613 A79-45589
Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures 24 p0632 A79-46318
The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation 24 p0649 A79-49231
Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization 24 p0660 A79-50538
Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system 24 p0681 A79-51806
A simplified algorithm for the evaluation of hybrid thermal storage with water systems 24 p0681 A79-51808
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 24 p0685 A79-51840
Solid polymer electrolyte water electrolysis status for large scale hydrogen production 24 p0686 A79-51847
The photochemical reaction applied to a multiply hybridized water-splitting system 24 p0715 A79-54294
Sb-I-Ca process for thermochemical hydrogen production 24 p0715 A79-54296
Thermochemical production of hydrogen from water [LA-UR-78-652] 21 p0180 N79-11236
Solar photolysis of water [NASA-CASE-NPO-14126-1] 21 p0182 N79-11470
The emissions and fuel economy of a Detroit diesel 6-71 engine burning a 10-percent water-in-fuel emulsion [AD-A058550] 21 p0203 N79-13375
Environmental and radiological safety studies. Interaction of (Pu-238)O_2 heat sources with terrestrial and aquatic environments --- soil and water analysis [LA-7033-PR] 21 p0232 N79-15783
Proceedings of symposium on water-in-fuel emulsions in combustion --- marine diesels, boilers, and gas turbine engines [AD-A061503] 22 p0338 N79-17019
Solar water pumps. Citations from the Engineering Index data base [NTIS/PS-78/1288/6] 22 p0343 N79-17348
Wind driven water pumps. Economics, technology, current activities [PB-292816/6] 23 p0585 N79-26542
North Stanley Polymer Demonstration Project [BETC/RI-78/19] 23 p0588 N79-27313
Water as a constraint to the use of coal for California 23 p0592 N79-27606
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy source for households and small consumers [DLR-FB-78-17] 24 p0760 N79-30836
Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils [ORNL/SUB-79/14274/1] 24 p0776 N79-31827
Physical properties and stability of water in fuel oil emulsions [PB-296146/4] 24 p0796 N79-33348

WATER CIRCULATION
An analytical and experimental study of pumped solar water heaters 21 p0128 A79-17389

An exploration of the applicability field of geothermal water-fed heat pumps
23 p0409 A79-34077
Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607
An overview of the OTEC-1 design --- including mooring, anchoring, site selection, installation, manufacturing, etc
24 p0625 A79-45846
OTEC system response and control analysis --- optimization of thermal cycle with seawater pumps
24 p0625 A79-45850
Results of a near field physical model study --- OTEC plant interaction with ocean environment
24 p0626 A79-45856

WATER CONSUMPTION
The consumptive use of water in geothermal energy applications
24 p0667 A79-50897
Water-related environmental effects in fuel conversion. Volume 2: Appendices
[PB-288874/1] 22 p0356 N79-19496
Water related environmental effects in fuel conversion. 1: Summary volume --- water requirements for synthetic fuel technologies
[FE-2445-1-VOL-1] 24 p0793 N79-32747

WATER COOLED REACTORS
Energy conservation by waste heat utilization
23 p0417 A79-34145

WATER CURRENTS
Tidal and river current energy systems
23 p0449 A79-37862

WATER FLOW
Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133
Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177
Wave driven power generating system
21 p0059 A79-13657
Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755
Performance matching and optimization of wind powered water pumping systems
23 p0479 A79-39842
Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/
24 p0618 A79-45790
Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector
[NASA-CR-161306] 24 p0797 N79-33561

WATER HEATING
Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177
Asymptotic behaviour as a guide to the long term performance of solar water heating systems
21 p0041 A79-11872
Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292
The analysis by stochastic modelling of solar systems for space and water heating
21 p0137 A79-17466
Dynamic response of a novel solar water heater --- collector using low-boiling liquid between flat plates
21 p0140 A79-17488
Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489
Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755
Effects of low solar input and amount of storage on thermosyphon hot water system performance
22 p0267 A79-24312
Solar energy for industrial process steam
22 p0267 A79-24315
Current status and prospects for low-temperature solar energy
22 p0269 A79-24623
Solar heating, cooling and hot water production - A critical look at CCMS installations
22 p0275 A79-25931
Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors
22 p0285 A79-26815
The Tritherm test house --- solar heating experiment
22 p0290 A79-27723
Economic feasibility of solar water and space heating
22 p0292 A79-27899
A Markov model of solar energy space and hot water heating systems
22 p0295 A79-28353
Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670
Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers
22 p0297 A79-28671
Case history - Hybrid passive/active solar system: Performance and cost
22 p0313 A79-31315
Measured and predicted performance of solar domestic water heaters
22 p0319 A79-31422
Domestic water preheating using solar energy
22 p0321 A79-31437
Economic design of a solar domestic water heating system
22 p0321 A79-31438
Control system for solar hot water system
22 p0321 A79-31442
Solutions to energy conservation in northern climates
22 p0321 A79-31443
Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457
P.E.I. solar assisted domestic water heat project
22 p0323 A79-31458
Modular stackable hot water storage/heat exchanger system for solar installations
23 p0400 A79-34004
Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies
23 p0403 A79-34032
The efficiency of solar assisted hot water systems
23 p0430 A79-35061
SOLPAC - A total design for energy conservation in housing
23 p0434 A79-35479
Domestic space and water heating for existing dwellings using a heat pump and conventional roofs as energy absorbers
23 p0449 A79-37851
Thermal energy storage using hot liquids
23 p0451 A79-37879
Thin-film coatings in solar water heating systems
23 p0452 A79-37887
Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888
Performance and cost of domestic solar water heating in Australia
23 p0452 A79-37889
A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894
Experimental project on the utilization of solar energy in domestic hot water heating in Iraq
23 p0465 A79-38597
The air-water collector - Operating experience and utilization possibilities --- for solar heating
23 p0467 A79-38615
The performance of solar water heating systems with flat plate collectors
23 p0468 A79-38620
Design of solar heated warm water heating facilities from an economic viewpoint
23 p0468 A79-38622
One year's experience with a do-it-yourself gravity-driven solar domestic hot water unit
23 p0468 A79-38623

Legal and economic aspects of engineering design in solar water heating systems 23 p0473 A79-38664
Energy analysis of low-temperature solar energy systems 23 p0473 A79-38670
Retrofitting strategies for a housing cooperative --- solar water heating installation 23 p0473 A79-38671
Design of a public exhibition building to demonstrate air, water, and passive solar heating systems 23 p0474 A79-38673
Cost reduction using modular installation for solar heating, cooling and water heating at the life clinic in Brandon, Florida [AIAA PAPER 79-1021] 23 p0476 A79-38895
Commercialization aspects of solar process hot water systems for the textile industry [AIAA PAPER 79-1027] 23 p0476 A79-38896
Performance of a collector/storage solar water heater 23 p0479 A79-39843
A novel thermal engine using metal hydride 23 p0479 A79-39844
Wind energy - Heat generation 23 p0486 A79-40133
Transport, distribution and storage of heat by water - Status and developments 23 p0524 A79-41803
Dynamic modeling of water- and air-heating solar collectors 23 p0531 A79-42897
Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate 24 p0602 A79-44263
The use of solar energy to provide heat and hot water for the students' residence of the Ecole des Mines in Ales, France 24 p0603 A79-44298
Passive solar heating for buildings 24 p0603 A79-44504
Economics of preheating water for commercial use --- solar collector system 24 p0608 A79-45206
Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems 24 p0608 A79-45207
Solar 'Plus' - Huntsville, Alabama 24 p0608 A79-45209
Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex 24 p0608 A79-45210
A review of current R&D in thermal energy storage and heat exchange in solar applications 24 p0608 A79-45211
The economics of solar domestic hot water systems in state university and community college buildings 24 p0610 A79-45227
Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems 24 p0637 A79-46908
Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers 24 p0637 A79-46909
An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University 24 p0641 A79-47797
Solar pond concepts - Old and new 24 p0671 A79-51734
Stability criteria for saturated solar ponds 24 p0671 A79-51736
Economic and performance comparisons of salty and saltless solar ponds 24 p0671 A79-51737
Sede Boqer - Shallow solar ponds project 24 p0671 A79-51738
Certification report for the CALMAC solar powered pump [NASA-CR-150872] 22 p0341 N79-17331
Solar project description: Scattergood School Recreation Center, West Branch, Iowa [SOLAR/2003-78/50] 23 p0561 N79-24481
Solar project description: Aratex Services, Incorporated, industrial laundry, Fresno, California [SOLAR/2008-78/50] 23 p0562 N79-24485
Solar project description: Iris Images, Incorported, film laboratory, Mill Valley, California [SOLAR/2005-78/50] 23 p0562 N79-24486
Solar project cost report. Iris Images, Incorporated, Film Laboratory, Mill Valley, California [SOLAR/2005-78/60] 23 p0563 N79-24494
Solar project cost report. Aratex Services, Inc., Industrial Laundry, Fresno, California [SOLAR/2008-78/60] 23 p0563 N79-24495
SOLCOST: Space heating handbook with service hot water and heat loads calculations [DOE/CS-0042/3] 23 p0564 N79-24501
Comprehensive areal model of residential heating demands [BNL-24998] 23 p0597 N79-27692
Production of hot water with the aid of solar energy: Conditions and costs [SIB-R-83-1978] 23 p0598 N79-27700
Solar project cost report [SOLAR/2018-78/60] 24 p0728 N79-28788
Solar heating and hot water system installed at Southeast of Saline, Unified School District 306, Mentor, Kansas [NASA-CR-161271] 24 p0737 N79-29602
Assessment of the technoeconomic feasibility or Seasonal Thermal Energy Storage systems (STES) [ANL/EES-TM-35] 24 p0740 N79-29637
Economy of a retrofit solar system [CONF-790213-2] 24 p0755 N79-30795
Macroeconomic and sector implications of installing 2.2 million residential solar units [DOE/EIA-0102/51] 24 p0773 N79-31798

WATER INJECTION
Energy extraction operations: Some preliminary results --- thermal energy from granitic rocks by water injection [LA-UR-79-679] 24 p0786 N79-32678

WATER INTAKES
Land-based OTEC plants - Cold water pipe 24 p0620 A79-45799

WATER MANAGEMENT
Optimal decisions for long-term operation of hydropower systems 22 p0245 A79-21473
Remote sensing use in hydraulic planification in Mexico 22 p0255 A79-22522
Water/energy management and evaluation model for Pennsylvania [PB-287577/1] 22 p0343 N79-17353

WATER POLLUTION
Environmental impacts of industrial energy systems in the coastal zone 21 p0075 A79-14722
Coupled heat and organic wastes stream pollution 21 p0086 A79-15602
OTEC program status and plans 21 p0094 A79-15902
Mercury in some New Zealand geothermal discharges 22 p0257 A79-22925
Factors affecting bitumen recovery by the hot water process 22 p0282 A79-26463
The effects of oil on marine life --- water pollution effects on ocean biology 23 p0434 A79-35463
Environmental implications of energy recovery from municipal solid waste 23 p0476 A79-38949
Pumped storage projects and their environmental impacts - An overview 24 p0666 A79-50894
Cogeneration with digester gas 24 p0676 A79-51773
Source assessment: Water pollutants from coal storage areas [PB-285420/6] 21 p0223 N79-14635
Oil pollution reports, volume 5, number 2 --- bibliographies [PB-287071/5] 22 p0336 N79-16437

- Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289
- Environmental assessment of the Alaskan Continental Shelf. Volume 1: Biological studies [PB-289154/7] 22 p0344 N79-17366
- Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies [PB-289155/4] 22 p0344 N79-17367
- Environmental assessment of the Alaskan Continental Shelf. Volume 3: Biological studies [PB-289156/2] 22 p0344 N79-17368
- Marine biological effects of OCS petroleum development [PB-288935/0] 22 p0344 N79-17374
- Treatment of petroleum refinery, petrochemical and combined industrial-municipal wastewaters with activated carbon: Literature review [PB-288211/6] 22 p0350 N79-18497
- Water-related environmental effects in fuel conversion, volume 1. Summary [PB-288313/0] 22 p0351 N79-18834
- Environmental assessment: Source test and evaluation report, Chapman low-Btu gasification [PB-289940/9] 22 p0373 N79-21662
- Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River [NASA-TM-80124] 24 p0777 N79-31839
- Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution [PB-297467/3] 24 p0803 N79-33548

WATER PRESSURE

- Effect of pressure head on the characteristics of hydroelectric stations with underwater lower reservoirs 24 p0646 A79-48827
- Combustion of hydrothermally treated coals [PB-287521/9] 22 p0338 N79-17025

WATER QUALITY

- Environmental investigations of in situ coal gasification experiments 24 p0664 A79-50880
- An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California [PB-293031/1] 23 p0585 N79-26562
- Strategic petroleum reserve: Expansion of reserve. Final supplement to final environmental impact statement [DOE/EIS-0034] 24 p0746 N79-30407

WATER RESOURCES

- New energy from an old source - Hydrogen from falling water 21 p0015 A79-10129
- Sea water desalination by means of solar energy 21 p0057 A79-13645
- Long-term availability of water resources for energy development in the Central United States 21 p0065 A79-14118
- Power from glaciers - The hydropower potential of Greenland's glacial water 21 p0087 A79-15672
- Regional analysis of potential water power 21 p0148 A79-17825
- Development of Brazilian hydroelectric potential - Future prospects and planning options 23 p0389 A79-33267
- Water for a synthetic fuels industry 24 p0645 A79-48050
- Undergound pumped hydro storage - An overview 24 p0660 A79-50451
- Hydroelectric power generation and mineral recovery in the Qattara Depression of Egypt 24 p0707 A79-52575
- Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography [PB-285129/3] 21 p0211 N79-13549
- Water related constraints in energy production [PB-285713/4] 21 p0222 N79-14582
- The ground water and energy supply situation for Great Plains irrigation [PB-286002/1] 21 p0222 N79-14586
- The impact of energy resource development on water resource allocations [PB-286135/9] 21 p0231 N79-15432
- Applying NASA remote sensing data to geologically related regional planning problems in Tennessee [E79-10095] 22 p0339 N79-17289
- Resource analysis: Water and energy as linked resources [PB-288046/6] 22 p0349 N79-18463

WATER TEMPERATURE

- Hybrid air to water solar collector design 21 p0021 A79-10174
- Central solar heat stations and the Studsvik Demonstration Plant 21 p0021 A79-10175
- A low cost approach to performance monitoring for the evaluation of a solar domestic hot water system 21 p0088 A79-15842
- A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah 21 p0097 A79-16075
- Controls for heat reclaim with thermal storage coupled with solar heating 21 p0102 A79-16420
- Economic use of materials in the design of solar water-heating collector plates of the pipe and fin type 21 p0129 A79-17396
- Comparative performance testing of flat-plate solar water heaters 21 p0130 A79-17405
- Thermal performance testing of flat-plate solar collectors 21 p0130 A79-17407
- Testing of water-heating collectors according to ASHRAE Standard 93-77 21 p0130 A79-17410
- Geothermal power and water production studies at the University of California [ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778
- Solar water heaters for a cold climate 22 p0254 A79-22325
- Geothermal community heating systems 23 p0409 A79-34078
- Extraction of sensible heat from waste water for domestic heating applications 23 p0418 A79-34152
- Regional-scale sea surface temperature determination from the geostationary environmental operational satellite 24 p0617 A79-45781
- Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants 24 p0621 A79-45816
- Ocean thermal and current velocity data requirements for design of an OTEC plant - An update 24 p0622 A79-45822
- Largo hot water system long range thermal performance test report, addendum [NASA-CR-150842] 21 p0204 N79-13492
- Prototype solar-heated hot water systems and double-walled heat exchangers [NASA-CR-150854] 21 p0205 N79-13495
- Prototype solar heating and cooling systems including potable hot water [NASA-CR-150850] 21 p0205 N79-13498
- LARGO hot water system thermal performance test report [NASA-CR-150841] 21 p0205 N79-13500
- Design and installation package for solar hot water system [NASA-CR-150859] 21 p0220 N79-14556
- Solar hot water system installed at Anderson, South Carolina [NASA-CR-150856] 21 p0229 N79-15405
- Solar heating and hot water system installed at Listerhill, Alabama [NASA-CR-150870] 21 p0229 N79-15406

WATER TREATMENT

- There is a lot of energy in digester gas . . . use it --- in municipal waste water plants 21 p0035 A79-11448
- A new thermochemical process for hydrogen production 22 p0312 A79-31153
- Direct thermomagnetic splitting of water 22 p0312 A79-31154
- The problem of fouling in the utilisation of geothermal energy 23 p0449 A79-37853

Solar system - Solar generator-inverter-asynchronous motor-pump --- for waste water treatment
23 p0466 A79-38605

Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants
24 p0629 A79-46228

Total energy consumption for municipal wastewater treatment
[PB-286688/7] 21 p0231 N79-15439

Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463

Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665

WATER VAPOR

Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

WATER WAVES

Two-dimensional analyses related to wave-energy extraction by submerged resonant ducts
22 p0312 A79-31099

The absorption of energy from ocean waves
23 p0449 A79-37859

Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column
23 p0480 A79-39845

Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873

Waves, salinity gradients and ocean currents - Alternative energy sources
24 p0616 A79-45780

WATERWAVE ENERGY

An investigative study of a wave-energy device
24 p0631 A79-46315

WATERWAVE ENERGY CONVERSION

Wave energy conversion in a random sea
21 p0030 A79-10252

Wave driven power generating system
21 p0059 A79-13657

Wind, waves, and tides --- as future energy sources
21 p0074 A79-14719

Useful power from ocean waves
21 p0077 A79-14773

Ocean energy unlimited --- water wave conversion
21 p0095 A79-15908

International Symposium on Wave and Tidal Energy, University of Kent, Canterbury, England, September 27-29, 1978, Proceedings. Volume 1
21 p0150 A79-18101

A theory for wave-power absorption by two independently oscillating bodies
21 p0151 A79-18103

The theoretical analysis of an air turbine generation system --- for waterwave energy conversion
21 p0151 A79-18106

Wave power electric generation study in Japan --- large scale buoy facility
21 p0151 A79-18107

The use of wave powered systems for desalination - A new opportunity --- seawater pumping for reverse osmosis
21 p0151 A79-18108

Principles of design and construction for marine structures for wave/tidal/ocean thermal energy
21 p0152 A79-18114

Integrating wave power into the electricity supply system
21 p0152 A79-18117

The oscillating water column wave-energy device
22 p0252 A79-22223

Wave-tank experiments on an immersed parallel-plate duct --- for testing performance of sub-sea wave energy converter
22 p0258 A79-23306

A theory for wave-power absorption by two independently oscillating bodies
22 p0259 A79-23307

On the dynamics of wave-power devices
22 p0269 A79-24539

A wave activated electric generator --- waterwave energy conversion
22 p0288 A79-27389

Energy from sea waves - System optimization by diffraction theory
22 p0288 A79-27390

Design and experimental testing of a fully-submerged model wave-power convertor
23 p0396 A79-33767

Energy from sea and air by large-span tensioned foils
23 p0410 A79-34084

Electro/mechanical aspects of the Mauritius 'passive' type wave energy project
23 p0449 A79-37856

Directly driven generators for wave energy conversion
23 p0449 A79-37858

The absorption of energy from ocean waves
23 p0449 A79-37859

Wave power - Some practical considerations
23 p0449 A79-37861

System economic optimisation for wave energy
23 p0450 A79-37864

The development of the wave contouring raft
23 p0450 A79-37869

System reliability studies for wave energy generation
23 p0450 A79-37872

Options and constraints in the use of wave power
23 p0454 A79-37914

Electrical generation from a randomly varying input --- waterwave energy conversion
23 p0455 A79-37915

Initial thoughts on the transmission implications of large wave power complexes
23 p0455 A79-37916

Energy analysis of wave and tidal power
23 p0455 A79-37918

Power extraction from ocean surface waves
23 p0486 A79-40198

Optimization of power absorption from sea waves
23 p0486 A79-40199

Hydrogen from falling water --- hydraulic energy conversion to chemical energy
24 p0614 A79-45594

An investigative study of a wave-energy device
24 p0631 A79-46315

Wave power, progress and prospects
24 p0666 A79-50891

Ball screw type wave power generator --- with flywheel drive
24 p0701 A79-51996

Low head hydropower: Focus group results
[DOE/TIC-10017] 24 p0740 N79-29645

Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients
[PB-295876/7] 24 p0792 N79-32735

WATERWAVE POWERED MACHINES

A wave power machine using free floating vertical plates
21 p0151 A79-18104

Experiences with a hydropneumatic wave power device
21 p0151 A79-18105

Electro/mechanical aspects of the Mauritius 'passive' type wave energy project
23 p0449 A79-37856

Directly driven generators for wave energy conversion
23 p0449 A79-37858

Wave power - Some practical considerations
23 p0449 A79-37861

The development of the wave contouring raft
23 p0450 A79-37869

Wave power experiments at Loch Ness
23 p0450 A79-37871

Electrical generation from a randomly varying input --- waterwave energy conversion
23 p0455 A79-37915

Power extraction from ocean surface waves
23 p0486 A79-40198

WAVE DIFFRACTION

Energy from sea waves - System optimization by diffraction theory
22 p0288 A79-27390

WAVE DISPERSION

Cyclotron-wave spectrum in a plasma with two ion species
22 p0245 A79-21443

The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
22 p0312 A79-31183
A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186
The theory of lower hybrid heating of tokamak plasmas
24 p0606 A79-45028

WAVE INTERACTION
Wave-tank experiments on an immersed parallel-plate duct --- for testing performance of sub-sea wave energy converter
22 p0258 A79-23306

WAVE PROPAGATION
Modal analysis of seismic guided waves in coal seams
24 p0803 N79-33664

WAVE REFLECTION
Wave reflection from the lower hybrid surface - A toroidal effect --- in tokamaks
22 p0255 A79-22427
Effects of nonlinear decay of backscattered light on the anomalous reflectivity --- in laser plasmas
22 p0310 A79-30742
High-frequency convective loss-cone instability in short mirror machines
24 p0639 A79-47421

WAVEFORMS
Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215] 24 p0723 N79-28728

WAVEGUIDES
A study of waveguides for far infrared interferometers measuring electron density of tokamak plasmas
23 p0526 A79-41842

WAXES
The development of a method of producing etch resistant wax patterns on solar cells
[NASA-CR-158563] 23 p0550 N79-23527

WEAPONS DEVELOPMENT
Satellite Power System (SPS) military implications
[NASA-CR-157436] 23 p0549 N79-23500

WEATHER FORECASTING
Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies
[NASA-CR-162162] 24 p0768 N79-31737

WEATHER MODIFICATION
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant --- for weather modification studies
23 p0438 A79-36432

WEATHER STATIONS
Some variability statistics of available wind power
[SAND-78-1735] 24 p0752 N79-30772

WEATHERING
Long-term weathering effects on the thermal performance of the Lennox/Honeywell (liquid) solar collector
[NASA-CR-150818] 21 p0204 N79-13493
Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments --- soil and water analysis
[LA-7033-PR] 21 p0232 N79-15783
Long term weathering effects on the thermal performance of the sunworks (liquid) solar collector
[NASA-CR-150899] 22 p0341 N79-17328
Long-term weathering effects on the thermal performance of the Libbey-Owens-Ford (liquid) solar collector
[NASA-CR-161093] 22 p0348 N79-18450
Long term weathering effects on the thermal performance of the solaron (air) solar collector
[NASA-CR-161166] 22 p0371 N79-21621
Thermal performance evaluation of the Semco (liquid) solar collector
[NASA-CR-161230] 23 p0594 N79-27656
Long-term weathering effects on the thermal performance of the solargenics (liquid) solar collector at outdoor conditions --- Marshall Space Flight Center Solar test facility
[NASA-CR-150523] 24 p0737 N79-29601
Indoor test and long-term weathering effects on the thermal performance of the solar energy system (liquid) solar collector --- Marshall Space Flight Center solar test facility and solar simulator
[NASA-CR-150794] 24 p0749 N79-30715

WEATHERPROOFING
Energy conservation and the rural home: Economic considerations for the nation and the individual
[PB-286222/5] 21 p0230 N79-15425

WEBS (SHEETS)
Silicon web process development --- for solar cell fabrication
[NASA-CR-162181] 24 p0770 N79-31762

WEDGES
Verification of wedge concentration using a helium neon laser --- solar collector design
21 p0098 A79-16104

WEIBULL DENSITY FUNCTIONS
A comparison of the Weibull and Rayleigh distributions for estimating wind power potential
21 p0045 A79-12243
Frequency distribution of wind speed near the surface
21 p0165 A79-20139
Optimal value of the rated speed of a wind generator
23 p0527 A79-41948

WEIGHT (MASS)
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553

WEIGHT ANALYSIS
Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026

WEIGHT REDUCTION
Silver-hydrogen, a long life light weight energy storage system --- design for spacecraft
21 p0001 A79-10012
Design features of the TDRSS solar array --- Tracking and Data Relay Satellites
21 p0002 A79-10019
Large, lightweight, replicated mirrors
21 p0043 A79-11976
Ultralightweight structures for space power --- solar energy collection for transmission to earth
21 p0108 A79-16609
Optimal distribution of heat conducting material in the finned pipe solar energy collector
22 p0242 A79-21163
Structural optimization of SMC line focusing collectors
23 p0534 A79-43295
Weight minimization of sandwich type solar collector panels
24 p0670 A79-51727

WEIGHTLESSNESS
Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330

WELD TESTS
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386

WELLS
Study of acoustic and microseismic emissions associated with a hydraulic fracture --- geothermal energy utilization
21 p0076 A79-14744
Testing and sampling procedures for geothermal-compressed wells
[UT/CES-GR-2] 24 p0726 N79-28770
Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807

WICKS
Investigation of the maximal heat-transmitting power of heat pipes with metal-fiber wicks
23 p0447 A79-37661
On the problem of heat transfer in low-temperature heat pipes
23 p0532 A79-42938

WILDLIFE
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679

Application of remote sensing to state and regional problems [E79-10196] 23 p0569 N79-25446
Status of SEASAT Commercial Demonstration Program [E79-10260] 24 p0768 N79-31720
Assessing the impact of nuclear-power plants on the environment [NUREG-CR-0552] 24 p0777 N79-31845

WIND (METEOROLOGY)
Stormy development of wind energy --- German technology utilization 22 p0268 A79-24323
Preliminary results of a field experiment to characterize wind flow through a vertical plane [PNL-2518] 21 p0203 N79-13322
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 2: Photovoltaic systems with energy storage [HCP/T22221-01/2-2] 21 p0207 N79-13510
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 1: Study summary and concept screening [HCP/T22221-01/1-VOL-1] 21 p0207 N79-13511
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development [NASA-TP-1359] 21 p0223 N79-14679
An operating 200-kW horizontal axis wind turbine [NASA-TM-79034] 22 p0333 N79-16357
Wind engineering research digest, volume 3, 1978 --- a bibliography of ongoing research projects [PB-290694/9] 23 p0567 N79-24621
LLL wind energy studies (OAHU) [UCRL-82171] 23 p0582 N79-26514
Proceedings of the Workshop on Mechanical Storage of Wind Energy [SAND-79-0001] 23 p0584 N79-26528
Barriers and incentives to solar energy development. An analysis of legal and institutional issues in the Northeast [NESEC-1] 24 p0726 N79-28765
Large wind energy focus group results [DOE/TIC-10038] 24 p0738 N79-29623
Availability of wind power [SAND-78-0548C] 24 p0751 N79-32719

WIND DIRECTION
Directional arrays of windmills 23 p0453 A79-37896
Depletion of available wind power by a large network of wind generators 23 p0453 A79-37899
Wind direction change criteria for wind turbine design [PNL-2531] 22 p0361 N79-20506

WIND EFFECTS
Dynamic response of a wind turbine system and its effect on performance 21 p0067 A79-14293
Generalized wind characteristics and their effect on wind turbine output 21 p0068 A79-14294
Effect of dust on flat plate collectors 21 p0129 A79-17399
The interaction of the wind field with a horizontal axis wind turbine 22 p0278 A79-26177
Heliostat survivability and structural stability for wind loading 23 p0400 A79-34001
Offshore wind power model estimates 23 p0482 A79-40110
Reductions in vehicle fuel consumption due to refinements in aerodynamic design --- for trailer trucks 24 p0658 A79-50335

WIND MEASUREMENT
Measurement of wind speed around a wind power plant in Sweden 23 p0483 A79-40113
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy 24 p0713 A79-53545
Wind direction change criteria for wind turbine design [PNL-2531] 22 p0361 N79-20506

WIND PRESSURE
Pressure measurements on wind tunnel models of the Aylesbury experimental house 22 p0300 A79-29372

WIND PROFILES
Wind power potential in the Pacific Northwest 22 p0244 A79-21334
Wind energy assessment 23 p0406 A79-34051
Measurement of wind speed around a wind power plant in Sweden 23 p0483 A79-40113
Atmospheric turbulence structure in relation to wind generator design 23 p0483 A79-40114
The use of wind data with an operational wind turbine in a research and development environment [NASA-TM-73832] 23 p0581 N79-26502

WIND TUNNEL CALIBRATION
Wind tunnel corrections for Savonius rotors 23 p0485 A79-40127

WIND TUNNEL MODELS
Pressure measurements on wind tunnel models of the Aylesbury experimental house 22 p0300 A79-29372
Wind tunnel tests of a 1/30 scale model of a 3.5 megawatt wind turbine 24 p0703 A79-52012

WIND TUNNEL TESTS
The design and testing of a vertical-axis wind turbine using sails 21 p0153 A79-18467
Fluid dynamics of diffuser-augmented wind turbines 22 p0238 A79-20798
Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity 23 p0387 A79-33241
An axial-flow wind-turbine with delta-wing blades 23 p0405 A79-34044
The aerodynamic design and testing of a vertical axis windmill 23 p0452 A79-37895
The interaction of windmill wakes 23 p0482 A79-40111
Wind tunnel corrections for Savonius rotors 23 p0485 A79-40127
Characterization of a swept-strut hydrogen fuel-injector for scramjet applications 24 p0649 A79-49345
Wind tunnel tests of a 1/30 scale model of a 3.5 megawatt wind turbine 24 p0703 A79-52012
Liquefied natural gas wind tunnel simulation and instrumentation assessments [SAN-W1364-01] 21 p0195 N79-12256
Giromill wind tunnel test and analysis, volume 2. Technical discussion [COO-2617-4/2] 21 p0204 N79-13378

WIND VANES
Windmills with increased power output due to tipvanes 23 p0405 A79-34045
Tipvane research at the Delft University of Technology --- auxiliary wings for turbine blades of windmills 23 p0485 A79-40129

WIND VARIATIONS
Total wind energy over Central Europe and its maximum utilization through optimal degree of development of solar wind conversion plants 23 p0472 A79-38657
Estimation of wind characteristics at potential wind energy conversion sites 23 p0534 A79-43377
Some variability statistics of available wind power [SAND-78-1735] 24 p0752 N79-30772

WIND VELOCITY
A comparison of the Weibull and Rayleigh distributions for estimating wind power potential 21 p0045 A79-12243
Frequency distribution of wind speed near the surface 21 p0165 A79-20139
Energy statistics for large wind turbine arrays 22 p0299 A79-29371
Depletion of available wind power by a large network of wind generators 23 p0453 A79-37899

Measurement of wind speed around a wind power plant in Sweden
23 p0483 A79-40113

Performance evaluation of wind power units
23 p0483 A79-40115

Optimal value of the rated speed of a wind generator
23 p0527 A79-41948

The influence of environmental parameters on flat plate solar collector performance
24 p0604 A79-44557

Interannual and month-to-month variations of wind speed --- for wind turbine sites
24 p0629 A79-46221

Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382

An assessment of wind characteristics and wind energy systems applications to electric utilities in Wisconsin and sections of Minnesota, Iowa and Illinois
24 p0736 N79-29593

Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170] 24 p0749 N79-30719

Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811

WIND VELOCITY MEASUREMENT

Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing
22 p0257 A79-22924

An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720

Run duration analysis of surface wind speeds for wind energy application
22 p0287 A79-27345

WINDMILLS (WINDPOWERED MACHINES)

Design and operating experience on the U.S. Department of Energy Experimental Mod-0 100 kW Wind Turbine
21 p0028 A79-10234

DOE/NASA Mod-0A wind turbine performance
21 p0028 A79-10235

On-line control of a large horizontal axis wind energy conversion system and its performance in a turbulent wind environment
21 p0028 A79-10236

Vortex sheet analysis of the Giromill
21 p0031 A79-10278

Calculation of wake effects in wind turbine parks
21 p0045 A79-12241

Performance prediction methods for horizontal axis wind turbines
21 p0045 A79-12244

Low-cost concept for energy supply from the wind
21 p0058 A79-13651

A small horizontal axis wind turbine feeding power into the utility grid
21 p0074 A79-14703

Wind energy conversion --- review discussing sites and machinery
21 p0091 A79-15870

The Campbell Chinese Type Windmill
21 p0142 A79-17510

Development of 1 kW vertical axis wind generator
21 p0142 A79-17511

An evaluation of the strategy of low cost horizontal axis windmills
21 p0143 A79-17517

The design and testing of a vertical-axis wind turbine using sails
21 p0153 A79-18467

An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720

Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0278 A79-26176

The interaction of the wind field with a horizontal axis wind turbine
22 p0278 A79-26177

A two dimensional vortex sheet model of a Savonius Rotor
22 p0278 A79-26178

Vortex sheet analysis of the Giromill --- vertical axis wind turbine with straight blades
22 p0278 A79-26179

Wind power distribution, control, and conversion in vortex augmentors --- influence on turbomachinery design and development
22 p0278 A79-26180

Some flow analyses for Tornado-type wind turbines
22 p0279 A79-26181

Diffuser designs for improved wind energy conversion
22 p0279 A79-26182

Induction-generator/synchronous-condenser system for wind-turbine power
22 p0286 A79-27219

Wind energy --- Book
22 p0287 A79-27327

The application of hydraulics in the 2,000 kW wind turbine generator
22 p0288 A79-27400

Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007

A hybrid wind turbine suitable for developing regions
22 p0323 A79-31455

A vertical-axis bicycle rotor turbine. I - Rotor design. II - Aerodynamic aspects --- windmill
23 p0386 A79-33237

A practical technique for basic windmill design
23 p0387 A79-33238

A method for calculating the induced velocity for windmills with application to the optimization of the aerodynamic design
23 p0387 A79-33239

The IAE 30-kW wind turbine - A review of the aerodynamic design
23 p0387 A79-33240

The Savonius rotor - Theory and optimization
23 p0387 A79-33242

A hybrid cyclogiro-Darrieus-rotor wind turbine
23 p0387 A79-33243

Free-wheeling hydraulic power mills --- wind or water current driven electric plants
23 p0387 A79-33244

Mechanical and vibrational problems of a vertical axis wind turbine
23 p0389 A79-33265

An axial-flow wind-turbine with delta-wing blades
23 p0405 A79-34044

Windmills with increased power output due to tipvanes
23 p0405 A79-34045

Flap-cone control of windmill speed
23 p0405 A79-34046

Optimal location of windmills
23 p0405 A79-34048

Data acquisition and signal processing for a vertical axis wind energy conversion system
23 p0432 A79-35078

Windpower generation on a large scale
23 p0452 A79-37891

The design construction and proving of a low cost 5kW wind powered turbine for isolated applications
23 p0452 A79-37893

A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894

The aerodynamic design and testing of a vertical axis windmill
23 p0452 A79-37895

Directional arrays of windmills
23 p0453 A79-37896

Materials for windmill blades
23 p0453 A79-37897

The design and construction of the Aldborough aerogenerator
23 p0453 A79-37900

Load matching effects on wind energy converter performance
23 p0455 A79-37917

Tilting wing overspeed control for vertical axis wind turbines
[AIAA PAPER 79-0967] 23 p0456 A79-38175

Analytical and experimental evaluation of Cycloturbine aerodynamic performance --- vertical-axis windmill
[AIAA PAPER 79-0968] 23 p0456 A79-38176

Prediction of stresses and natural frequencies for high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177

Further development of the high-speed converter with flapping hinge /Goslich system/ - Plans for application in developing countries --- windmill
23 p0471 A79-38655

Design analysis of a vertical axis wind turbine
23 p0472 A79-38656

Total wind energy over Central Europe and its maximum utilization through optimal degree of development of solar wind conversion plants
23 p0472 A79-38657

Flowfield measurements in the vicinity of the rotor of a 10 kw windmill
[AIAA PAPER 79-0969] 23 p0475 A79-38889

Performance matching and optimization of wind powered water pumping systems
23 p0479 A79-39842

Windpower programmes in Tanzania
23 p0482 A79-40106

The interaction of windmill wakes
23 p0482 A79-40111

Wake interaction in an array of windmills - Theory and preliminary results
23 p0483 A79-40112

Measurement of wind speed around a wind power plant in Sweden
23 p0483 A79-40113

Investigations on the aeroelastic stability of large wind turbines
23 p0483 A79-40116

The aeroelastic behaviour of large Darrieus-type wind energy converters derived from the behaviour of a 5,5 m rotor
23 p0483 A79-40118

Measurements of performance and structural response of the Danish 200kW Gedser windmill
23 p0484 A79-40121

The design, construction, testing and manufacturing of vertical axis wind turbines
23 p0484 A79-40124

Development of the Variable Geometry Vertical Axis Windmill
23 p0484 A79-40125

A new concept - The flexible blade windmill /FBW/
23 p0485 A79-40126

Wind tunnel corrections for Savonius rotors
23 p0485 A79-40127

Tipvane research at the Delft University of Technology --- auxiliary wings for turbine blades of windmills
23 p0485 A79-40129

Cretan windmills
23 p0536 A79-43576

Performance of windmills in a closely spaced array
23 p0537 A79-43681

Free vortices from a wing for wind turbine systems
23 p0537 A79-43683

Wind tunnel tests of a 1/30 scale model of a 3.5 megawatt wind turbine
24 p0703 A79-52012

Operation of self-excited generators for windmill application
24 p0706 A79-52538

Limits to wind-power
24 p0709 A79-52951

Design, instrumentation, and calibration of a vertical axis wind turbine rotor
[TID-27754] 21 p0174 N79-10533

Giromill wind tunnel test and analysis, volume 2. Technical discussion
[COO-2617-4/2] 21 p0204 N79-13378

Two-dimensional analysis of vertical axis windmills
22 p0353 N79-19446

Wind direction change criteria for wind turbine design
[PNL-2531] 22 p0361 N79-20506

A low-cost water pumping windmill using a sail type Savonius rotor
[PB-294413/0] 23 p0585 N79-26541

Wind driven water pumps. Economics, technology, current activities
[PB-292816/6] 23 p0585 N79-26542

Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779

Wind power, volume 2. Citations from the NTIS data base --- bibliographies
[NTIS/PS-79/0534/2] 24 p0777 N79-31836

Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837

Investigations on the aeroelastic stability of large wind turbines
[NPL-NP-78014-U] 24 p0792 N79-32731

WINDOWS

An efficient optical window for flat-plate solar energy collectors
23 p0536 A79-43591

WINDOWS (APERTURES)

Transparent heat mirrors for passive solar heating applications
[LBL-7829] 23 p0561 N79-24476

Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report)
[BMFT-FB-T-78-15] 23 p0590 N79-27345

Performance evaluation of solar films and screens
[AD-A070636] 24 p0800 N79-33583

WINDPOWER UTILIZATION

Advanced wind furnace systems for residential and agricultural heating and electrical supply applications
21 p0028 A79-10237

Torque ripple in a vertical axis wind turbine
21 p0029 A79-10239

Toroidal Accelerator Rotor Platforms for wind energy conversion
21 p0029 A79-10240

SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241

Calculation of wake effects in wind turbine parks
21 p0045 A79-12241

The influence of blade camber on the output of vertical-axis wind turbines
21 p0045 A79-12242

A comparison of the Weibull and Rayleigh distributions for estimating wind power potential
21 p0045 A79-12243

Selection of method for calculating the parameters of wind and solar power station storage facilities
21 p0054 A79-13293

Low-cost concept for energy supply from the wind
21 p0058 A79-13651

Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652

Vacation homes near the sea with solar and wind energy utilization - Research done at the Technical University of Hannover: Architectural considerations
21 p0058 A79-13653

Total energy systems --- domestic solar and windpowered facilities
21 p0058 A79-13654

Potential and technical utilization of renewable energy sources
21 p0058 A79-13655

The wind as a potential energy source in future hydrogen technology
21 p0059 A79-13661

Solar and wind energy applications in Hawaii
21 p0066 A79-14265

Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292

The National Program for Solar Energy
21 p0072 A79-14688

Airfoil data for use of wind turbine designers
21 p0073 A79-14702

Wind, waves, and tides --- as future energy sources
21 p0074 A79-14719

Toroidal accelerator rotor platforms for wind energy conversion
21 p0077 A79-14770

Feature review of some advanced and innovative design concepts in wind energy conversion systems
21 p0077 A79-14771

Wind energy conversion --- review discussing sites and machinery
21 p0091 A79-15870

Energy technology V: Challenges to technology: Proceedings of the Fifth Conference, Washington, D.C., February 27-March 1, 1978
21 p0091 A79-15879

Large wind turbine generators --- NASA program status and potential costs 21 p0092 A79-15881

Utility applications of wind power plants 21 p0092 A79-15882

A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system 21 p0098 A79-16107

Technical and economic feasibility of making fertilizer from wind energy, water, and air 21 p0142 A79-17512

Wind generation of electricity for a novel dwelling independent of servicing networks 21 p0142 A79-17513

A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas 21 p0143 A79-17514

A technique for longitudinal correlation of wind data - Theory and its application to siting of wind power plants 21 p0143 A79-17518

Wind power and other energy options --- Book 21 p0153 A79-18346

Wind power potential in the Pacific Northwest 22 p0244 A79-21334

Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing 22 p0257 A79-22924

Storay development of wind energy --- German technology utilization 22 p0269 A79-24323

Wind energy - The long road to commercialization 22 p0269 A79-24612

Wind power distribution, control, and conversion in vortex augmentors --- influence on turbomachinery design and development 22 p0278 A79-26180

Wind energy --- Book 22 p0287 A79-27327

Run duration analysis of surface wind speeds for wind energy application 22 p0287 A79-27345

Energy statistics for large wind turbine arrays 22 p0299 A79-29371

Pressure measurements on wind tunnel models of the Aylesbury experimental house 22 p0300 A79-29372

Large-scale introduction of wind power stations in the Swedish grid A simulation study 22 p0300 A79-29373

Wind power and electric utilities - A review of the problems and prospects 22 p0300 A79-29374

Limits to wind power utilization 22 p0302 A79-29601

Some recent developments in wind and ocean power systems 22 p0303 A79-29797

Sail power for the world's cargo ships 22 p0305 A79-30374

The economics of electric power generation from wind energy 22 p0310 A79-30998

Two-dimensional analyses related to wave-energy extraction by submerged resonant ducts 22 p0312 A79-31099

The role of applied meteorology in the Canadian energy programme 22 p0317 A79-31414

Wind power from a vortex chamber 22 p0319 A79-31425

NRC's wind energy program 22 p0319 A79-31426

The Prince Edward Island Wind Energy Program 22 p0319 A79-31427

Complementary nature of wind and solar energy at a continental mid-latitude station 23 p0396 A79-33763

Modelling of a domestic wind power system including storage 23 p0396 A79-33764

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy 23 p0404 A79-34036

Optimal location of windmills 23 p0405 A79-34048

Wind energy assessment 23 p0406 A79-34051

Energy from sea and air by large-span tensioned foils 23 p0410 A79-34084

Hydrogen fuel production by wind energy conversion 23 p0413 A79-34113

Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources 23 p0420 A79-34170

Development of vertical-axis wind-energy converters - Darrieus design 23 p0447 A79-37744

Wind energy conversion and hydrogen production - A feasibility study for South Africa 23 p0452 A79-37892

Offshore wind energy systems for the U.K. 23 p0453 A79-37901

Wind power for domestic use in the United Kingdom 23 p0453 A79-37902

The use of a complex-terrain wind model for the siting and design of wind generators [AIAA PAPER 79-0971] 23 p0456 A79-38178

International Solar Forum, 2nd, Hamburg, West Germany, July 12-14, 1978, Reports. Volumes 1, 2 & 3 23 p0463 A79-38576

Electrolytic hydrogen production by means of solar and wind energy 23 p0469 A79-38633

Total wind energy over Central Europe and its maximum utilization through optimal degree of development of solar wind conversion plants 23 p0472 A79-38657

Wind energy ships - Potential for modern wind-driven sea transport systems 23 p0472 A79-38661

Guaranteed power /capacity effect/ and total power as defining parameters of wind conversion system energy production 23 p0472 A79-38663

International Symposium on Wind Energy Systems, 2nd, Amsterdam, Netherlands, October 3-6, 1978, Proceedings. Volume 1 23 p0481 A79-40101

The Netherlands research program on wind enemgy 23 p0481 A79-40102

Recent developments in wind energy 23 p0482 A79-40104

Windpower programmes in Tanzania 23 p0482 A79-40106

Physical planning aspects of large-scale wind energy exploitation in the Netherlands 23 p0482 A79-40107

Program overview for the wind characteristics program element of the United States Federal Wind Energy Program 23 p0482 A79-40108

Wind energy prospecting in Prince Edward Island - A program overview and status report 23 p0482 A79-40109

Offshore wind power model estimates 23 p0482 A79-40110

Measurement of wind speed around a wind power plant in Sweden 23 p0483 A79-40113

The regulation of an electricity supply system including wind energy generators 23 p0485 A79-40130

An economic model to establish the value of WECS to a utility system --- Wind Energy Conversion System 23 p0485 A79-40131

Implications of large scale introduction of power from large wind energy conversion systems into the existing electric power supply system in the Netherlands 23 p0485 A79-40132

Wind energy - Heat generation 23 p0486 A79-40133

Wind energy utilization by means of aerogenerators 23 p0522 A79-41220

Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study 23 p0527 A79-41946

Concentration augmentation of power in a Savonius-type wind rotor 23 p0527 A79-41947

Program overview for the Wind Characteristics Program Element of the United States Federal Wind Energy Program
23 p0534 A79-43376
Estimation of wind characteristics at potential wind energy conversion sites
23 p0534 A79-43377
Prospecting for meteorological energy in Hawaii
23 p0536 A79-43615
Overview of solar energy programs and activities in the Southeast
24 p0607 A79-45202
Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings
24 p0633 A79-46526
Wind resource assessment status --- regional differences
24 p0633 A79-46529
Requirements assessment of wind power plants in electric utility systems
24 p0633 A79-46531
Wind energy systems application to regional utilities
24 p0633 A79-46532
Electric utility application of WECS in an island location --- Wind Energy Conversion System in Hawaii
24 p0634 A79-46534
Distributed wind generation assessment
24 p0634 A79-46536
A fully interconnected wind system
24 p0635 A79-46540
A review of the environmental effects and benefits of selected solar energy technologies
24 p0664 A79-50878
Projected impacts of a very large windpower complex
24 p0665 A79-50890
Hybrid alternate energy system --- wind-photovoltaic system for desert regions
24 p0675 A79-51768
The application of wind energy to a system with an inherent energy storage medium
24 p0677 A79-51778
Assessmentt of wind energy systems in a utility framework
24 p0677 A79-51779
Limits to wind-power
24 p0708 A79-52951
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy
24 p0713 A79-53545
Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534
Structural performance of the DOE/Sandia 17 meter vertical axis wind turbine
[SAND-78-0880C] 21 p0187 N79-11516
Data acquisition and signal processing for a vertical axis wind energy conversion system
[SAND-78-1000C] 21 p0187 N79-11517
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 3: Wind conversion systems with energy storage
[HCP/T22221-01/3] 21 p0189 N79-11535
Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527
Summary of atmospheric wind design criteria for wind energy conversion system development
[NASA-TP-1389] 21 p0223 N79-14678
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382
Expert opinion on wind energy conversion systems designed by Hermann Honnef
[BMFT-FB-T-77-35] 22 p0349 N79-18456
Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464
Stochastic analysis of wind characteristics for energy conversion
22 p0350 N79-18535
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568
A large scale wind energy program for the state of California
23 p0594 N79-27648
Analysis of the potential of wind energy conversion systems
[SAND-78-2099C] 23 p0595 N79-27668
An assessment of wind characteristics and wind energy systems applications to electric utilities in Wisconsin and sections of Minnesota, Iowa and Illinois
24 p0736 N79-29593
Large wind energy focus group results
[DOE/TIC-10038] 24 p0738 N79-29623
Small wind energy: Focus group results
[DOE/TIC-10018] 24 p0752 N79-30771
Some variability statistics of available wind power
[SAND-78-1735] 24 p0752 N79-30772
Economic overview of vertical axis wind turbines --- conferences
[SAND-79-9733C] 24 p0753 N79-30773
Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779
Wind power, volume 2. Citations from the NTIS data base --- bibliographies
[NTIS/PS-79/0534/2] 24 p0777 N79-31836
Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837
Wind power, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0536/7] 24 p0777 N79-31838
Wind turbines
[ANL/CES-TE-78-9] 24 p0790 N79-32711
Availability of wind power
[SAND-78-0548C] 24 p0791 N79-32719
Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811
An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884

WINDPOWERED GENERATORS
Design and operating experience on the U.S. Department of Energy Experimental Mod-0 100 kW Wind Turbine
21 p0028 A79-10234
DOE/NASA Mod-0A wind turbine performance
21 p0028 A79-10235
On-line control of a large horizontal axis wind energy conversion system and its performance in a turbulent wind environment
21 p0028 A79-10236
Experimental demonstration of the Diffuser Augmented Wind Turbine concept
21 p0029 A79-10238
Aeroelastic wind energy converter
21 p0047 A79-12275
Power extracted from the wind
21 p0058 A79-13650
Low-cost concept for energy supply from the wind
21 p0058 A79-13651
Optimum selection of a wind turbine generator system
[AIAA PAPER 78-1774] 21 p0062 A79-13871
The brake system for the DOE/Sandia 17-meter vertical axis wind turbine
21 p0067 A79-14289
Design of a direct wind energy converter to heat water by agitation in a closed tank
21 p0067 A79-14290
A low cost blade design for a Darrieus-type vertical-axis wind turbine
21 p0067 A79-14291
Dynamic response of a wind turbine system and its effect on performance
21 p0067 A79-14293
Generalized wind characteristics and their effect on wind turbine output
21 p0068 A79-14294

Generic power performance estimates for wind turbines
21 p0068 A79-14295
Analysis of wind turbine generator rotor response to one-dimensional turbulence
21 p0077 A79-14768
Toroidal accelerator rotor platforms for wind energy conversion
21 p0077 A79-14770
Large filament wound structures for energy and transportation systems --- turbine blades for windpowered energy systems
21 p0086 A79-15507
Control of wind turbine generators connected to power systems
21 p0086 A79-15574
Operation and control of wind-electric systems
21 p0086 A79-15575
Large wind turbine generators --- NASA program status and potential costs
21 p0092 A79-15881
Utility applications of wind power plants
21 p0092 A79-15882
A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system
21 p0098 A79-16107
On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742
Controlling a wind generator for increased efficiency
21 p0113 A79-16743
Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744
The Netherlands experimental vertical axis wind turbine
21 p0114 A79-17120
The Campbell Chinese Type Windmill
21 p0142 A79-17510
Development of 1 kW vertical axis wind generator
21 p0142 A79-17511
Wind generation of electricity for a novel dwelling independent of servicing networks
21 p0142 A79-17513
Field testing of 5-kW commercial wind generator with an automatic load-matching device for utilizing its output
21 p0143 A79-17515
Vertical axis wind turbine status
21 p0143 A79-17516
A technique for longitudinal correlation of wind data - Theory and its application to siting of wind power plants
21 p0143 A79-17518
A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing
21 p0144 A79-17617
Some effects of flow curvature on the performance of Darrieus wind turbines
[AIAA PAPER 79-0112] 21 p0156 A79-19538
Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539
Energy effectiveness of arbitrary arrays of wind turbines
[AIAA PAPER 79-0114] 21 p0156 A79-19540
The Madaras Rotor Power Plant - An alternate method for extracting large amounts of power from the wind
[AIAA PAPER 79-0115] 21 p0157 A79-19541
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358
Fluid dynamics of diffuser-augmented wind turbines
22 p0238 A79-20798
An inverse problem of vertical-axis wind turbines
22 p0239 A79-20800
Background and system description of the Mod 1 wind turbine generator
22 p0239 A79-20825
Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826
Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829
Microprocessor control of a wind turbine generator
22 p0244 A79-21302
Cost-effectiveness of the vortex-augmented wind turbine
22 p0266 A79-24048
Tropospheric conduits --- for pollution abatement and energy production
22 p0266 A79-24275
Stormy development of wind energy --- German technology utilization
22 p0268 A79-24323
An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720
Contribution to the development of wind energy systems using static power electronic converters
22 p0286 A79-26958
No ill winds for New Mexico utility --- windpower utilization in municipal electric power system
22 p0286 A79-27208
Wind energy --- Book
22 p0287 A79-27327
The application of hydraulics in the 2,000 kW wind turbine generator
22 p0288 A79-27400
Energy statistics for large wind turbine arrays
22 p0299 A79-29371
A Variable Speed Constant Frequency /VSCF/ wind generator for low power applications
22 p0303 A79-29799
Control strategy for a variable-speed wind energy conversion system
22 p0303 A79-29800
The economics of electric power generation from wind energy
22 p0310 A79-30998
Wind power from a vortex chamber
22 p0319 A79-31425
NRC's wind energy program
22 p0319 A79-31426
Alternate energy installations on the Jordan College Campus
22 p0323 A79-31454
Design and application of large wind turbine generators
22 p0326 A79-31916
Off-shore multi-MW size wind turbine system development is the key to cost-effective wind energy for Sweden
22 p0326 A79-31917
The IAE 30-kW wind turbine - A review of the aerodynamic design
23 p0387 A79-33240
Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity
23 p0387 A79-33241
The Savonius rotor - Theory and optimization
23 p0387 A79-33242
Mechanical and vibrational problems of a vertical axis wind turbine
23 p0389 A79-33265
Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy
23 p0404 A79-34036
Theoretical study of a hybrid wind turbine
23 p0405 A79-34047
Wind site selection for optimum wind power systems
23 p0406 A79-34049
A review of wind-electric conversion technology
23 p0406 A79-34050
Wind energy conversion systems /WECS/ for central station and dispersed power applications
23 p0406 A79-34052
An energy analysis of a wind energy conversion system for fuel displacement
23 p0406 A79-34054
Hydrogen from the wind - A clean energy system
23 p0413 A79-34112
Data acquisition and signal processing for a vertical axis wind energy conversion system
23 p0432 A79-35078
Windpower generation on a large scale
23 p0452 A79-37891

Wind energy conversion and hydrogen production - A feasibility study for South Africa
23 p0452 A79-37892

The design construction and proving of a low cost 5kW wind powered turbine for isolated applications
23 p0452 A79-37893

Prediction and measurement of aerogenerator performance
23 p0453 A79-37898

Depletion of available wind power by a large network of wind generators
23 p0453 A79-37899

The design and construction of the Aldborough aerogenerator
23 p0453 A79-37900

The integration of a complex of wind-driven generators into a power system
23 p0454 A79-37913

Low cost Darrieus vertical-axis wind turbine design
[AIAA PAPER 79-0966] 23 p0456 A79-38174

The use of a complex-terrain wind model for the siting and design of wind generators
[AIAA PAPER 79-0971] 23 p0456 A79-38178

Further development of the high-speed converter with flapping hinge /Goslich system/ - Plans for application in developing countries --- windmill
23 p0471 A79-38655

Test report and power measurement on a 200-watt wind generator
23 p0472 A79-38658

Wind energy plants for electric generation - Economic significance and example
23 p0472 A79-38662

Wind turbines for electric utilities - Development status and economics
[AIAA PAPER 79-0965] 23 p0475 A79-38888

The Netherlands research program on wind energy
23 p0481 A79-40102

The Swedish Wind Energy Programme
23 p0482 A79-40103

The development of wind power plants in Japan
23 p0482 A79-40105

Wake interaction in an array of windmills - Theory and preliminary results
23 p0483 A79-40112

Atmospheric turbulence structure in relation to wind generator design
23 p0483 A79-40114

Performance evaluation of wind power units
23 p0483 A79-40115

Aeroelastic stability and response of horizontal axis wind turbine blades
23 p0483 A79-40117

Gears for wind power plants
23 p0484 A79-40119

Test results from the Swedish 60 kW experimental wind power unit
23 p0484 A79-40120

Operating experience with the Magdalen Islands wind turbine
23 p0484 A79-40122

A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123

Design and construction of a pilot plant for a shrouded wind turbine
23 p0485 A79-40128

The regulation of an electricity supply system including wind energy generators
23 p0485 A79-40130

Implications of large scale introduction of power from large wind energy conversion systems into the existing electric power supply system in the Netherlands
23 p0485 A79-40132

Wind energy utilization by means of aerogenerators
23 p0522 A79-41220

Composite rotor blades for large wind energy installations
23 p0522 A79-41235

Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study
23 p0527 A79-41946

Concentration augmentation of power in a Savonius-type wind rotor
23 p0527 A79-41947

Optimal value of the rated speed of a wind generator
23 p0527 A79-41948

Parametric performance analysis of a Darrieus wind turbine system
23 p0536 A79-43676

Electromagnetic interference to television reception caused by horizontal axis windmills
24 p0627 A79-45923

Interannual and month-to-month variations of wind speed --- for wind turbine sites
24 p0629 A79-46221

Large horizontal axis wind turbine development
24 p0633 A79-46527

Economic overview of vertical axis wind turbines
24 p0633 A79-46528

Environmental issues assessment --- for large wind turbine systems
24 p0633 A79-46530

Wind energy central station power generation in the Southwest and Southeast
24 p0634 A79-46533

Wind/hydro generation assessment
24 p0634 A79-46535

Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine
24 p0634 A79-46537

MOD-1 wind turbine generator program status report
24 p0634 A79-46538

Cuttyhunk Island installation, WTG Energy Systems, Inc., MP1-200 control system design --- Wind Turbine Generator
24 p0634 A79-46539

Status of the Southern California Edison Company 3 MW wind turbine generator /WTG/ demonstration project
24 p0635 A79-46541

The MOD-2 wind turbine
24 p0635 A79-46542

Magdalen Islands VAWT field test --- Vertical Axis Wind Turbines
24 p0635 A79-46543

Summary report on the collapse of the Magdalen Islands wind turbine
24 p0635 A79-46544

Wind energy conversion system transient performance analysis
24 p0635 A79-46545

Impact of storm fronts on utilities with WECS arrays --- Wind Energy Conversion System
24 p0635 A79-46546

Lewis Research Center studies of multiple large wind turbine generators on a utility network
24 p0635 A79-46547

Field experience with wind turbine generator operation in utility systems
24 p0635 A79-46548

Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652

Wind and solar energies in the tornado type wind energy system
24 p0645 A79-48068

Digital simulation of dynamics of wind turbine generators
24 p0654 A79-50073

Projected impacts of a very large windpower complex
24 p0665 A79-50890

Operation and analysis of a vertical axis wind turbine
24 p0677 A79-51776

Design and performance of bicycle wind turbine rotors
24 p0677 A79-51777

Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780

A low cost composite blade for a 300 foot diameter wind turbine
24 p0677 A79-51781

Residential flywheel with turbine supply
24 p0679 A79-51792

Wind tunnel tests of a 1/30 scale model of a 3.5 megawatt wind turbine
24 p0703 A79-52012

Reliability of wind power from dispersed sites: A preliminary assessment
[LBL-6889] 21 p0176 N79-10547

Transient response to three-phase faults on a wind turbine generator
21 p0180 N79-11312

Nonlinear dynamic response of wind turbine rotors
[NASA-TM-78324] 21 p0195 N79-12542

Microprocessor control of a wind turbine generator
[NASA-TM-79021] 21 p0195 N79-12548

Lightning protection for the vertical axis wind turbine
[SAND-77-1241] 21 p0221 N79-14567

Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development
[NASA-TP-1359] 21 p0223 N79-14679

Aeroelastic response and stability of a coupled rotor/support system with application to large horizontal axis with turbines
22 p0332 N79-16346

Power train analysis for the DOE/NASA 100-kW wind turbine generator
[NASA-TM-78997] 22 p0333 N79-16355

An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357

Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382

A 200-kW wind turbine generator conceptual design study
[NASA-TM-79032] 22 p0341 N79-17333

Energy analyses applied to ocean thermal energy conversion and an offshore wind power system
22 p0353 N79-19442

Utility operational experience on the NASA/DOE MOD-0A 200-kW wind turbine
[NASA-TM-79084] 22 p0360 N79-20494

Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

The use of wind data with an operational wind turbine in a research and development environment
[NASA-TM-73832] 23 p0581 N79-26502

Large horizontal axis wind turbine development
[NASA-TM-79174] 23 p0581 N79-26504

A low-cost water pumping windmill using a sail type Savonius rotor
[PB-294413/0] 23 p0585 N79-26541

Aerodynamic performance of the 17-metre-diameter Darrieus wind turbine
[SAND-78-1737] 23 p0595 N79-27670

Scattered EM field due to rotating blades of horizontal-axis wind machines
[SAND-79-0434] 24 p0719 N79-28398

Safety considerations in the design and operation of large wind turbines
[NASA-TM-79193] 24 p0723 N79-28725

Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727

MOD-2 failure mode and effects analysis
[NASA-CR-159632] 24 p0747 N79-30415

Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170] 24 p0749 N79-30719

Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779

Wind power, volume 2. Citations from the NTIS data base --- bibliographies
[NTIS/PS-79/0534/2] 24 p0777 N79-31836

Wind power, volume 1. Citations from the Engineering Index data base --- bibliographies
[NTIS/PS-79/0535/9] 24 p0777 N79-31837

Wind turbines
[ANL/CES-TE-78-9] 24 p0790 N79-32711

Availability of wind power
[SAND-78-0548C] 24 p0791 N79-32719

Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients
[PB-295876/7] 24 p0792 N79-32735

A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines
24 p0794 N79-33158

WINDPOWERED PUMPS

A comparison between sun and wind as energy sources in irrigation plants
21 p0118 A79-17295

An evaluation of the strategy of low cost horizontal axis windmills
21 p0143 A79-17517

Aeroelastic pump --- wind energy from flutter of suspended liquid-filled cables
23 p0406 A79-34055

Load matching effects on wind energy converter performance
23 p0455 A79-37917

A low-cost water pumping windmill using a sail type Savonius rotor
[PB-294413/0] 23 p0585 N79-26541

Wind driven water pumps. Economics, technology, current activities
[PB-292816/6] 23 p0585 N79-26542

WING TIPS

Free vortices from a wing for wind turbine systems
23 p0537 A79-43683

WINGLETS

Winglets give USAF KC-135 new look in life
22 p0265 A79-23975

WINTER

Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486

On solar energy heating and degree days during the winter months
24 p0610 A79-45226

Comprehensive overview of winter energy data bulletins
[PB-282787/1] 21 p0177 N79-10565

Underground storage of natural gas by interstate pipeline companies for 1976 and winter 1976 - 1977
[DOE/EIA-0151] 23 p0597 N79-27684

Projections of energy supply and demand for the 1978-1979 winter heating season
[DOE/EIA-0102/33] 24 p0758 N79-30815

WIRE WINDING

Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges
22 p0298 A79-29286

Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor
24 p0663 A79-50776

Automatic tension control for winding superconducting coils --- conferences
[Y/EN-257] 24 p0734 N79-29384

WISCONSIN

An assessment of wind characteristics and wind energy systems applications to electric utilities in Wisconsin and sections of Minnesota, Iowa and Illinois
24 p0736 N79-29593

WOOD

Energy from biomass through hydrolysis of wood
21 p0003 A79-10036

Forest residues as an alternate energy source
21 p0072 A79-14689

Advanced processes for more efficient use of forest products residual material
21 p0096 A79-15919

A theoretical study of wood gasification processes
22 p0257 A79-22923

Observations on the production of methanol and anhydrous ammonia from wood
23 p0386 A79-33230

Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396

Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745

Biomass - The self-replacing energy resource
24 p0651 A79-49425

Environmental aspects of wood fuel
24 p0665 A79-50884

An evaluation of wood-waste energy conversion systems
21 p0174 N79-10528

Methanol from wood waste: A technical and economic study
[FPL-12] 21 p0194 N79-12239

FLAME: Forestry Lands Allocated for Managing energy. Feasibility study
[AD-A059993] 21 p0217 N79-14507

Material and energy balances in the production of ethanol from wood --- conferences
[CONF-7806139-1] 23 p0589 N79-27338

Rural development initiatives: Energy for rural America
[PB-295234/9] 24 p0743 N79-29674
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363
Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413

WORKING FLUIDS
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124
The Arboria control concept - Does flow regulation in the solar system cycle make sense --- working fluid regulation in solar heating facility
21 p0056 A79-13632
Plasma diagnostics in an MHD installation
21 p0106 A79-16492
Performance studies of a finned heat pipe latent thermal energy storage system
21 p0121 A79-17325
Liquid solar collector --- low cost assemblage with black water working fluid
21 p0133 A79-17433
Solar ammonia-water absorption system for cold storage application
21 p0143 A79-17521
Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523
Some aspects of the transient response of a flat-plate solar energy collector
21 p0153 A79-18466
Geothermal power and water production studies at the University of California
[ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825
Using N2O4 in a solar gas-turbine plant
21 p0167 A79-20357
Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation
22 p0262 A79-23757
Solar energy storage as hydrogen and bromine from hydrogen bromide
22 p0265 A79-24045
Solar system modeling using a modular approach with generalized programs for working fluid properties
22 p0266 A79-24310
Effects of test fluid, flow rate, and flow regime on solar collector thermal performance measurements
22 p0268 A79-24317
Use of organic fluids in solar turbines
22 p0269 A79-24621
Working fluids and turbines for OTEC power systems
22 p0280 A79-26192
Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204
Solar energy application of natural zeolites --- solid absorber-water vapor working fluid system for sorption-refrigeration cycles
22 p0286 A79-27213
Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354
Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960
Power generation experiments of a linear MHD generator with fully ionized seed
23 p0394 A79-33421
Liquid sorbent solar air conditioner
23 p0401 A79-34014
Ocean thermal energy conversion /OTEC/ plant working fluid study
23 p0404 A79-34080
Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130
Organic synthesis fluids for solar energy systems
23 p0435 A79-35485
On the problem of heat transfer in low-temperature heat pipes
23 p0532 A79-42938
Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821
Hybrid OTEC cycle avoids indirect heat exchangers
24 p0625 A79-45844
Thermodynamic basis for the choice of working fluids for solar absorption cooling systems
24 p0641 A79-47791
Storage assisted heat pumps using phase change materials
24 p0697 A79-51967
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991
Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268
Thermal performance evaluation of the Semco (liquid) solar collector
[NASA-CR-161230] 23 p0594 N79-27656

WYOMING
In situ coal gasification modeling
[UCRL-82269] 23 p0561 N79-24479
Geologic applications of thermal-inertia mapping from satellite --- Powder River Basin, Wyoming
[E79-10279] 24 p0796 N79-33518

X

X RAY ANALYSIS
Flash X-ray tests of solar cells
23 p0498 A79-40899

X RAY IMAGERY
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas --- during implosions for laser fusion
22 p0296 A79-28366

X RAY SPECTRA
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479
Pellet X-ray spectra for laser fusion reactor designs
22 p0291 A79-27878

X RAY SPECTROSCOPY
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

XENON LAMPS
Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator
21 p0130 A79-17406

Y

YAG LASERS
Frequency doubling of a solar pumped Nd:YAG laser
21 p0044 A79-12062
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171
Optical coatings for a space laser communications system
22 p0292 A79-28028

YELLOWSTONE NATIONAL PARK (ID-MT-WY)
Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming
23 p0551 N79-23551

YIELD
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28349

YOKES
Accounting for the effect of a yoke in an MHD linear induction machine by stipulating boundary conditions of a new kind
22 p0247 A79-21627

YTTRIUM OXIDES
Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813
Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712

Z

ZAMBIA
Description of hydro-electric development and proposal for future development on the Zambezi
22 p0340 N79-17323

ZEOLITES
Solar energy application of natural zeolites --- solid absorber-water vapor working fluid system for sorption-refrigeration cycles
22 p0286 A79-27213
The potential of zeolite molecular sieves as hydrogen storage media
23 p0415 A79-34123
Solar refrigeration utilizing zeolites
24 p0703 A79-52014
Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386

ZETA PINCH
Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817
Plasma behavior near the neutral line between parallel currents --- in planar zeta pinch
22 p0324 A79-31754
Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210

ZINC
Thermodynamic and kinetic considerations on zinc-halogen batteries
21 p0040 A79-11822
A zinc-bromine battery for energy storage
24 p0684 A79-51832
The zinc-chlorine battery in the BEST facility - 1981
24 p0703 A79-52013
Electrolysis of zinc. Statistical model of the process parameters for an industrial cell
[BLL-RTS-11317] 22 p0345 N79-17984

ZINC CHLORIDES
Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833

ZINC COMPOUNDS
100MWh zinc-chlorine peak-shaving battery plants
21 p0011 A79-10096
Photovoltaic effects in II-VI heterojunctions
21 p0042 A79-11967
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
Evaluation of selected chemical processes for production of low-cost silicon, phase 3 --- using a fluidized bed reactor
[NASA-CR-162168] 24 p0769 N79-31756

ZINC SULFIDES
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis
24 p0616 A79-45745
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

ZIRCONIUM ALLOYS
The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707

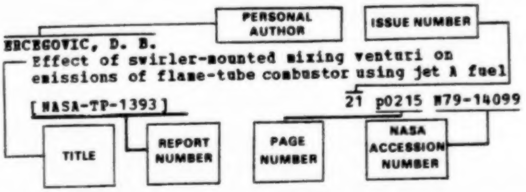
ZIRCONIUM OXIDES
Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813

PERSONAL AUTHOR INDEX

ENERGY/*A Continuing Bibliography (Issue 24)*

JANUARY 1980

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The issue, page and accession numbers are located beneath and to the right of the title, e.g., 21 p0215 N79-14099. Under any one author's name the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABARCAR, R. B.
Solar thermal systems long-term performance predictions using closed-form solutions
24 p0672 A79-51740

ABATUT, J. L.
Analysis and design of a field of heliostats for a solar power plant
22 p0242 A79-21161

ABATUT, J.-L.
WELMM analysis and solar energy conversion systems
24 p0644 A79-48022

ABBIN, J. P., JR.
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
24 p0673 A79-51752

ABBOTT, D.
Two-junction cascade solar cell characteristics under 1000 concentration ratio and AM 0-AM 5 spectral conditions
23 p0513 A79-41027
Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra
23 p0528 A79-42170
Computer modeling of a two-junction, monolithic cascade solar cell
24 p0785 N79-32672

ABDEL-KHALIK, S. I.
Properties optimization for phase-change energy storage in air-based solar heating systems
21 p0149 A79-18018
Sizing phase-change energy storage units for air-based solar heating systems
23 p0439 A79-36632

ABDEL-SALAM, O.
Molten-carbonate CO2 concentrator - Preliminary experiments
[ASME PAPER 78-ENAS-2] 21 p0048 A79-12551

ABDEL-WAHED, R. M.
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones
24 p0630 A79-46306

ABDELRAHMAN, M.
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation
22 p0262 A79-23757

ABDERRASSOUL, R.
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Thin film polycrystalline silicon solar cells
23 p0518 A79-41067

ABDULLAEV, A. SH.
Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

ABDURAKHMANOV, A.
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties
23 p0433 A79-35381
Heating characteristics of concentrator/receiver systems using selective absorption surfaces
24 p0646 A79-48739
Investigation of the absorption and emission characteristics of an ideal selective surface
24 p0648 A79-49186
Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties
24 p0663 A79-50704

ABELES, T. P.
Parameters for legislative consideration of bioconversion technologies
[PB-284742/4] 21 p0194 N79-12250

ABENS, S. G.
Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

ABERLEY, R. C.
Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147

ABHAT, A.
Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319
Performance studies of a finned heat pipe latent thermal energy storage system
21 p0121 A79-17325

ABIDOV, T. Z.
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

ABOUELEZZ, M.
Degradation of polymethylmethacrylate by radiation
23 p0431 A79-35074

ABRAHAM, K. M.
A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332

ABRAMOWITZ, S.
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167

ABRAMS, L. M.
The H-Coal pilot plant - History, description, and present status
23 p0412 A79-34100

ABRIKOSOV, N. KH.
Study of diffusion processes in low-temperature thermopiles
21 p0054 A79-13290

ABUBAKAR, M. Y.
New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863

ABUGHRES, S. M.
Thermal performance of single-pass solar fluid heaters
23 p0467 A79-38613

ABUL-FADL, A.
Material growth and characterization directed toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543
ACHAIBOU, A.
Analysis and design of a field of heliostats for a solar power plant
22 p0242 A79-21161
Control of a heliostat field by distributed microcomputer technique
23 p0389 A79-33269
Design of an indirect-drive heliostat
23 p0390 A79-33270
ACHAIBOU, A. K.
Dimensioning of energy-production systems - The use of geometric programming
23 p0388 A79-33254
ACHARD, J. C.
Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711
ACKERMAN, J. P.
Molten carbonate fuel cell systems - Status and potential
21 p0039 A79-11817
Development of central station power plants integrated with coal gasifiers
21 p0093 A79-15895
Molten carbonate fuel cell systems development program
24 p0682 A79-51814
ACKERMAN, R.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306
ACKERMAN, S. L.
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535
ACTON, R. G.
Prospects for improvements in lead-acid batteries
22 p0300 A79-29488
ADAMS, E. E.
Results of a near field physical model study
24 p0626 A79-45856
ADAMS, G. H.
Cogeneration with digester gas
24 p0676 A79-51773
ADAMS, L. J.
Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458
ADAMS, H. R.
Future transportation fuels
24 p0650 A79-49377
ADAMS, P. M.
Annual Simulation Symposium, 11th, Tampa, Fla., March 15-17, 1978, Record of Proceedings
23 p0475 A79-38876
ADAMS, R. C.
Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results
[PB-290514/9] 23 p0566 N79-24534
ADAMS, T. N.
Properties and operating experience with bagasse as a boiler fuel
23 p0489 A79-40395
ADAMS, W. A.
Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557
ADDEO, A.
Selective covers for natural cooling devices
22 p0272 A79-25522
ADDIE, A. N.
Energy requirements of the rail mode
[ASME PAPER 78-RT-1] 21 p0150 A79-18085
ADIBHATLA, S.
Computer aided optimization of integrated coal gasification combined cycle power plants
21 p0008 A79-10075
ADKINS, C. M.
New alloy systems for hydrogen storage
21 p0038 A79-11806
ADLER, T. A.
On design requisites for hydrogen energy systems
24 p0685 A79-51844
ADOLFSON, W. F.
Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800
Waste heat as an alternate fuel - Its opportunities and potential
24 p0698 A79-51968
ADOLPHSON, D. R.
Formation of protective layers on alloys developed for use in coal gasification environments
[SAND-78-8277] 24 p0765 N79-31383
ADYLOV, G. T.
Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259
AERNI, E.
Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight
23 p0511 A79-41018
AERTS, E.
Functional solar energy applications based on an improved insulation model
23 p0452 A79-37883
AFFENS, W. A.
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182
AFIAN, V. V.
Controlling the radiant flux of a high-temperature solar energy conversion system over two parameters
22 p0296 A79-28669
Combined radiant-flux controller for a high-temperature solar energy system
23 p0433 A79-35382
Control of the radiant flux of high-temperature solar-energy installations with respect to two parameters
24 p0637 A79-46907
Combination radiant-flux radiator for high-temperature solar plant
24 p0663 A79-50705
AGABAEV, CH.
Determination of thermal contact resistances
21 p0166 A79-20351
Energy balance of solar thermoelectric generators
24 p0646 A79-48734
AGAFONOV, A. V.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864
AGARWAL, K. N.
Design of radiometer for measurement of total and net exchange solar radiation
21 p0119 A79-17307
AGARWALA, A.
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357
AGAWA, T.
Optimum power plant capacity of ocean-based ocean thermal energy conversion systems
22 p0297 A79-28922
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821
AGEYEN, G.
Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses
[ORNL-TR-4483] 21 p0221 N79-14574
AGGARWAL, R.
An analysis of operational procedures and design modifications for aircraft fuel conservation
[AIAA 79-1656] 24 p0611 A79-45328
AGGARWAL, R. K.
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft. Volume 1: Executive summary
[AD-A061746] 22 p0351 N79-18969
An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft, volume 2
[AD-A062609] 22 p0356 N79-20109
AGNEW, C. E.
Impact of electric passenger automobiles on utility system loads, 1985 - 2000
[EPRI-EA-623] 21 p0203 N79-13281

AGNIHOTRI, O. P.
Preparation and properties of pure and tin doped indium oxide selective coatings 21 p0127 A79-17381
Spray deposited Cd/1-x/Zn/x/S films for low cost solar cells 23 p0500 A79-40912
High absorptivity Al-PbS selective surfaces for solar photothermal conversion 24 p0705 A79-52319

AGOST, M. G.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station 23 p0519 A79-41071

AHGREN, B.
Utility fuel cells for biomass fuel 21 p0016 A79-10131

AHL, D.
Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979 [DOE/EIA-0102/40] 24 p0746 N79-30403

AHLBERG, N. R.
Research and development facilities at the Ontario Center for Resource Recovery 23 p0490 A79-40410

AHLSTROM, H. G.
Diagnostics of Shiva Nova high-yield thermonuclear events 22 p0285 A79-26747

AHLUWALIA, R. K.
Two-dimensional MHD channel design 22 p0279 A79-26183
Design of optimum compressed air energy-storage systems 24 p0631 A79-46308
Parametric study of the performance of a CDIF 1-B coal-fired MHD generator [ANL-MHD-79-3] 22 p0361 N79-20503
Design of optimum compressed air energy storage systems [CONF-7811101-1] 23 p0565 N79-24508

AHMAD, A.
Recovery of oil from oil shale - An overall technological perspective 21 p0073 A79-14698

AHMADI, G.
Aeroelastic wind energy converter 21 p0047 A79-12275
Yield of ground storage of heat in solar ponds 21 p0133 A79-17429
Computer simulation of the performance of a solar pond in the southern part of Iran 21 p0133 A79-17432

AHMED, S.
A multivariate-utility approach for selection of energy sources 21 p0058 A79-16120

AHMED, S. B.
Analysis of thermal storage unit for solar energy 21 p0122 A79-17332

AHN, Y. K.
Comparative economics of alternative fuels for intermediate services, combined cycle power plant 23 p0419 A79-34160

AHNER, D. J.
Integrated low Btu gasification, combined cycle plant considerations and control 21 p0094 A79-15905
Study of integrated gasification combined cycle plant interaction and control [ASME PAPER 79-GT-60] 22 p0306 A79-30530

AHRENS, F. W.
Ejector augmentation of the air supply in a compressed air energy storage plant 21 p0013 A79-10109
Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems 22 p0280 A79-26191
Design of optimum compressed air energy-storage systems 24 p0631 A79-46308
Design of optimum compressed air energy storage systems [CONF-7811101-1] 23 p0565 N79-24508
Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants [CONF-780599-2] 24 p0758 N79-30822
Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants [CONF-780599-1] 24 p0776 N79-31830

AI, D. K.
A low cost blade design for a Darrieus-type vertical-axis wind turbine 21 p0067 A79-14291
Low cost Darrieus vertical-axis wind turbine design [AIAA PAPER 79-0966] 23 p0456 A79-38174

AIACHE, L.
Critical study of energy parameters of solar energy /illumination and concentration/ - Application to catoptric collectors 23 p0463 A79-38584
Theoretical and experimental study of a cylindrical solar photochemical reactor 23 p0467 A79-38618

AIKAWA, K.
MHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591

AIKAWA, S.
Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses 21 p0164 A79-19949

AIKEN, R.
Biomass utilization in Minnesota [PB-282531/3] 21 p0171 N79-10241

AIREY, J. R.
Fusion energy - The iceberg beneath the tip 23 p0406 A79-34057

AIZAWA, K.
Optimum design parameters of horizontal coaxial cylinders for a solar energy collector 21 p0134 A79-17444

AKBARZADEH, A.
Yield of ground storage of heat in solar ponds 21 p0133 A79-17429
Computer simulation of the performance of a solar pond in the southern part of Iran 21 p0133 A79-17432

AKERS, C. K.
Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978 24 p0620 A79-45803

AKHTAR, S.
Moessbauer spectroscopy of iron in coal and coal hydrogenation products 22 p0282 A79-26464

AKIYAMA, M.
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine 22 p0311 A79-31020

AKUTA, T.
Development of CDE /Concentration Difference Energy/ system and engine 24 p0702 A79-52005

AKYUZLU, K.
Determination of potential solar power sites in the United States based upon satellite cloud observations [NASA-CR-159944] 24 p0749 N79-30712

AL-SHEMRI, A.
The application of wind energy to a system with an inherent energy storage medium 24 p0677 A79-51778

ALARIO, J.
Recovery of waste heat from propellant forced-air dry house [AD-A064108] 23 p0543 N79-22638
Design, fabrication and test of a hydrogen heat pipe [NASA-CR-152267] 23 p0556 N79-24298
Cryogenic thermal diode heat pipes [NASA-CR-152268] 24 p0719 N79-28470

ALBAUGH, L. R.
Risk control in the development of energy processes 21 p0085 A79-15372

ALBRECHT, H.
Fast spectral radiometer 23 p0469 A79-38629

ALCONE, J. M.
Analysis and design of air heating unglazed flat plate solar collectors 22 p0280 A79-26202

ALCORN, W. R.
Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels
[FE-2321-12] 21 p0216 N79-14240

ALDERFER, R. G.
Assessing environmental costs of energy procurement
21 p0071 A79-14682

ALDRIDGE, M. H.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483

ALEFELD, G.
Basic physical and chemical processes for storage of heat
21 p0038 A79-11805
Efficiency improvement by means of multicomponent processes - Improvement of the efficiency of heat-power transformation by means of an employment of Clausius-Rankine sorption processes
21 p0164 A79-19975

ALEXANDER, A. J.
Wind tunnel corrections for Savonius rotors
23 p0485 A79-40127

ALEXANDER, D. W.
A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0419 A79-34156

ALEXANDER, G.
The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

ALEXANDER, W. E.
Material growth and characterization directed toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543

ALEXANDRE, A.
Theoretical and practical aspects of heat transfer in the window-absorber cavity of a flat plate collector
23 p0383 A79-32957

ALGERMISSEN, J.
Theoretical studies of coal pyrolysis in an entrained bed flow reactor
21 p0007 A79-10063

ALI MANSOORI, G.
Thermodynamic basis for the choice of working fluids for solar absorption cooling systems
24 p0641 A79-47791

ALIA, P.
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop
23 p0408 A79-34074

ALIEV, IU. M.
Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

ALIKAEV, V. V.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

ALIZADEH, S.
Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819

ALKAISI, M. M.
Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779

ALLEN, B. J.
International energy evaluation system. Volume 2: Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796

ALLEN, B. R.
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234

ALLEN, C. A.
Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies
23 p0403 A79-34032
Liquid-fluidized-bed heat exchanger flow distribution models
[ICP-1151] 22 p0369 N79-21559
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752

ALLEN, E. L.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699

ALLEN, F. G.
Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807

ALLEN, M. M.
Potential use of small dams to produce power for low-income communities
[PB-292745/7] 23 p0575 N79-25535

ALLEN, R.
The CCMS solar energy pilot study system performance reporting format
22 p0275 A79-25930

ALLEN, R. W.
Stochastic simulation experiments on solar air conditioning systems
21 p0138 A79-17474
Stochastic predictions of solar cooling system performance
[ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848
Report of the 4th CCMS (Committee on the Challenges of Modern Society) Solar Energy Pilot Study Meeting
[PB-289492/1] 22 p0372 N79-21631

ALLEN, T.
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538

ALLEN, W. R.
Economic analysis of solar photovoltaics for low-power lighted aids to navigation
[AD-A068365] 24 p0738 N79-29615

ALLISON, J.
Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779

ALLISON, K. L.
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773

ALLRED, D. D.
Chemical vapor deposited molybdenum films for use in photothermal conversion
22 p0294 A79-28148
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177

ALLRED, R. E.
Structural optimization of SMC line focusing collectors
23 p0534 A79-43295
Structural optimization of sheet molding compound line focusing collectors
[SAND-79-0215C] 24 p0790 N79-32710

ALLSUP, J. R.
Ethanol/gasoline blends as automotive fuel
[BETC/RI-79/2] 24 p0767 N79-31423

ALLUMS, S. L.
Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator
[NASA-TM-78222] 22 p0360 N79-20495

ALMANZA, R.
Total solar radiation in Mexico using sunshine hours and meteorological data
21 p0150 A79-18026

ALMEIDA, P. I. F.
Accuracy of empirical relations for flat plate collector performance prediction
23 p0398 A79-33987

ALONSO, A.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071

ALONSO, M.
Solar energy in Latin America - An overview
21 p0116 A79-17279

ALPER, M. E.
Photovoltaics and solar thermal conversion to electricity - Status and prospects
22 p0326 A79-31924

ALPERT, S. B.
Coal liquefaction - Status and new directions
21 p0007 A79-10062

ALTER, H.
Development of specifications for recycled products
22 p0295 A79-28182

ALTMAN, R. F.
The development of the Advanced Components Test Facility
23 p0429 A79-35047

ALTMANN, H.
A wave power machine using free floating vertical plates
21 p0151 A79-18104

ALTSCHULER, S. J.
Geothermal power from salt domes
21 p0014 A79-10120

ALTSEIMER, J. H.
Selected results from the technology assessment of solar energy program
[AIAA PAPER 79-0984] 23 p0458 A79-38187
Status review of the technology assessment of solar energy program
[LA-UR-79-1369] 24 p0790 N79-32714

ALVAREZ, I. S.
Anticonvective antiradiative systems
21 p0132 A79-17420

ALVIS, R. L.
Solar powered irrigation: Present status and future outlook
[SAND-78-0016C] 21 p0175 N79-10539
Solar irrigation program plan: Second revision
[SAND-78-0308-REV] 21 p0187 N79-11525
Solar irrigation program
[SAND-78-0049] 21 p0210 N79-13537

AMANO, H.
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821

AMATO, R. V.
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936

AMEEL, T. A.
Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809

AMEND, W. E.
MHD power plant characteristics
21 p0105 A79-16480

AMIN, H.
Evaluation of the use of oxygen as oxidant in fossil fuel fired open cycle MHD-steam energy conversion processes
22 p0353 N79-19444

AN, C. H.
Stability of tokamaks with elongated cross section
24 p0639 A79-47422

ANAGNOSTOU, E.
Endurance testing of first generation /Block I/ commercial solar cell modules
23 p0512 A79-41022

ANAND, D. K.
Stochastic simulation experiments on solar air conditioning systems
21 p0138 A79-17474
Use of solar energy for industrial process heat
21 p0143 A79-17524
Stochastic predictions of solar cooling system performance
[ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848
Solar thermal systems long-term performance predictions using closed-form solutions
24 p0672 A79-51740

ANAND, J. N.
Dow sodium-sulfur battery for energy storage
24 p0684 A79-51834

ANAND, R.
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560

ANAND, R. K.
Electric utility applications of thermal energy storage and transport
24 p0680 A79-51802

ANANIN, S. I.
Structure of the current shell in a Z pinch
22 p0245 A79-21434

ANATICHUK, L. I.
Thermal converters with transverse thermoelectromotive forces
22 p0256 A79-22847

ANDERMANN, R. E.
The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant
24 p0687 A79-51859

ANDERSON, A. F.
Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977
22 p0247 A79-21676

ANDERSON, A. W.
Gas turbine operating and maintenance experience in Saudi Arabia
22 p0298 A79-28989

ANDERSON, B. J.
A case study of OTEC financing for the Middle South Utilities
24 p0621 A79-45810

ANDERSON, B. N.
Passive solar design
21 p0074 A79-14720

ANDERSON, C. F.
Stability of alumina-base refractories in western lignite-ash slag environments
[PB-293238/2] 24 p0731 N79-29249

ANDERSON, D. N.
Effect of inlet temperature on the performance of a catalytic reactor
21 p0035 A79-11542

ANDERSON, G. Y.
Characterization of a swept-strut hydrogen fuel-injector for scramjet applications
24 p0649 A79-49345

ANDERSON, J.
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395

ANDERSON, J. E.
Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379

ANDERSON, J. H.
Progress in nuclear-pumped lasers
21 p0110 A79-16627

ANDERSON, J. H., JR.
Compact heat exchanger design progress
24 p0618 A79-45789

ANDERSON, J. L.
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436

ANDERSON, J. M.
Electrostatic separation of coal macerals
24 p0603 A79-44525

ANDERSON, L. L.
A survey of methods of coal hydrogenation for the production of liquids
24 p0628 A79-45994

ANDERSON, O. L.
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380
Rocky mountain coal for southern California's coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745

ANDERSON, P.
Solar absorption cooling
21 p0090 A79-15861

ANDERSON, P. M.
The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736

ANDERSON, R. H.
Linear echelon refractor/reflector solar concentrators
22 p0293 A79-28143

ANDERSON, R. L.
Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests
[PB-295478/2] 24 p0778 N79-32135

ANDERSON, V. R.
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132
Hydrogen Homestead
23 p0415 A79-34125

ANDERSON, W. A.
Reliability studies on MIS solar cells
21 p0148 A79-17950
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009
Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715
Current conduction in Cr-MIS solar cells on single-crystal p-silicon
24 p0648 A79-49215
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-287417/0] 22 p0343 N79-17349

ANDERSON, W. P.
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395

ANDERSSON, A.
Spectrally selective surfaces of Ni-pigmented anodic Al2O3
24 p0629 A79-46202

ANDREEV, P. L.
Airport power supply
24 p0660 A79-50499

ANDRESEN, A. F.
Structural studies of hydrides by neutron diffraction
22 p0248 A79-21681
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

ANDRIUSHCHENKO, A. I.
Thermodynamic basis for combining cycles of heat producing power plants
22 p0298 A79-29297

ANDRONOWSKI, P. M.
A 2500 HP addition to the Ruston range
[ASME PAPER 79-GT-205] 23 p0380 A79-32462

ANGELICI, G. L.
Solar potential inventory and modeling
24 p0657 A79-50219

ANGELINO, G.
The use of liquid natural gas as heat sink for power cycles
22 p0332 N79-16262
Development of thermal prime movers for heat pump drive
22 p0332 N79-16263

ANGELLO, J.
Militarized thermoelectric power sources
21 p0027 A79-10227
Regenerative burner system for thermoelectric power sources
22 p0261 A79-23621

ANGELLO, L. C.
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels
[AD-A060322] 21 p0226 N79-15203

ANISIMOV, A. M.
Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373

ANNAMALAI, N. K.
Technique to determine the growth rate and resistivity of evaporated CdS thin films
23 p0445 A79-37157

ANOSHIN, IU. A.
Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179

ANSARI, J. S.
Receiver designs for tower-top solar collector
21 p0135 A79-17450

ANSPAUGH, B.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973

ANSPAUGH, B. E.
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631
Effect of dopants on annealing performance of silicon solar cells
24 p0785 N79-32661
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

ANTAL, M. J.
A comparison of coal and biomass as feedstocks for synthetic fuel production
23 p0412 A79-34097

ANTAL, M. J., JR.
Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377

ANTHONY, K.
MSFC hot air collectors
[NASA-TM-78206] 21 p0196 N79-12556

ANTHONY, R. G.
Synthetic fuels from Gulf Coast lignite
21 p0146 A79-17643

ANTOINE, A. C.
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
22 p0274 A79-25917
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
[NASA-TM-79035] 22 p0338 N79-16930
Comparison of the properties of some synthetic crudes with petroleum crudes
[NASA-TM-79220] 24 p0765 N79-31405

ANTONOV, B. M.
Inverter systems
21 p0106 A79-16486
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator
22 p0258 A79-23137

ANTRIM, W. D.
Design of a second generation concentrating tracking solar collector
[AIAA PAPER 78-1775] 21 p0062 A79-13872

ANTRIM, W. D., JR.
A flat plate multiple pass solar collector using aqueous optical properties
22 p0293 A79-28144
A parabolic solar reflector for accurate and economic producibility
22 p0293 A79-28145

ANTYPAS, G. A.
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025

AOKI, M.
Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks
24 p0604 A79-44537

APARISI, R. R.
Solar radiation concentrator for uniform irradiation of flat energy receivers and converters
24 p0602 A79-44260

APLEY, W. J.
Systems analysis of solar thermal power systems. Report on task 1: Determination and characterization of solar thermal conversion options
[PNL-2693] 24 p0788 N79-32692

APOLLONSKII, S. M.
Calculation of the external electromagnetic field of closely spaced MHD machines 22 p0298 A79-29285

Calculation of the external electromagnetic field of closely spaced MHD machines 24 p0663 A79-50775

APOSTOLAKIS, G. C.
Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555

APPELBAUM, J.
Performance analysis of dc-motor-photovoltaic converter system. I - Separately excited motor 23 p0477 A79-39104

APPELDORN, R. H.
Linear echelon refractor/reflector solar concentrators 22 p0293 A79-28143

APPLEBY, A. J.
Advanced electrolysis in alkaline solution 21 p0037 A79-11798

Energy use and society in the 21st century 23 p0420 A79-34165

APPS, J. A.
Definition of engineering development and research problems relating to the use of geothermal fluids for electric power generation and nonelectric heating
[LBL-7025] 21 p0188 N79-11534

ARABZADAH, M. R.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

ARAFA, A.
A parametric investigation on flat-plate solar collectors 21 p0128 A79-17391

Transient behaviour of solar flat plate collectors 23 p0467 A79-38612

ARAI, Y.
Dynamic analysis of pipeline system for thermal power generation facility 24 p0627 A79-45863

ARANOVICH, J.
Heterojunction phenomena and interfacial defects in photovoltaic converters 23 p0438 A79-36150

Recent investigations of metal oxide/CdTe heterojunction solar cells 23 p0502 A79-40926

ARANOVITCH, E.
Experiments in solar space heating and cooling for moderately insolated regions 21 p0137 A79-17464

ARATA, W. H., JR.
Very large vehicles - To be or 22 p0306 A79-30484

ARAUJO, G. L.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station 23 p0519 A79-41071

ARCHBOLD, P.
OTEC-1 test conductor program 23 p0430 A79-35060

ARCHER, D. H.
Circulating-bed boiler concepts for steam and power generation 21 p0008 A79-10071

ARCHER, S. R.
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429

ARCHIBOLD, P.
Development of a Test Program for OTEC-1 24 p0617 A79-45785

ARDEN, W. M.
Specular mirrors for solar energy application 21 p0034 A79-11147

AREFEV, K. M.
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems 24 p0640 A79-47573

ARENS, E. A.
Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days
[PB-289204/0] 22 p0355 N79-19467

AREY, F. G., JR.
Potential for ocean thermal energy conversion electric power generation in the Southeast region 24 p0626 A79-45855

ARIAS, A.
The economics and policy of alternative energy sources - A review 21 p0103 A79-16454

ARIE, Y.
Composite semiconductors - Selective absorbers of solar energy 24 p0655 A79-50183

ARIENZO, M.
Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base 23 p0513 A79-41031

ARJONA, F.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application 24 p0704 A79-52311

ARMANTROUT, G. A.
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques 23 p0445 A79-37156

ARMANTROUT, J. D.
Silver-hydrogen, a long life light weight energy storage system 21 p0001 A79-10012

ARMINGTON, K.
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/BR-53-128] 24 p0773 N79-31800

ARMSTEAD, H. C. H.
Geothermal energy: Its past, present and future contributions to the energy needs of man 22 p0252 A79-21825

ARMSTRONG, E.
Multidisciplinary research related to the atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679

ARMSTRONG, J. A.
Balloon-borne particulate sampling for monitoring power plant emissions
[PB-290473/8] 23 p0566 N79-24543

ARMSTRONG, P. R.
Instrumentation, data acquisition and monitoring system for an air heating solar system 21 p0088 A79-15836

Space heating with solar all-air systems - CSU Solar House II 21 p0137 A79-17467

ARNAS, O. A.
On an irreversible thermodynamic analysis of thermoelectric devices 22 p0260 A79-23609

ARNDT, A. M.
Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities 23 p0490 A79-40414

ARNDT, E.
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat' 22 p0264 A79-23827

ARNDT, G. D.
Environmental considerations for the microwave beam from a solar power satellite 21 p0003 A79-10030

Design considerations for solar power satellites 21 p0113 A79-16738

Microwave system performance for a solar power satellite during startup/shutdown operations 24 p0694 A79-51944

ARNDT, W.
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
Fast spectral radiometer
23 p0469 A79-38629

ARNOLD, C. D.
Heat storage in crushed limestone
24 p0609 A79-45215

ARNOLD, E. D., JR.
Opportunities for energy conservation in transportation planning and systems management
[PB-291743/3] 23 p0544 N79-22643

ARNOLD, R. C.
Heavy-ion beam inertial-confinement fusion
21 p0054 A79-13448

ARORA, J. D.
Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768
Determination of the minority carrier diffusion length in silicon solar cells
23 p0528 A79-42248

AROSIO, S.
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop
23 p0408 A79-34074

ARP, V. D.
Review of hydrodynamics and heat transfer for large helium cooling systems
23 p0481 A79-40073

ARTEMENKOV, L. I.
Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762

ARUNASALAM, V.
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452

ARUNASALAM, V.
Recent results from the PLT tokamak
21 p0069 A79-14453

ARVIZU, D. E.
The USA 5MW solar thermal test facility
21 p0135 A79-17449

ASAHINA, T.
A thermal storage analysis on packed bed of alumina spheres
21 p0121 A79-17324

ASAKAVICIUS, J.
On the problem of heat transfer in low-temperature heat pipes
23 p0532 A79-42938

ASANUMA, N.
Hydride formation of C14-type Ti alloy
22 p0250 A79-21701

ASBURY, J. G.
The interface with solar - Alternative auxiliary supply systems
21 p0137 A79-17458

ASCENZO, P. J.
Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

ASCHER, H.
Is there repair after failure
21 p0086 A79-15378

ASH, R. L.
Feasibility of rocket propellant production on Mars
21 p0047 A79-12324

ASHARE, E.
Fuel gas production from animal residue. I - Technical perspective
23 p0381 A79-32593
Fuel gas production from animal residue. II - An economic assessment
23 p0381 A79-32594

ASHE, T. L.
Brayton engines for dispersed solar power
23 p0477 A79-38950

ASHMOLE, P. H.
The integration of a complex of wind-driven generators into a power system
23 p0454 A79-37913

ASHTON, W.
Energy analysis of an aluminum solar collector
22 p0316 A79-31405

ASKEGAARD, V.
Measurements of performance and structural response of the Danish 200kW Gedser windmill
23 p0484 A79-40121

ASL-SOLEIMANI, E.
Silicon solar cells for operation in concentrated sunlight
23 p0441 A79-36780

ASMUSSEN, J.
An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720

ASPLIDEN, C.
Offshore wind power model estimates
23 p0482 A79-40110

ASPNES, J. D.
Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants
21 p0016 A79-10135
Magnetohydrodynamic/steam power plant modeling and control
21 p0046 A79-12274

ASSELMAN, G. A. A.
A Stirling engine heat pump system
21 p0024 A79-10206

AST, D. G.
Structure and electrical activity of planar defects in EFG ribbons
[NASA-CR-158572] 23 p0551 N79-23806

ATHAVALEY, K.
An analysis of the terminal concentrator concept for solar central receiver systems
24 p0641 A79-47792

ATHERTON, R. W.
A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis
22 p0263 A79-23777

ATKINSON, D. W.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

ATKINSON, S.
Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/80] 24 p0786 N79-30403

ATLUNG, S.
Dynamic aspects of solid solution cathodes for electrochemical power sources
24 p0636 A79-46665

ATRAZHEV, V. A.
The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity
21 p0167 A79-20415

ATTALLA, A.
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684

ATTURIO, J. M.
Preliminary selection of anchor systems for ocean thermal energy conversion
23 p0437 A79-35846

ATWATER, M. A.
A numerical solar radiation model based on standard meteorological observations
21 p0041 A79-11871
Computation of IR sky temperature and comparison with surface temperature
21 p0042 A79-11875

AUBERT, A.
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956
Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization
24 p0656 A79-50188

AUDIBERT, M.
Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269

AUDIT, T. E.
Performance of combined solar-heat pump systems
22 p0285 A79-26817

AUER, F.
Test report and power measurement on a 200-watt wind generator
23 p0472 A79-38658

AUERBACH, J. M.
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

AUGENSTEIN, D. C.
Engineering analysis of in situ liquefaction of coal
21 p0032 A79-10521

AUGUST, W.
Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13631

AUL, G. N.
Methane drainage study in the Sunnyside coalbed, Utah
[PB-299772/6] 23 p0540 N79-22606

AUSLANDER, D. M.
An optimal standard for solar heating systems
[ASME PAPER 78-WA/SOL-19] 21 p0159 A79-19765

AUSTIN, T. C.
Air quality as a constraint to the use of coal in California
23 p0592 N79-27605

AUTHIER, B.
Model of fluid flow in boilers with heliocoidal coil
23 p0383 A79-32959

Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177

Thin film solar collectors for material science experiments in space
[IAF PAPER 79-202] 24 p0710 A79-53353

AUTHIER, B. F.
P.E.R.I.C.L.E.S. - Design of a stationary spherical collector
21 p0134 A79-17441

AUXER, W. L.
Performance of a Stirling engine powered heat activated heat pump
21 p0011 A79-10098

AVERY, W. H.
Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger
24 p0623 A79-45835

AVEZOV, R. R.
Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers
22 p0297 A79-28671

Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909

Method of calculating heat storages for solar heating systems
24 p0648 A79-49184

Investigation of the aerodynamic resistance of solar air heaters
24 p0648 A79-49185

AVRORIN, E. N.
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

AWAYA, H. I.
High temperature thermal energy storage in moving sand
21 p0012 A79-10103

AXELROD, M. C.
A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262

AXTMANN, R. C.
Cost study of superheating geothermal steam
24 p0707 A79-52572

AYATI, M. B.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

AYERS, J. W.
Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305

Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534

AYMAR, R.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

AYRAUD, S.
Santa Clara Community Center Project, USA
22 p0277 A79-25945

AZIMOV, O.
Method of calculating heat storages for solar heating systems
24 p0648 A79-49184

AZIMOV, S. A.
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347

Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379

Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259

Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760

Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183

Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

B

BABANIN, V. I.
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

BABAYIGIT, M.
Investigations of solar heat production for household heating in Turkey
22 p0253 A79-22265

BABCOCK, W. H.
Economic feasibility of solar water and space heating
22 p0292 A79-27899

BACH, W.
Climatic change in connection with energy growth
22 p0284 A79-26623

BACHMANN, K. J.
High efficiency solar cells based on indium phosphide
21 p0042 A79-11968

Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944

Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966

BACHRACH, A.
Satellite Power System (SPS) public acceptance
[NASA-CR-157429] 23 p0548 N79-23493

BACKUS, C. E.
Can solar energy contribute significantly to the solution of the world's energy famine
21 p0019 A79-10155

The status of solar energy
21 p0115 A79-17219

An overview of photovoltaic power systems
[ASME PAPER 79-SOL-12] 22 p0308 A79-30547

Measurement of free carrier lifetime in an illuminated solar cell from capacitance measurements
23 p0497 A79-40891

Performance of silicon and gallium arsenide concentration cells
23 p0511 A79-41017

Increased photovoltaic conversion efficiency through use of spectrum splitting and multiple cells
23 p0512 A79-41024

BADCOCK, C. C.
A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558

BADWAL, S. P. S.
Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712

BAE, H. S.
Defect free very shallow p+/n junction and associated photovoltaic effect
23 p0520 A79-41082

Schottky effect and photovoltaic devices on the texturized surfaces
23 p0522 A79-41100

BAEHR, H. D.
The exergy of fuels
24 p0611 A79-45500

BAER, D. A.
Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571
Cell design and manufacturing changes during the past decade
24 p0722 N79-28674

BAER, D. R.
Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062

BAER, M. R.
A two-dimensional pulverized coal combustor model
23 p0390 A79-33383

BAERT, D.
Solar-cell panel simulator
22 p0265 A79-23867

BAGDONAS, A. V.
Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419

BAGGE, C. E.
Coal - Meeting the energy challenge
21 p0147 A79-17647

BAHADORI, M. N.
Solar water pumping
21 p0066 A79-14266
Conceptual development of a solar town in Iran
21 p0138 A79-17469
Conceptual development of a solar town in Iran
24 p0660 A79-50539

BAHAR, F.
Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819
Solar collector development in Iran
23 p0493 A79-40675

BAHOR, M. P.
Technical aspects of the Resource Conservation and Recovery Act upon coal combustion and conversion systems
[ORNL/OEPA-10] 24 p0748 N79-30687

BAHR, D. M.
Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501

BAHR, D. W.
Experimental clean combustor program: Diesel no. 2 fuel addendum, phase 3
[NASA-CR-135413] 23 p0576 N79-26221

BAHRAMI, K. A.
Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept
24 p0673 A79-51750

BAILEY, C. E., JR.
High energy metal hydride fuel cell power source
[AD-A056491] 21 p0184 N79-11485
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930

BAILEY, D. S.
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

BAILEY, D. Z.
Energy from sea and air by large-span tensioned foils
23 p0410 A79-34084

BAILEY, E. M.
The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant
21 p0076 A79-14757

BAILEY, F. B.
Qualification of a duplex, clad material for OTEC
24 p0623 A79-45828

BAILEY, J. E.
Energy systems: An analysis for engineers and policy makers
21 p0114 A79-17218

BAILEY, J. B.
Dynamics and feedback control of ISX tokamak
21 p0107 A79-16559

BAILEY, M. M.
Rankine-cycle component characteristics
23 p0579 N79-26478
Power-conversion system component summation
23 p0580 N79-26483

BAILEY, V. L.
Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480

BAILIN, B. C.
Energy conversion engineering
22 p0302 A79-29575

BAILLEUX, R.
Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962

BAIMATOV, T.
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

BAIN, C. N.
Power from space by laser
22 p0284 A79-26596
Potential of laser for SPS power transmission
[NASA-CR-157432] 23 p0548 N79-23496
Satellite Power System (SPS) military implications
[NASA-CR-157436] 23 p0549 N79-23500

BAIN, R. L.
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453
Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

BAINBRIDGE, G. R.
The development and construction of a simulator for the proof testing of solar power devices
23 p0448 A79-37846
The design construction and proving of a low cost 5kW wind powered turbine for isolated applications
23 p0452 A79-37893

BAINES, T. M.
Heavy duty diesel particulate emission factors
23 p0461 A79-38481

BAIR, V. L.
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes
21 p0053 A79-13098

BAIRAMOV, R.
Construction of combined solar installations for heating and cooling
24 p0653 A79-49524

BAISLEY, R. L.
Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412

BAKER, B. S.
Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

BAKER, C. C.
Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953

BAKER, C. B.
Study of hydrogen recovery systems for gas vented while refueling liquid-hydrogen fueled aircraft
[NASA-CR-158991] 22 p0346 N79-18057

BAKER, D.
The NASA budget - Fiscal years 1979-80
23 p0535 A79-43448

BAKER, E. G.
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786

BAKER, I.
Enhancement of solar arrays in space through the use of concentrators
24 p0692 A79-51905

BAKER, J. D.
The status of oil shale development
24 p0665 A79-50887

BAKER, L.
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

BAKER, M. S.
Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899

BAKER, N. R.
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096

Fuel uses of hydrogen in the residential/commercial/industrial sectors
24 p0615 A79-45602

Feasibility of a heat-actuated heat-pump-centered integrated community energy system
24 p0696 A79-51961

BAKER, R. R.
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821

BAKER, R. W.
Wind power potential in the Pacific Northwest
22 p0244 A79-21334

BAKER, T. M.
Integrating wave power into the electricity supply system
21 p0152 A79-18117

BAKER, W. R.
Life cycle costing of energy systems
21 p0072 A79-14683

BAKKEN, O. A.
A control system analysis of the energy growth model: Coal
24 p0736 N79-29595

BAKSTAD, P. J.
TRW PSD-I power system design
24 p0618 A79-45792

BALACHANDRA, J.
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber
21 p0127 A79-17383

BALAKRISHNAN, A. R.
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327

Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407

Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409

BALASHOV, N. A.
Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854

BALCOMB, J. D.
Passive solar heating of buildings
[LA-UR-77-1162] 21 p0090 A79-15859

Passive solar heating of buildings
22 p0275 A79-25928

Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center
22 p0277 A79-25944

Initial experimental tests on the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36631

Passive solar heating for buildings
24 p0603 A79-44504

Trombe wall vs direct gain: A comparative analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754

Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790

BALDWIN, R. M.
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453

Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

BALDWIN, T. E.
Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699

BALEMANS, W. J. M.
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

BALIGA, B. V.
Liquid solar collector
21 p0133 A79-17433

BALL, G. L., III
Form-stable, crystalline polymer pellets for thermal energy storage
21 p0013 A79-10107

BALL, J. T.
A numerical solar radiation model based on standard meteorological observations
21 p0041 A79-11871

Computation of IR sky temperature and comparison with surface temperature
21 p0042 A79-11875

BALLANTYNE, A.
Coal combustor technology development
23 p0390 A79-33381

BALLANTYNE, W. E.
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224

BALTHAZAR, J. C.
Training energy specialists - A proposal
23 p0388 A79-33257

BALTISBERGER, R. J.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357

BALU, K.
Utilisation of solid waste
22 p0304 A79-30204

BALZHISER, R. E.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

BANKEWITZ, F.
Electronic components in solar technology
21 p0056 A79-13629

BAMMERT, K.
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532

BAN-YA, S.
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120

BANDER, T. J.
Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344

BANE, R.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

BANERJEE, A.
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346

Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349

Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171

Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis
24 p0616 A79-45745

BANERJEE, S.
Experimental investigation of a fused salt energy storage system
23 p0400 A79-34003

BANKS, R. S.
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436
BANKWITZ, E.
Rational energy utilization in coke-oven-plant operations
[BMFT-FB-T-77-72] 24 p0759 N79-30832
BANNEROT, R.
Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0280 A79-26201
BANNEROT, R. B.
Optimal geometries for one- and two-faced symmetric side-wall booster mirrors
21 p0149 A79-18019
BANY, J.
Analysis of a direct coupling d.c. motor and a photovoltaic converter
21 p0046 A79-12272
Performance analysis of dc-motor-photovoltaic converter system. I - Separately excited motor
23 p0477 A79-39104
BAR-AVRAHAM, E.
Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210
BARAK, M.
Batteries, fuel cells, a hydrogen economy - Keynote address
23 p0451 A79-37873
BARAKAT, S. A.
NBS solar monitoring program
22 p0318 A79-31419
BARAN, N.
Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593
BARANOV, G. A.
Calculation and design of liquid-metal MHD induction machines
22 p0266 A79-27302
BARANOV, N. N.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
BARAONA, C. R.
Status of wraparound contact solar cells and arrays
21 p0001 A79-10014
Modeling of thin, back-wall silicon solar cells
24 p0784 N79-32650
BARBER, R. E.
Solar Rankine engines - Examples and projected costs
[ASME PAPER 79-SOL-3] 22 p0307 A79-30541
BARBERA, N. J.
Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772
BARBERI, F.
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727
BARBIERI, R. H.
Solar energy in California industry - Applications, characteristics and potential
23 p0402 A79-34019
BARDAKOV, V. M.
Relaxation of a fast ion beam in a tokamak plasma
22 p0324 A79-31760
Calculation of the Q factor for a two-component tokamak
22 p0324 A79-31763
BARISH, J.
Energy use and supply in the Lake Champlain Basin
[PB-293437/0] 23 p0559 N79-27713
BARKATS, G.
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708
BARKER, H.
SERI solar energy standards activities
23 p0431 A79-35075
BARKHORDAR, P. R.
Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32384
BARLEY, C. D.
Optimal sizing of solar collectors by the method of relative areas
21 p0066 A79-14263
Load optimization in solar space heating systems
24 p0713 A79-53497
BARNA, G. J.
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225
Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444
Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665
BARNES, C.
Recent results from the PLT tokamak
21 p0069 A79-14453
BARNES, R. W.
Comparative evaluation of recent reports on the energy conservation potential from cogeneration
[ORNL/TM-6602] 24 N79-28776
Proposed industrial energy data base for technical evaluation of alternative energy systems
[CONF-781204-1] 24 p0791 N79-32725
BARNETT, A. M.
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428
Low cost thin-film CdS-based solar cells progress and promise
[ASME PAPER 79-SOL-15] 22 p0309 A79-30549
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949
BARNEY, D. L.
Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838
High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793
BARNSTAPLE, A. G.
Allowable costs for alternative domestic heating systems using utility supplied electricity for backup or charging energy
22 p0319 A79-31428
BARR, R. A.
Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads
24 p0621 A79-45812
BARR, W. L.
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919
BARRA, O.
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591
BARRETT, W. J.
Evaluation of electrostatic precipitator during SRC combustion tests
[PB-285864/5] 21 p0223 N79-14618
BARRINGER, A. R.
Surtrace - An airborne geochemical system
22 p0255 A79-22557
BARRON, W.
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837
BARRY, J. D.
Frequency doubling of a solar pumped Nd:YAG laser
21 p0044 A79-12062

BARSHAK, A. E.
Diagonal frame RM channel of the U-25 power plant 23 p0393 A79-33407

BARTAL-BORNSTEIN, A.
On the stability of the natural circulation solar heater 23 p0531 A79-42896

BARTEL, L. C.
Instrumentation development for in situ coal gasification 21 p0006 A79-10053
Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes [SAND-79-0746C] 24 p0769 N79-31744

BARTHELEMY, R. R.
The potential of alternative energy sources in meeting Air Force requirements 23 p0420 A79-34169
The military space power program 24 p0691 A79-51893
A DOD space energy module 24 p0691 A79-51898
Dynamic Isotope Power Systems /DIPS/ 24 p0692 A79-51928
Military needs for orbital power 21 p0169 N79-10127

BARTHLE, R. C.
Status of thermal imaging technology as applied to conservation [HCP/M4228-01] 24 p0800 N79-33584

BARTHOLME, L. G.
Advances in the development of Li-Al/FeS cells for electric-automobile batteries 24 p0683 A79-51829

BARTHOLOMEW, D. P.
Photosynthetic pathway and biomass energy production 24 p0605 A79-44580

BARTKE, T. C.
Comparison of shale oils from different sources produced by controlled-state retort 21 p0005 A79-10047

BARTLETT, D.
Heating and confinement in the CLEO stellarator 21 p0070 A79-14459

BARTLETT, R.
Novel duplex vapor electrochemical method for silicon solar cells [NASA-CR-158039] 21 p0218 N79-14537

BARTLIT, J. R.
Hydrogen isotope distillation for fusion power reactors 23 p0427 A79-34989

BARTOK, W.
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers [ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738

BARTOL, J. A.
Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B [PB-282924/0] 21 p0181 N79-11446
Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report [PB-282923/2] 21 p0181 N79-11447

BARTOLI, B.
Selective covers for natural cooling devices 22 p0272 A79-25522
Statistical correlation between daily and monthly averages of solar-radiation data 24 p0668 A79-51022

BARTON, A. F. M.
Resource recovery and recycling 24 p0706 A79-52570

BARTON, D. L.
Solar cells based on GaP/x/As/1-x/ compounds 23 p0515 A79-41045

BARTON, R. S.
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator 24 p0677 A79-51780

BARVE, K. M.
Solar ammonia-water absorption system for cold storage application 21 p0143 A79-17521

BARVENIK, F. W.
ERDA'S oceanographic program for the mid-Atlantic coastal region [BNL-24016] 21 p0192 N79-11641

Assessment of the solid waste impact of the National Energy Plan [BNL-50708] 21 p0213 N79-13572

BASAR, N. S.
Station keeping subsystem designs for modular experiment OTEC plants 24 p0626 A79-45851

BASELT, J. P.
Furnaces for experiments in zero-gravity conditions 23 p0487 A79-40330

BASHILOV, V. A.
Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator 21 p0167 A79-20419

BASHKATOV, V. A.
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator 22 p0258 A79-23137
Dynamics of a free-piston Diesel- MHD generator 23 p0395 A79-33424

BASILE, B. P.
Environmental effects of offshore oil production 22 p0336 N79-16389

BASON, F.
Solar energy use in Denmark /56 deg N/ and higher latitudes in Scandinavia 21 p0128 A79-17393

BASOV, N.
Laser and energetics of the future [UCRL-TRANS-11467] 24 p0734 N79-29513

BASOV, N. G.
Prospects for developing a laser thermonuclear electric power plant 23 p0432 A79-35171

BASS, A.
A practical regional scale air quality simulation model for energy resource development in the four corners area 23 p0535 A79-43430

BASS, J. C.
Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator 24 p0699 A79-51979

BASTOS NETTO, D.
The solar still - A new design 23 p0384 A79-33213
Simple methane digestors 23 p0386 A79-33234

BASU, D.
Health effects associated with diesel exhaust emissions, literature review and evaluation [PB-289817/9] 22 p0364 N79-20727

BASU, N.
Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells 24 p0606 A79-44919

BASU, P.
Role of the diode exponential factor in CdS solar cells 21 p0123 A79-17348

BASU, S. P.
Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection 21 p0129 A79-17401

BATCHELDER, J. S.
Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation 24 p0669 A79-51178

BATCHELDER, R. F.
Evaluation of use of syngas for coal liquefaction 24 p0703 A79-52027

BATEMAN, G.
MHD instabilities 22 p0259 A79-23599
Stability of tokamaks with elongated cross section 24 p0639 A79-47422

BATES, J. L.
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags 23 p0392 A79-33399
Thermal properties of MHD electrode materials 23 p0392 A79-33400
Development, characterization and evaluation of materials for open cycle MHD [PNL-2004-9] 22 p0361 N79-20504

Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557

BATES, J. O.
OTEC-1 test conductor program
23 p0430 A79-35060

BATEY, J.
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538

BATHELT, A. G.
Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136

BATISTELLI, J.-P.
Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269

BATTISTA, R. A.
Development of an industrial gas turbine combustor burning a variety of coal-derived low Btu fuels and distillate
[ASME PAPER 79-GT-172] 23 p0379 A79-32433

BATTON, W. D.
Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas
24 p0610 A79-45220

BAUDAT, N. P.
Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429

BAUDET, Y.
Solar cells on R.A.D. polycrystalline silicon
23 p0518 A79-41066

BAUER, P. T.
District heating and cooling with heat pump systems
24 p0656 A79-51960

BAUER, W.
Alpha transport and blistering in tokamaks
22 p0253 A79-22243
Surface processes in plasma wall interactions
23 p0442 A79-36877

BAUERLE, G. L.
Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

BAUGHN, J. W.
Effects of low solar input and amount of storage on thermosyphon hot water system performance
22 p0267 A79-24312

BAUM, B.
Low-cost encapsulation materials for terrestrial solar cell modules
23 p0439 A79-36636
Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544

I. V.
Large-aperture radiant solar energy concentrators
21 p0135 A79-17452

BAUM, IA. M.
Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585

BAUM, J. J.
An information approach to examining developments in an energy technology - Coal gasification
23 p0523 A79-41375

BAUM, P. E.
Energy utilization survey pamphlet for buildings
[AD-A062930] 22 p0371 N79-21624

BAUM, V. A.
The attainable efficiency of the solar thermoelectric generators
21 p0140 A79-17496
Energy balance of solar thermoelectric generators
24 p0646 A79-48734

BAVINGER, B. A.
Satellite Power System (SPS) mapping of exclusion areas for rectenna sites
[NASA-CR-157435] 23 p0548 N79-23499

BAWA, S. C.
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352

BAY, H. L.
Sputtering yields of graphite and carbides and their potential use as first wall materials
23 p0444 A79-36892

BAYAZITOGLU, Y.
A novel design of evacuated-concentrating spherical collector
23 p0399 A79-33998

BAYLISS, D.
Electric vehicles - Can they be fitted into urban Britain
22 p0301 A79-29493

BAYOUMI, M. S.
Optimization of power absorption from sea waves
23 p0486 A79-40199

BAYTOS, W. C.
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234

BAZ, A.
Optimization of power absorption from sea waves
23 p0486 A79-40199

BAZAN, J.
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385

BAZAROV, B. A.
The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358

BAZAROV, G. P.
Effect of load factor on the characteristics of series MHD generators
24 p0650 A79-49372
Characteristics of series channels with a reduced electrode commutation angle in the connecting section
24 p0650 A79-49374

BAZAROV, KH.
The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358

BAZQUES, E. O.
Stochastic simulation experiments on solar air conditioning systems
21 p0138 A79-17474
System performance predictions for solar cooling using regional stochastic weather models
22 p0264 A79-23781

BEALS, D. L.
Evaluation of battery performance using computer controlled test equipment
24 p0683 A79-51828

BEARD, J. T.
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415
Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26208
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991

BEARD, S. G.
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520

BEARD, T. N.
Colorado's oil-shale resource for vertical modified in-situ processes
21 p0005 A79-10046

BEARDSWORTH, E.
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500

BEASON, F. L.
Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506

BEATON, R. S.
Corrosion and deposits in MHD generator systems
21 p0081 A79-14935

Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

BEATTIE, A. G.
Acoustic emissions during hydride formation
22 p0249 A79-21691

BEAUJEAN, J. M.
A review of energy models. Part 4: July 1978
[IIASA-RR-78-11-PT-4] 23 p0594 N79-27652

BEAULIEU, R.
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911

CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197

Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317

BEAVERS, J. C.
Perspectives on developing country solar energy applications
24 p0672 A79-51743

BEBA, A.
The role of solar energy in the solution of Turkey's energy predicament
23 p0404 A79-34035

BEBERMEIER, H.
Space application of large area terrestrial solar cells for multi-KW-arrays
24 p0751 N79-30732

BECKER, F. E.
Design of superconducting magnets for full-scale MHD generators
21 p0064 A79-15306

Combustion of pulverized coal in high temperature preheated air
[AIAA PAPER 79-0298] 21 p0158 A79-19654

Coal combustor technology development
23 p0390 A79-33381

BECKER, H.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410

High power magnetohydrodynamic system, volume 1
[AD-A064796] 23 p0543 N79-22639

High power magnetohydrodynamic system, volume 2
[AD-A064435] 23 p0544 N79-22640

BECKER, M.
Development and application of techniques to evaluate cogeneration impacts
22 p0303 A79-29795

BECKERT, D. M.
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631

BECKMAN, L. W.
Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974

BECKMAN, J.
Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant
24 p0673 A79-51747

BECKMAN, R. P.
Gasification Combined Cycle Test Facility at Pekin, Illinois
21 p0145 A79-17632

BECKMAN, W. A.
Simulations of the performance of open cycle desiccant systems using solar energy
21 p0066 A79-14262

Design of active solar heating systems
21 p0090 A79-15860

A general design method for closed-loop solar energy systems
22 p0295 A79-28359

Economic evaluation and optimization of solar heating systems
24 p0660 A79-50537

BECUS, G. A.
Coupled heat and organic wastes stream pollution
21 p0086 A79-15602

BEDAIR, S. M.
A two-junction cascade solar-cell structure
22 p0256 A79-22856

BEEKLEY, D. C.
Long-term average performance of the Sunpak evacuated-tube collector
21 p0089 A79-15854

Problems in collector testing
23 p0430 A79-35064

Analysis and experimental tests of a high-performance evacuated tubular collector
[NASA-CR-150874] 22 p0334 N79-16370

BEEN, J. F.
The role of fuel cells in NASA's space power systems
24 p0681 A79-51810

An economic analysis of a commercial approach to the design and fabrication of a space power system
[NASA-TM-79153] 23 p0539 N79-22193

The role of fuel cells in NASA's space power systems
[NASA-TM-79182] 23 p0546 N79-23133

BEER, R.
Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644

BEESON, J. L.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels
[FE-2307-34] 24 p0718 N79-28358

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410

BEGG, L. L.
ZEPO - The worlds largest thermionic converter
24 p0699 A79-51982

BEGHI, G. E.
International developments in hydrogen technologies
24 p0612 A79-45579

BEHAGHEL, J. M.
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956

Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189

BEHLING, D. J., JR.
Technical-economic modeling in energy planning
23 p0419 A79-34164

BEHM, H. D.
National Conference on Energy Conservation in General Aviation, 1st, Kalamazoo, Mich., October 10, 11, 1977, Proceedings
21 p0047 A79-12376

BEHRENS, C. E.
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

BEHRET, H.
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates
21 p0038 A79-11808

BEHRIN, E.
General-purpose aluminum-air/flywheel electric vehicles
[UCRL-82003] 23 p0564 N79-24503

BEILIS, I. I.
Mechanism of erosion of metal electrodes of the channel of a MHD generator
22 p0306 A79-30391

BEIN, J.
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

BEJAN, A.
Two thermodynamic optima in the design of sensible heat units for energy storage
21 p0150 A79-18091

BEKEY, I.
High efficiency low cost solar cell power
21 p0048 A79-12471

Statement of Ivan Bekey, Director of Advanced Mission Studies, Aerospace Corporation
21 p0224 N79-15107

BEKIESINSKI, R.
Some aspects of aircraft jet engine fuels
21 p0035 A79-11368

BELANGER, G.
Fuels cells - Their development and potential
23 p0495 A79-40750
BELDING, J. A.
Conservation as an energy source
21 p0077 A79-14769
The impact of alternate energy resources on the future supply of electric power
[IEEE PAPER F 78 672-8] 22 p0304 A79-29939
BELIC, M.
A solid-state solar-powered heat transfer device
24 p0667 A79-50932
BELIKOV, V. V.
Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601
BELINKO, K.
Changes within tin-containing catalysts under hydrorefining conditions
24 p0628 A79-45993
BELK, J. P.
Low Btu coal gasification processes. Volume 1: Summary, screening, and comparisons
[ORNL/ENG/TM-13-VOL-1] 23 p0555 N79-24188
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368
BELL, C. R.
Solar options in central Europe - A synthesis of solar possibilities in technological terms according to present-day /1978/ criteria
23 p0435 A79-35490
BELL, D. M.
Solar energy for industrial process steam
22 p0267 A79-24315
BELL, J.
Repowering of a small utility - A unique solution to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332
BELL, J. M.
Off-peak electrical backup experience in the Meadowvale Solar Experiment
22 p0318 A79-31421
Measured and predicted performance of solar domestic water heaters
22 p0319 A79-31422
BELL, J. T.
Tritium permeation through steam generator materials
24 p0655 A79-51952
BELL, M. G.
Measurements of plasma rotation in tokamak LT-3
22 p0252 A79-22238
BELL, R. O.
Minority carrier diffusion length from spectral response measurements
23 p0497 A79-40893
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084
BELL, W. F.
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784
BELLAMY, N. W.
Wave power experiments at Loch Ness
23 p0450 A79-37871
BELLANTONI, J.
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040
BELLECCI, C.
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588
Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat
23 p0478 A79-39695
BELLER, M.
Energy systems studies program
[BNL-50822] 21 p0209 N79-13526
Impacts of new energy technologies as measured against reference energy systems
[BNL-25475] 23 p0597 N79-27694
Hydrogen technology: An overview
[BNL-25760] 24 p0734 N79-29379
BELOUET, C.
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900
BELTZER, M.
Real-time, continuous measurement of automotive sulfuric acid emissions
21 p0156 A79-19359
BELVEDERE, J.
Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805
BEN-DAVID, S.
The economic performance of passive solar heating - A preliminary analysis
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
BEN-DOV, E.
Hydrogen fuel production by wind energy conversion
23 p0413 A79-34113
Wind energy conversion and hydrogen production - A feasibility study for South Africa
23 p0452 A79-37892
BENARD, C.
Theoretical and experimental analysis of a latent heat storage system
21 p0121 A79-17323
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors
21 p0127 A79-17380
Prediction of the behavior of a solar storage system by means of recurrent stochastic models
22 p0258 A79-23295
Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963
BENDER, D. J.
Performance parameters for fusion-fission power systems
24 p0627 A79-45974
BENEDICT, H. M.
Review of current research on hydrocarbon production by plants
[SERI/TR-33-129] 24 p0779 N79-32374
BENENATI, R. F.
SOAR (solar assisted reactor) power system
[BNL-25633] 24 p0772 N79-31787
BENGTSON, R.
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426
BENHAM, W. L.
Preliminary design and analysis of a total energy system for Massachusetts Institute of Technology
[AD-A057289] 21 p0184 N79-11486
BENITEZ, F. L.
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806
BENJAMIN, R. F.
Prepulse damage to targets and alignment verification
22 p0258 A79-23027
BENKLEY, C. W.
A practical regional scale air quality simulation model for energy resource development in the four corners area
23 p0535 A79-43430
BENNETT, A.
Analysis of multiple-cell concentrator/photovoltaic systems
23 p0513 A79-41026
BENNETT, C. O.
Evaluation of commercial catalysts for the Fischer-Tropsch reaction
22 p0272 A79-25124

BENNETT, L. H.
Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553

BENNETT, O. L.
Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

BENNETT, R. P.
Chemical solutions to problems encountered in the gasification of coal
23 p0410 A79-34088

BENNINGTON, G.
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538

BENOIT, A. E.
Design of the Natural Bridges National Monument 100 kW PV power system
23 p0521 A79-41090

BENOIT, J.
The propulsion of vehicles by a flywheel
21 p0031 A79-10452

BENSON, D.
Economic and performance comparisons of salty and saltless solar ponds
24 p0671 A79-51737

BENSON, D. K.
Thermoelectric OTEC
24 p0624 A79-45843

Solar thermoelectric energy conversion
24 p0659 A79-51976

BENTE, P. F., JR.
New concepts in waste utilization and biomass
21 p0095 A79-15915

BERARD, M.
Constraints on a policy of evaluating recoverable energy
23 p0524 A79-41811

BERCAW, R. W.
Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478

BERCHOWITZ, D. M.
A computer and experimental simulation of Stirling cycle machines
21 p0023 A79-10192

BERDAHL, C. M.
Calibration standards and field instruments for the precision measurement of insolation
21 p0076 A79-14765

Thermal energy transformer
[NASA-CASE-NPO-14058-1] 22 p0348 N79-18443

BEREMAND, D. G.
Stirling engines for automobiles
[NASA-TM-79222] 24 p0723 N79-28726

BEREZHETSKII, M. S.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

BERGER, B. J.
An overview of the STOR hydrogen energy program
22 p0289 A79-27655

Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580

BERGER, J. A.
The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

BERGER, J. E.
Storage and distribution of synthetic fuels
24 p0650 A79-49379

BERGER, L. B.
The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

BERGESON, L.
Sail power for the world's cargo ships
22 p0305 A79-30374

BERGHMANS, J. A.
Performance of a hydraulic air compressor for use in Compressed Air Energy Storage power systems
22 p0280 A79-26191

Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants
[CONF-780599-2] 24 p0758 N79-30822

BERGLES, A. E.
Enhancement of heat transfer
23 p0533 A79-43016

Energy conservation via heat transfer enhancement
24 p0630 A79-46307

Energy conservation via heat transfer enhancement
[COO-4649-3] 24 p0758 N79-30819

BERGMAN, P. D.
Ionizing seed
21 p0106 A79-16490

BERGOUGNOU, M. A.
Electrostatic separation of coal macerals
24 p0603 A79-44525

New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863

BERGSTROM, S.
Salinity power station at the Swedish west-coast - Possibilities and energy-price for a 200 MW-plant
21 p0077 A79-14772

BERKELIEV, A.
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180

BERKEY, E.
Special considerations in the environmental study program for coal gasification plants
24 p0659 A79-50350

BERKOWITZ, B. J.
Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts
[NASA-CR-159411-VOL-1] 21 p0205 N79-13496

BERKOWITZ, D. A.
Preliminary controller evaluation for the METC/CTIU using a mathematical process model
21 p0008 A79-10073

BERKOWITZ, N.
Prospects for coal conversion in Canada
23 p0494 A79-40737

BERLAD, A. L.
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538

BERLANGIERI, N. J.
Applications and safety data
24 p0722 N79-28718

BERLIN, L. A.
Microwave system performance for a solar power satellite during startup/shutdown operations
24 p0694 A79-51944

BERLINER, D.
Review of selected solar market studies and techniques
[SERI/PR-52-076] 23 p0600 N79-28056

BERLINSKI, P.
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691

BERMAN, A. I.
Coupled systems and energy policy - Closing the supply/demand gap: Are there many roads not taken
23 p0421 A79-34175

BERMAN, E. A.
The Geysers geothermal area emissions and aerometric data base and air quality analysis
23 p0534 A79-43373

BERMAN, S.
Urbanism and energy in developing regions
[LBL-7808] 21 p0189 N79-11540

BERNAL, G., E.
Optics in adverse environments; Proceedings of the Seminar, San Diego, Calif., August 25, 26, 1977
21 p0044 A79-12037

BERNARD, C.
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature
23 p0382 A79-32875

BERNARD, M. J., III
Environmental development plan for transportation energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899
Transportation energy conservation: An environmental overview
[CONF-781109-16] 24 p0742 N79-29661
Transportation Energy Conservation (TEC) environmental development plan
[ANL/EES/CP-11] 24 p0801 N79-33589

BERNARD, R. F.
Advances in H-Coal
24 p0687 A79-51855

BERNDORFER, K.
Development of small solar power plants for rural areas in India
21 p0141 A79-17502

BERNER, W. E.
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels
[AD-A060322] 21 p0226 N79-15203

BERNHEISEL, J. F.
Energy from urban waste
21 p0096 A79-15917

BERRY, G. L.
Energy and input-output analysis
21 p0115 A79-17223

BERRY, H. R.
Sensor selection and placement in the National Solar Data Program
21 p0089 A79-15844

BERRY, J. P.
Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970

BERRY, R. S.
Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463

BERS, A.
Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424

BERSTEIN, A. D.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

BERT, C. W.
On vibration of a thick flexible ring rotating at high speed
22 p0235 A79-20511

BERTA, M.
Energy from sea waves - System optimization by diffraction theory
22 p0288 A79-27390

BERTHIER, S.
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956
Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189

BERTOLINI, E.
The 'FINTOR 1' design - A minimum size tokamak experimental reactor
21 p0078 A79-14782

BERTRAM, R. W.
The first year of solar collector testing at Ontario Research
22 p0322 A79-31450

BERWIG, D.
Geologic assessment of compressed air storage sites in Kansas
[EPRI-EM-877] 23 p0557 N79-27689

BESANT, R. W.
The Saskatchewan Conservation House - Some preliminary performance results
22 p0318 A79-31417
Energy management through energy conservation in buildings
22 p0320 A79-31431
Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444
Comparison of 100 per cent solar heated residences using active solar collection systems
23 p0477 A79-39106

BESENBRUCH, G.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

BESSOLOV, V. N.
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180

BESSON, J. M.
Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976

BEST, R. J.
Pressure measurements on wind tunnel models of the Aylesbury experimental house
22 p0300 A79-29372

BEST, R. W. B.
Limits to wind-power
24 p0708 A79-52951

BETHE, H. A.
The fusion hybrid
23 p0434 A79-35461

BETLEJ, A.
Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system
22 p0283 A79-26469

BEVAN, D. J. M.
Urania-yttria solid solution electrodes for high-temperature electrochemical applications
24 p0670 A79-51712

BEVAN, R. J. A.
Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798

BEYELER, J. A.
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520

BEYNON, T. D.
On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors
24 p0705 A79-52352

BEZDEK, R. H.
Costs and impacts of financial incentives for solar energy systems
21 p0119 A79-17296
Economic feasibility of solar water and space heating
22 p0292 A79-27899

BEZZA, E. F.
Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638

BHANDARI, D. R.
Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272

BHAR, T. N.
Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159

BHAT, P. K.
Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190

BHATNAGAR, V. P.
Magneto-acoustic resonance heating in the ion-cyclotron frequency domain
22 p0271 A79-24866

BHATTACHARYA, S.
Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985

BHATTACHARYA, S. C.
Investigation on the feasibility of using a two-phase thermosyphon for solar storage, space heating and cooking
21 p0121 A79-17330

BHATTACHARYA, T. K.
An experimental study of series combination of solar cells
23 p0518 A79-41062

BHAVSAR, V. C.
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

BHIDE, U. G.
Technology for solar energy utilization
[PB-296572/1] 24 p0802 N79-33598

BHOLAGIR, A. P.
Saur vidyut kosh - The solar cell
21 p0126 A79-17371

BHUMRALKAR, C. M.
Estimation of wind characteristics at potential wind energy conversion sites
23 p0534 A79-43377

BHUSHAN, B.
Honeycomb type flat plate collectors - Experiments leading to drinking straw
21 p0132 A79-17424

BIALUSCHEWSKI, H.
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

BIANCA, J. D.
Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188

BIANCARDI, F. R.
Analysis and design of an 18-ton solar-powered heating and cooling system
21 p0019 A79-10156

BIBERMAN, L. M.
Heat transfer in a high-power MHD channel
23 p0533 A79-43171

BIBLARZ, O.
Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

BICKERTON, R. J.
Progress in tokamak and stellarator experiments
23 p0443 A79-36878

BICKLER, D. B.
A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919

LSA project technology development update
[NASA-CR-162301] 24 p0782 N79-32633

BIEDERMAN, N.
Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505

Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042

Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595

Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980
[DSE/2426-19] 21 p0174 N79-10535

BIENERT, W.
Liquid metal heat pipes for the central solar receiver
21 p0014 A79-10114

BIENSTOCK, D.
Protection of the biosphere
21 p0105 A79-16483

Stability of coal-oil mixtures
[CONF-7805152-1] 23 p0589 N79-27332

BIERENBAUM, H. S.
Identification of cost effective energy conservation measures
21 p0099 A79-16133

BIERHALS, R.
Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0599 N79-27712

BIERMANN, A. H.
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231

BIERMANN, W. J.
Candidate chemical systems for air cooled, solar powered, absorption air conditioner design. Part 2: Solid absorbents, high latent heat refrigerants
[SAN-1587-2] 21 p0211 N79-13544

BIFANO, W.
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867

BIFANO, W. J.
Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131

Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089

Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411

Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443

Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501

BIGA, A. J.
Contribution to the study of the solar radiation climate of Lisbon
24 p0661 A79-50543

BIGGIO, M.
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950

BIGGS, F.
Helios model for the optical behavior of reflecting solar concentrators
[SAND-76-0347] 24 p0774 N79-31806

BIGNON, M.
Solar power towers
23 p0435 A79-35483

BIHLMAYR, H.
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730

BILGEN, E.
Solar heating and ventilating by natural means
21 p0103 A79-16458

Solar hydrogen production at high temperatures
21 p0104 A79-16464

On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SOL-13] 21 p0163 A79-19845

Solar power plants
22 p0318 A79-31416

Solar heating and ventilation using the modified Trombe wall system
22 p0320 A79-31435

Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452

A hybrid wind turbine suitable for developing regions
22 p0323 A79-31455

Theoretical study of a hybrid wind turbine
23 p0405 A79-34047

Free vortices from a wing for wind turbine systems
23 p0537 A79-43683

BILGER, G.
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345

A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351

BILLERBECK, W. J.
Synchronous orbit power technology needs
[AIAA 79-0916] 23 p0425 A79-34739

Long-term prediction of power system performance for geosynchronous spacecraft
24 p0691 A79-51899

BILLINGS, R. E.
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132

Hydrogen Homestead
23 p0415 A79-34125

BILLMAN, K. W.
Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162

Radiation energy conversion in space; Conference, 3rd, NASA Ames Research Center, Moffett Field, Calif., January 26-28, 1978, Technical Papers
21 p0107 A79-16601

Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605

A search for space energy alternatives
21 p0108 A79-16608

Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

Radiation energy conversion in space
22 p0284 A79-26595
SOLARES - A new hope for solar energy
23 p0399 A79-33992
Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615

BILSBACK, J. A.
Transportation systems center bibliography of technical reports
[PB-296342/9] 24 p0794 N79-33107

BINDER, H.
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates
21 p0038 A79-11808

BINGHAM, C. E.
Design optimization for solar array of multiple collector types
21 p0071 A79-14677
Estimating hourly solar radiation for one-axis tracking focusing collectors
21 p0071 A79-14678
A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997

BINIEK, J. P.
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

BINSLEY, R. L.
Integrated power unit
[AD-A066543] 23 p0569 N79-25396

BIRCHENOUGH, A. G.
Design and operating experience on the U.S. Department of Energy Experimental Mod-C 100 kW Wind Turbine
21 p0028 A79-10234

BIRINGER, K. L.
Combined photovoltaic thermal collector testing
23 p0519 A79-41072
Combined photovoltaic thermal collector testing
[SAND-78-1191C] 21 p0198 N79-12570
A summary of systems definition project activities
23 p0570 N79-25488

BIRK, J. R.
Superbatteries - A progress report
22 p0286 A79-27207

BIRKELAND, J.
Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers
21 p0051 A79-12577
Alternative hydrocarbon fuels: Combustion and chemical kinetics
[AD-A061050] 22 p0338 N79-17011

BIRNBREIER, H.
Design, operation and performance of the BBC Solar House
21 p0137 A79-17462
System analysis of solar space heating
23 p0465 A79-38595
Solar water heating
[BMFT-FE-T-77-42] 22 p0349 N79-18457

BIRZVALK, IU. A.
Equations of a conduction MHD ejector
22 p0298 A79-29289
Equations of a conduction-type MHD linkage
24 p0663 A79-50779

BISHOP, C. J.
Solar thermal test facilities users association
[SERI/PR-13-154] 24 p0787 N79-32688

BISHOP, R. R.
Performance evaluation of solar films and screens
[AD-A070636] 24 p0800 N79-33583

BISSET, J. B.
Design study on solar energy systems for commercial buildings
22 p0320 A79-31433
Design study - Solar systems for commercial buildings
23 p0425 A79-34601

BISSON, C. L.
Alpha transport and blistering in tokamaks
22 p0253 A79-22243

BISWAS, B.
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385

BISWAS, H.
Selected areas of aerospace technical applications to civil engineering
23 p0397 A79-33925

BITIURIN, V. A.
Effect of force field nonuniformity on flow in an MHD channel
21 p0101 A79-16365
Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392
Diagonal frame RM channel of the U-25 power plant
23 p0393 A79-33407

BITTNER, J. D.
Role of aromatics in soot formation
21 p0053 A79-12988

BITZER, R.
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452

BIVINS, R. L.
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280
Electricity from hot dry rock geothermal energy: Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773

BJERREGAARD, E.
Measurements of performance and structural response of the Danish 200kW Gedser windmill
23 p0484 A79-40121

BLACH, W.
Optimization of a novel hydrostatic drive performance using hybrid computing technique
22 p0264 A79-23809

BLACK, D. H.
Horizontally mounted solar collector
[NASA-CASE-MFS-23349-1] 23 p0546 N79-23481

BLACK, D. L.
Conceptual design of the Fort Hood Solar Total Energy-Large Scale Experiment
21 p0019 A79-10160
The control system for Fort Hood Solar Total Energy System
24 p0672 A79-51742
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

BLACKBURN, A. J.
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898

BLACKBURN, J. B., JR.
Satellite Power System (SPS) mapping of exclusion areas for rectenna sites
[NASA-CR-157435] 23 p0548 N79-23499

BLACKBURN, P.
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546

BLACKMON, J. B.
Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067

BLACKSHEAR, P. L., JR.
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones
24 p0630 A79-46306
Biomass utilization in Minnesota
[PB-282531/3] 21 p0171 N79-10241

BLACKWOOD, T. R.
Source assessment: Water pollutants from coal storage areas
[PB-285420/6] 21 p0223 N79-14635
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429

BLAGA, A.
Use of plastics in solar energy applications
21 p0067 A79-14268

BLAHA, R. J.
Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599

BLAIR, D. W.
Environmental assessment of a coal-fired open-cycle MHD power plant
24 p0701 A79-51993

BLAIR, J. F., JR.
The crucial role of financial institutions in solar heating installations
23 p0403 A79-34031

BLAIR, P. D.
Modeling energy and power requirements of electric vehicles
21 p0153 A79-18465

BLAIS, P.
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960

BLAIS, P. D.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940

BLAKE, R. L.
Potential prediction needs in support of energy systems
[LA-UR-79-673] 24 p0788 N79-32698

BLAKE, S.
Wind driven water pumps. Economics, technology, current activities
[PB-292816/6] 23 p0565 N79-26542

BLAKE, T. R.
A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model
23 p0410 A79-34087

BLAKE, W. H.
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930

BLAKEMORE, R. W.
Geothermal pump test facility
[ALO-3715-1] 24 p0755 N79-30793

BLANDINO, A.
Energy from sea waves - System optimization by diffraction theory
22 p0288 A79-27390

BLANKENSHIP, G. L.
Modelling energy storage systems for electric utility applications Preliminary considerations
21 p0081 A79-14960

BLASER, R. F.
Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232

BLAUNSTEIN, R. P.
Status review of the technology assessment of solar energy program
[LA-UR-79-1369] 24 p0790 N79-32714

BLAY, D.
The French CNRS 1 MW solar power plant
21 p0141 A79-17498
Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575

BLAZEK, C.
Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505
Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595

BLAZOWSKI, W. S.
Future fuels in gas turbine engines
21 p0051 A79-12979
Evaluation of future jet fuel combustion characteristics
[AD-A060218] 21 p0216 N79-14231
Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224

BLECHER, W. A.
Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190

BLEILER, K. W.
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243

BLIEDEN, R.
The inexhaustible energy resources study
23 p0420 A79-34166

BLIGH, T. P.
Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305

BLINK, J.
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

BLOCH, A. J.
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024

BLOCHER, J. M., JR.
Evaluation of selected chemical processes for production of low-cost silicon, phase 3
[NASA-CR-162168] 24 p0769 N79-31756

BLOCK, R. F.
Honeywell General Offices solar HVAC system
23 p0401 A79-34018

BLOCKER, W.
High efficiency low cost solar cell power
21 p0048 A79-12471

BLODGETT, J. E.
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

BLODGETT, R. E.
Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946

BLOM, J. H.
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

BLOMQUIST, C. A.
Undergound pumped hydro storage - An overview
24 p0660 A79-50451
Turbomachinery options for an underground pumped hydroelectric storage plant
24 p0679 A79-51794

BLOOMFIELD, H. S.
Benefits of solar/fossil hybrid gas turbine systems
[ASME PAPER 79-GT-38] 22 p0309 A79-30554
Benefits of solar/fossil hybrid gas turbine systems
[NASA-TM-79083] 21 p0229 N79-15410
Solar thermal power-conversion system
23 p0579 N79-26477
Brayton-cycle component characteristics
23 p0580 N79-26479
Power-conversion system component summation
23 p0580 N79-26483

BLOSS, W. H.
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
Cu2S-CdS thin-film solar cells
23 p0466 A79-38601

BLOTTNER, F. G.
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402
Numerical codes for MHD flows
[SAND-79-1954] 24 p0730 N79-29061

BLUE, T. E.
Advanced-fuel pellet approaches to inertial fusion
24 p0630 A79-46303

BLUHM, S. A.
Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198
Solar thermal power plants in small utilities - An economic impact analysis
24 p0675 A79-51761

BLUM, S.
Report of the 4th CCMS (Committee on the Challenges of Modern Society) Solar Energy Pilot Study Meeting
[PB-289492/1] 22 p0372 N79-21631

BLUME, W. J.
Application of the Cathelco system for control of fouling in OTEC systems
24 p0627 A79-45870

BLUMENBERG, J.
Optimisation of powerful energy supply systems for application in space
[IAF PAPER 79-169] 24 p0710 A79-53333

BLUMER, K.
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572

BOADE, R. R.
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741

BOARDMAN, C. R.
An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells
[NVO-1531-2] 22 p0366 N79-21523

BOAS, R. J.
Army energy plan
[AD-A057987] 21 p0157 N79-12562

BOBELDIJK, C.
Toroidal high-beta systems
21 p0070 A79-14462

BOBROV, V. L.
Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419

BOBROVSKII, G. A.
Progress in tokamak experimental research in the Soviet Union
21 p0069 A79-14455

BOBROVSKIY, S. A.
Dependence of the pour point of diesel fuels on the properties of the initial components
[NASA-TM-75424] 22 p0364 N79-21217

BOCK, E. H.
Development of space manufacturing systems concepts utilizing lunar resources
[AIAA PAPER 79-1411] 23 p0426 A79-34844
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302

BOCKRIS, J. O'M.
Economic, political and psychosocial barriers to a change-over to renewable energy resources
23 p0421 A79-34176
Towards the design of contrived photosynthesizers
24 p0655 A79-50185

BOCKRIS, J. OM.
Hydrogen production in a solar-hydrogen economy
21 p0037 A79-11796

BODE, K. H.
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

BODECHTEL, J.
Application of LANDSAT data and digital image processing
[E79-10102] 22 p0339 N79-17291

BODLE, W. W.
Synthetic natural gas production from peat
23 p0411 A79-34092
Process design for coal conversion reactors
[CONF-781110-15] 23 p0577 N79-26232

BODVARSSON, G.
Exploration of volcanic geothermal energy resources based on rheological techniques
[DOE/ET/28453-3] 23 p0596 N79-27676

BODY, Y.
Prediction of the behavior of a solar storage system by means of recurrent stochastic models
22 p0258 A79-23295

BOEER, K. W.
Progress and trends in the development of terrestrial photoelectric conversion
21 p0056 A79-13635
The photovoltaic effect in CdS/Cu2S solar cells
21 p0091 A79-15871
The photovoltaic effects in CdS/Cu2S solar cells
21 p0123 A79-17347
Solar retrofitting of existing residence with almost zero delta TE system
21 p0139 A79-17485
The physics of solar cells
24 p0637 A79-47050

BOEHM, D. W.
Environmental concerns related to compressed air energy storage
24 p0666 A79-50895

BOEHM, B.
The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300

BOEHM, H.
Development of a 1 kW fuel cell aggregate with acid electrolyte
21 p0148 A79-17994
Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813

BOEHM, R.
Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0280 A79-26201

BOEHM, R. F.
Electrical production from moderate temperature geothermal brines
23 p0486 A79-40197

BOENIG, H. J.
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555

BOES, E. C.
Solar radiation data modeling and its role in solar system studies
23 p0429 A79-35056
Status of the DOE Photovoltaic Concentrator Technology Development Project
23 p0517 A79-41054
Status of the DOE photovoltaic concentrator technology development project
[SAND-78-0948C] 21 p0176 N79-10550
Insolation modeling overview
[SAND-78-0963] 24 p0726 N79-28768

BOESE, F. K.
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592

BOGART, S. L.
Fusion-Fission Energy Systems
21 p0017 A79-10144
Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057

BOGGS, W. H.
Identification of cost effective energy conservation measures
21 p0099 A79-16133

BOGLE, A. W.
Modelling of a domestic wind power system including storage
23 p0396 A79-33764

BOGNER, S.
Effort of the Jet Propulsion Laboratory
22 p0370 N79-21575

BOGUS, K.
A European view of the solar satellite power system
24 p0694 A79-51942
Photovoltaic generators in space
[SP-140] 24 p0751 N79-30730

BOHACHEVSKY, I. O.
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

BOHARA, R. C.
Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859

BOHDANSKY, J.
Sputtering yields of graphite and carbides and their potential use as first wall materials
23 p0444 A79-36892

BOHLMANN, E. G.
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0557 N79-27691

BOHN, H. S.
Thermoelectric OTEC
24 p0624 A79-45843

BOL, K.
Recent results from the PLT tokamak
21 p0069 A79-14453

BOLAN, P.
Venture analysis case study for on-site fuel cell energy systems
[FCR-0783-VOL-1] 22 p0361 N79-20505

BOLDRIN, B.
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624

BOLEZ, C. A.
Production and use of low and medium Btu gas
21 p0095 A79-15912

BOLING, N. L.
Review of theories for predicting n2 in glasses and crystals
21 p0083 A79-15139
Luminescent solar concentrators
23 p0509 A79-40997

BOLOVNER, T. N.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289

BOLT, J. B. D. B.
The Netherlands experimental vertical axis wind turbine
21 p0114 A79-17120

BOLTON, G.
Electrical power distribution subsystem
23 p0493 A79-40719

BOLTON, H.
A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894

BOLTON, E. R.
Operation of self-excited generators for windmill application
24 p0706 A79-52538

BOLTON, J. R.
Solar fuels
21 p0149 A79-18009
Photochemical aspects of solar energy conversion and storage
23 p0495 A79-40746

BOLZAN, N.
LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624

BOMAR, S. H., JR.
Preliminary results from the Georgia Tech 400 kWth Solar Thermal Test Facility
21 p0141 A79-17499

BOMKAMP, D. H.
Open-cycle MHD development
22 p0289 A79-27659

BONACQUISTI, J.
An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445

BONANNO, A.
Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat
23 p0478 A79-39695

BONDI, H.
Energy research and development - A U.K. view
22 p0325 A79-31910

BONDIETTI, E. A.
Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570

BONDS, T. L.
Molten carbonate fuel cell based, coal fired power plants for electric power generation
24 p0682 A79-51816

BONELLO, A. H.
Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555

BONGAARTS, A. L. M.
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107

BONHOFF, S.
Engineering of microwave relays
23 p0526 A79-41931

BONHOMME, R.
Efficiency of sugar cane and cowpea as solar energy converters
21 p0125 A79-17368

BONI, A. A.
Mathematical models of direct initiation of unconfined gas phase detonations
[AIAA PAPER 79-0289] 21 p0157 A79-19649

BONINO, F.
Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

BONNE, U.
Modeling the performance of gas-fired heat pump systems
24 p0697 A79-51963

BONNER, R. F., JR.
Utilization of sewage skimmings as fuel to generate process steam
23 p0492 A79-40426

BONOLI, P. T.
Wave reflection from the lower hybrid surface - A toroidal effect
22 p0255 A79-22427

BONTIUS, G. H.
Implications of large scale introduction of power from large wind energy conversion systems into the existing electric power supply system in the Netherlands
23 p0485 A79-40132

BOO, J.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

BOODMAN, N. S.
Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies
21 p0045 A79-12121

BOODY, F. P.
Progress in nuclear-pumped lasers
21 p0110 A79-16627

BOOM, R. W.
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536
Superconductive magnetic energy storage
24 p0631 A79-46309
Superconductive magnetic energy storage inductor converter units
24 p0654 A79-50072

BOOTH, D. C.
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177

BOOTH, L. A.
Commercial applications of thermionic conversion using a fusion reactor energy source - A preliminary assessment
21 p0026 A79-10219
Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946
The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0696 A79-51955

BOOTH, T. C.
An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32348

BOOTHE, W. A.
Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455
The Powerton gasification combined-cycle test facility - A preview
23 p0424 A79-34454
BORAS, K. W.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052
BORDE, I.
Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648
BORDEN, C. S.
Lifetime Cost and Performance model for photovoltaic power systems
23 p0514 A79-41037
BORDEN, R.
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532
BORDERS, J. A.
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide
23 p0444 A79-36893
BORDINA, N. M.
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904
Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179
BORDOLOI, K. C.
Analysis of optical behavior and collector performance of a solar concentrator
21 p0107 A79-16545
Further modeling of a solar collector based on linear clipped-V channels
23 p0399 A79-33993
BORETZ, J. E.
Dynamic Isotope Power Systems /DIPS/
24 p0652 A79-51928
BORG, S.
Historic and forecasted energy prices by US Department of Energy region and fuel type for three macroeconomic scenarios and one imported oil price escalation scenario
[DOE/EIA-0102/27] 24 p0725 N79-28751
BORGATTI, C.
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390
BORGER, J. G.
Alternative fuels in aviation
24 p0651 A79-49381
BORGESE, D.
Design study of a thermohydraulic loop for the conversion of geothermal energy /low enthalpy/ into electricity
21 p0076 A79-14741
BORGHARD, W. G.
Evaluation of commercial catalysts for the Fischer-Tropsch reaction
22 p0272 A79-25124
BORGHI, C. A.
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758
BORGHI, L. C.
Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772
BORGONOVI, R. A.
Sweet sorghum - A renewable source for alcohol production
23 p0389 A79-33263
BORISHANSKII, V. M.
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems
24 p0640 A79-47573

BORKO, B. L.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844
BORNATICI, M.
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852
Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device
22 p0271 A79-24867
BOROWSKI, S. K.
Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor
24 p0630 A79-46302
BORREGO, J. M.
Grain-boundary edge passivation of GaAs films by selective anodization
21 p0154 A79-18487
Diffusion length measurements in Schottky barrier GaAs solar cells
22 p0281 A79-26243
Thin-film GaAs solar cells with grain-boundary edge passivation
23 p0436 A79-35749
Solar power satellite rectenna design study: Directional receiving elements and parallel-series combining analysis
[NASA-CR-151866] 22 p0330 N79-16039
BORTNIKOV, A. V.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429
BORTON, D.
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446
BORYS, S. S.
Molten carbonate fuel cell systems development program
24 p0682 A79-51814
BOS, P. B.
Perspectives on utility central station photovoltaic applications
21 p0041 A79-11873
BOSANAC, M.
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600
BOSSEL, U.
German Solar Energy Forum, 1st, Hamburg, West Germany, September 26-28, 1977, Proceedings. Volume 2
21 p0055 A79-13619
BOTHAM, R. A.
Form-stable, crystalline polymer pellets for thermal energy storage
21 p0013 A79-10107
BOTT, A. N. W.
Electro/mechanical aspects of the Mauritius 'passive' type wave energy project
23 p0449 A79-37856
BOTT, T. R.
The problem of fouling in the utilisation of geothermal energy
23 p0449 A79-37853
Rippled silica deposits in heat exchanger tubes
23 p0532 A79-42984
BOTTS, T. E.
The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants
21 p0009 A79-10078
Laser-particulate control for open-cycle, coal fired gas turbines
[ASME PAPER 79-GT-177] 23 p0379 A79-32437
BOUCHERON, P. H.
Evaluation of a flywheel-powered shuttle car
[FE-8890] 23 p0562 N79-24488
BOUCHET, J.
Rational utilization of electricity in order to satisfy the general objectives of the national energy policy
23 p0525 A79-41827
BOULTON, R.
The production of ethanol from agricultural waste: An economic evaluation
[PB-292552/7] 23 p0577 N79-26233

BOUNDY, R. A.
Advanced composites - Future space applications
21 p0086 A79-15504

BOURDEAU, C.
Control of a heliostat field by distributed microcomputer technique
23 p0389 A79-33269
Design of an indirect-drive heliostat
23 p0390 A79-33270

BOURDEAU, L.
An experimental study of walls with latent heat for residences
23 p0470 A79-38640

BOUREAU, G.
High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy
22 p0249 A79-21689

BOURQUE, R. F.
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14976] 21 p0214 N79-13871
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14946] 21 p0214 N79-13872

BOURQUIN, J. P.
Solar power plants
22 p0318 A79-31416

BOURRET, B.
Solar houses in Blagnac /Blagnac, Haute-Garonne, France/
22 p0276 A79-25937

BOWDEN, J. W.
Crude and product storage: State-of-the-art review and assessment
[AD-A066605] 23 p0568 N79-25243

BOWEN, A.
Integrated solar building systems
21 p0103 A79-16460
Prospects for ambient energy and cogeneration utilization in urban and regional planning
21 p0104 A79-16465
Inexpensive solar energy utilization in human settlements
21 p0104 A79-16470

BOWEN, B. M.
On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052

BOWEN, H. K.
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415

BOWEN, J.
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0599 N79-27730

BOWEN, S. W.
Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162
Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605
Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852
SOLARES - A new hope for solar energy
23 p0399 A79-33992
Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615

BOWEN, T. C., JR.
US Army/Environmental Protection Agency re-refined engine oil program
[AD-A056806] 21 p0171 N79-10216

BOWLER, C. E. J.
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780

BOWLES, D. F.
Parametric performance analysis of a Darrieus wind turbine system
23 p0536 A79-43676

BOWMAN, C. T.
Alternative hydrocarbon fuels: Combustion and chemical kinetics; SQUID Workshop, Loyola College, Columbia, Md., September 7-9, 1977, Technical Papers
21 p0051 A79-12977
Alternative hydrocarbon fuels: Combustion and chemical kinetics
[AD-A061050] 22 p0338 N79-17011

BOWMAN, M. G.
Thermochemical production of hydrogen from water
[LA-UR-78-652] 21 p0180 N79-11236

BOWMAN, R. C., JR.
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684

BOWREY, R. G.
Energy storage using the reversible oxidation of barium oxide
22 p0242 A79-21169

BOWYER, J. M.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660

BOY-MARCOTTE, J. L.
Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources
23 p0435 A79-35484

BOY-MARCOTTE, J.-L.
Medium capacity heliothermal power stations
21 p0142 A79-17507
Medium-power /100-1000 kWe/ solar power plants using distributed collectors
22 p0269 A79-24622

BOYCE, M. P.
The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100

BOYD, C. A.
Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224)
[PB-294342/1] 24 p0743 N79-29671
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362)
[PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes
[PB-294952/7] 24 p0743 N79-29673

BOYD, D.
Recent results from the PLT tokamak
21 p0069 A79-14453

BOYD, D. A.
The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
22 p0312 A79-31183

BOYD, D. W.
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORC-5474-T1] 24 p0761 N79-31067

BOYD, W. E.
Testing and sampling procedures for geothermal-compressed wells
[UT/CES-GR-2] 24 p0726 N79-28770

BOYD, W. K.
Chloride corrosion and its inhibition in refuse firing
21 p0080 A79-14930
Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391

BOYKIN, R. G.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181

BOYKO, B. I.
Research and development facilities at the Ontario Center for Resource Recovery
23 p0490 A79-40410

BOZLER, C. O.
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685

High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041

BRAASCH, C. E.
Vertical axis wind turbine status
[SAND-78-0397C] 23 p0582 N79-26512

BRAASCH, R. H.
The design, construction, testing and manufacturing of vertical axis wind turbines
23 p0484 A79-40124

BRACKEN, B. D.
Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147

BRADFORD, S.
Support services for electric vehicles
22 p0301 A79-29492

BRADLER, W.
Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591

BRADLEY, J.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

BRADLEY, J. O.
Design optimization for solar array of multiple collector types
21 p0071 A79-14677
Estimating hourly solar radiation for one-axis tracking focusing collectors
21 p0071 A79-14678
A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997
Stability criteria for saturated solar ponds
24 p0671 A79-51736

BRADLEY, T. G.
Bipolar lithium/iron disulfide cells
21 p0010 A79-10090

BRADSHAW, R. W.
Formation of protective layers on alloys developed for use in coal gasification environments
[SAND-78-8277] 24 p0765 N79-31383

BRAEUNLICH, G.
Meteorological measurement data for solar energy utilization
[ASSA-FA-5] 23 p0574 N79-25524

BRAGAGNOLO, J. A.
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949

BRAGG, G. M.
Performance matching and optimization of wind powered water pumping systems
23 p0479 A79-39842

BRAINARD, J. P.
Energy situation in the Mid-Atlantic region
[BNL-50703] 21 p0188 N79-11528

BRAITINGER, M.
A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432

BRAMBILLA, M.
The theory of lower hybrid heating of tokamak plasmas
24 p0606 A79-45028

BRAMLETTE, T. T.
Recent advances in thermochemical energy storage and transport
21 p0012 A79-10104
Thermochemical energy storage and transport program
[SAND-78-8056] 21 p0221 N79-14570
Recent advances in thermochemical energy storage and transport
[SAND-78-8505] 24 p0751 N79-32720

BRANDEMUEHL, M. J.
Economic evaluation and optimization of solar heating systems
21 p0118 A79-17293
Economic evaluation and optimization of solar heating systems
24 p0660 A79-50537

BRANDENBURG, C. F.
Field performance of underground coal gasification
24 p0688 A79-51866

BRANDHORST, H. W.
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545

BRANDHORST, H. W., JR.
Back wall solar cell
[NASA-CASE-LEW-12236-2] 21 p0217 N79-14528
The NASA Lewis Research Center program in space solar cell research and technology
24 p0783 N79-32641

BRANDSTETTER, A.
High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228
Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229

BRANDT, H.
Triaxial tests of coal gasification samples
[UCRL-13968] 24 p0733 N79-29374

BRANDVOLD, G. E.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
Vertical axis wind turbine status
21 p0143 A79-17516
Solar irrigation program status
21 p0143 A79-17520
Vertical axis wind turbine status
[SAND-78-0397C] 23 p0582 N79-26512

BRANTLEY, L. W.
Selling solar energy as a cash crop
21 p0049 A79-12725

BRAREN, R.
Development of compact heat exchangers for Ocean Thermal Energy Conversion /OTEC/ systems
[ASME PAPER 78-WA/HT-34] 21 p0161 A79-19815

BRASHEAR, J. P.
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654

BRAU, K.
Recent results from the PLT tokamak
21 p0069 A79-14453

BRAUN, H. R.
Operation and analysis of a vertical axis wind turbine
24 p0677 A79-51776

BRAUN, R. A.
Air monitoring network design for power plant siting
23 p0591 N79-27590

BRAUN, R. L.
Results of computer simulation of in situ oil shale retorting
24 p0668 A79-51024

BRAUNSBERGER, U.
Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

BRAUNSTEIN, J.
Migrational polarization in high-current density molten salt electrochemical devices
21 p0039 A79-11811
Steady-state composition profiles in mixed molten salt electrochemical devices. II - Molten carbonate fuel cell analogs
22 p0305 A79-30333
Migrational polarization in high current density molten salt battery and fuel cell analogs
23 p0446 A79-37273

BRAUNSTEIN, L. A.
Wind energy - The long road to commercialization
22 p0269 A79-24612

BREELLE, Y.
A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774

BREEN, B. P.
Reducing inefficiency and emissions of large steam generators in the United States
21 p0114 A79-17075

BREEV, V. V.
Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601

BREHANY, J. J.
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

BREITER, H. W.
Preparation and ionic conductivity of H30/+/ beta alumina 21 p0040 A79-11821

BRENCHLEY, D. L.
Analysis of Federal incentives used to stimulate energy production [PNL-2410-1-REV] 24 p0775 N79-31819

BRENNAN, P. J.
Copper/water axially-grooved heat pipes for RTG applications 21 p0023 A79-10188

BRENNECKE, P.
Hydrogen production by conventional and modified water electrolysis 21 p0059 A79-13659
Generation of electrical energy from hydrogen and oxygen by means of fuel cells 21 p0059 A79-13662
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation 23 p0466 A79-38603

BRESSAN, A.
Energy, development and diplomacy 24 p0652 A79-49518

BRETON, C.
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge 24 p0706 A79-52537

BRETZ, N.
Recent results from the PLT tokamak 21 p0069 A79-14453

BREUER, K.
Safety requirements for solar heating systems - Practical considerations 21 p0056 A79-13634

BREUSTEDT, W.
Active and passive solar energy utilization in urban construction 23 p0463 A79-38582

BREVNOV, N. N.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak 22 p0244 A79-21429

BREWER, D. R.
Measurement and control techniques in geothermal power plants [TREE-1312] 22 p0362 N79-20508

BREWER, G. D.
Some environmental and safety aspects of using hydrogen as a fuel 22 p0238 A79-20774
Cryohydrogen-fuel for tomorrow's commercial aircraft 22 p0289 A79-27656
Liquid hydrogen fueled commercial aircraft 24 p0615 A79-45600
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft [AIAA PAPER 79-1863] 24 p0643 A79-47920
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary [NASA-CR-132558] 24 p0794 N79-33207

BREWER, G. E.
Economic evaluation of the ATC/Wellman incandescent two-stage low Btu coal gas producer 21 p0146 A79-17640

BREWER, J. H.
Land-based OTEC plants - Cold water pipe 24 p0620 A79-45799

BRICKNER, R. H.
Refuse shredding - Performance, testing and evaluation data 23 p0451 A79-40419

BRIDGES, D. W.
Reproducibility and performance of large prototype Na/S cells 24 p0684 A79-51835

BRIGGS, D. C.
Intelsat V solar array design and development summary 21 p0002 A79-10018

BRIGGS, J. B.
Seasonal heat pump performance for a typical northern United States environment 23 p0418 A79-34153

BRIGGS, T.
Air quality assessment of particulate emissions from diesel-powered vehicles [PB-286172/2] 21 p0223 N79-14641

BRIGGS, W. B.
Fusion - Its status and outlook 24 p0601 A79-44281

BRIN, A.
Ocean thermal energy 23 p0524 A79-41810
Ocean and energy 23 p0529 A79-42350

BRINK, D. F.
Solar energy for industrial process steam 22 p0267 A79-24315

BRINKMAN, N. D.
Vehicle evaluation of neat methanol - Compromises among exhaust emissions, fuel economy and driveability 24 p0628 A79-45996

BRINKWORTH, B. J.
Asymptotic behaviour as a guide to the long term performance of solar water heating systems 21 p0041 A79-11872

BRIODY, K.
A low energy scenario for the United States - 1975-2050 21 p0147 A79-17649

BRISCOE, J. M.
Experimental demonstration of heat-to-electricity conversion within a dielectric 24 p0698 A79-51975

BRISTOW, D. J.
Operation and analysis of a vertical axis wind turbine 24 p0677 A79-51776

BRITT, E. J.
Thermionic power plant design point selection - The economic impact 21 p0025 A79-10214
Thermionics and its application to the SPS 21 p0109 A79-16616
The TELEC - A plasma type of direct energy converter 21 p0110 A79-16629
Power coupling alternatives for the NEP thermionic power system [NASA-CR-158372] 22 p0367 N79-21547

BRIX, V. L.
Analysis of Federal incentives used to stimulate energy production [PNL-2410-1-REV] 24 p0775 N79-31819

BROADBENT, D. H.
The Grimethorpe Experimental Pressurised Fluidised Bed Combustor 23 p0454 A79-37910

BROADBENT, S.
Photovoltaic concentrating array 21 p0021 A79-10172
A 10-kilowatt photovoltaic concentrator array [SAND-78-7024] 23 p0598 N79-27699

BROCK, B. C.
Scattered EM field due to rotating blades of horizontal-axis wind machines [SAND-79-0434] 24 p0719 N79-28398

BROCK, R.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient [ANL/CEN-FE-77-5] 21 p0216 N79-14242

BROCKMANN, H.
The potential of fusion reactors as process heat source 22 p0284 A79-26624

BROCKWAY, M. C.
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays 23 p0507 A79-40982

BRODALLA, D.
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O 23 p0470 A79-38641

BRODER, J. D.
Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells 23 p0498 A79-40898

Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545

BRODERICK, J. C.
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10274] 24 p0768 N79-31731

BRODERSEN, E.
Intelsat V solar array design and development summary
21 p0002 A79-10018
INTELSAT 5 solar array
24 p0752 N79-30757

BRODIN, J.
Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585

BROGAN, T. R.
Subsonic diffusers for MHD generators
22 p0279 A79-26185
Evaluation of the expected diffuser performance for a large MHD generator
23 p0393 A79-33408

BRONCA, G.
Superconducting magnets - Present status and problems
22 p0311 A79-31009

BRONFMAN, B. H.
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

BRONISZ, L.
Small-scale solar simulator for indoor testing of collector modules and materials
[LA-UR-79-1335] 24 p0790 N79-32716

BRONNER, G.
SIPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

BRONOEL, G.
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480
Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711

BRONSON, J. C.
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555

BROOKS, G. R.
Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017

BROOMHALL, E.
Solar energy retrofit system for an older-type building - The Williamstown Museum project
22 p0320 A79-31434

BROS, J. P.
Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961

BROSCHK, J.
Dornier/RWE solar house in Essen, FRG
22 p0276 A79-25933
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

BROSSIER, P.
Non-thermal emission at the plasma frequency
22 p0270 A79-24854

BROTHERS, K. C.
Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks
[PB-290579/2] 23 p0566 N79-24537

BROUNS, R. C.
Status report of the dynamic isotope power system
24 p0692 A79-51927

BROUSSARD, P. R.
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443

BROUSSARD, P. R., JR.
An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871

BROWN, B. T.
Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041

BROWN, C. K.
P.E.I. solar assisted domestic water heat project
22 p0323 A79-31458

BROWN, C. T.
Preliminary results from the Georgia Tech 400 kWth Solar Thermal Test Facility
21 p0141 A79-17499
The development of the Advanced Components Test Facility
23 p0429 A79-35047

BROWN, D.
Experimental demonstration of heat-to-electricity conversion within a dielectric
24 p0698 A79-51975

BROWN, D. G.
Power extraction from ocean surface waves
23 p0486 A79-40198
An investigative study of a wave-energy device
24 p0631 A79-46315

BROWN, F. C.
Methanol based heat pumps for storage of solar thermal energy
24 p0681 A79-51805

BROWN, G. C.
Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain
23 p0536 A79-43645

BROWN, G. L.
Results of a tilt-tilt low profile heliostat test program
21 p0076 A79-14761

BROWN, K. C.
Options for solar thermal conversion
21 p0043 A79-11969
A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199

BROWN, K. T.
Nuclear power today and tomorrow
22 p0340 N79-17317

BROWN, L. M.
Design of a public exhibition building to demonstrate air, water, and passive solar heating systems
23 p0474 A79-38673

BROWN, H. D.
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610

BROWN, R. A.
Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility
[ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741
Nickel-zinc battery for aircraft and missile applications
[AD-A059295] 21 p0220 N79-14561

BROWN, R. S.
Small hydropower - Promise and reality in New York State and the northeast
23 p0410 A79-34083
Assessment of hydropower restoration and expansion in New York State, volume 1
[PB-295782/7] 24 p0792 N79-32734

BROWN, S.
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419

BROWN, T. D.
Modification of electrostatic precipitator performance by use of fly-ash conditioning agents
[ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736

BROWN, T. G.
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques
23 p0445 A79-37156

BROWN, T. T.
Application of gas turbine/compressors in LNG plants
[ASME PAPER 79-GT-85] 23 p0376 A79-32362

BROWN, T. W.
Powerplant integration - The application of current experience to future developments
[ASME PAPER 78-GT-113] 21 p0032 A79-10788

BROWN, W. C.
A profile of power transmission by microwaves
23 p0427 A79-34987

Solar power satellites - Microwaves deliver the power
23 p0460 A79-38374

Applications of free-space microwave power transmission
24 p0652 A79-49487

The technology base for the microwave power transmission system in the SPS
24 p0694 A79-51943

BROWNELL, D. H., JR.
A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model
23 p0410 A79-34087

BROWNING, M. F.
Evaluation of selected chemical processes for production of low-cost silicon, phase 3
[NASA-CR-162168] 24 p0769 N79-31756

BRUCE, T.
Quantitative analysis of defects in silicon
[NASA-CR-162173] 24 p0771 N79-31772

BRUCK, J. M.
Particulate control for coal-fired industrial boilers
21 p0065 A79-14123

BRUCK, M.
Solar energy activities in Austria
21 p0117 A79-17283

Proposal for a representation of the quasisteady-state performance of flat-plate collectors
[ASSA-SE-B21/77] 22 p0349 N79-18461

Meteorological measurement data for solar energy utilization
[ASSA-PA-5] 23 p0574 N79-25524

Comparison of collector test methods
[ASSA-SE-B24/77] 23 p0574 N79-25526

Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78] 23 p0574 N79-25528

Thermal utilization of solar energy in Austria. Part 1: Hot water preparation, swimming pool and space heating
23 p0574 N79-25529

Meteorological data for solar energy applications
24 p0792 N79-32733

BRUCKENSTEIN, S.
Fundamental solid electrode studies related to corrosion prevention, fuel cells and batteries
[AD-A064554] 23 p0544 N79-22641

BRUECKNER, H.
Combined gas/steam turbine power plants with supplementary firing
24 p0723 N79-28736

BRUENGER, W.
Thin film solar absorber consisting of Au-particles in SiO2
23 p0465 A79-38599

BRUMMER, S. B.
The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838

A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332

Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

BRUMMET, B. D.
The zinc-chlorine battery in the BEST facility - 1981
24 p0703 A79-52013

BRUNNER, C. R.
Utilization of sewage skimmings as fuel to generate process steam
23 p0492 A79-40426

BRUNO, R.
What and where - Solar active systems or energy conservation in buildings
22 p0275 A79-25927

Solar heating, cooling and hot water production - A critical look at CCMS installations
22 p0275 A79-25931

The Philips experimental house - A system's performance study
22 p0277 A79-25941

BRUNS, R. J.
Reclamation of synthetic turbine engine oil mixtures
[AD-A071813] 24 p0795 N79-33211

BRUSATI, M.
Recent results from the PLT tokamak
21 p0069 A79-14453

BRUSSET, H.
Substitute fuels and development of recovery methods
23 p0525 A79-41818

BRUZZONE, C.
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202

Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384

BRYANT, H. C.
Heat extraction from a salt gradient solar pond
23 p0410 A79-34085

BRYANT, M. A.
Solar potential inventory and modeling
24 p0657 A79-50219

BRYANT, R.
On the effects of pellet neutron moderation on the blanket neutronics of inertially-confined fusion reactors
24 p0705 A79-52352

BRYANT, W. A.
Iron-air batteries for electric vehicles
21 p0011 A79-10094

A comparison of metal-air batteries for electric vehicle propulsion
24 p0683 A79-51827

BRYERS, R. W.
Ash deposits and corrosion due to impurities in combustion gases; Proceedings of the International Conference, New England College, Henniker, N.H., June 26-July 1, 1977
21 p0080 A79-14926

BRZUSKIEWICZ, J.
Suitable optical materials for solar collector applications
22 p0239 A79-20823

BRZUSKIEWICZ, J. E.
Parameters, measurement and criteria of solar materials testing
23 p0431 A79-35072

BUBE, R. H.
Photovoltaic effects in II-VI heterojunctions
21 p0042 A79-11967

The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907

Recent investigations of metal oxide/CdTe heterojunction solar cells
23 p0502 A79-40926

BUBENKO, J. A.
Heat pump application to single family dwellings - An analysis by computer model
23 p0449 A79-37855

BUCCIARELLI, L. L.
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883

Design of the Natural Bridges National Monument 100 kW PV power system
23 p0521 A79-41090

Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation
24 p0675 A79-51763

Mead 25 kilowatt photovoltaic system
[COO-4094-19] 23 p0596 N79-27677

BUCHANAN, C. H.
Energy storage for tokamak reactor cycles
21 p0111 A79-16727

BUCHANAN, P.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

BUCHER, E.
Polysilicon MIS solar cells with low work function metals
23 p0510 A79-41010

BUCHHEIM, R.
Influences on exhaust emissions from automotive gas turbines
[ASME PAPER 78-GT-85] 22 p0255 A79-22338

BUCHNER, H.
The hydrogen/hydride energy concept
22 p0252 A79-21717

BUCKINGHAM, J. F.
Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine
21 p0024 A79-10202

BUCKIUS, R. O.
Diffuse solar radiation on a horizontal surface for a clear sky
22 p0242 A79-21167
Direct solar transmittance for a clear sky
22 p0296 A79-28361

BUCKLEY, B. A.
Practical considerations for 'capturing the sun'
21 p0089 A79-15853

BUCKLEY, S. B.
A Thermic Controller for a thermic diode solar panel
[ASME PAPER 78-WA/SCL-9] 21 p0163 A79-19841
Cooling applications of thermic diode panels
[ASME PAPER 78-WA/SCL-10] 21 p0163 A79-19842

BUDEN, D.
Selection of power plant elements for future reactor space electric power systems
24 p0693 A79-51930

BUDENNAIA, L. D.
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

BUDGEN, H. P.
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424

BUDIMIR, J.
Active heat exchange system development for latent heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554

BUDLIGER, J. P.
Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines
[ASME PAPER 79-GT-54] 23 p0376 A79-32349

BUECHEL, J. M.
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821

BUEDENBENDER, U.
The need for closed service areas in a supply economy based on line networks
21 p0168 A79-20447

BUEHLER, E.
High efficiency solar cells based on indium phosphide
21 p0042 A79-11968
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966

BUEHRING, I. K.
A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894

BUEHRING, W. A.
Evaluation of selected near-term energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803

BUENROSTRO, J.
The direct reduction of sulfur dioxide
21 p0065 A79-14124

BUERGER, E. J.
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

BUGOS, B. J.
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

BUHS, R.
Silicon solar cell arrays - Technical status, terrestrial applications, and future developments for low cost production
23 p0501 A79-40923

BUILTJES, P. J. H.
Calculation of wake effects in wind turbine parks
21 p0045 A79-12241
The interaction of windmill wakes
23 p0482 A79-40111

BUIST, R. J.
Effective application of thermoelectric heat pumps
24 p0659 A79-51980

BUIVIDAS, L. J.
Modern ammonia synthesis use of hydrogen
24 p0612 A79-45581

BUJAKOWSKI, W.
The performance of solar water heating systems with flat plate collectors
23 p0468 A79-38620

BUKAU, F.
The use of the heat pumps to raise temperatures in an economical and ecological way
[BMFT-FB-T-78-35] 24 p0792 N79-32732

BUKKAPATNAM, S. T.
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712

BUKREEV, E. B.
Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342

BULIK, C.
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project
[PB-294926/1] 24 p0793 N79-32738

BULLIS, W. M.
Semiconductor technology program, progress briefs
[PB-292681/4] 23 p0569 N79-25337

BULTEEL, P.
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977

BULTYNCK, H. C.
Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment
23 p0551 N79-23539

BULZAN, D. L.
Correlations of catalytic combustor performance parameters
21 p0081 A79-14956

BUNK, A. R.
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982

BUNK, W.
Ceramic materials for vehicular gas turbine applications
21 p0165 A79-20085

BUNKER, W.
DOE stationary external combustion engine program - Status report
24 p0689 A79-51882

BUNKER, W. W.
A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434

BUNSHAH, R. F.
Metallurgical coatings 1978; Proceedings of the Fifth International Conference, San Francisco, Calif., April 3-7, 1978. Volumes 1 & 2
22 p0327 A79-31951

BUNTZEN, R.
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439

BUNYAGIDJ, C.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483

BUNYAN, S.
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498

BUONI, C. M.
Technology overview of energy storage systems
24 p0666 A79-50892

BUONICORE, A. J.
Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106

BURCH, J. L.
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443

BURCHILL, R. F.
Development of sensitized pick coal interface detector system
[NASA-CR-161225] 23 p0556 N79-24417

BURCK, C. G.
Solar comes out of the shadows
24 p0651 A79-49424

BURENKO, O.
Dynamics and feedback control of ISX tokamak
21 p0107 A79-16559

BURENKOV, D. K.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401

BURGESS, E. L.
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426
Photovoltaic concentrator system technology and applications experiments
[ASME PAPER 79-SOL-9] 22 p0308 A79-30544
Status of the photovoltaic concentrator applications experiments
23 p0496 A79-40884
The effect of solar cell parameter variation on array power output
23 p0517 A79-41059
Performance of a one kilowatt concentrator photovoltaic array utilizing active cooling
23 p0519 A79-41069
Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093
The design of photovoltaic systems for intermediate-sized applications
24 p0675 A79-51762
Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527
Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529
Photovoltaic concentrator system technology and applications experiments
[SAND-78-2184] 23 p0565 N79-24511

BURGESS, J. W.
Gallium arsenide solar cells
23 p0448 A79-37848

BURGGRAF, S. P.
Energy: The new economic development wildcard
[PB-282494/4] 21 p0177 N79-10564

BURIAK, A. A.
Development of thermoelectricity studies in the USSR
24 p0601 A79-43848

BURK, D.
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680
High efficiency, low cost processes for 3 in. diameter silicon solar cells
23 p0501 A79-40924
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967
Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0648 A79-49213

BURKE, A. R.
Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(OP)] 23 p0564 N79-24505

BURKE, F. P.
Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455

BURKE, J. D.
Energy conversion at a lunar polar site
21 p0108 A79-16607

BURKHARD, D. G.
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974

BURKHART, J. A.
Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305

BURLESON, J.
Photovoltaic concentrator system for Roxborough Park
24 p0675 A79-51767

BURMEISTER, L. C.
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651

BURNETT, J. C.
Aging behavior of crude shale oil
[AD-A062420] 22 p0357 N79-20273

BURNHAM, A. K.
Reaction kinetics for remodeling oil shale retorting
[UCRL-81622] 24 p0720 N79-28653

BURNS, B.
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800

BURNS, D.
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091

BURNS, D. J.
Fracture research in Canada
21 p0144 A79-17530

BURNS, R. K.
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225
Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444
Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665

BURR, R. K.
Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks
[PB-290579/2] 23 p0566 N79-24537

BURROUGHS, J. D.
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884

BURRY, R. V.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410

BURSELL, M.
Utility fuel cells for biomass fuel
21 p0016 A79-10131

BURTON, L. C.
Studies of CdSiAs2 for photovoltaic applications
24 p0654 A79-50027

BURTON, R. L.
Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151

BURWELL, E. L.
Status of the DOE underground coal conversion program
21 p0005 A79-10052
Environmental aspects of the Department of Energy's underground coal conversion program
24 p0664 A79-50882
Field performance of underground coal gasification
24 p0688 A79-51866

BUSCH, C. F.
Tests of various coals, coal-oil mixtures and refuse derived fuels in an experimental test facility
[ASME PAPER 78-WA/APC-12] 21 p0158 A79-19741

BUSCH, G.
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697
The plateau pressure of RE Ni5 and RE Co5 hydrides
22 p0250 A79-21698
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

BUSCHOW, K. H. J.
Model predictions for the stability of ternary metallic hydrides
21 p0038 A79-11802
Hydrogen absorption in rare earth intermetallic compounds
22 p0249 A79-21693

BUSH, J. R.
High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249

BUSH, L. R.
Future solar total energy markets for the U.S. industrial sector
[AIAA PAPER 78-1773] 21 p0062 A79-13870

BUSS, B.
Support services for electric vehicles
22 p0301 A79-29492

BUSSAC, M. N.
MHD stability of Spheromak
22 p0313 A79-31199

BUSSARD, R. W.
A realistic alternative for practical fusion power
24 p0602 A79-44275

BUT, D. A.
Optimization of a diagonal MHD channel
22 p0247 A79-21628

BUTCHER, S. G.
Coal preparation design for export markets, with particular reference to South African and Canadian coals
22 p0340 N79-17318

BUTERA, F.
The relationship between diffuse and total solar radiation in computer simulation of solar energy systems
21 p0119 A79-17304

BUTLER, B. L.
Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971

BUTLER, C. P.
Total solar irradiance at Table Mtn, California 1926-77
21 p0067 A79-14269

BUTLER, C. S.
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182

BUTLER, D.
Assessment of potential US petroleum supply shortfalls, 1978
[DOE/EIA-0102/38] 24 p0734 N79-29376
Assessment of potential US petroleum supply shortfalls, 1978 - 1980
[DOE/EIA-0102/13] 24 p0781 N79-32619

BUTLER, E. W.
Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations
22 p0265 A79-24046

BUTLER, G. D.
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405

BUTLER, M. A.
Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780

BUTLER, N. G.
Wind power potential in the Pacific Northwest
22 p0244 A79-21334

BUTLER, R.
Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source
22 p0283 A79-26466
Coal gasification studies. II - Reduction in the presence of I2 with H2, and H2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors
22 p0283 A79-26468
Coal gasification studies. III - Reduction in the presence of some metal iodides and iron halides
22 p0299 A79-29314

BUTT, S. H.
An overview of solar markets
21 p0092 A79-15884

BUTTACAVOLI, G.
Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948

BUTZE, H. F.
Parametric performance of a turbojet engine combustor using jet A and A diesel fuel
[NASA-TM-79089] 22 p0357 N79-20114

BUZNIKOV, A. E.
Diagonal frame RM channel of the U-25 power plant
23 p0393 A79-33407

BUZZELLI, E. S.
Iron-air batteries for electric vehicles
21 p0011 A79-10094
A comparison of metal-air batteries for electric vehicle propulsion
24 p0683 A79-51827

BWYER, C.
Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40] 24 p0746 N79-30403

BYCHENKOV, V. IU.
Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

BYDDER, E. L.
Ion heating in the LT-3 tokamak
24 p0639 A79-47399

BYERS, D. J.
Electricity - An indigenous transport fuel
22 p0292 A79-27898

BYLINSKY, G.
Space will be the next big construction site
22 p0268 A79-24450
Biomass - The self-replacing energy resource
24 p0651 A79-49425

BYNUM, F. A.
Further modeling of a solar collector based on linear clipped-V channels
23 p0399 A79-33993

BYRANT, B.
Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180

BYRON, R. A.
Particulate and sulfur oxide control options for conventional coal combustion
21 p0092 A79-15883

BYSTRYI, A. I.
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691
Turbulence of a combustion product plasma in an MHD channel
22 p0246 A79-21538
Combustion-products turbulence in the channel of an MHD generator
23 p0442 A79-36812

C

CADIEUX, S.
Control system for solar hot water system
22 p0321 A79-31442

CADOFF, L. H.
Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

CAETANO LOBO, P.
Accuracy of empirical relations for flat plate collector performance prediction
23 p0398 A79-33987

CAHEN, D.
Polycrystalline CdSe-based photo-electrochemical cells
21 p0037 A79-11785
Photoacoustic determination of photovoltaic energy conversion efficiency
21 p0154 A79-18503
Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

CAHEUX, J.
Solar photovoltaic energy
23 p0524 A79-41809

CAHILL, D. F.
Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922

CAHILL, T. P.
Wind-turbine-generator rotor-blade concepts with low-cost potential 22 p0240 A79-20828

CAIN, D. E.
Evaluation of a flywheel-powered shuttle car [FE-8890] 23 p0562 N79-24488

CAIRELLI, J. E.
Ceramic applications in the advanced Stirling automotive engine 21 p0051 A79-12851

CAIRNS, E. J.
Electric vehicles challenge battery technology 21 p0093 A79-15892

CALAWAY, W. F.
Chemical processing of liquid lithium fusion reactor blankets 24 p0655 A79-51951

CALDERON, M.
Dynagas Process 23 p0412 A79-34098

CALDWELL, R.
Proceedings of the distribution automation and control working group. Volume 1: Executive summary [NASA-CR-158642] 23 p0555 N79-24259
Proceedings of the Distribution Automation and Control Working Group. Volume 2: Proceedings [NASA-CR-158769] 23 p0595 N79-27659

CALISE, A. J.
An analysis of operational procedures and design modifications for aircraft fuel conservation [AIAA 79-1656] 24 p0611 A79-45328

CALLAGHAN, W. T.
Low-cost solar array project 23 p0570 N79-25489

CALM, J. M.
District heating and cooling with heat pump systems 24 p0696 A79-51960
Computer software for planning design of community energy systems [CONF-781182-2] 23 p0600 N79-28063

CALOGERAS, J. E.
Storage systems for solar thermal power 21 p0013 A79-10108

CALVIN, M.
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes 21 p0031 A79-10419
Petroleum plantations 21 p0095 A79-15910
Synthetic chloroplasts 22 p0262 A79-23721
Hydrocarbons and energy from plants [LBL-8596] 23 p0564 N79-24507

CALVO, R.
Development, testing and evaluation of MHD materials and component designs [FE-2248-19] 22 p0369 N79-21558

CALVY
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite [S-1267-CA/81-VOL-1] 23 p0599 N79-27708

CALZONETTI, F. J.
Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States [ORNL/OEPA-12] 24 p0791 N79-32724

CAMARA, E. H.
Effect of temperature and pressure on molten carbonate fuel cell fuels and performance 24 p0682 A79-51818

CAMARGO DO AMARANTE, O. A.
The IAE 30-kW wind turbine - A review of the aerodynamic design 23 p0387 A79-33240

CAMDEN, J. T.
Automotive engines - A viable alternative for aircraft 21 p0047 A79-12379

CAMERON, A. E.
Net energy analysis of five energy systems [ORAU/IEA(R)-77-12] 21 p0174 N79-10534

CAMERON, G. G.
Use of waste wood in plywood manufacture - A case history 23 p0489 A79-40396

CAMERON, H. E.
Stirling engine characteristics 23 p0580 N79-26480

CAMIA, F.-M.
How a wall uses solar energy 24 p0603 A79-44295

CAMMARATA, G.
A new approach for solar energy systems design by means of the sensitivity theory 23 p0448 A79-37849

CAMPBELL, A. G.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells 23 p0499 A79-40907
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion 23 p0515 A79-41043

CAMPBELL, B. C.
Progress report on hydrogen production and utilization for community and automotive power 21 p0016 A79-10132
Hydrogen economy - An alternative 21 p0096 A79-15925
Hydrogen Homestead 23 p0415 A79-34125

CAMPBELL, D. O.
Proliferation-resistant nuclear fuel cycles [ORNL/TM-6392] 21 p0214 N79-13849

CAMPBELL, J. A.
Characterization and formation of submicron particles in coal-fired plants 23 p0460 A79-38316

CAMPBELL, J. H.
Oil shale retorting - A correlation of selected infrared absorbance bands with process heating rates and oil yield 22 p0304 A79-29975
Reaction kinetics for remodeling oil shale retorting [UCRL-81622] 24 p0720 N79-28653

CAMPBELL, J. S.
The Campbell Chinese Type Windmill 21 p0142 A79-17510

CAMPBELL, K. M.
The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta 23 p0438 A79-36505

CAMPBELL, L.
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas 24 p0640 A79-47452

CAMPBELL, R. A.
Radiation shadow indicator [NASA-CASE-MFS-23546-2] 24 p0730 N79-29037

CAMPBELL, R. B.
Phase two of the array automated assembly task for the low cost solar array project [NASA-CR-158359] 22 p0359 N79-20484
The array automated assembly task for the low cost solar array project, phase 2 [NASA-CR-158538] 23 p0560 N79-24469

CAMPBELL, R. O.
Prefabricated caissons for tidal power development 21 p0152 A79-18113

CAMPOSVENUTI, G.
Problems and prospectives on solar energy utilization [ISS-P-78/1] 24 p0742 N79-29667

CANJA, S. S.
Post mortem assessment - Coal gasification plant 23 p0480 A79-39909

CANNADY, M. D.
The TDRSS solar array 23 p0500 A79-40917

CANNON, T.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient [ANL/CEN-FE-77-5] 21 p0216 N79-14242

CANNON, W. R.
Properties and test results of super-hot wall electrode materials 23 p0398 A79-33415

CANON, R. M.
Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743

CAPE, J. A.
Spectrally split tandem cell converter studies
23 p0513 A79-41028

CAPP, J. A.
ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148

CAPPS, A. G.
A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption
[AD-A067165] 23 p0582 N79-26510

CAPRIOGLIO, G.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

CAPUTO, R. S.
Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173

CARAM, H. S.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

CARATELLI, E. P.
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591

CARBAJA, B. G.
Thin tandem junction solar cell
23 p0521 A79-41092

CARBAJAL, B. G.
A 1982 low cost photovoltaic module factory study
23 p0501 A79-40921
Optimized solar module design
23 p0510 A79-41005
A device model for the tandem junction solar cell
24 p0714 A79-53938
Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512
Design considerations for the Tandem Junction Solar Cell
24 p0784 N79-32651

CARD, H. C.
Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels
23 p0507 A79-40986

CARD, H.
An information approach to examining developments in an energy technology - Coal gasification
23 p0523 A79-41375

CARDEN, P. O.
The efficiencies of thermochemical energy transfer
21 p0054 A79-13575
Energy storage efficiency for the ammonia/hydrogen-nitrogen thermochemical energy transfer system
22 p0261 A79-23718
Screening reversible reactions for thermochemical energy transfer
22 p0285 A79-26823
Ammonia dissociation for solar thermochemical absorbers
23 p0396 A79-33765

CARDER, B.
Pulsed power supplied for large laser systems
[UCRL-80113] 21 p0217 N79-14377

CARDOSO, H. P.
The Savonius rotor - Theory and optimization
23 p0387 A79-33242

CAREY, D. L.
Possible environmental effects of increased coal use in California
23 p0592 N79-27604

CARHART, S. C.
Economic impacts of a transition to higher oil prices
[BNL-50871] 22 p0364 N79-20927
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564
Long-term strategic analysis (towards an energy doctrine)
[BNL-25250] 24 p0772 N79-31791

CARIDES, J. N.
Low voltage behavior of lithium/metal dichalcogenide topochemical cells
22 p0286 A79-26995

CARL, J.
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730

CARLI, G.
Heat pipe central solar receiver gas turbine plant
21 p0022 A79-10178

CARLING, R. W.
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537

CARLSON, A.
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

CARLSON, G. A.
Mirror fusion reactors
21 p0018 A79-10148

CARLSON, L. W.
Steam generator and turbomachines
21 p0106 A79-16489
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716

CARLSON, N. G.
Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778

CARLSON, T. C. G.
Energy analyses applied to ocean thermal energy conversion and an offshore wind power system
22 p0353 N79-19442

CARLSSON, B.
Storage of heat: A survey of efforts and possibilities
[PB-295936/9] 24 p0801 N79-33592

CARMICHAEL, D. C.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

CARNEGGIE, D. M.
A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining
[PB-294299/3] 24 p0735 N79-29584

CARNES, S. A.
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

CARPENTIER, H. C.
Oil shale technologies and the potential for oil shale development
23 p0525 A79-41813

CARPETIS, C.
Cryogenic hydrogen storage and refueling for automobiles
24 p0686 A79-51846

CARR, J. H.
Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801

CARR, P.
Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833

CARRERAS, B.
Non-linear numerical algorithms for studying tearing modes
22 p0257 A79-22981

CARRIE, J.
Energy policy of the European Economic Community
22 p0282 A79-26403

CARRIER, W. D., III
Excavation costs for lunar materials
[AIAA PAPER 79-1376] 23 p0425 A79-34828

CARRIGAN, B.
Optical coatings for solar cells and solar collectors. Citations from the NTIS data base [NTIS/PS-78/1341/3] 22 p0350 N79-18465
Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base [NTIS/PS-78/1342/1] 22 p0350 N79-18466

CARROLL, A. F.
Studies of CdSiAs2 for photovoltaic applications 24 p0654 A79-50027

CARROLL, J. H.
Source emissions factors for refuse derived fuels 21 p0082 A79-15084

CARROLL, W. L.
Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days [PB-289204/0] 22 p0355 N79-19467

CARRUTHERS, R.
Fusion reactor problems 21 p0071 A79-14468

CARSCALLEN, W. E.
NRC solar monitoring program 22 p0318 A79-31419
First year performance data and lessons learned in the NRC 14 house solar demonstration program 22 p0323 A79-31453

CARSON, J. L.
Low head power generation with bulb turbines 21 p0074 A79-14705

CARTER, A. W.
Electricity from municipal wastes 23 p0454 A79-37911

CARTER, B. D.
Application of remote sensing to state and regional problems [E79-10196] 23 p0569 N79-25446

CARTER, C.
Mathematical modelling of passive solar systems 22 p0321 A79-31441

CARTER, E. A.
Solar radiation data in the southeastern United States 24 p0608 A79-45204

CARTER, G. C.
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/ 22 p0248 A79-21684

CARTER, J.
Aeronautics and space report of the President, 1978 activities 24 p0794 N79-33115

CARTER, W. J.
Permeability enhancement using explosive techniques 21 p0005 A79-10048

CARTWRIGHT, W. G.
Performance estimation of a total energy domestic heat pump 23 p0449 A79-37854

CARVALHO, A. V., JR.
Which alcohol fuel for Brasil - Methanol or ethanol 24 p0676 A79-51774

CARVER, G. E.
Chemical vapor deposited molybdenum films for use in photothermal conversion 22 p0294 A79-28148
CVD molybdenum thin films in photothermal solar converters 24 p0704 A79-52309

CASAMAJOR, A. B.
Design guide for shallow solar ponds [UCRL-52385] 21 p0185 N79-11497
Application of shallow solar ponds for industrial process heat: Case histories [UCRL-81764] 24 p0725 N79-28753
Design guide for shallow solar ponds [UCRL-52385-REV-1] 24 p0727 N79-28774

CASEY, E. J.
Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries 23 p0495 A79-40749
Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic 24 p0662 A79-50557

CASINI, G.
Engineering aspects of demonstration fusion power reactors 24 p0695 A79-51950

CASSADY, P.
Design investigation of solar powered lasers for space applications [NASA-CR-159554] 23 p0578 N79-26384

CASSADY, P. E.
CO/H2 production using fusion reactor heat 24 p0695 A79-51949
The energy exchanger in advanced power cycle systems 24 p0702 A79-52002

CASSEL, D. E.
Principles of solar cooling and heating 21 p0103 A79-16457
Application of solar cooling for a school building in subtropics 21 p0103 A79-16461
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States [PB-286940/2] 21 p0231 N79-15440

CASTLE, J.
SERI solar energy standards activities 23 p0431 A79-35075
Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight 23 p0511 A79-41018

CASTLE, J. A.
10 kW photovoltaic concentrator system design 23 p0519 A79-41070

CASTLE, J. G., JR.
Protection of solar collector materials from UV 24 p0609 A79-45217

CASTLE, J. H.
An overview of intermediate temperature solar collector and energy storage technology 23 p0533 A79-43018

CASWELL, W.
Measured and modeled passive performance in Montana 22 p0322 A79-31445

CATALANO, A.
Zn3P2 - A promising photovoltaic material 23 p0502 A79-40927

CATALANOTTI, S.
Statistical correlation between daily and monthly averages of solar-radiation data 24 p0668 A79-51022

CATALDO, R. L.
Response of lead-acid batteries to chopper-controlled discharge 21 p0011 A79-10097

CATANIA, P. J.
Solar distillation in Brasil 23 p0385 A79-33214
Mechanical and vibrational problems of a vertical axis wind turbine 23 p0389 A79-33265

CATCHPOLE, E. G.
Tests of Wisconsin S12D engine running on natural gas with addition of carbon dioxide [AD-A058486] 22 p0339 N79-17230

CATHALA
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite [S-1267-CA/81-VOL-1] 23 p0599 N79-27708

CATHERINO, H. A.
100MWh zinc-chlorine peak-shaving battery plants 21 p0011 A79-10096

CATHODEAU, R.
Rule of fuel management 21 p0155 A79-18521

CATTANEO, L. E.
Provisional flat plate solar collector testing procedures [PB-283721/9] 21 p0198 N79-12571

CATTELL, R. K.
Measurement of the performance of domestic air-to-air heat pumps 23 p0397 A79-33768

CAULDER, S. B.
Improvements in the lead-acid battery for load leveling applications [AD-A068990] 24 p0724 N79-28744

CAVAGNARO, D. M.
Nitrogen oxide air pollution. Volume 2, part 1: Control technology. A bibliography with abstracts
[NTIS/PS-78/0971/8] 21 p0199 N79-12591
Nitrogen oxide air pollution. Part 3: Atmospheric chemistry. A bibliography with abstracts
[NTIS/PS-78/0973/4] 21 p0199 N79-12593
Synthetic fuels: Methane. Citations from the Engineering Index data base
[NTIS/PS-79/0030/1] 22 p0365 N79-21223
Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413
Hydrogen production, volume 1. A bibliography with abstracts
[NTIS/PS-79/0540/9] 24 p0765 N79-31406
Hydrogen production, volume 2. A bibliography with abstracts
[NTIS/PS-79/0541/7] 24 p0765 N79-31407
Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341
Alcohol fuels, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0713/2] 24 p0795 N79-33342
Alcohol fuels, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0712/4] 24 p0795 N79-33343
Fuel Cells, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0717/3] 24 p0801 N79-33594
Hydrocarbon fuel cells. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0718/1] 24 p0801 N79-33595

CAVALLARO, J. A.
An overview of coal preparation
21 p0044 A79-12115

CAVARD, D.
Energy balances as a means for the evaluation of solar energy in developing countries
21 p0118 A79-17290

CAWOOD, W. H.
Low-temperature application of solar energy in South Africa
22 p0340 N79-17324

CEFARATTI, G.
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop
23 p0408 A79-34074

CELATA, C. M.
The contribution of plasma dielectric properties to the cyclotron radiation spectrum from a tokamak plasma
22 p0312 A79-31183

CELLERIER, M.
The 'Facility Data Base' or data bank on energy facilities
24 p0644 A79-48021
The comparison of energy chains
24 p0644 A79-48023
A WELMM comparison of energy scenarios
24 p0645 A79-48025

CENA, R. J.
In situ coal gasification modeling
[UCRL-82269] 23 p0561 N79-24479

CENA, V.
Stochastic simulation of hourly global radiation sequences
24 p0661 A79-50541

CENKNER, A. A., JR.
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937

CERINI, D. J.
Demonstration of a rotary separator for two-phase brine and steam flows
[TID-28519] 22 p0365 N79-21309

CERVIK, J.
Methane drainage study in the Sunnyside coalbed, Utah
[PB-289772/6] 23 p0540 N79-22606

CHA, J. H.
Some experimental investigations on solar space heating in Korea
21 p0138 A79-17470

CHAABAN, M.
Solar heating and ventilation using the modified Trombe wall system
22 p0320 A79-31435

CHABRE, Y.
NMR studies of hydrogen relaxation and diffusion in TiFeH/x/ and TiFe/1-y/Mn/y/H/x/
22 p0248 A79-21684

CHAI, V. W.
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0251 N79-19059
Comparison of two total energy systems for a diesel power generation plant
24 p0745 N79-30262

CHAI, Y.
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025

CHAKRABORTY, D.
Simulation study of natural convection heat transfer in inclined air layers with application to solar energy collection
21 p0129 A79-17401

CHAMBERLAIN, R. G.
Product pricing in the Solar Array Manufacturing Industry - An executive summary of SAMICS
23 p0513 A79-41032
A normative price for a manufactured product: The SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504
A normative price for a manufactured product: The SAMICS methodology. Volume 2: Analysis
[NASA-CR-158503] 23 p0549 N79-23505

CHAMBERLAIN, T. W.
Performance characteristics of automotive engines in the United States. First series: Report no. 15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305
Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V
[PB-286076/5] 21 p0227 N79-15306
Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), 1V
[PB-286294/4] 21 p0227 N79-15308
Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311
Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312
Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315

CHAMBERLIN, R.
Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47910
Energy efficient aircraft engines
[NASA-TM-79204] 23 p0587 N79-27141

CHAMBOULEYRON, I.
A novel photovoltaic panel for low cost power
23 p0510 A79-41006
Properties of chemically sprayed SnO2 antireflecting films on Si solar cells
24 p0656 A79-50196

CHAN, B. C.
Heat exchangers for Ocean Thermal Energy Conversion plants
21 p0142 A79-17506

CHAN, T. S.
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

CHANDLER, W. T.
Hydrogen embrittlement and its control in hydrogen-fueled engine systems
22 p0366 N79-21429

CHANDRA, K.
Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier
[EPRI-AF-782] 21 p0160 N79-11238

CHANDRA, M.
Dependence of solar radiation availability on atmospheric turbidity
21 p0119 A79-17308

CHANDRA, S.
Development of small solar power plants for rural areas in India
21 p0141 A79-17502

CHANDRA, S. K.
Development of 1 kW vertical axis wind generator
21 p0142 A79-17511

CHANDRASHEKAR, M.
Collector and storage efficiencies in solar heating systems
22 p0320 A79-31432
WATSUN - A simulation program for solar-assisted heating systems
22 p0321 A79-31439

CHANEY, R. E.
Semiconductor grade, solar silicon purification project
[NASA-CR-158868] 24 p0736 N79-29598

CHANG, G.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110

CHANG, G. C.
SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241
Environmental concerns related to compressed air energy storage
24 p0666 A79-50895
Energy storage and conversion in conjunction with photovoltaic energy systems
24 p0679 A79-51790
Underground pumped hydro storage - An evaluation of the concept
24 p0679 A79-51793

CHANG, J.
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

CHAO, C. C.
Technique to determine the growth rate and resistivity of evaporated CdS thin films
23 p0445 A79-37157

CHAO, N. H.
The modeling of thin film heat exchangers
24 p0622 A79-45820

CHAPMAN, A. J.
A novel design of evacuated-concentrating spherical collector
23 p0399 A79-33998

CHAPMAN, D. G.
Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845

CHAPMAN, G.
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911

CHAPMAN, G. N.
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317

CHAPMAN, J. N.
Economic optimization of the coal-fired MHD Steam Power Plant
21 p0016 A79-10134
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142

CHAPMAN, P. F.
Alternative energy sources: An analysis of their role in energy policy
24 p0743 N79-29668

CHAPMAN, P. K.
Health maintenance and health surveillance considerations for an SPS space construction base community
[AAS PAPER 78-176] 22 p0243 A79-21273
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

CHAPMAN, P. W.
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776

CHAPMAN, R. A.
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610

CHAPMAN, R. L.
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685

CHAPPELL, T. I.
The V-Groove Multijunction solar cell
23 p0511 A79-41015
V-groove multijunction solar cells
22 p0353 N79-19445

CHARAN, S.
Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745

CHARKEY, A.
Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826

CHARLESWORTH, G.
The energy and resource implications associated with the widespread use of electric vehicles
22 p0301 A79-29489

CHARLIER, J.
Combined gas/steam turbine power plants with supplementary firing
24 p0723 N79-28736

CHARLIER, R. H.
Tidal power plants - Sites, history and geographical distribution
21 p0150 A79-18102

CHARLSON, E. J.
An MIS photovoltaic cell with silicon nitride insulator
23 p0508 A79-40990

CHARPENTIER, J. P.
A review of energy models. Part 4: July 1978
[IIASA-RR-78-11-PT-4] 23 p0594 N79-27652

CHARTERS, W. W. S.
Convective effects in 'slat collectors'
21 p0129 A79-17400
Design problems of air source solar boosted heat pumps
21 p0138 A79-17472

CHARTIER, P.
Efficiency of sugar cane and cowpea as solar energy converters
21 p0125 A79-17368
Bioconversion of solar energy
23 p0524 A79-41808

CHARWAT, A. F.
The mist-transport cycle - Progress in economic and experimental studies
24 p0624 A79-45841

CHATHAM, G. N.
United States civilian space programs: An overview
[GPC-35-823] 21 p0232 N79-15815

CHATTERJEE, A.
Heat transfer between a fluidized bed and an immersed vertical U-tube
24 p0632 A79-46320

CHATTERJEE, A. K.
An overview of San Diego County's resource recovery plant
23 p0491 A79-40418

CHATTERJI, D.
Development of sodium-sulfur batteries for utility application
[EPRI-EM-683] 21 p0186 N79-11502

CHATURVEDI, S.
Solar collector as heat pump evaporator
24 p0672 A79-51744

CHATURVEDI, S. K.
Thermal performance of integrated solar collector evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182
CHAUMET, P.
Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401
CHAUNG, T. Z.
Entrainment coal gasification modeling
24 p0704 A79-52028
CHAUSSARD, R.
Some advantages to be expected from the optimization and automation of industrial processes - Conservations of primary energy and raw materials and better use of electricity
23 p0525 A79-41822
CHAVES, E. J.
Analysis of optical behavior and collector performance of a solar concentrator
21 p0107 A79-16545
CHEE, P. C.
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679
CHEEK, G.
Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011
CHEESEMAN, I. C.
The impact of aeronautical sciences on other modes of transport
22 p0325 A79-31915
CHEMERIS, V. T.
Electromagnetic excitation of a moving conducting piston
22 p0237 A79-20658
Electromechanical conversion of energy during the deceleration of a piston in a uniform magnetic field
22 p0309 A79-30599
CHEN, B.
Parameter estimation and validation of a solar assisted heat pump model
22 p0332 N79-16349
CHEN, C. W.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528
CHEN, F. C.
Land-based application of an OTEC open-cycle power system
24 p0627 A79-45871
CHEN, J. L. S.
Optimum dry-cooling sub-systems for a solar air conditioner
[NASA-TM-79007] 21 p0183 N79-11477
CHEN, J. H.
Kinetics of desulfurization of hot fuel gas with calcium oxide Reaction between carbonyl sulfide and calcium oxide
23 p0381 A79-32697
CHEN, J.-M.
Wind and solar energies in the tornado type wind energy system
24 p0645 A79-48068
CHEN, K. H.
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503
CHEN, K. I.
The effects of wall temperature on light impurities in Alcator
22 p0313 A79-31188
CHEN, K. L.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176
CHEN, L.
Theory of dissipative drift instabilities in sheared magnetic fields
22 p0292 A79-27884
CHEN, L.-T.
Gas-cycle solar refrigeration system performance
21 p0153 A79-18471
CHEN, P. J.
Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890
CHEN, T. L. C.
On vibration of a thick flexible ring rotating at high speed
22 p0235 A79-20511
CHEN, T. P.
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667
Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416
CHEN, W. S.
Improved semiconductors for photovoltaic solar cells
[DSE/2459-2] 21 p0221 N79-14577
CHENEVAS-PAULE, A.
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971
CHENEVEY, E. C.
Ultrafine polybenzimidazole (PBI) fibers
[NASA-CR-159644] 24 p0764 N79-31350
CHENG, C. H.
The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964
CHENG, P.
Heat transfer in geothermal systems
24 p0638 A79-47256
CHENG, S.
Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator
24 p0699 A79-51979
CHENOWETH, G. E.
Status report the SRC-1 and SRC-2 processes
23 p0593 N79-27616
CHEREMISINOFF, N. P.
Gasohol for energy production
24 p0713 A79-53724
CHERISH, P.
Process development for the Westinghouse advanced fluidized-bed coal gasification system
21 p0006 A79-10058
CHERKAS, V. D.
Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411
CHERNE, J.
Solar production of industrial process steam
24 p0673 A79-51748
CHERNIAVSKII, S. IU.
Effect of friction on motion of a piston driven by combustion products
23 p0436 A79-35656
CHERNIAVSKY, E. A.
Technical-economic modeling in energy planning
23 p0419 A79-34164
CHERNOFF, R.
Large active retrodirective arrays for solar power satellites
21 p0107 A79-16604
CHERNOPLEKOV, N. A.
Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003
CHERNYSHEV, V. K.
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209
CHERRINGTON, D. C.
Solids mixing and fluidization characteristics in a tube filled bed
21 p0008 A79-10070
CHERVENAK, M. C.
COIL process - First generation commercial coal liquefaction plant
23 p0412 A79-34101
CHETAEV, M. P.
Superconductivity in antenna engineering
22 p0311 A79-31008

CHETTY, P. R. K.
Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138

CHEUNG, A.
Clean energy from humid air
23 p0406 A79-34053

CHEVALIER, J. L.
Theoretical and experimental study of a cylindrical solar photochemical reactor
23 p0467 A79-38618

CHEVALIER, Y.
A novel photovoltaic panel for low cost power
23 p0510 A79-41006

CHEVY, A.
Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976

CHEYNET, B.
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature
23 p0382 A79-32875

CHI, C.
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091

CHI, C. H.
Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833

CHI, C. W.
Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812

CHIANG, C. W.
Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834

CHIANG, S. H.
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996
Effect of operating variables on reactor performance in the Synthoil coal conversion process
23 p0412 A79-34099

CHIANG, S. Y.
A device model for the tandem junction solar cell
24 p0714 A79-53938

CHIANG, S.-Y.
Thin tandem junction solar cell
23 p0521 A79-41092

CHICUREL, R.
Novel flywheel energy storage system
24 p0678 A79-51789

CHIK, H. H.
Design of optimum compressed air energy storage systems
[CONF-7811101-1] 23 p0565 N79-24508

CHIKOVANI, V. V.
Using N2O4 in a solar gas-turbine plant
21 p0167 A79-20357

CHILD, T. M.
Solar radiation charts
22 p0263 A79-23763

CHILDS, R.
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988

CHILENSKAS, A.
A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

CHILENSKAS, A. A.
Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

CHILINGARISHVILI, P. D.
A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers
24 p0704 A79-52166

CHIN, D.-T.
An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0397 A79-33836

CHIN, J.
Suppression of vaporization in copper-silver-selenide thermoelectric materials
21 p0027 A79-10224

CHINCHILLI, J.
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709

CHING, B. K.
Environmental factors of power satellites
[SAMSO-TR-79-66] 24 p0717 N79-28213

CHINNECK, J. W.
Collector and storage efficiencies in solar heating systems
22 p0320 A79-31432

CHIOU, H. J.
Catalyst deactivation in the hydroprocessing of coal-derived liquids
24 p0731 N79-29234

CHIRON, G.
Application of composite materials in the solar energy domain
21 p0034 A79-11195

CHITRE, S.
Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771

CHITRE, S. R.
A high volume cost efficient production macrostructuring process
23 p0499 A79-40904

CHIU, A. N. L.
Wind engineering research digest, volume 3, 1978
[PB-290694/9] 23 p0567 N79-24621

CHIU, H. S.
The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470

CHIU, S.
Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment
24 p0622 A79-45818

CHIU, S.-Y.
Long-term availability of water resources for energy development in the Central United States
21 p0065 A79-14118

CHIU, W. S.
The matching of a free piston Stirling engine coupled with a free piston linear compressor for a heat pump application
21 p0024 A79-10204
System performance of a Stirling engine powered heat activated heat pump
24 p0697 A79-51962

CHIU, Y. T.
Environmental factors of power satellites
[SAMSO-TR-79-66] 24 p0717 N79-28213

CHOBOTOV, V.
Analysis of photovoltaic total energy system concepts for single-family residential applications
23 p0520 A79-41078

CHOE, J. Y.
Stability properties of an anisotropic guiding center plasma and relation with the Suydam function
23 p0438 A79-36411

CHOI, C. K.
Advanced-fuel pellet approaches to inertial fusion
24 p0630 A79-46303

CHOPRA, I.
Nonlinear dynamic response of wind turbine rotors
[NASA-TM-78324] 21 p0195 N79-12542

CHOPRA, K. L.
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346
Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349
Transparent conducting coatings for solar cells
21 p0124 A79-17350
Selective coatings for solar energy conversion
21 p0126 A79-17376

Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171
Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis
24 p0616 A79-45745
Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190

CHOPRA, K. N.
An efficient optical window for flat-plate solar energy collectors
23 p0536 A79-43591
An optical valve for flat-plate solar energy collectors
24 p0607 A79-45154

CHOPRA, P. S.
Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDP-TM-78-3] 23 p0596 N79-27674
Reliability, maintainability, and materials performance of solar demonstration systems
[ANL/EES-CP-14] 24 p0754 N79-30781

CHORICH, M.
Cooking with offshore oil: A handbook for California local government
[PB-288656/2] 22 p0331 N79-16140

CHOUET, B. A.
Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

CHOW, E. Y.
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894

CHOW, J. C. F.
Two-phase LMMHD mixer-development experiments
23 p0394 A79-33422
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030

CHOW, L. S. H.
Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808

CHOW, S.
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

CHOWANIEC, C. R.
Solar photovoltaic intermediate power system operating strategies and economic considerations
23 p0516 A79-41051
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079

CHREITZBERG, A. M.
Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479
Sodium-antimony trichloride battery development program for load leveling
[EPRI-EM-751] 21 p0186 N79-11501

CHRISTENSEN, D. L.
Analysis of data user's needs for performance evaluation of solar heating and cooling systems
21 p0087 A79-15827
Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201
Overview of solar energy programs and activities in the Southeast
24 p0607 A79-45202
Evaluation of a thermographic scanning device for solar energy and conservation applications
24 p0611 A79-45229

CHRISTIAN, J. E.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704
Gas-steam turbine combined cycle power plants
[ANL/CES-TE-78-4] 24 p0727 N79-28775

CHRISTIAN, P. A.
Solid state electrodes for high energy batteries
24 p0611 A79-45479

CHRISTIANSEN, C. C.
Self-starting manual for direct use applications of geothermal resources
[PB-290872/1] 23 p0556 N79-24423

CHRISTIANSEN, W.
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384

CHRISTIANSEN, W. H.
A new concept for solar pumped lasers
21 p0110 A79-16624
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

CHRISTIE, W. H.
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

CHRISTMAN, R. C.
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

CHRISTMAS, S.
Review of selected solar market studies and techniques
[SERI/PR-52-076] 23 p0600 N79-28056

CHRISTNER, L.
Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159572] 24 p0737 N79-29604

CHRISTNER, L. G.
Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812

CHRISTOL, C. Q.
Satellite Power System (SPS) international agreements
[NASA-CR-157433] 23 p0548 N79-23497

CHRISTOPHER, J. C.
Lateral flow concept for rock bed systems
24 p0654 A79-50174

CHRISTOPHERSEN, G. E.
Oil shale: Report on a focus group discussion
[DOE/TIC-10032] 24 p0735 N79-29576

CHU, H. H.
Design of optimum compressed air energy-storage systems
24 p0631 A79-46308

CHU, S. S.
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Large area thin film gallium arsenide solar cells
23 p0515 A79-41042
Thin film polycrystalline silicon solar cells
23 p0518 A79-41067
Gallium arsenide films and solar cells on graphite substrates
24 p0667 A79-50937

CHU, T. L.
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Diffusion length inhomogeneities in silicon solar cells
23 p0497 A79-40894
Large area thin film gallium arsenide solar cells
23 p0515 A79-41042
Thin film polycrystalline silicon solar cells
23 p0518 A79-41067
Gallium arsenide films and solar cells on graphite substrates
24 p0667 A79-50937

CHUNG, P. M.
Combustion of coal particles in wall-burning swirl combustors
24 p0632 A79-46317

CHURCHILL, A. V.
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900

CHUVALA, J. T.
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937

CHYNOWETH, T.
Recent investigations of metal oxide/CdTe heterojunction solar cells
23 p0502 A79-40926

CIGNINI, P.
On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells
22 p0246 A79-21491

CILIBERTI, D. F.
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
CIPRIOS, G.
Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155
Fuel cell catalyst sintering studies
[EPRI-EM-833] 24 p0776 N79-31828
CIRRITO, A. J.
The energy reformation
24 p0698 A79-51969

CLAASSEN, R. S.
Materials problems in solar, nuclear and storage of energy
21 p0094 A79-15901

CLARK, A. F.
Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
24 p0603 A79-44526

CLARK, B.
The 25 kW space station
22 p0371 N79-21604

CLARK, B. R.
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689
CLARK, C. L.
The cryogenic heat transfer tunnel - A new tool for convective research
22 p0267 A79-24316

CLARK, D.
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212
Coal gasification and South Africa
22 p0340 N79-17321

CLARK, E. C.
Sulfuric acid-water - Chemical heat pump/energy storage system demonstration
22 p0281 A79-26209
Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system
24 p0681 A79-51806

CLARK, E. F.
Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings
24 p0633 A79-46526

CLARK, J. A.
Determining the terrestrial, incident solar flux on an arbitrarily oriented surface using available solar/weather data
21 p0119 A79-17310

CLARK, J. S.
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498
CLARK, R. H.
The economics of Fundy tidal power
21 p0152 A79-18112
Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866

CLARK, T. B.
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 1: Technical studies for solar point-focusing, distributed collector system, with energy conversion at the collector, category C
[NASA-CR-162369] 24 p0799 N79-33573
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 2: Appendix A - D
[NASA-CR-162370] 24 p0799 N79-33574
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 3: Appendix E - N
[NASA-CR-162371] 24 p0799 N79-33575
CLARK, W.
An analytical and experimental study of pumped solar water heaters
21 p0128 A79-17389

CLARKE, J. F.
Philosophy and physics of predemonstration fusion devices
21 p0078 A79-14783
Predemonstration fusion devices - Research and development needs
21 p0078 A79-14785

CLARKE, J. R.
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

CLARKE, W. E., SR.
There is a lot of energy in digester gas . . . use it
21 p0035 A79-11448

CLAUBERG, W.
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates
21 p0038 A79-11808

CLAUDET, G.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

CLAUSING, A. M.
The cryogenic heat transfer tunnel - A new tool for convective research
22 p0267 A79-24316

CLAVERIE, M.
Solar power plants. II - Economic aspects of solar power towers
23 p0435 A79-35482

CLAYTON, C.
Distributed parameter modelling of urban residential energy demand
24 p0657 A79-50218

CLAYTON, J. L.
Research on energy storage for solar thermal conversion
[NASA-CR-159427] 22 p0542 N79-22631
CLAYTON, R. M.
Hydrogen enrichment for low-emission jet combustion
22 p0244 A79-21347

CLEGG, R. J.
Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing
22 p0257 A79-22924

CLELAND, J. G.
Pollutants from synthetic fuels production: Facility construction and preliminary tests
[PB-287730/6] 22 p0339 N79-17027
CLELAND, J. W.
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

CLEMENT, M.
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
CLEMENTS, L. D.
Design considerations for the energy receiver in a fixed mirror-distributed focus /FMDF/ solar energy system
23 p0399 A79-33994
Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system
24 p0670 A79-51729

CLEMOT, M. G.
Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480

CLERMONT, H.
The potential of fusion reactors as process heat source
22 p0284 A79-26624

CLEWELL, H. J., III
Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft
[AIAA PAPER 79-0186] 21 p0157 A79-19585
CLEWER, G. E.
Thermal energy storage using hot liquids
23 p0451 A79-37879

CLICK, P. B., JR.
Estimating heat loads on multistage thermoelectric heat pumps
22 p0260 A79-23614

CLIFF, W. C.
Generalized wind characteristics and their effect on wind turbine output
21 p0068 A79-14294
Wind direction change criteria for wind turbine design
[PNL-2531] 22 p0361 N79-20506

CLIFFORD, A.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052

CLIFFORD, P.
An assessment of mercury emissions from fossil fueled power plants
[PB-285227/5] 21 p0213 N79-13592

CLINCH, J. H.
Major factors in OTEC power cycle design
23 p0404 A79-34041

CLOSE, D. J.
Simulations of the performance of open cycle desiccant systems using solar energy
21 p0066 A79-14262

CLOUD, T. J., JR.
Texas lignite: Environmental planning opportunities
[PB-286870/1] 21 p0231 N79-15438

CLUNIE, J. F.
Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects
23 p0490 A79-40408

COAD, W. J.
Quantification of energy resource consumption
21 p0073 A79-14701

COBAS, A.
Opportunities for solar thermal energy in Puerto Rico
[AIAA PAPER 79-1028] 23 p0460 A79-38208

COBB, J. T., JR.
Addition of devolatilization equations to synthane computerized mathematical model
[COO-0277-1] 24 p0766 N79-31418
Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386

COBBLE, M. H.
Verification of wedge concentration using a helium neon laser
21 p0098 A79-16104
Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator
22 p0260 A79-23616
Efficiency of a series of thermoelectric generators in a solar wedge concentrator
22 p0260 A79-23618
Analysis of a Cassegrain solar furnace
22 p0293 A79-28147
Concentration of a cassegrain solar furnace
24 p0658 A79-50344
Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power
24 p0659 A79-51977

COCCA, A. A.
Towards an adequate legal regulation of the geostationary orbit
24 p0663 A79-50855

COCCHI, A.
Thermodynamic analysis of a solar heating and cooling system equipped with an absorption refrigerator heat pump operating in winter
23 p0467 A79-38610

COCHRAN, A. A.
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276

COCHRAN, H. D., JR.
Recent developments in coal liquefaction in the United States
[CONF-790213-5] 24 p0779 N79-32383

COCLOF, S.
Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056

CODY, G. D.
Inhomogeneous surfaces as selective solar absorbers
24 p0704 A79-52313

COENSGEN, F. H.
The mirror machine program in the USA
21 p0070 A79-14461

COEYTAUX, M.
The French CNRS 1 MW solar power plant
21 p0141 A79-17498
Thermal energy storage
22 p0310 A79-31000

COFFAY, B.
An open cycle approach to ocean thermal energy conversion
24 p0674 A79-51759

COHEN-SOLAL, G.
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186

COHEN, A. D.
Commercialization aspects of solar process hot water systems for the textile industry
[AIAA PAPER 79-1027] 23 p0476 A79-38896

COHEN, B. I.
Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution
23 p0478 A79-39566

COHEN, B. L.
Hazards from radioactive waste in perspective
[CONF-790204-9] 24 p0761 N79-31024

COHEN, B. M.
NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106
Phase change thermal storage for a solar total energy system
21 p0120 A79-17321
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454

COHEN, D.
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991

COHEN, J.
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167

COHEN, M. I.
Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553

COHEN, M. J.
/SN/x-GaAs polymer-semiconductor solar cells
21 p0154 A79-18504

COHEN, R.
Market penetration for OTEC
21 p0094 A79-15903
An overview of the U.S. OTEC development program
21 p0100 A79-16247
Analysis of various OTEC missions
23 p0404 A79-34037
Thermal energy conversion - Tapping the sea depths
24 p0628 A79-45979

COHEN, S.
Recent results from the PLT tokamak
21 p0069 A79-14453

COHEN, S. A.
Tokamak plasma diagnosis by surface physics techniques
23 p0443 A79-36883

COHN, A.
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406

COHN, D. R.
Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27885

COLE, D. E.
The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375

COLE, L. T.
Liquid-fluidized-bed heat exchanger flow distribution models
[ICP-1151] 22 p0369 N79-21559
COLE, R. L.
Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024
Design and installation manual for thermal energy storage
[ANL-79-15] 24 p0740 N79-29636
COLE, T.
Research on the sodium heat engine
21 p0028 A79-10231
Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation
24 p0669 A79-51178
COLEMAN, G. C.
External single pass to superheat receiver
[AIAA PAPER 78-1751] 21 p0089 A79-15849
COLEMAN, H. J.
National motor gasoline surveys: A key source of fuel trend data
[BETC/RI-78/16] 23 p0568 N79-25248
COLEMAN, J.
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009
COLEMAN, L. W.
Diagnostics of Shiva Nova high-yield thermonuclear events
22 p0285 A79-26747
COLEMAN, M. G.
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979
Phase 1 of the automated array assembly task of the low cost silicon solar array project
[NASA-CR-158120] 22 p0348 N79-18451
COLEMAN, W. H.
Dynamic and off-design analysis of CTEC closed cycle power systems
24 p0624 A79-45837
COLES, D. G.
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595
COLESTOCK, P.
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724
COLLARES-PEREIRA, M.
Simple procedure for predicting long term average performance of nontracking and of tracking solar collectors
21 p0091 A79-15873
A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448
COLLIE, M. J.
Heat pump technology for saving energy
22 p0302 A79-29624
COLLIER, R. K.
Solar collectors. II - Recent developments and future performance data and economic analysis
21 p0103 A79-16456
COLLINS, J. F.
Industrial wastes to energy
21 p0096 A79-15916
COLLINS, P. O.
Satellite solar power stations - Current status and prospects
23 p0448 A79-37844
COLLINS, R. E.
Manmade geothermal energy
23 p0408 A79-34072
COLLINS, R. V.
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864
COLLINS, T.
Solar energy - Four sites demonstrate potential
22 p0328 A79-32194
COLLIS, W.
Material growth and characterization directed toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543
COLO, A.
Principal sources of electric power generation in Brazil
23 p0388 A79-33255
COLOMES, J.
Theoretical and experimental yields of a solar heater with flat plate collectors
21 p0134 A79-17437
COLOSIMO, D. D.
Power generation with binary cycles
24 p0724 N79-28740
COLSHER, C. S.
Evaluation of selected near-term energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803
COLSON, W. B.
New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34846
COLSTON, B. W.
Geothermal energy from a utility perspective
21 p0091 A79-15880
COLUZZI, B.
Selective covers for natural cooling devices
22 p0272 A79-25522
COLYER, D. B.
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555
COMBARNOUS, M.
Natural convection in porous media and geothermal systems
23 p0533 A79-43014
COMBS, L. P.
Coal conversion by flash hydropyrolysis and hydrogasification
21 p0006 A79-10055
COMBS, S. K.
Condensation of refrigerants on vertical fluted tubes
[ORNL/TM-5848] 24 p0781 N79-32515
COMOLLI, A. G.
Advances in H-Coal
24 p0687 A79-51855
COMPERE, A. L.
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363
COMTOIS, W. H.
What is the true cost of electric power from a cogeneration plant
23 p0424 A79-34453
CONCANNON, P. T.
Energy requirements of the rail mode
[ASME PAPER 78-RT-1] 21 p0150 A79-18085
CONDELL, M.
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040
CONE, B. W.
Analysis of Federal incentives used to stimulate energy production
[PNL-2410-1-REV] 24 p0775 N79-31819
CONEYBEAR, J. F.
The use of lasers for the transmission of power
21 p0109 A79-16621
CONGER, J.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052
CONN, R. W.
Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

First wall and divertor plate material selection in fusion reactors
23 p0444 A79-36886

Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies
[COO-4636-1] 23 p0582 N79-26511

CONNELL, J. R.
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

CONNER, D. W.
Technology requirements and readiness for very large vehicles
[NASA-TM-80127] 23 p0587 N79-27086

CONNOR, H. A.
Modern technology for recovering energy and materials from urban wastes - Its applicability in developing countries
22 p0295 A79-28183

CONNOR, T. J.
Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854

CONRAD, E. W.
Turbine engine altitude chamber and flight testing with liquid hydrogen
[NASA-TM-79196] 23 p0587 N79-27140

CONRADS, H.
Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

CONSOLI, T.
Present status of two R.F. heating schemes - I.C.R.H. and L.H.R.H.
21 p0071 A79-14467

CONSOLLOY, J. N.
Performance of molten salt sodium/beta-alumina/SbC13 cells
22 p0245 A79-21479

CONTI, R.
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588

Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591

Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat
23 p0478 A79-39695

CONTOS, G. Y.
Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625

CONVERS WYETH, N.
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927

CONVERSE, A. O.
Enhancement of intrinsic solar heating
21 p0140 A79-17494

CONWAY, B. E.
Electrocatalysis, charge-transfer and the states of H adsorption in the hydrogen evolution reaction
21 p0038 A79-11801

CONWAY, E. J.
Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C
24 p0668 A79-51008

Langley program of GaAs solar cells
24 p0783 N79-32644

Radiation damage in GaAs solar cells
24 p0785 N79-32663

CONWAY, T. M.
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939

Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507

COOK, J.
A passive rock bed - Design, construction, and performance
21 p0121 A79-17328

An earth-wrapped solar greenhouse house
21 p0140 A79-17493

Oil pollution reports, volume 5, number 2
[PB-287071/5] 22 p0336 N79-16437

COOK, L. M.
Wayside energy storage summary. Volume 1: Summary
[DOT-TSC-FRA-79-7-1-VOL-1] 22 p0370 N79-21563

COOK, L. P.
Compositional modeling of MHD channel slag, with preliminary vapor pressure data
23 p0391 A79-33390

COOKE, D.
Space environmental effects and the solar power satellite
23 p0552 N79-24028

COOKE, W. B. H.
Mechanical and vibrational problems of a vertical axis wind turbine
23 p0389 A79-33265

COOL, R. W.
Testing of ultra-thin solar cells
23 p0503 A79-40952

COOMBS, J.
The prospects of a biological-photochemical approach for the utilization of solar energy
23 p0448 A79-37850

COON, C. W.
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions
[AD-A062751] 22 p0366 N79-21406

COON, R. L.
Workshop on Energy Sources and Electric Power Generation for High School Students
[TID-28975] 24 p0740 N79-29643

COON, V. T.
Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386

COOPER, C. L.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699

COOPER, J. F.
Mechanically rechargeable, metal-air batteries for automotive propulsion
[CONF-780801-8] 21 p0011 A79-10093

Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538

General-purpose aluminum-air/flywheel electric vehicles
[UCRL-82003] 23 p0564 N79-24503

COOPER, L.
Measurement of high-temperature, high-pressure processes
[PB-284041/1] 21 p0195 N79-12424

COOPER, P. I.
Thermal performance testing of flat-plate solar collectors
21 p0130 A79-17407

COOPER, R. B.
The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910

COOPER, R. F.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410

COPE, W.
The design and evaluation of a hydraulic-solar powered tracking device
21 p0136 A79-17458

COPELAND, R. J.
Rough cost estimates of solar thermal/coal or biomass derived fuels
[AIAA PAPER 79-0988] 23 p0476 A79-38893

Storage systems analysis
[SERI/PR-35-101] 23 p0599 N79-27705

COPELAND, R. L.
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

COPPA, A. P.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

COPPI, B.
Compact experiments for alpha-particle heating
21 p0078 A79-14786

CORBETT, R. J.
Measured and modeled passive performance in Montana
22 p0322 A79-31445

CORBETT, W. E.
Guidelines for preparing environmental test plans for coal gasification plants
[PB-286659/8] 21 p0232 N79-15479

CORCORAN, W. L.
Performance of solar heating and cooling systems used in the national solar heating and cooling demonstration program
21 p0139 A79-17478

CORDIER, A.
Solar heating using a heat pump and cold collectors
22 p0254 A79-22268

CORLEY, T. L.
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927
Environmental assessment of a coal-fired open-cycle MHD power plant
24 p0701 A79-51993

CORNERY, G.
Supersonic transport vis-a-vis energy savings
[NASA-TM-75464] 24 p0763 N79-31163

CORNEIL, H. G.
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Economics of small user hydrogen
24 p0613 A79-45593

CORNET, F. H.
Study of acoustic and microseismic emissions associated with a hydraulic fracture
21 p0076 A79-14744

COROTIS, R. B.
Run duration analysis of surface wind speeds for wind energy application
22 p0287 A79-27345

CORREA DOS SANTOS, R. L.
Study of the electrochemical activity of a porous vitreous carbon
23 p0389 A79-33264

CORREIA, R. J.
Fossil superheating in geothermal steam power plants
21 p0014 A79-10122

CORRONS, A.
Solar irradiance measurements by means of optical fibers and silicon detectors
24 p0638 A79-47198

CORY, J. S.
Nitinol heat engines for economical conversion of low grade thermal density
21 p0027 A79-10230
Nitinol thermodynamic state surfaces
21 p0045 A79-12264
Low-grade thermal energy-conversion Joule effect heat engines
[ASME PAPER 78-ENAS-7] 21 p0048 A79-12556
Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production
22 p0237 A79-20730

COSMAN, C. B.
Energy requirements of the US pulp and paper industry
[ANL/EES/TM-42] 24 p0800 N79-33587

COSTAIN, J. K.
Evaluation and targeting of geothermal energy resources in the southeastern United States
[VPI-SU-5648-1] 21 p0204 N79-13478

COSTELLO, D.
Review of selected solar market studies and techniques
[SERI/PP-52-076] 23 p0600 N79-26056

COSTELLO, D. R.
Venture analysis of a proposed federal photovoltaic eight-year procurement plan
[AIAA PAPER 78-1766] 21 p0061 A79-13865
Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687

COSTELLO, R. M.
Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant
21 p0008 A79-10068

COSTELLO, V. A.
Heat transfer and calorimetric studies of a direct contact-latent heat energy storage system
22 p0281 A79-26210

COSTLEY, A. E.
Review of results from DITE tokamak
21 p0069 A79-14456

COSTOGUE, E. N.
Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169
Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells
23 p0500 A79-40913
Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

COTTER, J. E.
Technology overview reports for eight shale oil recovery processes
[PB-295665/4] 24 p0797 N79-33552

COTTINGHAM, J. G.
Heat pump design - Cost effectiveness in the collection, storage and distribution of solar energy
22 p0313 A79-31316
Cost-effective potential of optimumly designed heat pumps for the collection, storage, and distribution of solar energy
[BNL-25195] 23 p0556 N79-24307

COTTINGHAM, P. L.
Prerefining true in situ shale oil
21 p0004 A79-10044

COTTRILL, J. E. J.
System economic optimisation for wave energy
23 p0450 A79-37864

COUCH, M. D.
The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370

COUGHLIN, B. C.
An analysis of air pollution control costs in N.S.W.
21 p0115 A79-17228

COUGHLIN, R. W.
Hydrogen production from coal, water and electrons
23 p0445 A79-37072

COULBERT, C.
Encapsulation materials for photovoltaic arrays
23 p0534 A79-43294

COULBERT, C. D.
A life prediction methodology for encapsulated solar cells
23 p0428 A79-35041

COUNT, B. M.
On the dynamics of wave-power devices
22 p0269 A79-24539
The absorption of energy from ocean waves
23 p0449 A79-37859
Exploiting wave power
24 p0660 A79-50400
Wave power, progress and prospects
24 p0666 A79-50891

COURREGES, F.
Recent investigations of metal oxide/CdTe heterojunction solar cells
23 p0502 A79-40926

COURT, J. D.
An analysis of air pollution control costs in N.S.W.
21 p0115 A79-17228

COUSINS, W. J.
A theoretical study of wood gasification processes
22 p0257 A79-22923

COUTTS, T. J.
p-InP/n-CdS heterojunction solar cells
23 p0442 A79-36791

COVER, A. E.
Modern ammonia synthesis use of hydrogen
24 p0612 A79-45581

COVER, P. W.
Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788

COVER, R. A.
Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940

COX, J. R.
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368

COX, K. E.
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
24 p0685 A79-51834

Synfuel /hydrogen/ production from fusion power 24 p0655 A79-51946
Thermochemical production of hydrogen from water [LA-UR-78-652] 21 p0180 N79-11236

COX, M.
Sun: Mankind's future source of energy; Proceedings of the International Solar Energy Congress, New Delhi, India, January 16-21, 1978. Volumes 1, 2 & 3 21 p0116 A79-17276

COX, W. G.
Energy conservation with fired heaters [TREE-1308] 24 p0772 N79-31783

COXE, D. H.
Results of a near field physical model study 24 p0626 A79-45856

COXON, L. K.
Alternate energy installations on the Jordan College Campus 22 p0323 A79-31454

COYKENDALL, R. D.
Advances in lower cost phosphoric acid fuel cells 21 p0010 A79-10092

COYNE, J. K.
The Seattle experience - Conversion of solid waste to fuels or chemicals 24 p0651 A79-49394

CRABB, R. L.
The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells 23 p0498 A79-40897

CRABE, B.
Design of a public exhibition building to demonstrate air, water, and passive solar heating systems 23 p0474 A79-38673

CRABTREE, W. L.
Solar array systems 21 p0169 N79-10131

CRAIG, G. T.
A comparison of solar thermal energy collection using fixed and tracking collectors 22 p0293 A79-28146

CRAIG, J. I.
Moderate cost, calculator-based data acquisition for solar HVAC systems 21 p0088 A79-15837
Orientation studies for single-axis concentrating collectors 23 p0537 A79-43677

CRAIG, R. A.
Environmental concerns related to compressed air energy storage 24 p0666 A79-50895

CRAIG, R. B.
Environmental implications for geothermal energy development 24 p0659 A79-50351

CRAIGHEAD, H. G.
Design of selective surfaces for solar energy collection 24 p0655 A79-50180

CRANDALL, R. S.
Collection efficiency measurements on a-Si:H solar cells 24 p0638 A79-47063

CRANE, R. E.
Thermal storage of off-peak electrical energy in solar heating and cooling systems 24 p0644 A79-47945

CRAVEN, R. M.
Photovoltaic power generation by use of compound parabolic concentrators 23 p0402 A79-34024

CRAWFORD, A.
Solar engines - The thermal wheel and beyond 21 p0095 A79-15909

CRAWFORD, A. R.
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers [ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738

CRAWFORD, K.
Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion [PB-288602/6] 22 p0350 N79-18487
Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C [PB-288603/4] 22 p0350 N79-18488
Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F [PB-288604/2] 22 p0350 N79-18489
Applicability of petroleum refinery control technologies to coal conversion [PB-288630/7] 22 p0352 N79-19173

CRAWFORD, L. W.
Economic optimization of the coal-fired MHD Steam Power Plant 21 p0016 A79-10134
Corrosion and deposits in MHD generator systems 21 p0081 A79-14935

CRAWFORD, R. W.
Pressurized fluidized-bed combustion/component test and integration unit preliminary design report 21 p0008 A79-10076

CRAWFORD, W. J., III
Modern engine development test techniques 21 p0155 A79-18680

CRENIN, J. D.
The Mead 25 kilowatt photovoltaic system 23 p0496 A79-40883
Design development and implementation of data acquisition systems for photovoltaic tests and applications project [COO-4094-24] 23 p0596 N79-27672
Mead 25 kilowatt photovoltaic system [COO-4094-19] 23 p0596 N79-27677

CRENN, J. P.
A study of waveguides for far infrared interferometers measuring electron density of tokamak plasmas 23 p0526 A79-41842

CRENSHAW, J. M.
Enhanced oil recovery chemicals from renewable wood resources [ORNL-5525] 24 p0764 N79-31363

CREPY, G.
Advanced electrolysis in alkaline solution 21 p0037 A79-11798

CRESPI, I.
Coal liquefaction: Report on a focus group discussion [DOE/TIC-10039] 23 p0589 N79-27339
Enhanced oil recovery: Report on a focus group discussion [DOE/TIC-10021] 24 p0735 N79-29577

CRETCHER, C. K.
Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis [EPRI-ER-808-VOL-1] 23 p0597 N79-27687
Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis [EPRI-ER-808-SY] 24 p0787 N79-32687

CRETELLA, M. C.
Response of defects to illumination in silicon solar cells 23 p0521 A79-41084

CRIM, W. M.
Integrated coal conversion utilization program [AIAA PAPER 79-0997] 23 p0459 A79-38195

CRIM, W. M., JR.
Cogeneration in Europe and the combined cycle gas turbine 22 p0297 A79-28988

CRIQUI, P.
Energy balances as a means for the evaluation of solar energy in developing countries 21 p0118 A79-17290

CRISWELL, D. R.
Commercial prospects for extraterrestrial materials 23 p0395 A79-33748

CRITOPH, R. E.
Fossil fuel heat pumps for domestic, commercial and industrial space heating 23 p0449 A79-37852

CROLEY, T. E.
Optimum combinations of cooling alternatives for steam-electric power plants, volume 2 [PB-290576/8] 23 p0565 N79-24515

CROMACK, D.
Prediction of stresses and natural frequencies for high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177

CRONAUER, D. C.
Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367
Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation
[EPRI-AF-913] 24 p0795 N79-33344

CRONQUIST, C.
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

CROOKS, G.
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375

CROSS, J. B.
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348

CROUCH, C. E.
Coal-rock interface detector
[NASA-CASE-MFS-23725-1] 24 p0768 N79-31706

CROUTHAMEL, M. S.
An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445

CROWELL, W. H.
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024

CRYNES, B. L.
Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419

CSIGI, K. I.
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

CUDDIHY, E. F.
Low-cost encapsulation materials for terrestrial solar cell modules
23 p0439 A79-36636

CUEVAS, A.
Transcell, a novel approach for improving static photovoltaic concentration
21 p0124 A79-17356

CUKOR, P. M.
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610

CULL, R.
DOE photovoltaic tests and applications project
23 p0571 N79-25492

CULLEY, C.
Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests
[PB-295478/2] 24 p0778 N79-32135

CULLINGFORD, H. S.
Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057

CULLIS, C. F.
The influence of lead compounds on automotive exhaust catalysts
21 p0116 A79-17253

CULP, T. L.
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33594

CULVER, G. G.
Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems
21 p0150 A79-18092

CUMALI, Z. O.
Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463

CUMMINGS, J. E.
Solar heating and cooling - An electric utility perspective
21 p0093 A79-15890

CUMMINGS, R. G.
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280
Electricity from hot dry rock geothermal energy: Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773

CUNHA, J. C. C. DA C.
Fluidized bed combustion of Brazilian coals
23 p0395 A79-33226

CUNNINGHAM, M. E.
Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

CUNNINGHIS, S.
Preliminary designs of 10 MWe and 50 MWe power modules
24 p0618 A79-45791

CUOMO, V.
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022

CURCIJA, M.
Heliostat reflectivity variations due to dust buildup under desert conditions
23 p0430 A79-35067

CURL, R. L.
Direct thermomagnetic splitting of water
22 p0312 A79-31154

CURRAN, L. M.
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224

CURRIE, J. B.
Multichannel temperature controller for hot air solar house
24 p0658 A79-50347

CURRIE, J. W.
Impact of H2S emission abatement on geothermal power costs
24 p0659 A79-50352

CURRIN, C. G.
Solar electric generator for developing nations
23 p0452 A79-37885

CURTIN, D. J.
Testing of ultra-thin solar cells
23 p0503 A79-40952

CURTIS, C. W.
Particle size variation in the solvent refined coal process
23 p0492 A79-40451
Selectivity improvement in the SRC process
24 p0628 A79-45992

CURTIS, J. B.
Effect of electrolyte impurity on the electrochemical performance of the lead/tetrafluoroboric acid/lead dioxide cell
22 p0246 A79-21485

CURTIS, S. A.
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897

CURTO, P.
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538

CURTO, P. A.
An update of OTEC baseline design
23 p0404 A79-34038

CUSICK, R. T.
Core unit testing of the APL/JHU shell-less folded tube heat exchanger
24 p0618 A79-45788

CUSUMANO, J. A.
Catalysis in coal conversion
21 p0051 A79-12873

CUTTING, F. H.
Heliostat survivability and structural stability for wind loading
23 p0400 A79-34001

CWIENK, G.
Dialectical discussion on optimal order structures for an integrated energy supply system
24 p0649 A79-49331

CWIERTNY, A. J., JR.
On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288

CZUPPON, T. A.
Modern ammonia synthesis use of hydrogen
24 p0612 A79-45581
Hydrogen from coal using pressurized gasification
24 p0687 A79-51853

D

DA CAMARA TORRES, C.
Electrolytic hydrogen production by means of solar and wind energy
23 p0469 A79-38633

DA MATHA SANTANNA, F.
Theoretical study of a hybrid wind turbine
23 p0405 A79-34047

DA ROSA, A. V.
Universal generator storer curves
22 p0238 A79-20799

DABIRI, A. E.
Solar collector development in Iran
23 p0493 A79-40675

DAFLER, J. R.
A copper oxide-copper sulfate water-splitting cycle
21 p0015 A79-10128
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13874
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707

DAIDOLA, J. C.
Station keeping subsystem designs for modular experiment OTEC plants
24 p0626 A79-45851

DAIELLO, R. V.
Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068
Automated array assembly, phase 2
[NASA-CR-158360] 22 p0358 N79-20480
Automated aray assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758
Automated array assembly, phase 2
[NASA-CR-162176] 24 p0770 N79-31759

DAIGNIERES, M.
Determination and interpretation of the geothermal flux at Bournac /Haute-Loire/
23 p0480 A79-39850

DAILEY, N. S.
An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640

DAINES, N. H.
Coal's role in California's energy needs
23 p0591 N79-27602

DAKSLA, C.
Continuous extrusion of coal
22 p0282 A79-26372

DALAL, V.
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
Design, technology and cost of Si cells for concentrator applications
23 p0517 A79-41055

DALAL, V. L.
Comment on a simple measurement of absolute solar cell efficiency
23 p0440 A79-36683

DALBY, J. G.
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0650 A79-51883

DALHED, H. E.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

DALLA BETTA, R. A.
Catalysis in coal conversion
21 p0051 A79-12873

DALLEK, S.
Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells
22 p0246 A79-21487

DALY, J. C.
Solar concentrator flux distributions using backward ray tracing
24 p0603 A79-44365

DAMBLY, B. W.
Heat exchanger design for geothermal power plants
21 p0015 A79-10123

DAMIEN, A.
The use of fuel cell ion exchange membranes in electrolytic cells
[P/539/77/23] 23 p0584 N79-26532

DAMON, D.
CO/H2 production using fusion reactor heat
24 p0695 A79-51949

DAMORE, F.
Study of the applicability of the geochemistry of gases in geothermal prospection
21 p0075 A79-14736

DAMPIER, F. W.
The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838
Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

DAMS, R.
Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749

DAMSHALA, P. R.
Thermal analysis of receivers for solar concentrators and optimization procedure for power production
21 p0182 N79-11465

DANDL, R. A.
Electron cyclotron heating in Bumpy Torus Program
24 p0607 A79-45033

DANESCU, A.
Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593

DANESHYAR, H.
A theoretical method for the prediction of monthly mean solar radiation parameters
21 p0022 A79-10183

DANEY, D. E.
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267

DANG, V.-D.
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126

DANH, T. V.
Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization
24 p0656 A79-50188

DANIEL, A. S.
Legal and economic aspects of engineering design in solar water heating systems
23 p0473 A79-38664

DANIEL, J. L.
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-9] 22 p0361 N79-20504
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557

DANIEL, R. G.
Evaluation of intermediate-period seismic waves as a geothermal exploration tool
24 p0744 N79-29716

DANIELS, A.
The Stirling engine, an energy converter for cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777

DANIELS, P. A.
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382

DANOV, V. M.
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

DANILUK, S.
Materials problems experienced at the Synthane coal-gasification pilot plant
23 p0478 A79-39788

DAPKUNAS, S. J.
Materials and economics of energy systems
21 p0095 A79-15911

DAPKUS, P. D.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

DARBY, J. B., JR.
Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953

DARNELL, J. B.
Geothermal power and water production studies at the University of California
[ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778

DAROOKA, D. K.
Melting multifoil insulation for KIPS emergency cooling
21 p0023 A79-10191

DARSEY, D. M.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
Master control and data system for the 5MW Solar Thermal Test Facility
21 p0144 A79-17620
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

DART, R. H.
Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508

DARVAS, J.
Fuel technology and the environment
21 p0079 A79-14787
The potential of fusion reactors as process heat source
22 p0284 A79-26624

DAS, A. C.
Tearing mode instabilities and their suppression by lower hybrid fields
24 p0606 A79-45004

DAS, A. K.
A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell
21 p0125 A79-17361

DAS, R.
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894

DAS, R. L.
Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept
24 p0673 A79-51750

DAS, S.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344

DAS, S. R.
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346
Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171
Zn/x/Cd/1-x/S:Cu2S heterojunction solar cells. II - Junction analysis
24 p0616 A79-45745
Back illuminated high efficiency thin film Cu2S/CdS solar cells
24 p0656 A79-50190

DASPIT, C.
Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824

DAUBNER, L.
Surtrace - An airborne geochemical system
22 p0255 A79-22557

DAUD, T.
Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902
Effect of copper impurity on polycrystalline silicon solar cells
23 p0504 A79-40952

DAUDET, H. C.
Closed cycle gas turbines, an ECAS update. I
[ASME PAPER 79-GT-204] 23 p0380 A79-32461

DAUZVARDIS, P. V.
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423

DAVE, J. V.
Performance of a tilted solar cell under various atmospheric conditions
21 p0066 A79-14261
Isotropic distribution approximation in solar energy estimations
22 p0262 A79-23753

DAVID, J. P.
Critical study of energy parameters of solar energy /illumination and concentration/ - Application to catoptric collectors
23 p0463 A79-38584

DAVID, L.
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495

DAVID, R. A.
Induction-generator/synchronous-condenser system for wind-turbine power
22 p0286 A79-27219

DAVIDOV, D.
Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

DAVIDSON, B. J.
Thermal energy storage using hot liquids
23 p0451 A79-37879

DAVIDSON, C. R.
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

DAVIDSON, J.
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

DAVIDSON, K.
The National Program for Solar Energy
21 p0072 A79-14688

DAVIDSON, R. C.
Stability properties of an anisotropic guiding center plasma and relation with the Suydam function
23 p0438 A79-36411

DAVIES, J. H.
Surtrace - An airborne geochemical system
22 p0255 A79-22557

DAVIES, L. W.
The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989

DAVILA, S. G.
Development of a unipolar electrolysis unit
23 p0396 A79-33235

DAVIS, A. A.
Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829

DAVIS, D. B.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
The real time aperture flux system as part of the Solar Thermal Test Facility
23 p0429 A79-35050

Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

DAVIS, D. T.
Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front
23 p0486 A79-40251

DAVIS, E. E.
Construction of a 10GWe solar power satellite
21 p0003 A79-10029

DAVIS, F.
Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565

DAVIS, G. D.
Study of flywheel energy storage Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558
Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559

DAVIS, H. P.
Solar power satellite
22 p0287 A79-27375

DAVIS, H. S.
A technical analysis for cogeneration systems with potential applications in twelve California industrial plants
21 p0011 A79-10099
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658

DAVIS, J. J.
Wilson parameters for the system H2, N2, CO, CO2, CH4, H2S, CH3OH, and H2O
22 p0282 A79-26462

DAVIS, J. R.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

DAVIS, K.
Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922

DAVIS, K. E.
Manmade geothermal energy
23 p0408 A79-34072

DAVIS, R.
Gallium arsenide solar cells
23 p0448 A79-37849

DAVIS, S.
Recent results from the PLT tokamak
21 p0069 A79-14453

DAVIS, S. M.
Coal and nuclear: A comparison of the cost of generating baseload electricity by region
[PB-289595/2] 22 p0355 N79-19469

DAVISON, J. E.
A feasibility study of inorganic oxide-fluoride compositions for thermal energy storage applications
[AD-A059001] 21 p0156 N79-12559

DAVITIAN, H.
A method for the comparative economic assessment of storage systems
[BNL-24473] 21 p0013 A79-10111
Wind power and electric utilities - A review of the problems and prospects
22 p0300 A79-29374
Method for the comparative economic assessment of energy storage systems
[BNL-25291] 23 p0565 N79-24509

DAVLETOV, A.
Construction of combined solar installations for heating and cooling
24 p0653 A79-49524

DAVYDOVSKII, G. V.
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691

DAWES, M. H.
Molten carbonate fuel cell based, coal fired power plants for electric power generation
24 p0682 A79-51816
Molten carbonate fuel cell performance model for cycle studies
24 p0682 A79-51817

DAWSON, A. G., III
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors
22 p0295 A79-28356
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539

DAWSON, B. E.
Conceptual design of large heat exchangers for ocean thermal energy conversion
[ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813

DAWSON, F. G.
A summary of R&D programs
21 p0146 A79-17639

DAWSON, J. M.
System reliability studies for wave energy generation
23 p0450 A79-37872

DAY, J. T.
Methodology for solar-thermal power plant evaluation
[EPRI-ER-869] 24 p0739 N79-29631

DAY, R. E.
Collection, processing and dissemination of data for the national solar demonstration program
24 p0608 A79-45208

DAY, R. H.
Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

DAY, W. H.
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536

DAYAN, J.
A new power cycle that combines power generation with energy storage
21 p0004 A79-10040

DE ALBUQUERQUE ROSA, C.
Design of a mechanical energy storage unit
23 p0387 A79-33246

DE ALBUQUERQUE, J. C. R.
Principal sources of electric power generation in Brazil
23 p0388 A79-33255

DE BARROS NEIVA, A. C.
The Savonius rotor - Theory and optimization
23 p0387 A79-33242

DE BOER, A. A.
Energy storage - Economics and fuel conservation
21 p0153 A79-18464

DE BOER, P. C. T.
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297

DE CARVALHO MACEDO, I.
The Savonius rotor - Theory and optimization
23 p0387 A79-33242

DE CILLO, R. H.
New policy for electrical energy
23 p0388 A79-33260

DE COLIGNY, M.
Dimensioning of energy-production systems - The use of geometric programming
23 p0388 A79-33254

DE GEZELLE, L.
Suntrack-systems for solar concentrators
23 p0464 A79-38587

DE GRAAF, J. D.
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127

DE JONGE, A. K.
A free-piston Stirling engine for small solar power plants
21 p0024 A79-10205

DE KRASINSKI, J. S.
Wind tunnel tests on a wind operated suction-pump-turbine system to generate electricity
23 p0387 A79-33241

DE LAGARDE, J. M.
A new concept - The flexible blade windmill /FBW/
23 p0485 A79-40126

DE MARCHI DESENZANI, P.
An exploration of the applicability field of geothermal water-fed heat pumps
23 p0409 A79-34077
Remote new energy sources utilization in on-site non-polluting power plant - Liquid air as energy carrier concept and final conversion plant design
23 p0416 A79-34141
System aspects of geothermal resources utilization - The case of Castelnuovo Val di Cecina as an example
24 p0689 A79-51871

DE MAUBEUGE, M.
Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

DE MICHELIS, C.
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge
24 p0706 A79-52537

DE MORAIS, J.
A development program for hydrogen burners
23 p0386 A79-33232

DE PENA, R. G.
The conversion of SO2 to sulfate particles in coal fired power plant plumes
23 p0535 A79-43391

DE RENZO, D. J.
European technology for obtaining energy from solid waste
24 p0638 A79-47072

DE RIENZO, P. P.
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157

DE SANTIAGO, M.
Solar energy in Latin America - An overview
21 p0116 A79-17279

DE SMET, L.
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977

DE WINTER, F.
Solar energy and the flat plate collector - An annotated bibliography
21 p0090 A79-15858
Sun: Mankind's future source of energy; Proceedings of the International Solar Energy Congress, New Delhi, India, January 16-21, 1978. Volumes 1, 2 & 3
21 p0116 A79-17276
Optimum collection geometries for copper tube - copper sheet flat plate collectors
21 p0127 A79-17387
Workshop on Economic and Operational Requirements and Status of Large Scale Wind Systems, Monterey, Calif., March 28-30, 1979, Proceedings
24 p0633 A79-46526

DE WIT, M.
Tilt, orientation and overshadowing of solar collectors in the Netherlands
21 p0131 A79-17414

DEACON, D. A. G.
Boltzmann simulation of a storage ring laser
23 p0487 A79-40381

DEAN, A. H.
Study of electrostatic precipitators installed on oil-fired burners
[EPRI-FP-792-VOL-2] 24 p0760 N79-30848

DEAN, S. O.
Fusion power by magnetic confinement - Program plan
21 p0080 A79-14794

DEANGELIS, H. M.
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086

DEB, S.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344

DEBERRY, D. W.
Materials selection guidelines for geothermal power systems, first edition
[ALO-3904-1] 24 p0727 N79-28772

DEBOER, P. C. T.
Instrumentation
23 p0545 N79-22894

DEBS, A. S.
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282

DECARLO, V. A.
New processes for the recovery of resource materials from coal combustion wastes
21 p0007 A79-10065

DECHER, R.
MHD conversion of solar energy
21 p0109 A79-16614

DECK, C.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

DECKER, K.-D.
The improved rigid airship
21 p0086 A79-15572

DECKER, O.
Power generation with binary cycles
24 p0724 N79-28740

DECKMAN, H. W.
Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034

DECORA, A. W.
Oil shale technologies and the potential for oil shale development
23 p0525 A79-41813

DECOSTE, R.
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

DECOURSIN, D. G.
Progress on high temperature air heater development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188

DEDIVITIIS, L.
Design of a public exhibition building to demonstrate air, water, and passive solar heating systems
23 p0474 A79-38673

DEDOMINICIS, L.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

DEETER, C. R.
Energy related mathematical models - Annotated bibliography
21 p0154 A79-18472

DEFFENBAUGH, D. M.
Correlation of instantaneous and all-day thermal performance of flat-plate solar collectors
23 p0430 A79-35065

DEGANCE, A. E.
A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis
22 p0263 A79-23777

DEGRAFF, J. V.
A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0097 A79-16075

DEGREY, S. P.
Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

DEHESA, C.
An anomalous photocurrent in SnO2-Si heterojunction solar cells
24 p0668 A79-50950

DEHLI, M.
Energy conservation - Focal point for energy efficient operations
24 p0714 A79-53805

DEHNE, K.
Important specification of pyranometers for solar energy applications /Survey article/
23 p0468 A79-38627

DEIF, I. N.
Stochastic predictions of solar cooling system performance
[ASME PAPER 78-WA/SOL-16] 21 p0164 A79-19848
System performance predictions for solar cooling using regional stochastic weather models
22 p0264 A79-23781

DEIPENAU, H.
Methane and methanol as alternative energy sources: A comparative profitability study
[BMFT-FB-77-84] 24 p0747 N79-30412

DEISCHL, E.
Statement and comparison between different studies on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833

DEJESUSPARADA, N.
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias
[E79-10238] 24 p0747 N79-30599

DEKITSCH, A.
Development of vertical-axis wind-energy converters - Darrieus design
23 p0447 A79-37744

DELAHOY, A. E.
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084

DELAMETER, W. R.
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435

DELANEY, C. L.
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900

DELGADO, F. F.
Recent operating experience of the Wellman-Lord FGD process on a coal-fired boiler
21 p0065 A79-14120

DELL, R. M.
Advanced batteries
21 p0067 A79-14270

DELLIS, A. N.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

DELUCA, W.
A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

DELYANNIS, A. A.
Reflecting horizontal collector
21 p0128 A79-17395

DELYANNIS, E. A.
Reflecting horizontal collector
21 p0128 A79-17395

DEMEO, E. A.
Perspectives on utility central station photovoltaic applications
21 p0041 A79-11873

DEMERLIAC, Y.
The utilization of European space techniques for energy production
[IAF PAPER 78-190] 21 p0035 A79-11287

DEMETRI, E. P.
Energy conservation opportunities in appliances using energy storage
[ORNL/SUB-7303/1] 24 p0782 N79-32629

DEMETRIADES, S. T.
Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042

DEMICHELIS, F.
Cavity-type surfaces for solar collectors
22 p0283 A79-26497
Concentrator for solar air heater
23 p0487 A79-40379

DEMIDOV, S. A.
Investigation of the optical properties of transparent materials for solar energy applications
23 p0434 A79-35384
Investigation into the optical characteristics of transparent solar-energy materials
24 p0663 A79-50707

DEMIRJIAN, A.
Electrode development for coal fired MHD generators
23 p0392 A79-33396

DEMOKRITOS, N. R. C.
Experimental study of a heatpipe with an active porous medium
23 p0400 A79-34007

DEN OUDEN, C.
The development of a storage system based on encapsulated p.c.m.-materials
23 p0470 A79-38639
The design of four solar houses in Zoetermeer, The Netherlands
23 p0471 A79-38651

DENIS, J. M.
Development of the oil sands of Canada
23 p0524 A79-41612

DENMAN, O. S.
A microwave power transmission system for space satellite power
21 p0002 A79-10025
From sunlight in space to 60 Hz on earth - The losses along the way
21 p0003 A79-10027

DENN, M. M.
Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983

DENNIS, B. R.
Hot dry rock, an abundant clean energy resource
21 p0098 A79-16106

DENNIS, R.
A model for coal fly ash filtration
22 p0296 A79-28389

DENNO, K.
Compatibility of direct energy storage devices with ac. processing power system components
21 p0111 A79-16728
Feasibility of MHD-ac induction electric power plant
22 p0303 A79-29794
Bio-electrochemical conversion of refuse to energy
24 p0659 A79-50353
Problems in the redox flow cell power system for bulk energy storage
24 p0659 A79-50354

DENTON, W. H.
Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34989

DEPALMA, V. A.
Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978
24 p0620 A79-45803

DEPAZ, J. F.
A high temperature fusion reactor design
24 p0696 A79-51954

DEROOS, R. L.
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436

DERPICH, T.
Effect of operating variables on reactor performance in the Synthoil coal conversion process
23 p0412 A79-34099

DERR, V. E.
Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models
21 p0065 A79-14117

DERRINGER, G. C.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

DERRINGTON, J.
Principles of design and construction for marine structures for wave/tidal/ocean thermal energy
21 p0152 A79-18114

DERRINGTON, J. A.
Marine structures for energy conversion
23 p0450 A79-37867

DESAI, B. G.
Solar electrification and rural electrification - A techno-economic review
21 p0118 A79-17289

DESAI, T. B.
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352

DESARO, R.
Controlled utilization of coal slag in the MHD topping cycle
21 p0081 A79-14936
Coal combustor technology development
23 p0390 A79-33381

DESAUTEL, J.
Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269

DESCY, G. G.
Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

DESMET, D.
Development of surfaces optically suitable for flat solar panels
[NASA-CR-150831] 21 p0173 N79-10522

DESMON, L. G.
Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396

DESROSIERS, R. E.
Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413

DESTE, A.
Electrolysis of zinc. Statistical model of the process parameters for an industrial cell
[BLL-RTS-11317] 22 p0345 N79-17984

DESTEFANIS, R.
Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157

DESTIVAL, C.
Long term perspectives in energy resources
23 p0525 A79-41820

DEUCHLER, W. P.
Practical schemes for reducing cold water pipe loads
24 p0621 A79-45814

DEURBRAUCK, A. W.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

DEURBROUCK, A. W.
An overview of coal preparation
21 p0044 A79-12115

DEUTCH, J. M.
Department of Energy policy for fusion energy
[DOE/ER-0018] 23 p0586 N79-26952

DEUTSCHER, S. B.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

DEUTSCHMANN, D.
The Tritherm test house
22 p0290 A79-27723

DEVALETTE, M.
A new thermochemical process for hydrogen production
22 p0312 A79-31153

DEVANEY, W. E.
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927

DEVAUX, G. R.
COIL process - First generation commercial coal liquefaction plant
23 p0412 A79-34101

DEVIN, B.
Medium capacity heliothermal power stations
21 p0142 A79-17507
Current status and prospects for low-temperature solar energy
22 p0269 A79-24623

DEVIN, M. B.
Report on the development of solar energy in France
21 p0117 A79-17280

DEVINE, W. D., JR.
An energy analysis of a wind energy conversion system for fuel displacement
23 p0406 A79-34054
Net energy analysis of five energy systems
[ORAU/IEA(M)-77-12] 21 p0174 N79-10534

DEVITT, T.
Flue gas desulfurization system capabilities for coal-fired steam generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606

DEVITT, T. W.
State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes
21 p0064 A79-14111

DEWAN, S. B.
Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898

DEWINKEL, C. C.
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649
An assessment of wind characteristics and wind energy systems applications to electric utilities in Wisconsin and sections of Minnesota, Iowa and Illinois
24 p0736 N79-29593

DEXTER, S. C.
Oxygen, temperature and pH effects on corrosion of aluminum in seawater
24 p0623 A79-45827

DEY, S. K.
Heat exchanges and columnar growth in electron-beam evaporation of silicon films for solar cell applications
22 p0272 A79-25084

DHARIWAL, S. R.
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353
Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells
24 p0606 A79-44919

DI RAMIO, B.
Structures for solar power satellites
21 p0032 A79-10513

DIAMOND, S. C.
Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520
Component-based simulator for solar systems
[LA-UR-78-1494] 21 p0208 N79-13521

DIAS, J. M. C. S.
Small mills for producing alcohol from sugar cane
23 p0386 A79-33229

DIATLOV, V. M.
Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385
Analysis of the efficiency of a varizone photoelectric converter
24 p0663 A79-50708

DIAZ, J. S. V.
Liquefaction of high ash Brazilian coals
23 p0385 A79-33224

DIBBLE, J. T.
Stimulated biodegradation of waste petroleum
22 p0336 N79-16388

DIBELIUS, N. R.
The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344

DIBLIN, J. A.
Energy conservation in general aviation and operation and maintenance of Avco Lycoming piston engines
21 p0048 A79-12381

DICK, G.
Aluminum in solar technology
23 p0481 A79-40024

DICKENSON, R. L.
Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals
[TID-29093-VOL-5] 24 p0719 N79-28361
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375
Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385

DICKERHOOF, D. W.
Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

DICKEY, J. W.
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415

DICKINSON, R. M.
SPS microwave subsystem potential impacts and benefits
21 p0107 A79-16603
Satellite Power System (SPS) microwave subsystem impacts and benefits
[NASA-CR-157951] 21 p0196 N79-12558
Microwave power transmitting phased array antenna research project
[NASA-CR-157843] 21 p0202 N79-13263

DICKINSON, W. C.
Annual available radiation for fixed and tracking collectors
21 p0042 A79-11880

DICKS, J. B.
Economic optimization of the coal-fired MHD Steam Power Plant
21 p0016 A79-10134
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142
Corrosion and deposits in MHD generator systems
21 p0081 A79-14935

DICKS, J. B., JR.
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

DIESENDORF, M.
Optimal value of the rated speed of a wind generator
23 p0527 A79-41948

DIETRICH, B.
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

DIETRICH, G.
Selective coatings for aluminum and steel solar absorbers
21 p0058 A79-13647

DIEZ PEREZ, J. A.
Remote sensing use in hydraulic planification in Mexico
22 p0255 A79-22522

DIFIGLIO, C.
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868

DIGHE, S. V.
Heat exchangers for Ocean Thermal Energy Conversion plants
21 p0142 A79-17506

DIGUET, D.
Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions
23 p0501 A79-40922

DIJKHUIS, G. C.
Thermonuclear energy from ball lightning
24 p0696 A79-51957

DIJKMANS, A.
Stratification effects in the short and long term storage of solar heat
21 p0121 A79-17326

DIKKERS, R. D.
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543

DILMORE, J. A.
Design and operation of the Westinghouse electrode systems test facility /WESTF/
23 p0393 A79-33411
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

DIMICK, D. L.
Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374

DIMITRIU, S.
Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593

DIMOCK, D.
Recent results from the PLT tokamak
21 p0069 A79-14453

DIN, S.
System reliability studies for wave energy generation
23 p0450 A79-37872

DINELLI, G.
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390

DINOVO, S. T.
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224

DIPIPPO, R.
Geothermal preheating in fossil-fired steam power plants
21 p0014 A79-10118
Fossil superheating in geothermal steam power plants
21 p0014 A79-10122
Hybrid fossil-geothermal power plants
21 p0096 A79-15920
The geothermal power station at Ahuachapan, El Salvador
22 p0266 A79-24239
Geothermal power plants of New Zealand, Philippines, and Indonesia: A technical survey of existing and planned installations
[COO-4051-23] 24 p0738 N79-29622
Geothermal power plants of Mexico and Central America: A technical survey of existing and planned installations
[COO-4051-26] 24 p0740 N79-29638
Introduction to electric energy conversion systems for geothermal energy resources
[COO-4051-28] 24 p0740 N79-29639
Geothermal power plants of the Soviet Union. A technical survey of existing and planned installations
[COO-4051-41] 24 p0787 N79-32686

DIRHAM, L. A., JR.
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991

DISSINGER, G. R.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

DITTENHOEFER, A. C.
The conversion of SO2 to sulfate particles in coal fired power plant plumes
23 p0535 A79-43391

DIVAKARAN, C. P.
Power plant systems based on solar energy
21 p0142 A79-17508

DIVAKARUNI, S. M.
Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179

DIVI[illegible], J.
Clean Air Act amendments of 1977 and the impact on control efforts
21 p0097 A79-16091

DIVONE, L. V.
Recent developments in wind energy
23 p0482 A79-40104

DIXIT, D. K.
Some studies on an experimental solar pond
21 p0131 A79-17416

DIXIT, P. N.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344

DIXON, J. C.
Load matching effects on wind energy converter performance
23 p0455 A79-37917

DNESTROVSKII, IU. N.
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

DO CARMO TOMBESI GUEDES, N.
New policy for electrical energy
23 p0388 A79-33260

DOCKTER, L.
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522
Mathematical model of forward combustion retorting of oil shale
[LETC/TPR-78/1] 24 p0779 N79-32375

DODD, C. W.
The brake system for the DOE/Sandia 17-meter vertical axis wind turbine
21 p0067 A79-14289
Lightning protection for the vertical axis wind turbine
[SAND-77-1241] 21 p0221 N79-14567

DODEL, G.
Proposed non-interferometric FIR electron density measuring scheme for tokamaks
24 p0707 A79-52667

DODGE, C. H.
United States civilian space programs: An overview
[GPO-35-323] 21 p0232 N79-15815

DODSON, J. G.
Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems
22 p0304 A79-30123

DOELLING, N.
The economics and engineering of large-scale algae biomass energy systems
[PB-287868/4] 21 p0226 N79-15207

DOERING, H. VON E.
Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware
[ASME PAPER 79-GT-160] 23 p0378 A79-32422

DOERING, O. C., III
Small scale gasification of biomass - The case of corn cob gasifiers
24 p0631 A79-46311

DOERING, R. D.
Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems
24 p0608 A79-45207
The economics of solar domestic hot water systems in state university and community college buildings
24 p0610 A79-45227

DOERNBERG, A.
Energy use in Japan and the United States
[BNL-23101] 21 p0221 N79-14578
Impacts of new energy technologies as measured against reference energy systems
[BNL-25475] 23 p0597 N79-27694

DOERNER, H.
Expert opinion on wind energy conversion systems designed by Hermann Honnef
[BMFT-FB-T-77-35] 22 p0349 N79-18456

DOGGETT, R. M.
Ten scenarios of transportation energy conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647
Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648

DOHERTY, M. C.
Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331

DOKOS, W. T.
Air collector testing utilizing ASHRAE 93-77
23 p0430 A79-35062

DOKRAS, V. M.
Some studies on an experimental solar pond
21 p0131 A79-17416

DOLAND, C.
The dependence of optical properties on the structural composition of solar absorbers - Gold black
22 p0242 A79-21162
Microstructure dependence of the optical properties of solar-absorbing black chrome
22 p0256 A79-22858

DOLBEC, A. C.
Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems
[ASME PAPER 79-GT-195] 23 p0380 A79-32453

DOLGIREV, IU. E.
Design of a heat pipe with separate channels for vapor and liquid
22 p0268 A79-24486

DOLINSKII, IU. L.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401

DOLLARS, R.
Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas
24 p0610 A79-45220

DOLLERY, A. A.
The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells
23 p0498 A79-40897

DOLLOFF, J. W.
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667

DOMALSKI, E. S.
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167

DOMINGUEZ, R. R.
Local theory of finite-beta, collisional drift modes
22 p0253 A79-22244

DONAHUE, P.
Solar space heaters for low-income families
[PB-289244/6] 22 p0363 N79-20526

DONAKOWSKI, T. D.
Dedicated nuclear facilities for electrolytic hydrogen production
24 p0614 A79-45592

DONALDSON, A. B.
Analysis and design of air heating unglazed flat plate solar collectors
22 p0280 A79-26202

DONNELLY, H. L.
Cold water pipe verification test
24 p0621 A79-45811

DONNELLY, J. P.
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685

DONOVAN, L. E.
Geothermal community heating systems
23 p0409 A79-34078

DONOVAN, R. L.
Photovoltaic concentrating array
21 p0021 A79-10172
Photovoltaic concentrator system for Roxborough Park
24 p0675 A79-51767
A 10-kilowatt photovoltaic concentrator array
[SAND-78-7024] 23 p0598 N79-27699

DONOVAN, R. M.
Wind turbines for electric utilities - Development status and economics
[AIAA PAPER 79-0965] 23 p0475 A79-38888
Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170] 24 p0749 N79-30719

DONOVAN, T. J.
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373

DONOVON, R. M.
Large wind turbine generators
21 p0092 A79-15881
DONVITO, P. A.
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752
Regional residential sector energy price forecasts for 1978: Electricity, natural gas, number 2 fuel oil, and propane
[DOE/EIA-0102/46] 24 p0762 N79-31083
DOOLEY, D.
Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3] 23 p0546 N79-22971
DOPERCHUK, I. I.
Optimization of a diagonal MHD channel
22 p0247 A79-21628
DORF, R. C.
Energy, resources, and policy
22 p0304 A79-30175
DORGAN, C. E.
Residential energy design
21 p0073 A79-14694
Building energy standards and codes
21 p0073 A79-14696
DORN, D. W.
Technology transfer at Department of Energy laboratories - Selected case studies from the Lawrence Livermore Laboratory
21 p0099 A79-16130
DOROSHENKO, V. G.
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361
DORSEY, J.
Impact of storm fronts on utilities with WECS arrays
24 p0635 A79-46546
DOS SANTOS MOURA, C. R.
World energy scene and Brazil's alternatives
23 p0388 A79-33259
DOSAJ, V. D.
Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936
DOSANJOS, C. E.
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias
[E79-10238] 24 p0747 N79-30599
DOSCHER, T. M.
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654
DOSS, E.
Slag deposition and its effect on the performance of MHD channels
[AIAA PAPER 79-0189] 21 p0157 A79-19588
Two-dimensional MHD channel design
22 p0279 A79-26183
DOSS, E. D.
Parametric study of the performance of a CDIF 1-B coal-fired MHD generator
[ANL-MHD-79-3] 22 p0361 N79-20503
DOSSANI, N.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844
DOUGHERTY, D. A.
Effects of low solar input and amount of storage on thermosyphon hot water system performance
22 p0267 A79-24312
DOUGLASS, D. L.
The storage and release of hydrogen from magnesium alloy hydrides for vehicular applications
22 p0249 A79-21688
DOUZE, E. J.
Geothermal ground noise measurements at Roosevelt Hot Springs and Cove Fort, Utah
[PB-291624/5] 23 p0545 N79-22648
DOWDY, M. W.
The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370
Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412
DOWELL, D.
Urbanism and energy in developing regions
[LBL-7808] 21 p0189 N79-11540
DOWELL, K. E.
Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana
23 p0534 A79-43370
DOWGIALLO, E. J., JR.
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930
DOWLER, W. L.
Feasibility of rocket propellant production on Mars
21 p0047 A79-12324
DOWNER, J.
Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785
DOWNING, R. G.
Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631
DOYLE, D. W.
The fossil fuel cost of solar heating
21 p0022 A79-10180
DOYLE, P. A.
Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant
[ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075
Computer design and optimization of cryogenic refrigeration systems
[LBL-7934] 24 p0768 N79-31439
DRABKIN, L. M.
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine
21 p0166 A79-20348
Thermodynamic analysis of combined GTP-TEG solar energy converter
24 p0636 A79-46758
DRAGEL, G. M.
Materials problems experienced at the Synthane coal-gasification pilot plant
23 p0478 A79-39788
DRAGOO, A. L.
Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553
DRAKE, R. L.
Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527
DRAKE, R. P.
Evidence for neutral-beam-injected oxygen impurities in 2XIIB
22 p0292 A79-27887
DREES, H. M.
Analytical and experimental evaluation of Cycloturbine aerodynamic performance
[AIAA PAPER 79-0968] 23 p0456 A79-38176
DREVINSKY, P. J.
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086
DREWES, P. L.
Allowable costs for alternative domestic heating systems using utility supplied electricity for backup or charging energy
22 p0319 A79-31428
DREXLER, K. E.
An aperture-augmented prototype power satellite
21 p0046 A79-12268
DRIESEN, G. E.
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

DRIGGERS, J. M.
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762
DRIVER, P. M.
The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments
21 p0127 A79-17384
DROBNY, V. F.
The photovoltaic properties of thin copper oxide films
23 p0499 A79-40909
DROEGE, K.-H.
Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583
DROST, B. J.
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443
DROWLEY, C.
Open circuit voltage of high intensity silicon solar cells
23 p0511 A79-41014
DRUI, O. S.
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264
DRUMMOND, J. E.
Solar power satellites revisited
21 p0093 A79-15898
Solar Power Satellite beam disturbance of the upper ionosphere
[AIAA PAPER 79-1422] 23 p0426 A79-34849
Experimental demonstration of heat-to-electricity conversion within a dielectric
24 p0698 A79-51975
DRYER, F. L.
Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986
Fundamental combustion studies of emulsified fuels for diesel applications
[PB-287386/7] 22 p0330 N79-16138
DRZEWIECKI, T. M.
An initial model for the finite displacement response characteristics of a fluidyne pump
[AD-A069159] 24 p0734 N79-29521
DUA, C. R.
Performance analysis of a flat-plate solar collector using 'forge-fin' tubes
22 p0316 A79-31404
DUBAN, M.
Comparative efficiencies of solar energy collectors
23 p0382 A79-32955
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177
DUBE, G.
A survey of laser glasses
21 p0083 A79-15140
DUBEY, M.
Technical and economic feasibility of making fertilizer from wind energy, water, and air
21 p0142 A79-17512
Hydrogen from the wind - A clean energy system
23 p0413 A79-34112
DUBEY, R. C.
A new fabrication process for single crystal silicon solar cells
21 p0122 A79-17335
DUBIS, D.
Materials problems experienced at the Synthane coal-gasification pilot plant
23 p0478 A79-39788
DUBOIS, B. M.
North Stanley Polymer Demonstration Project
[BETC/RI-78/19] 23 p0588 N79-27313
DUBOIS, P.
SOLPAC - A total design for energy conservation in housing
23 p0434 A79-35479
DUBOW, J.
An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967
Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011
Review - Thermophysical properties of oil shales
24 p0651 A79-49401
On the design and operation of electrochemical solar cells
24 p0712 A79-53494
DUBOW, J. B.
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSCS/ solar cells
21 p0122 A79-17338
DUCARROIR, M.
Thermodynamic method of studying and optimizing thermochemical cycles of water decomposition at high temperature
23 p0382 A79-32975
DUDDING, C. H.
Sensitivities of outputs to variations of inputs in MHD combustors
23 p0390 A79-33382
DUDKIN, L. D.
Study of diffusion processes in low-temperature thermopiles
21 p0054 A79-13290
DUDLEY, V. E.
Concentrating solar collector test results from DOE/Sandia Collector Module Test Facility
23 p0428 A79-35044
Concentrating solar collector test results, Collector Module Test Facility
[SAND-78-0815] 21 p0208 N79-13522
Performance testing of the Hexcel Parabolic Trough Solar Collector
[SAND-76-0381] 21 p0221 N79-14569
Performance testing of the McDonnell Douglas fresnel lens solar collector
[SAND-78-0625] 23 p0565 N79-24512
Performance testing of the General Atomic Fixed mirror solar concentrator
[SAND-78-0624] 23 p0573 N79-25519
Concentrating solar collector test results from DOE/Sandia collector module test facility
[SAND-78-0881C] 23 p0573 N79-25520
Performance testing of the Del concentrating solar collector
[SAND-79-0515] 24 p0786 N79-32681
DUDT, P. J.
Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455
DUDZIK, M.
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614
DUE AS, F.
A novel photovoltaic panel for low cost power
23 p0510 A79-41006
DUFF, G. F. D.
Tidal power in the Bay of Fundy
22 p0237 A79-20729
DUFF, W. S.
Solar thermal electric power systems - Manufacturing cost estimation and systems optimization
21 p0046 A79-12273
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSCS/ solar cells
21 p0122 A79-17338

Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475
A Markov model of solar energy systems
21 p0138 A79-17476
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483
Solar thermal electric power systems - Comparison of line-focus collectors
22 p0263 A79-23758
Solar heating, cooling and hot water production - A critical look at CCMS installations
22 p0275 A79-25931
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939
A Markov model of solar energy space and hot water heating systems
22 p0295 A79-28353
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0429 A79-36629
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507
Solar evacuated tube collector: Absorption chiller systems simulation
[COO-2577-13] 21 p0209 N79-13530

DUFFEY-ARMSTRONG, M.
A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption
[AD-A067165] 23 p0582 N79-26510

DUFFIE, J. A.
Design of active solar heating systems
21 p0090 A79-15860

DUFFIELD, C.
Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549

DUFFY, J. L.
Preparation and ionic conductivity of H30/+/ beta alumina
21 p0040 A79-11821

DUGAN, V. L.
Dispersed power systems and total energy
[AIAA PAPER 78-1770] 21 p0062 A79-13868
Overview of solar system design and application principles
[SAND-78-2419C] 24 p0726 N79-28762

DUGGER, G. L.
Ocean thermal energy for the 80's
24 p0602 A79-44273
Ocean thermal energy for the 80's; Ocean Thermal Energy Conversion Conference, 6th, Washington, D.C., June 19-22, 1979, Preprints. Volumes 1 & 2
24 p0616 A79-45776
Use of satellite-derived sea surface temperatures by cruising OTEC plants
24 p0625 A79-45945

DUKE, K. M.
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224

DUMAS, L.
Environmental testing of flat plate solar cell modules
23 p0428 A79-35039

DUMONT, R. S.
The Saskatchewan Conservation House - Some preliminary performance results
22 p0318 A79-31417
Energy management through energy conservation in buildings
22 p0320 A79-31431
Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444
Comparison of 100 per cent solar heated residences using active solar collection systems
23 p0477 A79-39106

DUNCAN, C. S.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762

DUNCAN, D. A.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels
[FE-2307-34] 24 p0718 N79-28358
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410

DUNLAP, R. B.
A single insulated sodium conductor for HVDC underwater power transmission
24 p0620 A79-45800

DUNN, B.
Behavior of a sodium-sulfur cell with a dynamic sulfur electrode
23 p0487 A79-40372

DUNN, J. M.
Commercial synchronous alternating-current generators
23 p0580 N79-26482

DUNN, J. R.
A theoretical analysis of solar collector/storage panels
[ASME PAPER 78-WA/SOL-11] 21 p0163 A79-19843

DUNN, P. F.
An overview of liquid metal MHD
22 p0289 A79-27660
Two-phase LMMHD mixer-development experiments
23 p0394 A79-33422
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030

DUNNING, J. S.
High performance lithium/iron disulfide cells
21 p0010 A79-10087

DUNWOODY, J. E.
Resolving the environmental issues in developing fuels from biomass
24 p0664 A79-50877

DUPAS, A.
Photovoltaic cells and their future
23 p0435 A79-35486

DUPLESSIS, M. P.
Computer analysis of coal gasification combined cycle plants
24 p0687 A79-51858

DUPUIS, R. D.
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

DUQUETTE, F.
Testing for commercialization of the central power tower
24 p0660 A79-50460

DURAND, C.
French solar policy - Its extent, its methods, its objectives
23 p0434 A79-35476

DURAND, J. P.
Technology for solar energy utilization
[PB-296572/1] 24 p0802 N79-33598

DURRAN, D. R.
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538

DUSCHA, R. A.
Thermal energy storage for industrial waste heat recovery
21 p0012 A79-10101
Thermal storage for industrial process and reject heat
22 p0243 A79-21300
Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481

The role of thermal energy storage in industrial energy conservation
[NASA-TM-79122] 22 p0368 N79-21550

DUSHMAN, A.
An analysis of operational procedures and design modifications for aircraft fuel conservation
[AIAA 79-1656] 24 p0611 A79-45328

DUSKE, J.
Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

DUTHIL, R.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

DUTRIEU, E.
Behavior of solar generators in low orbits
24 p0752 N79-30766

DUTRUY, B.
The French CNRS 1 MW solar power plant
21 p0141 A79-17498
Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575
The Odeillo solar electric power plant
23 p0524 A79-41807

DUTTA, S.
Rates of coal pyrolysis and gasification reactions
24 p0714 A79-53778

DUTTON, G.
Time, technology and capital - Do we have enough to solve the energy crisis
21 p0097 A79-16100

DUVALL, J. J.
Comparison of shale oils from different sources produced by controlled-state retort
21 p0005 A79-10047

DUVALL, M. D.
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415

DWYER, C.
Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980
[DOE/EIA-0102/20] 24 p0718 N79-28356

DYCK, K.
Dehydration of ethanol - New approach gives positive energy balance
24 p0643 A79-47813

DYKEMA, O. W.
Combustion modification effects on NOx emissions from gas-, oil-, and coal-fired utility boilers
[PB-289878/1] 23 p0545 N79-22661

DYKSTRA, D. I.
Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes
[PB-287800/7] 22 p0344 N79-17365

DZIALO, F. J.
Limit analysis and design of a semi-submerged concrete hull for an ocean thermal differences power plant
23 p0486 A79-40195

DZIERLENGA, P. S.
Sampling and analysis of synthetic fuel processes
22 p0284 A79-26538

DZITOEV, M. S.
Using N2O4 in a solar gas-turbine plant
21 p0167 A79-20357

E

EAKLAND, P.
Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3] 23 p0546 N79-22971

EARLEY, R. F.
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798

EARNEST, E. D.
Combined cycle gas turbine for an automobile application
21 p0019 A79-10157

EASTMAN, G. Y.
Cost effective solar collectors using heat pipes
21 p0014 A79-10115

EATON, W. W.
Solar energy
21 p0147 A79-17648

EBEID, S. M.
Solar cells on R.A.D. polycrystalline silicon
23 p0518 A79-41066

EBY, P. A.
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311

ECCLESTON, D. B.
Ethanol/gasoline blends as automotive fuel
[BETC/RI-79/2] 24 p0767 N79-31423

ECKELS, R. E.
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197
High energy MHD fuels development program
[AD-A060156] 21 p0216 N79-14239

ECKERLIN, H. M.
A methodology for evaluating the effectiveness of energy conservation programs
21 p0072 A79-14684

ECKERT, E. R. G.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973
Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305

ECKHOFF, N. D.
Optimum selection of a wind turbine generator system
[AIAA PAPER 78-1774] 21 p0062 A79-13871
Basic technical and economical aspects of the use of solar energy for pumping irrigation water
21 p0076 A79-14763
Assessment of energy conservation by using alternate energy sources in Kansas
23 p0418 A79-34151

ECKLUND, E. E.
The status of alcohol fuels utilization technology for highway transportation
21 p0003 A79-10035
Survey of liquid hydrogen container technology for highway vehicle fuel system applications
24 p0686 A79-51850
Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189

ECKSTEIN, L.
EPA program status report: Oil shale
[PB-284480/1] 21 p0211 N79-13548

EDDINGER, R. T.
The pyrolysis route to gasification
24 p0688 A79-51860

EDELFELT, I. H.
Regenerative flywheel energy storage system
24 p0678 A79-51783

EDELSON, E.
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658

EDELSTEIN, M. W.
A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions
23 p0590 N79-27546

EDEN, A.
The application of thermography to large arrays of solar energy collectors
22 p0242 A79-21171

EDENBURN, M. W.
Status of the DOE Photovoltaic Concentrator Technology Development Project
23 p0517 A79-41054
Status of the DOE photovoltaic concentrator technology development project
[SAND-78-0948C] 21 p0176 N79-10550

EDESESS, M.
Solar pond concepts - Old and new
24 p0671 A79-51734
Economic and performance comparisons of salty and saltless solar ponds
24 p0671 A79-51737

EDEY, A.
Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549

EDGECOMBE, A. L.
A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199

EDGEL, W. R.
Development of retrofit energy conservation and solar heating systems, phase 1
[PB-295847/8] 24 p0801 N79-33593

EDGERTON, R. H.
The availability of solar energy for work processes
24 p0658 A79-50346

EDIE, D. D.
Heat transfer and calorimetric studies of a direct contact-latent heat energy storage system
22 p0281 A79-26210

EDLER, A.
Design of solar heated warm water heating facilities from an economic viewpoint
23 p0468 A79-38622

EDMONDS, F. C.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699

EDMONDS, J. A.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699

EDMUNDS, S.
The economics of geothermal energy development at the regional level
22 p0256 A79-22756
Geothermal element, Imperial County, California
[PB-287115/0] 22 p0335 N79-16385

EDSINGER, R. W.
SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884

EDWALL, D. D.
High-efficiency AlGaAs/GaAs concentrator solar cells
22 p0261 A79-23710
High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040

EDWARDS, B.
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498

EDWARDS, B. P.
Shading and spacing in paraboloidal collector arrays
21 p0150 A79-18025
Computer based sun following system
22 p0242 A79-21165

EDWARDS, J. A.
Transient analysis and optimization of an extended surface thermal storage unit which utilizes a phase change material
23 p0400 A79-34006

EFTHIMION, P. C.
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452

EGGER, J.
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448

EGGERS-LURA, A.
Solar energy in developing countries: An overview and buyers' guide for solar scientists and engineers
22 p0327 A79-32139
The LN solar/heat pump house at Skive, Denmark
23 p0471 A79-38652

EGGERS, A. G.
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

EGGERS, G. H.
Design, construction, and testing of a Fixed Mirror Solar Concentrator field
21 p0020 A79-10164
Fixed mirror solar concentrator for power generation
[GA-A-14983] 21 p0187 N79-11526

EGGERT, W.
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

EGUREN, J.
Transcell, a novel approach for improving static photovoltaic concentration
21 p0124 A79-17356
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071

EHRENREICH, H.
Solar photovoltaic energy
24 p0667 A79-50909

EHRENSPECK, H.
Oil pollution reports, volume 5, number 2
[PB-287071/5] 22 p0336 N79-16437

EHRICKE, K. A.
A socio-economic evaluation of the lunar environment and resources. II - Energy for the selenosphere
[IAF PAPER 79-A-16] 24 p0711 A79-53419
Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108

EHRLICH, S.
Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems
[ASME PAPER 79-GT-195] 23 p0380 A79-32453

EIBLING, J. A.
The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

EINARSSON, S. S.
Opportunities for direct use of geoheat in Central America and other tropical countries
21 p0097 A79-16074

EISENBERG, L.
Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824

EISENHAURE, D.
Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785
Performance of retainerless bearings for flywheels
24 p0678 A79-51786

EKERN, P. C.
Hawaii solar radiation summary
23 p0398 A79-33985

EKMANN, J. M.
Stability of coal-oil mixtures
[CONF-7805152-1] 23 p0589 N79-27332

EKOUHOHO, A.
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors
21 p0127 A79-17380

EKROTH, I. A.
Thermodynamic evaluation of heat pumps working with high temperatures
24 p0697 A79-51965

EKSTEDT, T. W.
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610

EL DERINI, M. N.
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536

EL GABALAWI, N.
Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173

EL SAWI, M.
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591

EL-DERINI, Z.
Two-dimensional MHD channel design
22 p0279 A79-26183

EL-GABALAWI, N.
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503

EL-GABALY, M.
Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343
EL-WADI, A.
Effect of scrape-off on tokamak radial transport
24 p0640 A79-47427
EL-SAWY, A.
A quantitative comparison of energy costing methods
24 p0651 A79-49475
EL-WAKIL, M. M.
An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398
Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors
22 p0281 A79-26206
ELCHAK, T. L.
Water/energy management and evaluation model for Pennsylvania
[PB-287577/1] 22 p0343 N79-17353
ELCOCK, D.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844
ELDERKIN, C. E.
Program overview for the wind characteristics program element of the United States Federal Wind Energy Program
23 p0482 A79-40108
Program overview for the Wind Characteristics Program Element of the United States Federal Wind Energy Program
23 p0534 A79-43376
ELDREDGE, L. L.
Tracking high temperature collectors
21 p0090 A79-15856
ELEFTHERIADES, C. M.
Multistage fluidised coal combustor
24 p0688 A79-51864
ELEMELACH, M.
Heat transfer characteristics of porous metallic matrix metal-hydrides
22 p0251 A79-21706
ELGABALAWI, N.
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
ELISEEV, V. B.
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356
ELIZALDE, E.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311
ELKINS, L. E.
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654
ELKINS, R. H., III
Hartmann flows in the MHD generator configuration
[AD-A070080] 24 p0793 N79-33036
ELKO, D. G.
Design, instrumentation, and calibration of a vertical axis wind turbine rotor
[TID-27754] 21 p0174 N79-10533
ELLINGSON, W. A.
Materials technology for coal-conversion processes
[ANL-79-2] 24 p0719 N79-28362
ELLIOT, D. C.
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
ELLIOTT, D. C.
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179
ELLIOTT, G. R. B.
Underground thermal generation of hydrocarbons from dry, southwestern coals
21 p0005 A79-10050
Electrochemical engines for power generation and load-leveling at sites for underground coal conversion
21 p0005 A79-10051
ELLIOTT, R. C.
Review of industrial participation in the ANL lithium/iron sulfide battery development program
21 p0010 A79-10086
ELLIS, M. J.
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543
ELLIS, P. F.
Materials selection guidelines for geothermal power systems, first edition
[ALC-3904-1] 24 p0727 N79-28772
ELLIS, W. E.
Heat rejection development requirements for orbital power systems
24 p0692 A79-51924
ELLISON, W.
Simultaneous nitrogen oxides and sulfur dioxide removal by absorption-reduction scrubbing
21 p0066 A79-14125
ELLWERTH, L.
Energy research and development in Sweden, 1978-1981
[DFE-13] 24 p0728 N79-28781
ELMS, R. V., JR.
Family of solar array design options
23 p0500 A79-40914
ELSNER, N. B.
Suppression of vaporization in copper-silver-selenide thermoelectric materials
21 p0027 A79-10224
Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator
24 p0699 A79-51979
ELSTON, L. W.
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222
ELTGROTH, M. W.
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements
24 p0612 A79-45532
EMARD-KATSONIS, F.
A WELMM comparison of energy scenarios
24 p0645 A79-48025
EMERSON, F.
Fact sheet: Forecasted automobile gasoline consumption
[DOE/EIA-0102/1] 24 p0746 N79-30402
EMERSON, P. F.
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones
24 p0630 A79-46306
EMETS, P. P.
Ways of improving steam-gas power plants
22 p0299 A79-29298
EMMER, R. E.
Environmental considerations and the geothermal energy resource in Louisiana
24 p0667 A79-50898
EMREN, A. T.
Salinity power station at the Swedish west-coast - Possibilities and energy-price for a 200 MW-plant
21 p0077 A79-14772
ENDER, A. IA.
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940
ENDER, R. L.
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970
ENDO, M.
Fabrication and characterization of SnO2/n-Si solar cells
24 p0642 A79-47802
ENGELMANN, F.
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852
ENGHOLM, G.
Performance of vacuum tube solar collector systems
21 p0102 A79-16424

ENGIBA, R. N.
Design fabrication and testing of three meter diameter parabolic dish heliostat system
21 p0135 A79-17447

ENGLAND, C.
Continuous extrusion of coal
22 p0282 A79-26372

ENGLAND, G. C.
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742

ENGLAND, P. C.
Continental geotherms during the Archaean
22 p0269 A79-24620

ENGLANDER, I.
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040

ENGLE, W. W.
The MOD-2 wind turbine
24 p0635 A79-46542

ENGLISH, J. M.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

ENGLISH, R. E.
Alternative power-generation systems
21 p0169 N79-10129

ENSOR, D. S.
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0796 N79-33352

EPLER, J. L.
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923

EPPERLY, W. R.
Exxon Donor Solvent coal liquefaction process development
21 p0007 A79-10060
Status and outlook of the Exxon Donor Solvent coal liquefaction process development
21 p0092 A79-15889
EXXON donor solvent coal liquefaction process
23 p0553 N79-27618

EPPICH, J. D.
Cogeneration with digester gas
24 p0676 A79-51773

EPSTEIN, M.
Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416

ERCEGOVIC, D. B.
Effect of swirler-mounted mixing venturi on emissions of flame-tube combustor using jet A fuel
[NASA-TP-1393] 21 p0215 N79-14099

ERDMAN, A. G.
Design of flywheel rotors utilizing cellulosic materials
24 p0678 A79-51787

ERGUN, S.
Coal classification and characterization
24 p0714 A79-53777

ERICSON, R. E.
Selenide thermoelectric converter technology
21 p0026 A79-10221

ERMAK, D. L.
A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262

ERNEST, F. P.
Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells
21 p0042 A79-11955
Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells
23 p0515 A79-41044

ERNST, D. M.
Cost effective solar collectors using heat pipes
21 p0014 A79-10115
NEP heat pipe radiators
24 p0700 A79-51985

ERNST, E. M.
Preliminary design of solar total energy - Large scale experiment at Shenandoah, Georgia
[AIAA PAPER 78-1776] 21 p0062 A79-13873
Background and system description of the Mod 1 wind turbine generator
22 p0239 A79-20825

ERTEKIN, T.
Numerical simulation of the compaction-subsidence phenomena in a reservoir for two-phase nonisothermal flow
23 p0540 N79-22401

ERTEL, D.
Photovoltaic conversion - Can its efficiency be improved through the application of color response data
23 p0402 A79-34025

ERZA, D.
Coal yesterday and tomorrow
24 p0652 A79-49516

ESBENSEN, T. V.
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0138 A79-17471
CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940
A low energy house in Sweden heated by a solar energy system with heat pump
23 p0471 A79-38650

ESCH, F. H.
Orbital antenna farm power systems challenges
24 p0690 A79-51892

ESCHER, W. J. D.
New energy from an old source - Hydrogen from falling water
21 p0015 A79-10129
Direct Solar Energy Conversion at Sea /DSECAS/ - Characteristics of a baseline concept
23 p0402 A79-34026
Dedicated nuclear facilities for electrolytic hydrogen production
24 p0614 A79-45592
Survey of liquid hydrogen container technology for highway vehicle fuel system applications
24 p0686 A79-51850
Toward the renewables - A natural gas/solar energy transition strategy
24 p0686 A79-51851
Hydrogen from existing falling-water sites: An initial feasibility assessment (summary)
[CONF-781142-8] 24 p0718 N79-28360

ESINGER, A. W.
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883

ESKESEN, J. H.
A comparison of the performance of steam turbine cycles using gas contaminated geothermal steam
[ASME PAPER 78-WA/ENER-3] 21 p0159 A79-19776

ESPINOLA, A.
Study of the electrochemical activity of a porous vitreous carbon
23 p0389 A79-33264

ESPY, P. N.
Solar thermal collectors using planar reflector
21 p0131 A79-17412

ESSENHIGH, R. H.
Coal combustion
24 p0714 A79-53779

ESSENWANGER, O. M.
Frequency distribution of wind speed near the surface
21 p0165 A79-20139
On solar energy heating and degree days during the winter months
24 p0610 A79-45226

ESTES, J. E.
Distributed parameter modelling of urban residential energy demand 24 p0657 A79-50218

ESTEVE, D.
Concentrated silicon solar cells: Basic design - Application example 23 p0384 A79-32970
Analysis of a 1 kW photovoltaic generator with concentration 23 p0466 A79-38604

ETIEVANT, C.
Solar power plants. I - Present programs and outlooks 23 p0434 A79-35481
Solar power plants. II - Economic aspects of solar power towers 23 p0435 A79-35482

EUBANK, H.
Measurement of the neutron spectra from beam-heated PLT plasmas 23 p0478 A79-39724

EUNSON, E. M.
Initial thoughts on the transmission implications of large wave power complexes 23 p0455 A79-37916

EUSTIS, R. H.
Coal slag effects in MHD generators 21 p0080 A79-14934

EVA, V.
On the problem of heat transfer in low-temperature heat pipes 23 p0532 A79-42938

EVANS, A. K.
Atlas of western surface-mined lands: Coal, uranium, and phosphate [PB-287846/0] 22 p0340 N79-17311

EVANS, A. R.
Evaluation of selected near-term energy-conservation options for the midwest [ANL/EES-TM-41] 24 p0756 N79-30803

EVANS, D.
Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning [NASA-CR-162331] 24 p0804 N79-34074

EVANS, D. L.
A modified single diode model for high illumination solar cells for simulation work 23 p0518 A79-41061
Combined photovoltaic/thermal system studies [SAND-78-7031] 24 p0787 N79-32691

EVANS, D. V.
A theory for wave-power absorption by two independently oscillating bodies 21 p0151 A79-18103
The oscillating water column wave-energy device 22 p0252 A79-22223
A theory for wave-power absorption by two independently oscillating bodies 22 p0259 A79-23307

EVANS, J. C., JR.
Solar cells having integral collector grids [NASA-CASE-LEW-12819-1] 21 p0182 N79-11467
Solar cell collector and method for producing same [NASA-CASE-LEW-12552-2] 21 p0182 N79-11472

EVANS, R. A.
Oil shale retorting - A correlation of selected infrared absorbance bands with process heating rates and oil yield 22 p0304 A79-29975

EVANS, R. D.
An inexpensive multiplexer temperature measuring system for monitoring and evaluation of solar collectors 21 p0089 A79-15847
Feasibility of retrofitting health care and correctional institutions in Florida with solar water heating systems 24 p0608 A79-45207
The economics of solar domestic hot water systems in state university and community college buildings 24 p0610 A79-45227

EVDOKIMOV, V. M.
New models of solar cells and prospects for their optimization 21 p0166 A79-20346
Optimization of exponential alloying impurity distribution in semiconductor photoconverter base 24 p0636 A79-46759

EVERETT, C.
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12 [DOE/EIA-0102/32] 23 p0589 N79-27337
Midterm oil and gas supply modeling system methodology description [DOE/EIA-0103/17] 23 p0600 N79-28059
Factors affecting the decline rate of old oil production [DOE/EIA-0102/29] 24 p0720 N79-28652

EVSEEV, V. S.
Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/ 24 p0636 A79-46757

EVTUHOV, V.
Parametric cost analysis of photovoltaic systems 23 p0477 A79-39102

EWAN, J.
GaAs solar cells for high solar concentration applications 23 p0514 A79-41039

EWASHINKA, J. G.
Discharge characteristics of 300 ampere-hour Ni-Zn traction cells [NASA-TM-79244] 24 p0772 N79-31781

EWE, H.
Hydrogen production by conventional and modified water electrolysis 21 p0059 A79-13659
Generation of electrical energy from hydrogen and oxygen by means of fuel cells 21 p0059 A79-13662
Hydrogen production with the ELOFLUX electrolysis cell 23 p0469 A79-38631

EWE, H. H.
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation 23 p0466 A79-38603

EWING, J.
Performance prediction evaluation of ceramic materials in point-focusing solar receivers [NASA-CR-158774] 23 p0594 N79-27654

EYNON, R. T.
The conceptual basis of the electric utility sub-model of Project Independence Evaluation System 24 p0616 A79-45764

EZZ, M.
Optimization of power absorption from sea waves 23 p0486 A79-40199

F

FABICK, L. B.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells 23 p0499 A79-40907

FABRE, E.
Solar cells on R.A.D. polycrystalline silicon 23 p0518 A79-41066
Solar cells made from polycrystalline silicon [LEP-78/519-679-D] 24 p0743 N79-29669

FABRIS, G.
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator [ASME PAPER 78-WA/HT-33] 21 p0161 A79-19814
Two-phase LMMHD mixer-development experiments 23 p0394 A79-33422
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation 23 p0527 A79-42030
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator 24 p0708 A79-52957
Experimental two-phase liquid-metal magnetohydrodynamic generator program [AD-A059240] 21 p0197 N79-12564

FACEY, J.
DOE stationary external combustion engine program - Status report 24 p0689 A79-51882

FACINELLI, W. A.
A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061
Combined photovoltaic/thermal system studies
[SAND-78-7031] 24 p0787 N79-32691

FAEHN, D. D.
Military applications of photovoltaic systems
23 p0571 N79-25494

FAFARMAN, L. M.
Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26208

FAGEN, E. A.
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927

FAGNONI
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708

FAHRENBRUCH, A. L.
Heterojunction phenomena and interfacial defects in photovoltaic converters
23 p0438 A79-36150
Recent investigations of metal oxide/CdTe heterojunction solar cells
23 p0502 A79-40926

FAHY, L. J.
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043

FAIMAN, D.
Concentrator cost bound for high-efficiency photovoltaic power production
23 p0440 A79-36637

FAIRBANKS, J. W.
Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041

FAIRFIELD, J. J.
Underground pumped hydro storage - An evaluation of the concept
24 p0679 A79-51793

FAITH, T. J.
High-temperature contacts for silicon solar cells
23 p0502 A79-40934

FAN, B.
Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981

FAN, J. C. C.
Selective-black absorbers using sputtered cermet films
22 p0327 A79-31969
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685
High-efficiency GaAs shallow-homojunction solar cells
23 p0515 A79-41041
Shallow-homojunction GaAs solar cells
24 p0785 N79-32666

FANCHI, J. R.
Manmade geothermal energy
23 p0408 A79-34072

FANG, C. S.
New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798

FANG, R. C. Y.
A theoretical analysis of the current-voltage characteristics of solar cells
[NASA-CR-158872] 24 p0737 N79-29606

FANINGER, G.
Solar energy activities in Austria
21 p0117 A79-17283
Thermal utilization of solar energy in Austria. Part 1: Hot water preparation, swimming pool and space heating
23 p0574 N79-25529

FANNING, D. N.
Frequency analysis of a thick-rim flywheel
[ORNL/TM-5804] 24 p0781 N79-32555

FARAG, I. H.
Computer modelling of solar energy collection
23 p0398 A79-33986

FARAHAT, M. M.
Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366

FARBER, E. A.
The design and evaluation of a hydraulic-solar powered tracking device
21 p0136 A79-17458
Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479
An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481

FARBER, P. S.
Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808

FARDMAN, G. H.
The Westinghouse Sulfur Cycle Hydrogen Production Process
24 p0614 A79-45591

FARFALETTI-CASALI, F.
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950

FARGO, V.
Experimental demonstration of heat-to-electricity conversion within a dielectric
24 p0698 A79-51975

FARIA, L. J.
The IAE 30-kW wind turbine - A review of the aerodynamic design
23 p0387 A79-33240

FARIBORZI, M.
Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660

FARLEY, F. J. M.
A wave power machine using free floating vertical plates
21 p0151 A79-18104

FARMER, E. D.
The integration of a complex of wind-driven generators into a power system
23 p0454 A79-37913

FARMER, E. W.
Tuned Sphere Stable OTEC Platform
24 p0620 A79-45802

FARMER, R.
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337
Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40] 24 p0746 N79-30403

FARMER, R. C.
Combustion kinetics of selected aromatic hydrocarbons
[AD-A059381] 21 p0215 N79-14184

FARO, A.
A new approach for solar energy systems design by means of the sensitivity theory
23 p0448 A79-37849

FAROOQUE, M.
Hydrogen production from coal, water and electrons
23 p0445 A79-37072

FAROUQ-ALI, S. M.
A numerical model of underground coal gasification for air-water injection into a permeable bed
24 p0689 A79-51867

FARQUHAR, J.
Non-electric applications of geothermal energy in six Alaskan towns
[IDO-1622-4] 21 p0208 N79-13523

FARRELL, J. O.
A distributed microcomputer-based control system for a large scale solar total energy system
24 p0672 A79-51741

FARRELL, K. W., JR.
A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0294 N79-13474

FARRELL, R. A.
Development of an industrial gas turbine combustor burning a variety of coal-derived low Btu fuels and distillate
[ASME PAPER 79-GT-172] 23 p0379 A79-32433

FARRELLY, P. J.
The impact of oil price increases on the competitiveness of non-conventional energy technologies
23 p0419 A79-34162

FARRINGTON, G. C.
Preparation and ionic conductivity of H3O/+/ beta alumina
21 p0040 A79-11821

FARRIS, D. R.
Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

FARRIS, P.
Venture analysis case study for on-site fuel cell energy systems
[FCR-0783-VOL-1] 22 p0361 N79-20505

FARUKHI, S.
The array automated assembly task for the low cost solar array project, phase 2
[NASA-CR-158538] 23 p0560 N79-24469

FAUGHNAN, B. W.
Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068

FAUST, B.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

FAVRE, O.
Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962

FAXEN, T.
Wake interaction in an array of windmills - Theory and preliminary results
23 p0483 A79-40112

FAY, H.
Photoelectrolysis of water with semiconductors
22 p0259 A79-23343

FAYARD, C.
Thin film solar collectors for material science experiments in space
[IAF PAPER 79-202] 24 p0710 A79-53353

FAYET, P.
Solar photovoltaic energy
23 p0524 A79-41809

FEAIRHELLER, W. R.
Analysis of the emissions from storage tanks during JP-4 fuel transfer operations. Phase 1: Warm weather conditions
[AD-A069339] 24 p0732 N79-29364

FEDERMANN, E. F.
Potential for stand-alone photovoltaic on-site total-energy residential systems
23 p0516 A79-41050

FEDIANIN, O. I.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

FEDORCHENKO, I. M.
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896

FEDOROVA, M. P.
Radiation regime of inclined surfaces
22 p0282 A79-26353

FEDORS, R. F.
Compatibility of elastomers in alternate jet fuels
[NASA-CR-159773] 23 p0588 N79-27321

FEDORUS, G. A.
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

FEDOSOVA, G. B.
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50701

FEDUSKA, W.
Potential for stand-alone photovoltaic on-site total-energy residential systems
23 p0516 A79-41050
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079

FEINBERG, A.
Thermal power systems small power systems applications project. Decision analysis for evaluating and ranking small solar thermal power system technologies. Volume 1: A brief introduction to multiattribute decision analysis
[NASA-CR-158425] 22 p0368 N79-21548

FEINDLER, K. S.
308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city
23 p0489 A79-40397

FEINGOLD, E.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

FEINGOLD, H.
Is there repair after failure
21 p0086 A79-15378

FEJER, A. A.
Wind energy conversion
21 p0091 A79-15870

FELDER, R. M.
A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0419 A79-34156
Polymeric interfaces for stack monitoring
[PB-294997/2] 24 p0761 N79-30866

FELDMAN, K. T.
Theoretical analysis of a passive heat pipe heating and cool system
[PB-296066/4] 24 p0792 N79-32736

FELDMAN, P. L.
High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249

FELDMANN, W. L.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966

FELIX, P. C.
The role of corrosion in modern gas turbines
24 p0647 A79-48912

FELL, B.
Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

FELLHAUER, C.
Review of selected solar market studies and techniques
[SERI/PR-52-076] 23 p0600 N79-28056

FELLING, W. E.
Coal research: Data systems and information transfer
[ORAU-133] 21 p0232 N79-15830

FELLS, I.
Energy today and tomorrow
22 p0341 N79-17326

FELS, M. F.
Breakdown of rapid rail energy costs - A study of three systems
21 p0068 A79-14323

FELSKE, J. D.
Analysis of an evacuated cylindrical solar collector
24 p0642 A79-47800

FELTNER, W. R.
Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23540-1] 23 p0579 N79-26475

FELTON, G. W.
Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels
[FE-2321-12] 21 p0216 N79-14240

FENDER, D. A.
A theoretical analysis of solar collector/storage panels
[ASME PAPER 78-WA/SOL-11] 21 p0163 A79-19843

FENG, K. L.
A practical technique for basic windmill design
23 p0387 A79-33238

FENG, T.
Merocyanine organic solar cells
21 p0165 A79-20216
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells
22 p0272 A79-25069
Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945
Barrier heights and interfacial effects in SnO2/Si solar cells
23 p0505 A79-40965
Efficient electron-beam-deposited ITO/n-Si solar cells
24 p0629 A79-46152
Spray-deposited high-efficiency SnO2/n-Si solar cells
24 p0629 A79-46201
Stability of SnO2/n-Si solar cells
24 p0655 A79-50187

FENTON, H. A.
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Design development and implementation of data acquisition systems for photovoltaic tests and applications project
[COO-4094-24] 23 p0596 N79-27672
Mead 25 kilowatt photovoltaic system
[COO-4094-19] 23 p0596 N79-27677

FENTON, J. E.
An air/fuel control system for the Stirling engine
[SAE PAPER 790328] 22 p0315 A79-31369

FENTON, R.
Solar space heaters for low-income families
[PB-289244/6] 22 p0363 N79-20526

FEOKTISTOV, L.
Laser and energetics of the future
[UCRL-TRANS-11467] 24 p0734 N79-29513

FEOKTISTOV, L. P.
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

FERBER, R. R.
JPL - Small Power Systems Applications Project
21 p0019 A79-10161
Solar thermal power plants in small utilities - An economic impact analysis
24 p0675 A79-51761

FERGUSON, B. K.
Regional analysis of potential water power
21 p0148 A79-17825

FERGUSON, F. A.
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574

FERNANDES, J. H.
Solid waste and coal firing in industrial boilers
21 p0096 A79-15918

FERNELIUS, W. A.
East Mesa geothermal test site
22 p0259 A79-23458

FERRAGLIO, R.
Proton radiation effects on Cr-MIS single-crystal Si solar cells
24 p0605 A79-44715

FERRARA, A. A.
Thermal energy storage heat exchanger design
[ASME PAPER 78-ENAS-30] 21 p0049 A79-12579

FERRARO, R. J.
EPRI/TVA pilot electric vehicle demonstration program
[SAE PAPER 790110] 22 p0314 A79-31357

FERREIRO, A.
Eighty atmospheres in reserve
23 p0436 A79-35830

FERRELL, G. C.
Strategies for alternative energy sources
23 p0421 A79-34173

FERRELL, J. K.
A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0419 A79-34156

Polymeric interfaces for stack monitoring
[PB-294997/2] 24 p0761 N79-30866

FERTIS, D. G.
Evaluation of urethane for feasibility of use in wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497

FETKOVICH, J.
Recent developments in the foam OTEC system
24 p0623 A79-45832

FEU, A.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311

FEUCHT, D. L.
Photovoltaic research and development status
23 p0571 N79-25495

FEUERMANN, D.
Evaluation of a sodium heat pipe/thermal energy storage unit utilizing LiF-MgF2-KF phase change material
[AIAA PAPER 79-1095] 23 p0462 A79-38565

FEUSTEL, J. E.
Exploitation of solar energy via modular power plants and multiple utilization of waste heat
21 p0141 A79-17497

FICKETT, A. P.
Fuel cell electrocatalysis - Where have we failed
21 p0039 A79-11810
Fuel-cell power plants
21 p0068 A79-14398

FIDONE, I.
Non-thermal emission at the plasma frequency
22 p0270 A79-24854

FIEGL, G.
LSA large area silicon sheet task continuous liquid feed Czochralski growth
[NASA-CR-158366] 22 p0357 N79-20281

FIELDING, P. J.
Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939

FIELDING, S. J.
Review of results from DITE tokamak
21 p0069 A79-14456

FIGARD, R. L.
Flowfield measurements in the vicinity of the rotor of a 10 kw windmill
[AIAA PAPER 79-0969] 23 p0475 A79-38889

FILE, J.
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

FILIPPOV, N. V.
Structure of the current shell in a Z pinch
22 p0245 A79-21434

FILLO, J.
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
The fast power cycle for fusion reactors
21 p0018 A79-10152
Advanced synfuel production with fusion
24 p0695 A79-51947

FILLO, J. A.
Advanced synfuel production with fusion
[BNL-26130] 24 p0780 N79-32388

FILLO, J. P.
Equipment and strategy for environmental sampling of complex coal gasification process streams
24 p0688 A79-51862

FILSON, F. E., JR.
Controls for heat reclaim with thermal storage coupled with solar heating
21 p0102 A79-16420

FINDLEY, C. E.
A methodology for evaluating the potential materials and energy recovery from municipal solid waste
21 p0215 N79-13935

FINE, K.
Electromagnetic propulsion alternatives
[AIAA PAPER 79-1400] 23 p0426 A79-34840
Electromagnetic launchers
24 p0702 A79-52006

FINEGOLD, J. G.
A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199

Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

FINETTI, M.
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003

FINIELS, G.
Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962

FINK, J. H.
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

FINKE, R. C.
Power management and control for space systems
21 p0170 N79-10134

FINKELSTEIN, T.
Balanced compounding of Stirling machines
21 p0024 A79-10200

FINKENTHAL, M.
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge
24 p0706 A79-52537

FINSTERWALDER, K.
OTEC 100-MWe alternate power systems study
24 p0623 A79-45831

FIORATO, A. E.
Development of a lightweight concrete for OTEC cold water pipes
24 p0622 A79-45823

FIREBAUGH, M. W.
Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/
21 p0147 A79-17646

FISCH, M.
A parametric investigation on flat-plate solar collectors
21 p0128 A79-17391
Transient behaviour of solar flat plate collectors
23 p0467 A79-38612

FISCHBACH, P. E.
25 kilowatt photovoltaic powered irrigation and grain drying experiment
21 p0143 A79-17519

FISCHBEIN, W.
Environmental interaction implications for large space systems
23 p0552 N79-24027

FISCHER, A. K.
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564

FISCHER, H.
Carrier lifetime in silicon and its impact on solar cell characteristics
23 p0437 A79-36148

FISCHER, J.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

FISCHER, J. W.
Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371

FISCHER, L. S.
Stratification effects in the short and long term storage of solar heat
21 p0121 A79-17326

FISCHER, P.
Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

FISCHER, R.
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

FISCHER, R. D.
The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

FISCHER, S.
Regulation and control concepts for the possibilities of a utilization of solar energy in the low-temperature range
22 p0305 A79-30345

FISCHER, W.
The sodium/sulfur battery - A storage battery for peak load adjustment and electric traction
21 p0165 A79-20244
Recent advances in Na/S cell development - A review
22 p0246 A79-21488
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836

FISCHL, R.
Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477

FISCUS, D. E.
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115

FISHER, A.
Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210

FISHER, E. R.
Conceptual design of a solar powered closed-cycle gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370

FISHER, G. L.
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595

FISHER, S. T.
Electrical induction heating of solid fossil fuels in situ - Some estimates
22 p0304 A79-30215
Fuel release from solid fossil-fuel deposits by electrical induction heating
23 p0446 A79-37285
Electrical induction heating - A new approach to underground coal gasification
24 p0708 A79-52953

FISHER, W. H.
Some environmental impacts of resource recovery systems
24 p0665 A79-50885

FISHMAN, C.
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells
22 p0272 A79-25069
Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945
Barrier heights and interfacial effects in SnO2/Si solar cells
23 p0505 A79-40965
Efficient electron-beam-deposited ITO/n-Si solar cells
24 p0629 A79-46152
Spray-deposited high-efficiency SnO2/n-Si solar cells
24 p0629 A79-46201
Stability of SnO2/n-Si solar cells
24 p0655 A79-50187

FISHMAN, B. H.
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems
24 p0640 A79-47573

FITZPATRICK, G. O.
Thermionic power plant design point selection - The economic impact
21 p0025 A79-10214
Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921
Thermionics and its application to the SPS
21 p0109 A79-16616

ZEPO - The worlds largest thermionic converter
24 p0699 A79-51982
Power coupling alternatives for the NEP thermionic power system
[NASA-CR-158372] 22 p0367 N79-21547

FITZSIMMONS, G. W.
Applicability of solid state microwave technology to solar power satellites
24 p0655 A79-51345

FIVEL, H. J.
Liquid metal heat pipe performance in the presence of a transverse magnetic field
[ASME PAPER 78-ENAS-20] 21 p0048 A79-12569

FLANAGAN, C. A.
Four ignition TNS Tokamak reactor systems: Design summary
[ORNL/SUB-7117/25] 21 p0193 N79-11389

FLANAGAN, T. B.
Hydrogen storage by LaNi5 - Fundamentals and applications
21 p0038 A79-11803
Thermodynamics of metal, alloy and intermetallic/hydrogen systems
22 p0248 A79-21680
Kinetics of hydrogen absorption and desorption
22 p0248 A79-21687

FLANDERS, A. F.
Selected areas of aerospace technical applications to civil engineering
23 p0397 A79-33925

FLANIGAN, E. E.
Field experience with the Detroit Diesel Allison 404/505 industrial gas turbine engines
[SAE PAPER 790129] 22 p0314 A79-31361

FLAT, A.
The potential of np GaAs solar cells for high efficiency concentrator applications
24 p0705 A79-52325
Studies of AlGaAs-GaAs solar cells
24 p0797 N79-33558

FLECHON, J.
Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960

FLECK, J. J.
Accounting for intangibles in a present worth comparison of advanced power generation alternatives
23 p0461 A79-38500

FLEISCHMANN, C. W.
Electric vehicle battery development
[SAE PAPER 790158] 22 p0314 A79-31363

FLEISCHMANN, R.
Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813

FLEMING, D. K.
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0590 N79-27342

FLEMING, E. S.
Development of combustion data to utilize low-Btu gases as industrial process fuels
[FE-2489-30] 23 p0576 N79-26143
Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner
[FE-2489-36] 24 p0755 N79-33340

FLEMING, H.
Performance estimation of a total energy domestic heat pump
23 p0449 A79-37854

FLEMING, J. R.
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158082] 22 p0333 N79-16365
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project
[NASA-CR-158732] 23 p0586 N79-26979

FLEMING, W. S.
Solar energy systems and life cycle cost
23 p0474 A79-38672

FLETCHER, E. A.
Solar energy storage as hydrogen and bromine from hydrogen bromide
22 p0265 A79-24045

FLETCHER, L. S.
Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38045

FLIAGIN, V. A.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

FLICKINGER, M. C.
Fuels and chemicals from biomass
24 p0631 A79-46313

FLING, R. B.
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575

FLINSENBERG, H. J.
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

FLORES, F. J.
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28349

FLORSCHUETZ, L. W.
Extension of the Hottel-Whillier model to the analysis of combined photovoltaic/thermal flat plate collectors
23 p0439 A79-36633

FLOWER, J. O.
Wave-tank experiments on an immersed parallel-plate duct
22 p0258 A79-23306
Design and experimental testing of a fully-submerged model wave-power convertor
23 p0396 A79-33767
Simulation studies of the basic non-linear effects of wave-energy conversion by an overtopping water-column
23 p0480 A79-39845

FLOWERS, A.
Direction of gas supply research in the US
22 p0340 N79-17320

FLYNN, T. S.
An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California
[PB-293031/1] 23 p0585 N79-26562

FOERSTER, S.
The potential of fusion reactors as process heat source
22 p0284 A79-26624

FOGAROLI, R. P.
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

FOGELSON, S.
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

FOGLER, H. S.
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348

FOH, S. E.
A copper oxide-copper sulfate water-splitting cycle
21 p0015 A79-10128
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13974
An evaluation of integrated coal gasification/water-splitting processes
23 p0411 A79-34094
Dedicated nuclear facilities for electrolytic hydrogen production
24 p0614 A79-45592

FOKIN, IU. A.
Determination of the design states of a complex system in evaluating the reliability of electrical power supply
24 p0646 A79-48826

FOKIN, V. G.
Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

FOLEY, D.
Conservation where it counts: Energy management systems
[PB-289837/7] 22 p0372 N79-21628

FOLLEA, D.
Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970
Analysis of a 1 kW photovoltaic generator with concentration
23 p0466 A79-38604

FOLSOM, B. A.
Environmental assessment of a coal-fired open-cycle MHD power plant
24 p0701 A79-51993
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610

FOLSOM, D.
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236

FOLSTAD, S.
Venture analysis case study for on-site fuel cell energy systems
[FCR-0783-VOL-1] 22 p0361 N79-20505

FONASH, S. J.
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988

FONG, F. K.
Heat transfer simulation in underground coal liquefaction
23 p0555 N79-24292

FONG, W. S.
Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals
[TID-29093-VOL-5] 24 p0719 N79-28361

FORD, F. E.
Battery workshop
21 p0170 N79-10143
Accelerated test program
22 p0370 N79-21577

FORD, J. M.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

FORDYCE, J. S.
Technology status: Batteries and fuel cells
21 p0170 N79-10132

FORDYCE, S. W.
Applications of free-space microwave power transmission
24 p0652 A79-49487

FOREMAN, K. M.
Experimental demonstration of the Diffuser Augmented Wind Turbine concept
21 p0029 A79-10238
Fluid dynamics of diffuser-augmented wind turbines
22 p0238 A79-20798
Diffuser designs for improved wind energy conversion
22 p0279 A79-26182

FOREST, J.
Modification and evaluation of a small station wagon designed for transportation of the handicapped
[PB-295106/9] 24 p0763 N79-31107

FORESTIERI, A. F.
Endurance testing of first generation /Block I/ commercial solar cell modules
23 p0512 A79-41022

FORMAN, S. E.
Field testing and evaluation of PV module performance
23 p0496 A79-40885
Measuring dirt on photovoltaic modules
23 p0533 A79-43283

FORNER, W.
The economics of electric power generation from wind energy
22 p0310 A79-30998

FORNALLAZ, P. A.
Conditions for the use of solar energy
23 p0473 A79-38669

FORREST, M. J.
Review of results from DITE tokamak
21 p0069 A79-14456

FORRESTER, R. C., III
Alternatives for coal based power generation - An international overview
21 p0008 A79-10074
In situ gasification - Recovery of inaccessible coal reserves
23 p0411 A79-34093

FORSTER, L. L.
History and development of condensers at the Geysers geothermal power plant
[ASME PAPER 78-JPGC-PWR-18] 21 p0150 A79-18099

FORSYTH, J. B.
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335

FORT, T., JR.
Recent developments in the foam OTEC system
24 p0623 A79-45832
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839
Multiple staging of the cold water in the open cycle OTEC Systems
24 p0624 A79-45840

FORTE, C.
Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

FORTUNATO, B.
Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179

FORTUNE, C. R.
The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil
21 p0156 A79-19219

FOSS, A. S.
A new power cycle that combines power generation with energy storage
21 p0004 A79-10040

FOSS, R. L.
Fuel conservative subsonic transport
22 p0337 N79-16874

FOSSUM, A. F.
On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns
24 p0680 A79-51798

FOSSUM, J. G.
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426
Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529

FOSTER, R. W.
Direct Solar Energy Conversion at Sea /DSECAS/ - Characteristics of a baseline concept
23 p0402 A79-34026
Assessment of hydrogen-fueled intercity trucking and rail transportation
24 p0615 A79-45601
Estimates of New Mexico's future oil production including reserves of the 50 largest pools
[PB-291780/5] 23 p0540 N79-22597

FOUGERE, L. F.
Repowering of a small utility - A unique solution to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332

FOULETIER, M.
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480

FOWLER, C. F.
Biological solar energy conversion approaches to overcome yield stability and product limitations
[PB-284823/2] 21 p0199 N79-12577
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations
[PB-286487/4] 21 p0230 N79-15422

FOX, G. R.
Advanced power cycles and their potential for electrical energy generation
23 p0424 A79-34457

FRAAS, A. P.
Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-32] 21 p0220 N79-14564
Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-33] 21 p0221 N79-14575

FRAAS, L. M.
Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029

FRAENKEL, D.
The potential of zeolite molecular sieves as hydrogen storage media
23 p0415 A79-34123

FRAENKEL, P. L.
Tidal and river current energy systems
23 p0449 A79-37862

FRAILE, J.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071

FRAIZE, W.
Coal-fired gas turbine power cycles with steam injection
21 p0004 A79-10042

FRAME, E. A.
US Army/Environmental Projection Agency re-refined engine oil program
[AD-A056806] 21 p0171 N79-10216
High sulfur fuel effects in a two-cycle high speed army diesel engine
[AD-A059534] 21 p0216 N79-14232
Direct utilization of crude oil as fuel in the US Army four-cycle diesel engine, model LDT-465-1C
[AD-A062387] 22 p0357 N79-20279

FRAME, J. D.
An information approach to examining developments in an energy technology - Coal gasification
23 p0523 A79-41375

FRANCESCHI, J.
Recent developments in pressurized fluidized bed coal combustion research
[AIAA PAPER 79-0190] 21 p0157 A79-19589

FRANCIA, G.
Regulation of the water steam cycle in a solar receiver
24 p0603 A79-44296

FRANCIS, M. S.
The development of a laser Doppler velocimetry system for unsteady separated flow research: Preliminary results
[AD-A061724] 22 p0352 N79-19305

FRANCKEN, J. C.
A heat pipe collector for low temperatures
21 p0127 A79-17385

FRANCOIS, B.
Furnaces for experiments in zero-gravity conditions
23 p0487 A79-40330

FRANDSEN, S.
Atmospheric turbulence structure in relation to wind generator design
23 p0483 A79-40114

FRANK, H. A.
Primary lithium battery technology and its application to NASA missions
[NASA-CR-158229] 22 p0354 N79-19449

FRANK, H. J.
Outlook for world oil into the 21st century with emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-11454

FRANK, R. I.
Performance of a new high-intensity silicon solar cell
22 p0257 A79-22862
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610

FRANK, T. G.
Commercial applications of thermionic conversion using a fusion reactor energy source - A preliminary assessment
21 p0026 A79-10219

FRANKE, F. H.
Gasification of raw lignite in the tube-furnace gasifier
22 p0310 A79-30996

FRANKEL, H. E.
Materials and economics of energy systems
21 p0095 A79-15911

FRANKEL, I. F.
Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625

FRANKLIN, A. D.
Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553

FRANKLIN, C. J.
Evaluation program for new industrial gas turbine materials
[ASME PAPER 78-GT-145] 21 p0031 A79-10269

FRANKLIN, I. V.
A review of some critical aspects of satellite power systems
22 p0326 A79-31921
The ESA lightweight hybrid solar array
23 p0500 A79-40916

FRANTTI, E. W.
Design and operation of the Westinghouse electrode systems test facility /WESTF/
23 p0393 A79-33411
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

FRASER, M. D.
Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133
Design, operation, and economics of the Energy Plantation as an alternate source of fuels
23 p0467 A79-38616
Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States
23 p0470 A79-38646
Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772
Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997

FRAZIER, G. C.
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368

FREDERICK, W. A.
A fully interconnected wind system
24 p0635 A79-46540

FREDERIKSE, H. P. R.
Materials
21 p0106 A79-16491

FREDERIKSEN, H. J.
Role of refined product imports in the domestic fuel market
[DOE/EIA-0102/53] 24 p0778 N79-32372

FREDRICKSON, D.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

FREEDMAN, G. M.
Minority carrier diffusion length from spectral response measurements
23 p0497 A79-40893

FREEDMAN, S. I.
Fluidized-bed combustion
22 p0347 N79-18365

FREEMAN, H. M.
Air emissions from waste to energy systems
24 p0665 A79-50883

FREEMAN, J. W.
New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34846
Space environmental effects and the solar power satellite
23 p0552 N79-24028

FREEMAN, R. A.
Potential application of Madison formation waters for community heating in South Dakota
[APL/JHU-QM-78-042R] 24 p0740 N79-29640

FREEMAN, R. E.
A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption
[AD-A067165] 23 p0582 N79-26510

FREEMAN, T. L.
Performance of combined solar-heat pump systems
22 p0285 A79-26817

FREITAG, R. F.
Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218
Overview of future programs - USA
21 p0116 A79-17275

FRENCH, E.
Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975

FRENCH, E. P.
The solar total energy system evaluation program /STESEP/
24 p0673 A79-51749
Hybrid thermal storage subroutine for transient simulation
24 p0681 A79-51807
Deterministic insolation model program description and user's guide
[SAND-78-7044] 24 p0744 N79-29743

FRERIS, L. L.
A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894

FREY, H.
Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610

FREY, W. P.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

FREYMUTH, H.
The use of a sort of slide rule for the quick determination of solar irradiation of surfaces and through double glazing of arbitrary orientation and different inclination
21 p0055 A79-13625

FREYTAG, K.
Pulsed power supplied for large laser systems
[UCRL-80113] 21 p0217 N79-14377

FRICKE, C. B.
A general history of the Nebraska Grain Alcohol and Gasohol Program
24 p0651 A79-49383

FRIEDMAN, R.
High-freezing-point fuels used for aviation turbine engines
[ASME PAPER 79-GT-141] 22 p0309 A79-30555

FRIEDMAN, S.
Exploratory research in coal conversion
21 p0007 A79-10061

FRIEDMANN, P. P.
Aeroelastic stability and response of horizontal axis wind turbine blades
23 p0483 A79-40117

FRIEFELD, J. M.
External single pass to superheat receiver
[AIAA PAPER 78-1751] 21 p0089 A79-15849
Testing of central receiver for central thermal power systems
23 p0428 A79-35045

FRIELING, D. H.
The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

FRIESEN, A. A.
Efficient Fresnel lens for solar concentration
22 p0285 A79-26816

FRIGO, A. A.
Turbomachinery options for an underground pumped hydroelectric storage plant
24 p0679 A79-51794

FRISCH, J. R.
The world balance for energy needs in view of year 2000: Development of the problem and areas involved, part 2
[BLI-RISLEY-TR-3395-(9091.9F)] 22 p0347 N79-18442

FRISSON, L.
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977

FRISWELL, N. J.
The influence of fuel composition on smoke emission from gas-turbine-type combustors - Effect of combustor design and operating conditions
22 p0323 A79-31510

FRITSCH, J.
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592

FRITTS, D. H.
Some fatigue characteristics of nickel battery plaque
[AD-A060370] 21 p0230 N79-15415

FRITZSCHE, A.
Development of vertical-axis wind-energy converters - Darrieus design
23 p0447 A79-37744

FROEHLING, W.
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

FROEMMING, J. H.
Performance testing of a three ton solar absorption chiller
[AIAA PAPER 78-1757] 21 p0060 A79-13858

FROHRIB, D. A.
Design of flywheel rotors utilizing cellulosic materials
24 p0678 A79-51787

FROSCH, R. A.
NASA takes stock
23 p0461 A79-38375
Statement of Doctor Robert A. Frosch, Administrator, National Aeronautics and Space Administration
21 p0224 N79-15111

FROST, H. J.
H2S emissions in the domain of chemical industry and means of suppressing emissions
23 p0481 A79-40068

FROST, W.
Analysis of wind turbine generator rotor response to one-dimensional turbulence
21 p0077 A79-14768
Summary of atmospheric wind design criteria for wind energy conversion system development
[NASA-TP-1389] 21 p0223 N79-14678
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development
[NASA-TP-1359] 21 p0223 N79-14679

FRULLANI, S.
Problems and prospectives on solar energy utilization
[ISS-P-78/1] 24 p0742 N79-29667

FRUTSCHI, H. U.
The relationship of power and heat production with closed cycle gas turbines
[ASME PAPER 79-GT-103] 23 p0377 A79-32379

FRY, D. J.
Results of a near field physical model study
24 p0626 A79-45856

FRYSINGER, G. R.
Storage assisted heat pumps using phase change materials
24 p0697 A79-51967

FU, T. T.
Residual shale oil as a boiler fuel
23 p0412 A79-34105

FU, Y. C.
Evaluation of use of syngas for coal liquefaction
24 p0703 A79-52027

FUCHS, M. R.
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864

FUCHS, E.
Passive solar heating of buildings using a transwall structure 24 p0712 A79-53493

FUEKI, K.
Progress in batteries and solar cells. Volume 1 21 p0148 A79-17989

FUENFER, E.
New results in high-beta stellarator and belt-pinch research 21 p0070 A79-14463

FUERTES, L.
The airport performance model. Volume 1: Extensions, validations, and applications [AD-A062863] 23 p0568 N79-25040

FUJIE, K.
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants [ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

FUJII, A.
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I. 21 p0130 A79-17409

FUJII, I.
A new combustion system in the three-valve stratified charge engine [SAE PAPER 790439] 22 p0316 A79-31376
Experimental study of thermal energy storage by use of reversible chemical reactions 23 p0416 A79-34137

FUJII, K.
The thermochemical decomposition of water using bromine and iodine 22 p0238 A79-20770

FUJIMOTO, Y.
Analysis of a cylindrical imploding shock wave 21 p0155 A79-18846

FUJINAWA, K.
Catalytic gasification of coals pretreated with liquid ammonia 23 p0411 A79-34091

FUJISAWA, N.
Lower hybrid heating experiments in JFT-2 tokamak 24 p0607 A79-45030
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak 24 p0649 A79-49254

FUJISHIMA, A.
Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes 22 p0273 A79-25548

FUJITA, T.
Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation 21 p0020 A79-10163
Comparative evaluation of distributed-collector solar thermal electric power plants 21 p0021 A79-10173
Projected techno-economic improvements for advanced solar thermal power plants 24 p0671 A79-51733
Turbine sizing of a solar thermal power plant 24 p0673 A79-51751
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000 [NASA-CR-158519] 23 p0549 N79-23503
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs [NASA-CR-158768] 23 p0595 N79-27660

FUKUDA, S.
SHI's recent achievements in the field of geothermal power generation 23 p0381 A79-32591

FULCHER, C. W. G.
The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2 23 p0427 A79-34860

FULCHER, M. K.
East Mesa geothermal test site 22 p0259 A79-23458

FULFORD, G.
Optimal value of the rated speed of a wind generator 23 p0527 A79-41948

FULHAGE, C. D.
Design criteria and operational guidelines for a pilot-scale anaerobic digester 23 p0523 A79-41371

FULLER, D.
USAF terrestrial energy study. Volume 3, part 1: Summary data display [AD-A061071] 22 p0382 N79-17341

FULLER, R. F.
Federal Energy Data System (FEDS) technical documentation [PB-281815/1] 21 p0189 N79-11542

FUMEAUX, P.
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation 22 p0262 A79-23757

FUNAHASHI, A.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak 23 p0390 A79-33345
Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma 24 p0642 A79-47804

FUNK, J. A.
Core unit testing of the APL/JHU shell-less folded tube heat exchanger 24 p0618 A79-45788

FUNT, B. L.
Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy 23 p0495 A79-40748

FURBER, J.
Concentrator photovoltaic systems for economical electricity and heat 21 p0124 A79-17354

FURIMSKY, E.
Coke formation on hydrodesulphurization catalysts 22 p0283 A79-26470

FURRER, A.
Localization and diffusion of hydrogen in lanthanum-nickel compounds 22 p0248 A79-21682

FURST, G. B.
Review of optimization and economic evaluation of potential tidal power developments in the Bay of Fundy 21 p0152 A79-18111

FURTH, H. P.
Review of experimental results. I, II 21 p0077 A79-14778

FURUSAWA, K.
Ni cermet selective absorbers for solar photothermal conversion 24 p0641 A79-47790

FURUSAWA, T.
Flywheel energy storage system for JT-60 toroidal field coil 21 p0112 A79-16729

FUSSMANN, G.
On the motion of runaway electrons in momentum space 22 p0291 A79-27880

FUWA, T.
Rate of desulfurization from liquid iron and iron alloys with hydrogen [NRC/CNR-TT-1930] 23 p0553 N79-24120

G

GABANO, J. P.
Progress in batteries and solar cells. Volume 1 21 p0148 A79-17989

GABLE, R. D.
Brayton Isotope Power System - The versatile dynamic power converter 21 p0023 A79-10190

GABRIELSON, J. E.
Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement) [PB-293731/6] 24 p0743 N79-29670
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site h [PB-295535/9] 24 p0803 N79-33654

ADRE, R.
Open-circuit to short-circuit switching - Method for lifetime measurement in solar cells
24 p0606 A79-44919

ADZHIEV, A. D.
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

AECHTER, J.-P.
Design of an indirect-drive heliostat
23 p0390 A79-33270

AFFIN, W. O.
JT9D-70/59 improved high pressure turbine active clearance control system
[NASA-CR-159661] 24 p0763 N79-31208

AGE, S. J.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

GAGGIOLI, R.
Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379

GAGNON, W.
Pulsed power supplied for large laser systems
[UCRL-80113] 21 p0217 N79-14377

GAHIMER, J.
Technology overview of energy storage systems
24 p0666 A79-50892

GAHIMER, J. S.
An evaluation of integrated coal gasification/water-splitting processes
23 p0411 A79-34094

GAHN, R. F.
Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells
21 p0040 A79-11824

Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479

GAIA, M.
A comparison between sun and wind as energy sources in irrigation plants
21 p0118 A79-17295

GAINES, G. B.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042

Procedure for developing experimental designs for accelerated tests for service-life prediction
23 p0496 A79-40886

Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982

Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

GAINES, J. R.
Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806

GALASCO, R. T.
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996

GALEF, A. E.
A limiting mechanism for the heave induced Mathieu type instability of a cold water pipe
24 p0621 A79-45813

GALKINA, N. S.
Study of the spectral characteristics of metallized polymer films for production of solar concentrators
22 p0297 A79-28672

Investigation of the spectral characteristics of metallized polymer films for making solar concentrators
24 p0637 A79-46910

GALLAGHER, B. D.
A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919

GALLAGHER, J. E., JR.
Catalytic gasification predevelopment research
21 p0029 A79-10246

GALLET, P.
Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses
21 p0164 A79-19949

GALLO, A.
A new approach for solar energy systems design by means of the sensitivity theory
23 p0448 A79-37849

GALLOPOULOS, N. E.
Alternative fuels for reciprocating internal combustion engines
21 p0051 A79-12980

GALLOT, J.
Latest developments in sponsored test programs for electric vehicles in France
22 p0302 A79-29497

GALLOWAY, T. R.
Predicting solar energy fluxes in polluted urban areas
24 p0671 A79-51732

Challenge of efficiently retorting very nonuniform beds of oil shale rubble
[UCRL-81721-REV-1] 24 p0721 N79-28657

GALVAN, L.
Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513

GAMBHIR, S. P.
Solid waste as a source of energy for industry - An overview
23 p0424 A79-34461

GAMBURZEV, S.
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions
22 p0245 A79-21483

GAMMON, R. B.
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874

GANDEL, M. G.
Energy storage requirements for spacecraft
22 p0246 A79-21486

GANDHIDASAN, P.
Rate of desorption in a solar regenerator
21 p0055 A79-13611

Buoyancy effects in a solar regenerator
22 p0262 A79-23752

Transient response of a solar regenerator
23 p0526 A79-41935

GANEFELD, R. V.
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691

Turbulence of a combustion product plasma in an MHD channel
22 p0246 A79-21538

Combustion-products turbulence in the channel of an MHD generator
23 p0442 A79-36812

GANGADHARAN, R.
The lithium-thionyl chloride battery - A review
23 p0487 A79-40370

GANGULI, P. S.
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119

GANGULY, B.
Performance of a solar space heating system
23 p0385 A79-33223

GANI, R.
Cover systems for high temperature flat-plate solar collectors
24 p0642 A79-47799

GANNON, R. E.
MHD power generation
21 p0146 A79-17638

Behavior of eastern and western coals in fuel-rich reaction conditions
23 p0390 A79-33384

Coal gasification as applied to MHD power cycle
23 p0411 A79-34095

GANOW, H. C.
Environmental investigations of in situ coal gasification experiments
24 p0664 A79-50880

GAPONOV, I. M.
Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854

GARABEDIAN, H. T.
Environmental aspects of wood fuel
24 p0665 A79-50884

GARBA, J. A.
Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

GARBE, Y.
An overview of San Diego County's resource recovery plant
23 p0491 A79-40418

GARBIN, H. D.
Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974

GARBUNY, M.
Quasi-isentropic laser engines
21 p0111 A79-16632

GARCIA-CAMARERO, E.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311

GARCIA, A.
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498

GARD, M.
Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448

GARDNER, C. L.
Electrochemical energy storage systems - A small scale application to isolated communities in the Canadian Arctic
24 p0662 A79-50557

GARDNER, K.
Solar cooling in the tropics
23 p0397 A79-33950

GARG, D.
Selectivity improvement in the SRC process
24 p0628 A79-45992

GARG, H. P.
Flat plate collector - Experimental studies and design data for India
21 p0132 A79-17425
Design, construction and performance of Fresnel lens for solar energy collection
21 p0136 A79-17456
System data on flat-plate collectors and its optimization
23 p0385 A79-33217

GARIBOLDI, R. J.
The National Program for Solar Energy
21 p0072 A79-14688

GARIBOTTI, J. F.
On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288

GARN, G. T.
The effect of coal characteristics on the catalytic liquefaction of Utah coals
24 p0628 A79-45991

GARRATT, A.
Energy sources of the future - A challenge to man's ingenuity
23 p0423 A79-34389

GARRETSON, G.
Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

GARRETT, B. G.
Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501

GARRETT, D. E.
The Garrett Energy Research biomass gasification process
21 p0004 A79-10037
Conversion of biomass materials into gaseous products, phase 1
[SAN-1241-77-1] 21 p0171 N79-10237
Thermochemical conversion: Biomass gasification
[TID-29391] 24 p0726 N79-28766

GARRETT, L. B.
Future large space systems opportunities: A case for space-to-space power?
21 p0169 N79-10095

GARRISON, J. D.
A vacuum solar thermal collector with optimal concentration
21 p0043 A79-11970
A comparison of solar thermal energy collection using fixed and tracking collectors
22 p0293 A79-28146
Optimization of a fixed solar thermal collector
23 p0400 A79-34000
Optimization of a fixed solar thermal collector
24 p0712 A79-53490

GARRISON, W. E.
Cogeneration with digester gas
24 p0676 A79-51773

GARRITY, T. F.
Thermal energy conversion - Tapping the sea depths
24 p0628 A79-45979

GARSIDE, B. K.
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317

GARSTANG, M.
Offshore wind power model estimates
23 p0482 A79-40110

GARVEY, L.
Selenide technology evaluation program at JPL
21 p0026 A79-10222

GARVEY, L. P.
Modified silicon-germanium alloys with improved performance
21 p0027 A79-10225

GARY, J. H.
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453
Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

GASIOROWSKI, K.
H2S associated with mineral oil refineries and natural gas processing plants - Emissions and absorptions
23 p0481 A79-40069

GASKINS, N. H.
Compilation of level 1 environmental assessment data
[PB-286924/6] 22 p0336 N79-16439

GATES, M. T.
Flash X-ray tests of solar cells
23 p0498 A79-40899

GATES, R. W.
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649

GATOS, H. C.
Present status of GaAs
[NASA-CR-3093] 21 p0215 N79-14192

GATTI, A.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

GAUNE-ESCARD, M.
Evaluation of fusion enthalpy of eutectic mixtures of fused salts used for thermal energy storage
23 p0383 A79-32961

GAUSE, R. L.
Protection of solar collector materials from UV
24 p0609 A79-45217

GAVALAS, G. R.
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119

GAVIN, L. W.
Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391

GAVRILKO, S. A.
Electromagnetic excitation of a moving conducting piston
22 p0237 A79-20658

GAVRILOVA, L. P.
Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters
21 p0053 A79-13288

Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356

GAWAIN, T. H.
Performance characteristics of a type of electrohydrodynamic generator
24 p0702 A79-51999

GAY, E. C.
Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries
21 p0010 A79-10089

GAY, C.
High efficiency solar panel /HESP/
23 p0503 A79-40951

GAY, C. F.
Ultra-thin silicon solar cells for high performance panel applications
21 p0029 A79-10243
Thin silicon solar cell performance characteristics
23 p0503 A79-40953

GAY, E. C.
Review of industrial participation in the ANL lithium/iron sulfide battery development program
21 p0010 A79-10086
Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829

GAZIEV, U. KH.
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

GEHLER, J.
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970

GEHRER, R.
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

GEHRKE, H.
Small solar power plant with a Freon turbine
21 p0057 A79-13642
A small solar power plant with a freon turbine
21 p0141 A79-17501

GEIST, J.
Spatial uniformity of quantum efficiency of a silicon photovoltaic detector
23 p0478 A79-39593

GELATT, C. D.
Calculated heats of formation of metal and metal alloy hydrides
22 p0249 A79-21690

GELB, G.
Solar production of industrial process steam
24 p0673 A79-51748

GELB, S. W.
Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017

GELIN, P.
A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774

GELS, H. B.
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836

GENDLER, J.
Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5
[PB-287180/4] 22 p0339 N79-17026

GENENS, L.
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

GENEVEY, P.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

GENIS, A. P.
Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011

GENSLAK, S. L.
Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374

GENTILHOMME, P.
The development of the energy-materials ratios of electrical energy production systems
24 p0645 A79-48024

GENTLE, K. W.
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426

GENTRY, K.
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

GENUARIO, R. D.
Characterization of electron and ion current flow in very large aspect-ratio terawatt diodes employing heated and unheated anodes
21 p0154 A79-18480

GEOOLA, F.
Design and optimisation of an absorption refrigeration system operated by solar energy
22 p0285 A79-26819

GEORGE, J. F.
System design considerations for a floating OTEC modular experiment platform
24 p0625 A79-45847
Preliminary design of a cruising OTEC modular experiment
24 p0674 A79-51758

GERASIMOV, IU. F.
Design of a heat pipe with separate channels for vapor and liquid
22 p0268 A79-24486

GERASIMOV, S. N.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

GERISCHER, H.
Semiconductor electrodes for conversion and storage of solar energy
21 p0036 A79-11777
Solar photoelectrolysis with semiconductor electrodes
23 p0437 A79-36147

GERLACH, T. M.
Fuels from magma: A potential energy source
[SAND-78-0191] 24 p0778 N79-32373

GERSHUNI, A. N.
Investigation of the maximal heat-transmitting power of heat pipes with metal-fiber wicks
23 p0447 A79-37661

GERSON, D. F.
The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739

GERSTEN, J. I.
A solid-state solar-powered heat transfer device
24 p0667 A79-50932

GERSTL, S. A. W.
The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0696 A79-51955

GERSTLE, R.
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606

GERTH, H. L.
Mechanical deflection analysis of diamond turned reflective optics
21 p0083 A79-15143

GERTSCH, W. D.
Soil cooling for geothermal electric power plants in the Western United States - The Raft River experiment
22 p0266 A79-24240

GERTZ, J. J.
Preliminary designs of 10 MWe and 50 MWe power modules
24 p0618 A79-45791
GERVAIS, R. L.
A central receiver solar thermal power system
21 p0091 A79-15872
Central receiver thermal power system
[AED-CONF-78-212-008] 23 p0582 N79-26513
GERVER, M. J.
High-frequency convective loss-cone instability in short mirror machines
24 p0639 A79-47421
GESSINN, G.
Solar heating using a heat pump and cold collectors
22 p0254 A79-22268
GEVANTMAN, L. H.
Evaluated physical properties data for materials used in energy storage systems
[UCRL-81159] 21 p0189 N79-11536
GEWEHR, H. W.
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828
GEWIN, R. J.
A microwave power transmission system for space satellite power
21 p0002 A79-10025
GEYER, H.
Two-dimensional MHD channel design
22 p0279 A79-26183
GEYER, H. K.
Parametric study of the performance of a CDIF 1-B coal-fired MHD generator
[ANL-MHD-79-3] 22 p0361 N79-20503
GHALY, M. A.
Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416
GHANDHI, S. K.
Grain-boundary edge passivation of GaAs films by selective anodization
21 p0154 A79-18487
Diffusion length measurements in Schottky barrier GaAs solar cells
22 p0281 A79-26243
Thin-film GaAs solar cells with grain-boundary edge passivation
23 p0436 A79-35749
GHANIME, L.
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424
GHASSEMI, M.
Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion
[PB-288602/6] 22 p0350 N79-18487
Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C
[PB-288603/4] 22 p0350 N79-18488
Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F
[PB-288604/2] 22 p0350 N79-18489
Applicability of petroleum refinery control technologies to coal conversion
[PB-288630/7] 22 p0352 N79-19173
GHATAK, A. K.
Performance of solar concentrators - A theoretical study
21 p0135 A79-17453
GHOSH, A. K.
Merocyanine organic solar cells
21 p0165 A79-20216
Angle-of-incidence effects in electron-beam-deposited SnO2/Si solar cells
22 p0272 A79-25069
Theoretical efficiency of SnO2/Si solar cells
23 p0480 A79-39945
Barrier heights and interfacial effects in SnO2/Si solar cells
23 p0505 A79-40965
Efficient electron-beam-deposited ITO/n-Si solar cells
24 p0629 A79-46152
Spray-deposited high-efficiency SnO2/n-Si solar cells
24 p0629 A79-46201
Stability of SnO2/n-Si solar cells
24 p0655 A79-50187
A study of oxide-based heterostructure photoelectrodes
24 p0705 A79-52314
GHOSH, S.
Biomethanation of Minnesota reed sedge peat
24 p0662 A79-50560
GHOSH, S. B.
Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523
GHOSH, S. P.
National Computer Conference, Anaheim, Calif., June 5-8, 1978, Proceedings
21 p0100 A79-16177
GHULE, H. M.
The role of the interfacial layer in Schottky barrier solar cells
23 p0438 A79-36241
GIACOMINI, F.
Sweet sorghum - A renewable source for alcohol production
23 p0389 A79-33263
GIAMMAR, R. D.
Combustion of hydrothermally treated coals
[PB-287521/9] 22 p0338 N79-17025
GIANNOTTI, J. G.
Technology considerations in the design of a commerical offshore energy conversion /OTEC/ plant
22 p0288 A79-27378
Practical schemes for reducing cold water pipe loads
24 p0621 A79-45814
GIAQUINTA, A. R.
Optimum combinations of cooling alternatives for stream-electric power plants, volume 2
[PB-290576/8] 23 p0565 N79-24515
GIBBON, G. A.
Moessbauer spectroscopy of iron in coal and coal hydrogenation products
22 p0282 A79-26464
GIBBS, B. M.
Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878
The potential application of rotating fluidised beds to power generating schemes
23 p0454 A79-37906
GIBBS, L.
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606
GIBBS, L. L.
Particulate and sulfur dioxide emission control costs for large coal-fired boilers
[PB-281271/7] 21 p0178 N79-10591
GIBBS, R. T.
A steam process for coal gasification
24 p0632 A79-46321
Steam gasification of Illinois coal and coke
24 p0687 A79-51857
GIBS, J.
Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities
23 p0490 A79-40414
GIBSON, A.
The JET project - A step towards the production of power by nuclear fusion
22 p0326 A79-31918
Impurity behaviour in real and simulated tokamak plasmas
23 p0444 A79-36885
GIBSON, C. B.
Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157] 24 p0770 N79-31763
GIBSON, J.
Aviation fuels from coal
22 p0325 A79-31913
GIBSON, R. A.
Studies in retiming tidal energy
21 p0152 A79-18115
Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777

GIDASPOW, D.
Multiphase flow analysis of oil shale retorting
[UCRL-81717-REV-1] 24 p0721 N79-28656
Multiphase flow analysis of oil shale retorting
[UCRL-81717] 24 p0721 N79-28658
GIERLOFF, J.
High-energy laser mirror thermal distortion testing techniques
23 p0447 A79-37670
GIESE, R. F.
The interface with solar - Alternative auxiliary supply systems
21 p0137 A79-17468
GIFT, E. H.
Proliferation-resistant nuclear fuel cycles
[ORNL/TM-6392] 21 p0214 N79-13849
GIGLIOLI, G.
An exploration of the applicability field of geothermal water-fed heat pumps
23 p0409 A79-34077
GIKIS, B. J.
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574
GILBERT, B. L.
Experimental demonstration of the Diffuser Augmented Wind Turbine concept
21 p0029 A79-10238
Fluid dynamics of diffuser-augmented wind turbines
22 p0238 A79-20798
Diffuser designs for improved wind energy conversion
22 p0279 A79-26182
GILBERT, J. A.
Current state-of-the-art of electrochemical batteries from a users point of view
21 p0071 A79-14681
GILBERT, L. J.
Control of wind turbine generators connected to power systems
21 p0086 A79-15574
Lewis Research Center studies of multiple large wind turbine generators on a utility network
24 p0635 A79-46547
Transient response to three-phase faults on a wind turbine generator
21 p0180 N79-11312
GILBERT, L. E.
Black germanium solar selective absorber surfaces
22 p0327 A79-31970
GILBREATH, W. P.
Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162
Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605
A search for space energy alternatives
21 p0108 A79-16608
Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852
SOLARES - A new hope for solar energy
23 p0399 A79-33992
Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615
GILBY, D. J.
Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888
GILL, R. D.
Review of results from DITE tokamak
21 p0069 A79-14456
GILLELAND, J. R.
Doublet III design and construction
21 p0018 A79-10145
GILLESPIE, P. D.
European solar collector development and testing - A commercial view
23 p0470 A79-38645
GILLET, I.
Electrochemical use of biomass
22 p0254 A79-22273
GILLETT, D. A.
Acceleration of solar heating application via improved data evaluation
21 p0087 A79-15829
GILLETT, P. R. C.
Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379
A study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
24 p0751 N79-30748
GILLETT, W. B.
The significance of longwave radiation in flat plate solar collector testing
23 p0448 A79-37847
GILLIGAN, J. E.
Suitable optical materials for solar collector applications
22 p0239 A79-20823
Parameters, measurement and criteria of solar materials testing
23 p0431 A79-35072
GILLIGAN, J. G.
A possible route to small, flexible fusion units
24 p0630 A79-46304
GILMAN, B. I.
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490
GILMAN, S. F.
Experience gained and lessons learned from monitoring the solar building, Albuquerque
21 p0088 A79-15833
GILMARTIN, T. J.
The laser fusion scientific feasibility experiment
21 p0030 A79-10250
GILMER, R. W.
Electric utilities and solar energy: The service contract in a new social context
[CRAU/IEA(C)-79-3] 23 p0597 N79-27685
GINELL, W. S.
Low-grade thermal energy-conversion Joule effect heat engines
[ASME PAPER 78-ENAS-7] 21 p0048 A79-12556
Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production
22 p0237 A79-20730
GINLEY, D. S.
Role of semiconductor properties in photoelectrolysis
21 p0037 A79-11780
GINOSAR, M.
A large scale wind energy program for the state of California
23 p0594 N79-27648
GINOT, P.
Review of plasma wall interactions in tokamaks
23 p0443 A79-36879
GINTZ, J. R.
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832
GIRAMONTI, A. J.
Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190
Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment
24 p0679 A79-51796
GIRARD, J. P.
On the ion energy balance in TFR with and without neutral injection heating
21 p0069 A79-14452
GIRI, N. K.
Solar ammonia-water absorption system for cold storage application
21 p0143 A79-17521
GIRIAT, W.
Photovoltaic effect in Cu/CuGaSe2 Schottky barriers
24 p0605 A79-44721
GITLOW, B.
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784

GITTLEMAN, J. I.
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183

GIUDICELLI
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708

GIUTRONICH, J. E.
Manufacture of curved glass mirrors for linear concentrators
21 p0136 A79-17459
Ideal prism solar concentrators
21 p0149 A79-18023
Symmetrical and asymmetrical ideal cylindrical radiation transformers and concentrators
22 p0303 A79-29647
New ideal concentrators for distant radiation sources
24 p0661 A79-50547

GLADD, N. T.
Warm plasma effects on drift cyclotron loss cone mode
23 p0478 A79-39568

GLADWELL, G. M. L.
Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976

GLADYSH, I. S.
Airport power supply
24 p0660 A79-50499

GLANTZ, M. H.
Multidisciplinary research related to the atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679

GLAROS, S. S.
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

GLASER, C. W.
Heat pumps without supplemental heat
21 p0073 A79-14695

GLASER, P. E.
Solar power satellite developments
[AAS PAPER 78-022] 21 p0035 A79-11558
Health maintenance and health surveillance considerations for an SPS space construction base community
[AAS PAPER 78-176] 22 p0243 A79-21273
The potential for solar energy development
22 p0304 A79-30172
First steps to the Solar Power Satellite
23 p0382 A79-32721
The development of solar power satellites
23 p0435 A79-35488
The solar power satellite concept
24 p0603 A79-44277
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

GLASGOW, G.
Reclamation of synthetic turbine engine oil mixtures
[AD-A071813] 24 p0795 N79-33211

GLASGOW, J. C.
Design and operating experience on the U.S. Department of Energy Experimental Mod-C 100 kW Wind Turbine
21 p0028 A79-10234
Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine
24 p0634 A79-46537
Utility operational experience on the NASA/DOE MOD-OA 200-kW wind turbine
[NASA-TM-79084] 22 p0360 N79-20494

GLASOV, B. V.
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264

GLASS, G. E.
Ecological effects of coal-fired steam-electric generating stations
22 p0346 N79-18358

GLASS, J. W.
Pollutant control through staged combustion of pulverized coal
[PB-1817-5] 24 p0744 N79-29683

GLASS, R. C.
Advancements in the design of solar array to battery charge current regulators
21 p0033 A79-10902

GLASS, N. R.
Environmental effects of increased coal utilization ecological effects of gaseous emission from coal combustion
[PB-285440/4] 21 p0213 N79-13591

GLASSMAN, I.
Combustion chemistry of chain hydrocarbons
21 p0052 A79-12986
Fundamental combustion studies of emulsified fuels for diesel applications
[PB-287386/7] 22 p0330 N79-16138

GLAUS, C. B.
Recycle energy system - City of Akron, Ohio
23 p0468 A79-40392

GLEASON, C. C.
Experimental clean combustor program: Diesel no. 2 fuel addendum, phase 3
[NASA-CR-135413] 23 p0576 N79-26221

GLEASON, R. J.
Options for treating and disposing of scrubber sludge
23 p0424 A79-34460

GLENDENNING, I.
Wave power - Some practical considerations
23 p0449 A79-37861
Compressed air storage
23 p0451 A79-37876

GLIBERMAN, A. IA.
Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators
24 p0646 A79-48735

GLICKSMAN, L. R.
An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling
24 p0707 A79-52574

GLOVER, L., III
Evaluation and targeting of geothermal energy resources in the southeastern United States
[VPI-SU-5648-1] 21 p0204 N79-13478

GLOWER, D. D.
Workshop on Energy Sources and Electric Power Generation for High School Students
[TID-28975] 24 p0740 N79-29643

GLUCK, D. F.
A combined photovoltaic/thermal electric central power plant
24 p0675 A79-51769

GLUCKMAN, M.
Coal gasification for electric utilities
23 p0436 A79-35799

GLUKHIKH, V. A.
Calculation and design of liquid-metal MHD induction machines
22 p0286 A79-27302

GNANAINDER, Y. A.
An experimental study of series combination of solar cells
23 p0518 A79-41062

GNECCO, A. J.
Microprocessor control of a wind turbine generator
22 p0244 A79-21302
Microprocessor control of a wind turbine generator
[NASA-TM-79021] 21 p0195 N79-12548

GNIRK, P. F.
On the formulation of stability and design criteria for compressed air energy storage in hard rock caverns
24 p0680 A79-51798

GOBIN, D.
Theoretical and experimental analysis of a latent heat storage system
21 p0121 A79-17323
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors
21 p0127 A79-17380
Prediction of the behavior of a solar storage system by means of recurrent stochastic models
22 p0258 A79-23295

Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963

GOCHBARG, I.
Energy projects at the Sao Paulo State Institute of Technological Research
23 p0389 A79-33261

GODDARD, J. P.
A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205

GODFREY, R. B.
655 mV open-circuit voltage, 17.6% efficient silicon MIS solar cells
23 p0447 A79-37686
The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989
High-temperature lifetesting of Al/SiOx/p-Si contacts for MIS solar cells
23 p0536 A79-43569

GODLEWSKI, M. P.
Open-circuit voltage improvements in low-resistivity solar cells
24 p0784 N79-32649

GODWIN, R. O.
The laser fusion scientific feasibility experiment
21 p0030 A79-10250

GOEBEL, C. J.
Selenide isotope generator for the Galileo mission
21 p0022 A79-10185
SNAP 19 performance update for Pioneer and Viking missions
24 p0694 A79-51940

GOEBEL, F.
Discharge reaction mechanisms in Li/SOCl2 cells
22 p0305 A79-30331

GOEBEL, J.
Solaronyx - Selective coating for solar energy absorbers
21 p0058 A79-13648

GOECKNER, N. A.
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689

GOELZ, R. R.
A canister fuel pump for general aviation aircraft
[SAE PAPER 790624] 23 p0440 A79-36752

GOERICKE, P.
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

GOETTLE, R. J., IV
Some measures of regional-industrial interfuel substitution potentials
[BNL-24368] 21 p0208 N79-13525

GOETZBERGER, A.
Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372
Thermal energy conversion with fluorescent collector-concentrators
23 p0477 A79-39103

GOGNA, P. K.
Selective coatings for solar energy conversion
21 p0126 A79-17376

GOGOTOV, I. N.
Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119

GOH, T. N.
Solar radiation studies for utilization of flat-plate collectors in an equatorial region
21 p0119 A79-17311

GOHAR, M. Y.
A high temperature fusion reactor design
24 p0696 A79-51954

GOIN, K. L.
Sandia laboratory combustion simulation facility
[SAND-78-2240] 23 p0576 N79-26146

GOKCEN, N. A.
Efficiency of tandem solar cell systems as a function of temperature and solar energy concentration ratio
24 p0656 A79-50194
Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-32671

GOKHMAN, A.
Complex solar-electrical plant of large capacity
23 p0403 A79-34029

GOLAN, L. P.
Solids mixing and fluidization characteristics in a tube filled bed
21 p0008 A79-10070

GOLANT, V. E.
Experiments on adiabatic compression of a tokamak plasma in Tuman-2
21 p0069 A79-14457

GOLBERG, E. D.
Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution
[PB-297467/3] 24 p0803 N79-33648

GOLD, H.
Power train analysis for the DOE/NASA 100-kW wind turbine generator
[NASA-TM-78997] 22 p0333 N79-16355
Water-related environmental effects in fuel conversion, volume 1. Summary
[PB-288313/0] 22 p0351 N79-18834
Water related environmental effects in fuel conversion. 1: Summary volume
[FE-2445-1-VOL-1] 24 p0793 N79-32747

GOLDBERG, B.
Flat plate collector dynamic evaluation
21 p0128 A79-17390
A comparison of some simple models used to predict solar irradiance on a horizontal surface
24 p0661 A79-50546

GOLDEN, J. A.
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243

GOLDEN, J. O.
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453
Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

GOLDEN, T. S.
Baltimore applications project
[NASA-TM-79667] 22 p0351 N79-18815

GOLDENBLATT, M. K.
An economic model to establish the value of WECS to a utility system
23 p0485 A79-40131
Wind energy systems application to regional utilities
24 p0633 A79-46532

GOLDFARB, J.
Electrolytic hydrogen production by means of solar and wind energy
23 p0469 A79-38633

GOLDGRABEN, G. R.
An assessment of mercury emissions from fossil fueled power plants
[PB-285227/5] 21 p0213 N79-13592

GOLDHAMMER, L.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973

GOLDHAMMER, L. J.
Orbiting Solar Observatory /OSO-8/ solar panel design and in-orbit performance
21 p0001 A79-10017

GOLDMAN, G. G.
Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico
24 p0622 A79-45817

GOLDMAN, G. S.
The Power Wheel - Elimination of energy-consuming drive components
21 p0112 A79-16734

GOLDMAN, H.
Analysis and evaluation of process and equipment in tasks 2 and 4 of the Low Cost Solar Array project
[NASA-CR-158089] 22 p0335 N79-16378
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158744] 23 p0580 N79-26485

Analysis and evalaution in the production process and equipment area of the low-cost solar array project
[NASA-CR-162163] 24 p0770 N79-31769

GOLDMAN, H. M.
Evaluation of options for process sequences
23 p0501 A79-40925

GOLDSMITH, J. V.
LSA project technology development update
[NASA-CR-162301] 24 p0782 N79-32633

GOLDSMITH, M.
Geothermal element, Imperial County, California
[PB-287115/0] 22 p0335 N79-16385

GOLDSMITH, P.
Spacecraft power systems
23 p0533 A79-43199
Solar array workshop
21 p0170 N79-10142

GOLDSTEIN, D. B.
Modeling passive solar buildings with hand calculations
[LBL-8583] 23 p0596 N79-27683

GOLDSTEIN, D. J.
Water-related environmental effects in fuel conversion, volume 1. Summary
[PB-288313/0] 22 p0351 N79-18834
Water-related environmental effects in fuel conversion. Volume 2: Appendices
[PB-288874/1] 22 p0356 N79-19496
Water related environmental effects in fuel conversion. 1: Summary volume
[FE-2445-1-VOL-1] 24 p0793 N79-32747

GOLDSTEIN, I.
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

GOLDSTEIN, L., JR.
Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177

GOLDSTEIN, M.
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

GOLDSTEIN, R. J.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973

GOLDSTEIN, R. M.
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679

GOLDSTEIN, S. A.
Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817

GOLDSTON, R. J.
Radially resolved measurements of 'q' on the adiabatic toroidal compressor tokamak
21 p0155 A79-18830
Alpha transport and blistering in tokamaks
22 p0253 A79-22243
A simple neutral density profile calculation for tokamaks with lambda sub mfp much smaller than a
22 p0255 A79-22379

GOLDWATER, B.
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370

GOLGER, A. L.
Direct conversion of solar energy into laser radiation
22 p0311 A79-31086

GOLOVIN, A. M.
Combustion of porous particles
21 p0049 A79-12708

GOLOVNER, T. M.
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904
Dependence of the photoelectric parameters of photovoltaic cells on illuminance
24 p0647 A79-49181

GOMAY, Y.
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

GOMBERG, H. J.
Production of synthetic fuels - An important civilian application of laser fusion
23 p0408 A79-34066

GOMES RODRIGUES, L. A.
The gasification of ethyl alcohol
23 p0386 A79-33228

GOMEZ, J. M.
Transcell, a novel approach for improving static photovoltaic concentration
21 p0124 A79-17356

GONCALVES BASTOS, L. E.
The minimization of drag torque for rotating disks
23 p0387 A79-33247

GONCZY, J.
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

GONCZY, J. D.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304

GONEN, T.
The impact of advanced technology on the future electric energy supply problem
21 p0112 A79-16736

GONY, J.-M.
Classification and energy evaluation of urban wastes
23 p0525 A79-41817

GONZALEZ, C.
Hail risk model for solar collectors
21 p0098 A79-16103

GOOD, R. R.
Drop formation, evaporation modelling and environmental assessment of JP-4 fuel jettisoned from aircraft
[AIAA PAPER 79-0186] 21 p0157 A79-19585

GOOD, W. A.
Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418

GOODALE, D. B.
Thermionic energy converter investigations
24 p0699 A79-51981

GOODELL, B. D.
The impact of a coal fired power plant on ambient sulfur dioxide levels
21 p0082 A79-15032

GOODMAN, A. S.
Small hydropower - Promise and reality in New York State and the northeast
23 p0410 A79-34083
Assessment of hydropower restoration and expansion in New York State, volume 1
[PB-295782/7] 24 p0792 N79-32734

GOODMAN, F. R., JR.
Photovoltaic electric power generation from a utility perspective
[ASME PAPER 79-SOL-18] 22 p0309 A79-30552

GOODMAN, M.
A 5-GWe nuclear satellite power system conceptual design
21 p0003 A79-10033

GOODMAN, N. B.
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440
Practical design considerations for CPC solar collectors
23 p0439 A79-36634

GOODNIGHT, J. A.
Role of government in solar energy development: A view from the northwest
[PNI-2784] 24 p0738 N79-29621

GOODRICH, P. R.
Farm-scale generation of bio-gas
24 p0631 A79-46312
GOODWIN, C. J.
Space platforms for building large space structures
21 p0032 A79-10511
GOODWIN, R. W.
Options for treating and disposing of scrubber sludge
23 p0424 A79-34460
GOOGE, J. M.
Automatic tension control for winding superconducting coils
[Y/EN-257] 24 p0734 N79-29384
GOPALAKRISHNAN, K. V.
Bio-mass energy for rural areas
21 p0126 A79-17373
GORADIA, C.
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446
GORASIA, J. M.
Design construction and short term performance of a solar pond
23 p0385 A79-33220
GORBAN, A. P.
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490
GORBIK, P. P.
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700
GORDIETS, B. F.
Solar-radiation-excited CO2-Br2-He gas laser
23 p0397 A79-33887
GORDON, L. H.
Storage systems for solar thermal power
21 p0013 A79-10108
SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241
Thermal storage technologies for solar industrial process heat applications
[NASA-TM-79130] 22 p0360 N79-20498
GORLAND, S.
Results from Symposium on Future Orbital Power Systems Technology Requirements
24 p0690 A79-51891
Results from Symposium on Future Orbital power systems technology requirements
[NASA-TM-79125] 23 p0539 N79-22191
GORMAN, R.
Metal hydride solar heat pump and power system /HYCSOS/
[AIAA PAPER 78-1762] 21 p0061 A79-13863
Design study and cost-effectiveness of the metal hydride solar heat pump and power system /HYCSOS/
24 p0672 A79-51745
Metal hydride solar heat pump and power system (HYCSOS)
[CONF-781133-5] 23 p0596 N79-27675
GORODETSKII, S. M.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Dependence of the photoelectric parameters of photovoltaic cells on illuminance
24 p0647 A79-49181
GOROVE, S.
Solar power space stations - Some issues of law and policy
[AAS 78-199] 23 p0427 A79-34864
Legal aspects of solar power satellites - Focus on microwave exposure standards
[IAF PAPER 79-IISL-01] 24 p0711 A79-53452
GORSKA, M.
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911
CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197
GORSKI, A. J.
On the design of CPC photovoltaic solar collectors
[CONF-780114-8] 21 p0124 A79-17355
Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024
GORSKI, S.
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970
GOSLICH, H. D.
Further development of the high-speed converter with flapping hinge /Goslich system/ - Plans for application in developing countries
23 p0471 A79-38655
GOSLICH, H.-D.
Low-cost concept for energy supply from the wind
21 p0058 A79-13651
GOSS, J. R.
Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690
An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier
23 p0381 A79-32592
GOSSAIN, D. M.
Dynamics of stepping of the Hermes flexible solar array
22 p0323 A79-31615
GOTT, P.
Recommended performance standards for electric and hybrid vehicles
[SAN-1335-1] 21 p0195 N79-12450
Evaluation of automobile drivetrain components to improve fuel economy
[PB-293728/2] 24 p0720 N79-28594
GOTTLIEB, M.
Environmental control implications of increased coal utilization under the National Energy Plan
[ANL/EES-CP-10] 24 p0760 N79-30846
GOULD, C. L.
Large-scale human benefits from the industrialization of space
21 p0099 A79-16136
Space to benefit mankind - 1980 to 2000
[IAF PAPER 79-206] 24 p0710 A79-53356
GOULD, J. R.
The effects of oil on marine life
23 p0434 A79-35463
GOULD, R. K.
Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158037] 21 p0219 N79-14555
Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158679] 23 p0558 N79-24448
GOUPIL, D. W.
Field demonstration of rapid microfouling in model heat exchangers - Gulf of Mexico, November 1978
24 p0620 A79-45803
GOVAERTS, R.
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977
GOYAL, I. C.
Transient plate temperature in flat plate solar collectors
24 p0603 A79-44294
GOYAL, K. P.
Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792
GRAAE, J. A. E.
Thermal management of the lithium/metal sulfide electric vehicle
[SAE PAPER 790161] 22 p0315 A79-31366
GRAEBER, W.-D.
Methane formation during the hydrogasification and the gas phase pyrolysis of defined aromatics
22 p0265 A79-23829
GRAF, J. C.
Rankine cycle solar driven heat pump development
24 p0610 A79-45221
GRAF, T. E.
DD-963 Class waste heat recovery system experience
[ASME PAPER 79-GT-159] 23 p0378 A79-32421
GRAFF, K.
Carrier lifetime in silicon and its impact on solar cell characteristics
23 p0437 A79-36148

GRAFF, R. A.
Improved techniques for gasifying coal
[FE-2340-7] 23 p0554 N79-24186

GRAFFEO, A. P.
Chemical characterization of shale oil and related fuels
24 p0665 A79-50888

GRAHAM, L.
Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

GRAHAM, R. W.
Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526

GRALLERT, H. K. H.
Experience with the MBB-solar testing house at Otterfing and relevant consequences on the commercial product
22 p0276 A79-25934

GRANATSTEIN, D. L.
Potential of biomass to substitute for petroleum in Canada
23 p0494 A79-40743

GRANCESCA, M.
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022

GRANNEMAN, W. W.
Dielectric development for GaAs solar cells
[PB-295837/9] 24 p0802 N79-33600

GRANQVIST, C. G.
Selective absorption of solar energy by ultrafine metal particles
21 p0127 A79-17382
Selective absorption of solar energy in ultrafine metal particles - Model calculations
22 p0273 A79-25746
Spectrally selective surfaces of Ni-pigmented anodic Al2O3
24 p0629 A79-46202
Ultrafine nickel particles for photothermal conversion of solar energy
24 p0638 A79-47062

GRANRYD, E.
Theory of solar assisted heat pumps
21 p0050 A79-15864

GRANT, A. J.
Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923

GRANTZ, W.
Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805

GRANVILLE, S.
Alternative models of energy demand
22 p0353 N79-19440

GRAS, J. M.
Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium
[P/539/77/20] 23 p0588 N79-27284

GRASSO, F.
Relation between concentration and acceptance in solar collectors
24 p0641 A79-47795

GRASYNSKI, K.
Proposals for power conditioning systems of high power communication satellites
21 p0033 A79-10897

GRATTEAU, J. C.
Cogeneration with digester gas
24 p0676 A79-51773

GRAVEN, R. M.
On the design of CPC photovoltaic solar collectors
[CONF-780114-8] 21 p0124 A79-17355
Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463

GRAVEN, W. M.
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575

GRAVES, G. B.
Southern regional solar energy center planning
24 p0608 A79-45203

GRAY, D. C.
Design of a bench model solar receiver for an open-cycle solar/electric system
[AIAA PAPER 79-0992] 23 p0459 A79-38193

GRAY, D. E.
Energy efficient engine preliminary design and integration study
[NASA-CR-135396] 21 p0194 N79-12084

GRAY, J.
The isotopic composition of carbon in the Alberta oil sand
24 p0650 A79-49357

GRAY, J. C.
Instrumenting hybrid passive/active solar systems
24 p0610 A79-45223

GRAY, J. L.
Contactless measurement of lifetime by free carrier infrared absorption
23 p0497 A79-40892

GRAY, S.
Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356

GREBENSHCHIKOV, S. E.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

GREBOGI, C.
Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity
22 p0269 A79-24814

GREBOWSKY, J. M.
Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897

GREELEY, D.
An inexpensive multiplexer temperature measuring system for monitoring and evaluation of solar collectors
21 p0089 A79-15847

GREEN, A. A.
The significance of longwave radiation in flat plate solar collector testing
23 p0448 A79-37847
The influence of environmental parameters on flat plate solar collector performance
24 p0604 A79-44557

GREEN, B.
Implementation of state solar incentives: Research, Development, and demonstration programs
[SERI/TR-51-161] 24 p0773 N79-31799

GREEN, B. J.
Large tokamak experiments - Report on the Third IAEA Technical Committee Meeting, Paris, 1-6 September 1978
22 p0313 A79-31193

GREEN, J.
The polar lunar base - A viable alternative to L-5
[AAS 78-191] 23 p0427 A79-34862

GREEN, M. A.
Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant
[ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775
The short-wavelength response of MIS solar cells
22 p0273 A79-25748
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075
655 mV open-circuit voltage, 17.6% efficient silicon MIS solar cells
23 p0447 A79-37686
The short-wavelength response of single- and poly-crystalline MIS solar cells
23 p0507 A79-40989
High-temperature lifetesting of Al/SiOx/p-Si contacts for MIS solar cells
23 p0536 A79-43569
Computer design and optimization of cryogenic refrigeration systems
[LBL-7934] 24 p0768 N79-31439

GREEN, R.
An ocean thermal difference power plant in the Canadian Arctic
22 p0318 A79-31415

GREEN, R. H.
Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132
GREENBERG, D. A.
A numerical model investigation of tidal phenomena in the Bay of Fundy and Gulf of Maine
22 p0323 A79-31554
GREENBERG, G.
Electric vehicle progress in the U.S. - Where to
22 p0269 A79-24611
GREENBERG, J.
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
GREENE, J. M.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226
GREENFELD, M.
Laboratory simulation of in-situ coal gasification
23 p0494 A79-40740
GREENMAN, P.
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
GREENSTEIN, D.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704
GREENSTEIN, J.
A low cost approach to performance monitoring for the evaluation of a solar domestic hot water system
21 p0088 A79-15842
Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex
24 p0608 A79-45210
GREENSTEIN, M.
Recent developments in the foam OTEC system
24 p0623 A79-45832
GREENWALD, A. C.
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
GREGOR, H. P.
Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0796 N79-33346
GREGORY, D. L.
A development strategy for the solar power satellite
[AAS PAPER 78-154] 22 p0243 A79-21266
GREIB, R. E.
Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374
GREMS, E. G.
Orientation studies for single-axis concentrating collectors
23 p0537 A79-43677
GRENON, L. A.
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
Phase 1 of the automated array assembly task of the low cost silicon solar array project
[NASA-CR-158120] 22 p0348 N79-18451
GRENON, M.
Fuels of the future. I
22 p0282 A79-26404
On future carburants. II
22 p0296 A79-28439
A completely solar power supply for France
23 p0436 A79-35492
A WELMM comparison of energy scenarios
24 p0645 A79-48025
On fossil fuel reserves and resources
[IIASA-RM-78-35] 23 p0593 N79-27628
GRETHER, D. F.
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion
21 p0082 A79-15077
GRETZ, J.
On the thermal and thermo-electrolytical generation of hydrogen by solar energy
21 p0059 A79-13660
The concept of the 1 MW/el/ solar thermal power plant of the European economic community
23 p0464 A79-38590
GREY, J.
Future energy alternatives
24 p0602 A79-44276
Utilization of alternative fuels for transportation; Proceedings of the Symposium, University of Santa Clara, Santa Clara, Calif., June 19-23, 1978
24 p0650 A79-49376
GREYWALL, M. S.
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
GRIDNEV, N. P.
Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626
GRIEKSPOOR, W.
OTEC in Europe
21 p0152 A79-18109
GRIER, N. T.
Large space system - Charged particle environment interaction technology
[AIAA 79-0913] 23 p0425 A79-34775
GRIESSEN, R.
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686
GRIEST, W. H.
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
GRIEVE, W.
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838
GRIFFEE, D. G., JR.
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828
Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525
GRIFFIN, C. W.
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
GRIFFIN, O. M.
Ocean thermal energy conversion; Proceedings of the Energy Technology Conference and Exhibition, Houston, Tex., November 6-9, 1978
21 p0100 A79-16245
Some early and recent novel OTEC systems
21 p0100 A79-16246
Vortex excited oscillations of marine structures with application to the OTEC cold water pipe
24 p0622 A79-45825
GRIFFITH, E. D.
Energy supply and demand in California
23 p0591 N79-27603
GRIFFITH, J.
Environmental testing of flat plate solar cell modules
23 p0428 A79-35039
GRIFFITH, J. S.
Environmental testing of block 2 solar cell modules
[NASA-CR-158521] 23 p0542 N79-22628
GRIFFITH, R. W.
Amorphous semiconductors in photovoltaic and solar thermal conversion
[BNL-24216] 21 p0122 A79-17339
GRIFFITH, W. L.
Economics of the ANFLOW process for municiple sewage treatment
[ORNL/TM-6574] 24 p0762 N79-31093
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363

GRIGGS, E. I.
Testing and evaluation methods to determine an optimal air-flow rate in flat-plate solar collectors
[AIAA PAPER 79-0972] 23 p0456 A79-38179
GRIGOREVA, G. M.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904
GRIGORIANTS, R. R.
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171
GRIGOROV, L.
Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes
22 p0245 A79-21482
GRIHANGNE, A.
Progress towards 100-knot nonconventional ocean ships. II
21 p0155 A79-18519
GRIJALVA, R.
Non-electric applications of geothermal energy in six Alaskan towns
[IDO-1622-4] 21 p0208 N79-13523
GRILIKHES, V. A.
Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/
24 p0636 A79-46757
GRILL, C.
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375
GRILLO, L. M.
Co-disposal of sewage sludge using refuse-derived fuel
21 p0097 A79-16098
GRILLY, E. R.
Development of cryogenic targets for laser fusion
21 p0085 A79-15333
GRIMES, G.
Use of waste wood in plywood manufacture - A case history
23 p0489 A79-40396
GRIMES, W. D.
Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826
GRIMES, W. R.
Optimization of the fission-fusion hybrid concept
[ORNL/PPA-79/3] 24 p0778 N79-32113
GRIMM, R. C.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226
GRIMM, U.
Fluidized-bed combustion of low-quality fuels
21 p0007 A79-10066
Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543
GRIMMER, D. P.
Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166
A comparison of compound parabolic and simple parabolic concentrating solar collectors
22 p0262 A79-23754
Theoretical considerations in the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36630
Initial experimental tests on the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36631
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494
Small-scale solar simulator for indoor testing of collector modules and materials
[LA-UR-79-1335] 24 p0790 N79-32716
GRIPPS, W.
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379
GRISCOM, R. W.
Regional air pollution study: Heat emission inventory
[PB-284081/7] 21 p0200 N79-12602
GRISHAM, L.
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724
GRISHUTIN, M. M.
Vapor-turbine units with organic working fluids and prospects for their use in solar power generation /Survey/
24 p0636 A79-46757
GROB, A.
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001
GROB, J. J.
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001
GROBMAN, J.
Alternative aircraft fuels
21 p0033 A79-10824
Alternative aviation turbine fuels
21 p0047 A79-12378
GROBMAN, J. S.
Characteristics and combustion of future hydrocarbon fuels
21 p0036 A79-11599
Impact of future fuel properties on aircraft engines and fuel systems
21 p0036 A79-11600
Characteristics and combustion of future hydrocarbon fuels
21 p0202 N79-13196
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
GRODZINSKII, E. V.
Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762
GROENEVELD, M. J.
Gasification of solid waste - Potential and application of co-current moving bed gasifiers
23 p0536 A79-43574
GROLL, M.
Heat pipe technology for spacecraft thermal control
24 p0764 N79-31274
GROMOVOI, L. I.
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361
Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385
Analysis of the efficiency of a varizone photoelectric converter
24 p0663 A79-50708
GRONCKI, P. J.
General-equilibrium approach to energy/environmental economic analysis
[BNL-24781] 23 p0564 N79-24504
GRONHOVD, G. H.
Technology and Use of Lignite
[GFERC/IC-77/1] 21 p0216 N79-14241
GRONICH, S.
OTEC program status and plans
21 p0094 A79-15902
GROSPILS, A.
Solar heating of sports centers in Belgium - Chevetogne and Butgenbach
23 p0472 A79-38659

GROSS, F.
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836
GROSS, G.
SERI solar energy standards activities
23 p0431 A79-35075
GROSSIN, B.
Medium-power /100 to 1000 kWe/ heat and electricity production from solar sources
23 p0435 A79-35484
GROSSMAN, G.
Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755
Solar collector development in Iran
23 p0493 A79-40675
GROTE, U.
Architectural planning - The possibility of using solar energy must be kept open
23 p0473 A79-38665
GROTTA, H. M.
Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels
[FE-2321-12] 21 p0216 N79-14240
GROVE, S.
Satellite Power System (SPS) international agreements
[NASA-CR-157437] 23 p0549 N79-23501
GROVES, W. N.
Clean energy from humid air
23 p0406 A79-34053
GRUBER, C. L.
Clean energy from humid air
23 p0406 A79-34053
GRUBER, R. P.
Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1] 22 p0357 N79-20179
GRUBER, S.
Modelling energy storage systems for electric utility applications Preliminary considerations
21 p0081 A79-14960
GRUBLER, A.
The comparison of energy chains
24 p0644 A79-48023
GRUEBLER, A.
A WELMM comparison of energy scenarios
24 p0645 A79-48025
GRUEN, D.
The HYCSOS solar energy driven heat pump
24 p0610 A79-45222
GRUEN, D. M.
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716
HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529
GRUENBERG, P.
Peak period of household load in the different stages of electrical power supply
23 p0528 A79-42226
GRUENE, H.
A thermoanalytical investigation of nickel catalysts for fuel cells
23 p0481 A79-40008
GRUNE, W. N.
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363
GRUNG, B. L.
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
GRUNINGER, R. M.
Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities
23 p0490 A79-40414
GRUZDEV, V. A.
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream
21 p0114 A79-16786
Toxic component concentration in kerosene-air mixture combustion products
22 p0291 A79-27733
GRZADZIELSKI, I.
Control problems of the magnetohydrodynamic electrical power generation in power station cooperating with electrical power system
22 p0303 A79-29798
GRZYBOWSKI, A.
Control problems of the magnetohydrodynamic electrical power generation in power station cooperating with electrical power system
22 p0303 A79-29798
GUASTAFERRO, A.
A technology program for large area space systems
21 p0100 A79-16145
GUAZZONI, G.
Militarized thermoelectric power sources
21 p0027 A79-10227
Regenerative burner system for thermoelectric power sources
22 p0261 A79-23621
GUBANKOV, V. N.
Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690
GUBAREV, A. V.
Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601
GUDIKSEN, P. H.
A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262
GUDMUNDSSON, J. S.
The problem of fouling in the utilisation of geothermal energy
23 p0449 A79-37853
Rippled silica deposits in heat exchanger tubes
23 p0532 A79-42984
GUDZENKO, A. I.
Solar-radiation-excited CO2-Br2-He gas laser
23 p0397 A79-33887
GUDZENKO, L. I.
Direct conversion of solar energy into laser radiation
22 p0311 A79-31086
GUENTHER, D. A.
Power extraction from ocean surface waves
23 p0486 A79-40198
An investigative study of a wave-energy device
24 p0631 A79-46315
GUERIN, M. R.
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923
GUESDON, J. P.
Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976
GUESS, T. R.
The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate
22 p0239 A79-20824
GUEYMARD, C.
Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452
GUFFANTI, M.
Geothermal systems and their energy resources
24 p0632 A79-46433
GUHA, B.
Energy from biomass through hydrolysis of wood
21 p0003 A79-10036
GUHA, T. K.
Manmade geothermal energy
23 p0408 A79-34072
GUIENNE, P.
High Speeds and aerotrain
23 p0551 N79-23836

GUILD, D. H.
Potential for ocean thermal energy conversion electric power generation in the Southeast region
24 p0626 A79-45855
Wind energy central station power generation in the Southwest and Southeast
24 p0634 A79-46533
GUILLAUMIN, J. C.
Evaluation of densified refuse derived fuels for use in pulverized coal-fired steam generators
23 p0491 A79-40422
GUIN, J. A.
Particle size variation in the solvent refined coal process
23 p0492 A79-40451
Selectivity improvement in the SRC process
24 p0628 A79-45992
GULBINAS, E.
Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745
Material and energy balances in the production of ethanol from wood
[CONF-7806139-1] 23 p0589 N79-27338
GULBRANSEN, E. A.
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395
GULIAENKO, A. B.
Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342
GUNDERSON, M.
A thermodynamic study of heating with geothermal energy
[ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253
GUNKEL, W. W.
Design of a direct wind energy converter to heat water by agitation in a closed tank
21 p0067 A79-14290
GUNN, M.
Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921
GUNTHER, B.
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
Flame-fired thermionic diode development
24 p0700 A79-51988
GUO, T.-H.
Digital simulation of dynamics of wind turbine generators
24 p0654 A79-50073
GUPTA, B. K.
Preparation and properties of pure and tin doped indium oxide selective coatings
21 p0127 A79-17381
Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators
21 p0153 A79-18469
Transport phenomena in MHD generators - Effect of boundary layers
21 p0156 A79-19098
Effect of diffusion on electron density across the nonequilibrium MHD channel
23 p0479 A79-39839
Spray deposited Cd/1-x/Zn/x/S films for low cost solar cells
23 p0500 A79-40912
High absorptivity Al-PbS selective surfaces for solar photothermal conversion
24 p0705 A79-52319
Power output of an MHD generator - Effect of ionization instability and boundary layer
24 p0708 A79-52958
GUPTA, B. P.
Exposure test results for reflective materials
23 p0430 A79-35068
GUPTA, C. L.
Flat plate collector - Experimental studies and design data for India
21 p0132 A79-17425
GUPTA, C. P.
Solar collector optimization
21 p0132 A79-17418
Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486
Design construction and short term performance of a solar pond
23 p0385 A79-33220
GUPTA, G. D.
Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832
GUPTA, G. P.
Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523
GUPTA, K. C.
A simple solar tracking system
21 p0136 A79-17457
GUPTA, M. C.
Rate of desorption in a solar regenerator
21 p0055 A79-13611
Buoyancy effects in a solar regenerator
22 p0262 A79-23752
Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607
Transient response of a solar regenerator
23 p0526 A79-41935
GUPTA, R. P.
Development of 1 kW vertical axis wind generator
21 p0142 A79-17511
GUPTA, S. C.
Energy through solar aided bio-gas systems
21 p0125 A79-17367
GUPTA, V. K.
Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489
GUREEV, K. G.
Optimum properties of a noncylindrical pinch
22 p0244 A79-21433
GUREVICH, I. G.
The theory of stabilization of the output power of a rechargeable fuel cell battery under conditions of significant concentration polarization
24 p0652 A79-49489
GURFEL, B.
Model of the economic efficiency of the exploitation of oil shale in comparison with other mineral sources of energy
23 p0536 A79-43575
GURFIELD, R. M.
Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198
GURNEY, C.
Space technology spinoffs
24 p0639 A79-47260
GURUSWAMY, V.
Towards the design of contrived photosynthesizers
24 p0655 A79-50185
Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316
GUSEV, V. K.
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430
GUSS, W. C.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429
GUSSAK, L. A.
LAG-Process, some results of utilization in transport and mechanical engineering
21 p0030 A79-10248
GUSTAFSON, R. E.
Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525
GUSTAFSON, R. J.
Farm-scale generation of bio-gas
24 p0631 A79-46312
GUSTAFSON, T. K.
Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981
GUSTAVSON, M. R.
Limits to wind power utilization
22 p0302 A79-29601

GUSTAVSSON, B.
Test results from the Swedish 60 kW experimental wind power unit
23 p0484 A79-40120

GUTJAHR, A. L.
Estimates of New Mexico's future oil production including reserves of the 50 largest pools
[PB-291780/5] 23 p0540 N79-22597

GUTMANN, R. J.
Output power variations with solar power satellites
21 p0067 A79-14267
Solar power satellite rectenna design study: Directional receiving elements and parallel-series combining analysis
[NASA-CR-151866] 22 p0330 N79-16039

GUTOWSKI, R. R.
The indirect Brayton energy recovery system
24 p0696 A79-51958

GUYENNE, T. D.
Photovoltaic generators in space
[SP-140] 24 p0751 N79-30730

GUZDAR, P. N.
Theory of dissipative drift instabilities in sheared magnetic fields
22 p0292 A79-27884

GUZMANN, G. L.
Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal
22 p0364 N79-21215

GVERDTSITELI, I. G.
A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers
24 p0704 A79-52166
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167

GYAMFI, M.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

H

HAAG, W. O.
Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis
24 p0669 A79-51196

HAAR, W.
Recent advances in Na/S cell development - A review
22 p0246 A79-21488

HAAS, F. A.
The effect of limiters and current profile on elliptic free-boundary MHD equilibria
22 p0291 A79-27881
Dynamics of high-beta tokamaks with anisotropic pressure
23 p0526 A79-41939

HAAS, R. J.
Silver-hydrogen, a long life light weight energy storage system
21 p0001 A79-10012

HAAS, S. A.
Preliminary design of the solar total energy-large scale experiment at Shenandoah, Georgia
21 p0019 A79-10159

HABEGGER, L. J.
Long-term availability of water resources for energy development in the Central United States
21 p0065 A79-14118

HABERCOM, G. E., JR.
Design and applications of flywheels. Citations from the NTIS data base
[NTIS/PS-78/0997/3] 21 p0190 N79-11550
Design and applications of flywheels. Citations from the engineering index data base
[NTIS/PS-78/0998/1] 21 p0190 N79-11551

HACKENBERG, C. M.
Thermal radiation - Transient heat transfer in plates with selective surfaces
23 p0389 A79-33266

HACKERMAN, N.
Iron oxide semiconductor electrodes in photoassisted electrolysis of water
21 p0037 A79-11781

HADDEN, L. D.
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132

HADLEY, G. R.
Numerical codes for MHD flows
[SAND-78-1954] 24 p0730 N79-29061

HAEFELE, W.
Energy for the long run - Fission or fusion
22 p0256 A79-22760

HAFEN, D. P.
Evaluation of methods for analyzing silver-zinc cells
21 p0010 A79-10085

HAGA JUNIOR, E.
Characteristics of GRP for applications in solar energy collectors
23 p0385 A79-33218

HAGEN, D. L.
Optimum insulation with internal and solar heat gains
21 p0140 A79-17490
Design of flywheel rotors utilizing cellulosic materials
24 p0678 A79-51787

HAGEN, H.
Vacation homes near the sea with solar and wind energy utilization - Research done at the Technical University of Hannover: Architectural considerations
21 p0058 A79-13653

HAGEN, W. F.
Requirements and new materials for fusion laser systems
21 p0082 A79-15138

HAGENMULLER, P.
A new thermochemical process for hydrogen production
22 p0312 A79-31153

HAGGERTY, J. J.
Spinoff 1979
[NASA-TM-80481] 24 p0730 N79-29108

HAGGMARK, L. G.
Alpha transport and blistering in tokamaks
22 p0253 A79-22243

HAGLER, M.
Market assessment of fuel cell total energy systems
[ORNL/CCN-36] 23 p0598 N79-27704

HAGLER, T.
Orbital demonstration - The prelude to large operational structures in space
[IAF PAPER 79-207] 24 p0710 A79-53357

HAHN, K. W.
Effect of temperature and pressure on molten carbonate fuel cell fuels and performance
24 p0682 A79-51818

HAHN, O. J.
A mass and energy balance of a Wellman-Galusha gasifier
22 p0283 A79-26467

HAHNE, E.
A parametric investigation on flat-plate solar collectors
21 p0128 A79-17391
Comparative outdoor measurements on flat-plate solar collectors in a metropolitan area in Western Germany
21 p0128 A79-17394
Transient behaviour of solar flat plate collectors
23 p0467 A79-38612

HAIGH, A. D.
Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782

HAIGH, B.
American Power Conference, Illinois Institute of Technology, Chicago, Ill., April 24-26, 1978, Proceedings. Volume 40
23 p0423 A79-34451

HAJELA, G. P.
Effect of noncondensable gases on geothermal power generation
21 p0015 A79-10125

HALBOUTY, M. T.
Future programs and prospects for resource exploration from space by the year 2000
[AAS PAPER 78-182] 22 p0243 A79-21275

HALE, M. J.
Solar project cost report
[SOLAR/2018-78/60] 24 p0728 N79-28788

HALE, M. R.
Energy conserving cogeneration plant benefits utility and industrial companies
23 p0423 A79-34452
HALE, S., JR.
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500
HALEY, G. M.
Satellite Power System (SPS) concept definition study (exhibit C)
[NASA-CR-161173] 22 p0352 N79-19071
HALG, W.
Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682
HALL, C. A. S.
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722
HALL, D. C.
The potential of alternative energy sources in meeting Air Force requirements
23 p0420 A79-34169
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341
HALL, D. O.
Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119
Solar energy use through biology - Past, present and future
23 p0439 A79-36627
The prospects of a biological-photochemical approach for the utilization of solar energy
23 p0448 A79-37850
HALL, E. W.
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560
HALL, F. D.
State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes
21 p0064 A79-14111
HALL, F. F.
Weightless solar energy collection
23 p0385 A79-33215
Hydrogen-electric power drives
23 p0386 A79-33231
Free-wheeling hydraulic power mills
23 p0387 A79-3324
Dual purpose solar-electric power plants
23 p0403 A79-34027
HALL, J. C.
Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries
21 p0010 A79-10088
HALL, J. L.
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115
Source emissions factors for refuse derived fuels
21 p0082 A79-15084
Environmental effects of burning solid waste as fuel
21 p0082 A79-15115
Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735
HALL, J. M.
Aging behavior of crude shale oil
[AD-A062420] 22 p0357 N79-20272
HALL, O. P., JR.
Power management battery storage systems
[AIAA PAPER 79-0982] 23 p0457 A79-38186
HALL, R. A.
Hydrogen-fueled postal vehicle performance evaluation
[NASA-CR-158811] 24 p0730 N79-29106
HALL, R. B.
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949
HALL, R. E.
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers
[ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738
HALL, R. N.
High efficiency cell geometry
24 p0784 N79-32653
HALLANGER, L.
Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805
HALLER, J. A.
Power-conversion system component summation
23 p0580 N79-26483
HALLET, R. W., JR.
A central receiver solar thermal power system
21 p0091 A79-15872
Central receiver thermal power system
[AED-CONF-78-212-008] 23 p0582 N79-26513
HALOW, J. S.
Fluidized-bed combustion of low-quality fuels
21 p0007 A79-10066
Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543
HALPERN, G. M.
Fuel content characterization and pressure retention measurements of DT-filled laser fusion microballoon targets
22 p0258 A79-23034
HALS, F. A.
Layout and design characteristics of MHD power stations
21 p0105 A79-16481
High-temperature oxidizer preheater
21 p0106 A79-16487
MHD power generation
21 p0146 A79-17638
Coal gasification as applied to MHD power cycle
23 p0411 A79-34095
HALVERSON, S. L.
Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922
HAM, N. D.
Analytical and experimental evaluation of Cycloturbine aerodynamic performance
[AIAA PAPER 79-0968] 23 p0456 A79-38176
HAM, R. K.
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235
HAMADA, Y.
Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037
HAMAKAWA, Y.
Ni cermet selective absorbers for solar photothermal conversion
24 p0641 A79-47790
HAMAKER, J.
Tilt, orientation and overshadowing of solar collectors in the Netherlands
21 p0131 A79-17414
HAMBERGER, S. M.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459
HAMED, A.
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Erosion study of different materials affected by coal ash particles
24 p0646 A79-48864
HAMEED, S.
The natural and perturbed troposphere
21 p0179 N79-10636
HAMERSMA, J. W.
Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals
21 p0044 A79-12117
HAMILTON, C. L.
Analysis of dynamic effects in solar thermal energy conversion systems
23 p0400 A79-34008
The engineering analysis of solar radiation
24 p0605 A79-44796

HAMILTON, G. W.
Efficient high-power high-energy neutral beams for the reference mirror reactor
23 p0397 A79-33919

HAMILTON, M. R.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052

HAMILTON, N. I.
Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783

HAMILTON, R. C.
Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036

HAMILTON, R. W.
Evaluation of selected near-term energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803

HAMILTON, W.
Outlook for electric road vehicles
24 p0650 A79-49380

HAMLET, I. L.
Summary results from the NASA Tech House one year live-in
[AIAA PAPER 79-0987] 23 p0475 A79-38892

HAMM, J. R.
Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
Utilization of fluidized bed combustion in energy recovery from solid wastes
23 p0490 A79-40416

HAMMAR, T.
Central receiver solar heating system
23 p0468 A79-38621

HAMMEL, E. F.
Energy, helium, and the future
23 p0422 A79-34181

HAMMEL, T. E.
Selenide isotope generator for the Galileo mission
21 p0022 A79-10185

HAMMER, H.
Statement and comparison between different studies on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833

HAMMOND, B.
Solar photovoltaic power for residential use
[ASME PAPER 79-SOL-11] 22 p0308 A79-30546

HAMMOND, D. C., JR.
Operation of a GT-225 diffusion-flame combustor on alternative fuels performance, durability and emissions
[ASME PAPER 79-GT-138] 23 p0378 A79-32407

HAMMOND, R. P.
The mist-transport cycle - Progress in economic and experimental studies
24 p0624 A79-45841

HAMPEL, V. E.
Evaluated physical properties data for materials used in energy storage systems
[UCRL-81159] 21 p0189 N79-11536

HAMPL, E. F., JR.
Selenide thermoelectric converter technology
21 p0026 A79-10221

HAMPTON, D. H.
Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457

HAMPTON, H. L.
Specularity measurements for solar materials
22 p0254 A79-28153
Specularity measurements by Fourier transform examination
23 p0431 A79-35069
Effects of noncontact cleaners on transparent solar materials
[PNL-2969] 24 p0789 N79-32709

HAMPTON, W. F.
Water related constraints in energy production
[PB-285713/4] 21 p0222 N79-14592

HAN, S. M.
A liquid solar energy storage tank model. I - Formulation of a mathematical model
22 p0267 A79-24314
Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213

HANAK, J. J.
Monolithic solar cell panel of amorphous silicon
24 p0712 A79-53496

HANCOCK, O. G., JR.
The Florida Solar Energy Standards Act of 1976
[AIAA PAPER 79-1018] 23 p0460 A79-38203
Solar heated and cooled house in Winter Springs, Florida - A Florida Gas Company Project
[AIAA PAPER 79-1019] 23 p0460 A79-38204

HANDA, S. K.
Honeycomb type flat plate collectors - Experiments leading to drinking straw
21 p0132 A79-17424

HANDLEY, L. M.
Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092

HANEMAN, D.
Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191

HANES, M. H.
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

HANITSCH, R.
Solar system - Solar generator-inverter-asynchronous motor-pump
23 p0466 A79-38605

HANKINS, J. D.
Predicted performance of heliostats for ERDA's 10 MWe power plant
21 p0044 A79-12045
User's guide for MIRVAL: A computer code for comparing designs of heliostat-receiver optics for central receiver solar power plants
[SAND-77-8280] 24 p0729 N79-28932

HANKINS, L.
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612

HANLEY, G.
Satellite Power Systems (SPS) concept definition study. Volume 3: SPS concept evolution
[NASA-CR-158066] 21 p0225 N79-15138
Satellite Power Systems (SPS) concept definition study. Volume 5: Transportation and operations analysis
[NASA-CR-158067] 21 p0225 N79-15139
Satellite Power Systems (SPS) concept definition study. Volume 6: SPS technology requirements and verification
[NASA-CR-150685] 21 p0225 N79-15140
Satellite Power Systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis
[NASA-CR-158068] 21 p0225 N79-15141
Satellite power systems (SPS) concept definition study. Volume 7: SPS program plan and economic analysis, appendixes
[NASA-CR-150702] 21 p0225 N79-15142
Satellite power systems (SPS) concept definition study. Volume 1: Executive summary
[NASA-CR-150700] 22 p0329 N79-16036
Satellite Power Systems (SPS) concept definition study. Volume 2: SPS system requirements
[NASA-CR-150681] 22 p0330 N79-16037
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies
[NASA-CR-161215] 23 p0543 N79-22633
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation
[NASA-CR-161216] 23 p0543 N79-22634

HANLEY, G. M.
Evolution of satellite power system /SPS/ concepts
21 p0002 A79-10023
Future space transportation systems
21 p0100 A79-16146

An evolutionary solar power satellite program
[AAS PAPER 78-153] 22 p0243 A79-21265
First steps to the Solar Power Satellite
23 p0382 A79-32721
Satellite Power Systems (SPS) concept definition study (exhibit C)
[NASA-CR-150827] 21 p0183 N79-11475
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 1: Executive summary
[NASA-CR-161218] 23 p0547 N79-23484
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 1: System engineering
[NASA-CR-161219] 23 p0547 N79-23485
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics
[NASA-CR-161220] 23 p0547 N79-23486
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics, appendixes
[NASA-CR-161221] 23 p0547 N79-23487
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 4: Transportation analysis
[NASA-CR-161222] 23 p0547 N79-23488
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 7: System/subsystem requirements data book
[NASA-CR-161223] 23 p0547 N79-23489
HANN, C. B.
Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541
HANNA, W. T.
Closed Cycle Gas Turbine power generation opportunities
21 p0004 A79-10039
HANNEMANN, R. J.
Externally pumped Rankine cycle thermal transport devices
[AIAA PAPER 79-1091] 23 p0456 A79-38060
HANNON, B.
Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0750 N79-30727
Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0772 N79-31788
HANNUS, S.
A planning and information system for strategic energy policy assessment
22 p0259 A79-23600
HANOKA, J. I.
Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon
23 p0504 A79-40959
HANSCHE, B. D.
Laser ray trace tester for parabolic trough solar collectors
21 p0144 A79-17619
HANSELMANN, G.
Flywheel energy accumulators for road vehicles
22 p0241 A79-20845
HANSEN, B. J.
Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416
HANSEN, J. S.
Erosion testing of potential valve materials for coal gasification systems
[PB-293308/3] 24 p0720 N79-28592
HANSEN, K. C.
Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508
HANSETH, E.
Advanced solar thermal technology - Potential and progress
24 p0671 A79-51739
HANSON, J. A.
Concepts for solar production of hydrogen
24 p0614 A79-45593
Toward the renewables - A natural gas/solar energy transition strategy
24 p0686 A79-51851
HANSON, R. E.
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649
HANTMAN, R. G.
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423
HARA, T.
Three-dimensional effects of electrode configuration on diagonal MHD generator performance
22 p0283 A79-26523
Application of finite element method to analysis of MHD generators
24 p0653 A79-50001
HARADA, H.
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110
HARAK, A. E.
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741
HARBAUGH, D. L.
EPRI/TVA pilot electric vehicle demonstration program
[SAE PAPER 790110] 22 p0314 A79-31357
HARDELL, R.
Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study
23 p0527 A79-41946
HARDGROVE, J. A.
High pressure MHD coal combustors investigation
[FE-2706-08] 22 p0362 N79-20510
HARDING, G. G.
Developing electric vehicles
22 p0302 A79-29496
HARDING, G. L.
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces
21 p0126 A79-17377
HARDING, S. R.
Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873
HARDT, H. H.
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations
[PB-286487/4] 21 p0230 N79-15422
HARDT, L.
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828
HARDY, D. M.
Wind energy assessment
23 p0406 A79-34051
HARDY, J.
Historical review of adaptive optics technology
21 p0114 A79-17171
HARDY, R. W.
Design considerations for the Tandem Junction Solar Cell
24 p0784 N79-32651
HARE, M.
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
HARE, R. C.
Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts
[NASA-CR-159411-VOL-1] 21 p0205 N79-13496
HARI RAO, C. V.
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084
HARKER, J. H.
Energy storage in fluidized beds
24 p0657 A79-50211
HARKNESS, J. M.
Accelerated test program
22 p0370 N79-21577
HARKNESS, S. D.
A high temperature fusion reactor design
24 p0696 A79-51954
Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953

HARLEY, R. G.
Wind energy conversion and hydrogen production - A feasibility study for South Africa
23 p0452 A79-37892

HARLING, O. K.
Solar pond stability experiments
21 p0042 A79-11878

HARMON, K. M.
Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0753 N79-32995

HARMON, R. A.
Cogeneration in Europe and the combined cycle gas turbine
22 p0297 A79-28988

HARMON, S. Y.
Measurement of free carrier lifetime in an illuminated solar cell from capacitance measurements
23 p0497 A79-40891

HARMS, A. A.
The synergetics of the catalytic D-D-fusion-fission breeder
22 p0252 A79-22236

HARNETT, R. M.
Three modes of energy cost analysis - Then-current, base-year, and perpetual-constant dollar
23 p0422 A79-34277
Three modes of energy cost analysis: Then-current dollars, base-year dollars, and perpetual-constant dollars
[ORAU/IEA(M)-78-10] 21 p0209 N79-13531

HARNEY, B. M.
Jet fuels from shale oil - A near term technology
21 p0005 A79-10045

HARPER, S.
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970

HARRAR, J. E.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

HARRIES, W. L.
Investigation of a staged plasma-focus apparatus
22 p0255 A79-22365

HARRIGAN, R. W.
Factors affecting market initiation of solar total energy
21 p0112 A79-16732

HARRIS, A. W.
The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311

HARRIS, E. F.
Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359

HARRIS, G. S.
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

HARRIS, H. G.
Mathematical model of forward combustion retorting of oil shale
[LETC/TPR-78/1] 24 p0779 N79-32375

HARRIS, I. R.
The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707

HARRIS, J. W.
A ceramic heat exchanger for a Brayton cycle solar electric power plant
22 p0239 A79-20822

HARRIS, J. S., JR.
/SN/x-GaAs polymer-semiconductor solar cells
21 p0154 A79-18504
High-efficiency AlGaAs/GaAs concentrator solar cells
22 p0261 A79-23710
Spectrally split tandem cell converter studies
23 p0513 A79-41028
High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040
Intercell ohmic contacts for high efficiency multijunction solar converters
24 p0786 N79-32673

HARRIS, R. J.
Performance of a large, salt-gradient solar pond
24 p0671 A79-51735
Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680

HARRISON, J. S.
The use of non-fossil-derived hydrogen in coal conversion processes
23 p0451 A79-37882

HARRISON, R.
Sputtered thin film solar cells
23 p0448 A79-37843
Energy analysis of wave and tidal power
23 p0455 A79-37918

HARRISON, S. J.
Studies on solar collector performance at NRC
22 p0322 A79-31451

HARRISON, T. D.
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565

HARRISON, W. B.
Coal-based electricity and air pollution control - A case for solvent refined coal
21 p0096 A79-15922

HART, D.
The honeycomb heat trap - Its application in flat plate solar collectors
22 p0322 A79-31447

HART, J.
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415

HART, R. E.
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545

HART, T. G.
Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130

HARTE, J.
Energy technologies and natural environments - The search for compatibility
21 p0074 A79-14721
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614

HARTLEY, R. P.
Pollution perspective for geothermal energy development
21 p0064 A79-14114
Pollution control guidance for geothermal energy development
[PB-282546/1] 21 p0178 N79-10604

HARTMAN, G. S.
Evaluation of battery performance using computer controlled test equipment
24 p0683 A79-51828

HARTMAN, H. P.
Low Btu coal gasification processes. Volume 1: Summary, screening, and comparisons
[ORNL/ENG/TM-13-VOL-1] 23 p0555 N79-24188

HARTMAN, J. L.
Electric vehicles challenge battery technology
21 p0093 A79-15892

HARTMAN, J. S.
Specularity measurements for solar materials
22 p0294 A79-28153
Specularity measurements by Fourier transform examination
23 p0431 A79-35069

HARTMAN, S.
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606

HARTMAN, T. L., III
A gas absorption cycle for electric power generation
23 p0418 A79-34154

HARTMAN, T. L., JR.
A gas absorption cycle for electric power generation
23 p0418 A79-34154

HARTMANN, B.
Casing materials for sodium/sulfur cells
22 p0245 A79-21481
Recent advances in Na/S cell development - A review
22 p0246 A79-21488

HARTNETT, J. P.
Midwest Energy Conference, Chicago, Ill., November 19-21, 1978, Proceedings
24 p0630 A79-46301
Advances in heat transfer. Volume 14
24 p0638 A79-47255

HARTSOCK, D. L.
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821

HARTWIG, H.
Laser-induced desorption experiments with technical metal surfaces
23 p0445 A79-36959

HARVEY, C. A.
Heavy duty diesel particulate emission factors
23 p0461 A79-38481

HARVEY, R. W.
Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940

HASAN, S.
Recovery of oil from oil shale - An overall technological perspective
21 p0073 A79-14698

HASDENTEUFEL, J. B.
Practical aspects and applications of bioconversion
23 p0467 A79-38617

HASELMAN, L. C.
Computer modeling of automotive engine combustion
[UCRL-80451] 21 p0181 N79-11412

HASHEMI, H. H.
Gasification Combined Cycle Test Facility at Pekin, Illinois
21 p0145 A79-17632

HASLETT, J.
The analysis by stochastic modelling of solar systems for space and water heating
21 p0137 A79-17466

HASLETT, R. A.
Thermal energy storage heat exchanger design
[ASME PAPER 78-ENAS-30] 21 p0049 A79-12579

HASSAB, M. A.
Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation
23 p0398 A79-33990

HASSAN, K.-E.
Thermal performance of single-pass solar fluid heaters
23 p0467 A79-38613

HASSELBERG, G.
Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces
22 p0270 A79-24855

HASSENZAHL, W. V.
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555

HASTINGS, L. J.
Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator
[NASA-TM-78222] 22 p0360 N79-20495

HATCH, A. M.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306

HATHAWAY, W. H.
A systems examination of the opportunities of coal for California
23 p0591 N79-27600

HATHI, V. V.
Thermal and kinetic analysis of the pyrolysis of coals
22 p0336 N79-16704

HATTORI, T.
Rotating strength of glass-carbon fiber-reinforced hybrid composite discs
21 p0165 A79-20273

HATTORI, Y.
Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
21 p0153 A79-18468
Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field
24 p0708 A79-52955

HATZIPROCOPIOU, M.
The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470

HAU, E.
Flywheel energy accumulators for road vehicles
22 p0241 A79-20845

HAUBENREICH, P. N.
The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541

HAUER, A.
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479

HAUER, K. L.
Farm-scale generation of bio-gas
24 p0631 A79-46312

HAUFFE, W.
The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution
21 p0037 A79-11795

HAUGER, J. S.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052

HAURY, G.
The extent of catalytic SO2 reactions in smoke plumes
24 p0616 A79-45748

HAUSER, J. R.
A two-junction cascade solar-cell structure
22 p0256 A79-22856
A theoretical analysis of the current-voltage characteristics of solar cells
[NASA-CR-158872] 24 p0737 N79-29606

HAUSZ, W.
Role of hydrogen in Eco Energy
24 p0612 A79-45578
Electric utility applications of thermal energy storage and transport
24 p0680 A79-51802
Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts
[NASA-CR-159411-VOL-1] 21 p0205 N79-13496
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560

HAVSTAD, P. H.
Test and development of ceramic combustors, stators, nose cones, and rotor tip shrouds
21 p0049 A79-12821
Evaluation of ceramics for stator application: Gas turbine engine report
[NASA-CR-159533] 22 p0364 N79-21075

HAWES, R. W., JR.
Annual Simulation Symposium, 11th, Tampa, Fla., March 15-17, 1978, Record of Proceedings
23 p0475 A79-38876

HAWKES, D.
The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754

HAWKINS, A. W.
A standard procedure of economic evaluation for energy-producing and pollution-abatement operations
21 p0064 A79-14109

HAWKINS, R. J.
Cost analysis of new and retrofit hot-air type solar assisted heating systems
[NASA-TM-78186] 21 p0173 N79-10519

HAWKS, R. J.
Parametric performance analysis of a Darrieus wind turbine system
23 p0536 A79-43676

HAY, J. E.
Measurement and modelling of shortwave radiation on inclined surfaces
22 p0242 A79-21062
On the use of synoptic weather map typing to define solar radiation regimes
22 p0272 A79-25392

HAY, R. D.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306
Flywheel energy storage interface unit for photovoltaic applications
24 p0679 A79-51791

HAYASHI, N.
Construction of Lur'e type Lyapunov function with effect of magnetic flux decay
24 p0606 A79-44916

HAYES, B. W.
Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste
[PB-285196/2] 21 p0213 N79-13590

HAYGOOD, E.
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447

HAYN, D.
A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432

HAYNES, B. S.
Kinetics of nitric oxide formation in combustion
21 p0053 A79-12989

HAYNES, W. M.
Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324

HAYS, B. A.
Analysis of a Cassegrain solar furnace
22 p0293 A79-28147
White Sands solar test facility
23 p0429 A79-35048

HAZELRIGG, G. A., JR.
Costing the satellite power system
[AAS PAPER 78-166] 22 p0243 A79-21270
Economics of fusion research
[COO-4181-] 21 p0153 N79-11890
Assessment of economic factors affecting the satellite power system. Volume 1: System cost factors
[NASA-CR-161185] 22 p0368 N79-21551

HAZLETT, R. N.
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182
Aging behavior of crude shale oil
[AD-A062420] 22 p0357 N79-20272

HEAD, R. R.
Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201

HEALEY, H. M.
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212

HEALEY, J.
A case study of a solar assisted heat pump system - 1977
23 p0469 A79-38634

HEALY, J. V.
The influence of blade camber on the output of vertical-axis wind turbines
21 p0045 A79-12242
An inverse problem of vertical-axis wind turbines
22 p0239 A79-20800

HEAP, M. P.
Use of alternative fuels in stationary combustors
21 p0052 A79-12981
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610

HEAPS, J. D.
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776

HEBENSTREIT, S.
Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463

HEBER, D. H.
Flue gas emissions from a shredded-municipal-refuse-fired steam generator
23 p0489 A79-40399

HECKEL, J.
Designing and testing Si3N4 turbine components at Mercedes-Benz
21 p0050 A79-12830

HECKES, A. A.
Hydride engines
24 p0685 A79-51841

HECKLINGER, R. S.
Oceanside Disposal Plant improvement program - Design, construction and operating experience
23 p0491 A79-40425

HECKMAN, R. A.
A waste management strategy for nuclear fusion power systems from a regulatory perspective
23 p0407 A79-34064

HEDDEN, R. E.
Application of solar cooling for a school building in subtropics
21 p0103 A79-16461

HEDGEPETH, J. M.
Ultralightweight structures for space power
21 p0108 A79-16609

HEDRICK, C. L.
Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876

HEDRICK, C. L., JR.
Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184

HEDSTROM, J. C.
Passive solar heating of buildings
[LA-UR-77-1162] 21 p0090 A79-15859
Passive solar heating of buildings
22 p0275 A79-25928
Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center
22 p0277 A79-25944
Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790

HEFFLER, J.
Tungsten carbide/platinum fuel cell with phosphoric acid as electrolyte
24 p0682 A79-51813

HEGAZI, A. I.
A channelled solar flat-plate booster
21 p0131 A79-17413

HEGE, H.
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

HEGE, M.
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747

HEGENBART, R.
European solar collector development and testing - A commercial view
23 p0470 A79-38645

HEGG, D. A.
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531
HEIDNER, R. F., III
Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513
HEIDT, F. D.
System selection and optimization of a solar thermal installation for cooling, heating, and warm water heating
23 p0466 A79-38609
HEIDTMANN, U.
Sea water desalination by means of solar energy
21 p0057 A79-13645
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457
HEIMLICH, R. E.
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762
HEIN, G. F.
Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131
Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411
HEINDL, W.
Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78] 23 p0574 N79-25528
HEINE, D.
Investigation of physical and chemical properties of phase change materials for space heating/cooling applications
21 p0120 A79-17319
HEINMILLER, W.
Effects of low ambient temperature on the exhaust emissions and fuel economy of 84 automobiles in Chicago
[PB-288400/5] 22 p0355 N79-19488
HEINZ, W.
Superconducting magnets - Some fundamentals and their state of the art
21 p0079 A79-14788
HEINZELMANN, F. J.
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Economics of small user hydrogen
24 p0613 A79-45583
HEISS, K.
Statement of Doctor Klaus Heiss, President, ECON, Incorporated, Princeton, New Jersey
21 p0224 N79-15110
HEISS, K. P.
Economic opportunities of space enterprise in the next decades
21 p0100 A79-16137
HEITBAUM, J.
The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution
21 p0037 A79-11795
HEKIMIAN, K. K.
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235
HELAVA, H.
The effects of wall temperature on light impurities in Alcator
22 p0313 A79-31188
HELLEBREKERS, W. M.
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419
HELLER, A.
Semiconductor liquid junction solar cells - Efficiency, electrochemical stability, and surface preparation
21 p0037 A79-11783
Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272
HELLER, J. A.
Brayton-cycle component characteristics
23 p0580 N79-26479
HELLER, M.
Ten scenarios of transportation energy conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647
HELLSTEN, T.
MHD stability for a spherator with a purely poloidal magnetic field
22 p0271 A79-24863
HELMAN, J. S.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054
HELMICK, H. H.
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337
Gaseous fuel reactors for power systems
[LA-UR-78-1437] 21 p0214 N79-13844
HELMSTETTER, A. J.
A technical and economic evaluation of the Baltimore Landgard demonstration
23 p0491 A79-40420
HELWA, N. H.
Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581
HEMINGWAY, D. J.
Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782
HEMSCH, R.
Santa Clara Community Center Project, USA
22 p0277 A79-25945
HEMSWORTH, M. C.
Making turbofan engines more energy efficient
[ASME PAPER 78-GT-198] 21 p0033 A79-10818
HENDERSON, D.
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538
HENDERSON, G. R.
Automatic tension control for winding superconducting coils
[Y/EN-257] 24 p0734 N79-29384
HENDERSON, J.
Solar pond concepts - Old and new
24 p0671 A79-51734
Economic and performance comparisons of salty and saltless solar ponds
24 p0671 A79-51737
Analysis of a heat exchanger - Thermoelectric generator system
24 p0699 A79-51978
HENDERSON, J. B.
Selected ordinates for total solar radiant property evaluation from spectral data
22 p0271 A79-25060
HENDERSON, R. A.
A power transmission concept for a European SPS system
24 p0712 A79-53487
HENDERSON, T. M.
Cryogenic pellets for laser-fusion research - Theoretical and practical considerations
21 p0085 A79-15334
Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335
HENDRICKS, R. C.
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267
HENDRON, R. H.
Hot dry rock energy project
23 p0408 A79-34073
Hot dry rock energy project
[LA-UR-77-2744] 21 p0175 N79-10540
Energy extraction operations: Some preliminary results
[LA-UR-79-679] 24 p0786 N79-32678

HENNE, R.
State of cermet electrode development for flame heated thermionic converters
24 p0700 A79-51989

HENNESSEY, J. P., JR.
A comparison of the Weibull and Rayleigh distributions for estimating wind power potential
21 p0045 A79-12243

HENNING, C. D.
Superconductivity for mirror fusion
22 p0236 A79-20542

HENRY, E. H.
Mississippi County Community College solar photovoltaic total energy project
[ASME PAPER 79-SOL-13] 23 p0380 A79-32463

HENRY, J. F.
Analysis of the Photosynthesis Energy Factory as an integrated bioconversion system
24 p0676 A79-51772

HENRY, J.-P.
Design, operation, and economics of the Energy Plantation as an alternate source of fuels
23 p0467 A79-38616

HENRY, M. E.
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373

HENRY, R.
Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker
[AD-A068452] 24 p0738 N79-29616

HENSLER, J. [illegible], III
Cost study of superheating geothermal steam
24 p0707 A79-52572

HENSLEY, W. N.
Solar heating and cooling of the Georgia Power Company Office Building in Atlanta
[AIAA PAPER 79-1024] 23 p0460 A79-38206

HENSTOCK, M. E.
The need for materials recycling
21 p0047 A79-12340

HERCHAKOWSKI, A.
Militarized thermoelectric power sources
21 p0027 A79-10227
Regenerative burner system for thermoelectric power sources
22 p0261 A79-23621

HERCZFELD, P. R.
Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477

HEREDY, L. A.
Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries
21 p0010 A79-10088

HERENDEEN, R. A.
Energy analysis of the Solar Power Satellite
24 p0601 A79-44160

HERION, J.
Chemical origin of the space-charge layer in cuprous oxide front-wall solar cells
23 p0424 A79-34530

HERLEVICH, F. A.
A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199

HERLIHY, J.
The efficiency of solar assisted hot water systems
23 p0430 A79-35061

HERMANCE, J. F.
Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey
[LA-7656-MS] 22 p0358 N79-20458

HERMANN, W.
The Philips experimental house - A system's performance study
22 p0277 A79-25941

HERMANS, M. L.
A Stirling engine heat pump system
21 p0024 A79-10206

HERMELEE, A.
Impacts of new energy technologies as measured against reference energy systems
[BNL-25475] 23 p0597 N79-27694

HERMELEE, A. L.
Reference Energy Systems as applied to regional energy policy
24 p0698 A79-51973

HERN, J. L.
Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

HERNANDEZ, R.
Anticonvective antiradiative systems
21 p0132 A79-17420

HERONEMUS, W. E.
Development of compact heat exchangers for Ocean Thermal Energy Conversion /OTEC/ systems
[ASME PAPER 78-WA/HT-34] 21 p0161 A79-19815
Limit analysis and design of a semi-submerged concrete hull for an ocean thermal differences power plant
23 p0486 A79-40195
Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796

HERR, K. C.
Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494

HERRERA, A.
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839

HERRERA, G.
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503

HERRERA, G. G.
Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173

HERRERA, R.
Anticonvective antiradiative systems
21 p0132 A79-17420

HERRMANN, G.
On the dynamics of electrostatically precipitated fly ash
[ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787

HERTZBERG, A.
A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613
Laser aircraft propulsion
21 p0109 A79-16618
Energy exchanger technology applied to laser heated engines
21 p0110 A79-16631
Laser aircraft
22 p0284 A79-26597
New energy conversion techniques in space, applicable to propulsion
[AIAA PAPER 79-1338] 23 p0493 A79-40490
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

HERVO, J.
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900

HERWIG, L. O.
The accomplishments of the United States Federal Solar Energy Program
21 p0117 A79-17281

HERZ, W.
The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300

HERZ, J.
Performance of vacuum tube solar collector systems
21 p0102 A79-16424

HESKETH, H. E.
Air pollution control
23 p0486 A79-40134

HESKEY, G. T.
Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414
HESS, K. L.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
HESTER, O. V.
A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766
The engineering analysis of solar radiation
24 p0605 A79-44796
HEUER, J.
Designing and testing Si3N4 turbine components at Mercedes-Benz
21 p0050 A79-12830
HEWIG, G. H.
Cu2S-CdS thin-film solar cells
21 p0057 A79-13637
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
HEWITSON, V. S.
European Scientific notes, volume 32, number 4
[AD-A065399] 23 p0552 N79-23886
HEWITT, E.
A solar energy system with a dual-source heat pump and long-term storage
21 p0119 A79-17312
HEWITT, H. C., JR.
Testing and evaluation methods to determine an optimal air-flow rate in flat-plate solar collectors
[AIAA PAPER 79-0972] 23 p0456 A79-38179
HEWSON, E. W.
Wind power potential in the Pacific Northwest
22 p0244 A79-21334
HEYER, W. D.
Refuse shredding - Performance, testing and evaluation data
23 p0451 A79-40419
HEYNEMANN, P. U.
A development program for hydrogen burners
23 p0386 A79-33232
HICKCOX, D. H.
Water and energy resource development in the Tongue River Basin, southeastern Montana
24 p0735 N79-29566
HICKEY, J. S.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110
HICKOX, C. E.
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0157 N79-12565
HIDY, G. M.
The Geysers geothermal area emissions and aerometric data base and air quality analysis
23 p0534 A79-43373
HIETBRINK, E. H.
Electric vehicles challenge battery technology
21 p0093 A79-15892
HIGGIN, R. M. R.
Component cost of solar energy systems
22 p0319 A79-31429
HIGGINS, J. E.
Design of the data acquisition system at Solar One
21 p0088 A79-15841
HIGGINS, S.
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059
HIGGS, G. K.
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446
HIGHTOWER, R. E.
Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector
23 p0358 A79-33989
HIGHTOWER, S. J.
A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system
21 p0058 A79-16107
HILAL, M. A.
Design criteria for multilayer superconductive magnets
22 p0236 A79-20536
Refrigeration requirements for future superconductive energy related applications
22 p0311 A79-31019
HILDEBRAND, R.
Jet fuels from shale oil - A near term technology
21 p0005 A79-10045
HILDEBRANDT, A. F.
Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101
HILL, F. E.
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762
HILL, F. K.
Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger
24 p0623 A79-45835
Use of satellite-derived sea surface temperatures by cruising OTEC plants
24 p0625 A79-45845
HILL, J. E.
Testing of solar collectors according to ASHRAE Standard 93-77
21 p0101 A79-16417
Testing of water-heating collectors according to ASHRAE Standard 93-77
21 p0130 A79-17410
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors
22 p0295 A79-28356
Experimental verification of a standard test procedure for solar collectors
[PB-289912/8] 22 p0372 N79-21632
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539
Testing of pebble-bed and phase-change thermal energy storage devices according to ASHRAE standard 94-77
[PB-295898/1] 24 p0801 N79-33596
HILL, L.
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177
Thin film solar collectors for material science experiments in space
[IAF PAPER 79-202] 24 p0710 A79-53353
HILL, L. G.
Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699
HILL, R.
Cadmium-sulphide/copper-sulphide thin-film solar cells - Review of methods of producing the CdS and Cu2S layers
23 p0441 A79-36786
Thin-film solar cells produced by physical vapour deposition
23 p0441 A79-36787
Sputtered thin film solar cells
23 p0448 A79-37843
HILL, R. D.
Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359
HILL, R. F.
Energy technology V: Challenges to technology; Proceedings of the Fifth Conference, Washington, D.C., February 27-March 1, 1978
21 p0091 A79-15879
HILLEBRAND, L. J.
Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels
[FE-2321-12] 21 p0216 N79-14240
HILLER, C. C.
Sulfuric acid-water - Chemical heat pump/energy storage system demonstration
22 p0281 A79-26209

Development and testing of the sulfuric acid-water chemical heat pump/chemical energy storage system
24 p0681 A79-51806

HILLIS, D. L.
Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787

HIMY, A.
Nickel-zinc vs. silver-zinc battery - A comparative study of baseline characteristics
21 p0009 A79-10083

HINDERMAN, J. D.
Selenide thermoelectric converter technology
21 p0026 A79-10221

HINDMARCH, C. E.
Energy storage in fluidized beds
24 p0657 A79-50211

HINES, J. B.
Chemical processing of liquid lithium fusion reactor blankets
24 p0655 A79-51951

HINKEBEIN, T. E.
Hydride engines
24 p0685 A79-51841

HINKLEY, L. G.
Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555

HINNOV, E.
Observed resonance lines of highly ionized titanium, chromium, iron, and nickel in tokamak discharges
23 p0478 A79-39676

HINO, M.
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120

HINOTANI, K.
An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University
24 p0641 A79-47797

HINZ, K.
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592

HIRAMOTO, A.
The theoretical analysis of an air turbine generation system
21 p0151 A79-18106

HIRANO, M.
A digital control system for superconducting magnet
22 p0268 A79-24508

HIRASAWA, S.
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

HIRATA, M.
Japan's national project - Development of high temperature gas turbine-steam turbine combined cycle plant for community cogenerating energy system
24 p0703 A79-52010

HIRATA, M. H.
A vertical-axis bicycle rotor turbine. I - Rotor design. II - Aerodynamic aspects
23 p0386 A79-33237

Design and performance of bicycle wind turbine rotors
24 p0677 A79-51777

HIRAYAMA, T.
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

HIRSCHBERG, J. G.
A combination solar direct electric conversion concentrator and heat collector system
23 p0399 A79-33996

HIRSHBERG, A. S.
Economic feasibility of solar water and space heating
22 p0292 A79-27899

HIRST, E.
Effects of energy conservation research, development, and demonstration on residential energy use
23 p0422 A79-34276

HIRST, M.
Garrett ATF 3
23 p0535 A79-43469

HIRUMA, T.
Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator
21 p0130 A79-17406

HISER, H. W.
International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 16-22, 1978, Symposium Lectures
21 p0102 A79-16451

Use of satellites in solar applications
21 p0104 A79-16468

Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712

HITTLE, D. C.
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522

HIVELY, L. M.
Superthermal alpha transport and wall bombardment in tokamaks
23 p0444 A79-36927

HIZA, M. J.
Liquid mixture excess volumes and total vapor pressures using a magnetic suspension densimeter with compositions determined by chromatographic analysis Methane plus ethane
21 p0085 A79-15324

HNAT, J.
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385

HNYILICZA, E.
Estimation methodology for energy supply from natural resources
[EPRI-EA-788] 24 p0718 N79-28355

HO, C.
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231

HO, D.
Extraterrestrial fiberglass production using solar energy
24 p0778 N79-32237

HO, F.
Silicon foil cells
23 p0503 A79-40954

HO, F. F.
Silicon solar cells for space use: Present performance and trends
24 p0784 N79-32654

HO, J. C.
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084

HO, T.
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568

HOAGLAND, L. C.
Potential of the Stirling engine for stationary power applications in the 500-2000 HP range
21 p0025 A79-10211

HOANG, D. C.
The Garrett Energy Research biomass gasification process
21 p0004 A79-10037

HOBBS, B. F.
Locational response to regulatory policy: A regional analysis of energy facility location
[BNL-23597] 23 p0598 N79-27695

HOBBS, P. V.
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531

Evolution of particles in the plumes of coal-fired power plants. II - A numerical model and comparisons with field measurements
24 p0612 A79-45532

HOCHSTEIN, M. P.
Geothermal systems in the Hauraki Rift zone /New Zealand/ - An example for geothermal systems over an inferred upper mantle swell
23 p0408 A79-34069

HOCKENBERRY, K. A.
Life-cycle costing. A guide for selecting energy conservation projects for public buildings
[PB-287804/9] 22 p0345 N79-17744

HOCOTT, C. R.
Requirements for the development, management and implementation of research in support of the Department of Energy enhanced oil recovery program
[BETC-2025-1] 24 p0776 N79-31831

HODAM, R.
Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690

HODES, G.
Polycrystalline CdSe-based photo-electrochemical cells
21 p0037 A79-11785
Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

HODGES, C. N.
The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860

HODGINS, J. W.
Experimental investigation of a fused salt energy storage system
23 p0400 A79-34003

HODSON, D. R.
Development of a high energy storage flywheel module
[AD-A060351] 21 p0230 N79-15413

HOECKER, W. H.
Relative effective solar space heating over the United States obtained from southward-tilted solar collectors
[PB-292963/6] 23 p0565 N79-24513

HOEHN, F. W.
Design of a preprototype Stirling Laboratory Research Engine
21 p0024 A79-10203

HOENIG, M. O.
Design and development of the US-TESPE toroidal coil
22 p0311 A79-31014

HOERSTER, H.
What and where - Solar active systems or energy conservation in buildings
22 p0275 A79-25927
The Philips experimental house - A system's performance study
22 p0277 A79-25941

HOERTZ, C.
H-Coal pilot plant project and status of commercial development at Ashland
21 p0092 A79-15888

HOERTZ, C. D.
The H-Coal project
21 p0145 A79-17635

HOFFMAN, A.
Environmental testing of flat plate solar cell modules
23 p0428 A79-35039

HOFFMAN, A. A. J.
Energy related mathematical models - Annotated bibliography
21 p0154 A79-18472

HOFFMAN, A. R.
Environmental qualification testing of terrestrial solar cell modules
23 p0512 A79-41021
Environmental requirements for flat plate photovoltaic modules for terrestrial applications
24 p0658 A79-50342

HOFFMAN, H. W.
Thermal energy storage for industrial waste heat recovery
21 p0012 A79-10101

HOFFMAN, J.
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

HOFFMAN, J. R.
Army facility energy conservation
21 p0028 A79-10233

HOFFMAN, K. C.
Technical-economic modeling in energy planning
23 p0419 A79-34164
Impacts of new energy technologies as measured against reference energy systems
[BNL-25475] 23 p0597 N79-27694
Long-term strategic analysis (towards an energy doctrine)
[BNL-25250] 24 p0772 N79-31791

HOFFMAN, L.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

HOFFMAN, M. A.
Direct energy converters - Efficiency and cost estimates for two electrostatic concepts
21 p0046 A79-12266

HOFFNAGLE, G. F.
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry
21 p0064 A79-14112

HOFLER, D.
Contextual analysis for industrial energy conservation R and D
[PB-290981/0] 23 p0575 N79-25537

HOFMANN, F.
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FE-T-78-28] 24 p0793 N79-32751

HOFMANN, J.
The concept of the 1 MW/el/ solar thermal power plant of the European economic community
23 p0464 A79-38590

HOFMANN, H.
Dynamic modeling of water- and air-heating solar collectors
23 p0531 A79-42897

HOFMANN, P. L.
A nuclear-solar energy strategy
23 p0421 A79-34174

HOGAN, J. T.
Numerical modeling of impurity effects
23 p0445 A79-36945

HOGAN, W. W.
Energy and the economy
[EPRI-EA-620-VOL-1] 21 p0189 N79-11539

HOGG, G. M.
Environmental factors affecting the installation and operation of gas turbine engines in agricultural aircraft
[SAE PAPER 781010] 22 p0274 A79-25892

HOHLA, K.
High power iodine atom laser
24 p0707 A79-52644

HOKANSON, A. E.
Methanol from wood waste: A technical and economic study
[FPL-12] 21 p0194 N79-12239

HOKE, R. C.
Emissions from pressurized fluidized-bed combustion processes
22 p0261 A79-23640

HOKKYO, N.
Energy impact on economic activity and long-term trend forecast
23 p0419 A79-34163

HOLBECK, H. J.
Thermal power systems small power systems application project: Siting issues for solar thermal power plants with small community applications
[NASA-CR-158520] 23 p0542 N79-22629

HOLCOMB, L.
NASA's OAST program: An overview
22 p0370 N79-21574
Future thrusts of the NASA space power program
24 p0722 N79-28670

HOLCOMB, L. B.
NASA's thermionic technology program
21 p0026 A79-10217

HOLCOMB, R. S.
Development progress on the atmospheric fluidized bed coal combustor for cogeneration gas turbine system for industrial cogeneration plants
[ASME PAPER 79-GT-104] 23 p0377 A79-32380

HOLDER, J. C.
Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931

HOLDREN, J.
Energy for the long run - Fission or fusion
22 p0256 A79-22760

HOLDSWORTH, P.
Pulverised fuel non-return flap valve
[TDR-317] 23 p0578 N79-26408

HOLICK, H.
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344

HOLL, R. J.
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 1: Executive summary
[NASA-CR-162372] 24 p0799 N79-33576
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 2: System concept selection
[NASA-CR-162373] 24 p0799 N79-33577
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 3: Experimental system descriptions
[NASA-CR-162374] 24 p0799 N79-33578
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 4: Commercial system definition
[NASA-CR-162375] 24 p0799 N79-33579
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 5: Supporting analyses and trade studies
[NASA-CR-162376] 24 p0800 N79-33580

HOLLA, V.
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352

HOLLANDER, J. M.
Annual review of energy. Volume 3
21 p0074 A79-14718

HOLLANDS, K. G. T.
An approximate equation for predicting the solar transmittance of transparent honeycombs
21 p0042 A79-11877
Optimization of the flow passage geometry for air heating solar collectors
22 p0316 A79-31403
Dimensional relations for free convective heat transfer in flat-plate collectors
22 p0316 A79-31406
Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407
Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409
A solar collector thermal performance test for developmental programs
22 p0317 A79-31413
Collector and storage efficiencies in solar heating systems
22 p0320 A79-31432
WATSUN - A simulation program for solar-assisted heating systems
22 p0321 A79-31439
Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976
Methods for reducing heat losses from flat plate solar collectors, phase 2
[COO-2597-4] 21 p0188 N79-11533

HOLLAY, E.
Advanced electrochemical energy sources for space power systems - A review
23 p0487 A79-40371

HOLLDORFF, G. M.
Combined cycles for pipeline compressor drives using heat
[ASME PAPER 79-GT-162] 23 p0378 A79-32424

HOLLENBACK, W. H.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181

HOLLENBERG, D.
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O
23 p0470 A79-38641

HOLLIS, B. R., JR.
Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23540-1] 23 p0579 N79-26475

HOLLIS, H. D.
Energy utilization survey pamphlet for buildings
[AD-A062930] 22 p0371 N79-21624

HOLME, O.
Performance evaluation of wind power units
23 p0483 A79-40115

HOLMES, J. D.
Pressure measurements on wind tunnel models of the Aylesbury experimental house
22 p0300 A79-29372

HOLMES, J. R.
The role of the local authority in waste reclamation
23 p0395 A79-33752

HOLMES, J. T.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

HOLMES, P.
Preparation of titanium dioxide films as solar photocatalysts
24 p0656 A79-50191

HOLMES, R. E.
Design of a freon jet pump for use in a solar cooling system
[ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847

HOLMGREN, J. D.
Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924

HOLT, J. F.
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197

HOLT, L.
Distributed energy storage for solar applications
22 p0317 A79-31410
Environmental considerations in R&D planning and evaluation of energy storage systems
24 p0666 A79-50893

HOLT, N.
Coal gasification for electric utilities
23 p0436 A79-35799

HOLT, N. A.
Incentives and requirements for gasification based power systems
21 p0094 A79-15904

HOLT, W. L.
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

HOLTON, J. K.
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630

HOLTZ, M. J.
Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805

HOLTZ, R. E.
Solid waste utilization in integrated community energy systems
23 p0490 A79-40415
DOE stationary external combustion engine program - Status report
24 p0689 A79-51882
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883
Integrating technologies to produce energy conservation
[CONF-780109-6] 21 p0189 N79-11541

HOLTZCLAW, B. H.
Energy storage by flywheels - A new flywheel concept
23 p0416 A79-34139

HOLTZE, R. F.
Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004

HOLZ, D.
Results of measurements of solar radiation on surfaces of different orientations
21 p0055 A79-13622

HOLZAPFEL, I.
Design and development of a low emission combustor for a car gas turbine
[ASME PAPER 78-GT-155] 24 p0605 A79-44793
HOLZRICHTER, J. F.
The laser fusion scientific feasibility experiment
21 p0030 A79-10250
HOMAN, H. S.
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297
HOMMA, T.
Optimum power plant capacity of ocean-based ocean thermal energy conversion systems
22 p0297 A79-28922
An overview of the Japanese OTEC development
24 p0616 A79-45779
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821
HOMMERT, P. J.
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520
Analysis of conduction responses during an underground coal gasification experiment
23 p0531 A79-42898
HOMOLYA, J. B.
The measurement of the sulfuric acid and sulfate content of particulate matter resulting from the combustion of coal and oil
21 p0156 A79-19219
HONDA, K.
Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes
22 p0273 A79-25548
HONDA, S.
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352
HONG, S. O.
Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44545
HONMA, T.
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103
HOOGENDOORN, C. J.
An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures
23 p0531 A79-42908
HOOK, W. R.
Future large space systems opportunities: A case for space-to-space power?
21 p0169 N79-10095
HOOKS, H. W.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181
HOORN-PRENE, D.
Heattube, a universal electrical solar heat equipment for building, community and agricultural purposes
21 p0138 A79-17473
HOOVER, L. J.
Long-term availability of water resources for energy development in the Central United States
21 p0065 A79-14118
HOPENFELD, J.
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546
HOPKINS, D. C.
Limitations of solar assisted heat pump systems
[ASME PAPER 78-WA/SOL-1] 21 p0162 A79-19834
HOPKINS, G. W.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528
HOPKINS, H. T.
SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319
HOPKINS, R. H.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762
HOPKINSON, J.
Turning to the sun for power
24 p0601 A79-44239
HOPKINSON, R. F.
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Performance of the Mead, Nebraska, 25 kWp photovoltaic solar energy system and comparison with simulation
24 p0675 A79-51763
Mead 25 kilowatt photovoltaic system
[COO-4094-19] 23 p0596 N79-27677
HOPMANN, H.
Development of solar thermal power plants
21 p0057 A79-13641
Development of small solar power plants for rural areas in India
21 p0141 A79-17502
HOPPE, R.
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538
HORAZAK, D. A.
Capital cost system optimization of OTEC power modules
21 p0101 A79-16249
HORD, J.
How safe is hydrogen
24 p0615 A79-45604
HORIBE, K.
Studies on the selective absorption surface on stainless steel
21 p0127 A79-17378
HORIGOME, T.
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Estimation of collector and electrical energy cost for STEPS in Japan
21 p0118 A79-17288
An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442
HORN, M.
Uncoupling of economic growth and energy consumption - A new strategy of energy politics or only a new slogan
22 p0310 A79-30997
HORN, R.
Improvement of direct-current electrical prospecting methods for the geothermal investigation of the Rhine Graben
21 p0075 A79-14734
HORNE, W. E.
Solar thermal photovoltaic electric power generator
23 p0402 A79-34023
HORNELL, C.
Utility fuel cells for biomass fuel
21 p0016 A79-10131
HORNER, M. W.
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536

HORNEY, F. A.
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0756 N79-33352

HORNSTRA, F.
A charging system for the LiAl/FeS electric vehicle battery
24 p0684 A79-51830

HOROWITZ, J. S.
OTEC power systems
21 p0101 A79-16248

HORSAK, R. D.
A primer on the rejection of waste heat from power plants
[PB-292529/5] 23 p0575 N79-25570

HORSFIELD, B. C.
Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690

HORTON, E. E.
Testing the OTEC cold water pipe using the 'Deep Oil X-1' platform
23 p0430 A79-35058

HORTON, E. H.
Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784

HORTON, R.
The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754

HORTON, T. L.
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370

HORTON, T. L. O.
Parametric analysis of power conversion systems for central receiver solar power generation
[ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835
Conceptual design of a solar powered closed-cycle gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522

HORTON, W. S.
An algorithm and BASIC computer program for calculating simple coal gasification equilibria
[PB-291241/8] 23 p0539 N79-22265

HORTON, W., JR.
Drift wave propagation and convective wave growth in tokamaks
23 p0446 A79-37262

HORVATH, J.
Hydrogen production at reduced cost through electrolysis and buoyancy
23 p0414 A79-34116

HOSEA, J. C.
A fast-scanning heterodyne receiver for measurement of the electron cyclotron emission from high-temperature plasmas
24 p0640 A79-47452

HOSHINO, C.
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

HOSODA, Y.
Development of a DC linear motor. II
24 p0707 A79-52800

HOTCHKISS, G. B.
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651
Comparison of three experimental methods used in determining the thermal performance of flat-plate solar collectors
23 p0557 N79-24434

HOUGH, R. L.
Solar engines - The thermal wheel and beyond
21 p0095 A79-15909

HOUGHTBY, W. E.
Advanced technology fuel cell program
[EPRI-EM-956] 23 p0598 N79-27702

HOUGHTON, A. V.
Low temperature geothermal energy use in existing institutional power plants
24 p0689 A79-51870

HOULBERG, W. A.
Space-dependent thermal stability of reacting tokamak plasmas
22 p0253 A79-22242

HOURDAKIS, S. E.
A general purpose electroanalytical system based on a microcomputer controlled coulostatic generator
24 p0744 N79-29798

HOUSE, P. A.
Performance tests of the radial outflow reaction turbine for geothermal applications
[UCID-17902] 24 p0788 N79-32693

HOUSEMAN, J.
Methanol decomposition bottoming cycle for IC engines
[SAE PAPER 790427] 23 p0495 A79-40774

HOUSMAN, J. J.
Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166

HOVEY, J.
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

HOVIND, E. L.
Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah
23 p0534 A79-43371
A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions
23 p0590 N79-27546

HOVINGH, J.
Overview of inertial confinement fusion reactor designs
21 p0018 A79-10149
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

HOWARD, J. B.
Role of aromatics in soot formation
21 p0053 A79-12988

HOWARD, P.
Health effects associated with diesel exhaust emissions, literature review and evaluation
[PB-289817/9] 22 p0364 N79-20727

HOWARTH, R.
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722

HOWELL, J. R.
Solar collector sizing and design - An overview
[AIAA PAPER 79-0975] 23 p0457 A79-38181

HOWELL, R. H.
Heat recovery devices for building HVAC systems
21 p0073 A79-14697

HOWELL, W. E.
Projected impacts of a very large windpower complex
24 p0665 A79-50890

HOWERTON, M. T.
A thermochemical energy storage system and heat pump
21 p0012 A79-10105

HOWES, J. E.
Emissions from pressurized fluidized-bed combustion processes
22 p0261 A79-23640

HOY, H. R.
Fluidised combustion for power generation
23 p0454 A79-37909

HOYER, E.
Estimating heat loss in residential structures using aerial infrared imagery
23 p0522 A79-41125

HOYT, C. D.
Energy and input-output analysis
21 p0115 A79-17223

HRABAK, H.
Proceedings of the 2nd Workshop on Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658

HRADAYNATH, R.
An efficient optical window for flat-plate solar energy collectors
23 p0536 A79-43591
An optical valve for flat-plate solar energy collectors
24 p0607 A79-45154

HRUBY, T.
Primary impacts of growing aquatic plants for energy
24 p0665 A79-50886
HRYCAJ, T. M.
Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534
HSIEH, B. C. B.
A survey of methods of coal hydrogenation for the production of liquids
24 p0628 A79-45994
HSIEH, C.-L.
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
HSIEH, Y. Y.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226
HSU, C. C.
Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model
[CONF-780941-6] 24 p0744 N79-30036
HSU, C. T.
Some flow analyses for Tornado-type wind turbines
22 p0279 A79-26181
HSU, G.
Electricity from sunlight
21 p0065 A79-14116
HSU, G. C.
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119
Surfactant-assisted liquefaction of particulate carbonaceous substances
[NASA-CASE-NPO-13904-1] 21 p0179 N79-11152
HSU, J. Y.
Theory of dissipative drift instabilities in sheared magnetic fields
22 p0292 A79-27884
HSU, L.
Photovoltaic properties of In2O3/semiconductor heterojunction solar cells
23 p0505 A79-40968
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
HSU, T. D.
Optimum combinations of cooling alternatives for steam-electric power plants, volume 2
[PB-290576/8] 23 p0565 N79-24515
HSU, Y.-S.
Grain-boundary edge passivation of GaAs films by selective anodization
21 p0154 A79-18487
Thin-film GaAs solar cells with grain-boundary edge passivation
23 p0436 A79-35749
HSUEH, Y. W.
Contact resistance of silver ink on solar cell
23 p0506 A79-40978
HU, C.
Open circuit voltage of high intensity silicon solar cells
23 p0511 A79-41014
HUANG, B. J.
Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354
HUANG, C. J.
Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580
HUANG, I.
Wind power from a vortex chamber
22 p0319 A79-31425
HUANG, T.
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395
HUANG, Y.-C.
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533
HUBBARD, E. L.
Doublet III
22 p0290 A79-27667
HUBBARD, J. K.
Application of gas turbine/compressors in LNG plants
[ASME PAPER 79-GT-85] 23 p0376 A79-32362
HUBBARD, S. J.
Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359
HUBBELL, R. H.
Solar heating and load managed/solar cooling of a small commercial building using flat plate collectors
[AIAA PAPER 79-1020] 23 p0460 A79-38205
HUBER, D. A.
Conceptual design and cost estimate 600 MWe coal fired fluidized-bed combined cycle power plant
21 p0008 A79-10068
HUBER, H.
The use of the heat pumps to raise temperatures in an economical and ecological way
[BMFT-FB-T-78-35] 24 p0792 N79-32732
HUCKO, R. E.
Interagency coal cleaning technology development
22 p0347 N79-18361
HUCKSTEP, F. L.
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991
HUDDLESTON, G.
MHD emissions and their controls
24 p0709 A79-52968
HUDGENS, C. R.
Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(CP)] 23 p0564 N79-24505
HUDSON, R.
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831
HUDSON, W. D.
Identification of wood energy resources in central Michigan
[NASA-CR-158130] 22 p0347 N79-18424
HUDSON, W. R.
The NASA Space Power Technology Program
24 p0691 A79-51894
HUDSON, W. T.
Cost reduction using modular installation for solar heating, cooling and water heating at the life clinic in Brandon, Florida
[AIAA PAPER 79-1021] 23 p0476 A79-38895
HUEBNER, A. W.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
HUETTINGER, K. J.
Methane formation during the hydrogasification and the gas phase pyrolysis of defined aromatics
22 p0265 A79-23829
HUETTNER, D. A.
Energy economics - A research analysis
21 p0115 A79-17222
HUFF, O.
The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant
21 p0076 A79-14757
HUFFMAN, F. N.
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831
Flame-fired thermionic diode development
24 p0700 A79-51988
HUFFMAN, R. L.
Coal gasification and its alternatives
21 p0071 A79-14679
HUGHES, R. L.
Optical analysis of solar facility heliostats
22 p0296 A79-28360

HUGHES, R. O.
- Effects of pointing errors on receiver performance for parabolic dish solar concentrators 21 p0020 A79-10167
- Efficiency degradation due to tracking errors for point focusing solar collectors [ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837
- Optimal control of sun tracking solar concentrators 23 p0526 A79-41831

HUGHES, W. L.
- Some economic considerations in the rush toward alternate energy sources 23 p0389 A79-33268

HUGILL, J.
- Review of results from DITE tokamak 21 p0069 A79-14456

HUGOSSON, S.
- The Swedish Wind Energy Programme 23 p0482 A79-40103

HULETT, D. T.
- Projections of energy supply and demand for the 1978-1979 winter heating season [DOE/EIA-0102/33] 24 p0758 N79-30815

HULL, D. E., III
- Singular optimal control of solar space heating systems 24 p0644 A79-48009

HULL, E. J.
- Experience gained and lessons learned from monitoring the solar building, Albuquerque 21 p0088 A79-15833

HULL, G.
- A retrofitted geothermal heating system 23 p0425 A79-34602

HULL, W. C.
- Analysis of a Cassegrain solar furnace 22 p0253 A79-28147
- Concentration of a cassegrain solar furnace 24 p0658 A79-50344

HULSTROM, R. L.
- A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations 23 p0382 A79-32723

HUMENIK, F. M.
- Parametric performance of a turbojet engine combustor using jet A and A diesel fuel [NASA-TM-79089] 22 p0357 N79-20114

HUMMEL, R. L.
- A cost effective vertical air/water solar heating collector 22 p0320 A79-31430

HUMPHREY, J. P.
- Energy from in situ processing of Antrim oil shale [FE-2346-29] 24 p0769 N79-31746

HUMPHREYS, B. D.
- Telluric sounding and mapping in the vicinity of the Salton Sea geothermal area, Imperial Valley, California [PB-296081/3] 24 p0797 N79-33553

HUMPHREYS, R. D.
- The AOSTRA role in developing energy from Alberta oil sands 23 p0494 A79-40738

HUMPHRIES, W. S.
- Collector testing in the MSFC simulator 24 p0611 A79-45230

HUNDEMAN, A. S.
- State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts [NTIS/PS-79/0639/9] 24 p0802 N79-33608

HUNDEMANN, A. S.
- Electric automobiles. Citations from the NTIS data base [NTIS/PS-78/0880/1] 21 p0171 N79-10363
- Electric automobiles, volume 2. Citations from the engineering index data base [NTIS/PS-78/0881/9] 21 p0172 N79-10364
- Energy conservation: Policies, programs and general studies. A bibliography with abstracts [NTIS/PS-78/0693/8] 21 p0176 N79-10552
- Solar ponds. Citations from the NTIS data base [NTIS/PS-78/0836/3] 21 p0176 N79-10553
- Solar ponds. Citations from the engineering index data base [NTIS/PS-78/0837/1] 21 p0176 N79-10554
- Solar energy concentrator design and operation. Citations from the NTIS data base [NTIS/PS-78/0838/9] 21 p0178 N79-10566
- Energy policy and research planning, volume 2. A bibliography with abstracts [NTIS/PS-78/0961/9] 21 p0191 N79-11552
- Energy policy and research planning, volume 3. A bibliography with abstracts [NTIS/PS-78/0962/7] 21 p0191 N79-11553
- Solar space heating and air conditioning, volume 2. Citations from the NTIS data base [NTIS/PS-78/1014/6] 21 p0211 N79-13545
- Solar space heating and air conditioning volume 3. Citations from the NTIS data base [NTIS/PS-78/1015/3] 21 p0211 N79-13546
- Solar space heating and air conditioning, volume 3. Citations from the engineering index data base [NTIS/PS-78/1017/9] 21 p0211 N79-13547
- Solar space heating and air conditioning, volume 2. Citations from the engineering index data base [NTIS/PS-78/1016/1] 21 p0212 N79-13550
- Flat plate solar collector design and performance. Citations from the NTIS data base [NTIS/PS-78/0840/5] 21 p0212 N79-13551
- Solar electric power generation, volume 2. Citations from the NTIS data base [NTIS/PS-78/1108/6] 21 p0212 N79-13557
- Solar electric power generation, volume 2. Citations from the Engineering Index data base [NTIS/PS-78/1109/4] 21 p0212 N79-13558
- Combined cycle power generation. Citations from the NTIS data base [NTIS/PS-78/1156/5] 21 p0222 N79-14587
- Combined cycle power generation. Citations from the Engineering Index data base [NTIS/PS-78/1157/3] 21 p0222 N79-14588
- Solar water pumps. Citations from the Engineering Index data base [NTIS/PS-78/1288/6] 22 p0343 N79-17348
- Pollution and environmental aspects of fuel conversion. A bibliography with abstracts [NTIS/PS-79/0378] 24 p0761 N79-30857
- Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base [NTIS/PS-79/0545/8] 24 p0767 N79-31433
- Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base [NTIS/PS-79/0546/6] 24 p0767 N79-31434
- Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base [NTIS/PS-79/0547/4] 24 p0767 N79-31435
- Wind power, volume 2. Citations from the NTIS data base [NTIS/PS-79/0534/2] 24 p0777 N79-31836
- Wind power, volume 1. Citations from the Engineering Index data base [NTIS/PS-79/0535/9] 24 p0777 N79-31837
- Wind power, volume 2. Citations from the Engineering Index data base [NTIS/PS-79/0536/7] 24 p0777 N79-31838
- Hydrogen use as a fuel. Citations from the NTIS data base [NTIS/PS-79/0779/3] 24 p0796 N79-33347
- Energy supply and demand modeling. A bibliography with abstracts [NTIS/PS-79/0665] 24 p0802 N79-33605

HUNDERI, O.
- Selective absorption of solar energy in ultrafine metal particles - Model calculations 22 p0273 A79-25746
- Spectrally selective surfaces of Ni-pigmented anodic Al2O3 24 p0629 A79-46202

HUNG, J. C.
- Accuracy analysis of pointing control system of solar power station [NASA-CR-150880] 21 p0215 N79-14143
- Automatic tension control for winding superconducting coils [Y/EN-257] 24 p0734 N79-29384

HUNKE, R. W.
- Preliminary design of the solar total energy-large scale experiment at Shenandoah, Georgia 21 p0019 A79-10159

HUNN, B. D.
- Analysis and design of solar buildings using the Cal-ERDA computer programs [CONF-780114-9] 21 p0137 A79-17463

Case history - Hybrid passive/active solar system: Performance and cost
22 p0313 A79-31315
Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520
Component-based simulator for solar systems
[LA-UR-78-1494] 21 p0208 N79-13521
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
Performance and cost of a hybrid passive/active solar house
[LA-UR-78-2209] 24 p0725 N79-28756

HUNNICUTT, C. L.
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829
An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357

HUNSCHE, U.
Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

HUNT, A. J.
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion
21 p0082 A79-15077
A new solar thermal receiver utilizing a small particle heat exchanger
24 p0674 A79-51754

HUNT, L. P.
Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936

HUNT, T. K.
Research on the sodium heat engine
21 p0028 A79-10231

HUNTER, J. H.
Flight performance evaluation of heat pipe solar collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041

HUNTER, M. W., II
Solar power satellites - The laser option
22 p0284 A79-26599

HURLEY, C. W.
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project
[PB-294926/1] 24 p0793 N79-32738

HURLEY, J. R.
Energy conservation opportunities in commercial appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810

HURLEY, P. J.
Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801

HURTER, D.
Recommended performance standards for electric and hybrid vehicles
[SAN-1335-1] 21 p0195 N79-12450
Evaluation of automobile drivetrain components to improve fuel economy
[PB-293728/2] 24 p0720 N79-28594

HUSSAIN, I. H.
Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428

HUSSEINY, A. A.
A multivariate-utility approach for selection of energy sources
21 p0098 A79-16120

HUSSMANN, E.
Reduction of the heat loss flux of collectors by infrared reflecting coatings on cover plates
21 p0058 A79-13649

HUSSON, J. C.
High accuracy off-shore position finding using the GEOLE satellite based system
22 p0329 N79-15932

HUTCHINS, F. P.
Investigation of turbo-dyne energy chamber (G:R: value trademark): An air bleed device
[PB-285381/0] 21 p0217 N79-14397

HUTCHINS, M. G.
Thin-film coatings in solar water heating systems
23 p0452 A79-37887
Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321
24 p0662 A79-50548
Spectrally selective solar absorber coatings
24 p0704 A79-52150

HUTCHINSON, D. P.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

HUTCHINSON, L. H.
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

HUTZLER, M. J.
International energy evaluation system. Volume 1: Executive summary
[HCP/I8602-01/1] 24 p0742 N79-29662

HWANG, H. H.
Control of wind turbine generators connected to power systems
21 p0086 A79-15574
Digital simulation of dynamics of wind turbine generators
24 p0654 A79-50073

HWANGBO, H.
Flight performance evaluation of heat pipe solar collector in a spin environment
[AIAA PAPER 79-1061] 23 p0455 A79-38041

HYPANTIS, G. J., JR.
Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949

HYLAND, R. E.
Power-conversion system component summation
23 p0580 N79-26483

HYLAND, S. L.
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009

HYMAN, E. A.
Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1] 21 p0184 N79-11490

I

IACHETTA, F. A.
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991

IAKOVLENKO, S. I.
Direct conversion of solar energy into laser radiation
22 p0311 A79-31086

IAKOVLEV, IU. P.
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180

IAKUBOV, I. T.
The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity
21 p0167 A79-20415

IAKUBOV, V. B.
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

IANNUCCI, J. J.
Energy storage requirements for autonomous and hybrid solar thermal electric power plants
21 p0120 A79-17315

IAZKULIEV, A.
Study of the spectral characteristics of metallized polymer films for production of solar concentrators
22 p0297 A79-28672

Investigation of the spectral characteristics of metallized polymer films for making solar concentrators 24 p0637 A79-46910

IBANEZ RUIZ, A.
Training energy specialists - A proposal 23 p0388 A79-33257

IBRAHIM, A.
Research on the physical properties of geothermal reservoir rock
[COO-2908-4] 22 p0358 N79-20459

IBRAMSHA, M.
Design of solar energy concentrators for power generation in residential and nonresidential areas 21 p0136 A79-17460

ICE, W. J.
Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona 23 p0521 A79-41089

ICERMAN, L.
Industrial cogeneration - Problems and promise 22 p0265 A79-24047

ICHIKAWA, Y. H.
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051

ICOVI, M.
On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells 22 p0246 A79-21491

IDZOREK, J. J.
Subsonic diffusers for MHD generators 22 p0279 A79-26185

Evaluation of the expected diffuser performance for a large MHD generator 23 p0393 A79-33408

IGEL, E. A.
Optical analysis of solar facility heliostats 22 p0296 A79-28360

IGELBUESCHER, H.
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751

IGNATIEV, A.
The dependence of optical properties on the structural composition of solar absorbers - Gold black 22 p0242 A79-21162

Microstructure dependence of the optical properties of solar-absorbing black chrome 22 p0256 A79-22858

Relationship of optical degradation to surface morphology changes in solar absorbers 23 p0446 A79-37158

The surface microstructure optical properties relationship in solar absorbers - Black chrome 24 p0655 A79-50181

IGNIZIO, J. P.
Water/energy management and evaluation model for Pennsylvania
[PB-287577/1] 22 p0343 N79-17353

IGRA, O.
Cost-effectiveness of the vortex-augmented wind turbine 22 p0266 A79-24048

Design and construction of a pilot plant for a shrouded wind turbine 23 p0485 A79-40128

IIDA, H.
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

IIYOSHI, A.
Confinement of ohmically heated plasmas in Heliotron D 23 p0350 A79-33346

IKEDA, H.
Progress in batteries and solar cells. Volume 1 21 p0148 A79-17989

Synthetic test methods of high-direct-current circuit breaker 24 p0716 A79-54504

IKEDA, K.
Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks 24 p0604 A79-44537

IKEGAMI, H.
Electron cyclotron heating in Bumpy Torus Program 24 p0607 A79-45033

IKEGAMI, K.
Rotating strength of glass-carbon fiber-reinforced hybrid composite discs 21 p0165 A79-20273

IKOKU, C. U.
Transient flow of non-Newtonian power-law fluids in porous media
[SAN-1265-9] 24 p0781 N79-32516

ILES, P. A.
Analysis of ID saw slicing of silicon for low cost solar cells 23 p0499 A79-40903

High-temperature contacts for silicon solar cells 23 p0502 A79-40934

The alpha factor - Controlling solar cell absorptance 23 p0502 A79-40935

Silicon foil cells 23 p0503 A79-40954

Fabrication experience with high efficiency silicon concentrator cells 23 p0517 A79-41056

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485

Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158736] 23 p0580 N79-26488

Silicon solar cell process development, fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495

Silicon solar cells for space use: Present performance and trends 24 p0784 N79-32654

ILIEV, I.
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions 22 p0245 A79-21483

ILIN, V. S.
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak 22 p0244 A79-21430

IM, K.
Slag deposition and its effect on the performance of MHD channels
[AIAA PAPER 79-0189] 21 p0157 A79-19588

IMARISIO, G.
R&D programmes in the field of hydrogen economy 24 p0648 A79-49227

IMBERT, B.
Solar thermal conversion installations in the medium power range - The Thek project 22 p0254 A79-22269

IMENKOV, A. N.
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination 24 p0647 A79-49180

INALL, E. K.
Homopolar generator energy storage for fusion reactors 22 p0304 A79-29942

INCULET, I. I.
Electrostatic separation of coal macerals 24 p0603 A79-44525

INGHAM, J. D.
Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513

Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

INGLE, W. M.
Semiconductor grade, solar silicon purification project
[NASA-CR-158868] 24 p0736 N79-29598

INGLEY, H. A.
The design and evaluation of a hydraulic-solar powered tracking device 21 p0136 A79-17458

Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479
An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481

INGLIS, D. R.
Wind power and other energy options
21 p0153 A79-18346

INHABER, H.
Risk with energy from conventional and nonconventional sources
22 p0266 A79-24151

INMAN, D.
Review of current research on hydrocarbon production by plants
[SERI/TR-33-129] 24 p0779 N79-32374

INNOCENTI, P.
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727

INOUE, N.
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

INUISHI, Y.
Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure
22 p0305 A79-30258

IPPOLITO, L.
Fiat Research Center hybrid vehicle prototype
[SAE PAPER 790014] 22 p0313 A79-31351

IPPOLITO, M.
What will be the price for energy tomorrow. I - Coal price
24 p0652 A79-49515

IQBAL, K. Z.
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124

IQBAL, M.
Hourly vs daily method of computing insolation on inclined surfaces
22 p0242 A79-21164
Optimum collector slope for residential heating in adverse climates
22 p0263 A79-23761

IRELAND, P. J.
A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723
The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910

IRELAND, S. J.
Thermal power systems small power systems application project: Siting issues for solar thermal power plants with small community applications
[NASA-CR-158520] 23 p0542 N79-22629

IRETON, V. H.
Domestic water preheating using solar energy
22 p0321 A79-31437

IRVINE, S. J. C.
The effect of induced disorder on the hydrogenation behaviour of the phase ZrCo
22 p0251 A79-21707

IRVINE, T. F., JR.
Advances in heat transfer. Volume 14
24 p0638 A79-47255

ISAAC, J. J.
Cycle optimization for a solar turbopack
21 p0141 A79-17500

ISAACS, H. S.
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813
Solid electrolyte fuel cell for electric utility power generation
24 p0682 A79-51815
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

ISAACS, H. P.
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

ISAENKOV, IU. I.
Study of the thermal inertia of an electrode microarc
23 p0530 A79-42869

ISAKOVA, N. P.
Subsonic flow in the channel of an MHD-generator
21 p0167 A79-20413

ISENBERG, A. O.
Growth of refractory oxide layers by electrochemical vapor deposition /EVD/ at elevated temperatures
21 p0039 A79-11812
Thin film high temperature solid electrolyte fuel cells
21 p0040 A79-11820

ISHIBASHI, T.
Studies on the selective absorption surface on stainless steel
21 p0127 A79-17378

ISHIDA, T.
Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396

ISHIDO, Y.
A novel thermal engine using metal hydride
23 p0479 A79-39844

ISHIHAMA, W.
Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets
23 p0409 A79-34076

ISHII, H.
Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091

ISHIKAWA, M.
Effects of position of output electrodes in entrance region of open-cycle diagonal type MHD generator
21 p0153 A79-18468

ISHIZAKI, O.
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence
24 p0629 A79-46249

ISHIZAKI, Y.
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020

ISMAIL, K. A. R.
The Savonius rotor - Theory and optimization
23 p0387 A79-33242
Latent heat storage
23 p0388 A79-33249

ISRAEL, J.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052

ISSAACS, G. A.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

ISSHIKI, N.
Heat transfer of absorbing evaporator in CDE engine system
23 p0531 A79-42900
Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005
R and D on Rankine cycle engines in Japan
24 p0702 A79-52007

ITAGAKI, T.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345
Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47004

ITO, H.
A digital control system for superconducting magnet
22 p0268 A79-24508

ITOH, H.
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958
ITOH, S.
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
ITOH, T.
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465
Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396
IUFEROV, V. B.
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264
IUN, G. M.
A problem of optimizing the setting angle of sun-battery panels of concave shape
21 p0045 A79-12186
Determining optimal angles of nonconvex solar battery panel mounting
21 p0080 A79-14837
IUNUSOV, M.
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760
IUREV, L. V.
Investigating the formation of oxides of nitrogen when burning solid fuel
23 p0474 A79-38864
IURIN, E. M.
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356
IURINSKII, V. I.
Ways of improving steam-gas power plants
22 p0299 A79-29298
IUROV, S. S.
Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585
IVANOFF, R.
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
IVANOV, A.
The chemical stability of kerosene fractions
23 p0529 A79-42275
IVANOV, D. P.
Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003
IVANOV, N. V.
Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762
IVASHCHENKO, N. I.
Deposition of the conduction-enhancing alkali metal from a fog in closed-cycle MHD generator systems
24 p0640 A79-47573
IVES, C.
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424
IWASAKI, H.
Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091
IWASAKI, N.
Development of a DC linear motor. II
24 p0707 A79-52800
IYNKARAN, K.
Cost effective optimum design of solar air heaters
21 p0127 A79-17386
IZARD, J.-L.
Solar energy diagrams
22 p0253 A79-22267
IZEROV, A. D.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
IZVOZCHIKOV, A. B.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

J

JACKO, R. B.
Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana
23 p0534 A79-43370
JACKSON, D. M.
SRC-II - Review of development and status
21 p0092 A79-15887
JACKSON, J. N.
Econometric-engineering analysis of Federal energy conservation programs in the commercial sector
[ORNL/CON-30] 23 p0562 N79-24489
JACKSON, R.
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576
JACKSON, R. J.
Directly driven generators for wave energy conversion
23 p0449 A79-37858
JACKSON, T. A.
Evaluation of future jet fuel combustion characteristics
[AD-A060218] 21 p0216 N79-14231
Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224
JACKSON, W. L.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704
JACOB, A.
Control strategy for a variable-speed wind energy conversion system
22 p0303 A79-29800
JACOB, I.
Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702
JACOBS, B.
Analysis of radioactive contaminants in by-products from coal-fired power plant operations
[PB-286365/2] 21 p0232 N79-15473
JACOBS, H. R.
Electrical production from moderate temperature geothermal brines
23 p0486 A79-40197
JACOBS, I. S.
Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434
JACOBS, J. K.
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686
JACOBS, M. R.
Considerations in choosing solar energy monitoring systems
21 p0087 A79-15831
JACOBS, N. J.
Underground pumped hydro storage - An evaluation of the concept
24 p0679 A79-51793
JACOBS, R. B.
Cryogenic pellets for laser-fusion research - Theoretical and practical considerations
21 p0085 A79-15334
Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335
JACOBS, R. R.
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-34192
JACOBSEN, J. J.
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786

JACOBSEN, T.
Dynamic aspects of solid solution cathodes for electrochemical power sources
24 p0636 A79-46665

JACOBSEN, W. E.
Analysis of prospects for CTEC commercialization for baseload power
24 p0617 A79-45786

JACOBSON, D.
Performance analysis of phase change thermal energy storage/heat pipe systems
[AIAA PAPER 79-1096] 23 p0462 A79-38566

JACOBSON, D. L.
Evaluation of a sodium heat pipe/thermal energy storage unit utilizing LiF-MgF2-KF phase change material
[AIAA PAPER 79-1095] 23 p0462 A79-38565

JACOBSON, M. R.
New instrumentation for high temperature and hemispherical measurements of selective surfaces
22 p0294 A79-28152
Optical properties of materials under simulated operating environments
23 p0431 A79-35071

JACOBSON, W. O.
Performance of a 10 MW geothermal energy conversion test facility
21 p0014 A79-10119

JACQUIER, M.
Storage of electricity
23 p0524 A79-41804

JAECKEL, G.
Published patent applications and patents resulting from German government sponsored research and development
[BMFT-FB-T-78-31] 24 p0794 N79-33151

JAEGER, E. F.
Radial transport in the ELMO Bumpy Torus in collisional regimes
22 p0312 A79-31184

JAFFRIN, A.
An experimental study of walls with latent heat for residences
23 p0470 A79-38640

JAGADISH, B. S.
Optimum tilt for the flat plate collector
21 p0132 A79-17426

JAGUARIBE, E. F.
Theoretical and experimental study of a cylindrical solar photochemical reactor
23 p0467 A79-38618

JAHNIG, C. E.
Hybrid OTEC cycle avoids indirect heat exchangers
24 p0625 A79-45844

JAIN, A. K.
Dynamic response of a novel solar water heater
21 p0140 A79-17488

JAIN, G. C.
Trends in silicon solar-photovoltaic cells - An invited talk
21 p0122 A79-17333

JAIN, R. C.
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

JAIN, S. C.
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353

JAIN, S. V.
Mechanical energy storage system for a 10 KWe solar power pack
21 p0121 A79-17329

JAIN, V. K.
Role of high performance solar cells in practical photovoltaic systems
21 p0122 A79-17336

JAKOBSEN, H. J.
Chemical characterization of shale oil and related fuels
24 p0665 A79-50888

JAKUBOWSKI, A. K.
Radioisotope-powered free-piston Stirling engine for space applications
[IAF PAPER 78-42] 21 p0034 A79-11217

JAMES, R. D.
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

JAMES, I. C., II
Effect of operating variables on reactor performance in the Synthoil coal conversion process
23 p0412 A79-34099

JAMES, L. W.
Fresnel optics for solar concentration on photovoltaic cells
23 p0508 A79-40994
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025
Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038
High performance GaAs photovoltaic cells for concentrator applications
[SAND-78-7018] 21 p0187 N79-11521

JAMES, O. B.
Application of a power recovery system to gas turbine exhaust gases
[ASME PAPER 79-GT-167] 23 p0379 A79-32429

JANAI, M.
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177
Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon
24 p0704 A79-52312

JANCARIK, J.
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426

JANDRASI, J. S.
Power distribution study for a 5-GW space power satellite
21 p0002 A79-10026

JANES, C. W.
Increasing gas turbine efficiency through the use of a waste heat methanol reactor
24 p0702 A79-52000

JANETZKE, D. C.
Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007
Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

JANSING, W.
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592

JANSSEN, W. R.
Energy conservation and the rural home: Economic considerations for the nation and the individual
[PB-286222/5] 21 p0230 N79-15425

JAPIKSE, D.
Annular diffuser performance for an automotive gas turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790

JARAS, T.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052

JARASS, A.
Stormy development of wind energy
22 p0268 A79-24323

JARASS, L.
Stormy development of wind energy
22 p0268 A79-24323
Guaranteed power /capacity effect/ and total power as defining parameters of wind conversion system energy production
23 p0472 A79-38663

JARDIN, S. C.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

JARVINEN, P. O.
Ceramic receivers for solar power conversion
[AIAA PAPER 79-1008] 23 p0459 A79-38200
Ceramic solar receivers
24 p0670 A79-51731

JARZYNSKI, J.
Ultrasonic detection of microbial slime films
24 p0620 A79-45807

JASIONOWSKI, W. J.
Distribution of gaseous hydrogen - Technology evaluation
24 p0615 A79-45598
Suitability of gas distribution equipment in hydrogen service
24 p0685 A79-51845
Behavior of gas distribution equipment in hydrogen service
[CONF-790512-2] 24 p0747 N79-30408

JASON, A.
Development of surfaces optically suitable for flat solar panels
[NASA-CR-150831] 21 p0173 N79-10522

JASSBY, A.
Energy technologies and natural environments - The search for compatibility
21 p0074 A79-14721
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614

JASSBY, D. L.
SIPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979
Fusion-supported decentralized nuclear energy system
24 p0696 A79-51956

JASTRZEBSKI, L.
Present status of GaAs
[NASA-CR-3093] 21 p0215 N79-14192

JAUD, P.
Preliminary results of the new geothermal domestic heating system at Creil
21 p0075 A79-14740

JAWETZ, P.
Improving octane values of unleaded gasoline via gasohol
24 p0676 A79-51775

JAWISH, W. K.
Load criteria for OTEC riser cable design
24 p0620 A79-45801

JAYADEV, T. S.
Thermoelectric OTEC
24 p0624 A79-45843
Solar pond concepts - Old and new
24 p0671 A79-51734
Economic and performance comparisons of salty and saltless solar ponds
24 p0671 A79-51737
Solar thermoelectric energy conversion
24 p0699 A79-51976

JAYET, P.-A.
Bioconversion - Energy and agriculture
23 p0435 A79-35489

JEFFRIES, T. W.
Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0796 N79-33346

JELDRES, R.
On the optimisation of Trombe wall solar collectors
[ASME PAPER 78-WA/SOL-13] 21 p0163 A79-19845

JELEN, F. C.
New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798

JELINEK, J.
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362)
[PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes
[PB-294952/7] 24 p0743 N79-29673

JELINEK, H.
Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648

JENKINS, D. H.
Integration of a passive and active solar heated, low density, multiple dwelling with atrium
22 p0322 A79-31446

JENKINS, G.
Sputtered thin film solar cells
23 p0448 A79-37843

JENKINS, G. H.
Form-stable, crystalline polymer pellets for thermal energy storage
21 p0013 A79-10107

JENKINS, J. P.
Testing of solar collectors according to ASHRAE Standard 93-77
21 p0101 A79-16417
Testing of water-heating collectors according to ASHRAE Standard 93-77
21 p0130 A79-17410
Experimental verification of a standard test procedure for solar collectors
[PB-289912/8] 22 p0372 N79-21632

JENKINS, L. H.
A technology program for large area space systems
21 p0100 A79-16145

JENKINS, P. E.
Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes
[ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836
Design of a freon jet pump for use in a solar cooling system
[ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847
Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309

JENKS, R. L.
Refined model of solar space cooling system
23 p0401 A79-34012

JENNINGS, J. W.
Analysis of geological limitations to underground coal gasification
24 p0668 A79-51025

JENNINGS, S. J.
Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837

JENSEN, H. B.
Oil shale technologies and the potential for oil shale development
23 p0525 A79-41813

JENSEN, J.
Advanced batteries
21 p0067 A79-14270
Large scale energy storage - Batteries for transport and stationary applications
23 p0451 A79-37875

JENSEN, N. O.
Atmospheric turbulence structure in relation to wind generator design
23 p0483 A79-40114

JENSEN, R. N.
Solar engine
[NASA-CASE-LAR-12148-1] 24 p0737 N79-29608

JENSEN, W. P.
Energy conservation with fired heaters
[TREE-1308] 24 p0772 N79-31783

JESCH, L. F.
Design analysis of a vertical axis wind turbine
23 p0472 A79-38656
Legal and economic aspects of engineering design in solar water heating systems
23 p0473 A79-38664

JETER, S.
Orientation studies for single-axis concentrating collectors
23 p0537 A79-43677

JEWETT, J.
Opportunities for energy conservation in finished concrete products
[HCP/CS-1549] 24 p0772 N79-31782

JHA, K. N.
The isotopic composition of carbon in the Alberta oil sand
24 p0650 A79-49357

JIRKA, G. H.
Modeling the intermediate field of ocean thermal energy conversion discharges
24 p0626 A79-45858

JOATTON, B.
Design of an indirect-drive heliostat
23 p0390 A79-33270
JOBE, C. E.
Large-vehicle concepts
22 p0306 A79-30485
JOCHEM, E.
The influence of demand development and resource proposals on the production of basic chemicals - Estimations with the aid of a simulation model for the year 2000
24 p0649 A79-49300
JOENSEN, A. W.
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115
Source emissions factors for refuse derived fuels
21 p0082 A79-15084
Environmental effects of burning solid waste as fuel
21 p0082 A79-15115
Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735
JOHANSON, E. E.
An economic model to establish the value of WECS to a utility system
23 p0485 A79-40131
Wind energy systems application to regional utilities
24 p0633 A79-46532
JOHANSON, E. S.
COIL process - First generation commercial coal liquefaction plant
23 p0412 A79-34101
Advances in H-Coal
24 p0687 A79-51855
JOHANSON, E. W.
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
JOHN, V. I.
A Variable Speed Constant Frequency /VSCF/ wind generator for low power applications
22 p0303 A79-29799
JOHNER, A. N.
Case study energy recovery from wastes from an automobile assembly plant
23 p0489 A79-40394
JOHNS, H. D.
Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing
22 p0257 A79-22924
JOHNSON, A. W.
Energy storage and conversion in conjunction with photovoltaic energy systems
24 p0679 A79-51790
JOHNSON, C. A.
An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640
JOHNSON, C. E.
'Ultra-black' coating for high absorptance of solar energy
24 p0658 A79-50329
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564
Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model
[CONF-780941-6] 24 p0744 N79-30036
JOHNSON, D.
The ground water and energy supply situation for Great Plains irrigation
[PB-286002/1] 21 p0222 N79-14586
JOHNSON, D. G.
New energy from an old source - Hydrogen from falling water
21 p0015 A79-10129
Distribution of gaseous hydrogen - Technology evaluation
24 p0615 A79-45598
Suitability of gas distribution equipment in hydrogen service
24 p0685 A79-51845
Hydrogen from existing falling-water sites: An initial feasibility assessment (summary)
[CONF-781142-8] 24 p0718 N79-28360
Behavior of gas distribution equipment in hydrogen service
[CONF-790512-2] 24 p0747 N79-30408
JOHNSON, D. L.
The performance of an experimental solar heating system
[AD-A066699] 23 p0573 N79-25516
JOHNSON, E. K.
Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923
JOHNSON, G. L.
Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155
JOHNSON, G. H.
Emissions of nitrogen dioxide from a large gas-turbine power station
21 p0152 A79-18344
JOHNSON, G. R.
A microprocessor based solar controller
21 p0082 A79-14979
JOHNSON, H. G.
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557
JOHNSON, I.
Factors limiting limestone utilization efficiency in fluidized-bed combustors
21 p0008 A79-10069
Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121
JOHNSON, J.
The use of a complex-terrain wind model for the siting and design of wind generators
[AIAA PAPER 79-0971] 23 p0456 A79-38178
JOHNSON, J. R.
Commodity hydrogen production and marketing
24 p0613 A79-45582
JOHNSON, J. L.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226
Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391
JOHNSON, L. A.
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043
JOHNSON, N.
Low-temperature application of solar energy in South Africa
22 p0340 N79-17324
JOHNSON, R.
Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor
23 p0395 A79-33428
JOHNSON, R. L.
Conceptual design study of an Improved Gas Turbine (IGT) powertrain
[NASA-CR-159604] 24 p0762 N79-31087
Single shaft automotive gas turbine engine characterization test
[NASA-CR-159654] 24 p0778 N79-32129
JOHNSON, R. E.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043
JOHNSON, R. W.
Space solar power - An energy alternative
22 p0303 A79-29796
A computer model of a heterojunction solar cell with application to GaP/Si
24 p0654 A79-50030
Solar power satellite - Putting it together
24 p0659 A79-50399
JOHNSON, R., JR.
On-orbit fabrication and assembly of large space structural subsystems
[IAF PAPER 78-192] 21 p0035 A79-11288

JOHNSON, S. H.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

JOHNSON, T. F.
Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies
21 p0045 A79-12121

JOHNSON, T. R.
Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808
MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500
Evaluation of available MHD seed-regeneration processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519

JOHNSON, V. E., JR.
Evaluation of analytical and experimental methods for determining OTEC plant dynamics and CWP loads
24 p0621 A79-45812

JOHNSON, V. H.
Sensor selection and placement in the National Solar Data Program
21 p0089 A79-15844

JOHNSON, W. H.
Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092

JOHNSTON, R.
Alternatives for coal based power generation - An international overview
21 p0008 A79-10074

JOHNSTON, R. S.
The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2
23 p0427 A79-34860

JONCICH, D. M.
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522
The performance of an experimental solar heating system
[AD-A066699] 23 p0573 N79-25516

JONES, A. B.
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231

JONES, B.
Use of low grade fuel derived from domestic and trade wastes
23 p0454 A79-37912

JONES, C.
A review of Curtiss-Wright rotary engine developments with respect to general aviation potential
[SAE PAPER 790621] 23 p0440 A79-36749
Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential
22 p0329 N79-15967

JONES, C. B.
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519

JONES, D.
Power extraction from ocean surface waves
23 p0486 A79-40198
An investigative study of a wave-energy device
24 p0631 A79-46315

JONES, D. C.
Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455

JONES, D. E.
System performance measurements for a packaged solar space heating system equipped with air-heating collectors
21 p0088 A79-15835
Testing of solar collectors according to ASHRAE Standard 93-77
21 p0101 A79-16417
Experimental verification of a standard test procedure for solar collectors
[PB-289912/8] 22 p0372 N79-21632
Testing of pebble-bed and phase-change thermal energy storage devices according to ASHRAE standard 94-77
[PB-295898/1] 24 p0801 N79-33596

JONES, D. W.
Regenerative flywheel energy storage system
24 p0678 A79-51783

JONES, E. W.
Coal-rock interface detector
[NASA-CASE-MFS-23725-1] 24 p0768 N79-31706

JONES, G.
Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444

JONES, G. F.
Isothermal flow distribution in solar collectors and collector manifolds
[ALO-5319-1] 24 p0789 N79-32708

JONES, G. J.
Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891
Status of the DOE Photovoltaic Systems Engineering and Analysis Project
23 p0519 A79-41075
The design of photovoltaic systems for intermediate-sized applications
24 p0675 A79-51762
A summary of systems definition project activities
23 p0570 N79-25488
Status of the DOE photovoltaic systems engineering and analysis project
[SAND-78-0955C] 24 p0754 N79-30780
Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796

JONES, G. T.
Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773

JONES, H. G. M.
Electric energy demand and supply prospects for California
23 p0591 N79-27601

JONES, I. W.
High temperature batteries
23 p0451 A79-37881

JONES, J.
Absence of bending effects on solar-receiver-tube fatigue
23 p0537 A79-43682

JONES, J. L.
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574
Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals
[TID-29093-VOL-5] 24 p0719 N79-28361
Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385

JONES, J. M.
Modeling the intermediate field of ocean thermal energy conversion discharges
24 p0626 A79-45858

JONES, K.
Midterm oil and gas supply modeling system methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059

JONES, K. A.
The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964

JONES, S. A.
Inventory of underground energy storage sites in California
[PB-290835/8] 23 p0566 N79-24519

JONES, H. C.
Review of hydrodynamics and heat transfer for large helium cooling systems
23 p0481 A79-40073
JONES, P. W.
Chemical characterization of shale oil and related fuels
24 p0665 A79-50888
JONES, R.
A source of error in cusp plasma leak measurements
23 p0446 A79-37265
JONES, R. B.
Application of computer animation for dynamic display in complex energy systems
23 p0421 A79-34172
JONES, R. L.
Improvements in the lead-acid battery for load leveling applications
[AD-A068990] 24 p0724 N79-28744
JONES, R. W.
Refined model of solar space cooling system
23 p0401 A79-34012
JONES, W. A.
Techniques for preventing damage to high power laser components
21 p0083 A79-15145
JONES, W. H.
Structuring a small national or state solar energy program
22 p0262 A79-23751
JONES, W. M.
Process design of the LASI bismuth sulfate thermochemical hydrogen cycle
24 p0685 A79-51839
JONES, W. S.
Laser-powered aircraft and rocket systems with laser energy relay units
21 p0109 A79-16619
Laser aircraft
22 p0264 A79-26597
Solar power satellites - The laser option
22 p0284 A79-26599
Space Laser Power System
[AIAA PAPER 79-1013] 23 p0459 A79-38201
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VCL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335
JONG, N.
A small horizontal axis wind turbine feeding power into the utility grid
21 p0074 A79-14703
JONKE, A.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242
JONKE, A. A.
Status and future promise of fluidized-bed coal combustion
23 p0412 A79-34103
JONZEN, M. R.
Mass-energy analyses for gas-cooled fast reactor and fusion-fission hybrid reactor systems
24 p0629 A79-46236
JORDAN, D.
Development of gas turbine performance seeking logic
[ASME PAPER 78-GT-13] 21 p0031 A79-10257
JORDAN, J. B.
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983
JORDAO FILHO, W.
Development of Brazilian hydroelectric potential - Future prospects and planning options
23 p0389 A79-33267
JORGENSEN, L. W.
Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma
22 p0255 A79-22369
JORGENSON, D. W.
Technical-economic modeling in energy planning
23 p0419 A79-34164
JOSEFSSON, T.
Energy research and development in Sweden, 1978-1981
[DFE-13] 24 p0728 N79-28781
JOSEPH, H. N.
Progress in batteries and solar cells. Volume 1
21 p0148 A79-17989
JOSEPHS, R. H.
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
JOSHI, S. P.
On the role of interface states in MOS solar cells
21 p0122 A79-17337
Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985
JOSSE
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708
JOSWIG, G.
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828
JOUBERT, J. I.
Fuels and combustion
21 p0106 A79-16488
JOURDAN
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708
JOUSSE, D.
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971
JUDD, M. R.
Multistage fluidised coal combustor
24 p0688 A79-51864
JUENTGEN, H.
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827
JUNG, H.
Performance of the Meadowvale solar home
22 p0318 A79-31420
JUNG, R.
Investigation of flow phenomena in pulverized coal gasification for the new process
[BMFT-FB-T-78-27] 23 p0590 N79-27341
JUNKAN, G. H.
Energy conservation via heat transfer enhancement
24 p0630 A79-46307
JUNKHAN, G. H.
Energy conservation via heat transfer enhancement
[COO-4649-3] 24 p0758 N79-30819
JURICIC, D.
On the dynamics of electrostatically precipitated fly ash
[ASME PAPER 78-WA/FU-3] 21 p0160 A79-19787
JURINAK, J. J.
Properties optimization for phase-change energy storage in air-based solar heating systems
21 p0149 A79-18018
Sizing phase-change energy storage units for air-based solar heating systems
23 p0439 A79-36632
JURISSON, J.
Multicolor solar cell power system for space
21 p0108 A79-16611
JUST, C.
Evaluation program for new industrial gas turbine materials
[ASME PAPER 78-GT-145] 21 p0031 A79-10269
JUSTI, E.
Problems, status, and prospects of a solar hydrogen economy
21 p0059 A79-13658
Hydrogen production by conventional and modified water electrolysis
21 p0059 A79-13659
Generation of electrical energy from hydrogen and oxygen by means of fuel cells
21 p0059 A79-13662
Hydrogen production with the ELOFLUX electrolysis cell
23 p0469 A79-38631

JUSTI, E. W.
Encapsulation of terrestric solar cell arrays by hydrocarbon foils transparent for both visible and infrared radiation 23 p0466 A79-38603

JUSTIN, B.
Performance testing of solar collectors 21 p0155 A79-18875

JUSTUS, C. G.
Generic power performance estimates for wind turbines 21 p0068 A79-14295
Energy statistics for large wind turbine arrays 22 p0299 A79-29371
Interannual and month-to-month variations of wind speed 24 p0629 A79-46221

JUTSEN, J.
Energy storage using the reversible oxidation of barium oxide 22 p0242 A79-21169

JUVINALL, G. L.
NASA's lithium cell technology program 24 p0722 N79-28709

JUZWA, H.
Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system 22 p0283 A79-26469

K

KABALA, S.
A low energy scenario for the United States - 1975-2050 21 p0147 A79-17649

KABE, A.
Superconducting energy storage magnets 22 p0236 A79-20537

KABEYA, H.
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte 24 p0715 A79-54298

KACHADORIAN, J.
Enhancement of intrinsic solar heating 21 p0140 A79-17494

KACINSKAS, H.
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells 24 p0685 A79-51838

KACZYNSKI, D. J.
A study of the physical and chemical properties of oil shale relevant to physical concentration processes 23 p0569 N79-25445

KADLEC, R. A.
The development of a laser Doppler velocimetry system for unsteady separated flow research: Preliminary results
[AD-A061724] 22 p0352 N79-19305

KADOMTSEV, B. B.
Controlled thermonuclear fusion 22 p0287 A79-27339

KAEMPFEN, C. E.
Tropospheric conduits 22 p0266 A79-24275

KAESTNER, P. C.
Solar Irrigation Program Data Base Management System (SIPDBMS)
[SAND-78-0641] 21 p0209 N79-13532

KAH, G. F.
Alternative energy sources and conservation technologies - Optimal systems 23 p0418 A79-34150
Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future 23 p0420 A79-34168

KAHLE, R. L.
Environmental assessment of solid residues from fluidized-bed fuel processing
[PB-282940/6] 21 p0179 N79-10968

KAHN, E.
Reliability of wind power from dispersed sites: A preliminary assessment
[LBL-6889] 21 p0176 N79-10547

KAISER, U.
Energy storage 24 p0606 A79-44959

KAILA, S. K.
Performance of a solar space heating system 23 p0385 A79-33223

KAINE, M.
A hybrid wind turbine suitable for developing regions 22 p0323 A79-31455

KAISHEVA, A.
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions 22 p0245 A79-21483

KAJI, I.
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section 22 p0327 A79-32103

KAJIKAWA, T.
Optimum power plant capacity of ocean-based ocean thermal energy conversion systems 22 p0297 A79-28922
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant 24 p0619 A79-45797
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL 24 p0622 A79-45821

KAKABAEV, A.
Experimental study of mass exchange in glazed solar solution regenerator 24 p0602 A79-44264

KAKAC, S.
Solar-hydrogen energy system and solar-hydrogen production methods 21 p0104 A79-16463

KAKAR, A. S.
Cuprous oxide photovoltaic cells 23 p0499 A79-40908
Cuprous oxide photovoltaic cells
[CONF-780619-16] 24 p0753 N79-30777

KAKHAROV, N. A.
Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers 22 p0297 A79-28671
Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers 24 p0637 A79-46909

KAKIMOTO, N.
Construction of Lur'e type Lyapunov function with effect of magnetic flux decay 24 p0606 A79-44916

KAKURIN, A. M.
Experiments on controlling the plasma density in the TO-1 tokamak 22 p0324 A79-31762

KALAAGHER, R. J.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

KALAC, S.
Thermal storage of solar energy 21 p0103 A79-16459

KALADZE, T. D.
Cyclotron-wave spectrum in a plasma with two ion species 22 p0245 A79-21443

KALANDARISHVILI, A. G.
A cesium vapor source based on a gas-regulated heat pipe for thermionic energy transducers 24 p0704 A79-52166

KALEJS, J. P.
Multiple silicon ribbon growth by EFG 23 p0502 A79-40939

KALFADELIS, C. D.
Environmental assessment of a coal-fired open-cycle MHD power plant 24 p0701 A79-51993

KALFAYAN, S. H.
Compatibility of elastomers in alternate jet fuels
[NASA-CR-158773] 23 p0588 N79-27321
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

KALINCHAK, A. I.
Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342

KALININ, A. V.
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171

KALMAN, G.
Non-uniform power distribution in linear induction motors due to end effects
24 p0707 A79-52798

KALMANOVIZ, D.
Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755

KALOS, F.
Solar collector tests in Rwanda
23 p0470 A79-38643

KALVINSKAS, J.
Bioconversion study conducted by JPL
[NASA-CR-158228] 22 p0354 N79-19450

KALVINSKAS, J. J.
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119

KAM, A. Y.
Fluid bed process studies on selective conversion of methanol to high octane gasoline
[FE-2490-15] 23 p0555 N79-24190

KAMAT, P. V.
Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370

KAMATH, G. S.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
GaAs solar cells for high solar concentration applications
23 p0514 A79-41039

KAMATH, S.
Low energy proton radiation damage to (AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507
High efficiency GaAs solar cell development
[AD-A066616] 23 p0573 N79-25514
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

KAMIMOTO, M.
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271

KAMIYA, N.
The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294

KAMIYAMA, S.
On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid
21 p0156 A79-19445
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020

KAMMASH, T.
Performance characteristics of the high power density, flux-conserving tokamak /FCT/ reactor
24 p0630 A79-46302

KAMMERUD, R. C.
Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805

KAMOGAWA, H.
An overview of the Japanese OTEC development
24 p0616 A79-45779
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797

KAMOSHIDA, J.
Heat transfer of absorbing evaporator in CDE engine system
23 p0531 A79-42900
Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005

KANADA, Y.
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051

KANAEV, B. I.
Stabilization of drift loss-cone instability /DCI/ by addition of cold ions
22 p0291 A79-27882

KANAKI, M. T.
Cretan windmills
23 p0536 A79-43576

KANATANI, K.
An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University
24 p0641 A79-47797

KANDLIKAR, S. G.
Geometrical aspects of a cylindrical parabolic collector
21 p0134 A79-17443

KANEKO, Y.
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

KANG, C. C.
Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5
[PB-287180/4] 22 p0339 N79-17026

KANTAK, A. V.
Automatic phase control in solar power satellite systems
[NASA-CR-151856] 21 p0194 N79-12130

KANTSIOS, A. G.
Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507

KAPLAN, E.
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572

KAPLAN, M. H.
Space Shuttle - America's wings to the future
21 p0114 A79-17124
Nuclear powered satellite studies
[COO-4045-3] 23 p0588 N79-27221

KAPLOW, R.
Performance of a new high-intensity silicon solar cell
22 p0257 A79-22862
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610

KAPUR, J. C.
A passive integrated unit for the collection, thermal storage in fusion materials and distribution of solar energy for home heating and other applications
21 p0121 A79-17322
A heat operated mechanical device to control the temperature and flow of water entering a hot water storage tank in a solar water heating system
21 p0140 A79-17487

KAPUR, V.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

KAPUR, V. K.
Investigation on the feasibility of using a two-phase thermosyphon for solar storage, space heating and cooking
21 p0121 A79-17330

KAR, S.
On the role of interface states in MOS solar cells
21 p0122 A79-17337
On the role of interface states in MOS solar cells
21 p0156 A79-19092
Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985
On the design and operation of electrochemical solar cells
24 p0712 A79-53494

KARAFFA, N.
Air quality assessment of particulate emissions from diesel-powered vehicles
[PB-286172/2] 21 p0223 N79-14641

KARAKI, S.
Instrumentation, data acquisition and monitoring system for an air heating solar system
21 p0088 A79-15836
Estimation of collector and electrical energy cost for STEPS in Japan
21 p0118 A79-17288
Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467
Solar air heating and nocturnal cooling system /CSU Solar House II/
22 p0275 A79-25932

KARAS, A. N.
Studies of tidal power from the Bay of Fundy
23 p0450 A79-37866

KARASAKI, T.
Operational characteristics of MHD turbine with air-core superconducting rotor
22 p0297 A79-28924

KARGIN, P. E.
Ways of improving steam-gas power plants
22 p0299 A79-29298

KARKHANAVALA, M. D.
Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370

KARKHECK, J.
Waste heat as an alternative heat source
23 p0417 A79-34144
Methodology for modeling geothermal district heating for residential markets
[BNL-50905] 22 p0361 N79-20502

KARLSSON, B.
Colored stainless steel - A new type of selective absorber
22 p0294 A79-28150
Temperature variation of the absorption edge of CVD amorphous and polycrystalline silicon
24 p0704 A79-52312

KARLSSON, G.
Utility fuel cells for biomass fuel
21 p0016 A79-10131

KARNEY, C. F. F.
Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424

KARPENKO, I. V.
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255

KARPUKHIN, A. V.
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
Diagonal frame EM channel of the U-25 power plant
23 p0393 A79-33407

KARTSOUNES, G. T.
Undergound pumped hydro storage - An overview
24 p0660 A79-50451
Study of turbomachinery options for compressed air energy storage plants
24 p0680 A79-51801

KARTTUNEN, S. J.
Effects of nonlinear decay of backscattered light on the anomalous reflectivity
22 p0310 A79-30742

KARY, T.
Energy analysis of the Solar Power Satellite
24 p0601 A79-44160

KASAI, M.
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence
24 p0629 A79-46249

KASAI, S.
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

KASATKIN, V. V.
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490

KASERMAN, D. L.
A methodological note on the evaluation of new technologies - The case of coal gasification
21 p0099 A79-16122

KASHANI, A. K.
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658

KASHKARI, C.
Input-output method applied to energy planning
21 p0112 A79-16737

KASS, W. J.
Acoustic emissions during hydride formation
22 p0249 A79-21691

KASSEL, S.
Pulsed-power research and development in the USSR
[AD-A056635] 21 p0193 N79-11859

KASSING, D.
Energy for Europe from space
22 p0273 A79-25605
A European view of the solar satellite power system
24 p0694 A79-51942
European technology applicable to Solar Power Satellite Systems /SPS/
[IAF PAPER 79-174] 24 p0710 A79-53335
Interface problems on an SPS solar array blanket
24 p0752 N79-30751

KASSOY, D. R.
Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792

KATARIA, N. D.
Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768

KATNANI, A.
Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343

KATOH, T.
Dynamic analysis of pipeline system for thermal power generation facility
24 p0627 A79-45863

KATS, E. IU.
Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952

KATSNELSON, S. S.
Nonstationary two-dimensional magnetohydrodynamic flow in a radial channel
22 p0247 A79-21626

KATSONIS, F.
A completely solar power supply for France
23 p0436 A79-35492

KATSURAI, M.
Operational characteristics of MHD turbine with air-core superconducting rotor
22 p0297 A79-28924

KATTEN, S. L.
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235

KATTER, L. B.
Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473

KATTO, Y.
A generalized correlation of critical heat flux for the forced convection boiling in vertical uniformly heated round tubes - A supplementary report
23 p0487 A79-40301

KATZ, B.
Effect of noncondensable gases on geothermal power generation
21 p0015 A79-10125

KATZ, J. J.
Biomimetic approach to solar energy conversion - Artificial photosynthesis
21 p0094 A79-15899

Biomimetic approach to solar energy conversion: Artificial photosynthesis
[CONF-780222-5] 21 p0186 N79-11506

KATZ, M.
Analysis of electrolyte shunt currents in fuel cell powerplants
21 p0039 A79-11816

KATZ, M. J.
The Department of Energy electric vehicle battery program - An overview
24 p0683 A79-51825

KATZER, M.
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560

KATZMAN, M. T.
Economics of solar photovoltaic energy systems for crop irrigation in the United States
[COO-4094-29] 24 p0726 N79-28769

KAU, C. J.
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610

KAUFFMAN, D.
Low temperature geothermal energy use in existing institutional power plants
24 p0689 A79-51870

KAUFFMAN, K. W.
Residential and commercial thermal storage
21 p0090 A79-15865

KAUFMAN, A. N.
Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419

KAUFMAN, H. L.
Co-disposal of sewage sludge using refuse-derived fuel
21 p0097 A79-16098

KAUN, T. D.
Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries
21 p0010 A79-10089

KAUP, D. J.
Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424

KAUSHIK, S. C.
Periodic heating/cooling by solar radiation
21 p0140 A79-17491
Performance of a collector/storage solar water heater
23 p0479 A79-39843
Transient plate temperature in flat plate solar collectors
24 p0603 A79-44294

KAW, P. K.
Theory of dissipative drift instabilities in sheared magnetic fields
22 p0292 A79-27884

KAWADA, Y.
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465

KAWAGOE, M.
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

KAWAKATSU, S.
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

KAY, H. K.
Convective effects in 'slat collectors'
21 p0129 A79-17400

KAY, M. I.
Description and status report of a program to define sea water-surfactant interactions in relation to the foam system
24 p0623 A79-45833

KAYSER, H.
Wave driven power generating system
21 p0059 A79-13657

KAYTON, M.
Steady-state and dynamic performance of an OTEC plant
24 p0624 A79-45838

KAZA, K. R. V.
Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007
Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549

KAZANDJIAN, A.
High efficiency, low cost processes for 3 in. diameter silicon solar cells
23 p0501 A79-40924

KAZMERSKI, L. L.
A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723
The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910
Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions
23 p0505 A79-40969

KEAIRNS, D. L.
Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
Utilization of fluidized bed combustion in energy recovery from solid wastes
23 p0490 A79-40416

KEANE, M. J.
Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822
Optimal control of on-board and station flywheel storage for rail transit systems
[ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771
The application of optimal control theory hybrid electric transit systems
[AD-A059365] 21 p0220 N79-14559

KEARNEY, D. W.
Demonstration and commercial prototype tokamak reactors
21 p0018 A79-10146
Nitrogen fixation with fusion heat
24 p0695 A79-51948

KEAST, D. N.
Noise-control needs in the developing energy technologies
[COO-4389-1] 21 p0213 N79-13569

KEATING, E. L.
Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232

KEDDY, E. S.
Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332] 24 p0781 N79-32518

KEDL, R. J.
Thermal energy storage for industrial waste heat recovery
21 p0012 A79-10101

KEEBLE, T. S.
Tests of Wisconsin S12D engine running on natural gas with addition of carbon dioxide
[AD-A058486] 22 p0339 N79-17230

KEELING, M. C.
A low cost, durable anti-reflective film for solar collectors
23 p0507 A79-40983
Fixed angle and seasonably adjustable structural support concepts for solar converters
23 p0518 A79-41063

KEENAN, B. R.
Energy and environment: An intergovernmental perspective
[PB-283733/4] 21 p0198 N79-12575

KEHL, A.
The Tritherm test house
22 p0290 A79-27723

KEILHACKER, M.
Magnetic divertors
21 p0078 A79-14781

KEILIN, V. E.
Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003

KEIRSEY, J. L.
Core unit testing of the APL/JHU shell-less folded tube heat exchanger
24 p0618 A79-45788

KEISCH, B.
Moessbauer spectroscopy of iron in coal and coal hydrogenation products
22 p0282 A79-26464

KEITH, J. E.
The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432

KEIZER, C. P.
An electric propulsion system for a town and city bus
22 p0302 A79-29499

KELLER, L.
Storage efficiency in a solar plant
22 p0254 A79-22270

KELLER, L. J.
Beneficiation of lignites
21 p0146 A79-17642

KELLER, R.
Energy and cost calculations. 1: Optimization of electrochemical processes to achieve minimum product cost and the impact on energy consumption
[ANL/OEPM-78-2] 24 p0788 N79-32697

KELLEY, J. E.
Erosion testing of potential valve materials for coal gasification systems
[PB-293308/3] 24 p0720 N79-28592

KELLEY, J. H.
Hydrogen in the U.S. energy picture
24 p0612 A79-45577

Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580

Hydrogen as the solar energy translator
24 p0686 A79-51852

KELLOGG, H. H.
Toward a materials-conservation ethic
21 p0167 A79-20438

KELLY, D. A.
Solar energy conversion system - Four quadrant, two dimension linear solar concentrators
23 p0399 A79-33999

Multiple section Minto Wheel driven by heat recovery from flue, steam, and return pipes of household heating systems /plus solar heat/
23 p0417 A79-34146

KELLY, F. G.
Design features of the TDRSS solar array
21 p0002 A79-10019

The TDRSS solar array
23 p0500 A79-40917

KELLY, H. N.
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

KEMME, J. E.
Performance limits for liquid-metal heat pipes containing long adiabatic sections
24 p0694 A79-51937

KENAHAN, C. B.
Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152

KENDALL, J. S.
Gaseous fuel reactor applications
24 p0715 A79-54351

KENNEDY, A. S.
Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659

KENNEDY, B. A.
Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0757 N79-33549

KENNEDY, C. J.
Frequency doubling of a solar pumped Nd:YAG laser
21 p0044 A79-12062

KENNEDY, W.
A novel low-cost photovoltaic concentrator
23 p0508 A79-40996

KENNEDY, W. K.
Plans and prospects for solar energy utilisation in Malawi
21 p0117 A79-17285

KENNEY, W. D.
Application of the Dynamic Isotope Power System to a multimission spacecraft
24 p0692 A79-51929

KENTFIELD, J. A. C.
A hybrid cyclogiro-Darrieus-rotor wind turbine
23 p0387 A79-33243

An axial-flow wind-turbine with delta-wing blades
23 p0405 A79-34044

KENWARD, M.
Fusion research - The temperature rises
23 p0445 A79-37000

KERKDIJK, C. B. W.
Temperature profile and power calculations in gas core reactors
24 p0702 A79-51998

KERMODE, R. I.
Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719

Wilson parameters for the system H_2, N_2, CO, CO_2, CH_4, H_2S, CH_3OH, and H_2O
22 p0282 A79-26462

The economics of hydrogen and carbon monoxide separation with cuprous ammonium lactate solutions
22 p0299 A79-29313

The cost of hydrogen from coal
23 p0396 A79-33766

KERN, E. C., JR.
Combined photovoltaic and thermal hybrid collector systems
23 p0519 A79-41073

Combined photovoltaic and thermal hybrid collector systems
[COC-4577-3] 23 p0583 N79-26525

Photovoltaic/thermal collectors and heat pumps
[COO-4577-2] 24 p0726 N79-28757

Phase-one experiment test plan solar photovoltaic/thermal residential experiment
[COO-4577-6] 24 p0739 N79-29625

KERR, R. G.
The performance of a site built, air heating, vertical collector with snow reflector in Quebec
22 p0319 A79-31423

Validation of an electric circuit model of a solar house
22 p0321 A79-31440

KERREBROCK, J. L.
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393

An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249

KERRISK, J. F.
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755

KERSTEN, R.
The Philips experimental house - A system's performance study
22 p0277 A79-25941

KERTAMUS, N. G.
Combined shift-methanation processes
[FE-2240-97] 24 p0766 N79-31414

KERTZ, W.
Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

KESSLER, G.
Energy for the long run - Fission or fusion
22 p0256 A79-22760

KESSLER, H. J.
The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860

KESSLER, R. K.
Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352

KESSLER, R.
MHD power generation 21 p0146 A79-17638
Detailed characterization of MHD generator operating parameters 23 p0393 A79-33409

KESTIN, J.
Geothermal preheating in fossil-fired steam power plants 21 p0014 A79-10118
Fossil superheating in geothermal steam power plants 21 p0014 A79-10122
Hybrid fossil-geothermal power plants 21 p0096 A79-15920
Effect of noncondensables on the performance of geothermal steam power plants 24 p0689 A79-51868
Available work in geothermal energy [COO-4051-25] 24 p0787 N79-32685
Thermodynamic and transport properties of isobutane: A survey of available data [COO-4051-35] 24 p0794 N79-33096

KETTANI, M. A.
Solar electricity production 21 p0104 A79-16467
Solar pumping 21 p0104 A79-16469

KETTERER, R. J.
The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels [ASME PAPER 79-GT-41] 23 p0375 A79-32344

KEY, J. M.
Computer simulation of a solar energy system 24 p0652 A79-49479

KEYES, G. W.
Commercial potential of the Space Shuttle [AAS PAPER 79-058] 23 p0438 A79-36548

KHALAFALLA, S. E.
Stability of alumina-base refractories in western lignite-ash slag environments [PB-293238/2] 24 p0731 N79-29249

KHALIFA, H. E.
Geothermal preheating in fossil-fired steam power plants 21 p0014 A79-10118
Fossil superheating in geothermal steam power plants 21 p0014 A79-10122
Hybrid fossil-geothermal power plants 21 p0096 A79-15920
Effect of noncondensables on the performance of geothermal steam power plants 24 p0689 A79-51868
Thermodynamic and transport properties of isobutane: A survey of available data [COO-4051-35] 24 p0794 N79-33096

KHALIL, T. M.
The economics and policy of alternative energy sources - A review 21 p0103 A79-16454

KHANDANI, S. M. H.
A Thermic Controller for a thermic diode solar panel [ASME PAPER 78-WA/SOL-9] 21 p0163 A79-19841

KHANDELWAL, G. S.
Elemental characteristics of aerosols emitted from a coal-fired heating plant [NASA-TM-78749] 21 p0191 N79-11560

KHANDURDYEV, A.
Experimental study of mass exchange in glazed solar solution regenerator 24 p0602 A79-44264

KHATAMOV, S. O.
Investigation of the aerodynamic resistance of solar air heaters 24 p0648 A79-49185

KHATTAK, C. P.
Directional solidification of crack-free silicon ingots by heat exchanger method 23 p0498 A79-40901
Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing [NASA-CR-158038] 21 p0219 N79-14540
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3 [NASA-CR-162182] 24 p0771 N79-31775

KHEMTHONG, S.
The alpha factor - Controlling solar cell absorptance 23 p0502 A79-40935
Fabrication experience with high efficiency silicon concentrator cells 23 p0517 A79-41056
Development of high efficiency (14%) solar cell array module [NASA-CR-158672] 23 p0559 N79-24454
Silicon solar cells for space use: Present performance and trends 24 p0784 N79-32654

KHEYRANDISH, K.
Design considerations of small solar collector systems using plane heliostats [ASME PAPER 79-SOL-2] 22 p0307 A79-30540

KHIMCHENKO, L. N.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak 22 p0244 A79-21429

KHIZHNIAK, V. I.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks 24 p0607 A79-45034

KHODZHAEV, A. SH.
Composite heliostats of large solar plants 21 p0166 A79-20350

KHOLEVA, N.
Study of the spectral characteristics of metallized polymer films for production of solar concentrators 22 p0297 A79-28672
Investigation of the spectral characteristics of metallized polymer films for making solar concentrators 24 p0637 A79-46910

KHOLEVA, N. N.
Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity 24 p0647 A79-49182

KHOLNOV, IU. V.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator 22 p0244 A79-21428

KHOLOD, IU. V.
Problems in the use of cryogenic pumps in thermonuclear synthesis 22 p0305 A79-30264

KHOURY, G.
The Sunship 22 p0254 A79-22324

KHUDOLEEV, A. V.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator 22 p0244 A79-21428

KHUONG, C. H.
Energy conservation through source reduction [PB-290126/2] 22 p0372 N79-21626

KICHAEVA, G. S.
Problems in the development of high-service-life capacitative accumulators 22 p0243 A79-21249

KIDNAY, A. J.
Enthalpy measurement of coal-derived liquids [FE-2035-12] 23 p0588 N79-27282

KIEHNE, H. A.
Demands and effects of solar technology on electric power storage [AED-CONF-78-155-047] 23 p0596 N79-27678

KIERULFF, H. E.
Satellite Power System (SPS) financial management scenarios [NASA-CR-157438] 23 p0549 N79-23502

KILGORE, C.
Evaluation of future world oil prices [DOE/EIA-0102/4] 24 p0762 N79-31082

KILGORE, W. C.
Petroleum supply vulnerability, 1985 [DOE/EIA-0102/44] 24 p0746 N79-30405

KILGROE, J. D.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization [PB-288223/1] 22 p0344 N79-17378
Interagency coal cleaning technology development 22 p0347 N79-18361

KILLEEN, J.
Non-linear saturation of the tearing mode in a reversed field pinch 23 p0527 A79-41941

Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks 24 p0606 A79-44979

KILROY, W. P.
Differential scanning calorimetry studies of possible explosion-causing mixtures in Li/SO2 cells 22 p0246 A79-21487

KIM, C. S.
Study of turbomachinery options for compressed air energy storage plants 24 p0680 A79-51801

KIM, E. T.
Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam 22 p0262 A79-23719

The cost of hydrogen from coal 23 p0396 A79-33766

KIM, J. D.
Experimental investigation of a fused salt energy storage system 23 p0400 A79-34003

KIM, J. K.
Reliability studies on MIS solar cells 21 p0148 A79-17950

Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon 23 p0510 A79-41009

KIM, R. H.
Applicability of energy model techniques to an analysis of impacts of SO2 emissions from the U.S. electric utilities and control policies 24 p0659 A79-50362

KIM, S. H.
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research 21 p0084 A79-15304

KIM, S. S.
The effect of gasifier steam demand on the overall efficiency of a coal gasification combined-cycle power plant 24 p0687 A79-51859

KIMPENHAUS, W.
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

KIMURA, K.
Flywheel energy storage system for JT-60 toroidal field coil 21 p0112 A79-16729

KIMURA, K.-I.
Comparison between simulation and experiment of solar heating 21 p0137 A79-17461

KINCAIDE, W. C.
Alkaline electrolysis - Past, present and future 24 p0613 A79-45588

KINCEL, K. L.
Evaluation of future world oil prices
[DOE/EIA-0102/4] 24 p0762 N79-31082

KINELSKI, E. H.
OTEC biofouling and corrosion testing program 23 p0429 A79-35057

KING, J. M., JR.
Advanced technology fuel cell program
[EPRI-EM-956] 23 p0598 N79-27702

KING, J. R.
Parameters for legislative consideration of bioconversion technologies
[PB-284742/4] 21 p0194 N79-12250

KING, R.
Diffuse solar radiation on a horizontal surface for a clear sky 22 p0242 A79-21167

Direct solar transmittance for a clear sky 22 p0296 A79-28361

KING, R. B.
Commercial phosphoric acid fuel cell system technology development 24 p0681 A79-51809

Commercial phosphoric acid fuel cell system technology development
[NASA-TM-79169] 23 p0571 N79-25500

KING, R. T.
Failure analysis in coal conversion systems 22 p0266 A79-24137

KING, S. T.
Role of government in solar energy development: A view from the northwest
[PNI-2784] 24 p0738 N79-29621

KINGSBURY, R. P.
Performance of retainerless bearings for flywheels 24 p0678 A79-51786

KINKEAD, W. K.
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243

KINMOND, S.
The interfacial layer in MIS amorphous silicon solar cells 22 p0258 A79-23039

KINNEY, C.
Coal-fired gas turbine power cycles with steam injection 21 p0004 A79-10042

KINNEY, C. A.
Cogeneration in Europe and the combined cycle gas turbine 22 p0297 A79-28988

Closed cycle gas turbines, an ECAS update. I
[ASME PAPER 79-GT-204] 23 p0380 A79-32461

KINNO, H.
Pumped storage battery with 100 percent efficiency 24 p0679 A79-51795

KINOSHITA, K.
Effects of sintering on porous fuel cell electrodes 21 p0039 A79-11818

KIPP, P.
Practical applications of silicon solar cells in appliances and installations 21 p0057 A79-13638

KIRCHHOFF, R. H.
The interaction of the wind field with a horizontal axis wind turbine 22 p0278 A79-26177

A two dimensional vortex sheet model of a Savonius Rotor 22 p0278 A79-26178

KIRICHENKO, IU. A.
Studies of cryogenic liquid boiling in centrifugal acceleration fields 23 p0530 A79-42893

KIRILLIN, V. A.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields 21 p0049 A79-12692

The U-25B facility for studies in strong magnetohydrodynamic interaction 23 p0393 A79-33406

KIRILLOV, I. R.
Calculation and design of liquid-metal MHD induction machines 22 p0286 A79-27302

KIRILLOV, IU. M.
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator 22 p0258 A79-23137

Dynamics of a free-piston Diesel- MHD generator 23 p0395 A79-33424

KIRILLOV, V. V.
Axial interelectrode breakdown in MHD channels 23 p0392 A79-33401

Inhomogeneity of the transverse current in an MHD channel and its effect on the local characteristics of an MHD generator 24 p0706 A79-52369

KIRK, B. J.
Application of the Cathelco system for control of fouling in OTEC systems 24 p0627 A79-45870

KIRKLIN, D. R.
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167

KIRKPATRICK, A. R.
Integral assembly of photovoltaic arrays using glass 22 p0241 A79-20883

Production technology for high efficiency ion implanted solar cells 23 p0509 A79-41000

Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086
Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648

KIRKPATRICK, R. C.
An overview of design space for small fusion targets
22 p0253 A79-22241

KIRKWOOD, P.
Non-electric applications of geothermal energy in six Alaskan towns
[IDO-1622-4] 21 p0208 N79-13523

KIRPICH, A. S.
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

KIRSCHBAUM, H. S.
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079

KIRTLEY, J. L., JR.
MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549

KISEEV, V. M.
Design of a heat pipe with separate channels for vapor and liquid
22 p0268 A79-24486

KISELEV, B. A.
Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952

KISHIMOTO, H.
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504

KISKO, W. A.
Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218

KISLIAKOV, A. I.
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877

KISSELL, F. N.
Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608

KISSELL, K. E.
International Instrumentation Symposium, 24th, Albuquerque, N. Mex., May 1-5, 1978, Proceedings. Parts 1 & 2
21 p0144 A79-17576

KISTEMAKER, J.
Temperature profile and power calculations in gas core reactors
24 p0702 A79-51998
Some aspects of a fission-based plasma engine
24 p0715 A79-54350

KITA, J. P.
Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826

KITO, M.
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103

KITTLAUS, E. B.
Controlling a wind generator for increased efficiency
21 p0113 A79-16743

KITTLE, P. A.
Chemical solutions to problems encountered in the gasification of coal
23 p0410 A79-34088

KITTLESON, K.
Identification of wood energy resources in central Michigan
[NASA-CR-158130] 22 p0347 N79-18424

KIYOHASHI, H.
Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets
23 p0409 A79-34076

KLABUNDE, K. J.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357

KLAISS, H.
Potential for use of solar energy in private households to the year 2000
23 p0473 A79-38667

KLAN, M. S.
Financial/management scenarios for a satellite power system program
[AAS PAPER 78-144] 22 p0243 A79-21259
Financing alternatives for space industrialization
[AIAA PAPER 79-1389] 23 p0426 A79-34836

KLASS, D. L.
Biomass and wastes as energy resources - 1977 update
21 p0091 A79-15868
Biomethanation of Minnesota reed sedge peat
24 p0662 A79-50560

KLATT, K. H.
The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700

KLECKNER, E. W.
Differential insolation and turbidity measurements
22 p0241 A79-21056

KLEIJN, B. J.
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

KLEIN, J. W.
No ill winds for New Mexico utility
22 p0286 A79-27208

KLEIN, M.
Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826

KLEIN, M. G.
Fabrication and testing of silver-hydrogen cells
[NASA-CR-159431] 22 p0334 N79-16374

KLEIN, S. A.
Calculation of flat-plate collector utilizability
21 p0149 A79-18020
A general design method for closed-loop solar energy systems
22 p0295 A79-28359

KLEIN, W. H.
Flat plate collector dynamic evaluation
21 p0128 A79-17390
A comparison of some simple models used to predict solar irradiance on a horizontal surface
24 p0661 A79-50546

KLEINER, C. T.
Power distribution study for a 5-GW space power satellite
21 p0002 A79-10026
Advanced semiconductor technology for alternate energy sources - D-C to A-C inverters
23 p0416 A79-34140

KLEINPETER, J. A.
Coal liquefaction and deashing studies. I - Consol Synthetic Fuel process. II - Solvent Refined Coal process
23 p0492 A79-40455

KLEINRATH, H.
Technology for solar energy utilization
[PB-296572/1] 24 p0802 N79-33598

KLEINSCHRAGER, H.
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344

KLEINWAECHTER, H.
Development of solar collectors for low temperature level and of concentrators for thermal and photoelectric conversion
21 p0135 A79-17445
Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583

KLEINWAECHTER, J.
Development of low-temperature solar collectors and collectors for thermal and photovoltaic conversion
23 p0463 A79-38583

KLEMM, H. A.
A model for coal fly ash filtration
22 p0296 A79-28389

KLEPEIS, J. E.
Open-cycle disk generator studies
23 p0351 A79-33386

KLEPPA, O. J.
High temperature thermodynamics of the solid solutions of hydrogen and deuterium in palladium and in the Pd/0.9/Ag/0.1/ alloy
22 p0249 A79-21689

KLEPPER, O. H.
Comparative evaluation of recent reports on the energy conservation potential from cogeneration
[ORNL/TM-6602] 24 N79-28776

KLETT, M. G.
Converting coal to liquid/gaseous fuels
23 p0461 A79-38376

KLIER, R.
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606

KLIMOVSKII, I. I.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401

KLIMPKE, C. M.
Meteorological effects on Schottky-barrier solar cells
23 p0441 A79-36781

Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992

KLINE, J. M.
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures
21 p0083 A79-15245

KLINE, R.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

KLINE, R. L.
Technology and development requirements of the solar power satellite
21 p0046 A79-12267

First steps to the Solar Power Satellite
23 p0382 A79-32721

KLINEBERG, J. M.
Technology for aircraft energy efficiency
21 p0066 A79-14136

The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912

KLINKENBERG, K.
The Philips experimental house - A system's performance study
22 p0277 A79-25941

KLIUCHEVSKII, IU. E.
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

KLOCHKO, M. A.
Electrochemical energy storage systems - On the selection of electrolytes for high-energy density storage batteries
23 p0495 A79-40749

KLOCK, P.
Distribution automation and control support: Analysis and interpretation of TAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074

KLOECKNER, K.-J.
Gasification of raw lignite in the tube-furnace gasifier
22 p0310 A79-30996

KLOSTERMAN, B. L.
CO/H2 production using fusion reactor heat
24 p0695 A79-51949

KLUCHER, T. M.
Variation of solar cell sensitivity and solar radiation on tilted surfaces
23 p0512 A79-41023

Evaluation of models to predict insolation on tilted surfaces
24 p0712 A79-53491

Open-circuit voltage improvements in low-resistivity solar cells
24 p0784 N79-32649

KLUNDER, K.
Superbatteries - A progress report
22 p0286 A79-27207

KLUNDER, K. W.
The Department of Energy electric vehicle battery program - An overview
24 p0683 A79-51825

KLYCHEV, SH. I.
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties
23 p0433 A79-35381

Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties
24 p0663 A79-50704

KLYSHCHAEVA, O.
Experimental study of mass exchange in glazed solar solution regenerator
24 p0602 A79-44264

KNAPPE, G.
Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report)
[BMFT-FB-T-78-15] 23 p0590 N79-27345

KNASEL, T. M.
System designs for low cost-low ratio solar concentrators
22 p0293 A79-28142

KNECHTLI, R. C.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973

Design of high efficiency monolithic stacked multijunction solar cells
23 p0513 A79-41029

GaAs solar cells for high solar concentration applications
23 p0514 A79-41039

Low energy proton radiation damage to (AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507

Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

KNEER, J.
Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591

KNIEBEL, C. J.
Operability and materials testing for MHD air heaters
24 p0701 A79-51994

KNIEP, R.
'Chemical heat storage pump' - Storage and utilization of solar energy through reversible chemical reaction in vacuum systems on the example of the system CaCl2-H2O
23 p0470 A79-38641

KNIGHT, J. A.
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222

KNIGHT, J. R.
Silicon solar cells for operation in concentrated sunlight
23 p0441 A79-36780

Gallium arsenide solar cells
23 p0448 A79-37848

KNISELEY, R. N.
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
23 p0432 A79-35079

KNOBLOCH, A. F.
Superconducting magnet systems in EPR designs
21 p0079 A79-14789

KNOEPFEL, H.
Tokamak reactors for breakeven: A critical study of the near-term fusion reactor program
21 p0077 A79-14776

KNOTEK, M. L.
Study of the interaction of H2O and O2 with the surface of TiO2 by electron stimulated desorption and Auger and characteristic loss spectroscopies
21 p0037 A79-11793

KNOTT, G. F.
Wave-tank experiments on an immersed parallel-plate duct
22 p0258 A79-23306

Design and experimental testing of a
fully-submerged model wave-power convertor
23 p0396 A79-33767
Simulation studies of the basic non-linear effects
of wave-energy conversion by an overtopping
water-column
23 p0480 A79-39845

KNOWLES, G. E.
Active heat exchange system development for latent
heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554

KNOX, A. E.
HYCSOS - A system for evaluation of hydrides as
chemical heat pumps
22 p0252 A79-21716

KNOX, J. B.
LLL wind energy studies (CAHU)
[UCRL-82171] 23 p0582 N79-26514
Program report for FY 1978: Atmospheric and
Geophysical Sciences Division of the Physics
Department
[UCRL-51444-78] 24 p0722 N79-28668

KNUTSEN, C. A.
Incremental cost analysis for advanced compressed
air energy storage concepts
24 p0679 A79-51797

KNUTSON, C. F.
An assessment of subsurface salt water disposal
experience on the Texas and Louisiana Gulf coast
for application to disposal of salt water from
geopressured geothermal wells
[NVO-1531-2] 22 p0366 N79-21523

KOBAK, J. A.
Burn coal cleanly in a fluidized bed - The key is
in the controls
22 p0282 A79-26374

KOBAYASHI, H.
Oscillations of and drift force acting on an
OTEC-CWP structure
24 p0622 A79-45824

KOBAYASHI, R.
Phase equilibria in coal hydrogenation systems
[FE-2334-6] 21 p0171 N79-10238

KOBYLARZ, T.
The application of wind energy to a system with an
inherent energy storage medium
24 p0677 A79-51778

KOCH, H.
Proposal for a representation of the
quasisteady-state performance of flat-plate
collectors
[ASSA-SE-B21/77] 22 p0349 N79-18461

KOCH, J.
Latest developments in solar array technology at
AEG-Telefunken
23 p0500 A79-40915
Some current developments in solar array
technology at AEG-Telefunken
24 p0751 N79-30736

KOCH, R. C.
Air quality impacts using SRC versus conventional
coal in power plants
[PB-290237/7] 22 p0373 N79-21671

KOCH, V. R.
The secondary lithium electrode in non-aqueous
electrolytes - Some problems, some solutions
21 p0041 A79-11838
Energy storage with ambient temperature
rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

KOCH, W.
Gasification of raw lignite in the tube-furnace
gasifier
22 p0310 A79-30996

KOCHANSKI, T.
Effects of turbulent heating in the Texas
turbulent torus
24 p0640 A79-47426

KOCHKA, E. L.
Development, testing and evaluation of MHD
materials and component designs
[FE-2248-19] 22 p0369 N79-21558

KODRAS, F. D.
Environmental assessment for residual oil
utilization
[PB-286982/4] 22 p0336 N79-16446

KOEHLER, D. E.
Performance characteristics of automotive engines
in the United States. First series: Report no.
15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305
Performance characteristics of automotive engines
in the United States. Second series: Report
no. 5 1977 Ford 140 CID (2.3 liters), 2V
[PB-286076/5] 21 p0227 N79-15306
Performance characteristics of automotive engines
in the United States Third series: Report No. 1
1977 Volvo 130 CID (2.1 liters), F.I.
[PB-286077/3] 21 p0227 N79-15307
Performance characteristics of automotive engines
in the United States. Second series, report no.
4: 1976 Chevrolet 85 CID (1.4 liters), IV
[PB-286294/4] 21 p0227 N79-15308
Performance characteristics of automotive engines
in the United States. Second series, report no.
6: 1976 Nissan diesel 198 CID (3.2 liters), F. I.
[PB-286295/1] 21 p0227 N79-15309
Performance characteristics of automotive engines
in the United States. Second series, report no.
7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310
Performance characteristics of automotive engines
in the United States. First series, report no.
16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311
Performance characteristics of automotive engines
in the United States. First series, report no.
17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312
Performance characteristics of automotive engines
in the United States. First series, report no.
20: 1975 Chevrolet 350 CID (5.7 liters) with
dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315
Performance characteristics of automotive engines
in the United States. Third series: Report no.
2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411

KOEHNE, R.
Solar power plants in the U.S.A.
21 p0057 A79-13640
Integrated solar energy installations for isolated
operation
23 p0522 A79-41239

KOELLE, D. E.
A European low-cost solution for Spacelab Power
augmentation
24 p0751 N79-30745

KOENIG, A.
Vehicle operation on fuels from solar energy
21 p0059 A79-13663

KOENIG, D. R.
Reactor design for nuclear electric propulsion
24 p0693 A79-51931
Baseline design of the thermoelectric reactor
space power system
24 p0693 A79-51932

KOENIG, H. L.
Solid waste and biomass. Their potential as
energy sources in Illinois, 1977
[PB-281649/4] 21 p0177 N79-10562

KOEPKE, B.
Silicon-on ceramic process: Silicon sheet growth
and device development for the large-area
silicon sheet and cell development tasks of the
low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776

KOEPKE, R.
Status and future development of photovoltaic
research in the Federal Republic of Germany
23 p0501 A79-40918

KOERNER, W.
Active heat insulation through solar
low-temperature system that can be integrated
into the house wall
23 p0465 A79-38596

KOESTER, J. K.
Coal slag effects in MHD generators
21 p0080 A79-14934
Discharge characteristics of slagging metal
electrodes
23 p0391 A79-33392

KOESTER, P. A.
Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595

KOETHE, H. K.
Solar electric power supplies - Design and layout
21 p0057 A79-13639
Operating systems for solar electric energy supplies
23 p0466 A79-38606

KOFSKEY, M. G.
Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance
[NASA-TM-78993] 22 p0345 N79-17859

KOHAN, S. M.
Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32384
Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385

KOHLI, K. S.
An efficient optical window for flat-plate solar energy collectors
23 p0536 A79-43591
An optical valve for flat-plate solar energy collectors
24 p0607 A79-45154

KOIDE, G. T.
Solar and wind energy applications in Hawaii
21 p0066 A79-14265

KOIKE, B. M.
The IAE 30-kW wind turbine - A review of the aerodynamic design
23 p0387 A79-33240

KOIKE, K.
On the flow of a conducting fluid between parallel disks with a transverse magnetic field. I - A theoretical investigation on a nonequilibrium plasma flow as a compressible inviscid fluid
21 p0156 A79-19445

KOIZUMI, H.
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465

KOK, B.
Biological solar energy conversion approaches to overcome yield stability and product limitations
[PB-284823/2] 21 p0199 N79-12577
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations
[PB-286487/4] 21 p0230 N79-15422

KOLB, C. E.
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393
An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption
[PB-290953/9] 23 p0568 N79-25249

KOLESAR, P. T.
A comparison of the silica and Na-K-Ca geothermometers for thermal springs in Utah
21 p0097 A79-16075

KOLIWAD, K. M.
Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902
Effect of copper impurity on polycrystalline silicon solar cells
23 p0504 A79-40962

KOLM, H.
Electromagnetic propulsion alternatives
[AIAA PAPER 79-1400] 23 p0426 A79-34840
Electromagnetic launchers
24 p0702 A79-52006

KOLOKOLTSEVA, A. L.
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875

KOLP, R.
Studies on two-phase flow mixing pertaining to liquid-metal magnetohydrodynamic power generation
23 p0527 A79-42030

KOLTUN, M. M.
Optimization of electrical and optical characteristics of silicon photocells used for photothermal concentrated solar radiation converters
21 p0053 A79-13288
New models of solar cells and prospects for their optimization
21 p0166 A79-20346
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255

KOMASHCHENKO, V. N.
Zn/x/Cd/1-x/S solid solution solar cells
23 p0433 A79-35377
Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737
Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions
24 p0662 A79-50700

KOMAYA, E.
A new three-dimensional equivalent circuit of diagonal type MHD generator
24 p0605 A79-44914

KOMP, R. J.
Cuprous oxide photovoltaic cells
23 p0499 A79-40908
Cuprous oxide photovoltaic cells
[PB-290529/7] 23 p0565 N79-24514
Cuprous oxide photovoltaic cells
[CONF-780619-16] 24 p0753 N79-30777

KONAGAI, M.
Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745

KONDO, K.
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346

KONDO, W.
The thermochemical decomposition of water using bromine and iodine
22 p0238 A79-20770

KONDRATEV, K. IA.
Radiation regime of inclined surfaces
22 p0282 A79-26353

KONDRATYEV, K. Y.
Radiation regime of inclined surfaces
[WMC-467] 21 p0192 N79-11613

KONEEV, S. M.-A.
Optimization of a diagonal MHD channel
22 p0247 A79-21628

KONOPKA, A.
Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505
Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595
Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980
[DSE/2426-19] 21 p0174 N79-10535

KONOSHIMA, S.
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

KOOI, C. F.
The steady state salt gradient solar pond
24 p0661 A79-50540

KOOL, K. L.
Energy efficiency in the transport sector
21 p0054 A79-13574

KOOMANOFF, F. A.
Status of the SPS concept development and evaluation program
22 p0326 A79-31919

KOPAC, Z.
Measurement of radiation intensity by means of a pyrheliometer
21 p0055 A79-13623

KOPECKY, V.
Supplementary RF plasma heating in tokamaks
24 p0668 A79-50999

KOPPEL, L. N.
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

KOPPELMAN, E.
The Koppelman process
21 p0145 A79-17634
Upgrading lignite by the Koppelman process
21 p0146 A79-17641

KOPPELMAN, L.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704

KOPSTEIN, M. J.
Synthetic fuels from peat gasification
24 p0687 A79-51856

KOR, G. J. W.
Desulfurization and sulfidation of coal and coal char
21 p0045 A79-12120

KORALEK, C. S.
Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595
Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes
[PB-287799/1] 22 p0344 N79-17364

KORDESCH, K. V.
Progress in batteries and solar cells. Volume 1
21 p0148 A79-17989

KORIAGIN, N. I.
Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670
Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

KORIAGINA, G. M.
Technical and economic aspects of open-cycle MHD power plants
21 p0105 A79-16482

KORN, C.
Electronic structure and physical properties of Ti-H and Zr-H using NMR
22 p0248 A79-21685

KORNBERG, J. P.
Health maintenance and health surveillance considerations for an SPS space construction base community
[AAS PAPER 78-176] 22 p0243 A79-21273

KORNEGAY, F. C.
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679

KORNIENKO, P. A.
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896

KORNREICH, T. R.
Wind energy conversion systems /WECS/ for central station and dispersed power applications
23 p0406 A79-34052
Environmental issues assessment
24 p0633 A79-46530

KOROLEV, I.
Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses
[ORNL-TR-4483] 21 p0221 N79-14574

KOROLEV, V. M.
Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

KOROLEV, V. N.
Use of fluidized media in thermal power systems
23 p0436 A79-35525

KOROVIN, N. V.
Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products
21 p0164 A79-19851
New chemical sources of current
22 p0237 A79-20679

KORPELA, S. A.
On the calculation of the temperature distribution in a packed bed for solar energy applications
24 p0712 A79-53495

KORSGAARD, V.
CCMS solar energy pilot study reporting format - The zero energy house in Denmark
22 p0277 A79-25940

KORTA, E. J.
Mechanical reliability considerations in the modern high temperature industrial gas turbine
[ASME PAPER 79-GT-101] 23 p0377 A79-32377

KOS, J. M.
On-line control of a large horizontal axis wind energy conversion system and its performance in a turbulent wind environment
21 p0028 A79-10236

KOSAKA, H.
A thermal storage analysis on packed bed of alumina spheres
21 p0121 A79-17324

KOSHAL, R. K.
Energy efficiency in the transport sector
21 p0054 A79-13574

KOSHELETS, V. P.
Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690

KOSSON, R. L.
Thermal energy storage heat exchanger design
[ASME PAPER 78-ENAS-30] 21 p0049 A79-12579

KOSSTRIN, H. M.
Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PO-1] 24 p0790 N79-32717

KOSTORS, C. H.
Performance optimization of an OTEC turbine
24 p0618 A79-45793

KOSTRZEWA, S.
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592

KOSUGE, H.
Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396

KOSVIC, T. C.
Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement)
[PB-293731/6] 24 p0743 N79-29670
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654

KOSZI, L. A.
A high-efficiency GaAlAs double-heterostructure photovoltaic detector
21 p0154 A79-18489

KOTHARI, H. S.
A new fabrication process for single crystal silicon solar cells
21 p0122 A79-17335

KOTHARI, L. S.
Response of p-n junction solar cells to concentrated sunlight and partial illumination
21 p0124 A79-17353

KOTHMANN, R. E.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940

KOTIN, A. D.
Satellite Power System (SPS) resource requirements (critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494

Satellite Power System (SPS) resource requirements (critical materials, energy, and land)
[NASA-CR-162310] 24 p0763 N79-31251

KOTLER, V. R.
An investigation of the formation of oxides of nitrogen in a pulverised coal flame
23 p0474 A79-38865

KOTTAPALLI, S. B. R.
Aeroelastic stability and response of horizontal axis wind turbine blades
23 p0483 A79-40117

KOTTLER, R. J., JR.
Environmental issues assessment
24 p0633 A79-46530

KOTVAL, P. S.
Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon
23 p0504 A79-40959

KOTWAL, R.
Erosion study of different materials affected by coal ash particles
24 p0646 A79-48864

KOTZE, D. J.
The planning and economic aspects of energy supply and demand in South Africa
22 p0341 N79-17325

KOUBA, G. E.
A microprocessor based solar monitoring system
21 p0088 A79-15838
A microprocessor compatible temperature measuring system
21 p0088 A79-15839

KOUMANS, W. A.
Electric car project of the Eindhoven University of Technology
22 p0302 A79-29498

KOUTSOUKOS, E. P.
Coal desulfurization test plant status - July 1977
21 p0044 A79-12118

KOVACHEVA, K.
The chemical stability of kerosene fractions
23 p0529 A79-42275

KOVALEV, I. I.
Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators
24 p0646 A79-48735

KOVARIK, M.
Optimal profile of solar energy collectors
21 p0130 A79-17408
Optimal distribution of heat conducting material in the finned pipe solar energy collector
22 p0242 A79-21163

KOVATS, A.
A simple solar gas turbine plant
[ASME PAPER 79-GT-90] 23 p0377 A79-32367

KOVBASIUK, V. I.
MHD generators
21 p0105 A79-16484
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
Diagonal frame EM channel of the U-25 power plant
23 p0393 A79-33407

KOWALCZEWSKI, J. J.
Cost of solar energy
21 p0118 A79-17291

KOZAWA, A.
Progress in batteries and solar cells. Volume 1
21 p0148 A79-17989

KOZLOV, IU. P.
Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire
24 p0706 A79-52368

KOZLOV, IU. M.
Model of photofuel element on the base of chlorophyll sensitized reactions
24 p0708 A79-52952

KOZLOV, S. M.
Studies of cryogenic liquid boiling in centrifugal acceleration fields
23 p0530 A79-42893

KOZLOV, V. B.
Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate
24 p0602 A79-44263

KOZYREVA, T. A.
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255

KRAFT, C. C., JR.
The solar power satellite concept - The past decade and the next decade
[AIAA PAPER 79-0534] 22 p0273 A79-25854
The Solar Power Satellite concept - Towards the future
22 p0327 A79-31925

KRAFT, E.
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

KRAFT, E. F.
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304

KRAFT, M.
Exploitation of solar energy via modular power plants and multiple utilization of waste heat
21 p0141 A79-17497

KRAFT, M. L.
Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals
21 p0044 A79-12117

KRAGL, W.
The Tritherm test house
22 p0290 A79-27723

KRAINER, H. R.
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531

KRAKOWSKI, R. A.
Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946
Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production
[LA-UR-79-574] 24 p0742 N79-29666

KRALL, N. A.
Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859
Theory of the striated corona in a theta pinch
22 p0295 A79-28315

KRAMER, P.
The wind as a potential energy source in future hydrogen technology
21 p0059 A79-13661

KRAN, A.
Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells
23 p0475 A79-38877

KRANIG, J. M.
Investigation of turbo-dyne energy chamber (G:R: value trademark): An air bleed device
[PB-285381/0] 21 p0217 N79-14397

KRAPF, R.
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344

KRAPP, R.
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532

KRASILOVSKII, B. I.
Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators
24 p0646 A79-48735

KRASILOVSKII, V. I.
Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292

KRASNOVSKII, A. A.
Biological conversion of solar energy
22 p0312 A79-31146

KRAUSE, A. J.
Special considerations in the environmental study program for coal gasification plants
24 p0659 A79-50350

KRAUSE, F. H.
The design impact of power-augmented ram technology on large energy efficient aircraft [AIAA PAPER 79-1864] 24 p0669 A79-51250

KRAUSE, H. H.
Chloride corrosion and its inhibition in refuse firing 21 p0080 A79-14930
Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler [ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler 23 p0488 A79-40391

KRAUSE, J.
Design of a public exhibition building to demonstrate air, water, and passive solar heating systems 23 p0474 A79-38673

KRAUSS, O.
Small low-head hydroelectric power [IDO-10076] 24 p0738 N79-29617

KREEB, H.
Furnaces for experiments in zero-gravity conditions 23 p0487 A79-40330
Development of a heat pipe cooled 200 watt TWT with improved efficiency 24 p0764 N79-31275

KREIDER, J. F.
Solar energy and the second law of thermodynamics 21 p0118 A79-17292
Distribution of beam radiation of the receiver plane of a CPC solar concentrator 21 p0135 A79-17451
Principles of solar engineering 22 p0287 A79-27372
First-order design variables for concentrating solar collectors 22 p0293 A79-28141

KREININ, L. B.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base 21 p0053 A79-13289
Study of photoelectric characteristics of photocells made from high-resistivity silicon 22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters 24 p0637 A79-46904
Dependence of the photoelectric parameters of photovoltaic cells on illuminance 24 p0647 A79-49181

KREISCHER, K.
Characteristics of electron-cyclotron-resonance-heated tokamak power reactors 22 p0292 A79-27885

KREISMAN, W. S.
Terrestrial solar arrays with integral glass construction 23 p0509 A79-41004

KREITER, B. G.
The 'effectiveness' of waste treatment systems 24 p0662 A79-50563

KREITH, F.
Options for solar thermal conversion 21 p0043 A79-11969
Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978 22 p0280 A79-26201
Principles of solar engineering 22 p0287 A79-27372
An overview of intermediate temperature solar collector and energy storage technology 23 p0533 A79-43018

KREITLOW, D. B.
Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems 21 p0150 A79-18092

KREITNER, J. D.
Northern Alaska hydrocarbon resources [PB-287394/1] 22 p0332 N79-16342

KREMENIK, S. F.
Gasification Combined Cycle Test Facility at Pekin, Illinois 21 p0145 A79-17632

KREMESEC, V. J.
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation [ANL/ES-74] 24 p0781 N79-32620

KRENNELLER, A.
Refined model of solar space cooling system 23 p0401 A79-34012

KRESSEL, H.
Approaches to low-cost solar cells 23 p0441 A79-36784

KREUSING, H.
Gasification of raw lignite in the tube-furnace gasifier 22 p0310 A79-30996

KREY, G.
Utilization of the cold by LNG vaporization with closed-cycle gas turbine [ASME PAPER 79-GT-84] 23 p0376 A79-32361

KRICKENBERGER, K.
An assessment of mercury emissions from fossil fueled power plants [PB-285227/5] 21 p0213 N79-13592

KRIEGER, H.
Analysis of radioactive contaminants in by-products from coal-fired power plant operations [PB-286365/2] 21 p0232 N79-15473

KRIKORIAN, J. S., JR.
Development of industrial owned, small hydroelectric facilities 21 p0073 A79-14699

KRINNINGER, H.
Solar energy utilization in comparison with utilization of other energy types 23 p0465 A79-38598

KRISHBERG, R. R.
Optimality criteria in the compensation of the longitudinal boundary effect in induction MHD machines 22 p0298 A79-29277
Limit of formation of counterflows in plane linear induction MHD machines 22 p0298 A79-29288
Limit of the formation of counterparallel flows in plane-parallel induction MHD machines 24 p0663 A79-50778

KRISHNA, S. A.
Evaluation and targeting of geothermal energy resources in the southeastern United States [VPI-SU-5648-1] 21 p0204 N79-13478

KRISHNAMURTHY, M. V.
Development of small solar power plants for rural areas in India 21 p0141 A79-17502

KRISHNAMURTHY, S.
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor 23 p0492 A79-40452

KRISHNAPRASED, K.
Receiver designs for tower-top solar collector 21 p0135 A79-17450

KRITCHMAN, E. M.
Efficient Fresnel lens for solar concentration 22 p0285 A79-26816

KRIVENTSEV, V. I.
Evaluation of the effectiveness of electric power systems for transport purposes 22 p0284 A79-26723

KRIVOSHEEV, E. F.
Superconductivity in antenna engineering 22 p0311 A79-31008

KRIZ, J. F.
Changes within tin-containing catalysts under hydrorefining conditions 24 p0628 A79-45993

KROCHMANN, J.
Irradiances on inclined surfaces 21 p0055 A79-13624

KROEGER, E.
Lithium and potassium heat pipes for thermionic converters 21 p0013 A79-10113

KROEGER, E. W.
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes 21 p0053 A79-13098

KROKHIN, O. N.
Progress in laser-fusion research 21 p0070 A79-14464

Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171

KROPP, L. I.
Methods of reducing harmful emissions from thermal power stations
23 p0474 A79-38863

KROPP, R. E.
Major considerations in the design and engineering of cogeneration facilities
[ASME PAPER 79-GT-151] 23 p0378 A79-32416

KRUEGER, E. C.
Status report of the dynamic isotope power system
24 p0692 A79-51927
Application of the Dynamic Isotope Power System to a multimission spacecraft
24 p0692 A79-51929

KRUGER, C. H.
Symposium on the Engineering Aspects of Magnetohydrodynamics, 17th, Stanford University, Stanford, Calif., March 27-29, 1978, Proceedings
23 p0390 A79-33379
Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0391 A79-33391

KRUGER, R. P.
Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

KRUGLYI, S. I.
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875

KRUPINSKI, K. C.
Fluid-bed carbonization/desulfurization of Illinois coal by the Clean Coke Process - PDU studies
21 p0045 A79-12121

KRUPKA, M. C.
Energy, helium, and the future
23 p0422 A79-34181
Selected results from the technology assessment of solar energy program
[AIAA PAPER 79-0984] 23 p0458 A79-38187

KRUPKE, W. F.
Excited-state kinetics for Nd/thd/3 and Tb/thd/3 chelate vapors and prospects as fusion laser media
23 p0422 A79-34192
Advanced lasers for fusion applications
24 p0669 A79-51405

KRUPNICK, A. C.
Method for making an aluminum or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-1] 21 p0182 N79-11469

KRUTILIN, V. A.
Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump
24 p0706 A79-52372

KRUVANT, W. J.
Economics and net energy analysis - Is a new analytical technique needed for energy decision making
21 p0074 A79-14706

KRUZHILIN, IU. I.
Self-adjusting laser-target system for laser fusion
21 p0086 A79-15625

KSENDZATSKAIA, IU. N.
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255

KUBE, W. R.
Technology and Use of Lignite
[GFERC/IC-77/1] 21 p0216 N79-14241

KUBOTA, Y.
Characteristics of co-axial Marx generator and its application to electron beam fusion
24 p0642 A79-47805

KUCERA, K. M.
ECO-FUEL II - A superior refuse derived fuel
23 p0417 A79-34148

KUCHINSKII, G. S.
Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249

KUCHNEL, R.
Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565

KUDIJA, D. A.
Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

KUDISH, A. I.
Sede Boqer - Shallow solar ponds project
24 p0671 A79-51738

KUDRIN, O. I.
Heating characteristics of concentrator/receiver systems using selective absorption surfaces
24 p0646 A79-48739
Investigation of the absorption and emission characteristics of an ideal selective surface
24 p0648 A79-49186

KUEHL, D. J.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

KUEHN, T. J.
Accelerating the commercialization on new technologies
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849
Selection and development of small solar thermal power applications
[AIAA PAPER 79-1005] 23 p0459 A79-38198

KUESTER, J. L.
Liquid fuels from biomass
[AIAA PAPER 78-1781] 21 p0063 A79-13876
Urban wastes as an energy source
21 p0115 A79-17220

KUFA, E. N.
Effect of load factor on the characteristics of series MHD generators
24 p0650 A79-49372
Characteristics of series channels with a reduced electrode commutation angle in the connecting section
24 p0650 A79-49374

KUHLMAN, P.
The stirling engine for vehicle propulsion
[NASA-TM-75442] 21 p0195 N79-12547

KUHN, H.
Photoelectric conversion in monomolecular layer formations
23 p0464 A79-38589

KUHN, R. W.
DOE/STOR bibliography for flywheel energy systems, 1977
[UCRL-52637] 24 p0742 N79-29665

KUIZENGA, D. J.
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171

KUKULKA, J.
High efficiency, low cost processes for 3 in. diameter silicon solar cells
23 p0501 A79-40924

KULASH, D. J.
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868

KULCINSKI, G. L.
Materials problems and possible solutions for near term tokamak fusion reactors
21 p0079 A79-14790
Energy for the long run - Fission or fusion
22 p0256 A79-22760
Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies
[COO-4636-1] 23 p0592 N79-26511

KULIASHA, M. A.
Assessment of load management on the electric power system
[CONF-781182-3] 23 p0590 N79-27412

KULISIC, P.
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600

KULKARNI, S. V.
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121

KUMAGAI, K.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345

KUMAGAI, T.
The thermochemical decomposition of water using bromine and iodine
22 p0238 A79-20770

KUMAR, A.
Numerical modeling of the thermal boundary layer near a synthetic crude oil plant
24 p0628 A79-46065

KUMAR, B.
Thermodynamic and transport properties of isobutane: A survey of available data
[COO-4051-35] 24 p0794 N79-33096

KUNITOMO, T.
Optimum design parameters of horizontal coaxial cylinders for a solar energy collector
21 p0134 A79-17444

KUNZ, H. R.
The state-of-the-art of hydrogen-air phosphoric acid electrolyte fuel cells
21 p0039 A79-11815

KUNZ, W.
Proposed non-interferometric FIR electron density measuring scheme for tokamaks
24 p0707 A79-52667

KUNZE, J. F.
Geothermal community heating systems
23 p0409 A79-34078
Utilizing geothermal resources below 150 C /300 F/
23 p0486 A79-40196
The consumptive use of water in geothermal energy applications
24 p0667 A79-50897

KUO, C. Y.
Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River
[NASA-TM-80124] 24 p0777 N79-31839

KUO, M. C. T.
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574

KUO, S. C.
Parametric analysis of power conversion systems for central receiver solar power generation
[ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835
Conceptual design of a solar powered closed-cycle gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370

KUO, T. J.
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503

KUPER, A. B.
Poly- vs single-crystal silicon solar cells
23 p0518 A79-41064

KURLAND, R. M.
Design features of the TDRSS solar array
21 p0002 A79-10019

KURNOSOV, V. I.
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264

KURODA, K.
Design of a D-shaped toroidal field coil
21 p0156 A79-19083

KUROKAWA, K.
Proposal for efficient appreciation of solar thermal absorptive materials by high irradiance solar simulator
21 p0130 A79-17406

KUROSAKI, Y.
Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204

KUSH, E. A., JR.
Role of the vapor compression cycle in solar energy utilization
[BNL-24573] 24 p0753 N79-30776
Experimental performance study of a series solar heat pump
[BNL-25928] 24 p0789 N79-32704

KUSHIDA, R.
Continuous extrusion of coal
22 p0282 A79-26372

KUSIK, C. L.
Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152

KUSSMANN, A.
Composite rotor blades for large wind energy installations
23 p0522 A79-41235

KUSTOM, R. L.
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304

KUSUDA, H.
Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

KUTEEV, B. V.
Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532
Hall effect in an induction discharge
23 p0442 A79-36806

KUTSAROVA, Z.
The chemical stability of kerosene fractions
23 p0529 A79-42275

KUTTEN, H.
Modelling and control of a fluidized bed gasifier
22 p0332 N79-16345

KUTZ, U.
Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644

KUUSKRAA, V. A.
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654

KUWAHARA, N.
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

KUZNETSOV, N. V.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

KUZNETSOV, V. I.
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

KUZNETSOV, Y. V.
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267

KVARTSKHAVA, I. F.
Plasma behavior near the neutral line between parallel currents
22 p0324 A79-31754

KWON, B. S.
Waste disposal by fluid bed incineration and energy recovery modes
23 p0487 A79-40387

KYDD, P. H.
H-coal products for direct application to power generation
21 p0006 A79-10056

KYLE, R.
Passive solar heating - Results from two Saskatchewan residences
22 p0322 A79-31444

KYO, M.
Thermal fracturing patterns and effects of an imitation hot dry rock by impinging of water jets
23 p0409 A79-34076

L

LA NAUZE, R. D.
Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908

LA ROTONDA, L.
Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat
23 p0478 A79-39695

LA STELLA, J. P.
Role and status of dispersed electric utility fuel cell power plants
21 p0093 A79-15894

LABELLE, D.
Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452

LABOVITZ, C.
Stabilization of power plant scrubbing slurries and fine coal refuse with the additive Calcilox
21 p0063 A79-14107

LACAL, B.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311

LACAVA, A.
Improved techniques for gasifying coal
[FE-2340-7] 23 p0554 N79-24186

LACEY, D. R.
Dynamic response of a wind turbine system and its effect on performance
21 p0067 A79-14293

LACHMANN, B. A. P. L.
European OTEC project
24 p0616 A79-45777

LADESIC, B. P.
Ambient air quality assessment of the Synthane coal gasification pilot plant, six month study /August 1976-January 1977/
21 p0064 A79-14113

LADISCH, M. R.
Fuels and chemicals from biomass
24 p0631 A79-46313
Dehydration of ethanol - New approach gives positive energy balance
24 p0643 A79-47813

LADKANY, S. G.
High-current Al-TiNb composite conductor for large energy storage magnets
24 p0604 A79-44546

LADSAONGIKAR, U. V.
Design and optimization of a flat plate collector for cooling application
21 p0132 A79-17419

LADWIG, A.
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495

LAFAIT, J.
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956
Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189

LAFKAS, C.
Development of the oil sands of Canada
23 p0524 A79-41812

LAFRAMBOISE, F.
Statistical analysis of solar radiation data in Montreal for solar energy utilization
22 p0322 A79-31452

LAGOWSKI, J.
Present status of GaAs
[NASA-CR-3093] 21 p0215 N79-14192

LAHR, H. R.
Pilot's view of the evolving air transport
21 p0053 A79-13085

LAHRI, R.
An experimental study of series combination of solar cells
23 p0518 A79-41062

LAIDLER, J. B.
The development and construction of a simulator for the proof testing of solar power devices
23 p0448 A79-37846

LAINE, E. F.
Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front
23 p0486 A79-40251

LAIRD, A. D. K.
Geothermal power and water production studies at the University of California
[ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778

LAL, A.
Design and performance of 1/4 H.P. solar power unit
21 p0141 A79-17503

LALONDE, D. R.
A new electrolytic cell type for hydrogen production in hybrid cycles
23 p0414 A79-34115

LAM, R. Y.
A combined cycle for solar-fossil hybrid power generation
24 p0674 A79-51760

LAM, S. H.
The effects of electron thermal conductivity on thermionic energy converters
24 p0700 A79-51990

LAMARCHE, N.
Electric utility applications of thermal energy storage and transport
24 p0680 A79-51802
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560

LAMB, J. C., III
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709

LAMBERT, B. J.
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895

LAMBERTI, G. A.
An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California
[PB-293031/1] 23 p0585 N79-26562

LAMBRECH, H.
Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

LAMBRECH, H. A.
Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812

LAMEIRO, G. F.
Options for solar thermal conversion
21 p0043 A79-11969
A Markov model of solar energy systems
21 p0138 A79-17476
A Markov model of solar energy space and hot water heating systems
22 p0295 A79-28353
A discrete, stochastic simulation model for the analysis and design of solar energy heating systems
23 p0475 A79-38878

LAMETHE, D.
Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739

LAMICH, G.
The HYCSOS solar energy driven heat pump
24 p0610 A79-45222
HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529

LAMICH, G. J.
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716

LAMNECK, J. H.
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545

LAMOREAUX, R. D.
New instrumentation for high temperature and hemispherical measurements of selective surfaces
22 p0294 A79-28152

LAMORTE, M. F.
A two-junction cascade solar-cell structure
22 p0256 A79-22856
Two-junction cascade solar cell characteristics under 1000 concentration ratio and AM 0-AM 5 spectral conditions
23 p0513 A79-41027
Analysis of AlGaAs-GaInAs cascade solar cell under AM 0-AM 5 spectra
23 p0528 A79-42170
Computer modeling of a two-junction, monolithic cascade solar cell
24 p0785 N79-32672

LAMPERT, C. M.
Microstructural characterization of a black chrome solar selective absorber
22 p0294 A79-28151
Microstructure of a black chrome solar selective absorber
24 p0655 A79-50182

Coatings for enhanced photothermal energy collection. I - Selective absorbers
24 p0704 A79-52307
Structure of a black chrome solar selective surface
[LBL-6691-REV] 24 p0753 N79-30778
Microstructure and optical properties of black chrome before and after exposure to high temperatures
[LBL-8632] 24 p0756 N79-30804

LAMPINEN, B. E.
The indirect Brayton energy recovery system
24 p0696 A79-51958

LAMSON, K. C.
A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262

LAN, H. S.
Gallium arsenide films and solar cells on graphite substrates
24 p0667 A79-50937

LANAUZE, R. D.
Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931

LANDER, H. R.
Shale oil - The answer to the jet fuel availability question
[SAE PAPER 781027] 22 p0274 A79-25900

LANDGREBE, A. R.
Batteries for transportation and load-leveling applications
21 p0041 A79-11837

LANDIS, G. A.
Optimization of tapered busses for solar cell contacts
23 p0440 A79-36638
Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004

LANDSBERG, P. T.
Thermodynamics of the conversion of diluted radiation
22 p0310 A79-30910
Meteorological effects on Schottky-barrier solar cells
23 p0441 A79-36781
Recombination effects in p-type silicon Schottky barrier solar cells
23 p0508 A79-40992

LANDSMAN, E. E.
Maximum power trackers for photovoltaic arrays
23 p0516 A79-41049

LANDSTROM, D. K.
Development of a low-temperature, low-cost, black-liquid solar collector
[CONF-780983-14] 24 p0756 N79-30805

LANG, B.
System selection and optimization of a solar thermal installation for cooling, heating, and warm water heating
23 p0466 A79-38609

LANG, W. R.
A central receiver solar thermal power system
23 p0424 A79-34455

LANGE, D. E.
Flying angle of attack
21 p0048 A79-12384

LANGE, R.
A methodology for assessing the potential impact on air quality resulting from geothermal resource development in the Imperial Valley
21 p0116 A79-17262

LANGE, R. H.
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

LANGENKAMP, H.
Problems around Fe-Cl cycles
22 p0238 A79-20771
Thermochemical hydrogen production by the Mark-13 process - A status report
24 p0686 A79-51849

LANGER, M.
Development of multi-density silicon nitride turbine rotors
21 p0050 A79-12832

LANGER, S. H.
Electrogenerative chemical reactors
24 p0631 A79-46310
Electrogenerative and voltameiotic processes
24 p0703 A79-52026

LANGERDEBRAKE, C. O.
Refrigerant-114 Rankine cycle energy recovery technology from the gaseous diffusion industry
[GAT-916] 24 p0750 N79-30724

LANGHAM, R. W., II
A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives
23 p0567 N79-24813

LANGLEY, R. A.
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide
23 p0444 A79-36893

LANGSJOEN, P. L.
Low-sulfur western coal use in existing small and intermediate size boilers
[PB-287937/7] 22 p0346 N79-18061
Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement)
[PB-293731/6] 24 p0743 N79-29670
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654

LANGTON, W.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306

LANIER, J. H.
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139

LANNING, D. D.
Stored energy calculation: The state of the art
[PNI-2581] 21 p0210 N79-13541

LANSING, F. L.
A simulation exercise of a cavity-type solar receiver using the HEAP program
24 p0670 A79-51730
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059
A two-dimensional thermal analysis of a new high-performance tubular solar collector
22 p0352 N79-19060
Computerized simulation and parameterization of a new high-performance tubular solar collector
23 p0539 N79-22163
HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers
[NASA-CR-158640] 23 p0560 N79-24466

LANTZKE, U.
The international energy agency - The way ahead
24 p0652 A79-49520

LANXNER, M.
High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228
Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229

LANZA, F.
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950

LAPAN, K.
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614

LAPEYRE, G. J.
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395

LAPP, H. M.
Methane production from manure
23 p0494 A79-40741

LARGE, J.-F.
Application of fluidization techniques to the combustion of coal - The state of the art
23 p0528 A79-42250

LARIMER, F. W.
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568

LARIONOV, M. M.
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430

LARKIN, B.
Electricity rate systems and energy conservation
24 p0696 A79-51959

LAROCK, R. I.
Satellite power systems /SPS/ overview
21 p0002 A79-10022
Satellite power systems program
21 p0169 N79-10128

LARSEN-BASSE, J.
The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

LARSEN, R.
MHD slag electrical conductivity studies
23 p0391 A79-33394

LARSON, D. C.
Double-exposure collector system for solar heating applications
[CONF-780114-6] 21 p0131 A79-17411

LARSON, G.
Diesel bus performance simulation program
[PB-295524/3] 24 p0763 N79-31110

LARSON, V.
Farm-scale generation of bio-gas
24 p0631 A79-46312

LARSSON, L.
Large-scale introduction of wind power stations in the Swedish grid A simulation study
22 p0300 A79-29373

LASTER, S. J.
Geothermal ground noise measurements at Roosevelt Hot Springs and Cove Fort, Utah
[PB-291624/5] 23 p0545 N79-22648

LASTRAS-MARTINEZ, A.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054

LATHROP, J. W.
Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50028

LATTA, A. F.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660

LATTIMORE, P. K.
Conventional combustion on environmental assessment program
[PB-291401/8] 23 p0545 N79-22668

LAU, C. V.
MHD conversion of solar energy
21 p0109 A79-16614

LAU, C.-V.
A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613

LAUG, M.
Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585

LAUGHON, K. O.
Hydrogen energy transport systems and nuclear heat - A promising way to conserve fossil energy resources
23 p0415 A79-34127

LAULAINEN, N. ..
Differential insolation and turbidity measurements
22 p0241 A79-21056

LAURENT, G.
Investigation of the optimal use of geothermal waters for the heating of several types of dwelling in various European climates
21 p0075 A79-14739

LAURIAT, G.
Effects of nonuniform distribution of the absorber temperature on radiation losses of a flat-plate solar collector
23 p0530 A79-42894

LAURMANN, J. A.
Market penetration characteristics for energy production and atmospheric carbon dioxide growth
24 p0643 A79-47812

LAUVRAY, H.
Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions
23 p0501 A79-40922

LAUWERS, P.
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977

LAVE, C. A.
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868

LAVI, G. H.
The commercialization of OTEC - Problems and opportunities
23 p0405 A79-34043

LAVIGNE, J.
Exploration and exploitation techniques for geothermal resources
23 p0525 A79-41819

LAVRENTEV, I. V.
Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373

LAW, C. K.
Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures
24 p0632 A79-46318

LAW, H. K.
Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures
24 p0632 A79-46318

LAW, S. L.
Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste
[PB-285196/2] 21 p0213 N79-13590

LAWAND, T. A.
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424

LAWFORD, T. W.
Today's geothermal power economics and risks
24 p0689 A79-51869

LAWING, P. L.
A cooling system for an aircraft having a cruise range from Mach 2 to Mach 8
[NASA-CASE-LAR-12406-1] 23 p0568 N79-24980

LAWRENCE, A.
National environmental impact projection no. 1
[HCP/P-6119] 2 p0777 N79-31844

LAWRENCE, K. A.
A review of the environmental effects and benefits of selected solar energy technologies
24 p0664 A79-50878

LAWRENCE, L. R., JR.
ERDA fuel cell programs
21 p0039 A79-11814

LAWRENCE, W. T.
Energy conservation opportunities in appliances using energy storage
[ORNL/SUB-7303/1] 24 p0782 N79-32629

LAWSON-TANCRED, H.
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898

LAWSON, A. C.
Evaluation of options for process sequences
23 p0501 A79-40925

LAWSON, D. D.
Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513

LAWSON, R. R.
Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845

LAWSON, K. J.
p-InP/n-CdS heterojunction solar cells
23 p0442 A79-36791

LAWSON, L. J.
Application of kinetic energy storage to transportation systems
22 p0299 A79-29337
Study of flywheel energy storage Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558
Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559
Wayside energy storage summary. Volume 1: Summary
[DOT-TSC-FRA-79-7-1-VCL-1] 22 p0370 N79-21563

LAWTON, R. G.
Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784

LAYS, E.
Turbine engines in light aircraft
21 p0047 A79-12380

LAZAR, R.
The potential of zeolite molecular sieves as hydrogen storage media
23 p0415 A79-34123

LAZARENKO, I. S.
Ways of improving steam-gas power plants
22 p0299 A79-29298

LAZARETH, O.
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126

LAZZARI, M.
Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

LAZZARIN, R.
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
LiBr absorption cooling devices as heat pumps
23 p0468 A79-38624

LE COMBER, P. G.
Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777

LE DET, M.
Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464

LE GRIVES, E.
A cavity receiver design for solar heated gas turbine generating systems
[ONERA, TP NO. 1978-137] 21 p0155 A79-18560

LE ROUX, N. W.
The microbial production of methane from the putrescible fractions of sorted household waste
23 p0396 A79-33753

LE, N. T.
WATSUN - A simulation program for solar-assisted heating systems
22 p0321 A79-31439

LE, T.
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572

LEACH, S.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

LEARY, P.
Predicted performance of heliostats for ERDA's 10 MWe power plant
21 p0044 A79-12045

LEARY, P. L.
User's guide for MIRVAL: A computer code for comparing designs of heliostat-receiver optics for central receiver solar power plants
[SAND-77-8280] 24 p0729 N79-28932

LEATHAM, C. R., JR.
Solid waste as a source of energy for industry - An overview
23 p0424 A79-34461

LEAVENS, J. M.
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

LEAVENS, W. M.
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

LEBAN, M.
Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy
23 p0495 A79-40748

LEBEDEV, A. D.
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430

LEBEDEVA, V. D.
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274

LECART, B.
A new thermochemical process for hydrogen production
22 p0312 A79-31153

LECHEVIN, L.
Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401

LECHTHALER, C. H.
Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064

LECLERC
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708

LECLERT, G. P.
Two-dimensional self-modulation of lower hybrid waves in inhomogeneous plasmas
24 p0639 A79-47424

LECOMTE, P.
Adaptation for the economy or adaptation for energy conservation
[AAAF-NT-77-23] 23 p0551 N79-23537

LEDAIN, B. L.
Fully developed laminar heat transfer in passages of triangular cross section for application to solar collector plate design
[AIAA PAPER 79-0974] 23 p0458 A79-38189

LEDENT, P.
In situ coal gasification - New energy source for Europe
23 p0525 A79-41815

LEE, B. S.
HYGAS - A process ready for commercial demonstration
23 p0411 A79-34090

LEE, C.
Thermionic energy converter investigations
24 p0699 A79-51981
Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659

LEE, C. H.
Combustion characteristics of droplets of coal/oil and coal/oil/water mixtures
24 p0632 A79-46318

LEE, C. M.
Measurements of compressed core density of laser-imploded targets by x-ray continuum-edge shift
21 p0154 A79-18479

LEE, D. W.
Energy conservation opportunities in appliances using energy storage
[ORNL/SUB-7303/1] 24 p0782 N79-32629

LEE, E. S.
Coal conversion technology
24 p0714 A79-53776
Coal liquefaction
24 p0714 A79-53781

LEE, G.
Status and summary of laser energy conversion
21 p0111 A79-16635

LEE, G. K.
Modification of electrostatic precipitator performance by use of fly-ash conditioning agents
[ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736

LEE, H.
An optimal standard for solar heating systems
[ASME PAPER 78-WA/DSC-19] 21 p0159 A79-19765

LEE, H. Y.
Radiant exchange for a fin and tube solar collector
22 p0271 A79-25066

LEE, J. C.
Supplementary steam - A viable hydrogen power generation concept
24 p0686 A79-51848

LEE, J. H.
Investigation of a staged plasma-focus apparatus
22 p0255 A79-22365

LEE, J. M.
Selectivity improvement in the SRC process
24 p0628 A79-45992

LEE, J. W.
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683

LEE, K. P.
Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine
21 p0024 A79-10201

LEE, M. K.
Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain
23 p0536 A79-43645

LEE, P.
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas
22 p0296 A79-28366

LEE, R. M. H.
Optimum combinations of cooling alternatives for steam-electric power plants, volume 2
[PB-290576/8] 23 p0565 N79-24515

LEE, S. C.
A systems study of our energy problems
21 p0074 A79-14704
Energy conservation by waste heat utilization
23 p0417 A79-34145

LEE, T. G.
Integration of a passive and active solar heated, low density, multiple dwelling with atrium
22 p0322 A79-31446

LEE, T. N.
Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment
24 p0622 A79-45818

LEES, D. J.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

LEFEBVRE, A. H.
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982

LEFEUVRE, T.
Solar heating of domestic hot water at the Confederation Heights Cafeteria
22 p0323 A79-31457

LEFFEL, C. S., JR.
Energy programs at the Johns Hopkins University Applied Physics Lab.
[PB-295439/4] 24 p0793 N79-32739

LEFKOWITZ, I.
Modelling energy storage systems for electric utility applications Preliminary considerations
21 p0081 A79-14960

LEFLAR, J. A.
Simulation and design of evacuated tubular solar residential air conditioning systems and comparison with actual performance
21 p0138 A79-17475
Solar evacuated tube collector: Absorption chiller systems simulation
[COO-2577-13] 21 p0209 N79-13530

LEFROIS, R. T.
Active heat exchange system development for latent heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554

LEGUILLY
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708

LEHRFELD, D.
Development of a 1 kW/e/ isotope fueled Stirling cycle power system
21 p0025 A79-10210
The Stirling engine, an energy converter for cogeneration applications
[ASME PAPER 78-WA/ENER-4] 21 p0159 A79-19777

LEIBOWITZ, L.
Advanced solar thermal technology - Potential and progress
24 p0671 A79-51739

LEICHTER, I.
Air quality impacts using SRC versus conventional coal in power plants
[PB-290237/7] 22 p0373 N79-21671

LEIDENFROST, W.
Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136

LEIGH, D. C.
Computer aided optimization of integrated coal gasification combined cycle power plants
21 p0008 A79-10075

LEIGH, J. G.
Projecting energy resource utilization - The geothermal case
21 p0068 A79-14321
A quantitative comparison of energy costing methods
24 p0651 A79-49475

LEIGH, R. W.
A method for the comparative economic assessment of storage systems
[BNL-24473] 21 p0013 A79-10111
Method for the comparative economic assessment of energy storage systems
[BNL-25291] 23 p0565 N79-24509

LEIPOLD, M. H.
Recent developments in low cost silicon solar cells for terrestrial applications
22 p0239 A79-20821

LEISING, C. J.
Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

LELOUP, C.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

LEMASOV, B. L.
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358

LEMPERT, J.
Design and operation of the Westinghouse electrode systems test facility /WESTF/
23 p0393 A79-33411

LENDER, R. J.
Diffusion length measurements in Schottky barrier GaAs solar cells
22 p0281 A79-26243

LENORMAND, J.
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424

LENTS, J.
Low cost selective surface-carbon particle coating
24 p0611 A79-45228

LENZ, T. G.
Conversion of solar energy to chemical energy using ammonia dissociation
24 p0672 A79-51746

LENZO, C. S.
An experimental investigation of rotating-drum separators for liquid-metal MHD applications
23 p0395 A79-33423

LEO, P. P.
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575
LEON, A.
Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451
LEON, M.
Structure identification and optical and electrical properties of cuprous sulphide layers in relation with solar energy application
24 p0704 A79-52311
LEONARD, J. A.
Operating experience at the DOE/Sandia midtemperature Solar Systems Test Facility
21 p0022 A79-10182
System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530
Linear concentrating solar collectors: Current technology and applications
[SAND-78-0949] 24 p0754 N79-30784
LEONARD, J. W.
Current state-of-the-art of electrochemical batteries from a users point of view
21 p0071 A79-14681
LEONARD, S. L.
Central station power plant applications for photovoltaic solar energy conversion
23 p0520 A79-41080
Photovoltaic mission analysis
23 p0570 N79-25496
LEONARD, T. A.
Temporally and spatially resolved harmonic emission from spherical laser fusion targets
23 p0480 A79-39940
LEOPOLD, L.
Environmental considerations for the microwave beam from a solar power satellite
21 p0003 A79-10030
Design considerations for solar power satellites
21 p0113 A79-16738
LERFALD, G. M.
Effects of weather and pollution on incident solar energy - Basic measurements leading to computer models
21 p0065 A79-14117
LEROY
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VCL-1] 23 p0599 N79-27708
LESCHLY, K.
User experience with on-road electric vehicles in the U.S.A. and Canada
21 p0009 A79-10080
LESHENDOK, T. V.
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
LESHUK, J. P.
Solar pond stability experiments
21 p0042 A79-11878
LESK, I. A.
Fixed angle and seasonably adjustable structural support concepts for solar converters
23 p0518 A79-41063
LESPERANCE, M. J.
Control system for solar hot water system
22 p0321 A79-31442
LESSARD, R. D.
Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment
24 p0679 A79-51796
LESTIENNE, R.
Storage tank efficiency as simulated in a Markovian model of meteorology
22 p0254 A79-22272
Application of a simplified Markov model to the study of a solar power plant storage system
23 p0383 A79-32964
LETIN, V. A.
Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179
Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity
24 p0647 A79-49182
LETTENMAIER, D. P.
Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845
LEUNG, K.
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555
LEUNG, K. N.
Magnetic multipole line-cusp plasma generator for neutral beam injectors
22 p0238 A79-20746
LEVANT, M.
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480
LEVCHENKO, N. M.
Studies of cryogenic liquid boiling in centrifugal acceleration fields
23 p0530 A79-42893
LEVELTON, B. H.
An evaluation of wood-waste energy conversion systems
21 p0174 N79-10528
LEVERENZ, D. J.
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522
The performance of an experimental solar heating system
[AD-A066699] 23 p0573 N79-25516
LEVESQUE, D.
Theoretical and experimental analysis of a latent heat storage system
21 p0121 A79-17323
Solar energy storage - Digital simulation of energy transfer by conduction and radiation in a two-phase medium
23 p0383 A79-32963
LEVI, E.
Inverter systems
21 p0106 A79-16486
LEVIN, A.
Attenuating the transverse edge effect in MHD generators
21 p0063 A79-13985
LEVIN, L. S.
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430
LEVIN, V. M.
Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity
22 p0324 A79-31845
LEVINE, D. I.
Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936
LEVINSON, A. L.
Energy and materials in three sectors of the economy: A dynamic model with technological change as an endogenous variable
24 p0748 N79-30710
LEVINSON, L. M.
Enhancement of magnetic separability in coal liquefaction residual solids
23 p0461 A79-38434
LEVTEROV, A. I.
Investigation of the thermophysical characteristics of cryogenic heat pipes with a metal-fiber wick
22 p0288 A79-27529
LEVY, D.
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614
LEVY, J. M.
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474
LEVY, R. B.
Catalysis in coal conversion
21 p0051 A79-12873
LEWELLEN, W. S.
Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189

LEWIS, A.
Future aviation fuels fuel suppliers views
21 p0202 N79-13194

LEWIS, B. G.
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679

LEWIS, F. A.
Hydrogen storage electrode systems
22 p0251 A79-21710

LEWIS, F. M.
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413

LEWIS, H. E.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181

LEWIS, L. G.
Ocean Thermal Energy Conversion /OTEC/ power plant instrumentation and measurement
23 p0430 A79-35059

LEWIS, P. F.
Char gasification. II - Oxidation results
24 p0667 A79-50914

LEWOLT, J. G.
Fuel conservative subsonic transport
22 p0337 N79-16874

LEY, W.
Solar radiation simulation by means of solar simulator for the indoor testing of solar collectors
21 p0055 A79-13620

LEYERLY, B. W.
Optimization of PtDoped KOCITE (trade name) electrodes in H3PO4 fuel cells
[AD-A061242] 22 p0342 N79-17340

LI, C. H.
Eutectic and cellular solar cells
23 p0502 A79-40928

LI, C. T.
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179

LI, K. W.
A thermoeconomic analysis of thermal energy storage
23 p0416 A79-34138

LI, K. Y.
Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508

LI, K.-Y.
New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798

LIA, T.
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370

LIBBY, D. O.
Power cables to accommodate the motions of an OTEC plant
21 p0101 A79-16251

LIBERATORE, A. J.
Design considerations for an in situ gasification test of eastern bituminous coals
21 p0005 A79-10049

LIBOWITZ, G. G.
The prospects of hydrogen as an energy carrier for the future
22 p0247 A79-21677

LICHTBLAU, J. H.
Outlook for world oil into the 21st century with emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-11454

LICHTENBERG, A. J.
Minimum-average-B wells in linked magnetic mirror fields
22 p0252 A79-22237

LIDDELL, C. B.
Refuse shredding - Performance, testing and evaluation data
23 p0491 A79-40419

LIDORENKO, N. S.
New models of solar cells and prospects for their optimization
21 p0166 A79-20346

LIEB, D.
Thermionic energy converter investigations
24 p0699 A79-51981

LIEBERMAN, M. A.
Minimum-average-B wells in linked magnetic mirror fields
22 p0252 A79-22237

LIEBERT, B. E.
The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

LIEBERT, C. H.
Tests of NASA ceramic thermal barrier coating for gas-turbine engines
[NASA-TM-79116] 22 p0357 N79-20118

LIEBLEIN, S.
Evaluation of urethane for feasibility of use in wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497

LIEMERT, K.
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

LIEMOHN, H. B.
Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

LIEN, P. L.
Energy and Technology Review, June 1978
[UCRL-52000-78-6] 21 p0215 N79-14168

LIEN, S.
Photobiological production of hydrogen: A solar energy conversion option
[SERI/TR-33-122] 24 p0767 N79-31422

LIEPINS, G. E.
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447

LIGHTHILL, J.
Two-dimensional analyses related to wave-energy extraction by submerged resonant ducts
22 p0312 A79-31099

LIHACH, N.
Eighty atmospheres in reserve
23 p0436 A79-35800

LIIKALA, R. C.
Perspective on the fusion-fission energy concept
21 p0095 A79-15913

LIKHACHEV, A. P.
Supersonic flow in an MHD channel with a downwash flow at the inlet
21 p0085 A79-15342

LILEY, B. S.
Ion heating in the LT-3 tokamak
24 p0639 A79-47399

LILIEN, G. L.
The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology
23 p0516 A79-41053

LILLELEHT, L. U.
Annual collection and storage of solar energy for the heating of buildings
21 p0131 A79-17415
Earth-conducted heat losses from thermal storage systems
22 p0281 A79-26208

LIM, R.
Preliminary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

LIN, C.
An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing
22 p0264 A79-23780

LIN, C. J.
Desulfurization of coals by high-intensity high-gradient magnetic separation - Conceptual process design and cost estimation
21 p0044 A79-12116

LIN, C. L.
High-efficiency thin-film polycrystalline-silicon solar cells
22 p0273 A79-25744
Thin film polycrystalline silicon solar cells
23 p0518 A79-41067

LIN, E. I. H.
Three dimensional mathematical model of flow stratification in thermocline storage tanks
24 p0609 A79-45214

LIN, H. C.
Contact resistance of silver ink on solar cell
23 p0506 A79-40978
Analysis of ion-implanted solar cells
23 p0508 A79-40991

LIND, M. A.
Specularity measurements for solar materials
22 p0294 A79-28153
Specularity measurements by Fourier transform examination
23 p0431 A79-35069
Effects of noncontact cleaners on transparent solar materials
[PNL-2969] 24 p0789 N79-32709

LINDAHL, B. C.
The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations
[ASME PAPER 79-GT-16] 22 p0306 A79-30510

LINDEN, H. R.
Energy and society
24 p0653 A79-49523

LINDGREN, E. R.
Hartmann flows in the MHD generator configuration
[AD-A070080] 24 p0793 N79-33036

LINDHOLM, F. A.
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426
Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
Design of high efficiency HLE solar cells for space and terrestrial applications
24 p0783 N79-32647

LINDLEY, C. A.
Electric utility application of WECS in an island location
24 p0634 A79-46534

LINDLEY, D.
Energy recovery and conservation by recycling municipal solid waste
[NZERDC-P7] 24 p0745 N79-30105

LINDMAYER, J.
Vertical junction silicon solar cell
21 p0001 A79-10013
Photovoltage in concentrator cells
23 p0511 A79-41013
Large-area concentrator solar cells
23 p0517 A79-41057
Characteristics of semicrystalline silicon solar cells
23 p0518 A79-41065

LINDROSE, A. M.
The thermomechanical behavior of polyvinyl butyral film and its effect on focal stability of a solar mirror-laminate
22 p0239 A79-20824

LINDSEY, W. C.
Automatic phase control in solar power satellite systems
[NASA-CR-151856] 21 p0194 N79-12130

LINDSTEDT-SIVA, J.
Energy/environment 1978: Symposium on energy development impacts
[PB-288578/8] 22 p0355 N79-19470

LINDSTROM, O.
Utility fuel cells for biomass fuel
21 p0016 A79-10131

LINFORD, R. M. F.
Optical coatings for a space laser communications system
22 p0292 A79-28028

LING, K. S.
Fabrication experience with high efficiency silicon concentrator cells
23 p0517 A79-41056
Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454

LINGLE, C. P.
Cast acrylic Fresnel lenses for solar energy concentration
23 p0432 A79-35076

LINKY, E. J.
Lead agency designation and proposed licensing procedures for ocean thermal energy conversion facilities
24 p0621 A79-45809

LINN, J. K.
Optimization of terrestrial photovoltaic power systems
23 p0520 A79-41076
Analysis of collectors for process heat applications
[SAND-78-1977] 24 p0756 N79-30806

LINSCOTT, B.
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829
An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357

LINTON, K. J.
South wall solar collector with active collector system
22 p0320 A79-31436

LIOR, N.
Standards applicable to performance measurement of solar heating and cooling systems
[COO-4142-2] 24 p0741 N79-29656
Isothermal flow distribution in solar collectors and collector manifolds
[ALO-5319-1] 24 p0789 N79-32708

LIPELES, J. L.
A low cost approach to performance monitoring for the evaluation of a solar domestic hot water system
21 p0088 A79-15842
Application of system design techniques to a solar domestic hot water retrofit and an 87 unit apartment complex
24 p0608 A79-45210

LIPKIND, B. A.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

LIPKIS, R. R.
Electromagnetic radiation energy arrangement
[NASA-CASE-NOO-00428-1] 22 p0352 N79-19186

LIPPERT, T. E.
Engineering studies of open-cycle coal-fired MHD for power generation
23 p0424 A79-34456

LIPPMANN, M. J.
Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317

LIPPS, F.
An analysis of the terminal concentrator concept for solar central receiver systems
24 p0641 A79-47792

LIPS, K. W.
Transient attitude dynamics of satellites with deploying flexible appendages
21 p0047 A79-12325

LISIECKI, M. G.
RDF storage and retrieval problems: Cause - effect - options
23 p0489 A79-40402

LISOVSKII, IU. D.
Optimization of exponential alloying impurity distribution in semiconductor photoconverter base
24 p0636 A79-46759

LISS-SUTER, D.
A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it
[AD-A056018] 21 p0192 N79-11686

A literature review-problem definition studies on selected toxic chemicals. Volume 8: Environmental aspects of diesel fuel and fog oils SGF number 1 and SGF number 2 and smoke screens generated from them
[AD-A056021] 21 p0193 N79-11688

LISSAMAN, P. B. S.
Energy effectiveness of arbitrary arrays of wind turbines
[AIAA PAPER 79-0114] 21 p0156 A79-19540

LISTER, J. B.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459

LITOVCHENKO, V. G.
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490

LITOVKIN, V. V.
Investigating the formation of oxides of nitrogen when burning solid fuel
23 p0474 A79-38864

LITTAUER, E. L.
Mechanically rechargeable, metal-air batteries for automotive propulsion
[CONF-780801-8] 21 p0011 A79-10093
Development and evaluation of a 600-kWh lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095
Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538

LITTLER, J. G. F.
Solar heating for a novel dwelling independent of servicing networks
21 p0140 A79-17492
Wind generation of electricity for a novel dwelling independent of servicing networks
21 p0142 A79-17513
Wind power for domestic use in the United Kingdom
23 p0453 A79-37902

LITTMAN, F. E.
Regional air pollution study: Heat emission inventory
[PB-284081/7] 21 p0200 N79-12602

LITVAK, A. G.
Nonlinear effects in propagation of lower hybrid waves in a plasma
24 p0706 A79-52381

LITVIN, A.
Development of a lightweight concrete for OTEC cold water pipes
24 p0622 A79-45823

LIU, C. C.
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996

LIU, C. S.
Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity
22 p0269 A79-24814
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852
Warm plasma effects on drift cyclotron loss cone mode
23 p0478 A79-39568

LIU, C. T.
Iron-air batteries for electric vehicles
21 p0011 A79-10094

LIU, C. Y.
Flap-cone control of windmill speed
23 p0405 A79-34046
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

LIU, H. C.
An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32348

LIU, J. K.
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0458 A79-40902

LIU, L. Y.
National Computer Conference, Anaheim, Calif., June 5-8, 1978, Proceedings
21 p0100 A79-16177

LIU, H.-K.
The use of a complex-terrain wind model for the siting and design of wind generators
[AIAA PAPER 79-0971] 23 p0456 A79-38178
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538

LIU, Y. A.
Desulfurization of coals by high-intensity high-gradient magnetic separation - Conceptual process design and cost estimation
21 p0044 A79-12116

LIUBIMOV, G. A.
Effect of force field nonuniformity on flow in an MHD channel
21 p0101 A79-16365
Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392
Heat transfer in a high-power MHD channel
23 p0533 A79-43171

LIVENGOOD, C. D.
Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808
Environmental control implications of increased coal utilization under the National Energy Plan
[ANL/EES-CP-10] 24 p0760 N79-30846

LIVINGSTON, F. R.
Satellite Power System (SPS) environmental impacts, preliminary assessment
[NASA-CR-157952] 21 p0196 N79-12557
Advanced subsystems development
[NASA-CR-158335] 23 p0542 N79-22627

LIWERSKI, H.-L.
Dynamic behaviour of light-weight solar collectors
21 p0056 A79-13628

LIZDAS, D. J.
Methane production from beef cattle feedlots
[CONF-7806107-2] 23 p0589 N79-27333

LJUNGSTROM, O.
Off-shore multi-MW size wind turbine system development is the key to cost-effective wind energy for Sweden
22 p0326 A79-31917
Off-shore based wind turbine systems /OS-WTS/ for Sweden - A systems concept study
23 p0527 A79-41946

LLABRES, J.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311

LO, R.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

LOBO, P. C.
Solar distillation in Brasil
23 p0385 A79-33214

LOBOV, G. V.
An investigation of the formation of oxides of nitrogen in a pulverised coal flame
23 p0474 A79-38865

LOCKE, F. E.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

LOCKMAN, W. J.
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235

LODGE, N.
The Prince Edward Island Wind Energy Program
22 p0319 A79-31427
Wind energy prospecting in Prince Edward Island - A program overview and status report
23 p0482 A79-40109

LODHI, M. A. K.
A self-consistent process of producing hydrogen from sea water
23 p0414 A79-34118

LOEB, G.
Ultrasonic detection of microbial slime films
24 p0620 A79-45807

LOEB, S.
Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133
Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997

LOEBL, A. S.
Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487

LOEF, G. O. G.
Space heating with solar all-air systems - CSU Solar House II
21 p0137 A79-17467
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939

LOESCH, H.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

LOESCH, H. R.
Activities in the field of solar cells in the Federal Republic of Germany
21 p0056 A79-13636

LOEWER, O. J., JR.
Heat storage in crushed limestone
24 p0609 A79-45215

LOF, G. O. G.
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629

LOFERSKI, J.
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967

LOFERSKI, J. J.
Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911
Investigation of potentially high efficiency photovoltaic cells consisting of two heterojunctions on a common wide band gap semiconductor base
23 p0513 A79-41031
Efficiency of tandem solar cell systems as a function of temperature and solar energy concentration ratio
24 p0656 A79-50194
CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197
Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317
Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-32671

LOFTING, E.
The economics of geothermal energy development at the regional level
22 p0256 A79-22756

LOFY, R. J.
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0578 N79-26235

LOHMANN, R. P.
Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050

LOHRKE, R. L.
Stratified thermal storage in residential Solar energy applications
[COO-4523-1] 24 p0786 N79-32682

LOKAI, V. V.
Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine
21 p0114 A79-16800
Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552
Study of heat-pipe heat exchanger in the small gas turbine engine system
24 p0646 A79-48511

LOKMANHEKIM, M.
Energy utilization analysis of buildings
21 p0103 A79-16462
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282
Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463
Energy utilization analysis of buildings
[LBL-7826] 24 p0753 N79-30779

LOMBARD, D. K.
The economics of energy recovery from industrial waste incineration
23 p0490 A79-40406

LONG, A.
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741

LONG, B. H.
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development
[NASA-TP-1359] 21 p0223 N79-14679

LONG, C. D.
Determination of the design states of a complex system in evaluating the reliability of electrical power supply
24 p0646 A79-48826

LONG, J. F.
Performance tests of organic dyes in a planar solar concentrator with ribbon photovoltaic cells
23 p0519 A79-41074

LONGLEY, W. L.
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576

LONGWELL, J. P.
Alternative aircraft fuels
21 p0033 A79-10824
Alternative fuels and combustion problems
21 p0051 A79-12978

LOO, R.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
GaAs solar cells for high solar concentration applications
23 p0514 A79-41039
Low energy proton radiation damage to (AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664

LOPER, D. E.
On the diffusive instability of some simple steady magnetohydrodynamic flows
22 p0278 A79-26163

LOPEZ, J. A.
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839

LOPEZ, M.
Automated array assembly, phase 2. Low-cost solar array project, task 4
[NASA-CR-158365] 22 p0358 N79-20481

LOPEZ, S.
Total solar radiation in Mexico using sunshine hours and meteorological data
21 p0150 A79-18026

LORA, J. H.
Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745
Material and energy balances in the production of ethanol from wood
[CONF-7806139-1] 23 p0589 N79-27338

LORBIER, E.
Preliminary design analysis of the quasi-electric drive vehicle
[UCRL-52613] 24 p0731 N79-29116

LORENSEN, L. E.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

LORENZ, J. J.
Major factors in OTEC heat exchanger design
23 p0404 A79-34039
Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787
Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/
24 p0618 A79-45790
Flow-induced vibration in shell-and-tube heat exchangers for Ocean Thermal Energy Conversion (OTEC)
[ANL-OTEC-78-3] 24 p0747 N79-30522

LORENZINI, E.
Thermal analysis in the focal spot of a solar furnace
24 p0641 A79-47794

LORENZO, E.
The effect of the dispersion of the characteristics of solar cells in large systems
22 p0285 A79-26822

LORMAN, W. R.
Digest of equipment for converting solar, wind, and geothermal energy into electric power for USN application ashore
[AD-A066221] 23 p0561 N79-24475

LORRIMAN, D.
Report on a survey of operational solar systems
22 p0318 A79-31418
Performance of the Meadowvale solar home
22 p0318 A79-31420
Off-peak electrical backup experience in the Meadowvale Solar Experiment
22 p0318 A79-31421

LORSCH, H. G.
Residential and commercial thermal storage
21 p0090 A79-15865
Thermal storage of off-peak electrical energy in solar heating and cooling systems
24 p0644 A79-47945

LOSCUTOFF, W. V.
Environmental concerns related to compressed air energy storage
24 p0666 A79-50895

LOSS, W.
Direct-contact heat exchange-storage tank in solar houses
23 p0468 A79-38626

LOTFALLIAN, M.
Impact of storm fronts on utilities with WECS arrays
24 p0635 A79-46546

LOTH, J. L.
Hybrid air to water solar collector design
21 p0021 A79-10174
Tilting wing overspeed control for vertical axis wind turbines
[AIAA PAPER 79-0967] 23 p0456 A79-38175
Domestic hot water heating using hot air solar collectors
[AIAA PAPER 79-0973] 23 p0457 A79-38180

LOTHROP, J. W.
Coal combustor technology development
23 p0390 A79-33381

LOTT, D. B.
Concentrator enhanced solar arrays design study
[NASA-CR-158032] 21 p0219 N79-14546

LOTTIN, J. C.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

LOUBSKY, W. J.
The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260

LOUGHEED, V. R.
Melting multifoil insulation for KIPS emergency cooling
21 p0023 A79-10191

LOUIS, J. F.
The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260
MHD generators
21 p0105 A79-16484
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415
Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841
Critical contributions in MHD power generation
[FE-2215-11] 22 p0362 N79-20511
Magnetohydrodynamics
24 p0724 N79-28741
Thermionic conversion
24 p0724 N79-28742

LOUNSBURY, M.
Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463

LOUTFY, R. O.
Photovoltaic properties of metal-free phthalocyanines - Al/H2Pc Schottky barrier solar cells
22 p0317 A79-31412
Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells
24 p0637 A79-47019

LOUTHAN, M. R., JR.
On design requisites for hydrogen energy systems
24 p0685 A79-51844

LOUW, B. J.
Mobile electrolytic hydrogen generators
24 p0649 A79-49228

LOVEDAY, D. L.
Domestic space and water heating for existing dwellings using a heat pump and conventional roofs as energy absorbers
23 p0449 A79-37851

LOVEJOY, S. B.
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-297314/9] 22 p0335 N79-16380

LOWDER, J. R. A.
Aspects of meeting complex industrial energy demand patterns using recuperated gas turbines
23 p0454 A79-37905

LOWE, J.
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975

LOWE, J. E.
The MOD-2 wind turbine
24 p0635 A79-46542

LOWELL, C. E.
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498

LOWENSTEIN, A.
Consolidation and local control of power in an MHD generator
23 p0395 A79-33425

LOWENSTEIN, A. I.
Shock tube studies of coal devolatilization
21 p0083 A79-15247

LOWENSTEIN, H. Z.
The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209
LOWRY, W.
A test bed for thermosyphon solar air collectors
[AIAA PAPER 79-0541] 22 p0274 A79-25860
LOWTHER, J. D.
FLAME: Forestry Lands Allocated for Managing energy. Feasibility study
[AD-A059993] 21 p0217 N79-14507
LU, P. W. T.
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
State of development in the area of water electrolysis /near term/
23 p0414 A79-34114
Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process
24 p0685 A79-51843
LUBIS, W.
Flux-redistribution in the focal region of a planar Fresnel ring mirror
22 p0263 A79-23764
LUBORSKY, F. E.
High-gradient magnetic separation for removal of sulfur from coal
[PB-290945/5] 23 p0569 N79-25469
LUBOSCHIK, U.
Uncovered absorber combined with flatroof collectors and heatpump
23 p0469 A79-38636
LUCAS, J.
Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492
Thermal power systems, point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-158534] 23 p0560 N79-24464
LUCAS, J. W.
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869
Solar parabolic dish thermal power systems - Technology and applications
24 p0674 A79-51755
LUCAS, W. J.
The department of Defense's alternate energy policy
[AD-A058200] 21 p0197 N79-12563
LUCHININ, A. G.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034
LUCKL, L.
Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720
LUDLOW, J. C.
The use of chlorophyll in a novel solar battery
24 p0736 N79-29594
LUDWIG, F. L.
Estimation of wind characteristics at potential wind energy conversion sites
23 p0534 A79-43377
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text
[PB-294812/3] 24 p0803 N79-33639
LUDWIG, L. P.
Energy conservation through sealing technology
22 p0237 A79-20700
LUE, J. T.
The fabrication of Schottky-barrier solar cells by electroless nickel plating
23 p0436 A79-35746
LUENGO, C. A.
Liquefaction of high ash Brazilian coals
23 p0385 A79-33224
Fluidised bed combustion of high ash Brazilian coals
23 p0385 A79-33225
LUFFEY, F. C.
The control system for Fort Hood Solar Total Energy System
24 p0672 A79-51742
LUFT, W.
Design features of the TDRSS solar array
21 p0002 A79-10019
LUKENS, L. L.
Solar powered irrigation systems
23 p0403 A79-34030
Solar powered irrigation: Present status and future outlook
[SAND-78-0016C] 21 p0175 N79-10539
Solar irrigation program plan: Second revision
[SAND-78-0308-REV] 21 p0187 N79-11525
Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566
LUKIANOV, A. V.
Superlight rotating reflectors in space
[IAF PAPER 79-112] 24 p0709 A79-53301
Satellite solar power station designs with concentrators and radiating control
[IAF PAPER 79-176] 24 p0710 A79-53336
LUMMUS, C.-E.
The Synthane process - A technical and economic assessment
23 p0410 A79-34089
LUND, W. W., JR.
A microwave power transmission system for space satellite power
21 p0002 A79-10025
Microwave phased array design considerations for SPS
21 p0003 A79-10031
LUNDBERG, R. M.
Hydrogen - Potential key to tomorrow's energy utility
22 p0289 A79-27657
LUNDE, P. J.
Prediction of the performance of solar heating systems utilizing annual storage
22 p0263 A79-23760
Prediction of the performance of solar heating systems over a range of storage capacities
24 p0712 A79-53492
LUNDIN, C. E.
A new rationale for the hysteresis effects observed in metal-hydrogen systems
22 p0250 A79-21704
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution
23 p0415 A79-34124
LUNDSAGER, P.
Measurements of performance and structural response of the Danish 200kW Gedser windmill
23 p0484 A79-40121
LUONGO, G.
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727
LUQUE, A.
Transcell, a novel approach for improving static photovoltaic concentration
21 p0124 A79-17356
The effect of the dispersion of the characteristics of solar cells in large systems
22 p0285 A79-26822
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071
LUSTENADER, E. L.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110
A status of the 'Alpha-ply' composite flywheel concept development
22 p0241 A79-20843
Regenerative flywheel energy storage system
24 p0678 A79-51783
LUTON, J. N.
The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541
LUTWACK, R.
Electricity from sunlight
21 p0065 A79-14116
LUTZ, S. J.
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results
[PB-290514/9] 23 p0566 N79-24534
LUXENBERG, E. A.
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
LUZZI, G.
Oxygen adsorption on stainless steel
23 p0445 A79-36965
LYCZKOWSKI, R. W.
Development of mechanistic theory for drying of porous media using two-fluid, two-phase flow theory
[UCRL-81604] 24 p0720 N79-28521
Multiphase flow analysis of oil shale retorting
[UCRL-81717-REV-1] 24 p0721 N79-28656
Multiphase flow analysis of oil shale retorting
[UCRL-81717] 24 p0721 N79-28658
LYDORF, I.
Latest developments in solar array technology at AEG-Telefunken
23 p0500 A79-40915
LYKOV, V. A.
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658
LYMAN, W. S.
Optimum collection geometries for copper tube - copper sheet flat plate collectors
21 p0127 A79-17387
LYNCH, F. E.
A new rationale for the hysteresis effects observed in metal-hydrogen systems
22 p0250 A79-21704
Modification of hydriding properties of AB5 type hexagonal alloys through manganese substitution
23 p0415 A79-34124
LYNCH, J. F.
Prospects for coal slurry pipelines in California
23 p0592 N79-27608
LYNCH, J. J.
Considerations for adapting an MHD baseload power plant for intermediate and peaking duty
24 p0701 A79-51992
LYNCH, J. R.
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
LYNETTE, R.
MOD-2 failure mode and effects analysis
[NASA-CR-159632] 24 p0747 N79-30415
LYNN, S.
A new power cycle that combines power generation with energy storage
21 p0004 A79-10040
LYON-ALLEN, M.
Developing small hydroelectric dam potential
[PB-296238/9] 24 p0802 N79-33601
LYON, E. F.
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Design of the Natural Bridges National Monument 100 kW PV power system
23 p0521 A79-41090
Mead 25 kilowatt photovoltaic system
[COO-4094-19] 23 p0596 N79-27677
LYON, R. J. P.
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10273] 24 p0768 N79-31730
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10274] 24 p0768 N79-31731
LYSAKOVSKII, G. G.
Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249
LYSENKO, S. E.
Recombination-induced neutral-particle flux in tokamaks
22 p0291 A79-27877
LYTLE, J. K.
The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260
LYTLE, J. M.
The effect of coal characteristics on the catalytic liquefaction of Utah coals
24 p0628 A79-45991
A survey of methods of coal hydrogenation for the production of liquids
24 p0628 A79-45994
LYTLE, R. J.
Use of high-frequency electromagnetic waves for mapping an in situ coal gasification burn front
23 p0486 A79-40251

M

MAAG, W. L.
Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192
Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403
Analysis of a fuel cell on-site integrated energy system for a residential complex
[NASA-TM-79161] 23 p0542 N79-22624
MAASS, K.
Development of a 1 kW fuel cell aggregate with acid electrolyte
21 p0148 A79-17994
MABES, D. L.
A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679
MACCHI, E.
A comparison between sun and wind as energy sources in irrigation plants
21 p0118 A79-17295
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268
MACFARLANE, J. J.
Future fuels for aviation
21 p0201 N79-13193
The role of fundamental combustion in the future aviation fuels program
21 p0202 N79-13195
MACGREGOR, A. W. K.
Economic use of materials in the design of solar water-heating collector plates of the pipe and fin type
21 p0129 A79-17396
MACHIDA, Y.
Hydride formation of C14-type Ti alloy
22 p0250 A79-21701
MACHIZAUD, F.
Study of refrigeration couples for solar cooling in tropical zone
23 p0383 A79-32960
MACHUEV, IU. I.
Thermal deformations of solar-energy concentrators
21 p0166 A79-20355
MACIOLEK, R. B.
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
MACIOROWSKI, A. F.
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709
MACK, M. R.
Solar power for telecommunications
24 p0628 A79-46050
MACKINTOSH, B.
Large area silicon sheet by EFG
21 p0123 A79-17340
MACKINTOSH, B. H.
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939
MACKLIS, S. L.
Wind energy conversion system transient performance analysis
24 p0635 A79-46545
Assessmentt of wind energy systems in a utility framework
24 p0677 A79-51779

MACLEOD, E. M.
Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells
[AD-A058380] 21 p0206 N79-13505
MACMILLAN, W. L.
Testing to assess the affect of degraded fuel specifications on the cold start ability of a T63-A-700 engine
[AIAA 79-7009] 22 p0300 A79-29384
MACPHERSON, H. G.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699
MACRAE, G. M.
Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah
23 p0534 A79-43371
MADAN, A.
A new amorphous silicon-based alloy for electronic applications
21 p0100 A79-16226
MADAN, M. K.
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357
MADEY, J. M. J.
Boltzmann simulation of a storage ring laser
23 p0487 A79-40381
MADIGAN, J. M.
Parameters, measurement and criteria of solar materials testing
23 p0431 A79-35072
MAEDA, H.
General view of low cost solar cell development in Japan
21 p0149 A79-17997
Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881
MAEDA, K.
MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192
MAEKAWA, T.
Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037
MAEKAWA, Y.
Heat transfer of absorbing evaporator in CDE engine system
23 p0531 A79-42900
MAELAND, A. J.
Hydrides for energy storage; Proceedings of the International Symposium, Geilo, Norway, August 14-19, 1977
22 p0247 A79-21676
Survey of the different types of hydrides
22 p0247 A79-21678
MAENO, M.
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0645 A79-49254
MAGAL, B. S.
Mechanical energy storage system for a 10 KWe solar power pack
21 p0121 A79-17329
MAGDELENAT, J.-L.
Solar energy via satellites and international cooperation
22 p0310 A79-30952
MAGEE, R. A.
Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
Sampling and analysis of synthetic fuel processes
22 p0284 A79-26538
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864
MAGELSSEN, G. R.
Pellet X-ray spectra for laser fusion reactor designs
22 p0291 A79-27878
MAGET, H. J. R.
Application of a GaAs photovoltaic solar system in a utility substation
24 p0676 A79-51770
MAGGITTI, L.
Future fuels in gas turbine engines
21 p0051 A79-12979
MAGNAS, H. L.
Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies
23 p0403 A79-34032
MAGNOLI, D.
Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177
MAHAJAN, S. M.
Stability criteria for current-driven drift wave eigenmodes
22 p0269 A79-24813
MAHAN, J. R.
Measurement of minority carrier lifetime in solar cells from photo-induced open-circuit voltage decay
23 p0438 A79-36610
MAHAN, J. S.
Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800
MAHAWILI, I.
A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming
24 p0681 A79-51811
MAHDJURI, F.
Evacuated heat pipe solar collector
24 p0708 A79-52554
MAHEFKEY, E. T.
Thermal management for future Air Force high power spacecraft
24 p0692 A79-51923
Military needs for orbital power
21 p0169 N79-10127
MAHEFKEY, T.
Dynamic Isotope Power Systems /DIPS/
24 p0692 A79-51928
MAHENC, J.
Solar and chemical energy
23 p0462 A79-38573
MAHN, M.
Midterm oil and gas supply modeling system methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059
MAHONEY, J. M.
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry
21 p0064 A79-14112
MAIDANIK, IU. F.
Design of a heat pipe with separate channels for vapor and liquid
22 p0268 A79-24486
MAIER, R. M.
Requirements for the development, management and implementation of research in support of the Department of Energy enhanced oil recovery program
[BETC-2025-1] 24 p0776 N79-31831
MAIFIELD, D. L.
Considerations in sizing coal gasification plants
[FE-2240-40] 24 p0766 N79-31417
MAILEN, G. S.
Condensation of refrigerants on vertical fluted tubes
[ORNL/TM-5848] 24 p0781 N79-32515
MAITLEN, J. L.
Energy storage operation of combined photovoltaic/battery plants in utility networks
23 p0520 A79-41079
MAITRA, K.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344
MAJER, E. L.
Seismological investigations in geothermal regions
22 p0356 N79-19506
MAKABE, M.
Reaction mechanism of alkali-alcohol treatment of coal
22 p0299 A79-29315
MAKAREVICH, I. M.
Optimization of radioisotope thermoelectric generators with gamma-radiation protection
23 p0433 A79-35176

MAKAROV, IU. V.
Effect of the properties of the working body on the selection of the temperature of the surface of the electrodes of the channel of an MHD generator
21 p0167 A79-20419

MAKHLIN, A. G.
Stability of work and sensitivity of semiconductor thermoelectric systems under automatic control
22 p0261 A79-23624

MAKOWITZ, H.
The fast power cycle for fusion reactors
21 p0018 A79-10152

MAKSIMENKO, V. I.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
Diagonal frame RM channel of the U-25 power plant
23 p0393 A79-33407

MAKSIMOV, G. N.
Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products
21 p0164 A79-19851

MAKSIMOV, V. I.
Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530

MAKSIMOVIC, S. D.
Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608

MALCOLM, J. W.
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States
[PB-286940/2] 21 p0231 N79-15440

MALECHA, R. F.
Review of industrial participation in the ANL lithium/iron sulfide battery development program
21 p0010 A79-10086

MALEK, A.
Current problems in the development and production of small gas turbine engines
21 p0048 A79-12529

MALES, R. H.
Exploring future energy options - An economic analysis
21 p0068 A79-14324

MALEVSKII, IU. N.
Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670
Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

MALEWSKI, W. F.
Combined cycles for pipeline compressor drives using heat
[ASME PAPER 79-GT-162] 23 p0378 A79-32424

MALGHAN, V. R.
Prospects of MHD power generation in India using coal
23 p0454 A79-37907

MALGIERI, A. J.
Technology assessment of geothermal pumping equipment
[ALO-4162-2] 24 p0735 N79-29524

MALIFAUD, P.
Contribution to the study of optimal conditions for optical concentration in solar power plant designs - Reduction of the radiation spot provided by a field of heliostats by use of optimized conical mirrors
23 p0382 A79-32952

MALIK, M. A. S.
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282
Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009
Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010
Performance of a collector/storage solar water heater
23 p0479 A79-39843
Transient plate temperature in flat plate solar collectors
24 p0603 A79-44294

MALIK, M. J.
Emissions and economy potential of prechamber stratified charge engines
[SAE PAPER 790436] 22 p0315 A79-31374

MALIK, S. K.
Structure and bonding in metal hydrides
22 p0247 A79-21679

MALININ, N. K.
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274

MALISHEVSKAIA, N. A.
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream
21 p0114 A79-16786

MALIUZHONOK, G. P.
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875

MALLAEVA, KH. M.
Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259
Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183

MALLNER, C.
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

MALLON, B.
DOE/STOR bibliography for flywheel energy systems, 1977
[UCRL-52637] 24 p0742 N79-29665

MALONEY, K. L.
Low-sulfur western coal use in existing small and intermediate size boilers
[PB-287937/7] 22 p0346 N79-18061

MALONEY, M.
End-use energy-consumption data base. Version 10: User's manual
[DOE/EIA-0175] 24 p0772 N79-31790

MALOTT, J. P.
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

MALYKHIN, A. I.
Electric power losses of current input into superconducting devices cooled by supercritical helium
22 p0235 A79-20530
Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670
Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

MAMANE, Y.
Oxidation of SO2 on the surface of fly ash particles under low relative humidity conditions
22 p0277 A79-26038

MAMOTA, H.
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051

MANASEVIT, H. M.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0459 A79-40907

MANASEVIT, H. M.
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

MANASSEN, J.
Polycrystalline CdSe-based photo-electrochemical cells
21 p0037 A79-11785
Materials aspects of photo-electrochemical systems
24 p0704 A79-52308

MANAUD, J. P.
A new thermochemical process for hydrogen production
22 p0312 A79-31153

MANCHESTER, D. F.
Development of an Air Force facilities energy information system
[AD-A059309] 21 p0223 N79-14918

MANCHESTER, F. D.
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686

MANCINI, F. P.
Performance testing of a three ton solar absorption chiller
[AIAA PAPER 78-1757] 21 p0060 A79-13858

MANCINI, T. R.
Performance evaluation of the New Mexico State University Solar House
[ASME PAPER 78-WA/SOL-8] 21 p0163 A79-19840

MANCUSO, R. L.
Estimation of wind characteristics at potential wind energy conversion sites
23 p0534 A79-43377

MANDA, M. L.
Power coupling alternatives for the NEP thermionic power system
[NASA-CR-158372] 22 p0367 N79-21547

MANDELIK, B. G.
Hydrogen from coal using pressurized gasification
24 p0687 A79-51853

MANDELL, M. J.
NASCAP modelling of high-voltage power system interactions with space charged-particle environments
23 p0479 A79-39806

MANDERS, A. H. E.
Implications of large scale introduction of power from large wind energy conversion systems into the existing electric power supply system in the Netherlands
23 p0485 A79-40132

MANGARELLA, P. A.
Thermal properties of the Florida Current as related to ocean thermal energy conversion /OTEC/
24 p0641 A79-47796

MANI, A.
Measurement of solar radiation for energy conversion
21 p0119 A79-17305

MANI, K.
Interannual and month-to-month variations of wind speed
24 p0629 A79-46221

MANICKAM, J.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

MANIKOPOULOS, C. N.
The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470

MANISCALCO, J.
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

MANLEY, R. W.
Analysis of prospects for OTEC commercialization for baseload power
24 p0617 A79-45786

MANN, J. W.
A comparison of the performance of steam turbine cycles using gas contaminated geothermal steam
[ASME PAPER 78-WA/ENER-3] 21 p0159 A79-19776

MANN, M. J.
Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid
24 p0619 A79-45794
Qualification of a duplex, clad material for OTEC
24 p0623 A79-45828

MANN, R. M.
Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864

MANNAN, K. D.
Performance of optimal geometry three step compound wedge stationary concentrator
21 p0134 A79-17438
Design fabrication and testing of three meter diameter parabolic dish heliostat system
21 p0135 A79-17447
Design and performance of 1/4 H.P. solar power unit
21 p0141 A79-17503
Optimal geometries for one- and two-faced symmetric side-wall booster mirrors
21 p0149 A79-18019

MANNER, D.
An analytical expression for the specific output of wind turbine generators
22 p0273 A79-25720

MANNING, G. B.
The effect of environmental regulations on the General Electric research and development program for combustion turbines using coal-derived fuels
[ASME PAPER 79-GT-41] 23 p0375 A79-32344
Integrated coal conversion utilization program
[AIAA PAPER 79-0997] 23 p0459 A79-38195

MANNING, R. D.
Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479

MANNY, E. H.
Combustion modifications for the control of air pollutant emissions from coal fired utility boilers
[ASME PAPER 78-WA/APC-7] 21 p0158 A79-19738

MANOFF, M.
Solar Power Satellite thermal analysis
21 p0003 A79-10028

MANSFIELD, R. G.
The application of thermography to large arrays of solar energy collectors
22 p0242 A79-21171

MANSHILIN, V. V.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

MANSOUR, W. M.
A vertical-axis bicycle rotor turbine. I - Rotor design. II - Aerodynamic aspects
23 p0386 A79-33237
Design and performance of bicycle wind turbine rotors
24 p0677 A79-51777

MANTEAU, G.
Elements for technological and economic modeling of tower-type solar power plants
[P/51/76/17] 23 p0584 N79-26535
Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area
[P/51/77/21] 23 p0584 N79-26536

MANTRI, V. B.
Considerations for adapting an MHD baseload power plant for intermediate and peaking duty
24 p0701 A79-51992

MANVI, R.
Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation
21 p0020 A79-10163
Hydrogen in the U.S. energy picture
24 p0612 A79-45577

Projected techno-economic improvements for advanced solar thermal power plants
24 p0671 A79-51733
Turbine sizing of a solar thermal power plant
24 p0673 A79-51751
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503
MANZANO, J. J.
Cooling applications of thermic diode panels
[ASME PAPER 78-WA/SOL-10] 21 p0163 A79-19842
MAPLES, D.
Properties and operating experience with bagasse as a boiler fuel
23 p0489 A79-40395
MAPLES, S.
A mass and energy balance of a Wellman-Galusha gasifier
22 p0283 A79-26467
MAR, B. W.
Thermochemical energy storage and transport program
[SAND-78-8056] 21 p0221 N79-14570
MARASCHIN, R.
A novel low-cost photovoltaic concentrator
23 p0508 A79-40996
MARATHE, B. R.
A new fabrication process for single crystal silicon solar cells
21 p0122 A79-17335
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352
MARCELJA, F.
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600
MARCHAND, P.
French OTEC program
24 p0616 A79-45778
MARCHANT, D. D.
Electrochemical studies of MHD channel electrode materials in molten potassium salt and coal slags
23 p0392 A79-33399
Thermal properties of MHD electrode materials
23 p0392 A79-33400
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-9] 22 p0361 N79-20504
Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557
MARCHANT, L. C.
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043
MARCHENKO, A. I.
Thin-film and ceramic cadmium sulfide/cadmium selenide solar cells
24 p0646 A79-48737
MARCHISIO, J.
Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow
23 p0383 A79-32962
MARCINIAK, T. J.
Solid waste utilization in integrated community energy systems
23 p0490 A79-40415
DOE stationary external combustion engine program - Status report
24 p0689 A79-51882
Integrating technologies to produce energy conservation
[CONF-780109-6] 21 p0189 N79-11541
MARCUSE, W.
Economic impacts of a transition to higher oil prices
[BNL-50878] 22 p0364 N79-20927
Hierarchial decomposition approach to environmental policy analysis
[BNL-24444] 24 p0729 N79-28814
MARDEN, S. M.
Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829
MARDESICH, N.
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498
MARFAING, Y.
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186
MARFISI, E. P.
Impact of electric passenger automobiles on utility system loads, 1985 - 2000
[EPRI-EA-623] 21 p0203 N79-13281
MARGARITIS, P. J.
Process development for the Westinghouse advanced fluidized-bed coal gasification system
21 p0006 A79-10058
MARGEN, P.
Central solar heat stations and the Studsvik Demonstration Plant
21 p0021 A79-10175
Transport, distribution and storage of heat by water - Status and developments
23 p0524 A79-41803
MARGULIES, A. E.
Design study of a coal-fired thermionic-topped powerplant using an advanced boiler
24 p0700 A79-51983
MARIANO, R. S.
Rationing energy to industries - Priorities and input-output dependence
23 p0423 A79-34278
MARIANOWSKI, L. G.
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819
MARIAU, F.
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 1
[REPT-30/1020-VOL-1] 24 p0759 N79-30834
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 2
[REPT-30/1020-VOL-2] 24 p0760 N79-30835
MARICLE, D. L.
Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092
MARIE, J. P.
Solar houses in Blagnac /Blagnac, Haute-Garonne, France/
22 p0276 A79-25937
MARINCIC, N.
Discharge reaction mechanisms in Li/SOCl2 cells
22 p0305 A79-30331
MARKHAM, D. M.
Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042
MARKIEWIECZ, D.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306
MARKOWITZ, T. H.
A cost effective vertical air/water solar heating collector
22 p0320 A79-31430
MARKOWSKI, G. R.
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0796 N79-33352
MARKS, J. E.
Air monitoring network design for power plant siting
23 p0591 N79-27590
MARKSBERRY, C. L.
The application of indirectly fired open cycle gas turbine systems utilizing atmospheric pressure fluidized bed combustors to industrial cogeneration situations
[ASME PAPER 79-GT-16] 22 p0306 A79-30510
MARKVOORT, J. A.
The effect of thermo-electric forces on the density profiles in a thermonuclear plasma surrounded by a cold blanket
22 p0292 A79-27886
MARLAND, G.
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

MARLOW, R.
Estimating heat loads on multistage thermoelectric heat pumps
22 p0260 A79-23614

MARMAR, E. S.
The effects of wall temperature on light impurities in Alcator
22 p0313 A79-31188
Recycling processes in tokamaks
23 p0443 A79-36882

MAROLI, C.
Wave propagation and absorption near the electron-cyclotron layer in the 'THOR' device
22 p0271 A79-24867

MARONI, V. A.
Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951

MARQUET, L. C.
Historical review of adaptive optics technology
21 p0114 A79-17171

MARRIOTT, A. T.
JPL - Small Power Systems Applications Project
21 p0019 A79-10161
Solar parabolic dish thermal power systems - Technology and applications
24 p0674 A79-51755
Thermal power systems, small power systems application project. Volume 1: Executive summary
[NASA-CR-157441] 23 p0560 N79-24462
Thermal power systems small power systems applications project. Volume 2: Detailed report
[NASA-CR-162104] 24 p0749 N79-30718

MARRON, H. D.
Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533

MARSH, R. O.
Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551

MARSH, W. D.
Utility applications of wind power plants
21 p0092 A79-15882
Requirements assessment of wind power plants in electric utility systems
24 p0633 A79-46531

MARSHALL, B. W.
A status report on the Solar Thermal Test Facility
21 p0112 A79-16731

MARSHALL, J. E.
Experience with solid waste as a supplementary fuel
23 p0488 A79-40388

MARSHALL, J. F.
Perspectives on solar electric power for small homes
23 p0401 A79-34016
High-grade fuels from biomass farming - Potentials and constraints
24 p0669 A79-51194

MARSHALL, K. N.
An approximate equation for predicting the solar transmittance of transparent honeycombs
21 p0042 A79-11877

MARSHALL, R. F.
Performance characteristics of automotive engines in the United States. Third series: Report no. 2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411

MARSHALL, W. F.
Performance characteristics of automotive engines in the United States. First Series: Report No. 14 1975 Mazda Rotary 79 CID (1.1 liters), 4V
[PB-286074/0] 21 p0226 N79-15304
Performance characteristics of automotive engines in the United States. First series: Report no. 15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305
Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I.
[PB-286077/3] 21 p0227 N79-15307
Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), IV
[PB-286294/4] 21 p0227 N79-15308
Performance characteristics of automotive engines in the United States. Second series, report no. 6: 1976 Nissan diesel 198 CID (3.2 liters), F. I.
[PB-286295/1] 21 p0227 N79-15309
Performance characteristics of automotive engines in the United States. Second series, report no. 7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310
Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311
Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312
Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V
[PB-286299/3] 21 p0227 N79-15313
Performance characteristics of automotive engines in the United States. First series, report no. 19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-15314
Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315

MARSIK, S. J.
Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells
23 p0498 A79-40898

MARSTON, C. H.
Fluids engineering in advanced energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0278 A79-26176

MARTIN, A. E.
Calcium/iron sulfide secondary cells
21 p0041 A79-11835

MARTIN, C. J.
The design impact of power-augmented ram technology on large energy efficient aircraft
[AIAA PAPER 79-1864] 24 p0669 A79-51250

MARTIN, D.
An assessment of mercury emissions from fossil fueled power plants
[PB-285227/5] 21 p0213 N79-13592

MARTIN, F. H.
An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640

MARTIN, G. B.
Emission control techniques for alternative fuel combustion
21 p0053 A79-12990
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742

MARTIN, G. D.
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

MARTIN, J. F.
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142

MARTIN, J. H.
Solar energy for residential housing
21 p0090 A79-15857
Solar photovoltaic energy
24 p0667 A79-50909

MARTIN, J. W.
Design considerations for an in situ gasification test of eastern bituminous coals
21 p0005 A79-10049

MARTIN, J.-M.
Chances for a low energy profile society
24 p0653 A79-49522

MARTIN, P. J.
Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801

MARTIN, R.
An inexpensive multiplexer temperature measuring system for monitoring and evaluation of solar collectors
21 p0089 A79-15847

MARTIN, R. E.
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784
Advanced technology light weight fuel cell program
[NASA-CR-159653] 24 p0800 N79-33581
MARTIN, W. E.
Performance of the short-pulse oscillators for Argus and Shiva
21 p0083 A79-15171
MARTIN, W. J.
Practice of heat utilization from refuse
23 p0488 A79-40393
MARTINELLI, R. R.
A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558
MARTINET, J.
Theoretical and practical aspects of heat transfer in the window-absorber cavity of a flat plate collector
23 p0383 A79-32957
MARTINEZ-LOZANO, J. A.
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653
MARTINEZ-SANCHEZ, M.
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393
Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841
Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717
MARTINEZ, H. H.
Water/energy management and evaluation model for Pennsylvania
[PB-287577/1] 22 p0343 N79-17353
MARTINEZ, J. D.
Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes
[PNL-2871] 23 p0562 N79-24487
MARTINEZ, R.
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839
MARTINI, W. R.
Energy conversion in the long run
21 p0019 A79-10154
A thermal energy storage system for a Stirling engine powered highway vehicle
24 p0680 A79-51803
MARTINO, F. J.
Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries
21 p0010 A79-10089
Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829
MARTRES, R.
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900
MARTYNOV, M. A.
Superconductivity in antenna engineering
22 p0311 A79-31008
MARTZ, J.
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867
MARU, H. C.
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819
Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812
MARUHNIC, P.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864
MARUSAK, T. J.
The matching of a free piston Stirling engine coupled with a free piston linear compressor for a heat pump application
21 p0024 A79-10204
MARUSKA, H. P.
A study of oxide-based heterostructure photoelectrodes
24 p0705 A79-52314
MARZEC, A.
Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system
22 p0283 A79-26469
MARZOLA, D. L.
Photosynthetic pathway and biomass energy production
24 p0605 A79-44580
MASAI, K.
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110
MASAPATI, G. R.
Performance of magnetohydrodynamic generator in the inlet region
23 p0397 A79-33769
MASCETTI, G. J.
Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432
MASDEN, G. W.
Optimization of the geometrical parameters for arrays of tracking solar collectors to give minimum energy cost
23 p0511 A79-41016
Increased photovoltaic conversion efficiency through use of spectrum splitting and multiple cells
23 p0512 A79-41024
MASH, D. H.
Solar eyeball - An automatic sun-tracking concentrator for use with photovoltaic generators
23 p0442 A79-36792
MASI, J. V.
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
MASICA, W. J.
Thermal storage for industrial process and reject heat
22 p0243 A79-21300
Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481
The role of thermal energy storage in industrial energy conservation
[NASA-TM-79122] 22 p0368 N79-21550
MASKELL, W. C.
Mathematics of coiling in cylindrical electrochemical cells - The theory of a spiral bounded by two circles and its application to the spiral-wound nickel-cadmium cell
22 p0246 A79-21489
MASLENNIKOV, V. M.
Protection of the biosphere
21 p0105 A79-16483
MASON, B.
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800
MASON, J. J.
Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417
MASON, J. L.
Flywheels for vehicles
21 p0092 A79-15885
MASON, R.
A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it
[AD-A056018] 21 p0192 N79-11686
MASS, R. A.
Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691
MASSEE, P.
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420

MASSER, P. S.
Fixed angle and seasonally adjustable structural support concepts for solar converters
23 p0518 A79-41063

MASSEY, L. G.
Coal gasification for high and low Btu fuels
24 p0714 A79-53780

MASSEY, R. J.
Equipment and strategy for environmental sampling of complex coal gasification process streams
24 p0668 A79-51862

MASSIE, L. D.
Military needs for orbital power
21 p0169 N79-10127

MASTERS, L.
Degradation of polymethylmethacrylate by radiation
23 p0431 A79-35074

MASTERS, L. W.
Solar energy systems - Survey of materials performance
23 p0431 A79-35073

MASTERS, W.
A novel low-cost photovoltaic concentrator
23 p0508 A79-40996

MASTERSON, K. D.
Optics applied to solar energy IV; Proceedings of the Seminar, San Diego, Calif., August 30, 31, 1978
22 p0293 A79-28140
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

MASUDA, M.
Superconducting energy storage magnets
22 p0236 A79-20537

MASUDA, Y.
Wave power electric generation study in Japan
21 p0151 A79-18107

MASUHARA, Y.
Experimental studies of a linear MHD generator with fully ionized seed
22 p0238 A79-20796
Power generation experiments of a linear MHD generator with fully ionized seed
23 p0394 A79-33421

MATABASSO, P.
Solar air conditioning and refrigeration in arid regions
23 p0466 A79-38608

MATAYA, K.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303

MATAYA, K. F.
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532

MATERA, R.
Engineering aspects of demonstration fusion power reactors
24 p0655 A79-51950

MATHER, G. R.
Problems in collector testing
23 p0430 A79-35064

MATHER, G. R., JR.
Long-term average performance of the Sunpak evacuated-tube collector
21 p0089 A79-15854
Analysis and experimental tests of a high-performance evacuated tubular collector
[NASA-CR-150874] 22 p0334 N79-16370

MATHUR, A. K.
Active heat exchange system development for latent heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554

MATHUR, H. L.
Design, construction and performance of Fresnel lens for solar energy collection
21 p0136 A79-17456

MATHUR, P. C.
Temperature dependence of photovoltaic solar energy conversion for GaAs homojunction solar cell
22 p0256 A79-22768
Determination of the minority carrier diffusion length in silicon solar cells
23 p0528 A79-42248

MATHUR, S. S.
Preparation and properties of pure and tin doped indium oxide selective coatings
21 p0127 A79-17381
Some aspects towards the performance evaluation and ensuing design components of solar collector systems
21 p0130 A79-17404
Periodic heating/cooling by solar radiation
21 p0140 A79-17491

MATLIN, R.
Solar photovoltaic field tests and applications project
23 p0571 N79-25493

MATLIN, R. W.
25 kilowatt photovoltaic powered irrigation and grain drying experiment
21 p0143 A79-17519
Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545
Photovoltaic-powered irrigation experiments in the United States
[COO-4094-28] 23 p0596 N79-27673
Economics of solar photovoltaic energy systems for crop irrigation in the United States
[COO-4094-29] 24 p0726 N79-28769
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
Field tests of photovoltaic power systems
[COO-4094-32] 24 p0788 N79-32700

MATOBA, T.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345
Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47804

MATRAI, P.
MHD emissions and their controls
24 p0709 A79-52968

MATSUBARA, S.
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958

MATSUBAYASHI, O.
Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan
24 p0640 A79-47506

MATSUDA, H.
Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091

MATSUDA, O.
Application of finite element method to analysis of MHD generators
24 p0653 A79-50001

MATSUDA, S.
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

MATSUI, K.
Solar heating performance of the Toshiba Solar House No. 1
21 p0137 A79-17465

MATSUSHITA, T.
Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504

MATTA, J. E.
Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608

MATTISON, L.
Theory of the striated corona in a theta pinch
22 p0295 A79-28315

MATTHEI, K. W.
Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648

MATTHEWS, C. C.
Measured effects of flow leakage on the performance of the GT-225 automotive gas turbine engine
[ASME PAPER 79-GT-3] 22 p0306 A79-30502

MATTHEWS, C. G.
The future of methane supply
24 p0601 A79-44242
MATTHEWS, J. E.
Treatment of petroleum refinery, petrochemical and combined industrial-municipal wastewaters with activated carbon: Literature review
[PB-288211/6] 22 p0350 N79-18497
MATTHEWS, L.
The DOE 5 MW Solar Thermal Test Facility
23 p0428 A79-35046
High temperature materials study
23 p0431 A79-35070
MATTHEWS, L. K.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
The real time aperture flux system as part of the Solar Thermal Test Facility
23 p0429 A79-35050
Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility
24 p0658 A79-50343
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568
MATTICK, A. T.
Absorption of solar radiation by alkali vapors
21 p0108 A79-16612
MATTINGLY, C. T.
Complex static mirror solar concentration arrays
23 p0452 A79-37886
MATTINGLY, G. E.
Flow rate calibration for solar heating and cooling system evaluation
21 p0089 A79-15845
MATTIOLI, M.
Vacuum ultraviolet spectroscopic apparatus for space- and time-resolved measurements on a single tokamak plasma discharge
24 p0706 A79-52537
MATULA, R. A.
Combustion kinetics of selected aromatic hydrocarbons
[AD-A055381] 21 p0215 N79-14184
MATVEEV, IU. V.
Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine
21 p0114 A79-16800
Study of heat-pipe heat exchanger in the small gas turbine engine system
24 p0646 A79-48511
MATVEEV, V. P.
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255
MATVIENKO, M. I.
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274
MATZEN, B.
Wind energy - Heat generation
23 p0486 A79-40133
MATZEN, W. T.
A device model for the tandem junction solar cell
24 p0714 A79-53938
Design considerations for the Tandem Junction Solar Cell
24 p0784 N79-32651
MATZKANIN, B. L.
Performance evaluation of the New Mexico State University Solar House
[ASME PAPER 78-WA/SOL-8] 21 p0163 A79-19840
MAUDES, J. S.
An anomalous photocurrent in SnO2-Si heterojunction solar cells
24 p0668 A79-50950
MAUK, C. E.
Optical and thermal analysis of a Cassegrainian solar concentrator
24 p0713 A79-53898
MAUL, G. A.
Regional-scale sea surface temperature determination from the geostationary environmental operational satellite
24 p0617 A79-45781
MAURER, J. R.
Use of the new stainless alloys for OTEC heat exchangers
24 p0627 A79-45864
MAX, C. E.
Stimulated scattering of light by ion modes in a homogeneous plasma - Space-time evolution
23 p0478 A79-39566
MAXIMOVITCH, S.
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480
MAXWELL, C. D.
Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042
MAXWELL, H.
Encapsulant materials for $2/watt terrestrial photovoltaic arrays
22 p0266 A79-24138
MAXWELL, H. G.
Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
MAXWELL, J. R.
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375
MAY, W. B., JR.
Engineering influences on the thermal performance of open-flow liquid solar collectors
23 p0398 A79-33991
MAYER-SCHWINNING, W.
Total wind energy over Central Europe and its maximum utilization through optimal degree of development of solar wind conversion plants
23 p0472 A79-38657
MAYER, H.
GUD - An unfired combined cycle approach to energy utilization
[ASME PAPER 79-GT-131] 23 p0377 A79-32400
MAYES, R. P.
Initial thoughts on the transmission implications of large wave power complexes
23 p0455 A79-37916
MAYFIELD, J.
Manufacturers developing fuel-efficient engines
23 p0438 A79-36380
MAYNARD, C. W.
Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies
[COO-4636-1] 23 p0582 N79-26511
MAYO, L. G.
Solar thermal power plants in small utilities - An economic impact analysis
24 p0675 A79-51761
Assessment of the potential of solar thermal small power systems in small utilities
[NASA-CR-158093] 22 p0335 N79-16377
MAYS, I. D.
Development of the Variable Geometry Vertical Axis Windmill
23 p0484 A79-40125
MAZARIS, G. A.
Open-circuit voltage improvements in low-resistivity solar cells
24 p0784 N79-32649
MAZRIA, E.
Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899
MAZUR, M. I.
Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371
MCALEES, D. G.
Characteristics of a predemonstration fusion device
21 p0078 A79-14784
MCALEVY, R. F., III
A critical review and evaluation of published electric-vehicle performance data
21 p0009 A79-10081

Optimum design of automotive vehicles employing alternate energy sources of low energy density - Impact on selection of an energy-carrier for future urban vehicle transportation systems
23 p0415 A79-34128

Prediction of vehicle performance and its sensitivity to component improvements Application to electric and H2-fueled vehicles
24 p0677 A79-51782

MCALLISTER, A. J.

Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553

MCALLISTER, W. J.

Potential for stand-alone photovoltaic on-site total-energy residential systems
23 p0516 A79-41050

MCBREEN, J.

The zinc electrode in sealed alkaline cells
21 p0040 A79-11823

An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0397 A79-33836

Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960

Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492

MCBRIDE, D. A.

Risk control in the development of energy processes
21 p0085 A79-15372

MCBRIDE, E. J.

Siting considerations for solar thermal electric generating plants
24 p0664 A79-50879

MCBRIDE, J. B.

Quasi-linear theory of heat flow and diffusion in a tokamak
22 p0270 A79-24859

Theory of the striated corona in a theta pinch
22 p0295 A79-28315

MCBRYAR, H.

Technology status: Fuel cells and electrolysis cells
21 p0170 N79-10133

MCCAFFERTY, R. H.

Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38045

MCCAIN, J. D.

Evaluations of novel particulate control devices
[PB-283973/6] 21 p0199 N79-12601

MCCALLUM, P. W.

The status of alcohol fuels utilization technology for highway transportation
21 p0003 A79-10035

MCCANDLESS, L. C.

Assessment of coal cleaning technology
[PB-287091/3] 22 p0330 N79-16139

Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625

MCCARLEY, H. B.

Energy conservation and solar energy - Partners in progress
[AIAA PAPER 79-0979] 23 p0475 A79-38890

MCCARTHY, J. E.

The Research-Cottrell/Bahco SO2 and particulate removal system at Rickenbacker Air Force Base
21 p0065 A79-14122

MCCARTHY, R. L.

Energy storage and conversion in conjunction with photovoltaic energy systems
24 p0679 A79-51790

MCCARTNEY, K.

Retrofitting strategies for a housing cooperative
23 p0473 A79-38671

MCCARTNEY, R. D.

A comparison of some simple models used to predict solar irradiance on a horizontal surface
24 p0661 A79-50546

MCCHESNEY, R. H.

Solar heated and cooled financial building
21 p0139 A79-17484

MCCLELLAND, J. F.

Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
23 p0432 A79-35079

Passive solar heating of buildings using a transwall structure
24 p0712 A79-53493

MCCONE, A. I.

Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667

MCCONNAUGHEY, J. S.

Life-cycle costing. A guide for selecting energy conservation projects for public buildings
[PB-287804/9] 22 p0345 N79-17744

MCCONNELL, J. C.

Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste
[PB-285196/2] 21 p0213 N79-13590

MCCONNELL, J. F.

EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378

MCCONNELL, R. D.

Validation of an electric circuit model of a solar house
22 p0321 A79-31440

A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123

Summary report on the collapse of the Magdalen Islands wind turbine
24 p0635 A79-46544

MCCORKLE, K.

Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

MCCORKLE, K. H.

Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127

MCCORMICK, J. E.

Brayton Isotope Power System - The versatile dynamic power converter
21 p0023 A79-10190

MCCORMICK, J. B.

Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936

Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960

MCCORMICK, M. E.

Wave energy conversion in a random sea
21 p0030 A79-10252

Waves, salinity gradients and ocean currents - Alternative energy sources
24 p0616 A79-45780

MCCORMICK, P. G.

The structure and properties of Cu based selective surfaces formed on an Al-Cu alloy by chemical brightening and etching treatments
21 p0127 A79-17384

MCCORMICK, S. F.

Toward optimal control of solar energy systems
24 p0643 A79-47944

MCCORMICK, S. T.

The diffusion of photovoltaics - Marketing and government policy implications for an emerging technology
23 p0516 A79-41053

MCCOY, B. C.

Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661

MCCOY, F. W.

The use of ocean energy - A hydrostatic motor
22 p0288 A79-27391

MCCOY, L. R.

Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries
21 p0010 A79-10088

MCCOY, M. G.

Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979

MCCOY, W.

The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

MCCRACKEN, G. M.

Review of results from DITE tokamak
21 p0069 A79-14456

Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876
Plasma-surface interactions in tokamaks
23 p0527 A79-41942

MCDANIEL, B.
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337

MCDONALD, C. F.
The nuclear closed-cycle gas turbine /GT-HTGR/ - A utility power plant for the year 2000
[AIAA PAPER 79-0191] 21 p0157 A79-19590
The role of the ceramic heat exchanger in energy and resource conservation
[ASME PAPER 79-GT-106] 23 p0377 A79-32381
Large closed-cycle gas turbine plant
[GA-A-14311] 22 p0331 N79-16261
Nuclear closed-cycle gas turbine (GT-HTGR): A utility power plant for the year 2000
[GA-A-15184] 23 p0582 N79-26515

MCDONALD, C. L.
An evaluation of the potential for district heating in the United States
23 p0417 A79-34142

MCDONALD, H. O.
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276

MCDONALD, R.
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538

MCDONALD, R. K.
Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PO-1] 24 p0790 N79-32717

MCDONALD, T. E.
Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520

MCDOUGAL, A. R.
Design of a preprototype Stirling Laboratory Research Engine
21 p0024 A79-10203

MCDOWELL, W. J.
New processes for the recovery of resource materials from coal combustion wastes
21 p0007 A79-10065

MCELMURRY, B.
Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier
[EPRI-AF-782] 21 p0180 N79-11238
Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation
[EPRI-AF-753] 21 p0185 N79-11498

MCELRAVY, E.
An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California
[PB-293031/1] 23 p0585 N79-26562

MCELROY, J. E.
Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells
[AD-A058380] 21 p0206 N79-13505

MCELROY, J. F.
Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130

MCFADDEN, J. H.
Energy supply and environmental impacts: Conventional sources, study module 3-A, technical appendix
[PB-283787/0] 21 p0198 N79-12573

MCFARLAND, B. L.
The solar total energy system evaluation program /STESEP/
24 p0673 A79-51749

MCFARLAND, D. R.
Investigation of a staged plasma-focus apparatus
22 p0255 A79-22365

MCFARLAND, R. D.
Passive solar heating of buildings
[LA-UR-77-1162] 21 p0090 A79-15859
Passive solar heating of buildings
22 p0275 A79-25928
Initial experimental tests on the use of small passive-solar test-boxes to model the thermal performance of passively solar-heated building designs
23 p0439 A79-36631

MCGARITY, A. E.
Solar heating of buildings: Design optimization and economic analysis
22 p0353 N79-19439

MCGEEHIN, P.
Large scale energy storage - Batteries for transport and stationary applications
23 p0451 A79-37875

MCGETCHIN, T. R.
Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

MCGILL, J.
The interfacial layer in MIS amorphous silicon solar cells
22 p0258 A79-23039
Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778
M-I-S solar cells on amorphous silicon
23 p0510 A79-41008

MCGOWAN, J. G.
Advanced wind furnace systems for residential and agricultural heating and electrical supply applications
21 p0028 A79-10237
Development of compact heat exchangers for Ocean Thermal Energy Conversion /OTEC/ systems
[ASME PAPER 78-WA/HT-34] 21 p0161 A79-19815
Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188

MCHARDY, J.
O2 reduction kinetics in concentrated acids
21 p0038 A79-11809

MCHENRY, H. I.
Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy
24 p0604 A79-44549

MCHUGH, J. P.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762

MCILHAGGER, D. S.
Options and constraints in the use of wave power
23 p0454 A79-37914

MCILHENNY, W. F.
Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826

MCINTIRE, W. R.
On the design of CPC photovoltaic solar collectors
[CONF-780114-8] 21 p0124 A79-17355
Photovoltaic power generation by use of compound parabolic concentrators
23 p0402 A79-34024

MCINTOSH, G. E.
Refrigeration requirements for future superconductive energy related applications
22 p0311 A79-31019

MCINTYRE, J. D. E.
Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776

MCINTYRE, J. F.
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A059795] 21 p0206 N79-13503

MCKAY, D. C.
The role of applied meteorology in the Canadian energy programme
22 p0317 A79-31414

MCKEE, C. R.
Bibliography of subsidence and related topics for in situ coal gasification
[LETC/RL-71316-1] 24 p0733 N79-29373

MCKENZIE, D. R.
Gold, silver, chromium, and copper cermet selective surfaces for evacuated solar collectors
22 p0256 A79-22855

MCKEON, R. M.
SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319

MCKHANN, G.
The 100 kW space station
22 p0371 N79-21603

MCKIEL, G.
Solar energy retrofit system for an older-type building - The Williamstown Museum project
22 p0320 A79-31434

MCKINNON, M. A.
Incremental cost analysis for advanced compressed air energy storage concepts
24 p0679 A79-51797

MCKINZIE, G. A.
Economy in flight operations
21 p0048 A79-12383

MCKLVEEN, J. W.
Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

MCKNIGHT, D.
Development of a compact gas turbine combuster to give extended life and acceptable exhaust emissions
[ASME PAPER 78-GT-146] 21 p0033 A79-10799

MCLALLIN, K. L.
Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance
[NASA-TM-78993] 22 p0345 N79-17859

MCLAREN, G. W.
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182

MCLAUGHLIN, E. R.
Experience gained and lessons learned from monitoring the solar building, Albuquerque
21 p0088 A79-15833

MCLAUGHLIN, J. F.
Determination of the potential for solar retrofitting in Edmonton
22 p0323 A79-31456

MCLEAN, E. A.
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

MCLEAN, W. J.
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines
23 p0461 A79-38387
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297

MCLOUGHLIN, G. T.
A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143

MCMULLAN, J. T.
Modelling of a domestic wind power system including storage
23 p0396 A79-33764

MCMULLEN, J. C.
Heavy duty gas turbine design changes for use with low Btu coal gas
[ASME PAPER 79-GT-198] 23 p0380 A79-32455

MCMURPHY, F. E.
Bibliographic and numeric data bases for fiber composites and matrix materials
21 p0114 A79-16984

MCNAMARA, B.
Single-particle behaviour in plasmas
22 p0257 A79-22977

MCNAMARA, T. J.
A solar energy system for space heating and space cooling
21 p0072 A79-14686

MCNEESE, L. E.
Recent developments in coal liquefaction in the United States
[CONF-790213-5] 24 p0779 N79-32383

MCNELIS, B.
Large scale solar thermal power generation
23 p0452 A79-37890

MCNELIS, D. N.
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0599 N79-27730

MCNERNEY, A. J.
High voltage insulation and bushing design for flexible superconducting cables
[BNL-25351] 24 p0719 N79-28439

MCNICHOLS, J. L.
Nitinol heat engines for economical conversion of low grade thermal density
21 p0027 A79-10230
Low-grade thermal energy-conversion Joule effect heat engines
[ASME PAPER 78-ENAS-7] 21 p0048 A79-12556
Thermoclines: A solar thermal energy resource for enhanced hydroelectric power production
22 p0237 A79-20730

MCNITT, R. P.
On design requisites for hydrogen energy systems
24 p0685 A79-51844

MCSHANE, W. R.
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024

MCVEIGH, J. C.
The development of a stationary concentrator
23 p0464 A79-38586

MCVEY, B. D.
A ray-tracing analysis of fast-wave heating of tokamaks
22 p0313 A79-31186

MCWILLIAMS, D. A.
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532

MEAD, G. H.
Energy education training: Feasibility study
[PB-285910/6] 21 p0230 N79-15428

MEAD, S. W.
Environmental investigations of in situ coal gasification experiments
24 p0664 A79-50880

MEADER, D. B.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414
High power magnetohydrodynamic system, volume 1
[AD-A064796] 23 p0543 N79-22639
High power magnetohydrodynamic system, volume 2
[AD-A064435] 23 p0544 N79-22640

MEADOWCROFT, D. B.
Open cycle MHD generation in the United Kingdom - A reappraisal
23 p0453 A79-37904

MEAGHER, J. F.
The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant
21 p0076 A79-14757

MEAGHER, P. C.
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375

MEAKIN, J. D.
Recent progress in thin film polycrystalline solar cells based on cadmium sulfide
21 p0042 A79-11966
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428

Low cost thin-film CdS-based solar cells progress and promise
[ASME PAPER 79-SCL-15] 22 p0309 A79-30549
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949

MECH, A. R.
Stratification in thermal storage during charging
23 p0532 A79-42974

MECHERIKUNNEL, A. T.
Solar spectral irradiance at ground level
23 p0429 A79-35053

MEDIN, S. A.
Subsonic flow in the channel of an MHD-generator
21 p0167 A79-20413
Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392
Diagonal frame RM channel of the U-25 power plant
23 p0393 A79-33407
Heat transfer in a high-power MHD channel
23 p0533 A79-43171
Effect of load factor on the characteristics of series MHD generators
24 p0650 A79-49372

MEDVEDEVA, L. N.
Large-area silicon photocells for the investigation of the optical/energetic characteristics of solar and radiant-energy concentrators
24 p0646 A79-48735

MEHROTRA, R. K.
Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486

MEHTA, B. R.
Hydrogen program at Electric Power Research Institute
24 p0687 A79-51854

MEHTA, D. C.
Catalyst aging tests and the role of catalyst wetting on hydrodesulfurization of a coal derived liquid
22 p0352 N79-19169

MEHTA, G. D.
Assessment of the potential of generating power from aqueous saline solutions by means of Osmo-Hydro Power systems
21 p0016 A79-10133
Feasibility and economics of salinity power using Osmo-Hydro Power
24 p0701 A79-51997

MEI, J. S.
Fluidized-bed combustion of low-quality fuels
21 p0007 A79-10066
Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543

MEI, V.
Thermal performance of integrated solar collector evaporator heat pump
[AIAA PAPER 79-0976] 23 p0457 A79-38182
Solar collector as heat pump evaporator
24 p0672 A79-51744

MEIER, G. H.
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395

MEIER, P. M.
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572
Locational response to regulatory policy: A regional analysis of energy facility location
[BNL-23597] 23 p0598 N79-27695
Application of resource allocation models to the problems of regional energy policy in large developing countries
[BNL-25537] 24 p0728 N79-28779

MEIER, R. F.
Potential application of Madison formation waters for community heating in South Dakota
[APL/JHU-CM-78-042R] 24 p0740 N79-29640

MEIER, R. L.
Urbanism and energy in developing regions
[LBL-7808] 21 p0189 N79-11540

MEIER, W.
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

MEIJER, R. J.
Conceptual design of a variable displacement Stirling engine for automotive propulsion
21 p0025 A79-10207
A variable angle wobble plate drive for a stroke controlled Stirling engine
24 p0690 A79-51890

MEINEL, A. B.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

MEINHOLD, H.
Recent advances in Na/S cell development - A review
22 p0246 A79-21488
Sodium/sulfur batteries for peak power generation
24 p0684 A79-51836

MEINKE, W. W.
Production of synthetic fuels - An important civilian application of laser fusion
23 p0408 A79-34066

MELDGIN, N. J.
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538

MELIB, M.
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624

MELIKIAN, G.
Analysis and design of an 18-ton solar-powered heating and cooling system
21 p0019 A79-10156

MELISS, M.
Potential and technical utilization of renewable energy sources
21 p0058 A79-13655
Energy resources for tomorrow - The possible role of non-nuclear and non-fossil energy resources
23 p0420 A79-34170
Aspects of solar energy use in the Federal Republic of Germany
23 p0473 A79-38668
Renewable energy sources
24 p0606 A79-44958

MELLOR, A. M.
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982
A characteristic time correlation for combustion inefficiency from alternative fuels
[AIAA PAPER 79-0357] 21 p0158 A79-19687

MELLOR, G. L.
Some flow analyses for Tornado-type wind turbines
22 p0279 A79-26181

MELROY, P. J.
Modular stackable hot water storage/heat exchanger system for solar installations
23 p0400 A79-34004

MELSA, J. L.
Energy savings for a solar heated and cooled building through adaptive optimal control
24 p0644 A79-47947

MELSHEIMER, S. S.
Heat transfer and calorimetric studies of a direct contact-latent heat energy storage system
22 p0281 A79-26210

MELTON, W. C.
Solar Heating and Cooling Of Buildings (SHACOB) requirements definition and impact analysis
[EPRI-ER-808-VOL-1] 23 p0597 N79-27687
Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis
[EPRI-ER-808-SY] 24 p0787 N79-32687

MELVIN, A.
The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation
24 p0649 A79-49231
MELZER, J.
Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513
MEMMING, R.
Energy production by photoelectrochemical processes
24 p0633 A79-46521
MENABDE, N. E.
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167
MENDELSOHN, M.
HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529
MENDELSOHN, M. H.
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716
MENDES, T. F.
The Coal Information Center of the Foundation for Science and Technology
23 p0389 A79-33262
MENSE, A. T.
Fusion power demonstration study at ORNL
23 p0407 A79-34059
Numerical modeling of impurity effects
23 p0445 A79-36945
MENSFORTH, T.
Windpower generation on a large scale
23 p0452 A79-37891
MENTLEY, D.
Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486
MENYUK, C. R.
Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473
MERCK, W. F. H.
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420
MERCURE, R. A.
Some design considerations of automotive gas turbines
[SAE PAPER 790128] 22 p0314 A79-31360
MEREDITH, D. B.
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I
22 p0276 A79-25939
The desiccant/rock bed method of solar cooling with air collectors
24 p0676 A79-51771
MEREDITH, G. O. G.
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507
MERGES, V.
Evacuated solar flat-plate collectors for economic applications
21 p0133 A79-17435
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730
MERRIAM, M. F.
Wind, waves, and tides
21 p0074 A79-14719
MERRIAM, R. L.
A computer simulation model for determining preferred solar heating and cooling systems
22 p0267 A79-24313
EPRI Methodology for Preferred Solar Systems (EMPSS) computer program documentation. User's guide
[EPRI-ER-771] 23 p0543 N79-22635
MERRICK, D.
The use of non-fossil-derived hydrogen in coal conversion processes
23 p0451 A79-37882
MERRILL, O. H.
Role of intermediate markets in P/V industry development
23 p0516 A79-41052
MERRILL, O. S.
The Department of Energy's thermionic energy conversion program
21 p0025 A79-10213
Increasing the efficiency of coal-fired steam electric plants with thermionic topping
21 p0096 A79-15921
MERRILL, W. C.
An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047
Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599
MERSIER, C.
Solar-tower power plants - Optimization of the mirror field and application to the field scale effect
23 p0382 A79-32951
MERTENS, E. W.
The effects of oil on marine life
23 p0434 A79-35463
MERTENS, R.
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977
MESCH, H. G.
High temperature, low mass solar blanket development
24 p0691 A79-51902
MESEROLE, F. B.
Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
MESHCHERIAKOV, E. A.
Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity
22 p0324 A79-31845
MESICH, F. G.
Sampling and analysis of synthetic fuel processes
22 p0284 A79-26538
Trace elements of fly ash: Emissions from coal-fired steam plants equipped with hot-side and cold-side electrostatic precipitators for particulate control
[PB-295040/0] 24 p0761 N79-30864
MESMER, R. E.
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691
MESSIAEN, A. M.
Magneto-acoustic resonance heating in the ion-cyclotron frequency domain
22 p0271 A79-24866
MESSIER, R.
Black germanium solar selective absorber surfaces
22 p0327 A79-31970
METZ, P. D.
State-of-the-art study of heat exchangers used with solar assisted domestic hot water systems (potential contamination of potable water supply)
[PB-287410/5] 22 p0343 N79-17351
METZNER, J. J.
Conservation of satellite transmitter energy with propagation and demand variations
23 p0493 A79-40587
MEULENBERG, A.
Limiting process in shallow junction solar cells
24 p0783 N79-32646
MEULENBERG, A., JR.
Space environment damage to solar cell coverslide assemblies
23 p0498 A79-40896
MEUNIER, G.
A new thermochemical process for hydrogen production
22 p0312 A79-31153
MEUNIER, R. F.
Electric utilities and solar energy: The service contract in a new social context
[ORAU/IEA(O)-79-3] 23 p0597 N79-27685

MEYER, A. P.
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553

MEYER, B. A.
An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398
Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors
22 p0281 A79-26206

MEYER, C.
A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774

MEYER, C. F.
Large-scale thermal energy storage for cogeneration and solar systems
21 p0092 A79-15886

MEYER, F. J.
Design and development of a low emission combustor for a car gas turbine
[ASME PAPER 78-GT-155] 24 p0605 A79-44793

MEYER, H.
Wind energy
22 p0287 A79-27327

MEYER, H. R.
Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570

MEYER, J. P.
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368

MEYER, L.
High-temperature nuclear heat source for hydrogen production
23 p0437 A79-36049

MEYER, R.
Ten scenarios of transportation energy conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647
Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648

MEYERS, A. C.
Design considerations of small solar collector systems using plane heliostats
[ASME PAPER 79-SOL-2] 22 p0307 A79-30540

MEYERS, A. C., III
Net energy analysis and environmental aspects for solar tower central receiver systems. I - Methodology
21 p0097 A79-16101
Manmade geothermal energy
23 p0408 A79-34072

MEYERS, J. E.
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

MEYERS, R. A.
Applicability of the Meyers process for desulfurization of U.S. coal - A survey of 35 coals
21 p0044 A79-12117
Coal desulfurization test plant status - July 1977
21 p0044 A79-12118
Coal desulfurization
23 p0533 A79-43200

MEZEY, E. J.
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236

MEZZINA, A.
Hydrogen technology: An overview
[BNL-25760] 24 p0734 N79-29379

MIAKIN, G. V.
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703

MIAO, D.
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721

MICHAEL, G. J.
Development of gas turbine performance seeking logic
[ASME PAPER 78-GT-13] 21 p0031 A79-10257

MICHAELIDES, E.
Effect of noncondensables on the performance of geothermal steam power plants
24 p0689 A79-51868

MICHAELIDES, E. E.
The concept of available work as applied to the conservation of fuel resources
24 p0698 A79-51970

MICHAELIS, D.
Long-term thermal storage in solar architecture in northern latitudes, with reference to typical single family dwellings
21 p0119 A79-17313

MICHAELIS, H.
Energy policies in the context of global economics
23 p0433 A79-35228
The Eppler scenario - A critical analysis
24 p0649 A79-49330

MICHAELS, A. I.
A review of current R&D in thermal energy storage and heat exchange in solar applications
24 p0608 A79-45211

MICHAELS, H. J.
Hydrogen production via the K-T gas gasification process - Current economic and technological aspects
24 p0613 A79-45586

MICHAELSON, G. S.
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436

MICHAELSON, P. F.
Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44545

MICHAL, C. J.
Passive solar design
21 p0074 A79-14720

MICHALOPOULOS, P. G.
Bus priority system studies
22 p0299 A79-29339

MICHALSKY, J. J.
Differential insolation and turbidity measurements
22 p0241 A79-21056

MICHEL, J. P.
The solar house
23 p0401 A79-34017

MICHEL, J. W.
Heat transfer consideration in utilizing solar and geothermal energy
23 p0409 A79-34080
Experimental and analytical OTEC studies at ORNL
24 p0626 A79-45859

MICHELS, A. P. J.
Conceptual design of a variable displacement Stirling engine for automotive propulsion
21 p0025 A79-10207

MICKELSEN, R.
Reliability analysis of contracts to silicon solar cells for use in concentrated sunlight
23 p0517 A79-41058

MICKELSEN, R. A.
Improved semiconductors for photovoltaic solar cells
[DSE/2459-2] 21 p0221 N79-14577

MICKLE, M. H.
Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776

MIDDLETON, R. L.
The Solar Heating and Cooling Commercial
Demonstration Program at Marshall Space Flight
Center - Some problems and conclusions
21 p0099 A79-16135
MIEDEMA, A. R.
Model predictions for the stability of ternary
metallic hydrides
21 p0038 A79-11802
Hydrogen absorption in rare earth intermetallic
compounds
22 p0249 A79-21693
Some applications of LaNi5-type hydrides
22 p0249 A79-21694
MIENTEK, A. P.
Advances in lower cost phosphoric acid fuel cells
21 p0010 A79-10092
MIGLIORE, P. G.
Some effects of flow curvature on the performance
of Darrieus wind turbines
[AIAA PAPER 79-0112] 21 p0156 A79-19538
A free-vortex model with numerical solution for
the unsteady lifting characteristics of straight
bladed darrieus wind turbines
24 p0794 N79-33158
MIKESELL, R. D.
The Garrett Energy Research biomass gasification
process
21 p0004 A79-10037
MIKHAIL, A.
Generic power performance estimates for wind
turbines
21 p0068 A79-14295
MIKHAIL, A. S.
Energy statistics for large wind turbine arrays
22 p0299 A79-29371
Interannual and month-to-month variations of wind
speed
24 p0629 A79-46221
MIKHAILOV, IU. S.
The measurement of plasma electrical conductivity
by the electromagnetic transmission method
23 p0530 A79-42875
MIKHAILOV, V. I.
Superconductivity in antenna engineering
22 p0311 A79-31008
MIKHAILOVSKII, IU. K.
Laser measurements of the radial profiles of the
electron temperature and density in the FT-1
tokamak
22 p0244 A79-21430
MIKHALEVICH, V. S.
Determining optimal angles of nonconvex solar
battery panel mounting
21 p0080 A79-14837
MIKKONEN, S.
A low energy house in Sweden heated by a solar
energy system with heat pump
23 p0471 A79-38650
MIKKOR, M.
Pulse characteristics of sodium sulfur cells for
electric vehicle propulsion
21 p0009 A79-10082
MIKOLOWSKY, W. T.
The potential of liquid hydrogen as a military
aircraft fuel
22 p0238 A79-20773
MIKRIUKOV, CH. K.
Optimality criteria in the compensation of the
longitudinal boundary effect in induction MHD
machines
22 p0298 A79-29277
MILBORROW, D. J.
Performance prediction methods for horizontal axis
wind turbines
21 p0045 A79-12244
Prediction and measurement of aerogenerator
performance
23 p0453 A79-37898
MILEBIS, G.
Heat pump system for process steam generation
24 p0697 A79-51964
MILES, C. R.
Thermosyphon models for downhole heat exchanger
applications in shallow geothermal systems
21 p0150 A79-18092
MILES, R. F., JR.
Thermal power systems small power systems
applications project. Decision analysis for
evaluating and ranking small solar thermal power
system technologies. Volume 1: A brief
introduction to multiattribute decision analysis
[NASA-CR-158425] 22 p0368 N79-21548
MILEY, G. H.
Progress in nuclear-pumped lasers
21 p0110 A79-16627
Particle orbits in field-reversed mirrors
22 p0253 A79-22239
Superthermal alpha transport and wall bombardment
in tokamaks
23 p0444 A79-36927
Advanced-fuel pellet approaches to inertial fusion
24 p0630 A79-46303
A possible route to small, flexible fusion units
24 p0630 A79-46304
MILKINS, E. E.
Some problems and benefits from the hydrogen
fueled spark ignition engine
21 p0016 A79-10130
MILLAR, W.
Heating and confinement in the CLEO stellarator
21 p0070 A79-14459
MILLER, B.
Semiconductor liquid junction solar cells -
Efficiency, electrochemical stability, and
surface preparation
21 p0037 A79-11783
The inexhaustible energy resources study
23 p0420 A79-34166
Effects of cations on the performance of the
photoanode in the n-GaAs/K2Se-K2Se2-KOH/C
semiconductor liquid junction solar cell
23 p0446 A79-37272
Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918
Energy efficient aircraft engines
[NASA-TM-79204] 23 p0587 N79-27141
MILLER, B. P.
Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720
MILLER, C. G.
Primary reflector for solar energy collection
systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529
Primary reflector for solar energy collection
systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432
Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433
MILLER, D. E.
Formation of thin Cu2S /chalcocite/ films using
reactive sputtering techniques
23 p0445 A79-37156
MILLER, D. L.
On an irreversible thermodynamic analysis of
thermoelectric devices
22 p0260 A79-23609
Intercell ohmic contacts for high efficiency
multijunction solar converters
24 p0786 N79-32673
MILLER, D. R.
Methanol from coal
23 p0593 N79-27619
MILLER, E.
Environmental interaction implications for large
space systems
23 p0552 N79-24027
MILLER, G.
Heat exchanger designs for coal-fired fluidized beds
21 p0009 A79-10079
Recent developments in pressurized fluidized bed
coal combustion research
[AIAA PAPER 79-0190] 21 p0157 A79-19589
The optimization of heat exchanger solidity for
coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357
MILLER, I. F.
Polyelectrolyte electrets for electrical energy
storage
24 p0632 A79-46316
MILLER, J. A.
A fully interconnected wind system
24 p0635 A79-46540

MILLER, J. D.
Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508

MILLER, J. R.
A new method for producing cryogenic laser fusion targets
21 p0085 A79-15332

MILLER, J. W.
Electricity from sunlight
21 p0065 A79-14116
Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38045

MILLER, K.
Energy intensive industry for Alaska. Volume 2: Case analysis
[TID-29025-2] 24 p0754 N79-30787
Energy-intensive industry for Alaska. Volume 3: Background data
[TID-29025-3] 24 p0755 N79-30788

MILLER, K. A.
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375

MILLER, K. H.
Construction of a 10GWe solar power satellite
21 p0003 A79-10029

MILLER, M.
The energy dilemma: A challenge for Maryland. Proceedings Maryland General Assembly/AISLE Conference
[PB-284703/6] 21 p0199 N79-12579

MILLER, R.
Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975

MILLER, R. C.
A high-efficiency GaAlAs double-heterostructure photovoltaic detector
21 p0154 A79-18489

MILLER, R. P.
Prospective needs for physical property data in the chemical and allied industries during the next decade
[NPL-CHEM-84] 23 p0546 N79-23185

MILLER, R. T.
Preliminary designs of 10 MWe and 50 MWe power modules
24 p0618 A79-45791

MILLER, R. W.
Design of a second generation concentrating tracking solar collector
[AIAA PAPER 78-1775] 21 p0062 A79-13872
A flat plate multiple pass solar collector using aqueous optical properties
22 p0293 A79-28144
A parabolic solar reflector for accurate and economic producibility
22 p0293 A79-28145

MILLER, S. H.
Geologic applications of thermal-inertia mapping from satellite
[E79-10279] 24 p0796 N79-33518

MILLER, W. D.
Photovoltaic concentrator system for Roxborough Park
24 p0675 A79-51767

MILLER, W. E.
Review of industrial participation in the ANL lithium/iron sulfide battery development program
21 p0010 A79-10086

MILLER, W. F.
Application of remote sensing to state and regional problems
[E79-10196] 23 p0565 N79-25446

MILLNER, A. R.
A flywheel energy storage and conversion system for solar photovoltaic applications
[ASME PAPER 79-SOL-1] 22 p0307 A79-30539
Flywheel energy storage interface unit for photovoltaic applications
24 p0679 A79-51791
Flywheel components for satellite applications
[AD-A060586] 21 p0226 N79-15145
Solar module curve tracer
[COO-4094-35] 24 p0759 N79-30826

MILLS, D. R.
Manufacture of curved glass mirrors for linear concentrators
21 p0136 A79-17459
Ideal prism solar concentrators
21 p0149 A79-18023
The place of extreme asymmetrical non-focussing concentrators in solar energy utilization
21 p0149 A79-18024
Symmetrical and asymmetrical ideal cylindrical radiation transformers and concentrators
22 p0303 A79-29647
New ideal concentrators for distant radiation sources
24 p0661 A79-50547

MILLS, G. L.
Heat pump/rock bed storage systems
[COO-4704-2] 24 p0789 N79-32705

MILLS, J. I.
Low-head hydroelectric power - A realizable alternative
23 p0409 A79-34082

MILNES, A. G.
Concepts for rheotaxially-grown thin-film tandem III-V solar cells
23 p0513 A79-41030
The potential of np GaAs solar cells for high efficiency concentrator applications
24 p0705 A79-52325

MILOVANOVA, N. A.
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904
Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179

MIMILA-ARROYO, J.
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186

MIN, S.
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236

MINAHAN, J. A.
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158740] 23 p0580 N79-26490

MINARDI, E.
Integral invariants and quasi-MHD nonlinear dissipation
22 p0270 A79-24862

MINARDI, J. E.
The Madaras Rotor Power Plant - An alternate method for extracting large amounts of power from the wind
[AIAA PAPER 79-0115] 21 p0157 A79-19541

MINASYAN, R.
Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses
[ORNL-TR-4483] 21 p0221 N79-14574

MINCHENER, A. J.
Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908

MINCK, R. W.
Pulse characteristics of sodium sulfur cells for electric vehicle propulsion
21 p0009 A79-10082
Reproducibility and performance of large prototype Na/S cells
24 p0684 A79-51835

MINDER, R.
A solar heating and cooling system for an industrial plant located in southern Europe
21 p0139 A79-17480
Solar heating and cooling systems - Practical experience in design and operation
23 p0452 A79-37888

MINETTI-MEZZETTI, B.
Concentrator for solar air heater
23 p0487 A79-40379

MINNUCCI, J. A.
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086
Development of pulsed processes for the manufacture of solar cells
[NASA-CR-158706] 23 p0570 N79-25484
Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648

MINOH, A.
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344

MINTON, S. M.
Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977
[PB-293733/2] 23 p0586 N79-26759

MIODUSZEWSKI, P.
Laser-induced desorption experiments with technical metal surfaces
23 p0445 A79-36969

MIRAKHUR, R. K.
A simple solar tracking system
21 p0136 A79-17457

MIRANDA, L. R.
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft
[AIAA PAPER 79-1863] 24 p0643 A79-47920

MIRIN, A. A.
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979

MIRSAGATOV, SH. A.
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354
Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760
Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

MISHIMA, J.
Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344

MISHKIN, E. A.
Analysis of a cylindrical imploding shock wave
21 p0155 A79-18846

MISHRA, R. K.
Harvesting solar energy using biological systems
21 p0126 A79-17372

MISKOLCZY, G.
Lithium and potassium heat pipes for thermionic converters
21 p0013 A79-10113
Characteristics of combustion-heated thermionic diodes
21 p0026 A79-10215
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831
Design study of a coal-fired thermionic-topped powerplant using an advanced boiler
24 p0700 A79-51983
Flame-fired thermionic diode development
24 p0700 A79-51988

MISSIG, J. R.
Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978
22 p0285 A79-27651

MITCHELL, D. H.
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327

MITCHELL, D. J.
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167

MITCHELL, J.
Thermal storage and heat transfer in solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0280 A79-26201

MITCHELL, J. T. D.
The impact of servicing requirements on tokamak fusion reactor design
21 p0079 A79-14793

MITCHELL, J. W.
Simulations of the performance of open cycle desiccant systems using solar energy
21 p0066 A79-14262
An interferometric investigation heat transfer in honeycomb solar collector cells
21 p0129 A79-17398
Natural convection heat transfer in small and moderate aspect ratio enclosures - An application to flat plate collectors
22 p0281 A79-26206
Performance of combined solar-heat pump systems
22 p0285 A79-26817

MITCHELL, K. B.
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas
22 p0296 A79-28366

MITCHELL, R. D.
A primer on the rejection of waste heat from power plants
[PB-292529/5] 23 p0575 N79-25570

MITCHELL, W. C.
Selenide thermoelectric converter technology
21 p0026 A79-10221

MITCHINER, J. L.
Prospects of generating power with particle-beam-drive inertial confinement fusion
23 p0407 A79-34063

MITO, S.
The development of photovoltaic conversion systems with sunlight concentration
21 p0148 A79-17995

MITOFF, S. P.
Development of sodium-sulfur batteries for utility application
[EPRI-EM-683] 21 p0186 N79-11502

MITRA, S. S.
Characterisation of amorphous semiconductor materials for solar cell applications
21 p0123 A79-17341

MITRISHKIN, IU. V.
Optimizing the conversion mode for solar energy
22 p0258 A79-23125

MITSUI, A.
Solar energy conversion in marine biological systems
23 p0402 A79-34021
Photoproduction of hydrogen by marine blue-green algae
[PB-287508/6] 22 p0343 N79-17354

MITTALL, H. L.
Performance of magnetohydrodynamic generator in the inlet region
23 p0397 A79-33769

MIURA, N.
Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296

MIURA, S.
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

MIXON, F. O.
Pollutants from synthetic fuels production: Facility construction and preliminary tests
[PB-287730/6] 22 p0339 N79-17027

MIXON, W. R.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704

MIYAGI, Y.
Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks
24 p0604 A79-44537

MIYAHARA, A.
Characteristics of co-axial Marx generator and its application to electron beam fusion
24 p0642 A79-47805

MIYAHIRA, T. F.
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631

MIYASAKA, T.
Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes
22 p0273 A79-25548

MIYAZAKI, S.
Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

MIYAZAKI, T.
Wave power electric generation study in Japan
21 p0151 A79-18107

MIZUSAKI, J.
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415

MIZUTA, S.
The thermochemical decomposition of water using bromine and iodine
22 p0238 A79-20770

MIZUUCHI, T.
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346

MLAVSKY, A. I.
Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965
Solar cells from inexpensive silicon ribbons - State of the art and trends
23 p0435 A79-35487

MNATSAKANIAN, A. KH.
Heat transfer in a high-power MHD channel
23 p0533 A79-43171

MOCKER, J. F.
Qualification of a duplex, clad material for OTEC
24 p0623 A79-45828

MODARRESI, K.
The interaction of the wind field with a horizontal axis wind turbine
22 p0278 A79-26177

MODEN, R. W.
Historic and forecasted energy prices by US Department of Energy region and fuel type for three macrceconomic scenarios and one imported oil price escalation scenario
[DOE/EIA-0102/27] 24 p0725 N79-28751
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752

MODESTOV, A. V.
Mass transfer in a current source during circulation of the mixture driven by gaseous reaction products
21 p0164 A79-19851

MODI, R.
Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367

MODI, V. J.
Transient attitude dynamics of satellites with deploying flexible appendages
21 p0047 A79-12325

MODIR, H.
Impact of storm fronts on utilities with WECS arrays
24 p0635 A79-46546

MODJESKI, N.
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

MODLINGER, A.
Procedure for flight guidance in the terminal maneuvering area for an experimental program employing a flying test device
21 p0147 A79-17680

MODY, K. J.
Transient analysis and optimization of an extended surface thermal storage unit which utilizes a phase change material
23 p0400 A79-34006

MOELLER, C. E.
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839

MOFFITT, J. V.
Direct utilization of crude oil as fuel in the US Army four-cycle diesel engine, model LDT-465-1C
[AD-A062387] 22 p0357 N79-20279

MOGUL, J. M.
A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434

MOHAMMADI, S. S.
Performance and evaluation of concepts and devices for heat reclamation from air conditioners, heat pumps, and refrigeration equipment
[AD-A069650] 24 p0752 N79-30770

MOHR, P. B.
Preliminary design of a subscale ceramic helical-rotor expander
21 p0050 A79-12849

MOHRE, D. L.
Assessment of load management on the electric power system
[CONF-781182-3] 23 p0590 N79-27412

MOHTADI, M. M.
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798

MOILANEN, G. L.
Low-sulfur western coal use in existing small and intermediate size boilers
[PB-287937/7] 22 p0346 N79-18061

MOIR, R. W.
Mirror fusion reactors
21 p0018 A79-10148

MOISAN, A.
An experimental study of walls with latent heat for residences
23 p0470 A79-38640

MOISAN, F.
Industrial applications of solar heat
23 p0434 A79-35477
Utilization of solar-derived heat in industrial processes
23 p0471 A79-38649

MOK, Y.
Electrons of high perpendicular energy in the low-density regime of tokamaks
22 p0270 A79-24852

MOKHOV, V. N.
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

MOLINARI, R. L.
Thermal and current data from the Gulf of Mexico and South Atlantic relative to placement of OTEC plants
24 p0621 A79-45816
Ocean thermal and current velocity data requirements for design of an OTEC plant - An update
24 p0622 A79-45822
Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977
[PB-293733/2] 23 p0586 N79-26759

MOLINI, A.
Recent developments in the foam OTEC system
24 p0623 A79-45832

MOLINI, A. E.
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839
Multiple staging of the cold water in the open cycle OTEC Systems
24 p0624 A79-45840

MOLL, A. J.
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369

MOLL, N. G.
The Dow Chemical liquefaction process
21 p0147 A79-17644

MOLLON, J. K.
Advanced air transport concepts
22 p0312 A79-31121

MOLLY, J.-P.
Composite rotor blades for large wind energy installations
23 p0522 A79-41235

MOLTCH, P. M.
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179

MOMOTA, H.
Lower hybrid resonance heating
22 p0271 A79-24865

MOMYER, W. R.
Development and evaluation of a 600-kWh lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095

MONAGHAN, P. F.
Design study on solar energy systems for commercial buildings
22 p0320 A79-31433
Design study - Solar systems for commercial buildings
23 p0425 A79-34601

MONDE, H.
Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

MONETTA, D. J.
Improved Conversion Efficiency Workshop. Volume 2: Summary
[CONF-771003-P2-VOL-2] 21 p0176 N79-10551

MONGEAU, P.
Electromagnetic propulsion alternatives
[AIAA PAPER 79-1400] 23 p0426 A79-34840
Electromagnetic launchers
24 p0702 A79-52006

MONSLER, M.
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

MONSON, D. J.
Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space
21 p0110 A79-16623

MONTAGNA, J. C.
Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121

MONTGOMERY, D. B.
Superconducting magnets
21 p0105 A79-16485
The Alcator liquid nitrogen-cooled tokamaks
22 p0290 A79-27668

MONTGOMERY, D. S.
Changes within tin-containing catalysts under hydrorefining conditions
24 p0628 A79-45993

MONTICELLO, D. A.
Non-linear numerical algorithms for studying tearing modes
22 p0257 A79-22981

MONZA, E.
Selective covers for natural cooling devices
22 p0272 A79-25522

MOON, R. L.
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025
Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038
High performance GaAs photovoltaic cells for concentrator applications
[SAND-78-7018] 21 p0187 N79-11521

MOORE, A. R.
An optimized grid design for a sun-concentrator solar cell
24 p0645 A79-48273
Optimum grid design for a nonuniformly illuminated sun-concentrator solar cell
24 p0645 A79-48274

MOORE, B., III
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722

MOORE, C. K.
Economic evaluation of the ATC/Wellman incandescent two-stage low Btu coal gas producer
21 p0146 A79-17640

MOORE, D.
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116

MOORE, D. J.
Depletion of available wind power by a large network of wind generators
23 p0453 A79-37899

MOORE, D. O.
Hydrogen from coal using pressurized gasification
24 p0687 A79-51853

MOORE, E.
The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

MOORE, H. F.
Synthetic oil from coal - The economic impact of five alternatives for making hydrogen from coal and steam
22 p0262 A79-23719

MOORE, H. G., JR.
Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949

MOORE, H. R.
The cost of hydrogen from coal
23 p0396 A79-33766

MOORE, J.
The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

MOORE, J. B.
Using coal inside California for electric power
23 p0591 N79-27598

MOORE, J. E.
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755

MOORE, J. W.
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

MOORTHY, P. N.
Direct photoelectrochemical conversion and storage of solar energy
21 p0126 A79-17370

MOOS, H. W.
Evidence for neutral-beam-injected oxygen impurities in 2XIIB
22 p0292 A79-27887
The effects of wall temperature on light impurities in Alcator
22 p0313 A79-31188

MORA-CAMINO, F.
Dimensioning of energy-production systems - The use of geometric programming
23 p0388 A79-33254

MORAN, M. J.
Simultaneous heat and mass transfer in soil with application to waste heat utilization
23 p0531 A79-42930

MORAN, W. A.
Giromill wind tunnel test and analysis, volume 2. Technical discussion
[COO-2617-4/2] 21 p0204 N79-13378

MORAN, W. P.
A microprocessor based solar monitoring system
21 p0088 A79-15838

MORANDI, G.
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop
23 p0408 A79-34074

MORE, E. R.
Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525

MOREHOUSE, J. H.
A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors
23 p0530 A79-42895

MOREIRA, M. R.
A development program for hydrogen burners
23 p0386 A79-33232

MORELLO, L.
Fiat Research Center hybrid vehicle prototype
[SAE PAPER 790014] 22 p0313 A79-31351

MORETTI, V. C.
A technical analysis for cogeneration systems with potential applications in twelve California industrial plants
21 p0011 A79-10099

MORGAN, C.
A comparison of solar thermal energy collection using fixed and tracking collectors
22 p0293 A79-28146

MORGAN, G. R.
Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051

MORGAN, J. D.
Annual Conference on Energy, 4th, University of Missouri-Rolla, Rolla, Mo., October 11-13, 1977, Proceedings. Volume 4
21 p0071 A79-14676

MORGAN, L. L.
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335

MORGAN, R.
Modelling of a domestic wind power system including storage
23 p0396 A79-33764

MORGAN, T.
A method to increase the efficiency of solar photovoltaic devices by secondary emission
[AIAA PAPER 79-0981] 23 p0457 A79-38185

MORGAN, W. L.
Orbital antenna farm power systems challenges
24 p0690 A79-51892

MORI, H.
Thermodynamic considerations for the energy conversion process in geothermal power plants
23 p0476 A79-38947

MORIARTY, M. P.
A simplified algorithm for the evaluation of hybrid thermal storage with water systems
24 p0681 A79-51808

MORIKAWA, J.
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

MORIMOTO, S.
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346

MORITZ, P. S.
Metal hydride solar heat pump and power system /HYCSOS/
[AIAA PAPER 78-1762] 21 p0061 A79-13863
Design study and cost-effectiveness of the metal hydride solar heat pump and power system /HYCSOS/
24 p0672 A79-51745
Metal hydride solar heat pump and power system (HYCSOS)
[CONF-781133-5] 23 p0596 N79-27675

MOROZOV, G. N.
MHD power plant characteristics
21 p0105 A79-16480
Layout and design characteristics of MHD power stations
21 p0105 A79-16481
Steam generator and turbomachines
21 p0106 A79-16489

MORRIS, G. E.
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280
Electricity from hot dry rock geothermal energy: Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773

MORRIS, J. F.
Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes
21 p0053 A79-13098

MORRIS, R. E.
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

MORRISON, C. A.
The design and evaluation of a hydraulic-solar powered tracking device
21 p0136 A79-17458
Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479
An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481

MORRISON, L. R., JR.
The economics of hydrogen and carbon monoxide separation with cuprous ammonium lactate solutions
22 p0299 A79-29313

MORROW, A. J.
A review of the PFBC combined cycle and its influence on gas turbine design parameters
21 p0007 A79-10067

MORSE, F. H.
Prospects for solar heating and cooling in the United States
22 p0275 A79-25929

MORTENSEN, J. J.
Hot dry rock - A new geothermal energy source
21 p0087 A79-15673

MORTON, A. H.
Ion heating in the LT-3 tokamak
24 p0639 A79-47399

MOSCHETTI, B.
Heat pipes in the thermal control of communication satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278

MOSCHITTO, M. D.
Operation of the Ft. Lewis, Washington Solvent Refined Coal /SRC/ Pilot Plant in the SRC I and SRC II processing modes
21 p0006 A79-10054

MOSCHOPEDIS, S. E.
Factors affecting bitumen recovery by the hot water process
22 p0282 A79-26463

MOSER, R. E.
Assessment of current flue gas desulfurization technology
21 p0145 A79-17637

MOSES, C. A.
Effects of fuel properties on soot formation in turbine combustion
[SAE PAPER 781026] 22 p0274 A79-25899
Outlook for the development of hybrid fuels
24 p0651 A79-49382

MOSES, G. A.
Pellet X-ray spectra for laser fusion reactor designs
22 p0291 A79-27878

MOSESMAN, I. D.
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

MOSHER, D.
Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817

MOSIN, I. I.
Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine
21 p0114 A79-16800
Choice of optimal parameters for a heat exchanger with heat pipes for a gas turbine engine
23 p0529 A79-42552
Study of heat-pipe heat exchanger in the small gas turbine engine system
24 p0646 A79-48511

MOSKOWITZ, S.
Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451

MOSS, R. H.
Legal considerations on the development and use of satellite solar power stations
24 p0664 A79-50860

MOSTINSKII, I. L.
Ionizing seed
21 p0106 A79-16490

MOTLEY, E.
Catalytic conversion of coal energy to hydrogen
[FE-2206-14] 21 p0180 N79-11239

MOUDY, L. A.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

MOUNTZ, J. M.
The photogalvanovoltaic cell
21 p0066 A79-14264

MOURA, J. C.
Development of a unipolar electrolysis unit
23 p0386 A79-33235

MOWFORTH, E.
The Sunship
22 p0254 A79-22324

MOZEICO, H. V.
Control of wind turbine generators connected to power systems
21 p0086 A79-15574

MOZER, C. J.
Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809

MPAWENAYO, P.
Solar collector tests in Rwanda
23 p0470 A79-38643

MRHA, J.
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions
22 p0245 A79-21483

MROZ, T. S.
Rankine-cycle component characteristics
23 p0579 N79-26478
Brayton-cycle component characteristics
23 p0580 N79-26479
Power-conversion system component summation
23 p0580 N79-26483

MRUS, S. T.
Heating value of refuse derived fuel
23 p0490 A79-40412

MUBAYI, V.
Application of resource allocation models to the problems of regional energy policy in large developing countries
[BNL-25537] 24 p0728 N79-28779

MUCH, C. H.
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

MUDGE, L. K.
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327

MUEHLBAUER, J. C.
Nuclear aircraft innovations and applications
[AIAA PAPER 79-0846] 23 p0526 A79-41913

MUEHLHAUSER, J. W.
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

MUELLER, G.
Recent ooids from different environments - Relationship between petrophysical properties and microstructure
23 p0529 A79-42424

MUELLER, H.-G.
Road vehicles with combined, at least partly electrical driving systems and energy supplies
22 p0301 A79-29494

MUELLER, L. J.
Jet impingement solar air heater
[AIAA PAPER 78-1760] 21 p0061 A79-13861

MUELLER, H. H.
The cryogenic heat transfer tunnel - A new tool for convective research
22 p0267 A79-24316

MUELLER, R. G.
The interface with solar - Alternative auxiliary supply systems
21 p0137 A79-17468

MUELLER, W.
Development of vertical-axis wind-energy converters - Darrieus design
23 p0447 A79-37748
Remarks on economic growth and energy requirements
23 p0535 A79-43523

MUELLER, W. A.
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

MUKHERJEE, D.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344

MUKHERJEE, M. K.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344
A diagnostic study on the polycrystalline nature and its relationship with the yield of CdS solar cell
21 p0125 A79-17361

MUKHERJEE, S.
Investigation on junction formation and realisation of high open-circuit voltage in Cu/x/S-CdS solar cells
21 p0123 A79-17344

MUKHOPADHYAY, K.
Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348

MULCAHEY, T.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

MULHERKAR, S. S.
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564

MULHOLLAND, G. P.
High temperature materials study
23 p0431 A79-35070
Preliminary testing of a scale model secondary concentrator for the Sandia Solar Thermal Test Facility
24 p0658 A79-50343

MULHOLLAND, J. P.
Economic structure and behavior in the natural gas production industry
[PB-294610/1] 24 p0760 N79-30839

MULIK, P. R.
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406

MULKEY, C. E.
Environmental implications of energy recovery from municipal solid waste
23 p0476 A79-38949

MULLANEY, P.
Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638

MULLER, J. C.
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001

MULLIGAN, G.
Development and application of techniques to evaluate cogeneration impacts
22 p0303 A79-29795

MULLIGAN, S. W.
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization) [PB-289921/5] 22 p0373 N79-21661
Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results [PB-290514/9] 23 p0566 N79-24534

MULLIN, J.
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization [PB-288223/1] 22 p0344 N79-17378

MULLIN, J. P.
Space power for space 21 p0100 A79-16143
The NASA Space Power Technology Program 24 p0691 A79-51894
OAST space power technology program 21 p0169 N79-10123
The NASA space power technology program 24 p0751 N79-30746

MUMMA, S. A.
The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors 21 p0102 A79-16423

MUNIER, R. S. C.
Observations of water mass structure and variability north of St. Croix, U.S. Virgin Islands for OTEC assessment 24 p0622 A79-45818

MUNIZ, A. C.
Simple methane digestors 23 p0386 A79-33234

MUNJAL, P. K.
Future solar total energy markets for the U.S. industrial sector [AIAA PAPER 78-1773] 21 p0062 A79-13870

MUNOZ, J. T.
Performance analysis of a flat-plate solar collector using 'forge-fin' tubes 22 p0316 A79-31404

MUNRO, A. B.
The fleet operator's viewpoint 22 p0302 A79-29495

MUNRO, N.
A multivariable controller for an automotive gas turbine [ASME PAPER 79-GT-73] 22 p0307 A79-30537

MUNROE, J. L.
An optical evaluation laboratory for laser fusion 23 p0447 A79-37667

MUNSCH, J. S.
Energy situation in the Mid-Atlantic region [BNL-50703] 21 p0188 N79-11528

MUNZ, P.
Polysilicon MIS solar cells with low work function metals 23 p0510 A79-41010

MURAKAMI, T.
A digital control system for superconducting magnet 22 p0268 A79-24508

MURALI, J.
On design requisites for hydrogen energy systems 24 p0685 A79-51844

MURASAKI, H.
Solar heating performance of the Toshiba Solar House No. 1 21 p0137 A79-17465

MURPHY, B. L.
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry 21 p0064 A79-14112

MURPHY, C. L.
Review of liquid piston pumps and their operation with solar energy [ASME PAPER 79-SOL-4] 22 p0308 A79-30542

MURPHY, D.
Influence of technological advances on potential tidal power development 23 p0450 A79-37865

MURPHY, D. W.
Low voltage behavior of lithium/metal dichalcogenide topochemical cells 22 p0286 A79-26995
Solid state electrodes for high energy batteries 24 p0611 A79-45479

MURPHY, E. B.
Measuring dirt on photovoltaic modules 23 p0533 A79-43283

MURPHY, G. W.
Model systems in photoelectrochemical energy conversion 21 p0149 A79-18021

MURPHY, L. J.
Collection, processing and dissemination of data for the national solar demonstration program 24 p0608 A79-45208

MURPHY, P.
The interaction of the wind field with a horizontal axis wind turbine 22 p0278 A79-26177

MURPHY, R. W.
Condensation of refrigerants on vertical fluted tubes [ORNL/TM-5848] 24 p0781 N79-32515

MURRAY, H. S.
Solar heating and cooling performance of the Los Alamos National Security and Resources Study Center 22 p0277 A79-25944
Solar heating and cooling results for the Los Alamos study center [LA-UR-78-2588] 24 p0729 N79-28790

MURRAY, J. G.
SLPX - Superconducting Long-Pulse Tokamak Experiment 22 p0237 A79-20557

MURRAY, J. J.
Hydroelectric power generation and mineral recovery in the Qattara Depression of Egypt 24 p0707 A79-52575

MURRAY, J. N.
High efficiency alkaline electrolysis technology 24 p0685 A79-51842

MURRAY, R. B.
Modelling of a domestic wind power system including storage 23 p0396 A79-33764

MURRAY, R. G.
The Koppelman process 21 p0145 A79-17634
Upgrading lignite by the Koppelman process 21 p0146 A79-17641

MURRAY, T. M.
Analysis of optical behavior and collector performance of a solar concentrator 21 p0107 A79-16545

MURRAY, T. M., JR.
A microprocessor-based control system for solar heating and cooling 21 p0107 A79-16565
Further modeling of a solar collector based on linear clipped-V channels 23 p0399 A79-33993
The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications 23 p0402 A79-34020

MURTHY, A. S. N.
Photochemical energy conversion studies in systems containing methylene blue 24 p0628 A79-45995

MURTHY, B. S.
Bio-mass energy for rural areas 21 p0126 A79-17373

MURTHY, H. N.
Observations made during the development of a thermal control system for a near earth orbiting satellite 24 p0763 N79-31272

MURTHY, K. S.
Emissions from pressurized fluidized-bed combustion processes 22 p0261 A79-23640

MUSA, G.
A new concept of thermionic converter 23 p0381 A79-32636

MUSER, D.
Composite rotor blades for large wind energy installations 23 p0522 A79-41235

MUSGROVE, J. G.
A survey of particulate collection devices for coal-fired boilers 21 p0147 A79-17645

MUSGROVE, P. J.
Tidal and river current energy systems 23 p0449 A79-37862

Offshore wind energy systems for the U.K.
23 p0453 A79-37901

Development of the Variable Geometry Vertical Axis Windmill
23 p0484 A79-40125

MUSGROVE, R. E.
Considerations in sizing coal gasification plants
[FE-2240-40] 24 p0766 N79-31417

MUSIL, J.
Supplementary RF plasma heating in tokamaks
24 p0668 A79-50999

MUSILOVA, M.
Influence of the electrolyte content of oxygen carbon gas-diffusion electrodes on their electro-chemical performance in acid solutions
22 p0245 A79-21483

MUSINSKI, D. L.
Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335

MUSK, E. D.
The energy dilemma: A challenge for Maryland. Proceedings Maryland General Assembly/AISLE Conference
[PB-284703/6] 21 p0199 N79-12579

MUSMANN, G.
Magnetotelluric and geoelectric measurements for geothermal exploration in the Phlegraean Fields /preliminary results/
21 p0075 A79-14732

MUSSELMAN, H. D.
Army facility energy conservation
21 p0028 A79-10233

MUSTACCHI, C.
Stochastic simulation of hourly global radiation sequences
24 p0661 A79-50541

MUSTAFAEV, A. S.
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

MUSUMECI, F.
Relation between concentration and acceptance in solar collectors
24 p0641 A79-47795

MUTDOGAN, A. G.
Passive solar heating system in Turkey
22 p0277 A79-25942

MUTHUVEERAPPAN, V. R.
Cost effective optimum design of solar air heaters
21 p0127 A79-17386

MUZZY, J. D.
Novel approaches to industrial energy conservation in Georgia
24 p0698 A79-51972

MYERS, D. D.
The Energy Research and Development Program of the United States
22 p0325 A79-31909

MYERS, I. T.
Power management and control for space systems
21 p0170 N79-10134

MYERS, J. E.
Alternative central receiver solar power plant using salt as a heat transfer and storage medium
[AIAA PAPER 78-1753] 21 p0060 A79-13855

MYNETT, J. A.
Availability of solar energy at Baghdad, Iraq - Performance and design data for flat plate collectors
21 p0133 A79-17428

MYNICK, H. E.
Realistic Vlasov slab equilibria with magnetic shear
24 p0639 A79-47419

MYSELS, K.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

MYSELS, K. J.
Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109

Nitrogen fixation with fusion heat
24 p0695 A79-51948

MYTTON, M. G.
System reliability studies for wave energy generation
23 p0450 A79-37872

N

NABATOV, G. V.
Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411

NACK, H.
Emissions from pressurized fluidized-bed combustion processes
22 p0261 A79-23640

NADEAU, P.
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177

NAEGELI, D. W.
Effects of fuel properties on soot formation in turbine combustion
[SAE PAPER 781026] 22 p0274 A79-25899

NAGALINGAM, S. J. S.
Progress in nuclear-pumped lasers
21 p0110 A79-16627

NAGAO, K.
Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan
24 p0640 A79-47506

NAGASAKI, S.
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797

Oscillations of and drift force acting on an OTEC-CWP structure
24 p0622 A79-45824

NAGASHIMA, T.
Lower hybrid heating experiments in JFT-2 tokamak
24 p0607 A79-45030

NAGATOMO, T.
Fabrication and characterization of SnO2/n-Si solar cells
24 p0642 A79-47802

NAGATSUKA, H.
Oscillations of and drift force acting on an OTEC-CWP structure
24 p0622 A79-45824

NAGDA, N. L.
Air quality impacts using SRC versus conventional coal in power plants
[PB-290237/7] 22 p0373 N79-21671

NAGELBERG, A. S.
Electrochemical determinations of the chemical potential and diffusivity of sodium in Na/x/TaS2 at 300 K
21 p0040 A79-11830

NAGENGAST, J. E.
DD-963 Class waste heat recovery system experience
[ASME PAPER 79-GT-159] 23 p0378 A79-32421

NAGY, G. D.
Power supplies for Arctic radio repeater systems
[AD-A061609] 22 p0339 N79-17118

NAGY, S.
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939

NAHAS, N. C.
Catalytic gasification predevelopment research
21 p0029 A79-10246

NAINIGER, J. J.
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498

NAISBITT, J.
Satellite Power System (SPS) centralization/decentralization
[NASA-CR-157434] 23 p0548 N79-23498

NAISMITH, R.
Passive solar heating and cooling
[AIAA PAPER 78-1756] 21 p0060 A79-13857

NAKAGAWA, H.
General view of low cost solar cell development in Japan
21 p0149 A79-17997

NAKAMURA, N.
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958

NAKAO, Y.
Nuclear characteristics of D-D fusion reactor blankets - Technical data
21 p0162 A79-19826

NAKAOJI, S.
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

NAKAOKA, T.
Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795

NAKASHIMA, H.
Nuclear characteristics of D-D fusion reactor blankets - Technical data
21 p0162 A79-19826

NALBANDIAN, S. J.
The solar total energy system evaluation program /STESEP/
24 p0673 A79-51749

NALOS, E. J.
A microwave power transmission system for space satellite power
21 p0002 A79-10025
Applicability of solid state microwave technology to solar power satellites
24 p0695 A79-51945

NAMBOODIRI, P. N. N.
The lithium-thionyl chloride battery - A review
23 p0487 A79-40370

NAMKOONG, D.
Optimum dry-cooling sub-systems for a solar air conditioner
[NASA-TM-79007] 21 p0183 N79-11477

NANCE, G. P.
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982

NANDA, S. K.
Comparative performance of tracking type and non-tracking type solar collectors
21 p0136 A79-17454

NANDA, V. P.
Legal and institutional aspects
24 p0621 A79-45808

NANDI, B. N.
Changes within tin-containing catalysts under hydrorefining conditions
24 p0628 A79-45993

NANDI, S. P.
Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391

NANIS, L.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

NANSEN, R. H.
Structures for solar power satellites
21 p0032 A79-10513
First steps to the Solar Power Satellite
23 p0382 A79-32721

NAOT, Y.
Hydrogen fuel production by wind energy conversion
23 p0413 A79-34113

NARANJO, S. E.
Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy
24 p0604 A79-44549

NARASIMHA, M.
A low-cost water pumping windmill using a sail type Savonius rotor
[PB-294413/0] 23 p0585 N79-26541

NARAYAN, J.
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

NARAYANAN, R.
The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432
Modeling and verification of heat pump performance for industrial energy conservation
23 p0556 N79-24293

NARAYANAN, T. V.
Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1] 21 p0162 A79-19832

NARKUS-KRAMER, M.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

NASBY, R. D.
Development of high-efficiency p/+/-n-n/+/ back-surface-field silicon solar cells
23 p0521 A79-41093
Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements
24 p0705 A79-52321
Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529

NASERI, M. A. J.
Experimental investigation on solar house heating in northern India
21 p0140 A79-17495

NASH, D. A.
Coal and nuclear: A comparison of the cost of generating baseload electricity by region
[PB-289585/2] 22 p0355 N79-19469

NASH, J. M.
Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309

NASH, R.
Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 427 cubic inch 1977 California GMC 6500
[PB-293530/2] 23 p0578 N79-26410
Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 361 cubic inch 1966 Ford F-600
[PB-293529/4] 23 p0586 N79-26567

NATESAN, K.
Corrosion of metals in coal-gasification environments
[CONF-790145-2] 24 p0732 N79-29305

NATESH, R.
Quantitative analysis of defects in silicon
[NASA-CR-162173] 24 p0771 N79-31772

NATH, P.
Sprayed CdS thin films for CdS/Cu2S heterojunction solar cells
21 p0123 A79-17346
Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349

NATHANS, R.
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500
Systems approach to energy planning
[BNL-25523] 24 p0741 N79-29657

NATHANSON, D.
Solar heating and cooling - An electric utility perspective
21 p0093 A79-15890
A computer simulation model for determining preferred solar heating and cooling systems
22 p0267 A79-24313
EPRI Methodology for Preferred Solar Systems (EMPSS) computer program documentation. User's guide
[EPRI-ER-771] 23 p0543 N79-22635

NAUMANN, A., JR.
The future United States space program; Proceedings of the Twenty-fifth Anniversary Conference, Houston, Tex., October 30-November 2, 1978. Parts 1 & 2
23 p0427 A79-34860

NAUMOVA, G. D.
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255

NAWROCKI, P. M.
Accelerating the commercialization on new technologies
[ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

NAYAK, J. K.
Performance of a collector/storage solar water heater
23 p0479 A79-39843
Transient plate temperature in flat plate solar collectors
24 p0603 A79-44294

NAZARE, E.
A contribution to solution of the energy crisis - Proposed solution: Aerothermal plants
23 p0465 A79-38594

NAZAROV, A.
Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

NAZAROV, B.
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180

NEAL, W. E. J.
Domestic space and water heating for existing dwellings using a heat pump and conventional roofs as energy absorbers
23 p0449 A79-37851

NEARHOOF, S. L.
Potential for stand-alone photovoltaic on-site total-energy residential systems
23 p0516 A79-41050

NEBRA, S. A.
Latent heat storage
23 p0388 A79-33249

NEBUS, J. R.
Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946

NECHAEV, IU. I.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

NECHAI, V. Z.
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

NEEF, H. J.
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

NEEL, L.
A few considerations on new energy source
24 p0652 A79-49514

NEFEDOV, A. P.
Plasma diagnostics in an MHD installation
21 p0106 A79-16492
Joint Soviet-American studies in the domain of plasma diagnostics
23 p0529 A79-42853
Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854

NEICE, S.
Design investigation of solar powered lasers for space applications
[NASA-CR-159554]
23 p0578 N79-26384

NEITHARDT, A.
Organic synthesis fluids for solar energy systems
23 p0435 A79-35485

NEKHAMIN, S. M.
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691
Investigation of velocity profiles in an MHD generator channel using combustion products
24 p0706 A79-52371

NELIBSEN, W.
Hydropower from a national point of view
21 p0059 A79-13656

NELL, J. H.
Energy recovery from domestic refuse by means of incineration and pyrolysis
[CSIR-SR-WAT-54]
23 p0560 N79-24468

NELSON, B. E.
Dynamic testing of a cryogenic heat pipe/radiator
23 p0531 A79-42937

NELSON, D. B.
Macroscopic stability and beta limit in the ELMO Bumpy Torus
22 p0291 A79-27876

NELSON, J. S.
Simulations of the performance of open cycle desiccant systems using solar energy
21 p0066 A79-14262

NELSON, L.
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015]
23 p0460 A79-38202
Design investigation of solar powered lasers for space applications
[NASA-CR-159554]
23 p0578 N79-26384

NELSON, B. I.
Ocean thermal energy conversion /OTEC/ plant working fluid study
23 p0404 A79-34040

NELSON, N. J.
Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038

NELSON, P. A.
High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94]
24 p0773 N79-31793

NELSON, R. M.
Coal slag effects in MHD generators
21 p0080 A79-14934
Discharge characteristics of slagging metal electrodes
23 p0391 A79-33392

NELSON, W.
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6]
22 p0339 N79-17309

NEMETHY, E. K.
Hydrocarbons and energy from plants
[IBI-8596]
23 p0564 N79-24507

NERSISIAN, T. A.
Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383
Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706

NESS, R. C.
A power extension package /PEP/ for the Shuttle Orbiter
24 p0691 A79-51897

NETO, F. P. L.
Design of a mechanical energy storage unit
23 p0387 A79-33246

NEUGROSCHEL, A.
Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
Design of high efficiency HLE solar cells for space and terrestrial applications
24 p0783 N79-32647

NEUNER, G. J.
Design of a 150 kWe distributed collector solar thermal power station
[AZE-COMP-78-212-013]
23 p0583 N79-26517

NEUSTADTER, H. E.
DOE/NASA Mod-0A wind turbine performance
21 p0028 A79-10235
The use of wind data with an operational wind turbine in a research and development environment
[NASA-TM-73832]
23 p0581 N79-26502

NEUWIRTH, F.
Meteorological measurement data for solar energy utilization
[ASSA-PA-5]
23 p0574 N79-25524
Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78]
23 p0574 N79-25528

NEVENS, T. D.
Technology overview reports for eight shale oil recovery processes
[PB-295665/4]
24 p0797 N79-33552

NEVEZHIN, O. A.
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356

NEVILLE, S.
Computer modelling of solar energy collection
23 p0398 A79-33986

NEVILLE, R. C.
Solar energy conversion: The solar cell
23 p0423 A79-34449

NEWBY, R. A.
Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071

NEWLAND, L. E.
Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah
23 p0534 A79-43371

NEWMAN, B. G.
The design and testing of a vertical-axis wind turbine using sails
21 p0153 A79-18467

NEWMAN, C.
The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

NEWMAN, M.
Utilization of alternative fuels for transportation; Proceedings of the Symposium, University of Santa Clara, Santa Clara, Calif., June 19-23, 1978
24 p0650 A79-49376

NEWMAN, V. G.
The integration of a complex of wind-driven generators into a power system
23 p0454 A79-37913

NEWTON, A. B.
Boosting the performance of solar HVAC systems by improving component interactions
21 p0089 A79-15851
Using controls to reduce component size and energy needs for solar HVAC
21 p0102 A79-16421

NEY, E. J.
Solar total energy - Large scale experiment
[AIAA PAPER 79-1025] 23 p0460 A79-38207

NEYELOFF, S.
Design of a direct wind energy converter to heat water by agitation in a closed tank
21 p0067 A79-14290

NEZGODA, E.
Dynamic Isotope Power Systems /DIPS/
24 p0652 A79-51528

NG, P. H.
Warm plasma effects on drift cyclotron loss cone mode
23 p0478 A79-39568

NG, T. T.
Ejector augmentation of the air supply in a compressed air energy storage plant
21 p0013 A79-10109
Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants
[CONF-780599-1] 24 p0776 N79-31830

NGABO, T. M.
The design and testing of a vertical-axis wind turbine using sails
21 p0153 A79-18467

NGUYEN, D. G.
Energy requirements of a limestone FGD system
21 p0114 A79-16747

NGUYEN, H. N.
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 1
[REPT-30/1020-VOL-1] 24 p0759 N79-30834
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 2
[REPT-30/1020-VOL-2] 24 p0760 N79-30835

NGUYEN, K. H.
Evaluation of control options for solar climate control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859

NGUYEN, N.
A study of positive electrode materials for batteries operating in a halide-aluminate medium
22 p0245 A79-21480

NGUYEN, N. H.
Copper/water axially-grooved heat pipes for RTG applications
21 p0023 A79-10188

NIAL, W. R.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110

NICHOLLS, R. L.
Solar radiation charts
22 p0263 A79-23763

NICHOLS, D. G.
Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106
An economic analysis of synthetic fuels production from eastern oil shale via hydroretort processing
22 p0264 A79-23780
Pollutants from synthetic fuels production: Facility construction and preliminary tests
[PB-287730/6] 22 p0339 N79-17027

NICHOLS, G. E.
Evaluation of electrostatic precipitator during SRC combustion tests
[PB-285864/5] 21 p0223 N79-14618

NICHOLS, K. E.
Technology assessment of geothermal pumping equipment
[ALC-4162-2] 24 p0735 N79-29524

NICHOLS, H. C.
Direct contact heat exchange for latent heat-of-fusion energy storage systems
23 p0416 A79-34132

NICHOLSON, R. W. S.
Production economics for hydrogen, ammonia, and methanol during the 1980-2000 period
23 p0413 A79-34107
Economics of small user hydrogen
24 p0613 A79-45583

NICHOLSON, W. E.
Energy from urban wastes: Report on a focus group discussion
[DOE/TIC-10022] 24 p0759 N79-30825

NICKOLS, W. R.
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898
The design and construction of the Aldborough aerogenerator
23 p0453 A79-37900

NICODEMOU, V. C.
A low cost wind energy conversion system for heating of domestic premises
23 p0452 A79-37894
Operation of self-excited generators for windmill application
24 p0706 A79-52538

NICOLAOU, M. C.
Method of producing a p-type or n-type alloy for direct thermoelectric energy conversion
22 p0260 A79-23615

NIEDZWIECKI, R. W.
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498

NINH, S.
Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354

NIEHAUS, F.
The problem of carbon dioxide
23 p0438 A79-36201
Studies of different energy strategies in terms of their effects on the atmospheric CO2 concentration
23 p0495 A79-40796

NIELD, K. J.
Design and installation manual for thermal energy storage
[ANL-79-15] 24 p0740 N79-29636

NIELSEN, C. E.
Conditions for absolute stability of salt gradient solar ponds
21 p0133 A79-17431

NIELSEN, O. M.
Effects of minority-carrier storage at the interface states on the fill factor of m.i.s. solar cells
22 p0313 A79-31347

NIELSON, K. K.
Characterization and formation of submicron particles in coal-fired plants
23 p0460 A79-38316

NIELSON, O. M.
The change in the interface-state Fermi level of MIS solar cells when going from dark to illuminated conditions
23 p0456 A79-38101

NIEMANN, R. C.
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533
Superconducting magnet systems for MHD generator facilities
22 p0290 A79-27662

NIEMCZYK, T. M.
Underground coal gasification research at the University of New Mexico
21 p0032 A79-10523

NIEMEYER, W.
Santa Clara Community Center Project, USA
22 p0277 A79-25945

NIESSEN, H. P.
The potential of fusion reactors as process heat source
22 p0284 A79-26624

NIESSEN, P.
Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407

NIESSING, W. J.
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543
Laboratories technically qualified to test solar collectors in accordance with ASHRAE standard 93-77: A summary report
[PB-289729/6] 22 p0363 N79-20524

NIGAGUNA, B. T.
Optimum tube pitch in solar collectors
21 p0132 A79-17421

NIGGEMANN, R. E.
Status report of the dynamic isotope power system
24 p0692 A79-51927

NIGRO, D. N.
Field experience with the Detroit Diesel Allison 404/505 industrial gas turbine engines
[SAE PAPER 790129] 22 p0314 A79-31361

NIHEI, H.
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

NIJS, J.
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889

NIKAI, I.
Heat transfer of absorbing evaporator in CDE engine system
23 p0531 A79-42900
Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005

NIKLASSON, G. A.
Selective absorption of solar energy by ultrafine metal particles
21 p0127 A79-17382
Ultrafine nickel particles for photothermal conversion of solar energy
24 p0638 A79-47062

NIKOLOV, I.
Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes
22 p0245 A79-21482

NIKUEV, IU. A.
'Local' breakdown criterion in highly ionized gas flow
21 p0049 A79-12683

NILSSON, T.
Utility fuel cells for biomass fuel
21 p0016 A79-10131

NIMMO, B.
An analytical and experimental study of pumped solar water heaters
21 p0128 A79-17389

NIMMO, M. H.
International project catalog of modular integrated utility systems
[PB-283477/8] 21 p0190 N79-11544
Committee on the Challenges of Modern Society Rational use of Energy Pilot Study Modular Integrated Utility Systems Project. Volume 1: Description, activities, and products
[PB-283428/1] 21 p0190 N79-11549
Committee on the challenges of modern society rational use of energy pilot study modular integrated utility system project. Volume 2: Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11558

NISHIDA, M.
Charge transfer by surface states in the photoelectrolysis of water using a semiconductor electrode
22 p0254 A79-22320

NISHIHARA, H.
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915

NISHIKAWA, K.
Thermodynamic considerations for the energy conversion process in geothermal power plants
23 p0476 A79-38947

NISHIKAWA, M.
A new combustion system in the three-valve stratified charge engine
[SAE PAPER 790439] 22 p0316 A79-31376

NISHIMAKI, M.
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence
24 p0629 A79-46249

NISHIMURA, M.
A digital control system for superconducting magnet
22 p0268 A79-24508

NISHIYAMA, K.
Studies on OTEC power system characteristics and enhanced heat transfer performance in PTL
24 p0622 A79-45821

NISHIYAMA, Y.
Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091

NISSEN, H.-H.
The economics of electric power generation from wind energy
22 p0310 A79-30998

NITSCH, J.
Potential for use of solar energy in private households to the year 2000
23 p0473 A79-38667
Energy consumption structures in the year 2000
23 p0523 A79-41241

NITZ, K. C.
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text
[PB-294812/3] 24 p0803 N79-33639

NIX, C. E.
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568

NIXON, J. M.
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716

NODA, R.
Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805

NOE, N. D.
Particulate control for coal-fired industrial boilers
21 p0065 A79-14123

NOEL, G. T.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

NOGGLE, L. W.
The potential of liquid hydrogen as a military aircraft fuel
22 p0238 A79-20773
Large-vehicle concepts
22 p0306 A79-30485

NOGUCHI, T.
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I.
21 p0130 A79-17409

NOGUEIRA, S. L.
A method for calculating the induced velocity for windmills with application to the optimization of the aerodynamic design
23 p0387 A79-33239

NOGUET, C.
Photovoltaic conversion in Cu_2O
23 p0384 A79-32973

NOLL, K. E.
Air monitoring network design for power plant siting
23 p0591 N79-27590

NOLL, R. B.
Analytical and experimental evaluation of Cycloturbine aerodynamic performance
[AIAA PAPER 79-0968] 23 p0456 A79-38176

NOLL, S.
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294

NOLL, S. A.
The economic performance of passive solar heating - A preliminary analysis
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
Economic performance: Evaluations for solar energy
[LA-UR-79-901] 24 p0759 N79-30828

NOLLET, A. R.
Air classify first, then shred
23 p0489 A79-40404

NOMURA, K.
A novel thermal engine using metal hydride
23 p0479 A79-39844

NONGBRI, G.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

NOON, E. L.
Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223

NOONE, M. J.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

NORCO, J. E.
Air monitoring network design for power plant siting
23 p0591 N79-27590

NORDMAN, D.
Solar Repowering Workshop
[SERI/TP-35-57] 24 p0787 N79-32689

NORED, D. L.
Fuel conservative aircraft engine technology
21 p0164 A79-20078

NORGATE, G.
The first year of solar collector testing at Ontario Research
22 p0322 A79-31450

NORMAN, J.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

NORMAN, J. H.
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127
Water splitting - The chemistry of the I_2-SO_2-H_2O reaction and the processing of H_2SO_4 and HI products
23 p0413 A79-34109

NORMAN, N. A.
Environmental aspects of the Syncrude tar sands project
24 p0665 A79-50889
Environmental aspects of the Syncrude tar sands project
24 p0665 A79-50889

NORMAN, R. H.
Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10186

NORRIE, D. H.
An axial-flow wind-turbine with delta-wing blades
23 p0405 A79-34044

NORTH, D. W.
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067

NORTHAM, G. B.
Characterization of a swept-strut hydrogen fuel-injector for scramjet applications
24 p0649 A79-49345

NORTHROP, D. A.
Instrumentation development for in situ coal gasification
21 p0006 A79-10053
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520
Instrumentation for in situ coal gasification. IV - Seismic and acoustic techniques for remote monitoring
22 p0304 A79-29974

NORTHRUP, C. J. M.
Acoustic emissions during hydride formation
22 p0249 A79-21691
Hydride engines
24 p0685 A79-51841

NOSEK, S. M.
Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design
21 p0050 A79-12850

NOTTENBURG, R.
Review - Thermophysical properties of oil shales
24 p0651 A79-49401

NOVAK, J. K.
Pumped storage projects and their environmental impacts - An overview
24 p0666 A79-50894

NOVAK, M.
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

NOVIL, M.
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707

NOWAK, F.
Development of the Kiener pyrolysis system for environmental protection, energy recovery and recycling
23 p0488 A79-40389

NOWAK, R. J.
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

NUNES TEIXEIRA, S. L.
The Coal Information Center of the Foundation for Science and Technology
23 p0389 A79-33262

NUNZ, G. J.
Federal hot dry rock geothermal energy development program: An overview
[LA-UR-79-670] 24 p0787 N79-32690

NUNZIATA, C.
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727

NUSINOVICH, G. S.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

NUSKE, D. J.
A multivariable controller for an automotive gas turbine
[ASME PAPER 79-GT-73] 22 p0307 A79-30537

NUSS, G.
An approach for development of performance criteria and test standards in photovoltaics
23 p0428 A79-35043

NUSS, H. E.
Thermal vacuum testing of solarpanels by solar simulation and infrared simulation
24 p0658 A79-50345

NUSSBERGER, A. A.
The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024

NUTKIS, M. S.
Pressurized fluidized bed coal combustion exposure testing of gas turbine and heat exchanger materials
[ASME PAPER 79-GT-166] 23 p0379 A79-32428

NUTTALL, H. E.
Underground coal gasification research at the University of New Mexico
21 p0032 A79-10523

NUTTALL, L. J.
Progress in solid polymer electrolyte water electrolysis
22 p0289 A79-27653

Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130

Water electrolysis using solid polymer electrolytes
24 p0613 A79-45599

Status of solid polymer electrolyte electrochemical cell technology for electrolytic hydrogen generation and fuel cell power generation
24 p0625 A79-45849

Solid polymer electrolyte water electrolysis status for large scale hydrogen production
24 p0686 A79-51847

NYE, J. L.
An advanced technology engine family for general aviation
[AIAA PAPER 79-1161] 24 p0669 A79-51705

NYE, N. B.
Study of a flexible solar array generator for a remote sensing satellite. Volume 1: Technical report
[ESS/SS-909-VOL-1] 23 p0599 N79-27709

NYHART, J. D.
Legal aspects of siting OTEC plants offshore the United States, on the high seas, and offshore other countries
24 p0626 A79-45854

O

OBENSCHAIN, S. P.
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

OBERBECK, G.
Development of a low loss flywheel magnetic bearing
24 p0678 A79-51785

OBERG, C. L.
Coal conversion by flash hydropyrolysis and hydrogasification
21 p0006 A79-10055

OBERJOHN, W. J.
Performance of a 5 MWt solar steam generator
22 p0288 A79-27399

OBERLE, R. D.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels
[FE-2307-34] 24 p0718 N79-28358

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-42] 24 p0765 N79-31410

OBERLY, C. E.
Air Force applications of lightweight superconducting machinery
22 p0290 A79-27666

OBERMAN, C.
Theory of dissipative drift instabilities in sheared magnetic fields
22 p0292 A79-27884

OBERMAN, F. R.
The measurement of plasma electrical conductivity by the electromagnetic transmission method
23 p0530 A79-42875

OBEZSAKHATOV, N.
Energy balance of solar thermoelectric generators
24 p0646 A79-48734

OBREZKOV, V. I.
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274

OBRIEN, G. P.
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

OBRIEN, P. J.
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398

Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581

OCHS, T. L.
Stability criteria for saturated solar ponds
24 p0671 A79-51736

ODLAND, R.
Implementation of state solar incentives: State testing and certification
[SERI/TR-51-162] 24 p0774 N79-31808

ODONNELL, D. T.
Performance of silicon and gallium arsenide concentration cells
23 p0511 A79-41017

ODONNELL, P. H.
Post mortem assessment - Coal gasification plant
23 p0480 A79-39909

ODONNELL, P.
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867

OETTINGER, P. E.
Thermionic energy converter investigations
24 p0699 A79-51981

OFARRELL, H. W.
Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447

OFARRELL, P. M.
A computer simulation model for determining preferred solar heating and cooling systems
22 p0267 A79-24313

OFFENHARTZ, P. O'D.
Chemically driven heat pumps for solar thermal storage
21 p0120 A79-17316

Methanol based heat pumps for storage of solar thermal energy
24 p0681 A79-51805

OFFENHAUER, R. D.
Perspectives on solar electric power for small homes
23 p0401 A79-34016

OFFIELD, T. W.
Geologic applications of thermal-inertia mapping from satellite
[E79-10279] 24 p0796 N79-33518

OFVERHOLM, E.
Passive solar house in Vetlanda - Interim report
22 p0277 A79-25943

OGALLAGHER, J.
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440

High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448

Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764

OGALLAGHER, J. J.

A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439

OGANOV, E. P.

Optimization of radioisotope thermoelectric generators with gamma-radiation protection
23 p0433 A79-35176

Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire
24 p0706 A79-52368

OGRADY, W. E.

Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

OHARA, F. M., JR.

Coal liquefaction advanced research digest
[ORNL/FE-2] 24 p0746 N79-30398

OHARE, T. J.

Small scale gasification of biomass - The case of corn cob gasifiers
24 p0631 A79-46311

OHE, T.

Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051

OHLEN, D. O.

A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining
[PB-294299/3] 24 p0735 N79-29584

OHLIG, U.

The potential of fusion reactors as process heat source
22 p0284 A79-26624

OHMATA, K.-I.

Ball screw type wave power generator
24 p0701 A79-51996

OHNO, T.

Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127

OHSAWA, Y.

Construction of Lur'e type Lyapunov function with effect of magnetic flux decay
24 p0606 A79-44916

OHTA, M.

Nuclear characteristics of D-D fusion reactor blankets - Technical data
21 p0162 A79-19826

OHTA, T.

The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294

OKABAYASHI, M.

SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557

Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

OKEEFE, D.

Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

OKEEFE, D. R.

Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109

OKEEFFE, T. W.

Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012

OKOLIE, C. C.

Solar energy bank for mankind in contemporary international space law
[IAF PAPER 79-IISL-47] 24 p0711 A79-53482

Legal norm creation concerning solar energy in contemporary international space law
24 p0713 A79-53680

OKRESS, E. C.

Solar thermal aerostat research station /STARS/
[IAF PAPER 79-35] 24 p0709 A79-53261

OKUDA, H.

The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020

OKUYAMA, M.

Ni cermet selective absorbers for solar photothermal conversion
24 p0641 A79-47790

OLAH, S.

Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454

OLDHAM, L. P.

Five MW solar thermal test facility heliostat focus and alignment system
21 p0043 A79-11972

OLEARY, B.

The construction of satellite solar power stations from nonterrestrial materials - Feasibility and economics
23 p0403 A79-34028

OLENDER, H.

Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

OLEXSEY, R. A.

Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115

Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788

Air emissions from waste to energy systems
24 p0665 A79-50883

OLIVER, D. A.

Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042

OLIVER, J. C.

Load criteria for OTEC riser cable design
24 p0620 A79-45801

OLIVER, K.

Clean energy from humid air
23 p0406 A79-34053

OLLENDORF, S.

Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183

OLMER, L. J.

Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813

Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

OLMSTED, H. G.

Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid
24 p0619 A79-45794

OLSEN, A. R.

Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

OLSEN, D. L.

Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369

OLSEN, J. N.

Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

OLSEN, L. C.

Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859

Analysis of multiple-cell concentrator/photovoltaic systems
23 p0513 A79-41026

Solar cells based on GaP/x/As/1-x/ compounds
23 p0515 A79-41045

Investigation of low cost solar cells based on Cu2O
[PB-295888/2] 24 p0792 N79-32737

OLSEN, N. H.
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

OLSON, R. L.
Development of coalbed methane as an energy source
24 p0660 A79-50452

OLSZANSKI, T. W.
Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829

OLSZEWSKI, M.
Use of waste heat from nuclear power plants
[CONF-7811109-4] 23 p0583 N79-26527
Overview of waste heat utilization techniques
[CONF-790443-2] 24 p0791 N79-32726

OM, J.
Hydrogen and electricity from water and light - A lanthanum chromite-titanium dioxide anode
24 p0705 A79-52316

OMAN, B. H.
Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026

OMAN, H.
Electrical power loss from high-voltage power circuits through plasma leakage
21 p0169 N79-10113
Solar cells for solar power satellites
24 p0751 N79-30749

OMAN, R. A.
Fluid dynamics of diffuser-augmented wind turbines
22 p0238 A79-20798

OMHOLT, T.
A wave activated electric generator
22 p0288 A79-27389

OMID, G. H.
Enthalpy measurements for coal-derived liquids
23 p0587 N79-26997

OMORI, S.
Cyclone and fluidized bed combustion concepts for coal fired open cycle MHD
23 p0391 A79-33385

OMOTO, O.
Fabrication and characterization of SnO2/n-Si solar cells
24 p0642 A79-47802

OMURTAG, Y.
A survey of energy information systems and its implications for industrial energy management
21 p0072 A79-14685

ONDOV, J. M.
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231

ONEILL, P.
The dependence of optical properties on the structural composition of solar absorbers - Gold black
22 p0242 A79-21162
Microstructure dependence of the optical properties of solar-absorbing black chrome
22 p0256 A79-22858
The surface microstructure optical properties relationship in solar absorbers - Black chrome
24 p0655 A79-50181

ONG, K. S.
Comparative performance testing of flat-plate solar water heaters
21 p0130 A79-17405

ONG, T. H.
A simulation study of phase change energy store
21 p0120 A79-17318

ONO, S.
A novel thermal engine using metal hydride
23 p0479 A79-39844

ONODERA, S.
Evaluation of the geothermal potential of Kirishima by resistivity sounding curves
23 p0476 A79-38948

ONUFREICZUK, S.
The application of hydraulics in the 2,000 kW wind turbine generator
22 p0288 A79-27400

ONYEONWU, R. O.
Commercialisation of solar energy devices in developing countries - Problems and prospects
23 p0477 A79-39105

OOI, B. T.
Induction-generator/synchronous-condenser system for wind-turbine power
22 p0286 A79-27219

OPLINGER, J.
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560

OPLINGER, J. L.
Distributed wind generation assessment
24 p0634 A79-46536
Assessmentt of wind energy systems in a utility framework
24 p0677 A79-51779

ORAN, W. A.
Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026

ORBACH, A.
Optimizing solar energy systems using continuous flow control
21 p0138 A79-17477

OREILLY, J. E., JR.
Computer-Aided Power System Design
24 p0646 A79-48632

OREILLY, L. P.
Planning for resource recovery in the 'Big Apple'
23 p0491 A79-40424

ORGAN, A. J.
Mechanical efficiency of the Stirling cycle machine with rhombic drive
21 p0025 A79-10208

ORGILL, J. F.
Component cost of solar energy systems
22 p0319 A79-31429
WATSUN - A simulation program for solar-assisted heating systems
22 p0321 A79-31439

ORGILL, M. M.
Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527

ORLANDO, A. F.
Thermosyphon solar water heating system under Brasilian conditions
21 p0021 A79-10177

ORLOSKI, M. J.
State-of-the-art study of heat exchangers used with solar assisted domestic hot water systems (potential contamination of potable water supply)
[PB-287410/5] 22 p0343 N79-17351

ORPHAN, R. C.
Program report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department
[UCRL-51444-78] 24 p0722 N79-28668

ORR, F. M., JR.
Viscosity reduction of coal liquids by dissolved carbon dioxide
[SAND-79-7027] 24 p0732 N79-29365

ORSHANSKII, I. S.
Study of photocell characteristics dependence on solar ray incidence angle and intensity
24 p0601 A79-44255

ORSINI, R. A.
Coal desulfurization test plant status - July 1977
21 p0044 A79-12118

ORTEGA, A.
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565

OSBORN, D. E.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

OSHIMA, K.
The utilization of LH2 and LNG cold for generation of electric power by a cryogenic-type Stirling engine
22 p0311 A79-31020

OSSANI, S. E.
Comparison of two hydrogen production methods for nuclear-hydrogen conversion
23 p0413 A79-34108

OSTASHOV, V. M.
Dependence of the pour point of diesel fuels on the properties of the initial components
[NASA-TM-75424] 22 p0364 N79-21217

OSTOJA, P.
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003

OSULLIVAN, G.
An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047

OSUMI, M.
An evacuated glass tube solar collector and its application to a solar cooling, heating and hot water supply system for the hospital in Kinki University
24 p0641 A79-47797

OSWALD, R. L.
Thermal storage of off-peak electrical energy in solar heating and cooling systems
24 p0644 A79-47945

OTAGAWA, T.
The photochemical reaction applied to a multiply hybridized water-splitting system
24 p0715 A79-54294

OTHMER, P. W.
The El Camino Real Solar Cooling Demonstration Project
21 p0102 A79-16425

OTI, M.
Recent ooids from different environments - Relationship between petrophysical properties and microstructure
23 p0529 A79-42424

OTIS, D. R.
Ejector augmentation of the air supply in a compressed air energy storage plant
21 p0013 A79-10109
Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants
[CONF-780599-1] 24 p0776 N79-31830

OTT, E.
Wave reflection from the lower hybrid surface - A toroidal effect
22 p0255 A79-22427

OTTENBERGER, W.
Sputtering yields of graphite and carbides and their potential use as first wall materials
23 p0444 A79-36892

OTTENS, H. H.
Investigations on the aeroelastic stability of large wind turbines
23 p0483 A79-40116
Investigations on the aeroelastic stability of large wind turbines
[NPL-MP-78014-U] 24 p0792 N79-32731

OTTERBEIN, R. T.
A modified single diode model for high illumination solar cells for simulation work
23 p0518 A79-41061
Combined photovoltaic/thermal system studies
[SAND-78-7031] 24 p0787 N79-32691

OTTINGER, P. F.
Microstability of a focused ion beam propagating through a z-pinch plasma
22 p0270 A79-24817

OTTO, C. H., JR.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229

OTTS, J. V.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

OTVOS, J. W.
Hydrocarbons and energy from plants
[LBL-8596] 23 p0564 N79-24507

OUCHI, K.
Reaction mechanism of alkali-alcohol treatment of coal
22 p0299 A79-29315

OUCHI, M. D.
The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739

OUTULNY, E.
The optimum voltage for batteries used in standby lighting systems
[BLL-RTS-11512] 22 p0347 N79-18439

OVCHARENKO, V. A.
Commercial realization of MHD - A challenge for superconducting magnets
21 p0084 A79-15302

OVCHINNIKOV, V. L.
Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373

OVEREND, R.
Potential for biomass utilization in Canada
23 p0494 A79-40744

OVERSKEI, D.
The effects of wall temperature on light impurities in Alcator
22 p0313 A79-31188
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

OVERTURF, B. W.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

OVEZSAKHATOV, B.
Determination of thermal contact resistances
21 p0166 A79-20351

OVEZSOKHATOV, B. O.
The attainable efficiency of the solar thermoelectric generators
21 p0140 A79-17496

OVSHINSKY, S. R.
A new amorphous silicon-based alloy for electronic applications
21 p0100 A79-16226

OVSIANNIKOV, G. A.
Effect of microwave radiation on the volt-ampere characteristics of superconducting bridges of variable thickness
23 p0395 A79-33690

OWEN, P. T.
An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640

OWENS, R. E.
Energy efficient engine: Propulsion system-aircraft integration evaluation
[NASA-CR-159488] 22 p0337 N79-16850

OWENS, W. L.
OTEC system response and control analysis
24 p0625 A79-45850

OWENS, W. R.
Considerations for adapting an MHD baseload power plant for intermediate and peaking duty
24 p0701 A79-51792
Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478

OXLEY, J. H.
A summary of R&D programs
21 p0146 A79-17639
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378
Using coal inside California for nonelectric applications
23 p0591 N79-27599

OZEROFF, M. J.
Satellite Power System (SPS) military applications
[NASA-CR-158109] 22 p0337 N79-16895

OZISIK, M. N.
Stability of gas in the gap of inclined flat plate solar collectors - Effects of convective boundary condition and radiation
23 p0358 A79-33990

OZONARO, C. O.
Analysis of coke combustion during in-situ oil recovery
23 p0553 N79-24095

P

PACKER, M. B.
Reducing institutional barriers to solar energy through the use of cooperatively-owned solar energy systems
24 p0707 A79-52573
An assessment of thermal energy storage in conjunction with heat pumps for residential heating and cooling
24 p0707 A79-52574

PADDISON, F. C.
Energy programs at the Johns Hopkins University Applied Physics Lab.
[PB-295439/4] 24 p0793 N79-32739

PADEN, L. J.
Temperature dependent parameter analysis of thermoelectric devices
21 p0113 A79-16740

PADERIN, L. IA.
Effect of form errors on the characteristics of ellipsoidal radiant energy concentrators
22 p0296 A79-28667
Composite paraboloidal radiant energy concentrators
24 p0602 A79-44262
The effect of errors in their shape on the characteristics of ellipsoidal concentrators of radiant energy
24 p0637 A79-46905

PADORIN, G. V.
Optimization of radioisotope thermoelectric generators with gamma-radiation protection
23 p0433 A79-35176

PADUNCHAI, S.
The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432

PAGANESSI, J. E.
Synthetic fuels from peat gasification
24 p0687 A79-51856

PAGE, D. J.
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

PAGE, G. C.
Guidelines for preparing environmental test plans for coal gasification plants
[PB-286659/8] 21 p0232 N79-15479
Environmental assessment: Source test and evaluation report, Chapman low-Btu gasification
[PB-289940/9] 22 p0373 N79-21662

PAGEL, L. L.
A cooling system for an aircraft having a cruise range from Mach 2 to Mach 8
[NASA-CASE-LAR-12406-1] 23 p0568 N79-24980

PAGLIARI, M.
A micrometeorological network for study of transport and diffusion of pollutants in two Apennine Valleys
23 p0586 N79-26638

PAHLMAN, J. E.
Stability of alumina-base refractories in western lignite-ash slag environments
[PB-293238/2] 24 p0731 N79-29249

PAHOJA, M. H.
Comparative performance of tracking type and non-tracking type solar collectors
21 p0136 A79-17454

PAI, V. P.
Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541
Energy availabilities for state and local development: 1974 data volume
[ORNL/TM-5890-S3] 21 p0175 N79-10542
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511

PAI, Y. P.
Analysis of ion-implanted solar cells
23 p0508 A79-40991

PAIGE, D.
The production of ethanol from agricultural waste: An economic evaluation
[PB-292552/7] 23 p0577 N79-26233

PAL, B. P.
Performance of solar concentrators - A theoretical study
21 p0135 A79-17453

PAL, D.
Field testing of 5-kW commercial wind generator with an automatic load-matching device for utilizing its output
21 p0143 A79-17515
A technique for longitudinal correlation of wind data - Theory and its application to siting of wind power plants
21 p0143 A79-17518

PALEN, W. A.
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555

PALMEDO, P. F.
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500
Systems approach to energy planning
[BNL-25523] 24 p0741 N79-29657
Systems framework for energy analysis in developing countries
[BNL-25933] 24 p0791 N79-32722

PALMER, A. J.
Radiatively sustained cesium plasmas for solar electric conversion
21 p0109 A79-16615

PALMER, E. A.
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398
Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581

PALMER, G. M.
Hybrid air to water solar collector design
21 p0021 A79-10174

PALMER, J. D.
An assessment of thermal energy storage and waste heat dissipation with total energy systems for MIT
[AD-A059061] 21 p0205 N79-13502

PALMITER, L.
Measured and modeled passive performance in Montana
22 p0322 A79-31445

PALOWITCH, E. R.
An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871

PALUMBO, J.
Hydrogen from falling water
24 p0614 A79-45594

PALZ, W.
Trends in photovoltaic development outside the United States
23 p0496 A79-40882

PAMPREEN, R.
Annular diffuser performance for an automotive gas turbine
[ASME PAPER 78-GT-147] 24 p0605 A79-44790

PAN, G. A.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

PAN, S. S.
A one-dimensional combustion model for a dual chamber stratified charge spark ignition engine
[SAE PAPER 790355] 22 p0315 A79-31371

PAN, Y. C.
Fuel cell catalyst sintering studies
[EPRI-EM-833] 24 p0776 N79-31828

PAN, Y. L.
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

PANAYOTATOS, P.
- Experimental critique of the simple Schottky theory of metal-silicon solar cells using a range of metals and illumination levels 23 p0507 A79-40986

PANCHENKO, V. IA.
- Solar-radiation-excited CO_2-Br_2-He gas laser 23 p0357 A79-33887

PANDE, G. D.
- A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S. 21 p0132 A79-17423

PANDE, K. P.
- Grain-boundary edge passivation of GaAs films by selective anodization 21 p0154 A79-18487
- Thin-film GaAs solar cells with grain-boundary edge passivation 23 p0436 A79-35749

PANDOLFINI, P. P.
- Core unit testing of the APL/JHU shell-less folded tube heat exchanger 24 p0618 A79-45788
- Experiments on ultrasonic cleaning of a shell-less folded-aluminum-tube, OTEC heat exchanger 24 p0623 A79-45835

PANDYA, D. K.
- Transparent conducting coatings for solar cells 21 p0124 A79-17350
- Selective coatings for solar energy conversion 21 p0126 A79-17376
- Back illuminated high efficiency thin film Cu_2S/CdS solar cells 24 p0656 A79-50190

PANERO, S.
- On the possibility of using silver salts other than Ag_2CrO_4 in organic lithium cells 22 p0246 A79-21491

PANGBORN, J. B.
- New energy from an old source - Hydrogen from falling water 21 p0015 A79-10129
- Hydrogen via thermochemistry and future water-splitting technologies 22 p0289 A79-27654
- Hydrogen via thermochemical and other advanced water-splitting technologies 24 p0614 A79-45590
- Distribution of gaseous hydrogen - Technology evaluation 24 p0615 A79-45598
- Suitability of gas distribution equipment in hydrogen service 24 p0685 A79-51845
- Hydrogen from existing falling-water sites: An initial feasibility assessment (summary) [CONF-781142-8] 24 p0718 N79-28360
- Behavior of gas distribution equipment in hydrogen service [CONF-790512-2] 24 p0747 N79-30408

PANICHI, C.
- Suggestions for a geochemical prospecting of geothermal systems - A first survey of the Italian thermal springs 21 p0075 A79-14737

PANNO, G.
- The relationship between diffuse and total solar radiation in computer simulation of solar energy systems 21 p0119 A79-17304

PANOV, D. A.
- Cryogenic technology and superconductivity in controlled fusion 22 p0311 A79-31003

PANTALONI, J.
- Thermal energy storage by means of the latent heat of fusion of a mineral salt - Study of a direct contact dynamic exchanger with salt crystallization during flow 23 p0383 A79-32962

PANYAKEOW, S.
- Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure 22 p0305 A79-30258

PANZHAUSER, E.
- Meteorological measurement data for solar energy utilization [ASSA-FA-5] 23 p0574 N79-25524

PAO, S. C.
- Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells 23 p0497 A79-40890
- Design considerations for silicon HLE solar cells 23 p0521 A79-41094

PAORICI, C.
- Crystal growth and properties of CuGa/x/In/1-x/Se_2 chalcopyrite compound 24 p0654 A79-50176

PAPADOPOULOS, K.
- Electrons of high perpendicular energy in the low-density regime of tokamaks 22 p0270 A79-24852

PAPAGNO, L.
- Oxygen adsorption on stainless steel 23 p0445 A79-36965

PAPAY, L. T.
- Direct firing of coal for power production 23 p0592 N79-27612

PAPINI, F.
- Effect of physical properties of a flat plate solar collector cover on efficiency calculations - Simplifying hypotheses 21 p0164 A79-19949

PAPPAS, T. A.
- Underground storage of natural gas by interstate pipeline companies for 1976 and winter 1976 - 1977 [DOE/EIA-0151] 23 p0597 N79-27684

PAPUSHA, O. N.
- Spatial oscillations of a solid body carrying a low-power flywheel motor 21 p0188 A79-17792

PAQUETTE, D. G.
- Reproducibility and performance of large prototype Na/S cells 24 p0684 A79-51835

PAQUETTE, E. L.
- Preliminary analysis of advanced ceramic magnetohydrodynamic /MHD/ combustor design concepts 22 p0240 A79-20838

PARAIN, J.
- Conceptual design of a superconducting tokamak - 'TORUS II SUPRA' 22 p0236 A79-20543

PARANJPE, P. A.
- Cycle optimization for a solar turbopack 21 p0141 A79-17500
- Application of turbopack in solar energy systems 21 p0141 A79-17504

PARASCHIVOIU, I.
- A hybrid wind turbine suitable for developing regions 22 p0323 A79-31455
- Theoretical study of a hybrid wind turbine 23 p0405 A79-34047
- Free vortices from a wing for wind turbine systems 23 p0537 A79-43683

PARFENOV, O. G.
- Fast penetration of a magnetic field into a low-density plasma 22 p0244 A79-21432

PARIKH, P. P.
- Design and optimization of a flat plate collector for cooling application 21 p0132 A79-17419

PARK, G. L.
- An analytical expression for the specific output of wind turbine generators 22 p0273 A79-25720
- Impact of storm fronts on utilities with WECS arrays 24 p0635 A79-46546

PARK, W. R.
- Estimating the commercial potential and energy benefits of ERDA electric energy research 23 p0419 A79-34161

PARKER, A. J., JR.
- The status of alcohol fuels utilization technology for highway transportation 21 p0003 A79-10035
- Principles of solar cooling and heating 21 p0103 A79-16457
- Application of solar cooling for a school building in subtropics 21 p0103 A79-16461

PARKER, B. F.
Heat storage in crushed limestone
24 p0609 A79-45215

PARKER, C. E.
A technique for longitudinal correlation of wind data - Theory and its application to siting of wind power plants
21 p0143 A79-17518

PARKER, C. L.
Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes
[PB-287800/7] 22 p0344 N79-17365

PARKER, G. H.
Laboratory model and electrolyzer development for the sulfur cycle hydrogen production process
24 p0685 A79-51843

PARKER, J. C.
Development, testing, and certification of Calmac Mfg. Corp. solar collector and solar operated pump
[NASA-TM-78218] 22 p0342 N79-17338
Development, testing, and certification of the Northrup, Inc., ML series concentrating solar collector model NSC-01-0732
[NASA-TM-78219] 22 p0371 N79-21618
Development, testing, and certification of Owens-Illinois model SEC-601 solar energy collector system
[NASA-TM-78223] 22 p0371 N79-21620

PARKER, L. W.
Plasma sheath effects and voltage distributions of large high-power satellite solar arrays
23 p0552 N79-24024
Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026

PARKER, R. R.
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

PARKER, S. A.
Power generation using thermal vapor pumping and hydro-pumped storage - Thermal gradient utilization cycle /TGUC/
21 p0095 A79-15914
Thermal gradient-hydro generation cycle /TGUC/
21 p0098 A79-16102

PARKINSON, B. A.
Effects of cations on the performance of the photoanode in the n-GaAs/K2Se-K2Se2-KOH/C semiconductor liquid junction solar cell
23 p0446 A79-37272

PARKS, G. E.
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures
21 p0083 A79-15245

PARKS, P. C.
A wave power machine using free floating vertical plates
21 p0151 A79-18104

PAROBEK, L.
Electrostatic separation of coal macerals
24 p0603 A79-44525

PARROTT, J. E.
Theoretical upper limit to the conversion efficiency of solar energy
21 p0042 A79-11876
The limiting efficiency of an edge-illuminated multigap solar cell
22 p0305 A79-30259
Analysis of an edge-illuminated graded-gap solar cell
23 p0442 A79-36793

PARSONS, B. I.
Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470

PARSONS, R. E.
Design guide for shallow solar ponds
[UCRL-52385] 21 p0185 N79-11497
Design guide for shallow solar ponds
[UCRL-52385-REV-1] 24 p0727 N79-28774

PARTL, R.
Power from glaciers - The hydropower potential of Greenland's glacial water
21 p0087 A79-15672

PASHA, M. L.
A numerical model of underground coal gasification for air-water injection into a permeable bed
24 p0689 A79-51867

PASHKOV, S. A.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406

PASION, A. J.
Design and evaluation of aircraft heat source systems for use with high-freezing point fuels
[NASA-CR-159568] 23 p0553 N79-24172

PASQUALETTI, M. J.
Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations
22 p0265 A79-24046

PASQUETTI, R.
Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269
Optimization of the heat transfer circuit of solar power plants using distributed solar thermal converters - Application to collectors of the THEK type
23 p0382 A79-32953

PASTEUR, G.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39984

PASTIRIK, E.
The development of a method of producing etch resistant wax patterns on solar cells
[NASA-CR-158563] 23 p0550 N79-23527

PASTIRIK, E. M.
A low cost, durable anti-reflective film for solar collectors
23 p0507 A79-40983

PATANE, P.
A new approach for solar energy systems design by means of the sensitivity theory
23 p0448 A79-37849

PATANI, A.
Modeling the performance of gas-fired heat pump systems
24 p0697 A79-51963

PATANKAR, S. V.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973

PATCH, R. W.
Reduction of particulate carryover from a pressurized fluidized bed
24 p0653 A79-49527
Preliminary comparison of theory and experiment for a conical, pressurized-fluidized-bed coal combustor
[NASA-TM-79137] 23 p0542 N79-22623

PATEL, A. S.
Study of integrated gasification combined cycle plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530

PATEL, D.
Heat transfer in phosphoric acid fuel cell stacks
21 p0010 A79-10091

PATEL, J. G.
IGT U-GAS pilot plant developments
24 p0688 A79-51861

PATEL, J. S.
A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S.
21 p0132 A79-17423

PATEL, P. M.
New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798

PATEL, S. S.
Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes
[PB-287799/1] 22 p0344 N79-17364

PATEL, V.
Thermodynamic basis for the choice of working fluids for solar absorption cooling systems
24 p0641 A79-47791
PATELUNAS, G. M.
Special considerations in the environmental study program for coal gasification plants
24 p0659 A79-50350
PATIENCE, R. L.
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375
PATIL, P. G.
Thermal performance of solar collectors used in the national solar heating and cooling demonstration program
21 p0130 A79-17403
PATTEMORE, S. W.
Wind power site evaluation. I - Wind energy potential. II - Data acquisition and processing
22 p0257 A79-22928
PATTEN, D. T.
Workshop on Ecological Impacts of Solar Energy Conversion
[COO-4339-4] 23 p0583 N79-26522
PATTEN, J.
Technical support for open-cycle MHD program
[ANL-MHD-78-8] 22 p0361 N79-20507
PATTERSON, B.
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426
PATTERSON, D. B.
The effectiveness of multi-date, multi-scale aerial remote sensing imagery for monitoring coal mining operations and reclamation efforts in Alberta
23 p0438 A79-36505
PATTERSON, G. N.
The race for unlimited energy
24 p0630 A79-47071
PATTERSON, P. D.
Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487
PATTERSON, R. D.
Production and use of low and medium Btu gas
21 p0095 A79-15912
PATTON, H. G.
Techniques for preventing damage to high power laser components
21 p0083 A79-15145
PAUCKERT, R. P.
Testing of central receiver for central thermal power systems
23 p0428 A79-35045
PAUL, D. K.
Characterisation of amorphous semiconductor materials for solar cell applications
21 p0123 A79-17381
PAUL, H. G.
Graphical representation of solar collector performance
24 p0609 A79-45216
PAUL, J. K.
Passive solar energy design and materials
22 p0302 A79-29625
PAUL, J. W. M.
Review of results from DITE tokamak
21 p0069 A79-14456
PAULLING, J. R., JR.
Testing the CTEC cold water pipe using the 'Deep Oil X-1' platform
23 p0430 A79-35058
PAULSON, D. G.
A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions
23 p0590 N79-27546
PAUVER, W. P.
Flow modeling of an atmospheric pressure, entrained-type coal gasifier
22 p0280 A79-26188
PAVELIC, V.
Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652
PAVLECKA, V. H.
Air buoyant vehicles - Energy efficient aircraft
[AIAA PAPER 79-1862] 24 p0643 A79-47919
PAVLIUK, V. A.
Superconductivity in antenna engineering
22 p0311 A79-31008
PAWLOWSKI, P.
Development of a heat pipe cooled 200 watt TWT with improved efficiency
24 p0764 N79-31275
PAYNE, P.
Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight
23 p0511 A79-41018
PAYNE, P. E.
Hybrid alternate energy system
24 p0675 A79-51768
PAYNE, P. R.
The fossil fuel cost of solar heating
21 p0022 A79-10180
PAYTON, R. A.
A microprocessor-based control system for solar heating and cooling
21 p0107 A79-16565
The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications
23 p0402 A79-34020
PEACHEY, C. J.
Tidal current energy conversion
23 p0450 A79-37870
PEACOCK, N. J.
Review of results from DITE tokamak
21 p0069 A79-14456
PEACY, J.
Integrating an electrostatic precipitator into a municipal solid waste resource recovery system
23 p0489 A79-40398
PEARCE, J.
An analytical and experimental study of pumped solar water heaters
21 p0128 A79-17389
PEARCE, L.
Preliminary evaluation of a GaAlAs solar concentrator space power unit
23 p0506 A79-40975
PEARCE, L. S.
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
PEARSON, C. V.
Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478
PEARSON, D.
A test bed for thermosyphon solar air collectors
[AIAA PAPER 79-0541] 22 p0274 A79-25860
PEARSON, G. F.
A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332
PEARSON, H.
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0599 N79-27730
PEARSON, R. G.
Energy analysis
[NP-23145] 21 p0187 N79-11513
PEARSON, R. O.
TRW PSD-I power system design
24 p0618 A79-45792
PEART, R. M.
Small scale gasification of biomass - The case of corn cob gasifiers
24 p0631 A79-46311
PECK, J. F.
The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860
PECK, L. J.
Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018
PECK, S.
Performance analysis of phase change thermal energy storage/heat pipe systems
[AIAA PAPER 79-1096] 23 p0462 A79-38566

PEDERSEN, B.
Nuclear magnetic resonance studies of metal hydrides
22 p0248 A79-21683
PEDERSEN, K. B.
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806
PEEBLES, P. Z., JR.
Accuracy analysis of pointing control system of solar power station
[NASA-CR-150880] 21 p0215 N79-14143
PEEL, R. B.
Liquefaction of high ash Brazilian coals
23 p0385 A79-33224
Fluidised bed combustion of high ash Brazilian coals
23 p0385 A79-33225
PEELLE, E.
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677
PEJSA, J. H.
Evaluation of control options for solar climate control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859
Jet impingement solar air heater
[AIAA PAPER 78-1760] 21 p0061 A79-13861
PELCZARSKI, W.
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533
PELCZARSKI, W. J.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
PELTO, C. R.
Energy information: Report to Congress
[NTISUB/C/027-001] 21 p0221 N79-14576
PELTZMAN, E. S.
Controls for residential solar heating
21 p0101 A79-16418
PENA, J. L.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054
PENDERGRASS, J. H.
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
24 p0685 A79-51839
Synfuel /hydrogen/ production from fusion power
24 p0695 A79-51946
The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0656 A79-51955
PENN, L. S.
Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors
[UCRL-80116-PT-A] 21 p0215 N79-14165
PENNELL, W. T.
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568
PENNER, P. S.
Total energy and labor requirements for an electric commuter railroad
21 p0068 A79-14325
PENNER, S. S.
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures
21 p0083 A79-15245
The AGARD propulsion and energetics panel, 1952-1977
[AGARD-AR-111] 22 p0337 N79-16848
PENSE, A. W.
Fracture toughness of cryogenic alloys
24 p0604 A79-44550
PERALDO, M.
Selective covers for natural cooling devices
22 p0272 A79-25522
PERALTA BELLIDO, M.
Study of the characteristics of Ni-Cd storage batteries for space applications
22 p0304 A79-30207
PERCHERON-GUEGAN, A.
Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711
PERCIVAL, W. H.
Potential of the Stirling engine for stationary power applications in the 500-2000 HP range
21 p0025 A79-10211
PEREGO, A.
Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492
PEREZ BRACETTI, F.
Electric utility system planning studies for OTEC power integration
24 p0625 A79-45848
PEREZ Y PEREZ, L.
Testing the OTEC cold water pipe using the 'Deep Oil X-1' platform
23 p0430 A79-35058
Cold water pipe verification test
24 p0621 A79-45811
PERGAMENT, V. I.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429
PERI, G.
Solar thermal conversion installations in the medium power range - The Thek project
22 p0254 A79-22269
The THEK program for solar energy plants with 'distributed' converters
23 p0462 A79-38574
PERINO, A. M.
Solar powered irrigation systems
23 p0403 A79-34030
Solar powered irrigation: Present status and future outlook
[SAND-78-0016C] 21 p0175 N79-10539
Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566
Methodology for determining the economic feasibility of residential or commercial solar energy systems
[SAND-78-0931] 24 p0759 N79-30827
PERKARI, S. B.
Scale-up of phosphoric acid fuel cells
24 p0682 A79-51812
PERKINS, F.
Prediction of stresses and natural frequencies for high speed wind turbine blades
[AIAA PAPER 79-0970] 23 p0456 A79-38177
PERKINS, G. S.
A low cost high temperature sun tracking solar energy collector
22 p0366 N79-21390
PERKINS, S. P., JR.
Assessment of the potential of solar thermal small power systems in small utilities
[NASA-CR-158093] 22 p0335 N79-16377
PERLICH, H.
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
PERRY, A. M.
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534
PERRY, J.
Improved anodes for liquid hydrocarbon fuel cell
[AD-A058456] 21 p0206 N79-13504
PERRY, J. H.
Methane drainage study in the Sunnyside coalbed, Utah
[PB-289772/6] 23 p0540 N79-22606
PERRY, R. T.
Perspective on the fusion-fission energy concept
21 p0095 A79-15913
PERRY, T. E.
Environmental considerations of the development of geothermal power plants which utilize liquid-dominated resources - The Heber project
24 p0667 A79-50900
PERSHING, B. M.
Performance of windmills in a closely spaced array
23 p0537 A79-43681

PERSHING, D. W.
Combustion modification pollutant control techniques for industrial boilers - The influence of fuel oil properties and atomization parameters
[ASME PAPER 78-WA/APC-13] 21 p0159 A79-19742
PERTUS, M.
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0458 A79-40900
PESANTE, D.
Preliminary results of a program to study OTEC oceanic environmental parameters at Punta Tuna, Puerto Rico
24 p0622 A79-45817
PESCHEL, W. H.
Development of ceramic parts for a truck gas turbine at MTU
21 p0050 A79-12831
PESCHKA, W.
Space power technology - Current status and future development trends
[DGLR PAPER 78-167] 21 p0063 A79-14054
Cryogenic hydrogen storage and refueling for automobiles
24 p0686 A79-51846
PESOCHIN, V. R.
Combustion of porous particles
21 p0049 A79-12708
PETERMAN, D. D.
Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112
Nitrogen fixation with fusion heat
24 p0695 A79-51948
PETERS, R. C.
Chemicals from coal. Report based on HRI H-coal product
[FE-1534-50] 21 p0180 N79-11166
PETERS, D. A.
Lag damping in autorotation by a perturbation method
[AHS 78-25] 21 p0152 A79-18151
PETERS, J. E.
Ignition/stabilization/atomization - Alternative fuels in gas turbine combustors
21 p0052 A79-12982
PETERSEN, C. K.
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142
Corrosion and deposits in MHD generator systems
21 p0081 A79-14935
PETERSON, D. J.
Applications of thermal energy storage to process heat and waste heat recovery in the iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473
PETERSON, D. R.
The lithium boiler - A 1500 to 2000 K fusion reactor blanket concept for process heat and/or electric power generation
24 p0656 A79-51955
PETERSON, F.
Production of hot water with the aid of solar energy: Conditions and costs
[SIB-R-83-1978] 23 p0598 N79-27700
PETERSON, J. L.
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
PETERSON, R. A.
Biomass utilization in Minnesota
[PB-282531/3] 21 p0171 N79-10241
PETERSON, S. D.
Modal analysis of seismic guided waves in coal seams
24 p0803 N79-33664
PETIT, G.
A technological and economic study of the distribution of hydrogen for motor vehicles
23 p0447 A79-37774
PETIT, R. B.
Effect of surface curvature on measurement of the absorptance properties of solar coatings
21 p0042 A79-11879
PETRESCU, S.
Experimental researches concerning the use of solar energy in the generation of electric energy
23 p0465 A79-38593
PETRICK, M.
Open-cycle magnetohydrodynamic electrical power generation
21 p0104 A79-16478
The MHD power plant and its environmental aspects - Introduction
21 p0105 A79-16479
Technical and economic aspects of open-cycle MHD power plants
21 p0105 A79-16482
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564
MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500
PETROV, V. G.
Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764
PETROVA, L. I.
Study of diffusion processes in low-temperature thermopiles
21 p0054 A79-13290
PETROVICH, A.
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309
PETTIT, R. B.
Optical evaluation techniques for reflecting solar concentrators
21 p0043 A79-11971
Hemispherical transmittance properties of solar glazings as a function of averaging procedure and incident angle
24 p0655 A79-50184
PETTITT, R. A.
Hot dry rock - A new potential for energy
22 p0265 A79-23832
PETTY, S. W.
Electrode development for coal fired MHD generators
23 p0392 A79-33396
PETURA, R. C.
Utilization of sewage skimmings as fuel to generate process steam
23 p0492 A79-40426
PEUBE, J.-L.
Heat storage and transient regimes in solar electric plants
23 p0462 A79-38575
The Odeillo solar electric power plant
23 p0524 A79-41807
PEUSER, F. A.
International Solar Energy Conference on the Performance of Solar Heating and Cooling Systems, Duesseldorf, West Germany, April 19, 20, 1978, Proceedings
[NATO/CCMS-85] 22 p0275 A79-25926
PFAENDER, F. K.
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709
PFEIFFER, W.
Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240
PFENDER, E.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973
Energy exchange between earth-sheltered structures and the surrounding ground
24 p0630 A79-46305
PFERDEHIRT, W. P.
Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659
PFIRSCH, D.
MHD equilibrium and stability
21 p0078 A79-14779
Collisional transport
21 p0078 A79-14780
Equilibrium relations in the presence of arbitrary plasma diffusion in axisymmetric configurations
22 p0257 A79-22979
Collisional transport
22 p0257 A79-22980

PFISTERER, F.
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
Cu2S-CdS thin-film solar cells
23 p0466 A79-38601

PFLUGER, J. R.
A fully interconnected wind system
24 p0635 A79-46540

PHADKE, L.
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

PHAM, V. V.
Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585

PHARABOD, F.
Production of mechanical energy by thermodynamic conversion of solar energy
22 p0310 A79-30999
Solar power plants. I - Present programs and outlooks
23 p0434 A79-35481

PHARR, E. H.
A feasibility study of an CTEC guyed tower concept
24 p0619 A79-45798

PHELINE, J.
Solar energy and decentralized electricity production - Low-power solar pumps and installations
23 p0434 A79-35480

PHELINE, M. J.
Report on the development of solar energy in France
21 p0117 A79-17280

PHILIP, C. V.
Synthetic fuels from Gulf Coast lignite
21 p0146 A79-17643

PHILLIPS, C. R.
Potential of biomass to substitute for petroleum in Canada
23 p0494 A79-40743

PHILLIPS, C. W.
International project catalog of modular integrated utility systems
[PB-283477/8] 21 p0190 N79-11544
Committee on the Challenges of Modern Society Rational use of Energy Pilot Study Modular Integrated Utility Systems Project. Volume 1: Description, activities, and products
[PB-283428/1] 21 p0190 N79-11549
Committee on the challenges of modern society rational use of energy pilot study modular integrated utility system project. Volume 2: Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11550

PHILLIPS, J. E.
Achievement of 9.15% efficiency in thin film CdS/Cu2S solar cells
23 p0503 A79-40949

PHILLIPS, J. W.
All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906

PHILLIPS, P.
An experimental determination of the parallel electron velocity distribution during strong turbulence
23 p0446 A79-37264
Effects of turbulent heating in the Texas turbulent torus
24 p0640 A79-47426

PHILLIPS, P. H.
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

PHILLIPS, R. C.
The Koppelman process
21 p0145 A79-17634
Upgrading lignite by the Koppelman process
21 p0146 A79-17641
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413

PHILLIPS, S. L.
National Geothermal Information Resource
[LBL-7803] 21 p0187 N79-11515
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555

PHILP, R. P.
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419

PHUNG, D. L.
A unified methodology for cost analysis of energy production
23 p0419 A79-34159
Three modes of energy cost analysis - Then-current, base-year, and perpetual-constant dollar
23 p0422 A79-34277
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699
Three modes of energy cost analysis: Then-current dollars, base-year dollars, and perpetual-constant dollars
[ORAU/IEA(M)-78-10] 21 p0209 N79-13531

PHUOC, N. T.
Growth and characteristics of polysilicon layers achieved by the ribbon-against-drop /RAD/ pulling process
23 p0498 A79-40900

PIAN, C. C. P.
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995
Evaluation of the ECAS open cycle MHD power plant design
[NASA-TM-79012] 22 p0341 N79-17335
Performance optimization of an MHD generator with physical constraints
[NASA-TM-79172] 23 p0558 N79-24446
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499

PIBIRI, G.
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy
24 p0713 A79-53545

PICCOLO, R.
Fiat Research Center hybrid vehicle prototype
[SAE PAPER 790014] 22 p0313 A79-31351

PICK, J. B.
Geothermal energy in Imperial County, California - Environmental, socio-economic, demographic, and public opinion research conclusions and policy recommendations
22 p0265 A79-24046

PICKRELL, R. L.
An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047
Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599

PIEKOSZEWSKI, J.
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911

PIELERT, J. H.
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543

PIELKE, R.
Offshore wind power model estimates
23 p0482 A79-40110

PIEPERS, G. G.
The Netherlands research program on wind energy
23 p0481 A79-40102
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107

PIERCE, N. T.
The Alcator liquid nitrogen-cooled tokamaks
22 p0290 A79-27668

PIERCE, R. A.
Annual Simulation Symposium, 11th, Tampa, Fla., March 15-17, 1978, Record of Proceedings
23 p0475 A79-38876
PIERINI, G.
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950
PIERONI, C. A.
Power cables to accommodate the motions of an OTEC plant
21 p0101 A79-16251
PIERRAT, D.
Photovoltaic conversion in Cu2O
23 p0384 A79-32973
PIERRE, B.
Application of recuperative gas cycles with a bypass heat generator to solar energy power plants
[ASME PAPER 79-GT-89] 23 p0376 A79-32366
PIERRE, D. A.
Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants
21 p0016 A79-10135
Magnetohydrodynamic/steam power plant modeling and control
21 p0046 A79-12274
PIERSON, E. S.
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991
The role of interfacial heat and mechanical energy transfers in a liquid-metal MHD generator
24 p0708 A79-52957
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564
PIETRUSZKIEWICZ, J.
Optimum design conditions for a power plant at a vapor dominated geothermal resource, Pacific Gas and Electric's The Geysers Power Plant Unit 16
21 p0014 A79-10121
History and development of condensers at the Geysers geothermal power plant
[ASME PAPER 78-JPGC-PWR-18] 21 p0150 A79-18099
PIETSCH, A.
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826
PIETSCH, S. J.
Electrogenerative chemical reactors
24 p0631 A79-46310
PIGNATARO, L. J.
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024
PILAND, R. O.
The solar power satellite concept evaluation program
21 p0107 A79-16602
PILIIA, A. D.
RF-heating in stationary systems
22 p0271 A79-24864
PILIUGIN, N. N.
Effect of friction on motion of a piston driven by combustion products
23 p0436 A79-35656
PILLER, S. J.
Status of free-piston Stirling engine/linear alternator power conversion system development
21 p0025 A79-10212
PILLSBURY, P. W.
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
PILLSBURY, R. D.
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534
PINDROS, A.
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384
PINE, G. D.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704
PINES, H. S.
Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant
[ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075
Computer design and optimization of cryogenic refrigeration systems
[LBL-7934] 24 p0768 N79-31439
PINKERTON, D.
Solar production of industrial process steam
24 p0673 A79-51748
PINKERTON, J. D.
Catalytic conversion of coal energy to hydrogen
[FE-2206-14] 21 p0180 N79-11239
Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743
PINKHASIK, D. S.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
PINKHASIK, M. S.
Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411
PINSON, W. E.
Measuring the quasi-Fermi level and flat band potential of an illuminated Au/n-GaAs/.6/P/.4/ anode
22 p0317 A79-31411
PINTO, A. B. O.
Characteristics of GRP for applications in solar energy collectors
23 p0385 A79-33218
PINTO, J.
The natural and perturbed troposphere
21 p0179 N79-10636
PIRMATOV, I. I.
Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259
Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183
PIROUZAN, A.
Description of solar energy activities and results at Arsham H.T.T. College
23 p0472 A79-38660
PISHARODY, R. K.
Modified silicon-germanium alloys with improved performance
21 p0027 A79-10225
PISHCHIKOV, S. I.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
Inverter systems
21 p0106 A79-16486
Diagonal frame BM channel of the U-25 power plant
23 p0393 A79-33407
PISTOIA, G.
On the possibility of using silver salts other than Ag2CrO4 in organic lithium cells
22 p0246 A79-21491
PISTUNOVICH, V. I.
Calculation of the Q factor for a two-component tokamak
22 p0324 A79-31763
PITASI, M. J.
A flat plate multiple pass solar collector using aqueous optical properties
22 p0293 A79-28144
A parabolic solar reflector for accurate and economic producibility
22 p0293 A79-28145
PITCHFORD, M. L.
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0599 N79-27730

PITTENGER, L. C.
Large-scale cryopumping for controlled fusion
21 p0085 A79-15330

PITTMAN, P. F.
Solar photovoltaic intermediate power system operating strategies and economic considerations
23 p0516 A79-41051

PIVIROTTO, D. S.
Solar energy in California industry - Applications, characteristics and potential
23 p0402 A79-34019

PIVOVAROVA, Z. I.
Radiation regime of inclined surfaces
22 p0282 A79-26353

PIWKO, R. J.
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780

PIWOWAR, T. R.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

PLA BARBY, F. E.
Solid desiccant air conditioning with silica gel using solar energy
21 p0181 N79-11464

PLACE, T. W.
Residential flywheel with turbine supply
24 p0679 A79-51792

PLACE, W.
Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805

PLAGGE, J.
Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644

PLANT, J.
Geochemical and geophysical evidence on the geothermal potential of Caledonian granites in Britain
23 p0536 A79-43645

PLANTE, E. R.
Compositional modeling of MHD channel slag, with preliminary vapor pressure data
23 p0391 A79-33390

PLATTS, W. J.
The development of the wave contouring raft
23 p0450 A79-37869

PLAZA, H.
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

PLEASS, C. M.
The use of wave powered systems for desalination - A new opportunity
21 p0151 A79-18108

PLESKOV, IU. V.
Photoelectrochemistry and solar energy conversion
24 p0654 A79-50153

PLESKUN, A. B.
Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0772 N79-31788

PLESZKUN, A. R.
Energy and labor intensities projected to the year 2010
[COO-4628-2] 24 p0750 N79-30727

PLETT, E. G.
Cylindrical parabolic collector optimization for interfacing with steam turbine generators
22 p0322 A79-31448

PLOTKIN, S.
Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464

PLOYART, R.
Theoretical and experimental yields of a solar heater with flat plate collectors
21 p0134 A79-17437

PLUMPTON, B.
Integrating wave power into the electricity supply system
21 p0152 A79-18117

PLUNKETT, A. B.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110
Regenerative flywheel energy storage system
24 p0678 A79-51783

PLUST, H. G.
Recent developments in power sources with special emphasis on alkaline batteries
22 p0301 A79-29490

POBER, R. L.
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415

POBEREZHSKII, L. P.
Mathematical model of interelectrode breakdown in MHD generator
21 p0167 A79-20418
Construction of a mathematical model for MHD generator electrodes in the arc regime of operation
22 p0258 A79-23138
Investigation of plasma electroconductivity on the U-25 facility
23 p0530 A79-42854
Study of the thermal inertia of an electrode microarc
23 p0530 A79-42869

POCH, L. A.
Optimum selection of a wind turbine generator system
[AIAA PAPER 78-1774] 21 p0062 A79-13871

POCHAN, M. J.
Equipment and strategy for environmental sampling of complex coal gasification process streams
24 p0688 A79-51862

POCHE, A. J.
Preliminary design of the solar total energy-large scale experiment at Shenandoah, Georgia
21 p0019 A79-10159

PODOLSKI, W. F.
Pressurized fluidized-bed combustion/component test and integration unit preliminary design report
21 p0008 A79-10076

PODOLTSEV, A. D.
Electromechanical conversion of energy during the deceleration of a piston in a uniform magnetic field
22 p0309 A79-30599

POEHLMANN, H. C.
Outgassing tests of fiber-epoxy composite materials
[SAND-78-7075] 23 p0552 N79-24071

POHL, J. H.
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474

POIRIER, R. H.
A summary of R&D programs
21 p0146 A79-17639

POISSON-QUINTON, P.
Energy conservation aircraft design and operational procedures
[ONERA, TP NO. 1978-107] 21 p0036 A79-11572
Energy conservation aircraft design and operational procedures
21 p0202 N79-13200

POLLACK, I.
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

POLLAERT, T. J.
Synthetic fuels from coal
21 p0145 A79-17636

POLLARD, F.
Influence of marketing requirements on definition of coal resources
22 p0340 N79-17319

POLLARD, H. E.
Intelsat V solar array design and development summary
21 p0002 A79-10018

POLLARD, W. G.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699

POLLINA, R.
MHD slag electrical conductivity studies
23 p0391 A79-33394

POLLOCK, G. A.
Effect of multiblade slurry saw induced damage on silicon solar cells
23 p0498 A79-40902

POMEROY, B. D.
Conceptual design of sodium-cooled central receiver solar power plant
[AIAA PAPER 79-0994] 23 p0459 A79-38194
Accounting for intangibles in a present worth comparison of advanced power generation alternatives
23 p0461 A79-38500

POMPON, J. P.
Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342
Formation and stability of MS or MIS Schottky solar cells
23 p0507 A79-40987

PONS, A.
Solar irradiance measurements by means of optical fibers and silicon detectors
24 p0638 A79-47198

PONS, R. L.
A solar-Stirling small power system
24 p0690 A79-51884

PONT, R. J.
An introduction to ocean thermal energy conversion /OTEC/ power plants
21 p0091 A79-15869

PONTI, C.
Engineering aspects of demonstration fusion power reactors
24 p0655 A79-51950

POOLE, A. D.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699

POON, P. T.
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894

POOR, R. H.
MOD-1 wind turbine generator program status report
24 p0634 A79-46538

POORE, R.
MOD-2 failure mode and effects analysis
[NASA-CR-159632] 24 p0747 N79-30415

POPA, B.
Optimal decisions for long-term operation of hydropower systems
22 p0245 A79-21473

POPE, G. G.
Prospects for reducing the fuel consumption of civil aircraft
22 p0325 A79-31911

POPE, M.
Fluidized combustion of coal
23 p0593 N79-27613

POPE, M. D.
Field tests of photovoltaic power systems
[ASME PAPER 79-SOL-10] 22 p0308 A79-30545
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
Field tests of photovoltaic power systems
[COO-4094-32] 24 p0788 N79-32700

POPE, W. L.
Floating dry cooling, a competitive alternative to evaporative cooling in a binary cycle geothermal power plant
[ASME PAPER 78-WA/ENER-2] 21 p0159 A79-19775
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075

POPOV, P. G.
Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249

POPOVA, V. A.
Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249

POPPENDIEK, H. F.
Ammonia vaporization and condensation investigations related to OTEC heat exchangers
24 p0622 A79-45819

PORTAS, J. Y.
Comparison of different techniques for producing hydrogen: Production costs analysis
[P/51/76/14] 23 p0578 N79-26240

PORTER, T. G.
Dynamic response of a wind turbine system and its effect on performance
21 p0067 A79-14293

POSELEVICH, V. A.
Effect of friction on motion of a piston driven by combustion products
23 p0436 A79-35656

POSNER, D.
Design optimization for solar array of multiple collector types
21 p0071 A79-14677

POSNER, D. M.
Estimating hourly solar radiation for one-axis tracking focusing collectors
21 p0071 A79-14678
Barriers and incentives to the commercialization of solar heating and cooling of buildings
21 p0072 A79-14687
A method for estimating hourly solar radiation for parabolic trough collectors
23 p0399 A79-33997

POSPIESZCZYK, A.
Laser-induced desorption experiments with technical metal surfaces
23 p0445 A79-36969

POSPISIL, M.
A space power station without movable parts
[IAF PAPER 79-177] 24 p0710 A79-53337

POST, D. E.
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979

POST, R. F.
Plasma-surface interactions in Q-enhanced mirror fusion systems
23 p0444 A79-36887

POSTLETHWAITE, A. W.
Progress on high temperature air heater development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188

POSTNIKOVA, I. N.
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator
22 p0258 A79-23137

POTASH, R. L.
OTEC goes to sea /A review of Mini-OTEC/
24 p0617 A79-45784

POTTER, A. G.
A solar assisted economy
23 p0469 A79-38632

POTTIER, J.
Production, transport, and storage of hydrogen
23 p0523 A79-41802

POTTIER, M.
Underground gasification of coal at deep levels - Perspectives and problems
21 p0156 A79-19401

POUBEAU, P. C.
Development of a satellite flywheel family operating on one active axis magnetic bearings
22 p0366 N79-21392

POUGET-ABADIE, X.
Production of mechanical energy by thermodynamic conversion of solar energy
22 p0310 A79-30999

POULIOT, H. N.
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435

POULIQUEN, D.
Model of fluid flow in boilers with helicoidal coil
23 p0383 A79-32959

POULIT, J.
Energy savings
24 p0653 A79-49521

POULOS, N. E.
Preliminary results from the Georgia Tech 400 kWth Solar Thermal Test Facility
21 p0141 A79-17499

POURING, A. A.
Quasi-equilibrium Air Standard heat balanced cycle analysis
21 p0028 A79-10232

POWE, R. E.
Thermal modeling of coal-fired MHD plant components
21 p0017 A79-10138
Gas stream composition and temperature determination in a coal-fired MHD simulation facility
[ASME PAPER 78-WA/HT-23] 21 p0161 A79-19810

POWELL, J.
The fast power cycle for fusion reactors
21 p0018 A79-10152

Waste heat as an alternative heat source 23 p0417 A79-34144

POWELL, J. R.
The LASH /laser-ash/ particulate fragmentation removal concept for coal fired turbine power plants 21 p0009 A79-10078
Hydrogen production from high temperature electrolysis and fusion reactor 21 p0015 A79-10126
Laser-particulate control for open-cycle, coal fired gas turbines [ASME PAPER 79-GT-177] 23 p0379 A79-32437
Advanced synfuel production with fusion 24 p0695 A79-51947
Fusion reactors for synthetic fuels [BNL-25634] 24 p0767 N79-31421
SOAR (solar assisted reactor) power system [BNL-25633] 24 p0772 N79-31787
Advanced synfuel production with fusion [BNL-26130] 24 p0780 N79-32388

POWELL, R. D.
Some practical aspects of the design and installation of domestic solar energy systems in the UK 23 p0452 A79-37884

POWELL, R.
A challenging role for the assurance sciences 21 p0086 A79-15396

POWELL, D. A.
Elastically deformed, linear focusing solar reflector 24 p0670 A79-51728

POWERS, T. B.
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries [TID-29025-1] 24 p0754 N79-30786

PRADHANANGA, R. R.
Saur vidyut kosh - The solar cell 21 p0126 A79-17371

PRAGER, R. C.
Analysis and application of the heat pipe heat exchanger 21 p0014 A79-10117
The analysis of heat transfer with and without condensation in a heat pipe heat exchanger [ASME PAPER 78-WA/HT-59] 21 p0161 A79-19824

PRASAD, B. N.
Saur vidyut kosh - The solar cell 21 p0126 A79-17371

PRASAD, K. V.
The lithium-thionyl chloride battery - A review 23 p0487 A79-40370

PRASAD, N. S. K.
Possibility of production of low cost solar grade silicon by trichlorosilane process 21 p0125 A79-17363

PRASAD, V.
Observations made during the development of a thermal control system for a near earth orbiting satellite 24 p0763 N79-31272

PRAST, G.
A free-piston Stirling engine for small solar power plants 21 p0024 A79-10205

PRATT, D. T.
Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes 23 p0474 A79-38871

PRATT, R. B.
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors - CSU Solar House I 22 p0276 A79-25939
Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1 [COO-2577-14] 21 p0206 N79-13507

PRATT, R. H.
Environmental conservation concerns in transportation: Energy, noise, and air quality [PB-286550/9] 21 p0232 N79-15868

PRELAS, M. A.
Progress in nuclear-pumped lasers 21 p0110 A79-16627

PRELAT, A. E.
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission [E79-10273] 24 p0768 N79-31730

PRENDERGAST, C. A.
Heating value of refuse derived fuel 23 p0490 A79-40412

PRENGER, F. C., JR.
Performance limits for liquid-metal heat pipes containing long adiabatic sections 24 p0694 A79-51937

PRENGLE, H. W., JR.
Optical and thermal analysis of a Cassegrainian solar concentrator 24 p0713 A79-53498

PRENTICE, B. A.
Chemical studies of stack fly ash from a coal-fired power plant 22 p0309 A79-30595

PRESSEY, R. E.
EPA program status report: Oil shale, 1979 update [PB-294998/0] 24 p0796 N79-33538

PRESTON, D. M.
Optimization of PtDoped KOCITE (trade name) electrodes in H3PO4 fuel cells [AD-A061242] 22 p0342 N79-17340

PRETO, S. K.
Calcium/iron sulfide secondary cells 21 p0041 A79-11835

PRETRO, G. A.
Effect of pressure head on the characteristics of hydroelectric stations with underwater lower reservoirs 24 p0646 A79-48827

PRIBIS, P. B.
Compact heat exchanger design progress 24 p0618 A79-45789

PRICE, C. W.
State of the art and science report on design of alloys resistant to high-temperature corrosion-erosion in coal conversion environments [EPRI-FP-557] 21 p0200 N79-13149

PRICE, J.
Lead-acid battery: An evaluation of commercialization strategies [MTR-7593] 21 p0220 N79-14565

PRICE, J. M.
Early developments in solar cooling equipment 24 p0609 A79-45218

PRICE, W. G., JR.
SLPX - Superconducting Long-Pulse Tokamak Experiment 22 p0237 A79-20557

PRICE, W. W.
Wind energy conversion system transient performance analysis 24 p0635 A79-46545

PRICKETT, W. Z.
Application of the Dynamic Isotope Power System to a multimission spacecraft 24 p0692 A79-51929

PRIEN, C. H.
Technology overview reports for eight shale oil recovery processes [PB-295665/4] 24 p0797 N79-33552

PRIKRYL, P.
Development of a prototype 10kW solar power plant [BMFT-FB-T-78-33] 24 p0792 N79-32730

PRINCE, J. L.
Considerations for accurately determining the maximum power output of solar cells 24 p0654 A79-50028

PRINCE, M. B.
Photovoltaic overview [AIAA PAPER 78-1763] 21 p0061 A79-13864

PRITCHARD, D. A.
Real-time environmental and performance testing of concentrating photovoltaic arrays 23 p0496 A79-40887
Performance of a one kilowatt concentrator photovoltaic array utilizing active cooling 23 p0519 A79-41069
Combined photovoltaic thermal collector testing 23 p0519 A79-41072
Combined photovoltaic thermal collector testing [SAND-78-1191C] 21 p0198 N79-12570

PRIVALOV, N. P.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406

PROBERT, S. D.
Cretan windmills
23 p0536 A79-43576

PROBSTEIN, R. F.
Water for a synthetic fuels industry
24 p0645 A79-48050

PROCTOR, D.
Performance and cost of domestic solar water heating in Australia
23 p0452 A79-37889

PROHAZKA, G. J.
Solid waste and coal firing in industrial boilers
21 p0096 A79-15918

PROKOPIUS, P. R.
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809
Commercial phosphoric acid fuel cell system technology development
[NASA-TM-79169] 23 p0571 N79-25500

PRONO, J. K.
Energy and Technology Review, June 1978
[UCRL-52000-78-6] 21 p0215 N79-14168

PROTASOV, M. S.
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

PROVENZANO, G.
Motor vehicle lead emissions in the United States - An analysis of important determinants, geographic patterns and future trends
21 p0113 A79-16745

PRUDEN, B. B.
Development of the oil sands of Canada
23 p0524 A79-41812

PRUESS, K.
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies
[LBL-8802] 24 p0786 N79-32684

PRYCE, A. W.
European Scientific notes, volume 32, number 4
[AD-A065399] 23 p0552 N79-23886

PRYOR, R. A.
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979
Phase 1 of the automated array assembly task of the low cost silicon solar array project
[NASA-CR-158120] 22 p0348 N79-18451
Metallization of large silicon wafers
[NASA-CR-158575] 23 p0550 N79-23517
The establishment of a production-ready manufacturing process utilizing thin silicon substrates for solar cells
[NASA-CR-158566] 23 p0550 N79-23523

PSOFOGIANNAKIS, M. G.
Cylindrical parabolic collector optimization for interfacing with steam turbine generators
22 p0322 A79-31488

PUCKETT, J. K.
Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446

PUESCHEL, R. F.
Oxidation of SO2 on the surface of fly ash particles under low relative humidity conditions
22 p0277 A79-26038
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant
23 p0438 A79-36432

PUGIN, V. S.
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896

PULFREY, D. L.
An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871
The photovoltaic properties of thin copper oxide films
23 p0499 A79-40909

PULICK, M. A.
The indirect Brayton energy recovery system
24 p0696 A79-51958

PUNWANI, D. V.
Synthetic natural gas production from peat
23 p0411 A79-34092
Synthetic fuels from peat gasification
24 p0687 A79-51856
Process design for coal conversion reactors
[CONF-781110-15] 23 p0577 N79-26232
Peat gasification: An experimental study
[CONF-780611-8] 24 p0780 N79-32391

PURCELL, J. J.
The National Program for Solar Energy
21 p0072 A79-14688

PURCELL, J. R.
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318

PURI, G. G.
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

PURI, J. S.
Performance of a solar space heating system
23 p0385 A79-33223

PURI, V. M.
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282
Domestic solar heating and cooling system for Kuwait and Saudi Arabia
23 p0401 A79-34009
Design curves for a solar heated and cooled Kuwaiti home
23 p0401 A79-34010

PUROHIT, G.
Methanol decomposition bottoming cycle for IC engines
[SAE PAPER 790427] 23 p0495 A79-40774

PUROHIT, G. P.
Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

PURONEN, R.
Regional air pollution study: Heat emission inventory
[PB-284081/7] 21 p0200 N79-12602

PURPER, G.
Wind energy plants for electric generation - Economic significance and example
23 p0472 A79-38662

PURSER, P. E.
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

PURVIS, G. D., III
Magnetically confined plasma solar collector
21 p0109 A79-16617

PUTNAM, L. E.
SNAP 19 performance update for Pioneer and Viking missions
24 p0694 A79-51940

PUTNEY, Z.
An economic analysis of a commercial approach to the design and fabrication of a space power system
[NASA-TM-79153] 23 p0539 N79-22193

PUTNEY, Z. C.
Unique aspects of terrestrial photovoltaic system design
[ASME PAPER 79-SOL-14] 22 p0308 A79-30548
Cast semicrystalline silicon for solar cells
[ASME PAPER 79-SOL-16] 22 p0309 A79-30550

PUTNIS, A.
Order-disorder transformations and the nature of the copper-sulphide layer in Cu/x/S/CdS solar cells
23 p0442 A79-36789

PUTT, R. A.
A zinc-bromine battery for energy storage
24 p0684 A79-51832

PYTLINSKI, J. T.
Solar energy installations for pumping irrigation water
21 p0066 A79-14260
Historical developments of the use of solar energy for pumping irrigation water
21 p0076 A79-14762
Basic technical and economical aspects of the use of solar energy for pumping irrigation water
21 p0076 A79-14763
Solar energy - Past and present developments
21 p0076 A79-14764
Use of a honeycomb as solar radiation absorber and heat exchanger in an air-type solar collector
23 p0398 A79-33989
Assessment of energy conservation by using alternate energy sources in Kansas
23 p0418 A79-34151
Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642

Q

QAZI, A. Q.
On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742

QIDWAI, H. A.
Quantitative analysis of defects in silicon
[NASA-CR-162173] 24 p0771 N79-31772

QUADE, R. N.
High efficiency thermal energy storage system for utility applications
21 p0012 A79-10102
Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112
High-temperature nuclear heat source for hydrogen production
23 p0437 A79-36049

QUARDERER, G. J.
The Dow Chemical liquefaction process
21 p0147 A79-17644

QUATTROCHI, D. A.
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446

QUELL, P.
The potential of fusion reactors as process heat source
22 p0284 A79-26624

QUENTIN, G.
Study of integrated gasification combined cycle plant interaction and control
[ASME PAPER 79-GT-60] 22 p0306 A79-30530

QUICK, T. M.
Bibliographic and numeric data bases for fiber composites and matrix materials
21 p0114 A79-16984

QUIMBY, D.
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384

QUINLIVAN, S.
Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion
[PB-288602/6] 22 p0350 N79-18487
Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C
[PB-288603/4] 22 p0350 N79-18488
Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F
[PB-288604/2] 22 p0350 N79-18489
Applicability of petroleum refinery control technologies to coal conversion
[PB-288630/7] 22 p0352 N79-19173

QUONG, R.
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669

R

RAAG, V.
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223
Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy
22 p0259 A79-23604
Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738

RABAS, T. J.
Capital cost system optimization of OTEC power modules
21 p0101 A79-16249
OTEC 100-MWe alternate power systems study
24 p0623 A79-45831

RABENHORST, D. W.
Low cost flywheel energy storage system demonstration
24 p0678 A79-51788

RABJAH, T. N.
Experimental project on the utilization of solar energy in domestic hot water heating in Iraq
23 p0465 A79-38597

RABKIN, IU. I.
Steam generator and turbomachines
21 p0106 A79-16489

RABL, A.
Performance of evacuated solar collectors with compound parabolic concentrators
21 p0089 A79-15855
Simple procedure for predicting long term average performance of nontracking and of tracking solar collectors
21 p0091 A79-15873
A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448
Practical design considerations for CPC solar collectors
23 p0439 A79-36634

RABLE, V. A.
Computer software for planning design of community energy systems
[CONF-781182-2] 23 p0600 N79-28063

RACALBUTO, S.
Wind energy utilization by means of aerogenerators
23 p0522 A79-41220

RACCAH, P. M.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054

RACKOFF, M. G.
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707

RADEMACHER, R. A.
A discrete, stochastic simulation model for the analysis and design of solar energy heating systems
23 p0475 A79-38878

RADER, A. H.
Synthetic natural gas production from peat
23 p0411 A79-34092

RADHA KRISHNA, H. C.
Characteristics of a fully reversible axial pump-turbine for application in tidal power plants
23 p0450 A79-37868

RADKE, L. F.
Evolution of particles in the plumes of coal-fired power plants. I - Deductions from field measurements
24 p0611 A79-45531

RADLER, K.
Thin-film solar cells - A chance to convert economically solar energy into electric energy
23 p0425 A79-34610

RADMER, R. J.
Biological solar energy conversion approaches to overcome yield stability and product limitations
[PB-284823/2] 21 p0199 N79-12577
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations
[PB-286487/4] 21 p0230 N79-15422

RADNOR, M.
Contextual analysis for industrial energy conservation R and D
[PB-290981/0] 23 p0575 N79-25537

RADOSEVICH, L. G.
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537
Thermal energy storage for advanced solar central receiver power systems
[SAND-78-8221] 24 p0788 N79-32694

RAEUCHLE, W.
Designing and testing Si3N4 turbine components at Mercedes-Benz
21 p0050 A79-12830

RAFFELLINI, G.
A contribution to evaluation of flat-plate solar collectors performance
21 p0133 A79-17427

RAFIKOV, M. M.
Dynamic model of an industrial plant manufacturing a variety of products
21 p0051 A79-12957

RAGAINI, R. C.
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595
Emissions and particle-size distributions of minor and trace elements at two western coal-fired power plants equipped with cold-side electrostatic precipitators
24 p0629 A79-46231

RAGHAVAN, S.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

RAGHUNATH, B. K.
A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S.
21 p0132 A79-17423

RAGLAND, K. W.
The impact of a coal fired power plant on ambient sulfur dioxide levels
21 p0082 A79-15032
Combustion of single coal particles in a jet
24 p0632 A79-46319

RAGSDELL, K. M.
Design of optimum compressed air energy-storage systems
24 p0631 A79-46308
Design of optimum compressed air energy storage systems
[CONF-7811101-1] 23 p0565 N79-24508

RAHNKE, C. J.
Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823

RAI-CHOUDHURY, P.
Materials for low-cost solar cells
22 p0252 A79-22099
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

RAINER, D.
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436

RAITHBY, G. D.
Methods for reducing heat losses from flat plate solar collectors, phase 2
[COC-2597-4] 21 p0188 N79-11533

RAJAGOPAL, K.
A simulation study of phase change energy store
21 p0120 A79-17318

RAJAGOPALAN, I.
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379

RAJAGOPALAN, S. R.
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379

RAJAGOPALAN, V.
Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744
Contribution to the development of wind energy systems using static power electronic converters
22 p0286 A79-26958
Control strategy for a variable-speed wind energy conversion system
22 p0303 A79-29800

RAJAN, R.
Simulation of fluidized bed coal combustors
[NASA-CR-159529] 22 p0359 N79-20487

RAJESHWAR, K.
An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678
Review - Thermophysical properties of oil shales
24 p0651 A79-49401
On the design and operation of electrochemical solar cells
24 p0712 A79-53494

RAJKANAN, K.
A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242
Current conduction in Cr-MIS solar cells on single-crystal p-silicon
24 p0648 A79-49215

RAJU, S. P. G.
A low-cost water pumping windmill using a sail type Savonius rotor
[PB-294413/0] 23 p0585 N79-26541

RAKOW, M. S.
Dynagas Process
23 p0412 A79-34098

RALDOW, W. M.
Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545

RALEIGH, L. H.
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815

RALEK, M.
Activation and desorption properties of iron particle catalysts for the Fischer-Tropsch synthesis
24 p0640 A79-47591

RALLIS, C. J.
A computer and experimental simulation of Stirling cycle machines
21 p0023 A79-10192

RALPH, E. L.
Solar cell workshop
21 p0170 N79-10141

RAMACHANDRAN, J.
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365

RAMAGE, C. S.
Prospecting for meteorological energy in Hawaii
23 p0536 A79-43615
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382

RAMAKRISHNAN, R.
Hydropyrolysis of coal derived liquids and related model compounds
23 p0553 N79-24171

RAMAKUMAR, R.
Operation and control of wind-electric systems
21 p0086 A79-15575
On the use of eddy-current couplings in wind-driven synchronous machines
21 p0113 A79-16742
Prospects for harnessing renewable energy sources in developing countries
21 p0117 A79-17286
A review of wind-electric conversion technology
23 p0406 A79-34050
Perspectives on developing country solar energy applications
24 p0672 A79-51743

RAMAN, K.
A solar energy system with a dual-source heat pump and long-term storage
21 p0119 A79-17312

RAMAPRASAD, V. R.
Prospects of MHD power generation in India using coal
23 p0454 A79-37907

RAMASESHAN, S.
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379

RAMEY, H. J., JR.
Transient flow of non-Newtonian power-law fluids in porous media
[SAN-1265-5]
24 p0781 N79-32516

RAMIREZ, A. A.
Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458

RAMLER, J. R.
Wind turbines for electric utilities - Development status and economics
[AIAA PAPER 79-0965]
23 p0475 A79-38888
Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170]
24 p0749 N79-30719

RAMOS BERJANO, F.
Calculation of solar energy incident on non-horizontal surfaces over Turkey
22 p0253 A79-22266

RAMOS, A. M.
Simple methane digestors
23 p0386 A79-33234

RAMPONI, G.
Non-thermal emission at the plasma frequency
22 p0270 A79-24854

RAMSEY, J.
Jet fuels from shale oil - A near term technology
21 p0005 A79-10045

RAMSEY, J. W.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973

RANADIVE, A. Y.
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190]
23 p0379 A79-32449

RANCE, J. E.
Development program for 3.0 KW inverter: Militarized inverter for use with fuel cell or battery power plants
[AD-A068433]
24 p0738 N79-29612

RAND, D. A. J.
Battery systems for electric vehicles - A state-of-the-art review
24 p0652 A79-49488

RANDALL, R. N.
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535

RANDHAWA, H. S.
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171

RANDOLPH, L. P.
The NASA Space Power Technology Program
24 p0691 A79-51894

RANGI, R. S.
NRC's wind energy program
22 p0319 A79-31426
Operating experience with the Magdalen Islands wind turbine
23 p0484 A79-40122

RANKEN, W. A.
Reactor design for nuclear electric propulsion
24 p0693 A79-51931
Baseline design of the thermoelectric reactor space power system
24 p0693 A79-51932
Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332]
24 p0781 N79-32518

RANKIN, J. G.
Heat rejection development requirements for orbital power systems
24 p0692 A79-51924

RANKIN, R. R.
Insulating wall boundary layer in a Faraday MHD generator
[FE-23417]
22 p0365 N79-21310

RAO, C. V. H.
Large area silicon sheet by EFG
21 p0123 A79-17340

RAO, C. V. P.
A study for optimum use of metallic plates for thermal storage in solar processes
21 p0122 A79-17331

RAO, D. P.
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
Performance of flat plate solar collector with fluid undergoing phase change
24 p0661 A79-50544

RAO, H. V.
Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523

RAO, K. K.
Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119

RAO, K. R.
Temperature dependent parameter analysis of thermoelectric devices
21 p0113 A79-16740
International Conference on Thermoelectric Energy Conversion, 2nd, University of Texas, Arlington, Tex., March 22-24, 1978, Proceedings and Supplement
22 p0259 A79-23603

RAO, K. S.
Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
Honeycomb type flat plate collectors - Experiments leading to drinking straw
21 p0132 A79-17424
Performance of flat plate solar collector with fluid undergoing phase change
24 p0661 A79-50544
Performance of flat plate solar collector with fluid undergoing phase change
24 p0661 A79-50544

RAO, M. R.
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber
21 p0127 A79-17383

RAO, N. S. M.
Structural design of a superheater for a central solar receiver
[ASME PAPER 78-WA/PVP-1]
21 p0162 A79-19832

RAO, T. K.
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2]
21 p0192 N79-11568

Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147

RAO, T. L. S.
Dynamic response of a novel solar water heater
21 p0140 A79-17488

RAO, T. V. L.
Optimising the pitching of tubes in a flat solar collector for increasing the efficiency for use in vapour absorption refrigeration
21 p0132 A79-17422

RAOUF, M.
New instrumentation for high temperature and hemispherical measurements of selective surfaces
22 p0294 A79-28152

RAPHAEL, D. L.
Water/energy management and evaluation model for Pennsylvania
[PB-287577/1] 22 p0343 N79-17353

RAPLEY, C. W.
Regenerator matrices for automotive gas turbines
23 p0532 A79-42981

RAPOLLA, A.
Shallow magmatic reservoirs as heat source of geothermal systems - Preliminary interpretation of data available for the Neapolitan active volcanic areas
21 p0075 A79-14727

RAPP, C. F.
Luminescent solar concentrators
23 p0509 A79-40997

RAPP, D.
Critique on the solar rehabilitation procedures used in SOLMET-2
24 p0708 A79-52956

RAPPAPORT, E. J.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306

RAPPEL, E.
Subsidies for a formulation of a plan of action for alternative energy sources and forms
23 p0388 A79-33258

RAPPERPORT, E. J.
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535

RASBAND, J. L.
Solar One - A 10-megawatt solar thermal central receiver pilot plant project
[AIAA PAPER 78-1750] 21 p0060 A79-13853
10-megawatt solar central receiver pilot plant
21 p0094 A79-15906

RASER, W. B.
Flexed beams in central receiver heliostat drives
[AIAA PAPER 78-1755] 21 p0060 A79-13856

RASHCHEPKIN, A. P.
Two asymptotic solutions for analyzing the transverse edge effect in induction MHD machines
22 p0298 A79-29287
Two limiting solutions for the analysis of transverse edge effects in MHD induction machines
24 p0663 A79-50777
Distribution of electric fields and currents in an MHD channel with a loop design in the region of a magnetic field jump
24 p0706 A79-52372

RASK, D. R.
Jet impingement solar air heater
[AIAA PAPER 78-1760] 21 p0061 A79-13861

RASOR, N. S.
A summary of USSR thermionic energy conversion activity
21 p0026 A79-10216

RASULOV, D. T.
Photoelectric properties of pCdTe-nCdS film heterojunctions
21 p0166 A79-20347
Calculating the photocurrent and maximum efficiency of film p-CdTe-n-CdS photocells
21 p0166 A79-20354
Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379
Influence of temperature on operational parameters of pCdTe-nCdS film photoconverters
24 p0636 A79-46760
Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

RATAJCZAK, A.
NASA Lewis Research Center photovoltaic application experiments
[AIAA PAPER 78-1768] 21 p0061 A79-13867

RATAJCZAK, A. F.
Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131
Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089
Description and status of NASA-LeRC/DOE photovoltaic applications systems experiments
23 p0521 A79-41091
Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411
Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443
Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501

RATAJCZAK, T.
DOE photovoltaic tests and applications project
23 p0571 N79-25492

RATCLIFF, G.
The role of the battery electric vehicle
22 p0301 A79-29491

RATH, J.
Roll-out solar arrays - Candidate power sources for future space missions
[IAF PAPER 78-39] 21 p0034 A79-11216
Flexible roll-out solar generators - Energy sources for future high-power space missions
[DGLR PAPER 78-165] 21 p0063 A79-14056

RATH, L. K.
Process development for the Westinghouse advanced fluidized-bed coal gasification system
21 p0006 A79-10058

RATHER, J. D. G.
New candidate lasers for power beaming and discussion of their applications
21 p0110 A79-16622

RATHJEN, S. M.
A microwave power transmission system for space satellite power
21 p0002 A79-10025
Microwave phased array design considerations for SPS
21 p0003 A79-10031
Computer modeling for a space power transmission system
24 p0694 A79-51941

RAU, J. G.
Economic considerations in coverting from oil/gas firing to coal
23 p0592 N79-27611

RAUCHHOLZ, A. W.
Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936

RAUCKIS, M. J.
The effect of hydrogen addition on ignition delays and flame propagation in spark ignition engines
23 p0461 A79-38387

RAUFER, R. K.
Air monitoring network design for power plant siting
23 p0591 N79-27590

RAUH, R. D.
The secondary lithium electrode in non-aqueous electrolytes - Some problems, some solutions
21 p0041 A79-11838
A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332
Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

RAUSCH, R. A.
Exposure test results for reflective materials
23 p0430 A79-35068

RAUSCHENBACH, H. S.
The TDRSS solar array
23 p0500 A79-40917

RAVI KUMAR, K.
Prospects of MHD power generation in India using coal
23 p0454 A79-37907

RAVI, K. V.
Large area silicon sheet by EFG
21 p0123 A79-17340
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084

RAVINDRA, N. M.
Some relations governing major solar cell parameters
24 p0655 A79-50179

RAVINDRAN, M.
Characteristics of a fully reversible axial pump-turbine for application in tidal power plants
23 p0450 A79-37868

RAWLIN, V. K.
Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257] 24 p0795 N79-33253

RAWLS, J. M.
Analytic computation of minimum beta at ignition for various transport scaling laws
23 p0526 A79-41940
Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943

RAY, A.
Preliminary controller evaluation for the MERC/CTIU using a mathematical process model
21 p0008 A79-10073

RAYL, G.
Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169
Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells
23 p0500 A79-40913

RAYL, G. J.
UV blocking filters for polymeric films
24 p0668 A79-51103
Conceptual approach study 200 watt per kilogram solar array, phase 3
[NASA-CR-158046] 21 p0219 N79-14551

RAYMER, D. P.
Manned strategic system concepts 1990-2000
[AIAA PAPER 79-1793] 24 p0643 A79-47882

RAYMOND, D.
Technique to determine the growth rate and resistivity of evaporated CdS thin films
23 p0445 A79-37157

RAYMOND, D. R.
Advanced processes for more efficient use of forest products residual material
21 p0096 A79-15919

RAYNARD, A. E.
Advanced flywheel energy storage unit for a high power energy source for vehicular use
24 p0683 A79-51821

RAZA, A.
Preparation and properties of pure and tin doped indium oxide selective coatings
21 p0127 A79-17381

RAZDOBARIN, G. T.
Laser measurements of the radial profiles of the electron temperature and density in the FT-1 tokamak
22 p0244 A79-21430

RAZINKOV, V. V.
Thermal converters with transverse thermoelectromotive forces
22 p0256 A79-22847

REA, M.
Electrostatic precipitation tests with fuel oil ash
22 p0296 A79-28390

READ, D. T.
Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy
24 p0604 A79-44549

READ, P. J.
Small-scale coal-gasification plants
24 p0647 A79-49158

READDY, L. A.
Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549

READER, G. T.
Aspects of pulsating combustion
21 p0009 A79-10072
The Pseudo Stirling cycle - A suitable performance criterion
21 p0023 A79-10196

REAGAN, D. E.
Low Btu coal gasification processes. Volume 1: Summary, screening, and comparisons
[CRNL/ENG/TM-13-VOL-1] 23 p0555 N79-24188

REAM, J.
Experimental demonstration of heat-to-electricity conversion within a dielectric
24 p0698 A79-51975

REAR, L.
Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner
[SAND-78-0700] 21 p0185 N79-11496

REARDON, P. J.
Status report on TFTR
22 p0290 A79-27669

REBIBO, K.
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538

REBITZER, J.
Energy analysis of the Solar Power Satellite
24 p0601 A79-44160

REDDOCH, T. W.
No ill winds for New Mexico utility
22 p0286 A79-27208
Field experience with wind turbine generator operation in utility systems
24 p0635 A79-46548

REDDY, G. L.
Design of a solar energy operated lithium-bromide water absorption refrigeration system for refrigeration storage
21 p0143 A79-17523

REDDY, G. B.
Advanced processes for generation of electric power - Solvent refining of coal and combined cycle plants
21 p0064 A79-14110

REDDY, K. S.
Photochemical energy conversion studies in systems containing methylene blue
24 p0628 A79-45995

REDDY, S. R.
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348

REDFIELD, D.
Temperature dependence of the optical properties of silicon
23 p0437 A79-35820
Cost criterion for low efficiency solar cells to make system power cost competitive with that of high efficiency cells
23 p0514 A79-41034

REDKIN, V. E.
Turbulence of a combustion product plasma in an MHD channel
22 p0246 A79-21538
Combustion-products turbulence in the channel of an MHD generator
23 p0442 A79-36812

REDMAN, J. D.
Tritium permeation through steam generator materials
24 p0695 A79-51952

REECE, E. W.
Status of the offshore technology program
[SAND-78-0665] 24 p0761 N79-30908

REED, J. W.
Analysis of the potential of wind energy conversion systems
[SAND-78-2099C] 23 p0595 N79-27668
Some variability statistics of available wind power
[SAND-78-1735] 24 p0752 N79-30772
Availability of wind power
[SAND-78-0548C] 24 p0791 N79-32719
Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811

REED, K. A.
Inclination dependence of pyranometer sensitivity
22 p0295 A79-28154

REED, R. P.
Instrumentation for in situ coal gasification. II - Thermal and gas sampling diagnostic techniques
21 p0032 A79-10520
Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
24 p0603 A79-44526
Low-temperature, fracture properties of a USSR aluminum-6% magnesium alloy
24 p0604 A79-44549
REED, T.
Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180
REED, T. B.
Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377
REED, W. E.
Cryogenic refrigeration, volume 2. A bibliography with abstracts
[NTIS/PS-78/1261/3] 22 p0331 N79-16144
Cryogenic refrigeration, volume 3. A bibliography with abstracts
[NTIS/PS-78/1262/1] 22 p0331 N79-16145
Corrosion of stainess steel, volume 2. A bibliography with abstracts
[NTIS/PS-79/0208/3] 23 p0553 N79-24143
Heat pipes, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0299/2] 23 p0569 N79-25360
Heat pipes volume 3. Citations from the NTIS data base
[NTIS/PS-79/0298/4] 23 p0569 N79-25361
REED, W. H.
Development of a process for a high capacity arc heater production of silicon for solar arrays
[NASA-CR-158745] 23 p0581 N79-26499
REEDY, E. D., JR.
A composite-rim flywheel design
22 p0240 A79-20840
Composite-rim flywheels - Spin tests
23 p0423 A79-34281
REEP, D.
Thin-film GaAs solar cells with grain-boundary edge passivation
23 p0436 A79-35749
REES, J.
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614
REEVES, J. B.
Solar One Project - A 10-megawatt solar thermal central receiver pilot plant
24 p0674 A79-51757
REEVES, S. G.
Biocatalytic production of hydrogen by an in vitro system
23 p0414 A79-34119
REGULINSKI, S. G.
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067
REHMAT, A.
Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077
REHMAT, A. G.
IGT U-GAS pilot plant developments
24 p0688 A79-51861
REICHARD, T.
Provisional flat plate solar collector testing procedures
[PB-283721/9] 21 p0198 N79-12571
REICHEL, R. S.
Windpower programmes in Tanzania
23 p0482 A79-40106
REICHERT, J. D.
Non-adaptive optics for solar thermal electric power
21 p0112 A79-16733
Optical-thermal performance analysis for a fixed mirror-distributed focus solar-thermal-electric power system
24 p0670 A79-51729
REID, G. W.
Energy conservation through source reduction
[PB-290126/2] 22 p0372 N79-21626
REID, M. A.
An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc
21 p0035 A79-11546
Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells
21 p0040 A79-11824
REID, M. S.
Calibration standards and field instruments for the precision measurement of insolation
21 p0076 A79-14765
A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766
The engineering analysis of solar radiation
24 p0605 A79-44796
REID, R. G.
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors
[ASME PAPER 79-GT-81] 23 p0376 A79-32360
REID, R. L.
System studies for a tokamak fusion power plant
23 p0407 A79-34061
REID, R. S.
Flue gas emissions from a shredded-municipal-refuse-fired steam generator
23 p0489 A79-40399
REIDELBACH, H.
Theoretical studies of coal pyrolysis in an entrained bed flow reactor
21 p0007 A79-10063
REIFF, P.
Space environmental effects and the solar power satellite
23 p0552 N79-24028
REIHMAN, T. C.
Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22] 21 p0161 A79-19809
Design study of coal-fired cored brick regenerative heat exchangers
23 p0532 A79-42983
REILLY, D. H.
Safety considerations in the design and operation of large wind turbines
[NASA-TM-79193] 24 p0723 N79-28725
REILLY, J. J.
Synthesis and properties of useful metal hydrides - A review of recent work at Brookhaven National Laboratory
22 p0250 A79-21699
Applications of metal hydrides
22 p0251 A79-21715
Metal hydride technology
[BNL-26047] 24 p0780 N79-32387
REILLY, W. W.
Compatibility of elastomers in alternate jet fuels
[NASA-CR-158773] 23 p0588 N79-27321
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314
REINBERGS, M.
A new and novel form of district heating using thermal effluents from electricity generating plants
23 p0417 A79-34143
REINHARTZ, K. K.
Energy for Europe from space
22 p0273 A79-25605
European aspects of Solar Satellite Power systems
22 p0326 A79-31923
A European view of the solar satellite power system
24 p0694 A79-51942
Review of European solar array technology and potential future developments
24 p0751 N79-30747
REISE, T. F.
Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518
REISS, H.
Testing the efficiency of solar collectors
21 p0056 A79-13627

REISTAD, G. E.
A thermodynamic study of heating with geothermal energy
[ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253
Thermosyphon models for downhole heat exchanger applications in shallow geothermal systems
21 p0150 A79-18092

REISTER, D. B.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

REITER, F. W.
Storage of solar energy at low temperatures through chemical processes
23 p0469 A79-38637
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950

REITZ, J. G.
Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649

REKANT, N. B.
Investigation of the optical properties of transparent materials for solar energy applications
23 p0434 A79-35384
Investigation into the optical characteristics of transparent solar-energy materials
24 p0663 A79-50707

REKLAITIS, G. V.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

REMMERS, H. E.
Heat pump/rock bed storage systems
[COO-4704-2] 24 p0789 N79-32705

RENNE, D. S.
Application of long-range transport modeling to assess coal development
23 p0535 A79-43429
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

RENNER, R. A.
Alternate engines: State of the art study
[PB-293940/3] 24 p0720 N79-28596

RENON, H.
The economic and political conditions of access to resources of natural gas
24 p0652 A79-49519

RENSINK, M. E.
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979

RESH, V. H.
An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California
[PB-293031/1] 23 p0585 N79-26562

RESHOTKO, E.
Drag reduction by cooling in hydrogen fueled aircraft
21 p0165 A79-20084
Drag reduction by cooling in hydrogen-fueled aircraft
24 p0653 A79-49921

RESKA, R. S.
A distributed microcomputer-based control system for a large scale solar total energy system
24 p0672 A79-51741

RETALLICK, F. D.
Engineering studies of open-cycle coal-fired MHD for power generation
23 p0424 A79-34456

RETTERER, B.
A challenging role for the assurance sciences
21 p0086 A79-15396

RETTICH, G.
Control of solar energy systems, heat storage, and heat utilization
21 p0056 A79-13630

REUL, S.
Development and thermodynamic layout of a fuel cell component
23 p0528 A79-42227

REUSCH, H.
Mass production of solar collectors and components
23 p0467 A79-38614

REUTER, R. C., JR.
Torque ripple in a vertical axis wind turbine
21 p0029 A79-10239
Structural optimization of SMC line focusing collectors
23 p0534 A79-43295
Weight minimization of sandwich type solar collector panels
24 p0670 A79-51727
Structural optimization of sheet molding compound line focusing collectors
[SAND-79-0215C] 24 p0790 N79-32710

REYER, R.
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

REYLEK, R. S.
Selenide thermoelectric converter technology
21 p0026 A79-10221

REYNOLDS, D. K.
Computer modeling for a space power transmission system
24 p0694 A79-51941

REYNOLDS, R. K.
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297

REZNEK, B.
An annotated compilation of the sources of information related to the usage of electricity in non-industrial applications
[PB-285260/6] 21 p0212 N79-13552

REZNEK, S. R.
Energy/environment technology areas to be developed
21 p0097 A79-16077

REZY, B. J.
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

RHEE, S. S.
Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773

RHODE, R. R.
Design and installation manual for thermal energy storage
[ANL-79-15] 24 p0740 N79-29636

RHODENIZER, R.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306

RHODES, G. W.
Solar Thermal Electric Program
21 p0112 A79-16730

RHODES, W. J.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

RHOTE, W. R.
An evolutionary solar power satellite program
[AAS PAPER 78-153] 22 p0243 A79-21265

RIABIKOV, S. V.
New models of solar cells and prospects for their optimization
21 p0166 A79-20346
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356

RIAZ, M.
Long-term storage of solar energy in native rock
21 p0120 A79-17314
Effects on thermal storage efficiencies of modifying heat-transport properties of indigenous sandstones
24 p0630 A79-46306

RIBBING, C. G.
Colored stainless steel - A new type of selective absorber
22 p0294 A79-28150

RIBIERE, P.
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537

RICE, C. K.
Analytical methods for evaluating two-dimensional effects in flat-plate solar collectors
21 p0181 N79-11462

RICE, G.
Conversion of a standard single cylinder I.C. engine into a 'gamma' configuration air charged Stirling engine
21 p0024 A79-10202

RICE, I. G.
The combined reheat gas turbine/steam turbine cycle. I - A critical analysis of the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-7] 22 p0306 A79-30505
The combined reheat gas turbine/steam turbine cycle. II - The LM 5000 gas generator applied to the combined reheat gas turbine/steam turbine cycle
[ASME PAPER 79-GT-8] 22 p0306 A79-30506

RICE, P. L.
Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541
Energy availabilities for state and local development: 1974 data volume
[ORNL/TM-5890-S3] 21 p0175 N79-10542
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511

RICE, R. E.
NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106
Phase change thermal storage for a solar total energy system
21 p0120 A79-17321
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454

RICE, W. E.
Macro-energy model - Impact of public policy on technological development
21 p0113 A79-16741

RICH, C. H., JR.
Projects to expand energy sources in the western states
[PB-283706/0] 21 p0190 N79-11547

RICHARDS, D.
Preliminary design of a cruising OTEC modular experiment
24 p0674 A79-51758

RICHARDS, L. M.
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060

RICHARDS, T. R.
DOE/NASA Mod-CA wind turbine performance
21 p0028 A79-10235

RICHARDS, W. D.
System performance of a Stirling engine powered heat activated heat pump
24 p0697 A79-51962

RICHARDS, W. D. C.
Performance of a Stirling engine powered heat activated heat pump
21 p0011 A79-10098

RICHARDSON, D.
Exhaust emissions and fuel economy from automobiles using alcohol/gasoline blends under high-altitude conditions
[PB-290612/1] 23 p0555 N79-24191

RICHARDSON, W. F.
An MIS photovoltaic cell with silicon nitride insulator
23 p0508 A79-40990

RICHELS, R. G.
Exploring future energy options - An economic analysis
21 p0068 A79-14324

RICHMAN, D.
Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758

RICHMOND, J. C.
Solar spectral irradiance at ground level
23 p0429 A79-35053
Evaluation of solar absorbers, reflectors and transmitters - Physical reflectance standards
24 p0657 A79-50327

RICHTER, R.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110
Regenerative flywheel energy storage system
24 p0678 A79-51783

RICHTER, P. H.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660

RICHTMYER, T. E.
The use of computer-controlled data acquisition systems in determining solar heating and cooling system performance
21 p0088 A79-15834

RIDGWAY, S. L.
The mist-transport cycle - Progress in economic and experimental studies
24 p0624 A79-45841

RIEBOLD, G.
Solar water heating
[EMFT-FB-T-77-42] 22 p0349 N79-18457

RIEDESEL, R. G.
A central receiver solar thermal power system
23 p0424 A79-34455

RIEGER, H.
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950

RIEKE, K. L.
Program to establish ceramic technology readiness for large combustion turbine utility application
[ASME PAPER 78-WA/GT-8] 21 p0160 A79-19796

RIEMER, D. E.
Evaluation of thick film materials for use as solar cell contacts
23 p0507 A79-40980

RIENECKER, F., JR.
Diagnostics of Shiva Nova high-yield thermonuclear events
22 p0285 A79-26747

RIERA, J.
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653

RIETHMUELLER, H.
Review of the Rhein-Flugzeugbau Wankel powered aircraft program
22 p0329 N79-15966

RIETJENS, L. H. T.
Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524
Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418
Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419
Design of the Eindhoven 5 MW thermal MHD blow down experiment
23 p0394 A79-33420
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758

RILEY, J. G.
Forest residues as an alternate energy source
21 p0072 A79-14689

RINGBLOM, L.
Production of hot water with the aid of solar energy: Conditions and costs
[SIB-R-83-1978] 23 p0598 N79-27700

RIORDAN, J. C.
Minimum-average-B wells in linked magnetic mirror fields
22 p0252 A79-22237

RIPIN, B. H.
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

RIPPEY, W. G.
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project
[PB-294926/1] 24 p0793 N79-32738
RISKIEV, T. T.
Calculating the radiant field of concentrators with artificial sources
24 p0602 A79-44259
Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183
RISLEY, R. C.
Lunar resources utilization - An economic assessment
[AIAA PAPER 79-1412] 23 p0426 A79-34845
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302
RISSELL, H. C.
Combined photovoltaic and thermal hybrid collector systems
[COO-4577-3] 23 p0583 N79-26525
RITCHIE, I. T.
DC reactively sputtered metal carbide and metal silicide selective absorbing surfaces
21 p0126 A79-17377
RITLAND, P. D.
An open cycle approach to ocean thermal energy conversion
24 p0674 A79-51759
RITTER, A.
Solar-assisted heat pump heating with tube collectors
23 p0469 A79-38635
RITTNER, E.
Limiting process in shallow junction solar cells
24 p0783 N79-32646
RIVAS, O. R.
Solvent selectivity for purification of natural cases
24 p0717 N79-28252
RIVORY, J.
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956
Chromium black coatings for photothermal conversion of solar energy. II - Optical properties
24 p0656 A79-50189
RIZOS, I.
Intelsat V solar array design and development summary
21 p0002 A79-10018
INTELSAT 5 solar array
24 p0752 N79-30757
RIZZON, E.
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
ROACH, F.
The economic performance of passive solar heating - A preliminary analysis
[AIAA PAPER 78-1761] 21 p0061 A79-13862
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294
ROACH, J. F.
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
Economic performance: Evaluations for solar energy
[LA-UR-79-901] 24 p0759 N79-30828
ROBB, S. P.
Performance of silicon and gallium arsenide concentration cells
23 p0511 A79-41017
ROBBINS, W. H.
Large horizontal axis wind turbine development
24 p0633 A79-46527
Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine
24 p0634 A79-46537
Utility operational experience on the NASA/DOE MOD-0A 200-kW wind turbine
[NASA-TM-79084] 22 p0360 N79-20494
Large horizontal axis wind turbine development
[NASA-TM-79174] 23 p0581 N79-26504
ROBERTS, A. G.
Fluidised combustion for power generation
23 p0454 A79-37909
ROBERTS, A. S., JR.
Solar collector as heat pump evaporator
24 p0672 A79-51744
ROBERTS, G. T.
Heat loss characteristics of an evacuated plate-in-tube collector
22 p0285 A79-26818
ROBERTS, J. J.
Computer software for planning design of community energy systems
[CONF-781182-2] 23 p0600 N79-28063
ROBERTS, J. O.
Coal and nuclear: A comparison of the cost of generating baseload electricity by region
[PB-289585/2] 22 p0355 N79-19469
ROBERTS, H. L.
Method for making an aluminum or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-1] 21 p0182 N79-11469
ROBERTS, P. B.
Soot and the combined cycle boiler
[ASME PAPER 79-GT-67] 22 p0307 A79-30533
Application of the Centaur industrial gas turbine to the central receiver concept for solar electric power
[ASME PAPER 79-GT-45] 23 p0375 A79-32345
ROBERTS, P. H.
On the diffusive instability of some simple steady magnetohydrodynamic flows
22 p0278 A79-26163
ROBERTSON, H. S.
Test results of a moderately focusing flat-plate solar collector
23 p0399 A79-33995
ROBERTUS, R. J.
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327
ROBIDART, C. H.
Conceptual design of large heat exchangers for ocean thermal energy conversion
[ASME PAPER 78-WA/HT-32] 21 p0161 A79-19813
ROBIE, R. B.
Water as a constraint to the use of coal for California
23 p0592 N79-27606
ROBIN, A. M.
Gasification of coal liquefaction residues
21 p0006 A79-10059
ROBINOVE, C. J.
Current and potential uses of aerospace technology by the U.S. Department of the Interior
[AIAA PAPER 78-1716] 21 p0060 A79-13833
ROBINSON, C. W.
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435
ROBINSON, G. S.
Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418
ROBINSON, J. E.
Energy analysis of an aluminum solar collector
22 p0316 A79-31405
ROBINSON, H.
High temperature, high pressure electrostatic precipitation
23 p0375 A79-32249
ROBINSON, P.
M-I-S solar cells on amorphous silicon
23 p0510 A79-41008
ROBINSON, P. H.
Epitaxial solar cells on low-cost silicon substrates
23 p0519 A79-41068
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758
ROBINSON, R.
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575
ROBINSON, S. L.
Transmission of gaseous hydrogen - A preliminary technology evaluation
24 p0614 A79-45597

ROBISON, H. I.
Liquid desiccant solar air conditioner and energy storage system
21 p0021 A79-10176
Liquid sorbent solar air conditioner
23 p0401 A79-34014
ROBLES, T.
Transient response of MHD/steam bottoming plants with phased air preheaters and heat capacitor
23 p0395 A79-33428
ROBLES, T. C.
Reducing combustion air temperature variations in magnetohydrodynamic/steam power plants
21 p0016 A79-10135
ROBSON, B.
Manufacture of fuel gas for power generation by fluidized bed gasification of coal
24 p0657 A79-50212
ROBSON, F. L.
Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778
ROCCHI, M.
Stochastic simulation of hourly global radiation sequences
24 p0661 A79-50541
ROCCO, P.
Engineering aspects of demonstration fusion power reactors
24 p0695 A79-51950
ROCHE, J. C.
Large space system - Charged particle environment interaction technology
[AIAA 79-0913] 23 p0425 A79-34775
NASCAP modelling of high-voltage power system interactions with space charged-particle environments
23 p0479 A79-39806
ROCHE, M. F.
Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes
21 p0040 A79-11832
Calcium/iron sulfide secondary cells
21 p0041 A79-11835
ROCHFORD, R. S.
Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390
ROCKEY, D. E.
High temperature, low mass solar blanket development
24 p0691 A79-51902
RODE, C. H.
High energy physics superconducting magnets and cryogenic systems
22 p0290 A79-27663
RODE, J.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840
RODEKOHR, M.
Recent energy consumption trends in European Economic Community countries
[DOE/EIA-0103/16] 24 p0758 N79-30817
Evaluation of future world oil prices
[DOE/EIA-0102/4] 24 p0762 N79-31082
RODEWALD, P. G.
Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis
24 p0669 A79-51196
RODGERS, C.
Design and development of a monorotor gas turbine auxiliary power unit
[ASME PAPER 78-WA/GT-2] 21 p0160 A79-19791
RODGERS, R. E.
Coal slag effects in MHD generators
21 p0080 A79-14934
Fluid mechanics and thermal behavior of MHD channel slag layers
23 p0391 A79-33391
RODOT, M.
Photovoltaic cells and their future
23 p0435 A79-35486
Solar energy - Principal directions of research
23 p0524 A79-41805
RODRIGUES, C. A.
A development program for hydrogen burners
23 p0386 A79-33232
RODRIGUEZ, L.
Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379
RODRIGUEZ, T.
An anomalous photocurrent in SnO2-Si heterojunction solar cells
24 p0668 A79-50950
ROESER, R. A.
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592
ROESLER, D. J.
A 60kW solar cell power system with peak power tracking and utility interface
23 p0516 A79-41046
ROESSLER, B.
Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911
CuInS2 films prepared by spray pyrolysis
24 p0657 A79-50197
ROFFMAN, H. K.
Environmental impacts of contemporary fossil energy systems
24 p0659 A79-50363
ROGALSKI, W. W.
Practical schemes for reducing cold water pipe loads
24 p0621 A79-45814
ROGALSKI, W. W., JR.
Technology considerations in the design of a commerical offshore energy conversion /OTEC/ plant
22 p0288 A79-27378
ROGERS, D. A.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426
ROGERS, E. A.
Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931
Combustion of low grade fuels in fluidised beds
23 p0454 A79-37908
ROGERS, J. D.
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555
ROGERS, W.
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446
ROGERS, W. A.
Refined model of solar space cooling system
23 p0401 A79-34012
ROGISTER, A.
Asymptotic theory of dissipative trapped electron mode overlapping many rational surfaces
22 p0270 A79-24855
ROGOFF, P.
SLPX - Superconducting Long-Pulse Tokamak Experiment
22 p0237 A79-20557
ROGOSHEWSKI, P. J.
Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595
ROHATGI, A.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484
ROHATGI, P. K.
Potential applications of solar furnaces in materials industry
23 p0471 A79-38654
ROHATGI, V. K.
A collisional plasma rotating between two cylinders
21 p0049 A79-12694
Performance of magnetohydrodynamic generator in the inlet region
23 p0397 A79-33769

ROHDE, A. G.
Mercury in some New Zealand geothermal discharges
22 p0257 A79-22925
ROHDE, F. G.
Hydropower from a national point of view
21 p0059 A79-13656
ROHM, H. H.
A unified methodology for cost analysis of energy production
23 p0419 A79-34159
ROHR, F. J.
Economic prospects for the application of new electric energy storage devices
22 p0246 A79-21490
Development of high temperature fuel cell battery
[BMFT-FE-T-77-17] 22 p0342 N79-17344
ROHRMANN, C. A.
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
ROIFE, I. M.
Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766
ROLINSKI, E. J.
Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106
ROLLINS, J. P.
Parametric performance analysis of a Darrieus wind turbine system
23 p0536 A79-43676
ROMAINE, W. R.
25 kilowatt photovoltaic powered irrigation and grain drying experiment
21 p0143 A79-17519
The Mead 25 kilowatt photovoltaic system
23 p0496 A79-40883
Mead 25 kilowatt photovoltaic system
[COO-4094-19] 23 p0596 N79-27677
ROMAK, R. K.
Sensible heat storage for solar energy applications
22 p0322 A79-31449
ROMANKEVICH, A. V.
Solar-to-thermal energy converter based on coaxial evacuated tubular elements with multilayer and selective coatings
21 p0167 A79-20356
ROMANOV, A. I.
Materials
21 p0106 A79-16491
ROMANOWSKI, L. J., JR.
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043
ROMEO, N.
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176
RON, M.
Heat transfer characteristics of porous metallic matrix metal-hydrides
22 p0251 A79-21706
RONEY, J. R.
The crucial role of financial institutions in solar heating installations
23 p0403 A79-34031
ROMNEY, K.
10 kW photovoltaic concentrator system design
23 p0519 A79-41070
ROOT, D. E.
Current solar applications and economics
21 p0099 A79-16134
ROOT, D. H.
Survey and appraisal of primary future energy sources
23 p0420 A79-34167
RORRER, D. E.
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project
[PB-294926/1] 24 p0793 N79-32738
RORSTE, D. S.
Particulate and sulfur dioxide emission control costs for large coal-fired boilers
[PB-281271/7] 21 p0178 N79-10591
ROSA, F.
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806
ROSA, R.
Contribution to the study of the solar radiation climate of Lisbon
24 p0661 A79-50543
ROSARD, D. D.
Working fluids and turbines for OTEC power systems
22 p0280 A79-26192
ROSCHKE, E. J.
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869
Projected techno-economic improvements for advanced solar thermal power plants
24 p0671 A79-51733
Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
ROSCHKE, M. A.
Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463
Component-based simulator for solar systems
[LA-UR-78-1494] 21 p0208 N79-13521
ROSE, A.
The economics of geothermal energy development at the regional level
22 p0256 A79-22756
ROSE, A. B.
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447
Energy intensity and related parameters of selected transportation modes: Passenger movements
[ORNL-5506] 24 p0731 N79-29115
ROSE, J. L.
Economic factors in refuse derived fuel utilization
23 p0490 A79-40407
ROSE, M.
Cuttyhunk Island installation, WTG Energy Systems, Inc., MP1-200 control system design
24 p0634 A79-46539
ROSE, P. H.
Energy exchanger technology applied to laser heated engines
21 p0110 A79-16631
ROSE, R. K.
Power generation with binary cycles
24 p0724 N79-28740
ROSE, S. D.
Coal-rock interface detector
[NASA-CASE-MFS-23725-1] 24 p0768 N79-31706
ROSEN, B.
Central solar heat stations and the Studsvik Demonstration Plant
21 p0021 A79-10175
ROSELL, F. E., JR.
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
21 p0027 A79-10226
Determining the reliability of radioisotope thermoelectric generators /RTGs/ designed for terrestrial and undersea applications
22 p0261 A79-23622
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
22 p0261 A79-23623
ROSEMAN, B. J.
An economist looks at solar energy - The government's role
21 p0099 A79-16132
ROSEMARY, J. K.
SNG production by the Rockgas process
21 p0093 A79-15896

Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190
ROSEN, A.
Aeroelastic stability and response of horizontal axis wind turbine blades
23 p0483 A79-40117
ROSEN, S.
The optimization of heat exchanger solidity for coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357
ROSENBERG, L.
Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California
24 p0667 A79-50899
ROSENBERG, L. C.
The economics of solar heating and cooling - A cautious view
21 p0119 A79-17297
ROSENBERG, S. A.
Cost minimization of photovoltaic power supplies
21 p0021 A79-10171
ROSENBLUM, L.
Photovoltaic power systems for rural areas of developing countries
22 p0278 A79-26131
Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411
ROSENBLUTH, M. N.
Non-linear numerical algorithms for studying tearing modes
22 p0257 A79-22981
MHD stability of Spheromak
22 p0313 A79-31189
ROSENFELD, A. H.
Analysis and design of solar buildings using the Cal-ERDA computer programs
[CONF-780114-9] 21 p0137 A79-17463
ROSENFIELD, S. B.
Solar energy and the 'Common Heritage of Mankind'
[IAF PAPER 78-SL-45] 21 p0035 A79-11356
ROSENFIELD, T.
High efficiency, high density terrestrial panel
[NASA-CR-162167] 24 p0770 N79-31765
ROSENQVIST, K.
The Stirling engine for automotive application
[SAE PAPER 790329] 22 p0315 A79-31370
ROSLER, R. S.
Semiconductor grade, solar silicon purification project
[NASA-CR-158868] 24 p0736 N79-29598
ROSS, B.
Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486
ROSS, D. W.
Stability criteria for current-driven drift wave eigenmodes
22 p0269 A79-24813
ROSS, L. E.
Calcium/iron sulfide secondary cells
21 p0041 A79-11835
ROSS, P. W.
Solar eyeball - An automatic sun-tracking concentrator for use with photovoltaic generators
23 p0442 A79-36792
ROSS, R.
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116
LSA engineering status
23 p0570 N79-25490
ROSS, R. G., JR.
Environmental qualification testing of terrestrial solar cell modules
23 p0512 A79-41021
Photovoltaic design optimization for terrestrial applications
23 p0517 A79-41060
Environmental requirements for flat plate photovoltaic modules for terrestrial applications
24 p0658 A79-50342
ROSS, R. S.
Evaluation of urethane for feasibility of use in wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497
ROSSBACH, R. J.
Alternate ways of using bottoming cycle power in pipeline gas compressor stations
[ASME PAPER 79-GT-201] 23 p0380 A79-32458
ROSSI, R. C.
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575
ROSSIDIVITO, E. L.
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798
ROSSING, B. R.
Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398
ROSSINI, F. L.
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702
ROSSOFF, J.
Disposal of by-products from nonregenerable flue gas desulfurization systems
[PB-293163/2] 23 p0586 N79-26575
ROTE, D. M.
Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922
ROTH, W. L.
Preparation and ionic conductivity of H3O/+/ beta alumina
21 p0040 A79-11821
ROTHFUS, R. R.
Heat exchangers for Ocean Thermal Energy Conversion plants
21 p0142 A79-17506
ROTHFUSZ, R. W.
A canister fuel pump for general aviation aircraft
[SAE PAPER 790624] 23 p0440 A79-36752
ROTHWARF, A.
Comment on a simple measurement of absolute solar cell efficiency
23 p0440 A79-36683
ROTOLANTE, B. H.
An economic comparison between solar and conventional residential air conditioning in Miami, Florida
23 p0401 A79-34013
ROTTIGNI, G. A.
Fixed-focal-axis solar concentrators with a curvature determined by gravity
23 p0523 A79-41254
ROTTY, R. M.
The atmospheric CO2 consequences of heavy dependence on coal
21 p0107 A79-16524
Uncertainties associated with global effects of atmospheric carbon dioxide
[ORAU/IEA-79-6(O)] 24 p0803 N79-33699
ROUKIS, J. G.
Thermal energy storage heat exchanger design
[ASME PAPER 78-ENAS-30] 21 p0049 A79-12579
ROUMENGOUS, C.
Experiments in solar space heating and cooling for moderately insolated regions
21 p0137 A79-17464
ROUSE, B.
Energy recovery and conservation by recycling municipal solid waste
[NZERDC-P7] 24 p0745 N79-30105
ROUSSEAU, J.
Solar-powered Rankine heat pump for heating and cooling
24 p0610 A79-45219
ROUSSEAU, R. W.
A coal gasification-gas cleaning pilot plant at North Carolina State University
23 p0419 A79-34156
ROUSSEAU, W. F.
Demonstration of the capabilities of the Livermore energy policy model
[UCRL-52508] 24 p0788 N79-32695
ROUT, R. K.
Simulation of solar powered Rankine cycle systems
21 p0022 A79-10179
ROUTH, D. E.
Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23540-1] 23 p0579 N79-26475

ROUTIE, R.
Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966

ROVNER, L. H.
Nitrogen fixation with fusion heat
24 p0655 A79-51948

ROWELL, R. M.
Methanol from wood waste: A technical and economic study
[FPL-12] 21 p0154 N79-12239

ROWLAND, S. J.
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375

ROWNY, P. E.
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454

ROY, A.
Sede Boger - Shallow solar ponds project
24 p0671 A79-51738

ROY, A. S.
Economic methodology for solar power-generating systems
21 p0030 A79-10251
A practical electrochemical transport equation for non-dilute solutions
21 p0041 A79-11841
Econometric analysis of concentrators for solar cells
21 p0149 A79-18017
Model for comparing cost of flat-array and concentrator photovoltaic solar-cell systems
23 p0514 A79-41035

ROY, G. D.
On supersonic and subsonic diffusers for magnetohydrodynamic generator applications
22 p0279 A79-26186

ROY, R.
Black germanium solar selective absorber surfaces
22 p0327 A79-31970

ROYE, C. E.
Practical aspects of designing and manufacturing MHD superconducting base-load magnets in 1988 time frame
22 p0235 A79-20535

ROZANOV, V. B.
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171

RUBENSTEIN, A. S.
Evaluation of a flywheel-powered shuttle car
[FE-8890] 23 p0562 N79-24488

RUBERTO, R. G.
Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367
Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation
[EPRI-AF-913] 24 p0755 N79-33344

RUBIN, E.
Assessment of the solid waste impact of the National Energy Plan
[BNL-50706] 21 p0213 N79-13572

RUBIN, E. S.
Energy requirements of a limestone FGD system
21 p0114 A79-16747

RUBIN, I. B.
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689

RUBTSOV, N. A.
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703

RUBY, J. D.
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667

RUCKER, F. H.
Economic evaluation of the ATC/Wellman incandescent two-stage low Btu coal gas producer
21 p0146 A79-17640

RUCKMAN, J. H.
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132
Hydrogen Homestead
23 p0415 A79-34125

RUDBERG, D. A.
Sensitivities of outputs to variations of inputs in MHD combustors
23 p0390 A79-33382

RUDEY, R. A.
Characteristics and combustion of future hydrocarbon fuels
21 p0036 A79-11599
Impact of future fuel properties on aircraft engines and fuel systems
21 p0036 A79-11600
Effect of broadened-specification fuels on aircraft engines and fuel systems
[AIAA 79-7008] 22 p0300 A79-29383
Characteristics and combustion of future hydrocarbon fuels
21 p0202 N79-13196
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
Effect of broadened-specification fuels on aircraft engines and fuel systems
[NASA-TM-79086] 22 p0330 N79-16136

RUDGE, A. W.
A review of some critical aspects of satellite power systems
22 p0326 A79-31921

RUDIAK, IU. B.
Optimization model of a system consisting of solar water heater plus accumulator plus user with variable heat carrier flowrate
24 p0602 A79-44263

RUDMAN, P. S.
Thermodynamics of pressure plateaus in metal-hydrogen systems
22 p0238 A79-20772
Hydrogen fuel production by wind energy conversion
23 p0413 A79-34113

RUEDA, F.
Structure identification and optical and electrical properties of cuprous sulphine layers in relation with solar energy application
24 p0704 A79-52311

RUEDISILI, L. C.
Perspectives on energy: Issues, ideas, and environmental dilemmas /2nd edition/
21 p0147 A79-17646

RUEGG, R. T.
Life-cycle costing. A guide for selecting energy conservation projects for public buildings
[PB-287804/9] 22 p0345 N79-17744

RUFF, R. E.
The influence of rough terrain on pollutant dispersion and transport from a geothermal power complex
23 p0534 A79-43372

RUISI, G.
The relationship between diffuse and total solar radiation in computer simulation of solar energy systems
21 p0119 A79-17304

RUIZ, J. M.
Transcell, a novel approach for improving static photovoltaic concentration
21 p0124 A79-17356
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071

RULE, T. T.
Performance of silicon and gallium arsenide concentration cells
23 p0511 A79-41017

RUMBAUGH, J. H.
Thermal energy conversion - Tapping the sea depths
24 p0628 A79-45979

RUP, R.
Experimental investigations of a physical system capable of using solar energy
22 p0247 A79-21667

RUPPE, H. O.
A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432

Powersat: An evaluation
[TUM-LRT-TE-22/2] 23 p0599 N79-27707
RUPPRECHT, G.
Sun-position diagrams using examples from Flensburg to Mittenwald
21 p0055 A79-13626
RUSEK, S. J.
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429
RUSH, C. M.
Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922
RUSH, E. E.
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839
RUSH, R. E.
Operating experience with three 20 MW prototype flue gas desulfurization processes
[ASME PAPER 78-JPGC-PWR-12] 21 p0150 A79-18098
RUSSELL, B. F.
An evaluation of the hydrothermal resources of the Desert Hot Springs Region, California
[PB-290942/2] 23 p0575 N79-25536
RUSSELL, J.
Low-cost monitoring of solar system performance
21 p0088 A79-15843
RUSSELL, J. L.
Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166
RUSSELL, J. L., JR.
Design, construction, and testing of a Fixed Mirror Solar Concentrator field
21 p0020 A79-10164
Fixed mirror solar concentrator for power generation
[GA-A-14883] 21 p0187 N79-11526
RUSSELL, M. C.
Combined photovoltaic and thermal hybrid collector systems
23 p0519 A79-41073
RUSSELL, O. R.
Remote sensing and mine subsidence in Pennsylvania
22 p0303 A79-29936
RUSSELL, P. A.
Balloon-borne particulate sampling for monitoring power plant emissions
[PB-290473/8] 23 p0566 N79-24543
RUSSELL, P. G.
Electrochemical characteristics of ZrO2-Y2O3 solid electrolytes for fuel cells
21 p0039 A79-11813
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728
RUSSELL, T. W.
Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177
RUSSO, A. J.
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0352 A79-33402
Numerical codes for MHD flows
[SAND-78-1954] 24 p0730 N79-29061
RUSSO, F. A.
Status report of the dynamic isotope power system
24 p0652 A79-51927
RUSSO, G.
Cavity-type surfaces for solar collectors
22 p0283 A79-26497
RUSTA, D.
Nickel-cadmium battery reconditioning and long term performance in geosynchronous orbit spacecraft
21 p0029 A79-10242
RUTH, J.
Solar power satellites for Europe
[IAF PAPER 79-173] 24 p0710 A79-53334
MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems
24 p0752 N79-30752
RUTH, R. P.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043
RUTHS, J.
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988
RUTTENBER, A. J., JR.
Urban areas as energy flow systems
24 p0736 N79-29592
RUTZ, W.
Development and application of techniques to evaluate cogeneration impacts
22 p0303 A79-29795
RUZIC, N.
How to tap NASA developed technology
21 p0164 A79-19896
RYAN, P. M.
Magnetic multipole line-cusp plasma generator for neutral beam injectors
22 p0238 A79-20746
RYAN, R. S.
Commercialization of fluidized-bed combustion systems by the State of Ohio
21 p0096 A79-15923
RYASON, P. R.
Solar photolysis of water
[NASA-CASE-NPO-14126-1] 21 p0182 N79-11470
RYLEY, D. J.
An analytical expression in terms of temperature only for optimising the flash cycle for geothermal power plants
23 p0487 A79-40369
RZAEV, P. F.
Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water
21 p0167 A79-20360
Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen
24 p0602 A79-44265
RZHEVSKII, S. V.
A problem of optimizing the setting angle of sun-battery panels of concave shape
21 p0045 A79-12186
Determining optimal angles of nonconvex solar battery panel mounting
21 p0080 A79-14837

S

SAARI, D. F.
Operability and materials testing for MHD air heaters
24 p0701 A79-51994
SAARI, D. P.
Progress in the testing of materials and design concepts for directly-fired MHD air heater service
21 p0017 A79-10141
SAASKI, E. W.
A thermal energy storage system for a Stirling engine powered highway vehicle
24 p0680 A79-51803
SAATY, T. L.
Rationing energy to industries - Priorities and input-output dependence
23 p0423 A79-34278
SABBERWAL, S. P.
Some aspects towards the performance evaluation and ensuing design components of solar collector systems
21 p0130 A79-17404
Performance of a collector/storage solar water heater
23 p0479 A79-39843
SABIN, C. M.
Ammonia vaporization and condensation investigations related to OTEC heat exchangers
24 p0622 A79-45819
SABOL, R.
Optimized solar module design
23 p0510 A79-41005

SACHS, E. M.
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939
SACK, B.
The potential of fusion reactors as process heat source
22 p0284 A79-26624
SACKER, A.
The Powerton gasification combined-cycle test facility - A preview
23 p0424 A79-34454
SADALA, B. L.
Coal-fired fluid bed compressed air energy storage power plants - A preliminary technical assessment
24 p0679 A79-51796
SADLER, J. W.
Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558
SADOWSKI, E. P.
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386
SAFAVI, H.
The legal aspect concerning solar energy
24 p0713 A79-53681
SAFONOVA, S. S.
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator
22 p0258 A79-23137
Dynamics of a free-piston Diesel-MHD generator
23 p0395 A79-33424
SAGER, J. C.
Flat plate collector dynamic evaluation
21 p0128 A79-17390
SAGER, P.
Conceptual design study of a doublet fusion ignition test reactor
23 p0407 A79-34065
SAGERMAN, G. D.
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225
Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665
SAH, C. T.
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
SAHA, H.
Role of the diode exponential factor in CdS solar cells
21 p0123 A79-17348
Solar energy storage via liquid filled cans - Test data and analysis
23 p0400 A79-34005
Biomass conversion potential in the Southeast
24 p0611 A79-45231
SAHAI, R.
High-efficiency AlGaAs/GaAs concentrator solar cells
22 p0261 A79-23710
Proton and electron irradiations of liquid phase epitaxial GaAlAs solar cells
23 p0506 A79-40972
Spectrally split tandem cell converter studies
23 p0513 A79-41028
High efficiency AlGaAs/GaAs concentrator solar development
23 p0515 A79-41040
SAINI, J. S.
Return flow solar air-heater
21 p0055 A79-13609
Solar collector optimization
21 p0132 A79-17418
Design of solar heating system for winter heating of buildings /A case study/
21 p0139 A79-17486
Design construction and short term performance of a solar pond
23 p0385 A79-33220
SAINT CLAIR, A. E.
Conference on Environmental Aspects of Non-Conventional Energy Resources - II, Denver, Colo., September 26-29, 1978, Proceedings
24 p0664 A79-50876
SAINT LORANT, S. J.
Applied Superconductivity Conference, Pittsburgh, Pa., September 25-28, 1978, Proceedings
22 p0235 A79-20526
SAINT-ETIENNE, J.
High accuracy off-shore position finding using the GEOLE satellite based system
22 p0329 N79-15932
SAITOH, T.
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958
SAKELLAROPOULOS, G. P.
Electrogenerative chemical reactors
24 p0631 A79-46310
Electrogenerative and voltameiotic processes
24 p0703 A79-52026
SAKHUJA, R.
Heat pump system for process steam generation
24 p0697 A79-51964
SAKR, I. A.
Possibilities for solar energy utilization in Egypt
21 p0102 A79-16453
A channelled solar flat-plate booster
21 p0131 A79-17413
Solar energy pattern on building vertical walls of different orientations
23 p0463 A79-38581
SAKUTA, K.
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Estimation of collector and electrical energy cost for STEPS in Japan
21 p0118 A79-17288
An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442
SALA, G.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071
Static concentrators for two-sided photovoltaic solar cells
24 p0661 A79-50542
SALAMA, A. M.
The effects of copper and titanium on silicon solar cells
23 p0504 A79-40961
SALARIYA, K. S.
Solar concentrators
21 p0136 A79-17455
SALEEM, A.
Particulate and sulfur oxide control options for conventional coal combustion
21 p0092 A79-15883
SALGE, J.
Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807
SALIEVA, R. B.
Selection of method for calculating the parameters of wind and solar power station storage facilities
21 p0054 A79-13293
Fundamentals of mathematical modeling of solar-radiation regime energy structure
21 p0166 A79-20352
SALKELD, R.
Financial/management scenarios for a satellite power system program
[AAS PAPER 78-144] 22 p0243 A79-21259
Financing alternatives for space industrialization
[AIAA PAPER 79-1389] 23 p0426 A79-34836
SALLES, Y.
Low cost manufacturing of monocrystalline silicon solar cells - A review of technological solutions
23 p0501 A79-40922
SALMON, L. E.
Recent developments in coal liquefaction in the United States
[CONF-790213-5] 24 p0779 N79-32383
SALOMAA, R. R. E.
Effects of nonlinear decay of backscattered light on the anomalous reflectivity
22 p0310 A79-30742

SALOMON, R. E.
Gas concentration cells for the conversion of ocean wave energy
24 p0605 A79-44873
Solar conversion by concentration cells with hydrides
24 p0662 A79-50549

SALTER, R. M.
Application of electron beams in space for energy storage and optical beam generation
21 p0108 A79-16606

SALTMARSH, M. J.
Optimization of the fission-fusion hybrid concept
[ORNL/PPA-79/3] 24 p0778 N79-32113

SALTZMAN, E. J.
Reductions in vehicle fuel consumption due to refinements in aerodynamic design
24 p0658 A79-50335

SALTZMAN, M. P.
Alkaline electrolysis - Past, present and future
24 p0613 A79-45588

SALVADOR, L. A.
Process development for the Westinghouse advanced fluidized-bed coal gasification system
21 p0006 A79-10058
Westinghouse fluidized bed coal gasification system - Experience and plans
21 p0096 A79-15924

SALYER, I. O.
Form-stable, crystalline polymer pellets for thermal energy storage
21 p0013 A79-10107

SALZANO, F. J.
Hydrogen production from high temperature electrolysis and fusion reactor
21 p0015 A79-10126
Hydrogen technology: An overview
[BNL-25760] 24 p0734 N79-29379

SAMBAR, M.
Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652

SAMPATH, V.
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819

SAMPLE, D. G.
Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-29366

SAMPSON, W. J.
Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454

SAMSEL, W.
A method of iteration for calculating the gasification gas composition of hydrocarbons and coal dust at low temperatures and high pressure
23 p0528 A79-42228

SAMUELS, G., JR.
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

SAMUELSON, R. S.
Low head power generation with bulb turbines
21 p0074 A79-14705

SAN MARTIN, R. L.
Standards and testing criteria for solar systems and components in the United States
23 p0470 A79-38642

SANAI, M.
Compartmental model for agricultural conversion of solar energy into fixed biomass
21 p0022 A79-10181
An incremental model for conversion of solar energy in agricultural systems
23 p0479 A79-39840
Feasibility of energy self sufficiency through decentralized use of renewable resources in Iran
24 p0658 A79-51974

SANBORN, C. R.
Environmental aspects of wood fuel
24 p0665 A79-50884

SANBORN, Y.
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564

SANCHEZ-SINENCIO, F.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054

SANCHEZ, L. R.
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Development of a shingle-type solar cell module
23 p0499 A79-40906
A candidate low-cost processing sequence for terrestrial silicon solar cell panel
23 p0501 A79-40919

SANCIER, K. M.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

SANDBERG, J. J.
User experience with on-road electric vehicles in the U.S.A. and Canada
21 p0009 A79-10080

SANDER, W. J.
Energy requirements for producing steel in the Republic of South Africa
22 p0340 N79-17322

SANDERSON, R. W.
Performance of silicon and gallium arsenide concentration cells
23 p0511 A79-41017

SANDO, M.
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I.
21 p0130 A79-17409

SANDROCK, G. D.
The metallurgy and production of rechargeable hydrides
22 p0250 A79-21703
A survey of the hydrogen storage properties of nickel-copper-mischmetal-calcium alloys
23 p0414 A79-34121

SANDS, M. D.
Environmental considerations for siting an ocean thermal conversion early ocean testing platform at four proposed areas
22 p0287 A79-27377

SANDSTEDE, G.
On the mechanism of the electrocatalytic oxygen reduction with particular regard to metal chelates
21 p0038 A79-11808

SANDSTROM, W. A.
Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077
IGT U-GAS pilot plant developments
24 p0688 A79-51861

SANDUSKY, W. F.
Application of long-range transport modeling to assess coal development
23 p0535 A79-43429

SANGHI, A. K.
The ground water and energy supply situation for Great Plains irrigation
[PB-286002/1] 21 p0222 N79-14586

SANGRADOR, J.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071
Static concentrators for two-sided photovoltaic solar cells
24 p0661 A79-50542

SANJURJO, A.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

SANKAR, S.
Optimization of a novel hydrostatic drive performance using hybrid computing technique
22 p0264 A79-23809

SANKARANARAYANAN, S.
Application of turbopack in solar energy systems
21 p0141 A79-17504

SANKHALA, V. K.
A reflector concentrator modified sterling engine unit and an aqua-ammonia absorber gas turbine unit for farm power needs
21 p0142 A79-17509

SANTALA, T.
Optimized solar module design
23 p0510 A79-41005

SANTANA, C. C.
Hydrogen storage in the form of metal hydrides
23 p0388 A79-33251

SANTIAGO, M.
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839

SANTINI, D. J.
Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829
Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699

SANTODONATO, J.
Health effects associated with diesel exhaust emissions, literature review and evaluation
[PB-289817/9] 22 p0364 N79-20727

SANTORO, R. T.
Optimization of the fission-fusion hybrid concept
[ORNL/PPA-79/3] 24 p0778 N79-32113

SANTOS, G.
Multi-foil insulator container for electrical vehicle application of a lithium-aluminum/metal sulfide battery
24 p0684 A79-51831

SANTOS, S. C.
Hydrogen storage in the form of metal hydrides
23 p0388 A79-33251

SANTY, M. J.
Coal desulfurization test plant status - July 1977
21 p0044 A79-12118
Coal desulfurization
23 p0533 A79-43200

SANZ, J.
Project of the 'Ramon Areces' Concentrated Photovoltaic Power Station
23 p0519 A79-41071

SAPIENZA, R. S.
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364

SAPOZHNIKOV, B. G.
Use of fluidized media in thermal power systems
23 p0436 A79-35525

SARADA, T.
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A058795] 21 p0206 N79-13503

SARAZIN, M.
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177

SARGENT, F. E.
Modeling the intermediate field of ocean thermal energy conversion discharges
24 p0626 A79-45858

SARKISIAN, P. H.
Advanced wind furnace systems for residential and agricultural heating and electrical supply applications
21 p0028 A79-10237

SAROFIM, A. F.
Flame emissivities - Alternative fuels
21 p0052 A79-12984
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474

SARONEN, J.
Gas turbine with waste heat utilization - Low investment costs and high fuel use efficiency
21 p0168 A79-20448

SAROYAN, R. A.
Requirements and new materials for fusion laser systems
21 p0082 A79-15138

SARRDIN, J.
Hydrogen electrochemical storage by substituted LaNi5 compounds
22 p0251 A79-21711

SASAKI, A.
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110
Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785

SASAKI, J. R.
Mississauga solar house /Mississauga, Ontario, Canada/
22 p0276 A79-25935
Studies on solar collector performance at NRC
22 p0322 A79-31451

SASAMOTO, T.
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415

SASSCER, D. S.
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806

SASTRI, V. B. K.
A study for optimum use of metallic plates for thermal storage in solar processes
21 p0122 A79-17331

SASTROAMIDJOJO, M. S. A.
Flux-redistribution in the focal region of a planar Fresnel ring mirror
22 p0263 A79-23764

SATCHWELL, D. L.
Composite material flywheel for the electric-powered passenger vehicle
22 p0240 A79-20842
High-energy-density flywheel
24 p0678 A79-51784

SATER, B. L.
A cost effective total energy system using a faceted mirror sunlight concentrator and high intensity solar cells
21 p0135 A79-17446

SATHE, A. P.
A simple solar tracking system
21 p0136 A79-17457

SATHER, N. F.
Major factors in OTEC heat exchanger design
23 p0404 A79-34039
Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787

SATMAN, A.
In-situ combustion models for the steam plateau and for fieldwide oil recovery
24 p0732 N79-29353

SATO, F.
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110

SATO, H.
Superconducting energy storage magnets
22 p0236 A79-20537

SATO, T.
Optical properties of aggregated gold on aluminum
24 p0669 A79-51181

SAUCEDO, E.
Properties of chemically sprayed SnO2 antireflecting films on Si solar cells
24 p0656 A79-50196

SAUER, H. J.
Heat recovery devices for building HVAC systems
21 p0073 A79-14697

SAV, G. T.
Life-cycle costing. A guide for selecting energy conservation projects for public buildings
[PB-287804/9] 22 p0345 N79-17744

SAVAGE, G. M.
Energy recovery from urban solid waste
23 p0386 A79-33233

SAVAGE, J. A.
Energy conservation by means of recycling
21 p0112 A79-16735

SAVCHENKO, I. G.
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358

SAVERY, C. W.
Double-exposure collector system for solar heating applications
[CONF-780114-6] 21 p0131 A79-17411
Dynamic modeling of water- and air-heating solar collectors
23 p0531 A79-42897

SAVINELL, R. F.
Discharge characteristics of a soluble iron-titanium battery system
22 p0286 A79-26996

SAWADA, Y.
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
SAWAN, Y.
Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343
SAWATA, S.
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Estimation of collector and electrical energy cost for STEPS in Japan
21 p0118 A79-17288
An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442
SAWLEY, M. L.
Magnetoacoustic oscillations in a finite-beta current carrying plasma column
24 p0714 A79-54188
SAWYER, C. J.
State-of-the-art assessment of air pollution control technologies for various waste-as-fuel processes
21 p0064 A79-14111
SAWYER, D. E.
Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352
SAXENA, S. C.
Heat transfer between a fluidized bed and an immersed vertical U-tube
24 p0632 A79-46320
SAYIGH, A. A. M.
Saudi Arabia looks at the sun
21 p0063 A79-13900
A comparison among various flat plate collectors with honeycomb structures
21 p0128 A79-17392
Effect of dust on flat plate collectors
21 p0129 A79-17399
Geothermal energy coupled with solar energy is the future energy in Saudi Arabia
23 p0408 A79-34071
SBERVEGLIERI, G.
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176
SBITNIKOVA, I. S.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428
SCALABRIN, G.
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
SCANVIC, J. Y.
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526
SCARBOROUGH, S. E.
Review report on the solar heating/cooling operational test site at Stouffer Place Building Number 1, Kansas University, Lawrence, Kansas
24 p0610 A79-45220
SCATURRO, L. S.
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570
SCHAEFER, A. O.
Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels
[FE-1784-39] 24 p0719 N79-28364
SCHAEFER, A. R.
Spatial uniformity of quantum efficiency of a silicon photovoltaic detector
23 p0478 A79-39593
SCHAEFER, G.
Identification of social and economic difficulties associated with the introduction of solar energy devices
[BMFT-FB-T-78-47] 23 p0595 N79-27712
SCHAEFER, H.
Research summary--oil spills
[PB-293597/1] 23 p0585 N79-26558
SCHAFFAR, G.
Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78] 23 p0574 N79-25528
SCHAFFER, M. J.
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
SCHAFFERT, R. E.
Sweet sorghum - A renewable source for alcohol production
23 p0389 A79-33263
SCHAFFT, H. A.
Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352
SCHAFT, H. A.
Standards for photovoltaic energy conversion systems
[PB-296274/4] 24 p0801 N79-33597
SCHAINKER, R. B.
A fundamental model for the evolution of a two-phase geothermal reservoir with application to environmental impact analysis
22 p0263 A79-23777
SCHALLER, E. G. A.
Solar energy in Southern Africa
21 p0117 A79-17287
SCHALLER, E. S.
Development and evaluation of a 600-kWh lithium-hydrogen peroxide reserve power system
21 p0011 A79-10095
SCHANK, J.
Alternative, semi-automated method for performing multiobjective analyses
[BNL-50892] 23 p0599 N79-27921
Multiobjective analysis in a national energy system model
[BNL-24371] 24 p0758 N79-30823
SCHAPPERT, G. T.
Prepulse damage to targets and alignment verification
22 p0258 A79-23027
SCHARF, F.
The Tritherm test house
22 p0290 A79-27723
SCHAUP, P.
Design of solar heated warm water heating facilities from an economic viewpoint
23 p0468 A79-38622
SCHEDLER, W. J.
Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571
SCHEEL, B. W.
Dynamic behaviour of light-weight solar collectors
21 p0056 A79-13628
SCHEFFLER, R. L.
Status of the Southern California Edison Company 3 MW wind turbine generator /WTG/ demonstration project
24 p0635 A79-46541
SCHEIBNER, E. J.
A computer model of a heterojunction solar cell with application to GaP/Si
24 p0654 A79-50030
SCHEINER, S. R.
Federal automobile fuel economy standards - A status report
21 p0073 A79-14693
SCHEININE, A.
Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033
SCHEITHAUER, R.
Distributed energy storage for solar applications
22 p0317 A79-31 10
SCHENK, K. F.
Performance analysis of a flat-plate solar collector using 'forge-fin' tubes
22 p0316 A79-31404
Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector
22 p0317 A79-31408
SCHENZLE, P.
Wind energy ships - Potential for modern wind-driven sea transport systems
23 p0472 A79-38661

SCHERBER, W.
Selective coatings for aluminum and steel solar absorbers
21 p0058 A79-13647

SCHERMER, R. I.
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555

SCHERTZ, W. W.
Nonimaging solar concentrators
21 p0043 A79-11973

SCHETZ, J. A.
Flowfield measurements in the vicinity of the rotor of a 10 kw windmill
[AIAA PAPER 79-0969] 23 p0475 A79-38889

SCHIEFELBEIN, G. F.
Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179

SCHIEFELBEIN, G. L.
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786

SCHIESSER, W. E.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

SCHILLING, G.
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

SCHILLING, H.-D.
Coal usage
24 p0606 A79-44957

SCHILLINGER, L.
Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224)
[PB-294342/1] 24 p0743 N79-29671

SCHIMKE, G. R.
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

SCHIMMEL, W. P., JR.
Analysis and design of air heating unglazed flat plate solar collectors
22 p0280 A79-26202

SCHINKEL, W. M. M.
An interferometric study of the local heat transfer by natural convection in inclined airfilled enclosures
23 p0531 A79-42908

SCHIPPER, L.
Energy use and conservation in industrialized countries
[LBL-7872] 24 p0756 N79-30802

SCHIRMER, O.
Second stage concentration with tapers for fluorescent solar collectors
23 p0423 A79-34372

SCHLAIKJER, C. R.
Discharge reaction mechanisms in Li/SOCl2 cells
22 p0305 A79-30331

SCHLAPBACH, L.
Localization and diffusion of hydrogen in lanthanum-nickel compounds
22 p0248 A79-21682
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697
The plateau pressure of RE Ni5 and RE Co5 hydrides
22 p0250 A79-21698
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

SCHLINGER, W. G.
Gasification of coal liquefaction residues
21 p0006 A79-10059
The Texaco coal gasification process for manufacture of medium BTU gas
23 p0593 N79-27614

SCHLITT, R.
A heat pipe radiator for shunt electronics: Development and test results
24 p0764 N79-31276

SCHLUDERBERG, D. C.
Moving bed heat transfer for advanced power reactor applications
23 p0416 A79-34133

SCHLUETER, R. A.
Impact of storm fronts on utilities with WECS arrays
24 p0635 A79-46546

SCHMID, B. K.
SRC-II - Review of development and status
21 p0092 A79-15887

SCHMID, E. R.
Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800

SCHMID, F.
Directional solidification of crack-free silicon ingots by heat exchanger method
23 p0498 A79-40901
Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing
[NASA-CR-158038] 21 p0219 N79-14540
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3
[NASA-CR-162182] 24 p0771 N79-31775

SCHMID, K. H.
Weak points of our prediction models for raw materials strategy
22 p0265 A79-24040

SCHMIDT-BURR, P.
Statement and comparison between different studies on energy requirement
[EMPT-FE-T-77-92] 24 p0759 N79-30833

SCHMIDT, D. A.
A characteristic time correlation for combustion inefficiency from alternative fuels
[AIAA PAPER 79-0357] 21 p0158 A79-19687

SCHMIDT, P. H.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966

SCHMIDT, W. L.
Performance matching and optimization of wind powered water pumping systems
23 p0479 A79-39842

SCHMIEDEL, H.-P.
Solar energy and heat pumps - A possible substitute for fossil fuels for heating private households
23 p0434 A79-35464

SCHMILL, W. C.
Potential of GaAlAs solar cells for the global positioning system missions
24 p0691 A79-51901

SCHMITZ, H. W.
Gasification of coal with high-temperature reactor heat - Investigations concerning the market and the economics
22 p0264 A79-23828

SCHMITZ, H.-H.
Oil shale in the U.S. - Current state of technology and research
22 p0265 A79-23830

SCHMITZ, K.
Energy management up to the turn of the century - Options and constraints
23 p0536 A79-43525

SCHMUCKER, R. H.
A nuclear waste deposit in space - The ultimate solution for low-cost and safe disposal
[IAF PAPER 79-A-15] 24 p0711 A79-53432

SCHNACK, D.
Non-linear saturation of the tearing mode in a reversed field pinch
23 p0527 A79-41941

SCHNACKE, A. W.
Molten carbonate fuel cell based, coal fired power plants for electric power generation
24 p0682 A79-51816

SCHNEIDER-MAUNOURY, M.
Energy development
22 p0282 A79-26402
SCHNEIDER, A. L.
Liquefied natural gas safety research overview
[AD-A063714] 22 p0365 N79-21233
SCHNEIDER, G. E.
Fully developed laminar heat transfer in passages of triangular cross section for application to solar collector plate design
[AIAA PAPER 79-0974] 23 p0458 A79-38189
Conductive heat transfer from hemispherical, buried tanks with application to solar heating
23 p0532 A79-42976
SCHNEIDER, G. R.
Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051
SCHNEIDER, J. C.
Differential pressure measurements in high temperature environments
21 p0144 A79-17599
SCHNEIDER, K.
Development and testing of the ULP solar array
21 p0029 A79-10245
SCHNEIDER, R. T.
Energy storage by flywheels - A new flywheel concept
23 p0416 A79-34139
SCHNEIDER, S. J.
Materials
21 p0106 A79-16491
Design and operation of the Westinghouse electrode systems test facility /WESTF/
23 p0393 A79-33411
SCHNEIDER, T.
Eighty atmospheres in reserve
23 p0436 A79-35800
SCHNEIDER, T. R.
Storage as an energy strategy for utilities
21 p0093 A79-15891
SCHNELL, P.
Energy conservation - Focal point for energy efficient operations
24 p0714 A79-53805
SCHNELL, R. C.
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant
23 p0438 A79-36432
SCHNELLER, D.
The influence of increasing energy costs on the economic dimensioning of electrical energy distribution equipment
23 p0535 A79-43524
SCHNEYER, G. P.
A numerical simulation model for entrained flow coal gasification. I - The hydrodynamical model
23 p0410 A79-34087
SCHNURR, N. M.
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
SCHOBER, T.
The iron-titanium - hydrogen system: A transmission electron microscope /TEM/ study
22 p0285 A79-26947
SCHOCK, A.
Use of modular heat source stack in RTGs
24 p0693 A79-51933
Design optimization of RTG for Solar-Polar Mission
24 p0693 A79-51935
SCHOCK, H. W.
Improvement of efficiency and stability by copper-treatment and front contacting of Cu/x/S-CdS solar cells
21 p0123 A79-17345
SCHOCK, H.-W.
A pilot line for the production of large area Cu/x/S-CdS solar cells
21 p0124 A79-17351
SCHOECK, P. A.
Influence of storage tank heat exchanger and mass flow rate on collector efficiency of solar heating units
23 p0468 A79-38625
SCHOENAU, G.
The Saskatchewan Conservation House - Some preliminary performance results
22 p0318 A79-31417
SCHOENAU, G. J.
Energy management through energy conservation in buildings
22 p0320 A79-31431
SCHOENBERGER, R. J.
Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities
23 p0490 A79-40414
SCHOEPF, K. F.
The synergetics of the catalytic D-D-fusion-fission breeder
22 p0252 A79-22236
SCHOIJET, M.
Possibilities of new materials for solar photovoltaic cells
24 p0655 A79-50178
SCHOLL, G.
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751
SCHOLL, H. H.
Projecting energy resource utilization - The geothermal case
21 p0068 A79-14321
SCHOLZ, F.
Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0648 A79-49213
SCHOOLEY, F. A.
Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals
[TID-29093-VOL-5] 24 p0719 N79-28361
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375
Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385
SCHOOLEY, J. F.
Temperature calibration for solar heating and cooling system evaluation
21 p0089 A79-15846
SCHORR, J. R.
Study of heat transfer through refractory lined gasifier vessel walls
[FE-2210-29] 23 p0556 N79-24306
SCHOTT, J. T.
Detection of processing- and radiation-induced defects in solar cells by transient capacitance spectroscopy
23 p0521 A79-41086
SCHOTT, T.
Potential for use of solar energy in private households to the year 2000
23 p0473 A79-38667
Energy consumption structures in the year 2000
23 p0523 A79-41241
SCHRADER, L.
Research and development work for hydrogasification of coal with nuclear processing heat done in the framework of the prototype nuclear processing heater project
[BMFT-FB-T-78-25] 24 p0780 N79-32393
SCHREIBER, H., JR.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966
SCHREIBER, J. D.
A copper oxide-copper sulfate water-splitting cycle
21 p0015 A79-10128
A hybrid thermochemical hydrogen production cycle using solar energy process heat
[AIAA PAPER 78-1779] 21 p0062 A79-13874
SCHREIBER, P.
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991
SCHREITMUELLER, K. R.
Integrated solar energy installations for isolated operation
23 p0522 A79-41239

SCHREYER, J. M.
Economy of a retrofit solar system
[CONF-790213-2] 24 p0755 N79-30795
SCHREIBER, C. F.
Interleakage of ammonia and seawater in OTEC heat exchangers - Effects on corrosion and scale formation
24 p0622 A79-45826
SCHROEDER, R. C.
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies
[LBL-8802] 24 p0786 N79-32684
SCHROEDER, T. A.
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382
SCHUELER, D. G.
Status of photovoltaic systems and applications
21 p0095 A79-15907
Status of the DOE Photovoltaic Concentrator Technology Development Project
23 p0517 A79-41054
Status of the DOE Photovoltaic Systems Engineering and Analysis Project
23 p0519 A79-41075
Status of the DOE photovoltaic concentrator technology development project
[SAND-78-0948C] 21 p0176 N79-10550
Status of the DOE photovoltaic concentrator development project
23 p0571 N79-25491
Status of the DOE photovoltaic systems engineering and analysis project
[SAND-78-0955C] 24 p0754 N79-30780
SCHUETZ, G. H.
A new electrolytic cell type for hydrogen production in hybrid cycles
23 p0414 A79-34115
SCHULDT, R. L.
Development of an Air Force facilities energy information system
[AD-A059309] 21 p0223 N79-14918
SCHULDT, S. B.
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
SCHULGASSER, K.
Design and construction of a pilot plant for a shrouded wind turbine
23 p0485 A79-40128
SCHULTE, S. C.
Incremental cost analysis for advanced compressed air energy storage concepts
24 p0679 A79-51797
SCHULZ, H.
One year's experience with a do-it-yourself gravity-driven solar domestic hot water unit
23 p0468 A79-38623
SCHULZE, W.
Impacts of the National Energy Plan on solar economics
[CONF-771203-6] 21 p0118 A79-17294
SCHUMACHER, J. C.
The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482
SCHUSS, J. J.
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570
SCHUSTER, J. R.
Design, construction, and testing of a Fixed Mirror Solar Concentrator field
21 p0020 A79-10164
Fixed mirror solar concentrator for power generation
[GA-A-14883] 21 p0187 N79-11526
SCHUSTER, O.
Solar storage unit with built-in oil-gas boiler
22 p0268 A79-24322
SCHWAB, C.
Photovoltaic conversion in Cu2O
23 p0384 A79-32973
SCHWAIGERER, W.
Comparative outdoor measurements on flat-plate solar collectors in a metropolitan area in Western Germany
21 p0128 A79-17394
SCHWARTZ, B.
A high-efficiency GaAlAs double-heterostructure photovoltaic detector
21 p0154 A79-18489
SCHWARTZ, M. W.
The effect of mechanical energy storage systems on the characteristics of electric vehicles
24 p0683 A79-51820
Preliminary design analysis of the quasi-electric drive vehicle
[UCRL-52613] 24 p0731 N79-29116
SCHWARTZ, R. G.
Analysis of ID saw slicing of silicon for low cost solar cells
23 p0499 A79-40903
SCHWARTZ, R. J.
Contactless measurement of lifetime by free carrier infrared absorption
23 p0497 A79-40892
SCHWARTZ, S. R.
Geothermal emissions data base: Cerro Prieto geothermal field
[UCID-4033] 21 p0204 N79-13480
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555
SCHWARZE, K.-H.
Aspects of the supply potential of the heat pump
23 p0433 A79-35229
SCHWEIG, H.
Evacuated solar flat-plate collectors for economic applications
21 p0133 A79-17435
SCHWEINBERG, R. W.
Solar One - A 10-megawatt solar thermal central receiver pilot plant project
[AIAA PAPER 78-1750] 21 p0060 A79-13853
Solar One Project - A 10-megawatt solar thermal central receiver pilot plant
24 p0674 A79-51757
SCHWEITZER, J. K.
Advanced industrial gas turbine cooling and high pressure compressor technology
21 p0004 A79-10041
SCHWEITZER, H.
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677
SCHWENDIMAN, L. C.
Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344
SCHWENK, F. C.
Gaseous fuel reactors for power systems
[LA-UR-78-1437] 21 p0214 N79-13844
SCHWENK, J.
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040
SCHWERZEL, R. E.
Methods for the photochemical utilization of solar energy
21 p0111 A79-16641
SCHWITZGEBEL, K.
Trace element emissions from coal-fired power plants
[ASME PAPER 78-WA/FU-9] 21 p0160 A79-19789
SCIESZKO, J. L.
The minimization of drag torque for rotating disks
23 p0387 A79-33247
SCINTA, J.
Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies
22 p0282 A79-26465
SCOLA, R.
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222
Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743
SCOTT-MONCK, J.
An overview of photovoltaics for space applications
23 p0503 A79-40950

High efficiency solar panel /HESP/
23 p0503 A79-40951

SCOTT-MONCK, J. A.
The JPL space photovoltaic program
24 p0783 N79-32643
Effect of dopants on annealing performance of silicon solar cells
24 p0785 N79-32661

SCOTT, C. D.
Emergence of biotechnology
[TID-28983] 23 p0567 N79-24626

SCOTT, C. J.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973

SCOTT, D. R.
Solar tracking control system Sun Chaser
[NASA-TM-78199] 21 p0172 N79-10514
Solar tracking system
[NASA-CASE-MFS-23999-1] 24 p0721 N79-28667

SCOTT, G. C.
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

SCOTT, G. D.
Optical properties of aggregated gold on aluminum
24 p0669 A79-51181

SCOTT, H. H.
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

SCOTT, H. I.
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096

SCOTT, R. J.
Technology considerations in the design of a commerical offshore energy conversion /OTEC/ plant
22 p0288 A79-27378
Conceptual designs and costs of OTEC 10/40 MW spar platforms
24 p0619 A79-45796

SCOTT, R. L.
Ambient air quality assessment of the Synthane coal gasification pilot plant, six month study /August 1976-January 1977/
21 p0064 A79-14113

SCOTT, T. C.
Solar system modeling using a modular approach with generalized programs for working fluid properties
22 p0266 A79-24310

SCOVILLE, A. E.
Acceleration of solar heating application via improved data evaluation
21 p0087 A79-15829

SCROSATI, B.
Silver selenate and silver tellurate as positive materials for lithium primary power sources
22 p0245 A79-21484

SCUDIERE, J. D.
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309

SEALOCK, L. J., JR.
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327

SEAMAN, C. H.
Results of the 1978 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-162298] 24 p0782 N79-32635

SEAMONS, L. O.
The USA 5MW solar thermal test facility
21 p0135 A79-17449
1MW calorimetric receiver for Solar Thermal Test Facility
[ASME PAPER 78-WA/SOL-7] 21 p0163 A79-19839
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568

SEARLES, B.
Oil pollution reports, volume 5, number 2
[PB-287071/5] 22 p0336 N79-16437

SEARS, D. R.
Air pollutant emission factors for military and civil aircraft
[PB-292520/4] 23 p0575 N79-25567

SEBASTIANI, G.
Energy from sea waves - System optimization by diffraction theory
22 p0288 A79-27390

SECRIST, D.
Solar-earth homes and cities
21 p0098 A79-16105

SEDIK, M. V.
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361

SEELEY, F. G.
New processes for the recovery of resource materials from coal combustion wastes
21 p0007 A79-10065
Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743

SEETHARAMU, K. N.
Liquid solar collector
21 p0133 A79-17433

SEGUR, H.
Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189

SEGURA, A.
Photovoltaic effect in InSe - Application to solar energy conversion
23 p0384 A79-32976

SEIBERT, M.
Photobiological production of hydrogen: A solar energy conversion option
[SERI/TR-33-122] 24 p0767 N79-31422

SEIDEL, R. C.
Power train analysis for the DOE/NASA 100-kW wind turbine generator
[NASA-TM-78997] 22 p0333 N79-16355

SEIDENSTICKER, R. G.
Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940
Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282
Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722
Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762

SEIFERT, P.
Investigation of the heat transfer in cylindrical receiver configurations with inner tubes
[ASME PAPER 79-GT-64] 22 p0306 A79-30532

SEIKEL, G. R.
Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51595
Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478
Evaluation of the ECAS open cycle MHD power plant design
[NASA-TM-79012] 22 p0341 N79-17335
Performance optimization of an MHD generator with physical constraints
[NASA-TM-79172] 23 p0558 N79-24446
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499

SEILER, A.
The plateau pressure of RE Ni5 and RE Co5 hydrides
22 p0250 A79-21698

SEITZ, N.
Total energy systems
21 p0058 A79-13654
Energy supply for the Federal Republic on a regenerative basis
23 p0473 A79-38666

SEIYAMA, T.
Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296

SEKHAR, K. C.
Combustion of hydrothermally treated coals
[PB-287521/9] 22 p0338 N79-17025

SEKHAR, N.
Modification of electrostatic precipitator performance by use of fly-ash conditioning agents
[ASME PAPER 78-WA/APC-3] 21 p0158 A79-19736

SEKI, H.
The formulation of the wall stabilization problem of an axisymmetrical toroidal sharp-boundary plasma with a horizontally elongated noncircular cross section
22 p0327 A79-32103

SEKIOKA, M.
Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620

SEKIYA, I.
Simultaneous nitrogen oxides and sulfur dioxide removal by absorption-reduction scrubbing
21 p0066 A79-14125

SELCUK, M. K.
A graphical approach to the efficiency of flat-plate collectors
21 p0102 A79-16422
Solar collectors. I - Fundamentals and collectors of the past and present
21 p0103 A79-16455
Solar thermal conversion
21 p0104 A79-16466
Analysis, development and testing of a fixed tilt solar collector employing reversible Vee-Trough reflectors and vacuum tube receivers
23 p0477 A79-39101
Non-tracking solar energy collector system
[NASA-CASE-NPO-13817-1] 21 p0182 N79-11471
A fixed tilt solar collector employing reversible vee-through reflectors and evaluated tube receivers for solar heating and cooling systems
[NASA-CR-158420] 22 p0359 N79-20490
An improved solar energy receiver for a stirling engine
[NASA-CASE-NPO-14619-1] 22 p0362 N79-20513

SELF, S. A.
Plasma diagnostics in an MHD installation
21 p0106 A79-16492
Diagnostic techniques in combustion MHD flows
23 p0478 A79-39508
Boundary layer velocity measurements in combustion MHD channels
24 p0647 A79-49037

SELIKSON, B.
Reliability analysis of contracts to silicon solar cells for use in concentrated sunlight
23 p0517 A79-41058

SELIN, K. I.
Energy sources and conventional magnets
21 p0079 A79-14791

SELKOWITZ, S.
Transparent heat mirrors for passive solar heating applications
[LBL-7829] 23 p0561 N79-24476

SELMAN, J. R.
Partial processes and transport parameters in molten carbonate fuel cell operation
21 p0040 A79-11819

SELWYN, S.
The use of ocean energy - A hydrostatic motor
22 p0288 A79-27391

SEMAN, E. J.
Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

SEMENA, M. G.
Investigation of the thermophysical characteristics of cryogenic heat pipes with a metal-fiber wick
22 p0288 A79-27529
Investigation of the maximal heat-transmitting power of heat pipes with metal-fiber wicks
23 p0447 A79-37661

SEMENOV, V. D.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406

SEMO, M.
Useful power from ocean waves
21 p0077 A79-14773

SEN, A.
Metropolitan work-trip energy consumption patterns
22 p0299 A79-29335

SEN, A. K.
Feedback control of a class of plasma instabilities
23 p0422 A79-34253

SENFT, J. R.
Advances in Stirling engine technology
24 p0690 A79-51888

SENGUPTA, D. L.
Electromagnetic interference to television reception caused by horizontal axis windmills
24 p0627 A79-45923

SENIOR, T. B. A.
Electromagnetic interference to television reception caused by horizontal axis windmills
24 p0627 A79-45923

SENN, H. V.
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712

SENS, A. F. C.
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758

SENS, P. F.
The Netherlands research program on wind energy
23 p0481 A79-40102

SENS, W.
Advanced turbofan engines for low fuel consumption
[ASME PAPER 78-GT-192] 21 p0033 A79-10816

SENS, W. H.
Engine component improvement and performance retention
21 p0202 N79-13198
Low energy consumption engines
21 p0202 N79-13199

SEONI, R. M.
Major electrical equipment proposed for tidal power plants in the Bay of Fundy
24 p0707 A79-52799

SERAFINI, A.
Bibliography of subsidence and related topics for in situ coal gasification
[LETC/RL-71316-1] 24 p0733 N79-29373

SERAPHIN, B. O.
Chemical vapor deposited molybdenum films for use in photothermal conversion
22 p0294 A79-28148
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149
New instrumentation for high temperature and hemispherical measurements of selective surfaces
22 p0294 A79-28152
Solar energy conversion: Solid-state physics aspects
23 p0437 A79-36144
Spectrally selective surfaces and their impact on photothermal solar energy conversion
23 p0437 A79-36145
Chemical vapor deposition of spectrally selective surfaces for high-temperature photothermal conversion
23 p0445 A79-37155
Optical properties and structure of amorphous silicon films prepared by CVD
24 p0654 A79-50177

SERDA, A. A.
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490

SEREDENKO, E. V.
Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766

SERGEEV, A. M.
Nonlinear effects in propagation of lower hybrid waves in a plasma
24 p0706 A79-52381

SERGISON, J.
Development and application of techniques to evaluate cogeneration impacts
22 p0303 A79-29795

SERIO, C.
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022

SERRA, A.
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy
24 p0713 A79-53545

SERREZE, H. B.
Optimizing solar cell performance by simultaneous consideration of grid pattern design and interconnect configuration
23 p0507 A79-40981

SERTH, R. W.
Energy requirements of present pollution control technology
[PB-286231/6] 21 p0223 N79-14643

SERVAIS, R. A.
Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106

SETRANU, I.
Optimal decisions for long-term operation of hydropower systems
22 p0245 A79-21473

SETH, A. K.
Periodic heating/cooling by solar radiation
21 p0140 A79-17491

SEVERN, R.
Prefabricated caissons for tidal power development
21 p0152 A79-18113
Tidal power - The path to production
23 p0450 A79-37863

SEVERSON, D.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357

SEVERSON, S. D.
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0796 N79-33352

SEXTON, F. W.
Compilation of level 1 environmental assessment data
[PB-286924/6] 22 p0336 N79-16439

SEYFERT, P.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543

SEYMOUR, A. H.
Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845

SFORZA, P. M.
Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539
Wind power distribution, control, and conversion in vortex augmentors
22 p0278 A79-26180

SHA, W. T.
Three dimensional mathematical model of flow stratification in thermocline storage tanks
24 p0609 A79-45214

SHABTAI, J.
The potential of zeolite molecular sieves as hydrogen storage media
23 p0415 A79-34123

SHAFFER, C. J.
Seasonal heat pump performance for a typical northern United States environment
23 p0418 A79-34153

SHAFFER, L. H.
Viscosity stabilized solar ponds
21 p0133 A79-17430

SHAFRANOV, V. D.
Review of tokamak theory results
21 p0069 A79-14454

SHAH, M.
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575

SHAH, Y. M.
Particulate and sulfur dioxide emission control costs for large coal-fired boilers
[PB-281271/7] 21 p0178 N79-10591

SHAH, Y. T.
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor
23 p0492 A79-40452
Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367

SHAI, I.
High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228
Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229

SHAKHBAZOV, SH. D.
Thermal calculations for the reactor of a solar-power unit to produce hydrogen by thermolysis of water
21 p0167 A79-20360
Thermodynamic analysis of water thermolysis in a solar furnace to obtain hydrogen
24 p0602 A79-44265

SHAKHOVA, N. A.
Nonlinear effects in propagation of lower hybrid waves in a plasma
24 p0706 A79-52381

SHAKHPARONIAN, V. V.
Study of the dynamics of the materials melting process for a solar furnace
21 p0167 A79-20359

SHAKIROV, N.
Analysis of the series resistance of thin-film pCdTe-nCdS photoconverters
23 p0433 A79-35379
Analysis of series resistance of pCdTe-nCdS film photoconverters
24 p0662 A79-50702

SHAKUN, M. F.
Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418

SHALABI, H. A.
Noncatalytic coal liquefaction in a donor solvent - Rate of formation of oil, asphaltenes, and preasphaltenes
23 p0492 A79-40453

SHALABY, M. A.
Kinetics of coal liquefaction to preasphaltenes, asphaltenes and oils
23 p0588 N79-27320

SHALTIEL, D.
Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

SHAMMA, S. E.
Electric effects in window-frame MHD generators with non-uniform velocity and conductivity in the transverse plane
23 p0479 A79-39841

SHAMS, A.
Economic optimization of heatpump assisted solar heating in Illinois
21 p0072 A79-14691

SHAMSUNDAR, N.
Analysis of energy storage by phase change with an array of cylindrical tubes
22 p0281 A79-26207

SHANER, W. W.
Solar thermal electric power systems - Manufacturing cost estimation and systems optimization
21 p0046 A79-12273
Solar thermal electric power systems - Comparison of line-focus collectors
22 p0263 A79-23758

SHANKAR, D.
On the role of interface states in MOS solar cells
21 p0122 A79-17337

SHANKER, D.
Experimental and theoretical study of silicon MOS solar cells with different barrier metals
23 p0507 A79-40985

SHANKER, R.
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704

SHANKLIN, R. V.
Considerations for MHD power generation development
21 p0016 A79-10136
National program for the development of commercial MHD
[AIAA PAPER 79-0188] 21 p0157 A79-19587

SHANKS, H. R.
- Environmental effects of burning solid waste as fuel 21 p0082 A79-15115
- Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures [ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735

SHANMUGAM, K. S.
- Estimating heat loss in residential structures using aerial infrared imagery 23 p0522 A79-41125

SHANNON, D. W.
- Sampling and analysis methods for geothermal fluids and gases [PNL-MA-572-APP] 23 p0596 N79-27679

SHANNON, R. J.
- Harnessing geothermal energy in Rotorua, New Zealand 23 p0408 A79-34068

SHANTHI, E.
- Transparent conducting coatings for solar cells 21 p0124 A79-17350

SHAPANKA, A.
- Further development and use of the transportation energy conservation network (TECNET) [HCP/M2101-2] 24 p0741 N79-29648

SHAPIRO, H. N.
- Simultaneous heat and mass transfer in soil with application to waste heat utilization 23 p0531 A79-42930

SHAPIRO, M. M.
- The performance of a site built, air heating, vertical collector with snow reflector in Quebec 22 p0319 A79-31423
- Validation of an electric circuit model of a solar house 22 p0321 A79-31440

SHAPIRO, P. S.
- Environmental conservation concerns in transportation: Energy, noise, and air quality [PB-286550/9] 21 p0232 N79-15868

SHAPOVALOVA, V. A.
- The optimization of efficiency relationships of the reverse hydraulic equipment of a hydraulic accumulator power station 24 p0641 A79-47700

SHARAN, R.
- Sensitivity calculations for the design of solar cells. I - Schottky barrier devices 21 p0125 A79-17360

SHARAN, S. G.
- Saur vidyut kosh - The solar cell 21 p0126 A79-17371

SHARKINA, E. V.
- Zn/x/Cd/1-x/S solid solution solar cells 23 p0433 A79-35377
- Solar photoconverters based on Zn/x/Cd/1-x/S solid solutions 24 p0662 A79-50700

SHARMA, A.
- Design of optimum compressed air energy-storage systems 24 p0631 A79-46308
- Design of optimum compressed air energy storage systems [CONF-7811101-1] 23 p0565 N79-24508

SHARMA, G. K.
- Performance of a honeycomb type flat plate collector with serpentine tube 21 p0054 A79-13579

SHARMA, R. P.
- Periodic heating/cooling by solar radiation 21 p0140 A79-17491
- Effect of finite boundary layer on the ionization instability in non-equilibrium MHD generators 21 p0153 A79-18469
- Transport phenomena in MHD generators - Effect of boundary layers 21 p0156 A79-19098
- Effect of diffusion on electron density across the nonequilibrium MHD channel 23 p0479 A79-39839

SHARMA, V. C.
- Fabrication of spectrally selective surfaces by thermal treatment of austenitic stainless steel AISI 321 24 p0662 A79-50548

SHARON, M.
- Saur vidyut kosh - The solar cell 21 p0126 A79-17371

SHARP, J. C.
- Some perspectives on research into the biological response to non-ionizing electromagnetic radiation 22 p0271 A79-24879

SHARP, J. H.
- Photovoltaic properties of metal-free phthalocyanines - Al/H2Pc Schottky barrier solar cells 22 p0317 A79-31412
- Photovoltaic properties of metal-free phthalocyanines. I - Al/H2Pc Schottky barrier solar cells 24 p0637 A79-47019

SHARP, K.
- Stratified thermal storage in residential Solar energy applications [COO-4523-1] 24 p0786 N79-32682

SHARP, L. E.
- Heating and confinement in the CLEO stellarator 21 p0070 A79-14459

SHARP, R.
- Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic 21 p0015 A79-10127
- Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production 24 p0685 A79-51840

SHARP, W. H.
- Realistic Vlasov slab equilibria with magnetic shear 24 p0639 A79-47419

SHARPE, J. E.
- Fluid bed combustion coal fired steam locomotive 23 p0453 A79-37903

SHARPE, M. H.
- Method for making an aluminum or copper substrate panel for selective absorption of solar energy [NASA-CASE-MFS-23518-1] 21 p0182 N79-11469

SHATFORD, P. A.
- Heating and confinement in the CLEO stellarator 21 p0070 A79-14459

SHAVER, R. D.
- Assessment of coal cleaning technology [PB-287091/3] 22 p0330 N79-16139

SHAW, D. T.
- The advanced thermionic converter with microwave power as an auxiliary ionization source 21 p0153 A79-18470

SHAW, H.
- Environmental assessment of a coal-fired open-cycle MHD power plant 24 p0701 A79-51993

SHAW, H. L.
- International energy evaluation system. Volume 1: Executive summary [HCP/I8602-01/1] 24 p0742 N79-29662
- International energy evaluation system. Volume 2: Technical documentation, September 1, 1978 [HCP/L8602-01/2] 24 p0755 N79-30796

SHAW, R. H.
- Complementary nature of wind and solar energy at a continental mid-latitude station 23 p0396 A79-33763

SHAW, S. C.
- Diffusion model validation from ambient air measurements around five coal-fired electrical power plants in Indiana 23 p0534 A79-43370

SHAW, T. L.
- The role of tidal power stations in future scenarios for electricity storage in U.K. 21 p0152 A79-18116

SHAY, H. D.
- Energy and Technology Review, June 1978 [UCRL-52000-78-6] 21 p0215 N79-14168

SHAY, J. L.
- n-CdS/n-GaAs photoanode 21 p0037 A79-11784
- High efficiency solar cells based on indium phosphide 21 p0042 A79-11968

SHCHUKIN, V. K.
- Study of a heat exchanger with heat pipes within the system of a small-scale gas-turbine engine 21 p0114 A79-16800
- Study of heat-pipe heat exchanger in the small gas turbine engine system 24 p0646 A79-48511

SHE, C. Y.
Generation of the new coherent radiation by harmonic conversion and nonlinear mixing for certain applications
21 p0111 A79-16639
SHEALY, D. L.
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974
SHEARER, D. W.
Theoretical basis and design for a residential size solar powered ammonia/water absorption air conditioning system
21 p0139 A79-17479
SHEARER, J.
Factors limiting limestone utilization efficiency in fluidized-bed combustors
21 p0008 A79-10069
SHEEHAN, J. L.
Hybrid alternate energy system
24 p0675 A79-51768
SHEERIN, P.
Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539
SHEFFIELD, J.
Auxiliary heating in breakeven tokamaks
21 p0079 A79-14792
SHEFFIELD, R. C.
Station keeping subsystem designs for modular experiment OTEC plants
24 p0626 A79-45851
SHEFT, I.
Absorption of hydrogen by the intermetallics NdNi5 and LaNi4Cu and a correlation of cell volumes and desorption pressures
21 p0038 A79-11804
HYCSOS - A system for evaluation of hydrides as chemical heat pumps
22 p0252 A79-21716
The HYCSOS solar energy driven heat pump
24 p0610 A79-45222
HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529
SHEINDLIN, A. E.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171
SHEKOIAN, M. G.
Study of the dynamics of the materials melting process for a solar furnace
21 p0167 A79-20359
SHELDON, C. S., II
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
SHELDON, P.
Fabrication and characterization of ITO/CuInSe2 photovoltaic heterojunctions
23 p0505 A79-40969
SHELKOV, E. M.
Dynamics of a free-piston Diesel- MHD generator
23 p0395 A79-33424
Joint Soviet-American studies in the domain of plasma diagnostics
23 p0529 A79-42853
SHELLEY, T. R.
Solar water heaters for a cold climate
22 p0254 A79-22325
SHELLEY, V. A.
A DOD space energy module
24 p0691 A79-51898
SHELPUK, B.
Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482
SHELTON, E. M.
Motor gasolines, summer 1978
[BETC/PPS-79/1] 23 p0555 N79-24189
National motor gasoline surveys: A key source of fuel trend data
[BETC/RI-78/16] 23 p0568 N79-25248
SHELTON, S. V.
Fixed mirror solar concentrator for power generation
[GA-A-14883] 21 p0187 N79-11526
SHEN, C. N.
The effects of internal latent energy storage on the operational dynamics of a solar-powered absorption cycle
22 p0267 A79-24311
SHEN, M.-S.
A regenerative process for fluidized-bed combustion of coal with lime additives
22 p0297 A79-28984
SHEN, Y. D.
Preparation and properties of Au-(-n) A sub X Ga sub 1 minus X aS-(n)GaAs Schottky-Barrier solar cells
23 p0579 N79-26473
SHENOY, S. U.
Optimum tube pitch in solar collectors
21 p0132 A79-17421
SHEPARD, N. F., JR.
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Development of a shingle-type solar cell module
23 p0499 A79-40906
SHEPHERD, E. M.
Description of hydro-electric development and proposal for future development on the Zambezi
22 p0340 N79-17323
SHERCLIFF, J. A.
Thermoelectric magnetohydrodynamics
22 p0312 A79-31098
SHERIDAN, J. C.
Cost of solar energy
21 p0118 A79-17291
SHERMAN, R. H.
Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34989
SHERMAZANIAN, IA. T.
Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383
Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706
SHERWIN, E. T.
Air classify first, then shred
23 p0489 A79-40404
SHERWOOD, A.
Electrochemically codeposited large-area photoelectrodes for converting sunlight to electrical energy
23 p0495 A79-40748
SHERWOOD, W. G.
Advances in ocean engineering aspects of ocean thermal energy conversion
21 p0101 A79-16250
OTEC ocean engineering progress report
24 p0617 A79-45783
SHESTACHENKO, I. IA.
Ways of improving steam-gas power plants
22 p0299 A79-29298
SHETH, A. C.
Evaluation of available MHD seed-regeneration processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519
SHEVCHENKO, O. A.
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267
SHEWCHUN, J.
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells
21 p0122 A79-17338
A better approach to the evaluation of the series resistance of solar cells
22 p0281 A79-26242
Experimental investigation of a fused salt energy storage system
23 p0400 A79-34003
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680

Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159

Investigation of thin film cadmium sulfide/mixed copper ternary heterojunction photovoltaic cells
23 p0500 A79-40911

High efficiency, low cost processes for 3 in. diameter silicon solar cells
23 p0501 A79-40924

The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967

Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011

Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0648 A79-49213

Cu/1-y/Ag/y/InS2/1-x/Se/2x/ as a prototype of the pentenary chalcopyrite semiconductor system for solar photovoltaic cells
24 p0705 A79-52317

SHEWEN, E. C.

Optimization of the flow passage geometry for air heating solar collectors
22 p0316 A79-31403

Optimization studies on black chrome electroplating variables for solar selective surfaces
22 p0317 A79-31407

A solar collector thermal performance test for developmental programs
22 p0317 A79-31413

SHEYNDLIN, A.

Power industry application of MHD technology
23 p0568 N79-24949

SHIBARSHOV, L. I.

Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

SHIELDS, K. J.

Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595

SHIH, C. C.

Technology overview reports for eight shale oil recovery processes
[PB-295665/4] 24 p0757 N79-33552

SHIH, T.

Gaseous, particulate, and smoke emissions from a heavy duty automotive gas turbine engine
23 p0522 A79-41154

SHIH, T. S.

Stratification in thermal storage during charging
23 p0532 A79-42974

SHIHAB-ELDIN, A.

Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282

SHILIN, O. V.

Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249

SHILKO, E. V.

Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383

Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706

SHILOH, J.

Interferometry of a gas-puff z-pinch plasma
24 p0648 A79-49210

SHIMADA, K.

Prospects of thermionic power systems
21 p0026 A79-10220

Recent progress in hybrid mode thermionic converter development
24 p0700 A79-51986

SHIMADA, M.

Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

SHIMADA, R.

Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729

Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504

SHIMAMOTO, G.

Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824

SHIMODA, H.

Ball screw type wave power generator
24 p0701 A79-51996

SHIMOMURA, Y.

Divertor experiments for controlling plasma-wall interactions
23 p0443 A79-36881

SHIMOTAKE, H.

Advances in the development of lithium-aluminum/metal sulfide cells for electric-vehicle batteries
21 p0010 A79-10089

Advances in the development of Li-Al/FeS cells for electric-automobile batteries
24 p0683 A79-51829

SHIMSHOCK, R. P.

New instrumentation for high temperature and hemispherical measurements of selective surfaces
22 p0294 A79-28152

SHINAR, J.

Hydrogen sorption properties in binary and pseudobinary intermetallic compounds
22 p0250 A79-21702

SHINDE, A. S.

Performance of a honeycomb type flat plate collector with serpentine tube
21 p0054 A79-13579

SHINTOMI, T.

Superconducting energy storage magnets
22 p0236 A79-20537

SHIODA, S.

Experimental studies of a linear MHD generator with fully ionized seed
22 p0238 A79-20796

MHD gas turbine energy conversion for mirror fusion reactors
22 p0313 A79-31192

Power generation experiments of a linear MHD generator with fully ionized seed
23 p0394 A79-33421

SHIRAFUJI, J.

Ga/1-x/Al/x/As-GaAs photovoltaic cells with multilayer structure
22 p0305 A79-30258

SHIRAI, H.

A new combustion system in the three-valve stratified charge engine
[SAE PAPER 790439] 22 p0316 A79-31376

SHIRAKURA, T.

Fracture strength of thick 5083-0 aluminum alloy for LNG storage tanks
24 p0604 A79-44537

SHIRATORI, E.

Rotating strength of glass-carbon fiber-reinforced hybrid composite discs
21 p0165 A79-20273

SHIRAZIAN, M.

CO/H2 production using fusion reactor heat
24 p0695 A79-51949

SHIRLAND, F. A.

Materials for low-cost solar cells
22 p0252 A79-22099

SHIROGANI, T.

Progress in batteries and solar cells. Volume 1
21 p0148 A79-17989

SHIRREFFS, D. F.

The effects of MISFIT dislocations on the photovoltaic properties of CdS based solar cells
23 p0505 A79-40964

SHISHKO, A. A.

Fast penetration of a magnetic field into a low-density plasma
22 p0244 A79-21432

SHITZER, A.

Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755

On the stability of the natural circulation solar heater
23 p0531 A79-42896

SHIVALKAR, B. D.
Some studies on an experimental solar pond
21 p0131 A79-17416

SHNEERSON, G. A.
Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249

SHNITSER, I. N.
Investigating the formation of oxides of nitrogen when burning solid fuel
23 p0474 A79-38864

SHOHET, J. L.
Heating of current-free stellarators
24 p0607 A79-45037

SHOJI, T.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345

SHOLTES, V. L.
Behavior of a sodium-sulfur cell with a dynamic sulfur electrode
23 p0487 A79-40372

SHONKA, D. B.
Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487
Transportation energy conservation data book, edition 3
[ORNL-5493] 22 p0369 N79-21562

SHONYO, C.
Technology assessment, volume 2. A bibliography with abstracts
[NTIS/PS-78/0830/6] 21 p0179 N79-10951

SHOR, N. Z.
A problem of optimizing the setting angle of sun-battery panels of concave shape
21 p0045 A79-12186

SHORE, C. P.
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

SHORE, N. L.
System reliability studies for wave energy generation
23 p0450 A79-37872

SHORT, N. M.
Energy and remote sensing applications
22 p0255 A79-22516

SHOSTAK, A.
Use of modular heat source stack in RTGs
24 p0693 A79-51933

SHOVE, G. C.
Solar farm buildings collect energy for crop drying
24 p0610 A79-45224

SHPIGEL, I. S.
Ohmic heating experiments in the L-2 stellarator
21 p0070 A79-14460
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

SHPILRAIN, E. E.
Dynamic characteristics of a free-piston diesel engine combined with a MHD generator
22 p0258 A79-23137
Dynamics of a free-piston Diesel- MHD generator
23 p0395 A79-33424
Prospects for developing a laser thermonuclear electric power plant
23 p0432 A79-35171

SHRINER, C. R.
Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018

SHU, H. T.
Conceptual design of a solar powered closed-cycle gas turbine electric power generation system
[ASME PAPER 79-GT-43] 22 p0306 A79-30522

SHU, H.-T.
Parametric analysis of power conversion systems for central receiver solar power generation
[ASME PAPER 78-WA/SOL-2] 21 p0162 A79-19835
Conceptual design of an 80,000-shp fossil-fired closed-cycle helium turbine propulsion system for naval ship applications
[ASME PAPER 79-GT-94] 23 p0377 A79-32370

SHULTIS, J. K.
Optimum selection of a wind turbine generator system
[AIAA PAPER 78-1774] 21 p0062 A79-13871

SHUMAKER, D. E.
Fokker-Planck/transport analyses of fusion plasmas in contemporary beam-driven tokamaks
24 p0606 A79-44979

SHUMAKER, D. L.
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33584

SHUMIATSKII, B. IA.
Open-cycle magnetohydrodynamic electrical power generation
21 p0104 A79-16478
The MHD power plant and its environmental aspects - Introduction
21 p0105 A79-16479
Technical and economic aspects of open-cycle MHD power plants
21 p0105 A79-16482
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401

SHUMKA, A.
Some failure modes and analysis techniques for terrestrial solar cell modules
23 p0512 A79-41020

SHUMWAY, D. L.
Pumped storage projects and their environmental impacts - An overview
24 p0666 A79-50894

SHURTLEFF, W. W.
Solar Total Energy Control Data Acquisition System
21 p0144 A79-17618
Solar energy system testing - Some experiences with minicomputers
23 p0432 A79-35082

SHUSTER, C. N., JR.
A commentary on a methodology for assessment of the environmental impact of the electrical power system within the Connecticut River Basin
21 p0093 A79-15893

SIBBIT, B. E.
Performance of the Meadowvale solar home
22 p0318 A79-31420

SIBBITT, B. E.
NRC solar monitoring program
22 p0318 A79-31419
First year performance data and lessons learned in the NRC 14 house solar demonstration program
22 p0323 A79-31453

SIBBITT, W. L.
Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems
22 p0304 A79-30123

SICHEL, E. K.
Composite semiconductors - Selective absorbers of solar energy
24 p0655 A79-50183

SIDLE, R. C.
Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

SIDOROV, V. S.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406

SIDWELL, L. B.
Results of the 1978 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-162298] 24 p0782 N79-32635

SIEBELS, J.
Development of multi-density silicon nitride turbine rotors
21 p0050 A79-12832

SIEBERS, D. L.
Some aspects of the transient response of a flat-plate solar energy collector
21 p0153 A79-18466

SIEBMANNS, W.
Development of ceramic parts for a truck gas turbine at MTU
21 p0050 A79-12831

SIEGEL, B.
Pennies a day - Financing early deployment of photovoltaic utility applications through a user subsidy
[AIAA PAPER 78-1767] 21 p0061 A79-13866
Analysis of photovoltaic total energy system concepts for single-family residential applications
23 p0520 A79-41078

SIEGER, R. B.
Pyrolysis gas from solid waste will provide total power demand for a major wastewater reclamation plant
23 p0417 A79-34147

SIEGMUND, S. C.
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348

SIEVERS, A. J.
Spectral selectivity of composite materials
23 p0437 A79-36146
Thermal emissivity of selective surfaces - New lower limits
24 p0648 A79-49207
Design of selective surfaces for solar energy collection
24 p0655 A79-50180
Thermal radiation from conducting surfaces
24 p0657 A79-50328

SIEVERS, D. M.
Design criteria and operational guidelines for a pilot-scale anaerobic digester
23 p0523 A79-41371

SIEVERS, G. K.
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0154 N79-12086

SIFFERT, P.
Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342
New techniques for fabricating silicon solar cells
23 p0384 A79-32969
Formation and stability of MS or MIS Schottky solar cells
23 p0507 A79-40987
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001

SIGALOV, IU. M.
Production and application of rolling-welded aluminum alloy panels for solar water heaters for hot water and cooling systems
22 p0297 A79-28670
Production and use of rolled-welded panels of aluminum alloys for solar water heaters of hot water supply and cooling systems
24 p0637 A79-46908

SIGL, A. B.
Run duration analysis of surface wind speeds for wind energy application
22 p0287 A79-27345
Stochastic analysis of wind characteristics for energy conversion
22 p0350 N79-18535

SIKRI, A. P.
Status of the DOE underground coal conversion program
21 p0005 A79-10052
In situ gasification - Recovery of inaccessible coal reserves
23 p0411 A79-34093

SILBERMAN, D.
Chemical studies of stack fly ash from a coal-fired power plant
22 p0309 A79-30595

SILLESEN, A. H.
Plasma density measurements on refuelling by solid hydrogen pellets in a rotating plasma
22 p0255 A79-22369

SILVERMAN, J.
Coal conversion by flash hydropyrolysis and hydrogasification
21 p0006 A79-10055

SILVESTER, L. F.
The optimization of alternative energy cycles using program GEOTHM
23 p0409 A79-34075

SILVESTON, P. L.
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327

SILVESTRI, A. J.
Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064

SILVESTRINI, V.
Selective covers for natural cooling devices
22 p0272 A79-25522
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022

SIM, S. R.
Environmental, socioeconomic, and consumer protection aspects of selected decentralized solar energy applications
24 p0803 N79-33609

SIMANDOUX, P.
Assisted recovery of new oil reserves
23 p0525 A79-41814

SIMENSEN, A. L.
Tuned Sphere Stable OTEC Platform
24 p0620 A79-45802

SIMKIN, T.
Volcanology
24 p0632 A79-46432

SIMMON, P. B.
Modeling of stationary air pollution sources in the central and western Kern County oil Fields. Task Report. Volume 2: Appendices
[PB-294813/1] 24 p0761 N79-30856
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text
[PB-294812/3] 24 p0803 N79-33639

SIMMONS, G.
A retrofitted geothermal heating system
23 p0425 A79-34602
Microcrack technology for geothermal exploration and assessment
[PB-290173/4] 22 p0367 N79-21530

SIMMONS, H.
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440

SIMMONS, M. K.
Annual review of energy. Volume 3
21 p0074 A79-14718

SIMMONS, W. W.
Large aperture components for solid state laser fusion systems
24 p0713 A79-53522

SIMMS, R. J.
Cryogenic pellets for laser-fusion research - Theoretical and practical considerations
21 p0085 A79-15334
Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335

SIMON, A. C.
Improvements in the lead-acid battery for load leveling applications
[AD-A068990] 24 p0724 N79-28744

SIMON, F. F.
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651
A method for correlating performance data of a terrestrial solar cell array
[NASA-TM-79163] 23 p0581 N79-26503

SIMON, H.
Solar thermal power stations
21 p0057 A79-13644
New developments and plannings for solar power plants of M.A.N.-Company
23 p0467 A79-38619

SIMONEIT, B. W.
Statement and comparison between different studies on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833

SIMONS, G. A.
Char gasification. I - Transport model
24 p0667 A79-50913
Char gasification. II - Oxidation results
24 p0667 A79-50914

SIMONS, S.
New methods for the conversion of solar energy to R. F. and laser power
[AIAA PAPER 79-1416] 23 p0426 A79-34846
SIMONS, S. N.
Fuel cell on-site integrated energy system parametric analysis of a residential complex
21 p0081 A79-14947
Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809
Fuel cell on-site integrated energy system parametric analysis of a residential complex
[NASA-TM-78996] 21 p0193 N79-11955
Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403
Analysis of a fuel cell on-site integrated energy system for a residential complex
[NASA-TM-79161] 23 p0542 N79-22624
Commercial phosphoric acid fuel cell system technology development
[NASA-TM-79169] 23 p0571 N79-25500
SIMONSEN, R. H.
Integrated safeguards information System (ISIS), executive summary
[PB-286869/3] 21 p0223 N79-14934
SIMPSON, C. J.
Landsat - Developing techniques and applications in mineral and petroleum exploration
21 p0111 A79-16725
SIMPSON, W. I.
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043
SIMS, C. T.
Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware
[ASME PAPER 79-GT-160] 23 p0378 A79-32422
High-temperature alloys in high-technology systems
24 p0647 A79-48911
SINAKARISIAN, A. G.
Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383
Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706
SINAY-FRIEDMAN, L.
Environmental impact assessment for OTEC-1
24 p0626 A79-45857
SINCLAIR, A. M.
The gasification of ethyl alcohol
23 p0386 A79-33228
SINCLAIR, T. J.
Effect of electrolyte impurity on the electrochemical performance of the lead/tetrafluoroboric acid/lead dioxide cell
22 p0246 A79-21485
SINCLAIR, W. R.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966
SINEATH, H. H.
A survey of energy information systems and its implications for industrial energy management
21 p0072 A79-14685
SINGAL, C. M.
Efficiency of conventional silicon solar cells
21 p0125 A79-17362
SINGER, P. C.
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709
SINGH, E. N.
Solar concentrators
21 p0136 A79-17455
SINGH, J. J.
Elemental characteristics of aerosols emitted from a coal-fired heating plant
[NASA-TM-78749] 21 p0191 N79-11560
Measurement techniques for trace metals in coal-plant effluents: A brief review
[NASA-RP-1047] 24 p0803 N79-33611
SINGH, M. K.
Environmental development plan for transportation energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899
SINGH, P.
Cheap packed bed absorbers for solar air heaters
21 p0128 A79-17388
Experimental investigation on solar house heating in northern India
21 p0140 A79-17495
Thermal performance evaluation of a flat-plate cylindrical parabolic concentrator and a flat-plate collector
22 p0317 A79-31408
On the design and operation of electrochemical solar cells
24 p0712 A79-53494
SINGH, P. P.
Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406
SINGH, R.
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680
Effect of grain boundaries on the performance of polycrystalline tunnel MIS solar cells
23 p0446 A79-37159
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967
Temperature dependence of the current-voltage characteristics of silicon MIS solar cells
24 p0648 A79-49213
SINGH, S.
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234
SINGH, V. P.
Characteristics of Cu/x/S/CdS cell on sprayed thin CdS films
23 p0505 A79-40963
SINNAMON, J. F.
The influence of overall equivalence ratio and degree of stratification on the fuel consumption and emissions of a prechamber, stratified-charge engine
[SAE PAPER 790438] 22 p0315 A79-31375
SINNASSE, C.
Study of a thermal converter using both the concentration and the greenhouse effects
23 p0464 A79-38585
SINNOTT, J.
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0789 N79-32707
SINOR, J. E.
Mixed fuel gas - A technically, economically and environmentally superior way to supplement natural gas supplies
24 p0664 A79-50881
SIOLI, G. C.
Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492
SIRAZETDINOV, T. K.
Dynamic model of an industrial plant manufacturing a variety of products
21 p0051 A79-12957
SIRONI, V. P.
Fixed bed methanation processes
[FE-2240-96] 24 p0779 N79-32382
SISTINO, A.
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546
SITNOV, V. I.
Optimization of a Knudsen Cs-Ba thermionic converter
22 p0241 A79-20940

SITTIG, M.
Solar cells for photovoltaic generation of electricity: Materials, devices and applications
24 p0713 A79-53725
SIVASEGARAM, S.
Concentration augmentation of power in a Savonius-type wind rotor
23 p0527 A79-41947
SIX, L. D.
Brayton engines for dispersed solar power
23 p0477 A79-38950
SIZEMORE, R. L.
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727
SKAGGS, S. R.
Treatment of molybdenite ore using a 2 kW solar furnace
[LA-UR-79-6] 23 p0561 N79-24478
SKANSEN, R.
Coal gasification, commercial concepts, gas cost guidelines, revision 1
[FE-2240-100] 23 p0589 N79-27331
SKELTON, A.
New approaches for the appropriate use of solar energy in northern climates
22 p0319 A79-31424
SKIBENKO, E. I.
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264
SKINROOD, A. C.
Solar central receiver program
24 p0674 A79-51756
SKLARCHUK, J. C.
Performance of molten salt sodium/beta-alumina/SbCl3 cells
22 p0245 A79-21479
SKODA, G.
Meteorological measurement data for solar energy utilization
[ASSA-FA-5] 23 p0574 N79-25524
SKODA, L. F.
Solar energy systems - Survey of materials performance
23 p0431 A79-35073
SKOKAN, C. K.
Research on the physical properties of geothermal reservoir rock
[COO-2908-4] 22 p0358 N79-20459
SKOKOV, IU. E.
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349
SKOKOV, IU. V.
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490
SKRATT, J. P.
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335
SLACK, A. V.
Emission control for SO2 - An update
[ASME PAPER 78-JPGC-PWR-11] 21 p0150 A79-18097
SLACK, L. H.
Studies of CdSiAs2 for photovoltaic applications
24 p0654 A79-50027
SLATTERY, J. C.
Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620
SLAUGHTER, W. W.
Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems
[ASME PAPER 79-GT-195] 23 p0380 A79-32453
SLAWSON, G. C., JR.
Compendium reports on oil shale technology
[PB-293279/6] 23 p0578 N79-26237
SLEGEL, D. L.
Soil cooling for geothermal electric power plants in the Western United States - The Raft River experiment
22 p0266 A79-24240
SLIEMERS, F. A.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019
SLIFER, L. W., JR.
Synchronous orbit power technology needs
[AIAA 79-0916] 23 p0425 A79-34739
SLIMAK, K. M.
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661
SLIVINSKY, V. W.
Diagnostics of Shiva Nova high-yield thermonuclear events
22 p0285 A79-26747
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060
SLIWINSKI, B. J.
Stratification in thermal storage during charging
23 p0532 A79-42974
SLOAN, E. D.
Performance and evaluation of concepts and devices for heat reclamation from air conditioners, heat pumps, and refrigeration equipment
[AD-A069650] 24 p0752 N79-30770
SLONSKI, M. L.
A technical analysis for cogeneration systems with potential applications in twelve California industrial plants
21 p0011 A79-10099
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658
SMEDMAN-HOGSTROM, A.-S.
Measurement of wind speed around a wind power plant in Sweden
23 p0483 A79-40113
SMELSER, P.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532
SMELSER, S.
Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier
[EPRI-AF-782] 21 p0180 N79-11238
Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation
[EPRI-AF-753] 21 p0185 N79-11498
SMELTZER, L. R.
Solar controls and control modifications - New century town solar homes, Vernon Hills, Il.
21 p0102 A79-16419
SMETANA, F. O.
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519
SMIRNOV, A. S.
Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532
Hall effect in an induction discharge
23 p0442 A79-36806
SMIRNOVA, A. N.
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358

SMIT, J.
Calculation of wake effects in wind turbine parks
21 p0045 A79-12241
Energy storage - Economics and fuel conservation
21 p0153 A79-18464
SMITH, A. K.
Study of flywheel energy storage Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558
Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559
SMITH, C. F., JR.
Studies of CdSiAs2 for photovoltaic applications
24 p0654 A79-50027
SMITH, C. W.
Application of the Cathelco system for control of fouling in OTEC systems
24 p0627 A79-45870
SMITH, D. P.
Water-cooled gas turbine technology development - Fuels flexibility
[ASME PAPER 79-GT-72] 22 p0307 A79-30536
Effects of the combustion products of coal-derived fuels on gas turbine hot-stage hardware
[ASME PAPER 79-GT-160] 23 p0378 A79-32422
SMITH, D. R.
Combined photovoltaic thermal collector testing
23 p0519 A79-41072
Combined photovoltaic thermal collector testing
[SAND-78-1191C] 21 p0198 N79-12570
SMITH, E. B.
Modeling the champagne effect in compressed air energy storage
22 p0280 A79-26190
SMITH, F. R.
Photoelectrolysis of aqueous solutions to hydrogen - An approach to solar energy storage
23 p0495 A79-40747
SMITH, G.
Gaseous, particulate, and smoke emissions from a heavy duty automotive gas turbine engine
23 p0522 A79-41154
Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565
SMITH, G. B.
Calorimetric emissivities for solar-selective coatings on flat sheet
24 p0706 A79-52536
SMITH, G. E. B.
Performance and cost of domestic solar water heating in Australia
23 p0452 A79-37889
SMITH, G. J.
Geothermal power and water production studies at the University of California
[ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778
SMITH, G. L.
Low-head hydroelectric power - A realizable alternative
23 p0409 A79-34082
SMITH, H. D.
Electrochemical corrosion of MHD electrodes in slags
23 p0392 A79-33398
SMITH, I. C.
The Joint Saudi Arabian-United States Solar Energy Program
[AIAA PAPER 79-1029] 23 p0460 A79-38209
SMITH, J.
Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762
Multistack nickel-hydrogen units
22 p0371 N79-21610
SMITH, J. C.
Superbatteries - A progress report
22 p0286 A79-27207
SMITH, J. D.
Impact of fuel availability and other cost trends on air carrier operations
21 p0053 A79-13077
SMITH, J. L.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354
SMITH, J. L., JR.
Influence of cyclic wall-to-gas heat transfer in the cylinder of the valved hot-gas engine
21 p0024 A79-10201
MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549
SMITH, J. M.
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment
23 p0479 A79-39807
Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995
Performance optimization of an MHD generator with physical constraints
[NASA-TM-79172] 23 p0558 N79-24446
Quantitative analysis of defects in silicon
[NASA-CR-162173] 24 p0771 N79-31772
SMITH, J. W.
Colorado's oil-shale resource for vertical modified in-situ processes
21 p0005 A79-10046
SMITH, K. E.
The El Camino Real Solar Cooling Demonstration Project
21 p0102 A79-16425
SMITH, K. G.
Energy analysis of wave and tidal power
23 p0455 A79-37918
SMITH, K. O.
Performance characteristics of a slagging gasifier for MHD combustor systems
[NASA-TM-79195] 24 p0749 N79-30720
SMITH, M. A.
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447
SMITH, M. C.
Wind site selection for optimum wind power systems
23 p0406 A79-34049
The future of hot dry rock geothermal energy systems
[LA-UR-79-683] 24 p0786 N79-32679
SMITH, M. F.
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1114/4] 21 p0212 N79-13554
Silicon solar cells, volume 3. Citations from the NTIS data base
[NTIS/PS-78/1115/1] 21 p0212 N79-13555
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1116/9] 21 p0212 N79-13556
Cadmium sulfide solar cells. Citations from the NTIS data base
[NTIS/PS-78/1213/4] 21 p0231 N79-15436
Cadmium sulfide solar cells. Citations from the Engineering Index Data base
[NTIS/PS-78/1214/2] 21 p0231 N79-15437
SMITH, M. S.
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
SMITH, M. Y.
Emissions of nitrogen dioxide from a large gas-turbine power station
21 p0152 A79-18344
SMITH, N.
Forest residues as an alternate energy source
21 p0072 A79-14689
SMITH, P. D.
Thermoelastic analysis of a superconducting cable
[LA-7465-MS] 24 p0781 N79-32477
SMITH, R.
Total energy consumption for municipal wastewater treatment
[PB-286688/7] 21 p0231 N79-15439
SMITH, R. D.
Energy storage requirements for autonomous and hybrid solar thermal electric power plants
21 p0120 A79-17315

Characterization and formation of submicron particles in coal-fired plants
23 p0460 A79-38316
Evaluation of the flash desulfurization process for coal cleaning
[PB-292328/2] 23 p0550 N79-27342

SMITH, R. P.
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531

SMITH, R. S.
Combustion of coal particles in wall-burning swirl combustors
24 p0632 A79-46317
Open-cycle coal-fired liquid-metal MHD
24 p0701 A79-51991

SMITH, T. F.
Radiant exchange for a fin and tube solar collector
22 p0271 A79-25066
The distributed flow, below atmospheric pressure solar collector
24 p0631 A79-46314

SMITH, W. L.
Energy and remote sensing applications
22 p0255 A79-22516

SMITHRICK, J. J.
Rapid, efficient charging of lead-acid and nickel-zinc traction cells
21 p0009 A79-10084
Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215] 24 p0723 N79-28728

SMOK, J. T.
Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309
Collection, processing and dissemination of data for the national solar demonstration program
24 p0608 A79-45208

SMOOT, L. D.
Pulverized-coal combustion and gasification: Theory and applications for continuous flow processes
23 p0474 A79-38871
Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330

SMORTO, M.
Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539

SMYRL, W. H.
Corrosion in molten salts used for solar thermal storage applications
[SAND-79-0246C] 24 p0786 N79-32683

SMYTH, R. R.
Progress in the testing of materials and design concepts for directly-fired MHD air heater service
21 p0017 A79-10141
Operability and materials testing for MHD air heaters
24 p0701 A79-51994

SNELLING, I. E.
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930

SNELLING, R. N.
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0599 N79-27730

SNELSON, A.
Coal gasification studies. I - Single stage complete gasification of coal using water as the hydrogen source
22 p0283 A79-26466
Coal gasification studies. II - Reduction in the presence of I2 with H2, and H2O/+/ metal, at pressures up to 3500 p.s.i. and temperatures of 600 C in all quartz reactors
22 p0283 A79-26468
Coal gasification studies. III - Reduction in the presence of some metal iodides and iron halides
22 p0299 A79-29314

SNOW, F. J.
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0600 N79-33584

SNOW, J. A.
Future programs in space
[AAS 78-180] 23 p0427 A79-34865

SNOW, J. W.
Offshore wind power model estimates
23 p0482 A79-40110

SNYDER, B.
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576

SNYDER, M. H.
Airfoil data for use of wind turbine designers
21 p0073 A79-14702
A small horizontal axis wind turbine feeding power into the utility grid
21 p0074 A79-14703

SNYDER, R. R.
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

SNYDER, R.
Factors limiting limestone utilization efficiency in fluidized-bed combustors
21 p0008 A79-10069

SNYDER, R. B.
Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121

SOBERMAN, R. K.
Solar thermal aerostat research station /STARS/
[IAF PAPER 79-35] 24 p0709 A79-53261

SOBKOWIAK, M.
Bituminous coal extraction in terms of electron-donor and -acceptor interactions in the solvent/coal system
22 p0283 A79-26469

SOBON, L. E.
Extraterrestrial fiberglass production using solar energy
24 p0778 N79-32237

SOBOROFF, D. M.
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276

SODHA, M. S.
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282
Performance of solar concentrators - A theoretical study
21 p0135 A79-17453
Effect of diffusion on electron density across the nonequilibrium MHD channel
23 p0479 A79-39839
Performance of a collector/storage solar water heater
23 p0479 A79-39843
Power output of an MHD generator - Effect of ionization instability and boundary layer
24 p0708 A79-52958

SOHN, J. C.
The use of fuel cell ion exchange membranes in electrolytic cells
[R/539/77/23] 23 p0588 N79-26532

SOIN, R. S.
Performance of flat plate solar collector with fluid undergoing phase change
21 p0129 A79-17397
Performance of flat plate solar collector with fluid undergoing phase change
24 p0661 A79-50588

SOKIRKO, IU. D.
U-25B MHD unit for carrying out investigations under the conditions of strong electric and magnetic fields
21 p0049 A79-12692
The U-25B facility for studies in strong magnetohydrodynamic interaction
23 p0393 A79-33406

SOKOLOV, A. V.
Construction of combined solar installations for heating and cooling
24 p0653 A79-49524

SOKOLOV, E. V.
Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

SOKOLOV, IU. N.
Channel No. 1 of the MHD generator of a U-25B unit for carrying out investigations in strong electric and magnetic fields
21 p0049 A79-12693

SOKOLOVA, V. N.
Study of diffusion processes in low-temperature thermopiles
21 p0054 A79-13290

SOLBES, A.
Electrode development for coal fired MHD generators
23 p0392 A79-33396
Detailed characterization of MHD generator operating parameters
23 p0393 A79-33409

SOLDATENKOVA, N. A.
Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges
22 p0298 A79-29286
Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor
24 p0663 A79-50776

SOLDATOS, P.
Legal and economic aspects of engineering design in solar water heating systems
23 p0473 A79-38664

SOLLAI, A.
Evaluation of the availability of renewable energy resources on Sardinia. II - Wind energy
24 p0713 A79-53545

SOLMI, S.
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003

SOLODOVNIKOVA, L. A.
Thermal deformations of solar-energy concentrators
21 p0166 A79-20355

SOLOMON, J. L.
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446

SOLOVEV, L. E.
Investigating the formation of oxides of nitrogen when burning solid fuel
23 p0474 A79-38864

SOLT, J. C.
Energy conserving cogeneration plant benefits utility and industrial companies
23 p0423 A79-34452

SOLTIS, D. G.
Lewis Research Center program
22 p0370 N79-21576

SOMBERG, H.
Automated solar panel assembly line. LSA task; production processes and equipment
[NASA-CR-158671] 23 p0559 N79-24455

SOMERS, E. R.
Fracture toughness of cryogenic alloys
24 p0604 A79-44550

SOMERS, J. H.
Heavy duty diesel particulate emission factors
23 p0461 A79-38481

SOMERS, R. R.
Solar 'Plus' - Huntsville, Alabama
24 p0608 A79-45209

SOMERS, R. R., II
Thermal contact conductance of flat plate solar collector materials
[AIAA PAPER 79-1066] 23 p0455 A79-38045

SOMMERFELD, J. T.
Novel approaches to industrial energy conservation in Georgia
24 p0658 A79-51972

SON, B. C.
Analysis of flat mirror V-trough solar concentrator
23 p0579 N79-26472

SONCINI, G.
A new process for production of shallow diffused silicon solar cells
23 p0509 A79-41003

SONES, J.
A Variable Speed Constant Frequency /VSCF/ wind generator for low power applications
22 p0303 A79-29799

SONG, Y. H.
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474

SONI, Y.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

SONJU, O. K.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414
High power magnetohydrodynamic system, volume 1
[AD-A064796] 23 p0543 N79-22639
High power magnetohydrodynamic system, volume 2
[AD-A064435] 23 p0544 N79-22640

SONNINO, T.
Energy utilization in industry - The case of Israel
23 p0421 A79-34171

SONSTEBY, J. K.
Comparison of refuse derived fuel /RDF/ characteristics between two Pennsylvania communities
23 p0490 A79-40414

SOO, S. L.
A steam process for coal gasification
24 p0632 A79-46321
Steam gasification of Illinois coal and coke
24 p0687 A79-51857

SOOD, M. K.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

SOOHOO, P.
Analytical and experimental evaluation of Cycloturbine aerodynamic performance
[AIAA PAPER 79-0968] 23 p0456 A79-38176

SOOKIAZIAN, H.
Design optimization of RTG for Solar-Polar Mission
24 p0693 A79-51935

SOOT, S.
Metropolitan work-trip energy consumption patterns
22 p0299 A79-29335

SORENSEN, B.
The regulation of an electricity supply system including wind energy generators
23 p0485 A79-40130

SORENSEN, G. L.
Status report of the dynamic isotope power system
24 p0692 A79-51927

SORENSON, E.
Oil pollution reports, volume 5, number 2
[PB-287071/5] 22 p0336 N79-16437

SORENSON, S. C.
A one-dimensional combustion model for a dual chamber stratified charge spark ignition engine
[SAE PAPER 790355] 22 p0315 A79-31371

SOROKIN, IU. V.
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349

SOROKIN, V. P.
Experimental study of the characteristics of heat and mass transfer in a two-component low-temperature heat pipe
22 p0246 A79-21585

SOROKOVOI, L. G.
Problems in the use of cryogenic pumps in thermonuclear synthesis
22 p0305 A79-30264

SOTGIA, G.
Pilot facility for the experimental study of binary-cycle conversion systems - Thermogravimetric loop
23 p0408 A79-34074

SOTTER, J. G.
Reducing inefficiency and emissions of large steam generators in the United States
21 p0114 A79-17075

SOUBY, M.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357

SOUERS, P. C.
Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806

SOUTH, P.
NRC's wind energy program
22 p0319 A79-31426
Operating experience with the Magdalen Islands wind turbine
23 p0484 A79-40122
Magdalen Islands VAWT field test
24 p0635 A79-46543
SOUTHALL, H. L.
Computer-Aided Power System Design
24 p0646 A79-48632
SOUTHARDS, W. T.
Performance of a 5 MWt solar steam generator
22 p0288 A79-27399
SOVRANO, M.
Performance predictions of a LiBr absorption air conditioner utilizing solar energy
21 p0139 A79-17482
SOWELL, E. F.
The use and limitations of ASHRAE solar algorithms in solar energy utilization studies
21 p0101 A79-16416
The El Camino Real Solar Cooling Demonstration Project
21 p0102 A79-16425
SOYSTER, A. L.
The conceptual basis of the electric utility sub-model of Project Independence Evaluation System
24 p0616 A79-45764
SPACIL, H. S.
Thermodynamic and kinetic considerations on zinc-halogen batteries
21 p0040 A79-11822
SPALDING, I. J.
Lasers: Their applications and operational requirements
23 p0590 N79-27494
SPANGLER, T. C.
Impact of coal fired power plant emissions on the air quality in Huntington Canyon, Utah
23 p0534 A79-43371
SPARACINO, C. M.
Pollutants from synthetic fuels production: Facility construction and preliminary tests
[PB-287730/6] 22 p0339 N79-17027
SPARKS, G. W., JR.
The development of a laser Doppler velocimetry system for unsteady separated flow research: Preliminary results
[AD-A061724] 22 p0352 N79-19305
SPARKS, R. H.
Nickel-cadmium battery reconditioning and long term performance in geosynchronous orbit spacecraft
21 p0029 A79-10242
Battery workshop
21 p0170 N79-10143
SPARKS, T. G.
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979
SPARROW, E. M.
Heat transfer - A review of 1977 literature
21 p0155 A79-18973
SPARROW, T.
Regional viability and solar commitment - An early adopter study
23 p0404 A79-34034
SPAUDE, H.-W.
Fast spectral radiometer
23 p0469 A79-38629
SPAULDING, L. D.
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
SPAZIANTE, P. M.
Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492
SPEAR, W. E.
Doped amorphous silicon and its application in photovoltaic devices
23 p0440 A79-36777
SPEICH, P.
Lignite - Abundant raw material of the future
22 p0296 A79-28438
SPEIDEL, K.
Dornier/RWE solar house in Essen, FRG
22 p0276 A79-25933
SPEIGHT, J. G.
Factors affecting bitumen recovery by the hot water process
22 p0282 A79-26463
SPENCER, C. R.
The development and implementation of microprocessor based control and instrumentation subsystems for solar energy applications
23 p0402 A79-34020
SPENCER, D. L.
Modular stackable hot water storage/heat exchanger system for solar installations
23 p0400 A79-34004
The distributed flow, below atmospheric pressure solar collector
24 p0631 A79-46314
SPENCER, E. G.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966
SPENCER, H. W., III
Advanced emissions control and test facility of the Electric Power Research Institute
21 p0115 A79-17249
SPENCER, S. G.
The consumptive use of water in geothermal energy applications
24 p0667 A79-50897
SPERBER, B. R.
An aperture-augmented prototype power satellite
21 p0046 A79-12268
Applicability of solid state microwave technology to solar power satellites
24 p0695 A79-51945
SPEWAK, P.
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538
SPIGA, M.
Thermal analysis in the focal spot of a solar furnace
24 p0641 A79-47794
SPISZ, E. W.
Application of multispectral scanner data to the study of an abandoned surface coal mine
[NASA-TM-78912] 21 p0204 N79-13472
SPITTLEHOUSE, D. P.
Contact resistance of silver ink on solar cell
23 p0506 A79-40978
SPITZ, J.
Selective materials for photothermal conversion of solar energy
23 p0383 A79-32956
Chromium black coatings for photothermal conversion of solar energy. I - Preparation and structural characterization
24 p0656 A79-50188
SPITZER, M. J.
New concept in solar thermal collectors
23 p0398 A79-33988
SPITZER, M.
The photovoltaic effect in interfacial layer heterojunctions or semiconductor-insulator-semiconductor diodes - Indium-tin-oxide on silicon, gallium arsenide and indium phosphide
23 p0505 A79-40967
SPONGBERG, R. C.
Economic prospects for solar energy for industrial process heat
23 p0403 A79-34033
SPRADLIN, L. W.
Molten carbonate fuel cell performance model for cycle studies
24 p0682 A79-51817
SPRINGER, G.
Gaseous, particulate, and smoke emissions from a heavy duty automotive gas turbine engine
23 p0522 A79-41154
SPRINGER, T. H.
Solar energy storage using reversible hydration-dehydration of CaO-Ca/OH/2
[AIAA PAPER 79-0986] 23 p0458 A79-38190

SPURGEON, W.
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0565 N79-26546

SPURR, A.
Thermal energy storage using hot liquids
23 p0451 A79-37879

SPYRIDONOS, A. V.
Experimental study of a heatpipe with an active porous medium
23 p0400 A79-34007

SREEHARSHA, K.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944

SREEHARSHA, K. S.
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966

SRINATH, L. S.
A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas
21 p0143 A79-17514

SRINIVASAMURTHY, S.
Development of small solar power plants for rural areas in India
21 p0141 A79-17502

SRINIVASAN, H. S.
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140

SRINIVASAN, R.
Analysis of energy storage by phase change with an array of cylindrical tubes
22 p0281 A79-26207

SRINIVASAN, S.
Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776
Electrochemical-ellipsometric studies of oxide films formed on nickel during oxygen evolution
21 p0038 A79-11799
An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0357 A79-33836
State of development in the area of water electrolysis /near term/
23 p0414 A79-34114
Feasibility study of a regenerative solid polymer electrolyte fuel cell system using hydrogen/chlorine reactants for high efficiency energy storage
23 p0416 A79-34130
Solid electrolyte fuel cell for electric utility power generation
24 p0682 A79-51815
Hydrogen technology: An overview
[BNL-25760] 24 p0734 N79-29379
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

SRIRAMULU, V.
Rate of desorption in a solar regenerator
21 p0055 A79-13611
Analysis of thermal storage unit for solar energy
21 p0122 A79-17332
Buoyancy effects in a solar regenerator
22 p0262 A79-23752
Transient response of a solar regenerator
23 p0526 A79-41935

SRIVASTAVA, R.
Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158679] 23 p0558 N79-24448

SRIVASTAVA, S.
The role of the interfacial layer in Schottky barrier solar cells
23 p0438 A79-36241

SRIVASTAVA, V. K.
Some relations governing major solar cell parameters
24 p0655 A79-50179

SROKOSZ, M. A.
A theory for wave-power absorption by two independently oscillating bodies
21 p0151 A79-18103
A theory for wave-power absorption by two independently oscillating bodies
22 p0259 A79-23307

STABENOW, G.
Design criteria to achieve industrial power plant reliability in solid waste processing plants with energy recovery
23 p0491 A79-40417

STACHIW, J. D.
Performance of photovoltaic cells in an undersea environment
[AD-A066385] 23 p0573 N79-25517

STADTER, J. T.
Cold water pipe verification test
24 p0621 A79-45811

STAEHLE, J. T.
Energy and Technology Review, June 1978
[UCRL-52000-78-6] 21 p0215 N79-14168

STAFFORD, D. A.
The use of anaerobic digestion for the treatment and recycling of organic wastes
23 p0396 A79-33754

STAFFORD, D. B.
Selected areas of aerospace technical applications to civil engineering
23 p0397 A79-33925

STAHL, D.
Solar central receiver power plants with sodium heat transfer - Design, Exergy flow and economics
23 p0464 A79-38592

STAHLE, C. V., JR.
Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827

STAIB, P.
Surface effects and impurity production in tokamak machines
23 p0443 A79-36884

STAIGER, P. J.
Evaluation of the ECAS open cycle MHD power plant design
[NASA-TM-79012] 22 p0341 N79-17335
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499

STAIR, W. K.
Energy conservation through sealing technology
22 p0237 A79-20700

STALEY, R. G.
Shock and vibration test program for the MB-M75/A/ radioisotope thermoelectric generator
24 p0699 A79-51979

STAMBAUGH, E. P.
Combustion of hydrothermally treated coals
[PB-287521/9] 22 p0338 N79-17025

STAMBAUGH, R. D.
Anomalous diffusion and transport beta limits in dense tokamak plasmas
23 p0527 A79-41943

STAMPER, K. R.
Performance characteristics of automotive engines in the United States. First Series: Report No. 14 1975 Mazda Rotary 79 CID (1.1 Liters), 4V
[PB-286074/0] 21 p0226 N79-15304
Performance characteristics of automotive engines in the United States. First series: Report no. 15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305
Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I.
[PB-286077/3] 21 p0227 N79-15307
Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), 1V
[PB-286294/4] 21 p0227 N79-15308
Performance characteristics of automotive engines in the United States. Second series, report no. 6: 1976 Nissan diesel 198 CID (3.2 liters), F. I.
[PB-286295/1] 21 p0227 N79-15309
Performance characteristics of automotive engines in the United States. Second series, report no. 7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310
Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311

Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312
Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V
[PB-286299/3] 21 p0227 N79-15313
Performance characteristics of automotive engines in the United States. First series, report no. 19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-15314
Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315

STANDLEY, W. B.
An overview of the STOS hydrogen energy program
22 p0289 A79-27655

STANFIELD, J. M.
An experimental evaluation of an intermittent cycle solar-powered ammonia/water absorption air conditioning system
21 p0139 A79-17481

STANG, L. V.
Avoiding future health problems related to solar energy (photovoltaic) technology
[BNL-25935] 24 p0790 N79-32718

STANGELAND, B. E.
Converting Green River shale oil to transportation fuels
[CONF-780460-3] 24 p0745 N79-30396

STANKIEWICZ, J.
Photovoltaic effect in Cu/CuGaSe2 Schottky barriers
24 p0605 A79-44721

STANLEY, W. E.
Soil cooling for geothermal electric power plants in the Western United States - The Raft River experiment
22 p0266 A79-24240

STANSFIELD, H. B.
System reliability studies for wave energy generation
23 p0450 A79-37872

STAPFER, G.
Selenide technology evaluation program at JPL
21 p0026 A79-10222
Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223

STAPLES, D. M.
Industrial cogeneration - Problems and promise
22 p0265 A79-24047

STAPLETON, C. A.
International Symposium on Wave and Tidal Energy, University of Kent, Canterbury, England, September 27-29, 1978, Proceedings. Volume 1
21 p0150 A79-18101

STARK, H. E., JR.
CO2-laser fusion
21 p0018 A79-10150

STARK, N.
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

STARKOVICH, J. A.
Catalytic conversion of coal energy to hydrogen
[FE-2206-14] 21 p0180 N79-11239

STARLING, K. E.
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124

STASA, F. L.
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems
23 p0545 N79-22950

STASI, W.
Wind turbine generator wakes
[AIAA PAPER 79-0113] 21 p0156 A79-19539
Wind power distribution, control, and conversion in vortex augmentors
22 p0278 A79-26180

STATLER, R. L.
The NTS-2 satellite solar cell experiment
21 p0001 A79-10016
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895
An interim report on the NTS-2 solar cell experiment
24 p0784 N79-32656

STAUBER, M. C.
Environmental interaction implications for large space systems
23 p0552 N79-24027

STAUDENMAIER, G.
Surface effects and impurity production in tokamak machines
23 p0443 A79-36884

STAUFFER, F. R.
The Powerton gasification combined-cycle test facility - A preview
23 p0424 A79-34454

STAUFFER, H. D.
Collection of data for estimating the probable life cycle costs of solar energy systems
21 p0087 A79-15828

STAUFFER, W. A.
Fuel conservative subsonic transport
22 p0337 N79-16874

STAVINOHA, L. L.
Crude and product storage: State-of-the-art review and assessment
[AD-A066605] 23 p0568 N79-25243

STAVROUDIS, O. N.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

STEARNS, C. R.
On the depletion of ambient ozone by a rural coal-fired power plant near Portage, Wisconsin
21 p0082 A79-15052

STEARNS, J. W., JR.
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894

STEELE, H.
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632

STEELE, R. V.
Environmental assessment of residential energy supply systems that use fuel cells
23 p0418 A79-34155

STEFAN, V.
Magnetic instability of laser-produced plasma and spontaneous generation of magnetic fields
23 p0423 A79-34400

STEFANAKOS, E. K.
Material growth and characterization directed toward improving III-V heterojunction solar cells
[NASA-CR-158476] 22 p0367 N79-21543

STEFFAN, K. F.
Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854

STEFFEN, D. R.
The Geysers geothermal area emissions and aerometric data base and air quality analysis
23 p0534 A79-43373

STEIN, F. P.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

STEIN, G.
Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization
24 p0660 A79-50538

STEIN, R. J.
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443

STEIN, T. R.
Investigating combustion turbine burner performance with coal derived liquids having high fuel bound nitrogen
[ASME PAPER 78-GT-126] 21 p0033 A79-10791

Fuel effects in recent combustion turbine burner tests of six coal liquids
[ASME PAPER 79-GT-137] 23 p0378 A79-32406

STEINBERG, M.
Hydrogen production from high temperature electrolysis and fusion reactor 21 p0015 A79-10126
Thermoelectrochemical cycles for power and hydrogen production
[BNL-24387] 23 p0563 N79-24491

STEINER, A.
The gas turbine/steam turbine cycle with coal gasification 24 p0723 N79-28737

STEINER, D.
Fusion power demonstration study at ORNL 23 p0407 A79-34059
System studies for a tokamak fusion power plant 23 p0407 A79-34061

STEINGASS, H. D.
Toward a rational energy supply system - Economies and diseconomies of scale in an expensive energy future 23 p0420 A79-34168

STEINHART, J. S.
A low energy scenario for the United States - 1975-2050 21 p0147 A79-17649

STEINHAUER, L. C.
CC/H2 production using fusion reactor heat 24 p0695 A79-51949

STEINMETZ, D.
Production of hydrogen by a thermo-electrochemical cycle using solar energy 23 p0383 A79-32966

STEINMETZ, G. F.
Hydrogen as a mid-term gaseous fuel supplement by blending with natural gas 23 p0415 A79-34129

STEITZ, P.
Assessment of the potential of solar thermal small power systems in small utilities
[NASA-CR-158093] 22 p0335 N79-16377

STELLA, P.
Test and evaluation of silicon cells optimized for high efficiency under concentrated sunlight 23 p0511 A79-41018

STELLA, P. M.
High efficiency solar panel /HESP/ 23 p0503 A79-40951
High Efficiency Solar Panel (HESP-2)
[AD-A065009] 23 p0544 N79-22642

STEMMLE, J.
Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464

STENBERG, V. I.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357

STENEHJEM, E. J.
Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699

STEPHENS, D. R.
Field performance of underground coal gasification 24 p0688 A79-51866

STEPHENS, H. S.
International Symposium on Wave and Tidal Energy, University of Kent, Canterbury, England, September 27-29, 1978, Proceedings. Volume 1 21 p0150 A79-18101
International Symposium on Wind Energy Systems, 2nd, Amsterdam, Netherlands, October 3-6, 1978, Proceedings. Volume 1 23 p0481 A79-40101

STEPHENS, J. B.
Primary reflector for solar energy collection systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529
Primary reflector for solar energy collection systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432
Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433

STEPHENS, R. B.
Inhomogeneous surfaces as selective solar absorbers 24 p0704 A79-52313

STEPHENSON, J. B.
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276

STERN, K. H.
Some failure modes and analysis techniques for terrestrial solar cell modules 23 p0512 A79-41020

STERN, R.
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572

STEUNENBERG, R. K.
Electrochemistry of lithium/metal sulfide and calcium/metal sulfide cells using molten salt electrolytes 21 p0040 A79-11832
High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793

STEVENS, A. L.
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741

STEVENS, B. C.
Technology evolution in the Allison Model 250 engine 21 p0155 A79-18681

STEVENS, G. A.
Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735

STEVENS, H. C.
A high temperature fusion reactor design 24 p0696 A79-51954

STEVENS, N. J.
Large space system - Charged particle environment interaction technology
[AIAA 79-0913] 23 p0425 A79-34775
NASCAP modelling of high-voltage power system interactions with space charged-particle environments 23 p0479 A79-39806
Evaluation of densified refuse derived fuels for use in pulverized coal-fired steam generators 23 p0491 A79-40422
Power management and control for space systems 21 p0170 N79-10134

STEVENS, W.
Eighty atmospheres in reserve 23 p0436 A79-35800

STEWART, D. A.
Frequency distribution of wind speed near the surface 21 p0165 A79-20139

STEWART, H. G.
Repowering of a small utility - A unique solution to a unique problem
[ASME PAPER 79-GT-15] 23 p0375 A79-32332

STEWART, J. T.
Converting coal to liquid/gaseous fuels 23 p0461 A79-38376

STEWART, L.
Measurement of the neutron spectra from beam-heated PLT plasmas 23 p0478 A79-39724

STEWART, R. D.
Cost analysis of new and retrofit hot-air type solar assisted heating systems
[NASA-TM-78186] 21 p0173 N79-10519

STEWART, R. W.
The natural and perturbed troposphere 21 p0179 N79-10636

STEWART, W. L.
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0194 N79-12086

STEYER, H.
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555

STHAPAK, B. K.
Effect of buoyancy and tube inclination on heat transfer in a solar air heater 21 p0129 A79-17402

STICE, J.
Solar collector storage panel
[ASME PAPER 78-WA/SOL-12] 21 p0163 A79-19844

STICKEL, F. V.
Geothermal power and water production studies at the University of California [ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778

STICKLE, J. W.
Engine requirements for future general aviation aircraft 22 p0329 N79-15968

STICKLER, D. B.
Controlled utilization of coal slag in the MHD topping cycle 21 p0081 A79-14936
MHD power generation 21 p0146 A79-17638
Combustion of pulverized coal in high temperature preheated air [AIAA PAPER 79-0298] 21 p0158 A79-19654
Mechanistic modeling of pulverized coal combustion 23 p0390 A79-33380
Coal combustor technology development 23 p0390 A79-33381
Behavior of eastern and western coals in fuel-rich reaction conditions 23 p0390 A79-33384

STIEFELD, B.
A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing 21 p0144 A79-17617
Data acquisition and signal processing for a vertical axis wind energy conversion system 23 p0432 A79-35078
Data acquisition and signal processing for a vertical axis wind energy conversion system [SAND-78-1000C] 21 p0187 N79-11517

STIEGEL, G. J.
Pyrolysis of Western Kentucky heavy oil using a transfer line reactor 23 p0492 A79-40452

STILLER, J.
Control problems of the magnetohydrodynamic electrical power generation in power station cooperating with electrical power system 22 p0303 A79-29798

STIMPSON, L. D.
Radioisotope thermoelectric generator cooling in the Shuttle bay 24 p0693 A79-51936

STINE, G. H.
Financial/management scenarios for a satellite power system program [AAS PAPER 78-144] 22 p0243 A79-21259
Financing alternatives for space industrialization [AIAA PAPER 79-1389] 23 p0426 A79-34836

STINGELIN, V.
Energy conversion by means of MHD shock-wave generators combined with closed-cycle gas turbines [ASME PAPER 79-GT-54] 23 p0376 A79-32349

STINNETT, R.
An experimental determination of the parallel electron velocity distribution during strong turbulence 23 p0446 A79-37264
Effects of turbulent heating in the Texas turbulent torus 24 p0640 A79-47426

STIRLING, W. L.
Magnetic multipole line-cusp plasma generator for neutral beam injectors 22 p0238 A79-20746

STIRN, R. J.
Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells 21 p0042 A79-11955
Overview of novel photovoltaic conversion techniques at high intensity levels 21 p0108 A79-16610
Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells 23 p0515 A79-41044
High-efficiency thin-film GaAs solar cells [NASA-CR-158641] 23 p0560 N79-24463
Schottky barrier cell and method of fabricating it [NASA-CASE-NPO-13689A] 23 p0568 N79-25311

STOCHL, R. J.
Power-conversion system component summation 23 p0580 N79-26483
Candidate power-conversion system cycles, appendix A 23 p0580 N79-26484

STOCK, L. M.
Coal anion structure and chemistry of coal alkylation [COO-4227-2] 21 p0170 N79-10178

STOCKBURGER, L.
The oxidation of sulfur dioxide to sulfate aerosols in the plume of a coal-fired power plant 21 p0076 A79-14757

STODIEK, W.
Measurement of the neutron spectra from beam-heated PLT plasmas 23 p0478 A79-39724

STOEWER, H.
European technology applicable to Solar Power Satellite Systems /SPS/ [IAF PAPER 79-174] 24 p0710 A79-53335

STOKER, R. C.
Geothermal community heating systems 23 p0409 A79-34078

STOKES, C. A.
Synthetic fuels at the crossroads 24 p0645 A79-48049

STOKES, E. D.
Diffusion length inhomogeneities in silicon solar cells 23 p0497 A79-40894
Thin film polycrystalline silicon solar cells 23 p0518 A79-41067

STOKOWSKI, S. E.
Requirements and new materials for fusion laser systems 21 p0082 A79-15138

STOLL, R. D.
Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies 23 p0403 A79-34032
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum [DOE/EIA-0102/22] 24 p0725 N79-28752

STOLTE, W.
Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications 23 p0520 A79-41081

STOLTE, W. J.
Structural cost optimization of photovoltaic central power station modules and support structure [ASME PAPER 79-SOL-17] 22 p0309 A79-30551

STOLTZ, R. E.
Formation of protective layers on alloys developed for use in coal gasification environments [SAND-78-8277] 24 p0765 N79-31383

STOMP, J. M.
Solar thermal test facility experiment manual [SAND-77-1173] 21 p0221 N79-14568

STONE, C. L.
Synthetic fuels program 24 p0651 A79-49385

STONE, R. L.
Refrigeration requirements for future superconductive energy related applications 22 p0311 A79-31019

STONE, R.
Environmental assessment of solid residues from fluidized-bed fuel processing [PB-282940/6] 21 p0179 N79-10968

STONE, R. G.
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel [UCRL-52623] 23 p0576 N79-26121

STONEKING, J. E.
Mechanical deflection analysis of diamond turned reflective optics 21 p0083 A79-15143

STOOKSBERRY, R.
Measurement of the neutron spectra from beam-heated PLT plasmas 23 p0478 A79-39724

STOOP, T.
Implications of large scale introduction of power from large wind energy conversion systems into the existing electric power supply system in the Netherlands 23 p0485 A79-40132

STORBECK, H. L.
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348

STORER, R. G.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226

STORK, A.
Sun-position diagrams using examples from Flensburg to Mittenwald
21 p0055 A79-13626
The air-water collector - Operating experience and utilization possibilities
23 p0467 A79-38615

STORMENT, J. O.
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions
[AD-A062751] 22 p0366 N79-21406

STORTI, G.
High efficiency ultrathin silicon solar cells
24 p0692 A79-51903
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-158172] 22 p0354 N79-19459
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Thin cells for space
24 p0784 N79-32652

STORTI, G. M.
The design and fabrication of CdS/Cu2S cells of 8.5-percent conversion efficiency
22 p0300 A79-29428

STOTT, P. E.
Review of results from DITE tokamak
21 p0069 A79-14456
Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876
Plasma-surface interactions in tokamaks
23 p0527 A79-41942

STOTTLEMYRE, J. A.
Environmental concerns related to compressed air energy storage
24 p0666 A79-50895

STOUT, R. D.
Fracture toughness of cryogenic alloys
24 p0604 A79-44550

STOUT, W. L.
Potential agricultural uses of fluidized bed combustion waste
21 p0064 A79-14108

STOVER, L. V.
Energy policy optimization by environmental systems analysis
23 p0422 A79-34180

STOWELL, S. A.
Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109

STOWERS, I. F.
Techniques for preventing damage to high power laser components
21 p0083 A79-15145

STOY, S.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303

STRABO, F.
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0058 A79-13652
Design of a low-energy house in Denmark heated by a combination of solar and wind energy
21 p0138 A79-17471

STRACHAN, J. D.
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

STRACK, J. T.
Measured and predicted performance of solar domestic water heaters
22 p0319 A79-31422

STRAIN, D. M.
The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059

STRAUSS, H. R.
Finite beta trapped electron fluid mode
23 p0478 A79-39561

STRAUSZ, O. P.
The isotopic composition of carbon in the Alberta oil sand
24 p0650 A79-49357

STRAZZA, N.
Copper/water axially-grooved heat pipes for RTG applications
21 p0023 A79-10188

STRAZZA, N. P.
Copper/water axially-grooved heat pipes - Fabrication and performance testing
24 p0694 A79-51938

STREBKOV, D. S.
The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358
New models of solar cells and prospects for their optimization
21 p0166 A79-20346
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50701

STREED, E. R.
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors
22 p0295 A79-28356
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543
Provisional flat plate solar collector testing procedures
[PB-283721/9] 21 p0198 N79-12571
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539

STREET, N. K.
Composite-rim flywheels - Spin tests
23 p0423 A79-34281

STREETER, H. H.
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532

STREHIER, D.
Applicability of petroleum refinery control technologies to coal conversion
[PB-288630/7] 22 p0352 N79-19173

STRICKLAND, G.
State-of-the-art summary of the technical problems involved in the storage of hydrogen via metal hydrides
23 p0414 A79-34120
Hydrogen storage technology for metal hydrides
24 p0615 A79-45599
Hydrogen storage devices for automobiles
[BNL-25263] 23 p0583 N79-26518
Hydrogen technology: An overview
[BNL-25760] 24 p0734 N79-29379

STRICKLAND, L. D.
Design considerations for an in situ gasification test of eastern bituminous coals
21 p0005 A79-10049

STRICKLAND, R. F.
Analysis of geological limitations to underground coal gasification
24 p0668 A79-51025

STRIETER, R.
Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648

STRINGER, J.
Materials problems and opportunities in coal conversion systems
21 p0034 A79-11146
Materials problems and opportunities in coal conversion systems
21 p0094 A79-15900

Assessment of hot gas clean-up systems and turbine erosion/corrosion problems in PFBC combined cycle systems
[ASME PAPER 79-GT-195] 23 p0380 A79-32453

STRINGER, T. E.
Theory of anomalous transport due to electrostatic fluctuations
22 p0270 A79-24858

STRISOWER, B.
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

STROBEL, G. L.
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974

STROCK, H. B.
Efficient polycrystalline solar cells made from low-cost refined metallurgical silicon
23 p0504 A79-40959

STROM, S. S.
Controlling NOx from a coal-fired MHD process
21 p0017 A79-10139

STROTHER, L. W.
Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506

STROUSE, E. A.
Optical coatings for a space laser communications system
22 p0292 A79-28028

STRUB, A. S.
The solar energy R & D programme of the European Communities
21 p0116 A79-17278

STRUMPF, H. J.
Conceptual design of a pulverized coal furnace for a utility size closed-cycle, gas-turbine power plant
[ASME PAPER 79-GT-158] 23 p0378 A79-32420

STRUP, P. E.
Chemical characterization of shale oil and related fuels
24 p0665 A79-50888

STUART, A.
The rough road to making oil and gas from coal
24 p0651 A79-49423

STUART, D. G.
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

STUART, T. A.
Transient analysis of the rectified superconducting alternator
23 p0462 A79-38529
A parameter sensitivity analysis of the rectified superconducting alternator model
24 p0646 A79-48654

STUCK, R.
Interface properties and stability of Schottky barriers and MIS solar cells
21 p0123 A79-17342
Low cost ion implantation procedure for the realization of silicon solar cells in a continuous way
23 p0509 A79-41001

STUCKAS, K. J.
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

STUCKI, F.
Hydrogen storage in FeTi - Surface segregation and its catalytic effect on hydrogenation and structural studies by means of neutron diffraction
22 p0312 A79-31156

STUEBKE, C.
Air Force High Efficiency Solar Panel - GaAs cell development
23 p0506 A79-40971

STUHLINGER, E.
Electric automobiles - Yes
21 p0046 A79-12265

STULTZ, J. W.
Thermal and other tests of photovoltaic modules performed in natural sunlight
[AIAA PAPER 79-0980] 23 p0457 A79-38184
Thermal and other tests of photovoltaic modules performed in natural sunlight
[NASA-CR-158174] 22 p0354 N79-19460

STUPIN, D. M.
Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

STUTZ, R. A.
Hydrogen isotope distillation for fusion power reactors
23 p0427 A79-34989

STUTZKE, R. D.
Financial/management scenarios for a satellite power system program
[AAS PAPER 78-144] 22 p0243 A79-21259
Financing alternatives for space industrialization
[AIAA PAPER 79-1389] 23 p0426 A79-34836

STYHR, K.
Ceramic heat exchanger - Applications and developments
21 p0050 A79-12826

STYMNE, H.
Storage of heat: A survey of efforts and possibilities
[PB-295936/9] 24 p0801 N79-33592

STYRIS, D. L.
Solar pond stability experiments
21 p0042 A79-11878
Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062

SU, C. S.
Dielectric development for GaAs solar cells
[PB-295837/9] 24 p0802 N79-33600

SUBOTOWICZ, M.
Satellite power systems /SPS/ and semiconductor photovoltaic cells /SPC/
[IAF PAPER 79-166] 24 p0709 A79-53330

SUCKLING, P. W.
On the use of synoptic weather map typing to define solar radiation regimes
22 p0272 A79-25392

SUDA, S.
Mixing effects of two different types of hydrides
22 p0251 A79-21714

SUDAN, R. N.
Generation and applications of high power ion beams to fusion research
21 p0070 A79-14466

SUDAR, S.
Lithium silicon - Iron sulfide load-leveling and electric vehicle batteries
21 p0010 A79-10088
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

SUDIT, E. F.
Structuring the international marketplace for maximum socio-economic benefits from space industrialization
[IAF PAPER 79-A-14] 24 p0711 A79-53418

SUBSER, K.
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

SUH, P. K.
Environmental interaction implications for large space systems
23 p0552 N79-24027

SULEEBKA, K. P.
High temperature solar thermoelectric generator
23 p0447 A79-37299

SULEIMANOV, S. KH.
Calculation of the optical characteristics of high-power two-mirror solar furnaces
24 p0648 A79-49183

SULLIVAN, D.
Technology impact study of a high efficiency industrial heat pump
24 p0697 A79-51966

SULLIVAN, H. F.
Use of monolithic structures for the short term storage of solar energy
21 p0121 A79-17327

Studies on the effect of bed aspect ratios and pressure drop on flow distribution in rock bed storage systems for solar energy applications
22 p0317 A79-31409

SULLIVAN, J.
Geothermal element, Imperial County, California
[PB-287115/0] 22 p0335 N79-16385

SULLIVAN, J. L.
New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863

SULLIVAN, R. F.
Converting Green River shale oil to transportation fuels
[CONF-780460-3] 24 p0745 N79-30396

SULLIVAN, R. L.
Thermal energy conversion - Tapping the sea depths
24 p0628 A79-45979

SULLIVAN, T. E.
Transport and ultra-thin insulator studies for MIS solar cell structures on silicon and gallium arsenide
23 p0507 A79-40988

SULLIVAN, T. L.
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828
Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0258 A79-29007
Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-O wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727

SULLIVAN, W. N.
The brake system for the DOE/Sandia 17-meter vertical axis wind turbine
21 p0067 A79-14289
Economic overview of vertical axis wind turbines
24 p0633 A79-46528
Structural performance of the DOE/Sandia 17 meter vertical axis wind turbine
[SAND-78-0880C] 21 p0187 N79-11516
Economic overview of vertical axis wind turbines
[SAND-79-9733C] 24 p0753 N79-30773

SULZMANN, K. G. P.
Shock-tube measurements of induction and post-induction rates for low-Btu gas mixtures
21 p0083 A79-15245

SUMARIA, V. H.
Preliminary controller evaluation for the MERC/CTIU using a mathematical process model
21 p0008 A79-10073

SUMMERS, R. A.
Energy and remote sensing applications
22 p0255 A79-22516

SUN, E. C.-H.
Optical and thermal analysis of a Cassegrainian solar concentrator
24 p0713 A79-53498

SUN, K.
Laser aircraft propulsion
21 p0109 A79-16618
Laser aircraft
22 p0284 A79-26597

SUN, K. C.
New energy conversion techniques in space, applicable to propulsion
[AIAA PAPER 79-1338] 23 p0493 A79-40490

SUN, T. H.
Analysis and application of the heat pipe heat exchanger
21 p0014 A79-10117
The analysis of heat transfer with and without condensation in a heat pipe heat exchanger
[ASME PAPER 78-WA/HT-59] 21 p0161 A79-19824

SUNDARAM, A. K.
Tearing mode instabilities and their suppression by lower hybrid fields
24 p0606 A79-45004

SUNDELL, J.
Heat pump application to single family dwellings - An analysis by computer model
23 p0449 A79-37855

SUPERCZYNSKI, M. J.
Heat pulses required to quench a potted superconducting magnet
22 p0236 A79-20538

SUREK, T.
Large area silicon sheet by EFG
21 p0123 A79-17340
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939

SURESH, D.
Potential applications of solar furnaces in materials industry
23 p0471 A79-38654

SURI, R. K.
Return flow solar air-heater
21 p0055 A79-13609
Development of small solar power plants for rural areas in India
21 p0141 A79-17502

SURKO, C. M.
Study of driven lower-hybrid waves in the Alcator tokamak using CO2-laser scattering
24 p0669 A79-51570

SURPRENANT, J. K.
A lithium/dissolved sulfur battery with an organic electrolyte
22 p0305 A79-30332

SUSSMAN, D. B.
A technical and economic evaluation of the Baltimore Landgard demonstration
23 p0491 A79-40420

SUSSMAN, S. S.
Demonstration of the capabilities of the Livermore energy policy model
[UCRL-52508] 24 p0788 N79-32695

SUTCLIFFE, P.
Prospects for improvements in lead-acid batteries
22 p0300 A79-29488

SUTER, G. W., II
Environmental implications for geothermal energy development
24 p0659 A79-50351

SUTER, P.
Study of solid-gas-suspensions used for direct absorption of concentrated solar radiation
22 p0262 A79-23757

SUTHERLAND, P. L.
Potential for ocean thermal energy conversion electric power generation in the Southeast region
24 p0626 A79-45855

SUTHERLAND, P. R.
Solar heating and load managed/solar cooling of a small commercial building using flat plate collectors
[AIAA PAPER 79-1020] 23 p0460 A79-38205

SUTTER, S. L.
Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344

SUTTON, D. G.
Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513

SUTTON, P. D.
Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551
Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891

SUWAL, G.
Comparison of nuclear and coal power plants using Net Energy Analysis
21 p0073 A79-14692

SUZUKI, H.
Thermal radiation - Transient heat transfer in plates with selective surfaces
23 p0389 A79-33266

SUZUKI, N.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33345
Molybdenum, carbon and silicon carbide limiter experiment in the JFT-2 tokamak
24 p0649 A79-49254

SVATA, M.
Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes
22 p0245 A79-21482

SVENSEN, N. A.
An overview of the OTEC-1 design
24 p0625 A79-45846
SVERDRUP, E. F.
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449
SVIATOSLAVSKY, I. N.
Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44545
SVIEDRYS, R.
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024
SVISHCHEV, V. S.
Experiments on controlling the plasma density in the TO-1 tokamak
22 p0324 A79-31762
SVOBODA, J. V.
Digital or analog modelling in the design of hydrostatic vehicular systems
22 p0264 A79-23808
Optimization of a novel hydrostatic drive performance using hybrid computing technique
22 p0264 A79-23809
SWABB, L. E., JR.
EXXON donor solvent coal liquefaction process
23 p0593 N79-27618
SWAINE, D. J.
The fate of trace elements in coal after combustion
21 p0116 A79-17250
SWALES, M. C.
Review of optimization and economic evaluation of potential tidal power developments in the Bay of Fundy
21 p0152 A79-18111
SWALLOM, D.
Subsonic diffusers for MHD generators
22 p0279 A79-26185
Evaluation of the expected diffuser performance for a large MHD generator
23 p0393 A79-33408
SWALLOM, D. W.
Development of a compact, lightweight high performance 30 MW MHD generator system
23 p0393 A79-33410
High energy fuel techniques for combustion driven MHD generators
[AIAA PAPER 79-1004] 23 p0459 A79-38197
Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414
High power magnetohydrodynamic system, volume 1
[AD-A064796] 23 p0543 N79-22639
High power magnetohydrodynamic system, volume 2
[AD-A064435] 23 p0544 N79-22640
SWAMI, N. K.
The role of the interfacial layer in Schottky barrier solar cells
23 p0438 A79-36241
SWAMY, M. N. S.
Efficient use of wind energy by using static slip recovery systems - A simulator study
21 p0113 A79-16744
SWANSON, R. M.
A proposed thermophotovoltaic solar energy conversion system
22 p0287 A79-27317
SWANSON, T. D.
Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183
SWART, P. L.
Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight
23 p0509 A79-40999
SWARTMAN, R. K.
An ocean thermal difference power plant in the Canadian Arctic
22 p0318 A79-31415
SWARTZ, C. K.
Annealing of radiation damage in 0.1- and 2-ohm-centimeter Silicon solar cells
[NASA-TP-1559] 24 p0798 N79-33572
SWARTZMAN, G. L.
Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662
Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845
SWEAN, T. F.
Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042
SWEET, L. M.
Optimal control of on-board and station flywheel storage for rail transit systems
21 p0148 A79-17822
Optimal control of on-board and station flywheel storage for rail transit systems
[ASME PAPER 78-WA/DSC-32] 21 p0159 A79-19771
SWENSON, P. F.
Feasibility of a heat-actuated heat-pump-centered integrated community energy system
24 p0696 A79-51961
SWERDLING, M.
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738
SWET, C. J.
Energy storage requirements for autonomous and hybrid solar thermal electric power plants
21 p0120 A79-17315
SWIFT-HOOK, D. T.
Directional arrays of windmills
23 p0453 A79-37896
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898
Open cycle MHD generation in the United Kingdom - A reappraisal
23 p0453 A79-37904
SWIFT, J. L.
Air quality impacts using SRC versus conventional coal in power plants
[PB-290237/7] 22 p0373 N79-21671
SWIFT, W. H.
Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786
SWISHER, J. H.
Hydrogen energy transport systems and nuclear heat - A promising way to conserve fossil energy resources
23 p0415 A79-34127
DOE program on hydrogen energy systems
24 p0615 A79-45605
SWISSHELM, B. A.
A mass and energy balance of a Wellman-Galusha gasifier
22 p0283 A79-26467
SWITZENBAUM, M. S.
The anaerobic attached film expanded bed reactor for the treatment of dilute organic wastes
22 p0356 N79-19928
SYKES, K. W.
Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River
[NASA-TM-80124] 24 p0777 N79-31839
SYLVESTER, J. R.
Thyristor controlled rectifier inverting at unity power factor
21 p0033 A79-10898
SYLWAN, C.
Utility fuel cells for biomass fuel
21 p0016 A79-10131
SYMONDS, R. A.
Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446
SYMONS, J. G.
Cover systems for high temperature flat-plate solar collectors
24 p0642 A79-47799

SYMONS, J. G.
Thermal performance testing of flat-plate solar collectors
21 p0130 A79-17407

SYMONS, P. C.
100MWh zinc-chlorine peak-shaving battery plants
21 p0011 A79-10096
Modeling of zinc-chloride batteries for electric vehicles
24 p0684 A79-51833
The zinc-chlorine battery in the BEST facility - 1981
24 p0703 A79-52013

SYROMIATNIKOV, N. I.
Use of fluidized media in thermal power systems
23 p0436 A79-35525

SZAJNER, J.
Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses
23 p0387 A79-33245

SZEDON, J. R.
Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012

SZEGO, G. C.
Design, operation, and economics of the Energy Plantation as an alternate source of fuels
23 p0467 A79-38616
Analysis of the economic potential of solar thermal energy to provide industrial process heat in the United States
23 p0470 A79-38646

SZETELA, E. J.
Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050

SZETO, K. Y.
Optical properties of aggregated gold on aluminum
24 p0669 A79-51181

SZLADOW, A. J.
Some aspects of the mechanism and kinetics of coal liquefaction
24 p0717 N79-28343

SZOKOLAY, S. V.
A 'real life' solar air conditioned house project
23 p0463 A79-38577

T

TABAKOFF, W.
Study of metals erosion in high temperature coal gas streams
[ASME PAPER 79-GT-88] 23 p0376 A79-32365
Erosion study of different materials affected by coal ash particles
24 p0646 A79-48864

TABET, E.
Problems and prospectives on solar energy utilization
[ISS-P-78/1] 24 p0742 N79-29667

TABOR, H.
Status report on selective surfaces
21 p0126 A79-17374

TABORS, R. D.
Planning and analysis for development of photovoltaic energy conversion systems
23 p0570 N79-25487

TAGER, S. A.
Fuels and combustion
21 p0106 A79-16488

TAHARA, M.
MHI's recent achievements in the field of geothermal power generation
23 p0381 A79-32591

TAI, A. S.
Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production
[LA-UR-79-574] 24 p0742 N79-29666

TAIROV, B. D.
The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358

TAKAGI, K.
Characteristics of co-axial Marx generator and its application to electron beam fusion
24 p0642 A79-47805

TAKAGI, T.
Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785

TAKAHASHI, K.
Series resistance effects in /GaAl/As/GaAs concentrator solar cells
22 p0273 A79-25745

TAKAHASHI, P. K.
Solar and wind energy applications in Hawaii
21 p0066 A79-14265

TAKAHASHI, T.
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298

TAKANASHI, S.
Study on room heating utilizing eutectic salt mixture
23 p0470 A79-38638

TAKANO, H.
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729

TAKAOKA, N.
Isotopic anomalies of rare gases in the Nigorikawa geothermal area, Hokkaido, Japan
24 p0640 A79-47506

TAKAOKA, S.
Pyrolysis, thermal gasification, and liquefaction of solid wastes and residues - Worldwide status of processes /as of Fall 1977/
23 p0490 A79-40413

TAKAZAWA, H.
Studies on OTEC power system characteristics and enhanced heat transfer performance in ETL
24 p0622 A79-45821

TAKETANI, H.
Specular mirrors for solar energy application
21 p0034 A79-11147

TAKEUCHI, M.
Heat transfer of absorbing evaporator in CDE engine system
23 p0531 A79-42900
Development of CDE /Concentration Difference Energy/ system and engine
24 p0702 A79-52005

TAKEUCHI, T.
Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396

TAKLE, E. S.
Complementary nature of wind and solar energy at a continental mid-latitude station
23 p0396 A79-33763

TALANOVA, V. D.
Contribution to the theory of the pulsed mode of operation of the thermionic energy converter. II
22 p0246 A79-21542
Theory of the pulsed operation of a thermionic converter. II - Ionization stage
23 p0442 A79-36815

TALAY, T. A.
Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River
[NASA-TM-80124] 24 p0777 N79-31839

TALBERT, S. G.
The development of a 37 kW solar-powered irrigation system
21 p0144 A79-17525

TALBERT, W.
Large, lightweight, replicated mirrors
21 p0043 A79-11976

TALBERT, W. M.
Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778

TALBOT, J. B.
Powerplant integration - The application of current experience to future developments
[ASME PAPER 78-GT-113] 21 p0032 A79-10788

TALIB, A.
Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505
Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595
TALIB, K.
Traditional architecture in West Africa and passive methods of cooling in the Tropics
23 p0463 A79-38580
TALL, W. A.
An application of 3-D viscous flow analysis to the design of a low-aspect-ratio turbine
[ASME PAPER 79-GT-53] 23 p0375 A79-32348
TALLACKSON, J. R.
Electricity in lieu of natural gas and oil for industrial thermal energy: A preliminary survey
[ORNL/TM-5937] 24 p0739 N79-29630
TALLERICO, L. N.
Solar central receiver program
24 p0674 A79-51756
TALWALKAR, A. T.
Process design for coal conversion reactors
[CONF-781110-15] 23 p0577 N79-26232
TAM, S. W.
Undergound pumped hydro storage - An overview
24 p0660 A79-50451
Turbomachinery options for an underground pumped hydroelectric storage plant
24 p0679 A79-51794
TAMAGAWA, T.
Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504
TAMAI, H.
Thermochemical water splitting process using iron-copper-chlorine cycle
23 p0413 A79-34110
TAMAI, Y.
Catalytic gasification of coals pretreated with liquid ammonia
23 p0411 A79-34091
TAMOR, S.
Interpretation of cyclotron radiation spectra from runaway discharges in TFR
22 p0313 A79-31185
TAMURA, S.
Flywheel energy storage system for JT-60 toroidal field coil
21 p0112 A79-16729
Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504
TAN, K. J.
Solar radiation studies for utilization of flat-plate collectors in an equatorial region
21 p0119 A79-17311
TAN, T. H.
Flap-cone control of windmill speed
23 p0405 A79-34046
TAN, W.-H.
Computer simulation of laser implosive compression of ADT target and analytic solutions on the shock waves and thermal waves
24 p0629 A79-46254
TANAKA, D.
Improvement of characteristics of nonequilibrium MHD generator by applying current parallel to magnetic field
24 p0708 A79-52955
TANAKA, S.
Hydrogen storage by LaNi5 - Fundamentals and applications
21 p0038 A79-11803
Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037
TANAKA, T.
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Estimation of collector and electrical energy cost for STEPS in Japan
21 p0118 A79-17288
An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442
A method for measuring the photothermal conversion efficiency of solar energy
24 p0642 A79-47806
TANASAWA, I.
R & D on advanced heat exchangers in Japan
24 p0702 A79-52008
TANASE, S.
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298
TANEMURA, S.
The testing procedures of thermal performance of solar collector at Solar Research Lab., G.I.R.I.
21 p0130 A79-17409
TANG, K.
Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580
TANG, T. P.
Effect of temperature and pressure on molten carbonate fuel cell fuels and performance
24 p0682 A79-51818
TANI, K.
Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504
TANI, T.
Solar thermal energy storage using heat of dilution - Analysis of heat generation in multistage mixing column
21 p0046 A79-12271
Estimation of collector and electrical energy cost for STEPS in Japan
21 p0118 A79-17288
An analysis of a cylindrical parabolic focussing collector for distributed collector power system
21 p0134 A79-17442
TANK, R.
Designing and testing Si3N4 turbine components at Mercedes-Benz
21 p0050 A79-12830
TANNER, C. E.
Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379
TANNER, D. P.
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158736] 23 p0580 N79-26488
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495
TANNER, R.
Influence of technological advances on potential tidal power development
23 p0450 A79-37865
TANNER, R. G.
Selection of optimum sites for tidal power development in the Bay of Fundy
21 p0152 A79-18110
TAPIERO, M.
Photovoltaic conversion in Cu2O
23 p0384 A79-32973
TAPLIN, D. M. R.
Fracture research in Canada
21 p0144 A79-17530
TARASOV, A. G.
Spectral emissivity of porous graphite heated in air
23 p0433 A79-35380
Spectral emissivity of porous graphite heated in an air atmosphere
24 p0662 A79-50703
TARASUK, J. D.
New approaches and baffled heat transfer studies in fluidized bed heat storage
24 p0688 A79-51863
TARMAN, P. B.
Hydrogen via gasification - Today and tomorrow
22 p0289 A79-27652
Synthetic natural gas production from peat
23 p0411 A79-34092
Developmental hydrogen via coal gasification processes
24 p0613 A79-45587

TARNIZHEVSKII, B. V.
Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292
Experimental investigation of the joint operation of wind and solar plants
21 p0167 A79-20358

TARR, N. G.
An investigation of dark current and photocurrent superposition in photovoltaic devices
22 p0291 A79-27871

TARRER, A. R.
Particle size variation in the solvent refined coal process
23 p0492 A79-40451
Selectivity improvement in the SRC process
24 p0628 A79-45992

TARRICONE, L.
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176

TASCHEK, W. G.
High energy metal hydride fuel cell power source
[AD-A056491] 21 p0184 N79-11485

TASDEMIROGLU, E.
Calculation of solar energy incident on non-horizontal surfaces over Turkey
22 p0253 A79-22266

TASSICKER, O. J.
Advanced emissions control and test facility of the Electric Power Research Institute
21 p0115 A79-17249

TATIT HOLTZ, A. C.
Principal sources of electric power generation in Brazil
23 p0388 A79-33255

TAUNTON, J. W.
Exxon Donor Solvent coal liquefaction process development
21 p0007 A79-10060
Status and outlook of the Exxon Donor Solvent coal liquefaction process development
21 p0092 A79-15889

TAUSSIG, R.
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384

TAUSSIG, R. T.
Energy exchanger technology applied to laser heated engines
21 p0110 A79-16631
CO/H2 production using fusion reactor heat
24 p0695 A79-51949
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

TAUTON, J. W.
EXXON donor solvent coal liquefaction process
23 p0593 N79-27618

TAVANA, M.
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555

TAVGER, M. D.
Selection of a characteristic quantity defining the self-ignition of a fuel in a stream
21 p0114 A79-16786

TAY, S. L.
Flap-cone control of windmill speed
23 p0405 A79-34046

TAYLOR, E. J.
New alloy systems for hydrogen storage
21 p0038 A79-11806

TAYLOR, G.
Energy research and development at the Canada Centre for Mineral and Energy Technology /CANMET/
24 p0698 A79-51971

TAYLOR, H. E.
A microprocessor monitoring system for a solar energy installation
21 p0088 A79-15840

TAYLOR, J. G.
Numerical codes for MHD flows
[SAND-78-1954] 24 p0730 N79-29061

TAYLOR, L. R.
Design problems of air source solar boosted heat pumps
21 p0138 A79-17472

TAYLOR, R. G.
Elements of financial risk - Identification of major elements affecting financial risk in the financing of solid waste resource recovery projects
23 p0490 A79-40408

TAYLOR, R. H.
Directional arrays of windmills
23 p0453 A79-37896
Prediction and measurement of aerogenerator performance
23 p0453 A79-37898

TAYLOR, R. J.
Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473
Preliminary selection of anchor systems for ocean thermal energy conversion
23 p0437 A79-35846
Surface interactions and conditioning techniques in tokamaks
23 p0443 A79-36880

TAYLOR, S. E.
Use of meteorological data in system evaluation
24 p0610 A79-45225

TAYLOR, T. M.
Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946

TAYLOR, W. R.
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498

TAYLOR, W. F.
Jet Fuel Thermal Stability
[NASA-TM-79231] 24 p0795 N79-33336

TCHERNEV, D. I.
Solar energy application of natural zeolites
22 p0286 A79-27213
Solar refrigeration utilizing zeolites
24 p0703 A79-52014

TEAGAN, W. P.
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883

TEARE, J. D.
The MHD interaction and plasma properties in a shock tube driven disk generator with swirl
21 p0083 A79-15260

TEATER, N. R.
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369

TEETER, R. R.
Earth orbital assessment of solar electric and solar sail propulsion systems
[NASA-CR-158167] 22 p0345 N79-17898

TEGGERS, H.
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

TEIXEIRA, D. P.
Status of NO sub x control for coal-fired power plants
23 p0592 N79-27609

TEJERINA, F.
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653

TELEGIN, G. P.
Materials
21 p0106 A79-16491

TELEKI, P. G.
Selected areas of aerospace technical applications to civil engineering
23 p0397 A79-33925

TEMKIN, R. J.
Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27885

TENOFONTE, T. A.
Scanned light spot evaluation of MIS solar cells to treat non-uniform peripheral photocurrents
23 p0511 A79-41012
TEMPELMEYER, K. E.
Status of the U.S./U.S.S.R. cooperative program for the development of open-cycle MHD power generators
22 p0290 A79-27661
MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500
Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546
TEMPLIN, R. J.
NRC's wind energy program
22 p0319 A79-31426
Operating experience with the Magdalen Islands wind turbine
23 p0484 A79-40122
Summary report on the collapse of the Magdalen Islands wind turbine
24 p0635 A79-46544
TENA, F.
Performance study of a solar still in Valencia /Spain/
23 p0471 A79-38653
TEOFILO, V. L.
Perspective on the fusion-fission energy concept
21 p0095 A79-15913
TEPER, M.
Alternatives for coal based power generation - An international overview
21 p0008 A79-10074
TEPLIAKOV, D. I.
Solar radiation concentrator for uniform irradiation of flat energy receivers and converters
24 p0602 A79-44260
TER BRUGGE, R.
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107
TERAMOTO, T.
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797
TERDAN, F. F.
Power management and control for space systems
21 p0170 N79-10134
TEREN, F.
An economical approach to space power systems
21 p0170 N79-10139
TERESHIN, V. D.
The feasibility of constructing a photoelectric unit utilizing effluent heat
21 p0125 A79-17358
TERMAIN, P. A.
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373
TERNAN, M.
Coke formation on hydrodesulphurization catalysts
22 p0283 A79-26470
TERRY, J. L.
The effects of wall temperature on light impurities in Alcator
22 p0313 A79-31188
TERUMICHI, Y.
Electron cyclotron heating in high density toroidal plasmas
22 p0265 A79-24037
TESSMER, R. G., JR.
Methodology for modeling geothermal district heating for residential markets
[BNL-50905] 22 p0361 N79-20502
Economic impacts of a transition to higher oil prices
[BNL-50871] 22 p0364 N79-20927
Comprehensive areal model of residential heating demands
[BNL-24998] 23 p0597 N79-27692
TESTER, J. W.
Mining earth's heat - Hot dry rock geothermal energy
22 p0258 A79-23280
Thermal conductivity of crystalline rocks associated with energy extraction for hot dry rock geothermal systems
22 p0304 A79-30123
Electricity from hot dry rock geothermal energy: Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773
TETZLAFF, G.
Power extracted from the wind
21 p0058 A79-13650
TEW, R. C., JR.
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721
TEWARI, S. K.
A methodology for evaluating the worth of a new energy resource with particular reference to wind energy utilisation in rural areas
21 p0143 A79-17514
An evaluation of the strategy of low cost horizontal axis windmills
21 p0143 A79-17517
TEWARY, V. K.
Response of a solar cell to intense and nonuniform illumination when used with solar concentrators
21 p0125 A79-17357
A report on the various heat collection and heat storage systems evolved under the solar energy programme at B. I. T. S.
21 p0132 A79-17423
THACHER, E. F.
Verification of wedge concentration using a helium neon laser
21 p0098 A79-16104
Some effects of leg surface heat losses on the performance of a p-n type thermoelectric generator
22 p0260 A79-23616
Concentration of a cassegrain solar furnace
24 p0658 A79-50344
Overall efficiency of a cassegrain solar collector using a thermoelectric module to generate electric power
24 p0699 A79-51977
THAKOOR, A. P.
Zn/x/Cd/1-x/S/Cu2S heterojunction solar cells. I - Fabrication and performance
23 p0528 A79-42171
THALHAMMER, E. D.
Real time computer control of 5 megawatts of solar thermal energy
21 p0144 A79-17621
THALLER, L. H.
Redox flow cell energy storage systems
[AIAA PAPER 79-0989] 23 p0458 A79-38191
Recent advances in Redox flow cell storage systems
24 p0684 A79-51837
Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442
Recent advances in redox flow cell storage systems
[NASA-TM-79186] 23 p0581 N79-26505
THAMPURAN, H. K. V. V.
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360
THANGARAJ, R.
High absorptivity Al-PbS selective surfaces for solar photothermal conversion
24 p0705 A79-52319
THAYER, W. J.
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002
THAYER, W. T.
CO/H2 production using fusion reactor heat
24 p0695 A79-51949
THEISEN, J. G.
Laminar flow stabilization by surface cooling on hydrogen fueled aircraft
[AIAA PAPER 79-1863] 24 p0643 A79-47920
THEODORE, L.
Energy and the environment; Proceedings of the Fifth National Conference, Cincinnati, Ohio, November 1-3, 1977
21 p0063 A79-14106

THEREZ, F.
Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970
THIAGARAJAN, V.
The ion fly-wheel effect on the electro-thermal instability in non-equilibrium MHD Hall disc generators
21 p0046 A79-12270
A collisional plasma rotating between two cylinders
21 p0049 A79-12694
THIEDE, H.-J.
Pollutant protection for the case of strip mining in the Rhine area
24 p0714 A79-53804
THIEL, F. A.
Solar-cell characteristics and interfacial chemistry of indium-tin-oxide/indium phosphide and indium-tin-oxide/gallium arsenide
23 p0480 A79-39944
Indium-tin oxide/indium phosphide and indium-tin oxide/gallium arsenide solar cells
23 p0505 A79-40966
THIELE, C. L.
Thermal energy transformer
[NASA-CASE-NPO-14058-1] 22 p0348 N79-18443
THIEME, L. G.
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721
THOBER, C. W. DE A.
Fluidized bed combustion of Brazilian coals
23 p0385 A79-33226
THOEM, T.
A study of long range air pollution problems related to coal development in the Northern Great Plains
24 p0612 A79-45538
THOEMEN, K. H.
308 billion ton-hours of refuse power experience - A review of the long-term operating record at Duesseldorf city
23 p0489 A79-40397
THOMANN, G. C.
A small horizontal axis wind turbine feeding power into the utility grid
21 p0074 A79-14703
THOMAS, A.
Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787
THOMAS, C. C.
Materials selection guidelines for geothermal power systems, first edition
[ALO-3904-1] 24 p0727 N79-28772
THOMAS, C. L.
The effect of limiters and current profile on elliptic free-boundary MHD equilibria
22 p0291 A79-27881
THOMAS, G. S.
Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977
[PB-293733/2] 23 p0586 N79-26759
THOMAS, J. P. S.
The performance of the heating system in the solar house of the Eindhoven University of Technology
22 p0276 A79-25938
THOMAS, M. G.
Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-29366
THOMAS, M. T.
Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062
THOMAS, R. B.
Solar heating for a novel dwelling independent of servicing networks
21 p0140 A79-17492
Wind generation of electricity for a novel dwelling independent of servicing networks
21 p0142 A79-17513
Wind power for domestic use in the United Kingdom
23 p0453 A79-37902
THOMAS, R. E.
Procedure for developing experimental designs for accelerated tests for service-life prediction
23 p0496 A79-40886
THOMAS, R. G.
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552
THOMAS, R. K.
High-current power leads for tokamak fusion reactor superconducting magnets
21 p0085 A79-15318
THOMAS, R. L.
Large wind turbine generators
21 p0092 A79-15881
Large horizontal axis wind turbine development
24 p0633 A79-46527
Large horizontal axis wind turbine development
[NASA-TM-79174] 23 p0581 N79-26504
THOMAS, W. C.
Modeling, simulation, testing, and measurements for solar energy systems; Proceedings of the Winter Annual Meeting, San Francisco, Calif., December 10-15, 1978
22 p0266 A79-24309
Effects of test fluid, flow rate, and flow regime on solar collector thermal performance measurements
22 p0268 A79-24317
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors
22 p0295 A79-28356
Guidelines for preparing environmental test plans for coal gasification plants
[PB-286659/8] 21 p0232 N79-15479
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539
THOMASSEN, K. I.
The Mirror Fusion Test Facility /MFTF/
21 p0018 A79-10147
THOME, R. J.
Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305
Fabrication and assembly considerations for a base load MHD superconducting magnet system
22 p0235 A79-20534
THOMPSON, C. J.
National motor gasoline surveys: A key source of fuel trend data
[BETC/RI-78/16] 23 p0568 N79-25248
THOMPSON, C. R.
SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319
THOMPSON, E.
Development of energetic neutral beams to the megawatt power level for controlled thermonuclear research
21 p0054 A79-13439
THOMPSON, K. P.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528
THOMPSON, M. J.
Doping of sputtered amorphous-silicon solar cells
23 p0441 A79-36779
THOMPSON, M. W.
Plasma surface interactions in controlled fusion devices; Proceedings of the Third International Conference, Abingdon, Oxon, England, April 3-7, 1978
23 p0442 A79-36876
THOMPSON, N. J.
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382
THOMPSON, P. B.
The role of the Large Coil Program in the development of superconducting magnets for fusion reactors
22 p0236 A79-20541

THOMPSON, R. A.
Advanced technology fuel cell program
[EPRI-EM-956] 23 p0598 N79-27702
THOMPSON, R. E.
Nuclear aircraft innovations and applications
[AIAA PAPER 79-0846] 23 p0526 A79-41913
THOMPSON, S. W.
Semiconductor grade, solar silicon purification project
[NASA-CR-158868] 24 p0736 N79-29598
THOMPSON, T. L.
The ClearView Solar Collector system and associated one and two stage evaporative cooling - Interim results
[AIAA PAPER 78-1759] 21 p0061 A79-13860
THOMS, R. L.
Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes
[PNL-2871] 23 p0562 N79-24487
THOMSON, J. J.
Stimulated Raman scatter in laser fusion target chambers
21 p0155 A79-18794
Neon spectral line broadening as a diagnostic for compressed laser-fusion targets
24 p0638 A79-47060
THOMSON, S. W.
Thomson Solar House I
22 p0276 A79-25936
THOMSON, W. E.
A 5-GWe nuclear satellite power system conceptual design
21 p0003 A79-10033
THORLEY, G. A.
Current and potential uses of aerospace technology by the U.S. Department of the Interior
[AIAA PAPER 78-1716] 21 p0060 A79-13833
THORNBLAD, P.
Gears for wind power plants
23 p0484 A79-40119
THORNHILL, J. W.
High Efficiency Solar Panel (HESP-2)
[AD-A065009] 23 p0544 N79-22642
THORNSJO, M.
A low energy scenario for the United States - 1975-2050
21 p0147 A79-17649
THORNTON, J. P.
A methodology for the comparative ranking of 0.1 to 10 MWe solar thermal electric power systems
[AIAA PAPER 79-1006] 23 p0459 A79-38199
THORNTON, M. W.
Oil recovery from a Utah tar sand deposit by in situ combustion
21 p0004 A79-10043
THORNTON, T. A.
Moving bed heat transfer for advanced power reactor applications
23 p0416 A79-34133
THORSNESS, C. B.
In situ coal gasification modeling
[UCRL-82269] 23 p0561 N79-24479
THROGMORTON, J.
Air quality assessment of particulate emissions from diesel-powered vehicles
[PB-286172/2] 21 p0223 N79-14641
THUNBORG, S., JR.
System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530
THURLOW, G. G.
Investigation of the corrosion performance of boiler, air heater, and gas turbine alloys in fluidized combustion systems
21 p0080 A79-14931
Manufacture of fuel gas for power generation by fluidized bed gasification of coal
24 p0657 A79-50212
THYAGARAJAN, K.
Performance of solar concentrators - A theoretical study
21 p0135 A79-17453
TIAGUNOV, M. G.
Application of automatic control methods to the inspection of the state and the testing of the power-generating systems of hydroelectric power plants
24 p0669 A79-51274
TIEN, H. T.
The photogalvanovoltaic cell
21 p0066 A79-14264
TIKHOMIROVA, V. A.
Temperature characteristics of high-voltage germanium photoconverters
23 p0433 A79-35378
Temperature characteristics of high-voltage germanium photogenerators
24 p0662 A79-50701
TIKHONOV, L. I.
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361
Analysis of the efficiency of a variable-band photoconverter
23 p0434 A79-35385
Analysis of the efficiency of a varizone photoelectric converter
24 p0663 A79-50708
TIKHOTSKII, A. S.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401
TILGNER, B.
European technology applicable to Solar Power Satellite Systems /SPS/
[IAF PAPER 79-174] 24 p0710 A79-53335
TILL, J. E.
Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570
TILLIETTE, Z. P.
Application of recuperative gas cycles with a bypass heat generator to solar energy power plants
[ASME PAPER 79-GT-89] 23 p0376 A79-32366
Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles
24 p0724 N79-28739
TIMBARIO, T. J.
The status of alcohol fuels utilization technology for highway transportation
21 p0003 A79-10035
TIMMCKE, W. E.
Storage and distribution of cryogenic fuels
24 p0650 A79-49378
TIMMERHAUS, K. D.
Advances in cryogenic engineering. Volume 23 - Proceedings of the Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
21 p0084 A79-15301
Advances in cryogenic engineering. Volume 24 - Proceedings of the Second International Cryogenic Materials Conference, University of Colorado, Boulder, Colo., August 2-5, 1977
24 p0603 A79-44526
TIMOFEEV, A. V.
A scheme for direct conversion of plasma thermal energy into electrical energy
22 p0324 A79-31765
TINAUT, D.
Calculation of solar energy incident on non-horizontal surfaces over Turkey
22 p0253 A 9-22266
TIO, T. H.
A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming
24 p0681 A79-51811
TIPNIS, P.
Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386
TISON, R. R.
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096
Feasibility of a heat-actuated heat-pump-centered integrated community energy system
24 p0696 A79-51961

TITCHENER, A. L.
Energy from biomass through hydrolysis of wood
21 p0003 A79-10036
TITKOV, A. S.
Optimization of an ideal thermionic converter
22 p0241 A79-20941
TITTLE, K.
Use of low grade fuel derived from domestic and trade wastes
23 p0454 A79-37912
TIWARI, N. K.
Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489
TIWARI, S.
Diffusion length measurements in Schottky barrier GaAs solar cells
22 p0281 A79-26243
TKALENKO, D. A.
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896
TLEIMAT, B. W.
Geothermal power and water production studies at the University of California
[ASME PAPER 78-WA/ENER-7] 21 p0159 A79-19778
TOBIAS, L.
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398
Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581
TOBIAS, R. F.
Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067515] 24 p0724 N79-28743
TOBIN, R. D.
Testing of central receiver for central thermal power systems
23 p0428 A79-35045
TODD, A. M. M.
Numerical determination of axisymmetric toroidal magnetohydrodynamic equilibria
24 p0645 A79-48226
TOERNKVIST, G.
Test results from the Swedish 60 kW experimental wind power unit
23 p0484 A79-40120
TOFIELD, B. C.
Advanced batteries
21 p0067 A79-14270
TOKAR, M. Z.
Heat transport near the wall of a tokamak reactor
22 p0324 A79-31764
TOKAREVA, O. N.
A problem of optimizing the setting angle of sun-battery panels of concave shape
21 p0045 A79-12186
Determining optimal angles of nonconvex solar battery panel mounting
21 p0080 A79-14837
TOKUYAMA, T.
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958
TOLAND, R. H.
Current status of composite flywheel development
22 p0241 A79-20853
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121
TOLVINSKAIA, E. V.
Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges
22 p0298 A79-29286
Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor
24 p0663 A79-50776
TOMANOFF, M.
The advance of natural gas
24 p0652 A79-49517
TOMAZIC, W. A.
Ceramic applications in the advanced Stirling automotive engine
21 p0051 A79-12851
TOMITA, R. H.
Control system for solar hot water system
22 p0321 A79-31442
TOMIZUKA, M.
An optimal standard for solar heating systems
[ASME PAPER 78-WA/DSC-19] 21 p0159 A79-19765
TOMKIEWICZ, M.
Photoelectrolysis of water with semiconductors
22 p0259 A79-23343
TOMKINS, B. A.
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147
TOMLINSON, M.
Chemistry for energy; Proceedings of the Symposium, Winnipeg, Manitoba, Canada, June 5-7, 1978
23 p0493 A79-40736
TOMLINSON, R.
A minicomputer based data acquisition and analysis systems for vertical axis wind turbine testing
21 p0144 A79-17617
TOMLINSON, R. N.
Data acquisition and signal processing for a vertical axis wind energy conversion system
23 p0432 A79-35078
Data acquisition and signal processing for a vertical axis wind energy conversion system
[SAND-78-1000C] 21 p0187 N79-11517
TOMPKINS, R. E.
Collection efficiency measurements on a-Si:H solar cells
24 p0638 A79-47063
TOMPKINS, D. M.
Wind energy conversion systems /WECS/ for central station and dispersed power applications
23 p0406 A79-34052
TONELLI, A. D.
The design and evaluation of a 5 GW GaAlAs solar power satellite /SPS/
21 p0002 A79-10024
TONGE, G.
Thermodynamics of the conversion of diluted radiation
22 p0310 A79-30910
TONKONOGII, IU. L.
Selection of thermal operating regimes for fuel cell reactor-condenser systems
21 p0165 A79-20342
TOPOUZIAN, A.
The indirect Brayton energy recovery system
24 p0696 A79-51958
Ford/ECE sodium-sulfur battery electric vehicle development and demonstration, phase 1
[COO-2566-37] 24 p0731 N79-29118
TORDA, T. P.
Optimal location of windmills
23 p0405 A79-34048
TORII, T.
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825
TOROSSIAN, A.
Conceptual design of a superconducting tokamak - 'TORUS II SUPRA'
22 p0236 A79-20543
TOSTES, A.
A development program for hydrogen burners
23 p0386 A79-33232
TOSTENSON, T. E.
Design and construction phase of a biofouling, corrosion, and materials study from a moored platform at Punta Tuna, Puerto Rico
24 p0620 A79-45806
TOTH, W. J.
Energy programs at the Johns Hopkins University Applied Physics Lab.
[PB-295439/4] 24 p0793 N79-32739
TOTTMAN, J. D.
Use of low grade fuel derived from domestic and trade wastes
23 p0454 A79-37912

TOUCHAIS, M.
Industrial aspects in solar energy instruction
22 p0254 A79-22274
Which is the true solar house
23 p0463 A79-38578

TOURYAN, K. J.
Transient behavior of the fluid and electrical properties in the turbulent boundary layer of an MHD channel
23 p0392 A79-33402

TOUSSAINT, M.
The utilization of European space techniques for energy production
[IAF PAPER 78-190]
21 p0035 A79-11287

TOWGOOD, D. A.
Composite material flywheel for the electric-powered passenger vehicle
22 p0240 A79-20842

TOWNES, H. W.
Experimental measurements and correlations of Nusselt number for MHD high temperature air preheaters
[ASME PAPER 78-WA/HT-22]
21 p0161 A79-19809
Design study of coal-fired cored brick regenerative heat exchangers
23 p0532 A79-42983

TOWNSEND, W. G.
Schottky-barrier versus homojunction silicon solar cells - A status report
23 p0441 A79-36783

TOYOSHIMA, H.
Development of a DC linear motor. II
24 p0707 A79-52800

TOZER, B. A.
Open cycle MHD generation in the United Kingdom - A reappraisal
23 p0453 A79-37904

TRACEY, T. R.
Alternative central receiver solar power plant using salt as a heat transfer and storage medium
[AIAA PAPER 78-1753]
21 p0060 A79-13855

TRAIN, K.
Consumers' responses to fuel-efficient vehicles - A critical review of econometric studies
24 p0714 A79-54278

TRAN, D. Q.
Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials
21 p0179 N79-11150

TRAN, T. S.
Analysis of helio-thermoelectrical energy conversion efficiency
[REPT-77/RP-40-241]
23 p0584 N79-26538
Energy analysis of the helio-thermal-electric conversion
[P-77/P40/242]
24 p0759 N79-30831

TRAPANI, C. M., JR.
The cost of sulfur removal from coal in electric power generation
23 p0419 A79-34157

TRAPPMANN, K.
Development of ceramic parts for a truck gas turbine at MTU
21 p0050 A79-12831

TRARIEUX, P.
Optical simulation for a fixed spherical solar collector
24 p0668 A79-51177

TRAUT, R. T.
Power cables to accommodate the motions of an OTEC plant
21 p0101 A79-16251

TRAUTWEIN, W. B.
Oceanside Disposal Plant improvement program - Design, construction and operating experience
23 p0491 A79-40425

TREAT, N. L.
Net energy from municipal solid waste
23 p0418 A79-34149
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12]
21 p0174 N79-10534

TREHAN, R. K.
Projecting energy resource utilization - The geothermal case
21 p0068 A79-14321
A quantitative comparison of energy costing methods
24 p0651 A79-49475

TRELA, W.
Evaluation of ceramics for stator application: Gas turbine engine report
[NASA-CR-159533]
22 p0364 N79-21075

TRELLA, M.
European aspects of Solar Satellite Power systems
22 p0326 A79-31923

TRENKLER, H.
Critical comments on energy models
23 p0481 A79-39994

TREPTE, L.
Rational energy utilization in coke-oven-plant operations
[BMFT-FB-T-77-72]
24 p0759 N79-30832

TRESTER, P.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

TREVILLION, W. L.
The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100

TREXEL, C. A.
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1]
24 p0733 N79-29369

TREXLER, C. A.
Characterization of a swept-strut hydrogen fuel-injector for scramjet applications
24 p0649 A79-49345

TRIBOULET, R.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054
Electric and photovoltaic properties of CdTe pn homojunctions
24 p0655 A79-50186

TRIBUTSCH, H.
Electrochemical solar cells based on layer-type transition metal compounds - Performance of electrode material
24 p0656 A79-50193

TRICE, J. B.
Commercialization aspects of solar process hot water systems for the textile industry
[AIAA PAPER 79-1027]
23 p0476 A79-38896

TRIEZENBERG, D. M.
Lewis Research Center studies of multiple large wind turbine generators on a utility network
24 p0635 A79-46547

TRIGLIA, A.
Relation between concentration and acceptance in solar collectors
24 p0641 A79-47795

TRILLING, C. A.
SNG production by the Rockgas process
21 p0093 A79-15896

TRIMBLE, L. C.
OTEC goes to sea /A review of Mini-OTEC/
24 p0617 A79-45784

TRIMMER, W. S.
Sophisticated solar heating controllers - Are they cost effective
24 p0644 A79-47946

TRINDADE, S. C.
Which alcohol fuel for Brasil - Methanol or ethanol
24 p0676 A79-51774

TRIPATHI, V. K.
Parametric decay of lower hybrid waves in a plasma - Effect of ion nonlinearity
22 p0269 A79-24814

TRIPPETT, R. J.
Air bearing development for a GM automotive gas turbine
[SAE PAPER 790107]
22 p0314 A79-31355

TRIVICH, D.
Cuprous oxide photovoltaic cells
23 p0499 A79-40908
Cuprous oxide photovoltaic cells
[PB-290529/7]
23 p0565 N79-24514
Cuprous oxide photovoltaic cells
[CONF-780619-16]
24 p0753 N79-30777

TROFIMOVA, A. A.
Study of the spectral characteristics of metallized polymer films for production of solar concentrators
22 p0297 A79-28672

Investigation of the spectral characteristics of metallized polymer films for making solar concentrators
24 p0637 A79-46910

TROISE, G.
Selective covers for natural cooling devices
22 p0272 A79-25522
Statistical correlation between daily and monthly averages of solar-radiation data
24 p0668 A79-51022

TROMP, C.
Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779

TROTTA, R.
Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492

TROTTER, D. M., JR.
Thermal emissivity of selective surfaces - New lower limits
24 p0648 A79-49207
Design of selective surfaces for solar energy collection
24 p0655 A79-50180

TROVILLION, T. A.
MHD generator duct flow with cross stream dependent fluid properties
22 p0336 N79-16668
Hartmann flows in the MHD generator configuration
[AD-A070080] 24 p0753 N79-33036

TRUDELL, L. G.
Colorado's oil-shale resource for vertical modified in-situ processes
21 p0005 A79-10046

TRUJILLO, P. E.
The Puchuldiza geothermal field
23 p0408 A79-34070

TRUKHOV, V. S.
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine
21 p0166 A79-20348
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761

TRUMBULE, R. E.
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

TRUNCELLITO, N. T.
Considerations for adapting an MHD baseload power plant for intermediate and peaking duty
24 p0701 A79-51992

TRUSCELLO, V.
JPL - Small Power Systems Applications Project
21 p0019 A79-10161

TRUSCELLO, V. C.
The parabolic concentrating collector: A tutorial
[NASA-CR-158426] 22 p0359 N79-20491

TRZASKOMA, W. F.
Advances in ocean engineering aspects of ocean thermal energy conversion
21 p0101 A79-16250

TSAI, C. C.
Magnetic multipole line-cusp plasma generator for neutral beam injectors
22 p0238 A79-20746

TSAI, S. C.
Flap-cone control of windmill speed
23 p0405 A79-34046

TSAKADZE, L. M.
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167

TSAMALASHVILI, L. V.
Cyclotron-wave spectrum in a plasma with two ion species
22 p0245 A79-21443

TSANG, C. F.
Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317

TSANG, K. T.
Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

TSAO, G. T.
Fuels and chemicals from biomass
24 p0631 A79-46313

TSARENKOV, B. V.
Wideband graded-band-gap Ga/1-x/Al/x/As-Si photoelectric cells with n-region illumination
24 p0647 A79-49180

TSCHULENA, G.
Energy for the year 2000 - The SPS concept
24 p0645 A79-48026

TSCHUPP, E. J.
Analysis of various OTEC missions
23 p0404 A79-34037

TSEUNG, A. C. C.
Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728

TSINKOTSKI, B.
Storage peak gas-turbine power plant
22 p0268 A79-24507

TSKHAKAIA, V. K.
Results of an experimental investigation of a low-temperature thermionic converter with an expanded collector
24 p0704 A79-52167

TSOU, P.
Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications
23 p0520 A79-41081

TSOULFANIDIS, N.
Comparison of nuclear and coal power plants using Net Energy Analysis
21 p0073 A79-14692

TSUCHIYA, K.
Experimental study of thermal energy storage by use of reversible chemical reactions
23 p0416 A79-34137

TSUGAWA, R. T.
Radiation-catalyzed ortho-to-para transition in solid tritium
23 p0474 A79-38806

TSUJI, T.
The development of photovoltaic conversion systems with sunlight concentration
21 p0148 A79-17995

TSUJINO, Y.
Hydrocarbons in ambient air. I - A statistical estimation of automobile hydrocarbons by factor analysis
24 p0646 A79-48376

TSUKAMOTO, T.
NOx formation with various combustion processes of premixed gas
23 p0528 A79-42220

TSUKANO, H.
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

TUCKER, H. L., JR.
The influence of systems and operations on rapid rail energy utilization
22 p0299 A79-29338

TUCKER, J. N.
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

TUILIEV, O.
Experimental study of mass exchange in glazed solar solution regenerator
24 p0602 A79-44264

TUKENMEZ, E.
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337
Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980
[DOE/EIA-0102/20] 24 p0718 N79-28356

TUKHVATULIN, R. SH.
Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532
Hall effect in an induction discharge
23 p0442 A79-36806

TULLY, G. F.
Regional analysis of residential photovoltaic system concepts
23 p0520 A79-41077

TUNG, Y.
A study of the effective resistance of the diffused layer and its effect on solar cell performance
22 p0367 N79-21541

TUNSTALL, J.
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

TURCHI, P. J.
Compact fusion reactors using controlled imploding liners
21 p0018 A79-10151

TURCK, B.
Energy losses in a flat transposed cable
[LA-7635-MS] 24 p0781 N79-32481

TURNA, K. S.
The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432

TURNBULL, F. G.
Laboratory evaluation of a composite flywheel energy storage system
21 p0013 A79-10110
Regenerative flywheel energy storage system
24 p0678 A79-51783

TURNER, A. F.
Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

TURNER, G. W.
Ion-implanted laser-annealed GaAs solar cells
23 p0447 A79-37685

TURNER, L. R.
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

TURNER, R. D.
30-MJ superconducting magnetic energy storage /SMES/ unit for stabilizing an electric transmission system
22 p0237 A79-20555
Superconducting Magnetic Energy Storage for electric power system stabilization
24 p0681 A79-51804

TURNER, R. E.
Summary of atmospheric wind design criteria for wind energy conversion system development
[NASA-TP-1389] 21 p0223 N79-14678
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development
[NASA-TP-1359] 21 p0223 N79-14679

TURNER, R. H.
High temperature thermal energy storage in moving sand
21 p0012 A79-10103

TURNER, T.
International Forum on Appropriate Industrial Technology. Appropriate technology for rural energy supply in developing countries
[PB-294602/8] 24 p0760 N79-30840

TURNER, T. F.
Combustion rates for oil shale carbonaceous residue
21 p0032 A79-10522

TVERIANOVICH, E. V.
Facility with sectioned photoreceiver and laser radiator for determining solar radiation concentrator accuracy characteristics
21 p0054 A79-13292

TWIDELL, J. W.
Renewable energy supplies for developing countries
23 p0422 A79-34178

TYAGI, H. R.
Heat transfer analysis of flat plate type domestic solar water heater
21 p0140 A79-17489

TYMURA, E. J.
Solutions to energy conservation in northern climates
22 p0321 A79-31443

TYNDALL, M. F.
Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446

TYNER, C. E.
An overview of in situ oil shale technology and recent advances in true in situ retort modeling
24 p0688 A79-51865

TYSON, T. J.
The fate of fuel nitrogen - Implications for combustor design and operation
21 p0080 A79-14927
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610

U

UBHAYAKAR, S. K.
Combustion of pulverized coal in high temperature preheated air
[AIAA PAPER 79-0298] 21 p0158 A79-19654
Mechanistic modeling of pulverized coal combustion
23 p0390 A79-33380
Coal combustor technology development
23 p0390 A79-33381
Behavior of eastern and western coals in fuel-rich reaction conditions
23 p0390 A79-33384
Coal gasification as applied to MHD power cycle
23 p0411 A79-34095

UCHIDA, H.
Mixing effects of two different types of hydrides
22 p0251 A79-21714

UCHIDA, T.
200-kV Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

UCKAN, N. A.
The ELMO Bumpy Torus - An alternative fusion reactor concept
23 p0407 A79-34060

UDAGAWA, M.
Comparison between simulation and experiment of solar heating
21 p0137 A79-17461

UEHARA, H.
Ocean Thermal Energy Conversion plant with Freon 22
24 p0619 A79-45795
Design considerations on 100MWe commercial scale OTEC power plant and a 1MWe class engineering test plant
24 p0619 A79-45797
Research and development on ocean thermal energy conversion in Japan
24 p0703 A79-52009

UENO, I.
Production of repetitive dense plasmas in a focus device with inductive energy storage
24 p0642 A79-47807

UENSAL, E.
Evaluation of flow properties of dilute aqueous polymer solutions for enhanced oil recovery applications
23 p0556 N79-24408

UHERKA, K. L.
DOE stationary external combustion engine program - Status report
24 p0689 A79-51882
Stirling engine combustion and heat transport system design alternatives for stationary power generation
24 p0690 A79-51883

UHL, V. W.
A standard procedure of economic evaluation for energy-producing and pollution-abatement operations
21 p0064 A79-14109

UHLEMAN, E. W.
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311

ULLI, E.
The Arbonia control concept - Does flow regulation in the solar system cycle make sense
21 p0056 A79-13632

ULLMAN, D.
An introduction to the variable inertia flywheel /VIF/
[ASME PAPER 79-APM-5] 22 p0298 A79-29064

UMAROV, G. G.
Investigation of the aerodynamic resistance of solar air heaters
24 p0648 A79-49185

UMAROV, G. IA.
Optimization and design of radiative heat-discharge system for energy unit with Stirling engine
21 p0166 A79-20348
Study of the temperature distribution across the width of the screen of low-temperature water heaters with tubular heat receivers
22 p0297 A79-28671
Solar energy thermoreceiver with selective coating and vacuum thermoisolation
24 p0636 A79-46761
Investigation of the temperature distribution over the width of the screen of low-temperature solar water heaters with tubular heat receivers
24 p0637 A79-46909

UMEMORI, T.
Development of a DC linear motor. II
24 p0707 A79-52800

UMESH, G.
Performance of solar concentrators - A theoretical study
21 p0135 A79-17453
Periodic heating/cooling by solar radiation
21 p0140 A79-17491

UMOTO, J.
Three-dimensional effects of electrode configuration on diagonal MHD generator performance
22 p0283 A79-26523
A new three-dimensional equivalent circuit of diagonal type MHD generator
24 p0605 A79-44914
Application of finite element method to analysis of MHD generators
24 p0653 A79-50001

UNDERHILL, B.
Recommended performance standards for electric and hybrid vehicles
[SAN-1335-1] 21 p0195 N79-12450

UNKEL, W. C.
Axial field limitations in MHD generators
[FE-2341-8] 22 p0362 N79-20512

UNNEWEHR, L. E.
Pulse characteristics of sodium sulfur cells for electric vehicle propulsion
21 p0009 A79-10082

UNNY, T. E.
Methods for reducing heat losses from flat plate solar collectors, phase 2
[COO-2597-4] 21 p0188 N79-11533

UNO, F.
High efficiency solar panel /HESP/
23 p0503 A79-40951

UNO, F. M.
High Efficiency Solar Panel (HESP-2)
[AD-A065009] 23 p0544 N79-22642

UNTERBERG, W.
Development of a dual-medium thermal storage system for solar turbo-electric power generation
23 p0429 A79-35051

UO, K.
Confinement of ohmically heated plasmas in Heliotron D
23 p0390 A79-33346

UPSHAW, G. A.
Design study of coal-fired cored brick regenerative heat exchangers
23 p0532 A79-42983

UPTON, C. W.
Impact of electric passenger automobiles on utility system loads, 1985 - 2000
[EPRI-EA-623] 21 p0203 N79-13281

URDANETTA-BOHORQUEZ, A. H.
Energy and economic analysis of industrial process heat recovery with heat pumps
22 p0331 N79-16210

URI, N.
Reexamination of the estimation of undiscovered oil resources in the US
[DOE/EIA-0103/31] 24 p0781 N79-32618

URI, N. D.
The impact of price expectations on the demand for electrical energy in the United States
23 p0447 A79-37286

URIE, H. W.
Explanation for low-efficiency Cu2O Schottky-barrier solar cells
22 p0256 A79-22859

USELMAN, J.
Radioisotope-powered photovoltaic generator
23 p0423 A79-34285

USHER, H.
Thermal performance evaluation of the Calmac (liquid) solar collector
[NASA-CR-150819] 21 p0173 N79-10521

USHER, L. H.
Cost effective solar collector performance testing under combined indoor and outdoor conditions
23 p0430 A79-35063

USHIBA, K. K.
A 5-MW acid fuel cell power plant featuring high temperature steam reforming of No. 2 fuel combined with autothermal reforming
24 p0681 A79-51811

USHIYAMA, I.
The development of wind power plants in Japan
23 p0482 A79-40105

USMANI, I. H.
Characteristics of a typical village in the solar belt of the developing countries of Asia, Africa, and Latin America
23 p0571 N79-25497

USNICK, G. B.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181

USOV, V. G.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

USPENSKAIA, G. L.
Axial interelectrode breakdown in MHD channels
23 p0392 A79-33401

UZIEL, M.
Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665

V

VACHON, R. I.
A reflecting radiation trap for producing higher temperatures in flat-plate solar collectors
23 p0530 A79-42895

VAIDYANATHAN, H.
Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826

VAIL, Y. K.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

VAILL, R. E.
Design and cost study of a nickel-iron oxide battery for electric vehicles. Volume 2: Public report
[ANL-K-3723-VOL-1] 21 p0222 N79-14579

VAINER, A. A.
Accuracy and energy characteristics of paraboloidal heliostat system
24 p0602 A79-44261

VAJK, J. P.
Financial/management scenarios for a satellite power system program
[AAS PAPER 78-144] 22 p0243 A79-21259
Financing alternatives for space industrialization
[AIAA PAPER 79-1389] 23 p0426 A79-34836

VALDEZ, H. B.
Controlling a wind generator for increased efficiency
21 p0113 A79-16743

VALDMANIS, IA. IA.
Optimality criteria in the compensation of the longitudinal boundary effect in induction MHD machines
22 p0298 A79-29277

VALENT, P. J.
Preliminary selection of anchor systems for ocean thermal energy conversion
23 p0437 A79-35846

VALENTINO, S. J.
Designing reliability into high-effectiveness industrial gas turbine regenerators
[ASME PAPER 79-GT-199] 23 p0380 A79-32456

VALFELLS, A.
The economics of upgrading geothermal steam by adiabatic compression
23 p0409 A79-34081

VALLANCE, J. K.
Reliability and durability of ceramic regenerators for gas turbine applications
21 p0050 A79-12823

VALLET, C. E.
Migrational polarization in high-current density molten salt electrochemical devices
21 p0039 A79-11811
Steady-state composition profiles in mixed molten salt electrochemical devices. II - Molten carbonate fuel cell analogs
22 p0305 A79-30333
Migrational polarization in high current density molten salt battery and fuel cell analogs
23 p0446 A79-37273

VAN ACKER, P.
Comparison of dust collection efficiencies of particulate emission samplers in a power plant burning fuel oil and coal fuel oil mixtures
24 p0616 A79-45749

VAN BUSSEL, G. J. W.
Windmills with increased power output due to tipvanes
23 p0405 A79-34045

VAN DEN BERG, J. H.
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107

VAN DER LEIJ, M.
Investigation and perspectives on iron oxide, zinc conversion coating, zinc oxide, cobalt oxide and tungsten oxide as spectral selective solar absorber surfaces
21 p0126 A79-17375
Spectral-selective surfaces for the thermal conversion of solar energy
23 p0523 A79-41732

VAN DER POT, B. J. G.
OTEC in Europe
21 p0152 A79-18109

VAN DUSEN, E. S.
A two dimensional vortex sheet model of a Savonius Rotor
22 p0278 A79-26178

VAN ESSEN, A. A.
Physical planning aspects of large-scale wind energy exploitation in the Netherlands
23 p0482 A79-40107

VAN GALEN, E.
The development of a storage system based on encapsulated p.c.m.-materials
23 p0470 A79-38639

VAN HEEK, K. H.
Materials, problems and research in German coal conversion projects
23 p0529 A79-42425

VAN HOLTEN, T.
Tipvane research at the Delft University of Technology
23 p0485 A79-40129

VAN HULSTEYN, D. B.
Two-dimensional monochromatic X-ray imaging of laser-produced plasmas
22 p0296 A79-28366

VAN KOPPEN, C. W. J.
Stratification effects in the short and long term storage of solar heat
21 p0121 A79-17326
The performance of the heating system in the solar house of the Eindhoven University of Technology
22 p0276 A79-25938

VAN LOOIJ, H.
Electrical power distribution subsystem
23 p0493 A79-40719

VAN MAL, H. H.
Model predictions for the stability of ternary metallic hydrides
21 p0038 A79-11802
Some applications of LaNi5-type hydrides
22 p0249 A79-21694

VAN MEERBERGEN, J.
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889

VAN METER, D. B.
Operation and emission of a stoker-fired boiler while burning refuse derived fuel and coal mixtures
[ASME PAPER 78-WA/APC-2] 21 p0158 A79-19735

VAN NICE, L. J.
Coal desulfurization test plant status - July 1977
21 p0044 A79-12118
Coal desulfurization
23 p0533 A79-43200

VAN OVERSTRAETEN, R.
Measurement of bandgap narrowing and diffusion length in heavily doped silicon
23 p0497 A79-40889
Screen printed contacts on silicon solar cells with low series resistance
23 p0506 A79-40977

VAN RIJSWICK, M. H. J.
Metal hydride electrodes for electrochemical energy storage
22 p0249 A79-21695

VAN SCIVER, S. W.
Refrigeration requirements for future superconductive energy related applications
22 p0311 A79-31019
Superconductive magnetic energy storage
24 p0631 A79-46309
Superconductive magnetic energy storage inductor converter units
24 p0654 A79-50072

VAN SWAAIJ, W. P. M.
Gasification of solid waste - Potential and application of co-current moving bed gasifiers
23 p0536 A79-43574

VAN TRAA-ENGELMAN, H. L.
Some observations of the legal implications relating to the use of solar energy
24 p0713 A79-53682

VAN VELZEN, D.
Problems around Fe-Cl cycles
22 p0238 A79-20771
Thermochemical hydrogen production by the Mark-13 process - A status report
24 p0686 A79-51849

VAN WYK, J. D.
Source tracking and power flow control of terrestrial photovoltaic panels for concentrated sunlight
23 p0509 A79-40999

VANBASSHUYSEN, R.
Update of development on the new Audi NSU rotary engine generation
22 p0329 N79-15965

VANCE, J. M.
Energy storage by flywheels - A new flywheel concept
23 p0416 A79-34139

VANCE, R. W.
Applications of cryogenic technology. Volume 7 - Proceedings of the Conference on Cryogenic Energy Systems, Oak Brook, Ill., May 16-18, 1978
22 p0289 A79-27651

VANDENBRAAK, H. J.
Experiences related to GEOS thermal control
24 p0763 N79-31269

VANDENPLAS, P. E.
Magneto-acoustic resonance heating in the ion-cyclotron frequency domain
22 p0271 A79-24866

VANDER AREND, P. C.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303

VANDER PLAS, H. A.
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025

Performance of AlGaAs/GaAs terrestrial concentrator solar cells
23 p0514 A79-41038

VANDERBORGH, N. E.
Underground thermal generation of hydrocarbons from dry, southwestern coals
21 p0005 A79-10050
Electrochemical engines for power generation and load-leveling at sites for underground coal conversion
21 p0005 A79-10051

VANDERPLAS, H. A.
High performance GaAs photovoltaic cells for concentrator applications
[SAND-78-7018] 21 p0187 N79-11521

VANDERWERF, D. F.
Linear echelon refractor/reflector solar concentrators
22 p0293 A79-28143

VANDEVENDER, S. G.
Solar powered irrigation systems
23 p0403 A79-34030
Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566

VANDUSEN, E. S.
Two-dimensional analysis of vertical axis windmills
22 p0353 N79-19446

VANHEEK, K. H.
Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat
[BMFT-FB-T-78-29] 24 p0780 N79-32394

VANKAR, V. D.
Stoichiometric Cu2S thin films for solar cells
21 p0123 A79-17349

VANLOON, H.
Multidisciplinary research related to the atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679

VANMETER, D. B.
Source emissions factors for refuse derived fuels
21 p0082 A79-15084

VANSANT, J. H.
A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123

VANT-HULL, L.
An analysis of the terminal concentrator concept for solar central receiver systems
24 p0641 A79-47792

VANTREUREN, K. W.
Sooting characteristics of liquid pool diffusion flames
[AD-A064111] 23 p0539 N79-22252

VARADY, J. M.
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380

VARDE, K. S.
Partial energy supply to electric vehicles through solar cell system
21 p0077 A79-14767
Extraction of sensible heat from waste water for domestic heating applications
23 p0418 A79-34152

VARGA, P.
Comparison of collector test methods
[ASSA-SE-E24/77] 23 p0574 N79-25526

VARGANOVA, L. F.
Hybrid reactor based on laser-induced thermonuclear fusion
21 p0032 A79-10658

VARLET GRANCHER, C.
Efficiency of sugar cane and cowpea as solar energy converters
21 p0125 A79-17368

VARLEY, J. S.
Energy analysis of wave and tidal power
23 p0455 A79-37918

VARMA, A. K.
Modeling two-phase flow in a swirl combustor
22 p0280 A79-26189

VARNADO, S. G.
Solar powered irrigation systems
23 p0403 A79-34030
Prospects of generating power with particle-beam-drive inertial confinement fusion
23 p0407 A79-34063
Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807

VARSI, G.
Feasibility of rocket propellant production on Mars
21 p0047 A79-12324

VARTANIAN, A. V.
Controlling the radiant flux of a high-temperature solar energy conversion system over two parameters
22 p0296 A79-28669
Combined radiant-flux controller for a high-temperature solar energy system
23 p0433 A79-35382
Control of the radiant flux of high-temperature solar-energy installations with respect to two parameters
24 p0637 A79-46907
Combination radiant-flux radiator for high-temperature solar plant
24 p0663 A79-50705

VASAGAM, R. M.
Enhanced power generation by optical solar reflectors on geostationary spinners
22 p0272 A79-25138

VASCONCELOS NUNES, M. A.
New energy sources - An option for the energy crisis
23 p0388 A79-33256

VASEASHTA, A. K.
Determination of the minority carrier diffusion length in silicon solar cells
23 p0528 A79-42248

VASILEV, V. P.
Induced fields during the motion of a conducting medium in the field of an air-core magnetic system
24 p0650 A79-49373

VASILEVA, I. A.
Plasma diagnostics in an MHD installation
21 p0106 A79-16492

VASILEVSKII, M. A.
Dynamic stabilization of toroidal discharges in weak longitudinal magnetic fields
22 p0324 A79-31766

VASSEUR, G.
Determination and interpretation of the geothermal flux at Bournac /Haute-Loire/
23 p0480 A79-39850

VASU, K. I.
Spectral selective properties of black chrome and nickel electrodeposited coatings for solar absorber
21 p0127 A79-17383

VASUDEVAN, N.
New processes for black coatings useful in harnessing solar energy. I - A room temperature black chromium plating bath
21 p0127 A79-17379

VAUGE, C.
Simulation and cost of photovoltaic generators
21 p0122 A79-17334

VAUGHAN, D. A.
Chloride corrosion and its inhibition in refuse firing
21 p0080 A79-14930
Corrosion and deposits from combustion of solid waste. VI - Processed refuse as a supplementary fuel in a stoker-fired boiler
[ASME PAPER 78-WA/FU-4] 21 p0160 A79-19788
Handling and co-firing of shredded municipal refuse and coal in a spreader-stoker boiler
23 p0488 A79-40391

VAZQUEZ-LOPEZ, C.
Study of the interface changes during operation of n CdTe-electrolyte solar cells
24 p0637 A79-47054

VECCHI, M. P.
Integrated tandem solar cells
23 p0439 A79-36635

VECCHIA, P.
Problems and prospectives on solar energy utilization
[ISS-P-78/1] 24 p0742 N79-29667

VEEFKIND, A.
Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524
Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418

Noble gas MHD generator experiments at low stagnation temperatures
23 p0394 A79-33419

Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758

VEHRENCAMP, J. E.
Electromagnetic radiation energy arrangement
[NASA-CASE-NOO-00428-1] 22 p0352 N79-19186

VEILLETTE, D.
Contribution to the development of wind energy systems using static power electronic converters
22 p0286 A79-26958

Control strategy for a variable-speed wind energy conversion system
22 p0303 A79-29800

VELIKHOV, E. P.
Controlled thermonuclear fusion
22 p0287 A79-27339

VELKOFF, H.
An introduction to the variable inertia flywheel /VIF/
[ASME PAPER 79-APM-5] 22 p0258 A79-29064

VELTHUYS, B. V.
Biological solar energy conversion approaches to overcome yield stability and product limitations
[PB-284823/2] 21 p0199 N79-12577

VELUPILLAI, D.
Satellite power for the 1980s
23 p0522 A79-41208

VELZY, C. O.
Oceanside Disposal Plant improvement program - Design, construction and operating experience
23 p0491 A79-40425

30 years of refuse-fired boiler experience
23 p0523 A79-41374

VENEMA, W. J.
Electronic states of concentrated Pd-H alloys from de Haas-van Alphen measurements
22 p0248 A79-21686

VENEZIANI, P.
Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias
[E79-10238] 24 p0747 N79-30599

VENKATESH, A.
Performance of an intermittent ammonia-water solar refrigerator operating with a flat plate collector
23 p0466 A79-38607

VENKATESWARAN, S. R.
Solar thermal systems long-term performance predictions using closed-form solutions
24 p0672 A79-51740

VENTURA, L. M.
The development of alternate combustibles for diesel engines
23 p0385 A79-33227

VERHOLEK, M. G.
Preliminary results of a field experiment to characterize wind flow through a vertical plane
[PNL-2518] 21 p0203 N79-13322

VERKIN, B. I.
Studies of cryogenic liquid boiling in centrifugal acceleration fields
23 p0530 A79-42893

VERMA, A.
Small-scale coal-gasification plants
24 p0647 A79-49158

VERMA, M. L.
Effect of buoyancy and tube inclination on heat transfer in a solar air heater
21 p0129 A79-17402

VERMA, V. K.
Design, construction and performance of Fresnel lens for solar energy collection
21 p0136 A79-17456

VERMA, V. V.
Design of radiometer for measurement of total and net exchange solar radiation
21 p0119 A79-17307

VERMES, G.
Thermophoresis - Enhanced deposition rates in combustion turbine blade passages
[ASME PAPER 78-WA/GT-1] 21 p0160 A79-19790

VERNEAU, A.
Use of organic fluids in solar turbines
22 p0269 A79-24621

VERSAILLES, C. A.
Modification and evaluation of a small station wagon designed for transportation of the handicapped
[PB-295106/9] 24 p0763 N79-31107

VERZAKOV, V. N.
An investigation of the formation of oxides of nitrogen in a pulverised coal flame
23 p0474 A79-38865

VEZILIER, J.-C.
The use of solar energy to provide heat and hot water for the students' residence of the Ecole des Mines in Ales, France
24 p0603 A79-44298

VEZIROGLU, T. N.
Miami International Conference on Alternative Energy Sources, Miami Beach, Fla., December 5-7, 1977, Proceedings of Condensed Papers
21 p0076 A79-14760

International Symposium-Workshop on Solar Energy, Cairo, Egypt, June 16-22, 1978, Symposium Lectures
21 p0102 A79-16451

Principles of solar cooling and heating
21 p0103 A79-16457

Application of solar cooling for a school building in subtropics
21 p0103 A79-16461

Solar-hydrogen energy system and solar-hydrogen production methods
21 p0104 A79-16463

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 1 - Solar energy 1
23 p0398 A79-33984

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 2 - Solar energy 2
23 p0400 A79-34002

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 3 - Solar Energy 3
23 p0402 A79-34022

Direct Solar Energy Conversion at Sea /DSECAS/ - Characteristics of a baseline concept
23 p0402 A79-34026

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 4 - Indirect solar energy
23 p0404 A79-34036

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 6 - Geothermal energy and hydropower
23 p0408 A79-34067

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 7 - Hydrocarbon conversion technology
23 p0410 A79-34086

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 8 - Hydrogen energy
23 p0413 A79-34106

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 9 - Energy delivery, conservation, and environment
23 p0416 A79-34131

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 10 - Energy economics and policy
23 p0419 A79-34158

Alternative energy sources; Proceedings of the Miami International Conference, Miami Beach, Fla., December 5-7, 1977. Volume 11 - Index
23 p0422 A79-34182

Hydrogen energy system concept and engineering applications
23 p0451 A79-37874

VIALARET, G.
Concentrated silicon solar cells: Basic design - Application example
23 p0384 A79-32970

Analysis of a 1 kW photovoltaic generator with concentration
23 p0466 A79-38604

VIALARON, A. C.
Production of hydrogen by a thermo-electrochemical cycle using solar energy
23 p0383 A79-32966

VIALARON, A.-C.
A hybrid chemical concept for solar energy storage
22 p0254 A79-22271

VIDEM, K.
Electrochemical utilization of metal hydrides
22 p0251 A79-21709

VIDZHAINDU, G. P. N.
Determination of the design states of a complex system in evaluating the reliability of electrical power supply
24 p0646 A79-48826

VIEGAS ASSUMPCAO, R. H.
Observations on the production of methanol and anhydrous ammonia from wood
23 p0386 A79-33230

VIELSTICH, W.
The anodic oxidation of ethyleneglycol at platinum, gold and Pt/Au-alloys in alkaline solution
21 p0037 A79-11795
Recent advances in electrocatalysis and their implications for fuel cells
21 p0038 A79-11807

VIEUX-ROCHAS, L.
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971

VIJ, S. K.
Geometrical aspects of a cylindrical parabolic collector
21 p0134 A79-17443

VIKHREV, V. V.
Structure of the current shell in a Z pinch
22 p0245 A79-21434

VIKTOROVITCH, P.
Schottky and MIS tunnel diodes based on photovoltaic-quality hydrogenated amorphous silicon prepared by cathodic sputtering - Electrical characterization on the basis of capacitative measurements
23 p0384 A79-32971

VILLERMAUX, J.
Solar chemical reactors
23 p0462 A79-38572

VILNITIS, A. IA.
Accounting for the effect of a yoke in an MHD linear induction machine by stipulating boundary conditions of a new kind
22 p0247 A79-21627

VINUKTA, D.
Integrating wave power into the electricity supply system
21 p0152 A79-18117

VINCENT, S. P.
Performance optimization of an OTEC turbine
24 p0618 A79-45793

VINDELOV, K. E.
Formation of thin Cu2S /chalcocite/ films using reactive sputtering techniques
23 p0445 A79-37156

VINOGRADOVA, E. B.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
Dependence of the photoelectric parameters of photovoltaic cells on illuminance
24 p0647 A79-49181

VINZ, P.
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730

VISENTIN, A.
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588

VISENTIN, R.
Influence of emissivity and pipe size on thermal losses of linear collectors measured under different vacuum conditions
23 p0464 A79-38588
Design problems of the hydraulic network in a linear collector power plant
23 p0464 A79-38591
Double-layer selective coating, high-temperature resistant, for the conversion of solar energy into heat
23 p0478 A79-39695

VISKANTA, R.
Some aspects of the transient response of a flat-plate solar energy collector
21 p0153 A79-18466
Slag transport models for radiant heater of an MHD system
[ASME PAPER 78-WA/HT-21] 21 p0161 A79-19808
Heat transfer in a solar radiation absorbing fluid layer flowing over a substrate
22 p0281 A79-26204
Latent heat-of-fusion energy storage - Experiments on heat transfer from cylinders during melting
[ASME PAPER 78-HT-47] 24 p0647 A79-49136

VISWANATHAN, B.
The lithium-thionyl chloride battery - A review
23 p0487 A79-40370

VISWANATHAN, S.
Performance characteristics of nickel-zinc electric vehicle battery
24 p0683 A79-51826

VISWANATHAN, T. L.
Sensitivity calculations for the design of solar cells. I - Schottky barrier devices
21 p0125 A79-17360

VITANOV, T.
Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes
22 p0245 A79-21482

VITORELLO, I.
Heat flow and radiogenic heat production in Brazil with implications for thermal evolution of continents
22 p0373 N79-21689

VITRAY, E.
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538

VITTITOE, C. N.
Helios model for the optical behavior of reflecting solar concentrators
[SAND-76-0347] 24 p0774 N79-31806

VLASOV, S. N.
Gyrotrons for the electron-cyclotron plasma heating in large tokamaks
24 p0607 A79-45034

VOELKER, H.
Solar energy and heat insulation
22 p0268 A79-24321

VOGEL, G. J.
Factors limiting limestone utilization efficiency in fluidized-bed combustors
21 p0008 A79-10069
Limestone SO2 reactivity and causes for reactivity loss during multi cycle utilization
21 p0065 A79-14121

VOGT, D. P.
Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541
Energy availabilities for state and local development: 1974 data volume
[ORNL/TM-5890-S3] 21 p0175 N79-10542
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511

VOGT, J. F.
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
21 p0027 A79-10226
Determining the reliability of radioisotope thermoelectric generators /RTGs/ designed for terrestrial and undersea applications
22 p0261 A79-23622
Recent terrestrial and undersea applications of radioisotope thermoelectric generators /RTGs/
22 p0261 A79-23623

VOGT, W. G.
Modeling and simulation. Volume 9 - Proceedings of the Ninth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 27, 28, 1978. Part 1 - Energy and power system modeling - Ecological and biomedical modeling. Part 2 - Socioeconomic modeling. Part 3 - Control and identification. Part 4 Methodology and applications
22 p0263 A79-23776

VOJDANI, S.
Solar energy R&D in Iran - The approach and the philosophy
21 p0117 A79-17284
Solar thermal electrical power plants for Iran
22 p0295 A79-28352

VOLDEK, A. I.
Theoretical and computational analysis of MHD machines with two-layer windings and half-filled slots and the inductor edges
22 p0298 A79-29286
Theoretical and calculational investigation of MHD machines with two-layer windings and half-filled slots around the edges of the inductor
24 p0663 A79-50776

VOLKMANN, D. J.
Capital investment for transition to new energy supply systems
23 p0480 A79-39993
The capital stake in the transition to new energy systems. II
23 p0535 A79-43522

VOLKOV, V. N.
Accelerated testing of the optical radiation resistance of profiled polyethylene sleeves and sheets under natural climatic conditions
23 p0433 A79-35383
Accelerated investigation of the light resistance of shaped polyethylene tubes and sheets under natural climatic conditions
24 p0663 A79-50706

VOLLAN, A. J.
The aeroelastic behaviour of large Darrieus-type wind energy converters derived from the behaviour of a 5,5 m rotor
23 p0483 A79-40118

VOLOSHINA, L. G.
Investigation of extruded sintered-nickel-powder porous materials used as electrodes in fuel cells
23 p0433 A79-35343
Application of extruded porous materials from sintered nickel powder as fuel cell electrodes
24 p0637 A79-46896

VOLOVIK, A. V.
High-temperature oxidizer preheater
21 p0106 A79-16487

VOLTZ, S. E.
Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor
23 p0492 A79-40454

VON BASSEWITZ, H.
Development and testing of the ULP solar array
21 p0029 A79-10245

VON BRADKE, M.
State of cermet electrode development for flame heated thermionic converters
24 p0700 A79-51989

VON HATTEN, P. P.
Sensible heat storage for solar energy applications
22 p0322 A79-31449

VON KRIES, W.
Institutional issues in international solar energy utilization
[IAF PAPER 79-IISL-02] 24 p0711 A79-53453

VON ROOS, O.
A simple theory of back-surface-field /BSF/ solar cells
24 p0637 A79-47051
Extension of a theorem used in the investigation of P-N junctions with the scanning electron microscope to arbitrary geometries and arbitrarily inhomogeneous material
24 p0648 A79-49211

VON ROSENBERG, C. W., JR.
Shock tube studies of coal devolatilization
21 p0083 A79-15247

VON WALDKIRCH, T.
Hydrides of rare earth-nickel compounds - Structure and formation enthalpies
22 p0250 A79-21697

VON WIENSKOWSKI, J.
Selective solar absorbers
21 p0057 A79-13646

VONRAD, U.
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592

VORA, M. K.
Low-Btu gas from the IGT ash-agglomeration gasification process
21 p0009 A79-10077
IGT U-GAS pilot plant developments
24 p0688 A79-51861

VORONOV, G. S.
Properties of the plasma ions and the particle lifetime in ohmic heating in the L-2 stellarator
22 p0244 A79-21428

VOROSMARTY, C. J.
Environmental impacts of industrial energy systems in the coastal zone
21 p0075 A79-14722

VOS, J.
Design characteristics of an advanced Stirling engine concept
24 p0690 A79-51889

VOSS, E.
Progress in batteries and solar cells. Volume 1
21 p0148 A79-17989

VOSS, W. C.
The H-Coal processes: A status report
23 p0593 N79-27617

VRABLE, D. L.
High efficiency thermal energy storage system for utility applications
21 p0012 A79-10102
Energy distribution and storage alternates with a centralized heat source
21 p0013 A79-10112

VRANOS, A.
Liquid-phase reactions of vaporizing hydrocarbon fuels
21 p0052 A79-12987
Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050

VUKOVICH, F. M.
Large cold tongues in the eastern Gulf of Mexico and their potential effect to OTEC
24 p0617 A79-45782

VULETIN, J.
Temperature dependence of selective properties for black chromium solar absorbers
23 p0465 A79-38600

VYAS, Y. K.
The external combustion steam injected gas turbine for cogeneration
21 p0012 A79-10100

VYLKOVA, S.
The chemical stability of kerosene fractions
23 p0529 A79-42275

W

WACHTELL, G. P.
Gravity opposed heat pipe
24 p0624 A79-45842

WACHTER, R. A.
Source assessment: Water pollutants from coal storage areas
[PB-285420/6] 21 p0223 N79-14635
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429

WADDELL, B. V.
Non-linear numerical algorithms for studying tearing modes
22 p0257 A79-22981

WAGER, J. F.
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680

Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011

WAGNER, H. J.
Energy analysis of low-temperature solar energy systems
23 p0473 A79-38670

WAGNER, N. P.
Technical and economic factors for evaluating flue gas desulfurization technologies
23 p0424 A79-34458

WAGNER, S.
n-CdS/n-GaAs photoanode
21 p0037 A79-11784
High efficiency solar cells based on indium phosphide
21 p0042 A79-11968
A combined irradiance-transmittance solar spectrum and its application to photovoltaic efficiency calculations
23 p0382 A79-32723

WAGNER, W. B.
A high-efficiency GaAlAs double-heterostructure photovoltaic detector
21 p0154 A79-18489

WAGONER, D. E.
Pollutants from synthetic fuels production: Facility construction and preliminary tests
[PB-287730/6] 22 p0339 N79-17027

WAHLIG, M.
The circumsolar measurement program - Assessment of the effects of atmospheric scattering on solar energy conversion
21 p0082 A79-15077

WAIBEL, R. T.
Development of combustion data to utilize low-Btu gases as industrial process fuels
[FE-2489-30] 23 p0576 N79-26143
Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner
[FE-2489-36] 24 p0795 N79-33340

WAINAUSKI, H. S.
Wind tunnel tests of a 1/30 scale model of a 3.5 megawatt wind turbine
24 p0703 A79-52012

WAKE, S. J.
Operation and analysis of a vertical axis wind turbine
24 p0677 A79-51776

WAKEFIELD, G. F.
Thin tandem junction solar cell
23 p0521 A79-41092

WAKERLEY, D. S.
The microbial production of methane from the putrescible fractions of sorted household waste
23 p0356 A79-33753

WAKIM, F. G.
Photovoltaic effect in metal-insulator-semiconductor structure
21 p0123 A79-17343

WAKSMAN, D.
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543
Provisional flat plate solar collector testing procedures
[PB-283721/9] 21 p0198 N79-12571

WALD, D. A.
Selenide thermoelectric converter technology
21 p0026 A79-10221

WALD, F. V.
Large area silicon sheet by EFG
21 p0123 A79-17340
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084
Large area silicon sheet by EFG
[NASA-CR-158379] 22 p0359 N79-20483

WALDRON, K. J.
Design considerations of small solar collector systems using plane heliostats
[ASME PAPER 79-SOL-2] 22 p0307 A79-30540

WALDRON, R. D.
Commercial prospects for extraterrestrial materials
23 p0395 A79-33748

WALES, C. P.
Improvements in the lead-acid battery for load leveling applications
[AD-A068990] 24 p0724 N79-28744

WALKDEN, B. W.
The effect of protons electrons and photons on the performance of some new types of high efficiency solar cells
23 p0498 A79-40897

WALKER, B. J.
Factors influencing solar energy commercialization
21 p0093 A79-15897

WALKER, B. V.
Transport fuels from natural gas
22 p0292 A79-27897

WALKER, D. H.
The NTS-2 satellite solar cell experiment
21 p0001 A79-10016
Solar cell experiments on the NTS-2 satellite
23 p0497 A79-40895
An interim report on the NTS-2 solar cell experiment
24 p0784 N79-32656

WALKER, F. E.
CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659

WALKER, G.
Elementary design guidelines for Stirling engines
24 p0689 A79-51874

WALKER, G. H.
Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C
24 p0668 A79-51008
Radiation damage in GaAs solar cells
24 p0785 N79-32663

WALKER, M. S.
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309

WALKER, P.
Electric power from laser fusion - The HYLIFE concept
21 p0030 A79-10249
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524

WALKER, W. E.
Measurement of heat loss from a heat receiver assembly of a Fixed Mirror Solar Concentrator
21 p0020 A79-10166

WALKUP, P. C.
Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327

WALLACE, W. E.
Structure and bonding in metal hydrides
22 p0247 A79-21679
Magnetic and electrical properties of rare earth and rare earth intermetallic hydrides
22 p0249 A79-21692
Rare earth and actinide intermetallics as hydrogenation catalysts
22 p0251 A79-21713

WALLENSTEIN, A. R.
Barriers and incentives to solar energy development. An analysis of legal and institutional issues in the Northeast
[NESEC-1] 24 p0726 N79-28765

WALLY, K.
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565

WALON, M.
An oil company expresses interest in solar energy
23 p0434 A79-35478

WALSH, B.
Engine technology for production turbofan engines
22 p0270 A79-24827

WALSH, D.
Silicon solar cells for operation in concentrated sunlight
23 p0441 A79-36780

WALSH, J. P.
OTEC ocean engineering progress report
24 p0617 A79-45783

WALTER, R. A.
The emissions and fuel economy of a Detroit diesel 6-71 engine burning a 10-percent water-in-fuel emulsion
[AD-A058550] 21 p0203 N79-13375
Proceedings of symposium on water-in-fuel emulsions in combustion
[AD-A061503] 22 p0338 N79-17019

WALTERS, C. T.
Magnetically confined plasma solar collector
21 p0109 A79-16617

WALTERS, D.
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots
[NASA-CR-162359] 24 p0798 N79-33567

WALTERS, R. A.
Underground coal gasification research at the University of New Mexico
21 p0032 A79-10523

WALTON, D.
Design analysis of a vertical axis wind turbine
23 p0472 A79-38656

WALTON, G. N.
Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522

WALTON, R.
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337
Fact sheet: Forecasted automobile gasoline consumption
[DOE/EIA-0102/1] 24 p0746 N79-30402
Regional residential sector energy price forecasts for 1978: Electricity, natural gas, number 2 fuel oil, and propane
[DOE/EIA-0102/46] 24 p0762 N79-31083

WALTON, H. L.
Solar water and space heating systems - Cost effective choices and economic impact of various incentive policies
23 p0403 A79-34032

WALTON, J. D.
A ceramic heat exchanger for a Brayton cycle solar electric power plant
22 p0239 A79-20822

WALTON, J. D., JR.
Preliminary results from the Georgia Tech 400 kWth Solar Thermal Test Facility
21 p0141 A79-17499

WALTON, J. J.
Wind energy assessment
23 p0406 A79-34051

WALTZ, R. E.
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153
Empirical scaling laws for energy confinement in ohmically-heated tokamaks
22 p0253 A79-22240

WALZER, P.
Ceramic components for vehicular gas turbines
21 p0034 A79-11150
Development of multi-density silicon nitride turbine rotors
21 p0050 A79-12832

WANDER, S. M.
Program to establish ceramic technology readiness for large combustion turbine utility application
[ASME PAPER 78-WA/GT-6] 21 p0160 A79-19796

WANG, E. Y.
Cuprous oxide photovoltaic cells
23 p0499 A79-40908
Photovoltaic properties of In203/semiconductor heterojunction solar cells
23 p0505 A79-40968
Cuprous oxide photovoltaic cells
[PB-290529/7] 23 p0565 N79-24514
Cuprous oxide photovoltaic cells
[CONF-780619-16] 24 p0753 N79-30777

WANG, F. T.
Environmental investigations of in situ coal gasification experiments
24 p0664 A79-50880

WANG, H. F.
Thermoelastic solutions for in-situ gasification of coal
22 p0330 N79-16135

WANG, J.
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632

WANG, L. K.
The Geysers geothermal area emissions and aerometric data base and air quality analysis
23 p0534 A79-43373
Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants
24 p0629 A79-46228

WANG, M. H.
Mathematical modeling of electrical energy consumption and heating requirements by municipal wastewater treatment plants
24 p0629 A79-46228

WANG, M. Y.
Particle orbits in field-reversed mirrors
22 p0253 A79-22239

WANG, P. N.
Wind power from a vortex chamber
22 p0319 A79-31425

WANG, S. T.
Cryogenic aspects of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15303
Fabrication experiences and operating characteristics of the U.S. SCMS superconducting dipole magnet for MHD research
21 p0084 A79-15304

WANG, S.-T.
A superconducting dipole magnet system for the MHD facility at Univ. of Tennessee Space Institute
21 p0017 A79-10140
A superconducting dipole magnet for the UTSI MHD Facility
22 p0235 A79-20533

WANG, Y.
An analysis of the dependence of thermal transport parameters on organic content for Green River oil shales
23 p0440 A79-36678

WANZL, W.
Materials, problems and research in German coal conversion projects
23 p0529 A79-42425

WARABISAKO, T.
Comparison between epitaxial and diffused solar cells on crystalline substrates grown from metallurgical-grade silicon
23 p0504 A79-40958

WARCHOL, E. J.
Wind power potential in the Pacific Northwest
22 p0244 A79-21334

WARD, D. S.
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483
Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors
22 p0285 A79-26815
Solar absorption cooling feasibility
22 p0295 A79-28358
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629

WARD, I. C.
A preliminary feasibility study into the use of solar energy to provide year-round heating for a factory unit
23 p0471 A79-38647

WARD, J. C.
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
21 p0139 A79-17483
Design considerations for residential solar heating and cooling systems utilizing evacuated tube solar collectors
22 p0285 A79-26815
Integration of evacuated tubular solar collectors with lithium bromide absorption cooling systems
23 p0439 A79-36629

WARD, J. J.
Integrated power unit
[AD-A066543] 23 p0569 N79-25396

WARDE, C. J.
100MWh zinc-chlorine peak-shaving battery plants
21 p0011 A79-10096
The zinc-chlorine battery in the BEST facility - 1981
24 p0703 A79-52013
WARFIELD, G.
Solar energy research, development and demonstration program in Kuwait
21 p0117 A79-17282
Zn3P2 - A promising photovoltaic material
23 p0502 A79-40927
WARKOV, S.
Regional viability and solar commitment - An early adopter study
23 p0404 A79-34034
WARMBRODT, W.
Aeroelastic response and stability of a coupled rotor/support system with application to large horizontal axis wind turbines
22 p0332 N79-16346
WARNE, D. F.
Design and application of large wind turbine generators
22 p0326 A79-31916
WARNER, G. H.
Estimates of New Mexico's future oil production including reserves of the 50 largest pools
[PB-291780/5] 23 p0540 N79-22597
WARNER, J. P.
Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor
23 p0492 A79-40454
WARNER, R. J.
Computer simulation and design of the control system for a wind turbine generator
[ASME PAPER 79-DE-9] 24 p0641 A79-47652
WARNOCK, J. G.
Selection of optimum sites for tidal power development in the Bay of Fundy
21 p0152 A79-18110
Influence of technological advances on potential tidal power development
23 p0450 A79-37865
WARREN, A. W.
SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241
An expanded system simulation model for solar energy storage (technical report), volume 1
[NASA-CR-159601] 24 p0804 N79-33881
An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884
WARSHAY, M.
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809
Commercial phosphoric acid fuel cell system technology development
[NASA-TM-79169] 23 p0571 N79-25500
WARTANOWICZ, T.
Optimization method of isotopic thermoelectric microgenerator geometry
22 p0260 A79-23613
WASHBURN, J.
Microstructure of a black chrome solar selective absorber
24 p0655 A79-50182
WATANABE, T.
Highly efficient quantum conversion at chlorophyll a-lecithin mixed monolayer coated electrodes
22 p0273 A79-25548
WATERBURY, G. R.
Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments
[LA-7033-PR] 21 p0232 N79-15783
WATERS, D. R.
Honeywell General Offices solar HVAC system
23 p0401 A79-34018
WATERS, E. D.
A thermal energy storage system for a Stirling engine powered highway vehicle
24 p0680 A79-51803
WATERS, M. D.
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
WATERS, P.
Degradation of polymethylmethacrylate by radiation
23 p0431 A79-35074
WATKIN, K.
Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782
WATKINS, J. L.
Sandia's photovoltaic test experience
23 p0428 A79-35040
Real-time environmental and performance testing of concentrating photovoltaic arrays
23 p0496 A79-40887
The effect of solar cell parameter variation on array power output
23 p0517 A79-41059
Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527
Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796
WATSON, G. R.
The design construction and proving of a low cost 5kW wind powered turbine for isolated applications
23 p0452 A79-37893
WATSON, H. C.
Some problems and benefits from the hydrogen fueled spark ignition engine
21 p0016 A79-10130
WATSON, J. J.
Energy consumption of environmental controls - Fossil fuel, steam electric generating industry
21 p0064 A79-14112
WATSON, J. S.
Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743
WATSON, K.
Geologic applications of thermal-inertia mapping from satellite
[E79-10279] 24 p0796 N79-33518
WATTS, A.
A 200kW vertical axis wind turbine - Results of some preliminary tests
23 p0484 A79-40123
Magdalen Islands VAWT field test
24 p0635 A79-46543
WATTS, A. W.
A proposed conceptual plan for integration of wind turbine generators with a hydroelectric system
21 p0098 A79-16107
Wind/hydro generation assessment
24 p0634 A79-46535
WAX, C. L.
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446
WAY, S.
A proposed 40 MWe MHD pilot plant
21 p0017 A79-10137
Application of a hot air turbine for efficiency improvement in MHD/steam power plants
[ASME PAPER 79-GT-36] 23 p0375 A79-32341
WAYMAN, M.
Liquid fuels from carbonates by a microbial system
23 p0494 A79-40742
Material and energy balances in the production of ethanol from wood
23 p0495 A79-40745
Material and energy balances in the production of ethanol from wood
[CONF-7806139-1] 23 p0589 N79-27338
WAYNE, H.
Energy on the horizon
23 p0529 A79-42458

WEAKLIEM, H. A.
Temperature dependence of the optical properties of silicon
23 p0437 A79-35820

WEATHERS, H. M.
Rankine cycle machines for solar cooling
[NASA-TM-78196] 21 p0173 N79-10524

WEAVER, H. T.
Minority carrier lifetimes in silicon solar cells determined from spectral and transient measurements
24 p0705 A79-52321

WEAVER, P.
Photobiological production of hydrogen: A solar energy conversion option
[SERI/TR-33-122] 24 p0767 N79-31422

WEBB, G. B.
Engineering and bench-scale studies of the sulfur-iodine cycle at General Atomic
21 p0015 A79-10127

WEBB, R. L.
Energy conservation via heat transfer enhancement
24 p0630 A79-46307
Energy conservation via heat transfer enhancement
[COO-4649-3] 24 p0758 N79-30819

WEBER, E. R.
Photovoltaics and environmental impact considerations
23 p0571 N79-25496

WEBER, H. E.
High efficiency wave engine
22 p0279 A79-26187

WEBER, H. I.
Storage of mechanical energy with flywheels - A new design concept for electric trolleybuses
23 p0387 A79-33245

WEBER, M. J.
Requirements and new materials for fusion laser systems
21 p0082 A79-15138

WEBER, N.
Research on the sodium heat engine
21 p0028 A79-10231

WEBER, R. J.
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0154 N79-12086

WEBER, W. H.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181

WEBSTER, W. H.
Battery and electrochemical systems program summary, FY 1977
[DOE/ET-0014] 21 p0176 N79-10546

WEDDIGEN, G.
Recent advances in Na/S cell development - A review
22 p0246 A79-21488

WEDEL, R. K.
An approximate equation for predicting the solar transmittance of transparent honeycombs
21 p0042 A79-11877

WEEKES, M. E.
Mechanical and vibrational problems of a vertical axis wind turbine
23 p0389 A79-33265

WEETER, D. W.
Technical aspects of the Resource Conservation and Recovery Act upon coal combustion and conversion systems
[ORNL/OEPA-10] 24 p0748 N79-30687

WEGLEY, H. L.
Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

WEHLAGE, E. F.
Conserving electric power by geothermal refrigeration - Cooling and freezing
23 p0409 A79-34079

WEI, F.-S.
Lag damping in autorotation by a perturbation method
[AHS 78-25] 21 p0152 A79-18151

WEI, J.
Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983
A stoichiometric analysis of coal gasification
23 p0492 A79-40456

WEI, R. P.
Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B
[PB-282924/0] 21 p0181 N79-11446
Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report
[PB-282923/2] 21 p0181 N79-11447

WEIAND, H.
Practice of heat utilization from refuse
23 p0488 A79-40393

WEICKMANN, H. K.
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant
23 p0438 A79-36432

WEIDE, W., JR.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

WEIGEL, W.
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592

WEIGEL, W. D.
A low cost composite blade for a 300 foot diameter wind turbine
24 p0677 A79-51781

WEIK, B.
Simple high-accuracy diode temperature-difference control circuit
21 p0056 A79-13631
Investigations of glass collectors with radiation absorbing heat carrier
23 p0470 A79-38644

WEIL, S. A.
Synthetic fuels from peat gasification
24 p0687 A79-51856

WEIN, D.
Mini-Brayton heat source assembly development
[NASA-CR-159447] 21 p0196 N79-12554

WEINBERG, C. J.
Environmental aspects of geysers geothermal operations
24 p0666 A79-50896

WEINBERG, I.
Annealing of radiation damage in 0.1- and 2-ohm-centimeter Silicon solar cells
[NASA-TP-1559] 24 p0798 N79-33572

WEINBURG, A. M.
Energy policy and mathematics
[ORAU/IEA(0)-79-5] 24 p0775 N79-31821

WEINER, A. J.
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024

WEINER, S. G.
Solids mixing and fluidization characteristics in a tube filled bed
21 p0008 A79-10070

WEINGART, J. M.
Solar energy as the basis of an energetic system
23 p0435 A79-35491

WEINGART, O.
Large filament wound structures for energy and transportation systems
21 p0086 A79-15507

WEINSTEIN, K. D.
Geologic issues related to underground pumped hydroelectric and compressed air energy storage
24 p0680 A79-51800

WEIR, E. B.
SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319

WEISBRICH, A. L.
Toroidal Accelerator Rotor Platforms for wind energy conversion
21 p0029 A79-10240
Alternative energy for domestic hot water - Wind or solar
21 p0067 A79-14292
Toroidal accelerator rotor platforms for wind energy conversion
21 p0077 A79-14770

WEISBRICK, A. L.
Feature review of some advanced and innovative design concepts in wind energy conversion systems
21 p0077 A79-14771

WEISBRODT, I.
Substitute natural gas from coal using high-temperature reactor heat - Project 'Prototype Plant Nuclear Process Heat'
22 p0264 A79-23827

WEISER, G.
Chemical vapor deposited amorphous silicon for use in photothermal conversion
22 p0294 A79-28149

WEISMAN, H.
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798

WEISS, A. J.
Synthane - A process for the gasification of caking and noncaking coals
21 p0006 A79-10057
The Synthane process - A technical and economic assessment
23 p0410 A79-34089

WEISS, C. A.
Combustion of single coal particles in a jet
24 p0632 A79-46319

WEISS, J. A.
DOE programs in material development for fusion laser systems
21 p0082 A79-15137

WEISS, R. O.
Cold water pipe verification test
24 p0621 A79-45811

WEISS, R. S.
Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631

WEISSBERG, B. G.
Mercury in some New Zealand geothermal discharges
22 p0257 A79-22925

WEISSBROD, R. S. P.
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837
Energy programs at the Johns Hopkins University Applied Physics Lab.
[PB-295439/4] 24 p0793 N79-32739

WEISSMAN, J. C.
Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650

WEISZ, P. B.
Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064
High-grade fuels from biomass farming - Potentials and constraints
24 p0669 A79-51194
Catalytic production of high-grade fuel /gasoline/ from biomass compounds by shape-selective catalysis
24 p0669 A79-51196

WEITHAS, F.
Sun-position diagrams using examples from Flensburg to Mittenwald
21 p0055 A79-13626

WEIZER, V. G.
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545
Open-circuit voltage improvements in low-resistivity solar cells
24 p0784 N79-32649

WELCH, H. W.
Potential research problems in energy systems analysis
21 p0115 A79-17221

WELLER, S. W.
Catalytic hydrodesulfurization and liquefaction of coal - Batch autoclave studies
22 p0282 A79-26465

WELLMAN, D. L.
Aerosol and ice nuclei measurements in the plume of the Homer City, Pa., power plant
23 p0438 A79-36432

WELLMAN, P.
Coal liquefaction - The H-Coal process
23 p0412 A79-34102

WELLS, A. A.
Experiences with a hydropneumatic wave power device
21 p0151 A79-18105

WELLS, C. H.
Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B
[PB-282924/0] 21 p0181 N79-11446
Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report
[PB-282923/2] 21 p0181 N79-11447

WELLS, D. R.
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

WELLS, J. W.
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368

WELLS, K. D.
Impact of H2S emission abatement on geothermal power costs
24 p0659 A79-50352

WELSH, L. B.
Optimization of PtDoped KOCITE (trade name) electrodes in H3PO4 fuel cells
[AD-A061242] 22 p0342 N79-17340

WELTE, D.
Development of vertical-axis wind-energy converters - Darrieus design
23 p0447 A79-37744

WELTY, D. R.
The Powerton gasification combined-cycle test facility - A preview
23 p0424 A79-34454

WEN, C. Y.
Entrainment coal gasification modeling
24 p0704 A79-52028
Coal conversion technology
24 p0714 A79-53776
Rates of coal pyrolysis and gasification reactions
24 p0714 A79-53778

WEN, L.
Thermal performance trade-offs for point focusing solar collectors
21 p0020 A79-10165
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632

WEN, L. C.
Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838

WENDEKAMM, W. U.
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy source for households and small consumers
[DLR-FB-78-17] 24 p0760 N79-30836

WENDELL, L. L.
Program overview for the wind characteristics program element of the United States Federal Wind Energy Program
23 p0482 A79-40108
Program overview for the Wind Characteristics Program Element of the United States Federal Wind Energy Program
23 p0534 A79-43376
Wind resource assessment status
24 p0633 A79-46529
Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

WENDER, I.
Exploratory research in coal conversion
21 p0007 A79-10061

WENDLER, W.
Design of the Eichenau solar house
23 p0463 A79-38579

WENDT, J. F.
VKI Short Course on Magnetohydrodynamic Accelerators and Generators
[VKI-LECTURE-SERIES-8] 23 p0545 N79-22891
WENDT, J. O. L.
Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683
WENTWORTH, D. E.
Techniques for preventing damage to high power laser components
21 p0083 A79-15145
WENTWORTH, R. L.
Fuel gas production from animal residue. I - Technical perspective
23 p0381 A79-32593
Fuel gas production from animal residue. II - An economic assessment
23 p0381 A79-32594
WENTWORTH, W. E.
Chemical heat pumps - A basic thermodynamic analysis
24 p0661 A79-50545
WENZEL, H.
Solar heating and safety techniques
21 p0056 A79-13633
WENZEL, L. M.
Power train analysis for the DOE/NASA 100-kW wind turbine generator
[NASA-TM-78997] 22 p0333 N79-16355
WENZL, H.
The use of FeTi-hydride for production and storage of suprapure hydrogen
22 p0250 A79-21700
WENZLER, S. A.
Evaluation of control options for solar climate control systems
[AIAA PAPER 78-1758] 21 p0060 A79-13859
WEPFER, W.
Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379
WEREKO-BROBBY, C. Y.
Calcium hydroxide as an energy storage medium for solar power systems
23 p0451 A79-37878
WERSINGER, J.-M.
Wave reflection from the lower hybrid surface - A toroidal effect
22 p0255 A79-22427
WESLEY, D. P.
A mass and energy balance of a Wellman-Galusha gasifier
22 p0283 A79-26467
WESNER, G. M.
There is a lot of energy in digester gas . . . use it
21 p0035 A79-11448
WESSLING, F. C.
Predicting the performance of passive solar-heated buildings
21 p0063 A79-13899
WESSON, L.
Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests
[PB-295478/2] 24 p0778 N79-32135
WEST, R. E.
Hydrocarbon working fluid and operating conditions selection for the conventional geothermal binary cycle
21 p0015 A79-10124
WEST, K.
Dynamic aspects of solid solution cathodes for electrochemical power sources
24 p0636 A79-46665
WESTBROOK, C. K.
Computer modeling of automotive engine combustion
[UCRL-80451] 21 p0181 N79-11412
WESTBROOK, R. D.
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
WESTCOTT, P. A.
EPA program status report: Oil shale, 1979 update
[PB-294598/0] 24 p0796 N79-33538
WESTERBERG, A. W.
The modeling of thin film heat exchangers
24 p0622 A79-45820
Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837
WESTMORELAND, J. S.
Second-generation integrated coal gasification/combined-cycle power systems
[ASME PAPER 78-GT-14] 21 p0032 A79-10778
WESTMORELAND, P. R.
In situ gasification - Recovery of inaccessible coal reserves
23 p0411 A79-34093
WESTON, J. R.
Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951
WESTPHAL, S.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537
WESTPHAL, W.
Solar power satellites for Europe
[IAF PAPER 79-173] 24 p0710 A79-53334
MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems
24 p0752 N79-30752
WESTSIK, J. H.
A combined cycle for solar-fossil hybrid power generation
24 p0674 A79-51760
WETH, G.
Pressurized fluidized bed pilot electric plant - A technology status
[ASME PAPER 79-GT-193] 23 p0379 A79-32451
WETTERMARK, G.
Storage of heat: A survey of efforts and possibilities
[PB-295936/9] 24 p0801 N79-33592
WETZEL, R. S.
Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595
WEWERKA, E. M.
Trace element characterization and removal/recovery from coal and coal wastes
[LA-7048-PR] 21 p0222 N79-14602
WEYANT, J. P.
A comparative analysis of three of ERDA's major R & D programs
21 p0099 A79-16121
WEYGANDT, W. P.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844
WEYLAND, P.
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537
WEYLER, G. H., JR.
Rotatable mass for a flywheel
[NASA-CASE-MFS-23051-1] 21 p0172 N79-10422
WEYNANTS, R. R.
Magneto-acoustic resonance heating in the ion-cyclotron frequency domain
22 p0271 A79-24866
WEYSS, N.
Solar stream in Austria
23 p0574 N79-25530
WHALE, A. V.
Silicon terrestrial solar photovoltaic installations
23 p0441 A79-36782
WHALEY, T. P.
Solar total energy systems
21 p0090 A79-15863
Transmission of energy by open-loop chemical energy pipeline
23 p0411 A79-34096
WHARTON, L.
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440
WHEALTON, J. H.
Effect of electrode shielding on beamlet-beamlet interaction in multiaperture sources
21 p0154 A79-18481
WHEATLEY, M. A.
Potential of biomass to substitute for petroleum in Canada
23 p0494 A79-40743

WHEELOCK, T. D.
Coal desulfurization: Chemical and physical methods; Proceedings of the Symposium, New Orleans, La., March 23, 1977
21 p0044 A79-12114

WHERRY, D. B.
A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0204 N79-13474

WHITAKER, A.
Protection of solar collector materials from UV
24 p0609 A79-45217

WHITAKER, R.
Scaling up coal liquids
21 p0031 A79-10475
Coal gasification for electric utilities
23 p0436 A79-35799

WHITAKER, R. D.
Air collector testing utilizing ASHRAE 93-77
23 p0430 A79-35062

WHITBECK, J. F.
Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508

WHITE, C. W.
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

WHITE, D. E.
Geothermal systems and their energy resources
24 p0632 A79-46433

WHITE, D. R.
Tidal power - The path to production
23 p0450 A79-37863

WHITE, F. B.
The performance of copper-ternary based thin-film solar cells
23 p0500 A79-40910

WHITE, G. H.
Heat storage in crushed limestone
24 p0609 A79-45215

WHITE, G. T.
Economics of preheating water for commercial use
24 p0608 A79-45206

WHITE, H.
Design for an OTEC Seacoast Test Facility at Ke-ahole Point, Kona, Hawaii
24 p0620 A79-45805

WHITE, H. C.
On the calculation of the temperature distribution in a packed bed for solar energy applications
24 p0712 A79-53495

WHITE, H. J.
The effects of biofouling and corrosion on heat transfer measurements
24 p0623 A79-45829

WHITE, H. R.
Utilization of used oil
[ATR-78(7384)-1] 24 p0767 N79-31432

WHITE, I. L.
Technology assessment of western energy resource development
22 p0347 N79-18368

WHITE, J.
Proceedings of symposium on water-in-fuel emulsions in combustion
[AD-A061503] 22 p0338 N79-17019

WHITE, J. D.
Technical and environmental aspects of oil shale processing
21 p0199 N79-12581

WHITE, J. H.
Ranking and evaluation of flat-plate collectors - Two new approaches
22 p0316 A79-31402

WHITE, J. R.
Perspectives on solar electric power for small homes
23 p0401 A79-34016

WHITE, L. R.
Progress in the testing of materials and design concepts for directly-fired MHD air heater service
21 p0017 A79-10141
Progress on high temperature air heater development for MHD systems
[AIAA PAPER 79-1003] 23 p0458 A79-38188
Operability and materials testing for MHD air heaters
24 p0701 A79-51994

WHITE, M.
Preliminary assessment of the environmental impacts of the Satellite Power System /SPS/
22 p0326 A79-31922

WHITE, M. L.
A low cost composite blade for a 300 foot diameter wind turbine
24 p0677 A79-51781

WHITE, O. L.
FY 1978 scientific and technical reports, articles, papers, and presentations
[NASA-TM-78203] 21 p0214 N79-13915

WHITE, P. R.
Solar tracking control system Sun Chaser
[NASA-TM-78199] 21 p0172 N79-10514
Solar tracking system
[NASA-CASE-MFS-23999-1] 24 p0721 N79-28667

WHITE, R.
Theory of dissipative drift instabilities in sheared magnetic fields
22 p0292 A79-27884

WHITE, R. A.
Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544

WHITE, R. B.
Non-linear numerical algorithms for studying tearing modes
22 p0257 A79-22981

WHITEHEAD, A.
A comparison of the performance of steam turbine cycles using gas contaminated geothermal steam
[ASME PAPER 78-WA/ENER-3] 21 p0159 A79-19776

WHITEHEAD, G. T.
Microprocessor control of a wind turbine generator
22 p0244 A79-21302
Microprocessor control of a wind turbine generator
[NASA-TM-79021] 21 p0195 N79-12548

WHITEHEAD, H. L.
A high energy tubular battery for a 1800 kg payload electric delivery van
[SAE PAPER 790162] 22 p0315 A79-31367

WHITEHOUSE, G. D.
Properties and operating experience with bagasse as a boiler fuel
23 p0489 A79-40395

WHITELAW, R. L.
The self-propelled hydrogen-powered refrigerator car
23 p0415 A79-34126

WHITELEY, H.
Liquid fuels from carbonates by a microbial system
23 p0494 A79-40742

WHITFORD, D. H.
The Madaras Rotor Power Plant - An alternate method for extracting large amounts of power from the wind
[AIAA PAPER 79-0115] 21 p0157 A79-19541

WHITLOCK, R. R.
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

WHITMAN, R. F.
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

WHITMAN, R. L.
Microradiographs of laser fusion targets - 2-D modeling and analysis
23 p0384 A79-32993

WHITMORE, D. H.
Basic research on ceramic materials for energy storage and conversion system
[COO-2564-4] 23 p0564 N79-24506

WHITRIDGE, J. E.
Pilon panels - A technical report
21 p0031 A79-10403

WHITSON, J. C.
Numerical study of drift-Alfven waves in a sheared magnetic field
24 p0653 A79-49762

WHITTAKER, T. J. T.
Experiences with a hydropneumatic wave power device
21 p0151 A79-18105

WHITTINGTON, H. W.
Electrical generation from a randomly varying input
23 p0455 A79-37915

WHITTLE, C. E.
Economic and environmental impacts of a U.S. nuclear moratorium, 1985-2010 /2nd edition/
23 p0493 A79-40699
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534

WHITTLESEY, C. C.
100MWh zinc-chlorine peak-shaving battery plants
21 p0011 A79-10096
The zinc-chlorine battery in the BEST facility - 1981
24 p0703 A79-52013

WICKEN, G. W.
The London Electric Delivery Van Assessment Scheme
[SAE PAPER 790111] 22 p0314 A79-31358

WICKENS, A. H.
The impact of aeronautical sciences on other modes of transport
22 p0325 A79-31915

WICKS, F. E.
Development and application of techniques to evaluate cogeneration impacts
22 p0303 A79-29795

WICKSON, B.
Design and operating experience of the cryogenic system of the U.S. SCMS as incorporated into the bypass loop of the U-25 MHD generator facility
22 p0235 A79-20532

WIDNER, M. M.
Fuel preconditioning studies for e-beam fusion targets
23 p0480 A79-39938

WIEBE, H. A.
A survey of energy information systems and its implications for industrial energy management
21 p0072 A79-14685

WIEBELT, J. A.
Selected ordinates for total solar radiant property evaluation from spectral data
22 p0271 A79-25060

WIELAND, U.
Development and thermodynamic layout of a fuel cell component
23 p0528 A79-42227

WIETING, A. R.
Recent advances in convectively cooled engine and airframe structures for hypersonic flight
21 p0165 A79-20087

WIGTON, H. F.
Corrosion of superalloys, inconels, and stainless steels by the products from fluidized-bed coal combustion
21 p0080 A79-14932

WIHL, M.
High efficiency, high density terrestrial solar panels
23 p0499 A79-40905
Analysis and simulation of the energy source of the future - The solar breeder
23 p0514 A79-41033
High efficiency, high density terrestrial panel
[NASA-CR-162167] 24 p0770 N79-31765

WIJEYSUNDERA, N. E.
Transient energy removal in cylindrical parabolic collector systems
21 p0020 A79-10168
Comparison of transient heat transfer models for flat plate collectors
22 p0242 A79-21168

WILBANKS, T. J.
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677

WILBUR, P. J.
The desiccant/rock bed method of solar cooling with air collectors
24 p0676 A79-51771

WILDE, P.
Environmental considerations for siting an ocean thermal conversion early ocean testing platform at four proposed areas
22 p0287 A79-27377

WILDIN, M. W.
Experience gained and lessons learned from monitoring the solar building, Albuquerque
21 p0088 A79-15833

WILER, C. D.
Manned strategic system concepts 1990-2000
[AIAA PAPER 79-1793] 24 p0643 A79-47882

WILES, C. C.
Evaluation of the Ames, Iowa refuse derived fuel recovery system
21 p0064 A79-14115

WILES, L. E.
Analysis of mass cycling in porous rock reservoirs for compressed air energy storage
24 p0680 A79-51799

WILEY, R. L.
Development of a 1 kW/e/ isotope fueled Stirling cycle power system
21 p0025 A79-10210

WILKENING, H. A.
Design of a 10kW photovoltaic 200/1 concentrator
23 p0508 A79-40993

WILKES, K. E.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019

WILKINSON, C. R.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

WILKINSON, M. K.
Crystallographic contributions to the energy problem
23 p0535 A79-43466

WILKINSON, W. H.
Closed Cycle Gas Turbine power generation opportunities
21 p0004 A79-10039

WILL, F. G.
Symposium on Electrode Materials and Processes for Energy Conversion and Storage, Philadelphia, Pa., May 9-12, 1977, Proceedings
21 p0036 A79-11776
Thermodynamic and kinetic considerations on zinc-halogen batteries
21 p0040 A79-11822

WILLCOX, W.
Dynamic simulation of a sodium-cooled, advanced central receiver solar-electric power plant
24 p0673 A79-51747

WILLENBERG, H. J.
Self-consistent analysis of alpha-particle heating of a fast-solenoid plasma
22 p0291 A79-27879

WILLIAMS, A.
Combustion of droplets and sprays of some alternative fuels
21 p0052 A79-12983

WILLIAMS, B. B.
Solar radiation data in the southeastern United States
24 p0608 A79-45204

WILLIAMS, B. F.
Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543

WILLIAMS, C. J. H.
The ESA lightweight hybrid solar array
23 p0500 A79-40916

WILLIAMS, F.
Electromagnetic propulsion alternatives
[AIAA PAPER 79-1400] 23 p0426 A79-34840
Electromagnetic launchers
24 p0702 A79-52006

WILLIAMS, J.
The effects of different energy strategies on the atmospheric CO2 concentration and climate
21 p0106 A79-16523
Studies of different energy strategies in terms of their effects on the atmospheric CO2 concentration
23 p0495 A79-40796

WILLIAMS, J. A.
Integrated power unit
[AD-A066543] 23 p0569 N79-25396

WILLIAMS, J. K.
Fresnel optics for solar concentration on photovoltaic cells
23 p0508 A79-40994

WILLIAMS, J. M.
Fusion energy - The iceberg beneath the tip
23 p0406 A79-34057
Trace element characterization and removal/recovery from coal and coal wastes
[LA-7048-PR] 21 p0222 N79-14602

WILLIAMS, J. R.
Moderate cost, calculator-based data acquisition for solar HVAC systems
21 p0088 A79-15837
A gas absorption cycle for electric power generation
23 p0418 A79-34154

WILLIAMS, K.
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448

WILLIAMS, O. M.
The efficiencies of thermochemical energy transfer
21 p0054 A79-13575
Energy storage efficiency for the ammonia/hydrogen-nitrogen thermochemical energy transfer system
22 p0261 A79-23718
Screening reversible reactions for thermochemical energy transfer
22 p0285 A79-26823
Ammonia dissociation for solar thermochemical absorbers
23 p0356 A79-33765

WILLIAMS, R.
Collection efficiency measurements on a-Si:H solar cells
24 p0638 A79-47063

WILLIAMS, R. C.
Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998

WILLIAMS, R. E.
Balloon-borne particulate sampling for monitoring power plant emissions
[PB-290473/8] 23 p0566 N79-24543

WILLIAMS, R. J.
Transient shutdown analysis of low-temperature thermal diodes
[NASA-TP-1369] 22 p0346 N79-18287

WILLIAMS, R. O.
Steam raising with low-Btu gas generators and potential for other applications
21 p0072 A79-14690
An assessment of the gasification characteristics of some agricultural and forest industry residues using a laboratory gasifier
23 p0381 A79-32592

WILLIAMSON, D. G.
Water splitting - The chemistry of the I2-SO2-H2O reaction and the processing of H2SO4 and HI products
23 p0413 A79-34109

WILLIFORD, R. E.
Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

WILLINSKI, G. A.
Optical characterization of high energy laser components
23 p0447 A79-37668

WILLIS, D. C.
The energy dilemma: A challenge for Maryland. Proceedings Maryland General Assembly/AISLE Conference
[PB-284703/6] 21 p0199 N79-12579

WILLIS, E. A.
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0194 N79-12086
General aviation energy-conservation research programs
22 p0329 N79-15963

WILLIS, P.
Low-cost encapsulation materials for terrestrial solar cell modules
23 p0439 A79-36636

WILLIS, R. B.
Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544

WILLMER, A. C.
The aerodynamic design and testing of a vertical axis windmill
23 p0452 A79-37895

WILLRATH, H.
The measurement of optical properties of selective surfaces using a solar calorimeter
21 p0041 A79-11874
Calorimetric emissivities for solar-selective coatings on flat sheet
24 p0706 A79-52536

WILMSEN, C.
Potential for low cost, high efficiency solar cells using indium tin oxide on semiconductor /OSOS/ solar cells
21 p0122 A79-17338
Influence of the interface upon the properties of ITO/silicon SIS solar cells
23 p0510 A79-41011

WILMSEN, C. W.
The operation of the semiconductor-insulator-semiconductor solar cell - Experiment
23 p0440 A79-36680

WILSON, A.
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116

WILSON, C. W.
Mathematical models of direct initiation of unconfined gas phase detonations
[AIAA PAPER 79-0289] 21 p0157 A79-19649

WILSON, D. B.
The direct reduction of sulfur dioxide
21 p0065 A79-14124

WILSON, D. C.
The efficiency of resource recovery from solid waste
24 p0662 A79-50561

WILSON, D. E.
Aeroelastic pump
23 p0406 A79-34055
Development and testing of two- and three-stage heat pipe radiators
[AIAA PAPER 79-1060] 23 p0455 A79-38040

WILSON, D. S.
Electrical generation from a randomly varying input
23 p0455 A79-37915

WILSON, E. M.
Studies in retiming tidal energy
21 p0152 A79-18115
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946

WILSON, G. L.
MIT-DOE program to demonstrate an advanced superconducting generator
22 p0236 A79-20549

WILSON, J. I. B.
The interfacial layer in MIS amorphous silicon solar cells
22 p0258 A79-23039
Amorphous-silicon m.i.s. solar cells
23 p0441 A79-36778
M-I-S solar cells on amorphous silicon
23 p0510 A79-41008

WILSON, K. L.
Alpha transport and blistering in tokamaks
22 p0253 A79-22243
Low energy hydrogen and deuterium sputtering measurements of stainless steel, graphite, and beryllium oxide
23 p0414 A79-36893

WILSON, M.
Thermionic emission properties of some synthetic coal slags
23 p0392 A79-33395

WILSON, M. N.
Large superconducting magnets for new energy technologies
24 p0604 A79-44527

WILSON, R. C.
Total solar irradiance at Table Mtn, California 1926-77
21 p0067 A79-14269

WILSON, R. E.
Vortex sheet analysis of the Giromill
21 p0031 A79-10278
Vortex sheet analysis of the Giromill
22 p0278 A79-26179

WILSON, R. L.
Sputtered thin film solar cells
23 p0448 A79-37843
WILSON, W. B.
Conserving energy via cogeneration
24 p0636 A79-46660
WILSON, W. D.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242
WILSON, W. I.
Limestone SO2 reactivity and causes for reactivity loss during multi-cycle utilization
21 p0065 A79-14121
WILT, M. J.
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609
WILZBACH, K. E.
Environmental control implications of increased coal utilization under the National Energy Plan
[ANL/EES-CP-10] 24 p0760 N79-30846
WINANT, J. H.
Impact of fuel availability and other cost trends on general aviation
21 p0053 A79-13078
WINEMILLER, J. R.
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727
WINN, C. B.
Optimal sizing of solar collectors by the method of relative areas
21 p0066 A79-14263
Singular optimal control of solar space heating systems
24 p0644 A79-48009
WINNICK, J.
Molten-carbonate CO2 concentrator - Preliminary experiments
[ASME PAPER 78-ENAS-2] 21 p0048 A79-12551
WINSOR, H. V.
Optics in adverse environments; Proceedings of the Seminar, San Diego, Calif., August 25, 26, 1977
21 p0044 A79-12037
WINSTON, R.
Optics applied to solar energy conversion; Proceedings of the Seminar, San Diego, Calif., August 23, 24, 1977
21 p0042 A79-11965
A compound parabolic concentrator for a high temperature solar collector requiring only twelve tilt adjustments per year
21 p0134 A79-17439
Compound parabolic concentrators with non-evacuated receivers - Prototype performance and a larger scale demonstration in a school heating system
21 p0134 A79-17440
High temperature solar collector of optimal concentration - Non-focusing lens with secondary concentrator
21 p0135 A79-17448
Practical design considerations for CPC solar collectors
23 p0439 A79-36634
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
WINTERBONE, D. E.
A multivariable controller for an automotive gas turbine
[ASME PAPER 79-GT-73] 22 p0307 A79-30537
WIRGIN, A.
Theoretical and experimental analysis of a latent heat storage system
21 p0121 A79-17323
On the use of grating or mesh selective filters to increase the efficiency of flat plate solar collectors
21 p0127 A79-17380
Prediction of the behavior of a solar storage system by means of recurrent stochastic models
22 p0258 A79-23295
WIRTSHAFTER, R. M.
Shelter design and energy usage: A methodology for evaluating the impacts of residential space conditioning technologies on the consumer, the electric utility, and society
24 p0797 N79-33557
WISE, D. L.
Engineering analysis of in situ liquefaction of coal
21 p0032 A79-10521
Fuel gas production from animal residue. I - Technical perspective
23 p0381 A79-32593
Fuel gas production from animal residue. II - An economic assessment
23 p0381 A79-32594
WISE, J.
Solar photovoltaic research and development program of the Air Force Aero Propulsion Laboratory
24 p0783 N79-32642
WISE, J. J.
Novel technology for conversion of methanol and synthesis gas to hydrocarbons
21 p0007 A79-10064
WISELY, F. E.
Case study energy recovery from wastes from an automobile assembly plant
23 p0489 A79-40394
WISER, W. H.
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-9] 24 p0719 N79-28363
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-12] 24 p0766 N79-31415
WISSMAN, G.
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592
WITALIS, E. A.
Theta-pinch description from classical electrodynamics
24 p0640 A79-47602
WITCOFSKI, R. D.
Alternate aircraft fuels prospects and operational implications
21 p0066 A79-14138
Comparison of alternate fuels for aircraft
24 p0668 A79-51100
Comparison of alternate fuels for aircraft
[NASA-TM-80155] 24 p0782 N79-32637
WITHAM, C. L.
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574
WITHERSPOON, P. A.
Underground aquifer storage of hot water from solar energy collectors
21 p0120 A79-17317
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies
[LBL-8802] 24 p0786 N79-32684
WITHROW, J.
A mass and energy balance of a Wellman-Galusha gasifier
22 p0283 A79-26467
WITKOWSKI, S. J.
Considerations in the design of a shredded municipal refuse burning and heat recovery system
23 p0488 A79-40390
WITT, C. E.
Terrestrial concentrating photovoltaic systems comparative performance and costs
23 p0514 A79-41036
WITTENBERG, L. J.
Performance of a large, salt-gradient solar pond
24 p0671 A79-51735
Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(OP)] 23 p0564 N79-24505
Evaluation of a large nonconvective solar pond
[MLM-2606(CP)] 24 p0786 N79-32680
WITTIG, J. M.
OTEC 100-MWe alternate power systems study
24 p0623 A79-45831

WOBKER, U.
Experimental results and concepts of different solar concentrators
21 p0057 A79-13643

WOELL, R. L.
Data acquisition using a modular data logger
21 p0088 A79-15832

WOERNER, L.
The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

WOESSNER, G.
Construction and test of a test apparatus for determining the efficiency of solar collectors with the ASE-test method
21 p0134 A79-17436

WOHLGEMUTH, J.
High efficiency, high density terrestrial solar panels
23 p0499 A79-40905
Characterization of vertical-junction silicon solar cells
23 p0504 A79-40955
High efficiency, high density terrestrial panel
[NASA-CR-162167] 24 p0770 N79-31765
Thin cells for space
24 p0784 N79-32652

WOHLGEMUTH, J. H.
Vertical junction silicon solar cell
21 p0001 A79-10013
Analysis of the effects of impurities in silicon
[NASA-CR-157439] 23 p0559 N79-24456

WOLF, D.
Liquid metal heat pipes for the central solar receiver
21 p0014 A79-10114
Development of small solar power plants for rural areas in India
21 p0141 A79-17502
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730

WOLF, J. C.
A high temperature turbine for operation on coal-derived fuel
[ASME PAPER 79-GT-173] 23 p0379 A79-32434

WOLF, M.
Evaluation of options for process sequences
23 p0501 A79-40925
Analysis and evaluation of process and equipment in tasks 2 and 4 of the Low Cost Solar Array project
[NASA-CR-158089] 22 p0335 N79-16378
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158580] 23 p0550 N79-23519
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158744] 23 p0580 N79-26485
Analysis and evalaution in the production process and equipment area of the low-cost solar array project
[NASA-CR-162163] 24 p0770 N79-31769
Updating the limit efficiency of silicon solar cells
24 p0783 N79-32645

WOLF, R. A.
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829
An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357

WOLFE, D. A.
Marine biological effects of OCS petroleum development
[PB-288935/0] 22 p0344 N79-17374

WOLFE, M. G.
Historical and projected power requirements
21 p0169 N79-10125

WOLFE, P. R.
The developing role of photovoltaic generation
23 p0448 A79-37845

WOLFE, R. W.
Design of pressurized fluid-bed combustor/particulate control system for reliable turbine operation
[ASME PAPER 79-GT-190] 23 p0379 A79-32449

WOLFE, S. M.
Characteristics of electron-cyclotron-resonance-heated tokamak power reactors
22 p0292 A79-27885

WOLFE, W. P.
Some effects of flow curvature on the performance of Darrieus wind turbines
[AIAA PAPER 79-0112] 21 p0156 A79-19538

WOLFF, D.
Wind energy
22 p0287 A79-27327

WOLFF, C. M.
Technique and instrumentation for measuring the performance of integrated solar heating/cooling systems
21 p0087 A79-15830

WOLFF, G.
High efficiency GaAs solar cell development
[AD-A066616] 23 p0573 N79-25514

WOLK, R. H.
Coal liquefaction - Status and new directions
21 p0007 A79-10062

WOLKEN, G., JR.
Magnetically confined plasma solar collector
21 p0109 A79-16617

WOLLENBERG, H.
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609

WOLOSEWICZ, R. M.
Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDP-TM-78-3] 23 p0596 N79-27674
Design and installation manual for thermal energy storage
[ANL-79-15] 24 p0740 N79-29636

WOLTER, J. G.
Current state-of-the-art of electrochemical batteries from a users point of view
21 p0071 A79-14681

WON, D. J.
Run duration analysis of surface wind speeds for wind energy application
22 p0287 A79-27345

WON, Y. S.
Solar Stirling system development
[AIAA PAPER 79-1009] 23 p0476 A79-38894

WONG, G. S.
Integrated power unit
[AD-A066543] 23 p0569 N79-25396

WOO, J.
Plasma-wall interaction and the tokamak fusion reactor
23 p0407 A79-34062

WOO, T.
Surface state and performance evaluation of Schottky barrier solar cells on amorphous silicon
23 p0510 A79-41009

WOOD, B.
The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors
21 p0102 A79-16423

WOOD, B. D.
Performance testing of a three ton solar absorption chiller
[AIAA PAPER 78-1757] 21 p0060 A79-13858
Results and analysis of a round robin test program for liquid-heating flat-plate solar collectors
22 p0295 A79-28356
Passive cooling for linearly concentrated solar cell arrays
23 p0509 A79-40998
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539

WOOD, B. E.
Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494
WOOD, D. O.
Annual review of energy. Volume 3
21 p0074 A79-14718
WOOD, D. W.
Design and application of a single gas turbine matched with two tandem driven centrifugal compressors
[ASME PAPER 79-GT-81] 23 p0376 A79-32360
WOOD, F. W.
Erosion testing of potential valve materials for coal gasification systems
[PB-293308/3] 24 p0720 N79-28592
WOOD, J. R.
Performance tests of organic dyes in a planar solar concentrator with ribbon photovoltaic cells
23 p0519 A79-41074
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543
WOOD, J. T.
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33584
WOOD, M. B.
All electric subsystems for next generation transport aircraft
[AIAA PAPER 79-1832] 24 p0643 A79-47906
WOOD, R. E.
The effect of coal characteristics on the catalytic liquefaction of Utah coals
24 p0628 A79-45991
A survey of methods of coal hydrogenation for the production of liquids
24 p0628 A79-45994
WOOD, R. F.
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083
WOOD, V. E.
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019
WOOD, W. B.
Synthetic natural gas in California: When and why
23 p0593 N79-27615
WOODBRIDGE, D. D.
Ocean energy unlimited
21 p0095 A79-15908
WOODCOCK, G. R.
Solar Power Satellite systems definition
22 p0326 A79-31920
Solar power satellites: The Engineering Challenges
24 p0752 N79-30750
WOODCOCK, K. E.
Catalytic coal gasification exploratory research program
21 p0030 A79-10247
WOODFIN, G.
An optical evaluation laboratory for laser fusion
23 p0447 A79-37667
WOODS, M. L.
An air-modulated fluidic fuel-injection system
[ASME PAPER 78-WA/DSC-21] 21 p0159 A79-19766
WOOLLAM, V. J.
Solar energy R&D in Iran - The approach and the philosophy
21 p0117 A79-17284
Solar thermal electrical power plants for Iran
22 p0295 A79-28352
WOOLLEY, R. L.
Progress report on hydrogen production and utilization for community and automotive power
21 p0016 A79-10132
Hydrogen Homestead
23 p0415 A79-34125
Thermodynamic considerations in the production of synthetic fuels from coal
24 p0615 A79-45603
WOOLSEY, N. F.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357
WOOTTON, A. J.
Measurements of plasma shape in a tokamak
23 p0527 A79-41944
WORKHOVEN, R. M.
Concentrating solar collector test results from DOE/Sandia Collector Module Test Facility
23 p0428 A79-35044
Sandia Laboratories' Midtemperature Systems Test Facility
23 p0429 A79-35049
Concentrating solar collector test results, Collector Module Test Facility
[SAND-78-0815] 21 p0208 N79-13522
Performance testing of the Hexcel Parabolic Trough Solar Collector
[SAND-76-0381] 21 p0221 N79-14569
Performance testing of the McDonnell Douglas fresnel lens solar collector
[SAND-78-0625] 23 p0565 N79-24512
Performance testing of the General Atomic Fixed mirror solar concentrator
[SAND-78-0624] 23 p0573 N79-25519
Concentrating solar collector test results from DOE/Sandia collector module test facility
[SAND-78-0881C] 23 p0573 N79-25520
Performance testing of the Del concentrating solar collector
[SAND-79-0515] 24 p0786 N79-32681
WORMHOUDT, J.
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393
WORMSER, E. M.
Design, performance, and economics of solar heating and cooling systems for single and multi-family residences
23 p0401 A79-34011
WORRELL, T. D.
Air monitoring network design for power plant siting
23 p0591 N79-27590
WORRELL, W. L.
Electrochemical determinations of the chemical potential and diffusivity of sodium in Na/x/TaS2 at 300 K
21 p0040 A79-11830
WORSTELL, M. H.
Torque ripple in a vertical axis wind turbine
21 p0029 A79-10239
Aerodynamic performance of the 17-metre-diameter Darrieus wind turbine
[SAND-78-1737] 23 p0595 N79-27670
WORTHINGTON, P. J.
Composite material flywheels for energy storage on electricity supply systems
22 p0241 A79-20852
Materials for windmill blades
23 p0453 A79-37897
WRAY, W. O.
Trombe wall vs direct gain: A comparative analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754
WRIGHT, B.
Field performance of certain selective and neutral surfaces in solar collectors
21 p0131 A79-17417
WRIGHT, D. E.
Hydrogen/oxygen steam generation - An example of aerospace technology transfer
24 p0613 A79-45585
Supplementary steam - A viable hydrogen power generation concept
24 p0686 A79-51848
WRIGHT, D. R.
Application of aircraft derivative and heavy duty gas turbines in the process industries
[ASME PAPER 79-GT-12] 23 p0375 A79-32331

WRIGHT, E. H.
Introducing new technologies for alternative energy sources - The economic, social, and environmental considerations for developing countries
23 p0421 A79-34177

WRIGHT, G. W.
Comparative cost analyses: Total flow vs other power conversion systems for the Salton Sea Geothermal Resource
[UCRL-52589] 22 p0342 N79-17337

WRIGHT, I. G.
State of the art and science report on design of alloys resistant to high-temperature corrosion-erosion in coal conversion environments
[EPRI-FP-557] 21 p0200 N79-13149

WRIGHT, J. G.
Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks
[PB-290579/2] 23 p0566 N79-24537

WRIGHT, J. H.
Conversion of solar energy to chemical energy using ammonia dissociation
24 p0672 A79-51746

WRIGHT, J. P.
Development and testing of two- and three-stage heat pipe radiators
[AIAA PAPER 79-1060] 23 p0455 A79-38040

WRIGHT, R.
Designing thermally efficient buildings for the U.S. Midwest
23 p0397 A79-33951

WRIGLEY, C.
Characterization of vertical-junction silicon solar cells
23 p0504 A79-40955
Photovoltage in concentrator cells
23 p0511 A79-41013
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-158172] 22 p0354 N79-19459
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Thin cells for space
24 p0784 N79-32652

WRIGLEY, C. Y.
Vertical junction silicon solar cell
21 p0001 A79-10013
Large-area concentrator solar cells
23 p0517 A79-41057
High efficiency ultrathin silicon solar cells
24 p0652 A79-51903

WRONSKI, C. R.
The dependence of solar cell characteristics on the electronic properties of discharge produced, hydrogenated amorphous silicon
23 p0510 A79-41007
Role of gap states in discharge produced a-SiHx in determining carrier transport and recombination
24 p0656 A79-50195

WU, H. Y.
Attitude and pointing control system for the microwave antenna of the solar power satellite
21 p0113 A79-16739

WU, S. T.
A liquid solar energy storage tank model. I - Formulation of a mathematical model
22 p0267 A79-24314
Application of solar energy; Proceedings of the Third Southeastern Conference, Huntsville, Ala., April 17-19, 1978
24 p0607 A79-45201
Computer simulation of a solar energy system with a viscous-entrainment liquid storage tank model
24 p0609 A79-45213

WU, Y. C.
Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838

WU, Y. C. L.
Design studies and trade-off analyses for a superconducting magnet/MHD power generator system
21 p0017 A79-10142
Insulator performance and anode recession rate in a direct coal fired cold copper diagonal conducting wall MHD generator
23 p0392 A79-33397

WUNG, T. Y.
Thermal analysis of black liquid cylindrical parabolic collector
22 p0295 A79-28354

WUTTKE, G. H.
Point-contact conduction-cooling technique and apparatus for cryogenic laser fusion pellets
21 p0085 A79-15335

WYMAN, C. E.
An overview of intermediate temperature solar collector and energy storage technology
23 p0533 A79-43018

WYMAN, P. R.
Tidal current energy conversion
23 p0450 A79-37870

Y

YADAV, K. S.
Design and fabrication of silicon solar cells for concentrated light
21 p0124 A79-17352

YAFFE, H. R.
High efficiency alkaline electrolysis technology
24 p0685 A79-51842

YAFFEE, P.
Baltimore applications project
[NASA-TM-79667] 22 p0351 N79-18815

YAGI, S.
A new combustion system in the three-valve stratified charge engine
[SAE PAPER 790439] 22 p0316 A79-31376

YAKHOT, A.
Attenuating the transverse edge effect in MHD generators
21 p0063 A79-13985

YAM, Y.
Turbulence dynamics in MHD plasmas
[AIAA PAPER 79-1538] 24 p0636 A79-46717

YAMADA, I.
Solar cells fabricated by ionised-cluster beam technology
23 p0441 A79-36785

YAMADA, T.
A numerical study of the effects of complex terrain on dynamics of airflow and pollutant dispersion
23 p0535 A79-43383

YAMADAYA, T.
Hydride formation of C14-type Ti alloy
22 p0250 A79-21701

YAMAGISHI, T.
A calculation of linear magnetic liner fusion reactor performance
21 p0018 A79-10153

YAMAGUCHI, Y.
Running test of 12,000-kW refuse-burning power plant in Tokyo Katsushika refuse-collecting plant
24 p0654 A79-50007

YAMAMOTO, K.
Development status of rotary engine at Toyo Kogyo
22 p0329 N79-15964

YAMAMOTO, O.
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298

YAMAMOTO, T.
Efficiency studies about Daihatsu engine/electric hybrid system
[SAE PAPER 790013] 22 p0314 A79-31352

YAMASAKI, H.
Experimental studies of a linear MHD generator with fully ionized seed
22 p0238 A79-20796
Power generation experiments of a linear MHD generator with fully ionized seed
23 p0394 A79-33421

YAMAUCHI, S.
Proton conduction in some solids and the fuel cell with a proton conducting electrolyte
24 p0715 A79-54298

YAMAUCHI, T.
Thomson scattering measurements on ohmically heated plasmas in the JFT-2 tokamak
23 p0390 A79-33365
Analytical approximations in the theory of relativistic Thomson scattering for high temperature fusion plasma
24 p0642 A79-47804

YAMAZAKI, K.
200-kv Blumlein transmission line for ultrafast toroidal theta-pinch
22 p0297 A79-28917

YAMAZAKI, S.
Analytical consideration of fuel economy and dynamic response of a regenerative high temperature automobile gas turbine. I
[ASME PAPER 79-GT-127] 23 p0377 A79-32396

YAMAZOE, N.
Sb-I-Ca process for thermochemical hydrogen production
24 p0715 A79-54296

YAMABU, S.
Synthetic test methods of high-direct-current circuit breaker
24 p0716 A79-54504

YANAGIDA, T.
The use of heat exchangers with THERMOEXCEL's tubing in ocean thermal energy power plants
[ASME PAPER 78-WA/HT-65] 21 p0162 A79-19825

YANCIK, J. J.
Coal supply for California
23 p0592 N79-27607

YANG, C. S.
Optimizing plant design for minimum cost per kilowatt with Refrigerant-22 working fluid
24 p0619 A79-45794

YANG, E.
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419

YANG, H. T.
Large area thin film gallium arsenide solar cells
23 p0515 A79-41042

YANG, J. J.
The properties of homoepitaxial InP films prepared by the MO-CVD process for the fabrication of heterojunction solar cells
23 p0499 A79-40907
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

YANG, L. C.
Underwater seismic source
[NASA-CASE-NPO-14255-1] 23 p0551 N79-23555

YANG, R. T.
A regenerative process for fluidized-bed combustion of coal with lime additives
22 p0297 A79-28984
Kinetics of desulfurization of hot fuel gas with calcium oxide Reaction between carbonyl sulfide and calcium oxide
23 p0381 A79-32697

YANG, V.
Which alcohol fuel for Brasil - Methanol or ethanol
24 p0676 A79-51774

YANG, W. C.
Circulating-bed boiler concepts for steam and power generation
21 p0008 A79-10071

YANG, Y. T.
Variation of photovoltaic effect in vertical n/p-junction solar cells
24 p0629 A79-46157

YANO, S.
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915

YAO, B.
A thermodynamic study of heating with geothermal energy
[ASME PAPER 77-WA/ENER-1] 21 p0030 A79-10253

YAO, N. P.
Advanced secondary batteries for electric vehicle propulsion
[CONF-780426-2] 21 p0186 N79-11508

YAO, S.
Dynamic and off-design analysis of OTEC closed cycle power systems
24 p0624 A79-45837

YAO, S.-C.
The modeling of thin film heat exchangers
24 p0622 A79-45820

YARON, I.
Continuous solar-heated absorption cooling unit for industrial applications
23 p0471 A79-38648

YAROSH, M. M.
Structuring a small national or state solar energy program
22 p0262 A79-23751

YASINSKY, J. B.
Advances in fluidized bed gasification process development
21 p0145 A79-17633

YATER, J. C.
Reversible thermoelectric power conversion of energy fluctuations
22 p0261 A79-23619

YAVROUIAN, A. H.
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314

YAWS, C. L.
Electricity from sunlight
21 p0065 A79-14116
New technologies for solar energy silicon - Cost analysis of UCC Silane process
24 p0642 A79-47798
Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508

YEE, J. H.
Systematic computation of the performance of photovoltaic based on first principles
[UCID-1804-PT-1] 23 p0567 N79-24877

YEE, S. T.
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727

YEE, T. K.
Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981

YEH, L.-S. R.
Iron oxide semiconductor electrodes in photoassisted electrolysis of water
21 p0037 A79-11781

YEH, Y. C. M.
Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells
21 p0042 A79-11955
Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells
23 p0515 A79-41044
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311

YEKUTIELI, G.
High reliability contacts for miniature thermoelectric converters
21 p0027 A79-10228
Solar furnace type high power density thermoelectric generator
21 p0027 A79-10229
Efficient Fresnel lens for solar concentration
22 p0285 A79-26816

YELLOTT, J. I.
History of solar energy applications - Solar energy yesterday, today and tomorrow
21 p0089 A79-15852
The application of ASHRAE Standard 93-77 to the thermal performance testing of air solar collectors
21 p0102 A79-1642

YEN, J. T.
Some flow analyses for Tornado-type wind turbines
22 p0279 A79-26181
Some recent developments in wind and ocean power systems
22 p0303 A79-29797

YEN, T. F.
Compendium reports on oil shale technology
[PB-293279/6] 23 p0578 N79-26237

YENER, Y.
Thermal storage of solar energy
21 p0103 A79-16459

YEO, R. S.
An electrochemically regenerative hydrogen-chlorine energy storage system
23 p0397 A79-33836

Transport properties of Nafion membranes in electrochemically regenerative hydrogen/halogen cells
24 p0708 A79-52960

YEOMAN, J. C., JR.
Wind turbines
[ANL/CES-TE-78-9] 24 p0790 N79-32711

YEP, T. O.
Multigap solar cell requirements and the performance of AlGaAs and Si cells in concentrated sunlight
23 p0512 A79-41025

YERASUNIS, S.
Development and application of techniques to evaluate cogeneration impacts
22 p0303 A79-29795

YEROSHENKO, V. M.
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267

YERUSHALMI, J.
Improved techniques for gasifying coal
[FE-2340-7] 23 p0554 N79-24186

YESAVAGE, V. F.
Enthalpy measurement of coal-derived liquids
[FE-2035-12] 23 p0588 N79-27282

YESIL, O.
Blackbody optical pumping of carbon dioxide laser mixtures
21 p0203 N79-13343

YIN, H. C.
Analysis of alternatives for U.S. international cooperation in solar energy
21 p0116 A79-17277

YIM, U. J.
Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667

YIN, A. K. K.
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354

YINGLING, R. D.
The properties of polycrystalline GaAs materials and devices for terrestrial photovoltaic energy conversion
23 p0515 A79-41043

YIP, H.-T.
A theoretical analysis of neutral beam probe for measuring ion temperature of a plasma
24 p0606 A79-44915

YOCKE, M. A.
The use of a complex-terrain wind model for the siting and design of wind generators
[AIAA PAPER 79-0971] 23 p0456 A79-38178

YOKOYAMA, T.
Dynamic analysis of pipeline system for thermal power generation facility
24 p0627 A79-45863

YONAS, G.
Fusion power with particle beams
21 p0034 A79-11121

YONCO, R. M.
Chemical processing of liquid lithium fusion reactor blankets
24 p0695 A79-51951

YONEDA, N.
Study on room heating utilizing eutectic salt mixture
23 p0470 A79-38638

YOO, H.
Analysis of ID saw slicing of silicon for low cost solar cells
23 p0499 A79-40903

YOO, H. I.
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158736] 23 p0580 N79-26488
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495

YOON, H.
Feasible operating regions for moving bed coal gasification reactors
22 p0297 A79-28983

YORTSOS, Y. C.
Analytical modelling of oil recovery by steam injection
22 p0358 N79-20434

YOSHIDA, M.
A new three-dimensional equivalent circuit of diagonal type MHD generator
24 p0605 A79-44914

YOSHIDA, S.
Thermodynamic considerations for the energy conversion process in geothermal power plants
23 p0476 A79-38947

YOSHIHARA, T.
Hawaii solar radiation summary
23 p0398 A79-33985

YOSHIKAWA, A.
Study on junction properties of n-CdS/p-InP heterodiodes by using injection electroluminescence
24 p0629 A79-46249

YOSHIMOTO, M.
Development of a sulfur-iodine thermochemical water-splitting cycle for hydrogen production
24 p0685 A79-51840

YOSHIMURA, M.
Properties and test results of super-hot wall electrode materials
23 p0394 A79-33415

YOSHIZAWA, S.
Energy storage by the use of high temperature electrochemical systems
21 p0148 A79-17992

YOUNG, F. C.
Long-pulse laser-plasma interactions at 10 to the 12th and 10 to the 15th W/sq cm
23 p0537 A79-43718

YOUNG, G. W.
Sunbird I - Utah's first commercial solar home
23 p0401 A79-34015

YOUNG, J.
Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

YOUNG, K. M.
Measurement of the neutron spectra from beam-heated PLT plasmas
23 p0478 A79-39724

YOUNG, L. E.
Status of wraparound contact solar cells and arrays
21 p0001 A79-10014

YOUNG, L. L., III
Health and safety hazards associated with solar concentration systems
23 p0439 A79-36628

YOUNG, M. F.
Numerical computation of the loss coefficients for evacuated cylindrical collector receiver tubes
[ASME PAPER 78-WA/SOL-3] 21 p0162 A79-19836

YOUNG, R. T.
Solar cells from laser-annealed ion-implanted silicon
23 p0509 A79-41002
Effects of laser irradiation on a diffused layer in silicon
23 p0521 A79-41083

YOUNG, W. C.
Resistance to strain degradation in preliminary UWMAK TF coil conductors for fusion reactors
24 p0604 A79-44545

YOUNGBLOOD, W. W.
Instrumenting hybrid passive/active solar systems
24 p0610 A79-45223

YOUNGER, P. R.
Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004

YOUNGSBLOOD, S. B.
Solar energy for industrial process steam
22 p0267 A79-24315

YOUSEFIAN, V.
Computer modeling of the effects of coal ash chemistry on the performance of MHD generators
23 p0391 A79-33393

YU, A. D.
Viscosity reduction of coal liquids by dissolved carbon dioxide
[SAND-79-7027] 24 p0732 N79-29365
YU, K.
Energy programs at the Johns Hopkins University Applied Physics Lab.
[PB-295439/4] 24 p0793 N79-32739
YU, T. I.
Integrated power unit
[AD-A066543] 23 p0569 N79-25396
YU, W. C.
Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446
YUDOW, B.
Alternative forms of energy transmission from OTEC plants
21 p0141 A79-17505
Alternative forms of energy carriers from ocean thermal energy plants
23 p0405 A79-34042
Hydrogen and alternative means of energy delivery from ocean thermal energy conversion /OTEC/ plants
24 p0614 A79-45595
Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980
[DSE/2426-19] 21 p0174 N79-10535
YUDOW, B. D.
Feasibility of a heat-actuated heat-pump-centered integrated community energy system
24 p0656 A79-51561
Production of high-energy chemicals using solar energy heat
[ORNL/SUB-7390/1] 24 p0799 N79-32707
YUHARA, K.
Infrared remote sensing on geothermal areas by helicopter
22 p0256 A79-22620
YUILL, G. K.
Economic design of a solar domestic water heating system
22 p0321 A79-31438
YUNG, C. S.
A two-dimensional thermal analysis of a new high-performance tubular solar collector
22 p0352 N79-19060
Computerized simulation and parameterization of a new high-performance tubular solar collector
23 p0539 N79-22163
YUNG, D.
Major factors in OTEC heat exchanger design
23 p0404 A79-34039
Flow-induced vibration in shell-and-tube heat exchangers for ocean thermal energy conversion /OTEC/
24 p0618 A79-45790
Flow-induced vibration in shell-and-tube heat exchangers for Ocean Thermal Energy Conversion (OTEC)
[ANL-OTEC-78-3] 24 p0747 N79-30522
YUNG, D. T.
Performance tests of the 1MWt shell-and-tube heat exchangers for OTEC
24 p0618 A79-45787
YURCHAK, S.
Process aging studies in the conversion of methanol to gasoline in a fixed bed reactor
23 p0492 A79-40454

Z

ZABRANSKY, Z.
Influence of composition on the activity of tungsten carbide gas diffusion hydrogen electrodes
22 p0245 A79-21482
ZACCOR, J. V.
Opportunities for energy conservation in finished concrete products
[HCP/CS-1549] 24 p0772 N79-31782
ZACHMANN, H. C.
Liquid hydrogen from solar energy now
23 p0410 A79-34117
ZAIAVLIN, V. N.
Analysis of the optical characteristics of silicon photovoltaic cells with bilateral sensitivity
24 p0647 A79-49182
ZAIENTS, S. L.
Problems in the development of high-service-life capacitative accumulators
22 p0243 A79-21249
ZAITSEVA, A. K.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289
New models of solar cells and prospects for their optimization
21 p0166 A79-20346
Photovoltaic cell with bilateral sensitivity
24 p0647 A79-49179
ZAJAC, G.
Microstructure dependence of the optical properties of solar-absorbing black chrome
22 p0256 A79-22858
Relationship of optical degradation to surface morphology changes in solar absorbers
23 p0446 A79-37158
The surface microstructure optical properties relationship in solar absorbers - Black chrome
24 p0655 A79-50181
ZAJIC, J. E.
The relation of surfactant properties to the extraction of bitumen from Athabasca tar sand by a solvent-aqueous-surfactant process
23 p0494 A79-40739
ZAKHARKO, IU. A.
Vaporization of drops of a melt of potassium carbonate in a medium of combustion products
21 p0167 A79-20411
ZAKHIDOV, R. A.
General principles of multielement concentrating system design
21 p0054 A79-13291
Composite heliostats of large solar plants
21 p0166 A79-20350
Accelerated tests for coatings
22 p0296 A79-28668
Optimal geometrical properties of cavity-type solar collectors with selective absorption properties
23 p0433 A79-35381
Accuracy and energy characteristics of paraboloidal heliostat system
24 p0602 A79-44261
Accelerated tests of coatings
24 p0637 A79-46906
Principles for the calculation of heliostat fields of a solar power plant
24 p0646 A79-48738
Optimal geometric parameters of cavity solar collectors with selective radiation-absorption properties
24 p0663 A79-50708
ZAKKAY, V.
Heat exchanger designs for coal-fired fluidized beds
21 p0009 A79-10079
Recent developments in pressurized fluidized bed coal combustion research
[AIAA PAPER 79-0190] 21 p0157 A79-19589
The optimization of heat exchanger solidity for coal-fired fluidized bed combustors
[ASME PAPER 79-GT-78] 23 p0376 A79-32357
ZAKS, M. B.
Characteristics of silicon photoconverters with inversion layer
21 p0166 A79-20349
Analysis of the characteristics of silicon photoconverters in the 100-400 K temperature range
21 p0167 A79-20361
Photoelectric characteristics of silicon insulator/semiconductor structures with induced channels
24 p0640 A79-47490
ZANCHINI, E.
A contribution to evaluation of flat-plate solar collectors performance
21 p0133 A79-17427
ZANDERS, D. L.
Particulate control mobile test units: Third year's operation
[PB-293657/5] 21 p0178 N79-10603
ZANGRANDO, F.
Heat extraction from a salt gradient solar pond
23 p0410 A79-34085

ZANOTTI, L.
Crystal growth and properties of CuGa/x/In/1-x/Se2 chalcopyrite compound
24 p0654 A79-50176

ZAR, J.
Design of superconducting magnets for full-scale MHD generators
21 p0084 A79-15306

ZATELEPIN, V. N.
Effect of force field nonuniformity on flow in an MHD channel
21 p0101 A79-16365
Heat transfer in a high-power MHD channel
23 p0533 A79-43171

ZAUDERER, B.
Developments in electrodes and power conditioning systems for open-cycle MHD generators
23 p0395 A79-33426

ZAVITSANOS, P. D.
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243

ZAWORSKI, R. J.
Solar pond stability experiments
21 p0042 A79-11878

ZEHR, S. W.
Intercell ohmic contacts for high efficiency multijunction solar converters
24 p0786 N79-32673

ZEICHNER, A.
Some thermodynamic considerations on the photodecomposition of water mediated by redox reactions and their relation to solar energy utilization
24 p0660 A79-50538

ZEITLIN, B. A.
Conductor for LASL 10-MWhr superconducting energy storage coil
21 p0085 A79-15309

ZEITNER, E. J., JR.
High performance lithium/iron disulfide cells
21 p0010 A79-10087

ZELBY, L. W.
Function of economics in energy policy
23 p0422 A79-34179

ZELDIN, B.
Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

ZELENER, B. V.
The electric conductivity of a plasma of combustion products of hydrocarbon fuels with alkali impurity
21 p0167 A79-20415

ZEMBRZUSKI, J.
Optimization method of isotopic thermoelectric microgenerator geometry
22 p0260 A79-23613

ZENER, C.
Recent developments in the foam OTEC system
24 p0623 A79-45832
Design of land-based, foam OTEC plants for bottoming cycles
24 p0624 A79-45839
Multiple staging of the cold water in the open cycle OTEC Systems
24 p0624 A79-45840

ZENKEVICH, B. V.
Superconducting magnets
21 p0105 A79-16485

ZENKIVICH, V. B.
Calculation of hysteresis losses in superconducting coils
23 p0432 A79-35174

ZENTNER, R. C.
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832

ZEREN, F.
Design of a freon jet pump for use in a solar cooling system
[ASME PAPER 78-WA/SOL-15] 21 p0164 A79-19847

ZERZAN, J. M.
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies
[LBL-8802] 24 p0786 N79-32684

ZETTI, B. J. B.
The solar still - A new design
23 p0384 A79-33213
Simple methane digestors
23 p0386 A79-33234

ZEWAIL, A. H.
Luminescent solar concentrators. I - Theory of operation and techniques for performance evaluation
24 p0669 A79-51178

ZHARINOV, E. I.
Possibility of solving the controlled nuclear thermosynthesis problem on the basis of magnetogasdynamic cumulative energy
24 p0709 A79-53209

ZHELEZNIAK, M. B.
Heat transfer in a high-power MHD channel
23 p0533 A79-43171

ZHELNIN, V. A.
Comparison of results of calculation of flow in an MHD generator with experimental data obtained on the U-25 device
22 p0306 A79-30392

ZHELTOV, V. V.
Calculation of hysteresis losses in superconducting coils
23 p0432 A79-35174

ZHEREBTSOV, V. A.
Contribution to the theory of the pulsed mode of operation of the thermionic energy converter. II
22 p0246 A79-21542
Theory of the pulsed operation of a thermionic converter. II - Ionization stage
23 p0442 A79-36815

ZHIDKOVA, E. V.
Spectral characteristics of photoconverters with nonuniform defect distribution in the base
21 p0053 A79-13289

ZHILINSKII, A. P.
Investigation of the Hall effect in a discharge with a rotational electric field
22 p0246 A79-21532
Hall effect in an induction discharge
23 p0442 A79-36806

ZHOLUDOV, IA. S.
Stability of combustion in the combustion chamber of an MHD generator
21 p0049 A79-12691
Development of the combustion chamber of an experimental MHD generator
22 p0327 A79-32105
Heat transfer in a high temperature combustion chamber with premixing
23 p0474 A79-38869

ZHUKOVSKII, V. G.
Effect of the magnetic configuration of the poloidal diverter on the plasma in the T-12 finger-ring tokamak
22 p0244 A79-21429

ZIAJKA, P.
Report on a simple fusion reactor model that is already in operation
23 p0407 A79-34058

ZIEGENBEIN, B.
Design, operation and performance of the BBC Solar House
21 p0137 A79-17462

ZIEGLER, W.
Atmospheric attenuation of centimeter microwaves
[AIAA PAPER 79-1423] 23 p0427 A79-34849

ZIELINGER, J. P.
Photovoltaic conversion in Cu2O
23 p0384 A79-32973

ZIERL, I.
Published patent applications and patents resulting from German government sponsored research and development
[BMFT-FB-T-78-31] 24 p0794 N79-33151

ZIMMERMAN, A. H.
A state of charge monitor for sealed lead-acid cells
[ATR-78(8114)-2] 21 p0220 N79-14558

ZIMMERMAN, D. K.
Evaluation of a plastic parabolic concentrator for terrestial photovoltaic applications
23 p0508 A79-40995

ZIMMERMAN, P. W.
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607

Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575

ZIMMERMAN, N.
An assessment of mercury emissions from fossil fueled power plants
[PB-285227/5] 21 p0213 N79-13592

ZIMMERMAN, W. F.
Mini-Brayton heat source assembly development
[NASA-CR-159447] 21 p0196 N79-12554

ZIMMERMANN, K. J.
New design verification aspects of large flexible solar arrays
[IAF PAPER 78-217] 21 p0035 A79-11298

ZIMONT, V. L.
Combustion of hydrogen in a supersonic flow in a channel in the presence of a pseudodiscontinuity
22 p0324 A79-31845

ZINN, K. G.
Augmented solar energy collection using different types of planar reflective surfaces - Theoretical calculations and experimental results
22 p0242 A79-21166
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494

ZINNEMAN, T. E.
Observation of voltage fluctuations in a Superconducting Magnet during MHD power generation
22 p0235 A79-20531

ZIPH, B.
A variable angle wobble plate drive for a stroke controlled Stirling engine
24 p0690 A79-51890
System analysis, design and proof-of-concept experiment of a total energy system, phase 2
[COO-2947-5] 24 p0742 N79-29660

ZIPKIN, M. A.
Making turbofan engines more energy efficient
[ASME PAPER 78-GT-198] 21 p0033 A79-10818

ZITSOW, U.
Steam generator and turbomachines
21 p0106 A79-16489

ZIVI, S. M.
Battery engineering problems in designing an electrical load leveling plant for lithium/iron-sulfide cells
24 p0685 A79-51838

ZLATANOVIC, M.
Performance of a closed-cycle MHD generator with molecular impurities
22 p0283 A79-26524
Performance of a closed cycle MHD generator with molecular impurities
23 p0394 A79-33418

ZOLLARS, G. F.
Forecasts of energy technology. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0337/0] 23 p0575 N79-25531

ZONDERVAN, K. L.
Dynamic computer simulation of the DOE 10 MW solar thermal pilot plant
[AIAA PAPER 78-1752] 21 p0060 A79-13854

ZOOK, J. D.
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776

ZORINA, T. P.
Analysis of the thermal state of a radioisotopic thermoelectric generator under conditions simulating a fire
24 p0706 A79-52368

ZORZI, E. S.
A status of the 'Alpha-ply' composite flywheel concept development
22 p0241 A79-20843

ZOSCHAK, R. J.
Heat pipe central solar receiver gas turbine plant
21 p0022 A79-10178

ZOTOV, A. V.
Some aspects of variable operating regimes of an MHD generator
23 p0436 A79-35601

ZOTOV, I. L.
Cryogenic technology and superconductivity in controlled fusion
22 p0311 A79-31003

ZUCKERBERG, H.
Diesel bus performance simulation program
[PB-295524/3] 24 p0763 N79-31110

ZUKAKISHVILI, G. G.
Plasma behavior near the neutral line between parallel currents
22 p0324 A79-31754

ZUKAKISHVILI, L. M.
Plasma behavior near the neutral line between parallel currents
22 p0324 A79-31754

ZUKOR, S. H.
Environmental aspects of the Department of Energy's underground coal conversion program
24 p0664 A79-50882

ZUMDIECK, J. F.
Energy exchanger technology applied to laser heated engines
21 p0110 A79-16631
The energy exchanger in advanced power cycle systems
24 p0702 A79-52002

ZVIAGINA, K. N.
Study of photoelectric characteristics of photocells made from high-resistivity silicon
22 p0296 A79-28666
Investigation of the photoelectric characteristics of high-resistivity silicon photoconverters
24 p0637 A79-46904

ZVIRIN, Y.
Experiments with a flat plate solar water heating system in thermosyphonic flow
22 p0262 A79-23755
On the stability of the natural circulation solar heater
23 p0531 A79-42896

ZWAAN, R. J.
Investigations on the aeroelastic stability of large wind turbines
23 p0483 A79-40116
Investigations on the aeroelastic stability of large wind turbines
[NLR-MP-78014-U] 24 p0792 N79-32731

ZWANZIGER, M. G.
Hydrogen storage in the form of metal hydrides
23 p0388 A79-33251

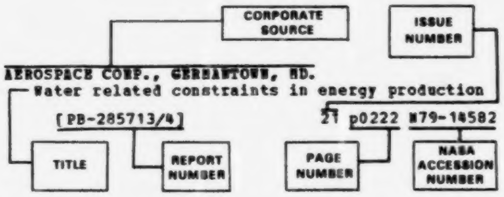
ZWEBEN, S. J.
Small-scale magnetic fluctuations inside the Macrotor tokamak
23 p0381 A79-32473

ZWISSLER, J.
Performance prediction evaluation of ceramic materials in point-focusing solar receivers
[NASA-CR-158774] 23 p0594 N79-27654

CORPORATE SOURCE INDEX

ENERGY / *A Continuing Bibliography (Issue 24)* JANUARY 1980

Typical Corporate Source Index Listing



The title of the document is used to provide a brief description of the subject matter. The issue, page number and NASA or AIAA accession number are included in each entry to assist the user in locating the abstract in the abstract section of an individual supplement of *Energy*. If applicable, a report number is also included as an aid in identifying the document.

A

ABACUS CONTROLS, INC., SOMERVILLE, N. J.
- An inverter/controller subsystem optimized for photovoltaic applications 23 p0516 A79-41047

ACUREX CORP., MOUNTAIN VIEW, CALIF.
- Design of a 150 kWe distributed collector solar thermal power station [AED-CONF-78-212-013] 23 p0583 N79-26517

ADDIS TRANSLATIONS INTERNATIONAL, PORTOLA VALLEY, CALIF.
- Laser and energetics of the future [UCRL-TRANS-11467] 24 p0734 N79-29513

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT, NEUILLY-SUR-SEINE (FRANCE).
- The AGARD propulsion and energetics panel, 1952-1977 [AGARD-AR-111] 22 p0337 N79-16848

ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT, PARIS (FRANCE).
- Aircraft Engine Future Fuels and Energy Conservation [AGARD-LS-96] 21 p0201 N79-13192

AEG-TELEFUNKEN, WEDEL (WEST GERMANY).
- Space application of large area terrestrial solar cells for multi-KW-arrays 24 p0751 N79-30732
- Some current developments in solar array technology at AEG-Telefunken 24 p0751 N79-30736
- Assessment of short and medium term improvements to the Spacelab power system [ESA-CR(P)-1193-VOL-2] 24 p0768 N79-31513

AEROCHEM RESEARCH LABS., INC., PRINCETON, N. J.
- Development of a model and computer code to describe solar grade silicon production processes [NASA-CR-158037] 21 p0219 N79-14555
- Development of a model and computer code to describe solar grade silicon production processes [NASA-CR-158679] 23 p0558 N79-24448

AERODYNE RESEARCH, INC., BEDFORD, MASS.
- An assessment of the potential impact of combustion research on internal combustion engine emissions and fuel consumption [PB-290953/9] 23 p0568 N79-25249

AERONAUTICAL RESEARCH LABS., MELBOURNE (AUSTRALIA).
- Tests of Wisconsin S12D engine running on natural gas with addition of carbon dioxide [AD-A058486] 22 p0339 N79-17230

AEROSPACE CORP., EL SEGUNDO, CALIF.
- High efficiency low cost solar cell power 21 p0048 A79-12471
- Historical and projected power requirements 21 p0169 N79-10125
- A state of charge monitor for sealed lead-acid cells [ATR-78(8114)-2] 21 p0220 N79-14558
- Statement of Ivan Bekey, Director of Advanced Mission Studies, Aerospace Corporation 21 p0224 N79-15107
- Combustion modification effects on NOx emissions from gas-, oil-, and coal-fired utility boilers [PB-289878/1] 23 p0545 N79-22661
- Low cost solar array project: Composition measurements by analytical photo catalysis [NASA-CR-158598] 23 p0550 N79-23513
- Photovoltaic mission analysis 23 p0570 N79-25486
- Solar Heating and Cooling Of Buildings (SHACCB) requirements definition and impact analysis [EPRI-ER-808-VOL-1] 23 p0597 N79-27687
- Environmental factors of power satellites [SAMSO-TR-79-66] 24 p0717 N79-28213
- Utilization of used oil [ATR-78(7384)-1] 24 p0767 N79-31432
- Solar Heating And Cooling Of Buildings (SHACOB): Requirements definition and impact analysis [EPRI-ER-808-SY] 24 p0787 N79-32687

AEROSPACE CORP., GERMANTOWN, MD.
- Water related constraints in energy production [PB-285713/4] 21 p0222 N79-14582

AEROSPACE CORP., LOS ANGELES, CALIF.
- Disposal of by-products from nonregenerable flue gas desulfurization systems [PB-293163/2] 23 p0586 N79-26575

AEROSPATIALE ETABLISSEMENT DES MUREAUX (FRANCE).
- Development of a satellite flywheel family operating on one active axis magnetic bearings 22 p0366 N79-21392

AEROTHERM ACUREX CORP., MOUNTAIN VIEW, CALIF.
- Measurement of high-temperature, high-pressure processes [PB-284041/1] 21 p0195 N79-12424

AGRICULTURAL AND TECHNICAL COLL. OF NORTH CAROLINA, GREENSBORO.
- Material growth and characterization directed toward improving III-V heterojunction solar cells [NASA-CR-158476] 22 p0367 N79-21543

AIA RESEARCH CORP., WASHINGTON, D. C.
- Phase one/base data for the development of energy performance standards for new buildings: Data analysis [PB-286901/4] 22 p0331 N79-16148
- Phase one/base data for the development of energy performance standards for new buildings: Sample design [PB-286903/0] 22 p0331 N79-16150
- Phase one/base data for the development of energy performance standards for new buildings. Climatic classification [PB-286900/6] 22 p0336 N79-16497
- Phase one/base data for the development of energy performance standard for new buildings. Task report: Building classification [PB-286904/8] 22 p0355 N79-19468
- Passive solar design: A survey of monitored buildings [HCP/CS-4113-2] 24 p0774 N79-31803
- Passive solar design: An extensive bibliography [HCP/CS-4113-3] 24 p0774 N79-31804

AIR FORCE ACADEMY, COLO.
The development of a laser Doppler velocimetry system for unsteady separated flow research: Preliminary results
[AD-A061724] 22 p0352 N79-19305

AIR FORCE AERO PROPULSION LAB., WRIGHT-PATTERSON AFB, OHIO.
Military needs for orbital power
21 p0165 N79-10127
Evaluation of future jet fuel combustion characteristics
[AD-A060218] 21 p0216 N79-14231
Some fatigue characteristics of nickel battery plaque
[AD-A060370] 21 p0230 N79-15415
Fuel hydrogen content as an indicator of radiative heat transfer in an aircraft gas turbine combustor
[AD-A067709] 23 p0577 N79-26224
Solar photovoltaic research and development program of the Air Force Aero Propulsion Laboratory
24 p0783 N79-32642

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.
The application of optimal control theory hybrid electric transit systems
[AD-A059365] 21 p0220 N79-14559
Development of an Air Force facilities energy information system
[AD-A059309] 21 p0223 N79-14918

AIRESEARCH MFG. CO., LOS ANGELES, CALIF.
Study of heat engine/flywheel: Hybrid propulsion configuration with electrical transmission system. Phase 2: Design definition
[ALO-41/2] 21 p0185 N79-11493

AIRESEARCH MFG. CO., PHOENIX, ARIZ.
Brayton engines for dispersed solar power
23 p0477 A79-38950
Mini-BRU/BIPS 1300 watt (sub)e dynamic power conversion system development: Executive summary
[NASA-CR-159440] 21 p0173 N79-10526
Ceramic technology readiness program
[PE-2664-7] 21 p0180 N79-11223
Conceptual design study of improved automotives gas turbine powertrain
[NASA-CR-159580] 24 p0762 N79-31088

AIRESEARCH MFG. CO., TORRANCE, CALIF.
Solar-powered Rankine heat pump for heating and cooling
24 p0610 A79-45219
Study of flywheel energy storage Volume 1: Executive summary
[PB-282652/7] 21 p0176 N79-10555
Study of flywheel energy storage. Volume 2: Systems analysis
[PB-282653/5] 21 p0176 N79-10556
Study of flywheel energy storage. Volume 3: System mechanization
[PB-282654/3] 21 p0177 N79-10557
Study of flywheel energy storage. Volume 4: Life-cycle costs
[PB-282655/0] 21 p0177 N79-10558
Study of flywheel energy storage. Volume 5: Vehicle tests
[PB-282656/8] 21 p0177 N79-10559
Prototype solar heating and cooling systems
[NASA-CR-150828] 21 p0196 N79-12552
Wayside energy storage summary. Volume 1: Summary
[DOT-TSC-FRA-79-7-1-VOL-1] 22 p0370 N79-21563
Prototype solar heating and cooling systems
[NASA-CR-161204] 23 p0557 N79-24437

ALABAMA A & M UNIV., HUNTSVILLE.
Solar energy storage via liquid filled cans - Test data and analysis
23 p0400 A79-34005

ALABAMA UNIV., HUNTSVILLE.
Analysis of data user's needs for performance evaluation of solar heating and cooling systems
21 p0087 A79-15827
Protection of solar collector materials from UV
24 p0609 A79-45217

ALABAMA UNIV., UNIVERSITY.
Development of surfaces optically suitable for flat solar panels
[NASA-CR-150831] 21 p0173 N79-10522
Development of surfaces optically suitable for flat solar panels
[NASA-CR-161290] 24 p0771 N79-31780

ALABAMA UNIV. IN HUNTSVILLE.
A comprehensive solar energy system analysis data base in Huntsville, Alabama
24 p0608 A79-45205

ALASKA UNIV., ANCHORAGE.
Energy-intensive industry for Alaska. Volume 3: Background data
[TID-29025-3] 24 p0755 N79-30788

ALL-UNION SCIENTIFIC RESEARCH INST. OF OIL REFINING, MOSCOW (USSR).
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864

ALLIED CHEMICAL CORP., IDAHO FALLS, IDAHO.
Liquid-fluidized-bed heat exchanger flow distribution models
[ICP-1151] 22 p0369 N79-21559

ALSID, SNOWDEN AND ASSOCIATES, BELLEVUE, WASH.
Solvent Refined Coal (SRC) process: Environmental program. Volume 3: Pilot plant development work, part 5
[FE-0496-T8] 23 p0588 N79-27329

AMERICAN GAS ASSOCIATION, INC., ARLINGTON, VA.
Direction of gas supply research in the US
22 p0340 N79-17320

AMERICAN PHYSICAL SOCIETY, NEW YORK, N. Y.
Principal conclusions of the American Physical Society study group on solar photovoltaic energy
[PB-292164/1] 23 p0575 N79-25533

AMERICAN UNIV., WASHINGTON, D. C.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkane sulfonic acids as potential fuel cell electrolytes
[AD-A056278] 21 p0184 N79-11483
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A058795] 21 p0206 N79-13503

APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL, MD.
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB-290226/0] 23 p0544 N79-22645
Potential application of Madison formation waters for community heating in South Dakota
[APL/JHU-QM-78-042R] 24 p0740 N79-29640
Geothermal energy market study on the Atlantic coastal plain. A review of recent energy price projections for traditional space heating fuel, 1985-2000
[PB-294013/8] 24 p0760 N79-30837
Energy programs at the Johns Hopkins University Applied Physics Lab.
[PB-295439/4] 24 p0793 N79-32739
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB-296217/3] 24 p0802 N79-33602

APPROPRIATE TECHNOLOGY GROUP, OSKALOOSA, KANS.
Wind driven water pumps. Economics, technology, current activities
[PB-292816/6] 23 p0585 N79-26542

ARCO SOLAR, INC., CHATSWORTH, CALIF.
Automated solar panel assembly line. LSA task; production processes and equipment
[NASA-CR-158671] 23 p0559 N79-24455
Vacuum die casting of silicon sheet for photovoltaic applications
[NASA-CR-162360] 24 p0798 N79-33566

ARGONNE NATIONAL LAB., ILL.
National coal utilization assessment: An integrated assessment of increased coal use in the midwest: Impacts and constraints, volume 1
[ANL/AA-11-VOL-1-DRAFT] 21 p0174 N79-10537
Biomimetic approach to solar energy conversion: Artificial photosynthesis
[CONF-780222-5] 21 p0186 N79-11506
Advanced secondary batteries for electric vehicle propulsion
[CONF-780426-2] 21 p0186 N79-11508
Integrating technologies to produce energy conservation
[CONF-780109-6] 21 p0189 N79-11541
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A059240] 21 p0197 N79-12564

Environmental control implications of generating electric power from coal. Appendix A, part 2: Coal preparation and cleaning assessment study appendix
[ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571

Coal liquefaction support studies. Task 1: Heat of reaction of hydrogen with coal slurries. Task 2: Heat transfer coefficient
[ANL/CEN-FE-77-5] 21 p0216 N79-14242

MDH balance of plant technology project
[ANL-MHD-78-7] 22 p0361 N79-20500

Parametric study of the performance of a CDIF 1-B coal-fired MHD generator
[ANL-MHD-79-3] 22 p0361 N79-20503

Technical support for open-cycle MHD program
[ANL-MHD-78-8] 22 p0361 N79-20507

A biologist's manual for the evaluation of impacts of coal-fired power plants on fish, wildlife and their habitats
[PB-291330/9] 22 p0373 N79-21679

Design of optimum compressed air energy storage systems
[CONF-7811101-1] 23 p0565 N79-24508

Environmental development plan for transportation energy conservation. FY 1979 update
[ANL/EES-TM-33] 23 p0567 N79-24899

Evaluation of available MHD seed-regeneration processes on the basis of energy considerations
[ANL/MHD-78-4] 23 p0583 N79-26519

HYCSOS chemical heat pump and energy conversion system
[CONF-781142-7] 23 p0584 N79-26529

Control of sulfur dioxide and particulate emission in MHD power systems using high sulfur coal
[CONF-781109-18] 23 p0585 N79-26546

Fusion power program
[ANL/FPP-78-2] 23 p0586 N79-26953

Reliability and maintainability evaluation of freezing in solar systems
[ANL/SDP-TM-78-3] 23 p0596 N79-27674

Metal hydride solar heat pump and power system (HYCSOS)
[CONF-781133-5] 23 p0596 N79-27675

Computer software for planning design of community energy systems
[CONF-781182-2] 23 p0600 N79-28063

Materials technology for coal-conversion processes
[ANL-79-2] 24 p0719 N79-28362

Cost study application of the guidebook on integrated community energy systems: Indirect economic and energy impacts
[ANL/ICES-TM-17] 24 p0727 N79-28777

Corrosion of metals in coal-gasification environments
[CONF-790145-2] 24 p0732 N79-29305

Design and installation manual for thermal energy storage
[ANL-79-15] 24 p0740 N79-29636

Proceedings of the 2nd Workshop on Energy-Conserving Site Design Case Studies
[ANL/ICES-TM-22] 24 p0742 N79-29658

Method for the preliminary feasibility analysis of community energy systems
[CONF-790107-5] 24 p0742 N79-29659

Transportation energy conservation: An environmental overview
[CONF-781109-16] 24 p0742 N79-29661

Potassium seed activities in open-cycle MHD system: Predictions using a multiphase multicomponent solution model
[CONF-780941-6] 24 p0744 N79-30036

Flow-induced vibration in shell-and-tube heat exchangers for Ocean Thermal Energy Conversion (OTEC)
[ANL-OTEC-78-3] 24 p0747 N79-30522

Reliability, maintainability, and materials performance of solar demonstration systems
[ANL/EES-CP-14] 24 p0754 N79-30781

Fusion energy for alternative applications: The generation of synthetic gaseous fuels
[ANL/FPP-TM-117] 24 p0755 N79-30790

Evaluation of selected near-term energy-conservation options for the midwest
[ANL/EES-TM-41] 24 p0756 N79-30803

Effects of the proposed new source performance standards: A comparative assessment of the energy and economic impact
[ANL/EES-CP-6] 24 p0756 N79-30808

Preliminary evaluation of the use of hydraulic air compressors in water-compensated reservoir compressed air storage power plants
[CONF-780599-2] 24 p0758 N79-30822

Environmental control implications of increased coal utilization under the National Energy Plan
[ANL/EES-CP-10] 24 p0760 N79-30846

Hazards from radioactive waste in perspective
[CONF-790204-9] 24 p0761 N79-31024

Solar energy program
[ANL-79-16] 24 p0772 N79-31789

High-performance batteries for electric-vehicle propulsion and stationary energy storage
[ANL-78-94] 24 p0773 N79-31793

Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801

Assessment of national consequences of increased coal utilization, executive summary, volume 2
[TID-29425-VOL-2] 24 p0774 N79-31802

Feasibility of district heating of northern US cities by cogeneration
[ANL/EES-CP-18] 24 p0776 N79-31829

Application of air ejectors to the performance improvement and cost reduction of compressed air storage power plants
[CONF-780599-1] 24 p0776 N79-31830

Micellar/polymer floods for enhanced oil recovery: A review of displacement mechanisms and their simulation
[ANL/ES-74] 24 p0781 N79-32620

Energy and cost calculations. 1: Optimization of electrochemical processes to achieve minimum product cost and the impact on energy consumption
[ANL/OEPM-78-2] 24 p0788 N79-32697

Transportation Energy Conservation (TEC) environmental development plan
[ANL/EES/CP-11] 24 p0801 N79-33589

ARIZONA PUBLIC SERVICE CO., PHOENIX.

Photovoltaics and environmental impact considerations
23 p0571 N79-25496

ARIZONA STATE UNIV., TEMPE.

Workshop on Ecological Impacts of Solar Energy Conversion
[COO-4339-4] 23 p0583 N79-26522

Pollutant control through staged combustion of pulverized coal
[FE-1817-5] 24 p0744 N79-29683

Combined photovoltaic/thermal system studies
[SAND-78-7031] 24 p0787 N79-32691

ARIZONA UNIV., TUCSON.

Outlook for world oil into the 21st century with emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-11454

Optical design of a solar collector for the advanced solar thermal electric conversion/process heat program
[Y/SUB-77/14261] 21 p0209 N79-13528

Solar energy, water, and industrial systems in arid lands: Technological overview and annotated bibliography
[PB-285129/3] 21 p0211 N79-13549

ARMY COMMAND AND GENERAL STAFF COLL., FORT LEAVENWORTH, KANSAS.

The department of Defense's alternate energy policy
[AD-A058200] 21 p0197 N79-12563

ARMY CONSTRUCTION ENGINEERING RESEARCH LAB., CHAMPAIGN, ILL.

Design of solar heating and cooling systems
[AD-A062719] 22 p0363 N79-20522

The performance of an experimental solar heating system
[AD-A066699] 23 p0573 N79-25516

ARMY ELECTRONICS COMMAND, FORT MONMOUTH, N. J.

Improved anodes for liquid hydrocarbon fuel cell
[AD-A058456] 21 p0206 N79-13504

ARMY FACILITIES ENGINEERING SUPPORT AGENCY, FORT BELVOIR, VA.

Energy utilization survey pamphlet for buildings
[AD-A062930] 22 p0371 N79-21624

ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTER, FORT BELVOIR, VA.
Military applications of photovoltaic systems
23 p0571 N79-25494
ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT COMMAND, FORT BELVOIR, VA.
High energy metal hydride fuel cell power source
[AD-A056491] 21 p0184 N79-11485
Baseline tests of the Sebring Citi-Van electric delivery truck
[AD-A066582] 23 p0576 N79-25930
ARTECH CORP., FALLS CHURCH, VA.
Thermal energy storage subsystems
[NASA-CR-150812] 21 p0172 N79-10517
ASHLAND OIL AND REFINING CO., KY.
The H-Coal processes: A status report
23 p0593 N79-27617
ASL ENGINEERING, GOLETA, CALIF.
Environmentally induced cracking of natural gas and liquid pipelines. Volume 2: Appendices A and B
[PB-282924/0] 21 p0181 N79-11446
Environmentally induced cracking of natural gas and liquid pipelines. Volume 1: Technical report
[PB-282923/2] 21 p0181 N79-11447
ASSOCIATION AERONAUTIQUE ET ASTRONAUTIQUE DE FRANCE, PARIS.
Adaptation for the economy or adaptation for energy conservation
[AAAF-NT-77-23] 23 p0551 N79-23537
ATLANTIC RICHFIELD CO., HARVEY, ILL.
Energy supply and demand in California
23 p0591 N79-27603
ATOMIC ENERGY BOARD, PRETORIA (SOUTH AFRICA).
Nuclear power today and tomorrow
22 p0340 N79-17317
ATOMICS INTERNATIONAL, CANOGA PARK, CALIF.
Deterministic insolation model program description and user's guide
[SAND-78-7044] 24 p0744 N79-29743
ATOMICS INTERNATIONAL DIV., RICHLAND, WASH.
Spent fuel handling and packaging program
[RHO-LD-78-4-SEP] 24 p0777 N79-32075
Spent fuel handling and packaging program
[RHO-LD-78-4-AUG] 24 p0777 N79-32081
AUDI NSU AUTO UNION A.G., NECKARSULM (WEST GERMANY).
Update of development on the new Audi NSU rotary engine generation
22 p0329 N79-15965
Review of the Rhein-Flugzeugbau Wankel powered aircraft program
22 p0329 N79-15966
AUSTRIAN SOLAR AND SPACE AGENCY, VIENNA.
Proposal for a representation of the quasisteady-state performance of flat-plate collectors
[ASSA-SE-B21/77] 22 p0349 N79-18461
Meteorological measurement data for solar energy utilization
[ASSA-PA-5] 23 p0574 N79-25524
Comparison of collector test methods
[ASSA-SE-B24/77] 23 p0574 N79-25526
Solar energy Measuring stations in Austria: Results and experiences
[ASSA-SE-INFO-6/78] 23 p0574 N79-25527
Global radiation on randomly oriented and inclined surfaces in Austria
[ASSA-SE-INFO-7/78] 23 p0574 N79-25528
Thermal utilization of solar energy in Austria. Part 1: Hot water preparation, swimming pool and space heating
23 p0574 N79-25529
Meteorological data for solar energy applications
24 p0792 N79-32733
AVCO-EVERETT RESEARCH LAB., MASS.
Engineering test facility conceptual design, part 1
[FE-2614-2-PT-1] 22 p0365 N79-21560
Engineering test facility conceptual design, part 2
[FE-2614-2-PT-2] 22 p0365 N79-21561
AXIOMATIX, LOS ANGELES, CALIF.
Microwave systems analysis, solar power satellite
[NASA-CR-160091] 22 p0337 N79-16892

B

B AND A ENGINEERS LTD., CHICAGO, ILL.
Assessment of the technoeconomic feasibility or Seasonal Thermal Energy Storage systems (STES)
[ANL/EES-TM-35] 24 p0740 N79-29637
B & K ENGINEERING, INC., TOWSON, MD.
Development of cryogenic thermal control heat pipes
[NASA-CR-152302] 24 p0747 N79-30499
BADGER PLANTS, INC., CAMBRIDGE, MASS.
Coal-to-gasoline conceptual design and market evaluation of methanol fuel and methanol-derived gasoline
[FE-2416-37] 24 p0734 N79-29378
BALL BROS. RESEARCH CORP., BOULDER, COLO.
Outgassing tests of fiber-epoxy composite materials
[SAND-78-7075] 23 p0552 N79-24071
BARBER-NICHOLS ENGINEERING CO., ARVADA, COLO.
Technology assessment of geothermal pumping equipment
[ALO-4162-2] 24 p0735 N79-29524
Geothermal pump test facility
[ALO-3715-1] 24 p0755 N79-30793
BARRY (THEODORE) AND ASSOCIATES, LOS ANGELES, CALIF.
SAMICS validation. SAMICS support study, phase 3
[NASA-CR-158746] 23 p0581 N79-26491
BATTELLE COLUMBUS LABS., OHIO.
Magnetically confined plasma solar collector
21 p0109 A79-16617
Methods for the photochemical utilization of solar energy
21 p0111 A79-16641
Measurement requirements and techniques for degradation studies and lifetime prediction testing of photovoltaic modules
23 p0428 A79-35042
Procedure for developing experimental designs for accelerated tests for service-life prediction
23 p0496 A79-40886
Evaluations of candidate encapsulation designs and materials for low-cost silicon photovoltaic arrays
23 p0507 A79-40982
Performance degradation mechanisms and modes in terrestrial photovoltaic arrays and technology for their diagnosis
23 p0512 A79-41019
State of the art and science report on design of alloys resistant to high-temperature corrosion-erosion in coal conversion environments
[EPRI-FP-557] 21 p0200 N79-13149
EPA program conference report: Coal cleaning, an option for Increased Coal Utilization
[PB-288223/1] 22 p0344 N79-17378
Earth orbital assessment of solar electric and solar sail propulsion systems
[NASA-CR-158167] 22 p0345 N79-17898
Preliminary environmental assessment of biomass conversion to synthetic fuels
[PB-289775/9] 22 p0365 N79-21224
Study of heat transfer through refractory lined gasifier vessel walls
[FE-2210-29] 23 p0556 N79-24306
Fuel contaminants. Volume 3: Control of coal-related pollutants
[PB-293328/1] 23 p0578 N79-26234
Fuel contaminants, volume 4: Application of oil agglomeration to coal wastes
[PB-293210/1] 23 p0578 N79-26236
Using coal inside California for nonelectric applications
23 p0591 N79-27599
Development of a low-temperature, low-cost, black-liquid solar collector
[CONF-780983-14] 24 p0756 N79-30805
Evaluation of selected chemical processes for production of low-cost silicon, phase 3
[NASA-CR-162168] 24 p0769 N79-31756
BATTELLE MEMORIAL INST., COLUMBUS, OHIO.
Combustion of hydrothermally treated coals
[PB-287521/9] 22 p0338 N79-17025

BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.

Chemical production from waste carbon monoxide: Its potential for energy conservation
[BNWL-2137] 21 p0170 N79-10179

Initial assessment: Electromagnetic compatibility aspects of proposed SPS Microwave Power Transmission System (MPTS) operations
[PNL-2482] 21 p0202 N79-13252

Preliminary results of a field experiment to characterize wind flow through a vertical plane
[PNL-2518] 21 p0203 N79-13322

Siting handbook for small wind energy conversion systems
[PNL-2521] 21 p0209 N79-13527

Analysis of federal incentives used to stimulate energy production
[PNL-2410] 21 p0210 N79-13539

Stored energy calculation: The state of the art
[PNL-2581] 21 p0210 N79-13541

Catalyst development program for hydrodesulfurization and liquefaction of coal to produce clean boiler fuels
[FE-2321-12] 21 p0216 N79-14240

Measured air flow rates through microorifices and flow prediction capability
[PB-286868/5] 21 p0217 N79-14344

Wind characteristics program element
[PNL-2545] 22 p0356 N79-19568

Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-9] 22 p0361 N79-20504

Wind direction change criteria for wind turbine design
[PNL-2531] 22 p0361 N79-20506

Development, characterization and evaluation of materials for open cycle MHD
[PNL-2004-8] 22 p0369 N79-21557

Investigation of gasification of biomass in the presence of catalysts
[CONF-7809125-1] 23 p0588 N79-27327

Sampling and analysis methods for geothermal fluids and gases
[PNL-MA-572-APP] 23 p0596 N79-27679

Role of government in solar energy development: A view from the northwest
[PNL-2784] 24 p0738 N79-29621

Energy-intensive industry for Alaska. Volume 1: Alaska cost factors, market factors, survey of energy-intensive industries
[TID-29025-1] 24 p0754 N79-30786

Energy intensive industry for Alaska. Volume 2: Case analysis
[TID-29025-2] 24 p0754 N79-30787

Energy-intensive industry for Alaska. Volume 3: Background data
[TID-29025-3] 24 p0755 N79-30788

Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801

Analysis of Federal incentives used to stimulate energy production
[PNL-2410-1-REV] 24 p0775 N79-31819

Systems analysis of solar thermal power systems. Report on task 1: Determination and characterization of solar thermal conversion options
[PNL-2693] 24 p0788 N79-32692

Effects of noncontact cleaners on transparent solar materials
[PNL-2969] 24 p0789 N79-32709

Summary of national and international radioactive waste management programs
[PNL-2941] 24 p0793 N79-32995

BDM CORP., MCLEAN, VA.

Federal photovoltaic utilization program. Planning resource document
[HCP/M50081-01] 23 p0599 N79-27706

BEAM ENGINEERING, INC., SUNNYVALE, CALIF.

Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162

Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

BECHTEL CORP., SAN FRANCISCO, CALIF.

Design of low-cost structures for photovoltaic arrays. Task 1: Survey of array structural characteristics
[SAND-78-7021] 21 p0206 N79-13509

Environmental control implications of generating electric power from coal. Appendix A, part 2: Coal preparation and cleaning assessment study appendix
[ANL/ECT-3-APP-A-PT-2] 21 p0213 N79-13571

Analysis of coal hydrogasification processes
[FE-2565-13] 23 p0554 N79-24183

Analysis of coal hydrogasification processes
[FE-2565-14] 24 p0766 N79-31416

BECHTEL INTERNATIONAL CORP., SAN FRANCISCO, CALIF.

Structural cost optimization of photovoltaic central power station modules and support structure
[ASME PAPER 79-SOL-17] 22 p0309 A79-30551

Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications
23 p0520 A79-41081

BECHTEL NATIONAL, INC., SAN FRANCISCO, CALIF.

Coal energy conversion options for Navy bases
[AD-A067463] 23 p0595 N79-27667

Conceptual design and cost study for a dual-purpose nuclear-electric reverse osmosis seawater conversion plant
[ORNL/TM-6821] 24 p0768 N79-31438

BECK (R. W.) AND ASSOCIATES, DENVER, COLO.

A primer on the rejection of waste heat from power plants
[PB-292529/5] 23 p0575 N79-25570

BERGBAU-FORSCHUNG G.M.B.H., ESSEN (WEST GERMANY).

Research and development concerning steam gasification of coal: Report on the concept of a prototype plant using nuclear processing heat
[BMFT-FB-T-78-29] 24 p0780 N79-32394

BIPHASE ENERGY SYSTEMS, INC., SANTA MONICA, CALIF.

Demonstration of a rotary separator for two-phase brine and steam flows
[TID-28519] 22 p0365 N79-21309

BITUMINOUS COAL RESEARCH, INC., MONROEVILLE, PA.

Coal supply for California
23 p0592 N79-27607

BLACK AND VEATCH CONSULTING ENGINEERS, KANSAS CITY, MO.

Geologic assessment of compressed air storage sites in Kansas
[EPRI-EM-877] 23 p0597 N79-27689

BLALOCK (S. D., JR.), KINGSPORT, TENN.

Use of waste heat from thermal electric power plants and nuclear power plants to heat greenhouses
[ORNL-TR-4483] 21 p0221 N79-14574

BOEING AEROSPACE CO., SEATTLE, WASH.

From sunlight in space to 60 Hz on earth - The losses along the way
21 p0003 A79-10027

Computer modeling for a space power transmission system
24 p0694 A79-51941

Applicability of solid state microwave technology to solar power satellites
24 p0695 A79-51945

Electrical power loss from high-voltage power circuits through plasma leakage
21 p0169 N79-10113

Improved semiconductors for photovoltaic solar cells
[DSE/2459-2] 21 p0221 N79-14577

Systems definition space based power conversion systems: Executive summary
[NASA-CR-150209] 23 p0541 N79-22616

Systems definition space-based power conversion systems
[NASA-CR-150268] 23 p0546 N79-23483

Plasma particle trajectories around spacecraft propelled by ion thrusters
23 p0552 N79-24029

Solar cells for solar power satellites
24 p0751 N79-30749

Solar power satellites: The Engineering Challenges
24 p0752 N79-30750

CO2 laser annealing of 50-microns-thick silicon solar cells
24 p0785 N79-32659
BOEING COMMERCIAL AIRPLANE CO., SEATTLE, WASH.
Design and evaluation of aircraft heat source systems for use with high-freezing point fuels
[NASA-CR-159568] 23 p0553 N79-24172
BOEING COMPUTER SERVICES, INC., SEATTLE, WASH.
SIMWEST - A simulation model for wind energy storage systems
21 p0025 A79-10241
An expanded system simulation model for solar energy storage (technical report), volume 1
[NASA-CR-159601] 24 p0804 N79-33881
An expanded system simulation model for solar energy storage (UNIVAC operation manual revisions), volume 2
[NASA-CR-159602] 24 p0804 N79-33882
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (CDC user's manual), volume 1
[NASA-CR-159607] 24 p0804 N79-33883
SIMWEST: A simulation model for wind and photovoltaic energy storage systems (cdc program descriptions), volume 2
[NASA-CR-159608] 24 p0804 N79-33884
BOEING COMPUTER SERVICES CO., FALLS CHURCH, VA.
Integrated safeguards information System (ISIS), executive summary
[PB-286869/3] 21 p0223 N79-14934
BOEING ENGINEERING AND CONSTRUCTION, SEATTLE, WASH.
Feasibility study of solar dome encapsulation of photovoltaic arrays
[NASA-CR-158368] 22 p0367 N79-21545
MOD-2 failure mode and effects analysis
[NASA-CR-159632] 24 p0747 N79-30415
Applications of thermal energy storage to process heat storage and recovery in the paper and pulp industry
[NASA-CR-159398] 24 p0756 N79-30801
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832
BOLT, BERANEK, AND NEWMAN, INC., CAMBRIDGE, MASS.
Noise-control needs in the developing energy technologies
[COO-4389-1] 21 p0213 N79-13569
BRAUN (C. F.) AND CO., ALHAMBRA, CALIF.
Coal gasification, commercial concepts, gas cost guidelines, revision 1
[FE-2240-100] 23 p0589 N79-27331
Combined shift-methanation processes
[FE-2240-97] 24 p0766 N79-31414
Considerations in sizing coal gasification plants
[FE-2240-40] 24 p0766 N79-31417
Fixed bed methanation processes
[FE-2240-96] 24 p0779 N79-32382
BRIGHAM YOUNG UNIV., PROVO, UTAH.
Mixing and kinetic processes in pulverized coal combustors
[EPRI-FP-806-SY] 23 p0589 N79-27330
BRISTOL UNIV. (ENGLAND).
The effect of maturation on the configuration of pristane in sediments and petroleum
22 p0272 A79-25375
BRITISH AEROSPACE DYNAMICS GROUP, BRISTOL (ENGLAND).
Study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
[ESS/SS-878] 22 p0335 N79-16379
Study of a flexible solar array generator for a remote sensing satellite. Volume 1: Technical report
[ESS/SS-909-VOL-1] 23 p0599 N79-27709
A study on solar arrays for programmes leading from the extension of Spacelab towards space platforms
24 p0751 N79-30748
BRITISH LIBRARY LENDING DIV., BOSTON SPA (ENGLAND).
Electrolysis of zinc. Statistical model of the process parameters for an industrial cell
[BLL-RTS-11317] 22 p0345 N79-17984
The optimum voltage for batteries used in standby lighting systems
[BLL-RTS-11512] 22 p0347 N79-18439
The world balance for energy needs in view of year 2000: Development of the problem and areas involved, part 2
[BLL-RISLEY-TR-3395-(9091.9F)] 22 p0347 N79-18442
BROOKHAVEN NATIONAL LAB., UPTON, N. Y.
Annual highlights of the energy technology programs
[BNL-50799] 21 p0185 N79-11499
Energy needs, uses, and resources in developing countries
[BNL-50784] 21 p0185 N79-11500
Energy situation in the Mid-Atlantic region
[BNL-50703] 21 p0188 N79-11528
ERDA'S oceanographic program for the mid-Atlantic coastal region
[BNL-24016] 21 p0192 N79-11641
Analytical framework for the assessment of energy resource and technology options for developing countries
[BNL-50800] 21 p0208 N79-13524
Some measures of regional-industrial interfuel substitution potentials
[BNL-24368] 21 p0208 N79-13525
Energy systems studies program
[BNL-50822] 21 p0209 N79-13526
Brookhaven National Laboratory burner-boiler/furnace efficiency test project. Annual fuel use and efficiency reference manual: hydronic equipment
[BNL-50816] 21 p0210 N79-13538
Assessment of the solid waste impact of the National Energy Plan
[BNL-50708] 21 p0213 N79-13572
Energy use in Japan and the United States
[BNL-23101] 21 p0221 N79-14578
Methodology for modeling geothermal district heating for residential markets
[BNL-50905] 22 p0361 N79-20502
Economic impacts of a transition to higher oil prices
[BNL-50871] 22 p0364 N79-20927
The Brookhaven buildings energy conservation optimization model
[BNL-50828] 22 p0370 N79-21564
Cost-effective potential of optimumly designed heat pumps for the collection, storage, and distribution of solar energy
[BNL-25195] 23 p0556 N79-24307
Thermoelectrochemical cycles for power and hydrogen production
[BNL-24387] 23 p0563 N79-24491
Hydrogen halogen energy storage system
[BNL-25212] 23 p0563 N79-24492
General-equilibrium approach to energy/environmental economic analysis
[BNL-24781] 23 p0564 N79-24504
Method for the comparative economic assessment of energy storage systems
[BNL-25291] 23 p0565 N79-24509
Hydrogen storage devices for automobiles
[BNL-25263] 23 p0583 N79-26518
Comprehensive areal model of residential heating demands
[BNL-24998] 23 p0597 N79-27692
Impacts of new energy technologies as measured against reference energy systems
[BNL-25475] 23 p0597 N79-27694
Locational response to regulatory policy: A regional analysis of energy facility location
[BNL-23597] 23 p0598 N79-27695
Alternative, semi-automated method for performing multiobjective analyses
[BNL-50892] 23 p0599 N79-27921
High voltage insulation and bushing design for flexible superconducting cables
[BNL-25351] 24 p0719 N79-28439
Application of resource allocation models to the problems of regional energy policy in large developing countries
[BNL-25537] 24 p0728 N79-28779
Hierarchial decomposition approach to environmental policy analysis
[BNL-24444] 24 p0729 N79-28814
Hydrogen technology: An overview
[BNL-25760] 24 p0734 N79-29379
Systems approach to energy planning
[BNL-25523] 24 p0741 N79-29657

Fuel cells: Applied research fuel cell materials and electrocatalysis
[BNL-50951] 24 p0750 N79-30728
Role of the vapor compression cycle in solar energy utilization
[BNL-24573] 24 p0753 N79-30776
Multiobjective analysis in a national energy system model
[BNL-24371] 24 p0758 N79-30823
FeTi methanation catalyst
[BNL-24477] 24 p0764 N79-31364
Fusion reactors for synthetic fuels
[BNL-25634] 24 p0767 N79-31421
SOAR (solar assisted reactor) power system
[BNL-25633] 24 p0772 N79-31787
Long-term strategic analysis (towards an energy doctrine)
[BNL-25250] 24 p0772 N79-31791
Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801
Metal hydride technology
[BNL-26047] 24 p0780 N79-32387
Advanced synfuel production with fusion
[BNL-26130] 24 p0780 N79-32388
Experimental performance study of a series solar heat pump
[BNL-25928] 24 p0789 N79-32704
Avoiding future health problems related to solar energy (photovoltaic) technology
[BNL-25935] 24 p0790 N79-32718
Systems framework for energy analysis in developing countries
[BNL-25933] 24 p0791 N79-32722

BROWN, BOVERI UND CIE, A.G., HEIDELBERG (WEST GERMANY).
Development of high temperature fuel cell battery
[BMFT-FB-T-77-17] 22 p0342 N79-17344
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457

BROWN UNIV., PROVIDENCE, R. I.
Geothermal power plants of New Zealand, Philippines, and Indonesia: A technical survey of existing and planned installations
[COO-4051-23] 24 p0738 N79-29622
Geothermal power plants of Mexico and Central America: A technical survey of existing and planned installations
[COO-4051-26] 24 p0740 N79-29638
Introduction to electric energy conversion systems for geothermal energy resources
[COO-4051-28] 24 p0740 N79-29639
Available work in geothermal energy
[COO-4051-25] 24 p0787 N79-32685
Geothermal power plants of the Soviet Union. A technical survey of existing and planned installations
[COO-4051-41] 24 p0787 N79-32686
Thermodynamic and transport properties of isobutane: A survey of available data
[COO-4051-35] 24 p0794 N79-33096

BUNDESANSTALT FUER GEOWISSENSCHAFTEN UND ROHSTOFFE, HANNOVER (WEST GERMANY).
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592

BUNDESMINISTERIUM FUER WISSENSCHAFT UND FORSCHUNG, VIENNA (AUSTRIA).
Austrian 10kWE solar power plant. A project of the Federal Ministry for Science and Research
22 p0349 N79-18460
Solar stream in Austria
23 p0574 N79-25530

BUREAU DE RECHERCHES GEOLOGIQUES ET MINIERES, ORLEANS (FRANCE).
Spatial thermal radiometry contribution to the Massif Armoricain and the Massif Central (France) litho-structural study
[E79-10294] 24 p0796 N79-33526

BUREAU OF MINES, ALBANY, OREG.
Erosion testing of potential valve materials for coal gasification systems
[PB-293308/3] 24 p0720 N79-28592

BUREAU OF MINES, COLLEGE PARK, MD.
Antimony, arsenic, and mercury in the combustible fraction of municipal solid waste
[PB-285196/2] 21 p0213 N79-13590

BUREAU OF MINES, PITTSBURGH, PA.
Methane drainage study in the Sunnyside coalbed, Utah
[PB-289772/6] 23 p0540 N79-22606
Tracer gas method for measuring leakage through mine stoppings
[PB-289864/1] 23 p0540 N79-22608

BUREAU OF MINES, ROLLA, MO.
Chemical vapor deposition of wear-resistant coatings
[BM-RI-8348] 24 p0732 N79-29276

BUREAU OF MINES, TWIN CITIES, MINN.
Stability of alumina-base refractories in western lignite-ash slag environments
[PB-293238/2] 24 p0731 N79-29249

BUREAU OF MINES, WASHINGTON, D. C.
Projects to expand energy sources in the western states
[PB-283706/0] 21 p0190 N79-11547
Bureau of Mines research 1977. A summary of significant results in mining, metallurgy, and mineral economics
[PB-284743/2] 21 p0217 N79-14521
Efficiency of tandem solar cell systems as function of temperature and solar energy concentration ratio
24 p0785 N79-32671

BURNS AND MCDONNELL, KANSAS CITY, MO.
Solar thermal power plants in small utilities - An economic impact analysis
24 p0675 A79-51761
Assessment of the potential of solar thermal small power systems in small utilities
[NASA-CR-158093] 22 p0335 N79-16377

BURNS AND ROE, INC., WOODBURY, N. Y.
USAF terrestrial energy study. Volume 3, part 1: Summary data display
[AD-A061071] 22 p0342 N79-17341

C

CALIFORNIA ENERGY COMMISSION, SACRAMENTO.
Conservation where it counts: Energy management systems
[PB-289837/7] 22 p0372 N79-21628
Feasibility and economics of cogeneration in California's thermal enhanced oil recovery operations
[PB-291794/6] 23 p0566 N79-24517
Inventory of underground energy storage sites in California
[PB-290835/8] 23 p0566 N79-24519
Electric energy demand and supply prospects for California
23 p0591 N79-27601

CALIFORNIA INST. OF TECH., PASADENA.
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119
Analytical modelling of oil recovery by steam injection
22 p0358 N79-20434

CALIFORNIA SPACE SHUTTLE TASK FORCE.
Air quality as a constraint to the use of coal in California
23 p0592 N79-27605

CALIFORNIA STATE DEPT. OF WATER RESOURCES, SACRAMENTO.
Water as a constraint to the use of coal for California
23 p0592 N79-27606

CALIFORNIA STATE UNIV., FULLERTON.
An evaluation of the hydrothermal resources of the Desert Hot Springs Region, California
[PB-290942/2] 23 p0575 N79-25536

CALIFORNIA UNIV., BERKELEY.
Organic geochemical studies on kerogen precursors in recently deposited algal mats and oozes
21 p0031 A79-10419
Simmer-enhanced flashlamp-pumped dye laser
23 p0384 A79-32981
Geothermal Reservoir Engineering Management Program Plan (GREMP Plan)
[LBL-7000] 21 p0174 N79-10536
Evaluation of the use of oxygen as oxidant in fossil fuel fired open cycle MHD-steam energy conversion processes
22 p0353 N79-19444

V-groove multijunction solar cells
22 p0353 N79-19445
Seismological investigations in geothermal regions
22 p0356 N79-19506
An evaluation of the effects of geothermal energy development on aquatic biota in the geysers area of California
[PB-293031/1] 23 p0585 N79-26562
Algal growth kinetics in bioconversion of solar energy
23 p0594 N79-27650
Solvent selectivity for purification of natural cases
24 p0717 N79-28252
Solar energy fixation and conversion with algal bacterial systems
24 p0721 N79-28665
Energy and materials in three sectors of the economy: A dynamic model with technological change as an endogenous variable
24 p0748 N79-30710

CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.
Reliability of wind power from dispersed sites: A preliminary assessment
[LBL-6889] 21 p0176 N79-10547
National Geothermal Information Resource
[LBL-7803] 21 p0187 N79-11515
Definition of engineering development and research problems relating to the use of geothermal fluids for electric power generation and nonelectric heating
[LBL-7025] 21 p0188 N79-11534
Urbanism and energy in developing regions
[LBL-7808] 21 p0189 N79-11540
Geothermal emissions data base: Cerro Prieto geothermal field
[UCID-4033] 21 p0204 N79-13480
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 1: Summary
[LBL-7896] 22 p0341 N79-17329
A computerized reporting and monitoring system for geothermal energy development
[LBL-8483] 22 p0369 N79-21555
Transparent heat mirrors for passive solar heating applications
[LBL-7829] 23 p0561 N79-24476
Hydrocarbons and energy from plants
[LBL-8596] 23 p0564 N79-24507
Modeling passive solar buildings with hand calculations
[LBL-8583] 23 p0596 N79-27683
Geothermal resource exploration assessment and data interpretation, Klamath Basin, Oregon: Swan Lake and Klamath Hills area
[LBL-8186(DRAFT)] 24 p0724 N79-28747
Geothermal exploration assessment and interpretation, Klamath Basin, Oregon - Swan Lake and Klamath Hills area
[LBL-8186] 24 p0747 N79-30609
Structure of a black chrome solar selective surface
[LBL-6691-REV] 24 p0753 N79-30778
Energy utilization analysis of buildings
[LBL-7826] 24 p0753 N79-30779
Energy use and conservation in industrialized countries
[LBL-7872] 24 p0756 N79-30802
Microstructure and optical properties of black chrome before and after exposure to high temperatures
[LBL-8632] 24 p0756 N79-30804
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 6. End-use energy conservation data base and scenarios
[LBL-7896-PT-6] 24 p0758 N79-30818
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436
Computer design and optimization of cryogenic refrigeration systems
[LBL-7934] 24 p0768 N79-31439
Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801
Description of the 3-dimensional 2-phase simulator SHAFT78 for use in geothermal reservoir studies
[LBL-8802] 24 p0786 N79-32684
Aquatic microcosms for assessment of effluent effects
[EPRI-EA-936] 24 p0803 N79-33614

CALIFORNIA UNIV., DAVIS.
The production of ethanol from agricultural waste: An economic evaluation
[PB-292552/7] 23 p0577 N79-26233
Triaxial tests of coal gasification samples
[UCRL-13968] 24 p0733 N79-29374

CALIFORNIA UNIV., LIVERMORE. LAWRENCE LIVERMORE LAB.
Computer modeling of automotive engine combustion
[UCRL-80451] 21 p0181 N79-11412
Design guide for shallow solar ponds
[UCRL-52385] 21 p0185 N79-11497
Evaluated physical properties data for materials used in energy storage systems
[UCRL-81159] 21 p0189 N79-11536
Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538
Civilian applications of laser fusion
[UCRL-52349] 21 p0195 N79-12439
Comparative properties of fiber composites for energy-storage flywheels part A. Evaluation of fibers for flywheel rotors
[UCRL-80116-PT-A] 21 p0215 N79-14165
Energy and Technology Review, June 1978
[UCRL-52000-78-6] 21 p0215 N79-14168
Pulsed power supplied for large laser systems
[UCRL-80113] 21 p0217 N79-14377
Comparative cost analyses: Total flow vs other power conversion systems for the Salton Sea Geothermal Resource
[UCRL-52589] 22 p0342 N79-17337
In situ coal gasification modeling
[UCRL-82269] 23 p0561 N79-24479
General-purpose aluminum-air/flywheel electric vehicles
[UCRL-82003] 23 p0564 N79-24503
Systematic computation of the performance of photovoltaic based on first principles
[UCID-1804-PT-1] 23 p0567 N79-24877
Prototype development of an optimized, tapered-thickness, graphite/epoxy composite flywheel
[UCRL-52623] 23 p0576 N79-26121
LLL wind energy studies (OAHU)
[UCRL-82171] 23 p0582 N79-26514
Electric power from laser fusion: The HYLIFE concept
[UCRL-81259-REV-1] 23 p0583 N79-26524
Prelimary results of tests of proprietary chemical additives, seeding, and other approaches for the reduction of scale in hypersaline geothermal systems
[UCID-18051] 23 p0595 N79-27669
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine
[UCID-18091] 24 p0717 N79-28229
Development of mechanistic theory for drying of porous media using two-fluid, two-phase flow theory
[UCRL-81604] 24 p0720 N79-28521
Reaction kinetics for remodeling oil shale retorting
[UCRL-81622] 24 p0720 N79-28653
Multiphase flow analysis of oil shale retorting
[UCRL-81717-REV-1] 24 p0721 N79-28656
Challenge of efficiently retorting very nonuniform beds of oil shale rubble
[UCRL-81721-REV-1] 24 p0721 N79-28657
Multiphase flow analysis of oil shale retorting
[UCRL-81717] 24 p0721 N79-28658
Program report for FY 1978: Atmospheric and Geophysical Sciences Division of the Physics Department
[UCRL-51444-78] 24 p0722 N79-28668
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-81764] 24 p0725 N79-28753
Design guide for shallow solar ponds
[UCRL-52385-REV-1] 24 p0727 N79-28774

Preliminary design analysis of the quasi-electric drive vehicle
[UCRL-52613] 24 p0731 N79-29116
DOE/STOR bibliography for flywheel energy systems, 1977
[UCRL-52637] 24 p0742 N79-29665
Performance tests of the radial outflow reaction turbine for geothermal applications
[UCID-17902] 24 p0788 N79-32693
Demonstration of the capabilities of the Livermore energy policy model
[UCRL-52508] 24 p0788 N79-32695
Energy and technology review
[UCRL-52000-79-3] 24 p0791 N79-32727

CALIFORNIA UNIV., LOS ANGELES.
Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency
22 p0252 A79-21807
Aeroelastic stability and response of horizontal axis wind turbine blades
23 p0483 A79-40117
Technical and environmental aspects of oil shale processing
21 p0199 N79-12581
Aeroelastic response and stability of a coupled rotor/support system with application to large horizontal axis with turbines
22 p0332 N79-16346
A large scale wind energy program for the state of California
23 p0594 N79-27648
Forecast of future aviation fuels. Part 1: Scenarios
[NASA-CR-158871] 24 p0732 N79-29354
Environmental, socioeconomic, and consumer protection aspects of selected decentralized solar energy applications
24 p0803 N79-33609

CALIFORNIA UNIV., RIVERSIDE.
Telluric sounding and mapping in the vicinity of the Salton Sea geothermal area, Imperial Valley, California
[PB-296081/3] 24 p0797 N79-33553

CALIFORNIA UNIV., SANTA BARBARA.
Oil pollution reports, volume 5, number 2
[PB-287071/5] 22 p0336 N79-16437

CALMAC MFG. CO., ENGLEWOOD, N. J.
Certification report for the CALMAC solar powered pump
[NASA-CR-150872] 22 p0341 N79-17331

CAMERON ENGINEERS, INC., DENVER, COLO.
Identification of probable automotive fuels consumption: 1985-2000, executive summary
[HCP/W3684-01/2] 21 p0194 N79-12249
EPA program status report: Oil shale
[PB-284480/1] 21 p0211 N79-13548

CANADA INST. FOR SCIENTIFIC AND TECHNICAL INFORMATION, OTTAWA (ONTARIO).
Rate of desulfurization from liquid iron and iron alloys with hydrogen
[NRC/CNR-TT-1930] 23 p0553 N79-24120

CANTERBURY UNIV., CHRISTCHURCH (NEW ZEALAND).
Energy analysis
[MP-23145] 21 p0187 N79-11513
Energy recovery and conservation by recycling municipal solid waste
[NZERDC-P7] 24 p0745 N79-30105

CARNEGIE-MELLON UNIV., PITTSBURGH, PA.
The potential of np GaAs solar cells for high efficiency concentrator applications
24 p0705 A79-52325
The thermodynamic performance of two combined cycle power plants integrated with two coal gasification systems
23 p0545 N79-22950
Studies of AlGaAs-GaAs solar cells
24 p0797 N79-33558

CARRIER CORP., SYRACUSE, N. Y.
Candidate chemical systems for air cooled, solar powered, absorption air conditioner design. Part 2: Solid absorbents, high latent heat refrigerants
[SAN-1587-2] 21 p0211 N79-13544

CATALYTIC, INC., CHARLOTTE, N. C.
Environmental assessment for residual oil utilization
[PB-286982/4] 22 p0336 N79-16446

CATALYTIC, INC., WILSONVILLE, ALA.
Solvent Refined Coal (SRC) process: Operation of solvent refined coal pilot plant
[FE-2270-34] 23 p0554 N79-24181

CELANESE RESEARCH CO., SUMMIT, N.J.
Ultrafine polybenzimidazole (PBI) fibers
[NASA-CR-159644] 24 p0764 N79-31350

CENTRAL ELECTRICITY GENERATING BOARD, HARROGATE (ENGLAND).
Pulverised fuel non-return flap valve
[TDB-317] 23 p0578 N79-26408

CENTRE NATIONAL D'ETUDES SPATIALES, TOULOUSE (FRANCE).
High accuracy off-shore position finding using the GEOLE satellite based system
22 p0329 N79-15932
Behavior of solar generators in low orbits
24 p0752 N79-30766

CHEVRON RESEARCH CO., RICHMOND, CALIF.
Converting Green River shale oil to transportation fuels
[CONF-780460-3] 24 p0745 N79-30396

CHICAGO UNIV., ILL.
Coal anion structure and chemistry of coal alkylation
[COO-4227-2] 21 p0170 N79-10178
Industrial international data base: Energy analysis methodology. Rational use of energy program pilot study
[NATO/CCMS-75] 21 p0206 N79-13508
Resource analysis: Water and energy as linked resources
[PB-288046/6] 22 p0349 N79-18463
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764

CHRISTOL (CARL Q.), PACIFIC PALISADES, CALIF.
Satellite Power System (SPS) international agreements
[NASA-CR-157433] 23 p0548 N79-23497

CITY COLL. OF THE CITY UNIV. OF NEW YORK.
Improved techniques for gasifying coal
[FE-2340-7] 23 p0554 N79-24186

CITY OF DESERT HOT SPRINGS, CALIF.
Self-starting manual for direct use applications of geothermal resources
[PB-290872/1] 23 p0556 N79-24423

CITY UNIV. OF NEW YORK, N. Y.
Modelling and control of a fluidized bed gasifier
22 p0332 N79-16345

CIVIL AND ENVIRONMENTAL ENGINEERING DEVELOPMENT OFFICE, TYNDALL AFB, FLA.
FLAME: Forestry Lands Allocated for Managing energy. Feasibility study
[AD-A059993] 21 p0217 N79-14507

CLARK UNIV., WORCESTER, MASS.
Shelter design and energy usage: A methodology for evaluating the impacts of residential space conditioning technologies on the consumer, the electric utility, and society
24 p0797 N79-33557

CLARKSVILLE COMMUNITY SCHOOL CORP., IND.
Solar energy retrofit for Clarksville Middle School, Clarksville, Indiana
[NASA-CR-161272] 24 p0749 N79-30721

CLEMSON UNIV., S.C.
Considerations for accurately determining the maximum power output of solar cells
24 p0654 A79-50028

COAST GUARD, WASHINGTON, D.C.
Liquefied natural gas safety research overview
[AD-A063714] 22 p0365 N79-21233

COAST GUARD RESEARCH AND DEVELOPMENT CENTER, GROTON, CONN.
Economic analysis of solar photovoltaics for low-power lighted aids to navigation
[AD-A068365] 24 p0738 N79-29615

COGAN AND ASSOCIATES, PORTLAND, OREG.
Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0585 N79-26539

COLORADO SCHOOL OF MINES, GOLDEN.
Research on the physical properties of geothermal reservoir rock
[COO-2908-4] 22 p0358 N79-20459
Clean solid and liquid fuels from coal
[FE-2047-8] 23 p0554 N79-24185

A study of the physical and chemical properties of oil shale relevant to physical concentration processes
23 p0569 N79-25445

Enthalpy measurements for coal-derived liquids
23 p0587 N79-26997

Enthalpy measurement of coal-derived liquids
[FE-2035-12] 23 p0588 N79-27282

Kinetics of coal liquefaction to preasphaltenes, asphaltenes and oils
23 p0588 N79-27320

Modal analysis of seismic guided waves in coal seams
24 p0803 N79-33664

COLORADO STATE UNIV., FORT COLLINS.

Liquefied natural gas wind tunnel simulation and instrumentation assessments
[SAN-W1364-01] 21 p0195 N79-12256

Evaluation of high performance evacuated tubular collectors in a residential heating and cooling system: Colorado State University Solar House 1
[COO-2577-14] 21 p0206 N79-13507

Solar evacuated tube collector: Absorption chiller systems simulation
[COO-2577-13] 21 p0209 N79-13530

Stratified thermal storage in residential solar energy applications
[COO-4523-1] 24 p0786 N79-32682

COLORADO UNIV., BOULDER.

Modeling heat and mass transfer at the Mesa geothermal anomaly, Imperial Valley, California
[LBL-8784] 24 p0755 N79-30792

COLT, INC. OF SOUTHERN CALIFORNIA, RANCHO MIRAGE.

Preliminary design package for solar heating and hot water system
[NASA-CR-150619] 21 p0173 N79-10520

Verification test report on a solar heating and hot water system
[NASA-CR-161165] 22 p0360 N79-20493

COLUMBIA UNIV., NEW YORK.

Ethanolic fuels from renewable resources in the solar age
[PB-295645/6] 24 p0796 N79-33346

COMMISSARIAT A L'ENERGIE ATOMIQUE, SACLAY (FRANCE).

Recuperative gas cycles with derivation for power and heat generation. Application to combined cycles
24 p0724 N79-28739

COMMISSION OF THE EUROPEAN COMMUNITIES, BRUSSELS (BELGIUM).

The comparison and coordination of national policies and programs in the energy research and development sector
[EUR-5911] 23 p0594 N79-27653

Energy research and development programme
[EUR-5889] 24 p0736 N79-29596

COMMITTEE OF CONFERENCE (U. S. CONGRESS).

Energy Tax Act of 1978
[PUB-LAW-95-618] 23 p0576 N79-25926

COMMITTEE OF THE WHOLE HOUSE ON THE STATE OF THE UNION (U. S. HOUSE).

Authorizing appropriations to the National Aeronautics and Space Administration
[H-REPT-96-52] 22 p0364 N79-20928

COMMITTEE ON APPROPRIATIONS (U. S. SENATE).

Alcohol fuels
[GPO-22-334] 23 p0588 N79-27322

COMMITTEE ON BANKING, HOUSING AND URBAN AFFAIRS (U. S. SENATE).

Impact of solar energy on rural housing
[GPO-31-641] 23 p0560 N79-24467

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION (U. S. SENATE).

National Aeronautics and Space Act of 1958, as amended, and related legislation
[GPO-34-175] 21 p0214 N79-13932

Symposium on the Future of Space Science and Space Applications
[GPO-23-876] 21 p0224 N79-15105

Liquefied natural gas: Safety, siting, and policy concerns
[GPO-26-349] 24 p0717 N79-28346

Diesel Fuel and Gasoline Conservation Act of 1977
[GPO-34-986] 24 p0718 N79-28348

Liquefied energy gases, part 2
[GPO-39-305] 24 p0732 N79-29356

COMMITTEE ON ENERGY AND NATURAL RESOURCES (U.S. SENATE).

Executive energy documents
[GPO-24-112] 23 p0582 N79-26507

Energy: Fiscal year 1980 budget request
[GPO-42-886] 23 p0582 N79-26508

The National Energy Act
[GPO-36-956] 23 p0582 N79-26509

Energy conservation and regulation in the President's budget
[GPO-25-418] 24 p0736 N79-29597

Solar Photovoltaic Energy Research, Development, and Demonstration Act of 1978
[GPO-36-187] 24 p0750 N79-30725

Solar Power Satellite Research, Development, and Demonstration Program Act of 1978
[GPO-35-994] 24 p0750 N79-30726

COMMITTEE ON GOVERNMENT OPERATIONS (U. S. HOUSE).

Solar energy
[GPO-36-957] 24 p0737 N79-29609

Biomass conversion
[GPO-32-317] 24 p0765 N79-31404

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE (U. S. HOUSE).

The national energy plan: Options under assumptions of national security threat
[H-PRINT-95-48] 21 p0228 N79-15398

The national energy plan: Options under assumptions of national security threat or energy policy as if it really mattered
[H-PRINT-95-42] 21 p0228 N79-15399

US energy demand and supply, 1975-1985: Limited options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400

Energy and the economy: The economic impact of alternative energy supply-demand assumptions
[H-PRINT-95-51] 22 p0333 N79-16352

Industrial energy conservation
[GPO-24-067] 22 p0333 N79-16353

COMMITTEE ON SCIENCE AND TECHNOLOGY (U. S. HOUSE).

United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815

Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

Electric and Hybrid Vehicle Act, Public Law 94-413 demonstration program objective and schedule
[GPO-98-809] 22 p0351 N79-18810

Oversight on photovoltaic energy conversion
[GPO-31-624] 23 p0573 N79-25513

NASA authorization, 1980, volume 1, part 2
[GPO-46-134] 24 p0730 N79-29105

Solar power satellite
[GPO-45-997] 24 p0731 N79-29212

Bioconversion
[GPO-37-136] 24 p0745 N79-30393

NASA authorization, 1980, volume 1, part 4
[GPO-46-423] 24 p0762 N79-31085

COMMITTEE ON THE DISTRICT OF COLUMBIA (U. S. HOUSE).

Natural gas shortage
[GPO-86-231] 24 p0717 N79-28347

COMMONWEALTH EDISON CO., CHICAGO, ILL.

Air monitoring network design for power plant siting
23 p0591 N79-27590

COMMUNITY SERVICES ADMINISTRATION, WASHINGTON, D. C.

Solar energy policy
[PB-296193/6] 24 p0802 N79-33603

COMPTROLLER GENERAL OF THE UNITED STATES, WASHINGTON, D.C.

Liquefied energy gases safety. Volume 1: Executive summary and main text
[EMD-78-28-VOL-1] 23 p0572 N79-25508

Liquefied energy gases safety. Volume 2: Appendixes
[EMD-78-28-VOL-2] 23 p0573 N79-25509

Liquefied energy gases safety. Volume 3: Federal agency comments
[EMD-78-28-VOL-3] 23 p0573 N79-25510

Improved energy contingency planning is needed to manage future energy shortages more effectively
[EMD-78-106] 24 p0750 N79-30729

COMSAT LABS., CLARKSBURG, MD.

Synchronous orbit power technology needs
[AIAA 79-0916] 23 p0425 A79-34739

Limiting process in shallow junction solar cells
24 p0783 N79-32646

COMSTOCK AND WESCOTT, INC., CAMBRIDGE, MASS.
NaOH-based high temperature heat-of-fusion thermal energy storage device
21 p0012 A79-10106
Phase change thermal storage for a solar total energy system
21 p0120 A79-17321
Development of a phase-change thermal storage system using modified anhydrous sodium hydroxide for solar electric power generation
[NASA-CR-159465] 22 p0354 N79-19454

CONGRESSIONAL BUDGET OFFICE, WASHINGTON, D. C.
Replacing oil and natural gas with coal: Prospects in the manufacturing industries
24 p0718 N79-28351

CONSAD RESEARCH CORP., PITTSBURGH, PA.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

CONTEMPORARY SYSTEMS, INC., JAFFREY, N. H.
Solar heating system final design package
[NASA-CR-161228] 23 p0572 N79-25503

CONTROL DATA CORP., MINNEAPOLIS, MINN.
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

COPPER DEVELOPMENT ASSOCIATION, INC., NEW YORK, N. Y.
Instrumentation at the Decade 80 solar house in Tucson, Arizona
[NASA-CR-150851] 21 p0204 N79-13491
Final system instrumentation design package for Decade 80 solar house
[NASA-CR-150869] 22 p0354 N79-19455

CORNELL UNIV., ITHACA, N. Y.
Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297
The anaerobic attached film expanded bed reactor for the treatment of dilute organic wastes
22 p0356 N79-19928
Structure and electrical activity of planar defects in EFG ribbons
[NASA-CR-158572] 23 p0551 N79-23806

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH, PRETORIA (SOUTH AFRICA).
Symposium on Energy Today and Tomorrow
[CSIR-S-145] 22 p0340 N79-17316
Coal preparation design for export markets, with particular reference to South African and Canadian coals
22 p0340 N79-17318
Influence of marketing requirements on definition of coal resources
22 p0340 N79-17319
Coal gasification and South Africa
22 p0340 N79-17321
Energy requirements for producing steel in the Republic of South Africa
22 p0340 N79-17322
Description of hydro-electric development and proposal for future development on the Zambezi
22 p0340 N79-17323
Low-temperature application of solar energy in South Africa
22 p0340 N79-17324
The planning and economic aspects of energy supply and demand in South Africa
22 p0341 N79-17325
Energy today and tomorrow
22 p0341 N79-17326

COUNCIL ON ENVIRONMENTAL QUALITY, WASHINGTON, D.C.
The good news about energy
22 p0355 N79-19461

CRYSTAL SYSTEMS, INC., SALEM, MASS.
Silicon sheet growth development for the large area sheet task of the low cost solar array project. Heat exchanger method - ingot casting fixed abrasive method - multi-wire slicing
[NASA-CR-158038] 21 p0219 N79-14540
Silicon ingot casting: Heat exchanger method. Multi-wire slicing: Fixed abrasine slicing technique, phase 3
[NASA-CR-162182] 24 p0771 N79-31775

CURTISS-WRIGHT CORP., WOOD-RIDGE, N.J.
A review of Curtiss-Wright rotary engine developments with respect to general aviation potential
[SAE PAPER 790621] 23 p0440 A79-36749
Rotary engine developments at Curtiss-Wright over the past 20 years and review of general aviation engine potential
22 p0329 N79-15967

D

DAMES AND MOORE, LOS ANGELES, CALIF.
The Mississippi, Alabama, Florida, outer continental shelf baseline environmental survey, MAFLA. 1977/1978. Volume 1-B: Executive summary report
[PB-294228/2] 24 p0744 N79-29783

DAYTON UNIV. RESEARCH INST., OHIO.
A feasibility study of inorganic oxide-fluoride compositions for thermal energy storage applications
[AD-A059001] 21 p0196 N79-12559
Behavior of nonmetallic materials in shale oil derived jet fuels and in high aromatic and high sulfur petroleum fuels
[AD-A060322] 21 p0226 N79-15203

DCS CORP., ARLINGTON, VA.
Status of thermal imaging technology as applied to conservation
[HCP/M4228-01] 24 p0800 N79-33584

DECISION FOCUS, INC., PALO ALTO, CALIF.
Resource-allocation methodology for establishing RD and D budgetary priorities
[ORO-5474-T1] 24 p0761 N79-31067

DEFENCE RESEARCH ESTABLISHMENT, OTTAWA. (ONTARIO).
Power supplies for Arctic radio repeater systems
[AD-A061609] 22 p0339 N79-17118

DELAWARE UNIV., NEWARK.
Catalyst deactivation in the hydroprocessing of coal-derived liquids
24 p0731 N79-29234

DELEGATIONEN FOER ENERGIFORSKNING, STOCKHOLM (SWEDEN).
Energy research and development in Sweden, 1978-1981
[DFE-13] 24 p0728 N79-28781

DENVER RESEARCH INST., COLO.
Balloon-borne particulate sampling for monitoring power plant emissions
[PB-290473/8] 23 p0566 N79-24543
EPA program status report: Oil shale, 1979 update
[PB-294998/0] 24 p0796 N79-33538

DEPARTMENT OF ENERGY, BARTLESVILLE, OKLA.
Performance characteristics of automotive engines in the United States. First Series: Report No. 14 1975 Mazda Rotary 79 CID (1.1 Liters), 4V
[PB-286074/0] 21 p0226 N79-15304
Performance characteristics of automotive engines in the United States. First series: Report no. 15 1975 Dodge Colt 98 CID (1.6 liters), 2V
[PB-286075/7] 21 p0226 N79-15305
Performance characteristics of automotive engines in the United States. Second series: Report no. 5 1977 Ford 140 CID (2.3 liters), 2V
[PB-286076/5] 21 p0227 N79-15306
Performance characteristics of automotive engines in the United States Third series: Report No. 1 1977 Volvo 130 CID (2.1 liters), F.I.
[PB-286077/3] 21 p0227 N79-15307
Performance characteristics of automotive engines in the United States. Second series, report no. 4: 1976 Chevrolet 85 CID (1.4 liters), IV
[PB-286294/4] 21 p0227 N79-15308
Performance characteristics of automotive engines in the United States. Second series, report no. 6: 1976 Nissan diesel 198 CID (3.2 liters), F. I.
[PB-286295/1] 21 p0227 N79-15309
Performance characteristics of automotive engines in the United States. Second series, report no. 7: 1977 Ford 171 CID (2.8 liters), 2V
[PB-286296/9] 21 p0227 N79-15310
Performance characteristics of automotive engines in the United States. First series, report no. 16: 1975 121 CID (2.0 liters), F.I.
[PB-286297/7] 21 p0227 N79-15311

Performance characteristics of automotive engines in the United States. First series, report no. 17: 1975 Buick 455 CID (7.5 liters), 4V
[PB-286298/5] 21 p0227 N79-15312

Performance characteristics of automotive engines in the United States. First series, report no. 18: 1976 Ford CID (6.6 liters), 2V
[PB-286299/3] 21 p0227 N79-15313

Performance characteristics of automotive engines in the United States. First series, report no. 19: 1975 Ford Windsor 351 CID (5.7 liters), 2V
[PB-286300/9] 21 p0228 N79-15314

Performance characteristics of automotive engines in the United States. First series, report no. 20: 1975 Chevrolet 350 CID (5.7 liters) with dresser variable-area venturi system
[PB-286301/7] 21 p0228 N79-15315

Motor gasolines, summer 1978
[BETC/PPS-79/1] 23 p0555 N79-24189

National motor gasoline surveys: A key source of fuel trend data
[BETC/RI-78/16] 23 p0568 N79-25248

Performance characteristics of automotive engines in the United States. Third series: Report no. 2, 1978 Pontiac, 301 CID (4.9 liters), 2V
[PB-293772/0] 23 p0579 N79-26411

Ethanol/gasoline blends as automotive fuel
[BETC/RI-79/2] 24 p0767 N79-31423

DEPARTMENT OF ENERGY, DALLAS, TEX.

Regional residential sector energy price forecasts for 1978: Electricity, natural gas, number 2 fuel oil, and propane
[DOE/EIA-0102/46] 24 p0762 N79-31083

DEPARTMENT OF ENERGY, DENVER, COLO.

Regional profile, energy-impacted communities: Regional 8
[DOE/TIC-10001] 24 p0800 N79-33588

DEPARTMENT OF ENERGY, LARAMIE, WYO.

Mathematical model of forward combustion retorting of oil shale
[LETC/TPR-78/1] 24 p0779 N79-32375

DEPARTMENT OF ENERGY, MORGANTOWN, W. VA.

Fluidized-bed combustion test of low-quality fuels: Texas lignite and lignite refuse
[MERC/RI-78/3] 21 p0175 N79-10543

DEPARTMENT OF ENERGY, OAK RIDGE, TENN.

Energy information data base. Guide to abstracting and indexing
[TID-4583-R1] 21 p0184 N79-11488

Electric batteries. A bibliography
[TID-3361] 21 p0184 N79-11491

Energy information data base: Serial titles
[TID-4579-R10] 21 p0197 N79-12566

Energy information data base. Serial titles, supplement 3
[TID-4579-R10-SUPPL-3] 24 p0745 N79-30088

Energy information data basw. Serial titles
[TID-4579-R-10-SUPPL-1] 24 p0791 N79-32721

DEPARTMENT OF ENERGY, PITTSBURGH, PA.

An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871

Stability of coal-oil mixtures
[CONF-7805152-1] 23 p0589 N79-27332

DEPARTMENT OF ENERGY, WASHINGTON, D. C.

SIMWEST - A simulation model for wind energy storage systems
21 p0029 A79-10241

Energy and remote sensing applications
22 p0255 A79-22516

Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580

Hydrogen energy storage program: Five-year plan
[DOE/ET-0046] 21 p0175 N79-10544

Environmental development Plan (EDP). Oil supply, FY 1977
[DOE/EDP-0024] 21 p0175 N79-10545

Battery and electrochemical systems program summary, FY 1977
[DOE/ET-0014] 21 p0176 N79-10546

Improved Conversion Efficiency Workshop. Volume 2: Summary
[CONF-771003-P2-VOL-2] 21 p0176 N79-10551

Comprehensive overview of winter energy data bulletins
[PB-282787/1] 21 p0177 N79-10565

Environmental control technology activities of the Department of Energy in FY 1977
[DOE/EV-0030] 21 p0178 N79-10572

Alcohol fuels program plan
[DOE/US-0001/2] 21 p0180 N79-11242

Solar heating and cooling demonstration project summaries
[DOE/CS-0009] 21 p0186 N79-11503

Environmental Development Plan (EDP): Solar thermal power systems, 1977
[DOE/EDP-0004] 21 p0187 N79-11522

Environmental Development Plan (EDP): Ocean thermal energy conversion, 1977
[DOE/EDP-006] 21 p0188 N79-11531

Federal Energy Data System (FEDS) technical documentation
[PB-281815/1] 21 p0189 N79-11542

Environmental Development Plan (EDP): Underground coal conversion program, FY 1977
[DOE/EDP-0011] 21 p0192 N79-11569

Overview of the magnetic fusion energy development and technology program
[HCP/T3073-01] 21 p0193 N79-11887

National photovoltaic program plan
[DOE/ET-0035(78)] 21 p0197 N79-12567

Environmental Development Plan (EDP): Photovoltaics, 1977
[DOE/EDP-0003] 21 p0198 N79-12569

Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572

Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189

Program information notice
[DOE/ET-0059] 21 p0207 N79-13517

Solar thermal power systems program: Program summary
[DOE/ET-0018/1] 21 p0207 N79-13518

Solar heating and cooling. Research and development: Project summaries
[DOE/CS-0010] 21 p0208 N79-13519

Photovoltaic program: Program summary
[DOE/ET-0019/1] 21 p0209 N79-13529

Solar energy
[DOE/ET-0062] 21 p0210 N79-13535

Requirements for environmental monitoring assessment, and controls for nonnuclear energy demonstration projects. Report to Congress, prepared in fulfillment of Public Law 95-39, section 113
[DOE/EV-0014] 21 p0213 N79-13573

Coal loan guarantee program (PL 94-163)
[DOE/EIS-0004] 21 p0213 N79-13574

Proposed standby gasoline rationing plan. Economic and regulatory analysis draft
[DOE/ERA-0009] 21 p0214 N79-13934

Phase one/base data for the development of energy performance standards for new buildings: Sample design
[PB-286903/0] 22 p0331 N79-16150

Satellite Power System (SPS) program summary
[DOE/ER-0022] 22 p0337 N79-16893

Fluidized-bed combustion
22 p0347 N79-18365

Characterization study of an electric motor-transmission system for electric vehicles
[HCP/M2835-01] 22 p0351 N79-18817

Measuring energy conservation
[DOE/EIA-0103/18] 22 p0362 N79-20509

Environmental impact determination of action to be taken under the Energy Supply and Environmental Coordination Act for powerplants 1, 2, 3, and 4, Portsmouth Generating Station, Portsmouth, Virginia
[DOE/EA-0033] 22 p0362 N79-20514

Satellite power system: Concept development and evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

Industrial energy efficiency improvement program
[DOE/CS-0033/1] 23 p0540 N79-22332

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 1: Executive summary
[NASA-TM-80354] 23 p0557 N79-24435

Energy Materials Coordinating Committee (EMACC)
[DOE/US-002] 23 p0563 N79-24490
Electric and hybrid vehicle program
[DOE/CS-0068] 23 p0567 N79-24900
Proceedings of the US DOE Photovoltaics Technology Development and Applications Program Review
[NASA-CR-158682] 23 p0570 N79-25485
Solar technology transfer program
[DOE/CS-0027/1] 23 p0574 N79-25521
A method for correlating performance data of a terrestrial solar cell array
[NASA-TM-79163] 23 p0581 N79-26503
Department of Energy policy for fusion energy
[DOE/ER-0018] 23 p0586 N79-26952
Findings and views concerning the exemption of aviation gasoline from the mandatory petroleum allocation and price regulations
[DOE/ERA-0024] 23 p0589 N79-27336
The 1980 motor gasoline supply and demand. Analysis memorandum AM/ES/79-12
[DOE/EIA-0102/32] 23 p0589 N79-27337
Diesel organic rankine cycle compound engine (Bottoming Cycle) program plan
[DOE/CS-0052] 23 p0590 N79-27521
Re-examination of undiscovered oil resources in the United States
[DOE/EIA-0103/9] 23 p0593 N79-27643
Underground storage of natural gas by interstate pipeline companies for 1976 and winter 1976 - 1977
[DOE/EIA-0151] 23 p0597 N79-27684
Environmental readiness document. Small scale low head hydro: Commercialization, phase 3 planning
[DOE/ERD-0009] 23 p0597 N79-27686
Solar energy for agricultural and industrial process heat
[DOE/CS-0053] 23 p0597 N79-27688
Environmental readiness document. Solar: Hot water and passive, commercialization phase 3 planning
[DOE/ERD-0010] 23 p0597 N79-27690
Findings and views concerning the exemption of kerojet fuels from the mandatory petroleum allocation and price regulations
[DOE/ERA-0023] 23 p0600 N79-28058
Midterm oil and gas supply modeling system methodology description
[DOE/EIA-0103/17] 23 p0600 N79-28059
Petroleum supply/demand estimates and cost of petroleum imports, 1978-1980
[DOE/EIA-0102/20] 24 p0718 N79-28356
Factors affecting the decline rate of old oil production
[DOE/EIA-0102/29] 24 p0720 N79-28652
Historic and forecasted energy prices by US Department of Energy region and fuel type for three macroeconomic scenarios and one imported oil price escalation scenario
[DOE/EIA-0102/27] 24 p0725 N79-28751
Solar energy potential for residential water heating and space heating in the 12th Congressional District of Pennsylvania. Analysis memorandum
[DOE/EIA-0102/22] 24 p0725 N79-28752
Solar heating and cooling demonstration project summaries
[DOE/CS-0038/2] 24 p0727 N79-28771
Energy and urban policies/programs: Official transcript of public briefing and addendum, 27 April 1978, Washington, D. C.
[DOE/IR-0042] 24 p0728 N79-28782
Solar collector manufacturing activity
[DOE/EIA-0174] 24 p0728 N79-28787
Environemental control technology activities of the Department of Energy in FY 1978
[DOE/EV-0031] 24 p0729 N79-28812
Second Annual Combustion and Fuels Technology Program Contractor Review Meeting
[CONF-7809103] 24 p0731 N79-29271
Clean energy from coal
[PETC-1000] 24 p0733 N79-29370
Assessment of potential US petroleum supply shortfalls, 1978
[DOE/EIA-0102/38] 24 p0734 N79-29376
Guide to solar energy programs
[DOE/ET-0036/1] 24 p0738 N79-29620
Environmental readiness document: Urban waste energy recovery. Commercialization phase 3 planning
[DOE/ERD-0002] 24 p0745 N79-30102
Motor gasoline deregulation and the gasoline tilt
[DOE/EIS-0039-VOL-1] 24 p0746 N79-30399
National coal model: Coal supply curves
[DOE/EIA-0103/2] 24 p0746 N79-30400
Motor gasoline deregulation and the gasoline tilt. Volume 2: Public comments
[DOE/EIS-0039-VOL-2] 24 p0746 N79-30401
Fact sheet: Forecasted automobile gasoline consumption
[DOE/EIA-0102/1] 24 p0746 N79-30402
Petroleum supply/demand estimates and cost of petroleum exports, 1978-1979
[DOE/EIA-0102/40] 24 p0746 N79-30403
Petroleum supply vulnerability, 1985
[DOE/EIA-0102/44] 24 p0746 N79-30405
Oil and gas supply curves for the administrator's annual report
[DOE/EIA-0103/4] 24 p0746 N79-30406
Strategic petroleum reserve: Expansion of reserve. Final supplement to final environmental impact statement
[DOE/EIS-0034] 24 p0746 N79-30407
Proceedings of a Symposium on the Utilization of Methane Generated in Landfills
[CONF-780340] 24 p0747 N79-30410
Office of Naval Petroleum and Oil Shale Reserve. Report of operations, 1 October 1978
[DOE/RA-0011] 24 p0748 N79-30686
Bituminous coal and lignite distribution, January - September 1978
[DOE/EIA-0125/3-78] 24 p0748 N79-30688
Analysis of the productivity of domestic petroleum exploration activities
[DOE/EIA-0102/7] 24 p0748 N79-30691
Oven curing: Energy conservation and emission control in coil coating
[TID-28705] 24 p0750 N79-30723
National solar heating and cooling commercial demonstration program: Key personnel directory
[DOE/CS-0057] 24 p0754 N79-30785
Short-term projections of the energy supply and demand in the United States from the EIA report to Congress, 1977
[DOE/EIA-0102/37] 24 p0755 N79-30799
Community systems program
[DOE/CS-0072] 24 p0757 N79-30813
Comprehensive program and plan for federal energy education, extension and information activities
[DOE/CS-0071] 24 p0757 N79-30814
Projections of energy supply and demand for the 1978-1979 winter heating season
[DOE/EIA-0102/33] 24 p0758 N79-30815
Role of the states in energy
[DOE/PE-0009] 24 p0758 N79-30816
Recent energy consumption trends in European Economic Community countries
[DOE/EIA-0103/16] 24 p0758 N79-30817
Evaluation of future world oil prices
[DOE/EIA-0102/4] 24 p0762 N79-31082
End-use energy-consumption data base. Version 10: User's manual
[DOE/EIA-0175] 24 p0772 N79-31790
Department of Energy FY 1980 obligations
[DOE/CR-0005] 24 p0773 N79-31792
Solar thermal power systems, program summary
[DOE/ET-0078] 24 p0773 N79-31794
Domestic policy review of solar energy
[TID-28834] 24 p0773 N79-31797
Macroeconomic and sector implications of installing 2.2 million residential solar units
[DOE/EIA-0102/51] 24 p0773 N79-31798
Social assessment of on-site solar energy technologies
[HCP/R-4040-02] 24 p0775 N79-31810
Passive solar energy planning aid kit for building design architects and planners
[CONF-780337-P1] 24 p0775 N79-31813
Passive solar energy planning aid kit for the business community and general public
[CONF-780337-P2] 24 p0775 N79-31814
Passive solar energy planning aid kit for solar energy systems engineers
[CONF-780337-P3] 24 p0775 N79-31815

Thermal and mechanical energy storage program
[DOE/ET-0091] 24 p0775 N79-31817

Briefing related to Executive Order 12003 and the National Energy Act
[DOE/TIC-10065] 24 p0775 N79-31818

Managerial plan: Executive order 12003 and the National Energy Act, proposed, synopsis
[DOE/TIC-10062] 24 p0776 N79-31826

Role of refined product imports in the domestic fuel market
[DOE/EIA-0102/53] 24 p0778 N79-32372

Strategic petroleum reserve
[DOE/TIC-10107] 24 p0781 N79-32617

Reexamination of the estimation of undiscovered oil resources in the US
[DOE/EIA-0103/31] 24 p0781 N79-32618

Assessment of potential US petroleum supply shortfalls, 1978 - 1980
[DOE/EIA-0102/13] 24 p0781 N79-32619

Fossil energy program summary document
[DOE/ET-0087] 24 p0788 N79-32696

Energy Emergency Management Information System (EMMIS): Program plan
[DOE/EIA-0135] 24 p0791 N79-32723

Environmental development plan, fossil fuel utilization program
[DOE/EDP-0046] 24 p0793 N79-32746

DEPARTMENT OF THE AIR FORCE, WASHINGTON, D.C.

Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218

DEPARTMENT OF TRANSPORTATION, WASHINGTON, D. C.

Energy in transportation
[PB-282928/1] 21 p0177 N79-10561

DETROIT DIESEL ALLISON, INDIANAPOLIS, IND.

Conceptual design study of an Improved Gas Turbine (IGT) powertrain
[NASA-CR-159604] 24 p0762 N79-31087

Single shaft automotive gas turbine engine characterization test
[NASA-CR-159654] 24 p0778 N79-32129

DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND RAUMFAHRT, TRAUEN (WEST GERMANY).

Photolytic decomposition of water into oxygen and hydrogen as an alternative energy source for households and small consumers
[DLR-FB-78-17] 24 p0760 N79-30836

DEUTSCHER NATURSCHUTZRING, E.V., BONN-OBERKASSEL (WEST GERMANY).

Statement and comparison between different studies on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833

DEVELOPMENT SCIENCES, INC., EAST SANDWICH, MASS.

Guidebook on integrated community energy systems: Indirect economic and energy impacts
[ANL/ICES-TM-16] 24 p0728 N79-28778

DISTRICT OF COLUMBIA BAR ASSOCIATION, WASHINGTON, D. C.

International energy conservation: Comparative law and policy. Proceedings from the 1978 International Conference on Energy conservation
[CONF-780274] 24 p0757 N79-30811

DOOLEY (DENNIS) AND ASSOCIATES, ANCHORAGE, ALASKA.

Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3] 23 p0546 N79-22971

DORNIER-WERKE G.M.B.H., FRIEDRICHSHAFEN (WEST GERMANY).

Rational energy utilization in coke-oven-plant operations
[BMFT-FB-T-77-72] 24 p0759 N79-30832

Development of a heat pipe cooled 200 watt TWT with improved efficiency
24 p0764 N79-31275

DOW CHEMICAL CO., MIDLAND, MICH.

Chemicals from coal. Report based on HRI H-coal product
[FE-1534-50] 21 p0180 N79-11166

Energy from in situ processing of Antrim oil shale
[FE-2346-29] 24 p0769 N79-31746

DOW CORNING CORP., HEMLOCK, MICH.

Advances in the Dow Corning process for solar-grade silicon
23 p0502 A79-40936

DOW CORNING CORP., MIDLAND, MICH.

Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960

Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471

DREXEL UNIV., PHILADELPHIA, PA.

Modeling and verification of heat pump performance for industrial energy conservation
23 p0556 N79-24293

DUBIN-BLOOME ASSOCIATES, NEW YORK.

Solar assisted heat pump study for heating of military facilities
[AD-A058626] 21 p0206 N79-13506

DUNHAM ASSOCIATES, INC., BISMARCK, N. DAK.

Bismarck, North Dakota, office commercial solar demonstration design and construction report
[COO-4228-1] 24 p0739 N79-29633

DYNAMIC SCIENCE, PHOENIX, ARIZ.

Paratransit vehicle test and evaluation. Volume 4: Fuel Economy tests
[PB-295478/2] 24 p0778 N79-32135

DYNAMICS RESEARCH CORP., WILMINGTON, MASS.

An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft. Volume 1: Executive summary
[AD-A061746] 22 p0351 N79-18969

An analysis of fuel conserving operational procedures and design modifications for bomber/transport aircraft, volume 2
[AD-A062609] 22 p0356 N79-20109

E

EAGLE-PICHER CO., JOPLIN, MO.

Nickel-zinc battery for aircraft and missile applications
[AD-A059295] 21 p0220 N79-14561

EAGLE-PICHER INDUSTRIES, INC., JOPLIN, MO.

Multistack nickel-hydrogen units
22 p0371 N79-21610

EASTERN OREGON COMMUNITY DEVELOPMENT COUNCIL, LA GRANDE.

Energy education training: Feasibility study
[PB-285910/6] 21 p0230 N79-15428

ECON, INC., PRINCETON, N. J.

Costing the satellite power system
[AAS PAPER 78-166] 22 p0243 A79-21270

Economics of fusion research
[COO-4181-] 21 p0193 N79-11890

Statement of Doctor Klaus Heiss, President, ECON, Incorporated, Princeton, New Jersey
21 p0224 N79-15110

Assessment of economic factors affecting the satellite power system. Volume 1: System cost factors
[NASA-CR-161185] 22 p0368 N79-21551

Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552

Space-based solar power conversion and delivery systems study. Volume 1: Executive summary
[NASA-CR-150294] 23 p0541 N79-22617

Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis
[NASA-CR-150295] 23 p0541 N79-22618

Space-based solar power conversion and delivery systems study. Volume 3: Microwave power transmission studies
[NASA-CR-150296] 23 p0541 N79-22619

Space-based solar power conversion and delivery systems study. Volume 4: Energy conversion systems studies
[NASA-CR-150297] 23 p0541 N79-22620

Space-based solar power conversion and delivery systems study. Volume 5: Economic analysis
[NASA-CR-150298] 23 p0541 N79-22621

Status of SEASAT Commercial Demonstration Program
[E79-10260] 24 p0768 N79-31720

Seasat-A ASVT: Commercial demonstration experiments. Results analysis methodology for the Seasat-A case studies
[NASA-CR-162162] 24 p0768 N79-31737

ECOVIEW, NAPA, CALIF.

Direct heat applications of geothermal energy in the geysers/Clear Lake Region, volume 2: Environmental assessment
[SAN-1326-1-2] 21 p0174 N79-10532

Energy conservation and the rural home: Economic considerations for the nation and the individual
[PB-286222/5] 21 p0230 N79-15425

EDGERTON, GERMESHAUSEN AND GRIER, INC., ALBUQUERQUE, N. MEX.
Performance testing of the Hexcel Parabolic Trough Solar Collector
[SAND-76-0381] 21 p0221 N79-14569
Performance testing of the McDonnell Douglas fresnel lens solar collector
[SAND-78-0625] 23 p0565 N79-24512
Performance testing of the General Atomic Fixed mirror solar concentrator
[SAND-78-0624] 23 p0573 N79-25519
Concentrating solar collector test results from DOE/Sandia collector module test facility
[SAND-78-0881C] 23 p0573 N79-25520

EDGERTON, GERMESHAUSEN AND GRIER, INC., IDAHO FALLS, IDAHO.
Measurement and control techniques in geothermal power plants
[TREE-1312] 22 p0362 N79-20508
Energy conservation with fired heaters
[TREE-1308] 24 p0772 N79-31783

EDUCATIONAL FACILITIES LABS., INC., NEW YORK.
A report on the development of a model energy management program for New York state schools, phase 2
[PB-295452/7] 24 p0802 N79-33607

EIC, INC., NEWTON, MASS.
Energy storage with ambient temperature rechargeable lithium batteries
[PB-290934/9] 23 p0566 N79-24518

ELCAM, INC., SANTA BARBARA, CALIF.
Prototype solar-heated hot water systems and double-walled heat exchangers
[NASA-CR-150854] 21 p0205 N79-13495

ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.
Status of NO sub x control for coal-fired power plants
23 p0592 N79-27609
Central receiver design considerations for Brayton cycle solar power plants
[AED-CONF-78-212-016] 24 p0777 N79-31832

ELECTRIC STORAGE BATTERY CO., YARDLEY, PA.
Sodium-antimony trichloride battery development program for load leveling
[EPRI-EM-751] 21 p0186 N79-11501

ELECTRICITE DE FRANCE, CHATOU.
Comparison of different techniques for producing hydrogen: Production costs analysis
[P/51/76/14] 23 p0578 N79-26240
Geothermal heating with heat pumps
23 p0584 N79-26531
Analysis of helio-thermoelectrical energy conversion efficiency
[REPT-77/HP-40-241] 23 p0584 N79-26534
Elements for technological and economic modeling of tower-type solar power plants
[P/51/76/17] 23 p0584 N79-26535
Cost/benefit analysis of a solar power plant supplemented by diesel generation in comparison with a solely diesel system - optimizing for size and initial investment in an isolated area
[P/51/77/21] 23 p0584 N79-26536
Study of low output solar energy power plants
[P/51/77/24] 23 p0585 N79-26537
Energy analysis of the helio-thermal-electric conversion
[P-77/P40/242] 24 p0759 N79-30831

ELECTRICITE DE FRANCE, PARIS.
The use of fuel cell ion exchange membranes in electrolytic cells
[P/539/77/23] 23 p0584 N79-26532
Bibliographical study of electrocatalysis involving mixed oxide compounds in an alkaline medium
[P/539/77/20] 23 p0588 N79-27284

ELRICK AND LAVIDGE, INC., SAN FRANCISCO, CALIF.
Commercialization focus group interview: Medium and low Btu coal gasification
[DOE/TIC-10029] 24 p0733 N79-29371
Geothermal/hydrothermal energy. Group interview
[DOE/TIC-10030] 24 p0755 N79-30791

EMORY UNIV., ATLANTA, GA.
Urban areas as energy flow systems
24 p0736 N79-29592

ENDER (RICHARD L.), ANCHORAGE, ALASKA.
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970

ENERGY AND ENVIRONMENTAL ANALYSIS, INC., ARLINGTON, VA.
End use energy consumption data base: Series 1 tables
[PB-281817/7] 21 p0177 N79-10560

ENERGY AND ENVIRONMENTAL RESEARCH CORP., SANTA ANA, CALIF.
Low NOx combustion concepts for advanced power generation systems firing low-Btu gas
[PB-282983/6] 21 p0178 N79-10610

ENERGY, INC., IDAHO FALLS, IDAHO.
Energy supply and environmental impacts: Conventional sources, study module 3-A, technical appendix
[PB-283787/0] 21 p0198 N79-12573

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION, GRAND FORKS, N. DAK.
Technology and Use of Lignite
[GFERC/IC-77/1] 21 p0216 N79-14241

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION, WASHINGTON, D. C.
Need for and deployment of inexhaustible energy resource technologies: Report of Technology Study Panel inexhaustible energy resources study
[TID-28202] 21 p0186 N79-11510
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-287417/0] 22 p0343 N79-17349

ENERGY RESEARCH CORP., BETHEL, CONN.
Fabrication and testing of silver-hydrogen cells
[NASA-CR-159431] 22 p0334 N79-16374

ENERGY RESEARCH CORP., DANBURY, CONN.
Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159572] 24 p0737 N79-29604
Improvement of phosphoric acid fuel cell stacks
[AD-A070881] 24 p0800 N79-33582

ENERGY RESOURCES CO., INC., CAMBRIDGE, MASS.
Potential use of wood and agriculture wastes as steam generator fuel for thermal enhanced oil recovery
[SAN-1038-PO-1] 24 p0790 N79-32717

ENERGY SYSTEMS INTERNATIONAL, MCLEAN, VA.
Solar energy commercialization for European countries, volume 2
[HCP/CS-4250-VOL-2] 23 p0563 N79-24493

ENERGY TRANSPORTATION SYSTEMS, INC., SAN FRANCISCO, CALIF.
Prospects for coal slurry pipelines in California
23 p0592 N79-27608

ENGINEERING OLYMPIC CORP., RICHLAND, WASH.
Solar heating, cooling, and hot water systems installed at Richland, Washington
[NASA-CR-161237] 24 p0722 N79-28721

ENGINEERING SUPERVISION CO., LOS ANGELES, CALIF.
National Energy Peak-Leveling Program (NEPLP)
[HCP/M1152-01] 23 p0551 N79-23534

ENGINS MATRA, VELIZY (FRANCE).
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 1
[REPT-30/1020-VOL-1] 24 p0759 N79-30834
Study of system implications of high speed flywheels as energy storage devices on satellites, volume 2
[REPT-30/1020-VOL-2] 24 p0760 N79-30835

ENTE NAZIONAL PER L'ENERGIA ELETTRICA, MILAN (ITALY).
A micrometeorological network for study of transport and diffusion of pollutants in two Apennine Valleys
23 p0586 N79-26638

ENVIRONMENTAL LAW INST., WASHINGTON, D. C.
Legal barriers to solar heating and cooling of buildings
[HCP/M2528-1] 21 p0209 N79-13534

ENVIRONMENTAL MONITORING AND SUPPORT LAB., CINCINNATI, OHIO.
Analysis of radioactive contaminants in by-products from coal-fired power plant operations
[PB-286365/2] 21 p0232 N79-15473

ENVIRONMENTAL MONITORING AND SUPPORT LAB., LAS VEGAS, NEV.
Energy-related air quality monitoring in the western energy resource development area
[PB-293160/8] 23 p0595 N79-27730

ENVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MICH.
Investigation of turbo-dyne energy chamber (G:R: value trademark): An air bleed device
[PB-285381/0] 21 p0217 N79-14397
Effects of low ambient temperature on the exhaust emissions and fuel economy of 84 automobiles in Chicago
[PB-288400/5] 22 p0355 N79-19488
Exhaust emissions and fuel economy from automobiles using alcohol/gasoline blends under high-altitude conditions
[PB-290612/1] 23 p0555 N79-24191
Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 427 cubic inch 1977 California GMC 6500
[PB-293530/2] 23 p0578 N79-26410
Exhaust emissions and fuel consumption of a heavy-duty gasoline powered vehicle over various driving cycles: 361 cubic inch 1966 Ford F-600
[PB-293529/4] 23 p0586 N79-26567

ENVIRONMENTAL PROTECTION AGENCY, CINCINNATI, OHIO.
Methods for the control of environmental damage caused by mining energy producing materials
22 p0347 N79-18359

ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MINN.
Ecological effects of coal-fired steam-electric generating stations
22 p0346 N79-18358

ENVIRONMENTAL PROTECTION AGENCY, RESEARCH TRIANGLE PARK, N.C.
National Emissions Data System (NEDS) fuel use report (1974)
[PB-284658/2] 21 p0194 N79-12251
Status of bioscreening of emissions and effluents from energy technologies
22 p0346 N79-18353
Interagency coal cleaning technology development
22 p0347 N79-18361
National Emissions Data Systems (NEDS) fuel use report (1975)
[PB-290162/7] 22 p0373 N79-21670
Control of volatile organic emissions from petroleum liquid storage in external floating roof tanks
[PB-290579/2] 23 p0566 N79-24537

ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C.
Energy environment III
[EPA-600/9-78-022] 22 p0346 N79-18352
Public hearing transcript: Federal non-nuclear energy research and development program
[PB-287910/4] 22 p0349 N79-18464
Research summary--oil spills
[PB-293597/1] 23 p0585 N79-26558

ENVIRONMENTAL RESEARCH INST. OF MICHIGAN, ANN ARBOR.
SEMTAP: A new technology transfer network to link business and industry with Federal research and development
[PB-292882/8] 23 p0587 N79-27026

ENVIRONMENTAL RESOURCES GROUP, LOS ANGELES, CALIF.
Satellite Power System (SPS) public acceptance
[NASA-CR-157429] 23 p0548 N79-23493

ENVIRONMENTAL SYSTEMS, INC., ANNAPOLIS, MD.
Use of solar energy to heat anaerobic digesters. Part 1: Technical and economic feasibility study. Part 2: Economic feasibility throughout the United States
[PB-286940/2] 21 p0231 N79-15440

ERNO RAUMFAHRTTECHNIK G.M.B.H., BREMEN (WEST GERMANY).
A heat pipe radiator for shunt electronics: Development and test results
24 p0764 N79-31276

ESC ENERGY CORP., DALY CITY, CALIF.
Distribution automation and control support; Analysis and interpretation of DAC working group results for use in project planning
[NASA-CR-162331] 24 p0804 N79-34074

ESCHER TECHNOLOGY ASSOCIATES, ST. JOHNS, MICH.
Toward the renewables - A natural gas/solar energy transition strategy
24 p0686 A79-51851

ETA ENGINEERING, INC., WESTMONT, ILL.
Air monitoring network design for power plant siting
23 p0591 N79-27590

EUROPEAN SPACE AGENCY, NOORDWIJK (NETHERLANDS).
Review of European solar array technology and potential future developments
24 p0751 N79-30747
Interface problems on an SPS solar array blanket
24 p0752 N79-30751

EUROPEAN SPACE AGENCY, PARIS (FRANCE).
Photovoltaic generators in space
[SP-140] 24 p0751 N79-30730

EXECUTIVE OFFICE OF THE PRESIDENT, WASHINGTON, D. C.
Rural development initiatives: Energy for rural America
[PB-295234/9] 24 p0743 N79-29674
Aeronautics and space report of the President, 1978 activities
24 p0794 N79-33115

EXXON RESEARCH AND ENGINEERING CO., FLORHAM PARK, N. J.
EXXON donor solvent coal liquefaction process
23 p0593 N79-27618

EXXON RESEARCH AND ENGINEERING CO., LINDEN, N. J.
Fuel cell catalyst sintering studies
[EPRI-EM-833] 24 p0776 N79-31828

F

FAUCETT (JACK) ASSOCIATES, INC., CHEVY CHASE, MD.
End use energy consumption data base: Series 1 tables
[PB-281817/7] 21 p0177 N79-10560

FEDERAL-STATE LAND USE PLANNING COMMISSION FOR ALASKA, ANCHORAGE.
Northern Alaska hydrocarbon resources
[PB-287394/1] 22 p0332 N79-16342

FEDERAL ENERGY ADMINISTRATION, WASHINGTON, D. C.
Energy information: Report to Congress
[NTISUB/C/027-001] 21 p0221 N79-14576

FEDERAL ENERGY REGULATORY COMMISSION, WASHINGTON, D. C.
National gas survey: Synthesized gaseous hydrocarbon fuels
[DOE/FERC-0008] 23 p0577 N79-26228

FEDERAL TRADE COMMISSION, WASHINGTON, D.C.
Economic structure and behavior in the natural gas production industry
[PB-294610/1] 24 p0760 N79-30839

FISH AND WILDLIFE SERVICE, FORT COLLINS, COLO.
Texas lignite: Environmental planning opportunities
[PB-286870/1] 21 p0231 N79-15438
Reservoir ecosystems and western coal development in the upper Missouri River Basin
[PB-287363/6] 22 p0339 N79-17309

FLORESTAL ACESITA, BELO HORIZONTE (BRAZIL).
Short notice on a grand forest: Tropical land converting sunlight to energy
[NP-23278] 24 p0741 N79-29653

FLORIDA AGRICULTURAL AND MECHANICAL UNIV., TALLAHASSEE.
Energy: The new economic development wildcard
[PB-282494/4] 21 p0177 N79-10564

FLORIDA SOLAR ENERGY CENTER, CAPE CANAVERAL.
Thermal performance evaluation of the Semco (liquid) solar collector
[NASA-CR-161230] 23 p0594 N79-27656

FLORIDA UNIV., GAINESVILLE.
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426
Forward-bias capacitance and current measurements for determining lifetimes and band narrowing in p-n junction solar cells
23 p0497 A79-40890
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
MHD generator duct flow with cross stream dependent fluid properties
22 p0336 N79-16668
Design of high efficiency HLE solar cells for space and terrestrial applications
24 p0783 N79-32647
Hartmann flows in the MHD generator configuration
[AD-A070080] 24 p0793 N79-33036

FLUOR ENGINEERS AND CONSTRUCTORS, INC., IRVINE, CALIF.
Economics of fuel gas from coal: An update including the British Gas Corporation's slagging gasifier
[EPRI-AF-782] 21 p0180 N79-11238
Economics of Texaco gasification: Combined cycle systems. Economic studies of coal gasification combined cycle systems for electric power generation
[EPRI-AF-753] 21 p0185 N79-11498
Conceptual design for advanced coal liquefaction commercial plant
[FE-2251-52] 23 p0554 N79-24182
Coal liquefaction test center
[FE-1517-67] 23 p0577 N79-26226
A systems examination of the opportunities of coal for California
23 p0591 N79-27600

FORD AEROSPACE AND COMMUNICATIONS CORP., NEWPORT BEACH, CALIF.
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 1: Technical studies for solar point-focusing, distributed collector system, with energy conversion at the collector, category C
[NASA-CR-162369] 24 p0799 N79-33573
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 2: Appendix A - D
[NASA-CR-162370] 24 p0799 N79-33574
Phase 1 of the first solar small power system experiment (experimental system no. 1). Volume 3: Appendix E - N
[NASA-CR-162371] 24 p0799 N79-33575

FORD MOTOR CO., DEARBORN, MICH.
Automotive Stirling engine development program
[NASA-CR-159436] 21 p0181 N79-11406
Evaluation of ceramics for stator application: Gas turbine engine report
[NASA-CR-159533] 22 p0364 N79-21075
Ford/DOE sodium-sulfur battery electric vehicle development and demonstration, phase 1
[COO-2566-37] 24 p0731 N79-29118
Conceptual design study of improved automotives gas turbine powertrain
[NASA-CR-159580] 24 p0762 N79-31088

FOREST PRODUCTS LAB., MADISON, WIS.
Methanol from wood waste: A technical and economic study
[FPL-12] 21 p0194 N79-12239

FOREST SERVICE, OGDEN, UTAH.
Draft environmental statement of the Island Park geothermal area, Idaho, Montana, Wyoming
23 p0551 N79-23551

FORUM FOR THE ADVANCEMENT OF STUDENTS IN SCIENCE AND TECHNOLOGY, WASHINGTON, D. C.
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495

FRANKLIN INST. RESEARCH LABS., ROCKVILLE, MD.
A literature review-problem definition studies on selected toxic chemicals. Volume 1: Occupational health and safety aspects of diesel fuel and white smoke generated from it
[AD-A056018] 21 p0192 N79-11686
A literature review-problem definition studies on selected toxic chemicals. Volume 8: Environmental aspects of diesel fuel and fog oils SGF number 1 and SGF number 2 and smoke screens generated from them
[AD-A056021] 21 p0193 N79-11688

FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E. V., KARLSRUHE (WEST GERMANY).
Published patent applications and patents resulting from German government sponsored research and development
[BMFT-FB-T-78-31] 24 p0794 N79-33151

G

GARDEN STATE RACING ASSOCIATION, CHERRY HILL, N. J.
Solar heating and hot water system installed at Cherry Hill, New Jersey
[NASA-CR-161235] 24 p0723 N79-28729

GARRETT CORP., LOS ANGELES, CALIF.
Systems definition space-based power conversion systems
[NASA-CR-150268] 23 p0546 N79-23483

GARRETT ENERGY RESEARCH AND ENGINEERING, INC., CLAREMONT, CALIF.
Conversion of biomass materials into gaseous products, phase 1
[SAN-1241-77-1] 21 p0171 N79-10237

GARRETT ENERGY RESEARCH AND ENGINEERING CO., OJAI, CALIF.
Thermochemical conversion: Biomass gasification
[TID-29391] 24 p0726 N79-28766

GEIRINGER (PAUL L.) AND ASSOCIATES, ROSLYN, N. Y.
Community application of integrated energy/utility systems
[PB-290675/8] 23 p0566 N79-24520

GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C.
The Federal Government should establish and meet energy conservation goals
[PB-283066/9] 21 p0190 N79-11546
Region at the crossroads: The Pacific Northwest searches for new sources of electric energy
[PB-284691/3] 21 p0222 N79-14583
GAO work involving title V of the Energy Policy and Conservation Act of 1975
[PB-286400/7] 21 p0230 N79-15424
Evaluation of four energy conservation programs--fiscal year 1977
[PB-288825/3] 22 p0355 N79-19472
Transportation energy conservation in the Federal Government
[PB-291697/1] 23 p0544 N79-22646
More use should be made of energy-saving products in federal buildings
[PB-291692/2] 23 p0544 N79-22647
US refining capacity: How much is enough
[PB-291437/2] 23 p0555 N79-24192
Analysis of the energy and economic effects of Iranian oil shortfall
[PB-292634/3] 23 p0575 N79-25540
The Congress needs to redirect the federal electric vehicle program
[PB-293977/5] 24 p0731 N79-29120
Unique helium resources are wasting: A new conservation policy is needed
[PB-293751/4] 24 p0748 N79-30701
The potential for hydrogen as an energy source
[PB-295317/2] 24 p0795 N79-33345
The United States refining policy in a changing world oil environment
[PB-297136/4] 24 p0796 N79-33349
Federal facilities for storing spent nuclear fuel; Are they needed
[PB-297071/3] 24 p0804 N79-34006

GENERAL ATOMIC CO., SAN DIEGO, CALIF.
Fixed mirror solar concentrator for power generation
[GA-A-14883] 21 p0187 N79-11526
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14876] 21 p0214 N79-13871
Parametric requirements for noncircular Tokamak commercial fusion plants
[GA-A-14946] 21 p0214 N79-13872
Large closed-cycle gas turbine plant
[GA-A-14311] 22 p0331 N79-16261
Nuclear closed-cycle gas turbine (GT-HTGR): A utility power plant for the year 2000
[GA-A-15184] 23 p0582 N79-26515

GENERAL DYNAMICS/CONVAIR, SAN DIEGO, CALIF.
Development of space manufacturing systems concepts utilizing lunar resources
[AIAA PAPER 79-1411] 23 p0426 A79-34844
Cost comparisons for the use of nonterrestrial materials in space manufacturing of large structures
[IAF PAPER 79-115] 24 p0709 A79-53302
Achievable flatness in a large microwave power antenna study
[NASA-CR-151831] 21 p0171 N79-10272
Vehicle Design Evaluation Program (VDEP). A computer program for weight sizing, economic, performance and mission analysis of fuel-conservative aircraft, multibodied aircraft and large cargo aircraft using both JP and alternative fuels
[NASA-CR-145070] 21 p0200 N79-13026

GENERAL ELECTRIC CO., EVENDALE, OHIO.
Experimental clean combustor program: Diesel no. 2 fuel addendum, phase 3
[NASA-CR-135413] 23 p0576 N79-26221
GENERAL ELECTRIC CO., PHILADELPHIA, PA.
Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Background and system description of the Mod 1 wind turbine generator
22 p0235 A79-20825
Wind turbine generator application places unique demands on tower design and materials
22 p0240 A79-20826
Fatigue impact on Mod-1 wind turbine design
22 p0240 A79-20827
The application of hydraulics in the 2,000 kW wind turbine generator
22 p0288 A79-27400
Development of a shingle-type solar cell module
23 p0499 A79-40906
Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells
23 p0500 A79-40913
UV blocking filters for polymeric films
24 p0668 A79-51103
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780
Solar heating and cooling system design and development
[NASA-CR-150803] 21 p0172 N79-10516
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 3: Wind conversion systems with energy storage
[HCP/T22221-01/3] 21 p0189 N79-11535
Mini-Brayton heat source assembly development
[NASA-CR-159447] 21 p0196 N79-12554
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 2: Photovoltaic systems with energy storage
[HCP/T22221-01/2-2] 21 p0207 N79-13510
Applied research on energy storage and conversion for photovoltaic and wind energy systems. Volume 1: Study summary and concept screening
[HCP/T22221-01/1-VOL-1] 21 p0207 N79-13511
Coal desulfurization using microwave energy
[PB-285880/1] 21 p0216 N79-14243
Conceptual approach study 200 watt per kilogram solar array, phase 3
[NASA-CR-158046] 21 p0219 N79-14551
MHD-ETF program. Volume 1: Executive summary
[FE-2613-6-VOL-1] 22 p0362 N79-20515
MHD-ETF program. Volume 2A, parts 1 and 2: Reference design description
[FE-2613-6-VOL-2A] 22 p0363 N79-20516
Regional conceptual design and analysis studies for residential photovoltaic systems. Volume 1: Executive summary
[SAND-78-7039] 24 p0741 N79-29651
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
Conceptual design of thermal energy storage systems for near term electric utility applications. Volume 1: Screening of concepts
[NASA-CR-159411-VOL-1] 21 p0205 N79-13496
Compendium reports on oil shale technology
[PB-293279/6] 23 p0578 N79-26237
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
Control and stabilization of the DOE/NASA Mod-1 two megawatt wind turbine generator
24 p0677 A79-51780
A study of flywheel energy storage for urban transit vehicles
[PB-282929/9] 21 p0177 N79-10563
Development of sodium-sulfur batteries for utility application
[EPRI-EM-683] 21 p0186 N79-11502
Evaluation of a flywheel-powered shuttle car
[FE-8890] 23 p0562 N79-24488
High-gradient magnetic separation for removal of sulfur from coal
[PB-290945/5] 23 p0569 N79-25469
High efficiency cell geometry
24 p0784 N79-32653
Conceptual design of thermal energy storage systems for near term electric utility applications
[NASA-CR-159577] 24 p0797 N79-33560
GENERAL ELECTRIC CO., WILMINGTON, MASS.
Evaluation and optimization of Solid Polymer Electrolyte (SPE) fuel cells
[AD-A058380] 21 p0206 N79-13505
Solid Polymer Electrolyte (SPE) fuel cell technology program
[NASA-CR-160159] 22 p0371 N79-21622
GEOENERGY CORP., LAS VEGAS, NEV.
An assessment of subsurface salt water disposal experience on the Texas and Louisiana Gulf coast for application to disposal of salt water from geopressured geothermal wells
[NVO-1531-2] 22 p0366 N79-21523
GEOLOGICAL SURVEY, DENVER, COLO.
Late diagenetic indicators of buried oil and gas. 2: Direct detection experiment at Cement and Garza fields, Oklahoma and Texas, using enhanced LANDSAT 1 and 2 images
[E79-10099] 22 p0347 N79-18373
Geologic applications of thermal-inertia mapping from satellite
[E79-10279] 24 p0796 N79-33518
GEORGIA INST. OF TECH., ATLANTA.
Thermal analysis of receivers for solar concentrators and optimization procedure for power production
21 p0182 N79-11465
Laboratory study of pyrolysis of explosive contaminated waste
[AD-A066973] 23 p0576 N79-26222
GEORGIA UNIV., ATHENS.
Comparison of the solar concentrating properties of truncated hexagonal, pyramidal and circular cones
21 p0043 A79-11974
GNOSTIC CONCEPTS, INC., MENLO PARK, CALIF.
Industrialization study
[NASA-CR-157953] 21 p0200 N79-12970
Industrialization study, phase 2
[NASA-CR-158015] 22 p0333 N79-16351
GOLDER ASSOCIATES, INC., KIRKLAND, WASH.
Plan to demonstrate oil shale mining and rubblizing for a modified in situ retorting process
[UCRL-13979] 24 p0721 N79-28655
Oil mining: A technical and economic feasibility study of oil production by mining methods
[PB-297134/9] 24 p0797 N79-33549
GOODYEAR ATOMIC CORP., PIKETON, OHIO.
Refrigerant-114 Rankine cycle energy recovery technology from the gaseous diffusion industry
[GAT-916] 24 p0750 N79-30724
GORDIAN ASSOCIATES, INC., NEW YORK.
Heat pump technology: A survey of technical developments, market prospects and research needs
[HCP/M2121-01] 21 p0210 N79-13540
GORDIAN ASSOCIATES, INC., WASHINGTON, D. C.
Energy supply and demand balances and financing requirements in non-OPEC developing nations
[HCP/H6407] 24 p0741 N79-29650
GRUMMAN AEROSPACE CORP., BETHPAGE, N.Y.
Space solar power - An energy alternative
22 p0303 A79-29796
Manned remote work station development article
[NASA-CR-151871] 22 p0330 N79-16057
The 25 kW space station
22 p0371 N79-21604
Space-based solar power conversion and delivery systems study. Volume 2: Engineering analysis
[NASA-CR-150295] 23 p0541 N79-22618
Recovery of waste heat from propellant forced-air dry house
[AD-A064108] 23 p0543 N79-22638
Environmental interaction implications for large space systems
23 p0552 N79-24027
Design, fabrication and test of a hydrogen heat pipe
[NASA-CR-152267] 23 p0556 N79-24298
Cryogenic thermal diode heat pipes
[NASA-CR-152268] 24 p0719 N79-28470

GRUY FEDERAL, INC., HOUSTON, TEX.
Assessment of potential increased oil production by polymer-waterflood in northern and southern mid-continent oil fields
[BETC-0026-4] 24 p0735 N79-29579
GULF MINERAL RESOURCES CO., DENVER, COLO.
Status report the SRC-1 and SRC-2 processes
23 p0593 N79-27616
GULF RESEARCH AND DEVELOPMENT CO., CHESWICK, PA.
Investigation of mechanism of reactions involving oxygen-containing compounds in coal hydrogenation
[EPRI-AF-913] 24 p0795 N79-33344
GULF RESEARCH AND DEVELOPMENT CO., PITTSBURGH, PA.
Investigation of mechanisms of hydrogen transfer in coal hydrogenation
[FE-2305-21] 24 p0733 N79-29367
GULF UNIVERSITIES RESEARCH CONSORTIUM, BELLAIRE, TEX.
Potential producibility and recovery of natural gas from geopressured aquifers of the Cenozoic sediments of the Gulf Coast Basin
[FE-2025-3] 21 p0192 N79-11607
Requirements for the development, management and implementation of research in support of the Department of Energy enhanced oil recovery program
[BETC-2025-1] 24 p0776 N79-31831
GULTON INDUSTRIES, INC., HAWTHORNE, CALIF.
Development program for 3.0 KW inverter: Militarized inverter for use with fuel cell or battery power plants
[AD-A068433] 24 p0738 N79-29612

H

HAMBURG UNIV. (WEST GERMANY).
Results of the geoscientific investigations from the VALDIVA cruise VA-10/1975 off Western Africa
[BMFT-FB-M-78-03] 23 p0567 N79-24592
HAMILTON STANDARD, WINDSOR LOCKS, CONN.
Methane production from beef cattle feedlots
[CONF-7806107-2] 23 p0589 N79-27333
HAMILTON STANDARD DIV., UNITED AIRCRAFT CORP., WINDSOR LOCKS, CONN.
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828
HARRY DIAMOND LABS., ADELPHI, MD.
An initial model for the finite displacement response characteristics of a fluidyne pump
[AD-A069159] 24 p0734 N79-29521
HAWAII UNIV., HONOLULU.
Control of wind turbine generators connected to power systems
21 p0086 A79-15574
Oahu wind power survey
[PB-287361/0] 22 p0335 N79-16382
Wind engineering research digest, volume 3, 1978
[PB-290694/9] 23 p0567 N79-24621
HEALTH EDUCATION AUTHORITY OF LOUISIANA, NEW ORLEANS.
Grip-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2
[COO-4337-2/2] 23 p0598 N79-27701
HITTMAN ASSOCIATES, INC., COLUMBIA, MD.
Standards of Practice Manual for the solvent refined coal liquefaction process
[PB-283028/9] 21 p0178 N79-10595
Environmental assessment data base for coal liquefaction technology. Volume 1: Systems for 14 liquefaction processes
[PB-287799/1] 22 p0344 N79-17364
Environmental assessment data base for coal liquefaction technology. Volume 2: Synthoil, H-coal, and Exxon donor solvent processes
[PB-287800/7] 22 p0344 N79-17365
Air quality impacts using SRC versus conventional coal in power plants
[PB-290237/7] 22 p0373 N79-21671
SRC (solvent refined coal) site, specific pollutant evaluation. Volume 1: Discussion
[PB-291495/0] 23 p0539 N79-22318
SRC (solvent refined coal) site--specific pollutant evaluation. Volume 2: Appendices
[PB-291496/8] 23 p0539 N79-22319
Comprehensive community energy planning. Volume 2: Appendices
[HCP/M0023-02-VOL-2] 24 p0749 N79-30713
Comprehensive community energy planning. Volume 1: A workbook
[HCP/M0023-01-VOL-1] 24 p0750 N79-30722
HONEYWELL CORPORATE MATERIAL SCIENCES CENTER, BLOOMINGTON, MINN.
Growth, evaluation and modeling of silicon-on-ceramic solar cells
23 p0504 A79-40957
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
HONEYWELL, INC., HORSHAM, PA.
Applications and safety data
24 p0722 N79-28718
HONEYWELL, INC., MINNEAPOLIS, MINN.
Solar pilot plant, phase 1
[SAN-1109-77-7] 21 p0210 N79-13542
Preliminary design package for prototype solar heating system
[NASA-CR-150858] 21 p0220 N79-14557
Preliminary design package for prototype solar heating and cooling systems
[NASA-CR-150853] 21 p0229 N79-15409
Preliminary design package for residential heating/cooling system: Rankine air conditioner redesign
[NASA-CR-150871] 22 p0354 N79-19453
Active heat exchange system development for latent heat thermal energy storage
[NASA-CR-159479] 22 p0368 N79-21554
Buildings energy management program workshop design
[CONS-8630-T1] 24 p0776 N79-31824
HOUSTON UNIV., TEX.
Demand and supply of hydrogen as chemical feedstock in USA
24 p0612 A79-45580
Environmental effects of offshore oil production
22 p0336 N79-16389
HUGHES AIRCRAFT CO., EL SEGUNDO, CALIF.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 1: Study overview and summary
[NASA-CR-162328] 24 p0782 N79-32638
Conceptual design study of concentrator enhanced solar arrays for space applications Volume 2: Technical
[HAC-REF-E3256-VOL-2] 24 p0782 N79-32639
HUGHES AIRCRAFT CO., LOS ANGELES, CALIF.
High efficiency GaAs solar cell development
[AD-A066616] 23 p0573 N79-25514
HUGHES AIRCRAFT CO., MALIBU, CALIF.
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664
HUGHES RESEARCH LABS., MALIBU, CALIF.
Electron and proton degradation in /AlGa/As-GaAs solar cells
23 p0506 A79-40973
GaAs solar cell development
[NASA-CR-158090] 22 p0334 N79-16366
Low energy proton radiation damage to (AlGa)As-GaAs solar cells
[NASA-CR-159040] 23 p0572 N79-25507
HYDROCARBON RESEARCH, INC., LAWRENCEVILLE, N. J.
Demetallization catalyst tests on heavy residual oils
[PB-285937/9] 21 p0232 N79-15864
Catalyst evaluation for denitrogenation of petroleum residua and coal liquids, phase 5
[PB-287180/4] 22 p0339 N79-17026
HYDROSCIENCE, INC., KNOXVILLE, TENN.
Assessment of long-distance thermal-energy transport: A comparison between water, steam, and hot oils
[ORNL/SUB-79/14274/1] 24 p0776 N79-31827

I

IBM FEDERAL SYSTEMS DIV., HUNTSVILLE, ALA.
Collection, processing and dissemination of data for the national solar demonstration program
24 p0608 A79-45208

SIMS prototype system 4 - performance test report [NASA-CR-150820] 21 p0205 N79-13499

System design package for SIMS prototype system 3, solar heating and domestic hot water [NASA-CR-150840] 22 p0333 N79-16359

System design package for SIMS prototype system 4, solar heating and domestic hot water [NASA-CR-150839] 22 p0333 N79-16361

System integration of marketable subsystems [NASA-CR-161104] 22 p0348 N79-18448

IBM WATSON RESEARCH CENTER, YORKTOWN HEIGHTS, N.Y.

Simmer-enhanced flashlamp-pumped dye laser 23 p0384 A79-32981

IIT RESEARCH INST., CHICAGO, ILL.

Hydrogen generator subsystem: Catalyst and equipment development for thermo-catalytic cracker [AD-A068452] 24 p0738 N79-29616

ILLINOIS ENERGY RESOURCES COMMISSION, SPRINGFIELD.

Solid waste and biomass. Their potential as energy sources in Illinois, 1977 [PB-281649/4] 21 p0177 N79-10562

ILLINOIS INST. OF TECH., CHICAGO.

Air monitoring network design for power plant siting 23 p0591 N79-27590

ILLINOIS UNIV. AT URBANA-CHAMPAIGN.

Energy and labor intensities projected to the year 2010 [COO-4628-2] 24 p0750 N79-30727

ILLINOIS UNIV. AT URBANA-CHAMPAIGN, URBANA.

Energy and environment: An intergovernmental perspective [PB-283733/4] 21 p0198 N79-12575

ILLINOIS UNIV., URBANA.

Design considerations for silicon HLE solar cells 23 p0521 A79-41094

Energy and labor intensities projected to the year 2010 [COO-4628-2] 24 p0772 N79-31788

ILLINOIS UNIV., URBANA-CHAMPAIGN.

Resource analysis: Water and energy as linked resources [PB-288046/6] 22 p0349 N79-18463

ILLINOIS VALLEY ECONOMIC DEVELOPMENT CORP., CARLINVILLE.

Solar space heaters for low-income families [PB-289244/6] 22 p0363 N79-20526

IMPERIAL COLL. OF SCIENCE AND TECHNOLOGY, LONDON (ENGLAND).

Future fuels for aviation 21 p0201 N79-13193

The role of fundamental combustion in the future aviation fuels program 21 p0202 N79-13195

INDIAN INST. OF SCIENCE, BANGALORE.

A low-cost water pumping windmill using a sail type Savonius rotor [PB-294413/0] 23 p0585 N79-26541

INDUSTRIAL ENVIRONMENTAL RESEARCH LAB., CINCINNATI, OHIO.

Pollution control guidance for geothermal energy development [PB-282546/1] 21 p0178 N79-10604

INDUSTRIAL ENVIRONMENTAL RESEARCH LAB., RESEARCH TRIANGLE PARK, N. C.

Demetallization catalyst tests on heavy residual oils [PB-285937/9] 21 p0232 N79-15864

EPA program conference report: Coal cleaning, an option for Increased Coal Utilization [PB-288223/1] 22 p0344 N79-17378

INSITU CONSULTING, LARAMIE, WYO.

Bibliography of subsidence and related topics for in situ coal gasification [LETC/BL-71316-1] 24 p0733 N79-29373

INSTITUT FUER DAS BAUEN MIT KUNSTSTOFFEN E.V., DARMSTADT (WEST GERMANY).

Description of the possibilities for energy savings during the design and construction of apertures in buildings (cross-section report) [BMFT-FB-T-78-15] 23 p0590 N79-27345

INSTITUT FUER SYSTEMTECHNIK UND INNOVATIONSFORSCHUNG, KARLSRUHE (WEST GERMANY).

Identification of social and economic difficulties associated with the introduction of solar energy devices [BMFT-FB-T-78-47] 23 p0595 N79-27712

INSTITUTE FOR ENERGY ANALYSIS, OAK RIDGE, TENN.

Three modes of energy cost analysis: Then-current dollars, base-year dollars, and perpetual-constant dollars [ORAU/IEA(M)-78-10] 21 p0209 N79-13531

INSTITUTE OF GAS TECHNOLOGY, CHICAGO, ILL.

Dedicated nuclear facilities for electrolytic hydrogen production 24 p0614 A79-45592

Feasibility study of transporting offshore OTEC-produced energy to shore by thermal media. Project 8980 [DSE/2426-19] 21 p0174 N79-10535

Pipeline gas from coal-hydrogenation: IGT hydrogasification process, project 9000 [FE-2434-29] 23 p0554 N79-24184

Development of combustion data to utilize low-Btu gases as industrial process fuels [FE-2489-30] 23 p0576 N79-26143

Process design for coal conversion reactors [CONF-781110-15] 23 p0577 N79-26232

Evaluation of the flash desulfurization process for coal cleaning [PB-292328/2] 23 p0590 N79-27342

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels [FE-2307-34] 24 p0718 N79-28358

Hydrogen from existing falling-water sites: An initial feasibility assessment (summary) [CONF-781142-8] 24 p0718 N79-28360

Behavior of gas distribution equipment in hydrogen service [CONF-790512-2] 24 p0747 N79-30408

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [FE-2307-42] 24 p0765 N79-31410

Peat gasification: An experimental study [CONF-780611-8] 24 p0780 N79-32391

Production of high-energy chemicals using solar energy heat [ORNL/SUB-7390/1] 24 p0789 N79-32707

Development of combustion data to utilize low-Btu gases as industrial process fuels. Flat-flame burner [FE-2489-36] 24 p0795 N79-33340

INSTITUTO DE PESQUISAS ESPACIAIS, SAO JOSE DOS CAMPOS (BRAZIL).

Remote sensors applied to the prospecting of thermomineral waters in the municipality of Caldas Novas-Goias [E79-10238] 24 p0747 N79-30599

INTERAGENCY REVIEW GROUP ON NUCLEAR WASTE MANAGEMENT, WASHINGTON, D. C.

Report to the President by the Interagency Review Group on Nuclear Waste Management [TID-29442] 24 p0729 N79-29021

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT, WASHINGTON, D.C.

Wind driven water pumps. Economics, technology, current activities [PB-292816/6] 23 p0585 N79-26542

INTERNATIONAL BUSINESS MACHINES CORP., HOPEWELL JUNCTION, N. Y.

Contribution to solving the energy crisis - Simulating the prospects for low cost energy through silicon solar cells 23 p0475 A79-38877

INTERNATIONAL BUSINESS MACHINES CORP., HUNTSVILLE, ALA.

Solar project cost report: Radian Corporation Office Building, Austin, Texas [SOLAR/2002-78/60] 23 p0561 N79-24480

Solar project description: Scattergood School Recreation Center, West Branch, Iowa [SOLAR/2003-78/50] 23 p0561 N79-24481

Solar project cost report: Scattergood School Recreation Center, West Branch, Iowa [SOLAR/2003-78/60] 23 p0562 N79-24482

Solar project cost report: Terrell E. Moseley Office Building, Lynchburg, Virginia [SOLAR/2011-78/60] 23 p0562 N79-24483

Solar project cost report: Kalwall Corporation Warehouse, Manchester, New Hampshire [SOLAR/2015-78/60] 23 p0562 N79-24484

Solar project description: Aratex Services, Incorporated, industrial laundry, Fresno, California [SOLAR/2008-78/50] 23 p0562 N79-24485

Solar project description: Iris Images, Incorporated, film laboratory, Mill Valley, California
[SOLAR/2005-78/50] 23 p0562 N79-24486
Solar project cost report. Iris Images, Incorporated, Film Laboratory, Mill Valley, California
[SOLAR/2005-78/60] 23 p0563 N79-24494
Solar project cost report. Aratex Services, Inc., Industrial Laundry, Fresno, California
[SOLAR/2008-78/60] 23 p0563 N79-24495
Solar project description. Radian Corporation Office Building, Austin, Texas
[SOLAR/2002-78/50] 23 p0563 N79-24496
Effects of air damper leaks on solar energy system performance
[SOLAR/0012-78/29] 23 p0563 N79-24497
Solar project description. Terrell E. Moseley Office Building, Lynchburg, Virginia
[SOLAR/2011-78/50] 23 p0563 N79-24498
Solar project description. Kalwall Corporation Warehouse, Manchester, New Hampshire
[SOLAR/2015-78/50] 23 p0564 N79-24499

INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS, LAXENBURG (AUSTRIA).
On fossil fuel reserves and resources
[IIASA-RM-78-35] 23 p0593 N79-27628
A review of energy models. Part 4: July 1978
[IIASA-RR-78-11-PT-4] 23 p0594 N79-27652

INTERNATIONAL NICKEL CO., INC., SUFFERN, N. Y.
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-2] 24 p0765 N79-31386

INTERNATIONAL RESEARCH AND TECHNOLOGY CORP., MCLEAN, VA.
Ten scenarios of transportation energy conservation using TECNET
[HCP/M2101-1] 24 p0740 N79-29647
Further development and use of the transportation energy conservation network (TECNET)
[HCP/M2101-2] 24 p0741 N79-29648
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844

INTERNATIONAL SCIENCE AND TECHNOLOGY INST., INC., WASHINGTON, D. C.
Potential use of small dams to produce power for low-income communities
[PB-292745/7] 23 p0575 N79-25535
Developing small hydroelectric dam potential
[PB-296238/9] 24 p0802 N79-33601

IOWA INST. OF HYDRAULIC RESEARCH, IOWA CITY.
Optimum combinations of cooling alternatives for stream-electric power plants, volume 2
[PB-290576/8] 23 p0565 N79-24515

IOWA STATE UNIV. OF SCIENCE AND TECHNOLOGY, AMES.
Energy conservation via heat transfer enhancement
[COO-4649-3] 24 p0758 N79-30819

ISRO SATELLITE CENTRE, PEENYA, BANGALORE (INDIA).
Observations made during the development of a thermal control system for a near earth orbiting satellite
24 p0763 N79-31272

ISTITUTO SUPERIORE DI SANITA, ROME (ITALY).
Problems and prospectives on solar energy utilization
[ISS-P-78/1] 24 p0742 N79-29667

J

JET PROPULSION LAB., CALIFORNIA INST. OF TECH., PASADENA.
User experience with on-road electric vehicles in the U.S.A. and Canada
21 p0009 A79-10080
A technical analysis for cogeneration systems with potential applications in twelve California industrial plants
21 p0011 A79-10099
High temperature thermal energy storage in moving sand
21 p0012 A79-10103
JPL - Small Power Systems Applications Project
21 p0019 A79-10161
Performance and economic risk evaluation of dispersed solar thermal power systems by Monte Carlo simulation
21 p0020 A79-10163
Effects of pointing errors on receiver performance for parabolic dish solar concentrators
21 p0020 A79-10167
Ultralow-mass solar-array designs for Halley's comet rendezvous mission
21 p0020 A79-10169
The application of photovoltaic roof shingles to residential and commercial buildings
21 p0020 A79-10170
Comparative evaluation of distributed-collector solar thermal electric power plants
21 p0021 A79-10173
Cooling radioisotope thermoelectric generators in the Shuttle
21 p0023 A79-10186
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
Design of a preprototype Stirling Laboratory Research Engine
21 p0024 A79-10203
Prospects of thermionic power systems
21 p0026 A79-10220
Selenide technology evaluation program at JPL
21 p0026 A79-10222
Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223
Modified silicon-germanium alloys with improved performance
21 p0027 A79-10225
Optimum antireflection coating for Antireflection-coated Metal-Oxide-Semiconductor /AMOS/ solar cells
21 p0042 A79-11955
Coal desulfurization by low-temperature chlorinolysis
21 p0045 A79-12119
Feasibility of rocket propellant production on Mars
21 p0047 A79-12324
Solar thermal power systems point-focusing distributed receiver /PFDR/ technology - A project description
[AIAA PAPER 78-1771] 21 p0062 A79-13869
Electricity from sunlight
21 p0065 A79-14116
Total solar irradiance at Table Mtn, California 1926-77
21 p0067 A79-14269
Calibration standards and field instruments for the precision measurement of insolation
21 p0076 A79-14765
A probabilistic model of insolation for the Mojave desert-area
21 p0076 A79-14766
Advanced composites - Future space applications
21 p0086 A79-15504
Hail risk model for solar collectors
21 p0098 A79-16103
Simulated hail impact testing of photovoltaic solar panels
21 p0098 A79-16116
A graphical approach to the efficiency of flat-plate collectors
21 p0102 A79-16422
Solar collectors. I - Fundamentals and collectors of the past and present
21 p0103 A79-16455
Solar thermal conversion
21 p0104 A79-16466
SPS microwave subsystem potential impacts and benefits
21 p0107 A79-16603
Large active retrodirective arrays for solar power satellites
21 p0107 A79-16604
Energy conversion at a lunar polar site
21 p0108 A79-16607
Overview of novel photovoltaic conversion techniques at high intensity levels
21 p0108 A79-16610
Efficiency degradation due to tracking errors for point focusing solar collectors
[ASME PAPER 78-WA/SOL-4] 21 p0162 A79-19837
Solar receiver performance of point focusing collector system
[ASME PAPER 78-WA/SOL-5] 21 p0163 A79-19838

Accelerating the commercialization on new technologies [ASME PAPER 78-WA/TS-4] 21 p0164 A79-19849

Integral assembly of photovoltaic arrays using glass 22 p0241 A79-20883

Hydrogen enrichment for low-emission jet combustion 22 p0244 A79-21347

Effect of grain boundaries in silicon on minority-carrier diffusion length and solar-cell efficiency 22 p0252 A79-21807

Design concepts of solar thermoelectric generators in space applications 22 p0260 A79-23612

Encapsulant materials for $2/watt terrestrial photovoltaic arrays 22 p0266 A79-24138

Continuous extrusion of coal 22 p0282 A79-26372

Structural cost optimization of photovoltaic central power station modules and support structure [ASME PAPER 79-SOL-17] 22 p0309 A79-30551

Photovoltaics and solar thermal conversion to electricity - Status and prospects 22 p0326 A79-31924

Analysis of dynamic effects in solar thermal energy conversion systems 23 p0400 A79-34008

Solar energy in California industry - Applications, characteristics and potential 23 p0402 A79-34019

Solar thermoelectric power generation for Mercury orbiter missions [AIAA 79-0915] 23 p0425 A79-34738

Environmental testing of flat plate solar cell modules 23 p0428 A79-35039

A life prediction methodology for encapsulated solar cells 23 p0428 A79-35041

Low-cost encapsulation materials for terrestrial solar cell modules 23 p0439 A79-36636

Thermal and other tests of photovoltaic modules performed in natural sunlight [AIAA PAPER 79-0980] 23 p0457 A79-38184

Selection and development of small solar thermal power applications [AIAA PAPER 79-1005] 23 p0459 A79-38198

Photovoltaic systems perspective [AIAA PAPER 79-0983] 23 p0475 A79-38891

Solar Stirling system development [AIAA PAPER 79-1009] 23 p0476 A79-38894

Analysis, development and testing of a fixed tilt solar collector employing reversible Vee-Trough reflectors and vacuum tube receivers 23 p0477 A79-39101

Methanol decomposition bottoming cycle for IC engines [SAE PAPER 790427] 23 p0495 A79-40774

Effect of multiblade slurry saw induced damage on silicon solar cells 23 p0498 A79-40902

Development of a shingle-type solar cell module 23 p0499 A79-40906

Ultra-low-mass flexible planar solar arrays using 50-micron-thick solar cells 23 p0500 A79-40913

A candidate low-cost processing sequence for terrestrial silicon solar cell panel 23 p0501 A79-40919

Evaluation of options for process sequences 23 p0501 A79-40925

An overview of photovoltaics for space applications 23 p0503 A79-40950

High efficiency solar panel /HESP/ 23 p0503 A79-40951

The effects of copper and titanium on silicon solar cells 23 p0504 A79-40961

Effect of copper impurity on polycrystalline silicon solar cells 23 p0504 A79-40962

Electron and proton degradation in /AlGa/As-GaAs solar cells 23 p0506 A79-40973

Production technology for high efficiency ion implanted solar cells 23 p0509 A79-41000

Terrestrial solar arrays with integral glass construction 23 p0509 A79-41004

Some failure modes and analysis techniques for terrestrial solar cell modules 23 p0512 A79-41020

Environmental qualification testing of terrestrial solar cell modules 23 p0512 A79-41021

Product pricing in the Solar Array Manufacturing Industry - An executive summary of SAMICS 23 p0513 A79-41032

Lifetime Cost and Performance model for photovoltaic power systems 23 p0514 A79-41037

Progress towards high efficiency polycrystalline thin-film GaAs AMOS solar cells 23 p0515 A79-41044

Photovoltaic design optimization for terrestrial applications 23 p0517 A79-41060

Effects of design on cost of flat-plate solar photovoltaic arrays for terrestrial central station power applications 23 p0520 A79-41081

Optimal control of sun tracking solar concentrators 23 p0526 A79-41831

Encapsulation materials for photovoltaic arrays 23 p0534 A79-43294

The engineering analysis of solar radiation 24 p0605 A79-44796

Hydrogen in the U.S. energy picture 24 p0612 A79-45577

Demand and supply of hydrogen as chemical feedstock in USA 24 p0612 A79-45580

Concepts for solar production of hydrogen 24 p0614 A79-45593

A simple theory of back-surface-field /BSF/ solar cells 24 p0637 A79-47051

Extension of a theorem used in the investigation of P-N junctions with the scanning electron microscope to arbitrary geometries and arbitrarily inhomogeneous material 24 p0648 A79-49211

Solar potential inventory and modeling 24 p0657 A79-50219

Environmental requirements for flat plate photovoltaic modules for terrestrial applications 24 p0658 A79-50342

Environmental assessment of the proposed nonelectric application of geothermal resources at Desert Hot Springs, California 24 p0667 A79-50899

A simulation exercise of a cavity-type solar receiver using the HEAP program 24 p0670 A79-51730

Projected techno-economic improvements for advanced solar thermal power plants 24 p0671 A79-51733

Advanced solar thermal technology - Potential and progress 24 p0671 A79-51739

Dynamics and control of Stirling engines in a 15 kWe solar electric generation concept 24 p0673 A79-51750

Turbine sizing of a solar thermal power plant 24 p0673 A79-51751

Solar parabolic dish thermal power systems - Technology and applications 24 p0674 A79-51755

Solar thermal power plants in small utilities - An economic impact analysis 24 p0675 A79-51761

Toward the renewables - A natural gas/solar energy transition strategy 24 p0686 A79-51851

Hydrogen as the solar energy translator 24 p0686 A79-51852

High temperature, low mass solar blanket development
24 p0691 A79-51902

Radioisotope thermoelectric generator cooling in the Shuttle bay
24 p0693 A79-51936

Recent progress in hybrid mode thermionic converter development
24 p0700 A79-51986

Hydrogen-fueled diesel engine without timed ignition
24 p0715 A79-54297

Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513

Surfactant-assisted liquefaction of particulate carbonaceous substances
[NASA-CASE-NPO-13904-1] 21 p0179 N79-11152

Non-tracking solar energy collector system
[NASA-CASE-NPO-13817-1] 21 p0182 N79-11471

Characterization of solar cells for space applications. Volume 4: Electrical characteristics of Spectrolab BSF 200-micron Helios cells as a function of intensity and temperature
[NASA-CR-157934] 21 p0195 N79-12543

Satellite Power System (SPS) environmental impacts, preliminary assessment
[NASA-CR-157952] 21 p0196 N79-12557

Satellite Power System (SPS) microwave subsystem impacts and benefits
[NASA-CR-157951] 21 p0196 N79-12558

Microwave power transmitting phased array antenna research project
[NASA-CR-157843] 21 p0202 N79-13263

The Otto-engine-equivalent vehicle concept
[NASA-CR-157840] 21 p0203 N79-13370

A synoptic description of coal basins via image processing
[NASA-CR-157970] 21 p0204 N79-13474

Parametric study of two planar high power flexible solar array concepts
[NASA-CR-157841] 21 p0205 N79-13501

Utilization of waste heat in trucks for increased fuel economy
[NASA-TM-79966] 21 p0215 N79-13937

Primary reflector for solar energy collection systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529

Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537

Concentrator enhanced solar arrays design study
[NASA-CR-158032] 21 p0219 N79-14546

Development of a model and computer code to describe solar grade silicon production processes
[NASA-CR-158037] 21 p0219 N79-14555

Analysis and evaluation of process and equipment in tasks 2 and 4 of the Low Cost Solar Array project
[NASA-CR-158089] 22 p0335 N79-16378

Thermal energy transformer
[NASA-CASE-NPO-14058-1] 22 p0348 N79-18443

Block 4 solar cell module design and test specification for residential applications
[NASA-CR-158117] 22 p0348 N79-18453

The updated algorithm of the Energy Consumption Program (ECP): A computer model simulating heating and cooling energy loads in buildings
22 p0351 N79-19059

A two-dimensional thermal analysis of a new high-performance tubular solar collector
22 p0352 N79-19060

Primary lithium battery technology and its application to NASA missions
[NASA-CR-158229] 22 p0354 N79-19449

Bioconversion study conducted by JPL
[NASA-CR-158228] 22 p0354 N79-19450

Thermal and other tests of photovoltaic modules performed in natural sunlight
[NASA-CR-158174] 22 p0354 N79-19460

LSA Low-cost Solar Array project
[NASA-CR-158250] 22 p0355 N79-19462

Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486

A fixed tilt solar collector employing reversible vee-through reflectors and evaluated tube receivers for solar heating and cooling systems
[NASA-CR-158420] 22 p0359 N79-20490

The parabolic concentrating collector: A tutorial
[NASA-CR-158426] 22 p0359 N79-20491

Thermal power systems point-focusing distributed receiver technology project. Volume 1: Executive summary
[NASA-CR-158421] 22 p0360 N79-20492

An improved solar energy receiver for a stirling engine
[NASA-CASE-NPO-14619-1] 22 p0362 N79-20513

A low cost high temperature sun tracking solar energy collector
22 p0366 N79-21390

Feasibility study of solar dome encapsulation of photovoltaic arrays
[NASA-CR-158368] 22 p0367 N79-21545

Power coupling alternatives for the NEP thermionic power system
[NASA-CR-158372] 22 p0367 N79-21547

Thermal power systems small power systems applications project. Decision analysis for evaluating and ranking small solar thermal power system technologies. Volume 1: A brief introduction to multiattribute decision analysis
[NASA-CR-158425] 22 p0368 N79-21548

Effort of the Jet Propulsion Laboratory
22 p0370 N79-21575

Computerized simulation and parameterization of a new high-performance tubular solar collector
23 p0539 N79-22163

Advanced subsystems development
[NASA-CR-158335] 23 p0542 N79-22627

Environmental testing of block 2 solar cell modules
[NASA-CR-158521] 23 p0542 N79-22628

Thermal power systems small power systems application project: Siting issues for solar thermal power plants with small community applications
[NASA-CR-158520] 23 p0542 N79-22629

Techno-economic projections for advanced small solar thermal electric power plants to years 1990-2000
[NASA-CR-158519] 23 p0549 N79-23503

A normative price for a manufactured product: The SAMICS methodology. Volume 1: Executive summary
[NASA-CR-158502] 23 p0549 N79-23504

A normative price for a manufactured product: The SAMICS methodology. Volume 2: Analysis
[NASA-CR-158503] 23 p0549 N79-23505

Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512

Low cost solar array project: Composition measurements by analytical photo catalysis
[NASA-CR-158598] 23 p0550 N79-23513

Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515

Metallization of large silicon wafers
[NASA-CR-158575] 23 p0550 N79-23517

Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158580] 23 p0550 N79-23519

Underwater seismic source
[NASA-CASE-NPO-14255-1] 23 p0551 N79-23555

Proceedings of the distribution automation and control working group. Volume 1: Executive summary
[NASA-CR-158642] 23 p0555 N79-24259

Primary reflector for solar energy collection systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432

Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433

Low-cost Solar Array (LSA) project
[NASA-CR-158650] 23 p0559 N79-24457

Low-cost Solar Array (LSA) project
[NASA-CR-158651] 23 p0559 N79-24458

LSA: Low-cost Solar Array project
[NASA-CR-158533] 23 p0559 N79-24459

Thermal Storage Applications Workshop. Volume 1: Plenary Session Analysis
[NASA-CR-158643] 23 p0559 N79-24460

Thermal Storage Applications Workshop. Volume 2: Contributed Papers
[NASA-CR-158644] 23 p0559 N79-24461
Thermal power systems, small power systems application project. Volume 1: Executive summary
[NASA-CR-157441] 23 p0560 N79-24462
High-efficiency thin-film GaAs solar cells
[NASA-CR-158641] 23 p0560 N79-24463
Thermal power systems, point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-158534] 23 p0560 N79-24464
HEAP: Heat Energy Analysis Program, a computer model simulating solar receivers
[NASA-CR-158640] 23 p0560 N79-24466
The array automated assembly task for the low cost solar array project, phase 2
[NASA-CR-158538] 23 p0560 N79-24469
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-158537] 23 p0561 N79-24471
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311
Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482
Low-cost solar array project
23 p0570 N79-25489
LSA engineering status
23 p0570 N79-25490
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Automotive fuel economy and emissions experimental data
[PB-293580/7] 23 p0579 N79-26412
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project
[NASA-CR-158732] 23 p0586 N79-26979
Compatibility of elastomers in alternate jet fuels
[NASA-CR-158773] 23 p0588 N79-27321
Proceedings of the Conference on Coal Use for California
[NASA-CR-158770] 23 p0591 N79-27597
Performance prediction evaluation of ceramic materials in point-focusing solar receivers
[NASA-CR-158774] 23 p0594 N79-27654
Potential for cogeneration of heat and electricity in California industry, phase 2
[NASA-CR-158772] 23 p0594 N79-27658
Proceedings of the Distribution Automation and Control Working Group. Volume 2: Proceedings
[NASA-CR-158769] 23 p0595 N79-27659
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-158768] 23 p0595 N79-27660
Development and evaluation of elastomeric materials for geothermal applications
[NASA-CR-158813] 24 p0717 N79-28314
NASA's lithium cell technology program
24 p0722 N79-28709
Hydrogen-fueled postal vehicle performance evaluation
[NASA-CR-158811] 24 p0730 N79-29106
Comparison of two total energy systems for a diesel power generation plant
24 p0745 N79-30262
Thermal power systems small power systems applications project. Volume 2: Detailed report
[NASA-CR-162104] 24 p0749 N79-30718
Evaluation of selected chemical processes for production of low-cost silicon, phase 3
[NASA-CR-162168] 24 p0769 N79-31756
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758
Automated array assembly, phase 2
[NASA-CR-162176] 24 p0770 N79-31759
Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157] 24 p0770 N79-31763
Winston solar concentrators and evaluation support. Phase 2: Non-imaging concentrators for space applications
[NASA-CR-162279] 24 p0770 N79-31764
High efficiency, high density terrestrial panel
[NASA-CR-162167] 24 p0770 N79-31765
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Analysis and evalaution in the production process and equipment area of the low-cost solar array project
[NASA-CR-162163] 24 p0770 N79-31769
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Silicon-on ceramic process: Silicon sheet growth and device development for the large-area silicon sheet and cell development tasks of the low-cost solar array project
[NASA-CR-162158] 24 p0771 N79-31776
Low-cost solar array project. Feasibility of the silane process for producing semiconductor-grade silicon
[NASA-CR-162172] 24 p0771 N79-31777
Three state-of-the-art individual electric and hybrid vehicle test reports, volume 2
[NASA-CR-162311] 24 p0778 N79-32130
Characterization of solar cells for space applications. Volume 9: Electrical characteristics of Spectrolab BSF, textured, 10-ohm-cm 200-micron cells as a function of intensity, temperature, and irradiation
[NASA-CR-162289] 24 p0782 N79-32631
A preliminary assessment of small steam Rankine and Brayton point-focusing solar modules
[NASA-CR-162302] 24 p0782 N79-32632
LSA project technology development update
[NASA-CR-162301] 24 p0782 N79-32633
Results of the 1978 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-162298] 24 p0782 N79-32635
The JPL space photovoltaic program
24 p0783 N79-32643
Effect of dopants on annealing performance of silicon solar cells
24 p0785 N79-32661
Fabrication of high efficiency and radiation resistant GaAs solar cells
24 p0785 N79-32664
Integral glass encapsulation for solar arrays
[NASA-CR-162361] 24 p0798 N79-33564
Vacuum die casting of silicon sheet for photovoltaic applications
[NASA-CR-162360] 24 p0798 N79-33566

JOHNS HOPKINS UNIV., BALTIMORE, MD.
Solar heating of buildings: Design optimization and economic analysis
22 p0353 N79-19439

JOHNS HOPKINS UNIV., LAUREL, MD.
Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283171/7] 21 p0191 N79-11554
Energy programs at The Johns Hopkins University Applied Physics Laboratory
[PB-283170/9] 21 p0191 N79-11555

JOHNS-MANVILLE SALES CORP., DENVER, COLO.
Performance and evaluation of concepts and devices for heat reclamation from air conditioners, heat pumps, and refrigeration equipment
[AD-A069650] 24 p0752 N79-30770
Performance evaluation of solar films and screens
[AD-A070636] 24 p0800 N79-33583

JOINT CENTER FOR GRADUATE STUDY, RICHLAND, WASH.
Investigation of low cost solar cells based on Cu2O
[PB-295888/2] 24 p0792 N79-32737

JOINT PUBLICATIONS RESEARCH SERVICE, ARLINGTON, VA.
Translations on USSR science and technology: Physical sciences and technology, no. 67
[JPRS-73388] 23 p0568 N79-24946
Power industry application of MHD technology
23 p0568 N79-24949

K

KAISER ENGINEERS, OAKLAND, CALIF.
Technical and economic feasibility study for the industrial utilization of waste derived fuel gas
[SAN-2092-T1] 24 p0733 N79-29372

KAMAN AEROSPACE CORP., BLOOMFIELD, CONN.
Wind-turbine-generator rotor-blade concepts with low-cost potential
22 p0240 A79-20828

KANSAS UNIV., LAWRENCE.
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651
Comparison of three experimental methods used in determining the thermal performance of flat-plate solar collectors
23 p0557 N79-24434

KAYEX CORP., ROCHESTER, N. Y.
Continuous Czochralski growth: Silicon sheet growth development of the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158096] 22 p0334 N79-16369

KENTUCKY UNIV., LEXINGTON.
A Kentucky energy resource utilization program
[PB-283796/1] 21 p0198 N79-12574
Proceedings of Energy Resource 5th Conference
[PB-286246/4] 21 p0230 N79-15423
A Kentucky energy resource utilization program
[PB-292949/5] 23 p0585 N79-26538

KERNFORSCHUNGSANLAGE, JUELICH (WEST GERMANY).
Possibilities and limitations of solar energy utilization with the use of low-temperature collectors in the German Federal Republic: Principles, engineering systems, economy
[JUEL-SPEZ-25] 24 p0738 N79-29624

KERR (ROBERT S.) ENVIRONMENTAL RESEARCH LAB., ADA, OKLA.
Treatment of petroleum refinery, petrochemical and combined industrial-municipal wastewaters with activated carbon: Literature review
[PB-288211/6] 22 p0350 N79-18497

KEWANEE OIL CO., SHIDLER, OKLA.
North Stanley Polymer Demonstration Project
[BETC/RI-78/19] 23 p0588 N79-27313

KIDDE (WALTER) AND CO., INC., BELLEVILLE, N. J.
Grip-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2
[COO-4337-2/2] 23 p0598 N79-27701

KOTIN (ALLAN D.) ECONOMIC CONSULTANTS, LOS ANGELES, CALIF.
Satellite Power System (SPS) resource requirements (critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
Satellite Power System (SPS). State and local regulations as applied to satellite power system microwave receiving antenna facilities
[NASA-CR-157430] 23 p0548 N79-23494

KRAFTWERK UNION A.G. REAKTORTECHNIK, ERLANGEN (WEST GERMANY).
Combined gas/steam turbine power plants with supplementary firing
24 p0723 N79-28736

KVB, INC., MINNEAPOLIS, MINN.
Field tests of industrial stoker coal-fired boilers for emissions control and efficiency improvement: Site A (data supplement)
[PB-293731/6] 24 p0743 N79-29670
Field tests of industrial stoker coal fired boilers for emission control and efficiency improvement, site b
[PB-295535/9] 24 p0803 N79-33654

KVB ENGINEERING, INC., TUSTIN, CALIF.
Low-sulfur western coal use in existing small and intermediate size boilers
[PB-287937/7] 22 p0346 N79-18061

L

LABORATOIRES D'ELECTRONIQUE ET DE PHYSIQUE APPLIQUEE, LIMEIL-BREVANNES (FRANCE).
Solar cells made from polycrystalline silicon
[LEP-78/519-679-D] 24 p0743 N79-29669

LAKE CHAMPLAIN BASIN STUDY, BURLINGTON, VT.
Energy use and supply in the Lake Champlain Basin
[PB-293437/0] 23 p0599 N79-27713

LAMAR UNIV., BEAUMONT, TEX.
Electricity from sunlight
21 p0065 A79-14116
Process feasibility study in support of silicon material task 1
[NASA-CR-158034] 21 p0219 N79-14541
Process feasibility study in support of silicon material, task 1
[NASA-CR-158587] 23 p0549 N79-23508

LEHIGH UNIV., BETHLEHEM, PA.
Development of a modular software system for the dynamic simulation of coal conversion plants
[FE-2338-10] 23 p0553 N79-24176

LEVELTON (B. H.) AND ASSOCIATES LTD., VANCOUVER (BRITISH COLUMBIA).
An evaluation of wood-waste energy conversion systems
21 p0174 N79-10528

LEWIN AND ASSOCIATES, INC., WASHINGTON, D. C.
Enhanced recovery of unconventional gas: The Methodology, volume 3
[HCP/T2705-03] 24 p0721 N79-28654

LIBRARY OF CONGRESS, WASHINGTON, D. C.
The national energy plan: Options under assumptions of national security threat
[H-PRINT-95-48] 21 p0228 N79-15398
The national energy plan: Options under assumptions of national security threat or energy policy as if it really mattered
[H-PRINT-95-42] 21 p0228 N79-15399
US energy demand and supply, 1976-1985: Limited options, unlimited constraints
[H-PRINT-95-43] 21 p0228 N79-15400
United States civilian space programs: An overview
[GPO-35-823] 21 p0232 N79-15815
Energy and the economy: The economic impact of alternative energy supply-demand assumptions
[H-PRINT-95-51] 22 p0333 N79-16352
Research and development needs to merge environmental and energy objectives
[GPO-23-254] 22 p0342 N79-17339

LINCOLN COLL., CANTERBURY (NEW ZEALAND).
Energy analysis
[NP-23145] 21 p0187 N79-11513

LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
Flywheel components for satellite applications
[AD-A060586] 21 p0226 N79-15145
Solar photovoltaic field tests and applications project
23 p0571 N79-25493
Combined photovoltaic and thermal hybrid collector systems
[COO-4577-3] 23 p0583 N79-26525
Design development and implementation of data acquisition systems for photovoltaic tests and applications project
[COO-4094-24] 23 p0596 N79-27672
Photovoltaic-powered irrigation experiments in the United States
[COO-4094-28] 23 p0596 N79-27673
Mead 25 kilowatt photovoltaic system
[COO-4094-19] 23 p0596 N79-27677
Photovoltaic/thermal collectors and heat pumps
[COO-4577-2] 24 p0726 N79-28757
Economics of solar photovoltaic energy systems for crop irrigation in the United States
[COC-4094-29] 24 p0726 N79-28769
Conceptual design of a packed bed for thermal-energy storage
[CAES-10] 24 p0728 N79-28783
Phase-one experiment test plan solar photovoltaic/thermal residential experiment
[COO-4577-6] 24 p0739 N79-29625
Photovoltaic power system field tests
[COO-4094-15] 24 p0739 N79-29627
Solar module curve tracer
[COO-4094-35] 24 p0759 N79-30826
Shallow-homojunction GaAs solar cells
24 p0785 N79-32666
Field tests of photovoltaic power systems
[COC-4094-32] 24 p0788 N79-32700
Microprocessor-controlled autonomous sun-following mount for solar photovoltaic energy planning
[COO-4094-34] 24 p0789 N79-32702

LINCOM CORP., PASADENA, CALIF.
Automatic phase control in solar power satellite systems
[NASA-CR-151856] 21 p0194 N79-12130

LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS.
Recommended performance standards for electric and hybrid vehicles
[SAN-1335-1] 21 p0195 N79-12450
Energy use patterns for metal recycling
[PB-284855/4] 21 p0201 N79-13152
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part B: Analysis of market development, volume 2
[HCP/M70066-01/2] 21 p0207 N79-13513
Assessment of economic factors affecting the satellite power system. Volume 2: The systems implications of rectenna siting issues
[NASA-CR-161186] 22 p0368 N79-21552
Space-based solar power conversion and delivery systems study. Volume 4: Energy conversion systems studies
[NASA-CR-150297] 23 p0541 N79-22620
EPRI Methodology for Preferred Solar Systems (EMPSS) computer program documentation. User's guide
[EPRI-ER-771] 23 p0543 N79-22635
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 1: Executive summary, September 1977
[HCP/M70066-01/1-VOL-1] 23 p0574 N79-25522
Solar Heating and Cooling of Buildings (SHACOB) commercialization report, part B, analysis of market development. Volume 3: Appendices, September 1977
[HCP/M70066-01/3-VOL-3] 23 p0574 N79-25523
Evaluation of automobile drivetrain components to improve fuel economy
[PB-293728/2] 24 p0720 N79-28594
Energy conservation opportunities in appliances using energy storage
[ORNL/SUB-7303/1] 24 p0782 N79-32629
Impact of national energy and environmental policies on industry location dynamics: A methodological review
[DOE/TIC-10129] 24 p0801 N79-33591

LOCKHEED AIRCRAFT SERVICE, INC., ONTARIO, CALIF.
An operating 200 kW horizontal axis wind turbine
22 p0240 A79-20829

LOCKHEED-CALIFORNIA CO., BURBANK.
Fuel conservative subsonic transport
22 p0337 N79-16874
Study of the application of hydrogen fuel to long-range subsonic transport aircraft. Volume 1: Summary
[NASA-CR-132558] 24 p0794 N79-33207

LOCKHEED ELECTRONICS CO., INC., LAS VEGAS, NEV.
Remote monitoring of coal strip mine rehabilitation
[PB-286647/3] 21 p0228 N79-15379

LOCKHEED MISSILES AND SPACE CO., HUNTSVILLE, ALA.
Air pollutant emission factors for military and civil aircraft
[PB-292520/4] 23 p0575 N79-25567

LOCKHEED MISSILES AND SPACE CO., PALO ALTO, CALIF.
Laser aircraft
22 p0284 A79-26597
New energy conversion techniques in space, applicable to propulsion
[AIAA PAPER 79-1338] 23 p0493 A79-40490
Mechanically rechargeable, metal-air batteries for automotive propulsion
[UCRL-81178] 21 p0189 N79-11538
Concentrator enhanced solar arrays design study
[NASA-CR-158032] 21 p0219 N79-14546
Laser power conversion system analysis, volume 1
[NASA-CR-159523-VOL-1] 22 p0366 N79-21334
Laser power conversion system analysis, volume 2
[NASA-CR-159523-VOL-2] 22 p0366 N79-21335
Cadmium sulfide-copper sulfide heterojunction cell research
[SAN-1459-3] 24 p0789 N79-32701

LOCKHEED MISSILES AND SPACE CO., SUNNYVALE, CALIF.
Assessment of SEPS solar array technology for orbital service module application
[NASA-CR-151859] 21 p0194 N79-12136
The 25 kW power module evolution study. Part 3: Conceptual designs for power module evolution. Volume 2: Program plans
[NASA-CR-161146] 22 p0345 N79-17890
Automated array assembly, phase 2. Low-cost solar array project, task 4
[NASA-CR-158365] 22 p0358 N79-20481
OTEC platform configuration and integration study. Volume 3: Project plan
[DOE/ET/4063-1-VOL-3] 24 p0725 N79-28750

LOCKMAN AND ASSOCIATES, MONTEREY PARK, CALIF.
Recovery, processing, and utilization of gas from sanitary landfills
[PB-293165/7] 23 p0576 N79-26235

LOGISTICS MANAGEMENT INST., WASHINGTON, D. C.
International energy evaluation system. Volume 1: Executive summary
[HCP/I8602-01/1] 24 p0742 N79-29662
International energy evaluation system. Volume 2: Technical documentation, September 1, 1978
[HCP/L8602-01/2] 24 p0755 N79-30796
Energy sector capital requirements, 1978-1985
[DOE/EIA-0103/24] 24 p0755 N79-30797

LOS ALAMOS SCIENTIFIC LAB., N. MEX.
Reactor design for nuclear electric propulsion
24 p0693 A79-51931
Research on fission induced plasmas and nuclear pumped lasers at the Los Alamos Scientific Laboratory
24 p0715 A79-54337
Hot dry rock energy project
[LA-UR-77-2744] 21 p0175 N79-10540
Thermochemical production of hydrogen from water
[LA-UR-78-652] 21 p0180 N79-11236
Augmented solar energy collection using various planar reflective surfaces: Theoretical calculations and experimental results
[LA-7041] 21 p0185 N79-11494
Thermal stress cracking and the enhancement of heat extraction from fractured geothermal reservoirs
[LA-7235-MS] 21 p0198 N79-12568
Verification methodology for the DOE-1 building energy analysis computer program
[LA-UR-78-1493] 21 p0208 N79-13520
Component-based simulator for solar systems
[LA-UR-78-1494] 21 p0208 N79-13521
Gaseous fuel reactors for power systems
[LA-UR-78-1437] 21 p0214 N79-13844
Trace element characterization and removal/recovery from coal and coal wastes
[LA-7048-PR] 21 p0222 N79-14602
Environmental and radiological safety studies. Interaction of (Pu-238)O2 heat sources with terrestrial and aquatic environments
[LA-7033-PR] 21 p0232 N79-15783
Toward assessing the geothermal potential of the Jemez Mountains volcanic complex: A telluric-magnetotelluric survey
[LA-7656-MS] 22 p0358 N79-20458
Treatment of molybdenite ore using a 2 kW solar furnace
[LA-UR-79-6] 23 p0561 N79-24478
Trombe wall vs direct gain: A comparative analysis of passive solar heating systems
[LA-UR-116] 24 p0725 N79-28754
Applications of DOE-1 to passive solar heating of commercial buildings: Preliminary results
[LA-UR-79-72] 24 p0725 N79-28755
Performance and cost of a hybrid passive/active solar house
[LA-UR-78-2209] 24 p0725 N79-28756
Electricity from hot dry rock geothermal energy: Technical and economic issues
[LA-7603-MS] 24 p0727 N79-28773
Data acquisition for the hot dry rock geothermal energy project
[LA-UR-79-812] 24 p0728 N79-28784
Solar heating and cooling results for the Los Alamos study center
[LA-UR-78-2588] 24 p0729 N79-28790
Trombe walls and direct gain: Patterns of nationwide applicability
[LA-UR-79-239] 24 p0739 N79-29634

Non-electrical uses of thermal energy generated in the production of fissile fuel in fusion-fission reactors: A comparative economic parametric analysis for hybrid with or without synthetic fuel production
[LA-UR-79-574] 24 p0742 N79-29666
Comparative economics of passive and active systems
[LA-UR-78-1878] 24 p0754 N79-30782
Economic performance: Evaluations for solar energy
[LA-UR-79-901] 24 p0759 N79-30828
Rocky mountain coal for southern California's coal-fired electric power generation
[LA-6915-MS] 24 p0769 N79-31745
Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801
Thermoelastic analysis of a superconducting cable
[LA-7465-MS] 24 p0781 N79-32477
Energy losses in a flat transposed cable
[LA-7635-MS] 24 p0781 N79-32481
Ceramic heat pipes for high temperature heat removal
[LA-UR-79-332] 24 p0781 N79-32518
Energy extraction operations: Some preliminary results
[LA-UR-79-679] 24 p0786 N79-32678
The future of hot dry rock geothermal energy systems
[LA-UR-79-683] 24 p0786 N79-32679
Federal hot dry rock geothermal energy development program: An overview
[LA-UR-79-670] 24 p0787 N79-32690
Potential prediction needs in support of energy systems
[LA-UR-79-673] 24 p0788 N79-32698
Status review of the technology assessment of solar energy program
[LA-UR-79-1369] 24 p0790 N79-32714
Small-scale solar simulator for indoor testing of collector modules and materials
[LA-UR-79-1335] 24 p0790 N79-32716
MHD deceleration of fusion reaction products
[LA-7778-MS] 24 p0804 N79-34044

LOUISIANA STATE UNIV., BATON ROUGE.
Preliminary long-term stability criteria for compressed air energy storage caverns in salt domes
[PNL-2871] 23 p0562 N79-24487

LOUISIANA STATE UNIV. AND AGR COLL., BATON ROUGE.
Combustion kinetics of selected aromatic hydrocarbons
[AD-A059381] 21 p0215 N79-14184

LUNAR AND PLANETARY INST., HOUSTON, TEX.
Commercial prospects for extraterrestrial materials
23 p0395 A79-33748
Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360

M

MAGNETIC CORP. OF AMERICA, WALTHAM, MASS.
Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator
21 p0084 A79-15305

MAIN (CHARLES T.), INC., BOSTON, MASS.
Underground hydroelectric pumped storage: An evaluation of the concept
[TID-29412] 24 p0742 N79-29664

MARKET FACTS, INC., WASHINGTON, D. C.
Shale oil: Focus group results
[DOE/TIC-10019] 23 p0593 N79-27644
High-efficiency electric motors: Focus group results
[DOE/TIC-10005] 24 p0719 N79-28441
Enhance oil recovery: Focus group results
[DOE/TIC-100200] 24 p0735 N79-29578
Large wind energy focus group results
[DOE/TIC-10038] 24 p0738 N79-29623
Low head hydropower: Focus group results
[DOE/TIC-10017] 24 p0740 N79-29645
Electric hybrid vehicles focus group research
[DOE/TIC-10009] 24 p0745 N79-30107
Small wind energy: Focus group results
[DOE/TIC-10018] 24 p0752 N79-30771
Passive solar energy focus group results
[DOE/TIC-10016] 24 p0774 N79-31807

MARQUETTE UNIV., MILWAUKEE, WIS.
Thermodynamic-economic analysis of the synthane process
[COO-4589-1] 24 p0779 N79-32379

MARTIN MARIETTA AEROSPACE, DENVER, COLO.
A 10-kilowatt photovoltaic concentrator array
[SAND-78-7024] 23 p0598 N79-27699

MARTIN MARIETTA LABS., BALTIMORE, MD.
Biological solar energy conversion approaches to overcome yield stability and product limitations
[PB-284823/2] 21 p0199 N79-12577
Biological solar energy conversion: Approaches to overcome yield, stability and product limitations
[PB-286487/4] 21 p0230 N79-15422

MARYLAND STATE DEPT. OF LEGISLATIVE REFERENCE, ANNAPOLIS.
The energy dilemma: A challenge for Maryland. Proceedings Maryland General Assembly/AISLE Conference
[PB-284703/6] 21 p0199 N79-12579

MARYLAND UNIV., COLLEGE PARK.
Solar energy pilot study
[PB-289380/8] 22 p0363 N79-20525
Report of the 4th CCMS (Committee on the Challenges of Modern Society) Solar Energy Pilot Study Meeting
[PB-289492/1] 22 p0372 N79-21631
Analysis of flat mirror V-trough solar concentrator
23 p0579 N79-26472
Cooperative extension service: Energy resource notes
24 p0745 N79-30394

MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
Alternative aircraft fuels
21 p0033 A79-10824
Electromagnetic propulsion alternatives
[AIAA PAPER 79-1400] 23 p0426 A79-34840
Energy budget of the volcano Stromboli, Italy
24 p0639 A79-47360
An assessment of thermal energy storage and waste heat dissipation with total energy systems for MIT
[AD-A059061] 21 p0205 N79-13502
Present status of GaAs
[NASA-CR-3093] 21 p0215 N79-14192
The economics and engineering of large-scale algae biomass energy systems
[PB-287868/4] 21 p0226 N79-15207
Combustion research on the fate of fuel-nitrogen under conditions of pulverized coal combustion
[PB-286208/4] 21 p0232 N79-15474
Critical contributions in MHD power generation
[FE-2215-11] 22 p0362 N79-20511
Microcrack technology for geothermal exploration and assessment
[PB-290173/4] 22 p0367 N79-21530
Planning and analysis for development of photovoltaic energy conversion systems
23 p0570 N79-25487
Estimation methodology for energy supply from natural resources
[EPRI-EA-788] 24 p0718 N79-28355
Magnetohydrodynamics
24 p0724 N79-28741
Thermionic conversion
24 p0724 N79-28742

MASSACHUSETTS UNIV., AMHERST.
Energy analyses applied to ocean thermal energy conversion and an offshore wind power system
22 p0353 N79-19442
Two-dimensional analysis of vertical axis windmills
22 p0353 N79-19446

MATERIALS RESEARCH, INC., CENTERVILLE, UTAH.
Quantitative analysis of defects in silicon
[NASA-CR-162173] 24 p0771 N79-31772

MATHEMATICA, INC., PRINCETON, N. J.
Coal liquefaction: Report on a focus group discussion
[DOE/TIC-10039] 23 p0589 N79-27339
Oil shale: Report on a focus group discussion
[DOE/TIC-10032] 24 p0735 N79-29576
Enhanced oil recovery: Report on a focus group discussion
[DOE/TIC-10021] 24 p0735 N79-29577

Energy from urban wastes: Report on a focus group discussion
[DOE/TIC-10022] 24 p0759 N79-30825
MATHEMATICAL SCIENCES NORTHWEST, INC., BELLEVUE, WASH.
Design investigation of solar powered lasers for space applications
[NASA-CR-159554] 23 p0578 N79-26384
MATHEMATICAL SCIENCES NORTHWEST, INC., SEATTLE, WASH.
Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202
MATHTECH, INC., PRINCETON, N. J.
Impact of electric passenger automobiles on utility system loads, 1985 - 2000
[EPRI-EA-623] 21 p0203 N79-13281
MAXWELL LABS., INC., WOBURN, MASS.
Magnetohydrodynamic lightweight channel development
[AD-A060429] 21 p0230 N79-15414
High power magnetohydrodynamic system, volume 1
[AD-A064796] 23 p0543 N79-22639
High power magnetohydrodynamic system, volume 2
[AD-A064435] 23 p0544 N79-22640
MCDONNELL AIRCRAFT CO., ST. LOUIS, MO.
Giromill wind tunnel test and analysis, volume 2. Technical discussion
[COO-2617-4/2] 21 p0204 N79-13378
MCDONNELL-DOUGLAS ASTRONAUTICS CO., HUNTINGTON BEACH, CALIF.
The 100 kW space station
22 p0371 N79-21603
Central receiver thermal power system
[AED-CONF-78-212-008] 23 p0582 N79-26513
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 1: Executive summary
[NASA-CR-162372] 24 p0799 N79-33576
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 2: System concept selection
[NASA-CR-162373] 24 p0799 N79-33577
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 3: Experimental system descriptions
[NASA-CR-162374] 24 p0799 N79-33578
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 4: Commercial system definition
[NASA-CR-162375] 24 p0799 N79-33579
Phase 1 of the first small power system experiment (engineering experiment no. 1). Volume 5: Supporting analyses and trade studies
[NASA-CR-162376] 24 p0800 N79-33580
MCDONNELL-DOUGLAS CORP., HUNTINGTON BEACH, CALIF.
A power extension package /PEP/ for the Shuttle Orbiter
24 p0691 A79-51897
MECHANICAL TECHNOLOGY, INC., LATHAM, N. Y.
Foil type bearings for the Chrysler Automotive Gas Turbine Engine Program - Development and operational experiences
[SAE PAPER 790109] 22 p0314 A79-31356
Power generation with binary cycles
24 p0724 N79-28740
Conceptual design study of an automotive Stirling reference engine system
[NASA-CR-159605] 24 p0730 N79-29110
Demonstration of a free piston Stirling engine driven linear alternator system
[COO-2764-002] 24 p0790 N79-32713
MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., OTTOBRUNN (WEST GERMANY).
A European low-cost solution for Spacelab Power augmentation
24 p0751 N79-30745
INTELSAT 5 solar array
24 p0752 N79-30757
Development of a prototype 10kW solar power plant
[BMFT-FB-T-78-33] 24 p0792 N79-32730
METAL PROPERTIES COUNCIL, INC., NEW YORK.
Program to discover materials suitable for service under hostile conditions obtaining in materials for the gasification of coal and other solid fuels
[FE-1784-39] 24 p0719 N79-28364
MIAMI UNIV., CORAL GABLES, FLA.
Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189
Determination of potential solar power sites in the United States based upon satellite cloud observations
[NASA-CR-159944] 24 p0749 N79-30712
MICHIGAN STATE UNIV., EAST LANSING.
Identification of wood energy resources in central Michigan
[NASA-CR-158130] 22 p0347 N79-18424
Small low-head hydroelectric power
[IDO-10076] 24 p0738 N79-29617
A general purpose electroanalytical system based on a microcomputer controlled coulostatic generator
24 p0744 N79-29798
MICHIGAN UNIV., ANN ARBOR.
Heat flow and radiogenic heat production in Brazil with implications for thermal evolution of continents
22 p0373 N79-21689
Extraterrestrial fiberglass production using solar energy
24 p0778 N79-32237
Physical properties and stability of water in fuel oil emulsions
[PB-296146/4] 24 p0796 N79-33348
MIDLAND-ROSS CORP., TOLEDO, OHIO.
Recuperative system for high and ultra-high temperature flue gases
[IDO-1672-2] 24 p0741 N79-29649
MIDWEST RESEARCH INST., GOLDEN, COLO.
Densified biomass: A new form of solid fuel
[SERI-35] 23 p0553 N79-24180
Photovoltaic research and development status
23 p0571 N79-25495
Storage systems analysis
[SERI/PR-35-101] 23 p0599 N79-27705
Review of selected solar market studies and techniques
[SERI/PR-52-076] 23 p0600 N79-28056
Process designs and cost estimates for a medium Btu gasification plant using a wood feedstock
[SERI/TR-33-151] 24 p0766 N79-31413
Photobiological production of hydrogen: A solar energy conversion option
[SERI/TR-33-122] 24 p0767 N79-31422
Implementation of state solar incentives: Research, Development, and demonstration programs
[SERI/TR-51-161] 24 p0773 N79-31799
Role of education and training programs in the commercialization and diffusion of solar energy technologies
[SERI/RR-53-128] 24 p0773 N79-31800
Classification scheme for the common passive and hybrid heating and cooling systems
[LBL-8814] 24 p0774 N79-31805
Implementation of state solar incentives: State testing and certification
[SERI/TR-51-162] 24 p0774 N79-31808
Generator gas: The Swedish experience from 1939-1945
[SERI/SP-33-140] 24 p0775 N79-31816
Review of current research on hydrocarbon production by plants
[SERI/TR-33-129] 24 p0779 N79-32374
Solar thermal test facilities users association
[SERI/PR-13-154] 24 p0787 N79-32688
Solar Repowering Workshop
[SERI/TP-35-57] 24 p0787 N79-32689
MIDWEST RESEARCH INST., KANSAS CITY, MO.
Solar Heating And Cooling Of Buildings (SHACOB) commercialization report. Part A: Options and strategies. Volume 1: Executive summary
[HCP/M70065-01/1] 21 p0207 N79-13512
MINERAL ECONOMICS CONSULTANTS, INC., SWARTHMORE, PA.
Energy requirements of the US pulp and paper industry
[ANL/EES/TM-42] 24 p0800 N79-33587
MINIBUS FOREST, INC., MONTREAL (QUEBEC).
Modification and evaluation of a small station wagon designed for transportation of the handicapped
[PB-295106/9] 24 p0763 N79-31107
MINNESOTA ENERGY AGENCY, ST. PAUL.
Minnesota coal study
[PB-292106/2] 23 p0575 N79-25538

MINNESOTA LEGISLATURE SCIENCE AND TECHNOLOGY PROJECT, ST. PAUL.
Parameters for legislative consideration of bioconversion technologies
[PB-284742/4] 21 p0194 N79-12250
MINNESOTA UNIV., MINNEAPOLIS.
Biomass utilization in Minnesota
[PB-282531/3] 21 p0171 N79-10241
Hospital ventilation standards and energy conservation: A summary of the literature with conclusions and recommendations
[LBL-8316] 24 p0767 N79-31436
MISSISSIPPI STATE UNIV., MISSISSIPPI STATE.
Application of remote sensing to state and regional problems
[E79-10196] 23 p0569 N79-25446
MISSOURI DEPT OF NATURAL RESOURCES, JEFFERSON CITY.
LPG in Missouri
[PB-286329/8] 21 p0230 N79-15421
MITEC G.M.B.H., OTTOBRUNN (WEST GERMANY).
The use of the heat pumps to raise temperatures in an economical and ecological way
[BMFT-FB-T-78-35] 24 p0792 N79-32732
MITRE CORP., MCLEAN, VA.
System for projecting the utilization of renewable resources. SPURR methodology
[ERHQ/2322-77/4] 21 p0174 N79-10538
An assessment of mercury emissions from fossil fueled power plants
[PB-285227/5] 21 p0213 N79-13592
Lead-acid battery: An evaluation of commercialization strategies
[MTR-7593] 21 p0220 N79-14565
National environmental impact projection no. 1
[HCP/P-6119] 24 p0777 N79-31844
MOBIL RESEARCH AND DEVELOPMENT CORP., PAULSBORO, N. J.
Fluid bed process studies on selective conversion of methanol to high octane gasoline
[FE-2490-15] 23 p0555 N79-24190
MOBIL TYCO SOLAR ENERGY CORP., WALTHAM, MASS.
Large area silicon sheet by EFG
21 p0123 A79-17340
Multiple silicon ribbon growth by EFG
23 p0502 A79-40939
Response of defects to illumination in silicon solar cells
23 p0521 A79-41084
Large area silicon sheet by EFG
[NASA-CR-158379] 22 p0359 N79-20483
MONSANTO RESEARCH CORP., DAYTON, OHIO.
Particulate control mobile test units: Third year's operation
[PB-283657/5] 21 p0178 N79-10603
Source assessment: Water pollutants from coal storage areas
[PB-285420/6] 21 p0223 N79-14635
Energy requirements of present pollution control technology
[PB-286231/6] 21 p0223 N79-14643
Source assessment: Open mining of coal. State of the Art
[PB-288497/1] 22 p0353 N79-19429
Analysis of the emissions from storage tanks during JP-4 fuel transfer operations. Phase 1: Warm weather conditions
[AD-A069339] 24 p0732 N79-29364
Reclamation of synthetic turbine engine oil mixtures
[AD-A071813] 24 p0795 N79-33211
MONTANA ENERGY AND MHD RESEARCH AND DEVELOPMENT INST., INC., BUTTE.
MHD power generation: Research, development and engineering
[FE-2524-8] 22 p0363 N79-20517
MHD power generation: Research, development and engineering
[FE-3087-2] 22 p0363 N79-20518
MOTOROLA, INC., PHOENIX, ARIZ.
Silicon solar cells, a manufacturing cost analysis
23 p0501 A79-40920
The Pd2Si - /Pd/ - Ni - solder plated metallization system for silicon solar cells
23 p0506 A79-40979
A low cost, durable anti-reflective film for solar collectors
23 p0507 A79-40983
Phase 1 of the automated array assembly task of the low cost silicon solar array project
[NASA-CR-158120] 22 p0348 N79-18451
Metallization of large silicon wafers
[NASA-CR-158575] 23 p0550 N79-23517
The establishment of a production-ready manufacturing process utilizing thin silicon substrates for solar cells
[NASA-CR-158566] 23 p0550 N79-23523
The development of a method of producing etch resistant wax patterns on solar cells
[NASA-CR-158563] 23 p0550 N79-23527
Semiconductor grade, solar silicon purification project
[NASA-CR-158868] 24 p0736 N79-29598
MOUND LAB., MIAMISBURG, OHIO.
Chemical and optical studies of heat transfer fluids containing solar energy absorbers
[MLM-2549(OP)] 23 p0564 N79-24505
Evaluation of a large nonconvective solar pond
[MLM-2606(OP)] 24 p0786 N79-32680
MUELLER ASSOCIATES, INC., BALTIMORE, MD.
Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183
Denaturants for ethanol/gasoline blends
[HCP/M2098-01] 21 p0180 N79-11237
Status of alcohol fuels utilization technology for highway transportation
[HCP/M2923-01] 21 p0201 N79-13190
Solar project cost report
[SOLAR/2018-78/60] 24 p0728 N79-28788
MUNICIPAL ENVIRONMENTAL RESEARCH LAB., CINCINNATI, OHIO.
Total energy consumption for municipal wastewater treatment
[PB-286688/7] 21 p0231 N79-15439

N

NAGOYA UNIV. (JAPAN).
Trends of plasma physics and nuclear fusion research life cycle and research effort curve
[IPPJ-396] 24 p0730 N79-29051
NALCO ENVIRONMENTAL SCIENCES, NORTHBROOK, ILL.
Atlas of western surface-mined lands: Coal, uranium, and phosphate
[PB-287846/0] 22 p0340 N79-17311
NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
Methane generation from human, animal, and agricultural wastes
[PB-276469/4] 21 p0171 N79-10240
Strategies for applied research management
[PB-284741/6] 21 p0214 N79-13913
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
Satellite power systems /SPS/ overview
21 p0002 A79-10022
NASA's thermionic technology program
21 p0026 A79-10217
Evolution of space power systems
[IAF PAPER 78-43] 21 p0035 A79-11218
High efficiency low cost solar cell power
21 p0048 A79-12471
Technology for aircraft energy efficiency
21 p0066 A79-14136
Space power for space
21 p0100 A79-16143
Overview of future programs - USA
21 p0116 A79-17275
Space solar power - An energy alternative
22 p0303 A79-29796
The NASA Aircraft Energy Efficiency program
22 p0325 A79-31912
NASA takes stock
23 p0461 A79-38375
Applications of free-space microwave power transmission
24 p0652 A79-49487
The NASA Space Power Technology Program
24 p0691 A79-51894
Orbital demonstration - The prelude to large operational structures in space
[IAF PAPER 79-207] 24 p0710 A79-53357
OAST space power technology program
21 p0169 N79-10123

Satellite power systems program
21 p0169 N79-10128

Program THEK energy production units of average power and using thermal conversion of solar radiation
[NASA-TM-75369] 21 p0183 N79-11474

The stirling engine for vehicle propulsion
[NASA-TM-75442] 21 p0195 N79-12547

Statement of Doctor Robert A. Frosch, Administrator, National Aeronautics and Space Administration
21 p0224 N79-15111

Hydrogen technology from thermonuclear research
22 p0338 N79-16997

NACA research on hydrogen for high altitude aircraft
22 p0338 N79-16999

New initiatives in high altitude aircraft
22 p0338 N79-17000

Dependence of the pour point of diesel fuels on the properties of the initial components
[NASA-TM-75424] 22 p0364 N79-21217

Satellite power system: Concept development and evaluation program, reference system report
[DOE/ER-0023] 22 p0367 N79-21538

NASA's OAST program: An overview
22 p0370 N79-21574

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 1: Executive summary
[NASA-TM-80354] 23 p0557 N79-24435

Preliminary environmental assessment for the Satellite Power System (SPS). Volume 2: Detailed assessment
[NASA-TM-80355] 23 p0557 N79-24436

Solar technology in the Federal Republic of Germany
[NASA-TM-75634] 23 p0558 N79-24439

Future thrusts of the NASA space power program
24 p0722 N79-28670

Spinoff 1979
[NASA-TM-80481] 24 p0730 N79-29108

The NASA space power technology program
24 p0751 N79-30746

Supersonic transport vis-a-vis energy savings
[NASA-TM-75464] 24 p0763 N79-31163

Investigation of a generator system for generating electrical power, to supply directly to the public network, using a windmill
[NASA-TM-75497] 24 p0771 N79-31779

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. AMES RESEARCH CENTER, MOFFETT FIELD, CALIF.

Enhanced solar energy options using earth-orbiting mirrors
21 p0019 A79-10162

Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398

Orbiting mirrors for terrestrial energy supply
21 p0108 A79-16605

A search for space energy alternatives
21 p0108 A79-16608

Systems efficiency and specific mass estimates for direct and indirect solar-pumped closed-cycle high-energy lasers in space
21 p0110 A79-16623

Status and summary of laser energy conversion
21 p0111 A79-16635

Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581

Some perspectives on research into the biological response to non-ionizing electromagnetic radiation
22 p0271 A79-24879

Space reflector technology and its system implications
[AIAA PAPER 79-0545] 22 p0273 A79-25852

Radiation energy conversion in space
22 p0284 A79-26595

SOLARES - A new hope for solar energy
23 p0399 A79-33992

Nonlinear dynamic response of wind turbine rotors
[NASA-TM-78324] 21 p0195 N79-12542

Transient shutdown analysis of low-temperature thermal diodes
[NASA-TP-1369] 22 p0346 N79-18287

Introductory assessment of orbiting reflections for terrestrial power generation
[NASA-TM-73230] 23 p0541 N79-22615

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. FLIGHT RESEARCH CENTER, EDWARDS, CALIF.

Reductions in vehicle fuel consumption due to refinements in aerodynamic design
24 p0658 A79-50335

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.

Energy and remote sensing applications
22 p0255 A79-22516

Synchronous orbit power technology needs
[AIAA 79-0916] 23 p0425 A79-34739

Solar spectral irradiance at ground level
23 p0429 A79-35053

Study on the application of NASA energy management techniques for control of a terrestrial solar water heating system
[AIAA PAPER 79-0977] 23 p0457 A79-38183

Battery workshop
21 p0170 N79-10143

The natural and perturbed troposphere
21 p0179 N79-10636

Changes in the terrestrial atmosphere-ionosphere-magnetosphere system due to ion propulsion for solar power satellite placement
[NASA-TM-79719] 22 p0345 N79-17897

Baltimore applications project
[NASA-TM-79667] 22 p0351 N79-18815

Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447

The 1977 Goddard Space Flight Center Battery Workshop
[NASA-CP-2041] 22 p0370 N79-21565

Synchronous meteorological and geostationary operational environmental satellites battery and power system design
22 p0370 N79-21571

Accelerated test program
22 p0370 N79-21577

Cell design and manufacturing changes during the past decade
24 p0722 N79-28674

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEX.

Environmental considerations for the microwave beam from a solar power satellite
21 p0003 A79-10030

A technology program for large area space systems
21 p0100 A79-16145

The solar power satellite concept evaluation program
21 p0107 A79-16602

Design considerations for solar power satellites
21 p0113 A79-16738

The solar power satellite concept - The past decade and the next decade
[AIAA PAPER 79-0534] 22 p0273 A79-25854

Solar power satellite
22 p0287 A79-27375

The Solar Power Satellite concept - Towards the future
22 p0327 A79-31925

Heat rejection development requirements for orbital power systems
24 p0692 A79-51924

Microwave system performance for a solar power satellite during startup/shutdown operations
24 p0694 A79-51944

Technology status: Fuel cells and electrolysis cells
21 p0170 N79-10133

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. JOHN F. KENNEDY SPACE CENTER, COCOA BEACH, FLA.

Identification of cost effective energy conservation measures
21 p0099 A79-16133

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, HAMPTON, VA.

Detection of internal defects in a liquid natural gas tank by use of infrared thermography
21 p0048 A79-12507

Alternate aircraft fuels prospects and operational implications
21 p0066 A79-14138

A technology program for large area space systems
21 p0100 A79-16145

Recent advances in convectively cooled engine and airframe structures for hypersonic flight 21 p0165 A79-20087

Investigation of a staged plasma-focus apparatus 22 p0255 A79-22365

Advanced air transport concepts 22 p0312 A79-31121

Summary results from the NASA Tech House one year live-in [AIAA PAPER 79-0587] 23 p0475 A79-38892

Characterization of a swept-strut hydrogen fuel-injector for scramjet applications 24 p0649 A79-49345

Annealing kinetics of electron-irradiated GaAs heteroface solar cells in the range 175-200 C 24 p0668 A79-51008

Comparison of alternate fuels for aircraft 24 p0668 A79-51100

Future large space systems opportunities: A case for space-to-space power? 21 p0169 N79-10095

Elemental characteristics of aerosols emitted from a coal-fired heating plant [NASA-TM-78749] 21 p0191 N79-11560

OAST Space Theme Workshop. Volume 1: Summary report. 1: Introduction. 2: General observations and some key findings. 3: Follow-on activity. Quick-look comments and working papers [NASA-TM-80001] 21 p0224 N79-15113

OAST Space Theme Workshop. Volume 2: Theme summary. 1: Space power (no. 7). A. Theme statement. B. 26 April 1976 presentation. C. Summary. D. Initiative action [NASA-TM-80002] 21 p0225 N79-15114

OAST Space Theme Workshop. Volume 3: Working group summary. 6: Power (P-2). A. Statement. B. Technology needs (form 1). C. Priority assessment (form 2) [NASA-TM-80013] 21 p0225 N79-15125

General aviation energy-conservation research programs 22 p0329 N79-15963

Engine requirements for future general aviation aircraft 22 p0329 N79-15968

A cooling system for an aircraft having a cruise range from Mach 2 to Mach 8 [NASA-CASE-LAR-12406-1] 23 p0568 N79-24980

Technology requirements and readiness for very large vehicles [NASA-TM-80127] 23 p0587 N79-27086

Solar engine [NASA-CASE-LAR-12148-1] 24 p0737 N79-29608

Remote monitoring of the Gravelly Run thermal plume at Hopewell and the thermal plume at the Surry Nuclear Power Plant on the James River [NASA-TM-80124] 24 p0777 N79-31839

Comparison of alternate fuels for aircraft [NASA-TM-80155] 24 p0782 N79-32637

Langley program of GaAs solar cells 24 p0783 N79-32644

Radiation damage in GaAs solar cells 24 p0785 N79-32663

NASA Tech House: An early evaluation [NASA-TM-80751] 24 p0798 N79-33571

Measurement techniques for trace metals in coal-plant effluents: A brief review [NASA-RP-1047] 24 p0803 N79-33611

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LEWIS RESEARCH CENTER, CLEVELAND, OHIO.

Status of wraparound contact solar cells and arrays 21 p0001 A79-10014

Rapid, efficient charging of lead-acid and nickel-zinc traction cells 21 p0009 A79-10084

Response of lead-acid batteries to chopper-controlled discharge 21 p0011 A79-10097

Thermal energy storage for industrial waste heat recovery 21 p0012 A79-10101

Storage systems for solar thermal power 21 p0013 A79-10108

Lithium and potassium heat pipes for thermionic converters 21 p0013 A79-10113

Design and operating experience on the U.S. Department of Energy Experimental Mod-0 100 kW Wind Turbine 21 p0028 A79-10234

DOE/NASA Mod-0A wind turbine performance 21 p0028 A79-10235

SIMWEST - A simulation model for wind energy storage systems 21 p0029 A79-10241

Alternative aircraft fuels 21 p0033 A79-10824

Effect of inlet temperature on the performance of a catalytic reactor 21 p0035 A79-11542

An improved method for analysis of hydroxide and carbonate in alkaline electrolytes containing zinc 21 p0035 A79-11546

Characteristics and combustion of future hydrocarbon fuels 21 p0036 A79-11599

Impact of future fuel properties on aircraft engines and fuel systems 21 p0036 A79-11600

Factors affecting the open-circuit voltage and electrode kinetics of some iron/titanium/redox flow cells 21 p0040 A79-11824

Alternative aviation turbine fuels 21 p0047 A79-12378

Ceramics for the advanced automotive gas turbine engine - A look at a single shaft design 21 p0050 A79-12850

Ceramic applications in the advanced Stirling automotive engine 21 p0051 A79-12851

Diminiode thermionic energy conversion with lanthanum-hexaboride electrodes 21 p0053 A79-13098

NASA Lewis Research Center photovoltaic application experiments [AIAA PAPER 78-1768] 21 p0061 A79-13867

Fuel cell on-site integrated energy system parametric analysis of a residential complex 21 p0081 A79-14947

Correlations of catalytic combustor performance parameters 21 p0081 A79-14956

Design study of superconducting magnets for a combustion magnetohydrodynamic /MHD/ generator 21 p0084 A79-15305

Control of wind turbine generators connected to power systems 21 p0086 A79-15574

Large wind turbine generators 21 p0092 A79-15881

Fuel conservative aircraft engine technology 21 p0164 A79-20078

Energy conservation through sealing technology 22 p0237 A79-20700

Wind-turbine-generator rotor-blade concepts with low-cost potential 22 p0240 A79-20828

An operating 200 kW horizontal axis wind turbine 22 p0240 A79-20829

Thermal storage for industrial process and reject heat 22 p0243 A79-21300

Microprocessor control of a wind turbine generator 22 p0244 A79-21302

Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels 22 p0274 A79-25917

Photovoltaic power systems for rural areas of developing countries 22 p0278 A79-26131

Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows 22 p0279 A79-26184

Burn coal cleanly in a fluidized bed - The key is in the controls 22 p0282 A79-26374

Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines [AIAA 79-0733] 22 p0298 A79-29007

Effect of broadened-specification fuels on aircraft engines and fuel systems
[AIAA 79-7008] 22 p0300 A79-29383
Benefits of solar/fossil hybrid gas turbine systems
[ASME PAPER 79-GT-38] 22 p0309 A79-30554
High-freezing-point fuels used for aviation turbine engines
[ASME PAPER 79-GT-141] 22 p0309 A79-30555
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[SAE PAPER 790327] 22 p0315 A79-31368
Large space system - Charged particle environment interaction technology
[AIAA 79-0913] 23 p0425 A79-34775
Redox flow cell energy storage systems
[AIAA PAPER 79-0989] 23 p0458 A79-38191
Analysis of a fuel cell on-site integrated energy system for a residential complex
[AIAA PAPER 79-0990] 23 p0458 A79-38192
Wind turbines for electric utilities - Development status and economics
[AIAA PAPER 79-0965] 23 p0475 A79-38888
NASCAP modelling of high-voltage power system interactions with space charged-particle environments
23 p0479 A79-39806
Preliminary results in the NASA Lewis H2-O2 combustion MHD experiment
23 p0479 A79-39807
Ultraviolet irradiation at elevated temperatures and thermal cycling in vacuum of FEP-A covered silicon solar cells
23 p0498 A79-40898
Endurance testing of first generation /Block I/ commercial solar cell modules
23 p0512 A79-41022
Variation of solar cell sensitivity and solar radiation on tilted surfaces
23 p0512 A79-41023
An inverter/controller subsystem optimized for photovoltaic applications
23 p0516 A79-41047
Design and fabrication of a photovoltaic power system for the Papago Indian Village of Schuchuli /Gunsight/, Arizona
23 p0521 A79-41089
Description and status of NASA-LeRC/DOE photovoltaic applications systems experiments
23 p0521 A79-41091
Photon-degradation effects in terrestrial silicon solar cells
23 p0529 A79-42545
Energy and cost savings results for advanced technology systems from the Cogeneration Technology Alternatives Study /CTAS/
[AIAA PAPER 79-1000] 24 p0601 A79-44225
Large horizontal axis wind turbine development
24 p0633 A79-46527
Utility operational experience on the NASA/DOE Mod-OA 200 kW Wind Turbine
24 p0634 A79-46537
Lewis Research Center studies of multiple large wind turbine generators on a utility network
24 p0635 A79-46547
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651
Energy efficient aircraft engines
[AIAA PAPER 79-1861] 24 p0643 A79-47918
Fundamental mechanisms that influence the estimate of heat transfer to gas turbine blades
24 p0653 A79-49526
Reduction of particulate carryover from a pressurized fluidized bed
24 p0653 A79-49527
Commercial phosphoric acid fuel cell system technology development
24 p0681 A79-51809
The role of fuel cells in NASA's space power systems
24 p0681 A79-51810
Recent advances in Redox flow cell storage systems
24 p0684 A79-51837
Results from Symposium on Future Orbital Power Systems Technology Requirements
24 p0690 A79-51891
Performance optimization of an MHD generator with physical constraints
24 p0701 A79-51995
Evaluation of models to predict insolation on tilted surfaces
24 p0712 A79-53491
Future Orbital Power Systems Technology Requirements
[NASA-CP-2058] 21 p0169 N79-10122
Alternative power-generation systems
21 p0169 N79-10129
Technology status: Batteries and fuel cells
21 p0170 N79-10132
Power management and control for space systems
21 p0170 N79-10134
An economical approach to space power systems
21 p0170 N79-10139
Solar cells having integral collector grids
[NASA-CASE-LEW-12819-1] 21 p0182 N79-11467
Solar cell collector and method for producing same
[NASA-CASE-LEW-12552-2] 21 p0182 N79-11472
Optimum dry-cooling sub-systems for a solar air conditioner
[NASA-TM-79007] 21 p0183 N79-11477
Preliminary summary of the ETF conceptual studies
[NASA-TM-78999] 21 p0183 N79-11478
Supply of reactants for Redox bulk energy storage systems
[NASA-TM-78995] 21 p0183 N79-11479
Thermal storage for industrial process and reject heat
[NASA-TM-78994] 21 p0183 N79-11481
Fuel cell on-site integrated energy system parametric analysis of a residential complex
[NASA-TM-78996] 21 p0193 N79-11955
NASA research on general aviation power plants
[NASA-TM-79031] 21 p0194 N79-12086
Microprocessor control of a wind turbine generator
[NASA-TM-79021] 21 p0195 N79-12548
Characteristics and combustion of future hydrocarbon fuels
21 p0202 N79-13196
Impact of future fuel properties on aircraft engines and fuel systems
21 p0202 N79-13197
Application of multispectral scanner data to the study of an abandoned surface coal mine
[NASA-TM-78912] 21 p0204 N79-13472
Effect of swirler-mounted mixing venturi on emissions of flame-tube combustor using jet A fuel
[NASA-TP-1393] 21 p0215 N79-14099
Back wall solar cell
[NASA-CASE-LEW-12236-2] 21 p0217 N79-14528
Some heat transfer and hydrodynamic problems associated with superconducting cables (SPTL)
[NASA-TM-79023] 21 p0226 N79-15267
Comparison of fuel-cell and diesel integrated energy systems and a conventional system for a 500-unit apartment
[NASA-TM-79037] 21 p0229 N79-15403
Benefits of solar/fossil hybrid gas turbine systems
[NASA-TM-79083] 21 p0229 N79-15410
Photovoltaic power systems for rural areas of developing countries
[NASA-TM-79097] 21 p0229 N79-15411
The rotary combustion engine: A candidate for general aviation
[NASA-CP-2067] 22 p0329 N79-15961
Effect of broadened-specification fuels on aircraft engines and fuel systems
[NASA-TM-79086] 22 p0330 N79-16136
Power train analysis for the DOE/NASA 100-kW wind turbine generator
[NASA-TM-78997] 22 p0333 N79-16355
An operating 200-kW horizontal axis wind turbine
[NASA-TM-79034] 22 p0333 N79-16357
Initial comparison of single cylinder Stirling engine computer model predictions with test results
[NASA-TM-79044] 22 p0337 N79-16721
Evaluation of the application of some gas chromatographic methods for the determination of properties of synthetic fuels
[NASA-TM-79035] 22 p0338 N79-16930
A 200-kW wind turbine generator conceptual design study
[NASA-TM-79032] 22 p0341 N79-17333

Evaluation of the ECAS open cycle MHD power plant design
[NASA-TM-79012] 22 p0341 N79-17335
Photovoltaic tests and applications project
[NASA-TM-79018] 22 p0342 N79-17336
Cold-air performance of free power turbine designed for 112-kilowatt automotive gas-turbine engine. 2: Effects of variable stator-vane-chord setting angle on turbine performance
[NASA-TM-78993] 22 p0345 N79-17859
Parametric performance of a turbojet engine combustor using jet A and A diesel fuel
[NASA-TM-79089] 22 p0357 N79-20114
Tests of NASA ceramic thermal barrier coating for gas-turbine engines
[NASA-TM-79116] 22 p0357 N79-20118
Closed Loop solar array-ion thruster system with power control circuitry
[NASA-CASE-LEW-12780-1] 22 p0357 N79-20179
Utility operational experience on the NASA/DOE MOD-0A 200-kW wind turbine
[NASA-TM-79084] 22 p0360 N79-20494
Thermal storage technologies for solar industrial process heat applications
[NASA-TM-79130] 22 p0360 N79-20498
Evaluation of MOSTAS computer code for predicting dynamic loads in two bladed wind turbines
[NASA-TM-79101] 22 p0368 N79-21549
The role of thermal energy storage in industrial energy conservation
[NASA-TM-79122] 22 p0368 N79-21550
Lewis Research Center program
22 p0370 N79-21576
Results from Symposium on Future Orbital power systems technology requirements
[NASA-TM-79125] 23 p0539 N79-22191
An economic analysis of a commercial approach to the design and fabrication of a space power system
[NASA-TM-79153] 23 p0539 N79-22193
Preliminary comparison of theory and experiment for a conical, pressurized-fluidized-bed coal combustor
[NASA-TM-79137] 23 p0542 N79-22623
Analysis of a fuel cell on-site integrated energy system for a residential complex
[NASA-TM-79161] 23 p0542 N79-22624
The role of fuel cells in NASA's space power systems
[NASA-TM-79182] 23 p0546 N79-23133
Redox flow cell energy storage systems
[NASA-TM-79143] 23 p0558 N79-24442
Description of photovoltaic village power systems in the United States and Africa
[NASA-TM-79149] 23 p0558 N79-24443
Benefits of advanced technology in industrial cogeneration
[NASA-TM-79160] 23 p0558 N79-24444
Redox flow cell development and demonstration project, calendar year 1977
[NASA-TM-79067] 23 p0558 N79-24445
Performance optimization of an MHD generator with physical constraints
[NASA-TM-79172] 23 p0558 N79-24446
DOE photovoltaic tests and applications project
23 p0571 N79-25492
Gas-turbine critical research and advanced technology support project
[NASA-TM-79139] 23 p0571 N79-25498
MHD performance calculations with oxygen enrichment
[NASA-TM-79140] 23 p0571 N79-25499
Commercial phosphoric acid fuel cell system technology development
[NASA-TM-79169] 23 p0571 N79-25500
Social and economic impact of solar electricity at Schuchuli Village
[NASA-TM-79194] 23 p0572 N79-25501
Handbook of data on selected engine components for solar thermal applications
[NASA-TM-79027] 23 p0579 N79-26476
Solar thermal power-conversion system
23 p0579 N79-26477
Rankine-cycle component characteristics
23 p0579 N79-26478
Brayton-cycle component characteristics
23 p0580 N79-26479
Stirling engine characteristics
23 p0580 N79-26480
Commercial synchronous alternating-current generators
23 p0580 N79-26482
Power-conversion system component summation
23 p0580 N79-26483
Candidate power-conversion system cycles, appendix A
23 p0580 N79-26484
The use of wind data with an operational wind turbine in a research and development environment
[NASA-TM-73832] 23 p0581 N79-26502
A method for correlating performance data of a terrestrial solar cell array
[NASA-TM-79163] 23 p0581 N79-26503
Large horizontal axis wind turbine development
[NASA-TM-79174] 23 p0581 N79-26504
Recent advances in redox flow cell storage systems
[NASA-TM-79186] 23 p0581 N79-26505
Turbine engine altitude chamber and flight testing with liquid hydrogen
[NASA-TM-79196] 23 p0587 N79-27140
Energy efficient aircraft engines
[NASA-TM-79204] 23 p0587 N79-27141
Energy and cost saving results for advanced technology systems from the Cogeneration Technology Alternatives Study (CTAS)
[NASA-TM-79213] 23 p0595 N79-27665
Use of refinery computer model to predict fuel production
[NASA-TM-79203] 24 p0718 N79-28349
Safety considerations in the design and operation of large wind turbines
[NASA-TM-79193] 24 p0723 N79-28725
Stirling engines for automobiles
[NASA-TM-79222] 24 p0723 N79-28726
Design, fabrication, and initial test of a fixture for reducing the natural frequency of the Mod-0 wind turbine tower
[NASA-TM-79200] 24 p0723 N79-28727
Effect of positive pulse charge waveforms on cycle life of nickel-zinc cells
[NASA-TM-79215] 24 p0723 N79-28728
Dynamic analysis of a photovoltaic power system with battery storage capability
[NASA-TM-79209] 24 p0736 N79-29599
Wind turbines for electric utilities: Development status and economics
[NASA-TM-79170] 24 p0749 N79-30719
Performance characteristics of a slagging gasifier for MHD combustor systems
[NASA-TM-79195] 24 p0749 N79-30720
Comparison of the properties of some synthetic crudes with petroleum crudes
[NASA-TM-79220] 24 p0765 N79-31405
Discharge characteristics of 300 ampere-hour Ni-Zn traction cells
[NASA-TM-79244] 24 p0772 N79-31781
Solar Cell High Efficiency and Radiation Damage, 1979
[NASA-CP-2097] 24 p0783 N79-32640
The NASA Lewis Research Center program in space solar cell research and technology
24 p0783 N79-32641
Open-circuit voltage improvements in low-resistivity solar cells
24 p0784 N79-32649
Modeling of thin, back-wall silicon solar cells
24 p0784 N79-32650
Reduced power processor requirements for the 30-cm diameter Hg ion thruster
[NASA-TM-79257] 24 p0795 N79-33253
Jet Fuel Thermal Stability
[NASA-TM-79231] 24 p0795 N79-33336
Annealing of radiation damage in 0.1- and 2-ohm-centimeter Silicon solar cells
[NASA-TP-1559] 24 p0798 N79-33572

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.
Status of wraparound contact solar cells and arrays
21 p0001 A79-10014
Selling solar energy as a cash crop
21 p0049 A79-12725

The Solar Heating and Cooling Commercial Demonstration Program at Marshall Space Flight Center - Some problems and conclusions
21 p0099 A79-16135
Solar thermal collectors using planar reflector
21 p0131 A79-17412
An approach to automated longwall mining
[AIAA PAPER 79-0532] 22 p0274 A79-25871
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212
Protection of solar collector materials from UV
24 p0609 A79-45217
Early developments in solar cooling equipment
24 p0609 A79-45218
Collector testing in the MSFC simulator
24 p0611 A79-45230
Multichannel temperature controller for hot air solar house
24 p0658 A79-50347
Solar array systems
21 p0169 N79-10131
Rotatable mass for a flywheel
[NASA-CASE-MFS-23051-1] 21 p0172 N79-10422
Solar tracking control system Sun Chaser
[NASA-TM-78199] 21 p0172 N79-10514
Cost analysis of new and retrofit hot-air type solar assisted heating systems
[NASA-TM-78186] 21 p0173 N79-10519
Rankine cycle machines for solar cooling
[NASA-TM-78196] 21 p0173 N79-10524
Method for making an aluminum or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-1] 21 p0182 N79-11469
MSFC hot air collectors
[NASA-TM-78206] 21 p0196 N79-12556
FY 1978 scientific and technical reports, articles, papers, and presentations
[NASA-TM-78203] 21 p0214 N79-13915
Summary of atmospheric wind design criteria for wind energy conversion system development
[NASA-TP-1389] 21 p0223 N79-14678
Engineering handbook on the atmospheric environmental guidelines for use in wind turbine generator development
[NASA-TP-1359] 21 p0223 N79-14679
The 25 kW power module updated baseline system
[NASA-TM-78212] 21 p0226 N79-15247
Development, testing, and certification of Calmac Mfg. Corp. solar collector and solar operated pump
[NASA-TM-78218] 22 p0342 N79-17338
Performance characteristics of a 1.8 by 3.7 meter Fresnel lens solar concentrator
[NASA-TM-78222] 22 p0360 N79-20495
Development, testing, and certification of the Northrup, Inc., ML series concentrating solar collector model NSC-01-0732
[NASA-TM-78219] 22 p0371 N79-21618
Development, testing, and certification of Owens-Illinois model SEC-601 solar energy collector system
[NASA-TM-78223] 22 p0371 N79-21620
Horizontally mounted solar collector
[NASA-CASE-MFS-23349-1] 23 p0546 N79-23481
Magnetic shielding of large high-power-satellite solar arrays using internal currents
23 p0552 N79-24026
Coal-shale interface detection
[NASA-CASE-MFS-23720-3] 23 p0569 N79-25443
Method of construction of a multi-cell solar array
[NASA-CASE-MFS-23540-1] 23 p0579 N79-26475
Solar tracking system
[NASA-CASE-MFS-23999-1] 24 p0721 N79-28667
Radiation shadow indicator
[NASA-CASE-MFS-23546-2] 24 p0730 N79-29037
Coal-rock interface detector
[NASA-CASE-MFS-23725-1] 24 p0768 N79-31706

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. PASADENA OFFICE, CALIF.
Dual membrane hollow fiber fuel cell and method of operating same
[NASA-CASE-NPO-13732-1] 21 p0172 N79-10513
Surfactant-assisted liquefaction of particulate carbonaceous substances
[NASA-CASE-NPO-13904-1] 21 p0179 N79-11152
Solar photolysis of water
[NASA-CASE-NPO-14126-1] 21 p0182 N79-11470
Non-tracking solar energy collector system
[NASA-CASE-NPO-13817-1] 21 p0182 N79-11471
Primary reflector for solar energy collection systems
[NASA-CASE-NPO-13579-4] 21 p0217 N79-14529
Thermal energy transformer
[NASA-CASE-NPO-14058-1] 22 p0348 N79-18443
An improved solar panel and method for fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445
Electromagnetic radiation energy arrangement
[NASA-CASE-NOO-00428-1] 22 p0352 N79-19186
An improved solar energy receiver for a stirling engine
[NASA-CASE-NPO-14619-1] 22 p0362 N79-20513
Underwater seismic source
[NASA-CASE-NPO-14255-1] 23 p0551 N79-23555
Primary reflector for solar energy collection systems and method of making same
[NASA-CASE-NPO-13579-3] 23 p0557 N79-24432
Solar energy collection system
[NASA-CASE-NPO-13579-2] 23 p0557 N79-24433
Schottky barrier cell and method of fabricating it
[NASA-CASE-NPO-13689A] 23 p0568 N79-25311
Double-sided solar cell package
[NASA-CASE-NPO-14199-1] 23 p0570 N79-25482

NATIONAL AEROSPACE LAB., AMSTERDAM (NETHERLANDS).
Investigations on the aeroelastic stability of large wind turbines
[NPL-MP-78014-U] 24 p0792 N79-32731

NATIONAL ASSOCIATION OF COUNTIES, WASHINGTON, D. C.
Guide to reducing energy-use budget costs
[HCP/U60505-01] 21 p0184 N79-11489

NATIONAL AVIATION FACILITIES EXPERIMENTAL CENTER, ATLANTIC CITY, N. J.
Simulation study of the effect of fuel-conservative approaches on ATC procedures and terminal area capacity
[SAE PAPER 780523] 21 p0031 A79-10398
Dynamic simulation studies of fuel conservation procedures used in terminal areas
22 p0259 A79-23581
Alternative energy sources for Federal Aviation Administration facilities
[AD-A058681] 21 p0196 N79-12555

NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
Solar spectral irradiance at ground level
23 p0429 A79-35053
Plan for the development and implementation of standards for solar heating and cooling applications
[PB-283237/6] 21 p0190 N79-11543
International project catalog of modular integrated utility systems
[PB-283477/8] 21 p0190 N79-11544
Committee on the Challenges of Modern Society Rational use of Energy Pilot Study Modular Integrated Utility Systems Project. Volume 1: Description, activities, and products
[PB-283428/1] 21 p0190 N79-11549
Committee on the challenges of modern society rational use of energy pilot study modular integrated utility system project. Volume 2: Minutes of project meeting
[PB-283429/9] 21 p0191 N79-11558
Provisional flat plate solar collector testing procedures
[PB-283721/9] 21 p0198 N79-12571
An annotated compilation of the sources of information related to the usage of electricity in non-industrial applications
[PB-285260/6] 21 p0212 N79-13552
Materials for fuel cells
[PB-285360/4] 21 p0212 N79-13553
The effects of resource impact factors on energy conservation standards for buildings
[PB-286909/7] 22 p0335 N79-16384
Environmental and safety considerations for solar heating and cooling applications
[PB-287772/8] 22 p0343 N79-17350
State-of-the-art study of heat exchangers used with solar assisted domestic hot water systems (potential contamination of potable water supply)
[PB-287410/5] 22 p0343 N79-17351
Measurement techniques for solar cells
[PB-287519/3] 22 p0343 N79-17352

Life-cycle costing. A guide for selecting energy conservation projects for public buildings
[PB-287804/9] 22 p0345 N79-17744
Geographical variation in the heating and cooling requirements of a typical single-family house, and correlation of these requirements to degree days
[PB-289204/0] 22 p0355 N79-19467
Solar building regulatory study, volume 2
[PB-289824/5] 22 p0357 N79-20291
Laboratories technically qualified to test solar collectors in accordance with ASHRAE standard 93-77: A summary report
[PB-289729/6] 22 p0363 N79-20524
Test procedures for the determination of the gross caloric value of refuse and refuse-derived-fuels by oxygen bomb calorimetry: Summary of the 1977 fiscal year results
[PB-290160/1] 22 p0364 N79-21167
Interim performance criteria for solar heating and cooling systems in residential buildings, second edition
[PB-289967/2] 22 p0372 N79-21630
Experimental verification of a standard test procedure for solar collectors
[PB-289912/8] 22 p0372 N79-21632
An algorithm and BASIC computer program for calculating simple coal gasification equilibria
[PB-291241/8] 23 p0539 N79-22265
Semiconductor technology program, progress briefs
[PB-292681/4] 23 p0569 N79-25337
Results and analysis of a round-robin test program for liquid-heating flat-plate solar collectors
[PB-292115/3] 23 p0575 N79-25539
HUD utilities demonstration series. Volume 9: Description of the data acquisition and instrumentation systems, Jersey City total energy project
[PB-294926/1] 24 p0793 N79-32738
Testing of pebble-bed and phase-change thermal energy storage devices according to ASHRAE standard 94-77
[PB-295898/1] 24 p0801 N79-33596
Standards for photovoltaic energy conversion systems
[PB-296274/4] 24 p0801 N79-33597

NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, BOULDER, COLO.
Multidisciplinary research related to the atmospheric sciences
[PB-283076/8] 21 p0179 N79-10679

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION, WASHINGTON, D. C.
Automotive Fuel Economy Contractor's Coordination Meeting
[PB-290516/4] 23 p0556 N79-24358

NATIONAL INST. FOR WATER RESEARCH, PRETORIA (SOUTH AFRICA).
Energy recovery from domestic refuse by means of incineration and pyrolysis
[CSIR-SR-WAT-54] 23 p0560 N79-24468

NATIONAL INST. OF BUILDING SCIENCES, WASHINGTON, D. C.
Solar building regulatory study, volume 1
[PB-289823/7] 22 p0365 N79-21235

NATIONAL LEAGUE OF CITIES, WASHINGTON, D. C.
Guide to reducing energy-use budget costs
[HCP/U60505-01] 21 p0184 N79-11489

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, BOULDER, COLO.
Environmental assessment of the Alaskan Continental Shelf. Volume 1: Biological studies
[PB-289154/7] 22 p0344 N79-17366
Environmental assessment of the Alaskan Continental Shelf. Volume 2: Biological studies
[PB-289155/4] 22 p0344 N79-17367
Environmental assessment of the Alaskan Continental Shelf. Volume 3: Biological studies
[PB-289156/2] 22 p0344 N79-17368
Marine biological effects of OCS petroleum development
[PB-288935/0] 22 p0344 N79-17374
Proceedings of a Workshop on Scientific Problems Relating to Ocean Pollution
[PB-297467/3] 24 p0803 N79-33648

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, MIAMI, FLA.
Data from the Atlantic Oceanographic and Meteorological Laboratories OTEC plant site study in the Gulf of Mexico, July 1977
[PB-293733/2] 23 p0586 N79-26759

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, SILVER SPRING, MD.
Relative effective solar space heating over the United States obtained from southward-tilted solar collectors
[PB-292963/6] 23 p0565 N79-24513

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, WASHINGTON, D. C.
Harnessing tidal energy
[PB-286671/3] 21 p0222 N79-14581

NATIONAL PHYSICAL LAB., TEDDINGTON (ENGLAND).
Prospective needs for physical property data in the chemical and allied industries during the next decade
[NPL-CHEM-84] 23 p0546 N79-23185

NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA.
Electric automobiles. Citations from the NTIS data base
[NTIS/PS-78/0880/1] 21 p0171 N79-10363
Electric automobiles, volume 2. Citations from the engineering index data base
[NTIS/PS-78/0881/9] 21 p0172 N79-10364
Energy conservation: Policies, programs and general studies. A bibliography with abstracts
[NTIS/PS-78/0693/8] 21 p0176 N79-10552
Solar ponds. Citations from the NTIS data base
[NTIS/PS-78/0836/3] 21 p0176 N79-10553
Solar ponds. Citations from the engineering index data base
[NTIS/PS-78/0837/1] 21 p0176 N79-10554
Solar energy concentrator design and operation. Citations from the NTIS data base
[NTIS/PS-78/0838/9] 21 p0178 N79-10566
Technology assessment, volume 2. A bibliography with abstracts
[NTIS/PS-78/0830/6] 21 p0179 N79-10951
Design and applications of flywheels. Citations from the NTIS data base
[NTIS/PS-78/0997/3] 21 p0190 N79-11550
Design and applications of flywheels. Citations from the engineering index data base
[NTIS/PS-78/0998/1] 21 p0190 N79-11551
Energy policy and research planning, volume 2. A bibliography with abstracts
[NTIS/PS-78/0961/9] 21 p0191 N79-11552
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-78/0962/7] 21 p0191 N79-11553
Nitrogen oxide air pollution. Volume 2, part 1: Control technology. A bibliography with abstracts
[NTIS/PS-78/0971/8] 21 p0199 N79-12591
Nitrogen oxide air pollution. Part 3: Atmospheric chemistry. A bibliography with abstracts
[NTIS/PS-78/0973/4] 21 p0199 N79-12593
Solar space heating and air conditioning, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1014/6] 21 p0211 N79-13545
Solar space heating and air conditioning volume 3. Citations from the NTIS data base
[NTIS/PS-78/1015/3] 21 p0211 N79-13546
Solar space heating and air conditioning, volume 3. Citations from the engineering index data base
[NTIS/PS-78/1017/9] 21 p0211 N79-13547
Solar space heating and air conditioning, volume 2. Citations from the engineering index data base
[NTIS/PS-78/1016/1] 21 p0212 N79-13550
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-78/0840/5] 21 p0212 N79-13551
Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1114/4] 21 p0212 N79-13554
Silicon solar cells, volume 3. Citations from the NTIS data base
[NTIS/PS-78/1115/1] 21 p0212 N79-13555

Silicon solar cells, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1116/9] 21 p0212 N79-13556
Solar electric power generation, volume 2. Citations from the NTIS data base
[NTIS/PS-78/1108/6] 21 p0212 N79-13557
Solar electric power generation, volume 2. Citations from the Engineering Index data base
[NTIS/PS-78/1109/4] 21 p0212 N79-13558
Combined cycle power generation. Citations from the NTIS data base
[NTIS/PS-78/1156/5] 21 p0222 N79-14587
Combined cycle power generation. Citations from the Engineering Index data base
[NTIS/PS-78/1157/3] 21 p0222 N79-14588
Cadmium sulfide solar cells. Citations from the NTIS data base
[NTIS/PS-78/1213/4] 21 p0231 N79-15436
Cadmium sulfide solar cells. Citations from the Engineering Index Data base
[NTIS/PS-78/1214/2] 21 p0231 N79-15437
Cryogenic refrigeration, volume 2. A bibliography with abstracts
[NTIS/PS-78/1261/3] 22 p0331 N79-16144
Cryogenic refrigeration, volume 3. A bibliography with abstracts
[NTIS/PS-78/1262/1] 22 p0331 N79-16145
Solar water pumps. Citations from the Engineering Index data base
[NTIS/PS-78/1288/6] 22 p0343 N79-17348
Optical coatings for solar cells and solar collectors. Citations from the NTIS data base
[NTIS/PS-78/1341/3] 22 p0350 N79-18465
Optical coatings for solar cells and solar collectors. Citations from the Engineering index data base
[NTIS/PS-78/1342/1] 22 p0350 N79-18466
Synthetic fuels: Methane. Citations from the Engineering Index data base
[NTIS/PS-79/0030/1] 22 p0365 N79-21223
A directory of computer software applications: Natural resources and earth sciences
[PB-288486/4] 23 p0551 N79-23710
Corrosion of stainess steel, volume 2. A bibliography with abstracts
[NTIS/PS-79/0208/3] 23 p0553 N79-24143
Heat pipes, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0299/2] 23 p0569 N79-25360
Heat pipes volume 3. Citations from the NTIS data base
[NTIS/PS-79/0298/4] 23 p0569 N79-25361
Hydrogen storage, part 1. Storage as a gas or liquid. A bibliography with abstracts
[NTIS/PS-79/0581] 24 p0747 N79-30413
Pollution and environmental aspects of fuel conversion. A bibliography with abstracts
[NTIS/PS-79/0378] 24 p0761 N79-30857
Hydrogen production, volume 1. A bibliography with abstracts
[NTIS/PS-79/0540/9] 24 p0765 N79-31406
Hydrogen production, volume 2. A bibliography with abstracts
[NTIS/PS-79/0541/7] 24 p0765 N79-31407
Synthetic fuels from municipal, industrial, and agricultural wastes. Citations from the NTIS data base
[NTIS/PS-79/0545/8] 24 p0767 N79-31433
Synthetic fuels from municipal, industrial and agricultural wastes, volume 1. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0546/6] 24 p0767 N79-31434
Synthetic fuels from municipal, industrial and agricultural wastes, volume 2. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0547/4] 24 p0767 N79-31435
Wind power, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0534/2] 24 p0777 N79-31836
Wind power, volume 1. Citations from the Engineering Index data base
[NTIS/PS-79/0535/9] 24 p0777 N79-31837
Wind power, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0536/7] 24 p0777 N79-31838
Alcohol fuels. Citations from the Engineering Index data base
[NTIS/PS-79/0714/0] 24 p0795 N79-33341
Alcohol fuels, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0713/2] 24 p0795 N79-33342
Alcohol fuels, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0712/4] 24 p0795 N79-33343
Hydrogen use as a fuel. Citations from the NTIS data base
[NTIS/PS-79/0779/3] 24 p0796 N79-33347
Fuel Cells, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0717/3] 24 p0801 N79-33594
Hydrocarbon fuel cells. Citations from the American Petroleum Institute data base
[NTIS/PS-79/0718/1] 24 p0801 N79-33595
Energy supply and demand modeling. A bibliography with abstracts
[NTIS/PS-79/0665] 24 p0802 N79-33605
State-of-the-art reviews and bibliographies on energy. A bibliography with abstracts
[NTIS/PS-79/0639/9] 24 p0802 N79-33608

NATO COMMITTEE ON THE CHALLENGES OF MODERN SOCIETY, BRUSSELS (BELGIUM).
Solar energy pilot study
[PB-289380/8] 22 p0363 N79-20525
Report of the 4th CCMS (Committee on the Challenges of Modern Society) Solar Energy Pilot Study Meeting
[PB-289492/1] 22 p0372 N79-21631

NAVAL AIR SYSTEMS COMMAND, WASHINGTON, D. C.
Naval Air Systems Command-Naval Research Laboratory Workshop on Basic Research Needs for Synthetic Hydrocarbon Jet Aircraft Fuels
[AD-A060081] 21 p0216 N79-14235

NAVAL CIVIL ENGINEERING LAB., PORT HUENEME, CALIF.
Digest of equipment for converting solar, wind, and geothermal energy into electric power for USN application ashore
[AD-A066221] 23 p0561 N79-24475

NAVAL OCEAN SYSTEMS CENTER, SAN DIEGO, CALIF.
Performance of photovoltaic cells in an undersea environment
[AD-A066385] 23 p0573 N79-25517

NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF.
Preliminary design and analysis of a total energy system for Massachusetts Institute of Technology
[AD-A057289] 21 p0184 N79-11486

NAVAL RESEARCH LAB., WASHINGTON, D. C.
Further studies of fuels from alternate sources: Fire extinguishment experiments with JP-5 jet turbine fuel derived from shale
[AD-A058586] 21 p0201 N79-13182
Aging behavior of crude shale oil
[AD-A062420] 22 p0357 N79-20272
Improvements in the lead-acid battery for load leveling applications
[AD-A068990] 24 p0724 N79-28744
An interim report on the NTS-2 solar cell experiment
24 p0784 N79-32656

NEBRASKA UNIV. - LINCOLN.
Parameter estimation and validation of a solar assisted heat pump model
22 p0332 N79-16349

NEW MEXICO ENERGY INST., ALBUQUERQUE.
Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177
Theoretical analysis of a passive heat pipe heating and cool system
[PB-296066/4] 24 p0792 N79-32736

NEW MEXICO ENERGY INST., LAS CRUCES.
Development of retrofit energy conservation and solar heating systems, phase 1
[PB-295847/8] 24 p0801 N79-33593
Dielectric development for GaAs solar cells
[PB-295837/9] 24 p0802 N79-33600

NEW MEXICO INST. OF MINING AND TECHNOLOGY, SOCORRO.
Estimates of New Mexico's future oil production including reserves of the 50 largest pools
[PB-291780/5] 23 p0540 N79-22597

NEW MEXICO UNIV., ALBUQUERQUE.
Hydrogen energy. A bibliography with abstracts
[NASA-CR-157962] 23 p0540 N79-22613
Solar thermal power generation. A bibliography with abstracts
[NASA-CR-158004] 23 p0540 N79-22614

Heat pipe technology. A bibliography with abstracts
[NASA-CR-158005] 23 p0546 N79-23364
Solar thermal components: A bibliography with abstracts
[NASA-CR-158699] 23 p0570 N79-25479
Solar thermal heating and cooling: A bibliography with abstracts
[NASA-CR-158693] 23 p0570 N79-25480
Forecasts of energy technology. Citations from the International Aerospace Abstracts data base
[NTIS/PS-79/0337/0] 23 p0575 N79-25531

NEW ORLEANS PUBLIC SERVICE, INC., LA.
Grip-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2
[COO-4337-2/2] 23 p0598 N79-27701

NEW ZEALAND ENERGY RESEARCH AND DEVELOPMENT COMMITTEE, AUCKLAND.
Energy scenarios: Supplementary studies
[NP-23292] 21 p0211 N79-13543

NORTH AMERICAN WEATHER CONSULTANTS, GOLETA, CALIF.
A method of computing maximum ground-level concentrations of SO2 under prolonged stagnation conditions
23 p0590 N79-27546

NORTH CAROLINA SCIENCE AND TECHNOLOGY RESEARCH CENTER, RESEARCH TRIANGLE PARK.
An analytical investigation of the performance of solar collectors as nighttime heat radiators in airconditioning cycles
[NASA-CR-3111] 22 p0363 N79-20519

NORTH CAROLINA STATE UNIV. AT RALEIGH.
Polymeric interfaces for stack monitoring
[PB-294997/2] 24 p0761 N79-30866

NORTH CAROLINA STATE UNIV., RALEIGH.
A theoretical analysis of the current-voltage characteristics of solar cells
[NASA-CR-158872] 24 p0737 N79-29606

NORTH CAROLINA UNIV. AT CHAPEL HILL.
Assessment of coal conversion waste-waters: Characterization and preliminary biothreatability
[PB-294338/9] 24 p0744 N79-29709

NORTH DAKOTA UNIV., GRAND FORKS.
Chemistry of lignite liquefaction
[FE-2211-10] 24 p0718 N79-28357

NORTHEAST SOLAR ENERGY CENTER, CAMBRIDGE, MASS.
Barriers and incentives to solar energy development. An analysis of legal and institutional issues in the Northeast
[NESEC-1] 24 p0726 N79-28765

NORTHROP SERVICES, INC., RESEARCH TRIANGLE PARK, N. C.
Conventional combustion on environmental assessment program
[PB-291401/8] 23 p0545 N79-22668

NORTHRUP, INC., HUTCHINS, TEX.
Design package for concentrating solar collector panels
[NASA-CR-150788] 21 p0173 N79-10523
Certification and verification for Northrup model NSC-01-0732 fresnel lens concentrating solar collector
[NASA-CR-161164] 23 p0572 N79-25504

NORTHWEST ENERGY POLICY PROJECT, PORTLAND, OREG.
Energy future Northwest: Northwest Energy Policy project
[PB-284697/0] 21 p0199 N79-12578

NORTHWESTERN UNIV., EVANSTON, ILL.
Stochastic analysis of wind characteristics for energy conversion
22 p0350 N79-18535
Basic research on ceramic materials for energy storage and conversion system
[COO-2564-4] 23 p0564 N79-24506
Contextual analysis for industrial energy conservation R and D
[PB-290981/0] 23 p0575 N79-25537

NOTRE DAME UNIV., IND.
Catalytic effect of Ni and K2CO2 in the gasification of carbon and coal
22 p0364 N79-21215

NUCLEAR REGULATORY COMMISSION, WASHINGTON, D. C.
Coal and nuclear: A comparison of the cost of generating baseload electricity by region
[PB-289585/2] 22 p0355 N79-19469

O

OAK RIDGE ASSOCIATED UNIVERSITIES, TENN.
Net energy analysis of five energy systems
[ORAU/IEA(R)-77-12] 21 p0174 N79-10534
Coal research: Data systems and information transfer
[ORAU-133] 21 p0232 N79-15830
Electric utilities and solar energy: The service contract in a new social context
[ORAU/IEA(O)-79-3] 23 p0597 N79-27685
Energy policy and mathematics
[ORAU/IEA(O)-79-5] 24 p0775 N79-31821
Uncertainties associated with global effects of atmospheric carbon dioxide
[ORAU/IEA-79-6(O)] 24 p0803 N79-33699

OAK RIDGE NATIONAL LAB., TENN.
Thermal energy storage for industrial waste heat recovery
21 p0012 A79-10101
Energy availabilities for state and local development: 1973 data volume
[ORNL/TM-5890-S2] 21 p0175 N79-10541
Energy availabilities for state and local development: 1974 data volume
[ORNL/TM-5890-S3] 21 p0175 N79-10542
Transportation Energy Conservation Data Book, edition 2
[ORNL-5320] 21 p0184 N79-11487
Energy availabilities for state and local development: Projected energy patterns for 1980 and 1985
[ORNL/TM-5890/S4] 21 p0186 N79-11511
Energy-related pollutants in the environment: The use of short-term for mutagenicity in the isolation and identification of biohazards
[CONF-780121-2] 21 p0192 N79-11568
Nonproliferation Alternative Systems Assessment Program (NASAP): Preliminary environmental assessment of thorium/uranium fuel cycle systems
[ORNL/TM-6069] 21 p0192 N79-11570
Proliferation-resistant nuclear fuel cycles
[ORNL/TM-6392] 21 p0214 N79-13849
Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-32] 21 p0220 N79-14564
Fluidized bed gas turbine experimental unit for MIUS applications
[ORNL/HUD/MIUS-33] 21 p0221 N79-14575
Buildings energy use data book, edition 1
[ORNL-5363] 22 p0348 N79-18447
Transportation energy conservation data book, edition 3
[ORNL-5493] 22 p0369 N79-21562
An inventory of environmental impact models related to energy technologies
[ORNL/EIS-147] 22 p0372 N79-21640
Low Btu coal gasification processes. Volume 1: Summary, screening, and comparisons
[ORNL/ENG/TM-13-VOL-1] 23 p0555 N79-24188
Econometric-engineering analysis of Federal energy conservation programs in the commercial sector
[ORNL/CON-30] 23 p0562 N79-24489
Emergence of biotechnology
[TID-28983] 23 p0567 N79-24626
Characterization of multialkylated polycyclic aromatic hydrocarbons in energy-related materials
[CONF-781039-9] 23 p0576 N79-26147
Relative chemical composition of selected synthetic crudes
[CONF-781150-4] 23 p0577 N79-26231
Use of waste heat from nuclear power plants
[CONF-7811109-4] 23 p0583 N79-26527
Inventory of data bases, graphics packages, and models in Department of Energy laboratories
[ORNL/EIS-144] 23 p0587 N79-27018
Assessment of load management on the electric power system
[CONF-781182-3] 23 p0590 N79-27412
Kinetics of silica deposition from simulated geothermal brines
[CONF-790108-1] 23 p0597 N79-27691
Market assessment of fuel cell total energy systems
[ORNL/CON-36] 23 p0598 N79-27704

Gas-steam turbine combined cycle power plants
[ANL/CES-TE-78-4] 24 p0727 N79-28775
Comparative evaluation of recent reports on the energy conservation potential from cogeneration
[ORNL/TM-6602] 24 N79-28776
Energy intensity and related parameters of selected transportation modes: Passenger movements
[ORNL-5506] 24 p0731 N79-29115
Mathematical model of the HYGAS pilot plant reactor
[CONF-790405-11] 24 p0733 N79-29368
Electricity in lieu of natural gas and oil for industrial thermal energy: A preliminary survey
[ORNL/TM-5937] 24 p0739 N79-29630
Coal liquefaction advanced research digest
[ORNL/FE-2] 24 p0746 N79-30398
Technical aspects of the Resource Conservation and Recovery Act upon coal combustion and conversion systems
[ORNL/OEPA-10] 24 p0748 N79-30687
Polar constituents of a shale oil: Comparative composition with other fossil-derived liquids
[CONF-790334-2] 24 p0748 N79-30689
Economy of a retrofit solar system
[CONF-790213-2] 24 p0755 N79-30795
Mutagenic components of alternate energy sources
[CONF-780636-8] 24 p0761 N79-30923
Economics of the ANFLOW process for municiple sewage treatment
[ORNL/TM-6574] 24 p0762 N79-31093
Enhanced oil recovery chemicals from renewable wood resources
[ORNL-5525] 24 p0764 N79-31363
Engineering analysis and comparison of new processes for the recovery of resource materials from coal ash
[CONF-790205-3] 24 p0769 N79-31743
Assessment of national consequences of increased coal utilization, executive summary, volume 1
[TID-29425-VOL-1] 24 p0774 N79-31801
Optimization of the fission-fusion hybrid concept
[ORNL/PPA-79/3] 24 p0778 N79-32113
Recent developments in coal liquefaction in the United States
[CONF-790213-5] 24 p0779 N79-32383
Condensation of refrigerants on vertical fluted tubes
[ORNL/TM-5848] 24 p0781 N79-32515
Frequency analysis of a thick-rim flywheel
[ORNL/TM-5804] 24 p0781 N79-32555
Decentralized solar energy technology assessment program: Research plan
[ORNL/TM-6913] 24 p0786 N79-32677
Wind turbines
[ANL/CES-TE-78-9] 24 p0790 N79-32711
Proposed industrial energy data base for technical evaluation of alternative energy systems
[CONF-781244-1] 24 p0791 N79-32725
Overview of waste heat utilization techniques
[CONF-790443-2] 24 p0791 N79-32726

OAK RIDGE Y-12 PLANT, TENN.
Automatic tension control for winding superconducting coils
[Y/EN-257] 24 p0734 N79-29384

OAO CORP., BELTSVILLE, MD.
Proceedings of the US DOE Photovoltaics Technology Development and Applications Program Review
[NASA-CR-158682] 23 p0570 N79-25485

OCEAN DATA SYSTEMS, INC., MONTEREY, CALIF.
OTEC thermal resource report for Central Gulf of Mexico
[TID-27951] 21 p0209 N79-13533

OCEAN SYSTEMS, INC., RESTON, VA.
OTEC platform configuration and integration study. Volume 1: Systems engineering and integration
[DOE/ET/4063-1-VOL-1] 24 p0724 N79-28749

OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, PARIS (FRANCE).
Energy conservation aircraft design and operational procedures
21 p0202 N79-13200

OFFICE OF NAVAL RESEARCH, LONDON (ENGLAND).
European Scientific notes, volume 32, number 4
[AD-A065399] 23 p0552 N79-23886

OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D. C.
Application of solar technology to today's energy needs, volume 1
[PB-283770/6] 21 p0190 N79-11548
Renewable ocean energy sources. Part 1: Ocean thermal energy conversion
[PB-283104/8] 21 p0191 N79-11556
Renewable ocean energy sources. Part 1: Working papers. Ocean thermal energy conversion
[PB-283103/0] 21 p0191 N79-11557
Application of solar technology to today's energy needs, volume 2
[OTA-E-77-VOL-2] 21 p0218 N79-14530
Analytical methods
21 p0218 N79-14531
Current and projected fuel costs
21 p0218 N79-14532
Calculation of backup requirements
21 p0218 N79-14533
Results of systems analysis
21 p0218 N79-14534
A detailed analysis of the impact of onsite equipment on utility costs
21 p0218 N79-14535
The direct use of coal: Prospects and problems of production and combustion
[PB-295797/5] 24 p0734 N79-29381
Technology assessment of changes in the future use and characteristics of the automobile transportation system. Summary and findings
[PB-293645/8] 24 p0762 N79-31105
Technology assessment of changes in the future use and characteristics of the automobile transportation system, volume 2
[PB-293646/6] 24 p0762 N79-31106
Renewable ocean energy sources. Part 2: Working papers: ocean winds, currents, waves, tides and salinity gradients
[PB-295876/7] 24 p0792 N79-32735
Management of fuel and nonfuel minerals in federal land: Current status and issues
[PB-295788/4] 24 p0797 N79-33554

OFFICE OF THE COUNTY CLERK, EL CENTRO, CALIF.
Geothermal element, Imperial County, California
[PB-287115/0] 22 p0335 N79-16385

OHIO STATE UNIV., COLUMBUS.
Workshop on Energy Sources and Electric Power Generation for High School Students
[TID-28975] 24 p0740 N79-29643

OKLAHOMA STATE UNIV., STILLWATER.
Catalyst aging tests and the role of catalyst wetting on hydrodesulfurization of a coal derived liquid
22 p0352 N79-19169
Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419

OKLAHOMA UNIV., NORMAN.
Thermal and kinetic analysis of the pyrolysis of coals
22 p0336 N79-16704
Technology assessment of western energy resource development
22 p0347 N79-18368
Energy conservation through source reduction
[PB-290126/2] 22 p0372 N79-21626
Analysis of coke combustion during in-situ oil recovery
23 p0553 N79-24095

OLD DOMINION UNIV., NORFOLK, VA.
Investigation of a staged plasma-focus apparatus
22 p0255 A79-22365
Public policy
21 p0179 N79-11011

OLD WEST REGIONAL COMMISSION, BILLINGS, MONT.
Energy Research Information System, volume 3, no. 1 (Proj. nos. 00001081 through 00001224)
[PB-294342/1] 24 p0743 N79-29671
Energy Research Information System, volume 3, no. 2 (Project nos. 00001225 through 00001362)
[PB-294951/9] 24 p0743 N79-29672
Energy Research Information System. Volume 3, no. 3: Projects report cumulative indexes
[PB-294952/7] 24 p0743 N79-29673

OPEN UNIV., MILTON (ENGLAND).
Alternative energy sources: An analysis of their role in energy policy
24 p0743 N79-29668
OPTICAL COATING LAB., INC., CITY OF INDUSTRY, CALIF.
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158363] 22 p0359 N79-20485
Development of high efficiency (14%) solar cell array module
[NASA-CR-158672] 23 p0559 N79-24454
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158736] 23 p0580 N79-26488
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158735] 23 p0581 N79-26495
Silicon solar cells for space use: Present performance and trends
24 p0784 N79-32654
OREGON DEPARTMENT OF ENERGY, SALEM.
Amended Oregon State energy conservation plan, 1978 Prepared in response to the Energy Policy and Conservation Act of 1975 (PL 94-163), and the Energy Conservation and Production Act of 1976 (PL 94-385)
[PB-286078/1] 21 p0231 N79-15430
OREGON STATE UNIV., CORVALLIS.
Geothermal resources for aquaculture
[PB-290345/6] 22 p0356 N79-19563
Exploration of volcanic geothermal energy resources based on rheological techniques
[DOE/ET/28453-3] 23 p0596 N79-27676
OREGON UNIV., EUGENE.
Water and energy resource development in the Tongue River Basin, southeastern Montana
24 p0735 N79-29566
ORR-SCHELEN-MAYERON AND ASSOCIATES, INC., MINNEAPOLIS, MINN.
Grip-connected integrated community energy system. Phase 2: Detailed feasibility and preliminary design, stage 2
[COO-4337-2/2] 23 p0598 N79-27701
OWENS-ILLINOIS, INC., TOLEDO, OHIO.
Design data brochure for the Owens-Illinois Sunpak (TM) air-cooled solar collector
[NASA-CR-150868] 21 p0229 N79-15404
Qualification test and analysis report: Solar collectors
[NASA-CR-150860] 22 p0333 N79-16360
Analysis and experimental tests of a high-performance evacuated tubular collector
[NASA-CR-150874] 22 p0334 N79-16370
Preliminary design package for Sunair SEC-601 solar collector
[NASA-CR-150875] 22 p0341 N79-17332
Owens-Illinois subsystem design package for the SEC-601 air-cooled solar collector
[NASA-CR-161094] 24 p0798 N79-33570
OZEROFF (MICHAEL J.), PACIFIC PALISADES, CALIF.
Satellite Power System (SPS) military applications
[NASA-CR-158109] 22 p0337 N79-16895

P

PACIFIC GAS AND ELECTRIC CO., SAN FRANCISCO, CALIF.
Coal's role in California's energy needs
23 p0591 N79-27602
Implications of the fusion power source to the electric utility industry
[EPRI-ER-943-54] 24 p0740 N79-29642
PACIFIC NORTHWEST ENVIRONMENTAL RESEARCH LAB., CORVALLIS, ORE.
Environmental effects of increased coal utilization ecological effects of gaseous emission from coal combustion
[PB-285440/4] 21 p0213 N79-13591
PACIFIC-SIERRA RESEARCH CORP., SANTA MONICA, CALIF.
Non-electric applications of geothermal energy in six Alaskan towns
[IDO-1622-4] 21 p0208 N79-13523
PARKER (LEE W.), INC., CONCORD, MASS.
Plasma sheath effects and voltage distributions of large high-power satellite solar arrays
23 p0552 N79-24024
PARSONS (RALPH M.) CO., PASADENA, CALIF.
Engineering and economic analysis of waste to energy systems
[PB-285797/7] 21 p0224 N79-14946
PEAT, MARWICK, MITCHELL AND CO., ANCHORAGE, ALASKA.
Alaska OCS socioeconomic studies program. Beaufort sea petroleum development scenarios: Impacts on Anchorage, Alaska
[PB-291916/5] 23 p0546 N79-22970
Alaska OCS socioeconomic studies program. Beaufort Sea petroleum development scenarios: Transportation impacts
[PB-291917/3] 23 p0546 N79-22971
Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems
[PB-291918/1] 23 p0546 N79-22972
PEDCO-ENVIRONMENTAL SPECIALISTS, INC., CINCINNATI, OHIO.
Particulate and sulfur dioxide emission control costs for large coal-fired boilers
[PB-281271/7] 21 p0178 N79-10591
Flue gas desulfurization system capabilities for coal-fired stream generators, volume 1. Executive summary
[PB-284045/2] 21 p0200 N79-12606
Air quality assessment of particulate emissions from diesel-powered vehicles
[PB-286172/2] 21 p0223 N79-14641
PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
Water/energy management and evaluation model for Pennsylvania
[PB-287577/1] 22 p0343 N79-17353
Numerical simulation of the compaction-subsidence phenomena in a reservoir for two-phase nonisothermal flow
23 p0540 N79-22401
Evaluation of flow properties of dilute aqueous polymer solutions for enhanced oil recovery applications
23 p0556 N79-24408
Nuclear powered satellite studies
[COO-4045-3] 23 p0588 N79-27221
Some aspects of the mechanism and kinetics of coal liquefaction
24 p0717 N79-28343
PENNSYLVANIA UNIV., PHILADELPHIA.
Evaluation of options for process sequences
23 p0501 A79-40925
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158580] 23 p0550 N79-23519
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158681] 23 p0572 N79-25506
Analysis and evaluation of processes and equipment in tasks 2 and 4 of the low-cost solar array project
[NASA-CR-158744] 23 p0580 N79-26485
Standards applicable to performance measurement of solar heating and cooling systems
[COO-4142-2] 24 p0741 N79-29656
Status of energy-management academic programs in US institutions of higher education: Executive summary
[COO-4465-2-EXEC-SUMM] 24 p0759 N79-30824
Analysis and evalaution in the production process and equipment area of the low-cost solar array project
[NASA-CR-162163] 24 p0770 N79-31769
Updating the limit efficiency of silicon solar cells
24 p0783 N79-32645
Isothermal flow distribution in solar collectors and collector manifolds
[ALO-5319-1] 24 p0789 N79-32708
PETROLEUM INDUSTRY RESEARCH FOUNDATION, INC., NEW YORK.
Outlook for world oil into the 21st century with emphasis on the period to 1990
[EPRI-EA-745] 21 p0181 N79-11454
PHILIPS LABS., BRIARCLIFF MANOR, NEW YORK.
System analysis, design and proof-of-concept experiment of a total energy system, phase 2
[COO-2947-5] 24 p0742 N79-29660
PITTSBURGH AND MIDWAY COAL MINING CO., SHAWNEE MISSION, KANS.
Solvent Refined Coal (SRC) process: Environmental program. Volume 3: Pilot plant development work, part 5
[FE-0496-T8] 23 p0588 N79-27329

Development of a process for producing an ashless, low-sulfur fuel from coal. Volume 4: Product studies. Part 10: Coal liquids catalyst work performed at Oklahoma State University. Solvent Refined Coal (SRC) process
[FE-0496-T10-VOL-4-PT-10] 24 p0766 N79-31419

PITTSBURGH UNIV., PA.
Hot corrosion of Ni-base turbine alloys in atmospheres in coal-conversion systems
22 p0288 A79-27395
Addition of devolatilization equations to synthane computerized mathematical model
[COO-0277-1] 24 p0766 N79-31418
Screening of zeolite catalysts for methanol conversion to light hydrocarbons
[COO-4691-1] 24 p0780 N79-32386

PLANNING RESEARCH CORP., MCLEAN, VA.
Application and system design study for cost-effective solar photovoltaic systems at Federal installations
[HCP/M2522-01] 24 p0790 N79-32715

POLITECNICO DI MILANO (ITALY).
The use of liquid natural gas as heat sink for power cycles
22 p0332 N79-16262
Development of thermal prime movers for heat pump drive
22 p0332 N79-16263
Power cycles and working fluids for low temperature heat sources
22 p0332 N79-16268

POLYTECHNIC INST. OF NEW YORK, BROOKLYN.
Potential use of small dams to produce power for low-income communities
[PB-292745/7] 23 p0575 N79-25535
Future directions for public transportation: A basis for decision
[PB-292781/2] 23 p0587 N79-27024
Assessment of hydropower restoration and expansion in New York State, volume 1
[PB-295782/7] 24 p0792 N79-32734

POPE, EVANS, AND ROBBINS, INC., NEW YORK.
Fluidized combustion of coal
23 p0593 N79-27613

PRATT AND WHITNEY AIRCRAFT, EAST HARTFORD, CONN.
Energy efficient engine: Propulsion system-aircraft integration evaluation
[NASA-CR-159488] 22 p0337 N79-16850
JT9D-70/59 improved high pressure turbine active clearance control system
[NASA-CR-159661] 24 p0763 N79-31208

PRATT AND WHITNEY AIRCRAFT GROUP, EAST HARTFORD, CONN.
Energy efficient engine preliminary design and integration study
[NASA-CR-135396] 21 p0194 N79-12084
Analytical evaluation of the impact of broad specification fuels on high bypass turbofan engine combustors
[NASA-CR-159454] 21 p0200 N79-13050
Engine component improvement and performance retention
21 p0202 N79-13198
Low energy consumption engines
21 p0202 N79-13199

PRC ENERGY ANALYSIS CO., MCLEAN, VA.
Satellite Power System (SPS) military applications
[NASA-CR-158109] 22 p0337 N79-16895
Satellite Power System (SPS) resource requirements (critical materials, energy and land)
[NASA-CR-158680] 23 p0548 N79-23492
Satellite Power System (SPS) public acceptance
[NASA-CR-157429] 23 p0548 N79-23493
Satellite Power System (SPS) student participation
[NASA-CR-157431] 23 p0548 N79-23495
Potential of laser for SPS power transmission
[NASA-CR-157432] 23 p0548 N79-23496
Satellite Power System (SPS) international agreements
[NASA-CR-157433] 23 p0548 N79-23497
Satellite Power System (SPS) centralization/decentralization
[NASA-CR-157434] 23 p0548 N79-23498
Satellite Power System (SPS) mapping of exclusion areas for rectenna sites
[NASA-CR-157435] 23 p0548 N79-23499
Satellite Power System (SPS) military implications
[NASA-CR-157436] 23 p0549 N79-23500
Satellite Power System (SPS) international agreements
[NASA-CR-157437] 23 p0549 N79-23501
Satellite Power System (SPS) financial management scenarios
[NASA-CR-157438] 23 p0549 N79-23502
Satellite Power System (SPS) resource requirements (critical materials, energy, and land)
[NASA-CR-162310] 24 p0763 N79-31251
Economic and demographic issues related to deployment of the Satellite Power System (SPS)
[NASA-CR-158886] 24 p0788 N79-32699

PRINCETON COMBUSTION RESEARCH LABS., INC., N.J.
The definition of a national program in energy-efficient pump utilization, volume 1
[HCP/W1260-01/1] 21 p0207 N79-13514
The definition of a national program in energy-efficient pump utilization. Volume 2: Appendices
[HCP/W1260-01/2] 21 p0207 N79-13515

PRINCETON UNIV., N. J.
Fundamental combustion studies of emulsified fuels for diesel applications
[PB-287386/7] 22 p0330 N79-16138
Sooting characteristics of liquid pool diffusion flames
[AD-A064111] 23 p0539 N79-22252
Symposium on Advances in Synthetic Fuels presented before the Division of Petroleum Chemistry, American Chemical Society
[CONF-780902-16] 24 p0734 N79-29377

PUBLIC SERVICE CO. OF NEW MEXICO, ALBUQUERQUE.
Technical and economic assessment of solar hybrid repowering
[SAN-1608-4-1] 24 p0729 N79-28791

PUBLIC SERVICE ELECTRIC AND GAS RESEARCH CORP., MAPLEWOOD, N. J.
Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1] 21 p0184 N79-11490

PUBLIC SERVICE ELECTRIC AND GAS CO., NEWARK, N. J.
Battery Energy Storage Test (BEST) Facility. Phenomenological cell modeling: A tool for planning and analyzing battery testing at the BEST facility
[COO-2857-1] 21 p0184 N79-11490
Blending of hydrogen in natural gas distribution systems. Volume 3: Gas blends leakage tests of selected distribution system components
[CONS/2925-3] 23 p0577 N79-26229

PUBLIC TECHNOLOGY, INC., WASHINGTON, D. C.
Planning program to accelerate energy conservation in municipalities
[HCP/M05017-01/1] 21 p0210 N79-13536

PULLMAN KELLOGG, HOUSTON, TEX.
Sources and delivery of carbon dioxide for enhanced oil recovery
[FE-2515-24] 24 p0735 N79-29575

PURDUE UNIV., LAFAYETTE, IND.
Lewis Research Center studies of multiple large wind turbine generators on a utility network
24 p0635 A79-46547
Alternative hydrocarbon fuels: Combustion and chemical kinetics
[AD-A061050] 22 p0338 N79-17011
Systems studies of coal conversion processes using a reference simulator
[FE-2275-8] 23 p0554 N79-24187

R

R AND D ASSOCIATES, MARINA DEL REY, CALIF.
Liquefied natural gas wind tunnel simulation and instrumentation assessments
[SAN-W1364-01] 21 p0195 N79-12256

RADEMAKER (RICHARD L.) CORP., LOUISVILLE, KY.
Solar system installation at Louisville, Kentucky
[NASA-CR-150814] 21 p0172 N79-10518

RADIAN CORP., AUSTIN, TEX.
Guidelines for preparing environmental test plans for coal gasification plants
[PB-286659/8] 21 p0232 N79-15479
Environmental assessment: Source test and evaluation report, Chapman low-Btu gasification
[PB-289940/9] 22 p0373 N79-21662

Materials selection guidelines for geothermal
power systems, first edition
[ALO-3904-1] 24 p0727 N79-28772
Trace elements of fly ash: Emissions from
coal-fired steam plants equipped with hot-side
and cold-side electrostatic precipitators for
particulate control
[PB-295040/0] 24 p0761 N79-30864

RADIAN CORP., MCLEAN, VA.
Comparison of atmospheric fluidized bed
combustion conceptual designs for utility
steam generation
[HCP/T2314] 24 p0729 N79-28792

RADIO CORP. OF AMERICA, PRINCETON, N. J.
An improved solar panel and method for
fabricating the same
[NASA-CASE-NPO-14490-1] 22 p0348 N79-18445

RAND CORP., SANTA MONICA, CALIF.
Pulsed-power research and development in the USSR
[AD-A056635] 21 p0193 N79-11859

RASOR ASSOCIATES, INC., SUNNYVALE, CALIF.
A summary of USSR thermionic energy conversion
activity
21 p0026 A79-10216
The TELEC - A plasma type of direct energy
converter
21 p0110 A79-16629
Power coupling alternatives for the NEP
thermionic power system
[NASA-CR-158372] 22 p0367 N79-21547

RAYTHEON CO., BURLINGTON, MASS.
Transportation systems center bibliography of
technical reports
[PB-296342/9] 24 p0794 N79-33107

RAYTHEON CO., LEXINGTON, MASS.
Applications of free-space microwave power
transmission
24 p0652 A79-49487

RAYTHEON CO., WAYLAND, MASS.
Solar Power Satellite (SPS) pilot beam and
communication link subsystem investigation
study, phase 1
[NASA-CR-161161] 22 p0345 N79-17896
Space-based solar power conversion and delivery
systems study. Volume 3: Microwave power
transmission studies
[NASA-CR-150296] 23 p0541 N79-22619

RCA LABS., PRINCETON, N. J.
Do photovoltaics have a future
[ASME PAPER 79-SOL-7] 22 p0308 A79-30543
Epitaxial solar cells on low-cost silicon
substrates
23 p0519 A79-41068
Automated array assembly, phase 2
[NASA-CR-158360] 22 p0358 N79-20480
Automated aray assembly, phase 2
[NASA-CR-158874] 24 p0737 N79-29607
Epitaxial silicon growth for solar cells
[NASA-CR-162177] 24 p0769 N79-31758
Automated array assembly, phase 2
[NASA-CR-162176] 24 p0770 N79-31759

RECON SYSTEMS, INC., PRINCETON, N. J.
Fundamental data needs for coal conversion
technology appendices
[TID-28152-APP] 21 p0187 N79-11512

RENSSELAER POLYTECHNIC INST., TROY, N. Y.
Solar power satellite rectenna design study:
Directional receiving elements and
parallel-series combining analysis
[NASA-CR-151866] 22 p0330 N79-16039

RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.
Compilation of level 1 environmental assessment
data
[PB-286924/6] 22 p0336 N79-16439
Pollutants from synthetic fuels production:
Facility construction and preliminary tests
[PB-287730/6] 22 p0339 N79-17027
Computer modeling of a two-junction, monolithic
cascade solar cell
24 p0785 N79-32672

RESOURCE PLANNING ASSOCIATES, INC., WASHINGTON, D. C.
European waste-to-energy systems: Case study of
Rennes, France
[HCP/W2103-0008] 24 p0737 N79-29605

REZNEK (BEN), SILVER SPRING, MD.
An annotated compilation of the sources of
information related to the usage of
electricity in non-industrial applications
[PB-285260/6] 21 p0212 N79-13552

REYNOLDS METALS CO., RICHMOND, VA.
Solar heating and hot water system installed at
Listerhill, Alabama
[NASA-CR-150870] 21 p0229 N79-15406

RHEINISCHE BRAUNKOHLENWERKE A.G., COLOGNE (WEST GERMANY).
Research and development work for
hydrogasification of coal with nuclear
processing heat done in the framework of the
prototype nuclear processing heater project
[BMFT-FB-T-78-25] 24 p0780 N79-32393

RICE UNIV., HOUSTON, TEX.
Phase equilibria in coal hydrogenation systems
[FE-2334-6] 21 p0171 N79-10238
Space environmental effects and the solar power
satellite
23 p0552 N79-24028

ROCKET RESEARCH CORP., REDMOND, WASH.
Applications of thermal energy storage to
process heat and waste heat recovery in the
iron and steel industry
[NASA-CR-159397] 21 p0183 N79-11473

ROCKETDYNE, CANOGA PARK, CALIF.
Development of a high energy storage flywheel
module
[AD-A060351] 21 p0230 N79-15413
Hydrogen embrittlement and its control in
hydrogen-fueled engine systems
22 p0366 N79-21429
Hydrogasifier development for the hydrane process
[FE-2518-17] 24 p0745 N79-30397

ROCKWELL INTERNATIONAL CORP., CANOGA PARK, CALIF.
A 5-GWe nuclear satellite power system
conceptual design
21 p0003 A79-10033
Supplementary steam - A viable hydrogen power
generation concept
24 p0686 A79-51848
Integrated power unit
[AD-A066543] 23 p0569 N79-25396

ROCKWELL INTERNATIONAL CORP., CREVE COEUR, MO.
Regional air pollution study: Heat emission
inventory
[PB-284081/7] 21 p0200 N79-12602

ROCKWELL INTERNATIONAL CORP., DOWNEY, CALIF.
Radioisotope thermoelectric generator cooling in
the Shuttle bay
24 p0693 A79-51936
Satellite Power Systems (SPS) concept definition
study (exhibit C)
[NASA-CR-150827] 21 p0183 N79-11475
Satellite Power System (SPS) concept definition
study (exhibit C)
[NASA-CR-150733] 21 p0225 N79-15137
Satellite Power Systems (SPS) concept definition
study. Volume 3: SPS concept evolution
[NASA-CR-158066] 21 p0225 N79-15138
Satellite Power Systems (SPS) concept definition
study. Volume 5: Transportation and
operations analysis
[NASA-CR-158067] 21 p0225 N79-15139
Satellite Power Systems (SPS) concept definition
study. Volume 6: SPS technology requirements
and verification
[NASA-CR-150685] 21 p0225 N79-15140
Satellite Power Systems (SPS) concept definition
study. Volume 7: SPS program plan and
economic analysis
[NASA-CR-158068] 21 p0225 N79-15141
Satellite power systems (SPS) concept definition
study. Volume 7: SPS program plan and
economic analysis, appendixes
[NASA-CR-150702] 21 p0225 N79-15142
Satellite power systems (SPS) concept definition
study. Volume 1: Executive summary
[NASA-CR-150700] 22 p0329 N79-16036
Satellite Power Systems (SPS) concept definition
study. Volume 2: SPS system requirements
[NASA-CR-150681] 22 p0330 N79-16037
Satellite Power System (SPS) concept definition
study (exhibit C)
[NASA-CR-161173] 22 p0352 N79-19071

Satellite Power Systems (SPS) concept definition study exhibit C. Volume 3: Experimental verification definition
[NASA-CR-161214] 23 p0543 N79-22632
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 5: Special emphasis studies
[NASA-CR-161215] 23 p0543 N79-22633
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 6: In-depth element investigation
[NASA-CR-161216] 23 p0543 N79-22634
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 1: Executive summary
[NASA-CR-161218] 23 p0547 N79-23484
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 1: System engineering
[NASA-CR-161219] 23 p0547 N79-23485
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics
[NASA-CR-161220] 23 p0547 N79-23486
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 2, part 2: System engineering, cost and programmatics, appendixes
[NASA-CR-161221] 23 p0547 N79-23487
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 4: Transportation analysis
[NASA-CR-161222] 23 p0547 N79-23488
Satellite Power Systems (SPS) concept definition study, exhibit C. Volume 7: System/subsystem requirements data book
[NASA-CR-161223] 23 p0547 N79-23489

ROCKWELL INTERNATIONAL CORP., THOUSAND OAKS, CALIF.
Intercell ohmic contacts for high efficiency multijunction solar converters
24 p0786 N79-32673

ROSENSTIEL SCHOOL OF MARINE AND ATMOSPHERIC SCIENCES, MIAMI, FLA.
Photoproduction of hydrogen by marine blue-green algae
[PB-287508/6] 22 p0343 N79-17354

ROSS (BERND) ASSOCIATES, SAN DIEGO, CALIF.
Development of economical improved thick film solar cell contact
[NASA-CR-158358] 22 p0359 N79-20486

ROYAL NETHERLANDS AIRCRAFT FACTORIES FOKKER, SCHIPHOL-OOST.
Experiences related to GEOS thermal control
24 p0763 N79-31269

RPC INTERNATIONAL, INC., AUSTIN, TEX.
Managing oil and gas activities in coastal environments
[PB-283677/3] 21 p0199 N79-12576

RUTGERS - THE STATE UNIV., NEW BRUNSWICK, N. J.
Stimulated biodegradation of waste petroleum
22 p0336 N79-16388

RUTGERS - THE STATE UNIV., PISCATAWAY, N. J.
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-283998/3] 21 p0198 N79-12572
Silicon Schottky photovoltaic diodes for solar energy conversion
[PB-287417/0] 22 p0343 N79-17349

S

SAARBERGWERKE A.G. SAARBRUECKEN (WEST GERMANY).
Engineering study of the flue gas desulfurization unit for the power plant Weiher 3
[BMFT-FB-T-78-28] 24 p0793 N79-32751

SALZGITTER A.G. (WEST GERMANY).
Methane and methanol as alternative energy sources: A comparative profitability study
[BMFT-FB-77-84] 24 p0747 N79-30412

SANDIA LABS., ALBUQUERQUE, N. MEX.
Application of the superposition principle to solar-cell analysis
22 p0300 A79-29426
Photovoltaic systems perspective
[AIAA PAPER 79-0983] 23 p0475 A79-38891
Design considerations for silicon HLE solar cells
23 p0521 A79-41094
Solar powered irrigation: Present status and future outlook
[SAND-78-0016C] 21 p0175 N79-10539
Status of the DOE photovoltaic concentrator technology development project
[SAND-78-0948C] 21 p0176 N79-10550
Sensitivity of slope measurements on parabolic solar mirrors to positioning and alignment of the laser scanner
[SAND-78-0700] 21 p0185 N79-11496
Structural performance of the DOE/Sandia 17 meter vertical axis wind turbine
[SAND-78-0880C] 21 p0187 N79-11516
Data acquisition and signal processing for a vertical axis wind energy conversion system
[SAND-78-1000C] 21 p0187 N79-11517
Solar irrigation program plan: Second revision
[SAND-78-0308-REV] 21 p0187 N79-11525
Effect of solar cell parameter variation on array power output
[SAND-78-0917C] 21 p0188 N79-11527
Development of high-efficiency P(+)-N-N(+) back-surface-field silicon solar cells
[SAND-78-1156C] 21 p0188 N79-11529
Solar Total Energy Test Facility project test results: High-temperature thermocline storage subsystem
[SAND-77-1528] 21 p0197 N79-12565
Combined photovoltaic thermal collector testing
[SAND-78-1191C] 21 p0198 N79-12570
Concentrating solar collector test results, Collector Module Test Facility
[SAND-78-0815] 21 p0208 N79-13522
Solar Irrigation Program Data Base Management System (SIPDBMS)
[SAND-78-0641] 21 p0209 N79-13532
Solar irrigation program
[SAND-78-0049] 21 p0210 N79-13537
Preliminary economic analysis of Solar Irrigation Systems (SIS) for selected locations
[SAND-77-1403] 21 p0220 N79-14566
Lightning protection for the vertical axis wind turbine
[SAND-77-1241] 21 p0221 N79-14567
Solar thermal test facility experiment manual
[SAND-77-1173] 21 p0221 N79-14568
Recommendations for the conceptual design of the Barstow, California, solar central receiver pilot plant: Executive summary
[SAND-77-8035] 21 p0221 N79-14571
Research at Sandia Laboratories for Solar Thermal Large Power Systems Program
[SAND-78-8051] 23 p0565 N79-24510
Photovoltaic concentrator system technology and applications experiments
[SAND-78-2184] 23 p0565 N79-24511
A summary of systems definition project activities
23 p0570 N79-25488
Status of the DOE photovoltaic concentrator development project
23 p0571 N79-25491
Concentrating solar collector test results from DOE/Sandia collector module test facility
[SAND-78-0881C] 23 p0573 N79-25520
Sandia laboratory combustion simulation facility
[SAND-78-2240] 23 p0576 N79-26146
Vertical axis wind turbine status
[SAND-78-0397C] 23 p0582 N79-26512
Proceedings of the Workshop on Mechanical Storage of Wind Energy
[SAND-79-0001] 23 p0584 N79-26528
System study on the feasibility of a coal-fired total-energy plant (with solar options) for Sandia Laboratories
[SAND-78-0979] 23 p0584 N79-26530
Analysis of the potential of wind energy conversion systems
[SAND-78-2099C] 23 p0595 N79-27668
Aerodynamic performance of the 17-metre-diameter Darrieus wind turbine
[SAND-78-1737] 23 p0595 N79-27670
Scattered EM field due to rotating blades of horizontal-axis wind machines
[SAND-79-0434] 24 p0719 N79-28398
Laser development for laser fusion applications
[SAND-78-2306] 24 p0720 N79-28540
Overview of solar system design and application principles
[SAND-78-2419C] 24 p0726 N79-28762
Insolation modeling overview
[SAND-78-0963] 24 p0726 N79-28768

Numerical codes for MHD flows
[SAND-78-1954] 24 p0730 N79-29061
Viscosity reduction of coal liquids by dissolved carbon dioxide
[SAND-79-7027] 24 p0732 N79-29365
Coal liquefaction catalyst tags
[SAND-79-0017] 24 p0732 N79-29366
Some variability statistics of available wind power
[SAND-78-1735] 24 p0752 N79-30772
Economic overview of vertical axis wind turbines
[SAND-79-9733C] 24 p0753 N79-30773
Status of the DOE photovoltaic systems engineering and analysis project
[SAND-78-0955C] 24 p0754 N79-30780
Linear concentrating solar collectors: Current technology and applications
[SAND-78-0949] 24 p0754 N79-30784
Analysis of collectors for process heat applications
[SAND-78-1977] 24 p0756 N79-30806
Geothermal well technology program
[SAND-78-1063] 24 p0756 N79-30807
Methodology for determining the economic feasibility of residential or commercial solar energy systems
[SAND-78-0931] 24 p0759 N79-30827
Status of the offshore technology program
[SAND-78-0665] 24 p0761 N79-30908
True in situ processing of oil shale: An evaluation of current bed preparation technology
[SAND-78-2162] 24 p0769 N79-31741
Use of electrical geophysical techniques to map and monitor in situ oil shale recovery processes
[SAND-79-0746C] 24 p0769 N79-31744
Summary of application analysis for photovoltaic systems
[SAND-78-0980C] 24 p0773 N79-31796
Helios model for the optical behavior of reflecting solar concentrators
[SAND-76-0347] 24 p0774 N79-31806
Problems of technology transfer to industry
[SAND-79-0096] 24 p0778 N79-32131
Fuels from magma: A potential energy source
[SAND-78-0191] 24 p0778 N79-32373
Performance testing of the Del concentrating solar collector
[SAND-79-0515] 24 p0786 N79-32681
Corrosion in molten salts used for solar thermal storage applications
[SAND-79-0246C] 24 p0786 N79-32683
Thermal energy storage for advanced solar central receiver power systems
[SAND-78-8221] 24 p0788 N79-32694
Structural optimization of sheet molding compound line focusing collectors
[SAND-79-0215C] 24 p0790 N79-32710
Availability of wind power
[SAND-78-0548C] 24 p0791 N79-32719
Wind power climatology of the United States, supplement
[SAND-78-1620] 24 p0793 N79-32811

SANDIA LABS., LIVERMORE, CALIF.
Variable-displacement spark-ignition engine
[SAND-77-8299] 21 p0172 N79-10435
Specific heat variations in oil energy storage media and their economic implications
[SAND-78-8672] 21 p0189 N79-11537
Thermochemical energy storage and transport program
[SAND-78-8056] 21 p0221 N79-14570
User's guide for MIRVAL: A computer code for comparing designs of heliostat-receiver optics for central receiver solar power plants
[SAND-77-8280] 24 p0729 N79-28932
Formation of protective layers on alloys developed for use in coal gasification environments
[SAND-78-8277] 24 p0765 N79-31383
Recent advances in thermochemical energy storage and transport
[SAND-78-8505] 24 p0791 N79-32720

SANTA CLARA UNIV., CALIF.
Comparative automotive engine operation when fueled with ethanol and methanol
[HCP/W1737-01] 21 p0201 N79-13189

SCHAFER (W. J.) ASSOCIATES, INC., ARLINGTON, VA.
New candidate lasers for power beaming and discussion of their applications
21 p0110 A79-16622

SCHUMACHER (J. C.) CO., OCEANSIDE, CALIF.
The production of solar cell grade silicon from bromosilanes
[NASA-CR-158362] 22 p0358 N79-20482

SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF.
Proceedings of the Engineering Foundation Conference on Clean Combustion of Coal
[PB-282949/7] 21 p0171 N79-10243

SCIENTIFIC SERVICE, INC., REDWOOD CITY, CALIF.
Opportunities for energy conservation in finished concrete products
[HCP/CS-1549] 24 p0772 N79-31782

SENSOR TECHNOLOGY, INC., CHATSWORTH, CALIF.
A high volume cost efficient production macrostructuring process
23 p0499 A79-40904
Development of low-cost, high energy-per-unit-area solar cell modules
[NASA-CR-158556] 23 p0550 N79-23515
Automated array assembly task in-depth study of silicon wafer surface texturizing
[NASA-CR-162161] 24 p0770 N79-31771
Array automated assembly task low cost silicon solar array project, phase 2
[NASA-CR-162174] 24 p0771 N79-31773

SETON, JOHNSON AND ODELL, INC., PORTLAND, OREG.
Environmental management and energy facility siting in the coastal zone
[PB-292947/9] 23 p0585 N79-26539

SHAKER RESEARCH CORP., BALLSTON LAKE, N. Y.
Development of sensitized pick coal interface detector system
[NASA-CR-161225] 23 p0556 N79-24417

SHELL RESEARCH LTD., CHESTER (ENGLAND).
Future aviation fuels fuel suppliers views
21 p0202 N79-13194

SIERRA CLUB, WASHINGTON, D.C.
Possible environmental effects of increased coal use in California
23 p0592 N79-27604

SIGMA RESEARCH, INC., RICHLAND, WASH.
Passive thermosyphon solar heating and cooling module with supplementary heating
[NASA-CR-150849] 21 p0229 N79-15402

SILTEC CORP., MENLO PARK, CALIF.
LSA large area silicon sheet task continuous liquid feed Czochralski growth
[NASA-CR-158366] 22 p0357 N79-20281
LSA large area silicon sheet task enhanced I.D. slicing technology for silicon ingots
[NASA-CR-162359] 24 p0798 N79-33567

SOCIETE BERTIN ET CIE, PLAISIR (FRANCE).
High Speeds and aerotrain
23 p0551 N79-23836

SOCIETE NATIONALE INDUSTRIELLE AEROSPATIALE, CANNES (FRANCE).
Design concept and feasibility study of a flexible deployable, solar panel generator used on a teledetection satellite
[S-1267-CA/81-VOL-1] 23 p0599 N79-27708
Heat pipes in the thermal control of communication satellites of the forthcoming generation (H-SAT)
24 p0764 N79-31278

SOCIETY OF PETROLEUM INDUSTRY BIOLOGISTS, LOS ANGELES, CALIF.
Energy/environment 1978: Symposium on energy development impacts
[PB-288578/8] 22 p0355 N79-19470

SOHIO PETROLEUM CO., CLEVELAND, OHIO.
Identification of probable automotive fuels consumption: 1985-2000, executive summary
[HCP/W3684-01/2] 21 p0194 N79-12249

SOLAR ACTION, INC., WASHINGTON, D. C.
Citizens' solar program: State reports on barriers and strategies to renewable energy development
[HCP/06308-01] 23 p0598 N79-27703

SOLAR DESIGNS, TAYLORS, S. C.
Solar hot water system installed at Anderson, South Carolina
[NASA-CR-150856] 21 p0229 N79-15405

SOLAR ENGINEERING AND EQUIPMENT CO., METAIRIE, LA.
Installation package for Hyde Memorial Observatory, Lincoln, Nebraska
[NASA-CR-150867] 22 p0334 N79-16373
Installation package for a solar heating system
[NASA-CR-150876] 22 p0349 N79-18454
SOLAR ENGINEERING AND MFG. CO., DEERFIELD BEACH, FLA.
Design and installation package for solar hot water system
[NASA-CR-150859] 21 p0220 N79-14556
SOLAREX CORP., ROCKVILLE, MD.
High efficiency ultrathin silicon solar cells
24 p0692 A79-51903
Pilot line report: Development of a high efficiency thin silicon solar cell
[NASA-CR-158028] 21 p0219 N79-14548
Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158095] 22 p0334 N79-16368
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-158172] 22 p0354 N79-19459
Evaluation of the technical feasibility and effective cost of various wafer thicknesses for the manufacture of solar cells
[NASA-CR-158588] 23 p0549 N79-23507
Analysis of the effects of impurities in silicon
[NASA-CR-157439] 23 p0559 N79-24456
High efficiency, high density terrestrial panel
[NASA-CR-162167] 24 p0770 N79-31765
Development of an improved high efficiency thin silicon solar cell
[NASA-CR-162159] 24 p0770 N79-31767
Thin cells for space
24 p0784 N79-32652
SOLARON CORP., COMMERCE CITY, COLO.
System design package for a solar heating and cooling system installed at Akron, Ohio
[NASA-CR-161192] 23 p0547 N79-23490
Installation package for the Solaron solar subsystem
[NASA-CR-161190] 23 p0548 N79-23491
SOLARON CORP., DENVER, COLO.
Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150850] 21 p0205 N79-13498
Prototype solar heating and cooling systems including potable hot water
[NASA-CR-150861] 22 p0334 N79-16372
SOLCOST SERVICE CENTER, FORT COLLINS, COLO.
SOLCOST: Space heating handbook with service hot water and heat loads calculations
[DOE/CS-0042/3] 23 p0564 N79-24501
SOLAR SYSTEMS OF VIRGINIA, INC., HAMPTON.
Cost effective solar hot water system for Econo-Travel Motor Hotel located at Woodbridge, Virginia
[COO-4661-1] 24 p0739 N79-29635
Cost effective solar hot water system for Econo-Travel Motor Hotel, Chesapeake, Virginia
[COO-4663-1] 24 p0757 N79-30812
SOUTH CAROLINA UNIV., COLUMBIA.
A study of the effective resistance of the diffused layer and its effect on solar cell performance
22 p0367 N79-21541
SOUTH COAST TECHNOLOGY, INC., SANTA BARBARA, CALIF.
Alternate engines: State of the art study
[PB-293940/3] 24 p0720 N79-28596
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY, RAPID CITY.
Solar energy system installed at Mount Rushmore National Visitor Center in Keystone, South Dakota
[NASA-CR-161238] 23 p0595 N79-27661
SOUTHERN CALIFORNIA EDISON CO., ROSEMEAD.
Using coal inside California for electric power
23 p0591 N79-27598
Direct firing of coal for power production
23 p0592 N79-27612
SOUTHERN CALIFORNIA GAS CO., LOS ANGELES.
Synthetic natural gas in California: When and why
23 p0593 N79-27615
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
Evaluations of novel particulate control devices
[PB-283973/6] 21 p0199 N79-12601
Evaluation of electrostatic precipitator during SRC combustion tests
[PB-285864/5] 21 p0223 N79-14618
Study of electrostatic precipitators installed on oil-fired burners
[EPRI-FP-792-VOL-2] 24 p0760 N79-30848
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
US Army/Environmental Projection Agency re-refined engine oil program
[AD-A056806] 21 p0171 N79-10216
Identification of probable automotive fuels consumption: 1985-2000, executive summary
[HCP/W3684-01/2] 21 p0194 N79-12249
Identification of probable automotive fuels composition: 1985-2000
[HCP/W3684-01/1] 21 p0201 N79-13191
High sulfur fuel effects in a two-cycle high speed army diesel engine
[AD-A059534] 21 p0216 N79-14232
Direct utilization of crude oil as fuel in the US Army four-cycle diesel engine, model LDT-465-1C
[AD-A062387] 22 p0357 N79-20279
Single-cylinder diesel engine tests with unstabilized water-in-fuel emulsions
[AD-A062751] 22 p0366 N79-21406
Crude and product storage: State-of-the-art review and assessment
[AD-A066605] 23 p0568 N79-25243
SPACE GLOBAL, LA JOLLA, CALIF.
Statement of Doctor Krafft A. Ehricke, President, Space Global, La Jolla, California
21 p0224 N79-15108
SPECTRAL DATA CORP., ARLINGTON, VA.
Energy and remote sensing applications
22 p0255 A79-22516
SPECTROLAB, INC., SYLMAR, CALIF.
Ultra-thin silicon solar cells for high performance panel applications
21 p0029 A79-10243
High efficiency solar panel /HESP/
23 p0503 A79-40951
Thin silicon solar cell performance characteristics
23 p0503 A79-40953
Solar cell workshop
21 p0170 N79-10141
High Efficiency Solar Panel (HESP-2)
[AD-A065009] 23 p0544 N79-22642
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158700] 23 p0572 N79-25505
Silicon solar cell process development, fabrication and analysis
[NASA-CR-158740] 23 p0580 N79-26490
Array automated assembly, phase 2
[NASA-CR-158728] 23 p0581 N79-26498
SPIRE CORP., BEDFORD, MASS.
Integral assembly of photovoltaic arrays using glass
22 p0241 A79-20883
Optimization of tapered busses for solar cell contacts
23 p0440 A79-36638
Production technology for high efficiency ion implanted solar cells
23 p0509 A79-41000
Terrestrial solar arrays with integral glass construction
23 p0509 A79-41004
Development of pulsed processes for the manufacture of solar cells
[NASA-CR-158706] 23 p0570 N79-25484
Applications of ion implantation to high performance, radiation tolerant silicon solar cells
24 p0784 N79-32648
Integral glass encapsulation for solar arrays
[NASA-CR-162361] 24 p0798 N79-33564
SPRINGBORN LABS., INC., ENFIELD, CONN.
Low-cost encapsulation materials for terrestrial solar cell modules
23 p0439 A79-36636
Encapsulation task of the low-cost silicon solar array project. Investigation of test methods, material properties, and processes for solar cell encapsulants
[NASA-CR-157939] 21 p0195 N79-12544

SRI INTERNATIONAL CORP., MENLO PARK, CALIF.
Novel duplex vapor electrochemical method for silicon solar cells
[NASA-CR-158039] 21 p0218 N79-14537
A pilot study of the potential for Navy utilization of solid waste derived fuels to offset fossil fuels consumption
[AD-A067165] 23 p0582 N79-26510
Mission analysis for the federal fuels from biomass program. Volume 5: Biochemical conversion of biomass to fuels and chemicals
[TID-29093-VOL-5] 24 p0715 N79-28361
Preliminary market evaluation for gas produced by underground gasification of western coal
[SAN-0115-T124-1] 24 p0733 N79-29369
Mission analysis for the federal fuels from biomass program. Volume 2: Mission selection, market penetration modeling, and economic evaluation
[TID-29091] 24 p0733 N79-29375
Modeling of stationary air pollution sources in the central and western Kern County oil Fields. Task Report. Volume 2: Appendices
[PB-294813/1] 24 p0761 N79-30856
Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research
[FE-2202-39] 24 p0765 N79-31411
Mission analysis for the federal fuels from biomass program. Volume 4: Thermochemical conversion of biomass to fuels and chemicals
[SAN-0115-T3] 24 p0779 N79-32384
Mission analysis for the Federal Fuels from biomass program. Volume 1: Summary and conclusions
[SAN-0115-T2] 24 p0779 N79-32385
Modeling of stationary air pollution sources in the central and western Kern County oil fields. Task report. Volume 1: Text
[PB-294812/3] 24 p0803 N79-33639
STANDARD OIL CO. OF INDIANA, WHITING.
Identification of probable automotive fuels consumption: 1985-2000, executive summary
[HCP/W3684-01/2] 21 p0194 N79-12249
STANFORD RESEARCH INST., MENLO PARK, CALIF.
Preliminary environmental assessment of energy conversion processes for agricultural and forest product residues, volume 1
[PB-281189/1] 21 p0178 N79-10574
STANFORD UNIV., CALIF.
Energy and the economy
[EPRI-EA-620-VOL-1] 21 p0189 N79-11539
Alternative models of energy demand
22 p0353 N79-19440
Axial field limitations in MHD generators
[FE-2341-8] 22 p0362 N79-20512
Insulating wall boundary layer in a Faraday MHD generator
[FE-23417] 22 p0365 N79-21310
Preparation and properties of Au-(-n) A sub X Ga sub 1 minus X aS-(n)GaAs Schottky-Barrier solar cells
23 p0579 N79-26473
In-situ combustion models for the steam plateau and for fieldwide oil recovery
24 p0732 N79-29353
Evaluation of intermediate-period seismic waves as a geothermal exploration tool
24 p0744 N79-29716
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10273] 24 p0768 N79-31730
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E79-10274] 24 p0768 N79-31731
Transient flow of non-Newtonian power-law fluids in porous media
[SAN-1265-9] 24 p0781 N79-32516
STATE GEOLOGIST'S OFFICE, SANTA FE, N. MEX.
Estimates of New Mexico's future oil production including reserves of the 50 largest pools
[PB-291780/5] 23 p0540 N79-22597
STATE UNIV. OF NEW YORK AT ALBANY.
New York State solar energy atlas
[PB-295453/5] 24 p0802 N79-33599
STATE UNIV. OF NEW YORK AT BUFFALO.
The advanced thermionic converter with microwave power as an auxiliary ionization source
21 p0153 A79-18470
Fundamental solid electrode studies related to corrosion prevention, fuel cells and batteries
[AD-A064554] 23 p0544 N79-22641
STATENS STRAALSKYDDINSTITUT, STOCKHOLM (SWEDEN).
Production of hot water with the aid of solar energy: Conditions and costs
[SIB-R-83-1978] 23 p0598 N79-27700
STD RESEARCH CORP., ARCADIA, CALIF.
Magnetogasdynamic phenomena in pulsed MHD flows
[AD-A070590] 24 p0794 N79-33042
STEARNS-ROGER CORP., DENVER, COLO.
Economic evaluation of fabric filtration versus electrostatic precipitation for ultrahigh particulate collection efficiency
[EPRI-FP-775] 24 p0796 N79-33352
STONE AND WEBSTER ENGINEERING CORP., N. Y.
Technical notes for the conceptual design for an atmospheric fluidized-bed direct combustion power generating plant
[HCP/T2583-01/2] 21 p0203 N79-13280
STONE (RALPH) AND CO., INC., LOS ANGELES, CALIF.
Environmental assessment of solid residues from fluidized-bed fuel processing
[PB-282940/6] 21 p0179 N79-10968
STUTTGART UNIV. (WEST GERMANY).
Expert opinion on wind energy conversion systems designed by Hermann Honnef
[BMFT-FB-T-77-35] 22 p0349 N79-18456
Heat pipe technology for spacecraft thermal control
24 p0764 N79-31274
SUEDDEUTSCHE-METALLWERKE G.M.B.H., WALLDORF (WEST GERMANY).
Solar water heating
[BMFT-FB-T-77-42] 22 p0349 N79-18457
SULZER BROS. LTD., WINTERTHUR (SWITZERLAND).
The gas turbine/steam turbine cycle with coal gasification
24 p0723 N79-28737
SUNKEEPER CONTROL CORP., ANDOVER, MASS.
Design package for programmable controller and hydronic subsystem
[NASA-CR-161151] 22 p0371 N79-21619
SWEDISH COUNCIL FOR BUILDING RESEARCH, STOCKHOLM.
Storage of heat: A survey of efforts and possibilities
[PB-295936/9] 24 p0801 N79-33592
SYNCAL CORP., SUNNYVALE, CALIF.
The application of solar thermoelectric generators in near-sun missions
21 p0023 A79-10187
Analytical predictions of selenide RTG power degradation
21 p0026 A79-10223
Modified silicon-germanium alloys with improved performance
21 p0027 A79-10225
Comprehensive thermoelectric properties of n- and p-type 78a/o Si - 22a/o Ge alloy
22 p0259 A79-23604
Design concepts of solar thermoelectric generators in space applications
22 p0260 A79-23612
Solar thermoelectric power generation for Mercury orbiter missions
[AIAA 79-0915] 23 p0425 A79-34738
SYRACUSE RESEARCH CORP., N. Y.
Health effects associated with diesel exhaust emissions, literature review and evaluation
[PB-289817/9] 22 p0364 N79-20727
SYSTEMS RESEARCH LABS., INC., DAYTON, OHIO.
High energy MHD fuels development program
[AD-A060156] 21 p0216 N79-14239
SYSTEMS SCIENCE AND SOFTWARE, LA JOLLA, CALIF.
NASCAP modelling of high-voltage power system interactions with space charged-particle environments
23 p0479 A79-39806

T

TECHNICAL MARKETING ASSOCIATES, INC., CONCORD, MASS.
Market definition studies for photovoltaic highway applications
[NASA-CR-159477] 22 p0354 N79-19451

TECHNICAL REPORT SERVICES, ROCKY RIVER, OHIO.
Evaluation of urethane for feasibility of use in wind turbine blade design
[NASA-CR-159530] 22 p0360 N79-20497

TECHNICOLOR GRAPHIC SERVICES, INC., SIOUX FALLS, S. DAK.
A selected bibliography: Remote sensing techniques for evaluating the effects of surface mining
[PB-294299/3] 24 p0735 N79-29584

TECHNION - ISRAEL INST. OF TECH., HAIFA.
Aeroelastic stability and response of horizontal axis wind turbine blades
23 p0483 A79-40117

TECHNISCHE HOGESCHOOL, EINDHOVEN (NETHERLANDS).
Experimental investigation on the discharge structure in a noble gas MHD generator
[TH-78-E-79] 22 p0350 N79-18758

TECHNISCHE UNIV., BERLIN (WEST GERMANY).
MOSGEN: A potential European contribution in developing large solar generators suitable for growing power levels up to SPS-systems
24 p0752 N79-30752

TECHNISCHE UNIVERSITAET, MUNICH (WEST GERMANY).
Powersat: An evaluation
[TUM-LRT-TB-22/2] 23 p0599 N79-27707

TEKNEKRON, INC., BERKELEY, CALIF.
Economic comparison of fabric filters and electrostatic precipitators for particulate control on coal-fired utility boilers
23 p0592 N79-27610

TELEDYNE CONTINENTAL MOTORS, MOBILE, ALA.
Concepts for reducing exhaust emissions and fuel consumption of the aircraft piston engine
[SAE PAPER 790605] 23 p0440 A79-36737

TENNESSEE UNIV., KNOXVILLE.
Energy conservation through sealing technology
22 p0237 A79-20700
Accuracy analysis of pointing control system of solar power station
[NASA-CR-150880] 21 p0215 N79-14143
Automatic tension control for winding superconducting coils
[Y/EN-257] 24 p0734 N79-29384

TENNESSEE UNIV. SPACE INST., TULLAHOMA.
Applying NASA remote sensing data to geologically related regional planning problems in Tennessee
[E79-10095] 22 p0339 N79-17289

TETRA TECH, INC., ARLINGTON, VA.
US Navy energy plan and program, 1978
[AD-A058054] 21 p0197 N79-12560
Department of the Navy energy fact book
[AD-A069138] 24 p0738 N79-29614

TEXACO, INC., MONTEBELLO, CALIF.
The Texaco coal gasification process for manufacture of medium BTU gas
23 p0593 N79-27614

TEXAS INSTRUMENTS, INC., DALLAS.
Optimized solar module design
23 p0510 A79-41005
A mobile apparatus for solar collector testing
[ASME PAPER 79-DE-5] 24 p0641 A79-47651
A device model for the tandem junction solar cell
24 p0714 A79-53938
Automated array assembly, phase 2
[NASA-CR-158599] 23 p0550 N79-23512
Design considerations for the Tandem Junction Solar Cell
24 p0784 N79-32651

TEXAS UNIV. AT AUSTIN.
Solid desiccant air conditioning with silica gel using solar energy
21 p0181 N79-11464
Energy and economic analysis of industrial process heat recovery with heat pumps
22 p0331 N79-16210
Testing and sampling procedures for geothermal-compressed wells
[UT/CES-GR-2] 24 p0726 N79-28770

THERMO ELECTRON CORP., WALTHAM, MASS.
Lithium and potassium heat pipes for thermionic converters
21 p0013 A79-10113
Thermionic energy converter investigations
24 p0699 A79-51981
Systems definition space-based power conversion systems
[NASA-CR-150268] 23 p0546 N79-23483

Energy conservation opportunities in commercial appliances
[ORNL/SUB-7261/1] 24 p0757 N79-30810

THOMPSON RAMO WOOLDRIDGE, INC., CLEVELAND, OHIO.
Electromagnetic radiation energy arrangement
[NASA-CASE-HQO-00428-1] 22 p0352 N79-19186

TOLEDO UNIV., OHIO.
Evaluation of MOSTAS computer code for predicting dynamic loads in two-bladed wind turbines
[AIAA 79-0733] 22 p0298 A79-29007
Transient response to three-phase faults on a wind turbine generator
21 p0180 N79-11312

TORONTO UNIV. (ONTARIO).
Material and energy balances in the production of ethanol from wood
[CONF-7806139-1] 23 p0589 N79-27338

TOYO KOGYO CO. LTD., HIROSHIMA (JAPAN).
Development status of rotary engine at Toyo Kogyo
22 p0329 N79-15964

TRANSPORTATION AND ECONOMIC RESEARCH ASSOCIATES, INC., ARLINGTON, VA.
Report on capital requirements for transportation of energy materials
[TID-28599] 23 p0545 N79-22965

TRANSPORTATION RESEARCH BOARD, WASHINGTON, D.C.
Environmental conservation concerns in transportation: Energy, noise, and air quality
[PB-286550/9] 21 p0232 N79-15868

TRANSPORTATION SYSTEMS CENTER, CAMBRIDGE, MASS.
The emissions and fuel economy of a Detroit diesel 6-71 engine burning a 10-percent water-in-fuel emulsion
[AD-A058550] 21 p0203 N79-13375
Proceedings of symposium on water-in-fuel emulsions in combustion
[AD-A061503] 22 p0338 N79-17019
The airport performance model. Volume 1: Extensions, validations, and applications
[AD-A062863] 23 p0568 N79-25040
Diesel bus performance simulation program
[PB-295524/3] 24 p0763 N79-31110

TRW DEFENSE AND SPACE SYSTEMS GROUP, REDONDO BEACH, CALIF.
Solar array workshop
21 p0170 N79-10142
Catalytic conversion of coal energy to hydrogen
[FE-2206-14] 21 p0180 N79-11239
High pressure MHD coal combustors investigation
[FE-2706-08] 22 p0362 N79-20510
Energy recovery from army ammunition plant solid waste by pyrolysis
[AD-A067519] 24 p0724 N79-28743

TRW ENERGY SYSTEMS, REDONDO BEACH, CALIF.
Technology overview reports for eight shale oil recovery processes
[PB-295665/4] 24 p0797 N79-33552
Analysis of battery storage for commercial buildings, phase 1
[COO-4556-2] 24 p0800 N79-33586

TRW, INC., DURHAM, N. C.
Evaluation of dry sorbents and fabric filtration for FGD (Flue Gas Desulfurization)
[PB-289921/9] 22 p0373 N79-21661
Demonstration of Wellman-Lord/Allied Chemical FGD technology: Acceptance test results
[PB-290514/9] 23 p0566 N79-24534

TRW, INC., MCLEAN, VA.
Cost and performance evaluation of passive solar systems
[ANL/EES-TM-34] 24 p0753 N79-30774
Methodology for the analysis of investment alternatives to stimulate development and technology transfer for energy technologies
[TID-28971] 24 p0757 N79-30809
Analysis of investment alternatives to stimulate development and technology transfer for energy technologies, solar photovoltaics, a case study
[TID-28968] 24 p0773 N79-31795
Methane recovery from coalbeds project technology test projects evaluation of candidate projects
[DOE/TIC-10128] 24 p0780 N79-32390

TRW, INC., REDONDO BEACH, CALIF.
Environmental assessment data base for high-Btu gasification technology. Volume 1: Technical discussion
[PB-288602/6] 22 p0350 N79-18487

Environmental assessment data base for high-Btu gasification technology. Volume 2: Appendices A, B, and C
[PB-288603/4] 22 p0350 N79-18488
Environmental assessment data base for high-Btu gasification technology. Volume 3: Appendices D, E, and F
[PB-288604/2] 22 p0350 N79-18489
Solar cell module assembly jig
[NASA-CASE-XGS-00829-1] 22 p0353 N79-19447

TRW SYSTEMS AND ENERGY, REDONDO BEACH, CALIF.
High temperature, low mass solar blanket development
24 p0691 A79-51902

TRW SYSTEMS, REDONDO BEACH, CALIF.
Applicability of petroleum refinery control technologies to coal conversion
[PB-288630/7] 22 p0352 N79-19173

TRW SYSTEMS GROUP, REDONDO BEACH, CALIF.
Study of automated module fabrication for lightweight solar blanket utilization
[NASA-CR-162157] 24 p0770 N79-31763

TULSA UNIV., OKLA.
Geothermal ground noise measurements at Roosevelt Hot Springs and Cove Fort, Utah
[PB-291624/5] 23 p0545 N79-22648

U

ULTRASYSTEMS, INC., IRVINE, CALIF.
Economic considerations in coverting from oil/gas firing to coal
23 p0592 N79-27611

ULTRASYSTEMS, INC., MCLEAN, VA.
End use energy consumption data base: Series 1 tables
[PB-281817/7] 21 p0177 N79-10560

UNIFIED INDUSTRIES, INC., ALEXANDRIA, VA.
Army energy plan
[AD-A057987] 21 p0197 N79-12562
Recommended changes to Executive Order 12003 and related authorities
[DOE/TIC-10066] 24 p0775 N79-31820
Analysis and update of roles and responsibilities derived from Executive Order 12003 and related authorities
[DOE/TIC-10064] 24 p0776 N79-31823

UNION CARBIDE CORP., NEW YORK.
Low-cost solar array project. Feasibility of the silane process for producing semiconductor-grade silicon
[NASA-CR-162172] 24 p0771 N79-31777

UNION CARBIDE CORP., TONAWANDA, N.Y.
Study of hydrogen recovery systems for gas vented while refueling liquid-hydrogen fueled aircraft
[NASA-CR-158991] 22 p0346 N79-18057

UNITED ENGINEERS AND CONSTRUCTORS, INC., PHILADELPHIA, PA.
Cooling systems addendum: Capital and total generating cost studies
[PB-287306/5] 21 p0231 N79-15431
Total generating costs: Coal and nuclear plants
[NUREG-0248] 24 p0742 N79-29663

UNITED NATIONS, NEW YORK, N. Y.
Characteristics of a typical village in the solar belt of the developing countries of Asia, Africa, and Latin America
23 p0571 N79-25497

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION, VIENNA (AUSTRIA).
International Forum on Appropriate Industrial Technology. Appropriate technology for rural energy supply in developing countries
[PB-294602/8] 24 p0760 N79-30840
Technology for solar energy utilization
[PB-296572/1] 24 p0802 N79-33598

UNITED TECHNOLOGIES CORP., EAST HARTFORD, CONN.
Development of advanced fuel cell system
[NASA-CR-159443] 21 p0196 N79-12553

UNITED TECHNOLOGIES CORP., SOUTH WINDSOR, CONN.
Venture analysis case study for on-site fuel cell energy systems
[FCR-0783-VOL-1] 22 p0361 N79-20505
Advanced technology fuel cell program
[EPRI-EM-956] 23 p0598 N79-27702
Strip cell test and evaluation program
[NASA-CR-159652] 24 p0772 N79-31784
Advanced technology light weight fuel cell program
[NASA-CR-159653] 24 p0800 N79-33581

UNITED TECHNOLOGIES CORP., WINDSOR LOCKS, CONN.
Design, fabrication, and test of a composite material wind turbine rotor blade
[NASA-CR-135389] 21 p0173 N79-10525

UNIVERSITY OF EASTERN NEW MEXICO, PORTALES.
Methane production from carbon oxides over borohydride-reduced transition metals
[PB-286385/0] 21 p0226 N79-15177

UNIVERSITY OF SOUTHEASTERN MASSACHUSETTS, NORTH DARTMOUTH.
Geothermal power plants of the Soviet Union. A technical survey of existing and planned installations
[COO-4051-41] 24 p0787 N79-32686

UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.
Cooking with offshore oil: A handbook for California local government
[PB-288656/2] 22 p0331 N79-16140

UNIVERSITY OF WESTERN KENTUCKY, BOWLING GREEN.
Evaluation of Rankine cycle air conditioning system hardware by computer simulation
24 p0609 A79-45212

UOP, INC., DES PLAINES, ILL.
Optimization of PtDoped KOCITE (trade name) electrodes in H3PO4 fuel cells
[AD-A061242] 22 p0342 N79-17340

UTAH STATE UNIV., LOGAN.
Local perceptions of energy development: The case of the Kaiparowits Plateau
[PB-287314/9] 22 p0335 N79-16380

UTAH UNIV., SALT LAKE CITY.
Hydropyrolysis of coal derived liquids and related model compounds
23 p0553 N79-24171
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-9] 24 p0719 N79-28363
Applied research and evaluation of process concepts for liquefaction and gasification of western coals
[FE-2006-12] 24 p0766 N79-31415

UTAH WATER RESEARCH LAB., LOGAN.
The impact of energy resource development on water resource allocations
[PB-286135/9] 21 p0231 N79-15432

V

VANDERBILT UNIV., NASHVILLE, TENN.
Investigation of a staged plasma-focus apparatus
22 p0255 A79-22365

VARIAN ASSOCIATES, LEXINGTON, MASS.
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the Low Cost Silicon Solar Array project
[NASA-CR-158082] 22 p0333 N79-16365
Slicing of silicon into sheet material: Silicon sheet growth development for the large area silicon sheet task of the low cost silicon solar array project
[NASA-CR-158732] 23 p0586 N79-26979

VARIAN ASSOCIATES, PALO ALTO, CALIF.
High performance GaAs photovoltaic cells for concentrator applications
[SAND-78-7018] 21 p0187 N79-11521

VARTA BATTERIE A.G., KELKHEIM (WEST GERMANY).
Demands and effects of solar technology on electric power storage
[AED-CONF-78-155-047] 23 p0596 N79-27678

VERSAR, INC., SPRINGFIELD, VA.
Assessment of coal cleaning technology
[PB-287091/3] 22 p0330 N79-16139
Assessment of coal cleaning technology: An evaluation of chemical coal cleaning processes
[PB-289493/9] 22 p0372 N79-21625

VERSUCHSANSTALT FUER GEOELEKTRIK UND BLITZSCHUTZ, VIENNA (AUSTRIA).
Investigation of flow phenomena in pulverized coal gasification for the new process
[BMFT-FB-T-78-27] 23 p0590 N79-27341

VIRGINIA HIGHWAY AND TRANSPORTATION RESEARCH COUNCIL, CHARLOTTESVILLE.
Opportunities for energy conservation in transportation planning and systems management
[PB-291743/3] 23 p0544 N79-22643

VIRGINIA POLYTECHNIC INST. AND STATE UNIV., BLACKSBURG.

Analytical methods for evaluating two-dimensional effects in flat-plate solar collectors
21 p0181 N79-11462

Evaluation and targeting of geothermal energy resources in the southeastern United States
[VPI-SU-5648-1] 21 p0204 N79-13478

A dynamic multi-criteria analysis of spent-nuclear-fuel alternatives
23 p0567 N79-24813

VIRGINIA UNIV., CHARLOTTESVILLE.

The use of chlorophyll in a novel solar battery
24 p0736 N79-29594

VON KARMAN INST. FOR FLUID DYNAMICS, RHODE-SAINT-GENESE (BELGIUM).

Closed cycle gas turbines, volume 1
[VKI-LECTURE-SERIES-100-VOL-1] 22 p0331 N79-16260

VKI Short Course on Magnetohydrodynamic Accelerators and Generators
[VKI-LECTURE-SERIES-8] 23 p0545 N79-22891

Instrumentation
23 p0545 N79-22894

Tracer experiments in the field. Example of application for the determination of slide levels for stack discharges at a nuclear research establishment
23 p0551 N79-23539

Lasers: Their applications and operational requirements
23 p0590 N79-27494

Aerodynamic separation of gases and isotopes: Recent advances
[VKI-LEC-SER-1978-8] 24 p0720 N79-28506

Combined cycles for power generation, volume 1
[VKI-LEC-SER-1978-6-VOL-1] 24 p0723 N79-28732

Combined cycles for power generation
[VKI-LEC-SER-1978-6-VOL-2] 24 p0723 N79-28738

VULCAN-CINCINNATI, INC., OHIO.

Methanol from coal
23 p0593 N79-27619

W

WAHLER (W. A.) AND ASSOCIATES, PALO ALTO, CALIF.

Pollution control guidelines for coal refuse piles and slurry ponds
[PB-291369/7] 22 p0373 N79-21682

WASHINGTON UNIV., SEATTLE.

Absorption of solar radiation by alkali vapors
21 p0108 A79-16612

A high temperature Rankine binary cycle for ground and space solar engine applications
21 p0108 A79-16613

MHD conversion of solar energy
21 p0109 A79-16614

Laser aircraft propulsion
21 p0109 A79-16618

A new concept for solar pumped lasers
21 p0110 A79-16624

Laser aircraft
22 p0284 A79-26597

Solar-pumped lasers for space power transmission
[AIAA PAPER 79-1015] 23 p0460 A79-38202

New energy conversion techniques in space, applicable to propulsion
[AIAA PAPER 79-1338] 23 p0493 A79-40490

Computer modeling for a space power transmission system
24 p0694 A79-51941

Blackbody optical pumping of carbon dioxide laser mixtures
21 p0203 N79-13343

A methodology for evaluating the potential materials and energy recovery from municipal solid waste
21 p0215 N79-13935

Assessing the impact of nuclear-power plants on the environment
[PB-290858/0] 23 p0545 N79-22662

A control system analysis of the energy growth model: Coal
24 p0736 N79-29595

Assessing the impact of nuclear-power plants on the environment
[NUREG-CR-0552] 24 p0777 N79-31845

WASHINGTON UNIV., ST. LOUIS, MO.

The ground water and energy supply situation for Great Plains irrigation
[PB-286002/1] 21 p0222 N79-14586

WATER PURIFICATION ASSOCIATES, CAMBRIDGE, MASS.

Water-related environmental effects in fuel conversion, volume 1. Summary
[PB-288313/0] 22 p0351 N79-18834

Water-related environmental effects in fuel conversion. Volume 2: Appendices
[PB-288874/1] 22 p0356 N79-19496

Water related environmental effects in fuel conversion. 1: Summary volume
[FE-2445-1-VOL-1] 24 p0793 N79-32747

WATERLOO UNIV. (ONTARIO).

Methods for reducing heat losses from flat plate solar collectors, phase 2
[COO-2597-4] 21 p0188 N79-11533

WAYNE STATE UNIV., DETROIT, MICH.

Cuprous oxide photovoltaic cells
[PB-290529/7] 23 p0565 N79-24514

Cuprous oxide photovoltaic cells
[CONF-780619-16] 24 p0753 N79-30777

WEST VIRGINIA UNIV., MORGANTOWN.

Design, instrumentation, and calibration of a vertical axis wind turbine rotor
[TID-27754] 21 p0174 N79-10533

Thermoelastic solutions for in-situ gasification of coal
22 p0330 N79-16135

Simulation of fluidized bed coal combustors
[NASA-CR-159529] 22 p0359 N79-20487

Heat transfer simulation in underground coal liquefaction
23 p0555 N79-24292

Impacts of the Resource Conservation and Recovery Act on the siting of coal-conversion energy facilities in the United States
[ORNL/OEPA-12] 24 p0791 N79-32724

A free-vortex model with numerical solution for the unsteady lifting characteristics of straight bladed darrieus wind turbines
24 p0794 N79-33158

WESTINGHOUSE ELECTRIC CORP., EAST PITTSBURGH, PA.

Methodology for solar-thermal power plant evaluation
[EPRI-ER-869] 24 p0739 N79-29631

WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.

Computer modeling of dendritic web growth processes and characterization of the material
23 p0503 A79-40940

Four ignition TNS Tokamak reactor systems: Design summary
[ORNL/SUB-7117/25] 21 p0193 N79-11889

Methane utilization from coalbeds for power generation
[TID-28408] 22 p0352 N79-19171

Development, testing and evaluation of MHD materials and component designs
[FE-2248-19] 22 p0369 N79-21558

WESTINGHOUSE ELECTRIC CORP., TAMPA, FLA.

Design and cost study of a nickel-iron oxide battery for electric vehicles. Volume 2: Public report
[ANL-K-3723-VOL-1] 21 p0222 N79-14579

WESTINGHOUSE ELECTRIC CORP., TRAFFORD, PA.

Development of a process for a high capacity arc heater production of silicon for solar arrays
[NASA-CR-158745] 23 p0581 N79-26499

WESTINGHOUSE RESEARCH AND DEVELOPMENT CENTER, PITTSBURGH, PA.

Characterization of the effects of metallic impurities on silicon solar cell performance
23 p0504 A79-40960

Silicon web process development
[NASA-CR-158376] 22 p0357 N79-20282

Phase two of the array automated assembly task for the low cost solar array project
[NASA-CR-158359] 22 p0359 N79-20484

Thin film battery/fuel cell power generating system
[CONS/1197-9] 22 p0369 N79-21556

The array automated assembly task for the low cost solar array project, phase 2
[NASA-CR-158538] 23 p0560 N79-24469

Silicon web process development
[NASA-CR-158852] 24 p0722 N79-28722

Silicon web process development
[NASA-CR-162181] 24 p0770 N79-31762

WICHITA STATE UNIV., KANS.
Velocity, temperature, and electrical conductivity profiles in hydrogen-oxygen MHD duct flows
22 p0279 A79-26184
WILLISTON, MCNEIL AND ASSOCIATES, LAKEWOOD, COLO.
A time domain survey of the Los Alamos Region, New Mexico
[LA-7657-MS] 22 p0365 N79-21248
WILSON AND CO., SALINA, KANS.
Solar heating and hot water system installed at Southeast of Saline, Unified School District 306, Mentor, Kansas
[NASA-CR-161271] 24 p0737 N79-29602
WIRTSCHAFT UND INFRASTRUKTUR G.M.B.H. UND CO. PLANUNGS-KG, MUNICH (WEST GERMANY).
Statement and comparison between different studies on energy requirement
[BMFT-FB-T-77-92] 24 p0759 N79-30833
WISCONSIN UNIV. - MADISON.
Proposal to the United States Energy Research and Development Administration for continuation of fusion reactor technology studies
[COO-4636-1] 23 p0582 N79-26511
An assessment of wind characteristics and wind energy systems applications to electric utilities in Wisconsin and sections of Minnesota, Iowa and Illinois
24 p0736 N79-29593
Simulation and design of solar thermal processes
[COO-2588-2] 24 p0741 N79-29655
WOODARD-CLYDE CONSULTANTS, SAN FRANCISCO, CALIF.
Impact prediction manual for geothermal development
[PB-288128/2] 22 p0349 N79-18462
WOHL ASSOCIATES, ANCHORAGE, ALASKA.
Alaska OCS socioeconomic studies program. Assessment of change in the north slope, Beaufort Sea Region sociocultural systems
[PB-291918/1] 23 p0546 N79-22972
WORLD METEOROLOGICAL ORGANIZATION, GENEVA (SWITZERLAND).
Radiation regime of inclined surfaces
[WMO-467] 21 p0192 N79-11613
WYLE LABS., INC., HUNTSVILLE, ALA.
Indoor test for thermal performance evaluation on the Northrup concentrating solar collector
[NASA-CR-150804] 21 p0172 N79-10515
Thermal performance evaluation of the Calmac (liquid) solar collector
[NASA-CR-150819] 21 p0173 N79-10521
Largo hot water system long range thermal performance test report, addendum
[NASA-CR-150842] 21 p0204 N79-13492
Long-term weathering effects on the thermal performance of the Lennox/Honeywell (liquid) solar collector
[NASA-CR-150818] 21 p0204 N79-13493
Libbey-Owens-Ford solar collector static load test
[NASA-CR-150852] 21 p0205 N79-13494
LARGO hot water system thermal performance test report
[NASA-CR-150841] 21 p0205 N79-13500
Thermal performance evaluation of the Solargenics solar collector at outdoor conditions
[NASA-CR-150857] 21 p0228 N79-15401
Long term weathering effects on the thermal performance of the sunworks (liquid) solar collector
[NASA-CR-150899] 22 p0341 N79-17328
Thermal performance evaluation of MSFC hot air collectors with various flow channel depth
[NASA-CR-150900] 22 p0348 N79-18449
Long-term weathering effects on the thermal performance of the Libbey-Owens-Ford (liquid) solar collector
[NASA-CR-161093] 22 p0348 N79-18450
Long term weathering effects on the thermal performance of the solaron (air) solar collector
[NASA-CR-161166] 22 p0371 N79-21621
Indoor test for thermal performance evaluation of seven Elcam fin-tube solar collector configurations
[NASA-CR-161236] 23 p0594 N79-27657
Long-term weathering effects on the thermal performance of the solargenics (liquid) solar collector at outdoor conditions
[NASA-CR-150523] 24 p0737 N79-29601
Indoor test and long-term weathering effects on the thermal performance of the solar energy system (liquid) solar collector
[NASA-CR-150794] 24 p0749 N79-30715
Indoor test for thermal performance of the Sunmaster evacuated tube (liquid) solar collector
[NASA-CR-161306] 24 p0797 N79-33561
Indoor test for thermal performance of the GE TC-100 liquid solar collector eight- and ten-tube configuration
[NASA-CR-161305] 24 p0798 N79-33568
WYOMING UNIV., LARAMIE.
Kinetic modeling of pyrolysis and hydrogasification of carbonaceous materials
21 p0179 N79-11150

X

XEROX ELECTRO-OPTICAL SYSTEMS, PASADENA, CALIF.
Research on energy storage for solar thermal conversion
[NASA-CR-159427] 23 p0542 N79-22631

Z

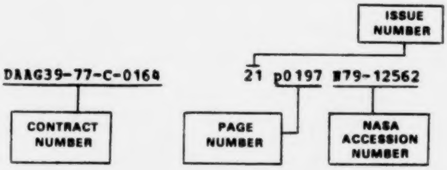
ZENTRALANSTALT FUER METEOROLOGIE UND GEODYNAMIK, VIENNA (AUSTRIA).
Meteorological measurement data for solar energy utilization
[ASSA-FA-5] 23 p0574 N79-25524
ZENTRALSTELLE FUER GEO-PHOTOGRAMMETRIE UND FERNERKUNDUNG, MUNICH (WEST GERMANY).
Application of LANDSAT data and digital image processing
[E79-10102] 22 p0339 N79-17291
ZIA ASSOCIATES, INC., BOULDER, COLO.
Heat pump/rock bed storage systems
[COO-4704-2] 24 p0789 N79-32705

CONTRACT NUMBER INDEX

ENERGY */A Continuing Bibliography (Issue 24)*

JANUARY 1980

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the *IAA* accession numbers appearing first. The accession number denotes the number by which the citation is identified in either the *IAA* or *STAR* section. Preceding the accession number are the issue and page number in the particular supplement in which the citation may be found.

AF PROJ. 2301
    21 p0196 N79-12559
AF PROJ. 2303
    21 p0230 N79-15415
AF PROJ. 2307
    22 p0352 N79-19305
AF PROJ. 2421
    21 p0226 N79-15203
AF PROJ. 3048
    21 p0216 N79-14231
    24 p0795 N79-33211
AF PROJ. 3145
    21 p0216 N79-14239
    22 p0342 N79-17341
    23 p0543 N79-22639
    23 p0544 N79-22640
    23 p0569 N79-25396
AF-AFOSR-74-2604
    21 p0052 A79-12986
AF-AFOSR-76-2997
    23 p0462 A79-38529
    24 p0646 A79-48654
AF-AFOSR-77-3413
    23 p0462 A79-38529
    24 p0646 A79-48654
AF-AFOSR-77-3437
    23 p0441 A79-36781
    23 p0508 A79-40992
AF-AFOSR-2572-74
    23 p0544 N79-22641
AF-AFOSR-3117-77
    21 p0196 N79-12559
AF-AFOSR-3384-77
    21 p0215 N79-14184
AID/CSD-2584
    21 p0171 N79-10240
ANL-31-109-38-3723
    21 p0222 N79-14579
ARPA ORDER 2397
    23 p0569 N79-25337
ARPA ORDER 2552
    22 p0250 A79-21704
ARPA ORDER 3520
    21 p0193 N79-11859
AT(04-3)-959
    21 p0026 A79-10222
    21 p0026 A79-10223
AT(11-1) 2533
    24 p0700 A79-51990
AT(29-1)-789
    21 p0037 A79-11780
    21 p0037 A79-11793
    22 p0280 A79-26202
    23 p0421 A79-34172
    23 p0423 A79-34281
    23 p0444 A79-36893
    23 p0480 A79-39938
    23 p0534 A79-43295
    23 p0537 A79-43682
    24 p0633 A79-46528
    24 p0655 A79-50194
    24 p0670 A79-51727
AT(40-1)-4478
    23 p0446 A79-37262
AT(45-1)-1830
    21 p0042 A79-11878
AT(49-24)-0351
    21 p0231 N79-15431
BMFT-ET-45
    21 p0123 A79-17345
BMFT-ET-4007-A
    23 p0510 A79-41010
BMFT-ET-4045-A
    21 p0124 A79-17351
    21 p0128 A79-17391
    21 p0128 A79-17394
    23 p0467 A79-38612
BMFT-ET-4060-A
    21 p0120 A79-17319
    21 p0121 A79-17325
BMFT-ET-4085-A
    22 p0268 A79-24323
    23 p0472 A79-38663
BMFT-ET-5207-A
    24 p0759 N79-30833
BMFT-ETS-400-A
    24 p0759 N79-30832
BMFT-ETS-3057-A
    24 p0747 N79-30412
BMFT-MT-0442
    24 p0794 N79-33151
BMFT-PLE-ET-1399-C
    24 p0780 N79-32393
BMFT-03E-1012-A/ETS-6000
    24 p0793 N79-32751
BMFT-03E-1399-A/ETS-0004-1
    24 p0780 N79-32394
BMFT-03E-4055-C/ETS-8000
    24 p0792 N79-32730
BMFT-03E-5211-A/ETS-0004-A
    24 p0792 N79-32732
BPA-EW-78-C-80-1310
    22 p0244 A79-21334
CEC-153-77-9-ESB
    23 p0497 A79-40889
CSA-B8B-5584
    23 p0575 N79-25535
CSA-00757-G-77-01
    21 p0230 N79-15428
DA PROJ. 1G7-62708-AH-67
    22 p0342 N79-17340
DA PROJ. 1L1-61102-AH-51
    21 p0184 N79-11483
    21 p0206 N79-13503
DA PROJ. 1L2-63701-DG-10
    24 p0738 N79-29616
DA PROJ. 1S7-62705-AH-94
    21 p0206 N79-13504
DA PROJ. 1T1-61101-A-91A
    24 p0734 N79-29521
DA PROJ. 3E7-62720-A-835
    21 p0192 N79-11686
    21 p0193 N79-11688
DA PROJ. 4A7-62731-AT-41
    22 p0363 N79-20522
    23 p0573 N79-25516
DAAA21-76-C-0537
    24 p0724 N79-28743
DAAA21-77-C-0021
    23 p0543 N79-22638
DAAE07-76-C-0063
    21 p0052 A79-12982
DAAG29-78-G-0147
    24 p0702 A79-52006
DAAG39-77-C-0164
    21 p0197 N79-12562
DAAG53-75-C-0278
    21 p0230 N79-15413
DAAG53-76-C-0003
    21 p0171 N79-10216
    22 p0357 N79-20279
DAAG53-76-C-0014
    22 p0342 N79-17340
DAAG53-76-C-0081
    24 p0738 N79-29616
DAAG56-76-C-0003
    21 p0216 N79-14232
DAAK10-78-C-0153
    23 p0576 N79-26222
DAAK70-77-C-0012
    24 p0738 N79-29612
DAAK70-77-C-0047
    21 p0184 N79-11483
DAAK70-77-C-0080
    21 p0206 N79-13503
DAAK70-77-C-0128
    21 p0206 N79-13505
DAAK70-77-C-0174
    24 p0800 N79-33582
DAAK70-78-C-0001
    22 p0274 A79-25899
    21 p0171 N79-10216
    21 p0216 N79-14232
    22 p0357 N79-20279
    23 p0568 N79-25243
DAAK70-78-D-0002
    24 p0752 N79-30770
    24 p0800 N79-33583
DAHC04-75-C-0095
    23 p0384 A79-32981
DAMD17-77-C-7020
    21 p0192 N79-11686
    21 p0193 N79-11688
DASG60-77-C-0083
    23 p0487 A79-40381
DE-AC03-78ET21050
    24 p0674 A79-51760
DE-AC04-76DP-00789
    24 p0793 N79-32811
DE-AC04-76DP0053
    24 p0671 A79-51735
DE-AC04-76DP00789
    24 p0673 A79-51752
DE-AC04-77ET20260
    24 p0672 A79-51741
DE-AC04-78CS05312
    24 p0675 A79-51767
DE-AI01-79ET20305
    24 p0723 N79-28725
DE-AI01-79ET20485
    23 p0572 N79-25501
    24 p0736 N79-29599
    24 p0747 N79-30415
DE-AI03-79ET11272
    23 p0571 N79-25500
DE-A101-79ET20485
    22 p0354 N79-19451
    23 p0558 N79-24443
DEN3-2
    24 p0747 N79-30415
DEN3-4
    24 p0778 N79-32129
DEN3-12
    21 p0205 N79-13496
    24 p0797 N79-33560
DEN3-28
    24 p0762 N79-31087
DEN3-32
    24 p0730 N79-29110
DEN3-37
    24 p0762 N79-31088
DEN3-38
    22 p0368 N79-21554
DEN3-40
    22 p0354 N79-19451
DEN3-42
    24 p0804 N79-33881
    24 p0804 N79-33882
    24 p0804 N79-33883
    24 p0804 N79-33884
DEN3-67
    24 p0737 N79-29604
DEN3-69
    23 p0477 A79-38950
DEN3-00019
    22 p0364 N79-21075
DFG-A1-104/6
    21 p0007 A79-10063
DFVLR-BPT-03-E5-110A
    24 p0759 N79-30832
DGRST-76-7-1495
    24 p0743 N79-29669
DHEW-100-77-0014
    23 p0566 N79-24520
DI-AA550-CT6-61
    23 p0546 N79-22970
    23 p0546 N79-22971
    23 p0546 N79-22972
DI-AA550-CT7-34
    24 p0744 N79-29783
DI-BM-HO-366008
    23 p0569 N79-25469
DI-BM-JO-275018
    24 p0797 N79-33549
DI-14-08-0001-16439
    24 p0735 N79-29584
DI-14-16-0008-2132
    22 p0349 N79-18462
DI-14-16-0008-2152
    21 p0199 N79-12576
DI-14-16-0009-77-004
    22 p0340 N79-17311
DI-14-31-0001-5201
    23 p0565 N79-24515
DI-14-31-0001-7030
    22 p0349 N79-18463
DI-14-32-0001-1213
    21 p0081 A79-14935
DI-14-34-0001-6125
    21 p0231 N79-15432
DI-14-34-0001-7080
    22 p0343 N79-17353
DOE TASK V
    23 p0443 A79-36880
DOE-CO-03-50346-00
    21 p0177 N79-10560
DOE-CO-03-60410
    21 p0177 N79-10560
DOE-CO-03-60412-00
    21 p0177 N79-10560
DOE-CR-03-70307-00
    23 p0545 N79-22965

DOE-DE-AC04-76DP00789
   23 p0475 A79-38891
DOE-EA-77-A-01-6010
   22 p0343 N79-17350
DOE-EA-77-01-6010
   21 p0198 N79-12571
DOE-EX-76-C-01-2445
   22 p0351 N79-18834
DOE-G-77-A-01-4070
   21 p0229 N79-15406
DOE-PP-67025-P
   22 p0278 A79-26177
DOE-05-0164
   23 p0514 A79-41039
DOE-05-4411
   23 p0497 A79-40892
DOE-05-4413
   23 p0514 A79-41038
DOE-05-4564A
   21 p0021 A79-10172
DOE-05-4564B
   23 p0519 A79-41070
DOE-05-6012
   23 p0518 A79-41061
DOE-05-6037
   23 p0497 A79-40891
   23 p0509 A79-40998
   23 p0511 A79-41016
   23 p0511 A79-41017
   23 p0512 A79-41024
DOE-05-6177
   23 p0520 A79-41077
DOE-05-6391
   23 p0517 A79-41057
DOE-07-6921
   23 p0509 A79-40997
DOE-07-6922
   23 p0508 A79-40996
DOE-07-6953
   23 p0512 A79-41025
DOE-07-6984
   23 p0518 A79-41063
DOE-31-109-38-3983
   24 p0680 A79-51803
DOE-31-109-38-4123
   24 p0684 A79-51831
DOE-31-109-38-4248
   24 p0683 A79-51826
DOE-76-C-03-1229
   21 p0012 A79-10105
DOE-77-G-01-1663
   21 p0229 N79-15405
DOT-HS-7-01790
   24 p0720 N79-28596
DOT-OS-60152
   21 p0159 A79-19766
DOT-OS-60519
   21 p0181 N79-11446
   21 p0181 N79-11447
DOT-OS-70056
   24 p0796 N79-33348
DOT-TSC-RA-75-41
   23 p0579 N79-26412
DOT-TSC-RA-77-07
   23 p0579 N79-26411
DOT-TSC-920
   22 p0366 N79-21406
DOT-TSC-1046
   24 p0720 N79-28594
DOT-TSC-1241
   24 p0778 N79-32135
DOT-TSC-1349-1
   22 p0370 N79-21563
DOT-TSC-1487
   23 p0568 N79-25249
DOT-UT-NY-11-0017
   23 p0587 N79-27024
DOT-UT-60096T
   21 p0177 N79-10563
DOT-UT-60097T
   21 p0176 N79-10555
   21 p0176 N79-10556
   21 p0177 N79-10557
   21 p0177 N79-10558
   21 p0177 N79-10559
DOT/TSC-RA-75-10
   21 p0227 N79-15311
   21 p0227 N79-15312
   21 p0227 N79-15313
   21 p0228 N79-15314
   21 p0228 N79-15315
DOT/TSC-RA-76-23
   21 p0227 N79-15308
   21 p0227 N79-15309
   21 p0227 N79-15310
DSS-OSU77-00099
   22 p0320 A79-31432
DSS-8AU77-00433
   23 p0495 A79-40748
DSS-12SQ-31155-7-4409
   22 p0316 A79-31403
   22 p0317 A79-31413
DSS-12SQ-31155-7-4410
   22 p0317 A79-31409
E(04-3)-3-PA-215
   22 p0252 A79-22237
E(04-3)-34-PA-215
   22 p0253 A79-22244
E(04-3)-34-PA-236
   22 p0249 A79-21688
E(04-3)-167
   21 p0027 A79-10224
   22 p0331 N79-16261
E(04-3)-1093
   24 p0638 A79-47256
E(04-3)-1103
   23 p0428 A79-35045
E(04-3)-1108
   23 p0429 A79-35051
E(04-3)-1109
   22 p0288 A79-27399
E(04-3)-1110
   21 p0162 A79-19832
E(04-3)-1203
   22 p0281 A79-26242
   23 p0440 A79-36680
E(04-3)-1234
   24 p0667 A79-50913
E(04-3)-1241
   21 p0171 N79-10237
E(04-3)-1254
   24 p0667 A79-50914
E(04-3)-1283
   22 p0272 A79-25069
   23 p0480 A79-39945
   23 p0505 A79-40965
   24 p0629 A79-46152
   24 p0629 A79-46201
E(04-3)-1286
   22 p0308 A79-30543
E(04-03)-1256
   21 p0042 A79-11877
E(11-1)-2463
   23 p0535 A79-43391
E(11-1)-2588
   21 p0066 A79-14262
   21 p0149 A79-18018
   21 p0149 A79-18020
   22 p0295 A79-28359
   23 p0439 A79-36632
E(11-1)-2616
   22 p0238 A79-20798
E(11-1)-2748
   23 p0439 A79-36633
E(11-1)-2868
   21 p0088 A79-15836
E(11-1)-2941
   22 p0281 A79-26206
E(11-1)-3073
   21 p0077 A79-14778
   23 p0478 A79-39566
E(11-2)-2744
   23 p0516 A79-41051
E(29-2)-3750
   23 p0404 A79-34034
E(40-1)-4927
   23 p0398 A79-33991
E(40-1)-4952
   21 p0038 A79-11806
E(40-1)-4976
   21 p0138 A79-17474
E(40-1)-5100
   21 p0149 A79-18019
E(40-1)-5136
   22 p0281 A79-26208
E(40-1)-5190
   22 p0281 A79-26210
E(40-1) 5134
   23 p0497 A79-40890
E(48-18)-2465
   24 p0646 A79-48864
E(49-1)-3800
   22 p0355 N79-19467
E(49-18)-1220
   21 p0045 A79-12121
E(49-18)-1536
   21 p0080 A79-14932
E(49-18)-1742
   21 p0220 N79-14564
   21 p0221 N79-14575
E(49-18)-1770
   23 p0410 A79-34087
E(49-18)-1773
   23 p0492 A79-40454
E(49-18)-1811
   21 p0046 A79-12274
E(49-18)-2212
   21 p0083 A79-15247
E(49-18)-2215
   23 p0479 A79-39841
E(49-18)-2217
   22 p0235 A79-20534
E(49-18)-2253
   23 p0412 A79-34097
E(49-18)-2268
   21 p0068 A79-14321
E(49-18)-2274
   24 p0704 A79-52028
E(49-18)-2321
   21 p0216 N79-14240
E(49-18)-2358
   22 p0278 A79-26180
E(49-18)-2369
   21 p0029 A79-10246
E(49-18)-2385
   21 p0172 N79-10518
E(49-18)-2426
   21 p0141 A79-17505
   23 p0405 A79-34042
   24 p0614 A79-45595
E(49-18)-2465
   23 p0376 A79-32365
E(49-18)-2484
   22 p0288 A79-27395
E(49-18)-2538
   21 p0042 A79-11966
   22 p0300 A79-29428
E(49-26)-1004
   22 p0333 N79-16357
   22 p0360 N79-20494
   23 p0581 N79-26502
E(49-26)-1022
   23 p0512 A79-41022
   23 p0512 A79-41023
   23 p0521 A79-41091
   22 p0342 N79-17336
E(49-26)-1024
   23 p0477 A79-39101
E(49-26)-1028
   22 p0244 A79-21302
   21 p0173 N79-10525
   21 p0195 N79-12548
   22 p0333 N79-16355
   22 p0341 N79-17333
   22 p0360 N79-20497
   22 p0368 N79-21549
   24 p0749 N79-30719
E(49-26)-1031
   23 p0571 N79-25494
E(49-26)-1059
   23 p0581 N79-26504
E(49-28)-1002
   21 p0040 A79-11824
   23 p0458 A79-38191
   21 p0183 N79-11479
   23 p0558 N79-24442
   23 p0558 N79-24445
EA-77-A-01-6010
   21 p0190 N79-11543
   22 p0357 N79-20291
   22 p0363 N79-20524
   22 p0365 N79-21235
EC-17-S-02-4272
   21 p0052 A79-12986
EC-77-A-31-1002
   23 p0581 N79-26505
EC-77-A-31-1011
   21 p0009 A79-10084
   22 p0345 N79-17859
   24 p0778 N79-32130
EC-77-A-31-1034
   22 p0243 A79-21300
   21 p0183 N79-11473
   21 p0183 N79-11481
   21 p0205 N79-13496
   22 p0354 N79-19454
   22 p0360 N79-20498
   22 p0368 N79-21550
   22 p0368 N79-21554
   24 p0756 N79-30801
EC-77-A-31-1034-2
   24 p0797 N79-33560
EC-77-A-31-1040
   21 p0035 A79-11542
   21 p0081 A79-14956
   22 p0337 N79-16721
   24 p0723 N79-28726
   24 p0762 N79-31088
   24 p0778 N79-32129
EC-77-A-31-1042
   23 p0576 N79-25930
EC-77-A-31-1044
   24 p0723 N79-28728
EC-77-A-31-1062
   24 p0601 A79-44225
   23 p0558 N79-24444
   23 p0595 N79-27665
EC-77-A-31-10040
   24 p0730 N79-29110
EC-77-C-01-2103
   24 p0737 N79-29605
EC-77-C-01-2133
   24 p0742 N79-29664
EC-77-C-01-4063
   24 p0724 N79-28749
   24 p0725 N79-28750
EC-77-C-01-5017
   21 p0210 N79-13536
EC-77-C-01-5025
   21 p0220 N79-14565
EC-77-C-01-5081
   21 p0183 N79-11473
EC-77-C-01-5082
   24 p0756 N79-30801
EC-77-C-01-8602
   24 p0742 N79-29662
   24 p0755 N79-30796
EC-77-C-02-4337
   23 p0598 N79-27701
EC-77-C-02-4396
   22 p0315 A79-31369
   21 p0181 N79-11406
EC-77-C-02-4434
   21 p0015 A79-10128
EC-77-C-02-4556
   24 p0800 N79-33586
EC-77-C-03-1181
   23 p0380 A79-32458
EC-77-C-03-1404
   21 p0010 A79-10091
   24 p0682 A79-51812
EC-77-C-03-1446
   24 p0757 N79-30814
EC-77-C-03-1574
   21 p0012 A79-10100
EC-77-C-05-5392
   21 p0025 A79-10211
EC-77-C-07-1672
   24 p0741 N79-29649
EC-77-C-10-0023
   24 p0749 N79-30713
   24 p0750 N79-30722
EC-77-S-03-1549
   24 p0772 N79-31782
EC-77-X-01-2752
   24 p0686 A79-51850
EC-77-X-01-2923
   21 p0201 N79-13190
EC-77-X-01-3559
   21 p0046 A79-12265
EC-77-X-01-4111
   21 p0045 A79-12264
EC-78-C-03-1735
   24 p0682 A79-51818
EC-78-C-03-1737
   21 p0201 N79-13189
EDA-PP-612
   21 p0177 N79-10564
EDA-99-7-13426
   21 p0177 N79-10564
EDA-99-06-09572
   23 p0587 N79-27026

- EE-77-C-01-6119
  - 24 p0777 N79-31844
- EE-77-C-02-4310
  - 21 p0198 N79-12575
- EE-77-C-02-4389
  - 21 p0213 N79-13569
- EE-77-C-03-1364
  - 21 p0195 N79-12256
- EE-77-S-02-4465
  - 24 p0759 N79-30824
- EF-75-C-01-2256
  - 21 p0157 A79-19589
  - 23 p0376 A79-32357
- EF-76-C-01-2215
  - 24 p0636 A79-46717
  - 22 p0362 N79-20511
- EF-76-C-01-2256
  - 21 p0009 A79-10079
- EF-77-A-01-2565
  - 23 p0554 N79-24183
  - 24 p0766 N79-31416
- EF-77-A-01-2593
  - 23 p0571 N79-25498
- EF-77-A-01-2647
  - 22 p0279 A79-26184
- EF-77-A-01-2674
  - 21 p0183 N79-11478
  - 22 p0341 N79-17335
  - 23 p0558 N79-24446
  - 23 p0571 N79-25499
  - 24 p0749 N79-30720
- EF-77-C-01-2430
  - 24 p0709 A79-52968
- EF-77-C-01-2519
  - 23 p0390 A79-33380
  - 23 p0390 A79-33381
  - 23 p0390 A79-33384
  - 23 p0411 A79-34095
- EF-77-C-01-2524
  - 21 p0016 A79-10135
  - 21 p0161 A79-19809
  - 23 p0390 A79-33382
  - 23 p0391 A79-33394
  - 23 p0395 A79-33428
  - 22 p0363 N79-20517
- EF-77-C-01-2583
  - 21 p0203 N79-13280
- EF-77-C-01-2609
  - 24 p0743 N79-29670
  - 24 p0803 N79-33654
- EF-77-C-01-2611
  - 23 p0378 A79-32420
- EF-77-C-01-2613
  - 23 p0391 A79-33385
  - 22 p0362 N79-20515
  - 22 p0363 N79-20516
- EF-77-C-01-2614
  - 22 p0369 N79-21560
  - 22 p0369 N79-21561
- EF-77-C-01-2621
  - 24 p0765 N79-31386
- EF-77-C-01-2664
  - 21 p0180 N79-11223
- EF-77-C-01-2705
  - 24 p0721 N79-28654
- EF-77-C-2524
  - 23 p0392 A79-33395
- EF-77-G-01-2741
  - 24 p0632 A79-46318
- EF-77-G-01-6003
  - 21 p0171 N79-10243
- EF-77-S-02-4227
  - 21 p0170 N79-10178
- EG-77-A-01-4076
  - 24 p0749 N79-30721
- EG-77-A-01-4077
  - 24 p0737 N79-29602
- EG-77-A-01-4086
  - 24 p0723 N79-28729
- EG-77-A-03-1509
  - 21 p0162 A79-19834
- EG-77-C-01-255
  - 23 p0563 N79-24498
- EG-77-C-01-2522
  - 23 p0561 N79-24481
  - 23 p0562 N79-24485
  - 23 p0562 N79-24486
  - 23 p0563 N79-24496
  - 23 p0564 N79-24499
  - 24 p0790 N79-32715
- EG-77-C-01-3974
  - 24 p0713 A79-53498
- EG-77-C-01-4015
  - 23 p0589 N79-27333
- EG-77-C-01-4024
  - 22 p0243 A79-21259
  - 23 p0426 A79-34836
  - 23 p0427 A79-34864
  - 22 p0337 N79-16895
  - 23 p0548 N79-23492
  - 23 p0548 N79-23493
  - 23 p0548 N79-23494
  - 23 p0548 N79-23495
  - 23 p0548 N79-23496
  - 23 p0548 N79-23497
  - 23 p0548 N79-23498
  - 23 p0548 N79-23499
  - 23 p0549 N79-23500
  - 23 p0549 N79-23501
  - 23 p0549 N79-23502
  - 24 p0763 N79-31251
- EG-77-C-01-4028
  - 21 p0209 N79-13533
- EG-77-C-01-4042
  - 23 p0406 A79-34051
  - 23 p0459 A79-38199
  - 24 p0624 A79-45843
  - 24 p0699 A79-51976
  - 23 p0553 N79-24180
  - 23 p0599 N79-27705
  - 24 p0766 N79-31413
  - 24 p0767 N79-31422
  - 24 p0773 N79-31799
  - 24 p0773 N79-31800
  - 24 p0774 N79-31808
  - 24 p0775 N79-31816
  - 24 p0779 N79-32374
  - 24 p0787 N79-32688
  - 24 p0787 N79-32689
  - 24 p0801 N79-33597
- EG-77-C-01-4049
  - 24 p0608 A79-45208
  - 23 p0561 N79-24480
  - 23 p0561 N79-24481
  - 23 p0562 N79-24482
  - 23 p0562 N79-24483
  - 23 p0562 N79-24484
  - 23 p0562 N79-24485
  - 23 p0562 N79-24486
  - 23 p0563 N79-24495
  - 23 p0563 N79-24496
  - 23 p0563 N79-24497
  - 23 p0563 N79-24498
  - 23 p0564 N79-24499
  - 24 p0728 N79-28788
- EG-77-C-01-4113
  - 24 p0774 N79-31803
  - 24 p0774 N79-31804
- EG-77-C-02-4181
  - 21 p0193 N79-11890
- EG-77-C-02-4228
  - 24 p0739 N79-29633
- EG-77-C-02-4271
  - 24 p0705 A79-52314
- EG-77-C-02-4378
  - 24 p0685 A79-51843
- EG-77-C-02-4480
  - 24 p0681 A79-51807
- EG-77-C-02-4557
  - 24 p0655 A79-50183
- EG-77-C-03-1326
  - 21 p0174 N79-10532
- EG-77-C-03-1459
  - 24 p0789 N79-32701
- EG-77-C-03-1569
  - 21 p0101 A79-16249
  - 24 p0624 A79-45837
- EG-77-C-03-1570
  - 24 p0618 A79-45792
- EG-77-C-03-1576
  - 23 p0503 A79-40949
- EG-77-C-03-1579
  - 23 p0500 A79-40911
  - 24 p0656 A79-50194
  - 24 p0657 A79-50197
- EG-77-C-03-1587
  - 21 p0211 N79-13544
- EG-77-C-03-1608
  - 24 p0729 N79-28791
- EG-77-C-03-1712
  - 23 p0446 A79-37159
- EG-77-C-03-1979
  - 24 p0705 A79-52317
- EG-77-C-04-3904
  - 24 p0727 N79-28772
- EG-77-C-04-3974
  - 22 p0281 A79-26207
  - 23 p0408 A79-34072
  - 24 p0641 A79-47792
- EG-77-C-04-3985
  - 21 p0019 A79-10159
  - 21 p0062 A79-13873
- EG-77-C-04-3988
  - 21 p0019 A79-10160
- EG-77-C-04-4097
  - 24 p0756 N79-30805
- EG-77-C-04-4162
  - 24 p0735 N79-29524
- EG-77-C-05-1473
  - 24 p0674 A79-51759
- EG-77-C-05-5359
  - 21 p0101 A79-16251
- EG-77-C-05-5560
  - 21 p0016 A79-10133
  - 24 p0701 A79-51997
- EG-77-C-06-1033
  - 22 p0287 A79-27377
- EG-77-G-01-4040
  - 24 p0775 N79-31810
- EG-77-G-01-4042
  - 23 p0600 N79-28056
- EG-77-G-01-4066
  - 24 p0701 A79-51997
- EG-77-G-01-4108
  - 23 p0443 A79-36882
- EG-77-G-03-1617
  - 23 p0536 A79-43615
- EG-77-G-04-4087
  - 21 p0021 A79-10174
- EG-77-G-04-4138
  - 21 p0022 A79-10180
- EG-77-S-01-4116
  - 21 p0154 A79-18487
  - 22 p0281 A79-26243
  - 23 p0436 A79-35749
- EG-77-S-02-4142
  - 24 p0741 N79-29656
- EG-77-S-02-4183
  - 22 p0292 A79-27885
- EG-77-S-02-4238
  - 21 p0161 A79-19815
- EG-77-S-02-4339
  - 23 p0583 N79-26522
- EG-77-S-02-4479
  - 22 p0267 A79-24314
  - 24 p0609 A79-45213
- EG-77-S-02-4523
  - 24 p0786 N79-32682
- EG-77-S-02-4577
  - 23 p0583 N79-26525
  - 24 p0726 N79-28757
  - 24 p0739 N79-29625
- EG-77-S-03-1456
  - 23 p0437 A79-36146
  - 24 p0648 A79-49207
  - 24 p0655 A79-50180
  - 24 p0657 A79-50328
- EG-77-S-04-4094
  - 21 p0087 A79-15826
- EG-77-5-04-3977
  - 23 p0410 A79-34085
- EG-77-5-52-4450
  - 22 p0273 A79-25720
- EG-77-78-S-02-4459-A000
  - 24 p0624 A79-45839
  - 24 p0624 A79-45840
- EG-78-C-3109
  - 24 p0669 A79-51570
- EG-78-S-02-4649
  - 24 p0630 A79-46307
  - 24 p0758 N79-30819
- EH-77-C-01-6407
  - 24 p0741 N79-29650
- EJ-78-C-01-2833
  - 24 p0801 N79-33591
- EL-78-A-01-2185
  - 23 p0568 N79-25243
- EM-75-C-01-8516
  - 21 p0184 N79-11489
- EM-76-C-01-8630
  - 24 p0776 N79-31824
- EM-77-C-01-8727
  - 21 p0207 N79-13512
- EM-77-C-01-8962
  - 24 p0775 N79-31818
  - 24 p0775 N79-31820
  - 24 p0776 N79-31823
  - 24 p0776 N79-31826
- EM-78-C-01-4127
  - 24 p0697 A79-51966
- EM-78-C-01-4228
  - 24 p0775 N79-31813
  - 24 p0775 N79-31814
  - 24 p0775 N79-31815
  - 24 p0800 N79-33584
- EM-78-C-01-4250
  - 23 p0563 N79-24493
- EM-78-C-01-4274
  - 24 p0726 N79-28765
- EM-78-C-02-4704
  - 24 p0789 N79-32705
- EM-78-C-03-1725
  - 23 p0459 A79-38194
- EM-78-C-03-2092
  - 24 p0733 N79-29372
- EM-78-C-04-4275
  - 21 p0062 A79-13872
  - 22 p0293 A79-28145
- EM-78-C-04-5319
  - 24 p0789 N79-32708
- EM-78-G-01-4206
  - 24 p0747 N79-30410
- EM-78-G-02-4661
  - 24 p0739 N79-29635
- EM-78-G-02-4663
  - 24 p0757 N79-30812
- EM-78-L-01-4144
  - 24 p0608 A79-45203
- EM-78-S-02-4628
  - 24 p0750 N79-30727
  - 24 p0772 N79-31788
- EN-77-C-02-4281
  - 24 p0693 A79-51933
  - 24 p0693 A79-51935
- EP-78-C-02-4651
  - 24 p0709 A79-52968
- EPA TASK 5
  - 22 p0296 A79-28389
- EPA TASK 6
  - 22 p0296 A79-28389
- EPA TASK 7
  - 22 p0296 A79-28389
- EPA-IAG-D5-0693
  - 23 p0438 A79-36432
- EPA-IAG-D6-E695
  - 22 p0340 N79-17311
- EPA-R-801578
  - 24 p0761 N79-30866
- EPA-R-803242
  - 21 p0232 N79-15478
- EPA-R-803283-03
  - 23 p0545 N79-22661
- EPA-R-803971
  - 21 p0082 A79-15032
- EPA-R-804008-2
  - 23 p0488 A79-40391
- EPA-R-804183
  - 22 p0372 N79-21626
- EPA-R-804829
  - 23 p0566 N79-24543
- EPA-R-804836-01
  - 23 p0412 A79-34097
- EPA-R-804917
  - 24 p0744 N79-29709
- EPA-R-804979
  - 22 p0339 N79-17027
- EPA-R-805052
  - 22 p0336 N79-16437
- EPA-R-805374
  - 22 p0344 N79-17378
- EPA-R-805615-01
  - 21 p0198 N79-12575
- EPA-R-806156
  - 24 p0796 N79-33538
- EPA-R-803903010
  - 21 p0082 A79-15115
  - 21 p0158 A79-19735
- EPA-R-803971020
  - 21 p0082 A79-15052
- EPA-68-01-2940
  - 21 p0178 N79-10574

EPA-68-01-3539
21 p0213 N79-13592
EPA-68-01-3591
24 p0612 A79-45538
EPA-68-01-3702
24 p0761 N79-30864
EPA-68-01-3955
23 p0585 N79-26539
EPA-68-01-4137
24 p0761 N79-30856
24 p0803 N79-33639
EPA-68-01-4337
21 p0211 N79-13548
EPA-68-01-4359
23 p0491 A79-40420
EPA-68-02-0227
21 p0158 A79-19738
EPA-68-02-0293
21 p0232 N79-15864
22 p0339 N79-17026
EPA-68-02-1010
23 p0586 N79-26575
EPA-68-02-1320
21 p0223 N79-14643
EPA-68-02-1323
22 p0365 N79-21224
EPA-68-02-1361
21 p0080 A79-14927
21 p0178 N79-10610
EPA-68-02-1415
21 p0158 A79-19738
EPA-68-02-1439
22 p0296 A79-28389
EPA-68-02-1480
21 p0199 N79-12601
EPA-68-02-1816
21 p0178 N79-10603
EPA-68-02-1863
22 p0346 N79-18061
EPA-68-02-1874
21 p0223 N79-14635
22 p0353 N79-19429
EPA-68-02-1877
23 p0566 N79-24534
EPA-68-02-1881
24 p0797 N79-33552
EPA-68-02-2093
21 p0200 N79-12602
EPA-68-02-2101
21 p0224 N79-14946
EPA-68-02-2112
23 p0578 N79-26234
23 p0578 N79-26236
EPA-68-02-2119
22 p0338 N79-17025
EPA-68-02-2126
23 p0590 N79-27342
EPA-68-02-2132
23 p0379 A79-32449
EPA-68-02-2147
21 p0232 N79-15479
22 p0373 N79-21662
EPA-68-02-2153
21 p0195 N79-12424
EPA-68-02-2155
22 p0336 N79-16446
EPA-68-02-2156
22 p0336 N79-16439
EPA-68-02-2162
21 p0178 N79-10595
22 p0344 N79-17364
22 p0344 N79-17365
22 p0373 N79-21671
23 p0539 N79-22318
23 p0539 N79-22319
EPA-68-02-2165
22 p0373 N79-21661
EPA-68-02-2172
21 p0216 N79-14243
EPA-68-02-2196
21 p0080 A79-14927
EPA-68-02-2199
22 p0330 N79-16139
22 p0372 N79-21625
EPA-68-02-2535
21 p0178 N79-10591
EPA-68-02-2566
23 p0545 N79-22668
EPA-68-02-2603
21 p0200 N79-12606
EPA-68-02-2610
21 p0223 N79-14618
EPA-68-02-2614
23 p0575 N79-25567
EPA-68-02-2624
21 p0159 A79-19742
EPA-68-02-2635
22 p0350 N79-18487
22 p0350 N79-18488
22 p0350 N79-18489
22 p0352 N79-19173
EPA-68-02-2800
22 p0364 N79-20727
EPA-68-03-2186
21 p0035 A79-11448
EPA-68-03-2207
22 p0351 N79-18834
22 p0356 N79-19496
EPA-68-03-2344
22 p0373 N79-21682
EPA-68-03-2347
21 p0179 N79-10968
EPA-68-03-2356
21 p0231 N79-15440
EPA-68-03-2431
22 p0373 N79-21682
EPA-68-03-2449
23 p0578 N79-26237
EPA-68-03-2528
22 p0295 A79-28182
EPA-68-03-2536
23 p0578 N79-26235
EPA-68-03-2636
21 p0228 N79-15379
EPA-68-03-2645
24 p0665 A79-50885
EPA-68-92-2515
21 p0223 N79-14641
EPRI PROJ. RP-377-1
24 p0777 N79-31832
EPRI PROJ. RP-549
23 p0543 N79-22635
EPRI PROJ. RP1082-1
24 p0797 N79-33560
EPRI PROJ. 239
21 p0180 N79-11238
EPRI PROJ. 364-1
23 p0589 N79-27330
EPRI PROJ. 413-1
24 p0760 N79-30848
EPRI PROJ. 553
23 p0597 N79-27687
24 p0787 N79-32687
EPRI PROJ. 648-1
24 p0739 N79-29631
EPRI PROJ. 713-1
24 p0795 N79-33344
EPRI PROJ. 834-1
24 p0796 N79-33352
EPRI PROJ. 871-1
24 p0718 N79-28355
EPRI PROJ. 927-1
23 p0575 N79-25570
EPRI PROJ. 939-1
24 p0803 N79-33614
ER-78-C-06-1034
24 p0702 A79-52002
ER-78-S-02-4899
22 p0294 A79-28148
22 p0294 A79-28149
22 p0294 A79-28152
23 p0445 A79-37155
24 p0654 A79-50177
24 p0704 A79-52312
ERDA PROJECT 38
21 p0085 A79-15318
ERDA PROJECT 60
21 p0027 A79-10224
ERDA TASK 23
22 p0278 A79-26179
ERDA 31-109-38-3628
22 p0314 A79-31363
ERDA 31-109-38-4206
22 p0314 A79-31363
ES-77-C-02-4149
21 p0085 A79-15334
21 p0085 A79-15335
23 p0408 A79-34066
23 p0480 A79-39940
ES-77-G-05-5576
24 p0740 N79-29642
ESA-3261/77/NL-AK
24 p0759 N79-30834
24 p0760 N79-30835
ESA-3404/77-F-HEW(SC)
22 p0335 N79-16379
ESA-3536/78-F-CG(SC)
23 p0599 N79-27709
ESA-3538/78-F-HEW(SC)
24 p0768 N79-31513
ESA-3542/78-F-CG(SC)
23 p0599 N79-27708
ET-76-C-01-2865
24 p0694 A79-51938
ET-76-C-03-1805
23 p0588 N79-27313
ET-76-S-02-2272
22 p0253 A79-22242
ET-76-01-9036
21 p0204 N79-13474
ET-77-C-01-8890
23 p0562 N79-24488
ET-78-C-01-2706
22 p0362 N79-20510
ET-78-C-01-2712
21 p0158 A79-19654
ET-78-C-01-2854
24 p0617 A79-45786
ET-78-C-01-3005
21 p0017 A79-10141
24 p0701 A79-51994
ET-78-C-01-3019
22 p0313 A79-31188
ET-78-C-01-3024
24 p0676 A79-51772
ET-78-C-01-3087
22 p0363 N79-20518
ET-78-C-02-5092
24 p0621 A79-45810
ET-78-C-03-1785
24 p0625 A79-45846
ET-78-C-05-5474
24 p0761 N79-31067
ET-78-C-05-5648
21 p0204 N79-13478
ET-78-C-05-5670
24 p0757 N79-30809
24 p0773 N79-31795
ET-78-C-06-1095
24 p0695 A79-51949
ET-78-F-02-5058
24 p0734 N79-29377
ET-78-R-03-1876
24 p0648 A79-49215
ET-78-S-02-4636
23 p0582 N79-26511
ET-78-S-02-4683
24 p0626 A79-45856
24 p0626 A79-45858
ET-78-S-02-4726
24 p0753 N79-30777
ET-78-S-05-5669
24 p0605 A79-44873
24 p0662 A79-50549
ET-78-S-07-1732
24 p0738 N79-29617
EU-78-C-01-6280
24 p0757 N79-30814
EJ-78-G-01-6308
23 p0598 N79-27703
EURATOM-JET-C-25-GI-181
23 p0444 A79-36892
EURATOM-30-74-IPUA-C
21 p0079 A79-14792
EV-78-C-01-6388
23 p0589 N79-27339
24 p0735 N79-29576
24 p0735 N79-29577
24 p0759 N79-30825
EV-78-C-01-6457
24 p0733 N79-29371
24 p0755 N79-30791
EV-78-C-01-6458
23 p0593 N79-27644
24 p0719 N79-28441
24 p0735 N79-29578
24 p0740 N79-29645
24 p0745 N79-30107
24 p0752 N79-30771
24 p0774 N79-31807
EV-78-S-05-6004
24 p0672 A79-51743
EW-78-C-19-0026
24 p0735 N79-29579
EW-78-C-21-8089
24 p0780 N79-32390
EW-78-S-02-4691
24 p0780 N79-32386
EW-78-S-22-0277
24 p0766 N79-31418
EW-78-X-03-1038
24 p0790 N79-32717
EX-76-A-01-2295
24 p0728 N79-28783
EX-76-A-01-2314
24 p0729 N79-28792
EX-76-A-29-1002
23 p0529 A79-42545
EX-76-A-29-1060
21 p0012 A79-10103
21 p0019 A79-10161
21 p0021 A79-10173
23 p0477 A79-38950
24 p0670 A79-51730
24 p0673 A79-51751
23 p0579 N79-26476
EX-76-A-31-1011
21 p0215 N79-13937
EX-76-A-31-1026
24 p0804 N79-33881
24 p0804 N79-33882
24 p0804 N79-33883
24 p0804 N79-33884
EX-76-A-36-1008
24 p0740 N79-29640
24 p0760 N79-30837
EX-76-C-01-0496
23 p0588 N79-27329
24 p0766 N79-31419
EX-76-C-01-1517
23 p0492 A79-40455
23 p0577 N79-26226
EX-76-C-01-1534
21 p0180 N79-11166
EX-76-C-01-1760
21 p0016 A79-10134
21 p0017 A79-10139
21 p0017 A79-10142
21 p0081 A79-14935
22 p0279 A79-26186
23 p0392 A79-33397
EX-76-C-01-1784
24 p0719 N79-28364
EX-76-C-01-1817
24 p0744 N79-29683
EX-76-C-01-2006
24 p0719 N79-28363
24 p0766 N79-31415
EX-76-C-01-2025
21 p0192 N79-11607
24 p0776 N79-31831
EX-76-C-01-2035
23 p0588 N79-27282
EX-76-C-01-2044
21 p0006 A79-10055
EX-76-C-01-2047
23 p0554 N79-24185
EX-76-C-01-2101
24 p0740 N79-29647
24 p0741 N79-29648
EX-76-C-01-2121
21 p0210 N79-13540
EX-76-C-01-2202
24 p0765 N79-31411
EX-76-C-01-2206
21 p0180 N79-11239
EX-76-C-01-2210
23 p0556 N79-24306
EX-76-C-01-2211
24 p0718 N79-28357
EX-76-C-01-2240
23 p0589 N79-27331
24 p0766 N79-31414
24 p0766 N79-31417
24 p0779 N79-32382
EX-76-C-01-2246
21 p0017 A79-10138
21 p0161 A79-19810
EX-76-C-01-2247
21 p0006 A79-10059
EX-76-C-01-2248
23 p0392 A79-33398
22 p0369 N79-21558

EX-76-C-01-2251
23 p0554 N79-24182
EX-76-C-01-2270
23 p0554 N79-24181
EX-76-C-01-2275
23 p0554 N79-24187
EX-76-C-01-2286
23 p0577 N79-26232
EX-76-C-01-2291
23 p0379 A79-32834
EX-76-C-01-2305
24 p0733 N79-29367
EX-76-C-01-2307
24 p0718 N79-28358
24 p0765 N79-31410
EX-76-C-01-2315
24 p0745 N79-30396
EX-76-C-01-2336
21 p0009 A79-10077
EX-76-C-01-2338
23 p0553 N79-24176
EX-76-C-01-2341
23 p0478 A79-39508
24 p0647 A79-49037
22 p0362 N79-20512
22 p0365 N79-21310
EX-76-C-01-2346
24 p0769 N79-31746
EX-76-C-01-2371
21 p0008 A79-10068
EX-76-C-01-2399
23 p0595 N79-27661
EX-76-C-01-2404
24 p0722 N79-28721
EX-76-C-01-2416
24 p0734 N79-29378
EX-76-C-01-2426
21 p0174 N79-10535
EX-76-C-01-2434
23 p0554 N79-24184
EX-76-C-01-2438
24 p0633 A79-46532
EX-76-C-01-2445
24 p0793 N79-32747
EX-76-C-01-2460
23 p0502 A79-40927
EX-76-C-01-2469
24 p0780 N79-32391
EX-76-C-01-2478
23 p0391 A79-33393
EX-76-C-01-2489
23 p0576 N79-26143
24 p0795 N79-33340
EX-76-C-01-2490
23 p0555 N79-24190
EX-76-C-01-2515
24 p0735 N79-29575
EX-76-C-01-2528
21 p0209 N79-13534
EX-76-C-01-2531
23 p0564 N79-24501
EX-76-C-01-2548
24 p0676 A79-51772
EX-76-C-01-3077
21 p0023 A79-10188
EX-76-C-04-0789
21 p0209 N79-13532
24 p0726 N79-28768
EX-76-C-10-3863
23 p0523 A79-41375
EX-76-C-10-3869
21 p0206 N79-13508
EX-76-C-16-3084
21 p0025 A79-10210
EX-76-I-01-1028
24 p0723 N79-28727
EX-76-S-01-2234
24 p0779 N79-32375
EX-76-S-01-2334
21 p0171 N79-10238
EX-76-S-01-2340
23 p0554 N79-24186
EX-76-S-01-2454
23 p0492 A79-40451
EX-76-01-22959
24 p0639 A79-47424
EX-77-C-01-2518
21 p0006 A79-10055
24 p0745 N79-30397
EX-77-C-01-2639
21 p0068 A79-14400
EX-77-C-01-2684
22 p0361 N79-20505
EY-75-C-05-0033
24 p0775 N79-31821
EY-75-S-04-3709
22 p0294 A79-28152
EY-76-C-2-2616
21 p0029 A79-10238
22 p0279 A79-26182
EY-76-C-01-2322
21 p0174 N79-10538
EY-76-C-02-0016
21 p0013 A79-10111
22 p0250 A79-21699
22 p0251 A79-21715
21 p0185 N79-11499
21 p0185 N79-11500
21 p0188 N79-11528
21 p0192 N79-11641
21 p0208 N79-13524
21 p0208 N79-13525
21 p0209 N79-13526
21 p0210 N79-13538
21 p0213 N79-13572
22 p0361 N79-20502
22 p0364 N79-20927
22 p0370 N79-21564
23 p0556 N79-24307
23 p0563 N79-24491
23 p0563 N79-24492
23 p0564 N79-24504
23 p0565 N79-24509
23 p0583 N79-26518
23 p0597 N79-27692
23 p0597 N79-27694
23 p0598 N79-27695
23 p0599 N79-27921
24 p0718 N79-28360
24 p0719 N79-28439
24 p0725 N79-28753
24 p0728 N79-28779
24 p0729 N79-28814
24 p0734 N79-29379
24 p0741 N79-29657
24 p0747 N79-30522
24 p0750 N79-30728
24 p0753 N79-30776
24 p0758 N79-30823
24 p0764 N79-31364
24 p0767 N79-31421
24 p0772 N79-31787
24 p0772 N79-31791
24 p0780 N79-32387
24 p0780 N79-32388
24 p0789 N79-32704
24 p0790 N79-32718
24 p0791 N79-32722
EY-76-C-02-0578-034
22 p0239 A79-20823
23 p0431 A79-35072
EY-76-C-02-2331
21 p0026 A79-10221
EY-76-C-02-2449
24 p0740 N79-29643
EY-76-C-02-2477
21 p0231 N79-15431
24 p0742 N79-29663
EY-76-C-02-2520
21 p0041 A79-11838
22 p0305 A79-30332
EY-76-C-02-2566
24 p0731 N79-29118
EY-76-C-02-2617
21 p0204 N79-13378
EY-76-C-02-2709
21 p0085 A79-15334
21 p0085 A79-15335
EY-76-C-02-2764
24 p0790 N79-32713
EY-76-C-02-2802
21 p0048 A79-12569
EY-76-C-02-2829
23 p0470 A79-38646
EY-76-C-02-2832
23 p0590 N79-27521
EY-76-C-02-2835
22 p0351 N79-18817
EY-76-C-02-2907
24 p0615 A79-45598
24 p0685 A79-51845
24 p0747 N79-30408
EY-76-C-02-2925
23 p0577 N79-26229
EY-76-C-02-2947
24 p0742 N79-29660
EY-76-C-02-2949
21 p0011 A79-10094
EY-76-C-02-2952
23 p0589 N79-27333
EY-76-C-02-2991
23 p0381 A79-32593
23 p0381 A79-32594
EY-76-C-02-3056
21 p0026 A79-10215
24 p0699 A79-51981
24 p0700 A79-51983
24 p0700 A79-51988
EY-76-C-02-3073
21 p0111 A79-16727
21 p0155 A79-18830
22 p0237 A79-20557
22 p0255 A79-22379
22 p0292 A79-27884
23 p0443 A79-36883
23 p0478 A79-39676
23 p0478 A79-39724
24 p0640 A79-47452
24 p0645 A79-48226
24 p0696 A79-51956
EY-76-C-02-4010
24 p0678 A79-51783
EY-76-C-02-4059
21 p0187 N79-11512
EY-76-C-02-4094
23 p0596 N79-27672
23 p0596 N79-27673
23 p0596 N79-27677
24 p0726 N79-28769
24 p0739 N79-29627
24 p0759 N79-30826
24 p0788 N79-32700
24 p0789 N79-32702
EY-76-C-03-0010
23 p0381 A79-32473
EY-76-C-03-0015-131
24 p0719 N79-28361
EY-76-C-03-0115
24 p0733 N79-29369
EY-76-C-03-0115-131
24 p0733 N79-29375
24 p0779 N79-32385
EY-76-C-03-0167
21 p0015 A79-10127
21 p0085 A79-15318
22 p0253 A79-22240
22 p0290 A79-27667
23 p0526 A79-41940
23 p0527 A79-41943
23 p0582 N79-26515
EY-76-C-03-0167-PA-63
24 p0685 A79-51840
EY-76-C-03-0167-038
21 p0214 N79-13871
21 p0214 N79-13872
EY-76-C-03-1018
22 p0313 A79-31185
EY-76-C-03-1094
24 p0622 A79-45819
EY-76-C-03-1101
21 p0061 A79-13866
EY-76-C-03-1109
21 p0210 N79-13542
EY-76-C-03-1152
23 p0551 N79-23534
EY-76-C-03-1169
21 p0010 A79-10092
EY-76-C-03-1197
22 p0369 N79-21556
EY-76-C-03-1213
21 p0092 A79-15885
EY-76-C-03-1220
23 p0476 A79-38896
EY-76-C-03-1228
22 p0365 N79-21309
EY-76-C-03-1241
24 p0726 N79-28766
EY-76-C-03-1250
23 p0512 A79-41025
EY-76-C-03-1260
21 p0207 N79-13514
21 p0207 N79-13515
EY-76-C-03-1265
24 p0781 N79-32516
EY-76-C-03-1282
23 p0511 A79-41012
EY-76-C-03-1283
24 p0655 A79-50187
EY-76-C-03-1284
23 p0515 A79-41042
24 p0667 A79-50937
EY-76-C-03-1285
22 p0273 A79-25744
23 p0497 A79-40894
23 p0518 A79-41067
EY-76-C-03-1286
23 p0510 A79-41007
24 p0638 A79-47063
24 p0712 A79-53496
EY-76-C-03-1335
21 p0195 N79-12450
EY-76-C-04-0053
22 p0248 A79-21684
23 p0564 N79-24505
24 p0786 N79-32680
EY-76-C-04-0700
23 p0565 N79-24510
EY-76-C-04-0789
21 p0172 N79-10435
21 p0175 N79-10539
21 p0185 N79-11493
21 p0185 N79-11496
21 p0187 N79-11516
21 p0187 N79-11517
21 p0187 N79-11521
21 p0187 N79-11525
21 p0187 N79-11526
21 p0188 N79-11527
21 p0188 N79-11529
21 p0189 N79-11537
21 p0197 N79-12565
21 p0198 N79-12570
21 p0206 N79-13509
21 p0208 N79-13522
21 p0210 N79-13537
23 p0552 N79-24071
23 p0565 N79-24511
23 p0565 N79-24512
23 p0573 N79-25519
23 p0573 N79-25520
23 p0576 N79-26146
23 p0582 N79-26512
23 p0584 N79-26528
23 p0584 N79-26530
23 p0595 N79-27668
23 p0595 N79-27670
23 p0598 N79-27699
24 p0719 N79-28398
24 p0720 N79-28540
24 p0726 N79-28762
24 p0729 N79-28932
24 p0730 N79-29061
24 p0732 N79-29365
24 p0732 N79-29366
24 p0741 N79-29651
24 p0744 N79-29743
24 p0752 N79-30772
24 p0753 N79-30773
24 p0754 N79-30780
24 p0754 N79-30784
24 p0756 N79-30806
24 p0756 N79-30807
24 p0759 N79-30827
24 p0761 N79-30908
24 p0765 N79-31383
24 p0769 N79-31741
24 p0769 N79-31744
24 p0773 N79-31796
24 p0774 N79-31806
24 p0778 N79-32131
24 p0778 N79-32373
24 p0786 N79-32681
24 p0786 N79-32683
24 p0787 N79-32691
24 p0788 N79-32694
24 p0790 N79-32710
24 p0791 N79-32719
24 p0791 N79-32720
EY-76-C-04-3684
21 p0194 N79-12249
21 p0201 N79-13191
EY-76-C-04-3715
24 p0755 N79-30793

EY-76-C-04-3727
  23 p0499 A79-40907
EY-76-C-05-0001
  24 p0750 N79-30724
EY-76-C-05-0033
  23 p0422 A79-34277
  23 p0493 A79-40699
  21 p0209 N79-13531
  23 p0597 N79-27685
  24 p0803 N79-33699
EY-76-C-05-0333
  21 p0174 N79-10534
EY-76-C-05-5135
  21 p0174 N79-10533
EY-76-C-06-1830
  21 p0068 A79-14294
  21 p0095 A79-15913
  22 p0241 A79-21056
  22 p0294 A79-28153
  23 p0392 A79-33399
  23 p0392 A79-33400
  23 p0431 A79-35069
  24 p0659 A79-50352
  24 p0666 A79-50895
  21 p0170 N79-10179
  21 p0202 N79-13252
  21 p0203 N79-13322
  21 p0209 N79-13527
  21 p0210 N79-13539
  21 p0210 N79-13541
  21 p0217 N79-14344
  22 p0356 N79-19568
  22 p0361 N79-20504
  22 p0361 N79-20506
  22 p0369 N79-21557
  23 p0562 N79-24487
  23 p0588 N79-27327
  23 p0596 N79-27679
  24 p0738 N79-29621
  24 p0775 N79-31819
  24 p0788 N79-32692
  24 p0789 N79-32709
  24 p0793 N79-32995
EY-76-C-07-1540
  22 p0369 N79-21559
EY-76-C-07-1570
  22 p0362 N79-20508
  24 p0772 N79-31783
EY-76-C-1101-003
  24 p0767 N79-31432
EY-76-E-03-1108
  23 p0428 A79-35045
EY-76-G-02-2597
  21 p0188 N79-11533
EY-76-S-01-2554
  21 p0157 A79-19541
EY-76-S-02-2564
  23 p0564 N79-24506
EY-76-S-02-2577
  21 p0206 N79-13507
  21 p0209 N79-13530
EY-76-S-02-2588
  24 p0741 N79-29655
EY-76-S-02-2641-A004
  24 p0622 A79-45820
EY-76-S-02-2711
  22 p0292 A79-27887
  22 p0313 A79-31188
EY-76-S-02-2846
  24 p0627 A79-45923
EY-76-S-02-2908
  22 p0358 N79-20459
EY-76-S-02-2957
  24 p0623 A79-45827
EY-76-S-02-2982
  21 p0063 A79-13876
EY-76-S-02-3170-1
  24 p0639 A79-47421
EY-76-S-02-3237
  22 p0313 A79-31189
EY-76-S-02-4009
  21 p0120 A79-17314
EY-76-S-02-4051
  21 p0014 A79-10118
  21 p0096 A79-15920
  21 p0159 A79-19776
  24 p0738 N79-29622
  24 p0740 N79-29638
  24 p0740 N79-29639
  24 p0787 N79-32685
  24 p0787 N79-32686
  24 p0794 N79-33096
EY-76-S-02-4051-A001
  24 p0689 A79-51868
EY-76-S-04-3709
  22 p0294 A79-28148
  23 p0431 A79-35071
  23 p0445 A79-37155
  24 p0704 A79-52309
EY-76-S-05-4241
  21 p0128 A79-17390
EY-76-S-05-4908
  22 p0363 N79-20525
  22 p0372 N79-21631
EY-76-S-05-4976
  24 p0672 A79-51740
EY-76-S-05-4976-A003
  21 p0164 A79-19848
  22 p0264 A79-23781
EY-76-S-05-5216
  21 p0201 N79-13189
EY-76-S-05-5243
  24 p0726 N79-28770
EY-76-S-06-2227
  21 p0031 A79-10278
  22 p0278 A79-26179
EY-76-S-06-2227-037
  23 p0596 N79-27676
EY-76-S-06-2342
  22 p0287 A79-27345
EY-76-S-06-2344
  23 p0482 A79-40110
EY-76-S-06-2429
  21 p0150 A79-18092
EY-76-S-06-2439
  21 p0068 A79-14295
  22 p0299 A79-29371
EY-76-S-4009
  24 p0630 A79-46306
EY-76-S-052598
  24 p0639 A79-47422
EY-76-5-02-2641
  21 p0142 A79-17506
EY-76-5-02-4051-A001
  22 p0266 A79-24239
EY-76-03-0010-PA-26
  23 p0443 A79-36880
EY-77-C-01-1514
  21 p0145 A79-17633
EY-77-C-03-1101
  23 p0520 A79-41078
  23 p0520 A79-41080
EY-77-C-03-1329
  23 p0556 N79-24423
EY-77-C-05-4478
  22 p0269 A79-24813
  23 p0446 A79-37264
EY-77-C-06-1002-001
  24 p0754 N79-30786
  24 p0754 N79-30787
  24 p0755 N79-30788
EY-77-C-06-1030
  24 p0777 N79-32075
  24 p0777 N79-32081
EY-77-C-07-1622
  21 p0208 N79-13523
EY-77-C-08-1531
  22 p0366 N79-21523
EY-77-C-21-8098
  22 p0352 N79-19171
EY-77-S-02-2446
  21 p0134 A79-17439
  21 p0134 A79-17440
EY-77-S-02-4083
  23 p0492 A79-40452
EY-77-S-02-4589
  24 p0779 N79-32379
EY-78-C-01-6458
  24 p0738 N79-29623
EY-78-S-02-4045
  23 p0588 N79-27221
EY-78-S-02-4399
  23 p0431 A79-35071
FAA PROJ. 081-431-100
  21 p0196 N79-12555
FG-77-C-01-4049
  23 p0563 N79-24494
FY-76-C-01-2292
  21 p0032 A79-10778
FY-76-C-06-1830
  23 p0407 A79-34062
F04701-74-C-0527
  24 p0691 A79-51901
F04701-78-C-0079
  24 p0717 N79-28213
F08635-76-C-0276
  21 p0206 N79-13506
F19628-78-C-0002
  21 p0226 N79-15145
F29601-76-C-0140
  23 p0447 A79-37668
F29601-77-C-0002
  23 p0447 A79-37670
F33615-72-C-1088
  24 p0647 A79-49037
F33615-75-C-2004
  21 p0220 N79-14561
F33615-75-C-2028
  23 p0503 A79-40951
F33615-75-C-2043
  21 p0216 N79-14239
F33615-76-C-1283
  23 p0513 A79-41027
F33615-76-C-2001
  21 p0230 N79-15414
F33615-76-C-2037
  24 p0795 N79-33211
F33615-76-C-2054
  23 p0569 N79-25396
F33615-76-C-2058
  23 p0504 A79-40955
F33615-76-C-2104
  23 p0393 A79-33410
  23 p0543 N79-22639
  23 p0544 N79-22640
F33615-76-C-2121
  23 p0573 N79-25514
F33615-76-C-2171
  22 p0342 N79-17341
F33615-76-C-3104
  22 p0351 N79-18969
  22 p0356 N79-20109
F33615-76-C-5034
  21 p0226 N79-15203
F33615-77-C-0115
  24 p0643 A79-47882
F33615-77-C-2059
  24 p0646 A79-48632
F33615-77-C-3108
  23 p0544 N79-22642
F33615-77-C-3150
  24 p0785 N79-32664
F33615-78-C-2036
  24 p0786 N79-32673
F33617-75-90100
  21 p0065 A79-14122
F33617-77-C-3130
  23 p0506 A79-40975
F41608-78-C-1240
  24 p0732 N79-29364
F42600-76-C-1214
  21 p0011 A79-10095
F44620-75-C-0037
  22 p0292 A79-27884
F49620-77-C-0138
  22 p0294 A79-28152
F49620-78-C-0004
  23 p0539 N79-22252
GEN. ATOMIC PROJ. 2095
  22 p0331 N79-16261
GEN. ATOMIC PROJ. 3227
  22 p0331 N79-16261
GEN. ATOMIC PROJ. 4351
  22 p0331 N79-16261
HC-01-07-03
  24 p0614 A79-45597
HUD-H-40-72
  21 p0220 N79-14564
HUD-H-2689
  22 p0331 N79-16148
  22 p0331 N79-16150
  22 p0336 N79-16497
  22 p0355 N79-19468
JPL PROJ. 5101-100
  23 p0559 N79-24459
JPL PROJ. 5101-104
  24 p0782 N79-32633
JPL PROJ. 5102-78
  23 p0559 N79-24460
  23 p0559 N79-24461
JPL PROJ. 5102-89
  23 p0542 N79-22627
JPL PROJ. 5102-99
  23 p0549 N79-23503
JPL PROJ. 5102-106
  23 p0560 N79-24466
JPL PROJ. 5102-115
  23 p0595 N79-27660
JPL PROJ. 5103-36
  23 p0560 N79-24462
  24 p0749 N79-30718
JPL PROJ. 5103-50
  23 p0542 N79-22629
JPL PROJ. 5104-26
  23 p0560 N79-24464
JPL PROJ. 5104-38
  24 p0782 N79-32632
JPL-BB-689-604
  23 p0570 N79-25485
JPL-KM-68903
  24 p0783 N79-32645
JPL-954331
  23 p0504 A79-40960
JPL-954334
  24 p0771 N79-31777
JPL-954339
  24 p0769 N79-31756
JPL-954343
  21 p0219 N79-14541
  23 p0549 N79-23508
JPL-954352
  22 p0308 A79-30543
  22 p0348 N79-18445
JPL-954355
  23 p0502 A79-40939
  22 p0359 N79-20483
JPL-954356
  24 p0771 N79-31776
JPL-954363
  23 p0501 A79-40920
  22 p0348 N79-18451
JPL-954373
  21 p0219 N79-14540
  24 p0771 N79-31775
JPL-954374
  22 p0333 N79-16365
  23 p0586 N79-26979
JPL-954393
  21 p0219 N79-14551
JPL-954442
  24 p0736 N79-29598
JPL-954471
  21 p0218 N79-14537
JPL-954521
  24 p0798 N79-33564
JPL-954527
  21 p0195 N79-12544
JPL-954559
  23 p0502 A79-40936
JPL-954563
  24 p0770 N79-31764
JPL-954589
  23 p0581 N79-26499
JPL-954605
  23 p0499 A79-40904
  23 p0550 N79-23515
JPL-954654
  22 p0357 N79-20282
  24 p0722 N79-28722
  24 p0770 N79-31762
JPL-954689
  23 p0506 A79-40979
  23 p0550 N79-23517
JPL-954773
  23 p0507 A79-40983
JPL-954786
  23 p0440 A79-36638
  23 p0570 N79-25484
JPL-954796
  23 p0501 A79-40925
  22 p0335 N79-16378
  23 p0550 N79-23519
  23 p0572 N79-25506
  23 p0580 N79-26485
  24 p0770 N79-31769
JPL-954817
  24 p0769 N79-31758
JPL-954817-78/1
  23 p0519 A79-41068
JPL-954822
  24 p0770 N79-31765
JPL-954833
  24 p0692 A79-51903

22 p0367 N79-21545
JPL-954852
23 p0551 N79-23806
JPL-954853
23 p0581 N79-26498
JPL-954862
21 p0219 N79-14555
23 p0558 N79-24448
JPL-954865
24 p0771 N79-31773
JPL-954868
22 p0358 N79-20480
24 p0737 N79-29607
24 p0770 N79-31759
JPL-954873
22 p0359 N79-20484
23 p0560 N79-24469
JPL-954881
23 p0510 A79-41005
23 p0550 N79-23512
JPL-954883
21 p0219 N79-14548
22 p0354 N79-19459
24 p0770 N79-31767
24 p0784 N79-32652
JPL-954886
22 p0357 N79-20281
JPL-954898
22 p0358 N79-20481
JPL-954899
21 p0200 N79-12970
22 p0333 N79-16351
JPL-954914
22 p0358 N79-20482
JPL-954929
24 p0654 A79-50028
JPL-954971
22 p0335 N79-16377
JPL-954977
24 p0771 N79-31772
JPL-954995
23 p0561 N79-24471
JPL-955009
24 p0699 A79-51981
JPL-955055
23 p0572 N79-25505
23 p0580 N79-26490
JPL-955062
22 p0334 N79-16366
JPL-955077
22 p0334 N79-16368
23 p0549 N79-23507
JPL-955089
22 p0359 N79-20485
23 p0580 N79-26488
23 p0581 N79-26495
JPL-955110
21 p0219 N79-14546
JPL-955115
24 p0799 N79-33573
24 p0799 N79-33574
24 p0799 N79-33575
JPL-955117
24 p0799 N79-33576
24 p0799 N79-33577
24 p0799 N79-33578
24 p0799 N79-33579
24 p0800 N79-33580
JPL-955121
22 p0367 N79-21547
JPL-955123
23 p0581 N79-26491
JPL-955164
22 p0359 N79-20486
JPL-955194
24 p0782 N79-32638
24 p0782 N79-32639
JPL-955201
23 p0550 N79-23513
JPL-955205
24 p0770 N79-31763
JPL-955217
23 p0559 N79-24454
JPL-955231
24 p0804 N79-34074
JPL-955266
24 p0770 N79-31771
JPL-955278
23 p0559 N79-24455
JPL-955282
24 p0798 N79-33567
JPL-955307
23 p0559 N79-24456
JPL-955324
23 p0550 N79-23527
JPL-955325
24 p0798 N79-33566
JPL-955328
23 p0550 N79-23523
MDA903-78-C-0189
21 p0193 N79-11859
NASA ORDER C-7653
22 p0360 N79-20497
NASA ORDER W-13755
24 p0715 A79-54337
NASA ORDER W-14280
21 p0109 A79-16617
NASW-2018
22 p0345 N79-17898
NASW-3047
24 p0768 N79-31737
NASW-3048
21 p0110 A79-16622
NASW-3198
21 p0183 N79-11474
NASW-3199
21 p0195 N79-12547
22 p0364 N79-21217
23 p0558 N79-24439
24 p0763 N79-31163
24 p0771 N79-31779
NAS1-12972
24 p0794 N79-33207
NAS1-13285
21 p0200 N79-13026
NAS1-14208
22 p0363 N79-20519
NAS1-14698
22 p0346 N79-18057
NAS1-14727
23 p0506 A79-40973
24 p0785 N79-32664
NAS1-15443
23 p0572 N79-25507
NAS2-7492
24 p0719 N79-28470
NAS2-9109
21 p0110 A79-16629
NAS2-9185
21 p0111 A79-16632
NAS2-9291
23 p0556 N79-24298
NAS2-9613
24 p0747 N79-30499
NAS3-18517
21 p0173 N79-10526
NAS3-18541
21 p0196 N79-12554
NAS3-19736
23 p0576 N79-26221
NAS3-19755
23 p0440 A79-36737
NAS3-19773
21 p0173 N79-10525
NAS3-19778
21 p0196 N79-12553
NAS3-19780
22 p0334 N79-16374
NAS3-19885
21 p0084 A79-15305
NAS3-20030
23 p0440 A79-36749
NAS3-20040
24 p0764 N79-31350
NAS3-20042
24 p0772 N79-31784
NAS3-20058
22 p0239 A79-20825
22 p0240 A79-20826
22 p0240 A79-20827
22 p0288 A79-27400
24 p0677 A79-51780
NAS3-20270
21 p0013 A79-10113
NAS3-20604
24 p0800 N79-33581
NAS3-20615
21 p0012 A79-10106
21 p0120 A79-17321
22 p0354 N79-19454
NAS3-20621
24 p0800 N79-33581
NAS3-20628
21 p0194 N79-12084
NAS3-20646
22 p0337 N79-16850
NAS3-20802
21 p0200 N79-13050
NAS3-20808
23 p0440 A79-36749
NAS3-20815
23 p0553 N79-24172
NAS3-20823
24 p0784 N79-32648
NAS3-21134
21 p0110 A79-16624
23 p0460 A79-38202
23 p0578 N79-26384
NAS3-21137
22 p0366 N79-21334
22 p0366 N79-21335
NAS3-21250
24 p0784 N79-32652
NAS3-21264
24 p0668 A79-51103
NAS3-21276
24 p0784 N79-32648
NAS5-22417
24 p0749 N79-30712
NAS5-24232
24 p0768 N79-31730
24 p0768 N79-31731
NAS6-100
23 p0550 N79-23513
NAS7-100
21 p0011 A79-10099
21 p0020 A79-10167
21 p0020 A79-10169
21 p0023 A79-10186
21 p0023 A79-10187
21 p0024 A79-10203
21 p0026 A79-10220
21 p0026 A79-10222
21 p0026 A79-10223
21 p0027 A79-10225
21 p0042 A79-11955
21 p0045 A79-12119
21 p0047 A79-12324
21 p0062 A79-13869
21 p0067 A79-14269
21 p0076 A79-14765
21 p0076 A79-14766
21 p0086 A79-15504
21 p0098 A79-16103
21 p0103 A79-16455
21 p0104 A79-16466
21 p0107 A79-16603
21 p0107 A79-16604
21 p0108 A79-16607
21 p0123 A79-17340
21 p0162 A79-19837
22 p0239 A79-20821
22 p0244 A79-21347
22 p0252 A79-21807
22 p0259 A79-23604
22 p0260 A79-23612
23 p0400 A79-34008
23 p0425 A79-34738
23 p0428 A79-35042
23 p0440 A79-36638
23 p0475 A79-38877
23 p0477 A79-39101
23 p0496 A79-40886
23 p0498 A79-40902
23 p0500 A79-40913
23 p0504 A79-40962
23 p0507 A79-40982
23 p0510 A79-41005
23 p0512 A79-41019
23 p0520 A79-41081
23 p0521 A79-41084
23 p0526 A79-41831
24 p0605 A79-44796
24 p0673 A79-51750
24 p0691 A79-51902
24 p0693 A79-51936
24 p0700 A79-51985
24 p0700 A79-51986
21 p0195 N79-12543
21 p0195 N79-12544
21 p0200 N79-12970
21 p0202 N79-13263
21 p0203 N79-13370
21 p0204 N79-1347
21 p0205 N79-1350
21 p0218 N79-1453
21 p0219 N79-1454
21 p0219 N79-1454
21 p0219 N79-1454
21 p0219 N79-1455
22 p0333 N79-1635
22 p0333 N79-16365
22 p0334 N79-16368
22 p0348 N79-18451
22 p0354 N79-19449
22 p0354 N79-19450
22 p0354 N79-19459
22 p0358 N79-20480
22 p0359 N79-20484
22 p0359 N79-20490
22 p0359 N79-20491
22 p0360 N79-20492
22 p0362 N79-20513
22 p0366 N79-21390
22 p0367 N79-21547
22 p0368 N79-21548
23 p0542 N79-22627
23 p0542 N79-22628
23 p0542 N79-22629
23 p0549 N79-23503
23 p0549 N79-23504
23 p0549 N79-23505
23 p0549 N79-23507
23 p0550 N79-23512
23 p0550 N79-23515
23 p0555 N79-24259
23 p0559 N79-24457
23 p0559 N79-24458
23 p0559 N79-24459
23 p0559 N79-24460
23 p0559 N79-24461
23 p0560 N79-24462
23 p0560 N79-24463
23 p0560 N79-24464
23 p0560 N79-24466
23 p0560 N79-24469
23 p0570 N79-25485
23 p0581 N79-26491
23 p0586 N79-26979
23 p0588 N79-27321
23 p0591 N79-27597
23 p0594 N79-27654
23 p0594 N79-27658
23 p0595 N79-27659
23 p0595 N79-27660
24 p0717 N79-28314
24 p0730 N79-29106
24 p0737 N79-29607
24 p0749 N79-30718
24 p0769 N79-31756
24 p0769 N79-31758
24 p0770 N79-31759
24 p0770 N79-31763
24 p0770 N79-31767
24 p0771 N79-31776
24 p0771 N79-31777
24 p0782 N79-32631
24 p0782 N79-32632
24 p0782 N79-32633
24 p0782 N79-32635
24 p0782 N79-32638
24 p0782 N79-32639
24 p0783 N79-32643
24 p0785 N79-32661
24 p0799 N79-33573
24 p0799 N79-33574
24 p0799 N79-33575
24 p0799 N79-33576
24 p0799 N79-33577
24 p0799 N79-33578
24 p0799 N79-33579
24 p0800 N79-33580
NAS8-3302
22 p0243 A79-21270
NAS8-20630
24 p0763 N79-31208
NAS8-27980
22 p0366 N79-21429
NAS8-31293
24 p0608 A79-45205
NAS8-31308
23 p0541 N79-22617
23 p0541 N79-22618
23 p0541 N79-22619

23 p0541 N79-22620
23 p0541 N79-22621
NAS8-31628
23 p0541 N79-22616
23 p0546 N79-23483
NAS8-32026
21 p0228 N79-15401
NAS8-32034
22 p0339 N79-17289
NAS8-32036
24 p0608 A79-45208
21 p0172 N79-10515
21 p0173 N79-10521
21 p0204 N79-13492
21 p0204 N79-13493
21 p0205 N79-13494
21 p0205 N79-13499
21 p0205 N79-13500
22 p0333 N79-16359
22 p0333 N79-16361
22 p0341 N79-17328
22 p0348 N79-18448
22 p0348 N79-18449
22 p0348 N79-18450
22 p0371 N79-21621
23 p0594 N79-27657
24 p0737 N79-29601
24 p0749 N79-30715
24 p0797 N79-33561
24 p0798 N79-33568
NAS8-32091
24 p0610 A79-45219
21 p0196 N79-12552
23 p0557 N79-24437
NAS8-32092
21 p0172 N79-10516
NAS8-32093
21 p0220 N79-14557
21 p0229 N79-15409
22 p0354 N79-19453
NAS8-32118
21 p0223 N79-14678
NAS8-32149
21 p0043 A79-11974
NAS8-32242
21 p0173 N79-10520
22 p0360 N79-20493
NAS8-32243
23 p0572 N79-25503
NAS8-32244
21 p0204 N79-13491
22 p0354 N79-19455
NAS8-32245
21 p0205 N79-13495
NAS8-32247
22 p0334 N79-16373
22 p0349 N79-18454
NAS8-32248
21 p0220 N79-14556
23 p0594 N79-27656
NAS8-32249
21 p0205 N79-13498
22 p0334 N79-16372
23 p0547 N79-23490
23 p0548 N79-23491
NAS8-32251
21 p0173 N79-10523
23 p0572 N79-25504
NAS8-32253
22 p0341 N79-17331
NAS8-32254
21 p0172 N79-10517
NAS8-32257
22 p0371 N79-21619
NAS8-32259
21 p0229 N79-15404
22 p0333 N79-16360
22 p0334 N79-16370
22 p0341 N79-17332
24 p0798 N79-33570
NAS8-32260
21 p0229 N79-15402
NAS8-32394
24 p0710 A79-53357
NAS8-32475
21 p0003 A79-10033
21 p0183 N79-11475
21 p0225 N79-15137
21 p0225 N79-15138
21 p0225 N79-15139
21 p0225 N79-15140
21 p0225 N79-15141
21 p0225 N79-15142
22 p0329 N79-16036
22 p0330 N79-16037
22 p0352 N79-19071
23 p0543 N79-22632
23 p0543 N79-22633
23 p0543 N79-22634
23 p0547 N79-23484
23 p0547 N79-23485
23 p0547 N79-23486
23 p0547 N79-23487
23 p0547 N79-23488
23 p0547 N79-23489
NAS8-32481
21 p0173 N79-10522
24 p0771 N79-31780
NAS8-32538
23 p0556 N79-24417
NAS8-32928
22 p0345 N79-17890
NAS8-33002
22 p0368 N79-21551
22 p0368 N79-21552
NAS8-33065
21 p0215 N79-14143
NAS8-33157
22 p0345 N79-17896
NAS9-14000
24 p0693 A79-51936
NAS9-14916
24 p0710 A79-53357
NAS9-15196
21 p0003 A79-10027
24 p0694 A79-51941
24 p0751 N79-30749
24 p0752 N79-30750
NAS9-15237
21 p0194 N79-12130
NAS9-15240
22 p0337 N79-16892
NAS9-15286
22 p0371 N79-21622
NAS9-15310
24 p0710 A79-53357
NAS9-15423
21 p0171 N79-10272
NAS9-15453
22 p0330 N79-16039
NAS9-15507
22 p0330 N79-16057
NAS9-15532
24 p0691 A79-51897
NAS9-15595
21 p0194 N79-12136
NAS9-15636
24 p0694 A79-51941
24 p0695 A79-51945
24 p0785 N79-32659
NERC-GR/3/2951
22 p0272 A79-25375
NGL-05-003-003
21 p0031 A79-10419
22 p0272 A79-25375
NGL-23-004-083
22 p0347 N79-18424
NGL-25-001-054
23 p0569 N79-25446
NGL-48-002-044
21 p0110 A79-16624
23 p0493 A79-40490
NGL-49-002-044
21 p0108 A79-16612
21 p0108 A79-16613
21 p0109 A79-16614
21 p0109 A79-16618
22 p0284 A79-26597
NGR-33-008-191
21 p0059 A79-13656
NGR-34-002-195
24 p0737 N79-29606
NGR-39-087-021
24 p0705 A79-52325
NIH-GM-12013
24 p0632 A79-46316
NOAA-2-35353
21 p0042 A79-11875
NOAA-3-7-022-35217
24 p0622 A79-45818
NOAA-03-6-022-35259
23 p0535 A79-43430
NOAA-04-7-158-44104
24 p0665 A79-50886
NOAA-04-7-158-44113
22 p0331 N79-16140
NOAA-04-7-158-44120
21 p0151 A79-18108
NR PROJ. 098-038
22 p0338 N79-17011
NR PROJ. 099-404
21 p0197 N79-12564
NRC A-2181
21 p0047 A79-12325
NRC A-4213
22 p0264 A79-23808
NRC A-7096
21 p0153 A79-18467
NRC A-7784
22 p0286 A79-27219
NRC 040-293
22 p0264 A79-23809
NRC 042-271
22 p0264 A79-23809
NRC 077-9
22 p0320 A79-31434
NRC-04-77-065
21 p0223 N79-14934
NSC-65E-0401-03(03)
22 p0319 A79-31425
NSF AER-72-03478
21 p0042 A79-11966
NSF AER-72-03490-A04
24 p0638 A79-47256
NSF AER-72-03551
24 p0797 N79-33553
NSF AER-72-03566-A02
23 p0431 A79-35071
NSF AER-73-0359-A02
22 p0262 A79-23719
23 p0396 A79-33766
NSF AER-73-03197
22 p0272 A79-25084
21 p0198 N79-12572
22 p0343 N79-17349
NSF AER-73-03291
21 p0199 N79-12577
21 p0230 N79-15422
NSF AER-74-20678
21 p0068 A79-14400
NSF AER-75-00033
21 p0141 A79-17505
23 p0405 A79-34042
24 p0614 A79-45595
NSF AER-75-00826
21 p0195 N79-12542
NSF AER-75-03481
24 p0630 A79-46305
NSF AER-75-03779
21 p0041 A79-11838
23 p0566 N79-24518
NSF AER-75-04819
23 p0545 N79-22648
NSF AER-75-08693
22 p0265 A79-24046
NSF AER-75-08793
22 p0256 A79-22756
22 p0335 N79-16385
NSF AER-75-09538
21 p0052 A79-12986
NSF AER-75-09588
22 p0367 N79-21530
NSF AER-75-14536
21 p0041 A79-11871
21 p0042 A79-11875
NSF AER-75-18650
23 p0440 A79-36678
NSF AER-75-20501
22 p0256 A79-22859
24 p0792 N79-32737
NSF AER-75-21364
21 p0083 A79-15245
NSF AER-75-23453
23 p0565 N79-24514
NSF AER-76-05596
21 p0066 A79-14265
22 p0335 N79-16382
NSF AER-76-06696
23 p0536 A79-43615
NSF AER-76-08210
22 p0330 N79-16138
NSF AER-76-09300
21 p0044 A79-12116
NSF AER-77-11545
22 p0343 N79-17354
NSF AER-77-17031
21 p0222 N79-14586
NSF AER-03259-A03
22 p0282 A79-26462
NSF AG-502
21 p0090 A79-15858
NSF ATM-76-09581
21 p0041 A79-11871
21 p0042 A79-11875
NSF C-75-22180
23 p0520 A79-41079
NSF C-75-22186
21 p0142 A79-17512
NSF C-75-22221-01
21 p0189 N79-11535
21 p0207 N79-13510
21 p0207 N79-13511
NSF C-310
21 p0214 N79-13913
NSF C-1008
21 p0141 A79-17505
23 p0405 A79-34042
NSF C-7522234
23 p0542 N79-22631
NSF DAR-75-09588-A01
22 p0367 N79-21530
NSF DCR-74-22044
21 p0154 A79-18472
NSF DCR-75-03578
21 p0082 A79-14979
NSF DMR-72-02977
22 p0249 A79-21690
NSF DMR-75-08175
22 p0249 A79-21689
NSF DMR-75-09329
23 p0505 A79-40964
NSF DMR-76-01111
22 p0249 A79-21690
NSF DMR-76-81083
23 p0437 A79-36146
24 p0648 A79-49207
24 p0655 A79-50180
24 p0657 A79-50328
NSF EAR-74-22249
22 p0278 A79-26163
NSF ENG-74-10444-A01
23 p0422 A79-34253
NSF ENG-75-02709
22 p0252 A79-22237
22 p0253 A79-22244
NSF ENG-75-06242
24 p0639 A79-47424
NSF ENG-75-07839
23 p0493 A79-40587
NSF ENG-75-15030
24 p0647 A79-49136
NSF ENG-75-19259
22 p0313 A79-31186
NSF ENG-76-04116-A01
23 p0478 A79-39508
NSF ENG-76-09933
23 p0508 A79-40991
NSF ENG-76-19806
23 p0567 N79-24621
NSF ENG-76-84439
21 p0152 A79-18151
NSF ENG-76-84509
24 p0657 A79-50197
NSF ENG-77-08780
24 p0632 A79-46320
NSF ENG-77-14820
24 p0607 A79-45037
NSF ENG-77-272527
24 p0638 A79-47256
NSF ENG-78-06263
23 p0445 A79-37157
NSF ENV-74-24276
21 p0113 A79-16745
NSF EPP-75-04148
22 p0260 A79-23609
NSF GI-34979
23 p0486 A79-40195
24 p0641 A79-47796
NSF GI-38701
21 p0044 A79-12116
NSF GI-39456
24 p0641 A79-47792
NSF GK-04116
24 p0647 A79-49037

NSF GK-43139
  24 p0641 A79-47791
NSF GK-43294
  24 p0632 A79-46316
NSF INT-76-02664
  22 p0294 A79-28150
NSF ISP-76-02379
  21 p0194 N79-12250
NSF MCS-76-18953
  23 p0479 A79-39841
NSF MCS-76-23801
  21 p0154 A79-18472
NSF MPS-75-07568
  24 p0639 A79-47424
NSF NSF-C-1008
  24 p0614 A79-45595
NSF OCE-76-18049
  22 p0288 A79-27391
NSF PRA-76-SP-1311
  23 p0575 N79-25537
NSF PTP-75-05156
  24 p0642 A79-47800
NSF SEP-77-26562
  23 p0445 A79-37157
NSF SER-76-05002
  21 p0031 A79-10257
NSF SMI-76-83578
  21 p0113 A79-16740
NSF 01P-75-20264
  24 p0704 A79-52311
NSG-1022
  22 p0255 A79-22365
NSG-1235
  22 p0255 A79-22365
NSG-1390
  22 p0367 N79-21543
NSG-2151
  23 p0384 A79-32981
NSG-3018
  23 p0497 A79-40890
  24 p0783 N79-32647
NSG-3082
  23 p0483 A79-40117
NSG-3087
  24 p0641 A79-47651
NSG-3116
  24 p0732 N79-29354
NSG-3134
  22 p0359 N79-20487
NSG-3186
  22 p0279 A79-26184
NSG-3214
  22 p0288 A79-27395
NSG-7331
  21 p0215 N79-14192
NSG-8041
  23 p0400 A79-34005
NSR-09-051-001
  23 p0395 A79-33748
  24 p0639 A79-47360
N0024-77-C-4366
  22 p0307 A79-30533
N00014-75-C-0210
  22 p0288 A79-27391
N00014-75-C-1143
  22 p0338 N79-17011
N00014-76-C-0351
  23 p0582 N79-26510
N00014-76-C-0410
  24 p0793 N79-33036
N00014-76-C-0867
  24 p0639 A79-47424
N00014-77-C-0574
  24 p0794 N79-33042
N00014-77-F-0006
  21 p0197 N79-12564
N00014-77-G-0034
  21 p0063 A79-13985
N00014-78-C-0097
  21 p0197 N79-12560
N00014-78-C-0434
  24 p0738 N79-29614
N00140-77-C-1345
  22 p0274 A79-25899
N68305-76-0036
  24 p0786 N79-32682
N68305-77-C-0043
  24 p0661 A79-50545
N68305-78-C-0036
  23 p0595 N79-27667
OSTP-77-13
  23 p0575 N79-25533
OWRT PROJ. A-048-PA(3)
  22 p0343 N79-17353
OWRT PROJ. A-081-ILL
  22 p0349 N79-18463
OWRT PROJ. B-131-UTAH(1)
  21 p0231 N79-15432
PROJ. SQUID
  22 p0338 N79-17011
PROJ. 2364
  23 p0550 N79-23523
PROJ. 2365
  23 p0550 N79-23527
PROJ. 3235
  21 p0214 N79-13872
PROJ. 6281
  24 p0763 N79-31107
PROJ. 8985
  23 p0576 N79-26143
PROJ. 8999
  24 p0789 N79-32707
PROJ. 61004
  24 p0795 N79-33340
PROJECT SQUID
  21 p0051 A79-12977
  23 p0478 A79-39508
SRC-B/RG/92338
  23 p0484 A79-40125
UN PROJECT PP-1303-1321
  23 p0439 A79-36627
USDA-WA-76-4277
  21 p0076 A79-14763
W-31-109-ENG-38
  21 p0089 A79-15855
  21 p0157 A79-19588
  22 p0279 A79-26183
  22 p0290 A79-27661
  22 p0295 A79-28154
  24 p0683 A79-51826
  24 p0701 A79-51991
  21 p0174 N79-10537
  21 p0186 N79-11506
  21 p0186 N79-11508
  21 p0189 N79-11541
  21 p0213 N79-13571
  21 p0216 N79-14242
  22 p0361 N79-20500
  22 p0361 N79-20503
  22 p0361 N79-20507
  22 p0373 N79-21679
  23 p0561 N79-24480
  23 p0562 N79-24482
  23 p0562 N79-24483
  23 p0562 N79-24484
  23 p0563 N79-24494
  23 p0563 N79-24495
  23 p0565 N79-24508
  23 p0567 N79-24899
  23 p0583 N79-26519
  23 p0584 N79-26529
  23 p0585 N79-26546
  23 p0586 N79-26953
  23 p0596 N79-27674
  23 p0596 N79-27675
  23 p0600 N79-28063
  24 p0719 N79-28362
  24 p0727 N79-28775
  24 p0727 N79-28777
  24 p0728 N79-28778
  24 p0728 N79-28788
  24 p0732 N79-29305
  24 p0740 N79-29636
  24 p0740 N79-29637
  24 p0742 N79-29658
  24 p0742 N79-29659
  24 p0742 N79-29661
  24 p0744 N79-30036
  24 p0753 N79-30774
  24 p0754 N79-30781
  24 p0755 N79-30790
  24 p0756 N79-30803
  24 p0756 N79-30808
  24 p0758 N79-30822
  24 p0760 N79-30846
  24 p0761 N79-31024
  24 p0772 N79-31789
  24 p0773 N79-31793
  24 p0776 N79-31830
  24 p0781 N79-32620
  24 p0788 N79-32697
  24 p0788 N79-32699
  24 p0790 N79-32711
  24 p0800 N79-33587
  24 p0801 N79-33589
W-7405
  24 p0624 A79-45841
W-7405-ENG-26
  21 p0012 A79-10101
  21 p0030 A79-10251
  21 p0099 A79-16122
  21 p0154 A79-18481
  22 p0236 A79-20541
  22 p0238 A79-20746
  22 p0266 A79-24137
  22 p0305 A79-30333
  22 p0312 A79-31184
  23 p0446 A79-37273
  23 p0509 A79-41002
  23 p0514 A79-41035
  23 p0521 A79-41083
  23 p0535 A79-43466
  24 p0626 A79-45859
  24 p0627 A79-45871
  24 p0639 A79-47422
  24 p0653 A79-49762
  24 p0659 A79-50351
  24 p0695 A79-51952
  21 p0175 N79-10541
  21 p0175 N79-10542
  21 p0184 N79-11487
  21 p0186 N79-11511
  21 p0192 N79-11568
  21 p0192 N79-11570
  21 p0193 N79-11889
  21 p0209 N79-13528
  21 p0214 N79-13849
  22 p0348 N79-18447
  22 p0369 N79-21562
  22 p0372 N79-21640
  23 p0555 N79-24188
  23 p0562 N79-24489
  23 p0567 N79-24626
  23 p0576 N79-26147
  23 p0577 N79-26231
  23 p0583 N79-26527
  23 p0587 N79-27018
  23 p0590 N79-27412
  23 p0597 N79-27691
  23 p0598 N79-27704
  24 N79-28776
  24 p0731 N79-29115
  24 p0733 N79-29368
  24 p0734 N79-29384
  24 p0739 N79-29630
  24 p0746 N79-30398
  24 p0748 N79-30687
  24 p0748 N79-30689
  24 p0755 N79-30795
  24 p0757 N79-30810
  24 p0761 N79-30923
  24 p0762 N79-31093
  24 p0764 N79-31363
  24 p0768 N79-31438
  24 p0769 N79-31743
  24 p0776 N79-31827
  24 p0778 N79-32113
  24 p0779 N79-32383
  24 p0781 N79-32515
  24 p0781 N79-32555
  24 p0782 N79-32629
  24 p0786 N79-32677
  24 p0789 N79-32707
  24 p0791 N79-32724
  24 p0791 N79-32725
  24 p0791 N79-32726
W-7405-ENG-36
  21 p0090 A79-15859
  23 p0384 A79-32993
  23 p0408 A79-34073
  21 p0175 N79-10540
  21 p0180 N79-11236
  21 p0185 N79-11494
  21 p0198 N79-12568
  21 p0208 N79-13520
  21 p0208 N79-13521
  21 p0214 N79-13844
  21 p0222 N79-14602
  21 p0232 N79-15783
  22 p0358 N79-20458
  22 p0365 N79-21248
  23 p0561 N79-24478
  24 p0725 N79-2875
  24 p0725 N79-2875
  24 p0725 N79-2875
  24 p0727 N79-2877
  24 p0728 N79-2878
  24 p0729 N79-2879
  24 p0739 N79-2963
  24 p0742 N79-2966
  24 p0754 N79-30782
  24 p0759 N79-30828
  24 p0769 N79-31745
  24 p0781 N79-32477
  24 p0781 N79-32481
  24 p0781 N79-32518
  24 p0786 N79-32678
  24 p0786 N79-32679
  24 p0787 N79-32690
  24 p0788 N79-32698
  24 p0790 N79-32714
  24 p0790 N79-32716
  24 p0804 N79-34044
W-7405-ENG-48
  21 p0011 A79-10093
  21 p0018 A79-10148
  21 p0018 A79-10149
  21 p0030 A79-10249
  21 p0030 A79-10250
  21 p0042 A79-11880
  21 p0046 A79-12266
  21 p0050 A79-12849
  21 p0070 A79-14461
  21 p0082 A79-15138
  21 p0083 A79-15145
  21 p0083 A79-15171
  21 p0085 A79-15330
  21 p0099 A79-16130
  21 p0114 A79-16984
  21 p0116 A79-17262
  21 p0155 A79-18794
  22 p0236 A79-20542
  22 p0241 A79-20853
  22 p0257 A79-22977
  22 p0285 A79-26747
  22 p0292 A79-27887
  22 p0304 A79-29975
  22 p0309 A79-30595
  23 p0397 A79-33919
  23 p0406 A79-34051
  23 p0407 A79-34064
  23 p0422 A79-34192
  23 p0444 A79-36887
  23 p0445 A79-37156
  23 p0474 A79-38806
  23 p0478 A79-39566
  23 p0486 A79-40251
  23 p0527 A79-41941
  24 p0627 A79-45974
  24 p0629 A79-46231
  24 p0638 A79-47060
  24 p0669 A79-51405
  24 p0671 A79-51732
  24 p0674 A79-51754
  24 p0688 A79-51866
  24 p0713 A79-53522
  21 p0174 N79-10536
  21 p0176 N79-10547
  21 p0181 N79-11412
  21 p0185 N79-11497
  21 p0187 N79-11515
  21 p0188 N79-11534
  21 p0189 N79-11536
  21 p0189 N79-11538
  21 p0189 N79-11540
  21 p0195 N79-12439
  21 p0204 N79-13480
  21 p0215 N79-14165
  21 p0215 N79-14168
  21 p0217 N79-14377
  22 p0341 N79-17329
  22 p0342 N79-17337
  22 p0369 N79-21555
  23 p0561 N79-24476
  23 p0561 N79-24479
  23 p0563 N79-24490
  23 p0564 N79-24503
  23 p0564 N79-24507
  23 p0567 N79-24877
  23 p0576 N79-26121
  23 p0582 N79-26514
  23 p0583 N79-26524
  23 p0595 N79-27669

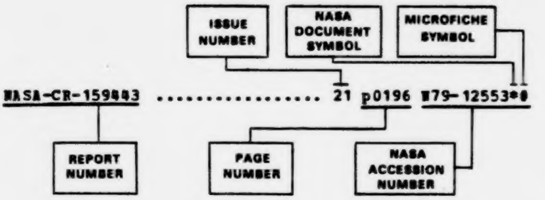
    23 p0596 N79-27683
    24 p0717 N79-28229
    24 p0720 N79-28521
    24 p0720 N79-28653
    24 p0721 N79-28655
    24 p0721 N79-28656
    24 p0721 N79-28657
    24 p0721 N79-28658
    24 p0724 N79-28747
    24 p0727 N79-28774
    24 p0731 N79-29116
    24 p0733 N79-29374
    24 p0742 N79-29665
    24 p0747 N79-30609
    24 p0753 N79-30778
    24 p0753 N79-30779
    24 p0755 N79-30792
    24 p0756 N79-30802
    24 p0756 N79-30804
    24 p0758 N79-30818
    24 p0767 N79-31436
    24 p0768 N79-31439
    24 p0774 N79-31805
    24 p0786 N79-32684
    24 p0788 N79-32693
    24 p0788 N79-32695
    24 p0791 N79-32727
    24 p0803 N79-33614
W-7405-ENG-82
    21 p0082 A79-15115
    21 p0158 A79-19735
    24 p0712 A79-53493
W-7504-ENG-26
    21 p0007 A79-10065
W-74050-ENG-48
    24 p0668 A79-51024
W-74595-ENG-48
    24 p0664 A79-50880
WF57571301
    21 p0201 N79-13182
ZF57571001
    23 p0595 N79-27667
ZF61512001
    23 p0573 N79-25517
141-95-01-19
    24 p0803 N79-33611
141-96-01-19
    21 p0191 N79-11560
505-04
    21 p0215 N79-14099
506-16-31
    22 p0346 N79-18287
    24 p0719 N79-28470
506-23-24
    24 p0764 N79-31350
506-25-32
    23 p0541 N79-22615
516-50-20-01
    21 p0200 N79-13026
516-50-23-01
    23 p0587 N79-27086

REPORT/ACCESSION INDEX

ENERGY /*A Continuing Bibliography (Issue 24)*

JANUARY 1980

Typical Report/Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The issue and page number indicate the actual Supplement and page where the citation may be located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

A-6996 .... 23 p0541 N79-22615*#
A-7642 .... 22 p0346 N79-18287*#

AAAF-NT-77-23 .... 23 p0551 N79-23537 #

AAS PAPER 78-022 .... 21 p0035 A79-11558 #
AAS PAPER 78-144 .... 22 p0243 A79-21259 #
AAS PAPER 78-153 .... 22 p0243 A79-21265 #
AAS PAPER 78-154 .... 22 p0243 A79-21266 #
AAS PAPER 78-166 .... 22 p0243 A79-21270*#
AAS PAPER 78-176 .... 22 p0243 A79-21273 #
AAS PAPER 78-182 .... 22 p0243 A79-21275 #
AAS PAPER 79-058 .... 23 p0438 A79-36548 #
AAS 78-180 .... 23 p0427 A79-34865
AAS 78-191 .... 23 p0427 A79-34862
AAS 78-199 .... 23 p0427 A79-34864

AD-A056018 .... 21 p0192 N79-11686 #
AD-A056021 .... 21 p0193 N79-11688 #
AD-A056278 .... 21 p0184 N79-11483 #
AD-A056491 .... 21 p0184 N79-11485 #
AD-A056635 .... 21 p0193 N79-11859 #
AD-A056806 .... 21 p0171 N79-10216 #
AD-A057289 .... 21 p0184 N79-11486 #
AD-A057987 .... 21 p0197 N79-12562 #
AD-A058054 .... 21 p0197 N79-12560 #
AD-A058200 .... 21 p0197 N79-12563 #
AD-A058380 .... 21 p0206 N79-13505 #
AD-A058456 .... 21 p0206 N79-13504 #
AD-A058486 .... 22 p0339 N79-17230 #
AD-A058550 .... 21 p0203 N79-13375 #
AD-A058586 .... 21 p0201 N79-13182 #
AD-A058626 .... 21 p0206 N79-13506 #
AD-A058681 .... 21 p0196 N79-12555 #
AD-A058795 .... 21 p0206 N79-13503 #
AD-A059001 .... 21 p0196 N79-12559 #
AD-A059061 .... 21 p0205 N79-13502 #
AD-A059240 .... 21 p0197 N79-12564 #
AD-A059295 .... 21 p0220 N79-14561 #
AD-A059309 .... 21 p0223 N79-14918 #
AD-A059365 .... 21 p0220 N79-14559 #
AD-A059381 .... 21 p0215 N79-14184 #
AD-A059534 .... 21 p0216 N79-14232 #
AD-A059993 .... 21 p0217 N79-14507 #
AD-A060081 .... 21 p0216 N79-14235 #
AD-A060156 .... 21 p0216 N79-14239 #
AD-A060218 .... 21 p0216 N79-14231 #
AD-A060322 .... 21 p0226 N79-15203 #
AD-A060351 .... 21 p0230 N79-15413 #
AD-A060370 .... 21 p0230 N79-15415 #
AD-A060429 .... 21 p0230 N79-15414 #
AD-A060477 .... 21 p0201 N79-13192 #
AD-A060586 .... 21 p0226 N79-15145 #
AD-A061050 .... 22 p0338 N79-17011 #
AD-A061071 .... 22 p0342 N79-17341 #
AD-A061242 .... 22 p0342 N79-17340 #
AD-A061503 .... 22 p0338 N79-17019 #
AD-A061609 .... 22 p0339 N79-17118 #
AD-A061724 .... 22 p0352 N79-19305 #
AD-A061746 .... 22 p0351 N79-18969 #
AD-A062387 .... 22 p0357 N79-20279 #
AD-A062420 .... 22 p0357 N79-20272 #
AD-A062609 .... 22 p0356 N79-20109 #
AD-A062719 .... 22 p0363 N79-20522 #
AD-A062751 .... 22 p0366 N79-21406 #
AD-A062863 .... 23 p0568 N79-25040 #
AD-A062930 .... 22 p0371 N79-21624 #
AD-A063714 .... 22 p0365 N79-21233 #
AD-A063849 .... 22 p0337 N79-16848 #
AD-A064108 .... 23 p0543 N79-22638 #
AD-A064111 .... 23 p0539 N79-22252 #
AD-A064435 .... 23 p0544 N79-22640 #
AD-A064554 .... 23 p0544 N79-22641 #
AD-A064796 .... 23 p0543 N79-22639 #
AD-A065009 .... 23 p0544 N79-22642 #
AD-A065399 .... 23 p0552 N79-23886 #
AD-A066221 .... 23 p0561 N79-24475 #
AD-A066385 .... 23 p0573 N79-25517 #
AD-A066543 .... 23 p0569 N79-25396 #
AD-A066582 .... 23 p0576 N79-25930 #
AD-A066605 .... 23 p0568 N79-25243 #
AD-A066616 .... 23 p0573 N79-25514 #
AD-A066699 .... 23 p0573 N79-25516 #
AD-A066973 .... 23 p0576 N79-26222 #
AD-A067165 .... 23 p0582 N79-26510 #
AD-A067463 .... 23 p0595 N79-27667 #
AD-A067519 .... 24 p0724 N79-28743 #
AD-A067709 .... 23 p0577 N79-26224 #
AD-A068365 .... 24 p0738 N79-29615 #
AD-A068433 .... 24 p0738 N79-29612 #
AD-A068452 .... 24 p0738 N79-29616 #
AD-A068990 .... 24 p0724 N79-28744 #
AD-A069138 .... 24 p0738 N79-29614 #
AD-A069159 .... 24 p0734 N79-29521 #
AD-A069339 .... 24 p0732 N79-29364 #
AD-A069650 .... 24 p0752 N79-30770 #
AD-A070080 .... 24 p0793 N79-33036 #
AD-A070590 .... 24 p0794 N79-33042 #
AD-A070636 .... 24 p0800 N79-33583 #
AD-A070881 .... 24 p0800 N79-33582 #
AD-A071813 .... 24 p0795 N79-33211 #

AD-E000199 .... 21 p0201 N79-13182 #
AD-E000240 .... 22 p0357 N79-20272 #
AD-E400264 .... 23 p0543 N79-22638 #
AD-E400292 .... 23 p0576 N79-26222 #
AD-E400300 .... 24 p0724 N79-28743 #

AED-CONF-78-155-047 .... 23 p0596 N79-27678 #
AED-CONF-78-212-008 .... 23 p0582 N79-26513 #
AED-CONF-78-212-013 .... 23 p0583 N79-26517 #
AED-CONF-78-212-016 .... 24 p0777 N79-31832 #

AEROCHEM-TN-200 .... 21 p0219 N79-14555*#
AEROCHEM-TN-206 .... 23 p0558 N79-24448*#

AFAPL-TR-77-93 .... 21 p0216 N79-14231 #
AFAPL-TR-78-10 .... 21 p0216 N79-14239 #
AFAPL-TR-78-16 .... 21 p0220 N79-14561 #
AFAPL-TR-78-19-VOL-3-PT-1 ...... 22 p0342 N79-17341 #
AFAPL-TR-78-37 .... 21 p0230 N79-15415 #
AFAPL-TR-78-41 .... 21 p0230 N79-15414 #
AFAPL-TR-78-50 .... 24 p0795 N79-33211 #
AFAPL-TR-78-51-VOL-1 .... 23 p0543 N79-22639 #
AFAPL-TR-78-51-VOL-2 .... 23 p0544 N79-22640 #
AFAPL-TR-78-60 .... 23 p0544 N79-22642 #
AFAPL-TR-78-96 .... 23 p0573 N79-25514 #

AFAPL-TR-78-98 .... 23 p0569 N79-25396 #
AFAPL-TR-79-2014 .... 23 p0577 N79-26224 #

AFCEC-TR-78-6 .... 21 p0206 N79-13506 #

AFFDL-TR-78-96-VOL-1 .... 22 p0351 N79-18969 #
AFFDL-TR-78-96-VOL-2 .... 22 p0356 N79-20109 #

AFIT-CI-78-113 .... 21 p0220 N79-14559 #
AFIT-CI-79-44T .... 23 p0539 N79-22252 #

AFIT-LSSR-8-78A .... 21 p0223 N79-14918 #

AFLRL-98 .... 21 p0171 N79-10216 #
AFLRL-105 .... 21 p0216 N79-14232 #
AFLRL-108 .... 22 p0357 N79-20279 #
AFLRL-110 .... 23 p0568 N79-25243 #

AFML-TR-78-100 .... 21 p0226 N79-15203 #

AFOSR-78-1145TR .... 21 p0196 N79-12559 #
AFOSR-78-1294TR .... 21 p0215 N79-14184 #
AFOSR-79-0033TR .... 23 p0544 N79-22641 #

AGARD-AR-111 .... 22 p0337 N79-16848 #

AGARD-LS-96 .... 21 p0201 N79-13192 #

AHS 78-25 .... 21 p0152 A79-18151

AIAA PAPER 78-1716 .... 21 p0060 A79-13833 #
AIAA PAPER 78-1750 .... 21 p0060 A79-13853 #
AIAA PAPER 78-1751 .... 21 p0089 A79-15849 #
AIAA PAPER 78-1752 .... 21 p0060 A79-13854 #
AIAA PAPER 78-1753 .... 21 p0060 A79-13855 #
AIAA PAPER 78-1755 .... 21 p0060 A79-13856 #
AIAA PAPER 78-1756 .... 21 p0060 A79-13857 #
AIAA PAPER 78-1757 .... 21 p0060 A79-13858 #
AIAA PAPER 78-1758 .... 21 p0060 A79-13859 #
AIAA PAPER 78-1759 .... 21 p0061 A79-13860 #
AIAA PAPER 78-1760 .... 21 p0061 A79-13861 #
AIAA PAPER 78-1761 .... 21 p0061 A79-13862 #
AIAA PAPER 78-1762 .... 21 p0061 A79-13863 #
AIAA PAPER 78-1763 .... 21 p0061 A79-13864 #
AIAA PAPER 78-1766 .... 21 p0061 A79-13865 #
AIAA PAPER 78-1767 .... 21 p0061 A79-13866 #
AIAA PAPER 78-1768 .... 21 p0061 A79-13867*#
AIAA PAPER 78-1770 .... 21 p0062 A79-13868 #
AIAA PAPER 78-1771 .... 21 p0062 A79-13869*#
AIAA PAPER 78-1773 .... 21 p0062 A79-13870 #
AIAA PAPER 78-1774 .... 21 p0062 A79-13871 #
AIAA PAPER 78-1775 .... 21 p0062 A79-13872 #
AIAA PAPER 78-1776 .... 21 p0062 A79-13873 #
AIAA PAPER 78-1779 .... 21 p0062 A79-13874 #
AIAA PAPER 78-1781 .... 21 p0063 A79-13876 #
AIAA PAPER 79-0112 .... 21 p0156 A79-19538 #
AIAA PAPER 79-0113 .... 21 p0156 A79-19539 #
AIAA PAPER 79-0114 .... 21 p0156 A79-19540 #
AIAA PAPER 79-0115 .... 21 p0157 A79-19541 #
AIAA PAPER 79-0186 .... 21 p0157 A79-19585 #
AIAA PAPER 79-0188 .... 21 p0157 A79-19587 #
AIAA PAPER 79-0189 .... 21 p0157 A79-19588 #
AIAA PAPER 79-0190 .... 21 p0157 A79-19589 #
AIAA PAPER 79-0191 .... 21 p0157 A79-19590 #
AIAA PAPER 79-0289 .... 21 p0157 A79-19649 #
AIAA PAPER 79-0298 .... 21 p0158 A79-19654 #
AIAA PAPER 79-0357 .... 21 p0158 A79-19687 #
AIAA PAPER 79-0532 .... 22 p0274 A79-25871*#
AIAA PAPER 79-0534 .... 22 p0273 A79-25854*#
AIAA PAPER 79-0541 .... 22 p0274 A79-25860 #
AIAA PAPER 79-0545 .... 22 p0273 A79-25852*#
AIAA PAPER 79-0846 .... 23 p0526 A79-41913 #
AIAA PAPER 79-0965 .... 23 p0475 A79-38888*#
AIAA PAPER 79-0966 .... 23 p0456 A79-38174 #
AIAA PAPER 79-0967 .... 23 p0456 A79-38175 #
AIAA PAPER 79-0968 .... 23 p0456 A79-38176 #
AIAA PAPER 79-0969 .... 23 p0475 A79-38889 #
AIAA PAPER 79-0970 .... 23 p0456 A79-38177 #
AIAA PAPER 79-0971 .... 23 p0456 A79-38178 #
AIAA PAPER 79-0972 .... 23 p0456 A79-38179 #
AIAA PAPER 79-0973 .... 23 p0457 A79-38180 #
AIAA PAPER 79-0974 .... 23 p0458 A79-38189 #
AIAA PAPER 79-0975 .... 23 p0457 A79-38181 #
AIAA PAPER 79-0976 .... 23 p0457 A79-38182 #
AIAA PAPER 79-0977 .... 23 p0457 A79-38183*#
AIAA PAPER 79-0979 .... 23 p0475 A79-38890 #
AIAA PAPER 79-0980 .... 23 p0457 A79-38184*#
AIAA PAPER 79-0981 .... 23 p0457 A79-38185 #
AIAA PAPER 79-0982 .... 23 p0457 A79-38186 #
AIAA PAPER 79-0983 .... 23 p0475 A79-38891*#
AIAA PAPER 79-0984 .... 23 p0458 A79-38187 #
AIAA PAPER 79-0986 .... 23 p0458 A79-38190 #
AIAA PAPER 79-0987 .... 23 p0475 A79-38892*#
AIAA PAPER 79-0988 .... 23 p0476 A79-38893 #
AIAA PAPER 79-0989 .... 23 p0458 A79-38191*#
AIAA PAPER 79-0990 .... 23 p0458 A79-38192*#
AIAA PAPER 79-0992 .... 23 p0459 A79-38193 #
AIAA PAPER 79-0994 .... 23 p0459 A79-38194 #
AIAA PAPER 79-0997 .... 23 p0459 A79-38195 #
AIAA PAPER 79-1000 .... 24 p0601 A79-44225*#
AIAA PAPER 79-1003 .... 23 p0458 A79-38188 #
AIAA PAPER 79-1004 .... 23 p0459 A79-38197 #
AIAA PAPER 79-1005 .... 23 p0459 A79-38198*#
AIAA PAPER 79-1006 .... 23 p0459 A79-38199 #
AIAA PAPER 79-1008 .... 23 p0459 A79-38200 #
AIAA PAPER 79-1009 .... 23 p0476 A79-38894*#
AIAA PAPER 79-1013 .... 23 p0459 A79-38201 #
AIAA PAPER 79-1015 .... 23 p0460 A79-38202*#
AIAA PAPER 79-1018 .... 23 p0460 A79-38203 #
AIAA PAPER 79-1019 .... 23 p0460 A79-38204 #
AIAA PAPER 79-1020 .... 23 p0460 A79-38205 #
AIAA PAPER 79-1021 .... 23 p0476 A79-38895 #
AIAA PAPER 79-1024 .... 23 p0460 A79-38206 #
AIAA PAPER 79-1025 .... 23 p0460 A79-38207 #
AIAA PAPER 79-1027 .... 23 p0476 A79-38896 #
AIAA PAPER 79-1028 .... 23 p0460 A79-38208 #
AIAA PAPER 79-1029 .... 23 p0460 A79-38209 #
AIAA PAPER 79-1060 .... 23 p0455 A79-38040 #
AIAA PAPER 79-1061 .... 23 p0455 A79-38041 #
AIAA PAPER 79-1066 .... 23 p0455 A79-38045 #
AIAA PAPER 79-1091 .... 23 p0456 A79-38060 #
AIAA PAPER 79-1095 .... 23 p0462 A79-38565 #
AIAA PAPER 79-1096 .... 23 p0462 A79-38566 #
AIAA PAPER 79-1161 .... 24 p0669 A79-51705 #
AIAA PAPER 79-1338 .... 23 p0493 A79-40490*#
AIAA PAPER 79-1376 .... 23 p0425 A79-34828*#
AIAA PAPER 79-1389 .... 23 p0426 A79-34836 #
AIAA PAPER 79-1400 .... 23 p0426 A79-34840*#
AIAA PAPER 79-1411 .... 23 p0426 A79-34844*#
AIAA PAPER 79-1412 .... 23 p0426 A79-34845 #
AIAA PAPER 79-1416 .... 23 p0426 A79-34846 #
AIAA PAPER 79-1422 .... 23 p0426 A79-34848 #
AIAA PAPER 79-1423 .... 23 p0427 A79-34849 #
AIAA PAPER 79-1538 .... 24 p0636 A79-46717 #
AIAA PAPER 79-1793 .... 24 p0643 A79-47882 #
AIAA PAPER 79-1832 .... 24 p0643 A79-47906 #
AIAA PAPER 79-1861 .... 24 p0643 A79-47918*#
AIAA PAPER 79-1862 .... 24 p0643 A79-47919 #
AIAA PAPER 79-1863 .... 24 p0643 A79-47920 #
AIAA PAPER 79-1864 .... 24 p0669 A79-51250 #
AIAA 79-0733 .... 22 p0298 A79-29007*#
AIAA 79-0913 .... 23 p0425 A79-34775*#
AIAA 79-0915 .... 23 p0425 A79-34738*#
AIAA 79-0916 .... 23 p0425 A79-34739*#
AIAA 79-1656 .... 24 p0611 A79-45328 #
AIAA 79-7008 .... 22 p0300 A79-29383*#
AIAA 79-7009 .... 22 p0300 A79-29384 #

AIAA-PAPER-79-2081 .... 24 p0795 N79-33253*#

AIAA-78-1000 .... 23 p0595 N79-27665*#

AIRESEARCH-31-2937 .... 21 p0173 N79-10526*#

ALO-41/2 .... 21 p0185 N79-11493 #
ALO-3715-1 .... 24 p0755 N79-30793 #
ALO-3904-1 .... 24 p0727 N79-28772 #
ALO-4162-2 .... 24 p0735 N79-29524 #
ALO-5319-1 .... 24 p0789 N79-32708 #

ANL-K-3723-VOL-1 .... 21 p0222 N79-14579 #

ANL-MHD-78-2 .... 21 p0197 N79-12564 #
ANL-MHD-78-7 .... 22 p0361 N79-20500 #
ANL-MHD-78-8 .... 22 p0361 N79-20507 #
ANL-MHD-79-3 .... 22 p0361 N79-20503 #

ANL-OTEC-78-3 .... 24 p0747 N79-30522 #

ANL-78-94 .... 24 p0773 N79-31793 #
ANL-79-2 .... 24 p0719 N79-28362 #
ANL-79-15 .... 24 p0740 N79-29636 #
ANL-79-16 .... 24 p0772 N79-31789 #

ANL/AA-11-VOL-1-DRAFT .... 21 p0174 N79-10537 #
ANL/CEN-FE-77-5 .... 21 p0216 N79-14242 #
ANL/CES-TE-78-4 .... 24 p0727 N79-28775 #
ANL/CES-TE-78-9 .... 24 p0790 N79-32711 #

ANL/ECT-3-APP-A-PT-2 .... 21 p0213 N79-13571 #
ANL/EES-CP-6 .... 24 p0756 N79-30808 #
ANL/EES-CP-10 .... 24 p0760 N79-30846 #
ANL/EES-CP-14 .... 24 p0754 N79-30781 #
ANL/EES-CP-18 .... 24 p0776 N79-31829 #
ANL/EES-TM-23 .... 24 p0788 N79-32699*#
ANL/EES-TM-33 .... 23 p0567 N79-24899 #
ANL/EES-TM-34 .... 24 p0753 N79-30774 #
ANL/EES-TM-35 .... 24 p0740 N79-29637 #
ANL/EES-TM-41 .... 24 p0756 N79-30803 #
ANL/EES/CP-11 .... 24 p0801 N79-33589 #
ANL/EES/TM-42 .... 24 p0800 N79-33587 #
ANL/ES-74 .... 24 p0781 N79-32620 #
ANL/FPP-TM-117 .... 24 p0755 N79-30790 #
ANL/FPP-78-2 .... 23 p0586 N79-26953 #
ANL/ICES-TM-16 .... 24 p0728 N79-28778 #
ANL/ICES-TM-17 .... 24 p0727 N79-28777 #
ANL/ICES-TM-22 .... 24 p0742 N79-29658 #
ANL/MHD-78-4 .... 23 p0583 N79-26519 #
ANL/OEPM-78-2 .... 24 p0788 N79-32697 #
ANL/SDP-TM-78-3 .... 23 p0596 N79-27674 #

APL/JHU-EQR-78-1 .... 21 p0191 N79-11554 #
APL/JHU-EQR-78-2 .... 23 p0544 N79-22645 #
APL/JHU-EQR-78-4 .... 24 p0793 N79-32739 #
APL/JHU-EQR-79-1 .... 24 p0802 N79-33602 #
APL/JHU-GEMS-005 .... 24 p0760 N79-30837 #
APL/JHU-QM-78-042R .... 24 p0740 N79-29640 #
APL/JHU-QM-79-016 .... 24 p0760 N79-30837 #

APPL/JHU-EQR-77-4 .... 21 p0191 N79-11555 #

APR-1 .... 22 p0334 N79-16369*#
APR-2 .... 23 p0545 N79-22662 #
APR-2 .... 23 p0549 N79-23507*#
APR-2 .... 24 p0777 N79-31845 #
APR-4 .... 22 p0351 N79-18815*#

AR-1 .... 22 p0330 N79-16139 #
AR-1 .... 23 p0560 N79-24469*#
AR-2 .... 22 p0336 N79-16446 #
AR-2 .... 23 p0567 N79-24900 #
AR-2 .... 24 p0781 N79-32617 #

ARI-RR-131 .... 23 p0568 N79-25249 #

ARID-LANDS-RESOURCE-IP-12 .... 21 p0211 N79-13549 #

ARL/MECH-ENG-TM-391 .... 22 p0339 N79-17230 #

ARLCD-CR-78027 .... 23 p0576 N79-26222 #
ARLCD-CR-78029 .... 23 p0543 N79-22638 #
ARLCD-CR-78030 .... 24 p0724 N79-28743 #

ASME PAPER 77-WA/ENER-1 .... 21 p0030 A79-10253 #
ASME PAPER 78-ENAS-2 .... 21 p0048 A79-12551 #
ASME PAPER 78-ENAS-7 .... 21 p0048 A79-12556 #
ASME PAPER 78-ENAS-20 .... 21 p0048 A79-12569 #
ASME PAPER 78-ENAS-30 .... 21 p0049 A79-12579 #
ASME PAPER 78-GT-13 .... 21 p0031 A79-10257 #
ASME PAPER 78-GT-14 .... 21 p0032 A79-10778 #
ASME PAPER 78-GT-85 .... 22 p0255 A79-22338 #
ASME PAPER 78-GT-113 .... 21 p0032 A79-10788 #
ASME PAPER 78-GT-126 .... 21 p0033 A79-10791 #
ASME PAPER 78-GT-145 .... 21 p0031 A79-10269 #
ASME PAPER 78-GT-146 .... 21 p0033 A79-10799 #
ASME PAPER 78-GT-147 .... 24 p0605 A79-44790 #
ASME PAPER 78-GT-155 .... 24 p0605 A79-44793 #
ASME PAPER 78-GT-192 .... 21 p0033 A79-10816 #
ASME PAPER 78-GT-198 .... 21 p0033 A79-10818 #
ASME PAPER 78-HT-47 .... 24 p0647 A79-49136 #
ASME PAPER 78-JPGC-PWR-11 .... 21 p0150 A79-18097 #
ASME PAPER 78-JPGC-PWR-12 .... 21 p0150 A79-18098 #
ASME PAPER 78-JPGC-PWR-18 .... 21 p0150 A79-18099 #
ASME PAPER 78-RT-1 .... 21 p0150 A79-18085 #
ASME PAPER 78-WA/APC-2 .... 21 p0158 A79-19735 #
ASME PAPER 78-WA/APC-3 .... 21 p0158 A79-19736 #
ASME PAPER 78-WA/APC-7 .... 21 p0158 A79-19738 #
ASME PAPER 78-WA/APC-12 .... 21 p0158 A79-19741 #
ASME PAPER 78-WA/APC-13 .... 21 p0159 A79-19742 #
ASME PAPER 78-WA/DSC-19 .... 21 p0159 A79-19765 #
ASME PAPER 78-WA/DSC-21 .... 21 p0159 A79-19766 #
ASME PAPER 78-WA/DSC-32 .... 21 p0159 A79-19771 #
ASME PAPER 78-WA/ENER-2 .... 21 p0159 A79-19775 #
ASME PAPER 78-WA/ENER-3 .... 21 p0159 A79-19776 #
ASME PAPER 78-WA/ENER-4 .... 21 p0159 A79-19777 #
ASME PAPER 78-WA/ENER-7 .... 21 p0159 A79-19778 #
ASME PAPER 78-WA/FU-3 .... 21 p0160 A79-19787 #
ASME PAPER 78-WA/FU-4 .... 21 p0160 A79-19788 #
ASME PAPER 78-WA/FU-9 .... 21 p0160 A79-19789 #
ASME PAPER 78-WA/GT-1 .... 21 p0160 A79-19790 #
ASME PAPER 78-WA/GT-2 .... 21 p0160 A79-19791 #
ASME PAPER 78-WA/GT-8 .... 21 p0160 A79-19796 #
ASME PAPER 78-WA/HT-21 .... 21 p0161 A79-19808 #
ASME PAPER 78-WA/HT-22 .... 21 p0161 A79-19809 #
ASME PAPER 78-WA/HT-23 .... 21 p0161 A79-19810 #
ASME PAPER 78-WA/HT-32 .... 21 p0161 A79-19813 #
ASME PAPER 78-WA/HT-33 .... 21 p0161 A79-19814 #
ASME PAPER 78-WA/HT-34 .... 21 p0161 A79-19815 #
ASME PAPER 78-WA/HT-59 .... 21 p0161 A79-19824 #
ASME PAPER 78-WA/HT-65 .... 21 p0162 A79-19825 #
ASME PAPER 78-WA/PVP-1 .... 21 p0162 A79-19832 #
ASME PAPER 78-WA/SOL-1 .... 21 p0162 A79-19834 #
ASME PAPER 78-WA/SOL-2 .... 21 p0162 A79-19835 #
ASME PAPER 78-WA/SOL-3 .... 21 p0162 A79-19836 #
ASME PAPER 78-WA/SOL-4 .... 21 p0162 A79-19837*#
ASME PAPER 78-WA/SOL-5 .... 21 p0163 A79-19838*#
ASME PAPER 78-WA/SOL-7 .... 21 p0163 A79-19839 #
ASME PAPER 78-WA/SOL-8 .... 21 p0163 A79-19840 #
ASME PAPER 78-WA/SOL-9 .... 21 p0163 A79-19841 #
ASME PAPER 78-WA/SOL-10 .... 21 p0163 A79-19842 #
ASME PAPER 78-WA/SOL-11 .... 21 p0163 A79-19843 #
ASME PAPER 78-WA/SOL-12 .... 21 p0163 A79-19844 #
ASME PAPER 78-WA/SOL-13 .... 21 p0163 A79-19845 #
ASME PAPER 78-WA/SOL-15 .... 21 p0164 A79-19847 #
ASME PAPER 78-WA/SOL-16 .... 21 p0164 A79-19848 #
ASME PAPER 78-WA/TS-4 .... 21 p0164 A79-19849*#
ASME PAPER 79-APM-5 .... 22 p0298 A79-29064 #
ASME PAPER 79-DE-5 .... 24 p0641 A79-47651*#
ASME PAPER 79-DE-9 .... 24 p0641 A79-47652 #
ASME PAPER 79-GT-3 .... 22 p0306 A79-30502 #
ASME PAPER 79-GT-7 .... 22 p0306 A79-30505 #
ASME PAPER 79-GT-8 .... 22 p0306 A79-30506 #
ASME PAPER 79-GT-12 .... 23 p0375 A79-32331 #
ASME PAPER 79-GT-15 .... 23 p0375 A79-32332 #
ASME PAPER 79-GT-16 .... 22 p0306 A79-30510 #
ASME PAPER 79-GT-36 .... 23 p0375 A79-32341 #
ASME PAPER 79-GT-38 .... 22 p0309 A79-30554*#
ASME PAPER 79-GT-41 .... 23 p0375 A79-32344 #
ASME PAPER 79-GT-43 .... 22 p0306 A79-30522 #
ASME PAPER 79-GT-45 .... 23 p0375 A79-32345 #
ASME PAPER 79-GT-53 .... 23 p0375 A79-32348 #
ASME PAPER 79-GT-54 .... 23 p0376 A79-32349 #
ASME PAPER 79-GT-60 .... 22 p0306 A79-30530 #
ASME PAPER 79-GT-64 .... 22 p0306 A79-30532 #
ASME PAPER 79-GT-67 .... 22 p0307 A79-30533 #
ASME PAPER 79-GT-72 .... 22 p0307 A79-30536 #
ASME PAPER 79-GT-73 .... 22 p0307 A79-30537 #
ASME PAPER 79-GT-78 .... 23 p0376 A79-32357 #
ASME PAPER 79-GT-81 .... 23 p0376 A79-32360 #
ASME PAPER 79-GT-84 .... 23 p0376 A79-32361 #
ASME PAPER 79-GT-85 .... 23 p0376 A79-32362 #
ASME PAPER 79-GT-88 .... 23 p0376 A79-32365 #
ASME PAPER 79-GT-89 .... 23 p0376 A79-32366 #
ASME PAPER 79-GT-90 .... 23 p0377 A79-32367 #
ASME PAPER 79-GT-94 .... 23 p0377 A79-32370 #
ASME PAPER 79-GT-101 .... 23 p0377 A79-32377 #
ASME PAPER 79-GT-103 .... 23 p0377 A79-32379 #
ASME PAPER 79-GT-104 .... 23 p0377 A79-32380 #
ASME PAPER 79-GT-106 .... 23 p0377 A79-32381 #
ASME PAPER 79-GT-127 .... 23 p0377 A79-32396 #
ASME PAPER 79-GT-131 .... 23 p0377 A79-32400 #
ASME PAPER 79-GT-137 .... 23 p0378 A79-32406 #
ASME PAPER 79-GT-138 .... 23 p0378 A79-32407 #
ASME PAPER 79-GT-141 .... 22 p0309 A79-30555*#
ASME PAPER 79-GT-151 .... 23 p0378 A79-32416 #
ASME PAPER 79-GT-158 .... 23 p0378 A79-32420 #
ASME PAPER 79-GT-159 .... 23 p0378 A79-32421 #
ASME PAPER 79-GT-160 .... 23 p0378 A79-32422 #
ASME PAPER 79-GT-162 .... 23 p0378 A79-32424 #
ASME PAPER 79-GT-166 .... 23 p0379 A79-32428 #
ASME PAPER 79-GT-167 .... 23 p0379 A79-32429 #
ASME PAPER 79-GT-172 .... 23 p0379 A79-32433 #
ASME PAPER 79-GT-173 .... 23 p0379 A79-32434 #
ASME PAPER 79-GT-177 .... 23 p0379 A79-32437 #
ASME PAPER 79-GT-190 .... 23 p0379 A79-32449 #
ASME PAPER 79-GT-193 .... 23 p0379 A79-32451 #
ASME PAPER 79-GT-195 .... 23 p0380 A79-32453 #
ASME PAPER 79-GT-198 .... 23 p0380 A79-32455 #
ASME PAPER 79-GT-199 .... 23 p0380 A79-32456 #
ASME PAPER 79-GT-201 .... 23 p0380 A79-32458 #
ASME PAPER 79-GT-204 .... 23 p0380 A79-32461 #
ASME PAPER 79-GT-205 .... 23 p0380 A79-32462 #
ASME PAPER 79-SOL-1 .... 22 p0307 A79-30539 #
ASME PAPER 79-SOL-2 .... 22 p0307 A79-30540 #
ASME PAPER 79-SOL-3 .... 22 p0307 A79-30541 #
ASME PAPER 79-SOL-4 .... 22 p0308 A79-30542 #
ASME PAPER 79-SOL-7 .... 22 p0308 A79-30543*#

ASME PAPER 79-SOL-9 .... 22 p0308 A79-30544 #
ASME PAPER 79-SOL-10 .... 22 p0308 A79-30545 #
ASME PAPER 79-SOL-11 .... 22 p0308 A79-30546 #
ASME PAPER 79-SOL-12 .... 22 p0308 A79-30547 #
ASME PAPER 79-SOL-13 .... 23 p0380 A79-32463 #
ASME PAPER 79-SOL-14 .... 22 p0308 A79-30548 #
ASME PAPER 79-SOL-15 .... 22 p0309 A79-30549 #
ASME PAPER 79-SOL-16 .... 22 p0309 A79-30550 #
ASME PAPER 79-SOL-17 .... 22 p0309 A79-30551*#
ASME PAPER 79-SOL-18 .... 22 p0309 A79-30552 #

ASSA-FA-5 .... 23 p0574 N79-25524 #

ASSA-SE-B21/77 .... 22 p0349 N79-18461 #
ASSA-SE-B24/77 .... 23 p0574 N79-25526 #

ASSA-SE-INFO-6/78 .... 23 p0574 N79-25527 #
ASSA-SE-INFO-7/78 .... 23 p0574 N79-25528 #

ATR-78(7384)-1 .... 24 p0767 N79-31432 #
ATR-78(8114)-2 .... 21 p0220 N79-14558 #
ATR-78(9409)-1 .... 21 p0222 N79-14582 #

AVRADCOM-TR-78-41 .... 21 p0215 N79-14099*#

BCS-40159-1 .... 24 p0804 N79-33881*#
BCS-40180-2-REV .... 24 p0804 N79-33882*#
BCS-40262-1 .... 24 p0804 N79-33883*#
BCS-40262-2 .... 24 p0804 N79-33884*#

BERC/OP-76/32 .... 21 p0226 N79-15304 #
BERC/OP-77/41 .... 21 p0227 N79-15311 #
BERC/OP-77/42 .... 21 p0226 N79-15305 #
BERC/OP-77/44 .... 21 p0227 N79-15312 #
BERC/OP-77/52 .... 21 p0227 N79-15313 #
BERC/OP-77/53 .... 21 p0228 N79-15314 #
BERC/OP-77/56 .... 21 p0228 N79-15315 #
BERC/OP-77/57 .... 21 p0227 N79-15306 #
BERC/OP-77/58 .... 21 p0227 N79-15308 #
BERC/OP-77/60 .... 21 p0227 N79-15307 #
BERC/OP-77/61 .... 21 p0227 N79-15309 #
BERC/OP-77/62 .... 21 p0227 N79-15310 #
BERC/OP-78/21 .... 23 p0579 N79-26411 #

BETC-0026-4 .... 24 p0735 N79-29579 #
BETC-2025-1 .... 24 p0776 N79-31831 #

BETC/PPS-79/1 .... 23 p0555 N79-24189 #
BETC/RI-78/16 .... 23 p0568 N79-25248 #
BETC/RI-78/19 .... 23 p0588 N79-27313 #
BETC/RI-79/2 .... 24 p0767 N79-31423 #

BK042-1012 .... 24 p0747 N79-30499*#

BLL-RISLEY-TR-3395-(9091.9F) ... 22 p0347 N79-18442

BLL-RTS-11317 .... 22 p0345 N79-17984
BLL-RTS-11512 .... 22 p0347 N79-18439

BLM/YK/TR-78/20 .... 23 p0546 N79-22971 #
BLM/YK/TR-78/22 .... 23 p0546 N79-22972 #
BLM/YM/ES-79/02-VOL-1-B .... 24 p0744 N79-29783 #

BLS/YK/TR-78/13 .... 23 p0546 N79-22970 #

BM-IC-8772 .... 21 p0190 N79-11547 #
BM-IC-8781 .... 21 p0201 N79-13152 #

BM-OFR-55-79 .... 24 p0797 N79-33549 #

BM-RI-8293 .... 21 p0213 N79-13590 #
BM-RI-8323 .... 23 p0540 N79-22606 #
BM-RI-8324 .... 23 p0540 N79-22608 #
BM-RI-8334 .... 24 p0731 N79-29249 #
BM-RI-8335 .... 24 p0720 N79-28592 #
BM-RI-8348 .... 24 p0732 N79-29276 #

BM-SP-2-78 .... 21 p0217 N79-14521 #

BMFT-FB-M-78-03 .... 23 p0567 N79-24592 #

BMFT-FB-T-77-17 .... 22 p0342 N79-17344 #
BMFT-FB-T-77-35 .... 22 p0349 N79-18456 #
BMFT-FB-T-77-42 .... 22 p0349 N79-18457 #
BMFT-FB-T-77-72 .... 24 p0759 N79-30832 #
BMFT-FB-T-77-92 .... 24 p0759 N79-30833 #
BMFT-FB-T-78-15 .... 23 p0590 N79-27345 #
BMFT-FB-T-78-25 .... 24 p0780 N79-32393 #
BMFT-FB-T-78-27 .... 23 p0590 N79-27341 #
BMFT-FB-T-78-28 .... 24 p0793 N79-32751 #
BMFT-FB-T-78-29 .... 24 p0780 N79-32394 #
BMFT-FB-T-78-31 .... 24 p0794 N79-33151 #
BMFT-FB-T-78-33 .... 24 p0792 N79-32730 #
BMFT-FB-T-78-35 .... 24 p0792 N79-32732 #
BMFT-FB-T-78-47 .... 23 p0599 N79-27712 #

BMFT-FB-77-84 .... 24 p0747 N79-30412 #

BMI-NLVP-TM-77-2 .... 22 p0345 N79-178[illegible]9*#

BNL-23101 .... 21 p0221 N79-14578 #
BNL-23597 .... 23 p0598 N79-27695 #
BNL-24016 .... 21 p0192 N79-11641 #
BNL-24216 .... 21 p0122 A79-17339
BNL-24368 .... 21 p0208 N79-13525 #
BNL-24371 .... 24 p0758 N79-30823 #
BNL-24387 .... 23 p0563 N79-24491 #
BNL-24444 .... 24 p0729 N79-28814 #
BNL-24473 .... 21 p0013 A79-10111
BNL-24477 .... 24 p0764 N79-31364 #
BNL-24573 .... 24 p0753 N79-30776 #
BNL-24781 .... 23 p0564 N79-24504 #
BNL-24998 .... 23 p0597 N79-27692 #
BNL-25195 .... 23 p0556 N79-24307 #
BNL-25212 .... 23 p0563 N79-24492 #
BNL-25250 .... 24 p0772 N79-31791 #
BNL-25263 .... 23 p0583 N79-26518 #
BNL-25291 .... 23 p0565 N79-24509 #
BNL-25351 .... 24 p0719 N79-28439 #
BNL-25475 .... 23 p0597 N79-27694 #
BNL-25523 .... 24 p0741 N79-29657 #
BNL-25537 .... 24 p0728 N79-28779 #
BNL-25633 .... 24 p0772 N79-31787 #
BNL-25634 .... 24 p0767 N79-31421 #
BNL-25760 .... 24 p0734 N79-29379 #
BNL-25928 .... 24 p0789 N79-32704 #
BNL-25933 .... 24 p0791 N79-32722 #
BNL-25935 .... 24 p0790 N79-32718 #
BNL-26047 .... 24 p0780 N79-32387 #
BNL-26130 .... 24 p0780 N79-32388 #
BNL-50703 .... 21 p0188 N79-11528 #
BNL-50708 .... 21 p0213 N79-13572 #
BNL-50784 .... 21 p0185 N79-11500 #
BNL-50799 .... 21 p0185 N79-11499 #
BNL-50800 .... 21 p0208 N79-13524 #
BNL-50816 .... 21 p0210 N79-13538 #
BNL-50822 .... 21 p0209 N79-13526 #
BNL-50828 .... 22 p0370 N79-21564 #
BNL-50871 .... 22 p0364 N79-20927 #
BNL-50892 .... 23 p0599 N79-27921 #
BNL-50905 .... 22 p0361 N79-20502 #
BNL-50951 .... 24 p0750 N79-30728 #

BNWL-2137 .... 21 p0170 N79-10179 #

BULL-62 .... 22 p0335 N79-16380 #

C-081 .... 24 p0723 N79-28727*#
C-78127-VOL-4 .... 23 p0541 N79-22620*#

CAEC-21 .... 23 p0566 N79-24517 #
CAEC-23 .... 23 p0575 N79-25536 #
CAEC-25 .... 23 p0556 N79-24423 #
CAEC-28 .... 23 p0577 N79-26233 #
CAEC-30 .... 23 p0575 N79-25570 #
CAEC-32 .... 23 p0566 N79-24519 #
CAEC-002 .... 22 p0372 N79-21628 #

CAES-10 .... 24 p0728 N79-28783 #

CASD-NAS-78-011 .... 21 p0171 N79-10272*#

CATMEC/27 .... 24 p0794 N79-33096 #

CATMET/17 .... 24 p0738 N79-29622 #

CBNS-AE-10 .... 21 p0222 N79-14586 #

CEEDO-TR-78-41 .... 21 p0217 N79-14507 #

CEL-CR-79.005 .... 23 p0595 N79-27667 #

CEL-TN-1534 .... 23 p0561 N79-24475 #

CERL-IR-E-144 .... 23 p0573 N79-25516 #

CERL-TR-E-139 .... 22 p0363 N79-20522 #

CGR/DC-11/78 .... 24 p0738 N79-29615 #

CIO-78/2 .... 21 p0222 N79-14581 #

CIRC-166 .... 23 p0540 N79-22597 #

COM-74-11103 .... 24 p0777 N79-31836 #
COM-74-11533 .... 24 p0801 N79-33594 #

CONF-771003-P2-VOL-2 .... 21 p0176 N79-10551 #
CONF-771053-10 .... 21 p0215 N79-14165 #
CONF-771071-SUMM .... 24 p0740 N79-29642 #
CONF-771203-5 .... 21 p0175 N79-10540 #
CONF-771203-6 .... 21 p0118 A79-17294
CONF-771207-1 .... 21 p0232 N79-15830 #
CONF-771246-1 .... 21 p0180 N79-11236 #
CONF-780109-6 .... 21 p0189 N79-11541 #
CONF-780114-4 .... 23 p0582 N79-26512 #
CONF-780114-6 .... 21 p0131 A79-17411
CONF-780114-7 .... 21 p0122 A79-17339
CONF-780114-8 .... 21 p0124 A79-17355
CONF-780114-9 .... 21 p0137 A79-17463
CONF-780121-2 .... 21 p0192 N79-11568 #
CONF-780222-5 .... 21 p0186 N79-11506 #
CONF-780253-1 .... 24 p0791 N79-32719 #
CONF-780274 .... 24 p0757 N79-30811 #
CONF-780337-P1 .... 24 p0775 N79-31813 #
CONF-780337-P2 .... 24 p0775 N79-31814 #
CONF-780337-P3 .... 24 p0775 N79-31815 #
CONF-780337-8 .... 23 p0561 N79-24476 #
CONF-780340 .... 24 p0747 N79-30410 #
CONF-780425-3 .... 21 p0187 N79-11526 #
CONF-780425-9 .... 23 p0583 N79-26517 #
CONF-780425-13 .... 24 p0777 N79-31832 #
CONF-780426-2 .... 21 p0186 N79-11508 #
CONF-780432-4 .... 24 p0741 N79-29656 #
CONF-780450-2 .... 24 p0758 N79-30823 #
CONF-780460-3 .... 24 p0745 N79-30396 #
CONF-780502-7 .... 21 p0187 N79-11516 #
CONF-780508-19 .... 21 p0214 N79-13872 #
CONF-780527-1 .... 21 p0175 N79-10539 #
CONF-780550-4 .... 21 p0187 N79-11517 #
CONF-780550-6 .... 23 p0573 N79-25520 #
CONF-780580-1 .... 24 p0756 N79-30807 #
CONF-780587-1 .... 21 p0189 N79-11536 #
CONF-780599-1 .... 24 p0776 N79-31830 #
CONF-780599-2 .... 24 p0758 N79-30822 #
CONF-780611-8 .... 24 p0780 N79-32391 #
CONF-780615-2 .... 21 p0181 N79-11412 #
CONF-780619-2 .... 21 p0188 N79-11529 #
CONF-780619-4 .... 21 p0176 N79-10550 #
CONF-780619-7 .... 21 p0188 N79-11527 #
CONF-780619-8 .... 21 p0198 N79-12570 #
CONF-780619-14 .... 24 p0754 N79-30780 #
CONF-780619-16 .... 24 p0753 N79-30777 #
CONF-780619-20 .... 24 p0739 N79-29627 #
CONF-780619-22 .... 23 p0596 N79-27677 #
CONF-780619-24 .... 23 p0583 N79-26525 #
CONF-780636-6 .... 24 p0756 N79-30808 #
CONF-780636-8 .... 24 p0761 N79-30923 #
CONF-780636-9 .... 24 p0760 N79-30846 #
CONF-780639-3 .... 21 p0208 N79-13520 #
CONF-780639-4 .... 21 p0208 N79-13521 #
CONF-780651-1 .... 21 p0208 N79-13525 #
CONF-780667-3 .... 24 p0754 N79-30782 #
CONF-780667-4 .... 24 p0753 N79-30779 #
CONF-780701-1 .... 24 p0754 N79-30781 #
CONF-780718-4 .... 24 p0768 N79-31439 #
CONF-780737-1 .... 24 p0778 N79-32373 #
CONF-780744-1 .... 24 p0776 N79-31829 #
CONF-780773-1 .... 23 p0596 N79-27673 #
CONF-780773-2 .... 24 p0726 N79-28769 #
CONF-780801-8 .... 21 p0011 A79-10093
CONF-780801-8 .... 21 p0189 N79-11538 #
CONF-780801-18 .... 21 p0214 N79-13844 #
CONF-780801-19 .... 21 p0013 A79-10111
CONF-780801-22 .... 24 p0791 N79-32720 #
CONF-780801-40 .... 23 p0583 N79-26524 #
CONF-780807-12 .... 23 p0563 N79-24491 #
CONF-780808-11 .... 24 p0753 N79-30778 #
CONF-780808-14 .... 24 p0753 N79-30776 #
CONF-780808-26 .... 24 p0726 N79-28757 #
CONF-780808-27 .... 24 p0789 N79-32708 #
CONF-780825-11 .... 24 p0761 N79-30908 #
CONF-780861-1 .... 23 p0564 N79-24504 #
CONF-780894-SUMM .... 24 p0787 N79-32689 #
CONF-780902-1 .... 24 p0764 N79-31364 #
CONF-780902-16 .... 24 p0734 N79-29377 #
CONF-780941-6 .... 24 p0744 N79-30036 #
CONF-780956-3 .... 23 p0561 N79-24478 #
CONF-780983-14 .... 24 p0756 N79-30805 #
CONF-781039-9 .... 23 p0576 N79-26147 #
CONF-781109-16 .... 24 p0742 N79-29661 #
CONF-781109-18 .... 23 p0585 N79-26546 #
CONF-781110-15 .... 23 p0577 N79-26232 #
CONF-781124-1 .... 24 p0756 N79-30802 #
CONF-781129-1 .... 24 p0772 N79-31791 #
CONF-781133-5 .... 23 p0596 N79-27675 #
CONF-781142-3 .... 23 p0563 N79-24492 #
CONF-781142-7 .... 23 p0584 N79-26529 #
CONF-781142-8 .... 24 p0718 N79-28360 #
CONF-781150-4 .... 23 p0577 N79-26231 #
CONF-781182-2 .... 23 p0600 N79-28063 #
CONF-781182-3 .... 23 p0590 N79-27412 #
CONF-781190-1 .... 24 p0724 N79-28747 #
CONF-781191 .... 23 p0570 N79-25485*#
CONF-781226-1 .... 24 p0741 N79-29657 #
CONF-781228-1 .... 24 p0786 N79-32683 #
CONF-781235-1 .... 24 p0725 N79-28753 #
CONF-781236-1 .... 24 p0729 N79-28790 #
CONF-781239 .... 23 p0582 N79-26514 #
CONF-781244-1 .... 24 p0791 N79-32725 #
CONF-790102-4 .... 23 p0582 N79-26515 #
CONF-790106-2 .... 24 p0725 N79-28754 #
CONF-790106-5 .... 24 p0739 N79-29634 #
CONF-790106-6 .... 24 p0725 N79-28755 #
CONF-790107-5 .... 24 p0742 N79-29659 #
CONF-790108-1 .... 23 p0597 N79-27691 #
CONF-790108-3 .... 23 p0596 N79-27683 #
CONF-790112-3 .... 23 p0556 N79-24307 #
CONF-790112-4 .... 24 p0725 N79-28756 #
CONF-790114-1 .... 23 p0595 N79-27668 #
CONF-790117 .... 24 p0742 N79-29666 #
CONF-790118-6 .... 24 p0774 N79-31805 #
CONF-790119-2 .... 24 p0786 N79-32684 #
CONF-790120-2 .... 24 p0756 N79-30804 #
CONF-790134-1 .... 24 p0728 N79-28779 #
CONF-790138-1 .... 24 p0773 N79-31796 #
CONF-790141-1 .... 24 p0719 N79-28439 #
CONF-790145-2 .... 24 p0732 N79-29305 #
CONF-790203-1 .... 24 p0726 N79-28762 #
CONF-790204-9 .... 24 p0761 N79-31024 #
CONF-790205-3 .... 24 p0769 N79-31743 #
CONF-790213-1 .... 24 p0778 N79-32131 #
CONF-790213-2 .... 24 p0755 N79-30795 #
CONF-790213-3 .... 24 p0759 N79-30828 #
CONF-790213-5 .... 24 p0779 N79-32383 #
CONF-790301-10 .... 24 p0780 N79-32387 #
CONF-790305-2 .... 23 p0565 N79-24511 #
CONF-790305-5 .... 24 p0788 N79-32700 #
CONF-790328-2 .... 24 p0786 N79-32680 #
CONF-790328-3 .... 24 p0789 N79-32705 #
CONF-790334-2 .... 24 p0748 N79-30689 #
CONF-790352-1 .... 24 p0753 N79-30773 #
CONF-790353-2 .... 24 p0789 N79-32702 #
CONF-790405-3 .... 23 p0561 N79-24479 #
CONF-790405-4 .... 23 p0564 N79-24505 #
CONF-790405-8 .... 24 p0720 N79-28653 #
CONF-790405-9 .... 24 p0721 N79-28657 #
CONF-790405-11 .... 24 p0733 N79-29368 #
CONF-790410-1 .... 24 p0734 N79-29384 #
CONF-790413-3 .... 24 p0788 N79-32698 #
CONF-790415-16 .... 24 p0734 N79-29379 #
CONF-790423-2 .... 24 p0721 N79-28658 #
CONF-790423-4 .... 24 p0721 N79-28656 #
CONF-790423-5 .... 24 p0720 N79-28521 #
CONF-790440-2 .... 24 p0769 N79-31744 #
CONF-790443-2 .... 24 p0791 N79-32726 #
CONF-790446-2 .... 24 p0789 N79-32704 #
CONF-790447-1 .... 24 p0790 N79-32718 #
CONF-790505-2 .... 24 p0728 N79-28784 #
CONF-790512-2 .... 24 p0747 N79-30408 #
CONF-790517-1 .... 24 p0790 N79-32710 #
CONF-790541-4 .... 24 p0790 N79-32714 #
CONF-790541-6 .... 24 p0790 N79-32716 #
CONF-790602-29 .... 24 p0772 N79-31787 #
CONF-790602-39 .... 24 p0767 N79-31421 #
CONF-790615-9 .... 24 p0787 N79-32690 #
CONF-790615-10 .... 24 p0786 N79-32678 #
CONF-790615-12 .... 24 p0786 N79-32679 #
CONF-790803-26 .... 24 p0780 N79-32388 #
CONF-7804102-13 .... 23 p0596 N79-27678 #
CONF-7804108-4 .... 23 p0582 N79-26513 #
CONF-7805102-1 .... 24 p0801 N79-33589 #
CONF-7805105-2 .... 23 p0598 N79-27695 #
CONF-7805120 .... 24 p0738 N79-29617 #
CONF-7805152-1 .... 23 p0589 N79-27332 #

CONF-7806107-2 .... 23 p0589 N79-27333 #
CONF-7806121-1 .... 24 p0729 N79-28814 #
CONF-7806139-1 .... 23 p0589 N79-27338 #
CONF-7808101-1 .... 24 p0781 N79-32518 #
CONF-7809103 .... 24 p0731 N79-29271 #
CONF-7809125-1 .... 23 p0588 N79-27327 #
CONF-7810135-1 .... 23 p0564 N79-24503 #
CONF-7810139-1 .... 23 p0597 N79-27692 #
CONF-7810142-1 .... 23 p0565 N79-24509 #
CONF-7811101-1 .... 23 p0565 N79-24508 #
CONF-7811109-4 .... 23 p0583 N79-26527 #
CONF-7811119-1 .... 23 p0564 N79-24507 #

CONS-5082-1 .... 24 p0756 N79-30801*#
CONS-8630-T1 .... 24 p0776 N79-31824 #

CONS/1197-9 .... 22 p0369 N79-21556 #
CONS/2925-3 .... 23 p0577 N79-26229 #
CONS/4396-3 .... 21 p0181 N79-11406*#
CONS/5081-1 .... 21 p0183 N79-11473*#

CONTRIB-21 .... 23 p0545 N79-22648 #

COO-0277-1 .... 24 p0766 N79-31418 #
COO-2477-11 .... 21 p0231 N79-15431 #
COO-2477-12 .... 24 p0742 N79-29663 #
COO-2564-4 .... 23 p0564 N79-24506 #
COO-2566-37 .... 24 p0731 N79-29118 #
COO-2577-13 .... 21 p0209 N79-13530 #
COO-2577-14 .... 21 p0206 N79-13507 #
COO-2588-2 .... 24 p0741 N79-29655 #
COO-2597-4 .... 21 p0188 N79-11533 #
COO-2617-4/2 .... 21 p0204 N79-13378 #
COO-2764-002 .... 24 p0790 N79-32713 #
COO-2857-1 .... 21 p0184 N79-11490 #
COO-2908-4 .... 22 p0358 N79-20459 #
COO-2947-5 .... 24 p0742 N79-29660 #
COO-4045-3 .... 23 p0588 N79-27221 #
COO-4051-23 .... 24 p0738 N79-29622 #
COO-4051-25 .... 24 p0787 N79-32685 #
COO-4051-26 .... 24 p0740 N79-29638 #
COO-4051-28 .... 24 p0740 N79-29639 #
COO-4051-35 .... 24 p0794 N79-33096 #
COO-4051-41 .... 24 p0787 N79-32686 #
COO-4094-15 .... 24 p0739 N79-29627 #
COO-4094-19 .... 23 p0596 N79-27677 #
COO-4094-24 .... 23 p0596 N79-27672 #
COO-4094-28 .... 23 p0596 N79-27673 #
COO-4094-29 .... 24 p0726 N79-28769 #
COO-4094-32 .... 24 p0788 N79-32700 #
COO-4094-34 .... 24 p0789 N79-32702 #
COO-4094-35 .... 24 p0759 N79-30826 #
COO-4142-2 .... 24 p0741 N79-29656 #
COO-4181- .... 21 p0193 N79-11890 #
COO-4227-2 .... 21 p0170 N79-10178 #
COO-4228-1 .... 24 p0739 N79-29633 #
COO-4337-2/2 .... 23 p0598 N79-27701 #
COO-4339-4 .... 23 p0583 N79-26522 #
COO-4389-1 .... 21 p0213 N79-13569 #
COO-4465-2-EXEC-SUMM .... 24 p0759 N79-30824 #
COO-4523-1 .... 24 p0786 N79-32682 #
COO-4556-2 .... 24 p0800 N79-33586 #
COO-4577-2 .... 24 p0726 N79-28757 #
COO-4577-3 .... 23 p0583 N79-26525 #
COO-4577-6 .... 24 p0739 N79-29625 #
COO-4589-1 .... 24 p0779 N79-32379 #
COO-4628-2 .... 24 p0750 N79-30727 #
COO-4628-2 .... 24 p0772 N79-31788 #
COO-4636-1 .... 23 p0582 N79-26511 #
COO-4649-3 .... 24 p0758 N79-30819 #
COO-4661-1 .... 24 p0739 N79-29635 #
COO-4663-1 .... 24 p0757 N79-30812 #
COO-4691-1 .... 24 p0780 N79-32386 #
COO-4704-2 .... 24 p0789 N79-32705 #

CRN-780301-00087 .... 21 p0189 N79-11542 #
CRN-780531-00226 .... 21 p0177 N79-10565 #

CSA/LN-2286 .... 21 p0230 N79-15428 #
CSA/LN-2391 .... 24 p0802 N79-33601 #
CSA/NP-03 .... 24 p0802 N79-33603 #
CSA/PAM-6143-10 .... 24 p0802 N79-33603 #
CSA/PAM-6143-12 .... 24 p0802 N79-33601 #

CSIR-S-145 .... 22 p0340 N79-17316 #

CSIR-SR-WAT-54 .... 23 p0560 N79-24468 #

D-133 .... 24 p0783 N79-32640*#

DCN-78-200-181-17 .... 24 p0727 N79-2877[illegible] #

DDA-EDR-9719 .... 24 p0762 N79-31087*#
DDA-EDR-9790 .... 24 p0778 N79-32129*#

DELET-TR-78-8 .... 21 p0206 N79-13504 #

DFE-13 .... 24 p0728 N79-28781 #

DGE/1026-2 .... 24 p0717 N79-28314*#

DGLR PAPER 78-165 .... 21 p0063 A79-14056 #
DGLR PAPER 78-167 .... 21 p0063 A79-14054 #

DLR-FB-78-17 .... 24 p0760 N79-30836 #

DOC-78-008-4-000 .... 22 p0335 N79-16377*#
DOC-78SDS4252 .... 21 p0196 N79-12554*#
DOC-78SDS4257 .... 21 p0219 N79-14551*#
DOC-79-292-2-REV-2 .... 24 p0768 N79-31737*#

DOE/CONS-0421-4 .... 23 p0576 N79-25930 #
DOE/CR-0005 .... 24 p0773 N79-31792 #
DOE/CRN-780106-00003 .... 21 p0177 N79-10560 #
DOE/CS-0009 .... 21 p0186 N79-11503 #
DOE/CS-0010 .... 21 p0208 N79-13519 #
DOE/CS-0027/1 .... 23 p0574 N79-25521 #
DOE/CS-0033/1 .... 23 p0540 N79-22332 #
DOE/CS-0038/2 .... 24 p0727 N79-28771 #
DOE/CS-0042/3 .... 23 p0564 N79-24501 #
DOE/CS-0052 .... 23 p0590 N79-27521 #
DOE/CS-0053 .... 23 p0597 N79-27688 #
DOE/CS-0057 .... 24 p0754 N79-30785 #
DOE/CS-0068 .... 23 p0567 N79-24900 #
DOE/CS-0071 .... 24 p0757 N79-30814 #
DOE/CS-0072 .... 24 p0757 N79-30813 #
DOE/EA-0033 .... 22 p0362 N79-20514 #
DOE/EDP-006 .... 21 p0188 N79-11531 #
DOE/EDP-0003 .... 21 p0198 N79-12569 #
DOE/EDP-0004 .... 21 p0187 N79-11522 #
DOE/EDP-0011 .... 21 p0192 N79-11569 #
DOE/EDP-0024 .... 21 p0175 N79-10545 #
DOE/EDP-0046 .... 24 p0793 N79-32746 #
DOE/EIA-0014 .... 21 p0177 N79-10560 #
DOE/EIA-0031/1 .... 21 p0189 N79-11542 #
DOE/EIA-0058 .... 21 p0177 N79-10565 #
DOE/EIA-0102/1 .... 24 p0746 N79-30402 #
DOE/EIA-0102/4 .... 24 p0762 N79-31082 #
DOE/EIA-0102/7 .... 24 p0748 N79-30691 #
DOE/EIA-0102/13 .... 24 p0781 N79-32619 #
DOE/EIA-0102/20 .... 24 p0718 N79-28356 #
DOE/EIA-0102/22 .... 24 p0725 N79-28752 #
DOE/EIA-0102/27 .... 24 p0725 N79-28751 #
DOE/EIA-0102/29 .... 24 p0720 N79-28652 #
DOE/EIA-0102/32 .... 23 p0589 N79-27337 #
DOE/EIA-0102/33 .... 24 p0758 N79-30815 #
DOE/EIA-0102/37 .... 24 p0755 N79-30799 #
DOE/EIA-0102/38 .... 24 p0734 N79-29376 #
DOE/EIA-0102/40 .... 24 p0746 N79-30403 #
DOE/EIA-0102/44 .... 24 p0746 N79-30405 #
DOE/EIA-0102/46 .... 24 p0762 N79-31083 #
DOE/EIA-0102/51 .... 24 p0773 N79-31798 #
DOE/EIA-0102/53 .... 24 p0778 N79-32372 #
DOE/EIA-0103/2 .... 24 p0746 N79-30400 #
DOE/EIA-0103/4 .... 24 p0746 N79-30406 #
DOE/EIA-0103/9 .... 23 p0593 N79-27643 #
DOE/EIA-0103/16 .... 24 p0758 N79-30817 #
DOE/EIA-0103/17 .... 23 p0600 N79-28059 #
DOE/EIA-0103/18 .... 22 p0362 N79-20509 #
DOE/EIA-0103/24 .... 24 p0755 N79-30797 #
DOE/EIA-0103/31 .... 24 p0781 N79-32618 #
DOE/EIA-0125/3-78 .... 24 p0748 N79-30688 #
DOE/EIA-0135 .... 24 p0791 N79-32723 #
DOE/EIA-0151 .... 23 p0597 N79-27684 #
DOE/EIA-0174 .... 24 p0728 N79-28787 #
DOE/EIA-0175 .... 24 p0772 N79-31790 #
DOE/EIS-0004 .... 21 p0213 N79-13574 #
DOE/EIS-0034 .... 24 p0746 N79-30407 #
DOE/EIS-0039-VOL-1 .... 24 p0746 N79-30399 #
DOE/EIS-0039-VOL-2 .... 24 p0746 N79-30401 #
DOE/ER-0018 .... 23 p0586 N79-26952 #
DOE/ER-0021/1 .... 23 p0557 N79-24435*#
DOE/ER-0021/2 .... 23 p0557 N79-24436*#
DOE/ER-0022 .... 22 p0337 N79-16893 #
DOE/ER-0023 .... 22 p0367 N79-21538*#
DOE/ERA-0009 .... 21 p0214 N79-13934 #
DOE/ERA-0023 .... 23 p0600 N79-28058 #
DOE/ERA-0024 .... 23 p0589 N79-27336 #

DOE/ D-0002 .... 24 p0745 N79-30102 #
DOE/E 0009 .... 23 p0597 N79-27686 #
DOE/ERU 010 .... 23 p0597 N79-27690 #
DOE/ET- 4 .... 21 p0176 N79-10546 #
DOE/ET-0 .... 21 p0207 N79-13518 #
DOE/ET-00 1 .... 21 p0209 N79-13529 #
DOE/ET-00 78) .... 21 p0197 N79-12567 #
DOE/ET-00 .... 24 p0738 N79-29620 #
DOE/ET-00 .... 21 p0175 N79-10544 #
DOE/ET-0 9 .... 21 p0207 N79-13517 #
DOE/ET-0 2 .... 21 p0210 N79-13535 #
DOE/ET- 78 .... 24 p0773 N79-31794 #
DOE/ET-0 7 .... 24 p0788 N79-32696 #
DOE/ET-0 1 .... 24 p0775 N79-31817 #
DOE/ET/4 3-1-VOL-1 .... 24 p0724 N79-28749 #
DOE/ET/4 3-1-VCL-3 .... 24 p0725 N79-28750 #
DOE/ET/ 53-3 .... 23 p0596 N79-27676 #
DOE/EV- 4 .... 21 p0213 N79-13573 #
DOE/EV-0 0 .... 21 p0178 N79-10572 #
DOE/EV-00 .... 24 p0729 N79-28812 #
DOE/FERC- 08 .... 23 p0577 N79-26228 #
DOE/IR-004 .... 24 p0728 N79-28782 #
DOE/JPL-101 .... 23 p0559 N79-24457*#
DOE/JPL-1012-3 .... 23 p0559 N79-24458*#
DOE/JPL-1012-4 .... 23 p0559 N79-24459*#
DOE/JPL-1012-7 .... 24 p0782 N79-32633*#
DOE/JPL-1012-78/9 .... 22 p0354 N79-19460*#
DOE/JPL-1012-78/13 .... 22 p0355 N79-19462*#
DOE/JPL-1012-78/14 .... 22 p0348 N79-18453*#
DOE/JPL-1012-79/1 .... 23 p0542 N79-22628*#
DOE/JPL-1012-79/5 .... 23 p0549 N79-23504*#
DOE/JPL-1012-79/5 .... 23 p0549 N79-23505*#
DOE/JPL-1024-78/1 .... 22 p0359 N79-20490*#
DOE/JPL-1060-4 .... 23 p0549 N79-23503*#
DOE/JPL-1060-6 .... 23 p0542 N79-22627*#
DOE/JPL-1060-7 .... 22 p0360 N79-20492*#
DOE/JPL-1060-7 .... 23 p0560 N79-24464*#
DOE/JPL-1060-9 .... 23 p0560 N79-24462*#
DOE/JPL-1060-9 .... 24 p0749 N79-30718*#
DOE/JPL-1060-12-VOL-1 .... 23 p0559 N79-24460*#
DOE/JPL-1060-12-VOL-2 .... 23 p0559 N79-24461*#
DOE/JPL-1060-13 .... 23 p0560 N79-24466*#
DOE/JPL-1060-15 .... 22 p0368 N79-21548*#
DOE/JPL-1060-16 .... 24 p0782 N79-32632*#
DOE/JPL-1060-17 .... 23 p0595 N79-27660*#
DOE/JPL-1060-23 .... 23 p0594 N79-27654*#
DOE/JPL-1060-79/1 .... 22 p0359 N79-20491*#
DOE/JPL-954339-79/15 .... 24 p0769 N79-31756*#
DOE/JPL-954355-78/3 .... 22 p0359 N79-20483*#
DOE/JPL-954356-79/2 .... 24 p0771 N79-31776*#
DOE/JPL-954363-78/8 .... 22 p0348 N79-18451*#
DOE/JPL-954373-78/7 .... 21 p0219 N79-14540*#
DOE/JPL-954373-79/11 .... 24 p0771 N79-31775*#
DOE/JPL-954374-78/1 .... 23 p0586 N79-26979*#
DOE/JPL-954442-78/12 .... 24 p0736 N79-29598*#
DOE/JPL-954521-79/2 .... 24 p0798 N79-33564*#
DOE/JPL-954527-78/8 .... 21 p0195 N79-12544*#
DOE/JPL-954589-78/8 .... 23 p0581 N79-26499*#
DOE/JPL-954654-79/3 .... 24 p0770 N79-31762*#
DOE/JPL-954654-79/7 .... 24 p0722 N79-28722*#
DOE/JPL-954689-78/4 .... 23 p0550 N79-23517*#
DOE/JPL-954786-78/06A .... 23 p0570 N79-25484*#
DOE/JPL-954796-77/1 .... 22 p0335 N79-16378*#
DOE/JPL-954796-77/1 .... 23 p0572 N79-25506*#
DOE/JPL-954796-78/4 .... 23 p0580 N79-26485*#
DOE/JPL-954796-78/5 .... 23 p0550 N79-23519*#
DOE/JPL-954796-79/6 .... 24 p0770 N79-31769*#
DOE/JPL-954817-79/4 .... 24 p0769 N79-31758*#
DOE/JPL-954822-78/1 .... 24 p0770 N79-31765*#
DOE/JPL-954833-78/1 .... 22 p0367 N79-21545*#
DOE/JPL-954852-79/1 .... 23 p0551 N79-23806*#
DOE/JPL-954853-79/2 .... 23 p0581 N79-26498*#
DOE/JPL-954862-78/4 .... 21 p0219 N79-14555*#
DOE/JPL-954862-79/6 .... 23 p0558 N79-24448*#
DOE/JPL-954865-79/5 .... 24 p0771 N79-31773*#
DOE/JPL-954868-78/4 .... 22 p0358 N79-20480*#
DOE/JPL-954868-79/1 .... 24 p0737 N79-29607*#
DOE/JPL-954868-79/7 .... 24 p0770 N79-31759*#
DOE/JPL-954873-78/01 .... 23 p0560 N79-24469*#
DOE/JPL-954881-79/4 .... 23 p0550 N79-23512*#
DOE/JPL-954886-79/1 .... 22 p0357 N79-20281*#
DOE/JPL-954898-78/4 .... 22 p0358 N79-20481*#
DOE/JPL-954899-78/3 .... 21 p0200 N79-12970*#
DOE/JPL-954914-78/2 .... 22 p0358 N79-20482*#
DOE/JPL-954977-79/6 .... 24 p0771 N79-31772*#
DOE/JPL-954995-78/3 .... 23 p0561 N79-24471*#
DOE/JPL-955055-78/1 .... 23 p0572 N79-25505*#
DOE/JPL-955055-78/1 .... 23 p0580 N79-26490*#
DOE/JPL-955077-78/3 .... 23 p0549 N79-23507*#
DOE/JPL-955089-79/1 .... 22 p0359 N79-20485*#
DOE/JPL-955089-79/3 .... 23 p0581 N79-26495*#
DOE/JPL-955089-79/4 .... 23 p0580 N79-26488*#
DOE/JPL-955123-79/1 .... 23 p0581 N79-26491*#
DOE/JPL-955164-78/4 .... 22 p0359 N79-20486*#
DOE/JPL-955201-78/1 .... 23 p0550 N79-23513*#
DOE/JPL-955217-79/4 .... 23 p0559 N79-24454*#
DOE/JPL-955266-79/1 .... 24 p0770 N79-31771*#
DOE/JPL-955278-79/1 .... 23 p0559 N79-24455*#
DOE/JPL-955282-79/1 .... 24 p0798 N79-33567*#
DOE/JPL-955307-79/1 .... 23 p0559 N79-24456*#
DOE/JPL-955324-79/1 .... 23 p0550 N79-23527*#
DOE/JPL-955325-79/1 .... 24 p0798 N79-33566*#
DOE/JPL-955328-79/1 .... 23 p0550 N79-23523*#
DOE/NASA/0004-79/1 .... 24 p0778 N79-32129*#
DOE/NASA/0012-78/1-VOL-1 .... 21 p0205 N79-13496*#
DOE/NASA/0012-79/2 .... 24 p0797 N79-33560*#
DOE/NASA/0019-78/1 .... 22 p0364 N79-21075*#
DOE/NASA/0028-79/1 .... 24 p0762 N79-31087*#
DOE/NASA/0032-79/1 .... 24 p0730 N79-29110*#
DOE/NASA/0037-79/1 .... 24 p0762 N79-31088*#
DOE/NASA/0038-79/1 .... 22 p0368 N79-21554*#
DOE/NASA/0040-78/1 .... 22 p0354 N79-19451*#
DOE/NASA/0042-79/1-VOL-1 .... 24 p0804 N79-33881*#
DOE/NASA/0042-79/2-VOL-2 .... 24 p0804 N79-33882*#
DOE/NASA/0042-79/3-VOL-1 .... 24 p0804 N79-33883*#
DOE/NASA/0042-79/4-VOL-2 .... 24 p0804 N79-33884*#
DOE/NASA/0067-79/1 .... 24 p0737 N79-29604*#
DOE/NASA/0207-78/1 .... 21 p0226 N79-15267*#
DOE/NASA/0615-79/1 .... 22 p0354 N79-19454*#
DOE/NASA/1002-78/1 .... 21 p0183 N79-11479*#
DOE/NASA/1002-78/2 .... 23 p0558 N79-24445*#
DOE/NASA/1002-79/3 .... 23 p0558 N79-24442*#
DOE/NASA/1002-79/4 .... 23 p0581 N79-26505*#
DOE/NASA/1004-79/1 .... 22 p0360 N79-20494*#
DOE/NASA/1004-79/16 .... 23 p0581 N79-26502*#
DOE/NASA/1011-78/28 .... 22 p0345 N79-17859*#
DOE/NASA/1022-78/42 .... 22 p0342 N79-17336*#
DOE/NASA/1028-72/2 .... 22 p0368 N79-21549*#
DOE/NASA/1028-78/19 .... 22 p0333 N79-16355*#
DOE/NASA/1028-78/20 .... 21 p0195 N79-12548*#
DOE/NASA/1028-79/1 .... 22 p0341 N79-17333*#
DOE/NASA/1028-79/23 .... 24 p0749 N79-30719*#
DOE/NASA/1028-79/24 .... 24 p0723 N79-28727*#
DOE/NASA/1034-78/3 .... 21 p0183 N79-11481*#
DOE/NASA/1034-79/1 .... 22 p0368 N79-21550*#
DOE/NASA/1034-79/2 .... 22 p0360 N79-20498*#
DOE/NASA/1040-78/30 .... 22 p0337 N79-16721*#
DOE/NASA/1044-79/3 .... 24 p0723 N79-28728*#
DOE/NASA/1059-79/2 .... 23 p0581 N79-26504*#
DOE/NASA/1060-78/1 .... 23 p0579 N79-26476*#
DOE/NASA/1062-79/1 .... 23 p0558 N79-24444*#
DOE/NASA/1062-79/2 .... 23 p0595 N79-27665*#
DOE/NASA/2593-79/6 .... 23 p0571 N79-25498*#
DOE/NASA/2674-78/1 .... 21 p0183 N79-11478*#
DOE/NASA/2674-78/2 .... 22 p0341 N79-17335*#
DOE/NASA/2674-79/4 .... 23 p0571 N79-25499*#
DOE/NASA/2674-79/5 .... 23 p0558 N79-24446*#
DOE/NASA/2674-79/6 .... 24 p0749 N79-30720*#
DOE/NASA/7653-79/1 .... 22 p0360 N79-20497*#
DOE/NASA/9773-78/1 .... 21 p0173 N79-10525*#
DOE/NASA/11272-79/1 .... 23 p0571 N79-25500*#
DOE/NASA/20305-79/3 .... 24 p0723 N79-28725*#
DOE/NASA/20485-79/1 .... 23 p0558 N79-24443*#
DOE/NASA/20485-79/2 .... 23 p0581 N79-26503*#
DOE/NASA/20485-79/3 .... 23 p0572 N79-25501*#
DOE/NASA/20485-79/4 .... 24 p0736 N79-29599*#
DOE/PE-0009 .... 24 p0758 N79-30816 #
DOE/RA-0011 .... 24 p0748 N79-30686 #
DOE/TIC-10001 .... 24 p0800 N79-33588 #
DOE/TIC-10005 .... 24 p0719 N79-28441 #
DOE/TIC-10009 .... 24 p0745 N79-30107 #
DOE/TIC-10016 .... 24 p0774 N79-31807 #
DOE/TIC-10017 .... 24 p0740 N79-29645 #
DOE/TIC-10018 .... 24 p0752 N79-30771 #
DOE/TIC-10019 .... 23 p0593 N79-27644 #
DOE/TIC-10021 .... 24 p0735 N79-29577 #
DOE/TIC-10022 .... 24 p0759 N79-30825 #
DOE/TIC-10029 .... 24 p0733 N79-29371 #
DOE/TIC-10030 .... 24 p0755 N79-30791 #
DOE/TIC-10032 .... 24 p0735 N79-29576 #
DOE/TIC-10038 .... 24 p0738 N79-29623 #
DOE/TIC-10039 .... 23 p0589 N79-27339 #
DOE/TIC-10062 .... 24 p0776 N79-31826 #
DOE/TIC-10064 .... 24 p0776 N79-31823 #
DOE/TIC-10065 .... 24 p0775 N79-31818 #
DOE/TIC-10066 .... 24 p0775 N79-31820 #
DOE/TIC-10107 .... 24 p0781 N79-32617 #
DOE/TIC-10128 .... 24 p0780 N79-32390 #

DOE/TIC-10129 .... 24 p0801 N79-33591 #
DOE/TIC-100200 .... 24 p0735 N79-29578 #
DOE/US-002 .... 23 p0563 N79-24490 #
DOE/US-0001/2 .... 21 p0180 N79-11242 #

DOT-HS-803-840 .... 24 p0720 N79-28594 #
DOT-HS-803-880 .... 24 p0720 N79-28596 #
DOT-HS-803324 .... 21 p0226 N79-15304 #
DOT-HS-803325 .... 21 p0226 N79-15305 #
DOT-HS-803326 .... 21 p0227 N79-15311 #
DOT-HS-803327 .... 21 p0227 N79-15312 #
DOT-HS-803328 .... 21 p0227 N79-15313 #
DOT-HS-803329 .... 21 p0228 N79-15314 #
DOT-HS-803330 .... 21 p0228 N79-15315 #
DOT-HS-803331 .... 21 p0227 N79-15308 #
DOT-HS-803332 .... 21 p0227 N79-15306 #
DOT-HS-803333 .... 21 p0227 N79-15309 #
DOT-HS-803334 .... 21 p0227 N79-15310 #
DOT-HS-803335 .... 21 p0227 N79-15307 #
DOT-HS-803706 .... 23 p0556 N79-24358 #
DOT-HS-803722 .... 23 p0568 N79-25249 #
DOT-HS-803808 .... 23 p0579 N79-26412 #
DOT-HS-803831 .... 23 p0579 N79-26411 #

DOT-MTB-OPSO-78-01 .... 21 p0181 N79-11447 #
DOT-MTB-OPSO-78-02 .... 21 p0181 N79-11446 #

DOT-RSPA-DPB-20-78-13 .... 21 p0177 N79-10561 #

DOT-TSC-FRA-79-7-1-VOL-1 .... 22 p0370 N79-21563 #

DOT-TSC-NHTSA-19-15 .... 23 p0579 N79-26412 #
DOT-TSC-NHTSA-78-8 .... 21 p0226 N79-15304 #
DOT-TSC-NHTSA-78-9 .... 21 p0226 N79-15305 #
DOT-TSC-NHTSA-78-11 .... 21 p0227 N79-15312 #
DOT-TSC-NHTSA-78-12 .... 21 p0227 N79-15313 #
DOT-TSC-NHTSA-78-13 .... 21 p0228 N79-15314 #
DOT-TSC-NHTSA-78-14 .... 21 p0228 N79-15315 #
DOT-TSC-NHTSA-78-15 .... 21 p0227 N79-15308 #
DOT-TSC-NHTSA-78-16 .... 21 p0227 N79-15306 #
DOT-TSC-NHTSA-78-17 .... 21 p0227 N79-15309 #
DOT-TSC-NHTSA-78-18 .... 21 p0227 N79-15310 #
DOT-TSC-NHTSA-78-19 .... 21 p0227 N79-15307 #
DOT-TSC-NHTSA-78-47 .... 23 p0568 N79-25249 #
DOT-TSC-NHTSA-79-2 .... 23 p0579 N79-26411 #
DOT-TSC-NHTSA-79-12 .... 24 p0720 N79-28594 #

DOT-TSC-RSPA-79-5 .... 24 p0794 N79-33107 #

DOT-TSC-UMTA-77-49-4 .... 24 p0778 N79-32135 #
DOT-TSC-UMTA-79-16 .... 24 p0763 N79-31110 #

DOT/RSPD/DPB/50-78/17 .... 24 p0796 N79-33348 #

DOW-FE-363 .... 21 p0180 N79-11166 #

DRD-SE-4 .... 23 p0550 N79-23527*#

DREO-R-787 .... 22 p0339 N79-17118 #

DRL-58-DRD-SE-7 .... 21 p0219 N79-14540*#

DSE/2426-19 .... 21 p0174 N79-10535 #
DSE/2459-2 .... 21 p0221 N79-14577 #

D6-48097 .... 23 p0553 N79-24172*#
D180-20309-1 .... 23 p0541 N79-22616*#
D180-20309-2 .... 23 p0546 N79-23083*#

E-005 .... 23 p0558 N79-24443*#
E-016 .... 23 p0558 N79-24444*#
E-018 .... 23 p0542 N79-22624*#
E-023 .... 23 p0581 N79-26503*#
E-034 .... 23 p0571 N79-25500*#
E-035 .... 24 p0749 N79-30719*#
E-036 .... 23 p0558 N79-24446*#
E-039 .... 23 p0581 N79-26504*#
E-042 .... 23 p0546 N79-23133*#
E-053 .... 23 p0581 N79-26505*#
E-062 .... 23 p0587 N79-27140*#
E-067 .... 24 p0723 N79-28725*#
E-071 .... 23 p0572 N79-25501*#
E-072 .... 24 p0749 N79-30720*#
E-088 .... 24 p0718 N79-28349*#
E-089 .... 23 p0587 N79-27141*#
E-094 .... 24 p0736 N79-29599*#
E-100 .... 24 p0723 N79-28728*#
E-115 .... 24 p0765 N79-31405*#
E-116 .... 24 p0723 N79-28726*#
E-151 .... 24 p0772 N79-31781*#
E-169 .... 24 p0795 N79-33253*#
E-1009 .... 23 p0539 N79-22193*#
E-9413 .... 22 p0333 N79-16355*#
E-9419 .... 23 p0581 N79-26502*#
E-9647 .... 21 p0204 N79-13472*#
E-9713 .... 21 p0169 N79-10122*#
E-9762 .... 21 p0215 N79-14099*#
E-9775 .... 22 p0345 N79-17859*#
E-9777 .... 21 p0183 N79-11481*#
E-9779 .... 21 p0183 N79-11479*#
E-9780 .... 21 p0193 N79-11955*#
E-9783 .... 21 p0183 N79-11478*#
E-9788 .... 21 p0183 N79-11477*#
E-9799 .... 22 p0341 N79-17335*#
E-9800 .... 22 p0329 N79-15961*#
E-9811 .... 22 p0342 N79-17336*#
E-9818 .... 21 p0195 N79-12548*#
E-9822 .... 23 p0579 N79-26476*#
E-9828 .... 21 p0194 N79-12086*#
E-9833 .... 22 p0333 N79-16357*#
E-9834 .... 22 p0338 N79-16930*#
E-9835 .... 21 p0229 N79-15403*#
E-9846-1 .... 22 p0357 N79-20118*#
E-9848 .... 22 p0337 N79-16721*#
E-9883 .... 23 p0558 N79-24445*#
E-9898 .... 22 p0330 N79-16136*#
E-9905 .... 21 p0229 N79-15410*#
E-9907 .... 22 p0360 N79-20494*#
E-9913 .... 22 p0357 N79-20114*#
E-9921 .... 21 p0229 N79-15411*#
E-9925 .... 22 p0368 N79-21549*#
E-9957 .... 22 p0368 N79-21550*#
E-9961 .... 23 p0539 N79-22191*#
E-9970 .... 22 p0360 N79-20498*#
E-9985 .... 23 p0542 N79-22623*#
E-9986 .... 23 p0571 N79-25498*#
E-9987 .... 23 p0571 N79-25499*#
E-9996 .... 23 p0558 N79-24442*#
E-9997 .... 24 p0798 N79-33572*#

ECON-77-158-2 .... 21 p0193 N79-11890 #
ECON-78-147-1 .... 22 p0368 N79-21551*#
ECON-78-292 .... 24 p0768 N79-31720*#

EDA-79-027 .... 23 p0587 N79-27026 #

EDA/OER-78-024 .... 21 p0177 N79-10564 #

EEB-HOSP-78-3 .... 24 p0767 N79-31436 #

EMD-78-28-VOL-1 .... 23 p0572 N79-25508 #
EMD-78-28-VCL-2 .... 23 p0573 N79-25509 #
EMD-78-28-VOL-3 .... 23 p0573 N79-25510 #
EMD-78-38 .... 21 p0190 N79-11546 #
EMD-78-76 .... 21 p0222 N79-14583 #
EMD-78-77 .... 23 p0555 N79-24192 #
EMD-78-81 .... 22 p0355 N79-19472 #
EMD-78-88 .... 21 p0230 N79-15424 #
EMD-78-98 .... 24 p0748 N79-30701 #
EMD-78-106 .... 24 p0750 N79-30729 #
EMD-79-3 .... 23 p0544 N79-22646 #
EMD-79-6 .... 24 p0731 N79-29120 #
EMD-79-11 .... 23 p0544 N79-22647 #
EMD-79-38 .... 23 p0575 N79-25540 #
EMD-79-58 .... 24 p0795 N79-33345 #
EMD-79-59 .... 24 p0796 N79-33349 #
EMD-79-82 .... 24 p0804 N79-34006 #

EPA-450/2-77-031 .... 21 p0194 N79-12251 #
EPA-450/2-78-018 .... 22 p0373 N79-21670 #
EPA-450/2-78-047 .... 23 p0566 N79-24537 #
EPA-450/3-78-007 .... 21 p0178 N79-10591 #
EPA-450/3-78-038 .... 21 p0223 N79-14641 #
EPA-450/3-78-117 .... 23 p0575 N79-25567 #
EPA-600/1-78-063 .... 22 p0364 N79-20727 #
EPA-600/2-77-235 .... 21 p0178 N79-10610 #
EPA-600/2-78-004N .... 21 p0223 N79-14635 #
EPA-600/2-78-004X .... 22 p0353 N79-19429 #
EPA-600/2-78-114-PT-1 .... 21 p0231 N79-15440 #
EPA-600/2-78-149 .... 21 p0231 N79-15439 #
EPA-600/2-78-200 .... 22 p0350 N79-18497 #
EPA-600/2-78-211 .... 22 p0336 N79-16439 #
EPA-600/2-78-214 .... 24 p0761 N79-30866 #
EPA-600/2-78-217 .... 23 p0545 N79-22661 #
EPA-600/2-79-001 .... 23 p0578 N79-26235 #
EPA-600/4-78-029 .... 21 p0200 N79-12602 #
EPA-600/4-78-039 .... 21 p0232 N79-15473 #
EPA-600/7-77-130 .... 22 p0344 N79-17378 #

EPA-600/7-78-011 .... 21 p0195 N79-12424 #
EPA-600/7-78-020 .... 21 p0211 N79-13548 #
EPA-600/7-78-023 .... 22 p0373 N79-21671 #
EPA-600/7-78-032A .... 21 p0200 N79-12606 #
EPA-600/7-78-047-VOL-1 .... 21 p0178 N79-10574 #
EPA-600/7-78-068 .... 22 p0338 N79-17025 #
EPA-600/7-78-073 .... 21 p0171 N79-10243 #
EPA-600/7-78-084 .... 21 p0223 N79-14643 #
EPA-600/7-78-086 .... 21 p0224 N79-14946 #
EPA-600/7-78-089 .... 21 p0216 N79-14243 #
EPA-600/7-78-091 .... 21 p0178 N79-10595 #
EPA-600/7-78-093 .... 21 p0199 N79-12601 #
EPA-600/7-78-098 .... 21 p0178 N79-10603 #
EPA-600/7-78-101 .... 21 p0178 N79-10604 #
EPA-600/7-78-107 .... 21 p0179 N79-10968 #
EPA-600/7-78-108 .... 21 p0213 N79-13591 #
EPA-600/7-78-119 .... 21 p0232 N79-15864 #
EPA-600/7-78-129 .... 21 p0223 N79-14618 #
EPA-600/7-78-134 .... 21 p0232 N79-15479 #
EPA-600/7-78-136B .... 24 p0743 N79-29670 #
EPA-600/7-78-146 .... 21 p0213 N79-13592 #
EPA-600/7-78-149 .... 21 p0228 N79-15379 #
EPA-600/7-78-150 .... 22 p0330 N79-16139 #
EPA-600/7-78-153A .... 22 p0346 N79-18061 #
EPA-600/7-78-159 .... 22 p0339 N79-17026 #
EPA-600/7-78-160-VOL-5 .... 22 p0336 N79-16437 #
EPA-600/7-78-165 .... 21 p0232 N79-15474 #
EPA-600/7-78-171 .... 22 p0339 N79-17027 #
EPA-600/7-78-173A .... 22 p0372 N79-21625 #
EPA-600/7-78-175 .... 22 p0336 N79-16446 #
EPA-600/7-78-181 .... 24 p0744 N79-29709 #
EPA-600/7-78-184A .... 22 p0344 N79-17364 #
EPA-600/7-78-184B .... 22 p0344 N79-17365 #
EPA-600/7-78-186A .... 22 p0350 N79-18487 #
EPA-600/7-78-186B .... 22 p0350 N79-18488 #
EPA-600/7-78-186C .... 22 p0350 N79-18489 #
EPA-600/7-78-190 .... 22 p0352 N79-19173 #
EPA-600/7-78-197A .... 22 p0351 N79-18834 #
EPA-600/7-78-197B-VOL-2 .... 22 p0356 N79-19496 #
EPA-600/7-78-202 .... 22 p0373 N79-21662 #
EPA-600/7-78-204 .... 22 p0365 N79-21224 #
EPA-600/7-78-205 .... 23 p0566 N79-24543 #
EPA-600/7-78-208 .... 23 p0569 N79-25469 #
EPA-600/7-78-222 .... 22 p0373 N79-21682 #
EPA-600/7-78-223 .... 23 p0539 N79-22319 #
EPA-600/7-78-223A .... 23 p0539 N79-22318 #
EPA-600/7-78-227 .... 23 p0599 N79-27730 #
EPA-600/7-79-005 .... 22 p0373 N79-21661 #
EPA-600/7-79-014A .... 23 p0566 N79-24534 #
EPA-600/7-79-016 .... 23 p0590 N79-27342 #
EPA-600/7-79-025A .... 23 p0578 N79-26234 #
EPA-600/7-79-025B-VOL-4 .... 23 p0578 N79-26236 #
EPA-600/7-79-039 .... 23 p0578 N79-26237 #
EPA-600/7-79-046 .... 23 p0586 N79-26575 #
EPA-600/7-79-075 .... 24 p0797 N79-33552 #
EPA-600/7-79-089 .... 24 p0796 N79-33538 #
EPA-600/8-78-015 .... 22 p0372 N79-21626 #
EPA-600/8-78-021 .... 23 p0545 N79-22668 #
EPA-600/8-79-007 .... 23 p0585 N79-26558 #
EPA-600/9-78-022 .... 22 p0346 N79-18352 #
EPA-600/9-78-023 .... 22 p0349 N79-18464 #
EPA-908/4-78-008 .... 24 p0761 N79-30864 #

EPRI-AF-753 .... 21 p0185 N79-11498 #
EPRI-AF-782 .... 21 p0180 N79-11238 #
EPRI-AF-913 .... 24 p0795 N79-33344 #

EPRI-EA-620-VOL-1 .... 21 p0189 N79-11539 #
EPRI-EA-623 .... 21 p0203 N79-13281 #
EPRI-EA-745 .... 21 p0181 N79-11454 #
EPRI-EA-788 .... 24 p0718 N79-28355 #
EPRI-EA-936 .... 24 p0803 N79-33614 #

EPRI-EM-683 .... 21 p0186 N79-11502 #
EPRI-EM-751 .... 21 p0186 N79-11501 #
EPRI-EM-833 .... 24 p0776 N79-31828 #
EPRI-EM-877 .... 23 p0557 N79-27689 #
EPRI-EM-956 .... 23 p0558 N79-27702 #

EPRI-ER-771 .... 23 p0543 N79-22635 #
EPRI-ER-808-SY .... 24 p0787 N79-32687 #
EPRI-ER-808-VOL-1 .... 23 p0597 N79-27687 #
EPRI-ER-869 .... 24 p0739 N79-29631 #
EPRI-ER-943-SY .... 24 p0740 N79-29642 #

EPRI-FP-557 .... 21 p0200 N79-13149 #
EPRI-FP-775 .... 24 p0796 N79-33352 #
EPRI-FP-792-VOL-2 .... 24 p0760 N79-30848 #
EPRI-FP-806-SY .... 23 p0589 N79-27330 #

EPRI-RP1082-1-VOL-1 .... 21 p0205 N79-13496*#

EP43-79-5 .... 22 p0360 N79-20495*#

ERDA/JPL-954343-78/13 .... 21 p0219 N79-14541*#
ERDA/JPL-954343-79/14 .... 23 p0549 N79-23508*#
ERDA/JPL-954471-77/3 .... 21 p0218 N79-14537*#
ERDA/JPL-954605-78/5 .... 23 p0550 N79-23515*#
ERDA/JPL-954654-79/1 .... 22 p0357 N79-20282*#

ERHQ/2322-77/4 .... 21 p0174 N79-10538 #

ER79-4032 .... 22 p0345 N79-17896*#

ESA-CR(P)-1112 .... 22 p0335 N79-16379 #
ESA-CR(P)-1152-VOL-1 .... 23 p0599 N79-27708 #
ESA-CR(P)-1153-VOL-1 .... 23 p0599 N79-27709 #
ESA-CR(P)-1168-VOL-1 .... 24 p0759 N79-30834 #
ESA-CR(P)-1168-VOL-2 .... 24 p0760 N79-30835 #
ESA-CR(P)-1193-VOL-2 .... 24 p0768 N79-31513 #

ESD-TR-78-97 .... 21 p0226 N79-15145 #

ESN-32-4 .... 23 p0552 N79-23886 #

ESS/SS-878 .... 22 p0335 N79-16379 #
ESS/SS-909-VOL-1 .... 23 p0599 N79-27709 #

EUR-5889 .... 24 p0736 N79-29596
EUR-5911 .... 23 p0594 N79-27653

E79-10095 .... 22 p0339 N79-17289*#
E79-10099 .... 22 p0347 N79-18373*#
E79-10102 .... 22 p0339 N79-17291*#
E79-10196 .... 23 p0569 N79-25446*#
E79-10238 .... 24 p0747 N79-30599*#
E79-10260 .... 24 p0768 N79-31720*#
E79-10273 .... 24 p0768 N79-31730*#
E79-10274 .... 24 p0768 N79-31731*#
E79-10279 .... 24 p0796 N79-33518*#
E79-10294 .... 24 p0796 N79-33526*#

FAA-NA-77-17 .... 21 p0196 N79-12555 #

FAA-RD-78-87 .... 21 p0196 N79-12555 #

FAR-3 .... 23 p0588 N79-27313 #

FCR-0398 .... 21 p0196 N79-12553*#
FCR-0783-VOL-1 .... 22 p0361 N79-20505 #
FCR-0945 .... 24 p0772 N79-31784*#
FCR-1017 .... 24 p0800 N79-33581*#

FE-0496-T8 .... 23 p0588 N79-27329 #
FE-0496-T10-VOL-4-PT-10 .... 24 p0766 N79-31419 #
FE-1517-67 .... 23 p0577 N79-26226 #
FE-1534-50 .... 21 p0180 N79-11166 #
FE-1784-39 .... 24 p0719 N79-28364 #
FE-1817-5 .... 24 p0744 N79-29683 #
FE-2006-9 .... 24 p0719 N79-28363 #
FE-2006-12 .... 24 p0766 N79-31415 #
FE-2025-3 .... 21 p0192 N79-11607 #
FE-2035-12 .... 23 p0588 N79-27282 #
FE-2047-8 .... 23 p0554 N79-24185 #
FE-2202-39 .... 24 p0765 N79-31411 #
FE-2206-14 .... 21 p0180 N79-11239 #
FE-2210-29 .... 23 p0556 N79-24306 #
FE-2211-10 .... 24 p0718 N79-28357 #
FE-2215-11 .... 22 p0362 N79-20511 #
FE-2240-40 .... 24 p0766 N79-31417 #
FE-2240-96 .... 24 p0779 N79-32382 #
FE-2240-97 .... 24 p0766 N79-31414 #
FE-2240-100 .... 23 p0589 N79-27331 #
FE-2248-19 .... 22 p0369 N79-21558 #
FE-2251-52 .... 23 p0554 N79-24182 #
FE-2270-34 .... 23 p0554 N79-24181 #
FE-2275-8 .... 23 p0554 N79-24187 #
FE-2305-21 .... 24 p0733 N79-29367 #
FE-2307-34 .... 24 p0718 N79-28358 #
FE-2307-42 .... 24 p0765 N79-31410 #
FE-2321-12 .... 21 p0216 N79-14240 #
FE-2334-6 .... 21 p0171 N79-10238 #
FE-2338-10 .... 23 p0553 N79-24176 #
FE-2340-7 .... 23 p0554 N79-24186 #
FE-2341-8 .... 22 p0362 N79-20512 #
FE-2346-29 .... 24 p0769 N79-31746 #
FE-2416-37 .... 24 p0734 N79-29378 #
FE-2434-29 .... 23 p0554 N79-24184 #

FE-2445-1-VOL-1 .... 24 p0793 N79-32747 #
FE-2489-30 .... 23 p0576 N79-26143 #
FE-2489-36 .... 24 p0795 N79-33340 #
FE-2490-15 .... 23 p0555 N79-24190 #
FE-2515-24 .... 24 p0735 N79-29575 #
FE-2518-17 .... 24 p0745 N79-30397 #
FE-2524-8 .... 22 p0363 N79-20517 #
FE-2565-13 .... 23 p0554 N79-24183 #
FE-2565-14 .... 24 p0766 N79-31416 #
FE-2613-6-VOL-1 .... 22 p0362 N79-20515 #
FE-2613-6-VOL-2A .... 22 p0363 N79-20516 #
FE-2614-2-PT-1 .... 22 p0369 N79-21560 #
FE-2614-2-PT-2 .... 22 p0369 N79-21561 #
FE-2621-2 .... 24 p0765 N79-31386 #
FE-2664-7 .... 21 p0180 N79-11223 #
FE-2706-C8 .... 22 p0362 N79-20510 #
FE-3087-2 .... 22 p0363 N79-20518 #
FE-8890 .... 23 p0562 N79-24488 #
FE-8969-1 .... 23 p0569 N79-25469 #
FE-9036-3 .... 21 p0204 N79-13474*#
FE-23417 .... 22 p0365 N79-21310 #

FEA/B-77/181 .... 21 p0221 N79-14576 #

FFB-W-78-03 .... 23 p0561 N79-24476 #

FHWA/VA-79-R24 .... 23 p0544 N79-22643 #

FIR-19 .... 24 p0766 N79-31419 #

FJSRL-TR-78-0010 .... 22 p0352 N79-19305 #

FPL-12 .... 21 p0194 N79-12239 #

FRA/ORD-78-1-VOL-1 .... 22 p0370 N79-21563 #

FSLUPCA-34 .... 22 p0332 N79-16342 #

FTC/BE-79/04 .... 24 p0760 N79-30839 #

FWS/OBS-78/20 .... 22 p0340 N79-17311 #
FWS/OBS-78/25 .... 22 p0339 N79-17309 #
FWS/OBS-78/26 .... 21 p0231 N79-15438 #
FWS/OBS-78/54 .... 21 p0199 N79-12576 #
FWS/OBS-78/75 .... 22 p0373 N79-21679 #
FWS/OBS-78/77 .... 22 p0349 N79-18462 #

GA-A-14311 .... 22 p0331 N79-16261 #
GA-A-14876 .... 21 p0214 N79-13871 #
GA-A-14883 .... 21 p0187 N79-11526 #
GA-A-14946 .... 21 p0214 N79-13872 #
GA-A-15184 .... 23 p0582 N79-26515 #

GAT-916 .... 24 p0750 N79-30724 #

GE77TMP-52 .... 23 p0578 N79-26237 #
GE78TMP-60-VOL-1 .... 21 p0205 N79-13496*#
GE79ET0101 .... 24 p0797 N79-33560*#

GFERC/IC-77/1 .... 21 p0216 N79-14241 #

GPO-21-616 .... 21 p0228 N79-15400 #
GPO-22-334 .... 23 p0588 N79-27322 #
GPO-22-673 .... 22 p0333 N79-16352 #
GPO-23-254 .... 22 p0342 N79-17339 #
GPO-23-434 .... 21 p0228 N79-15398 #
GPO-23-442 .... 21 p0228 N79-15399 #
GPO-23-876 .... 21 p0224 N79-15105 #
GPO-24-067 .... 22 p0333 N79-16353 #
GPO-24-112 .... 23 p0582 N79-26507 #
GPO-25-418 .... 24 p0736 N79-29597 #
GPO-26-349 .... 24 p0717 N79-28346 #
GPO-31-624 .... 23 p0573 N79-25513 #
GPO-31-641 .... 23 p0560 N79-24467 #
GPO-32-317 .... 24 p0765 N79-31404 #
GPO-34-175 .... 21 p0214 N79-13932 #
GPO-34-986 .... 24 p0718 N79-28348 #
GPO-35-823 .... 21 p0232 N79-15815 #
GPO-35-994 .... 24 p0750 N79-30726
GPO-36-187 .... 24 p0750 N79-30725
GPO-36-956 .... 23 p0582 N79-26509 #
GPO-36-957 .... 24 p0737 N79-29609 #
GPO-37-136 .... 24 p0745 N79-30393
GPO-39-139 .... 23 p0576 N79-25926 #
GPO-39-305 .... 24 p0732 N79-29356 #
GPO-41-646 .... 22 p0364 N79-20928
GPO-42-886 .... 23 p0582 N79-26508 #
GPO-45-997 .... 24 p0731 N79-29212 #
GPO-46-134 .... 24 p0730 N79-29105 #
GPO-46-423 .... 24 p0762 N79-31085 #
GPO-86-231 .... 24 p0717 N79-28347 #
GPO-98-809 .... 22 p0351 N79-18810

GURC-163A .... 24 p0776 N79-31831 #

H-PRINT-95-42 .... 21 p0228 N79-15399 #
H-PRINT-95-43 .... 21 p0228 N79-15400 #
H-PRINT-95-48 .... 21 p0228 N79-15398 #
H-PRINT-95-51 .... 22 p0333 N79-16352 #

H-REPT-96-52 .... 22 p0364 N79-20928

HAC-REF-E3256-VOL-1 .... 24 p0782 N79-32638*#
HAC-REF-E3256-VOL-2 .... 24 p0782 N79-32639*#

HCP/CS-1549 .... 24 p0772 N79-31782 #
HCP/CS-4113-2 .... 24 p0774 N79-31803 #
HCP/CS-4113-3 .... 24 p0774 N79-31804 #
HCP/CS-4250-VOL-2 .... 23 p0563 N79-24493 #
HCP/H6407 .... 24 p0741 N79-29650 #
HCP/I8602-01/1 .... 24 p0742 N79-29662 #
HCP/L8602-01/2 .... 24 p0755 N79-30796 #
HCP/M0023-01-VOL-1 .... 24 p0750 N79-30722 #
HCP/M0023-02-VOL-2 .... 24 p0749 N79-30713 #
HCP/M1011-02 .... 21 p0215 N79-13937*#
HCP/M1011-03/2-VOL-2 .... 24 p0778 N79-32130*#
HCP/M2098-01 .... 21 p0180 N79-11237 #
HCP/M2101-1 .... 24 p0740 N79-29647 #
HCP/M2101-2 .... 24 p0741 N79-29648 #
HCP/M2103-0008 .... 24 p0737 N79-29605 #
HCP/M2121-01 .... 21 p0210 N79-13540 #
HCP/M2522-01 .... 24 p0790 N79-32715 #
HCP/M2528-1 .... 21 p0209 N79-13534 #
HCP/M2835-01 .... 22 p0351 N79-18817 #
HCP/M2923-01 .... 21 p0201 N79-13190 #
HCP/M4228-01 .... 24 p0800 N79-33584 #
HCP/M05017-01/1 .... 21 p0210 N79-13536 #
HCP/M50081-01 .... 23 p0599 N79-27706 #
HCP/M70065-01/1 .... 21 p0207 N79-13512 #
HCP/M70066-01/1-VOL-1 .... 23 p0574 N79-25522 #
HCP/M70066-01/2 .... 21 p0207 N79-13513 #
HCP/M70066-01/3-VOL-3 .... 23 p0574 N79-25523 #
HCP/P-6119 .... 24 p0777 N79-31844 #
HCP/R-4024-1 .... 22 p0337 N79-16895*#
HCP/R-4024-02 .... 23 p0548 N79-23492*#
HCP/R-4024-04 .... 23 p0548 N79-23493*#
HCP/R-4024-05 .... 23 p0548 N79-23494*#
HCP/R-4024-06 .... 23 p0548 N79-23495*#
HCP/R-4024-07 .... 23 p0548 N79-23496*#
HCP/R-4024-08 .... 23 p0548 N79-23497*#
HCP/R-4024-09 .... 23 p0548 N79-23498*#
HCP/R-4024-10 .... 23 p0548 N79-23499*#
HCP/R-4024-11 .... 23 p0549 N79-23500*#
HCP/R-4024-12 .... 23 p0549 N79-23501*#
HCP/R-4024-13 .... 23 p0549 N79-23502*#
HCP/R-4040-02 .... 24 p0775 N79-31810 #
HCP/T2314 .... 24 p0729 N79-28792 #
HCP/T2583-01/2 .... 21 p0203 N79-13280 #
HCP/T2705-03 .... 24 p0721 N79-28654 #
HCP/T3073-01 .... 21 p0193 N79-11887 #
HCP/T22221-01/1-VOL-1 .... 21 p0207 N79-13511 #
HCP/T22221-01/2-2 .... 21 p0207 N79-13510 #
HCP/T22221-01/3 .... 21 p0189 N79-11535 #
HCP/U6308-01 .... 23 p0598 N79-27703 #
HCP/U60505-01 .... 21 p0184 N79-11489 #
HCP/W1152-01 .... 23 p0551 N79-23534 #
HCP/W1260-01/1 .... 21 p0207 N79-13514 #
HCP/W1260-01/2 .... 21 p0207 N79-13515 #
HCP/W1737-01 .... 21 p0201 N79-13189 #
HCP/W3684-01/1 .... 21 p0201 N79-13191 #
HCP/W3684-01/2 .... 21 p0194 N79-12249 #

HDL-TR-1868 .... 24 p0734 N79-29521 #

HDV-78-08 .... 23 p0586 N79-26567 #
HDV-78-09 .... 23 p0578 N79-26410 #

HI-78336 .... 22 p0368 N79-21554*#

HSER-7383 .... 21 p0173 N79-10525*#

HUD-0000190 .... 22 p0336 N79-16497 #
HUD-0000193 .... 22 p0331 N79-16148 #
HUD-0000194 .... 22 p0355 N79-19468 #
HUD-0000195 .... 22 p0331 N79-16150 #

IAF PAPER 78-SL-45 .... 21 p0035 A79-11356
IAF PAPER 78-39 .... 21 p0034 A79-11216

IAF PAPER 78-42 .... 21 p0034 A79-11217
IAF PAPER 78-43 .... 21 p0035 A79-11218*
IAF PAPER 78-190 .... 21 p0035 A79-11287
IAF PAPER 78-192 .... 21 p0035 A79-11288
IAF PAPER 78-217 .... 21 p0035 A79-11298
IAF PAPER 79-A-14 .... 24 p0711 A79-53418
IAF PAPER 79-A-15 .... 24 p0711 A79-53432
IAF PAPER 79-A-16 .... 24 p0711 A79-53419
IAF PAPER 79-IISL-01 .... 24 p0711 A79-53452 #
IAF PAPER 79-IISL-02 .... 24 p0711 A79-53453 #
IAF PAPER 79-IISL-47 .... 24 p0711 A79-53482 #
IAF PAPER 79-35 .... 24 p0709 A79-53261
IAF PAPER 79-112 .... 24 p0709 A79-53301
IAF PAPER 79-115 .... 24 p0709 A79-53302*
IAF PAPER 79-166 .... 24 p0709 A79-53330
IAF PAPER 79-169 .... 24 p0710 A79-53333
IAF PAPER 79-173 .... 24 p0710 A79-53334
IAF PAPER 79-174 .... 24 p0710 A79-53335
IAF PAPER 79-176 .... 24 p0710 A79-53336
IAF PAPER 79-177 .... 24 p0710 A79-53337
IAF PAPER 79-202 .... 24 p0710 A79-53353
IAF PAPER 79-206 .... 24 p0710 A79-53356
IAF PAPER 79-207 .... 24 p0710 A79-53357*

ICP-1151 .... 22 p0369 N79-21559 #

IDO-1622-4 .... 21 p0208 N79-13523 #
IDO-1672-2 .... 24 p0741 N79-29649 #
IDO-10076 .... 24 p0738 N79-29617 #

IEEE PAPER F 78 672-8 .... 22 p0304 A79-29939

IIASA-RR-78-35 .... 23 p0593 N79-27628

IIASA-RR-78-11-PT-4 .... 23 p0594 N79-27652

IIHR-212-VOL-2 .... 23 p0565 N79-24515 #

IITRI-C6363-33 .... 24 p0738 N79-29616 #

ILLDOE-78/09 .... 22 p0363 N79-20526 #

IMMR37-PR6-78 .... 21 p0198 N79-12574 #
IMMR38-PD21-78 .... 21 p0230 N79-15423 #
IMMR43-PR7-78 .... 23 p0585 N79-26538 #

INDEX-78-711-ZLG .... 21 p0226 N79-15207 #

INPE-1413-RPE/001 .... 24 p0747 N79-30599*#

IPPJ-396 .... 24 p0730 N79-29051 #

IPR-5 .... 22 p0342 N79-17340 #

IR-1 .... 23 p0570 N79-25484*#
IR-27 .... 23 p0588 N79-27329 #
IR-77-10052-1 .... 23 p0570 N79-25484*#

ISBN-0-309-02677-6 .... 21 p0232 N79-15868 #
ISBN-0-7988-1399-7 .... 23 p0560 N79-24468 #
ISBN-0-89779-006-5 .... 21 p0230 N79-15423 #
ISBN-2-7170-0448-3 .... 23 p0551 N79-23537 #
ISBN-9-024-72059-1 .... 24 p0736 N79-29596
ISBN-90-6144-079-3 .... 22 p0350 N79-18758 #
ISBN-91-540-2955-4 .... 24 p0801 N79-33592 #
ISBN-92-63-10467-0 .... 21 p0192 N79-11613 #
ISBN-92-825-0179-5 .... 23 p0594 N79-27653
ISBN-92-835-1258-8 .... 22 p0337 N79-16848 #
ISBN-92-835-1297-9 .... 21 p0201 N79-13192 #

ISS-P-78/1 .... 24 p0742 N79-29667 #

ISSN-0077-5606 .... 23 p0553 N79-24120 #
ISSN-0110-1692 .... 21 p0187 N79-11513 #
ISSN-0110-5388 .... 24 p0745 N79-30105 #
ISSN-0313-7639 .... 24 p0738 N79-29624 #

JPL-PUB-78-15-VOL-4 .... 21 p0195 N79-12543*#
JPL-PUB-78-15-VOL-9 .... 24 p0782 N79-32631*#
JPL-PUB-78-21 .... 23 p0579 N79-26412 #
JPL-PUB-78-28 .... 21 p0202 N79-13263*#
JPL-PUB-78-56 .... 23 p0591 N79-27597*#
JPL-PUB-78-75-REV-1 .... 23 p0542 N79-22629*#
JPL-PUB-78-82 .... 21 p0204 N79-13474*#
JPL-PUB-78-95 .... 21 p0205 N79-13501*#
JPL-PUB-78-97 .... 22 p0355 N79-19462*#
JPL-PUB-78-98-VOL-1 .... 23 p0549 N79-23504*#
JPL-PUB-78-98-VOL-2 .... 23 p0549 N79-23505*#
JPL-PUB-78-101 .... 21 p0203 N79-13370*#
JPL-PUB-78-106 .... 22 p0359 N79-20490*#
JPL-PUB-78-109 .... 23 p0594 N79-27658*#
JPL-PUB-79-1 .... 23 p0560 N79-24464*#
JPL-PUB-79-1-VOL-1 .... 22 p0360 N79-20492*#
JPL-PUB-79-5 .... 23 p0542 N79-22628*#
JPL-PUB-79-6 .... 22 p0354 N79-19449*#
JPL-PUB-79-7 .... 22 p0359 N79-20491*#
JPL-PUB-79-8-VOL-1 .... 23 p0559 N79-24460*#
JPL-PUB-79-8-VOL-2 .... 23 p0559 N79-24461*#
JPL-PUB-79-9 .... 22 p0354 N79-19450*#
JPL-PUB-79-12-VOL-1 .... 22 p0368 N79-21548*#
JPL-PUB-79-13 .... 23 p0560 N79-24466*#
JPL-PUB-79-14 .... 23 p0559 N79-24457*#
JPL-PUB-79-15 .... 23 p0559 N79-24458*#
JPL-PUB-79-16 .... 23 p0559 N79-24459*#
JPL-PUB-79-21 .... 24 p0782 N79-32632*#
JPL-PUB-79-24 .... 23 p0542 N79-22627*#
JPL-PUB-79-25 .... 23 p0549 N79-23503*#
JPL-PUB-79-26 .... 24 p0782 N79-32633*#
JPL-PUB-79-28 .... 23 p0588 N79-27321*#
JPL-PUB-79-35-VOL-1 .... 23 p0555 N79-24259*#
JPL-PUB-79-35-VOL-2 .... 23 p0595 N79-27659*#
JPL-PUB-79-38 .... 23 p0560 N79-24463*#
JPL-PUB-79-39 .... 23 p0595 N79-27660*#
JPL-PUB-79-40 .... 24 p0717 N79-28314*#
JPL-PUB-79-43-VOL-1 .... 23 p0560 N79-24462*#
JPL-PUB-79-43-VOL-2 .... 24 p0749 N79-30718*#
JPL-PUB-79-55 .... 24 p0730 N79-29106*#
JPL-PUB-79-58 .... 23 p0594 N79-27654*#
JPL-PUB-79-66 .... 24 p0782 N79-32635*#

JPL-900-800 .... 21 p0196 N79-12558*#
JPL-900-822 .... 21 p0196 N79-12557*#
JPL-1060-14 .... 22 p0335 N79-16377*#
JPL-5101-76 .... 22 p0354 N79-19460*#
JPL-5101-81 .... 22 p0355 N79-19462*#
JPL-5101-83 .... 22 p0348 N79-18453*#
JPL-5104-26 .... 22 p0360 N79-20492*#
JPL-9950-28 .... 23 p0560 N79-24469*#
JPL-9950-39 .... 23 p0561 N79-24471*#
JPL-9950-43 .... 23 p0549 N79-23507*#
JPL-9950-44 .... 23 p0549 N79-23508*#
JPL-9950-48 .... 23 p0550 N79-23512*#
JPL-9950-49 .... 23 p0550 N79-23513*#
JPL-9950-51 .... 23 p0572 N79-25505*#
JPL-9950-52 .... 23 p0550 N79-23515*#
JPL-9950-57 .... 23 p0550 N79-23517*#
JPL-9950-61 .... 23 p0572 N79-25506*#
JPL-9950-62 .... 23 p0550 N79-23519*#
JPL-9950-100 .... 23 p0581 N79-26491*#
JPL-9950-112 .... 23 p0581 N79-26499*#
JPL-954374-78/1 .... 22 p0333 N79-16365*#
JPL-954888-78/4 .... 22 p0334 N79-16369*#
JPL-955077-78/3 .... 22 p0334 N79-16368*#

JPRS-73388 .... 23 p0568 N79-24946 #

JUEL-SPEZ-25 .... 24 p0738 N79-29624 #

L-12427 .... 21 p0191 N79-11560*#
L-13164 .... 24 p0803 N79-33611*#

LA-UR-77-1162 .... 21 p0090 A79-15859 #
LA-UR-77-2694 .... 21 p0118 A79-17294
LA-UR-77-2744 .... 21 p0175 N79-10540 #
LA-UR-78-652 .... 21 p0180 N79-11236 #
LA-UR-78-1437 .... 21 p0214 N79-13844 #
LA-UR-78-1493 .... 21 p0208 N79-13520 #
LA-UR-78-1494 .... 21 p0208 N79-13521 #
LA-UR-78-1878 .... 24 p0754 N79-30782 #
LA-UR-78-2209 .... 24 p0725 N79-28756 #
LA-UR-78-2588 .... 24 p0729 N79-28790 #
LA-UR-79-6 .... 23 p0561 N79-24478 #
LA-UR-79-72 .... 24 p0725 N79-28755 #
LA-UR-79-239 .... 24 p0739 N79-29634 #
LA-UR-79-332 .... 24 p0781 N79-32518 #
LA-UR-79-574 .... 24 p0742 N79-29666 #
LA-UR-79-670 .... 24 p0787 N79-32690 #
LA-UR-79-673 .... 24 p0788 N79-32698 #
LA-UR-79-679 .... 24 p0786 N79-32678 #
LA-UR-79-683 .... 24 p0786 N79-32679 #
LA-UR-79-812 .... 24 p0728 N79-28784 #
LA-UR-79-901 .... 24 p0759 N79-30828 #
LA-UR-79-1335 .... 24 p0790 N79-32716 #
LA-UR-79-1369 .... 24 p0790 N79-32714 #
LA-UR-116 .... 24 p0725 N79-28754 #

LA-6915-MS .... 24 p0769 N79-31745 #
LA-7033-PR .... 21 p0232 N79-15783 #

LA-7041 .... 21 p0185 N79-11494 #
LA-7048-PR .... 21 p0222 N79-14602 #
LA-7235-MS .... 21 p0198 N79-12568 #
LA-7465-MS .... 24 p0781 N79-32477 #
LA-7603-MS .... 24 p0727 N79-28773 #
LA-7635-MS .... 24 p0781 N79-32481 #
LA-7656-MS .... 22 p0358 N79-20458 #
LA-7657-MS .... 22 p0365 N79-21248 #
LA-7778-MS .... 24 p0804 N79-34044 #

LBL-6691-REV .... 24 p0753 N79-30778 #
LBL-6889 .... 21 p0176 N79-10547 #
LBL-7000 .... 21 p0174 N79-10536 #
LBL-7025 .... 21 p0188 N79-11534 #
LBL-7803 .... 21 p0187 N79-11515 #
LBL-7808 .... 21 p0189 N79-11540 #
LBL-7826 .... 24 p0753 N79-30779 #
LBL-7829 .... 23 p0561 N79-24476 #
LBL-7872 .... 24 p0756 N79-30802 #
LBL-7896 .... 22 p0341 N79-17329 #
LBL-7896-PT-6 .... 24 p0758 N79-30818 #
LBL-7934 .... 24 p0768 N79-31439 #
LBL-8186 .... 24 p0747 N79-30609 #
LBL-8186(DRAFT) .... 24 p0724 N79-28747 #
LBL-8316 .... 24 p0767 N79-31436 #
LBL-8483 .... 22 p0369 N79-21555 #
LBL-8583 .... 23 p0596 N79-27683 #
LBL-8596 .... 23 p0564 N79-24507 #
LBL-8632 .... 24 p0756 N79-30804 #
LBL-8784 .... 24 p0755 N79-30792 #
LBL-8802 .... 24 p0786 N79-32684 #
LBL-8814 .... 24 p0774 N79-31805 #

LC-77-92794 .... 21 p0171 N79-10240 #
LC-78-13538 .... 21 p0232 N79-15868 #
LC-78-110283 .... 22 p0355 N79-19470 #
LC-78-600053 .... 21 p0191 N79-11556 #
LC-78-600056 .... 21 p0190 N79-11544 #
LC-78-600060 .... 21 p0218 N79-14530 #
LC-78-600096 .... 22 p0340 N79-17311 #
LC-78-600108 .... 22 p0349 N79-18462 #
LC-78-600138 .... 22 p0372 N79-21632 #
LC-78-606072 .... 22 p0335 N79-16384 #
LC-79-600030-1 .... 24 p0762 N79-31105 #
LC-79-600030-2 .... 24 p0762 N79-31106 #
LC-79-600071 .... 24 p0734 N79-29381 #

LCBS-20 .... 23 p0599 N79-27713 #

LEP-78/519-679-E .... 24 p0743 N79-29669 #

LETC/BL-71316-1 .... 24 p0733 N79-29373 #
LETC/TPR-78/1 .... 24 p0779 N79-32375 #

LMSC-D614944-PT-3-VOL-2 .... 22 p0345 N79-17890*#
LMSC-D623756-VOL-1 .... 24 p0724 N79-28749 #
LMSC-D623756-VOL-3 .... 24 p0725 N79-28750 #
LMSC-D626523 .... 24 p0789 N79-32701 #
LMSC-D632522 .... 22 p0358 N79-20481*#
LMSC-D665407 .... 21 p0219 N79-14546*#
LMSC-D665410 .... 21 p0194 N79-12136*#
LMSC-D673466-VOL-1 .... 22 p0366 N79-21334*#
LMSC-D673466-VOL-2 .... 22 p0366 N79-21335*#

LMSC-HREC-TR-D568208 .... 23 p0575 N79-25567 #

LR-26752-1 .... 24 p0794 N79-33207*#

M-267 .... 21 p0223 N79-14679*#
M-280 .... 21 p0223 N79-14678*#

MAE-T-1393 .... 23 p0539 N79-22252 #

MCGEE-79/0001 .... 24 p0760 N79-30837 #

MDC-G7833-VOL-1 .... 24 p0799 N79-33576*#
MDC-G7833-VOL-2 .... 24 p0799 N79-33577*#
MDC-G7833-VOL-3 .... 24 p0799 N79-33578*#
MDC-G7833-VOL-4 .... 24 p0799 N79-33579*#
MDC-G7833-VOL-5 .... 24 p0800 N79-33580*#

MEA/MCS-78 .... 23 p0575 N79-25538 #

MERADCOM-2268 .... 23 p0576 N79-25930 #

MERC/RI-78/3 .... 21 p0175 N79-10543 #

MITSG-78-11 .... 21 p0226 N79-15207 #

MLM-2549(OP) .... 23 p0564 N79-24505 #
MLM-2606(OP) .... 24 p0786 N79-32680 #

MML-TR-77-57C .... 21 p0230 N79-15422 #
MML-TR-78-18 .... 21 p0199 N79-12577 #

MPR-022 .... 21 p0206 N79-13505 #

MRC-DA-709 .... 22 p0353 N79-19429 #
MRC-DA-748 .... 21 p0223 N79-14635 #
MRC-DA-762 .... 21 p0223 N79-14643 #
MRC-DA-780 .... 24 p0795 N79-33211 #
MRC-DA-783 .... 21 p0178 N79-10603 #

MRI-273 .... 24 p0771 N79-31772*#

MSNW-79-1087/1090-1 .... 23 p0578 N79-26384*#

MTI-79ASE53RE1A .... 24 p0730 N79-29110*#

MTPR-17 .... 21 p0180 N79-11223 #

MTR-7593 .... 21 p0220 N79-14565 #

NASA-CASE-LAR-12148-1 .... 24 p0737 N79-29608*#
NASA-CASE-LAR-12406-1 .... 23 p0568 N79-24980*#

NASA-CASE-LEW-12236-2 .... 21 p0217 N79-14528*
NASA-CASE-LEW-12552-2 .... 21 p0182 N79-11472*
NASA-CASE-LEW-12780-1 .... 22 p0357 N79-20179*
NASA-CASE-LEW-12819-1 .... 21 p0182 N79-11467*

NASA-CASE-MFS-23051-1 .... 21 p0172 N79-10422*
NASA-CASE-MFS-23349-1 .... 23 p0546 N79-23481*
NASA-CASE-MFS-23518-1 .... 21 p0182 N79-11469*
NASA-CASE-MFS-23540-1 .... 23 p0579 N79-26475*
NASA-CASE-MFS-23546-2 .... 24 p0730 N79-29037*
NASA-CASE-MFS-23720-3 .... 23 p0569 N79-25443*
NASA-CASE-MFS-23725-1 .... 24 p0768 N79-31706*
NASA-CASE-MFS-23999-1 .... 24 p0721 N79-28667*#

NASA-CASE-NPO-13579-2 .... 23 p0557 N79-24433*
NASA-CASE-NPO-13579-3 .... 23 p0557 N79-24432*
NASA-CASE-NPO-13579-4 .... 21 p0217 N79-14529*
NASA-CASE-NPO-13689A .... 23 p0568 N79-25311*#
NASA-CASE-NPO-13732-1 .... 21 p0172 N79-10513*
NASA-CASE-NPO-13817-1 .... 21 p0182 N79-11471*
NASA-CASE-NPO-13904-1 .... 21 p0179 N79-11152*
NASA-CASE-NPO-14058-1 .... 22 p0348 N79-18443*
NASA-CASE-NPO-14126-1 .... 21 p0182 N79-11470*
NASA-CASE-NPO-14199-1 .... 23 p0570 N79-25482*
NASA-CASE-NPO-14200-1 .... 23 p0570 N79-25482*
NASA-CASE-NPO-14255-1 .... 23 p0551 N79-23555*
NASA-CASE-NPO-14490-1 .... 22 p0348 N79-18445*#
NASA-CASE-NPO-14619-1 .... 22 p0362 N79-20513*#

NASA-CASE-WOO-00428-1 .... 22 p0352 N79-19186*

NASA-CASE-XGS-00829-1 .... 22 p0353 N79-19447*

NASA-CP-2041 .... 22 p0370 N79-21565*#
NASA-CP-2058 .... 21 p0169 N79-10122*#
NASA-CP-2067 .... 22 p0329 N79-15961*#
NASA-CP-2097 .... 24 p0783 N79-32640*#

NASA-CR-3093 .... 21 p0215 N79-14192*#
NASA-CR-3111 .... 22 p0363 N79-20519*#
NASA-CR-132558 .... 24 p0794 N79-33207*#
NASA-CR-135389 .... 21 p0173 N79-10525*#
NASA-CR-135396 .... 21 p0194 N79-12084*#
NASA-CR-135413 .... 23 p0576 N79-26221*#
NASA-CR-145070 .... 21 p0200 N79-13026*#
NASA-CR-150209 .... 23 p0541 N79-22616*#
NASA-CR-150268 .... 23 p0546 N79-23483*#
NASA-CR-150294 .... 23 p0541 N79-22617*#
NASA-CR-150295 .... 23 p0541 N79-22618*#
NASA-CR-150296 .... 23 p0541 N79-22619*#
NASA-CR-150297 .... 23 p0541 N79-22620*#
NASA-CR-150298 .... 23 p0541 N79-22621*#
NASA-CR-150523 .... 24 p0737 N79-29601*#
NASA-CR-150619 .... 21 p0173 N79-10520*#
NASA-CR-150681 .... 22 p0330 N79-16037*#
NASA-CR-150685 .... 21 p0225 N79-15140*#
NASA-CR-150700 .... 22 p0329 N79-16036*#
NASA-CR-150702 .... 21 p0225 N79-15142*#
NASA-CR-150733 .... 21 p0225 N79-15137*#
NASA-CR-150788 .... 21 p0173 N79-10523*#
NASA-CR-150794 .... 24 p0749 N79-30715*#

NASA-CR-150803 .... 21 p0172 N79-10516*#
NASA-CR-150804 .... 21 p0172 N79-10515*#
NASA-CR-150812 .... 21 p0172 N79-10517*#
NASA-CR-150814 .... 21 p0172 N79-10518*#
NASA-CR-150818 .... 21 p0204 N79-13493*#
NASA-CR-150819 .... 21 p0173 N79-10521*#
NASA-CR-150820 .... 21 p0205 N79-13499*#
NASA-CR-150827 .... 21 p0183 N79-11475*#
NASA-CR-150828 .... 21 p0196 N79-12552*#
NASA-CR-150831 .... 21 p0173 N79-10522*#
NASA-CR-150839 .... 22 p0333 N79-16361*#
NASA-CR-150840 .... 22 p0333 N79-16359*#
NASA-CR-150841 .... 21 p0205 N79-13500*#
NASA-CR-150842 .... 21 p0204 N79-13492*#
NASA-CR-150849 .... 21 p0229 N79-15402*#
NASA-CR-150850 .... 21 p0205 N79-13498*#
NASA-CR-150851 .... 21 p0204 N79-13491*#
NASA-CR-150852 .... 21 p0205 N79-13494*#
NASA-CR-150853 .... 21 p0229 N79-15409*#
NASA-CR-150854 .... 21 p0205 N79-13495*#
NASA-CR-150856 .... 21 p0229 N79-15405*#
NASA-CR-150857 .... 21 p0228 N79-15401*#
NASA-CR-150858 .... 21 p0220 N79-14557*#
NASA-CR-150859 .... 21 p0220 N79-14556*#
NASA-CR-150860 .... 22 p0333 N79-16360*#
NASA-CR-150861 .... 22 p0334 N79-16372*#
NASA-CR-150866 .... 22 p0339 N79-17289*#
NASA-CR-150867 .... 22 p0334 N79-16373*#
NASA-CR-150868 .... 21 p0229 N79-15404*#
NASA-CR-150869 .... 22 p0354 N79-19455*#
NASA-CR-150870 .... 21 p0229 N79-15406*#
NASA-CR-150871 .... 22 p0354 N79-19453*#
NASA-CR-150872 .... 22 p0341 N79-17331*#
NASA-CR-150874 .... 22 p0334 N79-16370*#
NASA-CR-150875 .... 22 p0341 N79-17332*#
NASA-CR-150876 .... 22 p0349 N79-18454*#
NASA-CR-150880 .... 21 p0215 N79-14143*#
NASA-CR-150899 .... 22 p0341 N79-17328*#
NASA-CR-150900 .... 22 p0348 N79-18449*#
NASA-CR-151831 .... 21 p0171 N79-10272*#
NASA-CR-151856 .... 21 p0194 N79-12130*#
NASA-CR-151859 .... 21 p0194 N79-12136*#
NASA-CR-151866 .... 22 p0330 N79-16039*#
NASA-CR-151871 .... 22 p0330 N79-16057*#
NASA-CR-152267 .... 23 p0556 N79-24298*#
NASA-CR-152268 .... 24 p0719 N79-28470*#
NASA-CR-152302 .... 24 p0747 N79-30499*#
NASA-CR-157429 .... 23 p0548 N79-23493*#
NASA-CR-157430 .... 23 p0548 N79-23494*#
NASA-CR-157431 .... 23 p0548 N79-23495*#
NASA-CR-157432 .... 23 p0548 N79-23496*#
NASA-CR-157433 .... 23 p0548 N79-23497*#
NASA-CR-157434 .... 23 p0548 N79-23498*#
NASA-CR-157435 .... 23 p0548 N79-23499*#
NASA-CR-157436 .... 23 p0549 N79-23500*#
NASA-CR-157437 .... 23 p0549 N79-23501*#
NASA-CR-157438 .... 23 p0549 N79-23502*#
NASA-CR-157439 .... 23 p0559 N79-24456*#
NASA-CR-157441 .... 23 p0560 N79-24462*#
NASA-CR-157840 .... 21 p0203 N79-13370*#
NASA-CR-157841 .... 21 p0205 N79-13501*#
NASA-CR-157843 .... 21 p0202 N79-13263*#
NASA-CR-157934 .... 21 p0195 N79-12543*#
NASA-CR-157939 .... 21 p0195 N79-12544*#
NASA-CR-157951 .... 21 p0196 N79-12558*#
NASA-CR-157952 .... 21 p0196 N79-12557*#
NASA-CR-157953 .... 21 p0200 N79-12970*#
NASA-CR-157962 .... 23 p0540 N79-22613*
NASA-CR-157970 .... 21 p0204 N79-13474*#
NASA-CR-158004 .... 23 p0540 N79-22614*
NASA-CR-158005 .... 23 p0546 N79-23364*
NASA-CR-158015 .... 22 p0333 N79-16351*#
NASA-CR-158028 .... 21 p0219 N79-14548*#
NASA-CR-158032 .... 21 p0219 N79-14546*#
NASA-CR-158034 .... 21 p0219 N79-14541*#
NASA-CR-158037 .... 21 p0219 N79-14555*#
NASA-CR-158038 .... 21 p0219 N79-14540*#
NASA-CR-158039 .... 21 p0218 N79-14537*#
NASA-CR-158046 .... 21 p0219 N79-14551*#
NASA-CR-158055 .... 22 p0347 N79-18373*#
NASA-CR-158058 .... 22 p0339 N79-17291*#
NASA-CR-158066 .... 21 p0225 N79-15138*#
NASA-CR-158067 .... 21 p0225 N79-15139*#
NASA-CR-158068 .... 21 p0225 N79-15141*#
NASA-CR-158082 .... 22 p0333 N79-16365*#
NASA-CR-158089 .... 22 p0335 N79-16378*#
NASA-CR-158090 .... 22 p0334 N79-16366*#
NASA-CR-158093 .... 22 p0335 N79-16377*#
NASA-CR-158095 .... 22 p0334 N79-16368*#
NASA-CR-158096 .... 22 p0334 N79-16369*#
NASA-CR-158109 .... 22 p0337 N79-16895*#
NASA-CR-158117 .... 22 p0348 N79-18453*#
NASA-CR-158120 .... 22 p0348 N79-18451*#
NASA-CR-158130 .... 22 p0347 N79-18424*#
NASA-CR-158167 .... 22 p0345 N79-17898*#
NASA-CR-158172 .... 22 p0354 N79-19459*#
NASA-CR-158174 .... 22 p0354 N79-19460*#
NASA-CR-158228 .... 22 p0354 N79-19450*#
NASA-CR-158229 .... 22 p0354 N79-19449*#
NASA-CR-158250 .... 22 p0355 N79-19462*#
NASA-CR-158335 .... 23 p0542 N79-22627*#
NASA-CR-158358 .... 22 p0359 N79-20486*#
NASA-CR-158359 .... 22 p0359 N79-20484*#
NASA-CR-158360 .... 22 p0358 N79-20480*#
NASA-CR-158362 .... 22 p0358 N79-20482*#
NASA-CR-158363 .... 22 p0359 N79-20485*#
NASA-CR-158365 .... 22 p0358 N79-20481*#
NASA-CR-158366 .... 22 p0357 N79-20281*#
NASA-CR-158368 .... 22 p0367 N79-21545*#
NASA-CR-158372 .... 22 p0367 N79-21547*#
NASA-CR-158376 .... 22 p0357 N79-20282*#
NASA-CR-158379 .... 22 p0359 N79-20483*#
NASA-CR-158420 .... 22 p0359 N79-20490*#
NASA-CR-158421 .... 22 p0360 N79-20492*#
NASA-CR-158425 .... 22 p0368 N79-21548*#
NASA-CR-158426 .... 22 p0359 N79-20491*#
NASA-CR-158476 .... 22 p0367 N79-21543*#
NASA-CR-158502 .... 23 p0549 N79-23504*#
NASA-CR-158503 .... 23 p0549 N79-23505*#
NASA-CR-158510 .... 23 p0569 N79-25446*#
NASA-CR-158519 .... 23 p0549 N79-23503*#
NASA-CR-158520 .... 23 p0542 N79-22629*#
NASA-CR-158521 .... 23 p0542 N79-22628*#
NASA-CR-158533 .... 23 p0559 N79-24459*#
NASA-CR-158534 .... 23 p0560 N79-24464*#
NASA-CR-158537 .... 23 p0561 N79-24471*#
NASA-CR-158539 .... 23 p0560 N79-24469*#
NASA-CR-158556 .... 23 p0550 N79-23515*#
NASA-CR-158563 .... 23 p0550 N79-23527*#
NASA-CR-158566 .... 23 p0550 N79-23523*#
NASA-CR-158572 .... 23 p0551 N79-23806*#
NASA-CR-158575 .... 23 p0550 N79-23517*#
NASA-CR-158580 .... 23 p0550 N79-23519*#
NASA-CR-158587 .... 23 p0549 N79-23508*#
NASA-CR-158588 .... 23 p0549 N79-23507*#
NASA-CR-158598 .... 23 p0550 N79-23513*#
NASA-CR-158599 .... 23 p0550 N79-23512*#
NASA-CR-158640 .... 23 p0560 N79-24466*#
NASA-CR-158641 .... 23 p0560 N79-24463*#
NASA-CR-158642 .... 23 p0555 N79-24259*#
NASA-CR-158643 .... 23 p0559 N79-24460*#
NASA-CR-158644 .... 23 p0559 N79-24461*#
NASA-CR-158650 .... 23 p0559 N79-24457*#
NASA-CR-158651 .... 23 p0559 N79-24458*#
NASA-CR-158671 .... 23 p0559 N79-24455*#
NASA-CR-158672 .... 23 p0559 N79-24454*#
NASA-CR-158679 .... 23 p0558 N79-24448*#
NASA-CR-158680 .... 23 p0548 N79-23492*#
NASA-CR-158681 .... 23 p0572 N79-25506*#
NASA-CR-158682 .... 23 p0570 N79-25485*#
NASA-CR-158693 .... 23 p0570 N79-25480*
NASA-CR-158699 .... 23 p0570 N79-25479*
NASA-CR-158700 .... 23 p0572 N79-25505*#
NASA-CR-158706 .... 23 p0570 N79-25484*#
NASA-CR-158728 .... 23 p0581 N79-26498*#
NASA-CR-158732 .... 23 p0586 N79-26979*#
NASA-CR-158735 .... 23 p0581 N79-26495*#
NASA-CR-158736 .... 23 p0580 N79-26488*#
NASA-CR-158740 .... 23 p0580 N79-26490*#
NASA-CR-158744 .... 23 p0580 N79-26485*#
NASA-CR-158745 .... 23 p0581 N79-26499*#
NASA-CR-158746 .... 23 p0581 N79-26491*#
NASA-CR-158768 .... 23 p0595 N79-27660*#
NASA-CR-158769 .... 23 p0595 N79-27659*#
NASA-CR-158770 .... 23 p0591 N79-27597*#
NASA-CR-158772 .... 23 p0594 N79-27658*#
NASA-CR-158773 .... 23 p0588 N79-27321*#
NASA-CR-158774 .... 23 p0594 N79-27654*#
NASA-CR-158802 .... 24 p0747 N79-30599*#
NASA-CR-158811 .... 24 p0730 N79-29106*#
NASA-CR-158813 .... 24 p0717 N79-28314*#
NASA-CR-158852 .... 24 p0722 N79-28722*#
NASA-CR-158868 .... 24 p0736 N79-29598*#
NASA-CR-158871 .... 24 p0732 N79-29354*#
NASA-CR-158872 .... 24 p0737 N79-29606*#
NASA-CR-158874 .... 24 p0737 N79-29607*#
NASA-CR-158875 .... 24 p0768 N79-31720*#
NASA-CR-158886 .... 24 p0788 N79-32699*#

NASA-CR-158991 22 p0346 N79-18057*#
NASA-CR-159040 23 p0572 N79-25507*#
NASA-CR-159397 21 p0183 N79-11473*#
NASA-CR-159398 24 p0756 N79-30801*#
NASA-CR-159411-VOL-1 21 p0205 N79-13496*#
NASA-CR-159427 23 p0542 N79-22631*#
NASA-CR-159431 22 p0334 N79-16374*#
NASA-CR-159436 21 p0181 N79-11406*#
NASA-CR-159440 21 p0173 N79-10526*#
NASA-CR-159443 21 p0196 N79-12553*#
NASA-CR-159447 21 p0196 N79-12554*#
NASA-CR-159454 21 p0200 N79-13050*#
NASA-CR-159465 22 p0354 N79-19454*#
NASA-CR-159477 22 p0354 N79-19451*#
NASA-CR-159479 22 p0368 N79-21554*#
NASA-CR-159488 22 p0337 N79-16850*#
NASA-CR-159523-VOL-1 22 p0366 N79-21334*#
NASA-CR-159523-VOL-2 22 p0366 N79-21335*#
NASA-CR-159529 22 p0359 N79-20487*#
NASA-CR-159530 22 p0360 N79-20497*#
NASA-CR-159533 22 p0364 N79-21075*#
NASA-CR-159554 23 p0578 N79-26384*#
NASA-CR-159568 23 p0553 N79-24172*#
NASA-CR-159572 24 p0737 N79-29604*#
NASA-CR-159577 24 p0797 N79-33560*#
NASA-CR-159580 24 p0762 N79-31088*#
NASA-CR-159601 24 p0804 N79-33881*#
NASA-CR-159602 24 p0804 N79-33882*#
NASA-CR-159604 24 p0762 N79-31087*#
NASA-CR-159605 24 p0730 N79-29110*#
NASA-CR-159607 24 p0804 N79-33883*#
NASA-CR-159608 24 p0804 N79-33884*#
NASA-CR-159632 24 p0747 N79-30415*#
NASA-CR-159644 24 p0764 N79-31350*#
NASA-CR-159652 24 p0772 N79-31784*#
NASA-CR-159653 24 p0800 N79-33581*#
NASA-CR-159654 24 p0778 N79-32129*#
NASA-CR-159661 24 p0763 N79-31208*#
NASA-CR-159944 24 p0749 N79-30712*#
NASA-CR-160091 22 p0337 N79-16892*#
NASA-CR-160159 22 p0371 N79-21622*#
NASA-CR-161093 22 p0348 N79-18450*#
NASA-CR-161094 24 p0798 N79-33570*#
NASA-CR-161104 22 p0348 N79-18448*#
NASA-CR-161146 22 p0345 N79-17890*#
NASA-CR-161151 22 p0371 N79-21619*#
NASA-CR-161161 22 p0345 N79-17896*#
NASA-CR-161164 23 p0572 N79-25504*#
NASA-CR-161165 22 p0360 N79-20493*#
NASA-CR-161166 22 p0371 N79-21621*#
NASA-CR-161173 22 p0352 N79-19071*#
NASA-CR-161185 22 p0368 N79-21551*#
NASA-CR-161186 22 p0368 N79-21552*#
NASA-CR-161190 23 p0548 N79-23491*#
NASA-CR-161192 23 p0547 N79-23490*#
NASA-CR-161204 23 p0557 N79-24437*#
NASA-CR-161214 23 p0543 N79-22632*#
NASA-CR-161215 23 p0543 N79-22633*#
NASA-CR-161216 23 p0543 N79-22634*#
NASA-CR-161218 23 p0547 N79-23484*#
NASA-CR-161219 23 p0547 N79-23485*#
NASA-CR-161220 23 p0547 N79-23486*#
NASA-CR-161221 23 p0547 N79-23487*#
NASA-CR-161222 23 p0547 N79-23488*#
NASA-CR-161223 23 p0547 N79-23489*#
NASA-CR-161225 23 p0556 N79-24417*#
NASA-CR-161228 23 p0572 N79-25503*#
NASA-CR-161230 23 p0594 N79-27656*#
NASA-CR-161235 24 p0723 N79-28729*#
NASA-CR-161236 23 p0594 N79-27657*#
NASA-CR-161237 24 p0722 N79-28721*#
NASA-CR-161238 23 p0595 N79-27661*#
NASA-CR-161271 24 p0737 N79-29602*#
NASA-CR-161272 24 p0749 N79-30721*#
NASA-CR-161290 24 p0771 N79-31780*#
NASA-CR-161305 24 p0798 N79-33568*#
NASA-CR-161306 24 p0797 N79-33561*#
NASA-CR-162094 24 p0768 N79-31730*#
NASA-CR-162095 24 p0768 N79-31731*#
NASA-CR-162104 24 p0749 N79-30718*#
NASA-CR-162144 24 p0796 N79-33518*#
NASA-CR-162157 24 p0770 N79-31763*#
NASA-CR-162158 24 p0771 N79-31776*#
NASA-CR-162159 24 p0770 N79-31767*#
NASA-CR-162161 24 p0770 N79-31771*#
NASA-CR-162162 24 p0768 N79-31737*#
NASA-CR-162163 24 p0770 N79-31769*#
NASA-CR-162167 24 p0770 N79-31765*#
NASA-CR-162168 24 p0769 N79-31756*#
NASA-CR-162172 24 p0771 N79-31777*#
NASA-CR-162173 24 p0771 N79-31772*#
NASA-CR-162174 24 p0771 N79-31773*#
NASA-CR-162176 24 p0770 N79-31759*#
NASA-CR-162177 24 p0769 N79-31758*#
NASA-CR-162181 24 p0770 N79-31762*#
NASA-CR-162182 24 p0771 N79-31775*#
NASA-CR-162279 24 p0770 N79-31764*#
NASA-CR-162289 24 p0782 N79-32631*#
NASA-CR-162298 24 p0782 N79-32635*#
NASA-CR-162301 24 p0782 N79-32633*#
NASA-CR-162302 24 p0782 N79-32632*#
NASA-CR-162310 24 p0763 N79-31251*#
NASA-CR-162311 24 p0778 N79-32130*#
NASA-CR-162325 24 p0796 N79-33526*#
NASA-CR-162328 24 p0782 N79-32638*#
NASA-CR-162331 24 p0804 N79-34074*#
NASA-CR-162359 24 p0798 N79-33567*#
NASA-CR-162360 24 p0798 N79-33566*#
NASA-CR-162361 24 p0798 N79-33564*#
NASA-CR-162369 24 p0799 N79-33573*#
NASA-CR-162370 24 p0799 N79-33574*#
NASA-CR-162371 24 p0799 N79-33575*#
NASA-CR-162372 24 p0799 N79-33576*#
NASA-CR-162373 24 p0799 N79-33577*#
NASA-CR-162374 24 p0799 N79-33578*#
NASA-CR-162375 24 p0799 N79-33579*#
NASA-CR-162376 24 p0800 N79-33580*#

NASA-RP-1047 24 p0803 N79-33611*#

NASA-TM-73230 23 p0541 N79-22615*#
NASA-TM-73832 23 p0581 N79-26502*#
NASA-TM-75369 21 p0183 N79-11474*#
NASA-TM-75424 22 p0364 N79-21217*#
NASA-TM-75442 21 p0195 N79-12547*#
NASA-TM-75464 24 p0763 N79-31163*#
NASA-TM-75497 24 p0771 N79-31779*#
NASA-TM-75634 23 p0558 N79-24439*#
NASA-TM-78186 21 p0173 N79-10519*#
NASA-TM-78196 21 p0173 N79-10524*#
NASA-TM-78199 21 p0172 N79-10514*#
NASA-TM-78203 21 p0214 N79-13915*#
NASA-TM-78206 21 p0196 N79-12556*#
NASA-TM-78212 21 p0226 N79-15247*#
NASA-TM-78218 22 p0342 N79-17338*#
NASA-TM-78219 22 p0371 N79-21618*#
NASA-TM-78222 22 p0360 N79-20495*#
NASA-TM-78223 22 p0371 N79-21620*#
NASA-TM-78324 21 p0195 N79-12542*#
NASA-TM-78749 21 p0191 N79-11560*#
NASA-TM-78912 21 p0204 N79-13472*#
NASA-TM-78993 22 p0345 N79-17859*#
NASA-TM-78994 21 p0183 N79-11481*#
NASA-TM-78995 21 p0183 N79-11479*#
NASA-TM-78996 21 p0193 N79-11955*#
NASA-TM-78997 22 p0333 N79-16355*#
NASA-TM-78999 21 p0183 N79-11478*#
NASA-TM-79007 21 p0183 N79-11477*#
NASA-TM-79012 22 p0341 N79-17335*#
NASA-TM-79018 22 p0342 N79-17336*#
NASA-TM-79021 21 p0195 N79-12548*#
NASA-TM-79023 21 p0226 N79-15267*#
NASA-TM-79027 23 p0579 N79-26476*#
NASA-TM-79031 21 p0194 N79-12086*#
NASA-TM-79032 22 p0341 N79-17333*#
NASA-TM-79034 22 p0333 N79-16357*#
NASA-TM-79035 22 p0338 N79-16930*#
NASA-TM-79037 21 p0229 N79-15403*#
NASA-TM-79044 22 p0337 N79-16721*#
NASA-TM-79067 23 p0558 N79-24445*#
NASA-TM-79083 21 p0229 N79-15410*#
NASA-TM-79084 22 p0360 N79-20494*#
NASA-TM-79086 22 p0330 N79-16136*#
NASA-TM-79089 22 p0357 N79-20114*#
NASA-TM-79097 21 p0229 N79-15411*#
NASA-TM-79101 22 p0368 N79-21549*#
NASA-TM-79116 22 p0357 N79-20118*#
NASA-TM-79122 22 p0368 N79-21550*#
NASA-TM-79125 23 p0539 N79-22191*#
NASA-TM-79130 22 p0360 N79-20498*#
NASA-TM-79137 23 p0542 N79-22623*#
NASA-TM-79139 23 p0571 N79-25498*#
NASA-TM-79140 23 p0571 N79-25499*#
NASA-TM-79143 23 p0558 N79-24442*#
NASA-TM-79149 23 p0558 N79-24443*#
NASA-TM-79153 23 p0539 N79-22193*#
NASA-TM-79160 23 p0558 N79-24444*#
NASA-TM-79161 23 p0542 N79-22624*#

NASA-TM-79163 .... 23 p0581 N79-26503*#
NASA-TM-79169 .... 23 p0571 N79-25500*#
NASA-TM-79170 .... 24 p0749 N79-30719*#
NASA-TM-79172 .... 23 p0558 N79-24446*#
NASA-TM-79174 .... 23 p0581 N79-26504*#
NASA-TM-79182 .... 23 p0546 N79-23133*#
NASA-TM-79186 .... 23 p0581 N79-26505*#
NASA-TM-79193 .... 24 p0723 N79-28725*#
NASA-TM-79194 .... 23 p0572 N79-25501*#
NASA-TM-79195 .... 24 p0749 N79-30720*#
NASA-TM-79196 .... 23 p0587 N79-27140*#
NASA-TM-79200 .... 24 p0723 N79-28727*#
NASA-TM-79203 .... 24 p0718 N79-28349*#
NASA-TM-79204 .... 23 p0587 N79-27141*#
NASA-TM-79209 .... 24 p0736 N79-29599*#
NASA-TM-79213 .... 23 p0595 N79-27665*#
NASA-TM-79215 .... 24 p0723 N79-28728*#
NASA-TM-79220 .... 24 p0765 N79-31405*#
NASA-TM-79222 .... 24 p0723 N79-28726*#
NASA-TM-79231 .... 24 p0795 N79-33336*#
NASA-TM-79244 .... 24 p0772 N79-31781*#
NASA-TM-79257 .... 24 p0795 N79-33253*#
NASA-TM-79667 .... 22 p0351 N79-18815*#
NASA-TM-79719 .... 22 p0345 N79-17897*#
NASA-TM-79966 .... 21 p0215 N79-13937*#
NASA-TM-80001 .... 21 p0224 N79-15113*#
NASA-TM-80002 .... 21 p0225 N79-15114*#
NASA-TM-80013 .... 21 p0225 N79-15125*#
NASA-TM-80124 .... 24 p0777 N79-31839*#
NASA-TM-80127 .... 23 p0587 N79-27086*#
NASA-TM-80155 .... 24 p0782 N79-32637*#
NASA-TM-80354 .... 23 p0557 N79-24435*#
NASA-TM-80355 .... 23 p0557 N79-24436*#
NASA-TM-80481 .... 24 p0730 N79-29108*#
NASA-TM-80751 .... 24 p0798 N79-33571*#

NASA-TP-1359 .... 21 p0223 N79-14679*#
NASA-TP-1369 .... 22 p0346 N79-18287*#
NASA-TP-1389 .... 21 p0223 N79-14678*#
NASA-TP-1393 .... 21 p0215 N79-14099*#
NASA-TP-1559 .... 24 p0798 N79-33572*#

NATO/CCMS-74/1 .... 21 p0190 N79-11549 #
NATO/CCMS-74/2 .... 21 p0191 N79-11558 #
NATO/CCMS-75 .... 21 p0206 N79-13508 #
NATO/CCMS-83 .... 22 p0363 N79-20525 #
NATO/CCMS-84 .... 22 p0372 N79-21631 #
NATO/CCMS-85 .... 22 p0275 A79-25926

NBS-BSS-113 .... 22 p0345 N79-17744 #
NBS-BSS-114 .... 22 p0335 N79-16384 #
NBS-BSS-116 .... 22 p0355 N79-19467 #
NBS-BSS-117 .... 22 p0372 N79-21632 #

NBS-GCR-78-130 .... 21 p0212 N79-13552 #
NBS-GCR-78-141-1-VOL-1 .... 22 p0365 N79-21235 #
NBS-GCR-78-141-2-VOL-2 .... 22 p0357 N79-20291 #

NBS-SP-515 .... 21 p0190 N79-11544 #

NBS-TN-975 .... 23 p0575 N79-25539 #

NBSIR-76-1143 .... 21 p0190 N79-11543 #
NBSIR-78-1143A .... 21 p0190 N79-11543 #
NBSIR-78-1305A-REV-1 .... 21 p0198 N79-12571 #
NBSIR-78-1444-3 .... 23 p0569 N79-25337 #
NBSIR-78-1468-1 .... 21 p0190 N79-11549 #
NBSIR-78-1468-2-VOL-2 .... 21 p0191 N79-11558 #
NBSIR-78-1472 .... 21 p0212 N79-13553 #
NBSIR-78-1494 .... 22 p0364 N79-21167 #
NBSIR-78-1509 .... 23 p0539 N79-22265 #
NBSIR-78-1513 .... 22 p0343 N79-17352 #
NBSIR-78-1532 .... 22 p0343 N79-17350 #
NBSIR-78-1535 .... 22 p0363 N79-20524 #
NBSIR-78-1542 .... 22 p0343 N79-17351 #
NBSIR-78-1562 .... 22 p0372 N79-21630 #
NBSIR-79-1709 .... 24 p0793 N79-32738 #
NBSIR-79-1737 .... 24 p0801 N79-33596 #
NBSIR-79-1743 .... 24 p0801 N79-33597 #

NCAR-3141-78/1 .... 21 p0179 N79-10679 #

NEPP-3-A-APP .... 21 p0198 N79-12573 #

NESEC-1 .... 24 p0726 N79-28765 #

NMEI-20 .... 24 p0801 N79-33593 #
NMEI-21 .... 24 p0802 N79-33600 #
NMEI-23/SA .... 24 p0792 N79-32736 #

NMEI-76/173 .... 21 p0226 N79-15177 #

NOAA-TM-ERL-AOML-34 .... 23 p0586 N79-26759 #

NOAA-TM-ERL-ARL-73 .... 23 p0565 N79-24513 #

NOAA-TM-ERL-OCSEAP-1 .... 22 p0344 N79-17374 #

NOAA-78082203 .... 21 p0222 N79-14581 #
NOAA-78090601 .... 21 p0226 N79-15207 #
NOAA-78100601 .... 22 p0331 N79-16140 #
NOAA-78102401 .... 22 p0356 N79-19563 #
NOAA-78102601 .... 22 p0344 N79-17374 #
NOAA-78110701 .... 22 p0344 N79-17366 #
NOAA-78110702 .... 22 p0344 N79-17367 #
NOAA-78110703 .... 22 p0344 N79-17368 #
NOAA-79020801 .... 23 p0565 N79-24513 #
NOAA-79030710 .... 23 p0586 N79-26759 #
NOAA-79061309 .... 24 p0803 N79-33648 #

NOSC/TR-359 .... 23 p0573 N79-25517 #

NP-23145 .... 21 p0187 N79-11513 #
NP-23278 .... 24 p0741 N79-29653 #
NP-23292 .... 21 p0211 N79-13543 #

NPL-CHEM-84 .... 23 p0546 N79-23185 #

NPL-MP-78014-U .... 24 p0792 N79-32731 #

NRC/CNR-TT-1930 .... 23 p0553 N79-24120 #

NRL-MR-3780 .... 21 p0201 N79-13182 #
NRL-MR-3844 .... 22 p0357 N79-20272 #
NRL-MR-3988 .... 24 p0724 N79-28744 #

NSF/AER-76-08210 .... 22 p0330 N79-16138 #
NSF/PRA-76-SP-1311-F .... 23 p0575 N79-25537 #
NSF/RA-761743 .... 24 p0792 N79-32737 #
NSF/RA-770517 .... 21 p0230 N79-15422 #
NSF/RA-770583 .... 21 p0199 N79-12579 #
NSF/RA-770592 .... 22 p0335 N79-16380 #
NSF/RA-770652 .... 22 p0335 N79-16385 #
NSF/RA-780018 .... 21 p0222 N79-14586 #
NSF/RA-780065 .... 21 p0199 N79-12577 #
NSF/RA-780088 .... 21 p0214 N79-13913 #
NSF/RA-780196 .... 21 p0194 N79-12250 #
NSF/RA-780267 .... 22 p0343 N79-17349 #
NSF/RA-780272 .... 22 p0343 N79-17354 #
NSF/RA-780302 .... 22 p0367 N79-21530 #
NSF/RA-780379 .... 23 p0545 N79-22648 #
NSF/RA-780382 .... 23 p0566 N79-24518 #
NSF/RA-780383 .... 23 p0565 N79-24514 #
NSF/RA-780510 .... 24 p0797 N79-33553 #
NSF/RANN/AER-75-20501/PR/76/3 .. 24 p0792 N79-32737 #
NSF/RANN/SE/AER73-03197/PR/78 .. 21 p0198 N79-12572 #
NSF/RANN/SE/AER73-03197/PR/77 .. 22 p0343 N79-17349 #

NSR-7-1 .... 22 p0367 N79-21547*#

NSS-MR-RP-011 .... 22 p0330 N79-16057*#

NTIS/PS-75/070 .... 21 p0190 N79-11550 #
NTIS/PS-75/089 .... 21 p0231 N79-15436 #
NTIS/PS-75/137 .... 22 p0350 N79-18465 #
NTIS/PS-75/214 .... 21 p0176 N79-10552 #
NTIS/PS-75/317 .... 23 p0569 N79-25361 #
NTIS/PS-75/345 .... 21 p0211 N79-13546 #
NTIS/PS-75/346 .... 21 p0212 N79-13557 #
NTIS/PS-75/348 .... 24 p0777 N79-31836 #
NTIS/PS-75/371 .... 24 p0761 N79-30857 #
NTIS/PS-75/379 .... 24 p0765 N79-31407 #
NTIS/PS-75/479 .... 24 p0801 N79-33594 #
NTIS/PS-75/490 .... 21 p0171 N79-10363 #
NTIS/PS-75/628 .... 21 p0212 N79-13555 #
NTIS/PS-75/630 .... 21 p0191 N79-11553 #
NTIS/PS-75/655 .... 24 p0767 N79-31433 #
NTIS/PS-75/689 .... 21 p0211 N79-13546 #
NTIS/PS-75/691 .... 21 p0212 N79-13557 #
NTIS/PS-75/692 .... 22 p0350 N79-18465 #
NTIS/PS-75/693 .... 21 p0231 N79-15436 #
NTIS/PS-75/743 .... 21 p0190 N79-11550 #
NTIS/PS-75/826 .... 22 p0331 N79-16145 #
NTIS/PS-76/0114 .... 23 p0553 N79-24143 #
NTIS/PS-76/0222 .... 24 p0761 N79-30857 #
NTIS/PS-76/0249 .... 23 p0569 N79-25361 #
NTIS/PS-76/0251 .... 23 p0569 N79-25360 #
NTIS/PS-76/0358 .... 24 p0777 N79-31836 #
NTIS/PS-76/0359 .... 24 p0777 N79-31838 #

NTIS/PS-76/0458 .... 24 p0796 N79-33347 #
NTIS/PS-76/0459 .... 24 p0765 N79-31407 #
NTIS/PS-76/0507 .... 24 p0801 N79-33594 #
NTIS/PS-76/0560 .... 21 p0171 N79-10363 #
NTIS/PS-76/0561 .... 21 p0172 N79-10364 #
NTIS/PS-76/0710 .... 21 p0191 N79-11553 #
NTIS/PS-76/0727 .... 21 p0211 N79-13546 #
NTIS/PS-76/0728 .... 21 p0211 N79-13547 #
NTIS/PS-76/0767 .... 21 p0190 N79-11550 #
NTIS/PS-76/0768 .... 21 p0190 N79-11551 #
NTIS/PS-76/0795 .... 24 p0767 N79-31433 #
NTIS/PS-76/0796 .... 21 p0212 N79-13557 #
NTIS/PS-76/0797 .... 21 p0212 N79-13558 #
NTIS/PS-76/0800 .... 21 p0212 N79-13555 #
NTIS/PS-76/0801 .... 21 p0212 N79-13556 #
NTIS/PS-76/0855 .... 22 p0350 N79-18465 #
NTIS/PS-76/0871 .... 22 p0331 N79-16145 #
NTIS/PS-76/0929 .... 21 p0231 N79-15436 #
NTIS/PS-76/0930 .... 21 p0231 N79-15437 #
NTIS/PS-77/0112 .... 24 p0767 N79-31433 #
NTIS/PS-77/0113 .... 24 p0767 N79-31435 #
NTIS/PS-77/0183 .... 23 p0553 N79-24143 #
NTIS/PS-77/0212 .... 24 p0761 N79-30857 #
NTIS/PS-77/0275 .... 23 p0569 N79-25361 #
NTIS/PS-77/0399 .... 24 p0777 N79-31836 #
NTIS/PS-77/0400 .... 24 p0777 N79-31838 #
NTIS/PS-77/0458 .... 21 p0176 N79-10553 #
NTIS/PS-77/0458 .... 21 p0178 N79-10566 #
NTIS/PS-77/0459 .... 21 p0176 N79-10554 #
NTIS/PS-77/0492 .... 24 p0765 N79-31407 #
NTIS/PS-77/0506 .... 21 p0176 N79-10552 #
NTIS/PS-77/0520 .... 24 p0802 N79-33608 #
NTIS/PS-77/0522 .... 24 p0796 N79-33347 #
NTIS/PS-77/0544 .... 24 p0801 N79-33594 #
NTIS/PS-77/0620 .... 24 p0795 N79-33342 #
NTIS/PS-77/0621 .... 24 p0795 N79-33341 #
NTIS/PS-77/0635 .... 21 p0171 N79-10363 #
NTIS/PS-77/0637 .... 21 p0172 N79-10364 #
NTIS/PS-77/0827 .... 21 p0211 N79-13546 #
NTIS/PS-77/0829 .... 21 p0211 N79-13547 #
NTIS/PS-77/0839 .... 21 p0191 N79-11553 #
NTIS/PS-77/0850 .... 21 p0199 N79-12591 #
NTIS/PS-77/0853 .... 21 p0199 N79-12593 #
NTIS/PS-77/0882 .... 21 p0190 N79-11550 #
NTIS/PS-77/0883 .... 21 p0190 N79-11551 #
NTIS/PS-77/0898 .... 21 p0212 N79-13557 #
NTIS/PS-77/0900 .... 21 p0212 N79-13558 #
NTIS/PS-77/0956 .... 21 p0212 N79-13555 #
NTIS/PS-77/0958 .... 21 p0212 N79-13556 #
NTIS/PS-77/0991 .... 21 p0222 N79-14587 #
NTIS/PS-77/0992 .... 21 p0222 N79-14588 #
NTIS/PS-77/1036 .... 22 p0350 N79-18465 #
NTIS/PS-77/1051 .... 21 p0231 N79-15436 #
NTIS/PS-77/1052 .... 21 p0231 N79-15437 #
NTIS/PS-77/1158 .... 22 p0331 N79-16145 #
NTIS/PS-77/1161 .... 22 p0343 N79-17348 #
NTIS/PS-78/0054 .... 22 p0365 N79-21223 #
NTIS/PS-78/0233 .... 23 p0553 N79-24143 #
NTIS/PS-78/0302 .... 23 p0569 N79-25361 #
NTIS/PS-78/0304 .... 23 p0569 N79-25360 #
NTIS/PS-78/0314 .... 24 p0761 N79-30857 #
NTIS/PS-78/0416 .... 24 p0777 N79-31836 #
NTIS/PS-78/0417 .... 24 p0777 N79-31838 #
NTIS/PS-78/0499 .... 24 p0767 N79-31433 #
NTIS/PS-78/0500 .... 24 p0767 N79-31435 #
NTIS/PS-78/0514 .... 24 p0765 N79-31407 #
NTIS/PS-78/0586 .... 24 p0802 N79-33608 #
NTIS/PS-78/0599 .... 24 p0802 N79-33605 #
NTIS/PS-78/0633 .... 24 p0801 N79-33594 #
NTIS/PS-78/0635 .... 24 p0796 N79-33347 #
NTIS/PS-78/0651 .... 24 p0801 N79-33595 #
NTIS/PS-78/0673 .... 24 p0795 N79-33342 #
NTIS/PS-78/0674 .... 24 p0795 N79-33341 #
NTIS/PS-78/0693/8 .... 21 p0176 N79-10552 #
NTIS/PS-78/0830/6 .... 21 p0179 N79-10951 #
NTIS/PS-78/0836/3 .... 21 p0176 N79-10553 #
NTIS/PS-78/0837/1 .... 21 p0176 N79-10554 #
NTIS/PS-78/0838/9 .... 21 p0178 N79-10566 #
NTIS/PS-78/0840/5 .... 21 p0212 N79-13551 #
NTIS/PS-78/0880/1 .... 21 p0171 N79-10363 #
NTIS/PS-78/0881/9 .... 21 p0172 N79-10364 #
NTIS/PS-78/0961/9 .... 21 p0191 N79-11552 #
NTIS/PS-78/0962/7 .... 21 p0191 N79-11553 #
NTIS/PS-78/0971/8 .... 21 p0199 N79-12591 #
NTIS/PS-78/0973/4 .... 21 p0199 N79-12593 #
NTIS/PS-78/0997/3 .... 21 p0190 N79-11550 #
NTIS/PS-78/0998/1 .... 21 p0190 N79-11551 #
NTIS/PS-78/1014/6 .... 21 p0211 N79-13545 #
NTIS/PS-78/1015/3 .... 21 p0211 N79-13546 #
NTIS/PS-78/1016/1 .... 21 p0212 N79-13550 #
NTIS/PS-78/1017/9 .... 21 p0211 N79-13547 #
NTIS/PS-78/1108/6 .... 21 p0212 N79-13557 #
NTIS/PS-78/1109/4 .... 21 p0212 N79-13558 #
NTIS/PS-78/1114/4 .... 21 p0212 N79-13554 #
NTIS/PS-78/1115/1 .... 21 p0212 N79-13555 #
NTIS/PS-78/1116/9 .... 21 p0212 N79-13556 #
NTIS/PS-78/1156/5 .... 21 p0222 N79-14587 #
NTIS/PS-78/1157/3 .... 21 p0222 N79-14588 #
NTIS/PS-78/1213/4 .... 21 p0231 N79-15436 #
NTIS/PS-78/1214/2 .... 21 p0231 N79-15437 #
NTIS/PS-78/1261/3 .... 22 p0331 N79-16144 #
NTIS/PS-78/1262/1 .... 22 p0331 N79-16145 #
NTIS/PS-78/1288/6 .... 22 p0343 N79-17348 #
NTIS/PS-78/1341/3 .... 22 p0350 N79-18465 #
NTIS/PS-78/1342/1 .... 22 p0350 N79-18466 #
NTIS/PS-79/0030/1 .... 22 p0365 N79-21223 #
NTIS/PS-79/0208/3 .... 23 p0553 N79-24143 #
NTIS/PS-79/0298/4 .... 23 p0569 N79-25361 #
NTIS/PS-79/0299/2 .... 23 p0569 N79-25360 #
NTIS/PS-79/0337/0 .... 23 p0575 N79-25531 #
NTIS/PS-79/0378 .... 24 p0761 N79-30857 #
NTIS/PS-79/0534/2 .... 24 p0777 N79-31836 #
NTIS/PS-79/0535/9 .... 24 p0777 N79-31837 #
NTIS/PS-79/0536/7 .... 24 p0777 N79-31838 #
NTIS/PS-79/0540/9 .... 24 p0765 N79-31406 #
NTIS/PS-79/0541/7 .... 24 p0765 N79-31407 #
NTIS/PS-79/0545/8 .... 24 p0767 N79-31433 #
NTIS/PS-79/0546/6 .... 24 p0767 N79-31434 #
NTIS/PS-79/0547/4 .... 24 p0767 N79-31435 #
NTIS/PS-79/0581 .... 24 p0747 N79-30413 #
NTIS/PS-79/0639/9 .... 24 p0802 N79-33608 #
NTIS/PS-79/0665 .... 24 p0802 N79-33605 #
NTIS/PS-79/0712/4 .... 24 p0795 N79-33343 #
NTIS/PS-79/0713/2 .... 24 p0795 N79-33342 #
NTIS/PS-79/0714/0 .... 24 p0795 N79-33341 #
NTIS/PS-79/0717/3 .... 24 p0801 N79-33594 #
NTIS/PS-79/0718/1 .... 24 p0801 N79-33595 #
NTIS/PS-79/0779/3 .... 24 p0796 N79-33347 #
NTIS/SA-78/18 .... 23 p0551 N79-23710 #

NTISUB/C/027-001 .... 21 p0221 N79-14576 #

NUREG-CR-0066 .... 21 p0217 N79-14344 #
NUREG-CR-0328 .... 21 p0223 N79-14934 #
NUREG-CR-0552 .... 23 p0545 N79-22662 #
NUREG-CR-0552 .... 24 p0777 N79-31845 #

NUREG-0247 .... 21 p0231 N79-15431 #
NUREG-0248 .... 24 p0742 N79-29663 #
NUREG-0480 .... 22 p0355 N79-19469 #

NVO-1531-2 .... 22 p0366 N79-21523 #

NYSERDA-78/5 .... 24 p0802 N79-33599 #
NYSERDA-78/6-VOL-1 .... 24 p0792 N79-32734 #
NYSERDA-78/7 .... 24 p0802 N79-33607 #

NZERDC-P7 .... 24 p0745 N79-30105 #

OAQPS-1.2-116 .... 23 p0566 N79-24537 #

OEC-ER-014 .... 24 p0722 N79-28721*#

ONERA, TP NO. 1978-107 .... 21 p0036 A79-11572 #
ONERA, TP NO. 1978-137 .... 21 p0155 A79-18560 #

OPAV-41-P4 .... 21 p0197 N79-12560 #

OPPORTUNITY-BRIEF-11 .... 21 p0226 N79-15207 #

ORAU-133 .... 21 p0232 N79-15830 #

ORAU/IEA(M)-78-10 .... 21 p0209 N79-13531 #
ORAU/IEA(O)-79-3 .... 23 p0597 N79-27685 #
ORAU/IEA(R)-77-12 .... 21 p0174 N79-10534 #
ORAU/IEA(O)-79-5 .... 24 p0775 N79-31821 #
ORAU/IEA-79-6(O) .... 24 p0803 N79-33699 #

ORESU-W-78-001 .... 22 p0356 N79-19563 #

ORNL-TR-4483 .... 21 p0221 N79-14574 #

ORNL-5320 .... 21 p0184 N79-11487 #
ORNL-5363 .... 22 p0348 N79-18447 #
ORNL-5493 .... 22 p0369 N79-21562
ORNL-5506 .... 24 p0731 N79-29115 #
ORNL-5525 .... 24 p0764 N79-31363 #

ORNL/CON-30 .... 23 p0562 N79-24489 #
ORNL/CON-36 .... 23 p0598 N79-27704 #
ORNL/EIS-144 .... 23 p0587 N79-27018 #
ORNL/EIS-147 .... 22 p0372 N79-21640 #
ORNL/ENG/TM-13-VOL-1 .... 23 p0555 N79-24188 #
ORNL/FE-2 .... 24 p0746 N79-30398 #
ORNL/HUD/MIUS-32 .... 21 p0220 N79-14564 #
ORNL/HUD/MIUS-33 .... 21 p0221 N79-14575 #
ORNL/OEPA-10 .... 24 p0748 N79-30687 #
ORNL/OEPA-12 .... 24 p0791 N79-32724 #
ORNL/PPA-79/3 .... 24 p0778 N79-32113 #
ORNL/SUB-79/14274/1 .... 24 p0776 N79-31827 #
ORNL/SUB-7117/25 .... 21 p0193 N79-11889 #
ORNL/SUB-7261/1 .... 24 p0757 N79-30810 #
ORNL/SUB-7303/1 .... 24 p0782 N79-32629 #
ORNL/SUB-7390/1 .... 24 p0789 N79-32707 #
ORNL/TM-5804 .... 24 p0781 N79-32555 #
ORNL/TM-5848 .... 24 p0781 N79-32515 #
ORNL/TM-5890-S2 .... 21 p0175 N79-10541 #
ORNL/TM-5890-S3 .... 21 p0175 N79-10542 #
ORNL/TM-5890/S4 .... 21 p0186 N79-11511 #
ORNL/TM-5937 .... 24 p0739 N79-29630 #
ORNL/TM-6069 .... 21 p0192 N79-11570 #
ORNL/TM-6392 .... 21 p0214 N79-13849 #
ORNL/TM-6574 .... 24 p0762 N79-31093 #
ORNL/TM-6602 .... 24 N79-28776 #
ORNL/TM-6821 .... 24 p0768 N79-31438 #
ORNL/TM-6913 .... 24 p0786 N79-32677 #

ORO-5474-T1 .... 24 p0761 N79-31067 #

OTA-E-66-VOL-1 .... 21 p0190 N79-11548 #
OTA-E-77-VOL-2 .... 21 p0218 N79-14530 #
OTA-E-86 .... 24 p0734 N79-29381 #

OTA-M-88 .... 24 p0797 N79-33554 #

OTA-T-83 .... 24 p0762 N79-31105 #
OTA-T-84 .... 24 p0762 N79-31106 #

OTA-0-62 .... 21 p0191 N79-11556 #
OTA-0-63 .... 21 p0191 N79-11557 #

OWRC/ERIS-7808 .... 24 p0743 N79-29671 #
OWRC/ERIS-7812 .... 24 p0743 N79-29672 #
OWRC/ERIS-7901 .... 24 p0743 N79-29673 #

OWRT-A-063-CAL(1) .... 23 p0585 N79-26562 #
OWRT-A-081-ILL(1) .... 22 p0349 N79-18463 #

OWRT-C-6011(5201)(3)-VOL-2 ...... 23 p0565 N79-24515 #

OWRT-W-211(6254)(1) .... 21 p0211 N79-13549 #

P-77/P40/242 .... 24 p0759 N79-30831 #

P/51/76/14 .... 23 p0578 N79-26240 #
P/51/76/17 .... 23 p0584 N79-26535 #
P/51/77/21 .... 23 p0584 N79-26536 #
P/51/77/24 .... 23 p0585 N79-26537 #
P/539/77/20 .... 23 p0588 N79-27284 #
P/539/77/23 .... 23 p0584 N79-26532 #

PB-276469/4 .... 21 p0171 N79-10240 #
PB-281189/1 .... 21 p0178 N79-10574 #
PB-281271/7 .... 21 p0178 N79-10591 #
PB-281649/4 .... 21 p0177 N79-10562 #
PB-281815/1 .... 21 p0189 N79-11542 #
PB-281817/7 .... 21 p0177 N79-10560 #
PB-282494/4 .... 21 p0177 N79-10564 #
PB-282531/3 .... 21 p0171 N79-10241 #
PB-282546/1 .... 21 p0178 N79-10604 #
PB-282652/7 .... 21 p0176 N79-10555 #
PB-282653/5 .... 21 p0176 N79-10556 #
PB-282654/3 .... 21 p0177 N79-10557 #
PB-282655/0 .... 21 p0177 N79-10558 #
PB-282656/8 .... 21 p0177 N79-10559 #
PB-282787/1 .... 21 p0177 N79-10565 #
PB-282923/2 .... 21 p0181 N79-11447 #
PB-282924/0 .... 21 p0181 N79-11446 #
PB-282928/1 .... 21 p0177 N79-10561 #
PB-282929/9 .... 21 p0177 N79-10563 #
PB-282940/6 .... 21 p0179 N79-10968 #
PB-282949/7 .... 21 p0171 N79-10243 #
PB-282983/6 .... 21 p0178 N79-10610 #
PB-283028/9 .... 21 p0178 N79-10595 #
PB-283066/9 .... 21 p0190 N79-11546 #
PB-283076/8 .... 21 p0179 N79-10679 #
PB-283103/0 .... 21 p0191 N79-11557 #
PB-283104/8 .... 21 p0191 N79-11556 #
PB-283170/9 .... 21 p0191 N79-11555 #
PB-283171/7 .... 21 p0191 N79-11554 #
PB-283237/6 .... 21 p0190 N79-11543 #
PB-283428/1 .... 21 p0190 N79-11549 #
PB-283429/9 .... 21 p0191 N79-11558 #
PB-283477/8 .... 21 p0190 N79-11544 #
PB-283657/5 .... 21 p0178 N79-10603 #
PB-283677/3 .... 21 p0199 N79-12576 #
PB-283706/0 .... 21 p0190 N79-11547 #
PB-283721/9 .... 21 p0198 N79-12571 #
PB-283733/4 .... 21 p0198 N79-12575 #
PB-283770/6 .... 21 p0190 N79-11548 #
PB-283787/0 .... 21 p0198 N79-12573 #
PB-283796/1 .... 21 p0198 N79-12574 #
PB-283973/6 .... 21 p0199 N79-12601 #
PB-283998/3 .... 21 p0198 N79-12572 #
PB-284041/1 .... 21 p0195 N79-12424 #
PB-284045/2 .... 21 p0200 N79-12606 #
PB-284081/7 .... 21 p0200 N79-12602 #
PB-284480/1 .... 21 p0211 N79-13548 #
PB-284658/2 .... 21 p0194 N79-12251 #
PB-284691/3 .... 21 p0222 N79-14583 #
PB-284697/0 .... 21 p0199 N79-12578 #
PB-284703/6 .... 21 p0199 N79-12579 #
PB-284741/6 .... 21 p0214 N79-13913 #
PB-284742/4 .... 21 p0194 N79-12250 #
PB-284743/2 .... 21 p0217 N79-14521 #
PB-284823/2 .... 21 p0199 N79-12577 #
PB-284855/4 .... 21 p0201 N79-13152 #
PB-285129/3 .... 21 p0211 N79-13549 #
PB-285196/2 .... 21 p0213 N79-13590 #
PB-285227/5 .... 21 p0213 N79-13592 #
PB-285260/6 .... 21 p0212 N79-13552 #
PB-285360/4 .... 21 p0212 N79-13553 #
PB-285381/0 .... 21 p0217 N79-14397 #
PB-285420/6 .... 21 p0223 N79-14635 #
PB-285440/4 .... 21 p0213 N79-13591 #
PB-285713/4 .... 21 p0222 N79-14582 #
PB-285797/7 .... 21 p0224 N79-14946 #
PB-285864/5 .... 21 p0223 N79-14618 #
PB-285880/1 .... 21 p0216 N79-14243 #
PB-285910/6 .... 21 p0230 N79-15428 #
PB-285937/9 .... 21 p0232 N79-15864 #
PB-286002/1 .... 21 p0222 N79-14586 #
PB-286074/0 .... 21 p0226 N79-15304 #
PB-286075/7 .... 21 p0226 N79-15305 #
PB-286076/5 .... 21 p0227 N79-15306 #
PB-286077/3 .... 21 p0227 N79-15307 #
PB-286078/1 .... 21 p0231 N79-15430 #
PB-286135/9 .... 21 p0231 N79-15432 #
PB-286172/2 .... 21 p0223 N79-14641 #
PB-286208/4 .... 21 p0232 N79-15474 #
PB-286222/5 .... 21 p0230 N79-15425 #
PB-286231/6 .... 21 p0223 N79-14643 #
PB-286246/4 .... 21 p0230 N79-15423 #
PB-286294/4 .... 21 p0227 N79-15308 #
PB-286295/1 .... 21 p0227 N79-15309 #
PB-286296/9 .... 21 p0227 N79-15310 #
PB-286297/7 .... 21 p0227 N79-15311 #
PB-286298/5 .... 21 p0227 N79-15312 #
PB-286299/3 .... 21 p0227 N79-15313 #
PB-286300/9 .... 21 p0228 N79-15314 #
PB-286301/7 .... 21 p0228 N79-15315 #
PB-286329/8 .... 21 p0230 N79-15421 #
PB-286365/2 .... 21 p0232 N79-15473 #
PB-286385/0 .... 21 p0226 N79-15177 #
PB-286400/7 .... 21 p0230 N79-15424 #
PB-286487/4 .... 21 p0230 N79-15422 #
PB-286550/9 .... 21 p0232 N79-15868 #
PB-286647/3 .... 21 p0228 N79-15379 #
PB-286659/8 .... 21 p0232 N79-15479 #
PB-286671/3 .... 21 p0222 N79-14581 #
PB-286688/7 .... 21 p0231 N79-15439 #
PB-286868/5 .... 21 p0217 N79-14344 #
PB-286869/3 .... 21 p0223 N79-14934 #
PB-286870/1 .... 21 p0231 N79-15438 #
PB-286900/6 .... 22 p0336 N79-16497 #
PB-286901/4 .... 22 p0331 N79-16148 #
PB-286903/0 .... 22 p0331 N79-16150 #
PB-286904/8 .... 22 p0355 N79-19468 #
PB-286909/7 .... 22 p0335 N79-16384 #
PB-286924/6 .... 22 p0336 N79-16439 #
PB-286940/2 .... 21 p0231 N79-15440 #
PB-286982/4 .... 22 p0336 N79-16446 #
PB-287071/5 .... 22 p0336 N79-16437 #
PB-287091/3 .... 22 p0330 N79-16139 #
PB-287115/0 .... 22 p0335 N79-16385 #

PB-287180/4 .... 22 p0339 N79-17026 #
PB-287306/5 .... 21 p0231 N79-15431 #
PB-287314/9 .... 22 p0335 N79-16380 #
PB-287361/0 .... 22 p0335 N79-16382 #
PB-287363/6 .... 22 p0339 N79-17309 #
PB-287386/7 .... 22 p0330 N79-16138 #
PB-287394/1 .... 22 p0332 N79-16342 #
PB-287410/5 .... 22 p0343 N79-17351 #
PB-287417/0 .... 22 p0343 N79-17349 #
PB-287508/6 .... 22 p0343 N79-17354 #
PB-287519/3 .... 22 p0343 N79-17352 #
PB-287521/9 .... 22 p0338 N79-17025 #
PB-287577/1 .... 22 p0343 N79-17353 #
PB-287730/6 .... 22 p0339 N79-17027 #
PB-287772/8 .... 22 p0343 N79-17350 #
PB-287799/1 .... 22 p0344 N79-17364 #
PB-287800/7 .... 22 p0344 N79-17365 #
PB-287804/9 .... 22 p0345 N79-17744 #
PB-287846/0 .... 22 p0340 N79-17311 #
PB-287868/4 .... 21 p0226 N79-15207 #
PB-287910/4 .... 22 p0349 N79-18464 #
PB-287937/7 .... 22 p0346 N79-18061 #
PB-288046/6 .... 22 p0349 N79-18463 #
PB-288128/2 .... 22 p0349 N79-18462 #
PB-288211/6 .... 22 p0350 N79-18497 #
PB-288223/1 .... 22 p0344 N79-17378 #
PB-288313/0 .... 22 p0351 N79-18834 #
PB-288400/5 .... 22 p0355 N79-19488 #
PB-288486/4 .... 23 p0551 N79-23710 #
PB-288497/1 .... 22 p0353 N79-19429 #
PB-288578/8 .... 22 p0355 N79-19470 #
PB-288602/6 .... 22 p0350 N79-18487 #
PB-288603/4 .... 22 p0350 N79-18488 #
PB-288604/2 .... 22 p0350 N79-18489 #
PB-288630/7 .... 22 p0352 N79-19173 #
PB-288656/2 .... 22 p0331 N79-16140 #
PB-288825/3 .... 22 p0355 N79-19472 #
PB-288874/1 .... 22 p0356 N79-19496 #
PB-288935/0 .... 22 p0344 N79-17374 #
PB-289154/7 .... 22 p0344 N79-17366 #
PB-289155/4 .... 22 p0344 N79-17367 #
PB-289156/2 .... 22 p0344 N79-17368 #
PB-289204/0 .... 22 p0355 N79-19467 #
PB-289244/6 .... 22 p0363 N79-20526 #
PB-289380/8 .... 22 p0363 N79-20525 #
PB-289492/1 .... 22 p0372 N79-21631 #
PB-289493/9 .... 22 p0372 N79-21625 #
PB-289585/2 .... 22 p0355 N79-19469 #
PB-289729/6 .... 22 p0363 N79-20524 #
PB-289772/6 .... 23 p0540 N79-22606 #
PB-289775/9 .... 22 p0365 N79-21224 #
PB-289817/9 .... 22 p0364 N79-20727 #
PB-289823/7 .... 22 p0365 N79-21235 #
PB-289824/5 .... 22 p0357 N79-20291 #
PB-289837/7 .... 22 p0372 N79-21628 #
PB-289864/1 .... 23 p0540 N79-22608 #
PB-289878/1 .... 23 p0545 N79-22661 #
PB-289912/8 .... 22 p0372 N79-21632 #
PB-289921/9 .... 22 p0373 N79-21661 #
PB-289940/9 .... 22 p0373 N79-21662 #
PB-289967/2 .... 22 p0372 N79-21630 #
PB-290126/2 .... 22 p0372 N79-21626 #
PB-290160/1 .... 22 p0364 N79-21167 #
PB-290162/7 .... 22 p0373 N79-21670 #
PB-290173/4 .... 22 p0367 N79-21530 #
PB-290226/0 .... 23 p0544 N79-22645 #
PB-290237/7 .... 22 p0373 N79-21671 #
PB-290345/8 .... 22 p0356 N79-19563 #
PB-290473/8 .... 23 p0566 N79-24543 #
PB-290514/9 .... 23 p0566 N79-24534 #
PB-290516/4 .... 23 p0556 N79-24358 #
PB-290529/7 .... 23 p0565 N79-24514 #
PB-290576/8 .... 23 p0565 N79-24515 #
PB-290579/2 .... 23 p0566 N79-24537 #
PB-290588/6 .... 22 p0346 N79-18352 #
PB-290612/1 .... 23 p0555 N79-24191 #
PB-290675/8 .... 23 p0566 N79-24520 #
PB-290694/9 .... 23 p0567 N79-24621 #
PB-290835/8 .... 23 p0566 N79-24519 #
PB-290858/0 .... 23 p0545 N79-22662 #
PB-290872/1 .... 23 p0556 N79-24423 #
PB-290934/9 .... 23 p0566 N79-24518 #
PB-290942/2 .... 23 p0575 N79-25536 #
PB-290945/5 .... 23 p0569 N79-25469 #
PB-290953/9 .... 23 p0568 N79-25249 #
PB-290981/0 .... 23 p0575 N79-25537 #
PB-291241/8 .... 23 p0539 N79-22265 #
PB-291330/9 .... 22 p0373 N79-21679 #
PB-291369/7 .... 22 p0373 N79-21682 #
PB-291401/8 .... 23 p0545 N79-22668 #
PB-291437/2 .... 23 p0555 N79-24192 #
PB-291495/0 .... 23 p0539 N79-22318 #
PB-291496/8 .... 23 p0539 N79-22319 #
PB-291624/5 .... 23 p0545 N79-22648 #
PB-291692/2 .... 23 p0544 N79-22647 #
PB-291697/1 .... 23 p0544 N79-22646 #
PB-291743/3 .... 23 p0544 N79-22643 #
PB-291780/5 .... 23 p0540 N79-22597 #
PB-291794/6 .... 23 p0566 N79-24517 #
PB-291916/5 .... 23 p0546 N79-22970 #
PB-291917/3 .... 23 p0546 N79-22971 #
PB-291918/1 .... 23 p0546 N79-22972 #
PB-292106/2 .... 23 p0575 N79-25538 #
PB-292115/3 .... 23 p0575 N79-25539 #
PB-292164/1 .... 23 p0575 N79-25533 #
PB-292328/2 .... 23 p0590 N79-27342 #
PB-292520/4 .... 23 p0575 N79-25567 #
PB-292529/5 .... 23 p0575 N79-25570 #
PB-292552/7 .... 23 p0577 N79-26233 #
PB-292634/3 .... 23 p0575 N79-25540 #
PB-292681/4 .... 23 p0569 N79-25337 #
PB-292745/7 .... 23 p0575 N79-25535 #
PB-292781/2 .... 23 p0587 N79-27024 #
PB-292816/6 .... 23 p0585 N79-26542 #
PB-292882/8 .... 23 p0587 N79-27026 #
PB-292947/9 .... 23 p0585 N79-26539 #
PB-292949/5 .... 23 p0585 N79-26538 #
PB-292963/6 .... 23 p0565 N79-24513 #
PB-293031/1 .... 23 p0585 N79-26562 #
PB-293160/8 .... 23 p0599 N79-27730 #
PB-293163/2 .... 23 p0586 N79-26575 #
PB-293165/7 .... 23 p0578 N79-26235 #
PB-293210/1 .... 23 p0578 N79-26236 #
PB-293238/2 .... 24 p0731 N79-29249 #
PB-293279/6 .... 23 p0578 N79-26237 #
PB-293308/3 .... 24 p0720 N79-28592 #
PB-293328/1 .... 23 p0578 N79-26234 #
PB-293437/0 .... 23 p0599 N79-27713 #
PB-293529/4 .... 23 p0586 N79-26567 #
PB-293530/2 .... 23 p0578 N79-26410 #
PB-293580/7 .... 23 p0579 N79-26412 #
PB-293597/1 .... 23 p0585 N79-26558 #
PB-293645/8 .... 24 p0762 N79-31105 #
PB-293646/6 .... 24 p0762 N79-31106 #
PB-293728/2 .... 24 p0720 N79-28594 #
PB-293731/6 .... 24 p0743 N79-29670 #
PB-293733/2 .... 23 p0586 N79-26759 #
PB-293751/4 .... 24 p0748 N79-30701 #
PB-293772/0 .... 23 p0579 N79-26411 #
PB-293940/3 .... 24 p0720 N79-28596 #
PB-293977/5 .... 24 p0731 N79-29120 #
PB-294013/8 .... 24 p0760 N79-30837 #
PB-294228/2 .... 24 p0744 N79-29783 #
PB-294299/3 .... 24 p0735 N79-29584 #
PB-294338/9 .... 24 p0744 N79-29709 #
PB-294342/1 .... 24 p0743 N79-29671 #
PB-294413/0 .... 23 p0585 N79-26541 #
PB-294602/8 .... 24 p0760 N79-30840 #
PB-294610/1 .... 24 p0760 N79-30839 #
PB-294812/3 .... 24 p0803 N79-33639 #
PB-294813/1 .... 24 p0761 N79-30856 #
PB-294926/1 .... 24 p0793 N79-32738 #
PB-294951/9 .... 24 p0743 N79-29672 #
PB-294952/7 .... 24 p0743 N79-29673 #
PB-294997/2 .... 24 p0761 N79-30866 #
PB-294998/0 .... 24 p0796 N79-33538 #
PB-295040/0 .... 24 p0761 N79-30864 #
PB-295106/9 .... 24 p0763 N79-31107 #
PB-295234/9 .... 24 p0743 N79-29674 #
PB-295317/2 .... 24 p0795 N79-33345 #
PB-295439/4 .... 24 p0793 N79-32739 #
PB-295452/7 .... 24 p0802 N79-33607 #
PB-295453/5 .... 24 p0802 N79-33599 #
PB-295478/2 .... 24 p0778 N79-32135 #
PB-295524/3 .... 24 p0763 N79-31110 #
PB-295535/9 .... 24 p0803 N79-33654 #
PB-295645/6 .... 24 p0796 N79-33346 #
PB-295665/4 .... 24 p0797 N79-33552 #
PB-295782/7 .... 24 p0792 N79-32734 #
PB-295788/4 .... 24 p0797 N79-33554 #
PB-295797/5 .... 24 p0734 N79-29381 #
PB-295837/9 .... 24 p0802 N79-33600 #
PB-295847/8 .... 24 p0801 N79-33593 #
PB-295876/7 .... 24 p0792 N79-32735 #
PB-295888/2 .... 24 p0792 N79-32737 #
PB-295898/1 .... 24 p0801 N79-33596 #
PB-295936/9 .... 24 p0801 N79-33592 #
PB-296066/4 .... 24 p0792 N79-32736 #

PB-296081/3 .... 24 p0797 N79-33553 #
PB-296146/4 .... 24 p0796 N79-33348 #
PB-296193/6 .... 24 p0802 N79-33603 #
PB-296217/3 .... 24 p0802 N79-33602 #
PB-296238/9 .... 24 p0802 N79-33601 #
PB-296274/4 .... 24 p0801 N79-33597 #
PB-296342/9 .... 24 p0794 N79-33107 #
PB-296572/1 .... 24 p0802 N79-33598 #
PB-297071/3 .... 24 p0804 N79-34006 #
PB-297134/9 .... 24 p0797 N79-33549 #
PB-297136/4 .... 24 p0796 N79-33349 #
PB-297467/3 .... 24 p0803 N79-33648 #

PETC-1000 .... 24 p0733 N79-29370 #

PNL-MA-572-APP .... 23 p0596 N79-27679 #

PNL-2004-8 .... 22 p0369 N79-21557 #
PNL-2004-9 .... 22 p0361 N79-20504 #
PNL-2410 .... 21 p0210 N79-13539 #
PNL-2410-1-REV .... 24 p0775 N79-31819 #
PNL-2482 .... 21 p0202 N79-13252 #
PNL-2518 .... 21 p0203 N79-13322 #
PNL-2521 .... 21 p0209 N79-13527 #
PNL-2531 .... 22 p0361 N79-20506 #
PNL-2545 .... 22 p0356 N79-19568 #
PNL-2581 .... 21 p0210 N79-13541 #
PNL-2693 .... 24 p0788 N79-32692 #
PNL-2784 .... 24 p0738 N79-29621 #
PNL-2871 .... 23 p0562 N79-24487 #
PNL-2941 .... 24 p0793 N79-32995 #
PNL-2969 .... 24 p0789 N79-32709 #

PR-5 .... 21 p0230 N79-15422 #
PR-6 .... 21 p0199 N79-12577 #

PUB-LAW-95-618 .... 23 p0576 N79-25926 #

PUBL-95-114 .... 23 p0582 N79-26507 #
PUBL-95-139 .... 24 p0736 N79-29597 #
PUBL-95-166 .... 24 p0750 N79-30726
PUBL-95-167 .... 24 p0750 N79-30725
PUBL-96-1 .... 23 p0582 N79-26509 #
PUBL-96-9 .... 23 p0582 N79-26508 #

PWA-5500-18 .... 21 p0194 N79-12084*#
PWA-5515-87C .... 24 p0763 N79-31208*#
PWA-5565-15 .... 21 p0200 N79-13050*#
PWA-5594-48 .... 22 p0337 N79-16850*#

QPR-1 .... 22 p0334 N79-16368*#
QPR-2 .... 21 p0170 N79-10178 #
QPR-2 .... 21 p0221 N79-14577 #
QPR-3 .... 24 p0771 N79-31775*#
QPR-4 .... 21 p0219 N79-14540*#
QPR-5 .... 24 p0771 N79-31772*#
QPR-10 .... 24 p0798 N79-33564*#
QPR-11 .... 21 p0218 N79-14537*#
QPR-15 .... 24 p0769 N79-31756*#
QPR-37 .... 24 p0731 N79-29118 #

QR-1 .... 21 p0221 N79-14576 #
QR-1 .... 21 p0225 N79-15137*#
QR-1 .... 22 p0359 N79-20486*#
QR-1 .... 23 p0551 N79-23806*#
QR-1 .... 23 p0559 N79-24454*#
QR-1 .... 23 p0559 N79-24455*#
QR-1 .... 23 p0559 N79-24456*#
QR-1 .... 23 p0572 N79-25505*#
QR-1 .... 24 p0798 N79-33566*#
QR-1 .... 24 p0798 N79-33567*#
QR-2 .... 22 p0359 N79-20485*#
QR-2 .... 22 p0361 N79-20500 #
QR-2 .... 23 p0550 N79-23513*#
QR-2 .... 23 p0580 N79-26490*#
QR-2 .... 24 p0765 N79-31410 #
QR-3 .... 22 p0334 N79-16366*#
QR-3 .... 22 p0354 N79-19459*#
QR-3 .... 23 p0580 N79-26488*#
QR-3 .... 23 p0581 N79-26495*#
QR-4 .... 21 p0219 N79-14555*#
QR-4 .... 22 p0358 N79-20480*#
QR-5 .... 22 p0357 N79-20281*#
QR-5 .... 22 p0359 N79-20484*#
QR-6 .... 23 p0558 N79-24448*#
QR-6 .... 24 p0770 N79-31759*#
QR-7 .... 22 p0355 N79-19462*#
QR-7 .... 23 p0554 N79-24184 #
QR-7 .... 23 p0554 N79-24186 #
QR-7 .... 24 p0770 N79-31767*#
QR-8 .... 23 p0559 N79-24457*#
QR-9 .... 23 p0559 N79-24458*#
QR-10 .... 22 p0333 N79-16365*#
QR-12 .... 23 p0586 N79-26979*#
QR-12 .... 24 p0771 N79-31776*#
QR-15 .... 24 p0719 N79-28362 #

QTPR-2 .... 22 p0362 N79-20510 #
QTPR-13 .... 21 p0219 N79-14541*#
QTPR-14 .... 23 p0549 N79-23508*#

QTR-1 .... 23 p0550 N79-23523*#
QTR-1 .... 23 p0550 N79-23527*#
QTR-1 .... 24 p0770 N79-31771*#

R-247U .... 22 p0356 N79-20109 #
R-247U-VOL-1 .... 22 p0351 N79-18969 #

RAD-78-216-137-09 .... 24 p0761 N79-30864 #

RAND/R-2212-ARPA .... 21 p0193 N79-11859 #

REPT-1 .... 23 p0567 N79-24877 #
REPT-1 .... 24 p0796 N79-33526*#
REPT-14 .... 21 p0226 N79-15304 #
REPT-30 .... 21 p0187 N79-11513 #
REPT-30/1020-VOL-1 .... 24 p0759 N79-30834 #
REPT-30/1020-VOL-2 .... 24 p0760 N79-30835 #
REPT-33 .... 21 p0211 N79-13543 #
REPT-77-145-1-VOL-1 .... 23 p0541 N79-22617*#
REPT-77-145-1-VOL-5 .... 23 p0541 N79-22621*#
REPT-77/HP-40-241 .... 23 p0584 N79-26534 #
REPT-78-2-FPH .... 21 p0217 N79-14397 #
REPT-79-243 .... 22 p0347 N79-18373*#
REPT-79/FM/2 .... 23 p0585 N79-26541 #
REPT-2257/12 .... 24 p0736 N79-29598*#
REPT-2258/8 .... 22 p0348 N79-18451*#
REPT-2344/4 .... 23 p0550 N79-23517*#
REPT-2364/1 .... 23 p0550 N79-23523*#
REPT-2365/1 .... 23 p0550 N79-23527*#
REPT-5102-107 .... 22 p0359 N79-20491*#
REPT-5103-47-VOL-1 .... 22 p0368 N79-21548*#
REPT-5104-26-VOL-1 .... 22 p0360 N79-20492*#
REPT-08699-008-88-VOL-1-B ...... 24 p0744 N79-29783 #

RES/DEVELOP-53-VOL-4-PT-10 ..... 24 p0766 N79-31419 #

RHO-LD-78-4-AUG .... 24 p0777 N79-32081 #
RHO-LD-78-4-SEP .... 24 p0777 N79-32075 #

RI/RD78-207 .... 21 p0230 N79-15413 #
RI/RD78-237 .... 23 p0569 N79-25396 #

RLO/2227/T37-3 .... 23 p0596 N79-27676 #

RMP-5495-1 .... 21 p0224 N79-14946 #

RR-134 .... 22 p0349 N79-18463 #

RRC-78-R-607 .... 21 p0183 N79-11473*#

R79AEG367 .... 23 p0576 N79-26221*#
R7901-1 .... 22 p0337 N79-16892*#

S-100-Q12 .... 23 p0586 N79-26979*#
S-1267-CA/81-VOL-1 .... 23 p0599 N79-27708 #

SAE PAPER 780523 .... 21 p0031 A79-10398*
SAE PAPER 781010 .... 22 p0274 A79-25892
SAE PAPER 781026 .... 22 p0274 A79-25899
SAE PAPER 781027 .... 22 p0274 A79-25900
SAE PAPER 790013 .... 22 p0314 A79-31352
SAE PAPER 790014 .... 22 p0313 A79-31351
SAE PAPER 790107 .... 22 p0314 A79-31355
SAE PAPER 790109 .... 22 p0314 A79-31356*
SAE PAPER 790110 .... 22 p0314 A79-31357
SAE PAPER 790111 .... 22 p0314 A79-31358
SAE PAPER 790128 .... 22 p0314 A79-31360
SAE PAPER 790129 .... 22 p0314 A79-31361
SAE PAPER 790158 .... 22 p0314 A79-31363
SAE PAPER 790161 .... 22 p0315 A79-31366
SAE PAPER 790162 .... 22 p0315 A79-31367
SAE PAPER 790327 .... 22 p0315 A79-31368*
SAE PAPER 790328 .... 22 p0315 A79-31369
SAE PAPER 790329 .... 22 p0315 A79-31370
SAE PAPER 790355 .... 22 p0315 A79-31371
SAE PAPER 790427 .... 23 p0495 A79-40774*
SAE PAPER 790436 .... 22 p0315 A79-31374

SAE PAPER 790438 .... 22 p0315 A79-31375
SAE PAPER 790439 .... 22 p0316 A79-31376
SAE PAPER 790605 .... 23 p0440 A79-36737*
SAE PAPER 790621 .... 23 p0440 A79-36749*
SAE PAPER 790624 .... 23 p0440 A79-36752

SAMSO-TR-79-66 .... 24 p0717 N79-28213 #

SAN-W1364-01 .... 21 p0195 N79-12256 #

SAN-0115-T2 .... 24 p0779 N79-32385 #
SAN-0115-T3 .... 24 p0779 N79-32384 #
SAN-0115-T124-1 .... 24 p0733 N79-29369 #
SAN-1038-PO-1 .... 24 p0790 N79-32717 #
SAN-1109-77-7 .... 21 p0210 N79-13542 #
SAN-1241-77-1 .... 21 p0171 N79-10237 #
SAN-1265-9 .... 24 p0781 N79-32516 #
SAN-1326-1-2 .... 21 p0174 N79-10532 #
SAN-1329-5 .... 23 p0556 N79-24423 #
SAN-1335-1 .... 21 p0195 N79-12450 #
SAN-1459-3 .... 24 p0789 N79-32701 #
SAN-1587-2 .... 21 p0211 N79-13544 #
SAN-1608-4-1 .... 24 p0729 N79-28791 #
SAN-2092-T1 .... 24 p0733 N79-29372 #

SAND-76-0347 .... 24 p0774 N79-31806 #
SAND-76-0381 .... 21 p0221 N79-14569 #
SAND-77-1173 .... 21 p0221 N79-14568 #
SAND-77-1241 .... 21 p0221 N79-14567 #
SAND-77-1403 .... 21 p0220 N79-14566 #
SAND-77-1528 .... 21 p0197 N79-12565 #
SAND-77-8035 .... 21 p0221 N79-14571 #
SAND-77-8280 .... 24 p0729 N79-28932 #
SAND-77-8299 .... 21 p0172 N79-10435 #
SAND-78-0016C .... 21 p0175 N79-10539 #
SAND-78-0049 .... 21 p0210 N79-13537 #
SAND-78-0191 .... 24 p0778 N79-32373 #
SAND-78-0308-REV .... 21 p0187 N79-11525 #
SAND-78-0397C .... 23 p0582 N79-26512 #
SAND-78-0548C .... 24 p0791 N79-32719 #
SAND-78-0624 .... 23 p0573 N79-25519 #
SAND-78-0625 .... 23 p0565 N79-24512 #
SAND-78-0641 .... 21 p0209 N79-13532 #
SAND-78-0665 .... 24 p0761 N79-30908 #
SAND-78-0700 .... 21 p0185 N79-11496 #
SAND-78-0815 .... 21 p0208 N79-13522 #
SAND-78-0880C .... 21 p0187 N79-11516 #
SAND-78-0881C .... 23 p0573 N79-25520 #
SAND-78-0917C .... 21 p0188 N79-11527 #
SAND-78-0931 .... 24 p0759 N79-30827 #
SAND-78-0948C .... 21 p0176 N79-10550 #
SAND-78-0949 .... 24 p0754 N79-30784 #
SAND-78-0955C .... 24 p0754 N79-30780 #
SAND-78-0963 .... 24 p0726 N79-28768 #
SAND-78-0979 .... 23 p0584 N79-26530 #
SAND-78-0980C .... 24 p0773 N79-31796 #
SAND-78-1000C .... 21 p0187 N79-11517 #
SAND-78-1063 .... 24 p0756 N79-30807 #
SAND-78-1156C .... 21 p0188 N79-11529 #
SAND-78-1191C .... 21 p0198 N79-12570 #
SAND-78-1620 .... 24 p0793 N79-32811 #
SAND-78-1735 .... 24 p0752 N79-30772 #
SAND-78-1737 .... 23 p0595 N79-27670 #
SAND-78-1954 .... 24 p0730 N79-29061 #
SAND-78-1977 .... 24 p0756 N79-30806 #
SAND-78-2099C .... 23 p0595 N79-27668 #
SAND-78-2162 .... 24 p0769 N79-31741 #
SAND-78-2184 .... 23 p0565 N79-24511 #
SAND-78-2240 .... 23 p0576 N79-26146 #
SAND-78-2306 .... 24 p0720 N79-28540 #
SAND-78-2419C .... 24 p0726 N79-28762 #
SAND-78-7018 .... 21 p0187 N79-11521 #
SAND-78-7021 .... 21 p0206 N79-13509 #
SAND-78-7024 .... 23 p0598 N79-27699 #
SAND-78-7031 .... 24 p0787 N79-32691 #
SAND-78-7039 .... 24 p0741 N79-29651 #
SAND-78-7044 .... 24 p0744 N79-29743 #
SAND-78-7075 .... 23 p0552 N79-24071 #
SAND-78-8051 .... 23 p0565 N79-24510 #
SAND-78-8056 .... 21 p0221 N79-14570 #
SAND-78-8221 .... 24 p0788 N79-32694 #
SAND-78-8277 .... 24 p0765 N79-31383 #
SAND-78-8505 .... 24 p0791 N79-32720 #
SAND-78-8672 .... 21 p0189 N79-11537 #
SAND-79-0001 .... 23 p0584 N79-26528 #
SAND-79-0017 .... 24 p0732 N79-29366 #
SAND-79-0096 .... 24 p0778 N79-32131 #
SAND-79-0215C .... 24 p0790 N79-32710 #
SAND-79-0246C .... 24 p0786 N79-32683 #
SAND-79-0434 .... 24 p0719 N79-28398 #
SAND-79-0515 .... 24 p0786 N79-32681 #
SAND-79-0746C .... 24 p0769 N79-31744 #
SAND-79-7027 .... 24 p0732 N79-29365 #
SAND-79-9733C .... 24 p0753 N79-30773 #

SAPR-2 .... 23 p0542 N79-22627*#
SAPR-11 .... 23 p0569 N79-25446*#

SD-78-AD-0075 .... 21 p0225 N79-15137*#
SD-78-AP-0023-1-VOL-1 .... 22 p0329 N79-16036*#
SD-78-AP-0023-2-VOL-2 .... 22 p0330 N79-16037*#
SD-78-AP-0023-3-VOL-3 .... 21 p0225 N79-15138*#
SD-78-AP-0023-5-VOL-5 .... 21 p0225 N79-15139*#
SD-78-AP-0023-6-VOL-6 .... 21 p0225 N79-15140*#
SD-78-AP-0023-7-VOL-7 .... 21 p0225 N79-15141*#
SD-78-AP-0023-7-VOL-7-APP ...... 21 p0225 N79-15142*#
SD-78-AP-0115 .... 21 p0183 N79-11475*#

SE-655 .... 22 p0358 N79-20482*#
SP-4024-T1 .... 24 p0763 N79-31251*#

SERI-35 .... 23 p0553 N79-24180 #

SERI/PR-13-154 .... 24 p0787 N79-32688 #
SERI/PR-35-101 .... 23 p0599 N79-27705 #
SERI/PR-52-076 .... 23 p0600 N79-28056 #
SERI/RR-53-128 .... 24 p0773 N79-31800 #
SERI/SP-33-140 .... 24 p0775 N79-31816 #
SERI/TP-35-57 .... 24 p0787 N79-32689 #
SERI/TR-33-122 .... 24 p0767 N79-31422 #
SERI/TR-33-129 .... 24 p0779 N79-32374 #
SERI/TR-33-151 .... 24 p0766 N79-31413 #
SERI/TR-51-161 .... 24 p0773 N79-31799 #
SERI/TR-51-162 .... 24 p0774 N79-31808 #

SIB-R-83-1978 .... 23 p0598 N79-27700 #

SOA-76-328 .... 21 p0181 N79-11454 #

SOLAR/0012-78/29 .... 23 p0563 N79-24497 #
SOLAR/2002-78/50 .... 23 p0563 N79-24496 #
SOLAR/2002-78/60 .... 23 p0561 N79-24480 #
SOLAR/2003-78/50 .... 23 p0561 N79-24481 #
SOLAR/2003-78/60 .... 23 p0562 N79-24482 #
SOLAR/2005-78/50 .... 23 p0562 N79-24486 #
SOLAR/2005-78/60 .... 23 p0563 N79-24494 #
SOLAR/2008-78/50 .... 23 p0562 N79-24485 #
SOLAR/2008-78/60 .... 23 p0563 N79-24495 #
SOLAR/2011-78/50 .... 23 p0563 N79-24498 #
SOLAR/2011-78/60 .... 23 p0562 N79-24483 #
SOLAR/2015-78/50 .... 23 p0564 N79-24499 #
SOLAR/2015-78/60 .... 23 p0562 N79-24484 #
SOLAR/2018-78/60 .... 24 p0728 N79-28788 #

SORI-EAS-78-347-3344F .... 21 p0199 N79-12601 #

SP-140 .... 24 p0751 N79-30730 #

SPECIAL-REPT-5 .... 24 p0795 N79-33340 #

SQUID-PU-R2-78 .... 22 p0338 N79-17011 #

SRI-5258-7-VOL-1 .... 24 p0803 N79-33639 #
SRI-5258-7-VOL-2 .... 24 p0761 N79-30856 #
SRI-6581 .... 24 p0733 N79-29369 #

SSD-79-0010-1-VOL-1 .... 23 p0547 N79-23484*#
SSD-79-0010-2-1-VOL-2-PT-1 ..... 23 p0547 N79-23485*#
SSD-79-0010-2-2-VOL-2-PT-2 ..... 23 p0547 N79-23486*#
SSD-79-0010-2-2-VOL-2-PT-2-APP . 23 p0547 N79-23487*#
SSD-79-0010-3 .... 23 p0543 N79-22632*#
SSD-79-0010-4-VOL-4 .... 23 p0547 N79-23488*#
SSD-79-0010-5 .... 23 p0543 N79-22633*#
SSD-79-0010-6 .... 23 p0543 N79-22634*#
SSD-79-0010-7-VOL-7 .... 23 p0547 N79-23489*#
SSD-79-0076 .... 22 p0352 N79-19071*#

STD-UP-002-77-1 .... 24 p0794 N79-33042 #

STDR-79-2 .... 24 p0794 N79-33042 #

SU-SUPRI-TR-9 .... 24 p0781 N79-32516 #

SX/115/PL .... 21 p0219 N79-14548*#
SX/115/3Q .... 22 p0354 N79-19459*#
SX/115/7Q .... 24 p0770 N79-31767*#

TAC-HP78-004 .... 23 p0546 N79-23364*

TAC-H78-004 .... 23 p0540 N79-22613*

TAC-STPG-78-003 .... 23 p0540 N79-22614*

TAEB-79-1 .... 23 p0555 N79-24191 #

TDB-317 .... 23 p0578 N79-26408 #

TETRAT-A-6053-02-78-368 .... 21 p0197 N79-12560 #
TETRAT-A-6054-403 .... 24 p0738 N79-29614 #

TH-78-E-79 .... 22 p0350 N79-18758 #

TI-03-79-15 .... 23 p0550 N79-23512*#

TID-3361 .... 21 p0184 N79-11491 #
TID-4579-R-10-SUPPL-1 .... 24 p0791 N79-32721 #
TID-4579-R10 .... 21 p0197 N79-12566 #
TID-4579-R10-SUPPL-3 .... 24 p0745 N79-30088 #
TID-4583-R1 .... 21 p0184 N79-11488 #
TID-27754 .... 21 p0174 N79-10533 #
TID-27951 .... 21 p0209 N79-13533 #
TID-28152-APP .... 21 p0187 N79-11512 #
TID-28202 .... 21 p0186 N79-11510 #
TID-28408 .... 22 p0352 N79-19171 #
TID-28519 .... 22 p0365 N79-21309 #
TID-28599 .... 23 p0545 N79-22965 #
TID-28705 .... 24 p0750 N79-30723 #
TID-28834 .... 24 p0773 N79-31797 #
TID-28968 .... 24 p0773 N79-31795 #
TID-28971 .... 24 p0757 N79-30809 #
TID-28975 .... 24 p0740 N79-29643 #
TID-28983 .... 23 p0567 N79-24626 #
TID-29025-1 .... 24 p0754 N79-30786 #
TID-29025-2 .... 24 p0754 N79-30787 #
TID-29025-3 .... 24 p0755 N79-30788 #
TID-29091 .... 24 p0733 N79-29375 #
TID-29093-VOL-5 .... 24 p0719 N79-28361 #
TID-29391 .... 24 p0726 N79-28766 #
TID-29412 .... 24 p0742 N79-29664 #
TID-29425-VOL-1 .... 24 p0774 N79-31801 #
TID-29425-VOL-2 .... 24 p0774 N79-31802 #
TID-29442 .... 24 p0729 N79-29021 #

TM/ES/78-17 .... 24 p0746 N79-30406 #
TM/ES/79-03 .... 24 p0781 N79-32618 #
TM/ES/79-05 .... 23 p0600 N79-28059 #
TM/EU/79-06 .... 22 p0362 N79-20509 #

TN-152 .... 21 p0192 N79-11613 #
TN-1978-4 .... 21 p0226 N79-15145 #

TP-1777 .... 24 p0763 N79-31107 #

TPR-3 .... 24 p0789 N79-32701 #
TPR-59 .... 22 p0371 N79-21622*#

TR-1 .... 21 p0184 N79-11483 #
TR-01-002 .... 24 p0793 N79-33036 #
TR-13 .... 23 p0546 N79-22970 #
TR-20 .... 23 p0546 N79-22971 #
TR-22 .... 23 p0546 N79-22972 #
TR-531-28-ADD .... 24 p0737 N79-29601*#
TR-0079(4960-04)-5 .... 24 p0717 N79-28213 #
TR-7802-0977 .... 21 p0194 N79-12130*#

TRE/TRR-648 .... 21 p0232 N79-15868 #

TREE-1308 .... 24 p0772 N79-31783 #
TREE-1312 .... 22 p0362 N79-20508 #

TRS-101 .... 22 p0360 N79-20497*#

TRW-79.5536.3-06 .... 24 p0770 N79-31763*#

TSC-FAA-78-21-1 .... 23 p0568 N79-25040 #

TSC-USCG-77-4 .... 22 p0366 N79-21406 #
TSC-USCG-78-1 .... 21 p0203 N79-13375 #
TSC-USCG-78-12 .... 22 p0338 N79-17019 #

TUM-LRT-TB-22/2 .... 23 p0599 N79-27707 #

TUM-LRT-TB-79/3 .... 24 p0711 A79-53432

U-6529-VOL-1 .... 24 p0799 N79-33573*#
U-6529-VOL-2 .... 24 p0799 N79-33574*#
U-6529-VOL-3 .... 24 p0799 N79-33575*#

UC-60 .... 22 p0356 N79-19568 #

UCID-1804-PT-1 .... 23 p0567 N79-24877 #
UCID-4033 .... 21 p0204 N79-13480 #
UCID-17902 .... 24 p0788 N79-32693 #
UCID-18051 .... 23 p0595 N79-27669 #
UCID-18091 .... 24 p0717 N79-28229 #

UCLA-ENG-77-78-PT-1 .... 24 p0732 N79-29354*#

UCR/IGPP-78/17 .... 24 p0797 N79-33553 #

UCRL-TRANS-11467 .... 24 p0734 N79-29513 #

UCRL-13968 .... 24 p0733 N79-29374 #
UCRL-13979 .... 24 p0721 N79-28655 #
UCRL-51444-78 .... 24 p0722 N79-28668 #
UCRL-52000-78-6 .... 21 p0215 N79-14168 #
UCRL-52000-79-3 .... 24 p0791 N79-32727 #
UCRL-52349 .... 21 p0195 N79-12439 #
UCRL-52385 .... 21 p0185 N79-11497 #
UCRL-52385-REV-1 .... 24 p0727 N79-28774 #
UCRL-52508 .... 24 p0788 N79-32695 #
UCRL-52589 .... 22 p0342 N79-17337 #
UCRL-52613 .... 24 p0731 N79-29116 #
UCRL-52623 .... 23 p0576 N79-26121 #
UCRL-52637 .... 24 p0742 N79-29665 #
UCRL-80113 .... 21 p0217 N79-14377 #
UCRL-80116-PT-A .... 21 p0215 N79-14165 #
UCRL-80451 .... 21 p0181 N79-11412 #
UCRL-81159 .... 21 p0189 N79-11536 #
UCRL-81178 .... 21 p0011 A79-10093
UCRL-81178 .... 21 p0189 N79-11538 #
UCRL-81259-REV-1 .... 23 p0583 N79-26524 #
UCRL-81604 .... 24 p0720 N79-28521 #
UCRL-81622 .... 24 p0720 N79-28653 #
UCRL-81717 .... 24 p0721 N79-28658 #
UCRL-81717-REV-1 .... 24 p0721 N79-28656 #
UCRL-81721-REV-1 .... 24 p0721 N79-28657 #
UCRL-81764 .... 24 p0725 N79-28753 #
UCRL-82003 .... 23 p0564 N79-24503 #
UCRL-82171 .... 23 p0582 N79-26514 #
UCRL-82269 .... 23 p0561 N79-24479 #

UDRI-TR-78-41 .... 21 p0196 N79-12559 #

UHMET-77-01 .... 22 p0335 N79-16382 #

UII-70101 .... 21 p0197 N79-12562 #

UILU-WRC-78-0134 .... 22 p0349 N79-18463 #

UMD-4908-13 .... 22 p0363 N79-20525 #

UMICH-015657 .... 24 p0796 N79-33348 #

UMTA-CA-06-0106-77-1-VOL-1 ..... 21 p0176 N79-10555 #
UMTA-CA-06-0106-77-2-VOL-2 ..... 21 p0176 N79-10556 #
UMTA-CA-06-0106-77-3-VOL-3 ..... 21 p0177 N79-10557 #
UMTA-CA-06-0106-77-4-VOL-4 ..... 21 p0177 N79-10558 #
UMTA-CA-06-0106-77-5-VOL-5 ..... 21 p0177 N79-10559 #

UMTA-MA-06-0025-79-12 .... 24 p0763 N79-31107 #
UMTA-MA-06-0044-79-1 .... 24 p0763 N79-31110 #
UMTA-MA-06-0052-78-4 .... 24 p0778 N79-32135 #

UMTA-NY-06-0062-77-1 .... 21 p0177 N79-10563 #
UMTA-NY-11-0017-79-1 .... 23 p0587 N79-27024 #

US-PATENT-APPL-SN-008210 .... 23 p0568 N79-24980*#
US-PATENT-APPL-SN-017884 .... 22 p0348 N79-18445*#
US-PATENT-APPL-SN-027559 .... 22 p0362 N79-20513*#
US-PATENT-APPL-SN-051275 .... 24 p0737 N79-29608*#
US-PATENT-APPL-SN-060435 .... 24 p0721 N79-28667*#
US-PATENT-APPL-SN-112999 .... 22 p0352 N79-19186*
US-PATENT-APPL-SN-286824 .... 22 p0353 N79-19447*
US-PATENT-APPL-SN-632111 .... 21 p0172 N79-10422*
US-PATENT-APPL-SN-730468 .... 21 p0179 N79-11152*
US-PATENT-APPL-SN-760771 .... 21 p0217 N79-14528*
US-PATENT-APPL-SN-762362 .... 23 p0557 N79-24433*
US-PATENT-APPL-SN-762363 .... 23 p0557 N79-24432*
US-PATENT-APPL-SN-765138 .... 21 p0172 N79-10513*
US-PATENT-APPL-SN-801452 .... 21 p0182 N79-11471*
US-PATENT-APPL-SN-803823 .... 21 p0182 N79-11467*
US-PATENT-APPL-SN-823061 .... 23 p0546 N79-23481*
US-PATENT-APPL-SN-824024 .... 22 p0348 N79-18443*
US-PATENT-APPL-SN-829390 .... 21 p0182 N79-11469*
US-PATENT-APPL-SN-830458 .... 23 p0551 N79-23555*

US-PATENT-APPL-SN-837513 .... 23 p0568 N79-25311*#
US-PATENT-APPL-SN-838336 .... 21 p0182 N79-11470*
US-PATENT-APPL-SN-844346 .... 21 p0182 N79-11472*
US-PATENT-APPL-SN-848420 .... 23 p0569 N79-25443*
US-PATENT-APPL-SN-848793 .... 24 p0768 N79-31706*
US-PATENT-APPL-SN-863773 .... 23 p0579 N79-26475*
US-PATENT-APPL-SN-891243 .... 23 p0570 N79-25482*
US-PATENT-APPL-SN-891370 .... 22 p0357 N79-20179*
US-PATENT-APPL-SN-899123 .... 21 p0217 N79-14528*
US-PATENT-APPL-SN-906297 .... 21 p0217 N79-14529*
US-PATENT-APPL-SN-956167 .... 24 p0730 N79-29037*

US-PATENT-CLASS-15-230.16 .... 21 p0172 N79-10422*
US-PATENT-CLASS-15-230.17 .... 21 p0172 N79-10422*
US-PATENT-CLASS-29-125 .... 21 p0172 N79-10422*
US-PATENT-CLASS-29-572 .... 21 p0182 N79-11472*
US-PATENT-CLASS-29-572 .... 23 p0579 N79-26475*
US-PATENT-CLASS-29-577 .... 23 p0579 N79-26475*
US-PATENT-CLASS-29-578 .... 23 p0579 N79-26475*
US-PATENT-CLASS-29-580 .... 23 p0579 N79-26475*
US-PATENT-CLASS-33-1H 24 p0730 N79-29037*
US-PATENT-CLASS-33-281 .... 24 p0730 N79-29037*
US-PATENT-CLASS-44-51 .... 21 p0179 N79-11152*
US-PATENT-CLASS-60-508 .... 22 p0348 N79-18443*
US-PATENT-CLASS-60-572 .... 22 p0348 N79-18443*
US-PATENT-CLASS-60-641 .... 22 p0348 N79-18443*
US-PATENT-CLASS-73-12 .... 23 p0569 N79-25443*
US-PATENT-CLASS-73-82 .... 23 p0569 N79-25443*
US-PATENT-CLASS-74-572 .... 21 p0172 N79-10422*
US-PATENT-CLASS-117-35 .... 22 p0352 N79-19186*
US-PATENT-CLASS-126-270 .... 21 p0182 N79-11471*
US-PATENT-CLASS-126-270 .... 23 p0546 N79-23481*
US-PATENT-CLASS-126-270 .... 23 p0557 N79-24432*
US-PATENT-CLASS-126-271 .... 21 p0182 N79-11471*
US-PATENT-CLASS-126-271 .... 21 p0217 N79-14529*
US-PATENT-CLASS-126-271 .... 22 p0348 N79-18443*
US-PATENT-CLASS-126-271 .... 23 p0546 N79-23481*
US-PATENT-CLASS-126-271 .... 23 p0557 N79-24433*
US-PATENT-CLASS-126-400 .... 23 p0557 N79-24433*
US-PATENT-CLASS-136-89CA 23 p0570 N79-25482*
US-PATENT-CLASS-136-89CC 21 p0182 N79-11467*
US-PATENT-CLASS-136-89CC 23 p0570 N79-25482*
US-PATENT-CLASS-136-89PC 23 p0570 N79-25482*
US-PATENT-CLASS-136-89SJ 21 p0182 N79-11467*
US-PATENT-CLASS-136-89SJ 21 p0217 N79-14528*
US-PATENT-CLASS-136-89SJ 23 p0570 N79-25482*
US-PATENT-CLASS-165-105 .... 22 p0348 N79-18443*
US-PATENT-CLASS-181-115 .... 23 p0551 N79-23555*
US-PATENT-CLASS-181-120 .... 23 p0551 N79-23555*
US-PATENT-CLASS-204-32 .... 21 p0182 N79-11469*
US-PATENT-CLASS-204-33 .... 21 p0182 N79-11469*
US-PATENT-CLASS-204-37R 21 p0182 N79-11469*
US-PATENT-CLASS-204-38E 21 p0182 N79-11469*
US-PATENT-CLASS-204-157.1R 21 p0182 N79-11470*
US-PATENT-CLASS-208-8 .... 21 p0179 N79-11152*
US-PATENT-CLASS-208-10 .... 21 p0179 N79-11152*
US-PATENT-CLASS-237-1A 23 p0557 N79-24433*
US-PATENT-CLASS-250-253 .... 24 p0768 N79-31706*
US-PATENT-CLASS-250-272 .... 24 p0768 N79-31706*
US-PATENT-CLASS-250-527 .... 21 p0182 N79-11470*
US-PATENT-CLASS-264-1 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-33 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-34 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-35 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-70 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-71 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-510 .... 23 p0557 N79-24432*
US-PATENT-CLASS-264-516 .... 23 p0557 N79-24432*
US-PATENT-CLASS-269-153 .... 22 p0353 N79-19447*
US-PATENT-CLASS-302-66 .... 21 p0179 N79-11152*
US-PATENT-CLASS-323-15 .... 22 p0357 N79-20179*
US-PATENT-CLASS-323-20 .... 22 p0357 N79-20179*
US-PATENT-CLASS-340-12R 23 p0551 N79-23555*
US-PATENT-CLASS-350-83 .... 24 p0730 N79-29037*
US-PATENT-CLASS-350-288 .... 21 p0182 N79-11471*
US-PATENT-CLASS-350-288 .... 23 p0557 N79-24433*
US-PATENT-CLASS-350-292 .... 21 p0217 N79-14529*
US-PATENT-CLASS-350-292 .... 23 p0557 N79-24432*
US-PATENT-CLASS-350-293 .... 21 p0217 N79-14529*
US-PATENT-CLASS-350-294 .... 23 p0557 N79-24432*
US-PATENT-CLASS-350-296 .... 23 p0557 N79-24432*
US-PATENT-CLASS-350-299 .... 21 p0182 N79-11471*
US-PATENT-CLASS-350-299 .... 23 p0557 N79-24433*
US-PATENT-CLASS-350-320 .... 21 p0217 N79-14529*
US-PATENT-CLASS-357-15 .... 21 p0182 N79-11467*
US-PATENT-CLASS-357-16 .... 21 p0182 N79-11467*
US-PATENT-CLASS-357-30 .... 21 p0182 N79-11467*
US-PATENT-CLASS-357-30 .... 21 p0217 N79-14528*
US-PATENT-CLASS-357-45 .... 23 p0579 N79-26475*
US-PATENT-CLASS-357-65 .... 21 p0182 N79-11467*
US-PATENT-CLASS-357-67 .... 21 p0182 N79-11467*
US-PATENT-CLASS-405-229 .... 23 p0557 N79-24432*
US-PATENT-CLASS-405-263 .... 23 p0557 N79-24432*
US-PATENT-CLASS-427-75 .... 21 p0182 N79-11472*
US-PATENT-CLASS-427-84 .... 21 p0182 N79-11472*
US-PATENT-CLASS-427-123 .... 21 p0182 N79-11472*
US-PATENT-CLASS-427-126 .... 21 p0182 N79-11472*
US-PATENT-CLASS-427-261 .... 21 p0182 N79-11472*
US-PATENT-CLASS-427-343 .... 21 p0182 N79-11472*
US-PATENT-CLASS-427-398A 21 p0182 N79-11472*
US-PATENT-CLASS-427-399 .... 21 p0182 N79-11472*
US-PATENT-CLASS-428-133 .... 21 p0172 N79-10422*
US-PATENT-CLASS-429-13 .... 21 p0172 N79-10513*
US-PATENT-CLASS-429-41 .... 21 p0172 N79-10513*
US-PATENT-CLASS-429-42 .... 21 p0172 N79-10513*

US-PATENT-3,173,801 .... 22 p0352 N79-19186*
US-PATENT-3,262,694 .... 22 p0353 N79-19447*
US-PATENT-4,098,142 .... 21 p0172 N79-10422*
US-PATENT-4,100,331 .... 21 p0172 N79-10513*
US-PATENT-4,104,084 .... 21 p0182 N79-11467*
US-PATENT-4,104,134 .... 21 p0182 N79-11469*
US-PATENT-4,105,517 .... 21 p0182 N79-11470*
US-PATENT-4,121,995 .... 21 p0179 N79-11152*
US-PATENT-4,122,214 .... 21 p0182 N79-11472*
US-PATENT-4,122,833 .... 21 p0182 N79-11471*
US-PATENT-4,131,336 .... 21 p0217 N79-14529*
US-PATENT-4,131,486 .... 21 p0217 N79-14528*
US-PATENT-4,135,367 .... 22 p0348 N79-18443*
US-PATENT-4,143,314 .... 22 p0357 N79-20179*
US-PATENT-4,148,295 .... 23 p0546 N79-23481*
US-PATENT-4,149,521 .... 23 p0557 N79-24433*
US-PATENT-4,149,817 .... 23 p0557 N79-24432*
US-PATENT-4,153,134 .... 23 p0551 N79-23555*
US-PATENT-4,153,476 .... 23 p0570 N79-25482*
US-PATENT-4,154,084 .... 23 p0569 N79-25443*
US-PATENT-4,156,309 .... 23 p0579 N79-26475*
US-PATENT-4,159,576 .... 24 p0730 N79-29037*
US-PATENT-4,165,460 .... 24 p0768 N79-31706*

USAFESA-RT-2052 .... 22 p0371 N79-21624 #

USAFESA-TSD-2057 .... 24 p0752 N79-30770 #
USAFESA-TSD-2060 .... 24 p0800 N79-33583 #

USCG-D-10-78 .... 21 p0203 N79-13375 #
USCG-D-12-78 .... 22 p0338 N79-17019 #
USCG-D-13-78 .... 22 p0366 N79-21406 #
USCG-D-23-79 .... 24 p0738 N79-29615 #

USCSG-AS-01-78 .... 22 p0331 N79-16140 #

UT/CES-GR-2 .... 24 p0726 N79-28770 #

UWRL-P-78/005 .... 21 p0231 N79-15432 #

VHTRC-79-R24 .... 23 p0544 N79-22683 #

VKI-LEC-SER-1978-6-VOL-1 .... 24 p0723 N79-28732 #
VKI-LEC-SER-1978-6-VOL-2 .... 24 p0723 N79-28738 #
VKI-LEC-SER-1978-8 .... 24 p0720 N79-28506 #

VKI-LECTURE-SERIES-8 .... 23 p0545 N79-22891 #
VKI-LECTURE-SERIES-100-VOL-1 ... 22 p0331 N79-16260 #

VPI-SU-5648-1 .... 21 p0204 N79-13478 #

WFPS-TME-071 .... 21 p0193 N79-11889 #

WMO-467 .... 21 p0192 N79-11613 #

WYLE-TR-531-23 .... 24 p0749 N79-30715*#
WYLE-TR-531-25 .... 21 p0173 N79-10521*#
WYLE-TR-531-26 .... 21 p0172 N79-10515*#
WYLE-TR-531-29 .... 23 p0594 N79-27657*#
WYLE-TR-531-30R .... 24 p0797 N79-33561*#
WYLE-TR-531-36R .... 24 p0798 N79-33568*#

W78-10288 .... 21 p0211 N79-13549 #
W78-11211 .... 21 p0231 N79-15432 #
W79-00007 .... 22 p0343 N79-17353 #
W79-00453 .... 22 p0349 N79-18463 #
W79-03662 .... 23 p0565 N79-24515 #
W79-04962 .... 23 p0585 N79-26562 #

Y/EN-257 .... 24 p0734 N79-29384 #
Y/SUB-77/14261 .... 21 p0209 N79-13528 #

1. Report No. NASA SP-7043 (24)	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle ENERGY A Continuing Bibliography (Issue 24)		5. Report Date January 1980
		6. Performing Organization Code
7. Author(s)		8. Performing Organization Report No.
		10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546		11. Contract or Grant No.
		13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address		14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This bibliography lists 1609 reports, articles, and other documents introduced into the NASA scientific and technical information system from October 1, 1979 through December 31, 1979.

17. Key Words (Suggested by Author(s)) Bibliographies Energy Conversion Energy Policy Solar Energy Wind Energy	18. Distribution Statement Unclassified - Unlimited

19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 1079	22. Price* $15.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

☆U.S. GOVERNMENT PRINTING OFFICE: 1980 635-050/1 1-3

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley
COLORADO
University of Colorado, Boulder
DISTRICT OF COLUMBIA
Library of Congress
GEORGIA
Georgia Institute of Technology, Atlanta
ILLINOIS
The John Crerar Library, Chicago
MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge
MISSOURI
Linda Hall Library, Kansas City
NEW YORK
Columbia University, New York
OKLAHOMA
University of Oklahoma, Bizzell Library
PENNSYLVANIA
Carnegie Library of Pittsburgh
WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library
COLORADO
Denver Public Library
CONNECTICUT
Hartford Public Library
MARYLAND
Enoch Pratt Free Library, Baltimore
MASSACHUSETTS
Boston Public Library
MICHIGAN
Detroit Public Library
MINNESOTA
Minneapolis Public Library
MISSOURI
Kansas City Public Library
St. Louis Public Library
NEW JERSEY
Trenton Public Library
NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library
OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library
TENNESSEE
Memphis Public Library
TEXAS
Dallas Public Library
Fort Worth Public Library
WASHINGTON
Seattle Public Library
WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York 10017.

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from: ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.

JUN 30 1980

NASA

Item 830-J-5

NAS 1.21:7043(25)

Energy
A Continuing
Bibliography
with Indexes

NASA SP-7043(25)
April 1980

635-055
Cop 70 4

contin

9099

National Aeronautics and
Space Administration

y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

IAA (A-10000 Series)	A80-10001 – A80-21040
STAR (N-10000 Series)	N80-10001 – N80-16022

Previous publications announced in this series/subject category include:

DOCUMENT	*DATE*	*COVERAGE*
NASA SP-7042	April 1974	January 1968 – December 1973
NASA SP-7043(01)	May 1974	January 1, 1974 – March 31, 1974
NASA SP-7043(02)	November 1974	April 1, 1974 – June 30, 1974
NASA SP-7043(03)	February 1975	July 1, 1974 – September 30, 1974
NASA SP-7043(04)	May 1975	October 1, 1974 – December 31, 1974
NASA SP-7043(05)	August 1975	January 1, 1975 – March 31, 1975
NASA SP-7043(06)	October 1975	April 1, 1975 – June 30, 1975
NASA SP-7043(07)	December 1975	July 1, 1975 – September 30, 1975
NASA SP-7043(08)	February 1976	October 1, 1975 – December 31, 1975
NASA SP-7043(09)	April 1976	January 1, 1976 – March 31, 1976
NASA SP-7043(10)	July 1976	April 1, 1976 – June 30, 1976
NASA SP-7043(11)	October 1976	July 1, 1976 – September 30, 1976
NASA SP-7043(12)	January 1977	October 1, 1976 – December 31, 1976
NASA SP-7043(13)	April 1977	January 1, 1977 – March 31, 1977
NASA SP-7043(14)	July 1977	April 1, 1977 – June 30, 1977
NASA SP-7043(15)	October 1977	July 1, 1977 – September 30, 1977
NASA SP-7043(16)	January 1978	October 1, 1977 – December 31, 1977
NASA SP-7043(17)	April 1978	January 1, 1978 – March 31, 1978
NASA SP-7043(18)	August 1978	April 1, 1978 – June 30, 1978
NASA SP-7043(19)	October 1978	July 1, 1978 – September 30, 1978
NASA SP-7043(20)	January 1979	October 1, 1978 – December 31, 1978
NASA SP-7043(21)	April 1979	January 1, 1979 – March 31, 1979
NASA SP-7043(22)	July 1979	April 1, 1979 – June 30,1979
NASA SP-7043(23)	October 1979	July 1, 1979 – September 30, 1979
NASA SP-7043(24)	January 1980	October 1, 1979 – December 31, 1979

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

NASA SP-7043 (25)

ENERGY

A Continuing Bibliography

With Indexes

Issue 25

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced from January 1 through March 31, 1980 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

Scientific and Technical Information Branch 1980
National Aeronautics and Space Administration
Washington, DC

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price $15.00 domestic; $30.00 foreign.

INTRODUCTION

This issue of *Energy: A Continuing Bibliography with Indexes* (NASA SP-7043(25)) lists 1428 reports, journal articles, and other documents announced between January 1, 1980 and March 31, 1980 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA).* The first issue of this continuing bibliography was published in May 1974 and succeeding issues are published quarterly.

The coverage includes regional, national and international energy systems; research and development on fuels and other sources of energy; energy conversion, transport, transmission, distribution and storage, with special emphasis on use of hydrogen and of solar energy. Also included are methods of locating or using new energy resources. Of special interest is energy for heating, lighting, for powering aircraft, surface vehicles, or other machinery.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries* in that order. The citation, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR* including the original accession numbers from the respective announcement journals. This procedure, which saves time and money accounts for the slight variation in citation appearances.

Five indexes -- subject, personal author, corporate source, contract number, and report number -- are included. The indexes are of the cumulating type throughout the year, with the fourth quarterly publication containing abstracts for the fourth quarter and index references for the four quarterly publications.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A80-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at $7.00 per document up to a maximum of 40 pages. The charge for each additional page is $0.25. Microfiche[1] of documents announced in *IAA* are available at the rate of $3.00 per microfiche on demand, and at the rate of $1.25 per microfiche for standing orders for all *IAA* microfiche. The price for the *IAA* microfiche by category is available at the rate of $1.50 per microfiche plus a $1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of $1.50 per microfiche.

Minimum air-mail postage to foreign countries is $1.00 and all foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

STAR ENTRIES (N80-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page viii.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard $3.50 price, for those documents identified by a # symbol.)

---

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.

Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.

Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)

Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.

Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the quarterly supplements is $50.00 domestic; $100.00 foreign. All questions relating to the subscriptions should be referred to NTIS, Attn: Subscriptions, 5285 Port Royal Road, Springfield, Virginia 22161

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and
Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

Department of Energy
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information
Facility
P.O. Box 8757
B. W. I. Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Branch (NST-41)
Washington, D.C. 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey
1033 General Services Administration
Building
Washington, D.C. 20242

U.S. Geological Survey
601 E. Cedar Avenue
Flagstaff, Arizona 86002

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U.S. Geological Survey
Bldg. 25, Denver Federal Center
Denver, Colorado 80225

Fachinformationszentrum Energie, Physik,
Mathematik GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1980)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 3.50	$ 5.25
A02	001-025	5.00	10.00
A03	026-050	6.00	12.00
A04	051-075	7.00	14.00
A05	076-100	8.00	16.00
A06	101-125	9.00	18.00
A07	126-150	10.00	20.00
A08	151-175	11.00	22.00
A09	176-200	12.00	24.00
A10	201-225	13.00	26.00
A11	226-250	14.00	28.00
A12	251-275	15.00	30.00
A13	276-300	16.00	32.00
A14	301-325	17.00	34.00
A15	326-350	18.00	36.00
A16	351-375	19.00	38.00
A17	376-400	20.00	40.00
A18	401-425	21.00	42.00
A19	426-450	22.00	44.00
A20	451-475	23.00	46.00
A21	476-500	24.00	48.00
A22	501-525	25.00	50.00
A23	526-550	26.00	52.00
A24	551-575	27.00	54.00
A25	576-600	28.00	56.00
A99	601-up	-- 1/	-- 2/

1/ Add $1.00 for each additional 25 page increment or portion thereof for 601 pages up

2/ Add $2.00 for each additional 25 page increment or portion thereof for 601 pages and more

Schedule E

EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

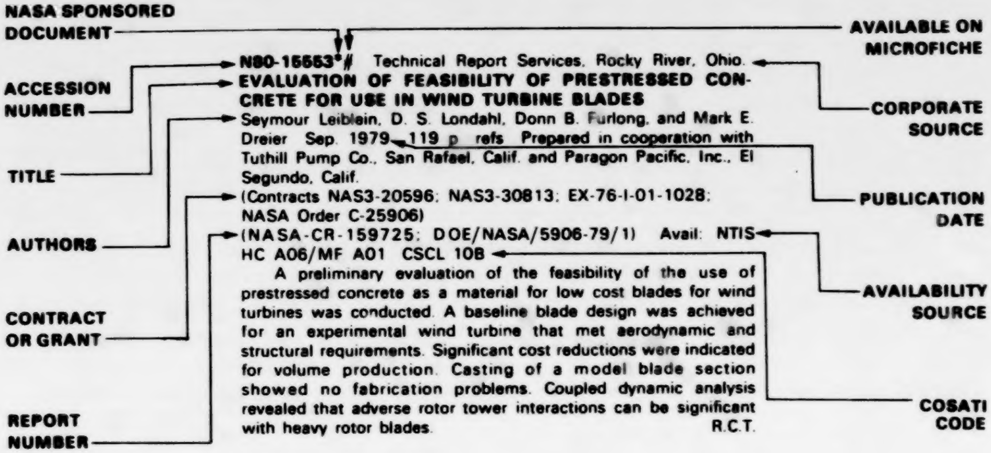
Price Code	North American Price	Foreign Price
E01	$ 5.50	$ 11.50
E02	6.50	13.50
E03	8.50	17.50
E04	10.50	21.50
E05	12.50	25.50
E06	14.50	29.50
E07	16.50	33.50
E08	18.50	37.50
E09	20.50	41.50
E10	22.50	45.50
E11	24.50	49.50
E12	27.50	55.50
E13	30.50	61.50
E14	33.50	67.50
E15	36.50	73.50
E16	39.50	79.50
E17	42.50	85.50
E18	45.50	91.50
E19	50.50	100.50
E20	60.50	121.50
E99 - Write for quote		
N01	28.00	40.00

TABLE OF CONTENTS

IAA Entries 1
STAR Entries 91

Subject Index A-1
Personal Author Index B-1
Corporate Source Index C-1
Contract Number Index D-1
Report/Accession Number Index E-1

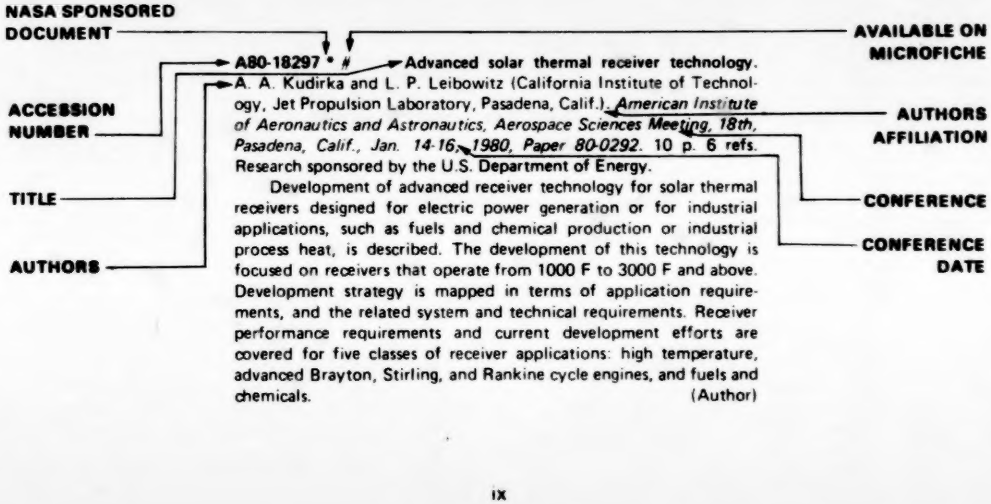
TYPICAL CITATION AND ABSTRACT FROM *STAR*


NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
CONTRACT OR GRANT
REPORT NUMBER
AVAILABLE ON MICROFICHE
CORPORATE SOURCE
PUBLICATION DATE
AVAILABILITY SOURCE
COSATI CODE

N80-15563*# Technical Report Services, Rocky River, Ohio.
EVALUATION OF FEASIBILITY OF PRESTRESSED CONCRETE FOR USE IN WIND TURBINE BLADES
Seymour Leiblein, D. S. Londahl, Donn B. Furlong, and Mark E. Dreier Sep. 1979 119 p refs Prepared in cooperation with Tuthill Pump Co., San Rafael, Calif. and Paragon Pacific, Inc., El Segundo, Calif.
(Contracts NAS3-20596; NAS3-30813; EX-76-I-01-1028; NASA Order C-25906)
(NASA-CR-159725; DOE/NASA/5906-79/1) Avail: NTIS HC A06/MF A01 CSCL 10B

A preliminary evaluation of the feasibility of the use of prestressed concrete as a material for low cost blades for wind turbines was conducted. A baseline blade design was achieved for an experimental wind turbine that met aerodynamic and structural requirements. Significant cost reductions were indicated for volume production. Casting of a model blade section showed no fabrication problems. Coupled dynamic analysis revealed that adverse rotor tower interactions can be significant with heavy rotor blades. R.C.T.

TYPICAL CITATION AND ABSTRACT FROM *IAA*


NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
AVAILABLE ON MICROFICHE
AUTHORS AFFILIATION
CONFERENCE
CONFERENCE DATE

A80-18297 * # Advanced solar thermal receiver technology.
A. A. Kudirka and L. P. Leibowitz (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0292.* 10 p. 6 refs. Research sponsored by the U.S. Department of Energy.

Development of advanced receiver technology for solar thermal receivers designed for electric power generation or for industrial applications, such as fuels and chemical production or industrial process heat, is described. The development of this technology is focused on receivers that operate from 1000 F to 3000 F and above. Development strategy is mapped in terms of application requirements, and the related system and technical requirements. Receiver performance requirements and current development efforts are covered for five classes of receiver applications: high temperature, advanced Brayton, Stirling, and Rankine cycle engines, and fuels and chemicals. (Author)

A Listing of Energy Bibliographies Contained In This Publication:

1. Hydrogen as a fuel. Citations from the international aerospace abstracts data base p0094 N80-10397
2. Hydrogen production. Citations from the international aerospace abstracts data base p0094 N80-10401
3. Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base p0094 N80-10402
4. Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base p0102 N80-10667
5. Aircraft fuel. Citations from the International Aerospace Abstracts Data Base p0102 N80-10668
6. Microwave heating: Industrial applications. Citations from the engineering data base p0102 N80-10674
7. Lead batteries, volume 2. Citations from the engineering index data base p0103 N80-10681
8. National environmental / energy workforce assessment, phase 3. Air programs --- bibliography p0117 N80-11670
9. Thermal performance of buildings and building envelope systems: An annotated bibliography p0145 N80-13680
10. Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base p0148 N80-13715
11. Geothermal energy. Part 2: Corrosion anp equipment, volume 3. Citations from the NTIS data base p0148 N80-13716
12. Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base p0148 N80-13717
13. Geothermal energy, volume 3. Citations from the Engineering Index data base p0148 N80-13718
14. Geothermal energy. Part 3: Technology and general studies, volume 4. Citations from the NTIS data base p0148 N80-13719
15. Geothermal energy, volume 4. Citations from the Engineering Index data base p0148 N80-13720

ENERGY

A Continuing Bibliography (Issue 25)

APRIL 1980

IAA ENTRIES

A80-10028 **Experimental techniques and mathematical models in the study of waste pyrolysis and gasification.** A. G. Buekens, J. J. R. Mertens, J. G. E. Schoeters, and P. C. Steen (Brussel, Vrije Universiteit, Brussels, Belgium). *(World Recycling Congress, 1st, Basel, Switzerland, Mar. 6-8, 1978.) Conservation and Recycling*, vol. 3, no. 1, 1979, p. 1-23. 36 refs.

Thermogravimetric analysis coupled with gas chromatography and mass spectrometry is used to study the weight loss of various samples and monitor the composition of the evolved volatile products. In addition, pyrolysis gas chromatography is applied for the scanning of pyrolysis rates and product distributions over a wide range of experimental conditions. Attention is given to the testing of a two phase model of a fluidized bed reactor for the case of polystyrene pyrolysis. Finally, the effect of the operation parameters on the production of styrene is discussed, noting that the computed results were in fair agreement with the literature data. M.E.P.

A80-10029 **Resource recovery systems costs.** B. M. Fabuss, D. B. Spencer, and R. L. Schroeder (Raytheon Service Co., Burlington, Mass.). *(World Recycling Congress, 1st, Basel, Switzerland, Mar. 6-8, 1978.) Conservation and Recycling*, vol. 3, no. 1, 1979, p. 77-89. U.S. Environmental Protection Agency Contract No. 68-01-4380.

The investment cost, operating cost and overall economics of resource recovery plants handling 500 to 2,000 tons per day of municipal solid waste were determined. These plants recover only refuse derived fuel and ferrous metal from the waste. Additional economics have been developed for plants recovering other products. (Author)

A80-10043 * # **The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor.** G. R. Zellars, S. M. Benford, A. P. Rowe, and C. E. Lowell (NASA, Lewis Research Center, Cleveland, Ohio). *U.S. Department of Energy and Electric Power Research Institute, Conference on Advanced Materials for Alternate Fuel Capable Directly Fired Heat Engines, Castine, Me., July 30-Aug. 3, 1979, Paper.* 25 p. 10 refs.

The operation of a turbine in the effluent of a pressurized fluidized bed (PFB) coal combustor presents serious materials problems. Synergistic erosion/corrosion and deposition/corrosion interactions may favor the growth of erosion-resistant oxides on blade surfaces, but brittle cracking of these oxides may be an important source of damage along heavy particle paths. Integrally cast alloy 713LC and IN792 + Hf superalloy turbine rotors in a single-stage turbine with 6% partial admittance have been operated in the effluent of a PFB coal combustor for up to 164 hr. The rotor erosion pattern exhibits heavy particle separation with severe erosion at the leading edge, pressure side center, and suction side trailing edge at the tip. The erosion distribution pattern gives a spectrum of erosion/oxidation/deposition as a function of blade position. The data suggest that preferential degradation paths may exist even under the targeted lower loadings (less than 20 ppm). S.D.

A80-10109 # **Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype (Conception, réalisation et expérimentation d'un générateur photovoltaique à concentration - Prototype SOPHOCLE 1000).** D. Folléa. Toulouse III, Université, Docteur-Ingénieur Thesis, 1979. 85 p. 21 refs. In French.

The work is concerned with the development of a photovoltaic generator of the concentration type that provides improvements in efficiency and cost. The conceptual design, based on thermal stress, leads to a relatively flexible structure characterized by passive cooling, a concentration level of approximately 40 suns, and a surface of cells equal to 4 sq cm. Results of experiments performed on the SOPHOCLE 1000 (SOlaire PHOtovoltaique à Concentration Limitée d'Energie) prototype confirmed the homogeneity of the structure, and provided performance estimates at the prefabrication stage. Future work should consider the development of high-efficiency (no less than 30 percent) solar cells, along with the realization of active-cooling structures. S.D.

A80-10199 # **An engine fuel chemistry solution to the problem of jet fuel supplies (Khimmotologicheskie resheniia problemy resursov reaktivnykh topliv).** V. A. Piskunov, K. S. Chernova, P. A. Mikheichev, N. P. Iurukovskii, and V. N. Zrelov. *Khimiia i Tekhnologiia Topliv i Masel*, no. 10, 1979, p. 35-38. 8 refs. In Russian.

Fuel refining techniques are discussed as means of increasing jet fuel supplies. It is shown that expanding the boiling range of jet fuel allows a greater yield from crude oil, at the expense of diesel fuel fractions, and increases the concentration of aromatic hydrocarbons in the jet fuel fractions. Investigations of the behavior of lower-quality fuels (with elevated crystallization temperatures) under simulated flight temperatures and means of controlling fuel flow and combustion properties under these conditions are discussed. Results indicating the decrease of low temperature Jet A-1 fuel fluidity with paraffin content and the increase in combustion chamber temperature with increasing hydrocarbon content are presented, emphasizing the applicability of engine fuel chemical analysis to the interactions of fuel properties, aviation technology and operational conditions. A.L.W.

A80-10223 # **A mathematical model for a future hydrogen power system (Model matematic pentru un viitor sistem energetic hidrogenic).** I. Ursu (Bucuresti, Universitatea, Bucharest, Rumania) and M. Pavelescu (Institutul de Reactori Nucleari Energetici, Bucharest, Rumania). *Studii si Cercetari de Fizica*, vol. 31, no. 8, 1979, p. 815-841. 13 refs. In Rumanian.

The paper introduces a mathematical model for a global energetic system based on hydrogen as an energy vector. The global system is defined as being formed by two partial systems, namely: an electric power and a hydrogen thermal power system. The best way to utilize nuclear energy for hydrogen production is investigated. It is shown that HTGR's and GCFBR's are the most attractive for this goal and therefore such reactors are considered as part of the second partial system. By application of the mathematical model it was possible - by help of a STEH code - to obtain numerous results which allow various interesting conclusions concerning this future power system. (Author)

A80-10226 **Rapid devolatilization and partial gasification of coal in an entrained dust reactor (Schnellentgasung und Teilvergasung von Steinkohle im Flugstaubreaktor).** K. Hedden, R. Hauk, and L. Huber (Karlsruhe, Universität, Karlsruhe, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 32, Sept. 1979, p. 423-429. 11 refs. In German. Research supported by the Bundesministerium für Forschung und Technologie.

The article surveys the results of laboratory experiments carried out to determine the optimum conditions for a high degree of desulfurization during rapid devolatilization and partial gasification. The yields and the composition of the gaseous and liquid products obtained during devolatilization are determined with regard to the application of the process for the production of chemical raw materials. In the investigation of rapid devolatilization it was found that more volatiles and therefore more sulfur were expelled by the rapid heating of carbon particles than by chamber carbonization. Finally, it is reported that more than 85 vol.-% of the gas obtained during devolatilization were methane, hydrogen, and carbon monoxide, while hydrogen, carbon monoxide, and carbon dioxide were the main constituents of the gas from partial gasification. M.E.P.

A80-10228 **Models of worldwide energy demand and consumption (Modelle für Energiebedarf und -verbrauch in weltweitem Rahmen).** W. Häfele and L. Schrattenholzer (Internationales Institut für angewandte Systemanalyse, Laxenburg, Austria). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 32, Sept. 1979, p. 447-451. In German.

An attempt is made to present two globally consistent scenarios for the development of the energy system in the next 50 years. The scenarios are based on high and low increases in energy demand. They consider a 5 kW and 3 kW per person energy consumption rate, respectively, in the year 2030. Factors considered and discussed include world population, economic development, energy demand, demand coverage, and economic consequences. In conclusion it is noted that other factors considered include an analysis of the forseeable development of the world market for crude oil, a study of global restrictions, and determining the potential of alternate energy carriers and technologies. M.E.P.

A80-10285 **A review of in situ composites for nonstructural applications.** A. S. Yue (California, University, Los Angeles, Calif.). In: Conference on In Situ Composites, 3rd, Boston, Mass., November 29-December 1, 1978, Proceedings.
Lexington, Mass., Ginn Custom Publishing, 1979, p. 171-184. 36 refs. Research supported by the U.S. Department of Energy and U.S. Air Force.

A review of directionally solidified (DS) eutectics for electronic, magnetic, thermomagnetic, and superconducting applications and potential uses for optical waveguides and energy conversion is presented. The anisotropy of resistances utilized in electronic devices, and image transmission properties of optical fiber eutectics are discussed. Applications for solar cell applications are described, noting that a lamellar (or fiberlike) semiconductor eutectic can be used for converting solar radiation into electricity. Finally, it is suggested that it is necessary to select a correct eutectic system for each application, and to obtain as nearly perfect a microstructure as possible for nonstructural applications. A.T.

A80-10306 **Microstructural objectives for high-temperature alloys in advanced energy systems.** C. T. Sims (General Electric Co., Gas Turbine Div., Schenectady, N.Y.). In: MiCon 78: Optimization of processing, properties, and service performance through microstructural control; Proceedings of the Symposium, Houston, Tex., April 3-5, 1978. Philadelphia, Pa., American Society for Testing and Materials, 1979, p. 480-513. 18 refs.

This paper reviews six advanced systems in a broad fashion helpful in orientation of engineering and technical personnel not directly involved in such developments. These are coal utilization systems including coal liquefaction, coal gasification and pressurized fluid beds, nuclear systems including liquid metal fast breeder reactors (LMFBR), and high-temperature gas reactors (HTGR). In concert with these systems, yet cross-functioning, superalloy technologies are discussed for combined-cycle electrical plants and high-temperature heat exchangers. Then potential applications and problems for superalloys in the systems, are identified, drawing from this base examples that might typically be applied, utilizing these to discuss ideal microstructures one may find. (Author)

A80-10321 **The electric trolley bus - Revisited.** J. W. Schumann (Sacramento Regional Transit District, Sacramento, Calif.) and B. J. Hanson (Louis T. Klauder and Associates, Philadelphia, Pa.). *Traffic Quarterly,* vol. 33, Oct. 1979, p. 577-587.

New interest in public transit, as a way to provide relief from the energy crisis and to reduce pollution, has led to a reevaluation of the potential of the electric trolley bus (ETB). This paper reviews current trends in the ETB field and discusses such new ETB system consideration as improved vehicle design, electric power distribution systems, electric power generation/conversion, off-wire systems, and network operations. Attention is also given to such factors as community esthetics and pollution, energy consumption, and research needs. B.J.

A80-10323 **Back to the central city - Myths and realities.** G. Sternlieb (Rutgers University, New Brunswick, N.J.) and J. W. Hughes (Rutgers University, Livingston and New Brunswick, N.J.). *Traffic Quarterly,* vol. 33, Oct. 1979, p. 617-636. 5 refs.

The paper brings together available statistical data for speculation on the future of the central city, with primary emphasis on demographic trends and their policy implications. It is noted that the future demand for central city transportation is a function of its resident population, nonresident workers, and nonresidents attracted to the city for a variety of non-job related purposes. It is concluded that, subject to limitations and financial resource, the central city core transportation issue is largely being blunted not by new means of transit but rather by decline in need. B.J.

A80-10324 **Forecasting automobile fleet fuel efficiency.** F. L. Mannering and K. C. Sinha (Purdue University, Lafayette, Ind.). *Traffic Quarterly,* vol. 33, Oct. 1979, p. 637-648. 10 refs. Research supported by Purdue University and Indiana State Highway Commission.

The paper presents a modeling procedure developed as part of a computer simulation model used to project statewide highway financing and system performance. This automobile fleet fuel efficiency model considers impacts of prevailing economic conditions, governmental policy decisions regarding new vehicle fuel efficiency standards, and auto usage characteristics, all of which are vital to the accurate projection of automobile fleet fuel efficiency. The basic approach is to: (1) determine the number of automobiles in use by model year, (2) estimate automobile fuel efficiencies by model year, and (3) establish relative automobile usage by model year. Projection of automobile fleet fuel efficiency was necessary to estimate future highway fuel consumption, revenues derived from fuel taxes, and other related factors affecting highway transportation system performance. B.J.

A80-10349 # **Hydrogen - The fuel of the future (Vodorod - Toplivo budushchego).** A. N. Podgornyi and I. L. Varshavskii. Kiev, Izdatel'stvo Naukova Dumka, 1978. 136 p. 129 refs. In Russian.

The application of hydrogen as fuel in various areas of the economy is examined. Consideration is given to the physico-chemical properties of hydrogen, chemical, thermal, electrochemical and thermochemical means of obtaining hydrogen, and hydrogen transport and storage in the form of metal hydrides. The use of hydrogen as a fuel in internal combustion, Stirling, rocket, jet and heat engines is discussed, and results of experimental investigations on internal combustion engines based on hydrogen and hydrogen-gasoline-air mixtures are reported. A.L.W.

A80-10474 **Power supply requirements for a tokamak fusion reactor.** J. N. Brooks and R. L. Kustom (Argonne National Laboratory, Argonne, Ill.). *Nuclear Technology,* vol. 46, Nov. 1979, p. 61-81. 10 refs. Research supported by the U.S. Department of Energy.

The power supply requirements for a 7-m major radius commercial tokamak reactor have been examined, using a system approach combining models of the reactor and poloidal coil set, plasma burn cycle and magnetohydrodynamics calculations, and power supply characteristics and cost data. A conventional system using a motor-generator flywheel set and solid-state rectifier/inverter power supplies was studied in addition to systems using a homopolar generator, superconducting energy storage inductor, and dump resistors. The requirements and cost of the power supplies depend on several factors but most critically on the ohmic heating ramp time used for startup. Long ramp times (at least about 8 s) seem to be feasible, from the standpoint of resistive volt-second losses, and would appear to make conventional systems quite competitive with nonconventional ones, which require further research and development. (Author)

A80-10524 **Salinity gradient power - Utilizing vapor pressure differences.** M. Olsson (California, University, La Jolla; Foundation for Ocean Research, San Diego, Calif.), G. L. Wick (Institute for Transcultural Studies, Los Angeles, Calif.), and J. D. Isaacs (California, University, La Jolla; Foundation for Ocean Research, San Diego, Calif.). *Science,* vol. 206, Oct. 26, 1979, p. 452-454. 12 refs. Grant No. NOAA-04-6-158-4410.

By utilizing the vapor pressure difference between high-salinity and low-salinity water, one can obtain power from the gradients of salinity. This scheme eliminates the problems associated with conversion methods in which membranes are used. The method tested in the present investigation gave higher conversion efficiencies than membrane methods. Furthermore, hardware and techniques being developed for ocean thermal energy conversion may be applied to this approach to salinity gradient energy conversion. (Author)

A80-10613 **Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine.** N. V. Lokai and I. I. Mosin. *(Aviatsionnaia Tekhnika,* vol. 22, no. 1, 1979, p. 41-46.) *Soviet Aeronautics,* vol. 22, no. 1, 1979, p. 30-34. 5 refs. Translation.

Some means of achieving maximum degree of regeneration in a heat exchanger with heat pipes are investigated by extending some previous analysis methods for heat exchangers with intermediate heat carrier. Two conditions are found which must be satisfied in order to achieve maximum degree of regeneration: (1) the heat transmitting power of the heat pipes must exceed the heat release intensity from both the gas and air directions; and (2) two dimensionless parameters for the gas and air sides must be equal. P.T.H.

A80-10823 # **Development of an aircraft-derivative gas turbine with high performance and large output.** Y. Shimura (Ishikawajima-Harima Heavy Industries Co., Ltd., Turbine and Compressor Engineering Div., Tokyo, Japan) and K. Takeo (Ishikawajima-Harima Heavy Industries Co., Ltd., Turbine Design Dept., Tokyo, Japan). *IHI Engineering Review,* vol. 12, July 1979, p. 29-32.

The design and performance of the 50,000 horsepower IM5000 industrial gas turbine are examined. Attention is given to the gas generator which is an industrial version of the GE CF-6 turbofan engine. The power turbine is described, noting that it can be used for generating 50/60-Hz power and mechanical drive applications. Areas of the power turbine examined include aerodynamic design, basic construction design concept, and component design such as buckets, vanes, rotor, transition duct, turbine casing, exhaust casing, and exhaust scroll. Finally, it is reported that tests revealed higher performance than predicted, and that NO(x) emissions are reduced with a water injection system. M.E.P.

A80-10842 **Energy conservation through recycling.** D. C. Wilson (Atomic Energy Research Establishment, Waste Research Unit, Harwell, Oxon, England). *International Journal of Energy Research,* vol. 3, Oct.-Dec. 1979, p. 307-323. 53 refs.

Best estimates of the energy savings due to recycling one ton of several materials are suggested by means of a critical review of the literature. Further the use of these estimates is demonstrated by a number of illustrative applications. It is shown that while substantial energy savings may be made by recycling most metals or paper, the savings from reclaiming glass cullet are marginal, although there is potential for energy conservation through the use of returnable as opposed to nonreturnable bottles. It is reported that the recycling of materials saves about 5% of the total energy requirement of the U.K. Finally, the recovery of fuel products and/or materials from solid waste is also shown to be an attractive and efficient energy source. M.E.P.

A80-10843 **Second-law analysis of solar-thermal processes.** J. F. Kreider. *International Journal of Energy Research,* vol. 3, Oct.-Dec. 1979, p. 325-331. 6 refs.

The second law of thermodynamics provides an analytic framework for the assessment of the potential displacement of fossil fuels by solar energy. The most promising areas are those which have entropy levels corresponding to the entropy level of the solar resource as converted to heat in various types of solar collectors. Since the entropy of solar heat can be partitioned by the means of collection - e.g., by the collector concentration ratio - solar can be matched much more precisely to many tasks at temperatures up to 300 C than can fossil fuels which are low entropy sources now widely misused for high entropy tasks. (Author)

A80-10844 **The assessment of actual wind power availability in Ireland.** J. Haslett and E. Kelledy (Trinity College, Dublin, Ireland). *International Journal of Energy Research,* vol. 3, Oct.-Dec. 1979, p. 333-348. 18 refs.

A80-10845 **A new approach to low cost large area selective surfaces for photothermal conversion.** B. K. Gupta, F. K. Tiwari, O. P. Agnihotri, and S. S. Mathur (Indian Institute of Technology, New Delhi, India). *International Journal of Energy Research,* vol. 3, Oct.-Dec. 1979, p. 371-377. 8 refs.

Selective black paint coatings have been prepared by coating reflective metal particles with a layer of selective black material. The coated particles were mixed in a binder and applied easily as a thin layer onto aluminum or galvanized iron (G.I.) sheet. Three selective black materials, namely CuO, CuS and PbS + CuS have been deposited on zinc metal powder. The solar absorptance of the coatings is about 0.95 and the emittance is about 0.4. The thickness of the coatings was about 20 to 30 microns. The emissivity decreases as the thickness increases, while the solar absorptivity does not change appreciably. The improvement in the collector efficiency, which is the ratio of the temperature increase above the temperature of the standard panel to the temperature increase of the standard panel above the ambient temperature, is estimated to be around 11 per cent. The process is potentially a low cost one for large scale application in solar photothermal conversion. (Author)

A80-10846 **Performance of an inexpensive constant flow solar collector/storage system in ground.** M. S. Sodha, A. Srivastava, G. N. Tiwari, S. C. Kaushik (Indian Institute of Technology, New Delhi, India), and M. A. S. Malik (Kuwait Institute of Scientific Research, Safat, Kuwait). *International Journal of Energy Research,* vol. 3, Oct.-Dec. 1979, p. 379-387.

This paper presents an analysis of the performance of an inexpensive constant flow solar collector/storage system, which has been validated by experiments. The system consists of a network of pipes buried in the ground, the top surface of the ground being blackened by black board paint spray and suitably glazed. The heat can be extracted by flow of fluid in the pipes at a constant flow rate. It is seen that for a 7 cm depth of the plane of heat retrieval and 8 l/min flow rate of water, the collection efficiency of the system is 20.0 per cent. The efficiency increases with flow rate and decreases with the depth of the plane of heat retrieval. (Author)

A80-10847 **Using a fin with a parabolic concentrator.** R. N. Singh, S. S. Mathur, and T. C. Kandpal (Indian Institute of Technology, New Delhi, India). *International Journal of Energy Research*, vol. 3, Oct.-Dec. 1979, p. 393-395.

The consequences of using a fin collector in focusing solar collectors is examined and attention is given to the variation of concentration ratios for a cylindrical parabolic concentration employing a fin receiver. The effect of rim angle variation on the receiver size in both the flat plate and fin receiver cases are examined. It is determined that the concentration ratio attains a maximum value at a rim angle of 90 deg, while the flat plate receiver obtains a maximum at half the inclination. C.F.W.

A80-10848 **The photo-electrochemical production of C-C bonds from carbon dioxide.** V. Guruswamy and J. O. Bockris (Texas A & M University, College Station, Tex.). *International Journal of Energy Research*, vol. 3, Oct.-Dec. 1979, p. 397-399. Research supported by the South Australian Energy Committee.

Using the experimental setup and procedure described in the present paper, it proved possible to use solar light to reduce CO2 to C-C bonds, with electricity as a by-product. Competitive reduction of water was avoided by passing CO2 into a cathode chamber containing a saturated solution of an aprotic solvent (DMF). It is seen that electrochemical photosynthesis should be justified if an efficiency of photoelectrochemical decomposition of somewhat more than 5 per cent would be attainable with solar light. V.P.

A80-10879 **A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes.** T. I. Quickenden and G. K. Yim (Western Australia, University, Nedlands, Australia). *Journal of Physical Chemistry*, vol. 83, Oct. 18, 1979, p. 2796-2804. 30 refs.

A comprehensive model for the processes associated with the generation of photovoltages at metal electrodes in contact with fluorescent dye solutions is developed, and relationships between open-circuit photovoltage and irradiance are derived. The model takes into account intermolecular oxidation-reduction reactions in the bulk of the solution and at the electrode, electrodic charge-transfer reactions, conversion of bulk species to surface species with or without the possibility of adsorption, direct photochemical pathways and photochemical side reactions. Steady-state analyses of the model, which are presented in full in an appendix separate from the present paper, lead to complicated relationships between open-circuit photovoltage, irradiance, the dark concentrations of various species and the various rate constants. The relationships are found to simplify to logarithmic relationships for cases of low photolytic concentration perturbation and open-circuit voltage, and linear relationships in cases of low irradiance. A.L.W.

A80-10944 **Lignite fuel and power-plant availability.** T. G. Woo (Stone and Webster Engineering Corp., Boston, Mass.). *IEEE Transactions on Reliability*, vol. R-28, Oct. 1979, p. 279-282. 13 refs.

The characteristics and handling of lignite fuel in lignite-fueled electric-generating plants are studied. Plant reliability problems associated with burning of Northern Great Plains (NGP) lignite are discussed along with information on present NGP lignite-fueled plants. Two plant arrangements are considered: a single boiler and turbine and a single boiler and two half-size boilers. Order-of-magnitude costs are compared to determine cost differentials between a 500 MW single-boiler plant and a 800 MW double-boiler plant using lignite and subbituminous coal. It is noted that lignite is inexpensive, abundant, and relatively easy to mine. V.T.

A80-11019 **Unleaded gasoline shortages and fuel switching - The potential impact in Southern California.** T. F. Heinsheimer, J. S. Nevitt, and M. A. Nazemi (South Coast Air Quality Management District, El Monte, Calif.). *Air Pollution Control Association, Journal*, vol. 29, Oct. 1979, p. 1064-1066. 5 refs.

The impact on ozone air quality of the use of leaded fuels in automobiles equipped with catalytic converters, due to a shortage of unleaded fuels, is assessed for Southern California. Results of statistical analyses of the percentage of catalyst-equipped cars forced to undergo catalyst deactivation as a result of three or more tankfuls of leaded gasoline in the event of unleaded gasoline shortfalls of various magnitudes are presented, as well as the maximum ozone concentrations expected as the result of the tenfold increase of reactive hydrocarbon emission from deactivated converters and the numbers of ozone episode days as a result. It is pointed out that even a 6% shortfall of unleaded gasoline supplies lasting for 44 weeks will deactivate 50% of automobile catalytic converters, leading to an increase in the maximum yearly ozone concentration in Southern California of from 0.40 to 0.50 ppm and a dramatic increase in the numbers of first, second and third stage health advisory episode days in the Los Angeles Basin. A.L.W.

A80-11140 **A policy-sensitive model of technology assessment.** R. S. Ahmad and A. N. Christakis (Battelle Columbus Laboratories, Washington, D.C.). *IEEE Transactions on Systems, Man, and Cybernetics*, vol. SMC-9, Sept. 1979, p. 450-458. 17 refs. Research supported by the Battelle Memorial Institute; U.S. Environmental Protection Agency Contract No. 68-02-2622.

Two approaches to technology assessment are examined and their implications for the actual conduct of technology assessment are briefly discussed. The epistemological differences between the approaches are studied and it is determined that the fundamental differences between the two lead to divergent conceptions of technology. The first approach is driven by the question 'how can society be organized to take full advantage of technology and to mitigate its adverse impacts', while the second one concerns itself with the question 'what does it mean to choose and deploy a certain technology'. The broader relationships between technology assessment, social change, and public policy making are reexamined and it is determined that the assessment of technologies entails socio-political choices since the two are both reciprocally linked. Attention is given to the linkage between technical-analytic and policy-analytic components of technology assessment and a policy-sensitive model is proposed. C.F.W.

A80-11331 # **Minimum ignition energies and quenching distances of methanol blends.** T. Yano and K. Ito (Hokkaido University, Sapporo, Japan). *Hokkaido University, Faculty of Engineering, Bulletin*, June 1979, p. 31-37.

A study of minimum ignition energies and quenching distances for methanol, iso-octane, and iso-octane/methanol blends in the 100 to 150C range and at 1 atm pressure is presented. Minimum ignition energies were measured with a conventional automobile ignition system and expressed by the primary current of the ignition coil, and the measurement methods of the quenching distances used the teflon-flanged electrode technique. The experimental results indicated that the minimal value of the minimum ignition energies, and the minimum quenching distances of methanol and iso-octane air mixtures were attained with a slightly rich mixture; the iso-octane/methanol blend yields larger flammability ranges than those of fuel in air. The quenching distances of iso-octane/methanol blend depend on that of iso-octane and do not become larger than that of either fuel. A.T.

A80-11333 **The effects of axial conduction on collector heat removal factor.** W. F. Phillips (Utah State University of Agriculture and Applied Science, Logan, Utah). *Solar Energy*, vol. 23, no. 3, 1979, p. 187-191. 9 refs.

A closed form solution is presented which predicts the performance of a solar collector and includes the effects of axial conduction in the receiver. The results are presented in terms of the well known collector heat removal factor which is shown to be a function of three dimensionless design parameters. The error, which is introduced by neglecting axial conduction, was found to be less than 30 per cent, for all collectors and less than 12 per cent for most collectors. (Author)

A80-11334 **Theory of the direct coupling between D.C. motors and photovoltaic solar arrays.** J. A. Roger (Lyon I, Université, Lyons, France). *Solar Energy,* vol. 23, no. 3, 1979, p. 193-198. 5 refs.

Direct coupling between photovoltaic solar panels and various d.c. motors (series shunt and separate excitation) is theoretically studied as a function of the load. Operating curves are given in some specific cases (centrifugal pumps and fans). Attention is given to the problem of matching the mechanical system with the panels, and to the problem of starting under different light flux densities. (Author)

A80-11335 **The optimal design of solar cell grid lines.** R. S. Scharlack (Thermo Electron Corp., Waltham, Mass.). *Solar Energy,* vol. 23, no. 3, 1979, p. 199-201.

The shape of grid lines or fingers, used to reduce conductive losses in photovoltaic cells, is shown to be optimized when the current flux in the line remains constant. This result is derived for cells of arbitrary geometry assuming the fraction of the cell area shaded is small. The shapes of grid lines for three special cases are provided. Optimal shapes for grid lines are also derived for cases when the area of the lines is a significant fraction of the cell area. (Author)

A80-11336 **Concentration ratio and efficiency in thermophotovoltaics.** R. L. Bell (Varian Associates, Inc., Palo Alto, Calif.). *Solar Energy,* vol. 23, no. 3, 1979, p. 203-210.

In thermophotovoltaics, concentrated sunlight is used to heat a 'black body' cavity which re-emits lower-temperature radiation. Solar cells immersed in the cavity can absorb the higher energy photons present and convert these to electric power with high efficiency. A generalization of this scheme is considered as a model for calculating the conversion efficiency expected for a real thermophotovoltaic system. This is shown to depend strongly on the concentration ratio used, as well as other factors. It is shown that conversion efficiencies above 30 per cent will require optics concentration ratios of the order of 10,000, for attainable values of other parameters. Cell conversion efficiencies exceed 60 per cent; however system performance is strongly degraded by parasitic losses and by re-radiation from the entrance aperture of the system. (Author)

A80-11337 **A theoretical study of laminar free convection in 1-D solar induced flows.** O. A. Barra and E. P. Carratelli (Calabria, Università, Cosenza, Italy). *Solar Energy,* vol. 23, no. 3, 1979, p. 211-215. 11 refs.

The effectiveness of natural circulation and ventilation systems based on the 'solar chimneys' principle has been tested for a number of years at numerous sites, but thermal and fluid mechanical aspects of their operation need to be fully understood before conclusive results can be supplied; a long term research work has therefore been undertaken by the authors, including both experimentation in two test sites in Italy and numerical simulation. In the present paper the heat transfer equation for one dimensional laminar flow is numerically solved with the appropriate radiative boundary conditions. Temperature fields calculated in this way are then employed to evaluate air density variations and consequently the upward driving force available to overcome head losses in the air circulation. Optical plate spacing in steady state conditions appears to be strongly dependent on head losses occurring outside the collecting section and on winter or summer use of the system; it shows a softer dependence on incident solar energy fluxes. (Author)

A80-11338 **Design of a small thermochemical receiver for solar thermal power.** T. A. Chubb, J. J. Nemecek, and D. E. Simmons (U.S. Navy, Naval Research Laboratory, Washington, D.C.). *Solar Energy,* vol. 23, no. 3, 1979, p. 217-221. 5 refs.

It is noted that the capture of solar thermal energy by means of chemical conversion provides an attractive means for collection of solar energy. A converter has been designed for operation at the focus of a 7 m diameter paraboloid. The converter is constructed from a multi-passage ceramic extrusion, which is wound into a spiral form prior to firing. The innermost wrap is designed to operate with a cavity-facing surface heated to 1000 C. In the passages adjacent to this surface SO3 is catalytically dissociated into SO2 and O2. The eight outer wraps are used for heat exchange between an inflowing SO3 rich gas stream and an outflowing SO2 rich gas stream. (Author)

A80-11339 **Derivation of method for predicting long term average energy delivery of solar collectors.** M. Collares-Pereira (Chicago, University, Chicago, Ill.) and A. Rabl. *Solar Energy,* vol. 23, no. 3, 1979, p. 223-233. 13 refs. Research supported by the Instituto Nacional de Investigaçao Cientifica and Centro de Fisica de Matéria Condensada; Contract No. EY-77-S-2446. DOE Task 3403,01.

Based on the utilizability concept of Hottle, Whillier, Liu and Jordan, an analytical model has been developed to predict the long term average energy delivery of almost any solar collector. The presentation has been split into two separate papers: a users guide (without explanation of the origin of the formulas) and the present paper (which derives these formulas and documents the validation). The model is applicable whenever the average operating temperature of the collector (receiver surface, fluid inlet, fluid outlet or mean fluid) is known. If the operating temperature is not known explicitly the model will give adequate results when combined with the f-chart of Klein and Beckman. By contrast to the alternative of hour-by-hour simulation, prediction methods such as the present model and the f-chart offer the advantages of automatically averaging over year-to-year weather fluctuations and of being sufficiently simple to permit hand calculation of long term performance. In a comparison with hourly summations of insolation data, the present model has been found to have an error of less than 3 per cent for the radiation available to a solar collector and an error of about 5 per cent for the heat delivery of solar thermal collectors. (Author)

A80-11340 **Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors.** M. Collares-Pereira (Chicago, University, Chicago, Ill.) and A. Rabl. *Solar Energy,* vol. 23, no. 3, 1979, p. 235-253. 28 refs. Research supported by the U.S. Department of Energy, Instituto Nacional de Investigacão Científica, and Centro de Fisica de Matéria Condensada.

The Liu and Jordan method of calculating long term performance of flat plate collectors (1963) is generalized to concentrating and nonconcentrating collectors. The collector is characterized by optical efficiency, heat loss, and extraction efficiency, and the tracking mode, and an operating temperature is assumed. A conversion factor is used which multiplies the total horizontal insolation to yield the long term useful energy delivered by the collector, and this factor depends on many variables including temperature, concentration, latitude, and clearness index. Formulas for flat plate, compound parabolic concentrator, and concentrators with east-west tracking axis, polar tracking axis, and 2-axis tracking showed that concentrating collectors can outperform the flat plate even for low temperature, cloudy climate applications. This method has been validated against hourly weather data showing better than 3 percent accuracy for the long term average radiation. A.T.

A80-11341 **Solar electric generating system resource requirements.** R. C. Enger (U.S. Air Force Academy, Colorado Springs, Colo.) and H. Weichel (USAF, Institute of Technology, Wright-Patterson AFB, Ohio). *Solar Energy,* vol. 23, no. 3, 1979, p. 255-261. 16 refs.

The paper presents an analysis of the potential consumption of materials, land, water, manpower, energy, and money by four proposed solar electric generating systems: a terrestrial solar thermal, a terrestrial photovoltaic, an orbiting solar reflector, and a satellite solar power system. It is found that the terrestrial solar thermal system would require less manpower, less energy of production, and

less money per megawatt of electrical generating capacity, than would the extra-terrestrial systems. Finally, it is noted that an extra terrestrial system would place the nation in a vulnerable position in times of war.
M.E.P.

A80-11342 **Some solar energy programmes in the United Nations system.** B. Châtel (United Nations, Office for Science and Technology, New York, N.Y.). *(International Colloquium on Solar Energy for Development, Tokyo, Japan, Feb. 5-10, 1979.) Solar Energy,* vol. 23, no. 3, 1979, p. 263-269. 16 refs.

The recent activities in the United Nations organization on solar and wind energy, particularly for the developing countries, are outlined. Programs of the Economic and Social Council, Advisory Committee on Science and Technology, and the Committee on Natural Resources which worked on surveys and classification of non-conventional energy sources are described. The Economic Commission on Europe is engaged in environmental aspects of energy production, which also covers solar energy, and the Economic Commission for Africa participated in a mission on application of solar energy in the Sahelian region. The financial institutions include the U.N. Development Program which sponsored solar projects in Algeria and Cyprus, the World Bank, and the U.N. Industrial Development Organization. Finally, specialized agencies like UNESCO, which organizes international conferences on solar energy and research centers in Africa and Asia, World Health Organization, and World Meteorological Organization are discussed.
A.T.

A80-11343 **A cheap method of improving the performance of roof type solar stills.** V. A. Akinsete and C. U. Duru (Lagos, University, Lagos, Nigeria). *Solar Energy,* vol. 23, no. 3, 1979, p. 271, 272.

The paper presents the results of a test comparing the performance of two types of roof type solar stills. It is reported that the use of charcoal to line the basin of a typical still results in improved productivity. The charcoal is used to reduce the thermal inertia of the still, which is possible for the following reasons: (1) charcoal exhibits capillary action and is hence capable of maintaining a wetted surface whenever it is partially immersed in a liquid; (2) charcoal absorbs incident radiation, and (3) the rough surface scatters rather than reflects incident radiation which reduces reflected losses. In conclusion it is noted that the production rate is increased the most in the morning and on cloudy days when values of direct radiation are low.
M.E.P.

A80-11347 **Nonlinear modification of resonance-cone trajectories.** J. R. Wilson and K. L. Wong (Princeton University, Princeton, N.J.). *Physical Review Letters,* vol. 43, Nov. 5, 1979, p. 1392-1394. 12 refs. Contract No. EY-76-C-02-3073.

Experimental measurements of the modification of the trajectory of a focused resonance cone as a result of the ponderomotive force in a cylindrical plasma are reported. A resonance cone was launched from one ring of a 36-ring antenna located at one end of the plasma in 0.5- to 10 microsec rf bursts and axially and radially driven double-tip probes were used to detect the electric field. The locations of the electric field maximums for linear and nonlinear powers and of the focus indicate that trajectory is bent toward the cylinder axis and the focus is moved closer to the exciter, in agreement with theory. The electron-plasma-wave resonance-cone-propagation technique also indicates the decrease in plasma density to be in accordance with predictions and electron heating not to be the source of the trajectory shift.
A.L.W.

A80-11349 **Tearing modes in a plasma with magnetic braiding.** P. K. Kaw, E. J. Valeo, and P. H. Rutherford (Princeton University, Princeton, N.J.). *Physical Review Letters,* vol. 43, Nov. 5, 1979, p. 1398-1401. 14 refs. Contracts No. F44620-75-C-0037; No. EY-76-C-02-3073.

Linear and nonlinear properties of macroscopic tearing modes driven by anomalous electron viscosity effects associated with the braiding of magnetic field lines in a tokamak plasma are examined. It is shown that in the linear case, tearing modes with m=1 have a growth rate which is proportional to the fifth root of the ratio between the hydrodynamic and viscous decay times, while in the nonlinear case for m greater than or equal to 2 the width of the instability scales as the cube root of the time. Implications for the growth times of viscosity-driven tearing modes relative to resistive modes and the development of disruptive instabilities in tokamak plasmas are considered.
A.L.W.

A80-11368 **The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms.** J. Shewchun, D. Burk, R. Singh, J. Dubow (McMaster University, Hamilton, Ontario, Canada; Brown University, Providence, R.I.; Colorado State University, Fort Collins, Colo.), and M. Spitzer. *Journal of Applied Physics,* vol. 50, Oct. 1979, p. 6524-6533. 12 refs. Contract No. E(04-3)-1203.

The theory of semiconductor-insulator-semiconductor (SIS) solar cells and the experimental characteristics of indium tin oxide (ITO)-SiOx-silicon cells have been reported in previous publications. There appear to be no reports in the literature on SIS devices of any type with conversion efficiencies greater than about 12%. Theoretically, 20% efficiency should be possible using 0.2 ohm cm p-type silicon with a 12-A interfacial layer. This paper seeks to identify the various possible loss mechanisms (and the range of efficiency loss associated with each of them) that seem to be impeding the achievement of the theoretical limit. To determine the losses, the dark I-V characteristics as a function of temperature and performance parameters as a function of the intensity of illumination (up to 6 suns) have been examined. The intensity measurements reveal in a very distinct way the presence of an interfacial layer and serve to confirm the applicability of the theoretical model.
(Author)

A80-11369 **Coal conversion technologies - Some health and environmental effects.** S. C. Morris, P. D. Moskowitz, W. A. Sevian, L. D. Hamilton (Brookhaven National Laboratory, Upton, N.Y.), and S. Silberstein (National Bureau of Standards, Washington, D.C.). *Science,* vol. 206, Nov. 9, 1979, p. 654-662. 34 refs. Contract No. EY-76-C-02-0016.

Selected health and environmental effects of four coal conversion and four existing technologies are compared. For each technology, the emission estimates for complete fuel cycles, including all steps in fuel use from extraction to the end use of space and water heating by electricity or direct combustion, are discussed. Quantitative occupational health and safety estimates are presented for the extraction, transportation, distribution, processing, and conversion activities associated with each technology. Qualitative estimates of health damage due to polycyclic organic matter and reduced sulfur are examined. The increasing order of some negative environmental effects and health damages was determined to be: (1) direct combustion of natural gas and oil, (2) direct combustion of synthetic gas and oil, (3) central-station electric power produced from synthetic gas, coal, and combustion of synthetic liquid fuels. Attention is given to the compliance and conflict of these technologies with amendments such as the Clean Air Act.
C.F.W.

A80-11370 **Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975.** J. G. Asbury, C. Maslowski, and R. O. Mueller (Argonne National Laboratory, Argonne, Ill.). *Science,* vol. 206, Nov. 9, 1979, p. 679-681. 8 refs. Research supported by the U.S. Department of Energy.

Solar availability for space heating on coldest-weather days has been determined from an analysis of SOLMET data tapes. The tapes contain hourly readings of insolation and ambient temperature over the period from 1953 through 1975. Scatter diagrams of insolation versus heating degree-days, compiled on a daily basis, indicate a wide variation in the insolation level, even during coldest-weather periods. For all but one of the eight sites studied, the peak-day backup energy requirement of the solar system was in excess of 85 percent of the peak-day energy requirement of the conventional (nonsolar) heating system.
(Author)

A80-11394 # **Is there a chance for OTEC.** G. L. Dugger (Johns Hopkins University, Laurel, Md.). *Astronautics and Aeronautics,* vol. 17, Nov. 1979, p. 36-42. 20 refs.

The paper discusses the steady growth of OTEC technology, the design plans for pilot energy plants, and the industrial readiness for this alternate energy source. Several new components are examined that will enhance and speed up OTEC implementation, including a 30 Mw set of titanium-tubed, shell-and-tube heat exchangers, a low-cost, folded-aluminum tube, shell-less heat exchanger, as well as designs for cold-water pipe 40Mw pilot plants. It is concluded that OTEC offers great potential for significant contributions to national and worldwide energy needs. C.F.W.

A80-11400 **Soft and hard energy paths - The roads not taken.** M. Stiefel. *Technology Review,* vol. 82, Oct. 1979, p. 56-66. 27 refs.

The paper considers political, technical, and philosophical aspects of the energy problem. The 'hard' energy path which relies on the continued expansion of centralized technologies to increase energy supply, will use oil, coal, and nuclear fission. The 'soft' path technologies use renewable energy flows, such as from the sun or wind, and require solar collectors, hydroelectric plants and wind for electric power. Cost estimates of energy technologies including nuclear power, coal and solar are discussed, and energy demand forecasts for U.S. are summarized. Comparison of hard and soft options indicates that the hard-path will collapse due to massive energy waste, but a single energy path is not likely. A.T.

A80-11448 **Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal (Analyse der hochsiedenden Emissionsanteile von Schwelungen und Bränden bei der Gewinnung von Braunkohle).** V. Kusy and V. Hruby. *Staub - Reinhaltung der Luft,* vol. 39, Oct. 1979, p. 363-367. 24 refs. In German.

The gas chromatography as a basic method for tarry emission fractions from the low-temperature oxidation of brown coal has been used. Besides of paraffines C9 till C27, phenol, cresols and xylenols also heterocyclic oxigenous compounds have been determined by the combination of the preparation and analytic gas chromatography. Very little multinucleous aromatic hydrocarbons were present. The quantitative determination of the components has been made from the differences of the retention indexes on the polar and non-polar stationary phase. (Author)

A80-11544 # **Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters.** K. Gac, A. Gacek, J. Tyl (Institute of Plasma Physics and Laser Microfusion, Warsaw, Poland), and S. Kaliski. *Journal of Technical Physics,* vol. 20, no. 2, 1979, p. 131-149. 8 refs.

The paper analyzes the effects of the kinetics of fusion products on the hydrodynamic parameters of the plasma. Different transport models for the fusion products are considered, and it is shown that neutron kinetics has a significant effect on fusion energy even for small-scale systems. Attention is also given to the role of such factors as dynamic friction forces, the method of fusion energy transmission, and the amount of neutron energy remaining in the plasma. B.J.

A80-11545 # **Optimization of neutron yield in conical system at explosion-induced compression.** W. Gluchowski, R. Swierczynski (Institute of Plasma Physics and Laser Microfusion, Warsaw, Poland), and S. Kaliski. *Journal of Technical Physics,* vol. 20, no. 2, 1979, p. 151-162. 9 refs.

The paper presents a numerical optimization analysis of neutron yield for a conical fusion system involving explosive plasma compression. The initial pressure of deuterium gas and the thickness of the imploded polyethylene shell were the parameters subject to optimization. An optimal yield of 7 x 10 to the 7th neutrons was obtained for deuterium, while a yield of 5 x 10 to the 9th neutrons was obtained for D-T. B.J.

A80-11546 # **Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves.** K. Gac, K. Jach, W. Stepniewski (Institute of Plasma Physics and Laser Microfusion, Warsaw, Poland), and S. Kaliski. *Journal of Technical Physics,* vol. 20, no. 2, 1979, p. 163-171. 7 refs.

The paper presents a numerical analysis of the complete system of equations of hydrodynamics and ionization kinetics describing the propagation of shock waves in a deuterium-argon mixture. It is shown that maximum temperatures are obtained in this shock compression process (in the case of constant boundary velocity and plane symmetry) for argon additions of approximately 4%. B.J.

A80-11612 **Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas.** A. V. Eletskii and V. D. Kulagin (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). *(Fizika Plazmy,* vol. 5, Jan.-Feb. 1979, p. 98-105.) *Soviet Journal of Plasma Physics,* vol. 5, Jan.-Feb. 1979, p. 55-59. 9 refs. Translation.

In the present paper, the conversion of the energy imparted by a beam to a gas is quantitatively analyzed, and the parameters of the quasi-stationary plasma generated in this process are calculated. The contribution of elastic and inelastic electron-atom collisions and free-electron production processes to the electron energy balance is calculated. V.P.

A80-11642 # **Performance of disk generators for open-cycle MHD power generation.** T. Nakamura and M. K. Jenkins (Stanford University, Stanford, Calif.). *Journal of Energy,* vol. 3, July-Aug. 1979, p. 217-226. 28 refs. Contract No. EX-76-C-2341.

The performance characteristics of disk MHD generators are analyzed for the combustion products of a western coal at typical baseload conditions. Three disk generator configurations - radial outflow, radial inflow, and radial inflow-outflow - are considered for both impulse and reaction modes of operation. It is shown that for enthalpy extraction, generator isentropic efficiency, and electric fields to be sustained along the generator channel and the reaction mode radial inflow configuration is preferable for the baseload disk generator. The radial inflow-outflow configuration, which is a combination of the inflow and outflow geometries, could attain higher performance than the radial inflow configuration with substantially reduced generator size. Comparisons of disk generators with linear generators show that the performance of the disk generator is comparable to that of the diagonal generator, while the magnet cost for the disk generator is expected to be less than for linear generators. In view of these results, together with the advantages associated with simple channel construction, it is concluded that the disk generator is a potentially effective alternative to linear generators for baseload power generations. (Author)

A80-11643 # **Experimental demonstration of the diffuser-augmented wind turbine concept.** B. L. Gilbert and K. M. Foreman (Grumman Aerospace Corp., Fluid Dynamics Laboratory, Bethpage, N.Y.). *Journal of Energy,* vol. 3, July-Aug. 1979, p. 235-240. 5 refs. Contract No. EY-76-C-2-2616-A001.

The surface area requirements of an efficient diffuser has been reduced by innovative use of the external wind to produce a cost-effective wind energy conversion system (WECS). Three sets of tests were conducted on very compact diffusers: 1) on small-scale models using screens to simulate a real turbine; 2) on ten times larger scale models with screens; and 3) on a real turbine. The first-generation nonoptimized diffuser-augmented wind turbine (DAWT) configuration is a conical, 60 deg included angle diffuser with an area ratio of 2.78 controlled by two tangential injection slots for boundary-layer control. This baseline model provided over three times the power of a conventional WECS with the same turbine efficiency, diameter, and free wind. An optimized configuration should provide augmentations greater than four. (Author)

A80-11644 # **Electricity generation from jet-stream winds.** C. A. J. Fletcher and B. W. Roberts (Sydney, University, Sydney, Australia). *Journal of Energy,* vol. 3, July-Aug. 1979, p. 241-249. 12 refs. Research supported by the National Energy, Research, Development, and Demonstration Council of Australia.

The feasibility of generating electricity from jet-stream winds has been investigated. Analysis of published meteorological data indicates that annual average power densities approaching 20 kW/sq m are available in the jet-stream altitudes over the complete west-east extent of Australia at a latitude of about 30 deg S. Computer-based optimization studies indicate that a 100-MW power station based on tethered aerodynamic generating platforms located at a jet-stream altitude would generate electricity at capital and operating costs that are competitive with other methods of electricity generation. The design of the tethered aerodynamic generating platform requires a high lift-to-weight ratio platform housing high power-to-weight ratio diffuser-augmented wind turbines and tethered by a high strength-to-weight ratio cable. Key design parameters include the turbine power coefficient and power-drag coefficient, the rated speed, and the stall speed. The required turbine area is determined primarily by the power coefficient and the rated speed. The cable weight depends directly on the drag associated with the maximum (rated) power generation which follows from the choice of rated speed. The wing area of the aerodynamic platform is fixed usually by the stall speed. (Author)

A80-11645 # **The pedal wind turbine.** T. Vinayagalingam (West Indies, University, St. Augustine, Trinidad and Tobago). *Journal of Energy*, vol. 3, July-Aug. 1979, p. 254-256.

A vertical-axis, resistance-type turbine has been developed for wind energy utilization in developing nations. The device employs cycling of the rectangular turbine sail at different orientations to the wind to ensure smooth operation, and resembles a bicycle pedal. Theoretical analysis of the quasi-steady performance of the turbine indicates that a two-sail version of the pedal turbine will exhibit more uniform torque characteristics than the two-bucket Savonius rotor, thus reducing the stalling problem, and will have a peak power coefficient of 0.13. Higher efficiencies are anticipated with a slack sail which assumes a bucket shape under wind pressure, and wind-tunnel tests of a scale model are in progress. A.L.W.

A80-11671 # **Improving the reliability of capacitance batteries in power grids with higher-harmonic sources (Povyshenie nadezhnosti kondensatsionnykh batarei v setiakh s istochnikami vysshikh garmonik).** A. N. Bokhan (Belorusskii Politekhnicheskii Institut, Minsk, Belorussian SSR). *Energetika*, vol. 22, Aug. 1979, p. 87-89. 5 refs. In Russian.

A80-11709 # **Interactive analysis methods for resource mapping.** A. K. Turner (Environment Consultants, Inc., Lakewood, Colo.). In: New technology for mapping; Proceedings of the International Symposium, Ottawa, Canada, October 2-6, 1978. Ottawa, Canada, Canadian Institute of Surveying, 1979, p. 735-754. 6 refs.

An interactive composite mapping system called GMAPS (General Map Analysis and Planning System), has been used to evaluate energy development plans, and make resource and environmental assessments. GMAPS is superior to the traditional transparent overlay methods because it is much cheaper, faster and more quantitative. Using GMAPS, variables and interactions can be easily modified to rapidly investigate an unlimited range of development alternatives. An associated mapping system GCARS, (Generalized Computer Aided Route Selection), can generate a set of alternative corridors between specified termini by applying linear programming methods to GMAPS models. The corridors are ranked for suitability according to environmental and socio-economic criteria. (Author)

A80-11816 **Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures.** P. Girard, M. Huneau, C. Rabasse, and J. C. Leyer (Ecole Nationale Supérieure de Mécanique et d'Aérotechnique, Poitiers, France). In: Symposium /International/ on Combustion, 17th, Leeds, England, August 20-25, 1978, Proceedings. Pittsburgh, Pa., Combustion Institute, 1979, p. 1247-1255. 20 refs. Research supported by the Commissariat à l'Energie Atomique, Electricité de France, and Institut de Recherche sur les Transports.

To observe nonsteady flame propagation across gaseous mixtures of nonuniform composition, a technique based on an improvement of the soap bubble method is proposed. Two applications of the method are presented. The first refers to constant volume combustion and is designed to model flame propagation in the cylinder of a stratified charge internal combustion engine where a hemispherical rich charge surrounds the ignition point. Effects of stratification on the final pressure and combustion time are reported for hydrogen and propane-air mixtures. The second application concerns flame propagation in free space, through layered hemispherical charges. Results which relate mainly to the correlation between the generated pressure field and the flame front velocity variations induced by concentration steps are used to describe some of the effects of nonuniform composition on the blast effects of actual vapor cloud explosions. (Author)

A80-11825 # **Solar panels exposed to cosmic rays (Solnechnye batarei v usloviiakh vozdeistviia kosmicheskoi radiatsii).** L. B. Kreinin and G. M. Grigor'eva. *Itogi Nauki i Tekhniki, Seriia Issledovanie Kosmicheskogo Prostranstva*, vol. 13, 1979, p. 3, 5-128. 232 ref. In Russian.

Data on radiation damage of solar cells are reviewed, and the mechanisms of damage by electrons and protons are discussed. The topics covered include the influence of the orbital parameters on the rate of solar panel degradation; methods of shielding spacecraft panels, and methods of improving the resistance of solar panels to cosmic rays. V.P.

A80-11826 **Annual review of energy. Volume 4.** Edited by J. M. Hollander (California, University, Berkeley, Calif.), M. K. Simmons (Solar Energy Research Institute, Golden, Colo.), and D. O. Wood (MIT, Cambridge, Mass.). Palo Alto, Calif., Annual Reviews, Inc., 1979. 567 p. $17.

An overview of the CONAES study is presented a long with reviews of several major energy supply resources and technologies, including the global uranium resource, the North Sea oil field, U.S. coal production, photochemical conversion of solar energy, and the interfacing of solar wind systems with electric grids. Topics related to energy economics and econometrics include three assessments of energy supply-demand models and projections, and a discussion of issues in the design of utility rate structures. Energy end-use is represented by a review of possible impacts of telecommunications on energy consumption. International policy-related reviews cover energy situation of Canada and the question of international assurance of nuclear fuel supply. B.J.

A80-11827 **United States energy alternatives to 2010 and beyond - The CONAES study.** H. Brooks (Harvard University, Cambridge, Mass.) and J. M. Hollander (California, University, Berkeley, Calif.). In: Annual review of energy. Volume 4. Palo Alto, Calif., Annual Reviews, Inc., 1979, p. 1-70. 56 refs.

The CONAES (Committee on Nuclear and Alternative Energy Systems) study examined contextual relationships among the many factors likely to be involved in determining United States energy policy, and, in particular, emphasized the importance of energy demand considerations in planning future U.S. energy supplies. It is concluded that there is a great deal of scope for reducing energy growth without appreciably sacrificing GNP growth or changing nonenergy consumption patterns. Although there is some uncertainty in this conclusion, it is likely that E/GNP one half of today's and conceivably one third of today's could be reached before significant impact on GNP growth is felt. It is recommended that reduction of energy demand growth be accorded the highest priority in United States energy policy. B.J.

A80-11828 **The compatibility of wind and solar technology with conventional energy systems.** E. Kahn (California, University, Berkeley, Calif.). In: Annual review of energy. Volume 4. Palo Alto, Calif., Annual Reviews, Inc., 1979, p.

313-352. 102 refs. Research supported by the U.S. Department of Energy.

A wide range of issues in the engineering and economics of wind and solar energy is reviewed. It is concluded that the various effects of introducing these devices into conventional energy systems are only partially understood; the present analytical tools are rather limited in their ability to grasp the total problem. In the short run, engineering issues involving resource assessment and appropriate scale seem particularly important. The more complex problems of structural optimality in energy systems emerge only in a longer range perspective. Economic analysis should probably concentrate first on financial risk. Regulatory structure is an on-going area where policy research is fruitful. B.J.

A80-11829 **Photochemical conversion and storage of solar energy.** J. R. Bolton (Western Ontario, University, London, Canada) and D. O. Hall (King's College, London, England). In: Annual review of energy. Volume 4. Palo Alto, Calif., Annual Reviews, Inc., 1979, p. 353-401. 190 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

Following a review of some of the general principles and limitations of the conversion of light energy to work, the paper examines in detail the only process that operates reliably and with an appreciable conversion efficiency, namely photosynthesis by plants, algae, and bacteria. These systems already produce 3 times 10 to the 21st J of stored energy per annum (which is 10 times the world's annual energy use). Attention is given to some of the ways in which photosynthesis can be mimicked and extended to produce other products such as hydrogen, reduced carbon compounds, ammonia, as well as electricity. Development of artificial systems for the photochemical conversion and storage of solar energy is critically examined. Both homogeneous and heterogeneous systems are considered, the latter involving valuable developments in photoelectrochemistry. Finally, an attempt is made to answer some economic questions relevant to some applications. S.D.

A80-11830 **Frontiers in energy demand modeling.** R. S. Hartman (Boston University, Boston; MIT, Cambridge, Mass.). In: Annual review of energy. Volume 4. Palo Alto, Calif., Annual Reviews, Inc., 1979, p. 433-466. 110 refs.

The paper introduces and critiques a series of energy demand models and explores the particularly promising directions for future energy demand modeling. Some detailed suggestions for advancing the frontiers of energy demand modeling are made. Important issues addressed by frontier energy demand modeling efforts include: (1) explicit analytical treatment of both long-run and short-run demand, for the purpose of identifying behavioral characteristics and policy variables specifically relevant to each; (2) appropriate level of disaggregation of energy end-use, for the purpose of permitting technological specificity in treating fuels and the fuel-burning capital stock; (3) appropriate treatment of new technologies; and (4) utilization of appropriate models and data for residential consumer choice and for dynamic modeling of industrial and commercial demand. B.J.

A80-11831 **Assessing energy policy models - Current state and future directions.** M. Greenberger (Johns Hopkins University, Baltimore, Md.) and R. Richels (Electric Power Research Institute, Palo Alto, Calif.). In: Annual review of energy. Volume 4. Palo Alto, Calif., Annual Reviews, Inc., 1979, p. 467-500. 41 refs.

The paper presents a brief review of the energy policy modeling process and considers two kinds of model analysis (i.e., analysis focusing primarily on the model and analysis focusing more on policy issues and uses of the model). A two-way classification scheme for model analyses is presented, and examples of analysis by model developers, model users, third-party model analysts, and joint efforts, are given. This is followed by an examination of the nature of independent assessment, and a description of an experiment in model assessment, i.e., the MIT assessment of the Baughman-Joskow Regional Electricity Model. B.J.

A80-11832 **Review of scenarios of future U.S. energy use.** J. Just (Donovan, Hamester and Rattien, Inc., Washington, D.C.) and L. Lave (Carnegie-Mellon University, Pittsburgh, Pa.). In: Annual review of energy. Volume 4. Palo Alto, Calif., Annual Reviews, Inc., 1979, p. 501-536. 41 refs.

The following energy scenarios are reviewed: (1) CINAES Integration Scenario (1976-1977); (2) Modeling Resource Group (1976-1977); (3) the Energy Policy Project (1974); (4) Workshop on Alternative Energy Strategies (1977); (5) Nuclear Energy Policy Study Group; (6) Project Independence; (7) Energy Information Adminstration's Annual Report (1977); (8) National Energy Plan (1977); (9) ERDA National Energy R&D Plan (1975); (10) Market Oriented Program Planning Study (1977); and (11) Inexhaustible Energy Resources Planning Study (1977). Emphasis in this assessment is placed on the limitations of the scenario method, whether assisted by formal or purely judgmental models. It is concluded that the strength of the scenario method will continue to depend more upon the richness of the set of alternative futures considered than upon the quality of any single projection. B.J.

A80-11837 **Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.** Symposium sponsored by the Joint Services Electrical Power Sources Committee. Edited by J. Thompson (Royal Aircraft Establishment, Farnborough, Hants., England). London, Academic Press, Inc. (London), Ltd., 1979. 786 p. $134.

A collection of papers is presented regarding recent advances in the research and development of nonmechanical electrical power sources. Attention is given to many types of primary, secondary, high-temperature and reserve batteries, along with fuel cells and other types of nonmechanical power sources. Topics of interest include some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells, recent advances in zinc-bromine batteries, hydrogen (hydride) air secondary battery, a new metal/plastic compound electrode for traction batteries, and lead-lead dioxide perchloric acid reserve cells. S.D.

A80-11838 **Cadmium electrodes with improved surface characteristics for alkaline storage batteries.** S. Sathyanarayana (Indian Institute of Science, Bangalore; Tamil Nadu Alkaline Batteries, Ltd., Madras, India). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 141-149; Discussion, p. 149-151. 5 refs.

It is shown that minute crystallites of active material which usually cover the exterior surface of sintered plate cadmium electrodes may be rendered electrochemically inactive by electrodepositing a thin layer of pure nickel on them. The charge-discharge reactions of the cadmium electrode occurring inside the porous matrix are not affected by this process. The stability of the cadmium electrode with regard to cycle life and possibly ageing, is enhanced due to a decreased density of nucleation sites for the formation and growth of cadmium dendrites on the exterior surface of the electrode. There is no hydrogen evolution during overcharge of sealed nickel-cadmium cells with such flash-nickel plated negative electrodes under normal conditions so long as the capacity of the cell is limited by that of the positive electrode. The oxygen recombination rate following overcharge is, surprisingly, enhanced by the above process of flash nickel-plating to a significant extent. (Author)

A80-11839 **Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance.** J. Mrha, I. Krejci, B. Klapste (Ceskoslovenska Akademie Ved, Ustav Fyzikalni Chemie a Elektrochemie, Prague, Czechoslovakia), B. Braunstein (Statni Vyzkumny Ustav Materialy, Prague, Czechoslovakia), V. Koudelka, and J. Malik (Prazska Akumulatorka, Mlada Boleslav, Czechoslovakia). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 153-176. 12 refs.

Conductive plastic enables an elastic and simultaneously electronic conductive connection between the particles of the active material used in pocket-type nickel oxide electrodes to be made. The mixture of these materials can be rolled after the addition of a liquid milling agent onto a metallic grid at room temperature. An electrode thus formed, pressed to 120 MPa gives more than 1000 cycles during accelerated life testing. At discharge rates greater than 1C (C = capacity) the electrochemical performance is controlled by the quality of the joining area of the active mass-collector and correlation of this performance with the results of impedance measurements is found. (Author)

A80-11840 **Failure mechanisms of vented nickel-cadmium cells in overcharge.** K. L. Dick, T. Dickinson (Newcastle-upon-Tyne, University, Newcastle-upon-Tyne, England), R. J. Doran, S. E. A. Pomroy, and J. Thompson (Royal Aircraft Establishment, Materials Dept., Farnborough, Hants., England). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 195-216; Discussion, p. 217, 218. 7 refs.

The observed overcharge characteristic of defective vented nickel-cadmium cells has been investigated in terms of three possible failure mechanisms, namely, oxygen recombination, the operation of redox systems and the formation of 'soft' shorts. Experiments have included electrochemical studies at stationary and rotating disc cadmium electrodes, voltammetry in cell electrolyte, characteristics of defective and specially constructed vented cells and the examination of cell components by scanning electron microscopy. Results indicate that all three mechanisms can carry current in overcharge to varying extents but that the formation of soft shorts appears to be critical in producing the defective behavior frequently observed. (Author)

A80-11841 **Improvement of the high-rate discharge behaviour of the nickel electrode.** G. Crespy, R. Schmitt (Battelle, Centre de Recherche de Genève, Geneva, Switzerland), M. A. Gutjahr, and H. Säufferer (Daimler-Benz AG, Stuttgart, West Germany). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 219-236; Discussion, p. 237. 14 refs. Research sponsored by the Daimler-Benz AG.

The energy density and the high-rate discharge behavior of alkaline batteries (Cd/Ni, Fe/Ni, Zn/Ni, TiNi/Ni) can be increased by structural improvements of the positive nickel electrode. A highly porous nickel-foam structure has been developed, applying a one-step sintering technique. Porosities of 85 percent and more can be achieved without diminution of the mechanical strength. The use of this structure as support in nickel electrodes allows an increase of the specific capacity and an improvement of the high-rate discharge behavior at different temperatures. The overall electrochemical characteristics of these electrodes are superior to that of conventional sintered electrodes which make them particularly well adapted for alkaline traction batteries. (Author)

A80-11842 **High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid.** J. Sandera, M. Cenek, A. Touskova, M. Calabek (Brno, Vysoke Uceni Technicke, Brno, Czechoslovakia), J. Mrha, and J. Jindra (Ceskoslovenska Akademie Ved, Ustav Fyzikalni Chemie a Elektrochemie, Prague, Czechoslovakia). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 239-247. 5 refs.

With the use of oxalic acid as modifying additive to active cadmium mass for alkaline accumulators it is possible to increase its efficiency of utilization by 10-20% due to the increase in porosity and specific active surface and to improve the accumulator output and low-temperature parameters. The results of the positive effect of oxalic acid have been demonstrated by evaluating the electrical parameters of nickel-cadmium accumulators during cycling. (Author)

A80-11843 **Development of silver-hydrogen cells.** G. L. Holleck, M. J. Turchan, F. S. Shuker, D. J. DeBiccari, and P. O. Offenhartz (EIC Corp., Newton, Mass.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 271-283; Discussion, p. 283, 284. Contract No. F33615-76-C-2093.

With a projected energy density of close to 80 Wh/kg and a cycle life of about 1000 cycles, silver-hydrogen cells represent a promising power source for specialized applications. Electrolyte management is the main problem area. Unfavorable electrolyte transport properties make common argentistatic membranes such as Visking and grafted polyethylene films not suitable for Ag/H2 cells. Attractive Ag/H2 cells can be constructed with an inorganic-organic separator developed by NASA. (Author)

A80-11844 **Development of silver-hydrogen cells.** P. Antoine and P. Fougere (Société des Accumulateurs Fixes et de Traction, Romainville, Seine-Saint-Denis, France). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 285-299; Discussion, p. 299, 300. Research supported by the European Space Agency and Direction des Recherches, Etudes et Techniques.

Metal-hydrogen systems have been intensively studied for several years because of their high energy density. A Ag-H2 couple, recently developed, offers an energy density of about 80-100 Wh/kg which is 70 percent higher than the energy density of the Ni-H2 couple. The physicochemical phenomena which can lead to the life-time limitation of the Ag-H2 system are under investigation. Different methods for improving the cycle life to Ag-H2 cells and first results already obtained are presented. Interesting characteristics of Ag-H2 cells have been obtained particularly during overcharge and charge retention tests. To date, several Ag-H2 cells have undergone 24-h cycle tests at 22 C and 50 percent depth of discharge. 300 cycles have already been achieved. Other cells on a 100-minute cycle test at 22 C and 27 percent depth of discharge have already reached 3000 cycles. (Author)

A80-11845 **Zinc-bromine battery studies.** R. J. Bellows, D. J. Eustace, P. Grimes, J. A. Shropshire, H. C. Tsien, and A. F. Venero (Exxon Advanced Energy Systems Laboratory, Linden, N.J.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 301-311; Discussion, p. 311, 312. 14 refs.

Studies on a circulating-electrolyte zinc-bromine battery are described. Used in conjunction with low-cost conductive plastic electrodes and separable bromine complexes, the system provides efficient operation at energy-density levels attractive for traction as well as energy storage use. Performance of the system is described, including evaluation of the cycling behavior of monopolar and bipolar modules. Projections of energy densities and possible cost ranges are made. (Author)

A80-11846 **Recent advances in zinc-bromine batteries.** F. G. Will (General Electric Co., Schenectady, N.Y.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 313-326; Discussion, p. 326-328. 11 refs. Contract No. EY-76-C-02-2950.

The design and performance of zinc-bromine cells which employ all-carbon electrodes, a stable cation exchange membrane and electrolyte circulation is described. The design permits internal electrolyte manifolding and stacking of cells in electrical series, using bipolar electrodes. Individual cells of this type have been charged and discharged with 3-1 A or 25 mA/sq cm for four and eight hours each, corresponding to an energy delivered of up to 36 Wh. Constant performance has been demonstrated for an 18 Wh cell in 170 cycles for a total of 1200 h while attaining a coulombic efficiency of 96%, volt-efficiency of 76% and electrochemical energy efficiency of 73%. (Author)

A80-11847 **Optimization of iron-air and nickel oxide-iron traction batteries.** B. Andersson and L. Ojefors (Swedish National Development Co., Dept. for Energy and Environmental Technology, Akersberga, Sweden). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 329-342; Discussion, p. 342, 343. 5 refs.

An analysis is carried out to determine how different factors contribute to the decrease in energy density from the theoretical values of 760 and 265 Wh per kg to the real values. For the iron-air battery, a full scale 30 kW h system with 80 kWh per kg is considered and for the nickel-oxide concept a 300 Ah cell with 55.5 Wh per kg. It is reported that the analysis shows the possibility of increasing the energy densities to 105 Wh per kg (advanced) for the nickel oxide iron system. It is concluded that the tests carried out with these two alkaline battery systems and the calculations made, show that they will be competitive power sources for traction applications in the near future. M.E.P.

A80-11848 **Hydrogen /Hydride/-air secondary battery.** J. Sarradin, G. Bronoel (CNRS, Grenoble, France), A. Percheron-Guegan, and J. C. Achard (CNRS, Meudon, Hauts-de-Seine, France). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 345-350; Discussion, p. 350, 351. 11 refs. Research supported by the Direction des Recherches, Etudes et Techniques.

The use of metal hydrides as negative electrodes in a hydrogen-air secondary battery seems promising. However, in an unpressurized cell, more stable hydrides that LaNi5H6 must be selected. Partial substitutions of nickel by aluminium or manganese increase the stability of hydrides. Combined with an air reversible electrode, a specific energy close to 100 Wh/kg can be expected. (Author)

A80-11849 **Neutral electrolyte aluminium-air battery.** D. M. Drazic, A. R. Despic, S. Zecevic, M. Atanackovic (Beograd, Univerzitet; ICTM, Institute of Electrochemistry, Belgrade, Yugoslavia), and I. Iliev (B'lgarska Akademiia na Naukite, Tsentralna Laboratoriia po Elektrokhimichni Iztochnitsi na Tok, Sofia, Bulgaria). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 353-362; Discussion, p. 362, 363. 5 refs.

A neutral electrolyte, aluminum-air battery, using an active aluminum-alloy anode and an active carbon-based air electrode is described. Attention is given to the development of the battery noting that problems with electrolyte gelling which resulted in reduced operation of the battery were overcome by adding NaF to the electrolyte and by seeding with aluminum oxide powder. It is calculated that energy from the Al-air system should be three times cheaper than that of the Zn-air and 2.8 times cheaper than that of the Mg-air system. Finally, it is claimed that it is ecologically superior to any battery system known to date, in that it is harmless, nonpolluting and acceptable to almost any environment. M.E.P.

A80-11850 **The conversion of ethylene glycol with air in alkaline fuel cells.** H. Cnobloch, D. Gröppel, H. Kohlmüller, D. Kuhl, and G. Siemsen (Siemens AG, Forschungslaboratorien, Erlangen, West Germany). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 389-403; Discussion, p. 403, 404. 13 refs.

Because of their easy storage and high charge density, liquid fuels are studied for use in fuel cells. The relatively cheap and industrially produced ethylene glycol can theoretically yield 428 Ah per liter during conversion to the stage of glycolic acid. A noble metal catalyst stabilized with bismuth and consisting of 43%Pt, 34%Pd, and 23%Bi has proved particularly useful for the oxidation of glycol. The reduction of air-oxygen takes place at hydrophobic carbon electrodes which contain silver as the catalyst. A 12-cell 50 W battery with a capacity of 77 Ah has performed well in a continuous service test. (Author)

A80-11851 **The performance of molten-carbonate fuel cells.** K. F. Blurton, L. G. Marianowski, and E. H. Camara (Institute of Gas Technology, Chicago, Ill.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 405-417; Discussion, p. 417, 418. ERDA Contract No. 31-109-38-3552.

Molten-carbonate fuel cells are potential high-efficiency power sources for the 1980s. At that time, we will be required to operate on a variety of fuels, thus this study was undertaken to determine the effect of fuel cell feedstock and other major operating parameters. Results are shown for the operation of the fuel cell on gases simulating those processed by common techniques from methane, naphtha, heavy fuel oils, and coal. The relationship between fuel quality and the fuel cell performance, and the effect of oxidant composition, fuel and oxidant utilization, and cell temperature are also described. (Author)

A80-11852 **Utility fuel cells for Sweden.** O. Lindstrom, T. Nilsson, M. Bursell, C. Hornell, G. Karlsson, C. Sylwan, and B. Ahgren (Kungl. Tekniska Hogskolan, Stockholm, Sweden). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 419-434; Discussion, p. 435, 436. 18 refs. Research supported by the National Swedish Board for Energy Source Development, Styrelsen for Teknisk Utveckling, and Carl Trygger's Foundation for Scientific Research.

A modest program for useful fuel cell systems is under way in Sweden. The concept is composed of a fuel processor (for conversion of biomass and peat to hydrogen) and alkaline fuel cells. The fuel processor uses a modified steam-iron process with a high conversion efficiency. Most of the experimental work is concerned with the development of electrode materials; cathodes consisting of nickel screens embedded in PTFE bonded silver catalysts give 1kA/sq m in the range -0.11 to -0.21 V vs. Hg/HgO; anodes with skeleton-nickel from AlNiTiMo alloys on nickel matrixes have given 1 kA/sq m at -0.87 V vs. Hg/HgO at best. Various cell and module designs are being evaluated for use in a theoretical 100 MW plant. One idea, using so-called FC-041 2.5 MW generator units, seems to be quite competitive in cost. (Author)

A80-11853 **Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells.** F. T. Tanasescu, C. I. Popescu, and D. Moraru (Institutul de Cercetari si Proiectari pentru Industria Electrotehnica, Bucharest, Rumania). In: Power sources 7: Research and development in non-mechanical electrical power

sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 437-444. 10 refs.

The paper presents a photoconverter with an Al/Cu2O/Cu structure, where the photovoltaic junction is Al/Cu2O; the Cu2O/Cu junction produces an electric field contributing to an increase in both the collection efficiency of the generated carriers and consequently in the conversion efficiency. The improvement of this type of converter for which the specialized literature mentions an efficiency approximately equal to 1%, may be a good solution for a large scale energy conversion in the future due to its real possibilities of development. (Author)

A80-11854 **Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications.** P. V. Dand, K. K. Press, and G. R. Wisniewski (KDISCORE, Inc., Cockeysville, Md.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 501-517; Discussion, p. 517, 518. 7 refs. USAF-supported research.

The need for a long life thermal battery has spurred efforts at evaluating new electrochemical couples for potential replacement of the Ca-CaCrO4 system. This paper compares the performance characteristics of the Ca-CaCrO4 and the Li-Al-FeS2 systems. Studies were conducted on single cells and batteries in order to evaluate various parameters including operating temperature, pressure, cell composition, thickness, and density. These studies indicate that although the Ca-CaCrO4 system is competitive at low current densities, the Li-Al-FeS2 system promises to substantially extend the present domain of high current density thermal batteries. (Author)

A80-11855 **Heat generation in Li/SOCl2 cells.** P. Bro (P. R. Mallory Laboratory for Physical Science, Burlington, Mass.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 571-579; Discussion, p. 579-582. 10 refs.

Short duration, constant current discharges of fresh Li/SOCl2 cells were carried out at 25 and 45 C in a calorimeter with the concurrent monitoring of the cell overvoltage and the heat evolution from the cells. At discharge currents between 20 and 200 mA the cells generated about three times as much heat at 25 C and twice as much heat at 45 C as could be calculated from the cell current and the cell overvoltage at the two temperatures. The heat evolution persisted for a considerable length of time beyond the cessation of the discharge. The results provide evidence for the occurrence of significant chemical reactions in Li/SOCl2 cells. (Author)

A80-11856 **Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions.** G. E. Blomgren, V. Z. Leger, T. Kalnoki-Kis (Union Carbide Corp., Battery Products Div., Parma, Ohio), M. L. Kronenberg (General Electric Co., Gainesville, Fla.), and R. J. Brodd (ESB Technology Co., Yardley, Pa.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 583-592; Discussion, p. 592, 593. 7 refs.

A80-11857 **Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes.** J. R. van Beek and P. J. Rommers (Philips' Gloeilampenfabrieken, Philips Research Laboratories, Eindhoven, Netherlands). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 595-621; Discussion, p. 621, 622. 19 refs.

Electrodeposition and dissolution of lithium metal in propylene carbonate based electrolytes have been studied with special emphasis on the morphology and passivating behavior. Both are influenced by using substrate electrodes, which can alloy electrochemically with lithium at ambient temperature. This may result in a considerable improvement of cycle-life and charge retention. Complications arise, however, when long waiting times between plating and stripping are introduced. The stripping efficiency decreases due to formation of compounds from which lithium cannot be stripped. Such a decrease was not observed when aluminum was used as substrate. Lithium deposits on aluminum, however, gave rise to a considerable disintegration of the electrode on cycling. (Author)

A80-11858 **Utilization of transition metal phosphorus trisulphides as battery cathodes.** A. Le Mehaute and P. Perche (Compagnie Générale d'Electricité Marcoussis, Essonne, France). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 623-635; Discussion, p. 635, 636. 16 refs. Research supported by the Délégation Générale à la Recherche Scientifique et Technique and Direction des Recherches et Moyens d'Essais.

A new positive material, NiPS3 for an electrochemical cell with a lithium negative electrode has been studied. Characterized by a stacking of two-dimensional slabs, an electrochemical improvement results from the solid solution formation (LixNiPS3). This study shows the advantage in energy and primary power sources for NiPS3 compared with TiS2. Electrochemical limitations are analyzed and measurements of diffusion coefficients in the solid phase are given. (Author)

A80-11859 **Lead oxides-lithium cells.** M. Broussely, Y. Jumel, and J. P. Gabano (Société des Accumulateurs Fixes et de Traction, Département Piles, Poitiers, France). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 637-645; Discussion, p. 645, 646. 8 refs.

The possibility of using lead and lead-bismuth mixed oxides as positive active materials in organic electrolyte lithium cells with a working voltage similar to those of silver zinc cells has been considered. Button cells of SR 44 size have been developed as a test vehicle and studied under various conditions of discharge rate and storage. This paper describes the performance characteristics obtained under these conditions and suggests in conclusion the possible replacement of silver zinc cells by such systems for a large range of low-rate applications on the basis of cost effectiveness. (Author)

A80-11861 **Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites.** L. B. Welsh, R. W. Leyerle (UOP Corporate Research Center, Des Plaines, Ill.), B. S. Baker, and M. A. George (Energy Research Corp., Danbury, Conn.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978.
London, Academic Press, Inc. (London), Ltd., 1979, p. 659-674; Discussion, p. 675, 676. ERDA-supported research; Grant No. DAAG53-76-C-0014.

The properties and performance of a new class of electrocatalysts being developed for phosphoric acid electrolyte fuel cell applications are reported. These electrocatalysts are produced by platinum impregnation of high surface area pyropolymer structures which are prepared by leaching the alumina from small-particle pyropolymer-alumina composites acid. When tested as 0.4-0.6 mg/sq cm Pt-loaded cathodes in model phosphoric fuel cells at 180 C, full cell performance levels above 0.60 V at 200 mA/sq cm have been obtained using Pt-black counter electrodes. Both the particle size and pore volume distribution of the electrocatalysts may be controlled by the appropriate choice of starting materials and process conditions. Such control constitutes a substantial improvement in the ability to optimize electrocatalyst structures. (Author)

A80-11862 **The electrochemical characteristics of iron sulphide in immobilized salt electrolytes.** D. Birt, C. Feltham, G. Hazzard, and L. Pearce (Admiralty Marine Technology Establishment, Poole, Dorset, England). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 691-699; Discussion, p. 699, 700.

While the lithium alloy-iron sulfide couple has attracted considerable attention in recent years for high-temperature secondary battery applications, the high efficiency and good thermal stability of iron sulphide makes it an attractive candidate for high rate, extended duration, primary thermal batteries. The feasibility of using a pile design of battery for iron sulphide coupled with immobilized lithium has been studied with test cells of 8.3 sq cm plate area. Using 10 A min/sq cm cathodes, high rates (up to 1 A/sq cm) and utilization of up to 80% have been achieved over the temperature range 400-700 C. Similar experiments with secondary cells have produced over 100 cycles at the 10 h (25 mA/sq cm) rate, with utilization between 80 and 90%. Cells are capable of sustained discharge at 100 mA/sq cm. (Author)

A80-11863 **Recent advances in high temperature primary lithium batteries.** M. D. Baird, A. J. Clark (Mine Safety Appliances Co., Ltd., Glasgow, Scotland), C. R. Feltham, and L. J. Pearce (Admiralty Marine Technology Establishment, Poole, Dorset, England). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 701-711; Discussion, p. 712. 8 refs.

The poor efficiency of calcium anodes in existing molten salt primary batteries has been a major constraint in extending their duration beyond a few minutes at high electrode current densities. The development of satisfactory techniques for immobilizing lithium coupled with suitable cathodes, has to a great extent overcome this problem. Studies on a lithium anode system using immobilized salt electrolytes have shown that it is capable of working over a wide range of power densities at high electrode efficiencies. Resulting from this, a new range of pyrotechnically activated batteries has been developed. The basic chemical characteristics of the cell system are discussed and battery data for a number of cell sizes on power and energy are presented, demonstrating the potential of the system with respect to a range of applications. (Author)

A80-11865 **Computer modelling of electrically parallel arrays of sodium-sulphur cells.** S. P. Mitoff (General Electric Co., Schenectady, N.Y.). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 733-741; Discussion, p. 741, 742. Research supported by the Electric Power Research Institute.

The individual charge and discharge curves of 20 experimental 16 A h sodium-sulphur cells were used as input data for a computer programme. The programme was used to synthesize the behavior of a parallel array of cells with their charge and discharge characteristics. The results predicted that they would deliver about the same power and capacity in the parallel connection as they do when tested individually at constant current. Although the cells get out of phase in ampere hours at the earlier stages of a cycle, they tend to equalize near the end of the cycle. (Author)

A80-11866 **Some aspects of sodium-sulphur batteries.** M. D. Hames, D. G. Hartley, and N. M. Hudson (British Railways Board, Railway Technical Centre, Derby, England). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. (A80-11837 02-44) London, Academic Press, Inc. (London), Ltd., 1979, p. 743-755; Discussion, p. 755, 756. Research supported by the Department of Transport.

Several 3 kW h, 50 V sodium-sulphur batteries have been constructed and tested under constant current and simulated duty cycle rates. These batteries contain 48 central sulphur cells (37 A h) connected as two parallel chains of 24 series cells. Experimental data are presented which illustrates the charge-discharge characteristics, thermal properties and safety aspects of these batteries. (Author)

A80-11867 **Current collectors for sodium-sulphur batteries.** T. L. Markin, A. R. Junkison, R. J. Bones, and D. A. Teagle (Atomic Energy Research Establishment, Harwell, Oxon, England). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 757-767.

In a previous paper (Bones, Brook and Markin, 1975), it was shown that stainless steel corroded at an unacceptable rate when used as a current collector in the sulphur/polysulphide melt in Na-S cells. A search has since been made for alternative current collectors that will allow Na-S cells to achieve at least 1000 cycles without a significant loss in capacity and have an initial resistance less than 2 ohm sq cm. Moreover, any resistance increase should be small. Fully engineered cells with capacities of 20 A h have been constructed, with the sulphur contained in the beta-alumina electrolyte tube and the sodium in an outer annulus. These were used to evaluate carbon and molybdenum current collectors. Variable results were obtained with molybdenum rod current collectors for reasons associated with the surface chemistry of this metal in polysulphide melts. Anodized molybdenum current collectors were an improvement. Capacities of 72% (based on the weight of S) were maintained after 300 cycles, accompanied by a small increase in resistance. (Author)

A80-11868 **An indirect ammonia-air fuel system.** C.-S. Cha, Z.-D. Wang, Y.-C. Chu, and C.-T. Lo (Wuhan University, Wuchang, Communist China). In: Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978. London, Academic Press, Inc. (London), Ltd., 1979, p. 769-773; Discussion, p. 773, 774.

A rather simple ammonia-air fuel cell system has been developed in Wuhan University. Ammonia is cracked to give a 25% N2, 75% H2 gas mixture, which is consumed directly in the fuel cell stack. Scrubbed air is supplied to the air electrodes by the 'chimney effect'. No platinum-group metal catalysts are used to fabricate the electrodes and the system contains neither pump nor fan. The system is therefore not expensive and appears to be quite reliable during prolonged unattended operation. The average service life of a fuel cell module is about three months of continuous operation at 50 mA/sq cm. (Author)

A80-11953 **Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979.** Edited by R. F. Hill. Washington, D.C., Government Institutes, Inc., 1979. 1167 p. $38.

Papers presented examine both the technical and institutional aspects of energy technology for an improved energy system in the United States. The proceedings include discussions of: energy policy; institutional opportunities and constraints; the efficient use of energy; technology for fossil, nuclear, and geothermal resources; and technology for renewable energy resources. B.J.

A80-11954 **Kentucky's coal-based chemical/energy park.** D. D. Drake (Kentucky, Dept. of Energy, Ky.) and H. L. Falkenberry (Tennessee Valley Authority, Knoxville, Tenn.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 56-69.

The Kentucky Department of Energy, assisted by the TVA, is proceeding with plans to develop a coal-based chemical/energy park in western Kentucky. This park will be designed to take high-sulfur coal from western Kentucky and convert it to clear synthetic fuels and feedstocks, which will in turn be used for power generation and as raw materials for a slate of chemical products. The entire operation will be economically viable and environmentally sound. It is concluded that this commercialization effort represents an outstanding opportunity to demonstrate a reproducible, innovative way to meet national energy supply needs with a minimum requirement of federal funding.

B.J.

A80-11955 **Hydrogen - A means of integrating competing technology into a unified energy system.** R. T. Jaske. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 207-214. 12 refs.

The 1975 state of hydrogen energy technology is reviewed, and some criteria for a long range national energy delivery system are outlined. It is found that only a limited number of systems can meet all of the key properties of a nationally optimized, highly independent energy system. The most promising combination appears to be the utilization of breeder reactors or fusion machines to supply thermal energy for generation of electricity and for production of hydrogenous fuel (methane-methanol-hydrogen) for a common pool delivery system. Competitive forces would allocate the shares of electricity and stored fuel on the basis of efficiency and market conditions, guided by national objectives.

B.J.

A80-11956 **Economic performance - Evaluations for solar energy.** F. Roach and S. Noll (California, University, Los Alamos, N. Mex.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 273-284. 16 refs. Research supported by the U.S. Department of Energy.

The LASL/UNM computer code for the economic evaluation of the feasibility of residential solar space and water heating systems is described. The inputs, sets of evaluative procedures, and outputs associated with the code are discussed in detail. Present status and on-going modifications to the various components are highlighted, and the utility of the LASL/UNM code is demonstrated through illustrative examples of recently completed studies.

B.J.

A80-11957 **Techniques for evaluation of advanced cogeneration technologies.** D. H. Brown (General Electric Co., Schenectady, N.Y.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 354-360.

A methodology is presented that characterizes the performance parameters of advanced energy conversion systems for cogeneration. Process temperature is directly coupled to the characteristic of the energy conversion system in a manner that is straightforward, simple, easy-to-check, and requires a minimum of computation. Parameters are expressed as ratios to the cogeneration fuel energy; the more familiar expression of fuel charged to power is shown to be a derivative of these expressions.

B.J.

A80-11958 **Gas recovery from unconventional sources.** A. A. Pitrolo, L. A. Schrider, W. K. Overbey, and R. L. Wise (U.S. Department of Energy, Morgantown Energy Technology Center, Morgantown, W. Va.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 483-494. 11 refs.

Department of Energy R&D activities in the field of unconventional sources of natural gas are reviewed. Emphasis is on four such sources: tight sandstones, Devonian shales, coalbed methane, and geopressured aquifers.

B.J.

A80-11959 **Combustion of anthracite culm in a fluidized bed boiler.** S. Moskowitz (Curtiss-Wright Corp., Wood-Ridge, N.J.), A. M. Leon (Dorr-Oliver, Inc., Stamford, Conn.), and D. A. Rosini (Shamokin Filler Co., Inc., Shamokin, Pa.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 530-538.

The Department of Energy is sponsoring several projects to use anthracite culm, a coal waste material, as a low cost fuel to generate steam in a fluidized bed combustion (FBC) boiler system. These projects involve steam generation units ranging from 20,000 pph for manufacturing processes to 100,000 pph for district heating. One of the projects which is discussed in this paper is directed at design, construction, operation and evaluation of a prototype atmospheric FBC boiler unit, on culm with a heating value as low as 3000 Btu/lb and with an ash content of over 70%. The culm is to be burned in an environmentally acceptable manner to produce 20,000 pph steam for industrial use, although the design is representative of steam generating capacity of 100,000 pph or greater. Details of this program including plant arrangement, FBC design considerations and preliminary combustion data obtained in an FBC technology rig are presented.

(Author)

A80-11960 **The prospect for anthracite as a national energy resource.** J. Pell (U.S. Department of Energy, Div. of Anthracite, Washington, D.C.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 539-552. 22 refs.

The paper presents some basic facts on the utilization of anthracite and describes the development of the DOE Division of Anthracite (DA). The primary objective of the DA is to seek ways to restore anthracite as a viable economic alternative to soft coals and to imported oil and gas now supplying the Northeast. Consideration is given to environmental requirements for new anthracite-fired facilities.

B.J.

A80-11961 **Economics of Pullman Kellogg's magnesium promoted FGD system.** L. Granger, L. J. Scotti, and J. C. Yarze (Pullman Kellogg, Co., Houston, Tex.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 602-616. 6 refs.

A magnesium sulfate-promoted limestone flue gas desulfurization system has been designed for treating flue gas resulting from the combustion of a coal containing 5.75% sulfur. This paper reviews the chemistry of magnesium sulfate-promoted calcium-based and nonpromoted calcium-based flue gas scrubbing, and discusses the advantages of the promoted system for high sulfur content coals. Economic evaluations are presented which include comparisons of reagent and power costs for promoted and nonpromoted limestone systems. Process design and economic analyses of forced oxidation as means of reducing waste slurry disposal costs are discussed. In addition, different slurry dewatering options are reviewed.

B.J.

A80-11962 **170 MW pressurized fluidized bed combustion electric plant.** J. J. Markowsky (American Electric Power Service Corp., New York, N.Y.) and B. Wickstrom (STAL-Laval Turbin AB, Sweden). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 617-629.

A pressurized fluidized bed combustion (PFBC) combustor, when operated in conjunction with a combined-cycle electric power generation, offers the potential for direct combustion of high-sulfur coal without stack gas clean-up, as well as increasing power plant efficiency and significantly reducing nitrogen oxide emissions. This paper presents the status of a privately funded development program initiated in December of 1976 to determine the technical and economic feasibility of utilizing PFBC for electric power generation. It is concluded that in order to develop PFBC to the point of commercialization, a large-scale Engineering Development System Plant will have to be built and operated. Toward this end, it is proposed to design and build a 170-MW PFBC combined cycle plant which would incorporate the same gas turbine and PFBC combustor that would be used in a commercial size plant. (Author)

A80-11963 **Development of fluidised bed combustion in the United Kingdom.** W. G. Kaye (National Coal Board, London, England). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 630-638.

The early development of fluidized bed combustion in the United Kingdom is reviewed with reference to: (1) deep-bed technology burning crushed coal with sulfur retention for power generation, and (2) the combustion of larger sizes of coal in shallower beds to satisfy the needs of the industrial market. The current status of these processes is examined, with attention given to pressurized fluidized combustion, atmospheric fluidized combustion, and smaller industrial boilers and furnaces. B.J.

A80-11964 **Coal liquefaction - An international perspective.** A. Baker and M. D. Teper (International Energy Agency, London, England). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 639-656. 18 refs.

The Coal Research Program of the International Energy Agency is briefly described. This is followed by a discussion of liquefaction processes and their development, some preliminary considerations on liquefaction economics, and some considerations on the future of coal liquefaction. B.J.

A80-11965 **Current German developments in coal liquefaction technology.** G. Kolling, I. Romey, and E. Wolowski. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 657-663. 6 refs.

The paper examines the IG (or Bergius-Pier) coal liquefaction process, based on slurry phase hydrogenation. Emphasis is placed on current German pilot plants for coal liquefaction, including the Bergbau-Forschung plant, the 200 t/d demonstration plant of Ruhrkohle AG/Veba Oel AG, and the 6 t/d pilot plant of Saarbergwerke AG. Sizes of these plants were chosen so as to enable scaling up to a commercial prototype plant. The possibility of using hydrogenation products as feedstock for the chemical industry is also being investigated. B.J.

A80-11966 **Recent developments in coal liquefaction in the United States.** L. E. McNeese, R. Salmon, and H. D. Cochran, Jr. (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 664-686. 28 refs. Contract No. W-7405-eng-26.

The current status of coal liquefaction in the United States is reviewed, with reference to basic chemistry, process research and development, and economics and commercialization. The following processes are described: direct liquefaction, two-stage liquefaction, pyrolysis processes, and indirect liquefaction. Process problems in coal liquefaction are briefly discussed, and some recent economic studies are reviewed. B.J.

A80-11967 **SRC solids - Boiler fuel and building block.** A. P. Flask (Wheelabrator-Frye, Inc., Keene, N.H.) and J. A. Pryor. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 687-706. 5 refs.

The current status of the solvent refined coal (SRC) process is reviewed. Pilot projects are assessed and the status of SRC technology is surveyed, with reference to: (1) solids separation, (2) hydrogen generation, (3) primary reactor scale-up, and (4) equipment life, maintenance, and operating difficulties. Both the solids and liquids SRC processes are described, and it is noted that market studies indicate that SRC solids have a unique potential for further processing to produce products for basic industries (liquid fuels, anode coke, and metallurgical coke are examples). B.J.

A80-11968 **SRC solids - A preferred compliance boiler fuel.** S. R. Hart, Jr. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 707-717. 7 refs.

Solid solvent refined coal (SRC-I) is a coal-derived fuel with a high heat content and a low ash and sulfur content. The SRC-I technology has been advanced in pilot plant operations over the past five years to the point where it is now considered to be the best candidate for early commercialization of a coal-derived clean fuel. This paper presents a preliminary outlook on the market potential of solid SRC and gives power plant cost data and information on other key factors which must be evaluated by electric utilities in decisions relating to the future use of solid SRC. B.J.

A80-11969 **Low/medium BTU coal gasification - Perspective of the gas industry.** R. H. McClelland. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 728-758.

A80-11970 **The near term potential for gasification-combined cycle electric power generation.** M. J. Gluckman, N. A. Holt, S. B. Alpert, and D. F. Spencer (Electric Power Research Institute, Palo Alto, Calif.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 771-777.

A80-11971 **Coal to electricity - Integrated gasification combined cycle.** J. C. Corman (GE Research and Development Center, Schenectady, N.Y.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 778-792. 11 refs.

An advanced energy conversion system, Integrated Gasification Combined Cycle (IGCC), has been identified as a viable approach for converting coal to electricity in an environmentally acceptable manner. This concept comprises three subsystems: a gasifier, a gas cleanup system, and a combustion gas turbine combined cycle. A research and development program is in progress to address the major technical requirements in each area. Experimental components have been constructed for each of the three subsystems. These components are also integrated and operated as a process development unit (PDU) simulation of the proposed commercial IGCC system. The results to date verify the performance characteristics of this conversion concept. The low-Btu coal gasification fuel supply system meets the stringent fuel requirements of utility gas turbines and offers the flexibility to meet tightening environmental constraints. (Author)

A80-11972 * **Survey of MHD plant applications.** J. J. Lynch (U.S. Department of Energy, Washington, D.C.), G. R. Seikel (NASA, Lewis Research Center, Cleveland, Ohio), and J. C. Cutting (Gilbert/Commonwealth, Inc., Reading, Pa.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 793-807. 24 refs.

Open-cycle MHD is one of the major R&D efforts in the Department of Energy's program to meet the national goal of reducing U.S. dependence on oil through increased utilization of coal. MHD offers an effective way to use coal to produce electric power at low cost in a highly efficient and environmentally acceptable manner. Open-cycle MHD plants are categorized by the MHD combustor oxidizer, its temperature and the method of preheat. The paper discusses MHD baseline plant design, open-cycle MHD plant in the Energy Conversion Alternatives Study (ECAS), early commercial MHD plants, conceptual studies of the engineering test facility, retrofit (addition of an MHD topping cycle to an existing steam plant), and other potential applications and concepts. Emphasis is placed on a survey of both completed and ongoing studies to define both commercial and pilot plant design, cost, and performance.
S.D.

A80-11973 **The reality of on-site fuel cells.** R. T. Sperberg and V. B. Fiore. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 808-810.

On-site phosphoric acid fuel-cell systems are considered. The electrical efficiency of such a cell is shown to be 40% and to be increased to about 80% with waste-heat recovery. Applications of on-site fuel cells with heat recovery coupled with heat pumps are discussed, along with the current objectives of research on phosphoric acid fuel cells.
F.G.M.

A80-11974 **Commercial applications of molten carbonate fuel cell systems.** K. F. Blurton (Institute of Gas Technology, Chicago, Ill.) and J. R. Peterson (General Electric Co., Fairfield, Conn.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 811-825.

The paper examines the potential applications of molten carbonate fuel cells. Attention is given to two configurations, a dispersed, oil fueled power plant, and a coal fueled base load power plant. The penetration of these power plants into the utility generation system is described. The status of this technology is reviewed, and the major technology areas currently under investigation are discussed. These include: electrolyte tile, contaminant tolerance, fuel cell endurance, and stack design. Finally, attention is given to gas composition and component production. M.E.P.

A80-11975 **Economics/reliability trade-offs in materials for various coal conversion and utilization processes.** M. K. Guha (American Electric Power Service Corp., New York, N.Y.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 826-835.

The economics and reliability in materials for coal conversion and utilization processes with emphasis on the conventional coal-burning system, pressurized fluidized bed combustion, and open cycle coal-fired magnetohydrodynamics power generation are examined. Corrosion and stress corrosion cracking are the most important problems in conventional systems, which are discussed relative to steam turbines, high pressure feed water heaters, and scrubbers. In direct and indirect coal conversion processes, combined effects of erosion and corrosion by sulfides and chlorides are considered, which affect heat transfer surfaces and in-bed tubes in the fluidized bed equipment. In magnetohydrodynamic (MHD) power generation, the high-temperature air heater, combustor and nozzle, and MHD generator are considered, noting that the combustor must be ceramic-lined to withstand temperatures up to 3200 F for which alumina-chrome materials may be suitable, but the materials selection for the MHD generator requires further investigation.
A.T.

A80-11976 **Status of inertial confinement fusion.** C. M. Stickley (U.S. Department of Energy, Washington, D.C.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 871-877.

Progress in the U.S. Department of Energy's Inertial Confinement Fusion program is reviewed. Program objectives for the scientific feasibility phase, which extends through the mid-1980's, are presented and the capabilities of the major program participants are summarized. Drivers for inertial confinement fusion reactors currently occupying project status include glass lasers, CO2 lasers and electron and light-ion beams, while short-wavelength lasers and heavy-ion beams are undergoing technology development. Target interaction experiments have involved the interaction of lasers with glass microballoon targets or exploding pusher targets, and isentropic compression or ablative compression targets have recently come under investigation. In addition, the transport of focused laser and light-ion beams has been demonstrated and advanced reactor technology for energy applications is being developed. Advantages to the inertial confinement scheme include the limitation of physics questions to the pellet burning phase and the modularity of inertial confinement technology, and it is expected that the scientific feasibility of inertial confinement fusion will be demonstrated in the mid-1980's.
A.L.W.

A80-11977 **Geothermal resources of the Atlantic Coastal Plain.** J. K. Costain (Virginia Polytechnic Institute and State University, Blacksburg, Va.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 878-880.

Optimum sites for the development of geothermal energy in the eastern United States will probably be associated with the flat-lying sediments beneath the Atlantic Coastal Plain. Basement granitic rocks relatively enriched in uranium and thorium and thus sources of geothermal energy are currently being sought beneath thick, porous, thermally insulating coastal sediments by a combination of gravimetric and geological methods. Measurements of a series of 1000-foot holes drilled into the sediments of the Atlantic Coastal Plain between New Jersey and Georgia indicate that the highest thermal gradients (45 C/km) occur in the Delmarva Peninsula, with maximum temperatures of 85 C. A geothermal test well is planned near Crisfield, Maryland to evaluate the productivity of deep aquifers in sediments of the Atlantic Coastal Plain.
A.L.W.

A80-11978 **Geothermal energy markets on the Atlantic coastal plain.** W. J. Toth and F. C. Paddison (Johns Hopkins University, Laurel, Md.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 881-895. 10 refs.

A survey of potential energy markets for geothermal resources up to 250 F made for the Atlantic coastal plain in New Jersey, the Delmarva Peninsula, Virginia, and North Carolina is presented. 175 companies have process heat requirements that could be satisfied by potential geothermal resources, and data were also analyzed for space and water heating requirements in the residential, commercial, and military, and agricultural sectors. The geothermal energy system components, such as the production well, the wellhead heat exchanger, and peaking plants, were approximately sized, and wellhead and delivery costs to various types and densities of users were considered. Wellhead costs to large industrial users can be competitive with conventional energy sources, and delivered costs to residential users can be competitive with current fuel oil and natural gas prices, and well below costs of electrical resistance heating. A.T.

A80-11979 **Overview of division of energy storage program - Department of energy.** G. F. Pezdirtz (U.S. Department of Energy, Div. of Energy Storage Systems, Washington, D.C.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 896-903.

The division of Energy Storage Systems of the U.S. Department of Energy was created in order to develop and seek out applications for new and more efficient energy storage techniques. The paper reviews the activities of the division from the point of view of the diversity of central and dispersed energy storage applications. The potential energy savings of the various forms of energy storage under consideration are outlined, and a timetable for the commercialization of energy storage batteries, chemical and thermal systems and physical methods is presented. Particular attention is given to programs investigating compressed air and battery storage for utility load leveling, thermal energy storage for industrial waste heat, aquifer storage of cooled water, the electrolytic production of hydrogen using low-head hydroelectric power, customer-owned thermal energy storage, lead-acid, nickel zinc, nickel iron, sodium sulfur, lithium/metal sulfide and aluminum air batteries and flywheel energy storage for electric vehicles and gasoline/electric hybrid vehicles. A.L.W.

A80-11980 **Development of renewable energy sources in the United Kingdom.** G. Long (Department of Energy, Energy Technology Support Unit, Harwell, Oxon, England). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 905-925. 9 refs.

In presenting a survey of UK energy research and development to the Second Energy Technology Conference in 1975, Leighton described the steps then being taken to further the development of renewable energy sources. In the present paper, the research programs which have stemmed from the assessments are reviewed. The approaches to two technologies - solar energy and wave power - with very different R&D requirements, are outlined. V.P.

A80-11981 **Pelletized wood /Woodex/ - Applications and potential.** D. C. Walker and W. F. Brimer. In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 992-997.

The paper surveys Woodex, a pelletized fuel, produced from biomass waste products and materials, and which is claimed to be a clean burning renewable energy source from domestic supply. The pellets are reported to generate a maximum 3% ash, contain no sulfur, and in most areas cost less per therm than traditional fuels. In addition, Woodex contains some 8,500 BTUs per pound at about 35 pounds per cubic foot bulk density, and can be burned in its pelletized form, reduced in size for direct combustion, or processed into a fuel gas. Further, it is claimed that in almost all cases Woodex burns with emissions below those required by the EPA under the clean air act. Finally, it is noted that the fuel can be burned in most systems using coal with little or no modifications required. M.E.P.

A80-11982 **Supply, harvesting and nature of forest biomass as a fuel.** J. P. Elwood (International Paper Co., Bellusco, Italy). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1004-1014. 8 refs.

A review of the critical technical and economic barriers to increased use of forest biomass fuel is presented. Three scenarios for forest biomass fuel production and use are outlined: an integrated pulp and paper mill, a regional electric power generating plant and a fuel plantation. These types of operations are compared to each other and to a forest products plantation to illustrate strategic, technical and economic differences and similarities. Finally, several recent or current developments in harvesting equipment are described. (Author)

A80-11983 **Source, supply and nature of municipal and industrial waste as a fuel.** W. R. Niessen (Camp, Dresser and McKee, Inc., Boston, Mass.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1015-1025. 10 refs.

A80-11984 **Economy of a retrofit solar system.** J. M. Schreyer (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1029-1041. Contract No. W-7405-eng-26.

A privately financed, double-glazed, flat-plate-collector-driven, solar-augmented hot water system was installed on an existing dwelling in which the hot water consumption averaged about 30 gallons per day. Data were obtained on the collector water temperature, storage tank temperature, amount of hot water used, and amount of supplemental electricity required. Using the data obtained from this $1500 installation, it is shown that the payback period would be about 10 years. This assumes the replacement of electrical energy costing 5 cents per kWh, hot water usage rate of 30 gal/day and money borrowed at 10.5% interest. If the usage rate were 55 gal/day, the payback period would be about 5 years. (Author)

A80-11985 **Commercial building and industrial applications for solar energy.** V. R. Daiga (Owens-Illinois, Inc., Pittsburgh, Pa.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1046-1055.

The application of solar thermal energy collected by an evacuated tube collector to the supply of heat to commercial buildings and industrial processes is discussed. Evacuated tube solar collectors are described and the Sunpak solar collector, which consists of a manifold of 24 evacuated tubes, is presented. It is shown that the energy output characteristics of the Sunpak system exhibit a higher operating efficiency and lower thermal losses and ambient temperature sensitivity compared to a flat plate solar collector with double glazing and a selective coating. The Sunpak collector has been applied to the heating and cooling of new and retrofitted commercial buildings, schools and industrial buildings, and in the supply of heat for a beer pasteurization process, utilizing various Sunpak-building interfaces in different climates. Experience has shown the collector system designs to be suitable to commercial and industrial process applications requiring heat up to 240 F, with favorable user reaction and maintenance requirements. A.L.W.

A80-11986 **Low-cost central receiver solar power plant using molten salt as a heat transfer and storage medium.** T. R. Tracey (Martin Marietta Aerospace, Bethesda, Md.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1059-1065.

The paper proposes an alternative approach to solar thermal power plants to reduce the electricity cost relative to the first generation water/steam systems. The cost reduction is achieved by generating a 950 F 2400 psig steam by pumping an eutectic salt mixture of sodium nitrate and potassium nitrate as the heat transfer and storage medium to the steam generator and/or storage tank. The salt is inexpensive, has a very low vapor pressure at the use temperatures, does not react with air or water, and is not toxic. Studies of plant size, storage, collector field configuration, and receiver type indicate that the thermal storage cost below $5.00/KWht and electricity cost below 40 mills/KWhe are a reasonable goal. A.T.

A80-11987 **Industrial solar total energy systems.** J. E. Rogan (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1066-1076. Contract No. EY-C-76-03-1132.

A program to define feasible solar energy systems which satisfy selected industry demands, and to determine the market potential of such systems is presented. The application of total energy systems where the industrial process heat, electrical demands, and space heating and cooling are satisfied at maximum efficiency was emphasized. Industrial energy usage was surveyed to produce first-level designs, and subsystem methodologies were established in collector performance and sizing, thermal storage, energy conversion, and heat transport. More than 40 first-level designs were generated in meat-packing, fluid milk, sugar beets, asphalt, and concrete block industries. Conceptual designs were then generated to determine system economics and market penetration showing positive returns on investment in the small central receiver configuration, and indicating that high performance distributed collectors, high-temperature low-vapor-pressure fluids, and small turbines need to be developed. A.T.

A80-11988 **Near-term prospects for solar industrial process heat.** K. C. Brown (Solar Energy Research Institute, Golden, Colo.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1077-1085. 10 refs.

The paper reviews the state of solar technology and evaluates the prospects for early application and impact of solar industrial process heat. The distribution of the industrial process heat (IPH) demand by market required temperatures, and operating temperature ranges of solar collectors, including heliostat-power tower, point focus, and flat plate, are discussed. The twenty pilot projects which demonstrate the feasibility of solar energy to supply hot water, hot air, and steam to industrial process needs are described, noting that cost reductions will be achieved through experience, but the deleterious effects of air pollutants in the plant environment on solar system performance must be considered. It is concluded that the near-term impact of solar process heat will be affected by the resolution of key problems, which include the removal of economic uncertainties and unequitable subsidies, market identification, cost reduction, performance improvement, and accumulation of operating experience. A.T.

A80-11989 **Improvements in the performance of a low cost thin film solar cell.** J. D. Meakin (Delaware, University, Newark, Del.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1088-1096. 11 refs. Contract No. EG-77-C-03-1576.

Improvements in the energy conversion efficiency of the low-cost CdS/Cu2S solar cell are reviewed. The development of the thin-film CdS solar cell up to 1975 is shown to have led to an average CdS cell efficiency of 6.1%. A formalized procedure for cell development based on a complete analysis of efficiency-limiting mechanisms, termed loss minimization, was then developed, resulting in a hybrid grid structure with a conversion efficiency of 8.55%. Subsequent modifications to the gridding have resulted in the demonstration of a 9.15% efficiency solar cell, which is close to its design limit, and technology improvements necessary to reach an efficiency of up to 11% have been defined. The substitution of zinc for 15% to 25% of the cadmium has been predicted to lead to efficiencies greater than 14%. A continuous-process pilot plant presently under construction is expected to demonstrate the feasibility of constructing and operating a full-scale manufacturing plant for CdS/Cu2S solar cells capable of selling for as little as $250/kW as early as 1986. A.L.W.

A80-11990 **Materials resource requirements and potential limitations in solar energy products.** R. L. Watts (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1097-1113.

A systematic methodology for identifying material constraints to the future expansion of advanced energy supply technologies is presented and applied to various solar energy applications. The identification process involves tracking the sources of technology components by means of an interactive computer system and evaluating their supply according to defined thresholds at various supply levels. Nine solar heating and cooling of buildings designs and three agricultural and industrial process heat designs, assuming scales of 500,000,000 sq m of collector area by the year 2000, are shown to be free of serious future material limitations; however, certain market and production variables indicated that it would be necessary to require monitoring of the supplies of iron and steel, soda lime glass and polyvinyl fluoride. For 13 photovoltaic cell designs in 15 configurations with total powers of 50 GWe by the year 2000, the analysis indicates definite availability constraints for indium, gallium and germanium in certain photovoltaic systems. A.L.W.

A80-11991 **Materials research - Probable impacts on solar energy.** D. K. Benson (Solar Energy Research Institute, Golden, Colo.). In: Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979. Washington, D.C., Government Institutes, Inc., 1979, p. 1114-1126. 6 refs. Contract No. EG-77-C-01-4042.

Consideration is given to the development of a materials science research program in order to accelerate the commercialization of solar energy conversion technologies by improving materials quality and decreasing life cycle costs. The methodology of research plan development includes the identification of materials problems and opportunities, the design of research paths for materials innovation or improvement, cost, benefit and success probability predictions, and synthesis into a program designed to maximize the probable benefit/cost ratio. Preliminary results of the solar materials research design methodology in use at the Solar Energy Research Institute are indicated, and it is shown that even a small improvement in the performance of certain solar technologies, especially utility-based OTEC, wind and solar thermal, can lead to large increases in market penetration and large displacements of fossil fuels. It is noted that materials studies can lead to fuel savings many times greater than the cost of initial research. A.L.W.

A80-11992 **Ambient air measurements of petroleum refinery emissions.** K. Sexton and H. Westberg (Washington State University, Pullman, Wash.). *Air Pollution Control Association, Journal,* vol. 29, Nov. 1979, p. 1149-1152. 12 refs. Research supported by the U.S. Environmental Protection Agency.

An ambient air monitoring program to characterize airborne emissions from the Exxon petroleum refinery at Benicia, California was conducted during September 8-22, 1975. Ground level sampling facilities and an instrumented aircraft provided an integrated, three-dimensional monitoring network. Measurements made during the study included ozone, oxides of nitrogen, methane, carbon monoxide, individual C2-C6 hydrocarbons, halocarbons, condensation nuclei, visual distance and various meteorological parameters. The study focused on three major areas: (1) the characterization of gaseous components within the refinery effluent, especially non-methane hydrocarbons and ozone, (2) natural sunlight bag irradiation experiments to determine the ozone forming potential of refinery emissions, and (3) an investigation of changes in plume chemistry as refinery emissions were transported downwind. (Author)

A80-12027 # **Stability of a system of coaxial superconducting shells (Ob ustoichivosti koaksial'noi sistemy sverkhprovodiashchikh obolochek).** R. N. Ovakimian (Akademiia Nauk Armianskoi SSR, Institut Mekhaniki, Yerevan, Armenian SSR). *Akademiia Nauk Armianskoi SSR, Izvestiia, Mekhanika,* vol. 32, no. 3, 1979, p. 42-55. 8 refs. In Russian.

The paper investigates the stability of a system of superconducting coaxial cylindrical shells under the influence of electromagnetic loads. The effect of the cryogenic liquid is neglected. The

Maxwell equations are solved to obtain expressions for the linear current density and the magnetic field intensity. A dispersion equation is derived for the case of loading the system of current-carrying shells with a transverse electromagnetic force. The critical values of the electromagnetic load are determined by computer for different sizes of the inner shell. It is shown that the current-carrying shell is more stable in the coaxial system than when it is in a free state. S.D.

A80-12049 **The physics of laser fusion.** H. Motz (Oxford University, Oxford, England). London and New York, Academic Press, 1979, 299 p. 207 refs. $40.50.

The basic physical aspects of laser-driven fusion are considered. Fusion reactions and the generation of power from them are discussed and laser systems are treated. Plasma physics is introduced, with discussions of collective motions, wave propagation and transverse waves, and nonlinear plasma processes, including stimulated and spontaneous transitions, Cerenkov radiation, scattering processes and filamentation, are discussed. Attention is given to the quasi-potential, the ponderomotive force and the emission and absorption of laser light by an inhomogeneous plasma surrounding the target. Shock waves and implosions are treated, with consideration of shock propagation, detonation and the isentropic compression of thin shells, and the Rayleigh-Taylor and Bénard instabilities are considered. The characteristics of plasmas at high density, pressure and temperature are examined, and the Medusa and simulation computer codes are presented. Results from experiments concerning temperature determination, ion spectra, absorption and profile steepening are also reviewed. A.L.W.

A80-12125 **Performance of silicon solar cells in front of a water absorber.** J. D. Arora and P. C. Mathur (Delhi, University, Delhi, India). *International Journal of Electronics,* vol. 47, Aug. 1979, p. 167-170. 5 refs.

I-V curves as a function of path length in ordinary and distilled water have been measured for two n-on-p diffused junction silicon solar cells. The normalized short circuit current and normalized conversion efficiency for the cells for different path lengths are determined from the I-V curves and comparison of the experimental results has been made with theoretical calculations. It is found that the agreement between the theoretical and experimental results is better for the cell having low substrate acceptor concentration. The agreement is still better with distilled water results. (Author)

A80-12128 # **Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States.** R. Rollins and J. B. Homolya (U.S. Environmental Protection Agency, Environmental Sciences Research Laboratory, Research Triangle Park, N.C.). *Environmental Science and Technology,* vol. 13, Nov. 1979, p. 1380-1383. 14 refs.

Measurements were carried out at two refuse energy recovery systems to assess the atmospheric emissions of HCL. Flue gas measurements data were used to establish both emission factors and mass emission rates. The latter were used as inputs to an elevated point source dispersion model to estimate maximum surface concentrations of HCl under a variety of meteorological conditions. The projected ambient HCL levels associated with refuse energy recovery processes raise a question regarding the potential for significant materials damage resulting from uncontrolled emissions. (Author)

A80-12166 **Flywheels for energy storage.** A. R. Millner (MIT, Lexington, Mass.). *Technology Review,* vol. 82, Nov. 1979, p. 32-40. 8 refs.

Flywheels are considered as an economical means of storing energy generated by solar and wind power systems and electric utilities when demand is low until the demand is high. The structural failure modes of flywheel materials are examined, noting the favorable characteristics of anisotropic wound fiber or fiber composite construction, and estimates of rotor size on the order of one ton for domestic applications (40 kWh storage capacity) are presented. Magnetic bearings are proposed as means of eliminating rotor drag in a vacuum environment while drawing only a small current and being capable of operating for at least 20 to 30 years. The design of motor-generators to convert electrical energy to mechanical energy and back again is examined, and brushless magnetic motor-generators are discussed. Cost comparisons show that flywheel storage could be cost-competitive with battery systems over a 20-year lifetime. A.L.W.

A80-12244 **Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis.** K. Tanabe, H. Sasaki, H. Hattori, K. Ouchi, K. Makino, H. Itoh (Hokkaido University, Sapporo, Japan), and G. Takeya (Hakodate Technical College, Hakodate, Japan). *Fuel Processing Technology,* vol. 2, Oct. 1979, p. 253-259. 12 refs.

The activities of fourteen kinds of catalysts for the hydrocracking of Taiheiyo coal were examined by a high pressure differential thermal analytical method. Exothermic peaks appeared at low temperatures (420-430 C) when MoO3-TiO2, Ni-Y zeolite and Co-Y zeolite were used as catalysts, indicating that these catalysts are highly active compared with other catalysts, including MoO3-CoO-Al2O3. The qualitative analysis of gas and liquid products revealed that MoO3-TiO2 and Co-Y are good catalysts for the liquefaction reaction. The hydrogenation ability of the catalyst is concluded to be more important than its acidity. (Author)

A80-12245 **An update of German non-isothermal coal pyrolysis work.** H. Jüntgen and K.-H. Van Heek (Bergbau-Forschung GmbH, Essen, West Germany). *Fuel Processing Technology,* vol. 2, Oct. 1979, p. 261-293. 50 refs.

The paper describes the theoretical and experimental approaches used and the results obtained so far from basic studies of coal pyrolysis at Bergbau-Forschung. Attention is given to nonisothermal kinetics of gas formation, interplay of devolatilization with combustion, interaction of pyrolysis and gasification, and pyrolysis under extremely high temperatures. Further work must take pressure into account, as trends in modern coal processing are toward elevated pressures in gasification and even combustion. Pressure could also be an additional factor in controlling the rates and yields of products. S.D.

A80-12246 **Catalysis of hydrogen transfer in a tetralin-coal system.** M.-C. Tsai and S. W. Weller (New York, State University, Buffalo, N.Y.). *Fuel Processing Technology,* vol. 2, Oct. 1979, p. 313-316. 7 refs. Research supported by the U.S. Department of Energy.

The paper is concerned with hydrogen donation from tetralin to coal in the presence of either 'cobalt-molybdate'-alumina (Co/Mo/Al2O3) or stannous chloride (SnCl2.2H2O). The former is known to be outstanding for hydrodesulfurization, the latter for hydroliquefaction of coal. Procedures and calculation methods differ in detail from those described by Neavel (1976), but definitions of hydrogen transfer and coal conversion are the same as his. The experiments are conducted in a small turbine reactor. As preliminary 'blank' experiments, two runs at 400 C are made with tetralin in the absence of coal but in the presence of catalyst in order to establish whether the reaction tetralin yielding naphthalene + H2 proceeds to any appreciable extent. Results in all the tetralin-coal runs are summarized in tabular form. For one coal, at least, the experiments demonstrate that hydrogen transfer at 400 C from tetralin to coal can be catalyzed by either Co/Mo/Al2O3 or SnCl2.2H2O, the latter being more effective. S.D.

A80-12310 **Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields.** S. T. Fisher (F. T. Fisher's Sons, Ltd., Montreal, Canada). *Canadian Electrical Engineering Journal,* vol. 14, Oct. 1979, p. 15-18. 6 refs.

The paper presents the results of a study made to determine the feasibility of extracting the energy commodities - electricity, gas, petroleum, coke, and chemical feedstocks - from coal, oil sand, and heavy oil, heating the deposits by electric and magnetic fields. It is reported that available electrical and chemical data indicate that this process may be technically and economically feasible. It is noted that some basic data are missing making it necessary to indicate possible ranges of values for some parameters. It is tentatively concluded that: (1) all these solid fossil fuels can be successfully processed underground, (2) all five energy commodities can be produced economically in adequate quantities for a period of a century or more, and (3) the development and construction time required is short enough to permit uninterrupted supply of energy commodities as present sources decline. M.E.P.

A80-12311 **Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials.** F. E. Vermeulen, F. S. Chute, and M. R. Cervenan (Alberta, University, Edmonton, Canada). *Canadian Electrical Engineering Journal*, vol. 4, Oct. 1979, p. 19-28. 25 refs. Research supported by the Alberta Oil Sands Technology and Research Authority and Natural Sciences and Engineering Research Council.

Maxwell's equations and the thermal equation for heat flow are considered and scaling criteria are developed which show that it is possible to construct scaled physical models in which the electromagnetic and thermal phenomena of the full scale system can be modeled simultaneously. It is demonstrated that simultaneously modeling is made possible by simulating electromagnetic frequency and thermal events on different time scales. It is also shown that simultaneous modeling of electromagnetic and thermal phenomena can be carried out when the electrical conductivity of the medium of the full scale system is temperature dependent. The electrical and thermal properties of oil sand and the general problem of in-situ recovery of oil therefrom have been used to guide the development of the modeling criteria. It is concluded that the results obtained can be applied to a large class of other problems as well, such as electromagnetic heating of earth-type materials in the mining and construction industry, as well as the electromagnetic heating of food stuffs and biological tissue. M.E.P.

A80-12426 **Computers in the design of solar energy systems.** S. A. Klein, J. W. Mitchell, J. A. Duffie, and W. A. Beckman (Wisconsin, University, Madison, Wis.). *Energy* (UK), vol. 4, Aug. 1979, p. 483-501. 58 refs. NSF-supported research; Contract No. E(11-1)-2588.

The methodology developed for detailed simulations of solar energy systems is presented. Consideration is given to the development of models for several specific system components from which the simulation model of a system is composed. The models are formulated from basic engineering principles, and a sensitivity analysis is performed to find those simplifications which yield a computational efficient, yet accurate, solution. Three components, a collector, storage tank, and building structure, are used as examples. These components are then combined into a simulation model for the space and hot water heating system of the Solar House. The performance data available from this house is compared with the simulation results. Emphasis is placed on simplified design methods based on the results of detailed computer simulations. V.T.

A80-12427 **On the performance of air-based solar heating systems utilizing phase-change energy storage.** J. J. Jurinak and S. I. Abdel-Khalik (Wisconsin, University, Madison, Wisc.). *Energy* (UK), vol. 4, Aug. 1979, p. 503-522. 22 refs. Contract No. E(11-1)-2588.

Simulation techniques are used to examine the performance of air-based solar heating systems utilizing phase change energy storage (PCES). The effects of storage size, melting temperature, and latent heat on the thermal performance of the system are quantified for various load characteristics, collector types, and control strategies. The effect of semi-congruent melting of the phase-change material (PCM) on system performance is also examined. Based on these simulations, (1) optimum physical properties of the PCM have been identified, (2) an empirical method for sizing PCES units has been developed, (3) a system-oriented figure of merit for comparing different PCMs has been established, and (4) the economic gains associated with the storage volume reductions achieved with PCES, vis-à-vis sensible heat storage in rock beds, have been quantified. (Author)

A80-12428 **Insolation modeling overview.** E. C. Boes (Sandia Laboratories, Albuquerque, N. Mex.). *Energy* (UK), vol. 4, Aug. 1979, p. 523-529. 9 refs. Contract No. DE-AC04-76DP00789.

This paper gives a summary of some of the major national projects in the area of solar radiation resource assessment. It also discusses the primary solar radiation data sources for the U.S. and the models that were used in developing these sources. Recommendations for appropriate solar radiation resource information for various types of solar system design and analysis needs are given. (Author)

A80-12429 **Validation of computer models for predicting radiation levels on tilted surfaces.** L. J. Lantz and C. B. Winn (Solar Environmental Engineering Co., Fort Collins, Colo.). *Energy* (UK), vol. 4, Aug. 1979, p. 531-536. 8 refs.

A methodology is developed for the validation of computer models used to predict the instantaneous radiation on a tilted surface, given the similar radiation on the horizontal surface. The resulting methodology is also used to evaluate algorithms used to predict horizontal radiation from surface and cloud cover statistics as well as the radiation model used in program SOLCOST which predicts the expected mean daily total radiation for a specific surface and location using primarily the per cent of possible sunshine value. Attention is given to the three phases of the validation process: (1) collection and evaluation of measured data, (2) discussion of model logic and assumptions, and (3) consideration of the statistics of model calculation versus measured results. Finally, the model validation methodology is presented and illustrated by analysis of four computer models used to predict instantaneous radiation levels on tilted surfaces. M.E.P.

A80-12430 **Solar cooling performance predictions via stochastic weather algorithms.** D. K. Anand and I. N. Deif (Maryland, University, College Park, Md.). *Energy* (UK), vol. 4, Aug. 1979, p. 537-548. 5 refs. Contract No. EY-76-S-05-4976-A003.

A80-12431 **Validation methodology for solar heating and cooling systems.** D. K. Anand, W. J. Kennish, A. C. Stolarz (TPI Inc., Energy Systems Analysis, Beltsville, Md.), and T. M. Knasel (Science Applications, Inc., McLean, Va.). *Energy* (UK), vol. 4, Aug. 1979, p. 549-560. 15 refs. Contract No. EM-78-C-04-4261.

The paper presents the validation methodology for solar heating and cooling computer programs to provide levels of confidence associated with detailed and simplified analysis models. A 4 level methodology is proposed, the first dealing with the validation of simulation programs with respect to unmodeled parameters, the second addressing the inaccuracies in simplified analysis procedures due to unmodeled parameter variation, while level three deals with assessment of variation in results due to the field variation of modeled parameters. Level four provides a verification of the results of level three by comparison studies with field performance data, resulting in a quantification of the level of confidence with which the simplified analysis program can be used. A case study was prepared to illustrate the Monte Carlo techniques suggested in levels two and three, concluding that this validation methodology will help establish an efficient solar system testing program. A.T.

A80-12432 **Instrumentation principles for performance measurement of solar heating systems.** N. Lior (Pennsylvania, University, Philadelphia, Pa.). *Energy* (UK), vol. 4, Aug. 1979, p. 561-573. 49 refs. Research supported by the U.S. Department of Energy.

An instrumentation design and implementation plan for monitoring the performance of solar heating systems and their components is described. Specifically, the selection of the data acquisition system and of the sensors, the procurement process, and installation and calibration principles are discussed in detail. As a practical example, the cost and choice of measurement methods and instruments used in the University of Pennsylvania SolaRow house are presented. (Author)

A80-12433 **A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis.** S. Noll and W. O. Wray (California, University, Los Alamos, N. Mex.). *Energy* (UK), vol. 4, Aug. 1979, p. 515-591. 13 refs. Research supported by the U.S. Department of Energy.

This paper presents a microeconomic methodology for the analysis and design evaluation of residential passive solar heating applications. Results from PASOLE, an hour-by-hour thermal network simulation program developed at Los Alamos, are used to graphically evaluate design-performance tradeoffs and to estimate quantitative interpolative relationships within the context of economic production function theory. Solar performance isoquants are generated and combined with architectural costs estimates to arrive at least-cost expansion paths along which the optimal life-cycle system can be determined. Comfort considerations, sizing limitations, building code restrictions and other factors introduce constraints in the design process, which can be dealt with qualitatively or quantitatively through a constrained optimization procedure. (Author)

A80-12434 **Optimal insulation of solar heating system pipes and tanks.** G. F. Jones and N. Lior (Pennsylvania, University, Philadelphia, Pa.). *Energy* (UK), vol. 4, Aug. 1979, p. 593-621. 10 refs. Research supported by the Pennsylvania Science and Engineering Foundation, U.S. Department of Housing and Urban Development, and U.S. Department of Energy.

A compact and time-effective insulation design procedure for solar heating system piping and water-filled thermal storage tanks is presented. The economics were treated by a present-value life-cycle cost analysis by determining the effects of piping variables and tank heat transfer coefficient values. It was found that only the pipe or tank diameter, the thermal conductivity of insulation, and the insulation thickness affect the overall heat transfer coefficient; the design data based on this result are presented which can be used to determine the optimal insulation thickness and type, annual heat losses, present-value annual insulation costs and lost heat, and overall insulation R-values. A major conclusion is that insulation cost in solar systems is significant, and that heat losses through insulation can amount to an important portion of the useful solar energy collected. A.T.

A80-12435 **Passive and active residential solar heating: A comparative economic analysis of select designs.** F. Roach, S. Noll (California, University, Los Alamos, N. Mex.), and S. Ben-David (New Mexico, University, Albuquerque, N. Mex.). *Energy* (UK), vol. 4, Aug. 1979, p. 623-644. 13 refs. Research supported by the U.S. Department of Energy.

A comparison is made between four passive solar heating concepts and a conventional air collector/rock storage system. Masonry (Trombe) and water walls are considered in the presence and absence of night insulation, and the performance of optimally sized systems is evaluated on a state-by-state basis. In addition, the effects of low interest loans and National Energy Act (NEA) income tax credits are examined. It is shown that with natural gas as the alternative fuel, the passive designs evaluated offer more promise than the active system. In addition, it is noted that the passive designs are economically competitive against the electric resistance alternative in all but a few states. Finally, on a life cycle cost basis, these designs are shown to be feasible today. M.E.P.

A80-12436 **The marginal cost of electricity used as backup for solar hot water systems - A case study.** R. Bright and H. Davitian (Brookhaven National Laboratory, Upton, N.Y.). *Energy* (UK), vol. 4, Aug. 1979, p. 645-661. 10 refs. Contract No. EY-76-C-02-0016.

A80-12437 **Determination of the optimal solar investment decision criterion.** M. R. Sedmak (Booz Allen and Hamilton, Inc., Bethesda, Md.) and E. M. Zampelli (PRC Energy Analysis Co., McLean, Va.). *Energy* (UK), Aug. 1979, p. 663-683. 10 refs.

This paper deals with the validity of the solar investment decision criteria employed in various studies. The life-cycle cost criterion (or positive net present value criterion) commonly used by solar analysts is examined, and it is shown that, given the theoretical hypotheses of dynamic investment planning and decision making, this criterion is suboptimal for evaluating the economic viability of fuel-saver solar systems. The optimal 'present cost competitive' criterion is then established and analyzed. The effect of uncertainty is introduced into the analysis by an examination of the payback-period criterion. To highlight the differences between these criteria, a comparison of the timing of and net benefits derived from investments in a residential solar space and water heating system made under each criterion is presented. (Author)

A80-12438 * **A high performance porous flat-plate solar collector.** F. L. Lansing, V. Clarke (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.), and R. Reynolds (Kentrol International, Inc., Pasadena, Calif.). *Energy* (UK), vol. 4, Aug. 1979, p. 685-694. 15 refs. Contract No. NAS7-100.

A solar collector employing a porous matrix as a solar absorber and heat exchanger is presented and its application in solar air heaters is discussed. The collector is composed of a metallic matrix with a porous surface which acts as a large set of cavity radiators; cold air flows through the matrix plate and exchanges heat with the thermally stratified layers of the matrix. A steady-state thermal analysis of the collector is used to determine collector temperature distributions for the cases of an opaque surface matrix with total absorption of solar energy at the surface, and a diathermanous matrix with successive solar energy absorption at each depth. The theoretical performance of the porous flat plate collector is shown to exceed greatly that of a solid flat plate collector using air as the working medium for any given set of operational conditions. An experimental collector constructed using commercially available, low cost steel wool as the matrix has been found to have thermal efficiencies from 73 to 86%. A.L.W.

A80-12439 **Modeling of a thermal wall panel using phase change materials.** S. I. Guceri and S. F. Faunce (Delaware, University, Newark, Del.). *Energy* (UK), vol. 4, Aug. 1979, p. 695-699. 8 refs.

This work presents a model for a phase-change material (PCM) thermal wall being tested at the University of Delaware's Solar One House under the auspices of the Institute of Energy Conversion. The PCM is contained in small-diameter tubes with staggered arrangement. Charging of the unit is done during the periods of insolation by using direct solar radiation. The discharge of the unit is provided by air flow across the tube arrangement to carry heat; a computer model is developed to predict the response of the unit during its discharge from a given initial state. The tubes are lumped in groups of three along the air stream. The Biot number is found to be less than 0.1, which indicates that the error associated with lumping is less than 5%. Each bundle of tubes is considered in three distinct regimes: presolidification, solidification, postsolidification. The model developed thus far has been used to predict the time response of the wall panel in satisfactory agreement with the actual performance. The simulation helped to establish the important system parameters. (Author)

A80-12440 **Design criteria in PCM wall thermal storage.** A. D. Solomon (Union Carbide Corp., Nuclear Div., Oak Ridge, Tenn.). *Energy* (UK), vol. 4, Aug. 1979, p. 701-709. 15 refs. Contract No. W-7405-eng-26.

Criteria for optimizing the thermal behavior of a wall composed of a phase-change material interspersed in a cementlike structural material are discussed. Results of computer simulations for a particular wall configuration are examined, and the heat-transfer process in such a system is interpreted. Some quantitative relations describing the wall behavior are outlined. The temporal variation of the wall system is considered, and an approximate expression is obtained for the total discharge time for stored latent heat in the wall. F.G.M.

A80-12453 **A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour.** W. Koppendorfer (EURATOM and Max-Planck-Institut fur Plasmaphysik, Garching, West Germany). *Nuclear Fusion*, vol. 19, Oct. 1979, p. 1319-1325. 13 refs.

A model first used to describe hydrogen isotope trapping and replacement in the wall of pinch discharges is extended to tokamak discharges including pulsed gas inlet. It calculates the trapped-particle density in the walls versus time as a function of trapping coefficient, replacement cross-section, geometrical factors, particle confinement time and cold-gas influx. The solutions are used to describe the development of the average electron density and yield criteria for the conditions under which the plasma density falls or rises during a discharge. The model also allows a distinction between plasma/limiter and plasma/first-wall interaction. A comparison with measurements from tokamak discharges is made. (Author)

A80-12607 **Monitoring of the solar-heated modular homes at Los Alamos.** J. C. Hedstrom (California, University, Los Alamos, N. Mex.). In: International Instrumentation Symposium, 25th, Anaheim, Calif., May 7-10, 1979, Proceedings. Part 1. Pittsburgh, Pa., Instrument Society of America, 1979, p. 121-126.

On-line performance of an active solar heated Modular Home has been obtained since October, 1976, with a desk top calculator controlled data acquisition system. A second passive heated Modular Home has been installed and is being monitored with the same system to obtain a comparison between the two units. This paper describes the modular homes, the data system and data reduction technique and presents some of the results obtained. (Author)

A80-12608 **Heat flow meters for solar system performance monitoring.** G. Russell (Conserdyne Corp., Glendale, Calif.). In: International Instrumentation Symposium, 25th, Anaheim, Calif., May 7-10, 1979, Proceedings. Part 1. Pittsburgh, Pa., Instrument Society of America, 1979, p. 131-134.

Heat-flow meters for solar heating applications are needed to provide a low-cost verification of the solar system's performance level. Due to the wide variety of temperature and flow conditions encountered in this field, designers should be aware of all the options available to them in order to design flexible, accurate, and economical heat-flow meters. In the present paper, the basic theory of heat flow measurement is outlined, and the types of temperature sensing devices, flow measurement devices, and electronics packages needed to manufacture heat-flow meters that will operate under various temperature and flow conditions are discussed. V.P.

A80-12609 **Energy meter for solar air systems.** C. B. Winn (Colorado State University, Fort Collins, Colo.). In: International Instrumentation Symposium, 25th, Anaheim, Calif., May 7-10, 1979, Proceedings. Part 1. Pittsburgh, Pa., Instrument Society of America, 1979, p. 135-138.

The paper deals with a low-cost energy meter developed for homeowners to determine (without computation) the amount of solar energy being collected. The energy readings are either in British thermal units or kilowatt hours. The display is digital and nonvolatile. The meter takes into account the different air flow rates that occur in air systems, depending on the mode of operation. The power consumption of the meter is negligible. V.P.

A80-12626 **Color graphic controls for the solar central receiver test facility.** D. M. Darsey (Sandia Laboratories, Albuquerque, N. Mex.). In: International Instrumentation Symposium, 25th, Anaheim, Calif., May 7-10, 1979, Proceedings. Part 2. Pittsburgh, Pa., Instrument Society of America, 1979, p. 345-352. 5 refs. Research supported by the U.S. Department of Energy.

The generalized, programmable graphics-and-image display terminal used at the Sandia central receiver test facility (CRTF) is described. The graphics hardware, integration software, and application programs are discussed as they apply to the real-time control and data presentation of the testing facility. The terminal features a single Facility Operator, separated controls for the Facility Operator and Experimenter with common display data, rapid display update without affecting control, and easily read data in engineering units. The flexibility of the display terminal will enable the CRTF to be tailored for new types of tests without changing anything but software of just interacting with a master control system. V.T.

A80-12627 **Heliostat Beam Characterization System.** E. D. Thalhammer and G. S. Phipps (Sandia Laboratories, Albuquerque, N. Mex.). In: International Instrumentation Symposium, 25th, Anaheim, Calif., May 7-10, 1979, Proceedings. Part 2. Pittsburgh, Pa., Instrument Society of America, 1979, p. 353-364. 9 refs.

The Beam Characterization System utilizes video radiometer techniques to quantitatively describe the solar energy projected by a heliostat. This system is designed to evaluate prototype heliostats and to improve the performance of the Central Receiver Test Facility heliostats. The system consists of a beam target, video camera, analog image analyzer, calibration system, video digitizer and a minicomputer system. The calibration technique corrects for background illumination, target irregularities, vidicon shading and camera dark currents. A computer code corrects for off-axis camera angle and converts calibration and beam data into a map of screen irradiance. Post test data analysis provides the geometric centroid, energy versus radius, iso-flux contours, intensity cross sections and 3-D intensity diagrams which are determined from the data map. The system has a fast data capture mode which can be used to study wind loading and short term tracking errors. The capabilities of the Beam Characterization System make it a useful heliostat evaluation tool. (Author)

A80-12628 **An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory.** G. I. Chandler, J. W. Lilberg, K. A. Klare, and R. W. Wilkins (California, University, Los Alamos, N. Mex.). In: International Instrumentation Symposium, 25th, Anaheim, Calif., May 7-10, 1979, Proceedings. Part 2. Pittsburgh, Pa., Instrument Society of America, 1979, p. 365-370. 7 refs.

An overview of the use of computers for data acquisition and control in fusion experiments is presented. Small to medium scale minicomputers interfaced to the experiment through CAMAC modules were used. System shielding and grounding were given special consideration. It is noted that the use of top-down, modular design techniques for both software and hardware increases system reliability and reduces system maintenance effort. The systems discussed can also be used for on-line data analysis and linked to a center where additional off-line analysis can be performed. V.T.

A80-12735 # **Area load-frequency control.** T. M. Athay, R. G. Smith (Systems Control, Inc., Palo Alto, Calif.), and H. G. Kwatny (Drexel University, Philadelphia, Pa.). In: Annual Allerton Conference on Communication, Control and Computing, 16th, Monticello, Ill., October 4-6, 1978, Proceedings. Urbana, Ill., University of Illinois, 1978, p. 882-893. 12 refs. Contract No. EG-77-01-2118.

Four basic objectives of load-frequency control (LFC) are discussed: (1) total-area generation should be controlled so as to track the area load plus schedule; (2) the individual-unit generations should be controlled so as to track the desired unit economic trajectories; (3) load-frequency control should allow the area primary response to occur naturally; and (4) individual-unit response rate limitations must not be violated. The parallel structure of LFC is exploited by designing independent controllers for each generating unit and a coordinating controller for the control area. These two components of the LFC structure are discussed and evaluated using a combination of the linear-quadratic-Gaussian (LQG) synthesis techniques, linear simulation, and frequency domain analysis. V.T.

A80-12739 **Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978.** Convention sponsored by the Solar Energy Society of India, Council of Scientific and Industrial Research, Department of Science and Technology, et al. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979. 742 p. $30.

The convention focused on solar radiation, photobiology, photochemistry, flat plate collectors, concentrators, solar thermal power and storage, solar water heaters and refrigerators, industrial applications and solar cells. Specifically, papers were presented on energy plantation for the Coromandel littoral, photogalvanic cells, effect of boosters on the flat plate collector performance, transient rise of plate temperature in solar collectors, performance of a high temperature air heater, an investigation of a compound parabolic concentrator, a seasonally adjusted collector made of mirror strips, testing of solar domestic water heaters, utilization of solar energy in dairy processing, design of a solar heated house, solar furnaces in foundries, role of the oxide layer in Schottky barrier solar cells, cadmium telluride solar cells, annealing and degradation studies of ceramic CdS solar cells, solar radiation, an electronic device for intermittent tracking, and performance of solar regenerators. A.T.

A80-12740 # **Solar energy availability over India for maximum utilisation.** H. R. Ganesan (Meteorological Office, Poona, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 1-7.

A80-12742 # **Energy plantation for coromandel littoral.** C. V. Seshadri and G. Venkataramani (Shri A.M.M. Murugappa Chettiar Research Centre, Madras, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 36-40.

The paper considers an energy plantation which grows plants for their fuel value with casuarina as the energy crop. In energy plantations the fuel resource is renewable, fuel transportation is minimal, and forestation conserves soils; however, large areas are needed, and new power plant designs may be required for the new fuel. Using Pondicherry and Madurantakam, India, cultivation practices, cost and energy analyses were performed for setting up a 160 MWe power-plant burning fuel-wood from the casuarina tree. The Pondicherry method using 10,000 trees/ha and producing up to 300 tons/ha in a 4-year cycle appears most suitable, requiring 1.1 sq km per MW. The plantation should be amortized in 5 to 30 years, with the land becoming wholly owned by the plantation at the end of longer periods. It is concluded that energy plantations provide means of generating small amounts of decentralized power for rural use. A.T.

A80-12743 # **Studies of photogalvanic cells.** R. Narayan and M. Subrahmanyam (Indian Institute of Technology, Madras, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 56-59. Research supported by the Department of Science and Technology of India.

An investigation to determine redox couples in combination with platinum and other electrode materials to provide good efficiency and reproducibility is presented. The reasons for poor efficiency are the internal cell resistance, the back reaction, and incorrect pretreatment of electrodes. Platinum gauze and foil, sintered Ta cylinders, Ta plates, stainless steel sheets, and carbon blocks were used as electrodes. Co(2+), Co(3+), and Cr(3+) ions, thionine dyes, and H2SO4 and HCl electrolytes were tested, noting that with Co(2+) and thionine in HCl a photogalvanic (pg) potential of -70 to -90 mV was observed with Pt electrodes. With stainless steel plate electrodes about -300 mV pg effect was obtained within two minutes of illumination, but the current through an 100 ohm resistance was only 20-30 microamperes requiring a modification of the cell geometry and chemistry. A.T.

A80-12744 # **Effect of boosters on the performance of flat plate collector.** P. C. Pande, H. P. Garg, and K. P. Thanvi (Central Arid Zone Research Institute, Jodhpur, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 61-70. 8 refs.

The effect of boosters (plane reflectors) on the performance of a flat plate collector inclined at an optimum tilt is determined for different seasons. The integrated enhancement in the energy gain by the collector due to boosters is calculated considering variation of transmittance of glass cover with angle of incidence, absorptance by the collector plate, and the total collector area exposed by the reflected radiations. It was found that more solar energy can be collected by adding boosters to the flat plate collector, which will be more effective with a large number of these collectors. During winter, a booster at the top edge of the south facing collector is more effective than that at the bottom edge, while the reverse is true during the summer. An experimental study of the improvement in the performance of a built-in storage type solar water heater by boosters was performed, concluding that available solar radiation should be analyzed in terms of direct and diffuse radiation before using the booster. A.T.

A80-12745 # **Solar energy flat plate collectors - Optimization of air gap.** N. M. Nahar and H. P. Garg (Central Arid Zone Research Institute, Jodhpur, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 71-78. 13 refs.

Convection losses between the absorber plate and glass cover calculated for various gap sizes and temperatures using previously developed correlations of natural convection in enclosed spaces are examined. The natural convective heat transfer coefficients were developed for horizontal, vertical, and tilted collectors, noting that coefficients decrease and shading on absorber plates due to side walls increases with increasing gap. The shade correction factor was calculated for several optimum tilt values of the collector at low and medium latitude stations. The gap between the absorber and cover glazing was optimized by considering natural convection and shading, concluding that for minimum convection losses and shading a 4 to 5 cm gap should be maintained for efficient use of a solar energy flat plate collector. A.T.

A80-12746 # **Transient rise of plate temperature in solar collectors.** M. S. Sodha, S. C. Kaushik, G. N. Tewari, A. K. Seth (Indian Institute of Technology, New Delhi, India), and M. A. S. Malik (Kuwait Institute of Scientific Research, Kuwait). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 84-87.

A80-12747 # **Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis.** A. K. Sharma, B. K. Gupta, S. S. Mathur, and O. P. Agnihotri (Indian Institute of Technology, New Delhi, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 119-121.

A80-12748 # **An investigation of experimental performance of a compound parabolic concentrator.** K. K. Rao (Regional Research Laboratory, Bhuvaneswar, India), S. B. Ahmed (Corporate R&D BHEL, Hyderabad, India), R. Natarajan, and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 137-141. 5 refs.

An experimental performance of a header-type compound parabolic concentrator (CPC) and a flat-plate collector (FPC) were investigated. Two collector configurations were considered: a collector with the absorber tubes oriented in the east-west direction, and a configuration in which the absorber tubes of the FPC were oriented in the north-south direction. The effects of several fluid flow rates and tilt angles on efficiency and useful thermal energy gain was determined as a function of the hour of the day. The CPC was found to be more efficient than FPC for two hours around noon when the tilt was equal to declination, but the FPC had better over-all performance when the tilt angle was equal to latitude. A.T.

A80-12749 # **Performance of solid compound parabolic concentrators in series.** R. Kumar, S. B. L. Garg, and R. K. Bhardwaj (Motilal Nehru Regional Engineering College, Allahabad, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 142-147. 5 refs.

The possibility of combining two or three solid compound parabolic concentrators (CPC) one over the other using materials of different refractive indices for collecting radiation at high concentration ratios is investigated. It was found that for the same aperture and concentration ratios, the collecting surface area of a multistage collector is minimized with a substantial saving in overall depth as compared to a single stage CPC above a critical concentration factor. For a satisfactory design, the first stage acceptance angle should be smaller than that of the second stage concentrator, and the divergence angle of a light beam higher than in a single CPC. It is concluded that collectors with more than two-stages have only limited advantages for reasons of absorption and refraction of rays. A.T.

A80-12750 # **A seasonally adjusted concentrating collector made of mirror strips.** S. C. Mullick and S. K. Nanda (Indian Institute of Technology, New Delhi, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 153-157. 11 refs.

The design and thermal performance of a seasonally adjusted concentrating collector for a tubular absorber with a glass cover, limiting the number of reflections and the incidence angle, are presented. Absorber design is discussed, noting that the angle of incidence on the glass cover can be limited to any desired value for efficient transmission by the proper choice of the ratio of the absorber radius to the glass tube. The sizes of the absorber and the glass tube are computed by thermal network analysis of radiation and convection heat losses from the absorber to the glass cover, and then to the atmosphere: the slope and the width of reflector mirror strips are related to incident rays. Finally, testing of the collector is described, with the optical efficiency determined under steady insolation and minimal heat losses. A.T.

A80-12751 # **Selection of working fluids for low temperature solar thermal power cycles.** A. Jaganmohan and S. G. Kandlikar (Indian Institute of Technology, Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 159-165. 10 refs.

The effect of the working fluid properties and the operating temperatures on the Rankine cycle performance and the turbine design in solar thermal power plants is investigated. The saturation curves, specific volume and latent heat, and stability are discussed; the performance of seven working fluids is compared. All the fluids are stable up to 110 C, but acetone is explosive requiring special care in operating a power plant. The vapor after isentropic expansion for R-11, R-21, methylene chloride and acetone is slightly in the wet region, and steam has the maximum efficiency, but is not recommended for low temperature cycles. However, for high temperature cycles with large power outputs steam is highly suitable. For low temperature cycles, methylene chloride, R-113, R-11, and R-114 are recommended in that order for low power units. For slightly higher temperature cycles and also for medium sized units, methylene chloride is promising and should be experimentally investigated. A.T.

A80-12752 # **Prime mover for solar power plant.** S. C. Jain (Samrat Ashok Technology Institute, Vidisha, India), A. Jaganmohan, and B. S. Jagadish (Indian Institute of Technology, Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 166-170.

Design and development of a 5 kW turbine for a solar power plant are presented. The Freon-11 working fluid is used with the operating cycle between 80 and 40 C. Design assumes a flat plate collector system which sets an upper limit to the maximum cycle temperature and restrictions on the working fluid. The turbine wheel blades were produced as integral parts of the wheel disk, and featured enclosure of the high pressure end of bearing and labyrinth sealing on the low pressure side with a provision for a direct drive. The performance test is discussed, noting that the turbine performance depends on the ratio of the blade to fluid velocity, and that an optimum exists for each mass flow rate condition. It is concluded that these initial tests proved the feasibility of turbine design for small ouputs of the order of 5 kW at moderate rotational speeds. A.T

A80-12753 # **A parametric study of solar thermal power plant.** A. A. Samuel, U. S. P. Shet, K. A. Bhaskaran, and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 171-179.

The solar thermal power plant discussed in this paper consists of four subsystems: collector system, storage system, prime mover, and generator. The paper considers a Rankine cycle engine which has high thermal efficiency, relatively simple mechanical components and acceptability for use over a wide range of powers. Three working fluids (butane, F113 and F114) are selected because of their low boiling point, high molecular weight and positive slope of vapor saturation curve. A parametric study is carried out to shed light on the design of a solar thermal power plant. The results show the effect of mass flow rate of the working fluid turbine inlet temperature and condenser pressure on thermal and cycle efficiencies of solar thermal power plants that use different working fluids. The results point to the great potential of a solar thermal power plant. Power could be derived more efficiently using a double-fluid Rankine cycle with water as the collector fluid and F114 as the working fluid. A double-glazed collector is seen to improve system efficiency by 1% with 4-C increase in optimum collector temperature. S.D.

A80-12754 # **Economics of small solar power plants.** B. S. Jagadish (Indian Institute of Technology, Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 180-185. 15 refs.

The economic parameters of energy conversion using flat plate collector systems in the output range of 5-25 kW (suitable for rural applications) are examined. Both capital cost per installed kW capacity and the cost of energy per kWH are computed. Some ways to make such systems more efficient are discussed. B.J.

A80-12755 # **Storage of solar heat by solid-liquid phase change.** V. Seeniraj (Government College of Technology, Coimbatore, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December

20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 186-189. 9 refs.

The storage of solar energy using phase change materials possessing high heats of fusion is analyzed for two energy storage and extraction configurations. Solutions for interface movement, temperature drop and surface heat flux for a tube filled with a salt or metal phase change material and immersed in a working fluid environment or a cylindrical phase change material tube through which the working fluid circulates within an inner tube are derived by means of a perturbation analysis using the Stefan number as the perturbation parameter. It is found that the temperature drop across a given frozen layer increases as the Biot number increases, and heat extraction is more efficient at higher Biot numbers. Surface heat flux calculations indicate, however, that small values of the Biot number (less than 1) are more conducive to a steady rate of energy extraction. A.L.W.

A80-12756 # **Review of thermal storage materials from the view point of solar energy application.** P. C. Pande and H. P. Garg (Central Arid Zone Research Institute, Jodhpur, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 191-202. 29 refs.

The thermal energy storage and chemical storage of solar energy are reviewed for evaluating the feasibility of its practical utilization in the solar energy devices for agricultural use. Sensible heat and latent heat storage media are considered for high and low thermal storage, and performances of sensible and latent heat materials are compared by investigating their heat capacities, melting points, enthalpies of fusion, densities, stability, corrosion resistance, and thermal conductivities. The hydration-dehydration equilibria are discussed, and storage by inorganic oxide/hydroxide such as MgO/Mg(OH)2 and CaO/Ca(OH)2 is investigated. A.T.

A80-12757 # **Electrochemical storage of photovoltaic solar energy.** H. Saha (Chloride India, Ltd., Calcutta; Kalyani, University, Kalyani, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 209-217.

Characteristics of storage batteries for electrochemical storage of solar energy for a power system for terrestrial applications are reviewed. Various batteries which may be used, such as lithium-sulfur, sodium-sulfur, and zinc-chlorine types, are analyzed and a design procedure developed for the selection of the battery capacity for a given application. The lead-acid battery is the only one that meets the requirements of the Photovoltaic Electric Power System (PEPS) to obtain energy 'on demand'. Results of the field-trial of a solar power system using a lead-acid battery especially developed for this application are reported, and the potential applications of such a solar cell power system in India are reviewed. A.T.

A80-12758 # **Testing of three installed solar domestic water heaters.** B. Nimmo (University of Petroleum and Minerals, Dharan, Saudi Arabia), J. Pearce, and W. Clark (Florida Technological University, Orlando, Fla.). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 237-249. 11 refs.

A solar water heating program of testing three installed solar water heaters in Orlando, Fla. is presented. The testing procedure described was applied to the commercially installed units for one week, the results including useful energy provided, hot water load, insolation, collector efficiency, auxiliary energy, and percent of required energy provided by solar power. The importance of the control unit was emphasized in two tests by the fact that heat was occasionally lost to the surroundings from the collectors. Curves of collector efficiency are presented for two collectors, and in one case the present linear best fit curve is compared to the efficiency curve for a similar collector obtained with NBS procedures. The efficiencies of the collectors are compared, ranging from 30.2 to 42.3%. A.T.

A80-12759 # **Design of 1-ton solar operated LiBr-water air-conditioning system with special reference to solar part.** H. K. Varma (Roorkee, University, Roorkee, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 325-330.

A80-12760 # **Programme and progress of DST sponsored solar photovoltaic work in India.** U. Venkateswarlu (Central Electronics, Ltd., Sahibabad, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 427-432.

A80-12761 # **Role of oxide layer in Schottky barrier solar cells.** N. K. Swami, S. Srivastava, and H. M. Ghule (Birla Institute of Technology and Science, Pilani, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 433-435. Research supported by the University Grants Commission.

A80-12762 # **Development of space quality silicon solar cells at B.A.R.C.** M. K. Gupta, Y. V. Oke, G. Chandran, and S. K. Gupta (Bhabha Atomic Research Centre, Reactor Control Div., Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 436-439.

The paper discusses the fabrication steps, performance and reliability tests, and future programs of space quality silicon solar cells. Solar cell characteristics for short circuit currents, open circuit voltage and efficiency are examined by plotting I-V characteristics using an X-Y recorder under a quartz-iodine lamp. Attention is given to diode characteristics, series resistance, radiation damage, contact adherence and antireflection coating. C.F.W.

A80-12763 # **A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics.** N. Srinivasamurthy, G. Malathi, and R. S. Mathur (Indian Space Research Organization Satellite Centre, Bangalore, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 440-444.

A theoretical approach is presented to compute the power loss of a parallel array connected set of solar cells. The equations for the current and voltage relation of a solar cell is derived, assuming the cell is made up of unit fragment cells. The calculations for a typical solar panel similar to the one that will be used in the Rohini Satellite-1 are also presented. It is concluded that with a power loss of less than 3%, the cell specified can be amply used for the solar panel without a significant overall power loss. C.F.W.

A80-12764 # **Effect of concentrated sunlight on the various parameters of the p-n junction solar cell.** N. K. Swami and H. M. Ghule (Birla Institute of Technology and Science, Pilani, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 445-450. Research supported by the University Grants Commission.

A80-12765 # **Cadmium telluride solar cells.** V. K. Jain (Solid State Physics Laboratory, Delhi, India) and A. P. Kulshreshtha (Solid State Physics Laboratory, Delhi; Indian Space Research Organization Satellite Centre, Dept. of Space, Bangalore, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 451-461. 17 refs.

Fabrication techniques for CdTe homo- and heterojunction solar cells and modifications to improve their efficiency are presented. CdTe is suitable for solar cell fabrication since it has a direct band gap with a value appropriate for efficient solar energy conversion. Fabrication of CdTe solar cells using thin film deposition and their efficiency are discussed, noting effects of carrier concentration. A critical examination of homo- and heterojunction solar cells was made, but many of the new proposed structures cannot be used due to their high cost. A cost effective sintered pellet technique for CdTe solar cell fabrication was proposed whose efficiency may be slightly lower than that of single crystal solar cells; it produces a polycrystalline CdS ingot, which is sliced for the deposition of p-type CdTe by screen printing process. A.T.

A80-12766 # **Performance studies on uniform illumination type nontracking concentrators.** A. Gupta, Mr. Murlidhar, S. Kumar, and V. K. Tewary (Birla Institute of Technology and Science, Pilani, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 462-466.

Experimental results are presented on uniform illumination-type nontracking concentrators. Three models were fabricated with half-acceptance angles of 6 and 11.5 deg, using plain and anodized aluminum sheets. Solar cell/photodiode units were used to determine the widthwise uniformity of the concentrators. Results show that uniformity of illumination is obtained within 10 to 12% variation at various times during the operating period. B.J.

A80-12768 # **Theoretical consideration of curve fill factor in solar cells.** A. Subrahmanyam, K. K. Mahendra, and A. P. Kulshreshtha (Solid State Physics Laboratory, Delhi; Indian Space Research Organization Satellite Centre, Dept. of Space, Bangalore, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 474-477.

The paper examines theoretical considerations of curve fill factor (CFF) in solar cells. The CFF determines the quality of voltage-current characteristics and the 'figure of merit' of the solar cell, and it is defined as the ratio of the optimum power under matched load conditions to the product of the open circuit voltage and the short circuit current. It was shown that for a silicon solar cell the CFF tends to a maximum value of 0.85 and a minimum of 0.25, and it saturates at around 0.81. Similar calculations can be made for solar cells fabricated with semiconductors other than silicon, but to evaluate the ratio of the short circuit current to the reverse saturation current, parameters such as life time of minority carriers, band gap, absorption coefficient in different spectral regions, and temperature dependence of these parameters need be known. A.T.

A80-12769 # **Experimental study of MOS solar cells under concentration.** S. Kar, S. Bhattacharya, and S. Varma (Indian Institute of Technology, Kanpur, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 478-486.

The electrical characteristics of Schottky Barrier (SB) and MOS solar cells fabricated on n-type Si using Au and Ag as barrier metals were studied under various values of concentration. Current-voltage, diode current-voltage, and capacitance-voltage characteristics were measured, showing that SB and MOS cells perform equally well as p-n junction solar cells under concentration. Therefore, use of non-tracking type concentrators will reduce the cost of photovoltaic power generation. The open-circuit voltage of these cells increases with concentration, but the increase is limited by a simultaneous rise in the interface state charge, requiring low interface state density cells for use under concentrated light. The fill factor degraded under concentration, but this can be reduced by a suitable design of the front grid contact. A.T.

A80-12771 # **Annealing and degradation studies of ceramic CdS solar cells.** H. Saha (Chloride India, Ltd., Calcutta, India), K. Mukhopadhyay, S. Sengupta, and P. Basu (Kalyani, University, Kalyani, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 493-500. 6 refs.

Sintered Cu(x)S/CdS solar cells of about 4% efficiency are fabricated by a pressing, sintering and dipping technique. A detailed study of the effect of annealing CdS in different atmospheres (air, nitrogen, and vacuum) on cell performance is reported. The rates of degradation of these annealed cells, at different ambients including vacuum, are also investigated with a view to understanding the mechanism of their degradation. It is observed that in these ceramic cells the principal mechanism of degradation is copper diffusion, which is seen to be partially arrested by proper annealing and partially enhanced by indium diffusion. (Author)

A80-12772 # **Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells.** S. R. Dhariwal, S. B. Sharma (Government College, Ajmer, India), and P. K. Bhatnagar (Delhi, University, Delhi, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 501-505. 11 refs. Research supported by the University Grants Commission.

The discrepancy between the theoretical and experimentally observed optimum thicknesses of an oxide layer placed between the metal and the semiconductor in a Schottky barrier solar cell is explained in terms of the nonuniform deposition of the thin (10 to 30 A) oxide layer. The Poisson distribution is used to account for the average oxide layer thickness and an expression for the average tunneling thickness is derived which is different from the average oxide layer thickness due to the difference between the tunneling effective electron mass and the free electron mass. In the case of a Au-SiO2-nSi structure, it is shown that the tunneling effective thickness is always less than the average oxide thickness, and thus the theoretical prediction of 10 A as an optimum thickness is shown to correspond to the experimentally determined optimum at 20 A. A.L.W.

A80-12773 # **Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting.** Mr. Mahabala, S. D. Gomkale, R. L. Datta, and K. S. Rao. In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 506-517.

A80-12774 # **GaAs-electrolyte photovoltaic cells.** U. Sengupta, H. N. Acharya, and D. N. Bose (Indian Institute of Technology, Kharagpur, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 518-520. 5 refs.

The performance of GaAs-electrolyte heterojunction photovoltaic cells is measured. Single crystal GaAs specimens in contact with various concentrations of NaOH electrolyte in an electrolytic cell using Pt as the counterelectrode were irradiated by a tungsten lamp. The I-V characteristics of the cell indicate the rectifying property of the junction and a photocurrent in the reverse bias direction is observed. The C-V characteristics indicate the presence of a depletion layer at the surface of the n-type GaAs. An open-circuit voltage of 0.68 V and a short-circuit current density of 0.18 mA/sq cm at 50 mW/sq cm were obtained with 0.1 N NaOH, and power is found to increase with increasing electrolyte concentration. The spectral response to the cell is observed to exhibit a peak at 700 nm, corresponding to an energy of 1.77 eV. It is concluded that further theoretical and experimental investigation of the system is warranted. A.L.W.

A80-12775 # **Reliability studies on thin film solar cells for satellite application.** N. R. Pillai, M. J. Nair, and M. K. Mukherjee (Indian Space Research Organization Space Centre, Trivandrum, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 521-527.

Studies of vacuum deposition of CdS thin films for use in solar cells for self-healing bulk satellite power-supply systems are discussed. Cell reliability is analyzed in terms of cell-material, substrate, and film reliability. It is shown that the thickness of CdS films has a pronounced effect on both the physical and electrical properties of solar cells, that typical CdS films consist of regions of varying porosity, and that the porosity may explain the necessity of attaining high film reliability in order to fabricate solar cells with an efficiency that is inversely proportional to the number of pores. The effect of such efficiency on overall performance, including the cost aspect of the power system, is considered. It is concluded that a negligible pore effect can be achieved by selecting optimum evaporation parameters for depositing fcc-type CdS thin films on highly reliable substrates. F.G.M.

A80-12776 # **Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells.** S. Kar, S. Bhattacharya, D. Shanker, and S. Varma (Indian Institute of Technology, Kanpur, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 528-533. 8 refs.

The effect of barrier metals on the performance of Schottky Barrier (SB)/MOS solar cells was investigated. Au, Ag, and Cu were studied for n-type and Al, Cr, and Sn for p-type silicon. Au and Ag films have very high transmission, followed by Cu, Cr, Sn, and Al. A short-circuit current density of 39.5 mA/sq cm was measured in Ag cells, and 36.0 mA/sq cm in Au cells; an open-circuit voltage of 300 mV was obtained in Au cells, 260 mV in Ag cells, and 160 mV in Cu cells on n-type silicon. In comparison, the open-circuit voltage of Au, Ag, and Al MOS cells ranged between 400 and 498 mV with a 22 A thick oxide. The transmission coefficient T of the thin metal layer was a strong inverse function of the wavelength, but the rate of decrease of T with wavelength varied between metals. A.T.

A80-12777 # **Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light.** B. R. Marathe, R. C. Dubey, A. R. Bardhan, H. S. Kothari, K. S. Yadav, V. Holla, N. N. Kundu, D. S. Rao, and S. Chandra (Central Electronics Engineering Research Institute, Pilani, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 534-538. 8 refs. Research sponsored by the Department of Science and Technology.

A80-12778 # **Design and development of a 100 peak watt photovoltaic concentrator system.** In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 539-543. Research sponsored by the Department of Science and Technology.

Solar photovoltaic cells for concentrated sunlight are described, which were fabricated using quarters of 50-mm-diameter, p-type silicon single crystal wafers. A one-axis tracking system capable of giving 12 peak watts is analyzed from the point of view of developing larger systems. Consideration is given to a 100 peak watt, two-axes tracking system. Its design is based on the heliostatic structure. This system has the advantage of rotating and supporting the structure along the gravitational axis, which improves its stability. V.T.

A80-12780 # **Industrial applications of solar energy in India.** B. C. Jain (Jyoti, Ltd., Baroda, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. (A80-12739 02-44) Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 588-594.

A80-12781 # **Solar absorption spectra of PbS-Al and PbSe-Al systems.** A. Chandra (Ministry of Communications, Betim, Goa, India), A. Varughese (Dhempe College of Arts and Science, Panaji, Goa, India), and A. S. Wagh (Bombay, University, Panaji, Goa, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 607-612. 6 refs.

A80-12782 # **An electronic device for intermittent tracking.** J. T. Eapen (Institute of Science, Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 623-628.

Solar collectors must track the sun in order to obtain high efficiency. The paper describes a project intended to design and construct a simple electronic device for intermittent tracking of the sun. The design is based on a light-dependent resistor (LDR) which is the sensor used in the circuit. The LDR has high resistance in the dark, and the resistance decreases with the intensity of the light incident on it. The design and construction of a 'seek and hold' tracking system are described, along with the drive system, operation, and cloud interference control. The tracking system can provide diurnal tracking. The azimuthal tracking (seasonal adjustment) is done by manual adjustment as shown schematically. The device has been constructed and tested, showing that it is suitable for adjusting the solar collector. S.D.

A80-12783 # **Study of photochemical processes in the ferrous-thionine system.** P. N. Moorthy, S. N. Guha, and P. V. Kamat (Bhabha Atomic Research Centre, Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 629-637. 8 refs.

The photogalvanic effect in the ferrous thionine system is affected by a number of factors, including light intensity, type of dye, redox components, pH, presence of organic solvents, types of electrodes, and mechanical agitation of the system. This paper describes a photochemical study designed to examine such influences on the photogalvanic effect in ferrous thionine system. The study involved flash photolysis, kinetic spectrophotometry, spectrofluorimetry, and photoelectrochemical studies. B.J.

A80-12784 # **Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement.** C. R. Marathe (Indian Institute of Technology, Bombay, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 638-643.

A80-12785 # **Effect of image force on the characteristics of MOS solar cell.** P. K. Bhatnagar (Delhi, University, Delhi, India), S. R. Dhariwal, and S. B. Sharma (Government College, Ajmer, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 670-674. Research supported by the University Grants Commission.

The effect of image force on the carrier of a metal-oxide semiconductor solar cell is studied. The image force lowering of the barrier for different thickness of the oxide layer is calculated. Emphasis is placed on the effect of image force barrier lowering on the I/V characteristics, power, fill-factor, and open circuit voltage of a typical MOS Au-SiO2-nSi solar cell. V.T.

A80-12786 # **Experimental investigations of an intermittent ammonia-water solar refrigerator.** A. Venkatesh and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 675-684.

The paper discusses the experimental results of an intermittent ammonia-water solar refrigerator operating with a flat plate collector. Results obtained from experiments conducted in the initial concentration range of 0.5 to 0.65 are compared and discussed. Also, the effects of cooling load, rate of cooling of the absorber and the use of mirror boosters on the performance of the refrigerator are discussed. (Author)

A80-12787 # **Performance characteristics of solar regenerators.** P. Gandhidasan, V. Sriramulu, and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 685-690.

The paper deals with the use of solar energy for regenerating absorbent chemical solutions. A method is described where the absorbent solution is made to flow, in the form of a thin film, over a solar collector; the water evaporating from the surface is removed by streaming air. In the forced convection regenerator, the film and the airstream can move in the same direction and in opposed directions. The effectiveness of the equidirectional and counter-flow versions of the solar regenerator is evaluated. The case where the evaporating water is removed by wind gusts is examined. V.P.

A80-12788 # **Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution.** S. Deb, M. K. Mukherjee, K. Maitra, and D. Mukherjee (Jadavpur University, Calcutta, India). In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 691-696. 6 refs.

The paper reports a method of electrolytic deposition on ceramic Cu2S-CdS solar cells using junctions on vacuum-annealed ceramic CdS tablets formed by an auto-diffusion technique. The Bogus treatment (1973) consisting of deposition of a thin copper layer by a vacuum technique, followed by a heat treatment to increase the cell efficiency and improve the yield is described. Fabrication of sintered CdS cells and various electroplating conditions of Cu deposition from a CuSO4 solution are presented. It is suggested that this method improves the curve factor, the short-circuit current, and open circuit cell voltage, and points to the possibility of a simple and inexpensive method of accomplishing the key step in fabrication of Cu2S/CdS solar cells. A.T.

A80-12789 # **Some experimental studies on the technical developments of low cost silicon solar cells.** In: Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978. Bhavnagar, India, Central Salt and Marine Chemicals Research Institute, 1979, p. 709-715. Research sponsored by the Department of Science and Technology.

The development of low cost production techniques for contact metallization and anti-reflection coatings is assessed, and a comparative analysis of material cost for vacuum evaporated and screen printed contacts is made. Result of preliminary studies on screen printed contacts, spin-on anti-reflection layers and textured black cells showed that a major cost reduction is possible by employing the described low cost techniques. The results highlight the fact that the introduction of low cost techniques could not only increase the process throughput but also eliminate the use of expensive vacuum evaporation systems. C.F.W.

A80-12815 **Power loss in photovoltaic arrays due to mismatch in cell characteristics.** L. L. Bucciarelli, Jr. (MIT, Cambridge, Mass.). *Solar Energy*, vol. 23, no. 4, 1979, p. 277-288. Research sponsored by the U.S. Department of Energy.

Variations in the current-voltage characteristics of photovoltaic cells can lead to significant power loss 'due to mismatch' when the cells are connected together in a network. This study explores how this mismatch loss depends on variations in max-power current and max-power voltage from cell to cell. An analysis of a series string is first performed. Losses in a parallel string are also determined. Estimates of mismatch losses in more complex arrays are then obtained. In addition to generally excellent comparison with several numerical studies, results show that, for a series string, there exists a critical magnitude of deviation in cell max-power current beyond which the power loss due to mismatch is sensitive to both the number of cells placed in series and the shape of the probability density function defining variations in max-power current. This critical level also depends on the cell fill-factor. (Author)

A80-12816 * **Optimization of multi-layer front-contact grid patterns for solar cells.** A. Flat and A. G. Milnes (Carnegie-Mellon University, Pittsburgh, Pa.). *Solar Energy*, vol. 23, no. 4, 1979, p. 289-299. 12 refs. Grant No. NGR-39-087-021.

In a front-contact grid pattern for a solar cell there is a trade-off necessary between shadowing loss and excessive power loss due to voltage drop in the metalization itself. If the metalization is too little there may be excessive contact resistance to the underlying semiconductor and insufficient coverage to control losses in the thin front-surface layer of the solar cell. Optimization of grid pattern area and geometry is considered analytically to minimize total losses. Worthwhile performance advantages are shown to be possible, particularly in concentrator systems, if multi-layer grid patterns are used. The current carrying fingers should be approximately square in metal cross section and the main current feedout bars should not only be wider but also thicker than the primary collecting fingers. This is termed multi-level metalization. Effective use of multi-level grid metalization allows much greater concentration-to-loss ratio for a cell of large area and permits good performance from cells of high front-layer sheet resistance. (Author)

A80-12817 **Calculation of monthly mean solar radiation for horizontal and inclined surfaces.** J. E. Hay (British Columbia, University, Vancouver, Canada). *Solar Energy*, vol. 23, no. 4, 1979, p. 301-307. 41 refs. Research supported by the British Columbia Energy Commission.

A technique is presented for calculating monthly means of solar radiation for both horizontal and south-facing surfaces. The time scale used is daily totals, and the regression relationship which allows the horizontal surface radiation to be calculated using bright sunshine and surface albedo shows no significant variation between stations or seasons despite the use of data from maritime and continental midlatitude and subarctic locations. The technique presented can therefore be used to establish the long-term solar energy climatology, for both horizontal and south-facing inclined surfaces, over a large geographical area with a wide range of climatic conditions. It is shown that the theoretical and empirical equations normally used on an hourly time scale may be applied to daily data without any significant reduction in the accuracy of the calculated values. S.D.

A80-12819 **The turnover times and pool sizes of photosynthetic hydrogen production by green algae.** E. Greenbaum (Union Carbide Corporate Research Laboratory, Tarrytown, N.Y.). *Solar Energy*, vol. 23, no. 4, 1979, p. 315-320. 26 refs. Research supported by the Union Carbide Corp.

An investigation of the turnover times of photobiological production of hydrogen gas by green algae indicate that the photoreactions associated with molecular hydrogen production have promising properties for solar energy conversion and storage. The results indicate that (a) the intrinsic kinetic rate capability of the hydrogen photoapparatus in green algae can keep pace with the incidence rate of light quanta, even in full sunlight; (b) the photogenerated electrons for hydrogen production probably lie in the mainstream of the electron transport chain of photosynthesis. These results have been obtained by performing the first measurements on the turnover times and pool sizes of photosynthetic hydrogen production. Rapid multiple flash experiments have been performed which indicate that the immediate source of reductant for photosynethetic hydrogen production is derived from a pool of 5-20 equivalents, depending on the alga. (Author)

A80-12820 **Calculation of climatic solar heating performance.** R. H. Bushnell. *Solar Energy*, vol. 23, no. 4, 1979, p. 321-325. 14 refs.

A climatic design method is presented which uses the long-term outdoor temperature distribution as well as utilizability of irradiation to find the solar fraction for building heat. The method considers a solar heater to be able, on the average, to supply all the heat needed by a building down to a cut-in temperature determined by the average amount of solar heat collected and the heat loss coefficient of the building. The amount of auxiliary heat needed is calculated from the kelvin day value below this cut-in temperature. The method permits the use of temperature distributions obtained from long records so that extremes can be represented. This allows calculations to be made near 100% solar heat. Any thermostat setting can be used. Several heat sources can be used. Examples are given. (Author)

A80-12821 **Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates.** M. S. Drew and R. B. G. Selvage (S-Matrix Enterprises, Ltd., Richmond, British Columbia, Canada). *Solar Energy*, vol. 23, no. 4, 1979, p. 327-331. 5 refs. Research supported by the British Columbia Ministry of Education, Science and Technology.

A simple correspondence is demonstrated between passive solar system performance and active system f-Chart estimates. The equations describing a thermal network model of a passive water wall solar system are compared term by term with similar equations governing the heat balance in an active solar heating system, making possible an identification of appropriate passive system parameters with active system parameters comprising inputs to the f-Chart procedure. Comparisions of f-Chart predictions and results using the Solar Load Ratio method are made for sample cities in sixteen climatic zones. Results indicate a discrepancy of at most about 9 per cent solar fraction between the two methods in the cases studied. (Author)

A80-12822 **An experimental study of corrugated steel sheet solar water heater.** S.-A. Wang (Shanghai Mechanical Engineering Institute, Shanghai, Communist China). *Solar Energy*, vol. 23, no. 4, 1979, p. 333-341. 16 refs.

The heat transfer process in a corrugated-steel-sheet solar water heater is analyzed, and an experimental procedure for deriving the collector efficiency equation is proposed. The calculated collector efficiency is greater than 0.94. The temperature is 7 C higher than the collector temperature. V.P.

A80-12823 **An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system.** B. Carlsson, H. Stymne, and G. Wettermark (Kungl. Tekniska Hogskolan, Stockholm, Sweden). *Solar Energy*, vol. 23, no. 4, 1979, p. 343-350. 10 refs.

The paper describes a method of ensuring that calcium chloride tetrahydrate is not a stable species in a heat-of-fusion system by chemically modifying it. Thus, an addition of SrCl2-6H2O to a CaCl2-H2O system decreases the solubility of CaCl2-6H2O and increases that of CaCl2-6H2O; if the addition of SrCl2-6H2O is about 2%, the melting point maximum for CaCl2-6H2O coincides with the peritectic point for equilibrium between the hexahydrate, the tetrahydrate, and the solution. With technical grade materials, tetrahydrate is a more severe problem as they contain impurities which have an opposite effect on the CaCl2 hydrate solubilities to that of SrCl2-6H2O. Addition of Ca(OH)2 suppresses tetrahydrate formation in some cases by neutralizing the excess of the chloride impurity and through formation of the CaCl2-CaO-2H2O phase. A.T.

A80-12824 **Truncation of nonimaging cusp concentrators.** W. R. McIntire (Argonne National Laboratory, Argonne, Ill.). *Solar Energy*, vol. 23, no. 4, 1979, p. 351-355. 5 refs. Contract No. W-7409-eng-38.

Truncation of nonimaging cusp reflectors which concentrate sunlight onto cylindrical receivers leads to collector designs which are more cost effective through substantial reductions in mirror height and length with small reductions in concentration ratios. In this paper, reflector shapes for truncated nonimaging cusp concentrators having various acceptance angles are presented, as well as curves for height/aperture and mirror arc length/aperture ratios versus concentration ratio. In addition to their general utility in concentrator design, the latter curves have special significance for thermoformed plastic reflector substrates. The reflector height/aperture ratio is the 'draw', and the reflector arc length/aperture ratio is the 'stretch' to which the material is subjected during forming. With this information, important considerations in plastics fabrication can be addressed easily in the early design stages. (Author)

A80-12825 **The analysis and simulation of an open cycle absorption refrigeration system.** R. K. Collier (California, University, Los Alamos, N. Mex.). *Solar Energy*, vol. 23, no. 4, 1979, p. 357-366. 10 refs. Research sponsored by the U.S. Department of Energy.

An open cycle absorption refrigeration system is simulated and analyzed. The open cycle differs from the closed cycle in that the open cycle regenerates the weak absorbent solution by evaporating refrigerant to the earth's atmosphere rather than to a condenser. The solar collector used for the open cycle is one in which the weak absorbent solution flows as a fluid film over a flat, open, black surface. The absorbent solution is heated by the black surface and is regenerated by water evaporating to the atmosphere. It was found that the relationship between the collector length and the solution mass flow rate was tied to environmental factors such as wind and humidity when optimizing system performance. The system performance was simulated for five cities using actual weather data. The overall daily cooling COP's (cooling/incident solar) ranged from 0.09 to 0.45 for various conditions. (Author)

A80-12835 **The scope of effective medium theory for fine metal particle solar absorbers.** G. B. Smith (Houston, University, Houston, Tex.; New South Wales Institute of Technology, Broadway, Australia). *Applied Physics Letters*, vol. 35, Nov. 1, 1979, p. 668-670. 12 refs. Research supported by the U.S. Department of Energy and University of Houston.

The treatment of an array of small metal particles as a continuous effective medium is shown to be possible for visible and near-infrared frequencies at much larger particle sizes and separations than often supposed. Specific upper limits are evaluated for chromium. Results are based on the strongly correlated model. For this, the usual topology, variation, and attenuation of the field strength over average unit cell dimensions are permissible, provided such variations are characteristic of the effective medium as a whole. As wavelength decreases, the leading contribution to diffuse scattering off such composite films should come from terms proportional to lambda to the -8th power not the Rayleigh term. (Author)

A80-12838 **Efficiency of quantum-utilizing solar energy converters in the absence of intraband thermalization.** R. T. Ross (Ohio State University, Columbus, Ohio). *Applied Physics Letters,* vol. 35, Nov. 1, 1979, p. 707, 708. 5 refs. Research supported by the U.S. Department of Energy; NSF Grant No. PCM-76-11655.

In some photoelectrical and photochemical devices, energy conversion may occur before thermal equilibrium within the electronic bands of the absorber. A statistical thermodynamic argument shows that such hot-transfer devices cannot have an efficiency greater than that of an ideal device in which thermalization precedes energy conversion. (Author)

A80-12853 **A 30-ps Josephson current injection logic /CIL/.** T. R. Gheewala (IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y.). *IEEE Journal of Solid-State Circuits,* vol. SC-14, Oct. 1979, p. 787-793. 21 refs.

A family of novel Josephson logic circuits called current injection logic (CIL) is presented. In contrast to previous approaches, it combines magnetically coupled interferometers with novel nonlinear injection gates to obtain ultra-fast logic speeds, wide margins, and greater fan-in and fan-out capabilities. Fastest logic delay of 30 ps/gate is measured averaged over two- and four-input OR and AND gates (average fan-in = 4.5, average fan-out = 2.5) fabricated using 2.5 micron nominal design rules. The average power dissipation of these experimental circuits is 6 micron W/gate. An unprecedented logic delay of 13 ps/stage is measured on a chain of two-input OR gates, and the logic delay for a circuit consisting of two two-input OR gates, the outputs of which are 'AND'ed, is measured at 26 ps. The experimental results are found to be in excellent agreement with delay estimates based upon computer simulations. (Author)

A80-12883 # **Laser fusion - Energy application perspectives (Lazernyi termoiadernyi sintez - Perspektivy energeticheskikh primenenii).** A. V. Kalinin. *Akademiia Nauk SSSR, Izvestiia, Energetika i Transport,* Sept.-Oct. 1979, p. 16-23. 12 refs. In Russian.

The paper presents a brief comparative investigation of different conceptual laser fusion systems. These include: (1) 'pure' laser fusion power plants; (2) hybrid (fusion-fission) plants; (3) laser fusion breeder reactors; and (4) laser fusion devices for the production of nonnuclear fuels. The basic characteristics of these systems are examined. B.J.

A80-12896 # **Calculation of the low-frequency electromagnetic field of MHD machines encapsulated in a common screening shell (Raschet nizkochastotnogo elektromagnitnogo polia MGD-mashin v obshchei ekraniruiushchei obolochke).** S. M. Apollonskii. *Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 83-86. 5 refs. In Russian.

The paper develops a method for calculating the electromagnetic fields of two or more MHD machines encapsulated in a common housing, with consideration of the mutual field interaction. Some results are presented on the field interaction of two MHD pumps in a common housing, taking into account ferromagnetic and screening effects. B.J.

A80-12897 # **Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump (Ob odnovremennom uchete poperechnogo i prodol'nogo kraevykh effektov v kanale ploskogo induktsionnogo MGD-nasosa).** L. M. Dronnik, S. Iu. Reutskii, and A. I. El'kin. *Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 87-93. 10 refs. In Russian.

The paper proposes a mathematical model of a plane MHD induction pump that makes it possible to investigate simultaneously longitudinal and transverse edge effects on flow parameters in the channel. An analytical solution is obtained for steady laminar flow in a channel with insulation barriers at the inlet and outlet. It is found that the longitudinal edge effect affects velocity in the central part of the channel, but has no influence on reverse flow at the walls. B.J.

A80-12898 # **Conduction-type MHD generator with back-and-forth motion of the hybrid working material (Konduktsionnyi MGD-generator s vozvratno-postupatel'nym dvizheniem kombinirovannogo rabochego tela).** S. E. Kuznetsov and V. I. Andreev. *Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 97-104. 5 refs. In Russian.

A conduction-type MHD generator with a hybrid working material, liquid metal and a solid conductor (a metallic plate), has been designed in an effort to reduce the total internal resistance of the system. The operating characteristics of an MHD generator with back-and-forth motion of a working material consisting of mercury and a copper plate are analyzed. B.J.

A80-12900 # **Determination of the geometry of the transition region of a series MHD generator (Opredelenie geometrii perekhodnogo uchastka seriesnogo MGD-generatora).** G. P. Bazarov, E. N. Kufa, and S. A. Medin. *Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 140-142. In Russian.

The paper considers the characteristics of the series channels of a MHD generator for a wide range of loads with zero field strength at connections between channels. Particular attention is given to the effects of the geometry of transition regions between channels on the power output characteristics of the generator. B.J.

A80-12940 # **Progress in R and D on coal liquefaction - Progress in research-development on coal liquefaction.** S. Hulisz. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 24 p. 25 refs.

The predictions which may be drawn from the present report indicate that at the turn of this century the production and utilization of petroleum will decrease progressively, whereas coal, the major deposits of which are located in the industrialized portions of the world, will progressively increase in importance as an energy source and as a source of chemical raw materials. Some advantages of the utilization of low-sulfuric oil from coal are noted. V.P.

A80-12941 # **The role of coal gasification and liquefaction in improving the efficiency of energy use - Comparative end use efficiency of the use of coal: Substitute natural gas and other gases versus electric power production.** H.-D. Schilling. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 13 p.

A80-12942 # **Environmental protection in the processing of coal - The utilization or disposal of coal processing residues.** J. S. Harrison. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 14 p. 54 refs.

All coal processing operations produce residues, either carbonaceous or inorganic. The present paper deals with the problem of finding means of using the residues profitably to help processing economics. The case where processing cost will be increased by the necessity of disposing residues in an environmentally acceptable fashion is also examined. V.P.

A80-12943 # **Environmental protection in the processing of coal.** J. Nemec. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 8 p. Translation.

The present report deals with some aspects of air pollution associated with the development of coal gasification and liquefaction techniques. It is based on published data and on experience in the operation of pressurized gasworks in Czechoslovakia. It is shown that the concentration of such harmful substances as dust, fumes, and gaseous emissions (sulfur oxides, carbon, nitrogen, sulfur compounds, arsenic, hydrogen chloride, etc.) emitted in the atmosphere depend on the brand of coal, the conversion technology employed, the degree of equipment sophistication, and adherence to technological specifications. V.P.

A80-12944 # **Coal as a source of chemical raw materials - Prospects for chemical synthesis based on gas from coal.** H. Teggers. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 20 p. 13 refs.

The requirements placed on coal gasification processes suitable for synthesis gas production are reviewed. The Lurgi, Winkler, Koppers-Totzek processes are outlined, and some recently proposed improvements to these processes are noted. The thermal efficiency of each step of methanol production by coal gasification (by the Lurgi process) is studied with a view toward the cost-optimization of the methanol production process. V.P.

A80-12945 # **Progress and development trends in coal gasification and liquefaction technologies.** A. A. Krichko. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 42 p. Translation.

In the present paper, methods of converting coal into combustible gases are reviewed with particular reference to the Lurgi process, the Winkler process, and the Koppers-Totzek process. Thermodynamic analysis of the reactions which occur in the reduction zone indicates that by conducting the process of CO_2 and H_2O reduction under equilibrium conditions, the gasification process can be considerably intensified and gas generator capacity can be drastically increased. The mechanisms and kinetics of the principal reactions between carbon and gases are examined. V.P.

A80-12946 # **Progress and development trends in coal gasification and liquefaction technologies - New gasification methods developed on a laboratory or large scale.** G. Fumich. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 10 p.

New large-scale and laboratory coal gasification methods are examined. The three stages in gasifier developments, the Lurgi fixed bed reactor, the second generation reactor split into separate sections making it possible to optimize each section, and the third generation hydropyrolysis reactor which reacts the coal with pure hydrogen to produce only methane are described. The review of the evolution of gasifier and gasification process is made considering electrofluid reactors, fluidization, slagging, hydrogasification, and the flash hydropyrolysis catalytic method. Fluidization provides good gas-solids contracting, heat transfer, and uniform temperatures; slagging gasifiers are suitable for a wide range of products from synthesis gas to processing coal liquefaction residues; and flash hydropyrolysis gasifier features effective single-element injector scaling and a minimization of the H_2/coal ratio. A.T.

A80-12947 # **Progress and development trends in coal gasification and liquefaction technologies - Recent achievements in conventional coal gasification processes.** H. J. F. Stroud. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 18 p. 13 refs.

In the present report, some recent developments in the technology of coal gasification, using conventional processes, or a modern variant developed directly from them, are reviewed. Particular attention is given to fixed-bed gasifiers, the Lurgi process, and to advances made in Czechoslovakia and India. V.P.

A80-12948 # **Progress and development trends in coal gasification and liquefaction technologies - Underground coal gasification.** P. Ledent. *U.N. Economic Commission for Europe, Symposium on the Gasification and Liquefaction of Coal, Katowice, Poland, Apr. 23-27, 1979, Paper.* 17 p. 26 refs. Translation.

Development trends in underground coal gasification are presented. Current methods being tested including the percolation method for horizontal deposits and drilling in steeply inclined seams are described; technical problems of lining between bore-holes, ground subsidence, and water intrusions are considered. Improved control of the advance of the gasification front by use of high pressure air and gasification of deep deposits by compressed air pressure are discussed, noting that operation at great depth has advantages of absence of air leakages and of not interfering with surface aquifers. Economic studies made in U.K., U.S., and Belgium are presented, concluding that this method may produce large amounts of energy at competitive prices and provide lean gas for power stations, synthesis gas for chemical plants, and replace natural gas in distribution networks. A.T.

A80-12964 **Laboratory evaluation of two laser fluorosensor systems.** G. A. Capelle and L. A. Franks (EG & G Corp., Advanced Measurements Group, Goleta, Calif.). *Applied Optics,* vol. 18, Nov. 1, 1979, p. 3579-3586. 11 refs. Research sponsored by the U.S. Department of Energy.

The characteristics and capabilities of two laboratory versions of a fluorosensor system built around N_2 and KrF lasers are compared. Both systems were tested to determine the feasibility of remotely detecting the fluorescent emission of organic effluents associated with coal processing. System performance was measured under daylight and nighttime conditions for both actual effluents and known reference solutions and is predicted for an airborne system. Experiments on a multichannel system are also described. (Author)

A80-13003 **Development of a sodium/sulphur battery for rail applications.** M. D. Hames and J. L. Sudworth (British Railways, Technical Centre, Derby, England). *Institution of Electrical Engineers, Proceedings,* vol. 126, Nov. 1979, p. 1157-1161. 12 refs. Research supported by the Department of Transport/Department of the Environment.

The energy and power requirements of sodium/sulphur batteries to meet three different rail-traction applications are considered. Cell design options to meet these requirements are discussed briefly, and it can be shown that the central-sulphur tube-cell design can meet the requirements of the three rail-traction applications. The design features of a central-sulphur cell design are discussed and data are presented to indicate the state of cell development in terms of cell performance, reliability reproducibility and safety. The electrical properties of cells connected in series/parallel arrays for battery operation are discussed, together with battery thermal management and safety. A practical 10KWh battery comprising 176 cells connected as two 11 x 8 series-parallel arrays has been tested, and problems which can arise from overdischarge, thermal management and electrical short circuits are discussed. (Author)

A80-13004 **Wind energy conversion system with electromagnetic stabiliser.** M. Kant, M. Berna (Compiègne, Université de Technologie, Compiègne, France), and E. Vidoni (Paris, Laboratoire de Génie Electrique, Fontenay-aux-Roses, Haufs-de-Seine, France). *Institution of Electrical Engineers, Proceedings,* vol. 126, Nov. 1979, p. 1201-1203.

Development of a wind-energy conversion system unit, consisting of a constant-pitch double-blade rigid rotor, electromagnetic brake, and two-stage generator, is considered. The first-stage output is used to actuate the brake, and the second stage produces electric power for utilities. Three types of bipolar machines were studied: (1) an armature-semiexcited dc generator, (2) a double-winding dc generator, and (3) a three-phase asynchronous ac generator with an asymmetric secondary. It is noted that such systems eliminate variable-pitch equipment, simplify output voltage control, and can be completed by incorporating an anemometer and gearbox. V.T.

A80-13011 **A pistonless Stirling engine - The traveling wave heat engine.** P. H. Ceperley (George Mason University, Fairfax, Va.). *Acoustical Society of America, Journal,* vol. 66, Nov. 1979, p. 1508-1513. 9 refs.

The propagation of acoustical waves through a differentially heated regenerator results in gas in the regenerator undergoing a Stirling thermodynamic cycle. One direction of wave propagation results in amplification of the waves and conversion of thermal energy into acoustical energy. The opposite direction results in acoustical energy being used to pump heat. The ideal gain and maximum energy conversion rates are derived in this paper. Low power gain measurements were made which verify the derived gain equation. Practical engines and heat pumps using this principle are discussed. (Author)

A80-13024 # **The possibilities of increasing gas turbine efficiency (Die Möglichkeiten zur Verbesserung des Wirkungsgrades der Gasturbinen).** F. Toth. *Acta Technica,* vol. 87, no. 3-4, 1978, p. 347-354. In German.

The most efficient cycle for a gas turbine, under conditions when all efficiency parameters are uniform, is determined. It turns out to be the open cycle consisting successively of adiabatic compression, heat uptake at a constant volume, and adiabatic expansion. An attempt is made to determine which of the existing heat engines could best approximate this maximum efficiency cycle, and what sort of gas turbine might enable a more efficient cycle. B.J.

A80-13109 **Hydrogen evolution from water using solid carbon and light energy.** T. Kawai and T. Sakata (Institute for Molecular Science, Okazaki, Japan). *Nature,* vol. 282, Nov. 15, 1979, p. 283, 284. 6 refs.

Hydrogen production in the light-mediated decomposition of water vapor in the presence of solid carbon is reported. Three mg of active carbon, together with 30 mg of TiO_2 and 10 mg of RuO_2 powder were illuminated in the presence of water vapor by a 500-W mercury lamp. Mass spectrometer analysis of the gas evolved reveals the production a nonflammable mixture of H_2, CO_2 and CO in the presence of the TiO_2/RuO_2 catalyst. Experiments with a regenerative TiO_2/metal oxide catalyst at 80 C resulted in a greater yield of CO and CO_2 than at 60 C, indicating the usefulness of a combination of solar light and thermal energy. The decomposition of water by solar energy in the presence of carbon is suggested as a means of coal gasification and hydrogen production. A.L.W.

A80-13116 * # **Aeroelastic stability and response of horizontal axis wind turbine blades.** S. B. R. Kottapalli, P. P. Friedmann (California, University, Los Angeles, Calif.), and A. Rosen (Technion - Israel Institute of Technology, Haifa, Israel). *AIAA Journal,* vol. 17, Dec. 1979, p. 1381-1389. 29 refs. Grant No. NsG-3082.

Coupled flap-lag-torsion equations of motion of an isolated horizontal axis wind turbine (HAWT) blade have been formulated. The analysis neglects blade-tower coupling. The final nonlinear equations have periodic coefficients. A new and convenient method of generating an appropriate time-dependent equilibrium position, required for the stability analysis, has been implemented and found to be computationally efficient. Steady-state response and stability boundaries for an existing (typical) HAWT blade are presented. Such stability boundaries have never been published in the literature. The results show that the isolated blade under study is basically stable. The tower shadow (wake) has a considerable effect on the out-of-plane response but leaves blade stability unchanged. Nonlinear terms can significantly affect linearized stability boundaries; however, they have a negligible effect on response, thus implying that a time-dependent equilibrium position (or steady-state response), based completely on the linear system, is appropriate for the type of HAWT blades under study. (Author)

A80-13174 **The financing problems of Europe's gas industry (Les problèmes de financement de l'industrie gazière européenne).** F. Glaser (Rheinische Energie AG, Cologne, West Germany). *Revue de l'Energie,* vol. 30, Oct. 1979, p. 828-831. In French.

This article aims to draw attention to several important points concerning the development of Europe's gas industry. It especially aims at examining this problem from the financial angle, that is in relation to the money markets of the various countries. The problem is to determine whether certain factors in the money markets could constitute great obstacles for the development of Europe's gas industry. (Author)

A80-13175 **The European economic community's policy concerning natural gas, coal and new sources of energy (La politique de la communauté économique européenne en matière de gas naturel, de charbon et d'énergies nouvelles).** I. Weiss and R. Constans. *Revue de l'Energie,* vol. 30, Oct. 1979, p. 837-843. In French.

This article is a history of the European Community's policy concerning energy. It retraces the birth of cooperation between member-states concerning natural gas, coal and new forms of energy. Concerning natural gas, the author concludes by noting that it is a flexible and nonpolluting energy and has obvious safety advantages. Concerning coal, following a temporary reduction in use, it will most probably once again become one of the main bases of world and European industry. New energies only seem to have a minor impact on the total of energy used by the member-states in a projection to 1990, but these new energies are likely to open promising perspectives for the beginning of the 21st Century. (Author)

A80-13180 **SSPS project - Two solar power plants in Spain (Projekt SSPS - Zwei Sonnenkraftwerke in Spanien).** H. Ellgering (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Bereich für Projekttragerschaften, Cologne, West Germany). *DFVLR-Nachrichten,* Nov. 1979, p. 15-17. In German.

The paper surveys the layout of the planned small solar power systems to be built by the IEA near the Costa del Sol in Spain. When completed the project will supply electrical power to the Spanish power grid, although the main purpose is to gain experience in the construction, design, and operation of solar power plants. The systems proposed will operate on the same principle in which solar heat is transferred to a heat transfer medium such as steam, gas, oil, or sodium. Two arrangements are discussed: the solar tower type and the solar farm type. The latter will utilize collectors of which one type will be adjustable only in elevation and the other in elevation and azimuth. It is concluded that if solar power plants are to be cost effective when fossil fuelled plants no longer are, then development work must begin now. M.E.P.

A80-13195 **The R&D programme of the European communities in the field of hydrogen - Progress and results.** G. Imarisio (Commission of the European Communities, Brussels, Belgium). *International Journal of Hydrogen Energy,* vol. 4, no. 5, 1979, p. 371-375. 9 refs.

A80-13196 **Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So_2-I_2 system for H_2O decomposition.** Y. Iwasawa, T. Takeo, and S. Ogasawara (Yokohama National University, Yokohama, Japan). *International Journal of Hydrogen Energy,* vol. 4, no. 5, 1979, p. 377-384. 13 refs.

A80-13197 **Microbial hydrogen production from replenishable resources.** J. E. Zajic, A. Margaritis, and J. D. Brosseau (Western Ontario, University, London, Canada). *International Journal of Hydrogen Energy,* vol. 4, no. 5, 1979, p. 385-402. 104 refs.

Fossil fuels such as oil, natural gas and coal represent nonreplenishable natural sources and their cost is rapidly escalating as the world energy demand keeps increasing due to population growth and technological development. Hydrogen is an important alternative fuel source which represents a highly efficient energy carrier, and compares favorably with other fuels available today. The paper reviews microbial energy production, microbial oxidation, microbial production of hydrogen, effect of nitrogenase on hydrogen synthesis, and photosynthetic bacteria. Hydrogen produced by a wide variety of microbial systems can be developed into an important alternative energy and chemical resource. Carbohydrates, such as cellulose and starches, represent an enormous reservoir of replenishable raw materials which have the potential of being converted biochemically to hydrogen gas and other valuable intermediates by a wide variety of microorganisms. S.D.

A80-13198 **Photophysical and chemical processes affecting the stability of the thiazine dye-iron system.** S. Solar and N. Getoff (Wien, Universität, Vienna, Austria). *International Journal of Hydrogen Energy*, vol. 4, no. 5, 1979, p. 403-410. 21 refs. Research supported by the Osterreichischer Fonds zur Förderung der wissenschaftlichen Forschung, Bundesministerium für Wissenschaft und Forschung, and Ludwig Boltzmann Gesellschaft.

Photoelectrochemical devices can be used to produce hydrogen under suitable conditions. Although the thiazine dye-iron system has been widely investigated since its introduction by Rabinowitch (1940) as a photogalvanic cell, its application for utilization of solar energy on a large scale is not realized as yet. The paper discusses some of the photophysical and chemical processes which affect the instability of this system. Various experimental techniques are employed to elucidate the reasons for the instability of the thiazine dye-iron system. Conditions under which hydrogen is formed are established. Based on the hydrogen yield, it is possible to calculate the total quantum yield of the energy transfer process. Pulse radiolysis experiments show that the H atoms can attack the dye molecule at various positions, with definite rate constants. The results indicate that the formation of H atoms as a result of a specified reaction and their further reactions with the dye limit the chemical stability of the thiazine dye-iron system. S.D.

A80-13199 **Hydrogen-powered vs. battery-powered automobiles.** J. J. Donnelly, Jr., W. C. Greayer, R. J. Nichols (Aerospace Corp., El Segundo, Calif.), W. J. D. Escher (Escher Technology Associates, St. Johns, Mich.), and E. E. Ecklund (U.S. Department of Energy, Washington, D.C.). *International Journal of Hydrogen Energy*, vol. 4, no. 5, 1979, p. 411-443. 33 refs.

Two future candidate automobile propulsion systems which do not rely upon petroleum or natural gas as an energy source have been studied and the resultant vehicle characteristics identified. The first vehicle system employs a gaseous hydrogen-fueled internal combustion engine (ICE) and either a liquid or metal hydride energy storage system. The second vehicle system employs an electronically controlled electric motor power-train and a battery energy storage system. Major tasks included in this study were the technical and economic assessments of the state of the art and future alternatives in hydrogen production and delivery, the hydrogen vehicle assessment, the battery-electric vehicle assessment and the comparison of the principal vehicle alternative in 1985, 1990 and 2000. The comparison includes weight, size, cost, energy and design range relationships and the implications on expenditure of all major energy sources. The study is summarized, results presented and conclusions drawn. Comments are made on the future roles of hydrogen and electricity in automobile propulsion. (Author)

A80-13200 **Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides.** H. Diaz, A. Percheron-Guégan, J. C. Achard (CNRS, Meudon, Hauts-de-Seine, France), C. Chatillon, and J. C. Mathieu (Grenoble, Ecole Nationale Supérieure d'Electrochimie et d'Electrométallurgie, Saint-Martin-d'Hères, Isère, France). *International Journal of Hydrogen Energy*, vol. 4, no. 5, 1979, p. 445-454. 25 refs.

Hydrogen is known to react reversibly with intermetallic LaNi5 type compounds to give hydrides in such temperature, pressure, and kinetics conditions that they are considered very suitable for hydrogen storage either in a solid-gas reaction or in an electrochemical reaction. The paper is concerned with replacing a fraction of nickel by aluminum in LaN(5-y)Aly compounds, with y increasing from 0 to 1.5 by 0.25 intervals. Al is chosen because it is cheaper and lighter than Ni and has properties very different from those of a transition metal, namely larger atomic radius, valence plus 3 and hydrogen affinity; this can lead to interesting changes in the structural and thermodynamic properties. Results are presented on the metallurgical, structural and thermodynamic properties of LaNi(5-y)Aly compounds and their related hydrides. Attention is given to an experimental determination of the enthalpies of formation of LaNi5 and LaNi4Al compounds. Correlations are established between structural and thermodynamic properties of intermetallic compounds of the series considered and their related hydrides. S.D.

A80-13204 **Copper diffusion and photovoltaic mechanisms at Cu-CdS contact.** B. Lepley, P. H. Nguyen, C. Boutrit, and S. Ravelet (Nancy, Institut des Sciences de l'Ingénieur, Vandoeuvre-les-Nancy, Meurthe-et-Moselle, France). *Journal of Physics D - Applied Physics*, vol. 12, Nov. 14, 1979, p. 1917-1928. 21 refs.

Schottky barriers have been formed by vacuum evaporation of Cu on to CdS thin films. The behavior of these samples has been investigated as a function of time and annealing by standard electrical methods: current-voltage analysis, capacitance-voltage analysis and analysis of the spectral dependence of the photoemission current. The impurity profile deduced from the reverse differential capacitance shows evidence of copper diffusion occurring between 20 and 200 C. An activation energy of 0.72 eV is found for the temperature dependence of the diffusion coefficient. The Cu-CdS interface has also been investigated by looking at the photovoltaic mechanisms in connection with the different heat treatments. Capacitance measurements performed under junction illumination have been used to obtain the true donor density after copper diffusion. (Author)

A80-13211 **Autonomous power supplies for telecommunications (Sources d'énergie autonomes pour télécommunications).** J. Auzilleau. *L'Onde Electrique*, vol. 59, Oct. 1979, p. 79-83. In French.

The operational principles of autonomous power supplies for telecommunications equipment, particularly radio relay stations, are considered, and the experimental solar- and wind-powered Aerosolec station is presented. Highly reliable, permanent telecommunications power supplies, often located in remote regions, are described as consisting of one or a number of types of energy sources connected in parallel, complemented by normal and emergency batteries. Aerosolec is composed of a 1100-W solar generator, a 300-W wind generator and normal and emergency batteries ensuring 12-day autonomy in the absence of sun and wind, delivering a permanent power of 180 W. Comparisons of investments costs per watt and per kWh over a 20-year period are presented which indicate the lower cost of wind-power technology. It is concluded that autonomous power supplies in telecommunications represent an advantage, especially in light of future utility limitations. A.L.W.

A80-13223 * **Fuel cell sesquicentennial.** E. M. Cohn (NASA; U.S. Army, Army Research Office, Washington, D.C.). *Energy*, vol. 4, Fall 1979, p. 13, 30.

The development of fuel cell technology is summarized, and the potential for utility-type fuel cell installations is assessed on the occasion of the 150th anniversary of the construction of the first fuel cell by Sir William Grove. The only functional fuel-cell systems developed to date, the hydrogen-oxygen cells used by NASA, are indicated, and hydrazine and alcohol (methanol) cells are considered. Areas requiring development before the implementation of fuel cells as general purpose utility-type electric generators include catalysts for naturally occurring hydrocarbons or processes for low-cost methanol or hydrazine production, efficient means of scrubbing and enriching air, self-regulating systems, and 15- to 20-fold power density increases. It is argued that although ideas for eliminating certain of the above-mentioned problems have been proposed, fuel-cell systems can never be expected to equal the efficiency, reliability and low cost of conventional power plants, and thus developmental support should be discontinued. A.L.W.

A80-13224 **Methanol from coal - An adaption from the past.** E. E. Bailey (Davy McKee Corp., Cleveland, Ohio). *Energy*, vol. 4, Fall 1979, p. 19, 20.

The production of methanol from coal using existing commercially available processing technology is examined for the example of a self-contained plant importing only coal, water and a small amount of power and located adjacent to a Wyoming mine site. Coal from the mine is crushed and dried to 8% moisture, then sent to a fluidized bed gasifier which produces H2, CO, CO2, methane and inert material from subbituminous coal. The hot gas is treated to ensure the proper H2 to CO ratio and remove sulfur and excess CO2, and is compressed in a methanol synthesis loop in order to produce a total of 7050 tons/day of methanol and 35 liquid tons/day of byproduct sulfur. The overall plant thermal efficiency is 46.5 %, and graphs of the cost of methanol as a function of the cost of coal are presented which indicate the greater sensitivity of methanol prices to capital costs than to plant efficiency. A.L.W.

A80-13225 **Gasoline's alternatives are feasible.** J. T. Miskell. *Energy,* vol. 4, Fall 1979, p. 22-24.

Various alternatives to petroleum-derived gasoline for use as automobile fuels are discussed. Results of a recent American Gas Association study which indicate substantial cost savings (with costs comparable to gasoline) to be obtained with coal-derived methane gas as compared with synthetic gasoline derived from coal or shale oil or with electricity are presented. The major features of gasoline, natural gas and electric automobiles are compared, noting similarities between gasoline and natural gas vehicles, and hydrocarbon and sulfur oxide emissions in fuel processing and utilization are compared for electric, coal gas, coal gasoline, shale oil gasoline, natural gas and conventional gasoline vehicles. Limitations on the use of methane-fuelled vehicles, including current conversion costs and the lack of a fuel distribution system, are indicated. A.L.W.

A80-13342 **Review of tokamak experiments.** R. J. Bickerton (EURATOM and Atomic Energy Research Establishment, Culham Laboratory, Abingdon, Oxon, England). In: Theory of magnetically confined plasmas; Proceedings of the Course, Varenna, Italy, September 1-10, 1977. Oxford, Pergamon Press, Ltd., 1979, p. 423-491. 35 refs.

A brief description of the history and evolution of the tokamak is followed by a review of the results of tokamak experiments. The topics covered include plasma measurements, coarse confinement and scaling, plasma equilibrium fluctuations in tokamak plasmas, impurities, recycling, plasma/wall interactions, tokamak modes of operation, energy balance, and auxialiary heating. Directions for future experimental work are outlined. V.P.

A80-13513 **Energy-storage systems.** F. R. Kalhammer (Electric Power Research Institute, Palo Alto, Calif.). *Scientific American,* vol. 241, Dec. 1979, p. 56-65.

Energy storage may play an important role in any shift towards increased use of coal, uranium, or solar energy. Prospects for energy storage by electric power systems, as well as in cars and commercial and residential structures are explored, including pumped-storage hydroelectric plants (one at Ludington, Michigan generates 2,000 megawatts at full power), compressed air (now successfully operational in Huntorf, West Germany), rechargeable batteries (such as lead-acid, nickel-iron, nickel-zinc, zinc-chlorine, sodium-sulfur, and lithium-iron sulfide types), and stored hot water. Pumped-storage hydroelectric plants (raised water) present topographic and environmental constraints, but underground storage is under study. Compressed air is more convenient to store, but requires cooling and then reheating for expansion into turbines. Vehicles powered by batteries, while economically feasible, have as a drawback limited range, and the idea of stored hot water, while gaining ground in Europe, faces in the United States institutional, rather than technical or economic, barriers to its use. J.B.

A80-13589 **The helium question.** E. Cook (Texas A & M University, College Station, Tex.). *Science,* vol. 206, Dec. 7, 1979, p. 1141-1147. 29 refs.

The question of the desirability of a governmental program of recovering and storing helium from helium-rich natural gas for the low-cost supply of future helium demands is considered. The geologic occurence and distribution of helium, most of which is found in the United States, are discussed, and difficulties in the assessment of helium resources are presented. Uncertainties of future large-scale demand for helium for such applications as fusion reactor magnetic confinement systems, refrigeration systems, and low-temperature energy transmission distribution and storage, which will not become operative until well into the next century, are assessed. Past helium conservation activities are reviewed, taking into account the introduction and subsequent suspension of the 1950 Helium Act Amendments. The present-value criterion of helium storage and the conservation approach are outlined, and it is concluded that a future decision to resume storing helium will be based more on prevailing ideas of fairness in intergenerational risk-bearing and equity, and on current views of the qualitative impact on future society of materials scarcities, than on any quantitative forecasts of future needs and costs. A.L.W.

A80-13861 **Semiconductor alternating-current motor drives and energy conservation.** D. J. BenDaniel (Exxon Enterprises, Inc., Woburn, Mass.) and E. E. David, Jr. (Exxon Research and Engineering Co., Florham Park, N.J.). *Science,* vol. 206, Nov. 16, 1979, p. 773-776. 8 refs.

Energy conservation by means of semiconductor alternating-current control of electric motor drives used in variable-rate industrial processes is presented and applications of the concept are discussed. The need for electrical energy conservation in the process industrial sector is pointed out for the case of drives used to operate industrial pumps, compressors, fans and blowers which typically involve ac electric motors controlled by throttling systems which dissipate excess motor energy. The electronic variable-speed drive is presented as an alternative to throttle control which varies the voltage and frequency simultaneously using a power inverter to achieve energy savings of up to 50% or more. The fully transistorized ac synthesizer (ACS), which represents an improvement in terms of efficiency, wave form quality, size, reliability and cost over previous silicon-controlled rectifier-based variable speed drives, is introduced and energy savings achieved with the ACS in a refinery pump are reported. Other possible applications of the ACS in high-frequency motors, as well as utility power converters and inverters and the integration of alternative electrical energy supplies into conventional power networks are indicated. A.L.W.

A80-13863 **Gasohol - Does it or doesn't it produce positive net energy.** R. S. Chambers, R. A. Herendeen, J. J. Joyce, and P. S. Penner (Illinois, University, Urbana, Ill.). *Science,* vol. 206, Nov. 16, 1979, p. 789-795. 41 refs.

A detailed analysis of energy inputs and outputs is performed on grain-based gasohol (10 percent grain-based ethanol, 90 percent gasoline). Existing differences of opinion on the energy balance derive mainly from variations in interpretation which are several examples of inherent methodological problems in energy analysis. The result is strongly dependent on assumptions about use of crop residues for fuel and the miles-per-gallon rating of gasohol. In terms of total nonrenewable energy, gasohol is close to the energy break-even point. On the other hand, in terms of petroleum or petroleum-substitutable energy, gasohol is an unambiguous energy producer, since most energy inputs to the process can be supplied by nonpetroleum sources such as coal. (Author)

A80-13980 **Textured silicon - A selective absorber for solar thermal conversion.** J. I. Gittleman, E. K. Sichel (RCA Laboratories, Princeton, N.J.), H. W. Lehmann, and R. Widmer (RCA Laboratories, Zurich, Switzerland). *Applied Physics Letters,* vol. 35, Nov. 15, 1979, p. 742-744. 10 refs.

Reactive sputter etching has been used to texture the surface of Si wafers. The texturing was in the form of pillars whose diameters and spacing were small compared with the useful solar wavelengths and whose heights were comparable with or larger than these wavelengths. The normal and hemispherical reflectances of textured wafers were measured. The solar absorptance was found to be 0.99 for wavelengths below 1.0 micron. Because of the sharp drop in absorptance for photon energies less than the energy gap, the overall solar absorptance was about 0.85. The calculated thermal emittance was about 0.25 and was primarily due to multiphoton absorption processes normally observed in thick Si crystals. Much smaller values of thermal emittance would be obtained from thin textured films.

(Author)

A80-13986 **Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy.** J. C. C. Fan, A. R. Calawa, R. L. Chapman, and G. W. Turner (MIT, Lexington, Mass.). *Applied Physics Letters,* vol. 35, Nov. 15, 1979, p. 804-806. 11 refs. USAF-sponsored research.

The paper reports that conversion efficiencies of up to 16% at AM1 have been obtained for molecular beam epitaxy (MBE) GaAs solar cells utilizing a shallow-homojunction n(+)/p/p(+) structure without a GaAlAs window. It is reported that the n(+), p, and p(+) GaAs layers were all grown by MBE on single-crystal p(+) GaAs substrates. In addition, cell metallization was performed by electroplating, and an antireflection coating was formed by anodic oxidation of the n(+) layer. In conclusion it is noted that these cells are the first efficient MBE solar cells of any type to be reported.

M.E.P.

A80-14409 **Flat-plate solar collector materials.** M. L. Day (Ford Aerospace and Communications Co., Palo Alto, Calif.), D. S. Remer, and D. Hyatt. *SAMPE Quarterly,* vol. 11, Nov. 1979, p. 28-37. 10 refs. Research supported by the Southern California Gas Co.

The desirability of specific materials and designs for conventional flat-plate solar collector components is considered. Then a methodology for choosing the most economic component is presented, consisting of a computer simulation and a rate-of-return analysis. The effect of rising conventional fuel costs is examined. Examples of using the methodology are given, based on Southern California climatic and user-demand conditions. Selective absorber-plate coatings and film inner glazing are shown to be economic, yielding a rate-of-return of 23% and 29%, respectively. (Author)

A80-14430 **Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge.** V. N. Gubankov, V. P. Koshelets, and G. A. Ovsiannikov (Akademiia Nauk SSSR, Institut Radiotekhniki i Elektroniki, Moscow, USSR). *(Zhurnal Tekhnicheskoi Fiziki,* vol. 49, Apr. 1979, p. 832-838.) *Soviet Physics - Technical Physics,* vol. 24, Apr. 1979, p. 481-485. 14 refs. Translation.

The paper examines data on the temperature and field dependences of the photodetection response (in narrowband and broadband detection modes) of thin-film Josephson microbridges subjected to centimeter-wave and millimeter-wave radiation. The effects of superconductivity induced in the bridges by microwave radiation and by dc current upon the response is considered. Operation in the heterodyne detection mode eliminates these effects and leads to an increase in the differential resistance of the bridges. B.J.

A80-14516 **Heat transfer in the channel of a high-power MHD generator.** L. M. Biberman, M. B. Zhelezniak, V. N. Zatelepin, G. A. Liubimov, S. A. Medin, and A. Kh. Mnatsakanian. *(Akademiia Nauk SSSR, Izvestiia, Mekhanika Zhidkosti i Gaza,* May-June 1979, p. 136-149.) *Fluid Dynamics,* vol. 14, no. 3, Nov. 1979, p. 434-445. 23 refs. Translation.

The present analysis deals with a linear conduction-type open-cycle MHD generator, employing the combustion products of natural gas in oxygen-enriched air as the working medium. An approximate method (first-approximation) is proposed for calculating the MHD flow and the radiative-convective heat transfer in the generator channel. The method takes the influence of a readily ionizable admixture into consideration. V.P.

A80-14530 **Some problems with variable operation of an MHD generator.** V. V. Velikov, V. V. Breev, A. V. Gubarev, and A. V. Zotov. *(Magnitnaia Gidrodinamika,* Jan.-Mar. 1979, p. 89-96.) *Magnetohydrodynamics,* vol. 15, no. 1, July 1979, p. 73-79. 5 refs. Translation.

Some of the variable operating regimes of MHD generators of independent, parallel, and series excitation are characterized. For parallel and series excitations, the current-voltage characteristics are given, and the limiting values of certain characteristics are computed. The variation of parameters along the length of the duct is established for normal and anomalous duct current regimes as the counterpressure in a supersonic generator increases. A plot of the transient regimes of a generator with series connection of the magnetic coil is constructed.

P.T.H.

A80-14588 **Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells.** R. R. Dubin and S. Prochazka (GE Corporate Research and Development Center, Schenectady, N.Y.). *Electrochemical Society, Journal,* vol. 126, Dec. 1979, p. 2156-2159. 8 refs.

Several general physical properties of sintered SiC ceramic are listed and can readily be seen as desirable in Na/S cell fabrication. The present experimental study uses relevant criteria to evaluate the electrically conductive sintered SiC ceramic as a dual-function cathode container/electrode in a Na/S cell. The chemical inertness of sintered SiC is demonstrated in anhydrous melts (350 C) of sulfur, and a range of sodium polysulfides (primarily Na2S4) under a variety of experimental conditions; these include the application of anodic and cathodic currents for extended time periods, melt exposure with no applied potentials, and conditions of actual Na/S cell cycling. In addition, the ability to cycle such cells in the two-phase region is demonstrated. The electrical and mechanical properties as well as the formability of this material are shown to be adequate for use in first-generation prototype Na/S cells. In conclusion, sintered SiC can successfully be used as a noncorrodable structural material in Na/S cells. It may be used as an electrically conducting or nonelectrically conducting cell component in contact with catholyte and/or oxidizing atmosphere.

S.D.

A80-14592 # **Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells (Termodinamicheskii analiz teplosilovykh preobrazovatelei solnechnoi energii rabotaiushchikh v bloke s FEP).** B. A. Bazarov and B. D. Tairov (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *Geliotekhnika,* no. 4, 1979, p. 10-13. In Russian.

The paper examines the operation of a solar energy system combining solar cells and a thermomechanical converter based on a Freon turbine with power output up to 10 kW. The basic thermodynamic and design parameters of such a system are investigated and compared to that of other Freon and water-vapor systems.

B.J.

A80-14593 # **High-voltage multijunction solar cell (Vysokovol'tnyi mnogoperekhodnyi fotoelektricheskii preobrazovatel' solnechnoi energii).** V. G. Doroshenko, M. B. Zaks, V. A. Kalash'ian, V. N. Lozovskii, Iu. V. Skokov, and O. I. Solodukha. *Geliotekhnika,* no. 4, 1979, p. 14-18. In Russian.

The paper examines the photoelectric properties of single-crystal silicon high-voltage solar cells with bulk arrangement of p-n junctions, obtained through gradient zone recrystallization. The temperature dependence of the basic properties of such cells was studied in the 100-400-K range, and volt-ampere characteristics at high illumination intensities were examined. B.J.

A80-14594 # **Maximum cold-generation capacity of thermoelectric refrigerators (Maksimal'naia kholodoproizvoditel'nost' termoelektricheskikh okhlazhdaiushchikh ustroistv).** R. V. Koval'skii (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *Geliotekhnika,* no. 4, 1979, p. 19-24. 6 refs. In Russian.

The paper investigates conditions under which a thermoelectric refrigerator with constant working-fluid temperature and a specified cold-generation capacity has minimum size, weight, and amount of thermoelectric material. The effect of switching losses on device optimization is considered, and an analytical relationship for determining optimal branch height of thermoelectric elements is proposed. B.J.

A80-14595 # **Evaluation of conductor mass and necessary voltage level for large satellite solar arrays (Otsenka massy tokoprovodov i neobkhodimogo urovnia napriazheniia krupnykh orbital'nykh solnechnykh batarei).** A. Kh. Cherkasskii (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *Geliotekhnika,* no. 4, 1979, p. 25-29. In Russian.

Estimates are obtained in a dimensionless form for the necessary mass of conductors for a large satellite solar array. In addition, necessary voltage levels at array output terminals are estimated as a function of area. B.J.

A80-14596 # **Development of optical waveguides for a power-related application (Razrabotka i primenenie silovykh svetovodov).** V. S. Dverniakov, V. V. Pasichnyi, I. E. Kasich-Pilipenko, T. V. Eremina, D. K. Sattarov, M. I. Murav'eva, and I. E. Galant (Akademiia Nauk Ukrainskoi SSR, Institut Problem Materialovedeniia, Kiev, Ukraninian SSR). *Geliotekhnika,* no. 4, 1979, p. 36-39. 6 refs. In Russian.

The paper examines the possibility of using optical waveguides to transmit high-flux solar radiation in solar-furnace type systems. The waveguides will be used to deliver concentrated solar radiation for such manufacturing processes as zone melting, welding, and heat treatment. Design parameters and materials selection for such waveguides are considered. B.J.

A80-14597 # **Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system (Selektivnoe luchepogloshchenie kak sredstvo povysheniia effektivnosti vysokotemperaturnoi gelioenergeticheskoi ustanovki).** O. I. Kudrin, A. Abdurakhmanov, and I. A. Aggeeva. *Geliotekhnika,* no. 4, 1979, p. 40-48. In Russian.

The use of selectively absorbing surfaces to increase the efficiency of high-temperature solar energy systems is examined. Particular attention is given to the application of selective absorption to: (1) a high-temperature Stirling-engine system and (2) a solar thermal rocket engine. B.J.

A80-14655 **Studies in heat transfer: A Festschrift for E. R. G. Eckert.** Edited by J. P. Hartnett (Illinois, University, Chicago, Ill.), T. F. Irvine, Jr. (New York, State University, Stony Brook, N.Y.), E. Pfender (Minnesota, University, Minneapolis, Minn.), and E. M. Sparrow (Minnesota, University, Minneapolis, Minn.). Washington, Hemisphere Publishing Corp.; New York, McGraw-Hill Book Co., 1979. 528 p. $42.50.

The book is a state-of-the-art overview of modern heat transfer, which details the most important new research, techniques, and procedures in the field. Significant topics such as boundary layers, external flows and jets, natural convection, internal flows, solar energy, conduction and fins, and boiling and condensation are covered. New information is presented on turbine blade cooling in aeroengines, heat transfer in axisymmetric confined jets, and natural convection in salt solutions near melting ice surfaces. Also covered are evaluations of solar collectors and energy converters, absorption heat pumps for solar space heating systems, the thermal conductivity of Apollo 15 lunar soil, and other subjects of interest. S.D.

A80-14667 **Heat transfer to a melting solid with application to thermal energy storage systems.** R. J. Goldstein and J. W. Ramsey (Minnesota, University, Minneapolis, Minn.). In: Studies in heat transfer: A Festschrift for E. R. G. Eckert.
Washington, Hemisphere Publishing Corp.; New York, McGraw-Hill Book Co., 1979, p. 199-208. 5 refs. NSF Grant No. ENG-77-21626.

The shape of a liquid-solid interface and the local heat transfer rate at this interface are studied. The experiments are performed with naphthalene in an apparatus that is designed to permit continuous observation of the melting process. In addition, the heater contains thermocouples to evaluate the time-varying heater wall temperatures and heat transfer coefficients. Photographs of the molten region are used to evaluate the local progression of the solid-liquid interface and thus the local heat transfer rates at the interface. It is noted that for a considerable period of time the total volume of the melted region can be closely obtained from the total heat flow and the density and latent heat of the solid. The actual shape of the molten region can vary considerably depending on the conditions as a plume begins to develop. V.T.

A80-14670 **Solar collectors as energy converters.** F. Bosnjakovic (Stuttgart, Universität, Stuttgart, West Germany). In: Studies in heat transfer: A Festschrift for E. R. G. Eckert.
Washington, Hemisphere Publishing Corp.; New York, McGraw-Hill Book Co., 1979, p. 331-381. 8 refs. Translation.

A thermal solar collector operates with the energy of solar radiation, which is available partly as direct, terrestrial primary radiation and partly as indirect, diffuse secondary radiation, which is scattered by the atmosphere in all directions. The solar disk, as a first approximation, acts as a blackbody with an effective temperature of 5780 K. It is shown that the thermodynamic utilization of solar energy in currently available thermal collectors can be described as unsatisfactory to good. Apart from the influence of the weather, the efficiency depends primarily on the choice of the collector and on its operation. The ultimate yield of solar energy depends, however, not only on the collector, but also on the thermodynamic efficiency of the required supplementary equipment attached to the collector, such as simple heat exchangers, heat pumps or heat-generating power plants. The development of first-rate collectors and comparable supplementary equipment is suggested to be important for the prospects of future success in the utilization of solar energy. S.D.

A80-14671 **Influence of the working fluid on heat transfer and layout of solar tower receivers.** K. Bammert (Hannover, Technische Universitat, Hanover, West Germany). In: Studies in heat transfer: A Festschrift for E. R. G. Eckert.
Washington, Hemisphere Publishing Corp.; New York, McGraw-Hill Book Co., 1979, p. 383-400. 13 refs.

Heat transfer to working medium is studied for a cylindrical or polygonal receiver with inner tubes. A method for calculating the distribution of the absorbed heat flux intensity on the tube surface is presented assuming axisymmetric irradiation in the receiver and considering both the tube cage geometry and reflection from the inner wall of the receiver. The method is applied to the layout of receivers in solar tower plants with closed-cycle gas turbines. A helium plant and an air plant with an output at terminals of 20 MW are taken into consideration. For both receivers an optimum irradiation pattern as well as the most favorable values for the receiver inlet pressure and geometric dimensions are given. V.T.

A80-14672 **Absorption heat pumps for solar space heating systems.** K. F. Knoche and D. Stehmeier (Aachen, Rheinisch-Westfalische Technische Hochschule, Aachen, West Germany). In: Studies in heat transfer: A Festschrift for E. R. G. Eckert.
Washington, Hemisphere Publishing Corp.; New York, McGraw-Hill Book Co., 1979, p. 401-408.

The use of an absorption heat pump to reduce solar collector operating temperatures to below the ambient temperature and thereby increase the efficiency of solar space heating is discussed. The operational principles and enthalpy-composition diagram of a single-stage absorption device are illustrated for a lithium bromide-water absorber system, and results of a parameter survey which indicate the greater desirability of a flexible ratio between heat recovered and the heat necessary to drive the absorption boiler are presented. A multi-stage absorption device, which would allow such a variable heat ratio to be realized in an absorber-resorber system, is outlined, and the similarity of the dependence of its heat ratio on collector entrance temperature to that of a reversible process is pointed out. A.L.W.

A80-14675 **The thermal triode.** P. Grassmann and W. Doerfler (Institut für Verfahrens- und Kältetechnik Zurich, Switzerland). In: Studies in heat transfer: A Festschrift for E. R. G. Eckert. Washington, Hemisphere Publishing Corp.; New York, McGraw-Hill Book Co., 1979, p. 475-484. 8 refs.

A hot water or steam heating system is a rectifier, for heat is transported only if the heat source is below the heat sink; this principle therefore applies to heat pipes. The paper demonstrates that it is possible to construct a thermal triode by adding a controlling zone to a heat pipe. This approach corresponds to the well-known electronic triode (three-electrode valve containing anode, cathode, and control grid electrode). The heat flow through the tube corresponds to the electron current and the temperature of the controlling zone corresponds to the biasing potential of the grid. The theory of such a thermal triode is developed and proved by experiment. S.D.

A80-14685 * **Solar cell spectral response characterization.** E. F. Zalewski and J. Geist (National Bureau of Standards, Radiometric Physics Div., Washington, D.C.). *Applied Optics,* vol. 18, Dec. 1, 1979, p. 3942-3947. 15 refs. NASA-supported research.

The absolute spectral response of solar cells is reported in the 400-1000-nm spectral region. Measurements were performed using two different types of monochromatic sources: amplitude-stabilized CW laser lines and interference filters with an incandescent lamp. Both types of calibration procedures use electrical substitution radiometry as the basis of traceability to absolute SI units. The accuracy of the calibration is shown to be limited by the nonideal characteristics of the solar cells themselves, specifically spatial nonuniformities and nonlinearities induced by high light levels. (Author)

A80-14700 * # **The role of technology as air transportation faces the fuel situation.** C. Driver (NASA, Langley Research Center, Hampton, Va.). *Upper Midwest Council, Meeting, Minneapolis, Minn., Nov. 1, 1979, Paper.* 14 p. 17 refs.

The discussion of system integrators whose task is to identify the application and payoff of various research disciplines is limited to aircraft of the subsonic commerical transport type. The aim is to provide a brief description of the existing fuel situation, the progress made in fuel reduction, near-term prospects for further reductions, and long-term prospects for even further reductions, all primarily from the technology point of view. V.P.

A80-14701 **Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings.** Workshop sponsored by the American Institute of Aeronautics and Astronautics. Edited by L. B. Sidor. Los Angeles, American Institute of Aeronautics and Astronautics, Inc. (AIAA Monograph Series. Volume 25); North Hollywood, Calif., Western Periodicals Co., 1979. 230 p. $42.

The proceedings consider the role of technical societies in technology transfer. Attention is also given to the political realities of technology transfer. Discussion of transportation command and control covers topics such as: the BEEP demonstration project, new technology and vehicle operation on roadways, and hydrogen fuel applications for urban transit. Environmental modelling and monitoring covers topics such as the application of the ATMOSAT system to air pollution monitoring, and advances in heavy gas dispersion modelling. Areas also covered are energy demonstration projects, air pollution abatement, and planning and management techniques. M.E.P.

A80-14702 * # **New technology and vehicle operation on roadways.** D. W. Humphreys (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings. Los Angeles, American Institute of Aeronautics and Astronautics, Inc.; North Hollywood, Calif., Western Periodicals Co., 1979, p. 35-44. 14 refs. Research sponsored by the U.S. Department of Energy and U.S. Department of Transportation.

Some concepts towards the optimum movement of vehicles on highways are presented. It is stressed that in proper perspective, the private automobile is one element of several modes of transportation. The modal mix in the long run is determined by proper land use planning, population density, and historic growth patterns. Discussion investigates the two main interacting elements of the highway in the dynamic state: the roadway and the driver operated vehicle, noting that the inefficiencies of the system are caused by the uncoordinated and disassociated actions of the two elements. Also discussed are vehicle operations on streets, highways, and freeways, on board communication, control, and guidance, systems considerations and traffic management, and benefits of optimized vehicle operations on roadways. M.E.P.

A80-14703 # **Hydrogen fuel applications for urban transit.** C. A. MacCarley (Denver, University, Denver, Colo.). In: Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings. Los Angeles, American Institute of Aeronautics and Astronautics, Inc.; North Hollywood, Calif., Western Periodicals Co., 1979, p. 45-62. 24 refs.

It is noted that hydrogen represents a fuel that is independent of oil supplies and virtually non-polluting. Also NASA and the aerospace industry have contributed to an increased understanding of the fuel properties of hydrogen, and its increased range of applications. It is reported that technology now exists for the conversion of city buses, trucks and rail systems to hydrogen fuel. The paper discusses the technical aspects of hydrogen vehicle systems, and summarizes past and present working examples. Finally, an integrated refuse disposal-hydrogen fueled transit system for Denver, Colorado is proposed. M.E.P.

A80-14706 * # **Heat and electricity from the sun using parabolic dish collector systems.** V. C. Truscello and A. N. Williams (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings. Los Angeles, American Institute of Aeronautics and Astronautics, Inc.; North Hollywood, Calif., Western Periodicals Co., 1979, p. 137-149. 5 refs. Research sponsored by the U.S. Department of Energy.

The paper investigates point focus distributed receiver (PFDR) solar thermal technology for the production of electric power and of industrial process heat. Attention is given to a thermal systems project conducted by JPL under DOE sponsorship. It is reported that project emphasis is on the development of cost-effective systems which will accelerate the commercialization and industrialization of plants up to 10 MWe, using parabolic dish collectors. Also discussed are the characteristics of PFDR systems, the cost targets for major systems hardware, and markets for this technology. Finally, the present system status of the technology development effort is discussed. M.E.P.

A80-14707 # **Application of solar and fuel cell technology to industrial users.** G. H. Gelb (TRW Energy Systems Group, Redondo Beach, Calif.). In: Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings. Los Angeles, American Institute of Aeronautics and Astronautics, Inc.; North Hollywood, Calif., Western Periodicals Co., 1979, p. 162-178.

The paper presents the results of two studies on the application of developing near term energy technologies of actual industrial applications. The first study applies solar energy collection to the production of medium temperature steam for a food processor. The second addresses the feasibility of using phosphoric acid fuel cells for the production of aluminum. Finally, design methodology and technical constraints are identified and the institutional and economic realities in each application are discussed. M.E.P.

A80-14708 # **Vehicle emissions control and its effect on engine development.** N. Kayne (California Air Resources Board, El Monte, Calif.). In: Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings. Los Angeles, American Institute of Aeronautics and Astronautics, Inc.; North Hollywood, Calif., Western Periodicals Co., 1979, p. 185-187.

It is noted that as emissions standards have become more stringent over the years, equipment for controlling engine parameters has become complex and the parts highly interdependent. The paper presents a brief overview of electronic equipment as well as computers which are being employed to sense and control various engine parameters. The conflict between reduced emissions and reduced fuel consumption is also considered. Attention is given the the three way catalyst system noting the need for electronics to effectively implement such a system. Also discussed are physical changes such as weight and size reductions in motor vehicles and the need for accurate diagnosis and maintenance to keep such systems functioning properly. M.E.P.

A80-14709 # **Hydrogen - The Denver story.** E. K. Demos (Denver City and County, Dept. of Public Works, Denver, Colo.). In: Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings. Los Angeles, American Institute of Aeronautics and Astronautics, Inc.; North Hollywood, Calif., Western Periodicals Co., 1979, p. 191-196.

The paper describes a solid waste to steam to hydrogen project being considered for implementation by the City and County of Denver, Colorado. Attention is given to issues leading to the decision to consider such a project, along with financial, institutional, and environmental concerns. Topics discussed include solid waste management, steam energy, air pollution control, energy shortages, chain of events/project status, hydrogen safety and financial considerations. It is concluded that while many questions remain unanswered, especially financial, the city's willingness to offer long term waste tonnage commitments to the project, and a strong commitment by the PSCo to purchase steam are important points in favor of the project. M.E.P.

A80-14791 **Earth benefits of solar power satellites.** P. E. Glaser (Arthur D. Little, Inc., Cambridge, Mass.). In: Space - The best is yet to come; Proceedings of the Sixteenth Space Congress, Cocoa Beach, Fla., April 25-27, 1979. Cocoa Beach, Fla., Canaveral Council of Technical Societies, 1979, p. 5-11 to 5-25. 25 refs.

The paper presents the potential of solar energy for global needs with emphasis on solar energy conversion in space for use on earth. This approach is compared with terrestrial solar energy conversion methods, and the concept of the solar power satellite (SPS) is presented. The technology options for converting solar energy in space, transmitting power, and converting it on earth into electricity are summarized, and the requirements for space transportation systems, orbital assembly, and maintenance are reviewed. The economic, institutional, and environmental aspects of SPS operations are discussed; a phased SPS development program and possible organizational structures to produce power generation on earth are outlined. A.T.

A80-14794 **A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volumes 1, 2, 3 & 4.** Congress sponsored by the International Federation of Automatic Control and Ministry of Education of Finland. Edited by A. Niemi (Helsinki University of Technology, Espoo, Finland). Oxford and New York, Pergamon Press, 1979. Vol. 1, 839 p.; vol. 2, 837 p.; vol. 3, 742 p.; vol. 4, 367 p. Price of four volumes, $400.

The Congress focused on electric power system dynamics, thermal power plant control, nuclear power plant dynamics and control, thermal processes in metallurgical industries, computer control of paper plants, chemical process control, heating systems, modelling of physiological systems, clinical health care control, systems engineering, management systems, mathematical programming, applications in control, guidance and control of aircraft, spacecraft navigation and guidance, transportation systems, and environmental and urban systems. Papers were presented on oil yield from oil shale retorting, parameter estimation of radiocardiograms with minicomputers, integrated walking robot modelling and simulation, energy management and singular perturbations in flight mechanics, attitude and orbit control requirements on application satellites and their ground stations, a combined system of vehicle motion control, command and stability systems for aircraft, and optimal orbital transfer strategy for geostationary satellites. A.T.

A80-14795 **Optimal oil yield from in situ oil shale retorting.** A. Ahmad (Owens-Corning Fiberglas Technical Center, Granville, Ohio), J. H. George, and H. G. Harris (Wyoming, University, Laramie, Wyo.). In: A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 287-290. 15 refs. Contract No. E(49-18)-2234.

Recent oil price increases have made oil shale hydrocarbon reserves much more attractive for development. Utilization of oil shale involves retorting to produce oil, which requires either mining and above ground processing, or treatment by an in situ method. Because of the high costs and environmental problems associated with mining, above ground processing, and disposing of spent shale, the in situ approach is being investigated in detail, and appears to be a viable alternative. A control scheme is proposed which optimizes the oil yield based on a model developed to describe operation of the Laramie Energy Research Center 150 ton oil shale retort at Laramie, Wyoming; this retort was designed and operated to simulate in situ processing of oil shale. It is possible to obtain increases in oil yield by the optimization program. (Author)

A80-14837 **On the basic dynamics of extracting power from waves.** P. C. Parks (Royal Military College of Science, Shrivenham, Wilts., England). In: A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 1537-1542. 5 refs.

The paper examines some basic mechanisms for extracting power from waves, first from waves on taut strings and then from waves in the sea. A mathematically attractive device for absorbing power from sea waves is proposed in the form of an exponentially shaped wedge containing a tuned mass-spring system with damping. Attention is given to single and double-sided systems; singled-sided systems suitably tuned were found to extract all the power from an incoming harmonic wave train, while the double-sided systems can usually extract only half this power. C.F.W.

A80-14844 **An optimization model for overall urban energy planning.** C. Mattsson and J. A. Bubenko (Kungl. Tekniska Hogskolan, Stockholm, Sweden). In: A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1657-1659. Research supported by the Statens Rad for Byggnadsforskning.

A model is presented for overall energy planning of an urban region with respect to the preference of energy forms. The region is divided into subareas depending on land use and their locations. Electrical and heating demands are forecasted for each subarea and network capacities and linearized cost functions. The objective is to find appropriate energy forms in each subarea to minimize the annual costs. This approach will be used to analyze the economical aspects of different trends in energy consumption, land use potentials and system performance. Finally, the model can be used to analyze the consequences of the uncertainties in cost parameters and demand forecasting. (Author)

A80-14948 **Enhanced power generation of GSS/4/PS by optical solar reflectors.** P. R. K. Chetty and R. M. Vasagam (Indian Space Research Organization, Satellite Centre, Bangalore, India). *IEEE Transactions on Aerospace and Electronic Systems,* vol. AES-15, Sept. 1979, p. 690-695. 8 refs.

A novel arrangement is proposed to enhance the power generation capabilities of a gravitationally stabilized solid-state-satellite solar-power station (GSS/4/PS) spherical solar collector. The unilluminated portion of a GSS(4)PS is illuminated by employing optical solar reflectors. The different mechanisms required for implementation of this arrangement are already space proven. The detailed study of this arrangement made by the authors reveals that practical realization of this concept will enhance the power generation capability of the GSS(4)PS and simultaneously reduce the weight per unit power and cost per unit power in GSS(4)PS spherical solar collectors.

(Author)

A80-14960 **CO2 electric discharge lasers - Present status and future applications.** J. P. Reilly (W. J. Schafer Associates, Inc., Wakefield, Mass.). In: Gas-flow and chemical lasers; Proceedings of the Second International Symposium, Rhode-Saint-Genèse, Belgium, September 1978. Washington, D.C., Hemisphere Publishing Corp., 1979, p. 129-149. 13 refs.

CO2 electric discharge lasers (EDLs) have proven themselves to be efficient sources of high-power high-quality laser energy. The paper outlines applications of high-power CO2 EDLs, applications which are now becoming commercially viable, as well as those which are still being investigated in research laboratories. Applications of CO2 lasers are discussed relative to industrial applications (laser welding, laser surface hardening, heat treatment, and surface chemistry modification by laser alloying and laser glazing), laser radar applications, laser-induced fusion, and laser propulsion. Attention is given to requirements of applications versus status of technology. Examples are given of the engineering solutions used to address the technology issues identified by particular laser applications.

S.D.

A80-15136 **Efficient indium tin oxide/polycrystalline silicon solar cells.** J. P. Schunck (CNRS, Centre de Recherches Nucléaires de Strasbourg, Strasbourg, France) and A. Coche (Strasbourg I, Universite, Strasbourg, France). *Applied Physics Letters,* vol. 35, Dec. 1, 1979, p. 863-865. 24 refs.

ITO/Si-N solar cells have been fabricated by a spraying process at 500 C on polycrystalline silicon. Electroless nickel plating was used for the back Ohmic contact deposition. Electrical characteristics and spectra response of these heterojunctions are compared to those obtained on monocrystalline silicon. AM1 efficiency of approximately 9 percent (based on active area) is achieved for polycrystalline material. Temperature dependence of open-circuit voltages and short-circuit currents are comparable to those reported for diffused Si junctions and Si based MIS cells. (Author)

A80-15141 **Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates.** J. C. C. Fan, C. O. Bozler, and B. J. Palm (MIT, Lexington, Mass.). *Applied Physics Letters,* vol. 35, Dec. 1, 1979, p. 875-878. 13 refs. USAF-sponsored research.

By using a simple analytical model for GaAs solar cells with the n(+)/p/p(+) shallow-homojunction structure, good fits have been obtained between computer calculations and experimental data for the external quantum efficiency and AM1 conversion efficiency of thin-film GaAs cells with different values of n(+) layer thickness grown on Ge substrates. The calculations yield values for material properties of the GaAs layers composing the cells and also permit the optimization of cell design parameters. In addition, the agreement between calculation and experiment demonstrates that the Ge substrates play a passive role. Thus there has been success in fabricating 21 % efficient thin-film GaAs solar cells on non-GaAs substrates.

(Author)

A80-15175 **The promise and puzzle of electric vehicles.** M. Wayne (Electric Power Research Institute, Palo Alto, Calif.). *EPRI Journal,* vol. 4, Nov. 1979, p. 6-15.

Electric vehicles (EVs) promise energy and environmental benefits which could cut U.S. oil use as well as hydrocarbon and CO emissions in half if they replaced the private passenger car. The drawbacks of their batteries are limited range (20-40 miles), top speed of 40-55 mph, long recharging time, and a 25-40% premium in cost over a similar gasoline-powered car. Should a breakthrough in battery technology occur (being tested are lead-acid, nickel-iron, nickel-zinc, zinc-chlorine, sodium-sulfur, and lithium-iron sulfide types), EVs would run more cheaply on electricity than on gasoline or synthetic fuels, and have fewer engine parts to wear down than conventional cars. However, these batteries are hampered by low energy density, short cycle life, high cost, or high operating temperature. Other EV commercialization possibilities include electrified highways, a massive network of public recharging outlets, battery exchange, or a greater emphasis on hybrid (electric and gasoline) vehicles.

J.P.B.

A80-15267 * # **Cooling a radioisotope power source in the Space Shuttle Orbiter.** D. I. Levine (Rockwell International Corp., Downey, Calif.) and L. D. Stimpson (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *American Society of Mechanical Engineers, Intersociety Conference on Environmental Systems, 9th, San Francisco, Calif., July 16-19, 1979, Paper 79-ENAs-44.* 7 p. Members, $1.50; nonmembers, $3.00.

Radioisotope thermoelectric generators (RTG's), used to generate electrical power on outer planetary spacecraft, are presently planned for a January 1982 launch of Galileo and later for a February 1983 launch. The RTG's will be externally located on a spacecraft to be deployed from the Space Shuttle Orbiter. Each RTG rejects nearly 2.5 kW (8500 Btu/hr) of thermal energy. From the time the RTG's are loaded into the payload bay until the doors are opened one to three hours after launch, active cooling will maintain proper temperature limits. This paper includes a description of two types of RTG's and the various cooling concepts considered. The payload cooling capability of the Shuttle Orbiter and modifications required to accommodate the RTG's are discussed. The analytical technique for determining the heat load split between the orbiter environment and RTG coolant is also presented. (Author)

A80-15328 **Calculation of steam generation with parabolic solar collectors (Berechnung der Dampferzeugung mit parabolischen Sonnenkollektoren).** M. Kuczera (Dornier System GmbH, Friedrichschafen, West Germany) and R. Günther. *Brennstoff-Wärme-Kraft,* vol. 31, Nov. 1979, p. 432-436. In German.

The paper presents a mathematical model which can be used to calculate the energy flow, temperatures, and efficiency degree of the steam generation performed by a cylinder-parabolic solar collector with a shielding pipe. Attention is given to a collector without a shielding pipe, a collector with a transparent shield pipe, and gray and selective absorbers. Finally, the results are compared with those from the literature. It is shown that there is no loss in operating efficiency if the steam is super heated to 500 C or 550 C. The system operated at 30 bar pressure and it is concluded that this pressure can be raised to that typical of power generating plants without any fundamental difficulties.

M.E.P.

A80-15329 **Measurements on a 15 kW wind energy conversion system (Messungen an einer 15 kW-Windkraftanlage).** U. Machens (Giessen, Fachhochschule, Giessen, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, Nov. 1979, p. 437-440. In German. Research supported by the Bundesministerium für Forschung und Technology and Bundesministerium für wirtschaftliche Zusammenarbeit.

The paper describes a WECS which generates with an asynchronous alternator and supplies electricity to the power grid under adequate wind conditions. Attention is given to the design which consists of a high three bladed device with a horizontal axis which is 15 m in diameter. Also discussed are the measurement facilities. Finally, the results after 300 hours of operation are examined. M.E.P.

A80-15330 **The Kirsten rotor as a wind turbine (Der Kirstenrotor als Windrad).** W. M. Pieper (Giessen, Fachhochschule, Giessen, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, Nov. 1979, p. 441-445. 18 refs. In German.

The paper calculates the output of a Kirsten rotor in terms of the various relationships between peripheral speed and wind speed and for various blade widths. Attention is given to the kinematics and dynamics of the Kirsten rotor. An equation is derived for the numerical evaluation of the rotor output. Finally, a demonstration model tested in a water tunnel is mentioned and comparisons are made with the Darrieus rotor. M.E.P.

A80-15358 **Coulombic effects in the quenching of photo-excited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen.** G. L. Gaines, Jr. (General Electric Co., Schenectady, N.Y.). *Journal of Physical Chemistry,* vol. 83, Nov. 29, 1979, p. 3088-3091. 24 refs. Contract No. EG-77-C-02-4395.

A study of the quenching of luminescence of several ruthenium(II)-bipyridyl complexes by methyl viologen in aqueous salt solutions using intensity and lifetime measurements is presented. One neutral complex shows no salt effect and its quenching rate constant is near the diffusion-controlled limit; another neutral complex exhibits a small negative salt effect, possibly due to its highly dipolar structure. The three positively charged complexes studied are all quenched with similar rate constants and show similar large positive salt effects; the quenching rate constant increases sixfold when neutral salt (NaCl) is increased from 0.03 to 1.5 M, and at the highest salt content it is within a factor of 2 of the diffusion-controlled limit. While the results are consistent with the conventional Bronsted-Debye treatment of ionic reaction rates, large specific ion effects are indicated by limited data with NaClO4 as a neutral salt. A.T.

A80-15501 **New development and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978.** Symposium sponsored by the Metallurgical Society of AIME. Edited by D. Kuhlmann-Wilsdorf (Virginia, University, Charlottesville, Va.) and W. C. Harrigan, Jr. (DWA Composite Specialities, Inc., Chatsworth, Calif.). Warrendale, Pa., Metallurgical Society of AIME, 1979. 377 p. $35.

A collection of papers is presented which directs attention to properties of composites with components of ultrasmall dimensions, and to new applications of composites in all important areas, not only for structures but also for superconducting devices, electric contacts, and magnets. The book spans both the whole range of the most important physical (as contrasted to chemical) aspects of composites and the range from basic research to the latest industrial uses and future planning. Methods that can be employed in the production of composites with tailor-made structures are also considered. S.D.

A80-15511 **Superconducting composites fabrication and properties.** E. Gregory (Airco Central Research Laboratories, Murray Hill, N.J.). In: New developments and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978. Warrendale, Pa., Metallurgical Society of AIME, 1979, p. 175-196. 90 refs.

The paper describes the present commercial fabrication methods and the properties of the two most generally available multifilamentary composite conductors in the U.S.A., NbTi and Nb3Sn. An attempt is made to explain the reasons why commercial superconductors should have composite structures. Some possible future manufacturing techniques are mentioned. The complex factors affecting the optimization of the electrical and mechanical properties of the Nb3Sn composites are discussed in some detail. S.D.

A80-15512 **Preparation of superconducting coil through composite.** F. E. Wang and A. P. Divecha (U.S. Navy, Naval Surface Weapons Center, Silver Spring, Md.). In: New developments and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978. Warrendale, Pa., Metallurgical Society of AIME, 1979, p. 197-203. 9 refs.

The usefulness and application of a superconductor are critically dependent on its critical temperature and on how much current it can carry at how high a field. Nb3Al is potentially very attractive as a practical superconductor because it has the highest critical temperature (in bulk) and critical field. The problem of instability can be alleviated in four ways: utilize a superconductor with sufficiently high critical temperature, bleed off the heat generated, retard the motion of magnetic flux, and make the superconductor so finely divided that heat pulse cannot be generated to get the instability going in the first place. Taking these possible solutions into account, a multistep technique is proposed for forming a superconducting composite coil based on Nb3Al. The inherent advantages of this technique are summarized. The technique includes all the possible solutions in one sweep to remedy the instability encountered in the application of superconductivity to motor and generator devices. S.D.

A80-15532 **Volt-second consumption during the start-up phase of PLT.** R. J. Hawryluk, K. Bol, and D. Johnson (Princeton University, Princeton, N.J.). *Nuclear Fusion,* vol. 19, Nov. 1979, p. 1519-1522. 13 refs. Contract No. EY-76-C-02-3073.

The volt-second consumption in the PLT tokamak was measured. During the start-up phase, the volt-second consumption is determined primarily by the external and internal flux required to establish the current profile. The resistive volt-second loss on axis is typically less than 1/4 of the total volt-seconds consumed during the first 180 ms of the discharge. The measurements reported here provide an empirical basis for establishing the volt-second requirements for future tokamak devices. (Author)

A80-15625 **The role of coal in the world energy picture up to the year 2000 - Reserves, resources, and availability from the Western European viewpoint (Die Rolle der Kohle im Weltenergiebild bis zum Jahre 2000 - Reserven, Resourcen und Verfügbarkeit aus westeuropäischer Sicht).** R. Neumann (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 32, Nov. 1979, p. 505-512. 27 refs. In German.

The paper stresses the importance of the situation of reserves of the fossil primary energy sources in determining the role of coal in the world energy picture. An analysis of the volume of the reserves is presented that leads to higher estimation of crude oil and natural gas reserves than is usual today. It is suggested that the established coal reserves are not clearly defined and thus cannot be directly compared with oil and gas reserves. Also, it is not likely that these reserves will be exhausted by 2000. It is noted however, that actual availability must be judged differently. It is hypothesized that problems with environmental protection, the necessity of transferring coal production into less accessible areas, and of transport problems will not allow a production significantly higher than 5 x 10 to the 9 tce in the year 2000. Finally, consideration is given to the possibility that the main coal producing countries in the world - USA, USSR, and China, will themselves need the coal they produce in a situation of energy scarcity. M.E.P.

A80-15653 # **A study of the thermal effect that radiant energy produces on a mass of water (Estudio del efecto térmico que la energia radiante produce sobre una masa de agua).** M. I. S. Lopez. Extremadura, Universidad, Facultad de Ciencias, Grado de Licenciado Thesis, 1978. 77 p. 31 refs. In Spanish.

A study of heat transmission via conduction in water irradiated by a 250 W infrared lamp is reported. A plexiglass cube containing 39,304 cc of isotropic, homogeneous, distilled water (electrical conductivity of four millionths/ohm) was used, and the temperature of the experiment did not exceed 40 C so as to eliminate any effects due to convection. The water is assumed to be continuous, and the heat dynamics are considered differentially. Applying Fourier's law of the conductivity of solids, one can calculate to a very good approximation the temperature at any point and at any moment in a mass of irradiated water. J.P.B.

A80-15658 **Electric and hybrid vehicles.** Edited by M. J. Collie. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 44), 1979. 652 p. $36.

The report presents data developed by the ERDA with the assistance of NASA on the state of the art of electric and hybrid vehicles. Attention is given to three sources of data: (1) controlled tests of a representative sample of commercially available and experimental electric and hybrid vehicles, (2) information and data from the literature and vehicle manufacturers, and (3) the experience of users, both fleet operators and individual owners. Topics covered include electric vehicles - theoretical background, vehicle components such as tires, traction motors, controllers, batteries, and battery chargers, as well as hybrid vehicles, and electrochemical devices. Discussion of foreign technology covers foreign all-electric and hybrid-electric vehicle R&D, power sources, drive systems, and control systems for electric vehicles, military electric vehicles, computer analysis of foreign traction batteries in all-electric vehicles. Finally, the latest developments available Jan. 1979 are reviewed including R&D and updated assessment. M.E.P.

A80-15659 **Heat exchange fluids and techniques.** M. W. Ranney. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 50; Chemical Technology Review, No. 143), 1979. 402 p. $42.

The book presents detailed technical information based on United States patents issued since January, 1975 on heat exchange fluids and techniques, emphasizing the potential energy savings attainable. Attention is given to general heat exchanger construction and design, including tubular and other constructions, particulate exchange mediums and surface treatments, and to the compositions of heat transfer fluids. Refrigerant processes and fluids are presented, together with chemical reaction, fusion and other processes for thermal energy storage and transport. Consideration is also given to the control of heat transfer processes such as air conditioning in building structures, solar and geothermal energy processes, industrial applications of heat exchange techniques in such processes as electric energy generation and plastics processing, and specialized applications in such fields as cryobiology, automotive and aircraft design and electronics. A.L.W.

A80-15705 # **Modeling and experimental analysis of a fluidic generator.** C. F. Tacey (DuPont de Nemours and Co., Engineering Dept., Wilmington, Del.), F. E. Verrier (Shell Oil Co., New Orleans, La.), L. R. Wood (Westinghouse Electric Corp., Pressurized Water Reactor Systems Div., Pittsburgh, Pa.), L. D. Mitchell, and H. A. Kursted (Virginia Polytechnic Institute and State University, Blacksburg, Va.). *American Society of Mechanical Engineers, Design Engineering Technical Conference, St. Louis, Mo., Sept. 10-12, 1979, Paper 79-DET-9.* 11 p. 28 refs. Members, $1.50; nonmembers, $3.00. Army-supported research.

Modeling of the mechanical portion of a fluidic generator for its dynamic characteristics so that optimization of the power output may be attained through mechanical system modification is presented. A regression analysis is performed on experimentally obtained data to allow specific definition of defects in the model; structural inertia, stiffness, viscous damping, and internal structural damping are used to model a corrugated diaphragm, a connecting rod, coupling nuts, and a cantilever laminated rod. A computer algorithm is used to solve the impedance formulation of the model, resulting in the dynamic compliance matrix of the structural assembly. The resultant dynamic transfer compliance is compared to the experimental Fast Fourier Transform dynamic transfer compliance as measured on the actual structure. A.T.

A80-15729 # **Whirling response and stability of flexibly mounted, ring-type flywheel systems.** T. L. C. Chen and C. W. Bert (Oklahoma, University, Norman, Okla.). *American Society of Mechanical Engineers, Design Engineering Technical Conference, St Louis, Mo., Sept. 10-12, 1979, Paper 79-DET-71.* 10 p. 21 refs. Members, $1.50, nonmembers, $3.00. Research supported by the U.S. Department of Energy.

An investigation of free whirling, forced whirling, and stability analyses of two ring type composite-material flywheel systems installed in a quill-shaft, air-turbine-drive test facility is presented. These systems differ from turbine/compressor systems in two respects: (1) the flywheel rim attachment to its hub is very flexible for both translation and tilting, and (2) these flexibilities depend upon rotational speed through centrifugal stiffening. It is believed that the eight-degree-of-freedom analysis presented here is the most comprehensive for such systems, and numerical results are presented for specific flywheel systems under development at Sandia Laboratories. Critical speeds encountered in the 8000 to 32,000 rpm range and a method of overcoming the adverse effect of material internal damping on the system stability by providing an adequate external damper are discussed. A.T.

A80-15750 * **A solar-heated water system for a photographic processing laboratory.** R. P. Michaelis and H. Nitta (NASA, Ames Research Center, Moffett Field, Calif.). *(Society of Photographic Scientists and Engineers and U.S. Geological Survey, Seminar on Chemical and Efficient Management, Sioux Falls, S. Dak., Oct. 1978.) Journal of Applied Photographic Engineering,* vol. 5, Summer 1979, p. 127-131. Contract No. NAS2-9925.

A80-15968 **Colloquium on the Microclimatic Environment and Habitat, Reims, France, May 21-23, 1979, Proceedings (Colloque sur l'Environnement Microclimatique et Habitat, Reims, France, May 21-23, 1979, Proceedings).** Colloquium sponsored by the Société Française des Thermiciens and l'Académie des Sciences. Reims, Université de Reims, 1979. 244 p. In French.

Two broad topics are discussed: (1) mass and heat transfer in urban microclimates and in dwellings; and (2) adaptation of dwellings to the microclimate. Particular consideration is given to: humidity transfer in walls; microclimate structure and heat flux measurements; solar adaptation of dwellings; climatic adaptation of dwellings by latent heat of fusion; and humidity control in buildings. B.J.

A80-15976 **Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings.** Seminar sponsored by the Commission of the European Communities. Luxembourg, Commission of the European Communities, 1978. 593 p. In English, French, German, and Italian.

The seminar focused on the thermochemical production of hydrogen, hydrogen production by water electrolysis, basic and future technologies, hydrogen use, storage, and transporation. Papers are presented on pulsed electrocatalytic dissociation of water vapor, liquid-gas equilibrium in the bromine-hydrobromic acid-water system, hybrid process for hydrogen generation, hydrogen production by hybrid thermoelectric cycles, alkaline inofganic-membrane-electrolyte water electrolysis, application of electrocatalysis to the electrolysis of water at high temperature and high current density, anodic materials for the electrolysis of water, separators for electrolytic hydrogen production, fundamentals and technological aspects of medium temperature high pressure water electrolysis, hydrogen storage by reversible magnesium alloys, hydrogen storage by cryoadsorbents in comparison to alternatives, and technical-economic study of the use of hydrogen and methanol for automotive transportation. A.T.

A80-15990 **Hydrogen storage by means of reversible magnesium alloy.** P. Guinet, D. Halotier, and P. Perroud (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Grenoble, Grenoble, France). In: Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings. Luxembourg, Commission of the European Communities, 1978, p. 373-391. 20 refs.

The hydrogen sorption-desorption characteristics of various magnesium alloys are evaluated in order to assess their hydrogen-storage capabilities. The absorption of pure hydrogen and hydrogen containing 0.1 percent O2 by Mg2Cu, Mg 5Cu, Mg2Ni, Mg3Cd, Mg2Sn, MgAl, Mg2Si, Mg 1.16Si, Mg 1Zn, MG 2Pd, Mg 8Al, Mg plus 1 wt percent FeTi, Mg plus 20 wt percent LaNi5 and Mg2Cu plus 5 wt percent FeTi alloys was determined from the pressure drop in a reaction chamber containing the metal and a specific amount of gas at temperatures up to 600 C. It is found that the sorption capacities of Mg2Cu and Mg2Ni degrade more slowly than those of pure Mg regardless of impurity content, and that Mg2Ni exhibits a greater sorption capacity and desorption rate and a smaller loss of capacity with time. The hydriding kinetics and capacity of Mg 5Cu are found to be better than those of Mg, and the capacity of Mg2Si is shown to be greater than that of Mg2Cu, while alloys such as Mg3Cd, Mg2Sn, Mg 8Al and Mg 2Pd exhibited little or no sorption. Grain size and the presence of additions such as LaNi5 are also shown to affect hydriding kinetics. A.L.W.

A80-15991 **Use of reversible hydrides for hydrogen storage (Utilisation d'hydrures reversibles pour le stockage de l'hydrogène).** B. Darriet, M. Pezat, and P. Hagenmuller (CNRS, Laboratoire de Chimie du Solide, Talence, Gironde, France). In: Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings. Luxembourg, Commission of the European Communities, 1978, p. 392-406. In French.

The addition of a metal or alloy to form a hydride that is thermodynamically less stable than MgH2 leads to a considerable increase in the hydriding rate of Mg. Results are presented for a study designed to assess the effect of the nature of an adjuvant alloy, its concentration, the reaction temperature, and the hydrogen pressure on the reaction rate. Results on the hydriding of Mg-rich alloys - such as Mg2Ca, La2Mg17, and CeMg12 - are presented. The hydriding mechanism of La2Mg17 and CeMg12 alloys is identified. S.D.

A80-15992 **Hydrogen storage by use of cryoadsorbents in comparison to alternatives.** C. Carpetis and W. Peschka (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). In: Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings. Luxembourg, Commission of the European Communities, 1978, p. 407-426. 14 refs.

The paper reports investigations on the techniques and economics of hydrogen storage by means of cryoadsorption. Also a comparison with alternative storage methods is included. The hydrogen storage capacity of several adsorbents in the temperature ranges from 65 K to 150 K has been investigated experimentally. Basing on these data economics and operating conditions for minimum total costs of the system are calculated. Utilization-factor and capacity-factor parameters are shown to be decisive for outlining the favorable ranges of application for competitive hydrogen storage methods. (Author)

A80-15993 **Technico economic study of the use of hydrogen and methanol for road transport.** Y. Breelle, A. Chauvel, P. LePrince, C. Meyer (Institut Francois du Pétrole, Rueil-Malmaison, Hauts-de-Seine, France), P. Gelin, and G. Petit (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Saclay, Gif-sur-Yvette, Essonne, France). In: Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings.
Luxembourg, Commission of the European Communities, 1978, p. 506-530. 12 refs. European Economic Communities Contract No. 07076-EHF.

In 1977, the French Commissariat à l'Energie Atomique and the Institut Francais du Pétrole began a study of the technical and economic feasibility of using hydrogen and methanol as automotive energy sources. The paper details the portion of the study related to hydrogen distribution and summarizes the main conclusions concerning methanol. Options for the large-scale storage and transportation of gaseous and liquid hydrogen and hydrides are examined, and different systems of energy conversion and vehicular hydrogen storage are considered. Hydrogen distribution stations are discussed, and evaluations of the economics and energetics of hydrogen use as an automotive fuel are presented. It is concluded that hydrogen internal combustion engines cannot compete with gasoline engines in the areas of primary energy consumption and fuel cost, however a hydrogen fuel cell provides appreciable energy savings at a fuel cost comparable to that of gasoline. The optimal use of methanol has been found to be as a 15 percent methanol-gasoline mixture with methanol produced in a local unit and delivered to the service station by barge and trailer. A.L.W.

A80-16083 **A review of the U.S. wind energy programme.** J. R. C. Armstrong, N. H. Lipman, and P. D. Dunn (Reading, University, Reading, Berks., England). *Wind Engineering*, vol. 3, no. 2, 1979, p. 75-106. Research supported by the Department of Energy of England.

A80-16084 **A low level wind measurement technique for wind turbine generator siting.** R. W. Baker, R. L. Whitney, and E. W. Hewson (Oregon State University, Corvallis, Ore.). *Wind Engineering*, vol. 3, no. 2, 1979, p. 107-114. 11 refs. Research sponsored by the Bonneville Power Administration.

The paper presents a low level wind measurement technique for wind turbine generator siting. The Tethered Aerodynamically Lifting Anemometer (TALA) consisting of a kite with tail, tethering line, a reel, and a scale for measurement of the line tension was tested at heights of 17 to 100 m with no systematic errors suggesting that wind drag on the line of varying lengths does not introduce a significant error. With a small lifting balloon filled with helium it can be flown in very light surface winds to a level where the wind is at least 4 m/sec, the threshold of the TALA system. Although present use of the TALA system is for a large wind turbine generator siting in a mountainous terrain, it should be equally effective for air pollution investigations. A.T.

A80-16085 **Comparative performance measurements on a Savonius rotor with ancillary surfaces.** D. V. Nguyen (Thiès, Ecole Polytechnique, Thiès, Senegal). *Wind Engineering*, vol. 3, no. 2, 1979, p. 115-120. 8 refs.

In an attempt to improve the performance of the conventional Savonius rotor, a model rotor was fitted with ancillary surfaces of aerofoil and 'umbrella' form to produce six alternative configurations. Wind tunnel tests on the models showed the performance to be improved in only one case; in the other units tested the drag effect of the ancillary surfaces appeared to predominate over any possible flow improvement. (Author)

A80-16086 **The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes.** M. J. M. Stevens and P. T. Smulders (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). *Wind Engineering*, vol. 3, no. 2, 1979, p. 132-145. 16 refs. Research supported by the Dutch Ministry of Development Cooperation.

A80-16146 **The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes.** N. A. Hampson, M. J. Willars (Loughborough University of Technology, Loughborough, Leics., England), and B. D. McNicol (Shell Research, Ltd., Thornton Research Centre, Chester, England). *Journal of Power Sources*, vol. 4, Nov. 1979, p. 191-201. 85 refs. Research supported by the Science Research Council and Shell Research, Ltd.

Over the past few years there has been a resurgence of interest in methanol oxidation in acid electrolytes, where platinum group metals are the only practical catalysts. The recent literature concerning the adsorption and oxidation processes occurring at platinum in acid solutions is reviewed. The overall model based on contemporary data assumes that methanol adsorption follows Langmuir kinetics at low surface coverages and Elovich kinetics at higher values. The 'poisoning' intermediate (probably COH) is susceptible to an ageing process, rendering it less active, and its ultimate removal is

achieved via a chemical reaction with an electrosorbed water molecule.
(Author)

A80-16147 **Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode.** J. Jindra, J. Mrha, K. Micka, Z. Zabransky (Ceskoslovenska Akademie Ved, Ustav Fyzikalni Chemie a Elektrochemie, Prague, Czechoslovakia), V. Koudelka, and J. Malik (Prazska Akumulatorka, Mlada Boleslav, Czechoslovakia). *Journal of Power Sources*, vol. 4, Nov. 1979, p. 227-237, 239-250. 20 refs.

Cadmium electrodes of outstanding electrochemical properties (over 1,000 charge-discharge cycles, active mass having a current-voltage slope of 1-2 ohm/sq. cm., volumetric capacity higher than pocket-type electrodes, depth of discharge 38 - 44% of theoretical capacity) were produced by rolling a mixture (5% polytetrafluoroethylene) of the active material onto a metallic current collector at normal temperature. Nickel oxide electrodes (68 - 74% precipitated Ni(OH)2, 16 - 19% powdered graphite, 4 - 7% water), similarly prepared, and having a theoretical capacity of 0.214 A h/g, were tested in alkaline electrolyte. At current loads of 3 - 100 mA/sq. cm., their current carrying capability depends on the conducting component and is proportional to the area of the active layer-collector interface, which can be enlarged either by metallization of the collector or by a combination of coarse and fine metal screens, while their cycle life depends on the quality of this interface. J.P.B.

A80-16148 **Methane fermentation of aquatic biomass.** D. L. Wise, D. C. Augenstein (Dynatech R/D Co., Cambridge, Mass.), and J. H. Ryther (Woods Hole Oceanographic Institution, Woods Hole, Mass.). *Resource Recovery and Conservation*, vol. 4, Nov. 1979, p. 217-237. 36 refs. Contract No. EY-76-S-02-2948.

Results of a study of the characteristics of the anaerobic fermentation to methane of four aquatic biomass species in order to evaluate their suitability as energy sources are presented. Solar-dried samples of the freshwater weeds duckweed (Lemna sp.) and Hydrilla verticillata and the marine algae Gracilaria ceae and Ulva lactuca were fermented at mesophilic conditions (37 C) in continuous stirred tank reactors using a rich nutrient feed of essentially equal parts sewage sludge and aquatic biomass; the freshwater weeds were also fermented at thermophilic (60 C) conditions. Bioconversion efficiencies of 25 to 34% and 27 to 45% were obtained at mesophilic conditions for the freshwater and marine species, respectively, and efficiencies of 32 to 46% were found for freshwater weeds at thermophilic conditions. The lower than anticipated bioconversion rates at mesophilic conditions are accounted for by the slow acclimatization of innoculating microorganisms, and bioconversion efficiencies obtained in mesophilic in situ units were found to be comparable to those obtained at thermophilic conditions in the reactors. A.L.W.

A80-16150 **The uncertain costs of waste disposal and resource recovery.** D. C. Wilson (U.K. Atomic Energy Authority, Harwell Laboratory, Didcot, Oxon, England). *Resource Recovery and Conservation*, vol. 4, Nov. 1979, p. 261-299. 21 refs. Research supported by the U.K. Atomic Energy Authority.

Principles of economic evaluation previously developed are applied to a case study of the available options for waste disposal or resource recovery from solid waste. The dominant feature in any such analysis at a preliminary stage of planning is the uncertainty in the cost and revenue estimates. It is shown how this uncertainty can be explicitly included, with sensitivity analysis used to isolate the critical parameters and risk analysis to examine the range of probable costs. The results of the case study suggests that, of the thirty options studied, landfill at a local site or the use of pulverized waste directly as a fuel are currently the cheapest, followed by indirect landfill or the production of a solid refuse-derived fuel. Other options, including incineration and pyrolysis, appear currently uncompetitive in economic terms.
(Author)

A80-16175 **Technical possibilities and economic prospects for coal refining.** A. Ziegler (Ministry for Non-nuclear Energy Research and Energy Technology, West Germany) and R. Holighaus. *Endeavour*, vol. 3, no. 4, 1979, p. 150-157. 10 refs.

Methods of gasifying or liquefying coal to produce jet fuels, gas substitutes, hydrogen and electricity, are discussed. Fixed-bed gasification (Lurgi process), with gas leaving at a low temperature and coal completely converted in the high temperature zone, gives the highest overall yields; fluidized-bed gasification (Winkler gasifier) loses some coal, which is carried away in the gas stream due to short residence time and entrained gasification that has reduced yield, since coal is used to provide 1500 C heat. Coal liquefaction by hydrogenation with today's (300 bar) pressure gasification of solid residues eliminates centrifuging, while liquefaction by Fischer-Tropsch synthesis is aimed at producing high-quality chemical feedstocks and synthesizing olefins (straight or branched chains). Gasification processes in USA (maximum methane yields) and Federal Republic of Germany work in improving existing processes are detailed, as is the potential profitability of coal liquefaction.
J.P.B.

A80-16194 **Non-stochastic heating of magnetized plasma by electrostatic wave.** R. Sugihara and Y. Midzuno (Nagoya University, Nagoya, Japan). *Physical Society of Japan, Journal*, vol. 47, Oct. 1979, p. 1290-1295. 11 refs.

When an electrostatic wave is suddenly applied, initially trapped particles suffer a rapid, large acceleration as well as the stochastic heating, while initially untrapped particles suffer only the stochastic heating. When the bounce frequency is larger than the square root of the product of wave frequency times cyclotron frequency, the initially trapped particles mainly absorb the wave energy and form a high energy tail. The results are applied to the problem of energetic ion creation in laser fusion plasma and of a high energy tail formation in a plasma heated by the lower hybrid wave. (Author)

A80-16262 # **Selected topics on surface effects in fusion devices - Neutral-beam injectors and beam-direct converters.** M. Kaminsky (Argonne National Laboratory, Argonne, Ill.). In: The physics of ionized gases; Summer School, 9th and Symposium, Dubrovnik, Yugoslavia, August 28-September 2, 1978, Invited Lectures and Progress Reports. Belgrade, Institut za Fiziku, 1979, p. 717-736. 20 refs. Contract No. W-31-109-eng-38.

Neutral-beam injectors are being used for the heating and fueling of plasmas in existing devices such as PLT (Princeton), ISX (Oak Ridge) and 2XIIB (Lawrence Livermore Laboratory) and will be used in devices such as TFTR (Princeton), MX (Livermore) and Doublet III (Gulf Atomic). For example, TFTR has been designed to receive a total of 20 MW of 120-keV deuterium atoms in pulses of 0.5-sec duration from 12 neutral beam injectors; for the MX experiment it is planned to inject a total of 750A (equivalent) of deuterium atoms with a mean energy of 56 keV in 0.5-sec pulses. The interaction of energetic deuterium atoms with exposed surfaces of device components such as beam dumps, beam-direct-convertors collectors, beam calorimeters, and armor plates, cause a variety of surface effects which affect deleteriously the operation of such devices. Some of the major effects are discussed.
(Author)

A80-16264 # **The physics of closed cycle MHD power generation.** L. H. T. Rietjens (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). In: The physics of ionized gases; Summer School, 9th and Symposium, Dubrovnik, Yugoslavia, August 28-September 2, 1978, Invited Lectures and Progress Reports. Belgrade, Institut za Fiziku, 1979, p. 753-771. 15 refs.

A historical review of research work in MHD power generation is followed by a discussion of the principle of an MHD steam power plant. The physics of closed cycle MHD power generation is outlined, and means of eliminating, or drastically reducing, all losses not inherent to the actual MHD conversion processes are examined. The problem of modelling the plasma in the MHD generator is analyzed.
V.P.

A80-16484 **Dynamic suppression of ionization instability.** A. P. Vinogradov and V. S. Filinov (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teplofizika Vysokikh*

Temperatur, vol. 17, Mar.-Apr. 1979, p. 236-245.) *High Temperature,* vol. 17, no. 2, Sept. 1979, p. 201-208. 22 refs. Translation.

A method is considered for modeling switching of MHD devices of the Faraday and Hall type, taking into account the influence of the load on the effective plasma parameters. A linear and nonlinear analysis is carried out on the development and possible suppression of ionization instability in a plasma when the direction of the mean current vector changes periodically in the channel of an MHD device. Constraints are obtained on the values of the external load, Hall parameter, and frequency of change of the direction of current (caused by changing the type of switching of the MHD device) which are necessary both for complete and partial suppression of ionization instability. The calculated effective plasma parameters are compared with experimental data.
(Author)

A80-16625 **Photoconverter with bilateral sensitivity.** Iu. A. Anoshin, N. M. Bordina, A. K. Zaitseva, V. A. Letin, and N. A. Milovanova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 2, 1979, p. 3-8.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 1-7. 6 refs. Translation.

In the present paper, the current-voltage equations are derived for a photovoltaic cell with a n(+)-p-p(+) heterojunction, both for illumination of the isotopic junction and for simultaneous illumination of the isotopic and p-n junctions. The influence of the base and p(+) layer parameters on the performance of the cell is studied, and some experimental data are discussed.
V.P.

A80-16626 **Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region.** A. Berkeliev, V. N. Bessolov, A. N. Imenkov, N. Nazarov, B. V. Tsarenkov, and Iu. P. Iakovlev (Akademiia Nauk SSSR, Fiziko-Tekhnicheskii Institut, Leningrad, USSR; Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *(Geliotekhnika,* no. 2, 1979, p. 9-12.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 8-11. Translation.
(Previously cited in issue 22, p. 4179, Accession no. A79-49180)

A80-16627 **Photoelectric parameters of photoelectric converters in relation to illumination.** E. B. Vinogradova, T. M. Golovner, S. M. Gorodetskii, and L. B. Kreinin (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 2, 1979, p. 13-17.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 12-16. 7 refs. Translation.

In the experiments described, the recombination characteristics and spectral sensitivity of photovoltaic cells were studied as a function of the illuminance level. The nature of bulk defects in the cell structure is studied for cells with a nonlinear lux-ampere characteristic.
V.P.

A80-16628 **Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity.** V. R. Zaiavlin, V. A. Letin, and N. M. Kholeva (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 2, 1979, p. 18-22.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 17-22. 7 refs. Translation.

In the present paper, the optical characteristics of bilaterally illuminated photovoltaic cells are analyzed with the object of assessing the effectiveness of their production technology and calculating their equilibrium temperature with allowance for infrared and reflected solar radiation. The results of the analysis can be used to control current losses and to modify the production technology.
V.P.

A80-16629 **Calculation of the optical characteristics of high-power two-mirror solar furnaces.** S. A. Azimov, Kh. M. Mallaeva, I. I. Pirmatov, T. T. Riskiev, and S. Kh. Suleimanov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 2, 1979, p. 23-28.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 23-29. 9 refs. Translation.

Tashkent, Uzbek SSR). *(Geliotekhnika,* no. 2, 1979, p. 48-54.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 49-56. 7 refs. Translation.

A method of designing large solar furnaces is proposed. For illustration, the method is applied to the design of a two-mirror solar furnace and a tower-mounted solar plant.
V.P.

A80-16630 **On a calculation procedure for a heat accumulator in a solar heating system.** O. Azimov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR) and R. R. Avezov (Samarkandskii Gosudarstvennyi Universitet, Samarkand, Uzbek SSR). *(Geliotekhnika,* no. 2, 1979, p. 29-32.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 30-33. 6 refs. Translation.

A80-16631 **Investigation of aerodynamic drag of solar air heaters.** S. O. Khatamov, R. R. Avezov, and G. G. Umarov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut,

The paper deals with a theoretical and experimental study of the dynamic resistance of five representative solar air heaters of the hot box type. All the heaters studied were 1 m long, 0.64 m wide, and 0.175 m thick. Good agreement between theory and experiment is established.
V.P.

A80-16632 **Investigation of absorptive and radiative characteristics of an ideal selective surface.** O. I. Kudkin and A. Abdurakhmanov. *(Geliotekhnika,* no. 2, 1979, p. 55-62.) *Applied Solar Energy,* vol. 15, no. 2, 1979, p. 57-64. 6 refs. Translation.

A method for calculating the absorptivity and emissivity of a selectively absorbing surface is proposed, along with a technique for calculating the optimal threshold wave length. An improved analytical definition of an ideal selective surface for solar heating purposes is given.
V.P.

A80-16651 **Prospects - A social context for natural science.** W. S. von Arx (Woods Hole Oceanographic Institution, Woods Hole, Mass.). *Oceanus,* vol. 22, Winter 1979-1980, p. 3-11. 12 refs.

Renewable global energy resources such as sunlight, photosynthesis, ocean thermal power, bioconversion of waste materials, wind, hydroelectric, and geothermal power, and the power from ocean movements (tides, currents, waves), each of which contains enormous amounts of energy in relation to present energy demands, are compared in terms of their relative power contents in this general presentation. Also discussed are the low-grade uses (e.g., space heating) of high-grade fuels such as electricity or nuclear power, and the problems stemming from waste disposal in the oceans and the storing of radionuclides, while food needs will require the proper resource management of fresh water, soil, and the marine aquaculture.
J.P.B.

A80-16652 **Energy from ocean thermal gradients.** R. Cohen (U.S. Department of Energy, Washington, D.C.). *Oceanus,* vol. 22, Winter 1979-1980, p. 12-22. 13 refs.

Ocean Thermal Energy Conversion (OTEC) transforms the solar heating of the ocean surface into electrical energy, either transmitting it to shore or using it to manufacture energy-intensive products such as aluminum, ammonia, hydrogen or magnesium at sea. Open-cycle systems, requiring extremely large turbines and degasifiers, are not thought to be as advanced as closed-cycle systems which use heat exchangers (either shell-and-tube or plate) that are made of titanium, stainless steel or aluminum alloys, which must minimize corrosion and biofouling, and that use ammonia, propane or fluorocarbons as working fluids. OTEC platform configurations include ship shapes and submersibles, such as spar buoys, and require cold-water pipes 1,000 m long, made of such materials as elastomers, lightweight concrete and fiberglass-reinforced plastic.
J.P.B.

A80-16653 **The Coriolis program.** P. B. S. Lissaman (AeroVironment, Inc., Pasadena, Calif.). *Oceanus,* vol. 22, Winter 1979-1980, p. 23-28.

The Coriolis array of 242 large turbines (each rated at 83 megawatts and approximately 170 m in diameter) moored in the

Gulf Stream (or, perhaps, Japan's Kuroshio Current) could produce about 10,000 megawatts at 4 cents per kilowatt-hour, assuming a plant factor of 57%. The central mechanism of the Coriolis system is a two-stage, 91-meter rotor consisting of a pair of counter-rotating turbines housed in a flared axisymmetric duct, and having catenary blade construction, whose tips are attached to circular rims driving electrical generators. As far as environmental effects are concerned, they would be approximately as follows: reduction in the speed of the Gulf Stream, 1.2%; thermal effects, on the order of 1/100,000 degrees C; maximum wake perturbation, 2 cm.
J.P.B.

A80-16654 **Salt power - Is Neptune's ole salt a tiger in the tank.** G. S. Wick (Institute for Transcultural Studies, Los Angeles, Calif.). *Oceanus,* vol. 22, Winter 1979-1980, p. 29-37. 7 refs.

Methods of exploiting the 24 atm osmotic pressure difference between fresh and salt water to generate energy include reverse electrodialysis, wherein 80 millivolts of electricity cross each ion-selective membrane placed between solutions of fresh and salt water. Pressure-retarded osmosis, using pumps and pressure chambers, relies on semipermeable membranes that allow fresh water to flow into saline, with power generated by the permeated water being released through a turbine. In reverse vapor compression, water vapor rapidly transfers from fresh water to salt water in an evacuated chamber (due to the vapor pressure difference between them), and power can be extracted using 24 m diameter turbine blades. Environmental concerns include protecting estuaries from stress, managing sediments, and protecting marine animals, while filtration would be needed to keep the membranes free from corrosion, biological fouling, or silting.
J.P.B.

A80-16655 **Power from ocean waves.** J. N. Newman (MIT, Cambridge, Mass.). *Oceanus,* vol. 22, Winter 1979-1980, p. 38-45. Navy-NSF-supported research.

Extracting some of the estimated two to three trillion watts of low-grade power from wind-generated surface waves is basically a matter of utilizing vertically-moving devices either submerged or on the waves. The dynamics of unidirectional wavemakers (oscillating or rotating) is discussed, since their geometry is identical to that of efficient wave absorbers. Specific configurations include simple, small point absorbers that can theoretically focus the incident wave energy from a capture width of about half a wavelength; and hinged vessels contouring to the waves and elongated in the direction perpendicular to the wave crests, power being extracted from the relative motion of the hinged subelements. Pneumatic wave absorbers using an oscillatory air column can amplify the air's motion with a nozzle before passing through a high-speed turbine, resulting in higher grade power.
J.P.B.

A80-16656 **Fuels from marine biomass.** J. H. Ryther (Woods Hole Oceanographic Institution, Woods Hole, Mass.). *Oceanus,* vol. 22, Winter 1979-1980, p. 48-58.

Seaweed and kelp are being investigated as possible large-scale sources of marine biomass for energy. By suspending seaweed in water, instead of near the bottom where it usually grows, the seaweed cultures maintain themselves permanently in a nonreproductive, nonfruiting stage, thereby continually vegetating. Under highly idealized test conditions (vigorous aeration, rapid exchange of seawater, frequent harvests and nutrient-enriched), the red seaweed Gracilaria tikvahiae yielded 35 g dry weight per sq. m daily, equivalent to 51 dry tons per acre yearly (with 50% ash content). The prospect of extensive offshore farms for growing plants on floating trays or woven into ropes near the surface is being studied by means of the 50 m long Macrocystis pyrifera kelp on a modular ocean test farm consisting of a 9 ft. diameter buoy attached to radial arms holding the kelp plants; nutrient-rich water is pumped from depths of 1,500 ft.
J.P.B.

A80-16657 **Chemosynthetic production of biomass - An idea from a recent oceanographic discovery.** H. W. Jannasch (Woods Hole Oceanographic Institution, Woods Hole, Mass.). *Oceanus,* vol. 22, Winter 1979-1980, p. 59-63. 8 refs.

Chemosynthetic production as a possibly important part of an ecosystem was verified when the first deep-sea thermal springs (a source of sulfide, which provides the needed electrons) were discovered at the Galapagos Rift, where large mussels, clams and many other invertebrates had supposedly been feeding on chemosynthetically-produced organic nutrients. A high concentration of ATP was found around the vents of the springs, as well as a high production of bacterial biomass. Some 200 strains of bacteria, all capable of oxidizing sulfur compounds, and numbering approximately 1 million cells per cubic centimeter of water, were found. A chemosynthetic aquaculture, using hydrogen sulfide (which is relatively inexpensive and easily available) as the source of electrons, has the advantage over photosynthesis that all environmental factors could be kept constant.
J.P.B.

A80-16658 **Harnessing power from tides - State of the art.** P. R. Ryan. *Oceanus,* vol. 22, Winter 1979-1980, p. 64-67.

Instead of a conventional dam, a membrane of reinforced plastic (the 'water sail'), hermetically anchored to the bottom and sides of a bay, could harness power from tides. Such a membrane, constructed in sections, and estimated to be 20 to 30 times cheaper to construct than a conventional tidal project, could operate in a tidal range of two meters, instead of the usual five meters. Moreover, it could be lowered or pulled aside to allow ship traffic to pass or to protect it during storms. The top of the barrier would be supported by a cable (fixed to floats) spanning the entrance to the bay, while the conversion of tidal energy would be accomplished using compressed air, with two tidal chambers connected to a large piston air motor, although the possible use of gas turbine engines will also be tested.
J.P.B.

A80-16718 **Particle beam systems in plasma diagnostics.** H. P. Eubank (Princeton University, Princeton, N.J.). In: Diagnostics for fusion experiments; Proceedings of the Course, Varenna, Italy, September 4-16, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 17-34. 16 refs.

The paper reviews basic principles of active beam systems in plasma diagnostics, with emphasis on systems for the measurement of plasma potential, and current and impurity profiles. Attention is given to the following: determination of ion density and Zeff; beam dissociation and optical techniques; heavy ion beam probes; and tangentially injected neutral beam probes.
B.J.

A80-16720 **Diagnostics for mirror machines.** J. E. Osher (California, University, Livermore, Calif.). In: Diagnostics for fusion experiments; Proceedings of the Course, Varenna, Italy, September 4-16, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 47-77. 40 refs. Contract No. W-7495-eng-48.

The neutral-beam-heated quasi-dc mirror confinement systems are described and a general example of mirror diagnostics is given by a discussion of the diagnostics used on the 2XIIB experiment at the Lawrence Livermore Laboratory. Mirror machine diagnostics are then developed in more detail and attention is given to the special diagnostic needs of future mirror machines; emphasis is placed on diagnostics involving the higher-power neutral beams to be used with these future machines.
B.J.

A80-16722 **Hard X-ray measurements.** H. Knoepfel (EURATOM and Comitato Nazionale per l'Energia Nucleare sulla Fusione, Frascati, Italy). In: Diagnostics for fusion experiments; Proceedings of the Course, Varenna, Italy, September 4-16, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 111-137. 44 refs.

A review of hard X-ray measurements performed on plasma confinement devices is presented. Attention is given to measurements of bremsstrahlung from plasma (thin targets), bremsstrahlung from solid (thick) targets, and recombination lines. The use of scintillation detectors, semiconductor detectors, and collimators to perform such measurements is considered, and attention is paid to energy measurements (pileup rejection system/data analysis) and flux measurements (energy resolution).
B.J.

A80-16731 **Measurements of the density fluctuations using the microwave scattering method.** T. Tsukishima (Nagoya University, Nagoya, Japan). In: Diagnostics for fusion experiments; Proceedings of the Course, Varenna, Italy, September 4-16, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 255-270. 13 refs.

An expression is derived for microwave scattering from density fluctuations over a finite spatial region of a toroidal plasma. The accuracy of measurement is examined in terms of the finite scattering volume and observation time. In addition, measurements of scattering from nonstationary fluctuations are treated. A method for obtaining time-resolved spectra of fluctuations is described and applied to the determination of the temporal development of the electron temperature in a linear turbulent heating experiment. B.J.

A80-16745 **Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers.** M. S. Di Capua and D. G. Pellinen (Physics International Co., San Leandro, Calif.). In: Diagnostics for fusion experiments; Proceedings of the Course, Varenna, Italy, September 4-16, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 511-524. 24 refs. Research supported by the U.S. Department of Energy.

This paper describes electrical diagnostic techniques applicable to experiments with pulsed power particle beam fusion drivers. To display these techniques an experiment has been designed to investigate the propagation of a 0.1-TW power pulse in coaxial and triplate vacuum transmission lines with applied fiels of 1 MV/cm, currents of approximately 100 kA, and voltages of 2 MV. Instrumentation was developed (1) to obtain a simultaneous measurement of the current on the ground as well as the high-voltage electrode at different positions along the transmission line; (2) to measure the input voltage to the transmission line, and the voltage at an arbitrary position on the triplate transmission line; (3) to measure the voltage in the field-emission diode at the output of the vacuum transmission line; (4) to measure the voltage in a resistive termination to the transmission line that could be used in the vacuum. The instruments and experimental techniques developed to acquire these kinds of data are discussed. (Author)

A80-16752 **Survey of mirror machine reactors.** W. C. Condit (California, University, Livermore, Calif.). In: Diagnostics for fusion experiments; Proceedings of the Course, Varenna, Italy, September 4-16, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 651-680. 35 refs. Contract No. W-7405-eng-48.

The paper examines the Magnetic Mirror Fusion Program. Starting from the simple axisymmetric mirror concept the program overcame gross flute-type instabilities and the most serious microinstabilities. Dense plasmas approaching the temperature range for fusion were produced, and extensive design studies of mirror configurations led to three designs: the standard mirror fission-fusion hybrid, tandem mirror, and the field-reversed mirror. Typical plasma parameters are given for each type of machine, concluding that in a working fusion reactor, diagnostics will be required for operational control. A.T.

A80-16760 # **Magnetic field design for a large tokamak.** G.-Y. Yu, J.-B. Chen, and Y.-P. Ho (Academia Sinica, Institute of Plasma Physics, Communist China). *Acta Physica Sinica*, vol. 28, Sept. 1979, p. 712-721. In Chinese, with abstract in English.

The paper summarizes methods of the magnetic field design of the CT-8 tokamak. The effect of various types of stray field on the equilibrium of the plasma torus was analyzed, the requirement which should be satisfied by the magnetic field was discussed, and an optimization method developed. In addition, the possibility of maintaining equilibrium during thermal rises was investigated. A.T.

A80-16776 **Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets.** H. Pepin, F. Martin, B. Grek, T. W. Johnston, J. C. Kieffer, and G. Mitchel (Québec, Université, Varennes, Canada). *Journal of Applied Physics*, vol. 50, Nov. 1979, pt. 1, p. 6784-6788. 18 refs. Research supported by the National Research Council of Canada.

A study of the effects of nonlinear processes on X-ray emission by irradiation of CH2, Al, and Pb targets with a focused CO2 laser is presented. A multichannel X-ray spectrometer measured the X-ray spectrum from 1 to 50 keV; above a critical flux of 6 times 10 to the 12th power W/sq cm, the results show a change in slope of soft X-ray intensity vs laser flux, a change in the power-law dependence of hot temperature vs flux, an anisotropy of soft X-ray emission, and a strong production of energetic electrons. With the increasing Z number, there is no reduction of the effects of nonlinear phenomena, which appeared stronger with Al. A.T.

A80-16786 **The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion.** J. Shewchun (McMaster University, Hamilton, Ontario, Canada; Brown University, Providence, R.I.), J. J. Loferski, R. Beaulieu (Brown University, Providence, R.I.), G. H. Chapman, and B. K. Garside (McMaster University, Hamilton, Ontario, Canada). *Journal of Applied Physics*, vol. 50, Nov. 1979, pt. 1, p. 6978-6985. 13 refs. Research supported by the National Research Council of Canada; Contract No. EG-77-C-1979.

The paper reports on investigation of pentenary alloy systems similar to the quarternary system in In(1-x)Ga(x)P(1-x)As(y). Such pentenary alloys are mixtures of ternary chalcopyrites of the I-III-VI2 and II-IV-V2 variety, and are of interest because they can improve the performance of heterojunction electrooptic devices such as solar cells. This improvement results because the pentenaries permit different semiconductor layers to be deposited on each other so that they are lattice and crystallographically matched, but also have independently adjustable band gaps. The Cu(1-y)Ag(y)InS2(1-x)Se(2x) system appears to have the best potential for solar energy applications. Cathodoluminescence was used to determine band gaps, and the spectra indicate that all alloys are direct-band-gap semiconductors. Isolattice constant and band-gap contour maps were obtained for the system. A.T.

A80-16794 **A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures.** B. T. Debney (Plessey-Caswell Research, Ltd., Allen Clark Research Centre, Towcester, Northants., England). *Journal of Applied Physics*, vol. 50, Nov. 1979, pt. 1, p. 7210-7219. 38 refs.

Theoretical treatments are used to analyze the performance of Ga(1-x)Al(x)As/GaAs heteroface and graded band-gap solar cells, and to study the radiation resistance of the two types of cell. The optimization of these solar-cell structures to tolerate radiation-induced degradation in electronic properties is discussed and their power-conversion efficiency evaluated. The calculations indicate only a marginally greater output from the graded band-gap cell compared to the conventional heteroface type for optimized structures. A comparison with the performance of a Si space cell under 1-MeV-electron irradiation is made which illustrates a superior performance from GaAs in respect of efficiency and radiation tolerance. (Author)

A80-16799 **AlGaAs tunnel diode.** S. M. Bedair. *Journal of Applied Physics*, vol. 50, Nov. 1979, pt. 1, p. 7267, 7268. 8 refs. U.S. Department of Energy Contract No. 07-7149; Contract No. F33616-78-C-2077.

An AlGaAs tunnel diode with a band gap of 1.6 eV has been fabricated. This diode provides a suitable connecting junction between the high- and low-band gap cells of a cascade solar-cell structure operating at several hundred suns concentration without causing any appreciable loss in efficiency. (Author)

A80-16948 * # **Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles.** V. U. Muirhead (Kansas, University, Lawrence, Kan.) and E. J. Saltzman (NASA, Flight Research Center, Edwards, Calif.). *Journal of Energy*, vol. 3, Sept.-Oct. 1979, p. 279-284. 12 refs. NASA-supported research.

Wind-tunnel tests were performed on a scale model of a cab-over-engine tractor-trailer vehicle and several modifications of the model. Results from two of the model configurations were compared with full-scale drag data obtained from similar configurations during coast-down tests. Reductions in fuel consumption derived from these tests are presented in terms of fuel quantity and dollar savings per vehicle year, based on an annual driving distance of 160,900 km (100,000 mi.). The projected savings varied from 13,001 (3435) to 25,848 (6829) liters (gallons) per year which translated to economic savings from $3435 to about $6829 per vehicle year for an operating speed of 88.5 km/h (55 mph) and wind speeds near the national average of 15.3 km/h (9.5 mph). The estimated cumulative fuel savings for the entire U.S. fleet of cab-over-engine tractor, van-type trailer combinations ranged from 4.18 million kl (26.3 million bbl) per year for a low-drag configuration to approximately twice that amount for a more advanced configuration. (Author)

A80-16952 # **On the weathervaning of wind turbines.** R. H. Miller (MIT, Cambridge, Mass.). *Journal of Energy,* vol. 3, Sept.-Oct. 1979, p. 319,320.

The paper discussed the static stability characteristics of horizontal-axis wind turbines that are free to pivot about a vertical axis. Consideration is given to the problem of a wind turbine in the upward position with a constant velocity in the opposite direction. However, there are no solutions given or analysis offered. C.F.W.

A80-16995 **Efficiency improvements in bioenergy conversion systems.** C. W. Lewis (Strathclyde, University, Glasgow, Scotland). *Energy Conversion,* vol. 19, no. 3, 1979, p. 125-131. 32 refs.

A discussion of the main bioenergy conversion systems is presented, including their respective efficiencies and how these are being improved. The concept of net energy analysis is also introduced as a guideline for determining system efficiencies and process selection. Combustion remains the most efficient conversion method for dry organic matter, with anaerobic digestion and ethanolic fermentations preferred for biomass containing a high percentage of water. The efficiencies of gasification, pyrolysis and the longer term proposition of biophotolysis are also covered. (Author)

A80-16996 **Influence of wall-jet gas injection on liquid-metal MHD generator performance.** G. Fabris, E. S. Pierson, and R. L. Cole (Argonne National Laboratory, Argonne, Ill.). *Energy Conversion,* vol. 19, no. 3, 1979, p. 133-145. 6 refs. Research sponsored by the U.S. Department of Energy.

A80-16997 **Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction.** N. Kayukawa and Y. Ozawa (Hokkaido University, Sapporo, Japan). *Energy Conversion,* vol. 19, no. 3, 1979, p. 147-152. 7 refs.

A80-16998 **Measurement of insolation using CdS photoresistor.** E. Klugmann (University of Nigeria, Nsukka, Nigeria; Gdansk, Politechnika, Gdansk, Poland) and O. E. Onyeogu (University of Nigeria, Nsukka, Nigeria). *Energy Conversion,* vol. 19, no. 3, 1979, p. 153-157.

A80-16999 **The ampere-hour efficiency of photovoltaic solar generators.** D. G. S. Chuah (University of Science, Penang, Federation of Malaysia). *Energy Conversion,* vol. 19, no. 3, 1979, p. 177-180. 7 refs. Research supported by the University of Science.

The charging power and discharge power of two photovoltaic solar generators are measured simultaneously with the sunshine hours. A comparison of these two powers shows that there is sufficient power under the available local sunshine for lighting purposes. The ampere-hour efficiency of these generators is compared with that of lead-acid and nickel-iron cells. A 10% difference in the ampere-hour efficiencies for the two generators is observed. (Author)

A80-17004 # **MHD boundary layer of the seeded combustion gas near cold electrodes.** K. Okazaki, Y. Mori, K. Hijikata, and K. Ohtake (Tokyo Institute of Technology, Tokyo, Japan). *AIAA Journal,* vol. 18, Jan. 1980, p. 39-46. 7 refs.

The magnetohydrodynamic boundary layer of a seeded combustion gas around a cold electrode in a magnetohydrodynamic generator in the presence of a magnetic field is analyzed for the case when a current is applied by an external electric field. A three-fluid model is used to analyze the seeded combustion gas boundary layer for the cases of continuous and ideally segmented Faraday electrodes. It is shown that as the effective electrical conductivity perpendicular to the electrode surfaces is reduced by the magnetic field, the thicknesses of the low-electron-density region and the charge separation region increase, while for an ideally segmented electrode the deviation of the electron density from a Saha equilibrium value increases in laminar, however not in turbulent, flow. Linear stability theory is used to show that a perturbed propagating wave is generated by the effect of the magnetic field on the transition of the discharge from a diffuse mode to an arc mode, and that the stability of the diffuse discharge is degraded by the magnetic field. A.L.W.

A80-17064 # **Legal and political problems of solar power stations in space.** K. Wiewiorowska (Polish Institute of International Affairs, Warsaw, Poland). *International Astronautical Federation, International Astronautical Congress, 30th, Munich, West Germany, Sept. 17-22, 1979, Paper 79-IISL-03.* 6 p. 8 refs.

The future construction of Solar Power Stations (SPS) is discussed in the light of international and outer space law. According to the Outer Space Treaty of 1967, the free exploration and exploitation of outer space should be for the benefit and in the interests of all countries, and nations should not appropriate regions of outer space - particularly with regard to the placing of geostationary satellites, 283 of which are expected to be in orbit by 1990. Other obligations include avoiding terrestrial contamination, such as by microwave radiation beamed from an SPS, and fixing international liability with regard to objects falling to earth or colliding with other satellites. J.P.B.

A80-17126 **Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979.** Conference sponsored by the United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii. Edited by W. Bach (Münster, Universität, Münster, West Germany), W. Manshard (United Nations University, Tokyo, Japan), W. H. Matthews, and H. Brown (East-West Center, Honolulu, Hawaii). *Energy* (UK), vol. 4, Oct. 1979. 321 p.

Papers are presented on the prospects of renewable alternative energy sources, with consideration given to the options for short- and long-range energy strategies, the potentials and constraints of individual renewable energy resources, and energy policies and strategies. Specific topics include the feasibility of large-scale alternative energy use by the year 2000, global perspectives for long- and short-range alternative energy strategies and the prospects of solar heating and cooling systems, satellite power systems, wind energy conversion systems, wave, current and tide power, OTEC, hydro power, petroleum plantations and geothermal energy systems. Attention is also given to the growth in energy demand, the implementation of energy conservation, the climatic impact of alternative energy sources, energy sources for rural development and the prospects for renewable energy options in developing nations. A.L.W.

A80-17127 **Exploring alternative energy strategies.** W. Bach (Munster, Universitat, Münster, West Germany) and W. H. Matthews (East-West Center, Environment and Policy Institute, Honolulu, Hawaii). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel*

Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy (UK), vol. 4, Oct. 1979, p. 711-722. 14 refs.

General considerations in the exploration of alternative energy strategies are presented. The increasing energy demand due to world population growth, economic growth, per capita energy consumption growth, unconventional resource development and urbanization is discussed, and the selection of the proper combination of fossil energy resources, nuclear energy resources and renewable energy resources is examined. The transition to such mixed energy strategies is considered, noting the technical, economic, social, political, and environmental areas that require analysis, and the controversial issues of the time scale, international relations, economic analysis, large-scale deployment, lifestyles and risks of the implementation of new strategies are outlined. The role of the technical community in the resolution of the energy problem is discussed, and a flexible energy strategy is recommended to accommodate the present state of uncertainty in future energy policy. A.L.W.

A80-17128 **Can alternative energy resources be brought into large-scale use in the United States by the year 2000.** H. Brown (East-West Center, Resource Systems Institute, Honolulu, Hawaii). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 723-731. 6 refs.

The replacement of crude oil and natural gas in the United States by the year 2000, when oil and gas production is expected to peak, by alternative energy sources, particularly synthetic crude oil made from coal, is examined, considering the interrelationships between the liquid fuel, gaseous fuel and electrical subsystems in industrialized countries. The cost of gasoline derived solely from synthetic natural gas produced from coal at a price of $20 to $30 per barrel is estimated to be at most less than gasoline costs in many countries, and a gradual program of gasoline tax rises is suggested to ease and finance a possible transition. The higher costs of ethanol and methanol produced from biomass as fuels are also considered, and the possibility and costs of producing three billion barrels of synthetic crude oil and 12 billion gallons of ethanol per year by the year 2000 are estimated. Modifications of the gaseous fuel subsystem by the use of methane derived from biomass and waste gasification is also considered, and the effects of these changes on the relative contributions of electrical energy sources and on world energy economics are assessed. A.L.W.

A80-17129 **Global options for short-range alternative energy strategies.** J. Goldemberg (São Paulo, Universidade, São Paulo, Brazil). *United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 733-744. 13 refs.

A discussion is presented on the possibilities of supplying the energy needs of the world and particularly of the developing countries on the basis of renewable resouces: hydro power and biomass. Hydro power is found to be underused in many parts of the developing countries, and, up to the end of the century at least, 25 quads per year could be produced from this source. In addition, the unused annual increment of present-day forests could supply at least another 100 quads/year in developing countries. In industralized countries only conservation can have a significant impact as an alternative strategy. (Author)

A80-17130 **Global perspectives and options for long-range energy strategies.** W. Haeffele (International Institute for Applied Systems Analysis, Laxenburg, Austria). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 745-760.

An attempt is made to envisage the evolution of energy supply and demand for the next 50 yr. Seven identified world regions are considered in order to bring out their interrelationships and to provide a background against which national or regional energy strategies can be evaluated. The principal tool for doing this is the elaboration of two detailed and largely internally consistent scenarios. This permits us to make interpolations and extrapolations. The scenarios are only conceptualizations, not predictions. This paper addresses only the technical and substantive aspects of the energy problem and does not look into political, institutional, and societal problems. It is thus meant to serve as a basis for broader policy decision-making. (Author)

A80-17131 **Global aspects of sunlight as a major energy source.** J. M. Weingart (California, University, Berkeley, Calif.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 775-798. 65 refs. Research supported by the Ford Foundation, International Institute for Applied Systems Analysis, Electric Power Research Institute, and University of California.

To achieve and sustain a decent livable world for all is a central goal for human society. While an abundant supply of energy is not in itself a determinant of such a world, it is nevertheless essential. A careful inquiry suggests that sunlight could eventually be the primary and even exclusive source of heat, electricity and synthetic fuels for the entire world, continuously and eternally on a scale (upwards of 100 TW) generally regarded possible only with fusion or with fission via the fast breeder. This could be achieved through a global network of solar conversion facilities coupled with appropriate energy transport and storage systems, and appears to be possible within acceptable constraints on energy payback time, materials and water resources, capital investment, and available suitable land. (Author)

A80-17132 **Impacts of satellite power system technology.** H. Moses (U.S. Department of Energy, Office of Health and Environmental Research, Washington, D.C.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 799-809. 15 refs.

In the Satellite Power System (SPS) considered, energy from the sun is collected by an array 5 km x 10.5 km in area, located in geostationary orbit. The array contains either silicon or gallium aluminum arsenide photovoltaic cells whose output is transformed to 2.45 GHz microwaves. These are beamed to earth to a 10 km x 15 km rectifying antenna (rectenna) which rectifies the microwaves and interfaces the power with utility power lines. Each unit will produce 5 million kW of electrical power (5GWe). Sixty such units are planned at the rate of two per year over 30 yr. The paper deals with an assessment of both the environmental and societal aspects of an SPS. Under environmental aspects, attention is devoted to the health and ecological effects of both microwave radiation and other effects. The interaction of microwaves with the atmosphere is examined particularly as it affects communication. Nonelectromagnetic radiation effects such as noise and increased pollution are also considered. (Author)

A80-17133 **An analysis of the potential of wind energy conversion systems.** J. W. Reed (Sandia Laboratories, Albuquerque, N. Mex.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 811-822. 31 refs.

Wind energy conversion systems (WECS) are solar systems because the sun drives the atmospheric circulation. An average 500 GW of electricity could be generated by massive exploitation of the U.S. Great Plains wind field. There are, however, large fluctuations in available wind power. Gusts and turbulence also require filtering to meet normal power requirements. Several schemes are evolving to tame this erratic wind power supply. Modern technology is refining horizontal-axis turbines of a wide size range. Progress is also being made toward producing an economical vertical-axis turbine. Standards for turbine performance evaluation and installation site selection are now being developed. Eventually, mass-produced WECS may cost $1000 per installed, rated kW, but the wind does not often flow at turbine-rated speed. With some storage or filtering, problems with wind variability may be overcome. (Author)

A80-17134 **Waves, currents, tides - Problems and prospects.** A. Voss (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 823-831. 13 refs.

A quantitative estimation of the energy potential of ocean surface waves, ocean currents and tides and a review of the techniques for utilizing these renewable energy sources, their present state of development and their economic and environmental aspects are presented. The potential of wave power, which is in the order of 1-10 TW, could become a significant source of energy in regions of the world with favorable wave conditions, such as the United Kingdom and Japan. All wave-power schemes investigated today are in early stage of development, and require more research to become commercially available. The prospects for utilizing ocean currents are relatively unattractive due to the small resource base and the possible environmental effects. Although tidal mills have been used since the eleventh century, today only one sizable tidal power plant has been built, the 240 MWe Rance Tidal Power Station in France. The overall potential of tidal energy is about 3 TW, but only in certain locations of the world do the natural conditions promise technical and economic viability. (Author)

A80-17135 **Ocean thermal energy conversion /OTEC/ - Social and environmental issues.** A. Lavi (Carnegie-Mellon University, Pittsburgh, Pa.) and G. H. Lavi (ERDI, Inc., Pittsburgh, Pa.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 833-840. 13 refs.

Economic, social and environmental issues in the commercialization of OTEC are addressed, assuming technical feasibility and cost competitiveness, at least in certain areas. The market potential of OTEC on U.S. islands and in near-shore regions of the mainland is assessed and the economics of commercialization are considered. It is concluded that the private ownership of OTEC plants and facilities is not likely without government financial incentives, and the nature of possible incentives is outlined. Environmental problems of OTEC are discussed, noting ocean water mixing, chemical leakages, CO2 release from deep cold water and the presence of large numbers of plants and electric cables, and institutional questions of baseload OTEC plant licensing, regulation, world market impact and labor requirements are considered. It is concluded that OTEC represents a beneficial long-term option. A.L.W.

A80-17136 **The application potential of hydro power.** E. J. Jeffs. *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 841-849. 6 refs.

The potential for the future application of hydroelectric power, the only renewable alternative energy source with already established large-scale technology, is discussed. The scenario of a totally electric energy society in which heat can be produced as a byproduct of electricity generation is presented, and means for the expansion of hydropower installations are considered. It is suggested that small hydro plants with capacities between 1 and 10 MW could be used to meet local energy demands, pumped storage may be used to accommodate peak demands and provide back-up energy storage, and hydropower potential can be exploited in remote regions and developing nations, possibly even by the exploitation of glacial run-off. The economic and political aspects of the development of an energy trade on the basis of new hydropower installations in remote regions are also considered. A.L.W.

A80-17137 **Petroleum plantations and synthetic chloroplasts.** M. Calvin (California, University, Berkeley, Calif.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 851-869. 22 refs. Research sponsored by the U.S. Department of Energy.

The use of green plants as energy capturing and material storage devices is reviewed and the development of synthetic devices based on green plant photosynthesis to capture solar energy and convert it directly into long-lived useful substances is discussed. The conversion of plant-produced carbohydrates into a more reduced form by anaerobic fermentation is examined, taking into account the Brazilian program of sugar cane and manioc conversion to alcohol for fuel, and the development of plantations of plants of the Euphoribiaecea family, which reduce carbon dioxide to hydrocarbons directly, is surveyed. Attempts to artificially reproduce the photosynthetic membrane process of electron transfer without the use of water for agriculture by the construction of separate micelles containing each reaction of the quantum absorption process, the induction of photoelectron transfer from a donor other than water, electron exchange between the two systems, and the separation of oxygen are presented. Such synthetic membrane systems would be capable of capturing solar energy and storing it indefinitely. A.L.W.

A80-17138 **Prospects of future geothermal energy development.** J. Suyama (Geological Survey of Japan, Kawaskai, Japan). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 871-879. 28 refs.

Prospects for the future development of the world's geothermal energy resources are analyzed. It is shown that of the three types of geothermal resources available (hydrothermal convection, hot igneous systems and regional conductive environments), only high temperature hydrothermal convection presently has the proven technology to be commercially attractive for electric power generation. Problems in the development of hydrothermal resources in Japan and the United States for electricity generation are presented, and the use of geothermal resources for nonelectrical purposes is considered. Environmental, institutional and legal aspects of the use of geothermal energy are discussed, and it is concluded that the full exploitation of potential geothermal resources requires the improvement of exploration and assessment technology, the development of appropriate technology for utilizing these resources and the removal of many institutional constraints. A.L.W.

A80-17139 **Comparative risk assessment of energy systems.** S. H. Schneider (National Center for Atmospheric Research, Boulder, Colo.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 919-931.

The issue of risk assessment is addressed and results of a detailed analysis performed by the National Academy of Sciences Committee on Nuclear and Alternative Energy Systems of the health, environmental and socio-political risks associated with various energy alternatives are summarized. Consideration is given to the measurement of risks, the spatial and temporal heterogeneity of risks, marginal risks and benefits, the comparison of risks among activities with different benefits, the discounting of future risks, the perception of risks by the public and the uncertainties in risk assessment. Tables of the risks of nuclear, coal, oil, gas, hydroelectric, geothermal and solar energy systems are presented which demonstrate that no form of energy production is without risk. It is also concluded that our methods of risk analysis must be improved to cope with the diversity of risks and benefits associated with energy systems, that diversity in energy sources will provide some protection against unforeseen risks, and that, because of the inherent risks, it should be attempted to minimize global energy usage. A.L.W.

A80-17140 **Climatic impact of alternative energy sources.** J. Williams (National Center for Atmospheric Research, Boulder, Colo.). *(United Nations University, East-West Center, International Institute for Applied Systems Analysis, and University of Hawaii, Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, Jan. 9-12, 1979.) Energy* (UK), vol. 4, Oct. 1979, p. 933-939. 14 refs. Research supported by the United Nations Environmental Programme.

The impact on the climate of the large-scale deployment of solar energy conversion systems, including OTEC and biomass conversion, to meet a future energy demand of 25 to 40 TW is estimated. The effects of solar thermal electric conversion systems on the surface energy balance, surface roughness and surface wetness of the earth are discussed. It is also shown that photovoltaic conversion could act as a local heat source, OTEC systems would modify the ocean temperature distribution, ocean currents, atmospheric CO2 content and ocean surface albedo, and the cultivation and conversion of plant biomass could cause large-scale changes in surface and atmospheric characteristics. The necessity of further climate research to better quantify these effects is pointed out and the adoption of a flexible energy strategy is suggested. A.L.W.

A80-17218 **Ablation of solid hydrogen in a plasma.** L. W. Jorgensen (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon; Imperial College of Science and Technology, London, England) and A. H. Sillesen (EURATOM and Riso National Laboratory, Roskilde, Denmark). *Journal of Physics D - Applied Physics,* vol. 12, Dec. 14, 1979, p. 2145-2153. 29 refs. Research supported by the Statens Naturvidenskabelige Forskningsrad.

Several hydrogen pellet ablation models based on the formation of a shielding neutral cloud have been reported by different authors. The predicted ablation rates are shown to follow almost the same scaling law and this is used to explain our ablation experiment. (Author)

A80-17222 **The present status of coal gasification following the 14th World Gas Congress - Toronto 1979 (Point sur la gazéification du charbon après le 14e Congrès Mondial du Gaz - Toronto 1979).** P. Gaussens (Gaz de France, Paris, France). *Revue de l'Energie,* vol. 30, Nov. 1979, p. 905-922. In French.

The objectives of coal gasification are discussed and various processes are examined. Consideration is given to the advantages of using gas derived from coal rather than solid or fluidized coal in small-scale installations and coal gasification products required for space heating, water heating, small industries and heavy industry are outlined. Processes of oxyvapogasification and hydrogenation for the production of natural gas and industrial gases from coal are reviewed and evaluated with attention given to autothermic oxyvapogasification for industrial gas production and for industrial gas and synthetic natural gas production, autothermic hydrogenation processes, allothermic oxyvapogasification and hydrogenation processes and methanation processes. A.L.W.

A80-17223 **The policy of the European Economic Community in the field of energy savings (La politique de la communauté économique européenne dans le domaine des économies d'énergie).** J. Carrié. *Revue de l'Energie,* vol. 30, Nov. 1979, p. 912-916. In French.

Policies of the European Economic Community from before the oil crisis of 1973 to the present with respect to energy savings are reviewed. The lack of response to the 1971 Report to the Club of Rome indicating the risks which could result from excessive economic growth, the report of the United States National Petroleum Committee concluding that energy savings should be a national goal and the position of the European Economic Community stressing the utilization rather than the acquisition of energy in May, 1973, are discussed. Actions taken by the Community in response to the crisis following the 1973 Arab-Israeli conflict to reduce the consumption of energy are then outlined, including the emergency measures taken by various countries at the time of the crisis and the results of community and national studies of long-term steps to be taken in the domestic, transportation and industrial sectors to ensure the availability of energy. It is concluded that events in the oil exporting countries render imperative the implementation of a policy of energy savings in Europe. A.L.W.

A80-17227 **Energy conservation - Aerodynamic drag reduction of intercity buses.** N. L. Nihan (Washington, University, Seattle, Wash.) and M. C. Sullivan (Boeing Commercial Airplane Co., Renton, Wash.). *Journal of Advanced Transportation,* vol. 13, Fall 1979, p. 17-23. 9 refs.

An uncertain energy supply and rising fuel prices point toward a need for energy conservation techniques in intercity travel. One economical means of conserving fuel is through the reduction of aerodynamic drag for intercity buses. This can be achieved by the use of very simple add-on devices such as guidevanes and front and side curtains. Tests indicate that a 40 percent reduction in drag could be achieved in this way. This would mean overall fuel savings of nearly 20 percent. Thus, net income for companies specializing in intercity travel would increase substantially through use of these devices. (Author)

A80-17236 **Geology of the Athabasca oil sands.** G. D. Mossop (Alberta Research Council, Geology Div., Edmonton, Canada). *Science,* vol. 207, Jan. 11, 1980, p. 145-152. 21 refs.

In-place bitumen resources in the Alberta oil sands are estimated at 1350 billion barrels. Open-pit mining and hot water extraction methods, which involve the handling of huge tonnages of earth materials, are being employed in the two commercial plants now operating. In situ recovery methods will be required to tap the 90 percent of reserves that are too deeply buried to be surface mined. Development of in situ technologies will be painstaking and expensive, and success will hinge on their compatibility with extremely complex geological conditions in the subsurface. (Author)

A80-17241 **Ethyl alcohol production and use as a motor fuel.** Edited by J. K. Paul. Park Ridge, N. J., Noyes Data Corp. (Energy Technology Review, No. 50; Chemical Technology Review, No. 144), 1979. 366 p. $48.

The book presents an economic assessment of possible modes of preparation of ethanol from various forms of biomass, natural resources and their waste materials or by-products. A chapter on current technology is also included. The present and potential availability of biomass from sugar crops, grains and grasses and silviculture is considered. Current crop production, proposed crops grown specifically for energy production, and crop wastes and residues are discussed. Finally, to determine the actual practicality of fueling motor vehicles with ethanol, either 100% or in blends, several sets of engine test data are reviewed. The results seem favorable, 10 to 20% ethanol blends performing very similarly to straight gasoline with slight gains in octane rating and mileage. S.D.

A80-17243 # **Brightness distribution over the solar disk (Raspredelenie iarkosti po solnechnomn disku).** K. O. Annaniiazov, V. A. Baum, and S. O. Mamedniiazov (Akademiia Nauk Turkmenskoi SSR, Institut Solnechnoi ENergii, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk,* no. 5, 1979, p. 26-29. 7 refs. In Russian.

A basic characteristic of concentrating mirror systems is radiant flux density distribution over the receiver surface. In precise mirror systems, this distribution is formed by superposition of solar images projected by the individual elements of the mirror surface onto the focal plane. In the present paper, interpolational analytical expressions are derived for the brightness distribution over the solar disks within various spectral ranges. V.P.

A80-17244 # **Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices (Gelioustanovka s negermetichno i germetichno osteklennym regeneratorom-nagrevatelem i ee energeticheskie pokazateli).** A. Khandurdyev, A. Kakabaev, and Ch. Kurbankuliev (Turmenskii Gosudarstvennyi Universitet, Ashkhabad, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk*, no. 5, 1979, p. 30-36. In Russian.

A80-17245 # **Results of interdepartmental tests of solar water heaters over an annual cycle. I (Rezul'taty godichnogo tsikla mezhvedomstvennykh ispytanii solnechnykh vodonagrevatelei. I).** R. Bairamov, A. D. Ushakova, A. Khodzhaev, N. A. Kuladova, and O. Annaklycheva (Akademiia Nauk Turkmenskoi SSR, Institut Solnechnoi Energii, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk*, no. 5, 1979, p. 37-44. In Russian.

The paper deals with the measurement techniques and types of solar water heaters used in tests conducted by several organizations over a period of one year. Measurements of the total solar radiation at the heat-receiver surface are tabulated, along with the parameters of the water heaters tested. V.P.

A80-17246 # **Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant (Algoritm rascheta zateneniia i blokirovki geliostatov solnechnoi elektricheskoi stantsii /SES/).** I. V. Baum and S. O. Mamedniiazov (Akademiia Nauk Turkmenskoi SSR, Institut Solnechnoi Energii, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk*, no. 5, 1979, p. 97-100. In Russian.

A80-17247 # **Structure of an averaged statistical pencil of rays reflected from a heliostat (Struktura srednestatisticheskogo puchka luchei, otrazhennogo ot geliostata).** I. V. Baum and S. O. Mamedniiazov (Akademiia Nauk Turkmenskoi SSR, Institut Solnechnoi Energii, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk*, no. 5, 1979, p. 100-102. In Russian.

An important characteristic of the optical system of a solar power plant is the collection coefficient of radiation reflected from the heliostats. In view of the variety of existing heliostat versions, the present analysis is carried out for the reflected averaged statistical pencil of rays, whose formation is influenced by noncorrelated heliostat errors and the angular errors of the orientation systems. V.P.

A80-17252 # **Ion-stimulated sorption of nitrogen on a continuously deposited titanium film.** G. I. Grigorov, I. N. Martev, and K. K. Tsatsov (B'lgarska Akademiia na Naukite, Institut po Elektronika, Sofia, Bulgaria). *Bolgarskaia Akademiia Nauk, Doklady*, vol. 32, no. 8, 1979, p. 1069-1072. 7 refs.

Currently, a number of important technologies rely on the use of metal-metalloid compounds with a high metalloid content. The present paper deals with the preparation of TiN(x)-type compounds with x values higher than 1.15. The principal results of ion-stimulated nitrogen sorption on a continuously deposited titanium film are described, and characteristic parameters of sorption on continuously deposited getter films are identified. V.P.

A80-17307 **Numerical computation of singular control problems with application to optimal heating and cooling by solar energy.** H. J. Oberle (München, Technische Universität, Munich, West Germany). *Applied Mathematics and Optimization*, vol. 5, no. 4, 1979, p. 297-314. 25 refs.

The method presented here is an extension of the multiple shooting algorithm in order to handle multipoint boundary-value problems and problems of optimal control in the special situation of singular controls or constraints on the state variables. This generalization allows a direct treatment of (nonlinear) conditions at switching points. As an example a model of optimal heating and cooling by solar energy is considered. The model is given in the form of an optimal control problem with three control functions appearing linearly and a first order constraint on the state variables. Numerical solutions of this problem by multiple shooting techniques are presented. (Author)

A80-17343 **Thionine coated electrode for photogalvanic cells.** W. J. Albery, A. W. Foulds, K. J. Hall, A. R. Hillman (Imperial College of Science and Technology, London, England), R. G. Egdell, and A. F. Orchard (Oxford University, Oxford, England). *Nature*, vol. 282, Dec. 20-27, 1979, p. 793-797. 13 refs.

The characteristics of a thionine-coated illuminated electrode in a photogalvanic cell intended for solar energy conversion are investigated. Pt and SnO2 electrodes were coated with a stable layer of thionine by holding them at 1.1 to 1.5 V in a thionine solution for several minutes, and the electrode kinetics of various redox couples were examined. Current-voltage curves indicate that the reductions of thionine and its disulphonated derivative are reversible on a clean Sn or Pt electrode and nearly reversible on a coated electrode, while the coating has little effect on the reduction of quinone. For inorganic couples, the coating is found to greatly reduce the kinetics of Fe(III), Fe(CN)6(-4), Ru(2,2 prime bipyridine)3(+3) and Ce(IV) reduction. Coating voltages and times are also found to affect electrode kinetics. The inhibition of inorganic reduction by the coating is explained by the blockage of single electron transfers to the ion. It is concluded that the thionine-coated electrode has the required selectivity to act as the illuminated electrode in an iron-thionine galvanic cell. A.L.W.

A80-17352 # **The relative value of energy derived from municipal refuse.** R. S. Hecklinger (Charles R. Velzy Associates, Inc., Armonk, N.Y.). *ASME, Transactions, Journal of Energy Resources Technology*, vol. 101, Dec. 1979, p. 251-255; Discussion, p. 255-258; Author's Closures, p. 258-259. 14 refs.

Many systems for utilizing the heat energy in municipal refuse are in various stages of development. These systems either use unprocessed solid waste as a fuel or derive a fuel through processing. The fuels produced vary radically in heating value. The energy expended in processing differs from one process to another and the potential end use is not the same for each system. Six representative systems are compared to determine the relative potential value of refuse as a source of energy. (Author)

A80-17573 **Solar-hydrogen energy systems.** Edited by T. Ohta (Yokohama National University, Yokohama, Japan). Oxford and New York, Pergamon Press, 1979. 276 p. $35.

The use of solar energy to produce hydrogen for use as a fuel is examined, with particular emphasis on processes for the splitting of water by sunlight. Consideration is given to the thermodynamics of watersplitting, and to the electrolysis and direct thermal decomposition of water. Thermochemical, photochemical, photoelectrochemical and biological and biochemical hydrogen production processes are presented and evaluated, and the concept of a system for the direct conversion of solar energy at sea by a general process for splitting of sea water is detailed. The storage of solar energy in the form of metal hydrides is also treated. A.L.W.

A80-17574 **Introduction - A review of the scope.** T. Ohta (Yokohama National University, Yokohama, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 1-23. 51 refs.

The significance, solar technology, processes and utilization of solar energy systems used to produce hydrogen are reviewed. Attention is given to the role of solar hydrogen energy systems within desirable future energy networks and chemical manufacturing industries, and the various types of solar collectors, including reflectors, refractors and flat plates. Direct (photolytic, thermal decomposition, biophotolytic) and indirect (electrolytic, by means of solar-generated electricity) processes of hydrogen acquisition from water are presented, taking into account various possible means of separating resultant water, hydrogen and oxygen mixtures. The utilization of hydrogen in advanced energy systems, as a chemical feedstock, as an agent in materials manufacturing and in the transportation sector is discussed. A.L.W.

A80-17575 **Thermodynamics of water-splitting.** T. Ohta (Yokohama National University, Yokohama, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 25-33. 7 refs.

The thermodynamics of water decomposition are examined with particular emphasis on thermochemical processes to be used in solar-powered systems. The structure and vibration of the water molecule are discussed, and its thermodynamic parameters, including heat of formation and changes in Gibbs free energy, entropy and enthalpy upon dissociation in the vapor state, are considered. Chemical cycles for the decomposition of water are discussed, noting the advantages of a scheme which does not require useful work, and the thermal efficiencies of the thermochemical decomposition of water and of hybrid (using thermal and nonthermal energy) cycles are examined. A.L.W.

A80-17576 **Water electrolysis.** T. Takahashi (Nagoya University, Nagoya, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 35-58. 20 refs.

The electrolysis of water is evaluated as a potentially efficient, low cost means of hydrogen production. The theoretical energy and voltage, current, and energy efficiencies of water electrolysis are considered. The present status of water electrolysis is reviewed, with attention given to caustic potash of soda electrolytes, electrode materials, diaphragms inserted between the electrodes, and the design of unipolar and bipolar cells. Current electrolytic cells are presented and their performances are compared. Advanced high-efficiency electrolysis systems, including the Teledyne Energy Systems bipolar filter press cell, the static feed water electrolyzer, solid polymer electrolyte water electrolysis systems, high temperature solid electrolyte water electrolyzers and palladium electrode electrolyzers are described, and their potential performances are compared. Problems in the direct electrolysis of sea water are indicated, and it is concluded that water electrolysis is expected to become one of the principle means of producing large quantities of hydrogen. A.L.W.

A80-17577 **Direct thermal decomposition of water.** S. Ihara (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan). In: Solar-hydrogen energy systems. Oxford and New York Pergamon Press, 1979, p. 59-79. 19 refs.

The thermodynamics of the direct thermal decomposition of water are treated, and practical aspects of the application of solar energy as a heat source are examined. The thermodynamics of the two-step dissociation of water at temperatures less than 6000 K are discussed, with attention given to the translational, rotational, vibrational and electronic partition functions, the equilibrium composition of the gaseous products, the net energy requirements of the process, and its thermodynamic efficiency. The technical requirements of a solar system which would supply operating temperatures greater than 1500 K for decomposition in order to maximize its efficiency are examined, and possible techniques for the separation of the gas mixtures produced by the thermal decomposition of water are compared. Experimental studies of the decomposition of water using a solar furnace and of high-temperature separation membranes are reported, and it is concluded that extensive development of a separation process is necessary for the systems analysis of solar water thermal decomposition systems. A.L.W.

A80-17578 **Thermochemical hydrogen production.** S. Sato (Japan Atomic Energy Research Institute, Takasaki Radiation Chemistry Establishment, Tokai, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 81-114. 53 refs.

Thermochemical methods of hydrogen production by the decomposition of water are discussed. The development of thermochemical processes which would lead to the formation of hydrogen from water is reviewed, and the use of nuclear and solar heat sources for thermochemical processes is discussed. One-step and two-step processes for water decomposition are examined, discussing the thermodynamics of the overall process, the amount of energy recoverable, and the energy requirements of ideal and nonideal processes. Thermochemical reaction sequences for water decomposition, hydrogen generation, oxygen generation and the regeneration of intermediates are presented, including iron-halide and sulfur dioxide-iodine reaction families. Consideration is also given to the technical and overall evaluation of possible thermochemical processes for hydrogen production. A.L.W.

A80-17579 **Photochemical hydrogen production.** M. Kamiya and T. Ohta (Yokohama National University, Yokohama, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 115-135. 27 refs.

The photochemical production of hydrogen from water using solar radiation as the light source is discussed. Catalytic and energetic requirements of photochemical decomposition and the electron transfer spectra of candidate catalyst ions are considered, and photochemical water dissociation reactions are classified into one-photon hydrogen-radical-forming systems, one-photon hydroxy-radical-forming systems, one-photon hydrogen-and-oxygen-forming systems and two-photon hydrogen-and-oxygen-forming systems. Specific proposed photochemical and hybrid water-splitting processes are outlined, including the hybrid Yokohama Mark 5 and 6 cycles which complete the chemical cycle using photochemical as well as thermochemical and/or electrochemical reactions, hydrogen production by the Ce(+)/Ce(+3) redox reaction, the ruthenium, rhodium, and copper complex systems, the silver zeolite process and highly organized simulated membrane systems. A.L.W.

A80-17580 **Photoelectrochemical hydrogen production.** T. Watanabe, A. Fujishima, and K. Honda (Tokyo, University, Tokyo, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 137-169. 106 refs.

Principles of and recent advances in the conversion of sunlight to fuel and electricity by means of systems based on semiconductor-liquid junctions, including biophotoelectrochemical processes, are reviewed. The generation of electron-hole pairs at a semiconductor electrode in a photoelectrochemical cell and the resulting oxidation and reduction reactions in the cell are examined, noting the applicability of the system to the splitting of water and the production of hydrogen. Possible fuel-producing cells are considered, including the already demonstrated titanium dioxide/platinum electrode water-splitting cell, and discussed in terms of the stability, flatband potential, bandgap and quantum efficiency requirements of the process. The stabilization of small-bandgap semiconductor electrodes by the addition of redox species to the solution in a regenerative electrochemical photovoltaic cell is examined, and a hybrid system consisting of a combination of an electrolytic cell with a photodecomposition cell is presented. Consideration is given to photosynthetic water splitting in the presence of light, and in vitro processes based on chloroplast activity. Photoelectrocatalytic processes for hydrogen production, nitrogen reduction and carbon dioxide reduction and dye-semiconductor systems are also examined. A.L.W.

A80-17581 **Biological and biochemical hydrogen production.** A. Mitsui (Miami, University, Coral Gables, Fla.). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 171-191. 166 refs.

The production of hydrogen by intact microorganisms and cell-free biochemical systems using solar energy is discussed. Current understandings of the photoproduction of hydrogen by algae and photosynthetic bacteria are reviewed, and work with cell-free systems consisting of chloroplasts, biological electron carriers and bacterial hydrogenase is summarized, noting the feasibility of using hydrogen photoproduction by algae as a source of fuel. Means of increasing the efficiency of biological hydrogen photoproduction in living cells and cell-free systems are surveyed, and the utilization of photosynthetically produced materials for a variety of applications including biomass, fertilizer, methane, pharmaceuticals and chemicals is considered as a means of increasing the economic potential of the process. Increased research and development in the field of hydrogen photoproduction is suggested as a means leading to the production of clean, renewable energy. A.L.W.

A80-17582 **Solar energy storage by metal hydride.** S. Ono (National Chemical Laboratory for Industry, Tokyo, Japan), M. Yamaguchi, and T. Ohta (Yokohama National University, Yokohama, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 193-224. 14 refs.

Metal hydride systems for long-term solar thermal energy storage are examined. Various materials for solar heat storage for architectural applications are reviewed, including water, pebble beds, insulators such as rock wool, glass wool and synthetic resins, molten salts and reaction heat storage systems, of which the metal hydride system is considered the most effective. The thermodynamics of metal hydride systems for hydrogen or heat storage are discussed, and the characteristics of some representative systems, namely iron-titanium hydrides, magnesium-nickel hydrides and lanthanum-nickel hydrides, are considered. Results of performance tests of the endothermic and exothermic processes of an iron-titanium system are reported and the HYCSOS hydride conversion and storage system, which employs two types of hydrides, is presented. An ideal heat engine based on the metal hydriding reaction is examined theoretically and a promising prototype chemical engine based on LaNi5H6 is described. A.L.W.

A80-17583 **Direct solar energy conversion at sea.** W. J. D. Escher (Escher Technology Associates, St. Johns, Mich.) and T. Ohta (Yokohama National University, Yokohama, Japan). In: Solar-hydrogen energy systems. Oxford and New York, Pergamon Press, 1979, p. 225-248. 11 refs.

Hydrogen production and delivery from direct solar energy conversion facilities located at sea is treated, assuming the use of a heat engine/electricity generation/water electrolysis system. The concept of ocean energy is discussed, noting the distinction between direct and indirect solar energy conversion at sea, and direct solar energy conversion is considered within the framework of the seaward advancement of industrial societies. Results of preliminary experiments on a PORSHE (Planned Ocean Raft System for Hydrogen Economy) device are reported, and the advantages and disadvantages of locating large-scale solar energy systems at sea are discussed, noting as well the possible association of marine farming installations with energy facilities. The potential of solar hydrogen systems is assessed, and an illustrative model of an ocean-based direct solar energy conversion system for hydrogen energy production is described. The significance of hydrogen energy to other sectors of the energy economy is also examined. A.L.W.

A80-17710 **Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash.** B. J. Kimble (California, University, Davis, Calif.) and M. L. Gross (Nebraska, University, Lincoln, Neb.). *Science*, vol. 207, Jan. 4, 1980, p. 59-61. 26 refs. Research supported by the U.S. Environmental Protection Agency; NSF Grant No. CHE-78-18572; Contract No. DE-AM03-76SF00472.

Gas chromatography-high resolution mass spectrometry has been used to quantitate tetrachlorodibenzo-p-dioxin (TCDD) in fly ash collected from the stack of a typical commercial coal-fired power plant. No TCDD was detected in this fly ash, but minute traces may be present below the detection limit of 1.2 parts per trillion (by weight). This finding indicates that this type of fossil-fueled power plant is not a large source of this compound in environmental samples, in contrast to the conclusions presented in a recent industrial report. (Author)

A80-17737 * # **Preparing aircraft propulsion for a new era in energy and the environment.** W. L. Stewart, D. L. Nored, J. S. Grobman, C. E. Feiler, and D. A. Petrash (NASA, Lewis Research Center, Cleveland, Ohio). *Astronautics and Aeronautics*, vol. 18, Jan. 1980, p. 18-31, 37. 22 refs.

Improving fuel efficiency, new sources of jet fuel, and noise and emission control are subjects of NASA's aeronautics program. Projects aimed at attaining a 5% fuel savings for existing engines and a 13-22% savings for the next generation of turbofan engines using advanced components, and establishing a basis for turboprop-powered commercial air transports with 30-40% savings over conventional turbofan aircraft at comparable speeds and altitudes, are discussed. Fuel sources are considered in terms of reduced hydrogen and higher aromatic contents and resultant higher liner temperatures, and attention is given to lean burning, improved fuel atomization, higher freezing-point fuel, and deriving jet fuel from shale oil or coal. Noise sources including the fan, turbine, combustion process, and flow over internal struts, and attenuation using acoustic treatment, are discussed, while near-term reduction of polluting gaseous emissions at both low and high power, and far-term defining of the minimum gaseous-pollutant levels possible from turbine engines are also under study. J.P.B.

A80-17743 **The scope of environmental risk management.** T. O'Riordan (East Anglia, University, Norwich, England). *Ambio*, vol. 8, no. 6, 1979, p. 260-264. 17 refs.

Environmental risk management, which incorporates both scientific analysis and political judgement in a search for the safest route between social benefits and losses, is examined, and its role in decision-making institutions is discussed. Environmental risk management is shown to consist of the sequential functions of risk identification, risk estimation, risk evaluation and implementation, or risk control. The advances of environmental impact analysis and risk analysis are related to the adversary and consensus styles of political policymaking, and an organizational structure which would allow a combination of policy review and project assessment in a nonadversary seminar setting is proposed for the UK. It is concluded that the maturation of environmental risk management will not be seen until both politicians and scientists broaden the scope of their decision making to deal with a wider variety of interests. A.L.W.

A80-17751 **Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volumes 1, 2 & 3.** Conference sponsored by the International Atomic Energy Agency. Vienna, International Atomic Energy Agency (*Nuclear Fusion Supplement*), 1979. Vol. 1, 846 p.; vol. 2, 690 p.; vol. 3, 566 p. Price of three volumes, $238.

The volumes deal with the following: tokamak experiments and theory; high-beta systems, nonaxisymmetric systems, and plasma heating; and inertial confinement, and technical and reactor concepts. Specific topics covered include: investigations of lower-hybrid plasma heating in FT-1 tokamaks, deuterium diffusion studies in a tokamak plasma by pulsed injection, recent developments in linear theta-pinch and laser heated solenoid, stochastic ion heating by an electrostatic wave in a sheared magnetic field, as well as recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory. C.F.W.

A80-17754 **Results from the Divertor Injection Tokamak Experiment /DITE/.** K. B. Axon, G. A. Baxter, J. Burt, W. H. M. Clark, G. M. McCracken, S. J. Fielding, R. D. Gill, D. H. J. Goodall, M. Hobby, and J. Hugill (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 1. Vienna, International Atomic Energy Agency, 1979, p. 51-64; Discussion, p. 64. 17 refs.

The paper contains a review of results obtained on the DITE experiment over the last two years and previously unpublished data on plasma stability, energy and particle transport, and hydrogen re-cycling. The new 1.2-MW neutral-injection system is described, with preliminary results of injection experiments into a 150-kA discharge. (Author)

A80-17759 **Accumulation of impurities and stability behaviour in the high-density regime of Pulsator.** W. Engelhardt, O. Kluber, D. Meisel, H. Murmann, S. Sesnic, G. Fussmann, E. Glock, N. Gottardi, F. Karger, and G. Lisitano (EURATOM and Max-Planck-Institut für Plasmaphysik, Garching, West Germany). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 1. Vienna, International Atomic Energy Agency, 1979, p. 123-133; Discussion, p. 133, 134.

At the end of high-density plateaus a strong accumulation of impurities by a factor of 5 within less than 10 ms is observed in Pulsator. This leads to a displacement of the current into an outer region with a subsequent steepening of the gradient at the $q = 2$ surface. The resulting disruption prevents the production of longer density plateaus. From observations of the internal disruption and of the $m = 2$, $n = 1$ mode activity, it was determined that steep current gradients at $q = 2$ trigger the current disruption. The existence of a sharp density limit, however, cannot be explained satisfactorily in these terms. B.J.

A80-17789 **High-beta tokamaks.** R. A. Dory, D. P. Berger, L. A. Charlton, J. T. Hogan, J. K. Munro, D. B. Nelson, Y.-K. M. Peng, D. J. Sigmar, and D. J. Strickler (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 1. Vienna, International Atomic Energy Agency, 1979, p. 579-591; Discussion, p. 591, 592. 23 refs. Contract No. W-7405-eng-26.

MHD equilibrium, stability, and transport calculations are made to study the accessibility and behaviour of 'high-beta' tokamak plasmas in the range of about 5-15%. For next-generation devices, beta values of, at least, 8% appear to be accessible and stable if there is a conducting surface nearby. (Author)

A80-17790 **Dependence of ideal MHD beta limits on current density and pressure profiles.** R. Gruber, R. Schreiber, F. Troyon (Lausanne, Ecole Polytechnique Féderale, Lausanne, Switzerland), W. Kerner, K. Lackner (EURATOM and Max-Planck-Institut für Plasmaphysik, Garching, West Germany), A. Sykes, and J. A. Wesson (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abington, Oxon, England). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 1. Vienna, International Atomic Energy Agency, 1979, p. 593-603; Discussion, p. 603. 5 refs.

Numerical calculations of the MHD stability of a range of JET equilibria have been made. It is found that by shaping the current profile stability can be obtained for low mode numbers for values of beta in excess of 10 percent provided the plasma surface is bounded by a conducting wall. In the absence of such a wall, all of the equilibria studied are found to be unstable to free boundary modes. (Author)

A80-17797 **MHD stability limits on high-beta tokamaks.** M. S. Chance, R. L. Dewar, E. A. Frieman, A. H. Glasser, J. M. Greene, R. C. Grimm, S. C. Jardin, J. Manickam, M. Okabayashi (Princeton University, Princeton, N.J.), and J. L Johnson. In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 1. Vienna, International Atomic Energy Agency, 1979, p. 677-686; Discussion, p. 686, 687. 13 refs. Contract No. EY-76-C-02-3073.

Limitations on high-beta tokamaks are imposed by a number of ideal and resistive MHD instabilities. The present paper reports results on three such studies: (1) Numerical analyses using the Princeton PEST code on beta optimization of tokamaks for low toroidal mode numbers n; (2) analytic and numerical results on ideal ballooning modes with high n; and (3) analytic and numerical results on resistive modes at high n. (Author)

A80-17807 **What is the mechanism responsible for the precursors of internal disruptions.** A. Rogister and G. Hasselberg (EURATOM and Kernforschungsanlage Jülich GmbH, Institut für Plasmaphysik, Jülich, West Germany). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 1. Vienna, International Atomic Energy Agency, 1979, p. 809-813. 8 refs.

The theory of the resistive layer of the $m = 1$ (MHD marginally stable) mode is revisited by including a finite diamagnetic drift frequency. The equations describing the tearing mode are approximations of more general equations which admit another solution, i.e., the electromagnetic drift wave. For the $m = 1$ MHD neutral mode there is no instability of the drift-tearing type, i.e., with frequency of the resistive layer approximately equal to the electron diamagnetic drift frequency while the growth rate of the tearing mode is reduced. The electromagnetic drift wave is also found to be stable; this mode would, however, yield, like the tearing mode, a natural explanation for the formation of magnetic islands. It is concluded that the precursors of the internal disruption cannot be explained without taking toroidal effects into account. (Author)

A80-17809 **LASL toroidal reversed-field pinch programme.** D. A. Baker, C. J. Buchenauer, L. C. Burkhardt, J. N. DiMarco, J. N. Downing, A. Haberstich, R. B. Howell, A. R. Jacobson, H. J. Karr (California, University, Los Alamos, N. Mex.), and C. K. Chu (California, University, Los Alamos, N. Mex.; Columbia University, New York, N.Y.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 3-22. 15 refs. Research sponsored by the U.S. Department of Energy.

The determination of the absolute energy loss due to radiation from impurities in the LASL toroidal reversed-field pinch experiment ZT-S is reported. The measurements show that over half the energy loss is accounted for by this mechanism. Thomson-scattering electron density measurements indicate only a gradual increase in temperature as the filling pressure is reduced, indicating an increased energy loss at lower pressures. Cylindrical and toroidal simulations of the experiment indicate either that a highly radiative pinch boundary or anomalous transport is needed to match the experimental results. New effects on the equilibrium due to plasma flows induced by the toroidal geometry are predicted by the toroidal simulations. The preliminary results on the low-temperature discharge cleaning of the ZT-S torus are reported. A description of the upgrade of the ZT-S experiment and the objectives, construction and theoretical predictions for the new ZT-40 experiment are given. (Author)

A80-17811 **Studies on plasma formation, relaxation and heating in a reversed-field pinch.** M. Bagatin, A. Buffa, R. De Angelis, G. Malesani, and S. Ortolani (EURATOM and Consiglio Nazionale delle Ricerche, Centro di Studio sui Gas Ionizzati, Padua, Italy). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 37-52. 15 refs.

Some problems relevant for the formation, relaxation and heating of a comparatively slow pinch have been investigated. The spontaneous relaxation of the pinch to a reversed-field pinch (RFP) configuration has been studied under various conditions of the ratio of the current risetime (tau sub I) to the MHD time (tau sub A). For large tau sub I/tau sub A the tendency of the pinch to evolve along a universal patch is more evident; the stability analysis and the axial flux amplification phenomenon are discussed. Ionization and start-up problems are shown to be important with reference to experiments performed on ETA-BETA I with long (exceeding 160 microsec) current risetimes and to zero-dimensional calculations of the ionization and formation phases. The steady-state and time-dependent power balance of the pinch is studied, with reference to a proposed RFP reactor, including impurity line radiation losses. Conditions for ignition are briefly discussed. (Author)

A80-17822 **Principles of plasma heating and confinement in a compact toroidal configuration.** A. G. Es'kov, R. Kh. Kurtmullaev, A. P. Kreshchuk, Ia. N. Laukhin, A. I. Maliutin, A. I. Markin, Iu. S. Martiushov, B. N. Mironov, M. M. Orlov, and A. P. Proshletsov (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 187-204. 6 refs.

Data obtained on a so-called compact toroid (a configuration where shock compression improves the stable confinement properties) are generalized and shown to be valid in a magnetic field range of 2-12 kG, a plasma density range of 10 to the 14 to 10 to the 16th per cu cm, and chamber dimensions of 20-40 cm x 100-200 cm. Attention is given to the following aspects of the problem: pulsed shaping of closed structures; optimization of shock heating; methods of magnetic-structure shaping; stability of the neutral layer; shock wave characteristics and generation conditions; toroid injection; and principles of compact-toroid confinement. B.J.

A80-17824 **End plugging of a hot linear theta pinch.** H. Azodi, M. Naraghi, H. Tahsiri, and A. Torabi-Fard (Atomic Energy Organization of Iran, Fusion Div., Teheran, Iran). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 217-227. 6 refs.

With and without solid end plugging schemes, some plasma parameters and stability traits of a 1-m-long, 10-cm-coil-bore linear theta pinch which incorporates modular construction have been investigated. The compressed thermonuclear-like plasma, having maximum density of 10 to the 16th per cu cm and ion temperature exceeding 1 keV, is stable for a short life of 5-6 microsec. Numerical calculations treated in the sharp-boundary, two-fluid approximation, with the plug assumed to be held at a constant temperature and experiencing no ablation, have shown increases in T sub e, T sub i, and N sub N, the rate of neutron production, when the end is plugged compared to the unplugged case. Streak photography at the midplane has shown a more stable but less compressed plasma when end plugs are used. Measurements of the extent of damage incurred by the plugs have shown that a similar amount of loss of plug material occurs whether the plugs are placed at the ends of the coil or positioned 20 cm outside the coil. (Author)

A80-17825 **Recent developments in linear theta-pinch and laser-heated solenoid research.** K. F. McKenna, R. R. Bartsch, R. J. Commisso, C. A. Ekdahl, K. B. Freese, R. F. Gribble, F. C. Jahoda, G. Miller, R. E. Siemon, and J. U. Brackbill (California, University, Los Alamos, N. Mex.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 229-246; Discussion, p. 246, 247. 25 refs. Research sponsored by the U.S. Department of Energy.

Efforts of groups at the Los Alamos Scientific Laboratory (LASL), Mathematical Sciences Northwest (MSNW), and the University of Washington (UW), are reported. Experiments on the LASL high energy Scylla IV-P theta pinch have been directed toward the investigation of particle and thermal losses, the plasma flow and magnetic field interaction processes near the coil ends, end-loss suppression using solid material and plugs, and the plasma stability characteristics. Theoretical efforts at LASL have dealt with the driving mechanisms of the observed m = 1 wobble instability, numerical studies of particle end-loss, instability effects on radial diffusion, and magnetoacoustic heating methods. The interaction of CO2 laser radiation with theta-pinch-like plasma columns is being studied at MSNW and UW. In these experiments channeling of the laser light along the axis of a partially ionized plasma column and the resultant heating are investigated. B.J.

A80-17826 **Heating, confinement and fluctuations in the CLEO stellarator.** D. W. Atkinson, J. E. Bradley, A. N. Dellis, P. C. Johnson, D. J. Lees, P. J. Lomas, W. Millar, A. C. Selden, L. E. Sharp, and P. A. Shatford (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 251-263; Discussion, p. 263, 264. 9 refs.

The confinement of an Ohmically heated plasma has been investigated in the CLEO stellarator. The electron energy replacement time is found to decrease as the drift parameter, characterized by the ratio of electron drift velocity to electron thermal velocity, is increased. Density fluctuations have been seen but do not appear to explain the observed loss as being due to a drift instability. A beam of neutrals has been injected into a plasma produced by Ohmic heating: ion heating has been observed. The results have been compared with theoretical models. It is shown that increased power input will be necessary to sustain a currentless plasma of the same parameters as those produced by Ohmic heating. (Author)

A80-17829 **Current equilibrium and effective ion charge in L-2 stellarator plasma.** D. K. Akulina, E. D. Andriukhina, G. S. Voronov, M. S. Berezhetskii, S. E. Grebenshchikov, I. S. Danilkin, B. I. Kornev, O. I. Fedianin, I. S. Sbitnikova, and Iu. V. Khol'nov (Akademiia Nauk SSSR, Fizicheskii Institut, Moscow, USSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 287-301. 6 refs.

This paper presents data on the equilibrium of a current in a stellarator magnetic field. It is shown that the equilibrium of a plasma column is only determined by the vacuum rotational transform angle at constant longitudinal and external transverse fields. The transverse field of the current is identical with the external transverse field. An investigation of the plasma radiation at a frequency of 2 Omega (Be) was carried out. It is shown that at a plasma density of greater than 7 x 10 to the 12th per cu cm the electron temperature obtained from the intensity of the cyclotron radiation is in a good agreement with the results of X-ray measurements and the radial temperature distribution is near to parabolic. Measurement of the effective ion charge in the plasma shows a discrepancy between the values obtained from plasma conductivity and those obtained from radiation in the soft-X-ray and visible regions of the spectrum. (Author)

A80-17840 **Transverse particle losses in axially asymmetrical open traps.** M. E. Kishinevskii, P. B. Lysianskii, D. D. Riutov, G. V. Stupakov, B. M. Fomel', B. V. Chirikov, and G. I. Shul'zhenko (Akademiia Nauk SSSR, Institut Iadernoi Fiziki, Novosibirsk,

USSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2.
Vienna, International Atomic Energy Agency, 1979, p. 411-426; Discussion, p. 426. 11 refs.

The effect of axial asymmetry of the magnetic field on transverse plasma losses from traps with improved longitudinal confinement is discussed. The role of these losses is characterized by the angle of rotation of the guiding centre of the particle around the magnetic axis during motion of the particle from mirror to mirror. The transport regimes are classified as a function of this angle. Corresponding analytical estimates of the transport coefficients are presented. A stochastic instability leading to collisionless diffusion due to field perturbation as a result of slight misaligments in the magnetic system was studied experimentally in terms of a specially constructed electron model in which the electrons moved in longitudinal magnetic and radial electric fields. Resonance and stochastic diffusion were also investigated numerically in terms of a special model. The numerical results are in satisfactory agreement with simple analytical estimates for the instability boundary and diffusion rate under the joint effects of resonances and multiple scattering.
(Author)

A80-17846 **Drift wave stability and transport theory in fusion systems.** N. A. Krall, S. Hamasaki, J. B. McBride (Science Applications, Inc., La Jolla, Calif.), N. T. Gladd, P. H. Ng, H. H. Chen (Maryland, University, College Park, Md.), J. D. Huba (U.S. Navy, Naval Research Laboratory, Washington, D.C.), R. C. Davidson (U.S. Department of Energy, Washington, D.C.), R. E. Aamodt, and Y.-C. Lee (Science Applications, Inc., Boulder, Colo.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 483-495; Discussion, p. 495, 496. 17 refs.

The linear properties of lower hybrid, drift cyclotron, and drift cyclotron loss-cone instabilities are calculated including shear, beta and distribution function effects. Transport runs including these effects are carried out for experiment-sized and reactor-sized devices. Non-linear effects on the DC mode due to frequency and wavenumber shifts are calculated.
(Author)

A80-17855 **Fast-magnetosonic-wave excitation in large-tokamak plasmas.** A. V. Longinov, K. N. Stepanov, V. A. Tsurikov (Akademiia Nauk Ukrainskoi SSR, Fiziko-Tekhnicheskii Institut, Kharkov, Ukrainian SSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2. Vienna, International Atomic Energy Agency, 1979, p. 583-605; Discussion, p. 605. 16 refs.

A general description of fast magnetosonic wave (FMSW) excitation in a large plasma torus is given. Resonant excitation of a separate eigenmode is shown to be possible in a region of weak damping as well as resonant excitation of paired eigenmodes. With increasing damping multimode resonances appear and a regime of radiation into half space is realized in the strong damping region. Characteristics of FMSW excitation by a current layer in the presence of a metal screen (vacuum chamber) are discussed. Results are presented on the calculation of excitation and damping of FMSW with a frequency of 2Omega(Bi) in a T-10 tokamak. Attention is also given to the advantages and disadvantages of using different regimes of FMSW excitation for plasma heating in tokamaks of various dimensions.
B.J.

A80-17857 **Investigation of plasma heating by powerful relativistic electron beams.** A. V. Arzhannikov, A. V. Burdakov, B. N. Breizman, A. S. Burmasov, L. N. Viacheslavov, V. S. Koidan, V. V. Koniukhov, V. A. Kornilov, E. P. Krugliakov, and V. N. Lukh'ianov (Akademiia Nauk SSSR, Institut Iadernoi Fiziki, Novosibirsk, USSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 2.
Vienna, International Atomic Energy Agency, 1979, p. 623-637; Discussion, p. 637. 10 refs.

Plasma heating experiments using relativistic electron beams (part of a solenoid-based thermonuclear program) were carried out on the GOL-1 and INAR devices. Transport of a beam with current up to 55 kA in a multimirror magnetic field was obtained on the GOL-1 device without any indication of development of macroscopic instabilities. INAR experiments showed an increase in magnetic field up to 25 kOe and a decrease in the anode foil thickness down to 6 microns, making it possible to achieve 20% efficiency of energy transfer from the REB with a current density of 1 kA/sq cm to a plasma with a density of 4 x 10 to the 14th per cu cm at a plasma column length of 240 cm.
B.J.

A80-17860 **The KMSF laser fusion programme.** R. L. Berger, P. M. Campbell, G. Charatis, J. G. Downward, T. M. Henderson, R. R. Johnson, T. A. Leonard, F. J. Mayer, D. Mitrovich, and N. K. Moncur (KMS Fusion, Inc., Ann Arbor, Mich.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 3-15. Contract No. ES-77-C-02-4149.

Laser-driven implosion experiments have been performed at both 1.06 microns and 0.53 microns. The fractional absorption was greater at 0.53 microns although with the laser power available at 0.53 microns it was not possible to observe effects of a high-temperature corona. Other experiments were performed using cryogenic targets at 1.06 microns. It was found that the neutron yield and peak fuel densities were greater when the fuel formed a liquid or solid layer on the inside of the spherical glass-shell targets.
(Author)

A80-17861 **Inertial confinement fusion at NRL.** S. E. Bodner, J. P. Boris, G. Cooperstein, S. A. Goldstein (U.S. Navy, Naval Research Laboratory, Washington, D.C.; Science Applications, Inc., McLean, Va.), D. Mosher, B. H. Ripin, R. Decoste (U.S. Navy, Naval Research Laboratory, Washington, D.C.; Maryland, University, College Park, Md.), J. H. Gardner, R. Lee, and R. H. Lehmberg (U.S. Navy, Naval Research Laboratory, Washington, D.C.; Jaycor, Inc., McLean, Va.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 17-28. 27 refs. Research supported by the U.S. Department of Energy.

The NRL Inertial Confinement Fusion Program's emphasis has moved toward pellet concepts which use longer (10 ns) lower intensity driver pulses than previously assumed. For laser drivers, this change was motivated by recent experiments at NRL with enhanced stimulated Brillouin backscatter. For ion drivers, the motivation is the possibility that substantial energy at 10-ns pulse lengths may soon be available. To accept these 10-ns pulses, it may be necessary to consider pellets of larger radius and thinner shell. The computational studies of Rayleigh-Taylor instability at NRL indicate the possibility of a dynamic stabilization of these thinner shells. (Author)

A80-17862 **Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory.** R. B. Perkins (California, University, Los Alamos, N. Mex.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 41-52. Discussion, p. 52. 13 refs. Research sponsored by the U.S. Department of Energy.

Recent progress in the inertial confinement fusion programme at the Los Alamos Scientific Laboratory is reviewed. Helios, an eight-beam 10-kJ CO2 laser, became operational in April 1978 and has produced output powers exceeding 21 TW. Antares, a 100-kJ CO2 laser, is under construction and should permit breakeven experiments in 1983/84. Current and planned target experiments are discussed. Laser fusion power plants employing CO2 lasers are being studied to identify areas requiring early attention. (Author)

A80-17863 **Work on laser interaction and implosion at Centre d'Etudes de Limeil.** A. Bekiarian, E. Buresi, A. Coudeville, R. Dautray, F. Delobeau, P. Guillaneux, C. Patou, J. M. Reisse, B. Sitt, and J. M. Vedel (Commissariat à l'Energie Atomique, Centre d'Etudes de Limeil, Villeneuve-Saint-Georges, Val-de-Marne, France). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 65-72; Discussion, p. 72,73. 15 refs.

A80-17864 **Experimental studies of interaction and transport processes in laser fusion.** A. Amiranoff, R. Benattar, R. Fabbro, E. Fabre, C. Garban, C. Popovics, A. Poquerusse, C. Stenz, J. Virmont (Ecole Polytechnique, Palaiseau, Essonne, France), and R. Sigel. In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3.
Vienna, International Atomic Energy Agency, 1979, p. 75-85. 6 refs.

The effect of laser wavelength and pulse shaping on interaction and the transport process is investigated. Experiments show that absorption increases with shorter wavelength, from 35% at 1.06 microns to 45% at 0.53 microns. The production of hot electrons is significantly reduced in short-wavelength experiments. The hot electron temperature determined from X-ray emission decreases from 8 keV at 1.06 microns wavelength to 2 keV at 0.53 microns, indicating a better thermal electron transport at shorter wavelength. The measurement of burn-through depth has confirmed this result, showing that at 0.53 microns this depth is almost three times larger than at 1.06 microns. Experiments with different types of prepulse show that there is a difference between discrete and continuous prepulse in backscattering and refraction effects, in favour of the continuous pulse shaping. It is also observed that pulse shaping enhances lateral thermal transport. (Author)

A80-17867 **Developments in Sandia Laboratories particle beam fusion programme.** G. Yonas (Sandia Laboratories, Albuquerque, N. Mex.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3.

Vienna, International Atomic Energy Agency, 1979, p. 125-132; Discussion, p. 132, 133. 21 refs. Research supported by the U.S. Department of Energy.

Recent developments in the fields of reactor design, target concepts and electron and light ion driver development in Sandia Laboratories' particle beam fusion program are reviewed. Requirements for a reactor in which several megavolt megampere electron or ion beams propagate within multiple magnetized plasma channels are discussed, and results of experiments with a target containing preheated fuel and magnetic fields for electron thermal conduction supression are presented, noting observed deposition enhancement and the coupled nature of electron focusing and deposition. Investigations of high-current-density electron and light ion drivers are outlined, and the use of multiple, compact pulse-forming modules in the 50-kJ range to achieve the multimegajoule beam levels required in both approaches is discussed. A.L.W.

A80-17868 **Inertial confinement fusion research at Osaka.** H. Azechi, H. Fujita, K. Imasaki, Y. Izawa, Y. Kato, Y. Kawamura, M. Matobe, K. Mima, S. Miyamoto, and Y. Mizumoto (Osaka University, Osaka, Japan). In: Plasma physics and controlled nuclear fusion research 1978. Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 135-154; Discussion, p. 154. 7 refs.

A80-17869 **Laser fusion implications of resonance absorption and associated electrostatic field pressure.** T. P. Donaldson, J. E. Balmer, P. Wägli, and P. Lädrach (Bern, Universität, Berne, Switzerland). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3.
Vienna, International Atomic Energy Agency, 1979, p. 157-165. 31 refs.

Resonance absorption of laser radiation in plasma and some of its implications for laser fusion have been studied. The angular width of the resonance is shown to be broad enough to permit a non-critical incidence angle, which is important when laser radiation is focused onto the curved surface of a microsphere. For the range of parameters studied, the energy loss to non-thermal ions is found to be small. Modification of the electron density profile by the resonant electrostatic field pressure is shown to play an important role. (Author)

A80-17870 **Non-linear theory of collective processes in laser-pellet interaction and soliton generation.** H. H. Chen, C. Grebogi, C. S. Liu, and V. K. Tripathi (Maryland, University, College Park, Md.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3.
Vienna, International Atomic Energy Agency, 1979, p. 181-186. 20 refs.

The paper proposes soliton generation through the ponderomotive force effect of large amplitude electrostatic waves generated locally around the resonance region as a saturation mechanism for collective processes in laser-pellet interaction. Collective processes involving the interaction of plasma and ion waves with laser waves affect the absorption and scattering of laser light and determine the efficiency of laser-pellet coupling. As a result of wave growth in a localized region, ponderomotive force tends to push the plasma out of the high intensity region, leading to the formation of soliton and density cavity. The local reduction of plasma density gives rise to a nonlinear frequency shift of the plasma wave, and it modifies the density profile affecting the growth of subsequent parametric instability. The roles of soliton formation in the resonance absorption at critical density, parametric decay into two plasmons, and Raman backscattering at quarter-critical density are discussed. A.T.

A80-17871 **Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances.** K. Sauer, K. Baumgärtel (Deutsche Akademie der Wissenschaften, Zentralinstitut für Elektronenphysik, Berlin, East Germany), and N. E. Andreev (Akademiia Nauk SSSR, Fizicheskii Institut, Moscow, USSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. , Vienna, International Atomic Energy Agency, 1979, p. 187-199. 8 refs.

The interaction of normally incident electromagnetic waves of high intensity with an inhomogeneous plasma whose maximum density is above the critical one is investigated theoretically. Structure resonances can be formed self-consistently due to deformations of the plasma density profile which are produced by the ponderomotive force. During the resonance, the electromagnetic energy is temporarily trapped in a self-induced density cavity whereby the reflection coefficient decreases to values near zero. Simultaneously, the absorption coefficient reaches a maximum of about 50%. The rest of the energy is re-emitted when the resonance is destroyed. In this moment, peak values of the reflection coefficient greater than one can occur. The characteristic properties of these structure resonances have been studied analytically using a linear model in which the resonant density cavity is approximated by a step-like density profile (caviton model). (Author)

A80-17872 **Theory of cavitons in laser-irradiated plasmas.** K. H. Spatschek, M. Y. Yu, and P. K. Shukla (Bochum, Ruhr-Universitat, Bochum, West Germany). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh

International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 201-208.

The propagation and absorption of laser light at the outer region of the corona as well as at critical density are crucially dependent on the density profile. For large intensities the density profile varies self-consistently through the radiation pressure and other nonlinear effects such as relativistic electron-mass variations. The paper deals with calculating the plasma density cavitation in different regions which can occur in laser fusion experiments. Two pertinent problems are considered: (1) density depression caused by mode-converted Langmuir waves in the critical region; and (2) density localization caused by the radiation pressure of very-high-power laser light. The results of large-scale density steepening are discussed. A new phenomenon of supersonic density humps is discovered. S.D.

A80-17873 **The United States programme in heavy ion beam fusion.** T. F. Godlove and D. F. Sutter (U.S. Department of Energy, Washington, D.C.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 211-222; Discussion, p. 222, 223. 12 refs.

Inertial confinement fusion relies on the rapid delivery of a large pulse of energy to a small heavy hydrogen mass, resulting in its compression and burn during a brief period of inertial confinement. Means that have been identified as promising for delivery of the required energy are lasers, electrons, light ions and, most recently, heavy ions. Although the requirements in terms of energy and power are similar for all delivery methods, the origin of the technology, the scientific and technical issues, and the projected characteristics of each method are quite different. Heavy ion fusion as a distince programme in the USA has been funded since early 1977. In this paper the pellet requirements and potential advantages of the method are described, followed by a discussion of the various scientific and technical aspects of accelerator design and beam transport which are being studied so that a more complete evaluation can be made together with other pellet drivers in the mid-1980s. (Author)

A80-17874 **Nuclear fusion by cylindrical ion implosion.** M. Gryzinski, J. Appelt, J. Baranowski, M. Bielik, E. Gorski, A. Horodenski, L. Jakubowski, A. Jerzykiewicz, J. Kurzyna, and J. Langner (Instytut Badan Jadrowych, Swierk, Poland). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 225-236. 11 refs.

The present status of investigations on ion-implosion fusion undertaken at the Institute of Nuclear Research, Swierk, Poland, in the early 1960s is presented. Since then several experiments on production of intense radially convergent ion beams have been carried out by means of cylindrical devices equipped with coaxial electrodes consisting of thin metal rods, placed symmetrically and parallel to the axis of symmetry. With these devices, supplied from condenser banks of energy 10 - 20 kJ operated at 30 kV initial voltage, deuteron beams have been produced in a few hundred nanosecond pulses with energy sometimes greater than 30 keV and intensity of the order of 10 kA. The production of energetic ions was accompanied by the production of neutrons, up to 5 times ten to the 8th n per discharge. It was found from X-ray observations that convergent ion beams are focused on the symmetry axis of the system so that the cross-section of the dense plasma is several millimetres in diameter. Investigations on a complete symmetric implosion by means of a 150-kJ device have begun. (Author)

A80-17875 **Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions.** H. Hora, R. Castillo, R. G. Clark, E. L. Kane, V. F. Lawrence, R. D. C. Miller, M. F. Nicholson-Florence, M. M. Novak, P. S. Ray, and J. R. Shepanski (New South Wales, University, Kensington, Australia). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 237-245. 47 refs.

A80-17876 **Low-aspect-ratio limit of the toroidal reactor - The spheromak.** M. N. Bussac, M. N. Rosenbluth (Institute for Advanced Study, Princeton, N.J.), H. P. Furth, M. Okabayashi, and A. M. M. Todd (Princeton University, Princeton, N.J.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 249-264; Discussion, p. 264. 24 refs. Contracts No. EY-76-C-02-3073; No. E(11-1)-3237.

The ideal and resistive MHD stability properties of a class of toroidal plasma configurations ('spheromaks') having internal toroidal and poloidal fields and external poloidal fields are considered. The reactor advantage of the spheromak is two-fold: (1) the maximum field strength at the external coils is about half the field at the plasma centre, rather than twice, as in a tokamak, and (2) a roughly spherical blanket can be used, rather than a blanket that links the plasma topologically. Taylor's criterion, which ensures stability against both ideal and resistive modes, has been applied to force-free spheromaks of unity aspect ratio. In the presence of a loosely fitting external conducting shell, oblate spheromaks are stable against all modes except short-wave surface kinks (which are an artifact of the idealized current density profile). The Mercier criterion gives a beta-limit below 1%; however, at aspect ratio greater than or almost equal to 1, the beta-limit for representative spheromak models rises into the range 2-4%. (Author)

A80-17877 **Boundary layer analysis of cold-blanket systems.** B. Lehnert, B. Bonnevier, J. R. Drake, A. Kuthy, D. Ohlsson, E. Tennfors, and B. Wilner (Kungl. Tekniska Hogskolan, Stockholm, Sweden). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 265-275; Discussion, p. 275, 276.

Theoretical analysis of the partially ionized boundary layer of a magnetized plasma indicates that a cold-blanket state exists only within restricted ranges of such parameters as the power input, the ion density, and the beta-value. In tokamaks, cold-blanket operation is likely to require total beta-values of at least a few per cent. Experimental investigations show that the plasma core density increases with the imposed power input, as long as the plasma is permeable to neutral gas. On the other hand, at large enough power inputs and ion densities to sustain in impermeable plasma, the core density becomes weakly dependent on both the power input and the neutral wall density, while the boundary layer thickness then decreases as the power input increases. (Author)

A80-17883 **The Elmo Bumpy Torus /EBT/ reactor.** N. A. Uckan, D. B. Batchelor, E. S. Bettis, R. A. Dandl, C. L. Hedrick, E. F. Jaeger, D. B. Nelson, L. W. Owen, R. T. Santoro (Oak Ridge National Laboratory, Oak Ridge, Tenn.), and D. G. McAlees (Oak Ridge National Laboratory, Oak Ridge, Tenn.; Exxon Nuclear Co., Inc., Bellevue, Wash.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 343-356. 21 refs. Contract No. W-7405-eng-26.

The EBT combines many of the most attractive features of both tokamaks and mirrors into an attractive reactor configuration: steady-state operation, potential for high beta, large aspect ratio, modular construction, favorable geometry for ease of maintenance, modest technology requirements, high Q value, and economic potential. Recent designs which incorporate the increased understanding from plasma research have lead to smaller reactors with easier and practical maintenance. Critical physics issues are discussed, and dimensionless parameter scalings are explored. S.D.

A80-17884 **Impact of technology and maintainability on economic aspects of tokamak power plants.** M. A. Abdou, C. C. Baker, J. Brooks, R. Clemmer, C. Dennis, D. Ehst, K. Evans, S. Harkness, R. Kustom, and V. Maroni (Argonne National Laboratory, Argonne, Ill.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 357-367; Discussion, p. 367, 368. 7 refs.

Results of system studies on the primary energy conversion, energy storage and transfer, tritium and vacuum subsystems of a tokamak reactor are presented. These results quantify technology choices and maintainability on the economics of tokamak power plants. It is found that the expensive refractory alloys must offer a factor of three or greater advantage in lifetime compared to stainless steel in order that their costly development should have a reasonable benefit-to-cost ratio. Five reactor concepts are analyzed in terms of their scheduled maintenance requirements for replacing the first wall and blanket. The total downtime is found to vary from approximately 100 days to 500 days for a single replacement of the entire first wall and blanket. Substantial reduction in the power supply requirements and costs over previous estimates seems possible. The emergency air detritiation system is found to be a major cost item. (Author)

A80-17885 **Concept of tokamak-type reactor with high-temperature blanket.** N. N. Vasil'ev, V. E. Lukash, A. V. Nedospasov, L. B. Nefedkina, V. G. Petrov, M. Z. Tokor (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR), B. N. Kolbasov, D. K. Kurbatov, V. V. Orlov, and V. I. Pistunovich (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 379-386; Discussion, p. 386, 387. 9 refs.

A design study for a tokamak reactor with a high-temperature blanket is presented. It is expected that such a reactor, whose structure is more complicated than that of a low-temperature one, may be used as a source of high-temperature heat as well as for, e.g. hydrogen production from water. Parameters of such a device are given. (Author)

A80-17887 **Tandem mirror reactors.** B. G. Logan, W. L. Barr, D. J. Bender, G. A. Carlson, W. L. Dexter, J. N. Doggett, R. S. Devoto, T. K. Fowler, G. W. Hamilton (California, University, Livermore, Calif.), and J. F. Fink. In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 401-410; Discussion, p. 410, 411. 14 refs. Contract No. W-7405-eng-48.

Preliminary designs of tandem mirror fusion reactors burning D-T fuel and of fusion-fission (hybrid) tandem mirrors producing both fissile fuel and electricity have been made. For the hybrid reactor, it is found that, by using stream-stabilized, 2XIIB-like plugs and by injecting 200-keV deuterium beams into a tritium-plasma target confined electrostatically in the solenoid, a useful Q (fusion power/injection power) near unity is obtained. The D-T tandem reactor parameters are optimized to obtain the minimum capital cost per kW(e) net. To allow for more expensive injector costs, a higher D-T reactor Q of 10 is obtainable with increased power output or decreased neutron wall loading. Fokker-Planck calculations show steady-state Q of approximately 5 for D-D tandem reactors burning only deuterium fuel and its reaction products, with most of the charged-particle fusion power recovered in a direct converter. (Author)

A80-17888 **Fuel production characteristics of fusion hybrid reactors.** R. P. Rose, T. C. Varljen (Westinghouse Electric Corp., Pittsburgh, Pa.), F. L. Ribe, N. J. McCormick, G. C. Vlases, G. L. Woodruff (Washington, University, Seattle, Wash.), V. L. Teofilo, B. R. Leonard, Jr., D. T. Aase, and R. T. Perry (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 413-418; Discussion, p. 419. 9 refs. Research supported by the Electric Power Research Institute; Contracts No. EG-77-C-02-4544; No. EN-77-3-01-6173; No. EY-76-C-03-0167.

The potential role of hybrid systems in the production of fuel for fission reactors is examined in the context of a possible serious fuel shortfall developing early in the next century. Various proliferation-resistant fuel-cycle options are considered, including the use of the Th/U233 fuel cycle and the Refresh Concept. It is concluded that the fusion hybrid reactor has a high potential to extend fuel resources for nuclear power stations. The hybrid concept also appears to offer the flexibility to operate with a variety of fuel-cycle options. Furthermore, a demonstration of fissile-fuel production in a hybrid based on the tokamak concept appears to be a feasible near-term goal. (Author)

A80-17893 **Summary on inertial-confinement fusion.** K. Nishikawa (Hiroshima, University, Hiroshima, Japan). (*Nuclear Fusion*, vol. 19, Jan. 1979, p. 137-142.) In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1973, p. 469-478.

It is noted that great progress has been made in recent years, particularly in understanding laser plasma coupling and the implosion process with the aid of various diagnostic developments. The paper summarizes the problems relevent to this progress by classifying them into three topics: (1) driver technology, (2) driver plasma coupling, and (3) implosion and target design. Finally, attention is given to some problems which need further investigation. In conclusion, it is stressed that international collaboration is of paramount importance, and that the classification policy followed in some countries may be a hindrance to timely progress of research. M.E.P.

A80-17894 **Summary on reactor systems.** R. W. Conn (Wisconsin, University, Madison, Wis.). (*Nuclear Fusion*, vol. 19, Jan. 1979, p. 143-146.) In: Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volume 3. Vienna, International Atomic Energy Agency, 1979, p. 479-485.

The papers at the Innsbruck Conference on reactor systems and technology dealt primarily with reactor design and plasma engineering. The present review covers four categories of reactor systems - tokamaks, magnetic confinement, nontokamaks, and inertial confinement. Some special topics, such as plasma engineering and alternate applications of fusion, are examined. V.P.

A80-18086 **The effect of current shear on the tearing instability.** R. J. Barker and O. Buneman (Stanford University, Stanford, Calif.). *Journal of Plasma Physics*, vol. 22, Dec. 1979, p. 453-476. 20 refs. NSF Grant No. ENG-76-02402.

A fully relativistic stream superposition model is employed to conduct a linear numerical simulation of a self-consistently confined sheet of collisionless, neutral plasma. This multi-stream model employs a novel variable termed the 'canonical momentum potential' (or 'action function') to follow the ion and electron dynamics. For the classic, unsheared sheet pinch, growth rates obtained for the tearing instability are in reasonable agreement with previous estimates using an approximate Vlasov approach. Current shear is then introduced into the sheet and growth rates are again measured. Stabilization of the shorter wavelength modes is observed. (Author)

A80-18110 **X-ray measurement of laser fusion targets using least squares fitting.** R. M. Singleton, B. W. Weinstein, and C. D. Hendricks (California, University, Livermore, Calif.). *Applied Optics*, vol. 18, Dec. 15, 1979, p. 4116-4123. 10 refs. Contract No. W-7405-eng-48.

The paper presents an X-ray technique for measurement of opaque hollow microspheres used as laser fusion targets. Consideration is given to a nondestructive method for holding microspheres that enables microsphere rotation between X-ray exposures. Film images of the microspheres are recorded using contact microradiography. Computer image analysis is used for measurement of the microsphere characteristics, which involves mathematically modeling processes that relate the microsphere characteristics to film density and then applying a least squares fit of the model to the image data. This measurement is compared with the optical interferometric measurement for several glass microspheres and it is found that measurement differences are less than 0.3 micron for wall thickness and 0.1 micron for nonconcentricity. (Author)

A80-18111 **Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers.** J. Lasalle and P. Platz (EURATOM and Commissariat à l'Energie Atomique sur la Fusion, Département de Physique du Plasma et de la Fusion Contrôlée, Fontenay-aux-Roses, Hauts-de-Seine, France). *Applied Optics*, vol. 18, Dec. 15, 1979, p. 4124-4133. 10 refs.

In actual and future large tokamaks, the electron temperature T(e) and density n(e) profiles must be measured with a single discharge and laser shot. To accomplish this, T(e) is deduced from the ratio of powers scattered into two large spectra intervals, while n(e) is deduced from the absolute power detected in one of the intervals and from the knowledge of T(e). The spectrometers designed for this purpose and their calibration are described. T(e), n(e) profiles are obtained in a single shot on TFR with a nine-channel scattering system based on these two-detector spectrometers. (Author)

A80-18123 **A method of estimating monthly average solar radiation on shaded receivers.** D. M. Utzinger and S. A. Klein (Wisconsin, University, Madison, Wis.). *Solar Energy*, vol. 23, no. 5, 1979, p. 369-378. 9 refs. Research supported by the U.S. Department of Energy.

A80-18124 **Analysis of systems for the generation of electricity from solar radiation.** W. G. Pollard (Oak Ridge Associated Universities, Inc., Institute for Energy Analysis, Oak Ridge, Tenn.). *Solar Energy*, vol. 23, no. 5, 1979, p. 379-392. 8 refs.

An analysis relating the annual electrical output of any solar-electric facility directly to the effective annual insolation received on its solar collectors per unit collector area is presented. An expression for the capacity factor of such facility is derived through which the ratio of the actual annual electrical output to the maximum mean annual output without demand, generating and downtime reductions, and storage losses can be determined. Expressions are also derived for a solar availability factor which measures the ratio of the annual output of the solar facility to that of a fuel-fired plant. The capital cost of solar-electric facilities comprises cost of solar-electric generation, nonsolar auxiliary power, and storage, and the choice of solar collector area and of the relative dependence on storage and auxiliary nonsolar power are also discussed. A.T.

A80-18125 **The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study.** C. M. Bhumralkar, A. Slemmons (SRI International, Menlo Park, Calif.), and J. Williams (National Center for Atmospheric Research, Boulder, Colo.). *Solar Energy*, vol. 23, no. 5, 1979, p. 393-403. 8 refs. Research supported by the International Institute for Applied Systems Analysis and United Nations Environment Program.

A two-dimensional, mesoscale model of the atmosphere that incorporates hydrodynamic, thermodynamic, and microphysical processes has been applied to simulate the impact on regional weather of a solar-thermal electric conversion (STEC) installation in southern Spain. The STEC plant is conceptualized to occupy an area of 1,000 sq km with heliostats covering 25 per cent of the total power plant area. It is assumed to use wet natural draft cooling towers for dissipating waste heat into the atmosphere. The 2-D model is applied to a STEC facility that covers a distance of 32 km in the horizontal with heliostats installed in the middle over a distance of 8 km. The model has been integrated for 9 hr of real time for both typical summer and winter conditions. The results of integration for summer indicate that a STEC installation of the above size has considerable potential for modifying regional weather. Clouds formed after 5 hr of real-time integration and persisted until the end of the integration; rainfall also occurred. In contrast, clouds did not form until 7 hr of real-time integration without the installation and were more sporadic and transient; rainfall was much less. The results for winter conditions do not show any cloud formation after 9 hr of real-time integration. This difference between summer and winter cases is attributed to the very strong winds used as initial conditions for the winter simulation. (Author)

A80-18126 **Selective black nickel coatings on zinc surfaces by chemical conversion.** P. K. Gogna and K. L. Chopra (Indian Institute of Technology, Delhi, India). *Solar Energy*, vol. 23, no. 5, 1979, p. 405-408. 11 refs.

A flat plate solar collector uses a selective coating to convert solar radiation into thermal energy that is transferred from the absorber to the working fluid. Spectral selectivity is possible because the solar spectrum and the spectral distribution of the thermal reradiation emitted from the coating are distinct, as illustrated elsewhere (Jurisson et al., 1975). An electrochemical conversion has been developed to deposit selective black nickel coatings of high absorptance-to-emittance ratio on galvanized iron as well as on zincated and zinc electroplated aluminum substrates. The paper reports on the microstructure and the optical and thermal properties of black nickel deposited on these zinc surfaces. The effect of various deposition parameters on the optical and thermal performance of the coatings is studied. Durability tests of thermal cycling, humidity tests and exposure to sunlight are carried out to evaluate the coatings. S.D.

A80-18127 **High temperature solar collector with optimal concentration - Non-focusing Fresnel lens with secondary concentrator.** M. Collares-Pereira (Chicago, University, Chicago, Ill.). *Solar Energy*, vol. 23, no. 5, 1979, p. 409-420. 24 refs. Research sponsored by the Instituto Nacional de Investigacão Cientifica.

A80-18128 **Sensitivity of direct gain space heating performance to fundamental parameter variations.** W. O. Wray and J. D. Balcomb (California, University, Los Alamos, N. Mex.). *Solar Energy*, vol. 23, no. 5, 1979, p. 421-425. 7 refs. Research sponsored by the U.S. Department of Energy.

Interest in passive solar space heating has increased steadily over the past few years. Much of this interest has centered on direct gain structures because they depart the least from conventional construction and are therefore more acceptable to the market. Construction of direct gain houses has proceeded in spite of the lack of well-validated design guidelines capable of quantifying expected thermal performance. In an effort to provide such guidelines, a thermal network code based on PASOLE is being developed specifically for direct gain systems. This new code is called SUNSPOT and is designed to operate at two levels of detail, depending on the needs of the user. Specifically, a computer program has been developed for analyzing the performance of direct gain passive solar heated enclosures. This computer program is validated by comparison with data from passive solar test cells. The direct gain enclosure characteristics revealed by a sensitivity study are identified as design guidelines applicable to any climate. S.D.

A80-18129 **Photovoltaic solar cell array used for supplemental power generation.** A. S. Barker, Jr. (Bell Telephone Laboratories, Inc., Whippany, N.J.) and H. J. Power (AT & T, New York, N.Y.). *Solar Energy,* vol. 23, no. 5, 1979, p. 427-434. 6 refs.

A study of the performance of a silicon cell non-tracking photovoltaic array has been made over a three year period. The array provided power in parallel with commercial utility power in a shared mode which makes use of all the solar energy generated. Tests of degradation, dirt accumulation, compatability with telephone plant, and day by day performance were performed. A method is developed for predicting the energy output of a non-tracking array based on standard global insolation measurements. (Author)

A80-18130 **Solar heating system performance estimation using sinusoidal inputs.** M. S. Drew and R. B. G. Selvage (S-Matrix Enterprises, Ltd., Richmond, British Columbia, Canada). *Solar Energy,* vol. 23, no. 5, 1979, p. 435-442. 14 refs. Research supported by the British Columbia Ministry of Education, Science and Technology.

A method is presented for the estimation of the fraction of the heating load supplied by solar energy during the heating season. This procedure remains useful even when system design parameters are far from the norm, and in particular is applicable to systems incorporating seasonal storage of heat. Insolation, temperature and hot water demand are input as sinusoids, and the closed-form solution of the heat transfer differential equation is found. The method as presented here is suitable for domestic hot water and liquid space heating systems. (Author)

A80-18131 **An electrochemical heat engine for direct solar energy conversion.** R. H. Hammond and W. M. Risen, Jr. (Brown University, Providence, R.I.). *Solar Energy,* vol. 23, no. 5, 1979, p. 443-449. Research supported by the Research Corp.

A system is described and tested which converts heat directly into electrical energy. It employs a solution electrochemical reaction with a small polarizability and a large molar entropy change. This is run in opposite directions in two cells: one at high temperature, where heat is absorbed, and one at low temperature, where heat is emitted. The difference in heat absorbed and heat emitted is available as electrical work; recirculation of the solutions between these cells gives a closed regenerative EMF system. The conversion efficiency of the system is high, varying from 50 to 75 per cent of the Carnot efficiency as the power output varies from maximum to 75 per cent of maximum. The power output depends strongly upon the reaction used. For the reaction tested here, the power output density was 6.4 W/sq m of cell area for operation between 90 and 30 C. Design factors for improving power output density and minimizing costs are discussed, and basic requirements for successful cell reactions are given. The feasibility of obtaining power output on the order of 200 W/sq m of cell area at 35 per cent conversion efficiency using 300 C input heat is discussed. (Author)

A80-18132 **Performance and analysis of a 'series' heat pump-assisted solar heated residence in Madison, Wisconsin.** R. E. Terrell (Wisconsin, University, Madison, Wis.). *Solar Energy,* vol. 23, no. 5, 1979, p. 451-453. 6 refs.

A80-18133 **A simplified technique for comparing the effectiveness of collector absorber coatings.** R. K. Collier (California, University, Los Alamos, N. Mex.). *Solar Energy,* vol. 23, no. 5, 1979, p. 455-458. Research sponsored by the U.S. Department of Energy.

It is noted that there has been some confusion about how to rate the performance of selective surface absorbers. Edwards et al. (1962) developed a concept called the 'absorptance of merit' for comparing selective surfaces. This concept was further developed to demonstrate the comparison of various surfaces for varying environmental conditions. The present paper is an attempt to take that previous work and formulate a universal graphical concept that requires a minimum of calculation for comparing the relative effectiveness of various selective surfaces. It is noted that while the best way to judge the relative effectiveness of various absorber coatings is to perform a yearly simulation of collector performance, the scheme described is a simple and effective alternative. It is concluded that the advantage of this scheme is that the relative trade-offs are displayed visually for quick reference. M.E.P.

A80-18137 **Influence of the loading factor on the performance characteristics of series MHD generators.** G. P. Bazarov, E. N. Kufa, and S. A. Medin. *(Magnitnaia Gidrodinamika,* Apr.-June 1979, p. 99-104.) *Magnetohydrodynamics,* vol. 15, no. 2, Oct. 1979, p. 193-197. Translation.

Local and integral characteristics of singly loaded series MHD generators operating under partial loads are investigated. Two-dimensional channels with perfectly sectioned electrodes having different types of sectional connection are considered. The flow parameters and channel height are assumed to be constant, and the calculations are performed by the finite-difference technique. It is shown that in the region where the current-collecting electrodes join a sectioned part of the channel, a significant increase in electric-field density is possible when the load factor is changed. F.G.M.

A80-18138 **Induced fields in the motion of a conducting medium in the field of an air-core magnetic system.** A. M. Anisimov, V. F. Vasil'ev, I. V. Lavrent'ev, and V. L. Ovchinnikov. *(Magnitnaia Gidrodinamika,* Apr.-June 1979, p. 136, 137.) *Magnetohydrodynamics,* vol. 15, no. 2, Oct. 1979, p. 220, 221. Translation.

An equation is obtained which describes the distribution of the magnetic field induced in a conducting medium when that medium moves in the transverse field of an air-core magnetic system. It is shown that the channel height, rather than its width (as is the case for ferromagnetic systems), is the characteristic linear dimension involved in the magnetic-Reynolds-number determination. Experiments performed with electrically conducting films moving in the field of two Helmholtz coils are discussed which demonstrate that the experimental data are in completely satisfactory agreement with a computer-aided solution to the equation obtained. F.G.M.

A80-18139 **Characteristics of series channels with a diminishing electrode-commutation angle in the transition section.** G. P. Bazarov and E. N. Kufa. *(Magnitnaia Gidrodinamika,* Apr.-June 1979, p. 138-140.) *Magnetohydrodynamics,* vol. 15, no. 2, Oct. 1979, p. 222-224. Translation.

Local and integral characteristics of singly loaded series MHD generators with a reduced electrode commutation angle in the connecting section are investigated. Boundary-value problems for two-dimensional channels with constant flow properties and a magnetic field that varies along the channel are solved by the finite-difference method; the parameters of the solution are the position of the channel with respect to the magnetic field and the connecting-section geometry. It is shown that the integral characteristics of the generators considered are not degraded under rated operating conditions and that channels with a smaller commutation angle are more stable under alternate operating conditions. F.G.M.

A80-18162 **Ocean energy - Forms and prospects.** J. D. Isaacs and W. R. Schmitt (California, University, La Jolla, Calif.). *Science,* vol. 207, Jan. 18, 1980, p. 265-273. 48 refs.

The primary nonpetroleum power sources of the sea can be classified as mechanical (waves, tides and currents), chemical (salinity gradients and biomass), and thermal (temperature gradients, including ice). Power potential of each of these sources, their particular characteristics, geographic distribution, energy density and feasibility of practical utilization are analyzed. Waves, tides and currents are already employed to produce power. Examples of some existing practical devices which utilize tidal and wave power are: wave pumps, Salter's Duck power plants, and tidal power plants. Different approaches to utilizing other marine power sources are discussed. The complexity of practical devices for the extraction of power seems to vary with energy density, the salinity gradient requiring the most complex approaches and the currents the simplest. Even more important than direct utilization of ocean energy may be the use of seawater as a coolant and of the sediments below the seabed for the disposal of nuclear wastes. V.L.

A80-18165 **Net energy analysis of alcohol production from sugarcane.** C. S. Hopkinson, Jr. and J. W. Day, Jr. (Louisiana State University, Baton Rouge, La.). *Science,* vol. 207, Jan. 18, 1980, p. 302-304. 23 refs. NOAA-supported research.

Energy requirements were calculated for the agricultural and the industrial phase of ehtyl alcohol production from sugarcane grown in Louisiana. Agricultural energy requirements comprised 54 percent of all energy inputs, with machinery, fuel, and nitrogen fertilizer representing most of the energy subsidies. Overall net energy benefits (output:input) for alcohol production ranged from 1.8:1 to 0.9:1 depending on whether crop residues or fossil fuels were used for industrial processes. (Author)

A80-18167 **Linear synchronous motor development for urban and rapid transit systems.** H. Weh (Braunschweig, Technische Universität, Braunschweig, West Germany). *(Institute of Electrical and Electronics Engineers and American Institute of Physics, Joint International Magnetics Conference and Conference on Magnetism and Magnetic Materials, 2nd, New York, N.Y., July 17-20, 1979.) IEEE Transactions on Magnetics,* vol. MAG-15, Nov. 1979, p. 1422-1427. 6 refs.

The following paper presents and discusses technical variants in magnetic suspension-repelling permanent magnets, electrodynamic and electromagnetic suspension methods, controlled lift magnets. In addition, propulsion methods for magnetically suspended vehicles are also shown. The synchronous long stator linear motor has achieved particular importance since it makes possible an efficient energy conversion. The load-carrying capacity is not reduced by the weight of the drive and the layout enables a very good integration of the lift and thrust functions. A further reduction of the on-board power requirements can be achieved by using permanent magnets to generate the rated induction in the air gap. Several magnetic suspension systems constructed or under construction with the long stator method are also mentioned. (Author)

A80-18184 **Electric heat - The right price at the right time.** J. G. Asbury, R. F. Geise, and R. O. Mueller (Argonne National Laboratory, Argonne, Ill.). *Technology Review,* vol. 82, Dec.-Jan. 1980, p. 32-40. 5 refs.

Four general types of efficient off-peak electric heating systems which could be commercialized in the U.S. for home heating as an alternative to gas and fuel oil systems are discussed. The four types could work through the introduction of lower off-peak rates. Electric storage heating systems use a storage medium (refractory brick, cast iron, water) to store off-peak electric energy in thermal form for application during peak hours. In bivalent heating systems oil- or gas-fired furnaces substitute for the electric heat during periods of high electricity demand. Electric heat pumps use a compression-expansion cycle to transfer about two units of thermal energy from outdoor to indoor air for each unit of electric energy consumed. Finally, electric heating is used as backup for residential solar heating systems. Advantages and limitations of each of the heating systems are discussed. A computer model is used to analyze the performance characteristics and operation costs of the heating systems and numerical results are presented. V.L.

A80-18213 **A performance and current distribution model for scaled-up molten carbonate fuel cells.** V. Sampath, A. F. Sammells (Institute of Gas Technology, Chicago, Ill.), and J. R. Selman (Illinois Institute of Technology, Chicago, Ill.). *Electrochemical Society, Journal,* vol. 127, Jan. 1980, p. 79-85. 11 refs.

The performance of scaled-up (100 sq cm) fuel cells with cross flow of fuel and oxidant has been modeled using the polarization characteristics of small-scale (3 sq cm) fuel cells. The model also yields the two-dimensional (superficial) current distribution. The performance predicted by the model approximates to within 4% the experimental data if a suitable average value is assigned to the effective cell impedance. The latter depends on the inlet gas composition but does not vary much with the current; its value may be estimated from small-scale cell data. Carbon monoxide conversion contributes appreciably to the performance of low Btu cells; it tends to make the current distribution less uniform. The presence of methane must be considered in pressurized cells, but it does not appear to be formed to a significant extent. The relative contribution of mass transfer and kinetic resistance to the cell impedance are discussed in light of recent experimental results. (Author)

A80-18214 **Power conversion efficiency monitoring in photoelectrochemical and other solar cells.** B. Miller (Bell Telephone Laboratories, Inc., Murray Hill, N.J.). *Electrochemical Society, Journal,* vol. 127, Jan. 1980, p. 184-188. 7 refs.

A device is described which incorporates a superimposed a-c voltage signal, current-voltage product generation, synchronous detection, and a feedback loop to bias a photovoltaic converter to its point of maximum power output. Examples of its operation as a continuous monitor of power conversion efficiency are given for p-n junction and photoelectrochemical cells. Applications to studying the design fundamentals of the latter are illustrated, based on control derived with two- and three-electrode configurations to evaluate response to efficiency determining parameters such as light intensity and mass transport in the cell. The circuit stably responds with the average values of power output under periodically interrupted light up to at least 10 Hz. These characteristics open the way to external power conversion spectroscopy in the ultraviolet to near infrared range. (Author)

A80-18231 **Relating computer simulation studies with interface state measurements on MIS solar cells.** J. K. Kim (RCA David Sarnoff Research Center, Princeton, N.J.), W. A. Anderson (New York, State University, Buffalo, N.Y.), and S. Hyland. *IEEE Transactions on Electron Devices,* vol. ED-26, Nov. 1979, p. 1777-1782. 18 refs. Research supported by the Rutgers Research Council; NSF Grant No. AER-73-03197.

A lock-in-amplifier technique has been used to measure interface state density (N-ss) values ranging from 2 x 10 to the 11th to -3 x 10 to the 13th states/sq cm eV depending on energy in the gap, type of Si substrate, and choice of Schottky metal used in MIS diodes. Polycrystalline, ribbon, and (100) single-crystal Si substrates with 40-60 interfacial oxides have been tested using Cr, Al, Ti, and Cu as Schottky metal. A computer simulation is used to predict the influence of interface states, interfacial oxide thickness, and Schottky metal on open-circuit voltage. The influence of Schottky metal on open-circuit voltage is also clearly seen. Very close agreement is shown between experimental and theoretical values. This study clearly relates experimental and theoretical data to permit design of more efficient MIS solar cells. (Author)

A80-18240 # **An in-situ optical particle sizing technique.** D. J. Holve (Stanford University, Stanford, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16,, 1980, Paper 80-0020.* 10 p. 28 refs. Research supported by the Electric Power Research Institute; Contracts No. EEF-77-C-03-1481; No. N00014-79-C-0318.

This paper discusses the application of an in-situ optical counter to the measurement of liquid fuel droplets and solid coal particles under combustion conditions. Mie theory computations are used to determine an optimal near-forward light-scattering geometry for sizing both spherical transparent particles and irregularly shaped light-absorbing particles in the 5-80 micron range. Results are presented for a burning methanol spray and for reacting coal particles. (Author)

A80-18242 # **High interaction subsonic MHD channel operation.** R. Kessler, A. W. McClaine, and A. Solbes (Avco Everett Research Laboratory, Inc., Everett, Mass.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0022.* 9 p. 5 refs. Contract No. EF-77-01-2519.

Analytical and experimental investigations were conducted into the subsonic operation of MHD generator channels. Experiments were performed with a combustion-driven MHD channel in which transitions from supersonic flow to subsonic flow and vice versa were caused by varying the magnetic field strength. Subsonic operation under various conditions was verified by increases in combustor pressure with increases in magnetic field. Experimentally measured operating parameters were compared with predictions. Satisfactory agreement was generally found. (Author)

A80-18243 * # **Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment.** J. M. Smith (NASA, Lewis Research Center, Cleveland, Ohio). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0023.* 7 p.

MHD power generation experiments utilizing a cesium-seeded H2-O2 working fluid have been carried out using a diverging area Hall duct having an entrance Mach number of 2. The experiments are conducted in a high-field strength cryomagnet facility at field strengths up to 5 tesla. The effects of power takeoff location, generator loading, B-field strength, and electrode breakdown voltage have been investigated. In this paper the effect of area ratio, multiple loading of the duct, and duct location within the magnetic field are considered. (Author)

A80-18265 # **Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results.** L. D. Sullivan, J. E. Klepeis (U.S. Department of Energy, Magnetohydrodynamics Div., Germantown, Md.), W. J. Coderre (Dynatrend, Inc., Woburn, Mass.), and W. H. Fischer (Gilbert/Commonwealth, Reading, Pa.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0091.* 7 p.

For electrical power generation utilizing a high temperature alkali-seeded coal combustion plasma, the certainty of high electrical conductivity in the presence of coal ash and trace impurities is vitally important, especially for use in extrapolation of existing designs to higher power levels, as envisioned for commercial applications. The paper surveys the results of the workshop which provides an industry wide overview of the computational methods and analyses that are currently in use. Attention is given to uncertainty bands for plasma electrical conductivity. Also discussed are other issues such as coal, slag, seed, and conductivity. Finally, the paper gives suggested areas for further work. M.E.P.

A80-18191 **Estimation of OH radical concentration in a propylene-NOx-dry air system.** H. Akimoto, F. Sakamaki, G. Inoue, and M. Okuda (National Institute for Environmental Studies, Ibaraki, Japan). *Environmental Science and Technology,* vol. 14, Jan. 1980, p. 93-97. 17 refs.

A80-18297 * # **Advanced solar thermal receiver technology.** A. A. Kudirka and L. P. Leibowitz (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0292.* 10 p. 6 refs. Research sponsored by the U.S. Department of Energy.

Development of advanced receiver technology for solar thermal receivers designed for electric power generation or for industrial applications, such as fuels and chemical production or industrial process heat, is described. The development of this technology is focused on receivers that operate from 1000 F to 3000 F and above. Development strategy is mapped in terms of application requirements, and the related system and technical requirements. Receiver performance requirements and current development efforts are covered for five classes of receiver applications: high temperature, advanced Brayton, Stirling, and Rankine cycle engines, and fuels and chemicals. (Author)

A80-18298 * # **Performance characteristics of point-focusing distributed-receiver solar Brayton systems.** N. El Gabalawi (California Institute of Technology, Jet Propulsion Laboratory, Solar Thermal Energy Systems Group, Pasadena, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0293.* 9 p. 10 refs. Research sponsored by the U.S. Department of Energy.

Due to variations in solar insolation, it may be necessary or desirable to operate solar energy systems continuously in off-design conditions. Design of solar energy systems should maximize system efficiency at the design point and throughout the range of operational solar insolation. The solar power system considered in this study consists of a point-focusing concentrator, a cavity receiver, an open cycle gas turbine engine, and a heat regenerator. A computer simulation model was developed to predict off-design system performance. Results showing system efficiency and associated subsystems interface requirements are presented for various turbine inlet temperatures and engine speeds. (Author)

A80-18299 # **Use of adjustable flat mirrors with flat-plate collectors.** D. C. Larson (Drexel University, Philadelphia, Pa.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0294.* 8 p. 14 refs.

Flat mirrors are frequently used to increase the heat output from flat-plate collectors. They are generally oriented in an east-west direction and are mounted below and/or above the collector panels. The annual performance of a mirror-boosted system can be improved by allowing periodic adjustments of the mirrors alone or of the panel-mirror units. In order to compare different mirror-panel configurations their solar flux concentration ratios are averaged over a yearly period using the solar elevation angle time probability function. All configurations have the same ratio of mirror area to panel area. In general it is found that the mirror orientations are more important than the panel orientations. Seasonal adjustments of the mirrors suffice to maintain acceptable values of the concentration and there is relatively little advantage in providing for collector panel adjustments. For year-round collection semiannual mirror adjustments provide a marked increase in output relative to fixed configurations. A double-mirror system (adjustable trough) provides higher concentrations than a single-mirror system for equal mirror area. Adjustable trough configurations with zero acceptance angle provide higher annual average concentration ratios than those with non-zero acceptance angles. (Author)

A80-18300 # **A new solar thermal electricity/cooling generation system.** J. T. Pytlinski and J. Cherng (New Mexico State University, Las Cruces, N. Mex.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0296.* 7 p. 20 refs.

The paper presents the results of a basic thermodynamic and economic study of a combined solar thermal electricity generation and refrigeration system employing a Rankine cycle or refrigeration cycle respectively. The study demonstrates the technical and economical feasibility of retrofitting a water-ammonia solar powered absorption refrigeration system with a turbine and electric generator for the purpose of electricity generation. Through optimization of the system, an increase in the solar energy conversion efficiency and a decrease in the payback period could be expected. (Author)

A80-18301 # **Experimental results of the solar heating system on the LSU field house.** D. Maples (Louisiana State University, Baton Rouge, La.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0297.* 6 p.

Presented in this paper is an analysis of a solar heating system installed on the Lousiana State University Field House. A comparison between predicted performance and actual performance of the flat-plate collectors is discussed. The measured storage tank temperatures, solar insolations, and mean plate temperatures are presented as a function of the time of day for a given day and as three day averages. (Author)

A80-18303 * # **Thermal barrier coatings for aircraft gas turbines.** R. A. Miller, S. R. Levine, and S. Stecura (NASA, Lewis Research Center, Cleveland, Ohio). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0302.* 6 p. 13 refs.

Improvements in gas turbine performance are approaching the limits imposed by alloy properties and excessive cooling air requirements. Thin ceramic coatings can increase the difference between gas temperature and metal temperature by several hundred degrees. Thus, they are potentially a major step forward in surface protection. These coatings offer the potential to reduce fuel consumption by permitting reduced coolant flow or higher turbine inlet temperature or to improve durability by reducing metal temperatures and transient thermal stresses. At NASA Lewis, in-house and contractual programs are in place to bring this promising technology to engine readiness in the early 1980's. Progress towards this goal is summarized in this paper. (Author)

A80-18353 # **Integral modeling of MHD channel boundary layers.** J. Gertz, T. Opar, A. Solbes, and G. Weyl (Avco Everett Research Laboratory, Inc., Everett, Mass.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0175.* 11 p. Contract No. EF-77-01-2519.

New families of profiles are presented which are suitable for integral modeling of MHD electrode wall and side wall boundary layers. In the case of electrode walls, the total enthalpy profile is well represented by a cubic in velocity, which depends parametrically on the wall heat flux. Voltage drops are seen to first increase and then decrease with current density and channel size. For insulator walls, the proposed velocity profiles depart nearly linearly from classical power law profiles. Calculations for a typical subsonic CDIF channel show good agreement with the two dimensional code STAN-5. The effect of boundary layers on generator efficiency is discussed. (Author)

A80-18354 * # **Off-design performance analysis of MHD generator channels.** D. R. Wilson and T. S. Williams (Texas, University, Arlington, Tex.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0176.* 13 p. 16 refs. Grant No. NsG-3255.

A computer code for performing parametric design point calculations, and evaluating the off-design performance of MHD generators has been developed. The program is capable of analyzing Faraday, Hall, and DCW channels, including the effect of electrical shorting in the gas boundary layers and coal slag layers. Direct integration of the electrode voltage drops is included. The program can be run in either the design or off-design mode. Details of the computer code, together with results of a study of the design and off-design performance of the proposed ETF MHD generator are presented. Design point variations of pre-heat and stoichiometry were analyzed. The off-design study included variations in mass flow rate and oxygen enrichment. (Author)

A80-18355 # **Convective heat transfer in MHD channels and its influence on channel performance.** R. K. Ahluwalia and E. D. Doss (Argonne National Laboratory, Argonne, Ill.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan 14-16, 1980, Paper 80-0178.* 12 p. 16 refs.

The limitations of the integral boundary layer methods and the potential of the differential boundary layer method in analyzing MHD channel flows are assessed. The sensitivity of results from the integral method to the parametrization of boundary layer profiles and calculation of wall heat transfer is established. A mixing-length type turbulence model for flow on rough walls is developed and validated by comparison with experimental data. The turbulence model is used in a quasi-three-dimensional boundary layer model to evaluate the influence of wall roughness and pressure gradients on the flow characteristics and performance of MHD channels. The behaviors of skin friction and Stanton number calculated from the analytical model are found to differ considerably from the empirical correlations valid for non-MHD flows without pressure gradients. (Author)

A80-18366 # **Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick.** K. T. Feldman, Jr. (New Mexico, University, Albuquerque, N. Mex.) and D. L. Noreen (Solar Energy Research Institute, Golden, Colo.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0148.* 7 p. 6 refs. Contract No. F29601-76-C-0132.

The heat pipe laser mirror is cooled by evaporation of a liquid from a porous wick on the backside of the mirror. The liquid is distributed over the surface by the capillary wick, eliminating the need for a liquid pump, piping, heat exchanger, and pumping power. Thus the heat pipe cooled mirror can be particularly valuable where compact, light weight, high heat flux mirrors are required. In this report an analysis of the hydrodynamic performance limits of a flat plate heat pipe evaporator is described. A thin copper plate is heated on one side and cooled on the other by evaporation of water from fine grooves fed by a liquid transport wick. This type of evaporator wick is known as the inverted-meniscus heat pipe evaporator. The analysis includes determination of the wicking limit for three composite wick designs and gives the optimum wick dimensions. (Author)

A80-18378 # **Osmotically pumped energy transport system.** A. Basiulis and D. J. Formiller (Hughes Aircraft Co., Torrance, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0210.* 5 p. 6 refs.

An osmotic heat pipe using commercially available membranes has been constructed and its continuous operation demonstrated. Principles of operation and technology status are considered along with polarization concentration effects, flow control, leakage through a membrane, and solute carryover. Evaluation of potential applications indicates that totally passive energy transport systems can be developed for applications such as deicing of leading edges of aircraft wings, helicopter rotor blades, cooling of electronics, and solar heating and cooling of buildings. V.T.

A80-18379 # **Performance testing of a hydrogen heat pipe.** J. Alario and R. Kosson (Grumman Aerospace Corp., Bethpage, N.Y.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0212.* 9 p.

Test results are presented for a reentrant groove heat pipe with hydrogen working fluid. The heat pipe became operational between 20 and 30 K after a cooldown from 77 K without any difficulty. Steady-state performance data taken over a 19 to 23 K temperature range indicated the following: (1) maximum heat transport capacity = 5.4 W-m; (2) static wicking height = 1.42 cm; and (3) overall heat pipe conductance = 1.7 W/C. These data agreed remarkably well with extrapolations made from comparable ammonia test results. The maximum heat transport capacity is 9.5% larger than the extrapolated value, but the static wicking height is the same. The overall conductance is 29% of the ammonia value, which is close to the ratio of liquid thermal conductivities (24%). Also, recovery from a completely frozen condition was accomplished within 5 min by simply applying an evaporater heat load of 1.8 W. (Author)

A80-18505 **The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors.** W. I. Wilson, R. B. Snyder, and I. Johnson (Argonne National Laboratory, Argonne, Ill.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development,* vol. 19, Jan. 1980, p. 47-51. 9 refs. Research sponsored by the U.S. Department of Energy.

Oil shale-SO2 reactivity, determined with a thermogravimetric analyzer, was used to estimate the quantity of oil shale required to reduce SO2 concentration in the effluent gas sufficiently to meet the SO2 emission standard in atmospheric-pressure fluidized-bed coal combustion (AFBC). It was calculated that the oil shale could reduce the SO2 concentration in the effluent gas from FBC units below the SO2 emission limit. In evaluating virgin oil shale and spent oil shale for SO2 emission control, they were compared with (1) Germany Valley limestone, (2) Greer Limestone, and (3) Tymochtee dolomite. The results indicate that more oil shale than limestone or dolomite may be required to meet the SO2 emission standard since the calcium content of the shale is relatively low. The attrition rate of Green River oil shale was similar to attrition rates of limestones and dolomites. (Author)

A80-18552 # **Economic comparisons of solar and fossil total energy systems for industrial applications.** G. D. Pine (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/TS-6.* 8 p. 7 refs. Members, $1.50; nonmembers, $3.00. Contract No. W-7405-eng-26.

Four industrial application case studies were completed comparing fuel cell, diesel, and solar central receiver total energy systems with boiler and grid-electric systems. All total energy systems save significant quantities of fuel compared with separate supply of electricity and heat. However, the fuel cell and diesel systems require natural gas and oil, respectively, and while using less total fuel, they may substitute the use of these fuels for more plentiful coal or uranium. Solar total energy systems, on the other hand, reduce not only total fuel consumption, but also the oil and gas consumption. Solar systems are relatively capital intensive, but show significant economies of scale. They were found to compete well with the other systems in sizes larger than two to three MWe, but not so well for smaller sizes. (Author)

A80-18553 * # **Optimization of a point-focusing, distributed receiver solar thermal electric system.** R. L. Pons (Ford Aerospace and Communications Corp., Aeronutronic Div., Newport Beach, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-11.* 10 p. Members, $1.50; nonmembers, $3.00. Contract No. JPL-955115.

This paper presents an approach to optimization of a solar concept which employs solar-to-electric power conversion at the focus of parabolic dish concentrators. The optimization procedure is presented through a series of trade studies, which include the results of optical/thermal analyses and individual subsystem trades. Alternate closed-cycle and open-cycle Brayton engines and organic Rankine engines are considered to show the influence of the optimization process, and various storage techniques are evaluated, including batteries, flywheels, and hybrid-engine operation. (Author)

A80-18554 # **Solar-powered liquid-metal MHD power systems.** E. S. Pierson, G. Fabris, C. B. Reed (Argonne National Laboratory, Argonne, Ill.), and H. Branover (Argonne National Laboratory, Argonne, Ill.; Negev, University, Beersheba, Israel). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-22.* 8 p. 15 refs. Members, $1.50; nonmembers, $3.00. Research supported by the Ministry of Energy of Israel; Contract No. W-31-109-eng-38.

The two-phase liquid-metal MHD power cycles coupled to solar collectors have potentially a higher efficiency of converting solar energy input into useful electrical power output for all collector temperatures. The MHD interaction is a volume effect, so that efficiency is essentially independent of design power level down to fractional-megawatt size, and the performance is attractive even at approximately 50 kWe size. The use of two working fluids in the energy-conversion system is advantageous in coupling the conversion cycle to solar collectors and direct-contact boilers can be used to obtain, higher conversion system temperatures. Two liquid-metal MHD systems of interest for solar collectors are presented and explained. Liquid metal MHD conversion systems appropriate to low, intermediate, and high collector temperatures are described along with initial efficiency and cost results. (Author)

A80-18555 # **A simplified procedure for performance of solar systems with heat pumps.** F. Osterle, A. Murphy (Carnegie-Mellon University, Pittsburgh, Pa.), A. Salehpour, and P. Vercaemert. *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-23.* 12 p. 11 refs. Members, $1.50; nonmembers, $3.00.

A simple procedure is described and assessed for determining the annual heating and cooling energy requirements of a hypothetical small residential building in Pittsburgh, PA by four methods: (1) direct solar plus auxiliary for heating and heat pump for cooling, (2) unassisted heat pump plus auxiliary, (3) and (4) two solar heat pump combinations. The procedure used average daily temperatures and insolation for each month. The emphasis of the paper is on the modeling procedures developed rather than on the specific results presented. The use of the simplified procedure provides good results with great time saving compared to hour-by-hour performance modeling. (Author)

A80-18556 # **Simulation of solar-assisted urban sewage digestion.** T. Newell and R. Boehm (Utah, University, Salt Lake City, Utah). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-36.* 5 p. 8 refs. Members, $1.50; nonmembers, $3.00. Research supported by the Envirotech Corp.

In the present work, it was desired to simulate the quantitative aspects of solar augmentation of sewage digestion. Three solar-assisted configurations where heat is exchanged with combinations of the influent stream and the digestor were investigated in this study. The three systems were modeled using a solar computer simulation program developed at the University of Utah. This simulation program performs half hour calculations of system energy flows. Year-long performance is summarized for solar and ambient temperature variations that are set by long-term averages while maintaining particular year variations. Typical urban sewage digestion plant designs for the location of Atlanta, Georgia, were used in the simulations. Plots of the solar system performance versus solar system size are presented for the three system configurations. Comparisons are made to residential system simulations. (Author)

A80-18557 # **Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction.** A. C. Ratzel (Sandia Laboratories, Albuquerque, N. Mex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-18.* 8 p. 11 refs. Members, $1.50; nonmembers, $3.00. Contract No. DE-AC04-76DP00789.

Analytical and experimental work has investigated reducing thermal conduction and natural convection heat losses in annular solar receiver geometries using high molecular weight fill gases. Gases analyzed in a Sandia Laboratories prototype receiver design included nitrogen, argon, krypton, xenon, sulfur hexafluoride, and Freon C-318 R. Experimental results indicate that high molecular weight monatomic gases can reduce receiver heat loss by nearly 50 percent, comparable to annulus gas evacuation to the 5.0 to 0.5 Pa range. Computer simulation studies show that heavy gas utilization in the annular space can improve overall collector performance by 4.5 to 13.5 percent, depending upon the gas and annulus pressure. (Author)

A80-18558 # **Heat transfer analysis of receivers for a solar concentrating collector.** M. P. Rice, M. F. Modest, D. N. Borton, and W. E. Rogers (Rensselaer Polytechnic Institute, Troy, N.Y.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-20.* 5 p. 7 refs. Members, $1.50; nonmembers, $3.00.

The heat transfer characteristics and performance of conically wound, single-layer monotube receivers for a concentrating solar collectors are investigated. A discussion of methods and assumptions used to formulate the basic energy balances is presented. Results obtained from this analysis indicate the degree of sensitivity of performance to variations in tube radius, inlet temperature, ambient temperature, absorptivity of the tube coating, and cone half-angle within receiver size and mounting limitations. (Author)

A80-18559 # **Computer simulation results for planar reflectors and flat plate solar collectors.** F. A. Rudloff, S. R. Swanson, and R. F. Boehm (Utah, University, Salt Lake City, Utah). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-37.* 8 p. 14 refs. Members, $1.50; nonmembers, $3.00.

The benefits attributed to reflectors for increasing performance of flat plate collectors vary quite widely in the literature. In the present study, a detailed computer simulation is carried out to investigate the increase in performance. The results show that: (1) collectors should be placed at higher tilt angle than usual; (2) reflectors placed in front of the collectors can be tilted up 5 or 10 deg; and (3) performance has a broad peak with respect to tilt angle. The system performance enhancement in Salt Lake City, Utah ranges from 1.16 for domestic hot water to 1.28 for space heating for equal reflector-collector areas, and the break-even ratio of per area reflector to collector cost is from 16 to 28% for these systems.

(Author)

A80-18560 # **A solar energy system with annual aquifer storage.** W. J. Schaetzle, C. E. Brett (Alabama, University, University, Ala.), L. R. Fang and D. M. Grubbs. *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-30.* 6 p. 8 refs. Members, $1.50; nonmembers, $3.00.

By utilizing a sufficiently large thermal energy storage system, solar energy can be collected the year round and utilized during relatively short periods. Solar energy collected in the summer can be used in the winter. In some cases, over four times as much solar energy can be collected per month in the summer versus collection per month in the winter. The actual capital cost of the solar system for heating with storage can be reduced by over a factor of two where adequate aquifers are available. Two examples are analyzed - one in Boston, Massachusetts and one in Birmingham, Alabama. The advantages of annual storage can decrease the capital costs appreciably. For heating in the northern parts of the continental United States, collector areas can be reduced by over 75 percent. This reduction will result in a similar reduction in capital cost, thereby increasing the feasibility of solar systems. (Author)

A80-18561 # **Effectiveness - NTU charts for latent heat storage units.** N. Shamsundar (Houston, University, Houston, Tex.) and R. Srinivasan. *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-16.* 12 p. 13 refs. Members, $1.50; nonmembers, $3.00. Contract No. EG-77-C-04-3974/EFT-5.

In recent papers, numerically obtained results were presented in which two-dimensional effects were accounted for. In these calculations, axial changes in fluid temperature and solidification rate were neglected, and the coolant temperature was assumed constant. In the present paper, these restrictions are removed. It is shown that complete three-dimensional results can be obtained from the numerical results of the two-dimensional analysis by performing rather simple calculations. The results are presented in the form of charts giving the effectiveness of a heat exchanger in terms of its size, as represented by the number of transfer units, the layout of the tubes in the heat exchanger, and the Biot number. (Author)

A80-18562 # **A home-size solar-powered engine for cooling systems of generation of electricity.** F. O. Smetana, P. G. Bladen, and T. B. Dameron, III (North Carolina State University, Raleigh, N.C.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-34.* 12 p. Members, $1.50; nonmembers, $3.00.

The paper outlines the steps taken in designing and constructing a solar-powered engine at the N.C. State University, to produce sufficient electricity from sunlight to meet the needs of the average N.C. resident, estimated at being approximately 1000 KWH/month. Attention is given to the component selection and assembly, and an examination of the preliminary system operating results is given. Four criteria for the structure are outlined, including that the structure be able to withstand 100 mph winds and that it requires only bolt-together assembly in relatively light-weight sections. C.F.W.

A80-18563 # **Helium penetration in evacuated solar collectors - Theory and effect on their performance.** J. R. Thomas, Jr. (Virginia Polytechnic Institute and State University, Blacksburg, Va.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-17.* 4 p. 9 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

An important method of improving the thermal performance of solar collectors is to evacuate the region between collector surface and cover, thereby minimizing convection and conduction heat losses. Convection can be eliminated with modest vacuum levels, but elimination of conduction losses requires vacuum levels of 0.0001 Torr or higher. Vacuum durability becomes an important question for collectors operating under such hard vacuum conditions. Of particular interest are the effects of helium which is present in the atmosphere in the amount of 5 ppm and is known to penetrate most glasses. This paper gives results for helium permeation rates into evacuated collectors, and for the increase in heat loss that results.

(Author)

A80-18564 * # **Comparative study of solar optics for paraboloidal concentrators.** L. Wen, P. Poon, W. Carley (California Institute of Technology, Jet Propulsion Laboratory, Energy Technology Engineering Section, Pasadena, Calif.), and L. Huang (U.S. Navy, Civil Engineering Laboratory, Port Hueneme, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-8.* 13 p. 71 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the U.S. Department of Energy.

Different analytical methods for computing the flux distribution on the focal plane of a paraboloidal solar concentrator are reviewed. An analytical solution in algebraic form is also derived for an idealized model. The effects resulting from using different assumptions in the definition of optical parameters used in these methodologies are compared and discussed in detail. These parameters include solar irradiance distribution (limb darkening and circumsolar), reflector surface specular spreading, surface slope error, and concentrator pointing inaccuracy. The type of computational method selected for use depends on the maturity of the design and the data available at the time the analysis is made. (Author)

A80-18565 # **RAPAD - Real-time Accurate Performance Analysis of Data.** L. Lewin, C. A. Baer, D. V. Pryor, C. B. Winn (Colorado State University, Fort Collins, Colo.), and B. W. Parkinson (Rockwell International Corp., Los Angeles, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-1.* 7 p. Members, $1.50; nonmembers, $3.00.

An innovative method for the real-time estimation of generic performance characteristics based on recursive least squares filtering is developed. After presenting the theoretical basis for the algorithm, its use is illustrated by applying it by computer simulation to a wind energy conversion system (WECS) whose true performance characteristics are assumed known. It is shown that good agreement between estimated and true performance is obtainable with as little as 1000 data samplings using a realistic level of instrumentation noise. This corresponds to approximately six days of WECS operation. The method is suitable for microprocessor implementation. This would result in the unique advantage of having a best estimate of system performance in real-time, thus alleviating labor-intensive and time-consuming data processing often necessary with conventional data acquisition procedures. Ongoing development, including implementation of the technique in conjunction with operational vertical and horizontal axis WEC systems, and optimization of the filter are discussed. (Author)

A80-18566 # **Addition of solar air heaters to a pre-engineered metal building.** R. E. Forbes and R. W. McClendon (Mississippi State University, Mississippi State, Miss.). *American*

Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-33. 6 p. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

A80-18567 # **Superheated steam generation in a Fresnel lens concentrating collector.** R. E. Glass and P. R. Smith (New Mexico State University, Las Cruces, N. Mex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-21.* 8 p. 16 refs. Members, $1.50; nonmembers, $3.00.

Concurrent analytical and experimental studies were carried out on linear Fresnel lens solar collectors to determine their potential for producing superheated steam. Nine tracking Northrup collectors were connected in parallel as a single pass boiler. Flat plate collectors were used to preheat the water entering the Fresnel collectors, and superheated steam was produced for all cases. The results of the experimental study were used to verify the computer model developed to study Fresnel lens collectors. The computer model predicted the temperature profiles through the collector in all cases, including the occurrence of the critical heat flux point, and a parametric computer study was made of boiling in linear Fresnel lens collectors. (Author)

A80-18568 # **Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages.** A. W. Harris (General Electric Co., Schenectady, N.Y.) and C. N. Shen (Rensselaer Polytechnic Institute, Troy, N.Y.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-27.* 9 p. 8 refs. Members, $1.50; nonmembers, $3.00.

Results of operational and parameter studies of a solar-powered heat pump system are presented. The system is based on an absorption cycle having a solar collector directly coupled to the generator with three latent energy storages internal to the cycle. The operational studies are concerned with the development of system design features and operating algorithms that cope with system constraints such as: emptying storage tanks, mixture strength limits, and system operating limits. (Author)

A80-18569 # **The thermal design and analysis of an integrated sodium boiler/receiver for solar energy conversion.** D. B. Osborn (Ford Aerospace and Communications Corp., Newport Beach, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-10.* 6 p. 5 refs. Members, $1.50; nonmembers, $3.00.

This paper presents the results of the thermal design and analysis of an integrated sodium boiler receiver used for solar energy conversion. The receiver is a major element of a point focus distributed receiver (PFDR) solar thermal-electric system employing Stirling engines for power conversion. The results of the design/analysis study show that a high temperature cavity receiver, employing pool-boiling sodium, is an excellent choice for use in dish-Stirling PFDR systems. The concept is technically feasible at the present time, employing state-of-the-art materials and technology, and will be a cost-effective subsystem when put into production. (Author)

A80-18570 # **Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector.** A. Olvera and R. B. Bannerot (Houston, University, Houston, Tex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-3.* 10 p. 33 refs. Members, $1.50; nonmembers, $3.00.

The thermal performance of a moderately concentrating, non-tracking solar energy collector is predicted based on a series of experimental evaluations of its components. Four reflector designs were constructed and tested. Six simple tubular receiver designs and a collector utilizing one of the reflector designs and one of the receiver designs were constructed and tested. The predicted performance closely approximated the actual thermal performance of the collector. The component evaluations are discussed in detail, so that the analysis can be extended to other designs. (Author)

A80-18571 # **Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation.** W. F. O'Brien and J. M. Hinerman (Virginia Polytechnic Institute and State University, Blacksburg, Va.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-2.* 7 p. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Agriculture.

An experimental investigation of the performance of a horizontal-axis wind generator was conducted with varying rotor tip speed ratio and orientation relative to wind directions. The machine tested had a rotor diameter of 6.6 m, and a three-phase alternator with diode-rectified output. Rotor speed was controlled by changing the voltage level of the battery load. Operation at varying tip speed ratio (blade tip speed/wind speed) was thus produced. Rotor orientation relative to wind direction (yaw) was controlled by adjusting the position of a steering tail mounted on the wind generator. Values of performance coefficient C(p) are calculated for the various data points, using an elliptical model for projected rotor area. The results are considered to be useful for guidance in the design of performance-optimizing control systems and power-limiting devices for horizontal-axis wind generators. (Author)

A80-18572 # **An average slope factor for solar insolation.** R. L. Field (Texas A & M University, College Station, Tex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-41.* 6 p. 6 refs. Members, $1.50; nonmembers, $3.00.

Design methods for solar collector sizing (such as f-chart) usually require a multiplying factor (the slope factor) to correct insolation data taken on the horizontal for the tilt angle of the solar collector. Available slope factor data were averaged and were re-plotted to result in a chart whose parameters are latitude and month of year. Correction charts for off-average locations are presented. The error in the given standard slope factor chart is estimated to be accurate + or - 5 percent for many cities. (Author)

A80-18573 # **Optimization and comparison strategies for solar energy systems.** R. C. Estes and W. Kahan (Singer Corporate Research and Development Laboratory, Fairfield, N.J.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-26.* 13 p. 8 refs. Members, $1.50; nonmembers, $3.00. Contract No. EG-77-C-03-1467.

An analytical model of several simple, generic solar energy systems, with and without heat pumps is described. The model is augmented by marginal analysis to configure the components of each system type for an economic optimum and consequently, for maximum marketability. This model is to be used as a first-cut means of identifying the combinations of ranges of system component parameters and general geographic regions for which each generic configuration is most marketable. Assessment of marketability includes the following considerations: the size of the capital investment, the operating cost savings relative to alternative systems, future cost of energy, and cost of money. The following six systems types are optimized (where appropriate) and compared: (1) an all electric resistance heating system, (2) a stand-alone heat pump system, (3) a stand-alone solar energy system, (4) a series solar assisted heat pump (SAHP) system, (5) a parallel SAHP system, and (6) a dual source SAHP system. (Author)

A80-18574 # **The simulation of building heat transfer for passive solar systems.** A. F. Emery, C. J. Kippenhan, D. R. Heerwagen, and G. B. Varey (Washington, University, Seattle, Wash.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-38.* 7 p. 6 refs. Members, $1.50; nonmembers, $3.00. U.S. Department of Social and Health Services Contract No. 8072-FGF-10432.

A numerical simulation program, based upon a finite difference nodal network, was used to simulate two Los Alamos test cells (one single and one multi-room cell) and a typical residence - all of which were exposed to intense insolation and large changes in ambient weather conditions. For the test cells, the predicted surface and globe temperatures are in good agreement with the measured values and indicate the acceptability of thermal modeling. The program was used to predict the behavior of a residential structure. The process of refining these predictions, guided by observations, led to the development of a stepwise simulation methodology. The insights gained as a result of this interdisciplinary involvement have been stimulating and instructive. The importance of recognizing the differences in the thought processes and the work styles of the several professions has been demonstrated. The most effective simulation methodology was that based upon human comfort, which appeared to be a common perception among all the program users. (Author)

A80-18575 # **Thermal energy utilization in the Mississippi County Community College Photovoltaic Project.** F. K. Deaver, W. D. Turner (Arkansas, University, Fayetteville, Ark.), and W. H. Woodsmall, Jr. (Cromwell, Neyland, Truemper, Levy, and Gatchell, Inc., Little Rock, Ark.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-29.* 6 p. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

The first DOE funded solar photovoltaic demonstration project at the Mississippi County Community College in Blytheville, Arkansas is examined. One of the features of the project, the cooling loop for the silicon cells and the subsequent utilization of the thermal energy to supply heat to the building are described in detail. The overall configuration of the Solar Photovoltaic Conversion System includes four major functional subsystems: the collection subsystem, the power conditioning system, the solar energy control subsystem, and the collector cooling/thermal subsystem. C.F.W.

A80-18576 # **Evaluation of a solar heating system installed in the LSU Field House.** D. Maples (Louisiana State University, Baton Rouge, La.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-31.* 6 p. Members, $1.50; nonmembers, $3.00.

As a demonstration in the use of solar energy, a solar system was installed on the Louisiana State University Field House. The system is capable of handling most of the hot water load and a small part of the space heating load required by the Field House. A mathematical model of the solar heating system was also developed. This model is capable of predicting the performance of the system using the following parameters: incident solar flux, outside ambient temperature, wind velocity and the amount of makeup water for the hot water system. A comparison between the predicted performance and the actual performance of the system was made. Control strategies and system parameters were varied to gauge the effect on the system. Finally, the flat-plate collector efficiency as a function of inlet water temperature was determined. (Author)

A80-18577 # **Noniterative solution of heat transfer equation of fluid flow in solar collector.** J. P. Chiou (Detroit, University, Detroit, Mich.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-24.* 6 p. 23 refs. Members, $1.50; nonmembers, $3.00.

If the longitudinal heat conduction in the absorber plate and the tube wall of the solar collector are significant, thermal analysis of the fluid flowing through the collector tube generally requires an initial assumption of the fluid temperature distribution. Iteration scheme is then used in the analysis until the actual fluid temperature distribution is found. In this paper, a more efficient noniterative method for determination of this temperature distribution is presented. Collector efficiencies of a typical flat plate solar collector are calculated by this method for various operating conditions. The results are found to be in excellent agreement with those calculated by conventional techniques. (Author)

A80-18578 # **An optimization formulation for solar hot water systems.** K. K. Chang and A. Minardi (Central Florida, University, Orlando, Fla.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-42.* 7 p. 6 refs. Members, $1.50; nonmembers, $3.00.

A mathematical correlation between collector area and auxiliary energy used in a solar hot water system was obtained by using TRNSYS program. Based on this correlation, optimum collector area was directly related to both economic factors and system parameters. A criteria for economic feasibility was obtained. A comparison of optimum area calculated by this analysis with optimum area based on f-chart data was in good agreement. (Author)

A80-18579 # **SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants.** S. P. Bird (Battelle Pacific Northwest Laboratory, Richland, Wash.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-12.* 8 p. 9 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

A thermodynamic and economic performance analysis code, SOLSTEP, was developed to facilitate the evaluation of solar thermal power plant designs. The code conducts a time step simulation of the plant thermodynamic performance using actual recorded meteorological and insolation data. Each analysis case provides capacity factor and levelized energy cost results for several plant configurations using various combinations of collector field size and storage capacity. The code has been used to analyze a variety of solar thermal generic concepts involving several collector types and energy conversion and storage subsystems. (Author)

A80-18580 # **A design method for optimizing collector systems for small solar center receivers.** R. B. Bannerot and C. L. Laurence (Houston, University, Houston, Tex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-14.* 9 p. 12 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the U.S. Department of Energy.

The design methodology for the determination of the optimal heliostat field designs is presented in detail for a small solar central receiver. The optimization process is reviewed. Cost and performance models are discussed. To illustrate the design process, a representative small solar central receiver system is optimized. Cost factors were developed from current prices. The individual heliostat design and cost data were taken from the design of the ten megawatt-electric Barstow Pilot Plant design. A north field configuration, steel guyed tower and a tilted, circular aperture, cavity receiver were utilized. It is demonstrated that solar central receiver systems are more cost effective at higher power levels, above those considered here. But this fact has nothing to do with relative cost effectiveness of competing small, stand-alone, power systems. (Author)

A80-18581 # **SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators.** W. J. Apley (Battelle Pacific Northwest Laboratory, Richland, Wash.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-13.* 7 p. 7 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the U.S. Department of Energy.

A computer model SHADE (Selection of Heliostat Arrangement for Distributed Engines) has been developed at the Pacific Northwest Laboratory to aid in determining the optical performance of two-axis tracking parabolic concentrators. The shading of individual mirror assemblies in a field of parabolic dishes determines the optimal field arrangement and the most efficient method of plant operation. SHADE provides a simple and inexpensive analytical tool for examining certain design aspects of solar thermal power systems using a network of point-focusing parabolic concentrators. (Author)

A80-18582 # **Analysis of convective heat loss from the receiver of solar power plants.** L. S. Yao and F. M. Chen (Illinois, University, Urbana, Ill.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-36.* 9 p. 24 refs. Members, $1.50; nonmembers, $3.00.

The receiver of solar power plants is modeled as a semiinfinite vertical cylinder. The analysis is carried out to investigate the convective heat loss. Constant surface temperature is selected as the idealized condition for the receiver. Heat loss from the receiver is due to the combined mode of the free convection and the forced convection. The problem is studied under the condition that a steady horizontal breeze passes the receiver. The forced convection is treated as a perturbed effect. The solution shows that the free convection dominates the heat loss along the bottom of the cylinder. (Author)

A80-18583 # **Preliminary analysis of a total solar heating system.** C. B. Winn, P. Burns, E. Trigg (Colorado State University, Fort Collins, Colo.), and J. Leflar (SEEC, Inc., Fort Collins, Colo.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-40.* 7 p. Members, $1.50; nonmembers, $3.00.

The thermal and economic performances of long-term storage solar systems have been studied by use of a computer simulation developed at Colorado State University. The systems have been analyzed for Madison, Wisconsin and Boulder-Denver, Colorado. The effects of long-term storage size, long-term storage insulation and collector tilt angle have been detailed. Economic analyses indicate savings vs. long-term storage volume for various values of rock box insulation. Also, some interesting heat transfer effects are presented. Results indicate that long-term storage systems perform well where the annual heat load is high and the values of winter insolation are low. Also, relatively small (142 cu m) storage volumes performed most economically. (Author)

A80-18584 * # **A solar thermal electric power plant for small communities.** R. J. Holl (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-7.* 12 p. 9 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the U.S. Department of Energy and NASA.

A solar power plant has been designed with a rating of 1000-kW electric and a 0.4 annual capacity factor. It was configured as a prototype for plants in the 1000 to 10,000-kWe size range for application to small communities or industrial users either grid-connected or isolated from a utility grid. A small central receiver was selected for solar energy collection after being compared with alternative distributed collectors. Further trade studies resulted in the selection of Hitec (heat transfer salt composed of 53 percent KNO3, 40 percent NaNO2, 7 percent NaNO3) as both the receiver coolant and the sensible heat thermal stroage medium and the steam Rankine cycle for power conversion. The plant is configured with road-transportable units to accommodate remote sites and minimize site assembly requirements. Results of the analyses indicate that busbar energy costs are competitive with diesel-electric plants in certain situations, e.g., off-grid, remote regions with high insolation. Sensitivity of energy costs to plant power rating and system capacity factor are given. (Author)

A80-18585 # **A comparison of test results for flat-plate water-heating solar collectors using the BSE and ASHRAE procedures.** J. P. Jenkins and J. E. Hill (National Bureau of Standards, Washington, D.C.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-4.* 13 p. 10 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the U.S. Department of Energy.

Five solar collectors were tested according to the BSE and ASHRAE test procedures and the results compared. All five collectors tested were modular, flat-plate, water heating, and included single- and double-glazed designs with and without selectively coated absorbers. In both procedures, collector efficiency curves are determined. The ASHRAE procedure consists exclusively of outdoor testing whereas the BSE procedure requires a combination of outdoor and indoor testing (no irradiation) to determine the collector's optical and thermal loss characteristics, respectively. During the indoor testing in this study, the environmental test conditions were controlled and regulated by use of specially built environmental simulators to investigate the effect of wind speed and 'sky' temperature on the thermal loss characteristics of the collectors. (Author)

A80-18586 * # **Small solar thermal electric power plants with early commercial potential.** H. E. Jones, D. J. Bisantz, R. N. Clayton, H. H. Heiges, and A. C. Ku (General Electric Co., Schenectady, N.Y.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-9.* 8 p. 5 refs. Members, $1.50; nonmembers, $3.00. Contract No. JPL-955116.

Cost-effective small solar thermal electric power plants (1- to 10-MW nominal size) offer an attractive way of helping the world meet its future energy needs. The paper describes the characteristics of a conceptual near-term plant (about 1 MW) and a potential 1990 commercial version. The basic system concept is one in which steam is generated using two-axis tracking, parabolic dish, and point-focusing collectors. The steam is transported through low-loss piping to a central steam turbine generator unit where it is converted to electricity. The plants have no energy storage and their output power level varies with the solar insolation level. This system concept, which is firmly based on state-of-the-art technology, is projected to offer one of the fastest paths for U.S. commercialization of solar thermal electric power plants through moderate technology advances and mass production. (Author)

A80-18587 # **Performance of heat pumps at elevated evaporating temperatures - With application to solar input.** E. A. Kush (Brookhaven National Laboratory, Upton, N.Y.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-19.* 9 p. 10 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the U.S. Department of Energy.

The paper presents theoretical predictions, results of systematic experiments run on a special heat pump simulator, and interpretation/analysis of how high Coefficients of Performance (COP) heat pumps can be used in installed Solar Assisted Heat Pump (SAHP) systems. The residential application of heat pumps is discussed and an emphasis is placed on liquid source heat pumps - liquid source affording more efficient heat exchange, water tank thermal storage, and compatibility with earth sources. It is concluded that heating COP's which increase substantially with source (and evaporating) temperature are attainable with capacity modulating compressors, large heat exchangers and proper expansion device. C.F.W.

A80-18588 * # **The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs.** A. F. Latta, J. M. Bowyer, and T. Fujita (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-15.* 10 p. 11 refs. Members, $1.50; nonmembers, $3.00. Contract No. DE-AI01-79ET-20307.

This paper presents the performance and cost of four 10-MWe advanced solar thermal electric power plants sited in various regions of the continental United States. Each region has different insolation characteristics which result in varying collector field areas, plant performance, capital costs, and energy costs. The paraboloidal dish, central receiver, cylindrical parabolic trough, and compound parabolic concentrator (CPC) comprise the advanced concepts studied. This paper contains a discussion of the regional insolation data base, a description of the solar systems' performances and costs, and a presentation of a range for the forecast cost of conventional electricity by region and nationally over the next several decades. (Author)

A80-18589 # **Comparison of predicted and measured solar energy system performance.** J. C. Mears, Jr., J. M. Nash, and J. T. Smok (IBM, Federal Systems Div., Gaithersburg, Md.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-39.* 7 p. 12 refs. Members, $1.50; nonmembers, $3.00. Contract No. EG-77-C-01-4049.

The paper describes the comparison methods of solar energy between the measured performance data and the data from an f-chart analysis. The results of the comparison demonstrate that it is possible to utilize FCHART to generate monthly performance references for selected systems if suitable inputs to the program are defined. This approach enables the realization of two important goals: the establishment of a monthly performance reference for the National Solar Data Network, and further verification of the validity of f-chart as a design aid. Four systems were selected from the NSDN to illustrate expected performance prediction analysis. The systems include: (1) an air space heating and domestic hot water system, (2) a large liquid domestic hot water system, and (3) a liquid space heating and domestic hot water system. C.F.W.

A80-18590 # **Comparisons of measured and simulated performance for CSU Solar House I.** J. W. Mitchell, W. A. Beckman (Wisconsin, University, Madison, Wis.), and M. J. Pawelski (Trane Co., LaCrosse, Wis.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-35*. 5 p. 7 refs. Members, $1.50, nonmembers, $3.00. Contract No. E(11-1)-2588.

The solar heating system for CSU Solar House I is simulated using TRNSYS, and simulation results are compared to the measured performance. The heating system is composed of a liquid collection and storage system, a domestic hot water system, and an air delivery system. The components were modeled using standard TRNSYS components. Weather data recorded at the site were employed as the driving function. Measured energy quantities were compared to those from the simulation for three periods of six to eleven days each and on both a daily basis and over the entire period. The simulated energy quantities agree with the data within the accuracy of the measurements. Simulated values of storage tank temperatures generally agree within 2C of the measured values. These results help establish the validity of simulation methods for system analysis. (Author)

A80-18591 # **Residential solar heat pump systems - Thermal and economic performance.** J. H. Morehouse and P. J. Hughes (Science Applications, Inc., McLean, Va.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-25*. 9 p. 21 refs. Members, $1.50; nonmembers, $3.00. Contract No. DE-8C04-78CS-34261.

This study performed an analysis of series and parallel configured solar heat pump systems for residences. The year-round thermal performance for all the heating, cooling and hot water system configurations were determined by simulation and compared against conventional heating and cooling systems in three geographic locations. The series and parallel combined solar heat pump systems investigated are at best marginally competitive, on a 20-year life-cycle cost basis, with conventional oil and electric furnace systems. The combined solar heat pump systems are not economically competitive with conventional gas furnace or stand-alone heat pump systems for residential space heating, cooling and water heating. (Author)

A80-18592 # **Design of the International Energy Agency 500 kWe distributed-collector solar thermal-electric powerplant.** T. W. Neumann and C. D. Hartman (Acurex Corp., Alternate Energy Div., Mountain View, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Sol-6*. 7 p. Members, $1.50; nonmembers, $3.00.

This paper reviews the results of engineering studies for an International Energy Agency (IEA) project for the design and construction of a 500-kWe (net) solar thermal-electric power generation system of the distributed collector system (DCS) type. The project is part of the IEA Small Solar Power System (SSPS) Project, and is being constructed as a demonstration plant in the province of Almeria in southern Spain. The DCS system design was completed by a 10 nation team. Construction is presently underway. The design consists of a mixed field of parabolic trough-type solar collectors of both German and U.S. design which are used to heat a thermal heat transfer oil. (Author)

A80-18593 # **The influence of thermophysical properties on the design and sizing of geothermal power plant components.** H. E. Khalifa (United Technologies Research Center, East Hartford, Conn.) and J. Kestin (Brown University, Providence, R.I.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-18*. 7 p. 19 refs. Members, $1.50; nonmembers, $3.00. Contract No. EY-76-S-02-4051-A002.

The paper presents a study of the influence of uncertainties in the thermophysical properties of the working fluids on the preliminary design and sizing of the major components of a power plant. The effect of these uncertainties is discussed first qualitatively to characterize the nature of the problems resulting from them, then quantitatively to determine the relative magnitude of the differences in component design and size that would result if a power plant is designed on the basis of different sets of working fluid properties. Special emphasis is placed on isobutane which appears to be attractive for geothermal energy extraction. (Author)

A80-18595 # **A solar assisted and wind powered heat pump for residential dwellings.** E. Spero (Basic Automation, Ltd., Jerusalem, Israel) and A. Dybbs (Case Western Reserve University, Cleveland, Ohio). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-33*. 10 p. 14 refs. Members, $1.50; nonmembers, $3.00.

This paper presents a practical and cost-effective design of a residential energy system. The system combines the use of solar collectors and a wind turbine with a water to air heat pump. The wind turbine is directly coupled to the compressor of the heat pump and a thermal energy generator, thus eliminating intermediate stages and improving energy conversion efficiency. Proper matching between collection and conversion elements eliminates the need for complex speed controls. The system was simulated on a digital computer using hourly wind, temperature, and total daily isolation data for the Cleveland, Ohio, area. The results indicate that the collector and storage elements are smaller than expected because of the high degree of matching between the solar and wind energy availability and demand, along with an increased probability that one of these energy sources will be available. (Author)

A80-18596 # **Solar thermal central receiver systems.** D. L. Siebers, M. Abrams, and R. J. Gallagher (Sandia Laboratories, Livermore, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-38*. 6 p. 17 refs. Members, $1.50; nonmembers, $3.00.

Research needs in the thermal sciences relevant to the development of the solar central receiver concept are identified. The primary need is the creation of theoretical and empirical tools to predict energy loss from cavity and external receivers due to combined natural and forced convection heat transfer. The possibility of using boundary layer suction to reduce the convective energy loss is explored. The technique is found to be advantageous if the energy in the withdrawn air is recovered. In an unrelated problem area, a test to quantify boiling-induced thermal fatigue in a solar receiver is described. (Author)

A80-18600 # **Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation.** N. M. Rafat, M. M. Elkotb, and M. F. El-Refaie (Cairo University, Cairo, Egypt). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-67*. 8 p. 9 refs. Members, $1.50; nonmembers, $3.00.

This is an analytical treatment of the multi-pass solar fluid-heater when the received radiant energy is nonuniformly distributed in the cross direction, normal to the flow. Adjacent passes are allowed to exchange energy. Closed-form formulas are derived for the fluid and wall temperature distributions along different passes. Mathematical expressions are presented for two performance indices, the efficiency and the effectiveness. (Author)

A80-18620 # **A vortex model of the Darrieus turbine - An analytical and experimental study.** J. H. Strickland, B. T. Webster, and T. Nguyen (Texas Tech University, Lubbock, Tex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York,* *N.Y., Dec. 2-7, 1979, Paper 79-WA/FE-6.* 6 p. 16 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

An aerodynamic prediction model has been formulated for two- and three-dimensional Darrieus turbines using a vortex lattice method of analysis. Experiments were conducted on a series of two-dimensional rotor configurations in a water tow tank. The agreement between analysis and experiment was in general found to be good. This model should allow one to make accurate predictions of instantaneous aerodynamic blade forces and to characterize the near wake flow behind the rotor. (Author)

A80-18623 # **Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber.** W. L. Wells, J. F. Shiau, and J. H. Buckner (Tennessee Valley Authority, Chattanooga, Tenn.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/APC-10.* 15 p. 6 refs. Members, $1.50; nonmembers, $3.00.

The report updates TVA's experiences with its first full-scale limestone scrubber. A status report is given on operational and maintenance problems, including discussion of solutions found for some of these and a listing of others in the yet-to-be-resolved category. In addition, some of the results obtained from 12 monitoring points are outlined. Emphasis is on the changes observed as a function of time. Also discussed is the chemistry in the absorber and venturi circulation loops. The impact of the scrubber reheater on turbine cycle efficiency and scrubber system auxiliary power consumption are presented. Finally, an attempt is made to assess the cost of the flue gas desulfurization facility, considering all the factors proper to such an evaluation. M.E.P.

A80-18627 # **Feasible thermophysical conditions for gas receiver tubes in solar power stations.** M. Becker (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Cologne, West Germany). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-37.* 10 p. 7 refs. Members, $1.50; nonmembers, $3.00.

Heat transfer to air in turbulent pipe flow is analyzed and numerically computed. This is applied to estimate the energy transfer process in a solar thermal receiver of a central tower facility. The general condition of uniformly heated pipe flow will be discussed with dependence on, e.g., heat flux (10 to 1000 kW/m-sq), inlet pressure (4 to 80 bar), and tube radius (10 to 40 mm). For technical and economical optimization, the combination of high heat flux and high pressure is recommended. Thus, for a solar power station with gas as heat transfer medium, the closed thermal cycle is favored. (Author)

A80-18631 # **An evaluation of thermal energy storage for residential air-conditioning applications.** J. W. Jones and T. J. Small, III (Texas, University, Austin, Tex.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/HT-31.* 9 p. 6 refs. Members, $1.50; nonmembers, $3.00.

The application of daily cycle thermal energy storage in residential air conditioning has significant potential for energy use management. The purpose of this study has been to evaluate the technical feasibility of two thermal storage systems and to determine the possible energy and economic benefits of their use. A computerized load analysis and system simulation procedure was used to determine the power requirements of both storage and conventional air conditioning system for a 1600-sq ft residence. The results obtained indicate that thermal storage could have a positive impact on utility load profiles. It could also result in operating cost savings to homeowners under proposed time-of-day rate schedules, but the high initial cost makes storage systems a marginal investment at present. The results indicate that the impact on residential energy conservation ranges from negligible to somewhat negative. (Author)

A80-18637 # **A small hybrid solar closed-cycle gas turbine cogeneration plant concept based on today's technology.** C. F. McDonald (General Atomic Co., San Diego, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/GT-3.* 14 p. 41 refs. Members, $1.50; nonmembers, $3.00.

There are currently several possibilities for conversion of solar energy into electrical power (i.e., direct conversion, steam plant, open-cycle gas turbine, and closed-cycle gas turbine), with differing degrees of complexity, technology readiness, cost, and development requirements. This paper emphasizes a low technology approach of combining a closed-cycle gas turbine power conversion system, operating at a very modest temperature, and a point-focusing distributed receiver system consisting of parabolic dish concentrators with focal-mounted heat source exchangers, and a centralized prime-mover. The utilization of existing and proven technology is also emphasized, and aspects of the power conversion and heat source systems for a small plant concept are discussed. (Author)

A80-18644 # **Screening evaluation of electric power cycles integrated with coal gasification plants.** S. P. Gallagher (General Electric Co., Schenectady, N.Y.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Ener-4.* 8 p. Members, $1.50; nonmembers, $3.00.

The paper presents the results of an investigation of potentially lower cost alternatives to present concepts for integrated gasification combined cycle power plants. The study aimed to determine if a gasification system integrated with a reduced cost power plant could provide an attractive thermal efficiency; the cost reduction was achieved by removing the steam-bottoming system from a combined cycle so that only the gas turbine remained. The cycle efficiencies were determined for this non-bottomed cycle and several steam-bottom systems, using current and advanced gas turbines. Based on these performances, an economic overview was made comparing the capital cost and efficiency differences of competing systems. A.T.

A80-18645 # **Novel power generation cycles using coal gas.** R. V. Garland (Westinghouse Electric Corp., Combustion Turbine Systems Div., Concordville, Pa.) and M. J. Gluckman (Electric Power Research Institute, Palo Alto, Calif.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Ener-5.* 10 p. Members, 1.50; nonmembers, $3.00.

This paper presents the results of a screening study on power cycles integrated with a coal gasification plant. Three basic plant configurations are studied: (1) the Condensing Combined Cycle, the most common combined cycle, which includes combustion turbines, gas expanders and condensing steam turbines. This configuration should be considered as the base case; (2) the Single Cycle, which is comprised of combustion turbines and gas expanders, but no steam turbines; (3) the Non-Condensing Combined Cycle, which utilizes combustion turbines, gas expanders and a non-condensing steam turbine. The gasifier used throughout is the Texaco entrained, coal slurry-fed, air blown gasification system along with a scrubber, sulfur removal system and a tail gas treater. (Author)

A80-18646 # **Novel gas turbine cycles with coal gasification.** S. Hamilton (United Technologies Corp., Power Systems Div., South Windsor, Conn.) and S. J. Lehman (United Technologies Research Center, East Hartford, Conn.). *American Society of Mechanical Engineers, Winter Annual Meeting, New York, N.Y., Dec. 2-7, 1979, Paper 79-WA/Ener-6.* 7 p. 6 refs. Members, $1.50; nonmembers, $3.00. Research sponsored by the Electric Power Research Institute.

This paper summarizes the results of a study to devise efficient gas turbine cycles without steam bottoming for use with coal gasification. Substitution of other forms of heat recovery in place of steam bottoming offers a potential cost saving. A novel form of the intercooled-reheat-regenerative cycle was devised with thermal efficiency nearly as high as that of combined cycles. As an additional finding, a reference gasified coal combined cycle power plant with current technology gas turbines was shown to be potentially more efficient than current coal-fired steam power plants with flue gas desulfurization. (Author)

A80-18721 **Transmission of tidal energy over a plateau.** R. A. Heath (New Zealand Oceanographic Institute, Wellington, New Zealand). *Deutsche Hydrographische Zeitschrift,* vol. 32, no. 6, 1979, p. 289-296. 6 refs.

Variations in the response to an incident long wave on a step function plateau are considered as a function of the angle of incidence. Only for large angles of incidence is there a substantial change in the modulus of the amplitude ratio of the transmitted to incidence wave. The amplitude of the wave on top of the plateau varies strongly with the angle of incidence. Zero transmission can occur only if there is a net increase in depth across the plateau in the direction of the incident wave, the critical angle of incidence being independent of frequency. If the modulus of the angle of incidence is greater than the critical angle, wave energy is trapped along the trailing escarpment of the plateau. (Author)

A80-18728 * **Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K.** G. Rosen (Drexel University, Philadelphia, Pa.) and R. W. H. Webeler (Iowa, University, Iowa City, Iowa). *Nuovo Cimento, Lettere, Serie 2,* vol. 26, Dec. 22, 1979, p. 579-585. 7 refs. Grant No. NsG-7491.

The storage and release of atomic hydrogen produced by the beta decay of tritium contained in a crystalline solid H2 matrix at concentrations greater than 2% and temperatures below 0.80 K are investigated. The temperature of a sample chamber containing tritium-impregnated H2 and placed in the mixing chamber of a dilution refrigerator was measured as the chamber was heated and cooled in order to determine the rates of energy storage and release. It is found that for samples containing 1.2 wt.% tritium, after storage at 0.054 K for 40 h, an increase in sample temperature to a trigger point of 0.17 K leads to an energy release due to the destabilization of atomic H in H2 as predicted by the phenomenological rate process theory. For a tritium weight fraction of 2.5%, energy releases were triggered at 0.54 and 0.82 K after storage at 0.080 K, indicating the trapping of H atoms at the sites of T2 and HT molecules in the sample. The application of a 15 kG magnetic field is shown to increase the storage capacity of T2 traps while reducing that of HT traps, and to lower the trigger temperatures of both. Results suggest that the direct conversion of nuclear energy to chemical energy may become technically feasible in the future. A.L.W.

A80-18733 # **Energetics aspects of environmental protection (Energeticheskie aspekty zashchity okruzhaiushchei sredy).** S. S. Kutateladze, V. N. Moskvicheva, B. I. Psakhis, V. K. Shitov, and L. A. Ogurechnikov. *Akademiia Nauk SSSR, Izvestiia, Energetika i Transport,* Nov.-Dec. 1979, p. 84-97. 10 refs. In Russian.

Consideration is given to means of effectively utilizing low-temperature heat and toxic wastes produced by chemical and petrochemical processing installations. Means developed for the reduction of thermal wastes in the major energy processing industries and for the processing and recovery of solid, liquid and gaseous chemical-process industrial effluents are presented. Of the more than 20 types of apparatus developed by the Thermophysical Institute of the Siberian Academy of Sciences in the last five to seven years, it is noted that the most important processes make use of boiling and condensation, together with gas/liquid interactions, film flow, bubbling and stream flow, while heat and mass transfer processes have not yet been investigated sufficiently. The technical and economic effectiveness of the various processes are also evaluated. A.L.W.

A80-18734 # **Automobile transportation and the environment (Avtomobil'nyi transport i okruzhaiushchaia sreda).** D. P. Velikanov. *Akademiia Nauk SSSR, Izvestiia, Energetika i Transport,* Nov.-Dec. 1979, p. 98-109. 8 refs. In Russian.

The problem of the pollution of the atmosphere by substances released by automobiles burning petroleum-derived fuels is reviewed. The production of carbon monoxide, hydrocarbons, nitrogen oxides and sulfur by gasoline, diesel and gas engines is quantified, and the introduction of pollution-free electric automobiles is considered in terms of the limitations imposed by the current state of battery technology. Measures taken to control automobile pollution in the United States are presented, including the use of catalytic converters and improvements to the fuel system and combustion chamber and predictions of air pollution levels in major cities in the USSR by 1990 are presented. The introduction of maximum allowable pollutant levels in the Soviet Union and the measurement of engine emissions are reported, and planned conversion to electric vehicles, replacement of lead as an antiknock ingredient, and increased fuel efficiency by means of equal fuel and air distribution to each cylinder and combustion gas recirculation are presented. The use of nonpolluting hydrogen fuel is also evaluated. A.L.W.

A80-18735 **Fluid bed combustion in processing, environmental protection and energy supply.** L. Reh (Lurgi Chemie und Hüttentechnik GmbH, Frankfurt am Main, West Germany). *(American Flame Research Committee, International Fluidized Bed Combustion Symposium, Boston, Mass., Apr. 30-May 1, 1979.) Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 32, Dec. 1979, p. 560-566. 65 refs.

Following a brief review of the history of development of fluid bed combustion the advantages of the fluid bed principle for an environmentally favorable combustion at low temperatures and the conditions of different fluidizing states applicable to combustion are discussed. Hereby the importance of the radial mixing behavior of fluidizing gas and fluidized solids for achieving the desired uniformity of fluid bed temperatures is mentioned. Applications of fluid bed combustion of different fuels in processing, in environmental protection and in energy supply are explained. In process techniques a description is given of the regeneration of used HCL-pickle liquors and the calcination of aluminum trihydrate in a circulating fluid bed. In environmental processing, the incineration of sludge in compact fluid bed and combined multiple hearth/fluidized bed furnaces is described, as, in energy supply techniques, is the roasting of sulphidic ores and the new development of coal combustion in a circulating fluid bed for exclusively supplying steam or heat. (Author)

A80-18746 **International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge University, Cambridge, England, August 10-12, 1978, Lectures.** *Journal of Photochemistry,* vol. 10, Jan. 1979. 135 p. (For individual items see A80-18747 to A80-18752)

Articles are presented on energy storage in organic photoisomers, light induced electron transfer reactions, photogalvanic cells, as well as on photoelectrochemistry and heterogeneous photocatalysis at semiconductors. Other subjects include the physics and chemistry of solar cells and synthetic molecular organizates. C.F.W.

A80-18747 **Energy storage in organic photoisomers.** G. Jones, II, S.-H. Chiang, and P. T. Xuan (Boston University, Boston, Mass.). *(International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge, England, Aug. 10-12, 1978.) Journal of Photochemistry,* vol. 10, Jan. 1979, p. 1-18. 69 refs. Research supported by the U.S. Department of Energy.

Criteria for the successful photochemical storage of solar energy as latent heat in organic materials are outlined. Photoisomerization reactions which have some potential for storage of photon energy in kinetically stable products are surveyed. Emphasis is placed on well-known internal cyclo-additions which display thermal reversibility, large storage capacities and high chemical and quantum efficiencies. Chemicals available on an industrial scale, which are known to undergo valence isomerization, are identified, and attempts to drive these reactions via exciplexes (complexes involving strong electron donor or electron acceptor sensitizers) are described. The sensitized isomerization of dimethylnorbornadiene-2,3-dicarboxylate and a model compound, hexamethyldewarbenzene, are identified as bona fide exciplex isomerizations. Triplet sensitizers have been employed in the sensitization of 7 to visible light (to 500 nm) and the potential importance of endothermic energy transfer in triplet sensitization (the upconversion of very low energy triplets) is discussed. The review includes developments by several research groups in the spectral sensitization of isomerizable substrates, the use of heterogeneous photosensitizers, and photocalorimetric techniques. (Author)

A80-18749 **Photogalvanic cells.** W. J. Albery and A. W. Foulds (Imperial College of Science and Technology, London, England). *(International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge, England, Aug. 10-12, 1978.) Journal of Photochemistry,* vol. 10, Jan. 1979, p. 41-57. 27 refs.

The theory of the operation of the ideal photogalvanic cell for solar energy conversion is described and the crucial kinetic characteristics that the system must possess are deduced for the homogeneous kinetics, the mass transfer and the electrode kinetics. Existing iron-ruthenium and iron-thionine systems are discussed with respect to the ideal characteristics. In the case of the iron-ruthenium system the kinetics of the thermal back reaction are too rapid and the cell does not have differential electrode kinetics. The iron-thionine system satisfies many of the criteria. A thionine-coated electrode possesses the necessary differential electrode kinetics. Sulphonated thionine is to be preferred to ordinary thionine in that it is more soluble. The performance of the iron-thionine cell with respect to the ideal cell is analyzed and discussed. (Author)

A80-18750 **Photoelectrochemistry and heterogeneous photocatalysis at semiconductors.** A. J. Bard (Texas, University, Austin, Tex.). *(International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge, England, Aug. 10-12, 1978.) Journal of Photochemistry,* vol. 10, Jan. 1979, p. 59-75. 73 refs. Research supported by the Robert A. Welch Foundation and NSF.

The principles and applications of semiconductor electrodes in photoelectrochemical (PEC) cells (liquid junction photovoltaic, photoelectrosynthetic, photocatalytic) are described. Factors important to the design of practical systems and the extension of the principles of PEC cells to particulate systems for carrying out heterogeneous photocatalysis and photosynthesis are discussed. A 'dual n-type semiconductor' model of biological photosynthesis is proposed and possible means of utilization of such a system is described. (Author)

A80-18751 **The physics and chemistry of solar cells.** K. W. Boer (Delaware, University; SES, Inc., Newark, Del.). *(International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge, England, Aug. 10-12, 1978.) Journal of Photochemistry,* vol. 10, Jan. 1979, p. 77-110. 52 refs. Research supported by SES, Inc.

The physics of the photovoltaic effect is analyzed using the example of a frontwall solar cell. The effect results from the interplay of the emitter, in which minority carriers are generated via absorbed light and diffuse to the junctión, and the junction, in which the essential voltage drop occurs. The interplay is established by the minority carrier density at the emitter-junction interface, acting as prominent boundary condition, and connecting current through the device with applied voltage. The chemistry of the interlayer between emitter and junction has essential influence on this boundary condition by determining interface recombination and space charge. Both of these determine band connection and performance of the device. A brief review of material properties in the light of the basic cell operation is given. (Author)

A80-18752 **Synthetic molecular organizates.** H. Kuhn (Max-Planck-Institut für biophysikalische Chemie, Göttingen, West Germany). *(International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge, England, Aug. 10-12, 1978.) Journal of Photochemistry,* vol. 10, Jan. 1979, p. 111-132. 27 refs.

Organized systems of molecules (organizates) can be obtained by assembling monolayers of planned composition and architecture. Appropriately constructed monolayer assemblies can be used to study light-induced vectorial charge separation. Such systems are of interest in designing devices for solar energy conversion. Possibilities of such devices are discussed and experiments are presented to demonstrate light-induced charge separation. Charge separation is limited by the quantum mechanical tunnelling effect which cannot be avoided at molecular dimensions. Experiments to study that effect are described. Monolayer assemblies to discriminate between different mechanisms of spectral sensitization of photoeffects by dyes are discussed and cases are considered where an increased spectral sensitization is achieved by cooperation of different dye molecules. (Author)

A80-18797 **Space light - Space industrial enhancement of the solar option.** K. A. Ehricke (Space Global, La Jolla, Calif.). *Acta Astronautica,* vol. 6, Dec. 1979, p. 1515-1633. 34 refs.

The paper considers space light systems which provide an opportunity for the application of space technology to the enhancement of the solar energy uses in industrial countries. The space light functions range from night illumination of rural and urban areas (Lunetta systems) to photosynthetic production enhancement for the growth of food and biomass for conversion to chemical fuels; to electric power generation by irradiating photovoltaic or thermal ground receivers at night or by adding to the natural solar energy input in daytime (Soletta systems). The Lunetta and Solletta concepts are reviewed, and an assessment of terrestrial alternatives is made; the Lunetta, Powersolletta, and a large Biosolletta space light systems are selected for large-scale seafood production in Antarctic and Arctic waters. Models are developed for rural and urban lighting, power generation with photovoltaic and thermal ground stations, and for the large-scale production of seafood. A.T.

A80-18800 **Cost effectiveness requirements for space power stations.** G. K. C. Pardoe (General Technology Systems, Ltd., Brentford, Middx., England). *Acta Astronautica,* vol. 6, Dec. 1979, p. 1745-1752.

The concept of converting solar energy in orbital space stations and transmitting electrical power to Earth at radio frequency, is receiving increasing attention both in paper studies and experimental and development work. The projects conceived are large in scale and implications and will demand major resources in their development and deployment. This paper, therefore, examines the requirements which together will determine the appropriate levels of cost effectiveness of space power stations and should assist in establishing critical or sensitive areas which will influence the operational validity of the concepts. The r.f. transmission of electric power to and from, or between, spacecraft may itself have wider implications and is another aspect considered in the paper. In summary, the paper does not seek to introduce new design concepts, but appraises the situation and exposes indicators concerning cost effectiveness. (Author)

A80-18832 **Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels.** J. Connan and A. M. Cassou (Société Nationale Elf-Aquitaine /Production/, Département Laboratoire de Géologie, Pau, Pyrénées-Atlantiques, France). *Geochimica et Cosmochimica Acta,* vol. 44, Jan. 1980, p. 1-23. 48 refs.

The paper presents a study dealing mainly with shale-sandstone series in which the disseminated kerogen is mostly composed of land-derived debris. Organic matter was characterized by microscopic and chemical techniques, while the kerogen maturity was assessed by microscopic studies, mainly by means of vitrinite reflectance measurements. The oil and gas properties are tentatively interpreted in terms of maturity, using a comparison of oil properties with the kerogen features of shales interbedded in the impregnated sandstone reservoirs. In low maturity stages (immature zone), dry gas with minor condensate is observed, whereas in higher maturity levels (oil window), wet gas with high paraffinic crudes is generally recorded. Shallow depth condensates and their related gases have been identified as immature fluids. In conclusion, it is noted that the study offers a maturity frame work as a guide for oil and gas prediction in shale sandstone sequences containing land derived kerogen. M.E.P.

A80-18833 **The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal.** D. J. Casagrande, K. Gronli, and N. Sutton (Governors State University, Park Forest South, Ill.). *Geochimica et Cosmochimica Acta,* vol. 44, Jan. 1980, p. 25-32. 25 refs. Research supported by the Governors State University and NSF.

A80-18849 # **Pollution aspects of oilfired and coalfired boilers.** C. M. Deshpande and S. C. Kale (Associated Industrial Consultants, Bombay, India). *Indian Journal of Air Pollution Control,* vol. 2, Jan. 1979, p. 24-28.

A80-18859 **First experiences with the use of impactors in large power plants (Erste Betriebserfahrungen uber den Einsatz von Impaktoren in Grosskraftwerken).** W. Jockel (Technischer Uberwachungsverein Rheinland, Cologne, West Germany). *(Internationales Kolloquium uber polycyclische aromatische Kohlenwasserstoffe, Hanover, West Germany, Sept. 18-21, 1979.) Staub - Reinhaltung der Luft,* vol. 39, Dec. 1979, p. 474-475. In German.

In conjunction with gravimetric dust measurements with a filter head device, the grain distribution of pure gas dust was determined by means of a cascade impactor. The measurements were made in the flue gas of a powerplant fuelled by bituminous coal. The equipment consisted of an Andersen Mark III impactor which was equipped with a manual partial flow sampling system instead of a filter head device. Attention is given to the preparation of the fiberglass filter, operation of the impactor, and evaluation of the results. M.E.P.

A80-18861 **Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites (Erfahrungen beim praktischen Einsatz eines Andersen-Kaskadenimpaktors im Abgas verschiedener Industrieanlagen).** K. Lutzke and W. Muhr (Rheinisch-Westfalischer Technischer Uberwachungsverein, Essen, West Germany). *(Internationales Kolloquium uber polycyclische aromatische Kohlenwasserstoffe, Hanover, West Germany, Sept. 18-21, 1979.) Staub - Reinhaltung der Luft,* vol. 39, Dec. 1979, p. 477, 478. In German.

A80-18868 **Gasification of solid waste in a fluidized bed reactor with circulating sand.** M. Hasegawa, J. Fukuda (Tsukishima Kikai Co., Ltd., Tokyo, Japan), and D. Kunii (Tokyo, University, Tokyo, Japan). *Conservation and Recycling,* vol. 3, no. 2, 1979, p. 143-153. Research supported by the Ministry of International Trade and Industry.

The paper reports on the operation of a demonstration plant in Japan using a process which can gasify a variety of solid materials such as organic sludge, waste plastics, municipal wastes and spent tires. It is shown that plastic rubbish is particularly suitable as a feedstock for this process which can produce a considerable amount of clean fuel gas with a high calorific value. It is concluded that the operability, safety and flexibility of the demonstration plant verified the adequate application of the process for pollution-free treatment of solid materials. M.E.P.

A80-18870 **The microbial production of methane from household wastes - Fixed-bed anaerobic digestion.** N. W. Le Roux, D. S. Wakerley, and M. N. Simpson (Warren Spring Laboratory, Stevenage, Herts., England). *Conservation and Recycling,* vol. 3, no. 2, 1979, p. 165-174. 18 refs.

Putrescible fractions of sorted household waste were anaerobically digested in fixed-bed tests. At 30 C, digestion was almost completed in 60 days when unfragmented waste was inoculated and submerged with digested sludge. The gas yield was approximately 0.12 cu m/kg of putrescible waste with an average composition of 58% CH4 + 42% CO2, but initially the percentage of methane was low. With water, instead of a digested sludge inoculum, about 160 days was required for digestion. Digestion of fragmented waste, even with CaCO3, was slower than with unfragmented material. At 15 plus or minus 3 C the digestion of inoculated fragmented waste required about 280 days. Practical and economic aspects of operating fixed-bed methane fermentations are discussed. (Author)

A80-18871 **The basics of magnetic separation as applied to municipal solid waste reclamation plants.** E. H. Richard (Magnetics International, Inc., Maple Heights, Ohio; Stearns Magnetics, Inc., Cudahy, Wis.). *Conservation and Recycling,* vol. 3, no. 2, 1979, p. 187-197. 5 refs.

Magnetic separation of ferrous metallics from municipal solid waste is based on technology developed for, and profitably applied to, ore beneficiation, slag reclamation, automobile shredding, and scrap processing industries. No one system or type of magnet can be used for all ferrous waste recovery. Above all, the system must initially be engineered into the process to provide recovery of a product that is readily marketable. Various magnet arrangements in the recovery system separate, clean and transport the recycled ferrous material. There are a number of basic magnetic system configurations and typical applications, some of which are presented here. (Author)

A80-18883 **Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems.** E. N. Ziegler and R. E. Meyers (Brookhaven National Laboratory, Upton, N.Y.). *Water, Air, and Soil Pollution,* vol. 12, Oct. 1979, p. 355-369, 371-381. 111 refs.

The status of air pollution control technology for coal-fired industrial and power plant boilers has been surveyed. Lime and limestone based scrubbers are capable of removing as much as 93% of flue gas SO2 at facilities supplying 800 MW power. The Wellman-Lord, thiosorbic, and citrate processes are capable of producing salable products instead of the sludge. Electrostatic precipitators, the major control device for removing particulates, can eliminate 99.5% of the fine particles. Fabric filtration can remove 99.9% and is more efficient in the 0.2 to 2 micron size range than ESPs. Utilization of fabric filters is expected to increase significantly from its present 5% of the particulate removal market. Nitrogen oxide concentrations in coal fired systems are usually reduced by modification of the combustion system. Various process capital and annualized costs are reported for SO2 and particulate removal systems. The status of fluidized bed combustion, fuel desulfurization, conversion of coal to gaseous and liquid fuels, and flue gas denitrification is also discussed. Part A deals with S emissions; Part B with NOx, particulates, and combined systems. (Author)

A80-18990 **Principles of photoelectrochemical solar energy conversion.** M. A. Butler and D. S. Ginley (Sandia Laboratories, Albuquerque, N. Mex.). *Journal of Materials Science,* vol. 15, Jan. 1980, p. 1-19. 66 refs. Contract No. DE-AC04-76DP00789.

Photoelectrochemical devices for conversion of solar energy into both electrical energy and chemical energy are discussed with emphasis on how the various material properties of the photoactive electrodes influence device efficiency and stability. The similarity between photoelectrochemical cells (PECs) and solid state devices is used to model their behavior and optimize such parameters as band gap, doping level, minority carrier lifetime, etc. A model is presented which calculates the electron affinity of any semiconductor and allows the prediction of the open circuit voltage of wet photovoltaic cells and optimum biasing for chemical producing cells. The effects of absorbed ions at the semiconductor electrolyte interface are reviewed. The temperature dependence of the energy levels in the semiconductor and the electrolyte are considered and the implications of these results to operation of PECs at elevated temperature are discussed. The major differences between PECs and solid state devices are the stability considerations. The thermodynamics of this problem is discussed. Other important degradation mechanisms and some solutions to these problems are reviewed. Finally, a prognosis of the future of this field is presented. (Author)

A80-19000 **On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example (Zur Frage der Substitution von Mineralöl durch andere Energieträger - Dargestellt am Beispiel der Energiewirtschaft eines Bundeslandes).** U. Dolinski and K.-D. Labahn. *Energiewirtschaftliche Tagesfragen,* vol. 29, Dec. 1979, p. 740-745. 6 refs. In German.

The paper discusses the necessity for substituting other energy sources for the rapidly decreasing amount of available petroleum as the demand increases. Three factors are important in developing alternate means: (1) the available supply possibilities of other energy sources, (2) the willingness to substitute of the oil users, as well as (3) the availability of technical substitution potential. Among the alternate sources examined are anthracite, ligneous coal, natural gas, nuclear power, electric energy, and remote heating systems. C.F.W.

A80-19031 **Controllable d.c. power supply from wind-driven self-excited induction machines.** D. B. Watson, J. Arrillaga (Canterbury, University, Christchurch, New Zealand), and T. Densem (New Zealand Electricity, Christchurch, New Zealand). *Institution of Electrical Engineers, Proceedings,* vol. 126, Dec. 1979, p. 1245-1248. 10 refs.

A variable-speed generating system is described which uses a 3-phase squirrel-cage induction machine with self-excitation capacitors. The variable-frequency/variable-voltage generated is then fed through a 3-phase controlled rectifier to provide a d.c. supply at constant voltage. The proposed scheme is suitable for wind power sources as it allows wide changes in wind turbine speed and, at all speeds, optimum generating power can be set up by rectifier delay angle control. (Author)

A80-19048 **Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean.** R. I. Kutas, M. I. Bevziuk, and V. F. Vygovskii (Akademiia Nauk Ukrainskoi SSR, Institut Geofiziki, Kiev, Ukrainian SSR). *Geothermics,* vol. 8, no. 1, 1979, p. 31-36. 9 refs.

The results are reported of heat flow determinations during the 10th and 11th cruises of the 'Akademik Vernadsky'. Geothermal gradients were measured by the thermograd PTG-2MTB, with two temperature sensors of 1 or 1.2 m spacing. The temperature sensors were fixed to the coring tube. The lower sensor penetrated the sediment to a depth of 2.5 m. On board determinations of thermal conductivity were made by one of two methods: the needle probe method and analysis of water content in sediments. Twenty-one heat flow measurements ranging from 4 to 120 mW/sq m have been obtained. The heat flow values depend on the type and granulometric composition of the sediments. High values are obtained on the southern slope of the Karlsberg Ridge, in the zones where bottom sediments have been found to have the maximum content of pelitic fraction and minimum of foraminifera. Low values of heat flow are due to a long-term effect of the ascending hydrothermal flow. This is confirmed by the traces of hydrothermal activity found in the sediments. (Author)

A80-19049 **The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction.** J. Hanson (California, University, Livermore, Calif.), K. Ahlbom, S. A. Larson, and G. Lind (Chalmers Tekniska Hogskola, Goteborg, Sweden). *Geothermics,* vol. 8, no. 1, 1979, p. 37-53. 19 refs. Contract No. W-7405-eng-48.

A80-19201 **Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, September 12-16, 1977, Proceedings.** Workshop sponsored by the Ente Nazionale per l'Energia Elettrica and ERDA. Edited by E. Barbier. *Geothermics,* vol. 7, no. 2-4, 1978. 225 p.

Activity in reservoir physics and engineering and resource assessment (particularly in central and southern Tuscany) in the field of geothermal research and development is reported. Pressure transient studies made from well tests in the geologically and hydrologically complicated Travale-Radicondoli (Italy) reservoir, as well as an analysis of pressure and of decline curves in the Serrazzano reservoir are presented. In addition, the thermodynamic behavior of the Bagnore geothermal field, reservoir performance of the Geysers Field (Calif.), and an evaluation of Baltazor known geothermal resources area (Nevada), are discussed, and an estimate of the resource potential of New Zealand geothermal fields for power generation is presented. J.P.B.

A80-19202 **Methods for regional assessment of geothermal resources.** P. Muffler (U.S. Geological Survey, Menlo Park, Calif.) and R. Cataldi (Ente Nazionale per l'Energia Elettrica, Centro Ricerca Geotermica, Pisa, Italy). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 53-89. 61 refs.

The paper describes the EEA-3/1 geothermal assessment methodology developed jointly by the United States and Italy. The goals of EEA-3/1 were: (1) to provide a comprehensive evaluation of geothermal resource assessment techniques in a report that can serve as a basis for future discussion and refinement of assessment methodology; (2) to propose geothermal resources methodology that is compatible with established usage in the mining and petroleum industries, yet takes into account the peculiar characteristics of geothermal energy; (3) to propose a methodology for forthcoming refinements and revisions of geothermal resource assessment in the United States and Italy; and (4) to stimulate the careful attention of geothermal resources specialists to questions of geothermal resources methodology, particularly with respect to terminology, assumptions, limitations, and documentation. B.J.

A80-19203 **Assessment of geothermal potential of central and southern Tuscany.** R. Cataldi (Ente Nazionale per l'Energia Nucleare, Centro Ricerca Geotermica, Pisa, Italy), A. Lazzarotto (Siena, Università, Siena, Italy), P. Muffler (U.S. Geological Survey, Menlo Park, Calif.), P. Squarci (CNR, Istituto Internazionale per le Ricerche Geotermiche, Pisa, Italy), and G. Stefani (Ente Nazionale per l'Energia Elettrica, Florence, Italy). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 91-131. 13 refs.

A80-19204 **Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field.** P. Atkinson (Union Oil Company of California, Santa Rosa, Calif.), F. G. Miller (Stanford University, Stanford, Calif.), R. Marconcini, G. Neri (Ente Nazionale per l'Energia Elettrica, Gruppo Minerario, Larderello, Italy), and R. Celati (CNR, Istituto Internazionale per le Ricerche Geotermiche, Pisa, Italy). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 133-144. 9 refs.

An estimate of reserves in the Serrazzano reservoir was obtained from mass balance studies and production decline curve analyses. The straight-line p/z vs cumulative production material balance relationship was applied to vapor-dominated geothermal reservoirs. Furthermore, an empirical type curve matching technique was applied to the production decline curves of wells in the reservoir; an estimated total production (past and future) of 200,000,000 tons was obtained. The agreement between the estimated total production using material balance principles and decline curve analyses was found to be remarkably good. B.J.

A80-19205 **Thermodynamic behaviour of the Bagnore geothermal field.** P. Atkinson (Union Oil Company of California, Santa Rosa, Calif.), R. Celati (CNR, Istituto Internazionale per le Ricerche Geotermiche, Pisa, Italy), R. Corsi (Ente Nazionale per l'Energia Elettrica, Centro Ricerca Geotermica, Pisa, Italy), F. Kucuk (Science Applications, Inc., Morgantown, W. Va.), and H. J. Ramey, Jr. (Stanford University, Stanford, Calif.). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 185-208. 10 refs.

The paper examines the thermodynamic behavior of the Bagnore, Italy, geothermal field. Hydrogeological data and the history of watering-out of wells on the field periphery were examined, noting that the depth of fracture in these wells can be correlated with the gas-water interface in the reservoir. A mathematical model which accounts for thermodynamic and chemical equilibria between the vapor, liquid, and solid carbonate phases in the reservoir was applied to a study of initial conditions in the reservoir; a lumped-parameter CO2-H2O liquid-vapor model was used to calculate history of pressure and composition for the reservoir. The research confirms the existence of a large accumulation of noncondensable gas in the reservoir drawn off during the first years of exploitation; calculations with the producing-state lumped-parameter model indicate that the long-term producing concentration of CO2 cannot be accounted for by assuming reasonable amounts of CO2-saturated liquid-water influx. A.T.

A80-19206 **Evaluation of Baltazor known geothermal resources area, Nevada.** W. F. Isherwood and D. R. Mabey (U.S. Geological Survey, Menlo Park, Calif.). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 221-229. 9 refs.

By virtue of the Geothermal Steam Act of 1970, the U.S. Geological Survey is required to appraise geothermal resources of the United States prior to competitive lease sales. This appraisal involves coordinated input from a variety of disciplines, starting with reconnaissance geology and geophysics. This paper describes how the results of several geophysical methods used in KGRA evaluation were interpreted by the authors, two geophysicists, involved with both the Evaluation Committee and the research program responsible for obtaining and interpreting the geophysical data to be used by the committee. (Author)

A80-19207 **The United Nations' approach to geothermal resource assessment.** J. R. McNitt. *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 231-242. 49 refs.

Although the emphasis of United Nations' assisted geothermal projects has been on demonstrating the feasibility of producing geothermal fluids, the potential capacity of individual fields has been estimated by both the energy in place and decline curve methods. The energy in place method has been applied to three geothermal fields resulting in total resource estimates ranging from 380 to 16,800 MW-yr. The decline curve method has not given quantitative results concerning ultimate field potential because of the relatively short duration of well tests (several weeks to a maximum of 11 months). A new method for making regional assessment of geothermal potential is described, which is based, in part, on an assessment of the probable range of the power potential of geothermal fields as inferred from a frequency distribution analysis of fields already under development throughout the world. Depending on the reservoir containing dry steam or water, and its location in a region of groundwater recharge or discharge, average power potentials can be expected to range from 36 to 3360 MW. (Author)

A80-19208 **An estimate of the resource potential of New Zealand geothermal fields for power generation.** I. G. Donaldson (Department of Scientific and Industrial Research, Physics and Engineering Laboratory, Lower Hutt, New Zealand) and M. A. Grant (Department of Scientific and Industrial Research, Applied Mathematics Div., Wellington, New Zealand). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 243-252. 5 refs.

The basic similarity between most of the New Zealand geothermal fields suggests that the exploited fields of Wairakei and Broadlands can be used as indicators of the potential of other fields as resources for steam for power production. Assuming adequate permeability will be obtained in fields yet to be tested, the two parameters controlling this potential are areal extent (as defined by resistivity survey) and temperature at depth. As most field temperatures are bracketed by Wairakei (270 C maximum) and Broadlands (310 C maximum), field potential per unit area should also be bracketed by the field potentials per unit area of these two fields, i.e. Wairakei at 10-11 MWe per sq km and Broadlands at 12-14 MWe per sq km. Based upon present knowledge of the fields in question it may be possible to assess their proven, inferred and speculative reserves. Our totals for all fields of 450 MWe proven, 750 MWe inferred and 1300 MWe speculative suggests that New Zealand has some 1300-2500 MWe available from its geothermal resources should it desire to exploit these for electrical power. (Author)

A80-19209 **Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase.** A. F. Moench (U.S. Geological Survey, Menlo Park, Calif.) and P. G. Atkinson (Union Oil Company of California, Santa Rosa, Calif.). *(Ente Nazionale per l'Energia Elettrica and ERDA, Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, Sept. 12-16, 1977.) Geothermics,* vol. 7, no. 2-4, 1978, p. 253-264. 14 refs. Research supported by the Ente Nazionale per l'Energia Elettrica, ERDA, and NSF.

A finite-difference model for the radial horizontal flow of steam through a porous medium is used to evaluate transient-pressure behavior in the presence of an immobile vaporizing or condensing liquid phase. Graphs of pressure drawdown and buildup in terms of dimensionless pressure and time are obtained for a well discharging steam at a constant mass flow rate for a specified time. The assumptions are made that the steam is in local thermal equilibrium with the reservoir rocks, the temperature changes are due only to phase change, and that effects of vapor-pressure lowering are negligible. Computations show that when a vaporizing liquid phase is present the pressure drawdown exhibits behavior similar to that observed in noncondensable gas reservoirs, but delayed in time. A theoretical analysis allows for the computation of this delay and demonstrates that it is independent of flow geometry. The response that occurs upon pressure buildup is markedly different from that in a noncondensable gas system. This result may provide a diagnostic tool for establishing the existence of phase-change phenomena within a reservoir. (Author)

A80-19275 # **Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels.** S. E. Najim, A. C. Styles, and N. Syred (University College, Cardiff, Wales). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0075.* 8 p. 13 refs. Research supported by the Science Research Council.

This paper describes an experimental investigation in which the combustion of low calorific value gases in a cyclone combustor are simulated by dilute mixtures of natural gas and air (mixture ratio = 1.68). The flame front formed is annular and is located close to the chamber walls. Detailed measurements of the combustion aerodynamics and pollution characteristics of the burner are presented which show low flame front temperatures, i.e. 1200 C, and negligible NO emissions throughout the cyclone chamber, in which complete burnout of fuel occurs. Refractory lining of the cyclone chamber is shown to improve performance by 40% with further increases possible by insulation of the inlet/outlet manifold and an increase in the strength of the annular recirculation zone. Comparison is made of the mean and fluctuating values of three components of velocity, measured by laser Doppler anemometry, for both isothermal and combustion conditions. (Author)

A80-19304 # **Heat transfer including radiation and slag particles evolution in MHD channel. I.** K. H. Im and R. K. Ahluwalia (Argonne National Laboratory, Argonne, Ill.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0250.* 13 p. 13 refs. Contract No. W-31-109-eng-38.

Accurate estimates of convective and radiative heat transfer in the magnetohydrodynamic channel are provided. Calculations performed for a base load-size channel indicate that heat transfer by gas radiation almost equals that by convection for smooth walls, and amounts to 70% as much as the convective heat transfer for rough walls. Carbon dioxide, water vapor, and potassium atoms are the principal participating gases. The evolution of slag particles by homogeneous nucleation and condensation is also investigated. The particle-size spectrum so computed is later utilized to analyze the radiation enhancement by slag particles in the MHD diffuser. The impact of the slag particle spectrum on the selection of a workable design of an efficient seed collection system is discussed. (Author)

A80-19309 # **Power take-off analysis for diagonally connected MHD channels.** Y.-C. Pan and E. D. Doss (Argonne National Laboratory, Argonne, Ill.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0253.* 13 p. 16 refs. Contract No. W-31-109-eng-38.

The electrical loading of the power take-off region of diagonally connected MHD channels is investigated by a two-dimensional model. The study examines the loading schemes typical of those proposed for the U-25 and U-25 Bypass channels. The model is applicable for the following four cases: (1) connection with diodes only, (2) connection with diodes and equal resistors, (3) connection with diodes and variable resistances to obtain a given current distribution, and (4) connection with diodes and variable resistors under changing load. The analysis is applicable for the power take-off regions of single or multiple-output systems. The general behaviors of the current and the potential distributions in all four cases are discussed. The analytical results are in good agreement with the experimental data. It is found possible to design the electrical circuit of the channel in the take-off region so as to achieve a fairly even load current output under changing total load current. (Author)

A80-19310 * # **Effect of off-design operation of MHD generators on NO/x/ chemical kinetics.** G. A. Simmons and D. R. Wilson (Texas, University, Arlington, Tex.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0254.* 11 p. 27 refs. Grant No. NsG-3255.

The purpose of this study is to provide a capability for determining the chemical kinetic behavior of one family of pollutants, the nitrogen oxides, in the flow of a coal-fired MHD generator facility. The method used in the study allows the prediction of the nonequilibrium concentration of the minor NO(x) species in a flow otherwise assumed in equilibrium. Consideration is given to the effect of preheat, stoichiometry, and oxygen enrichment of the NO(x) concentration. The effect of preheat and stoichiometry is found to have a significant influence on the NO(x) concentration at the exit of the radiant boiler. V.T.

A80-19311 # **Mach 3 hydrogen external/base burning.** D. H. Neale, Sr., J. E. Hubbartt, and W. C. Strahle (Georgia Institute of Technology, Atlanta, Ga.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0280.* 9 p.

Experimental studies of base pressure manipulation for an axisymmetric model at Mach 3 with simulated and actual external/base burning are described. Early work using contoured test section walls and cold gas base region injection is reviewed to demonstrate wake detail and length scale changes under the influence of simulated external/base burning. Tests with actual combustion of radially and axially injected hydrogen are then reported. Outstanding performance values with significant base drag reduction is shown for injection and burning directly in the near-wake (base burning). Current attempts at radial injection and burning in the free stream (external burning) have not yet succeeded. These tests, however, have defined an envelope within which external burning, if feasible, will presently be achieved. (Author)

A80-19326 # **Solar concentrators using vacuum-contoured surfaces for tracking.** W. Alexander and J. R. Howell (Texas, University, Austin, Tex.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0399.* 10 p. 8 refs.

The paper presents an analysis of solar concentrators using vacuum-contoured trough collectors for tracking. The analysis considers (1) the predicted radius of a flexible membrane subjected to a constant pressure differential, (2) methods of approximating a parabola with these circular shapes, (3) a computer program implementation, and (4) the nonideal effects which affect the mirror performance. It is shown that concentration ratios from 31 to 16 are obtained for incidence angles varying from normal to the trough to plus or minus 40 deg from normal at solar noon for two-segment collectors. Experimental results showing reflected beam profiles from the collector onto an absorber tube for trough collectors with f-numbers of 1.16 and 1.32 are presented and compared with predictions. A.T.

A80-19327 # **A study of the solar LiBr dual cycle characteristics.** H. Sofrata, A. Nasser, A. Shibl, and M. Megahed (Riyadh, University, Riyadh, Saudi Arabia). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0400.* 7 p. 8 refs.

In arid zones the Li-Br dual cycle may be used in air-conditioning. It has the advantage of avoiding the use of cooling tower. It, also, has the advantage of being powered by solar energy. A computer programme has been developed during this course of research in order to design this dual cycle, fulfilling all its temperature constraints and heat balance equations. The characteristics of the dual cycle has also been studied at different environmental conditions. The output results of the computer programme may be displayed on a cathodic ray tube or stored in a field and presented graphically. This facilitates a complete vision and study of the precalculated results. (Author)

A80-19328 # **Solar-thermal jet pumping for irrigation.** L. D. Clements, P. A. Dellenback, and C. A. Bell (Texas Tech University, Lubbock, Tex.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0402.* 6 p. 9 refs. Research supported by Texas Tech University.

This paper describes a novel concept in solar powered irrigation pumping, gives measured performance data for the pump unit, and projected system performance. The solar-thermal jet pumping concept is centered around a conventional jet eductor pump which is commercially available at low cost. The jet eductor pump is powered by moderate temperature, moderate pressure Refrigerant-113 vapor supplied by a concentrating solar collector field. The R-113 vapor is direct condensed by the produced water and the two fluids are separated at the surface. The water goes on to use and the R-113 is repressurized and returned to the solar field. The key issue in the solar-thermal jet eductor concept is the efficiency of pump operation. Performance data from a small scale experimental unit which utilizes an electrically heated boiler in place of the solar field is presented. The solar-thermal jet eductor concept is compared with other solar irrigation concepts and optimal application situations are identified. Though having lower efficiencies than existing Rankine cycle solar-thermal irrigation systems, the mechanical and operational simplicity of this concept make it competitive with other solar powered irrigation schemes. (Author)

A80-19421 **The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor.** G. Donsì, L. Massimilla, M. Miccio, G. Russo, and P. Stecconi (CNR, Laboratorio di Ricerche sulla Combustione; Napoli, Università, Naples, Italy). *Combustion Science and Technology*, vol. 21, no. 1-2, 1979, p. 25-33. 23 refs.

A80-19471 **Under ground thermal storage in the operation of solar ponds.** A. Akbarzadeh and G. Ahmadi (Shiraz University, Shiraz, Iran). *Energy* (UK), vol. 4, Dec. 1979, p. 1119-1125. 14 refs. Research supported by the Ministry of Science and Higher Education of Iran.

The thermal interaction between a large solar pond and the surrounding ground is considered. For a given sinusoidal variation of the temperature at the bottom of the pond, the time-dependent temperature profiles in the ground are calculated and the corresponding heat fluxes to or from the ground as functions of time are obtained. The temperature variations in the ground for several years are plotted and the heat transfer between the solar pond and the ground thermal storage is discussed. The efficiency of heat recovery is studied and its significance is pointed out. (Author)

A80-19472 **Solar enhanced oil recovery - An assessment of economic feasibility.** K. D. Bergeron (Sandia Laboratories, Albuquerque, N. Mex.). *Energy* (UK), vol. 24, Dec. 1979, p. 1127-1137. 15 refs.

There are several qualitative reasons why steam enhanced oil recovery (EOR) appears to be well suited to solar energy use. These include favorable characteristics with regard to energy utilization, land availability, energy form, and geographical location. A number of technical questions require further research before the characteristics of solar enhanced oil recovery (SEOR) can be precisely specified or optimum systems designed. However, a cost model based on a number of working assumptions indicates competitiveness with conventional fuel-burning EOR systems at crude prices and solar collector system costs which can be reasonably expected to occur in the near future; e.g., for a nominal parameter set, including a solar energy system cost of $200/sq m, the breakeven crude oil price is $11.90/bbl.). (Author)

A80-19473 **Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice.** R. B. Diver and E. A. Fletcher (Minnesota, University, Minneapolis, Minn.). *Energy* (UK), vol. 4, Dec. 1979, p. 1139-1150. 10 refs. Contract No. ER-78-S-02-4737.

An analytical model of a one-step thermochemical process for producing hydrogen and oxygen from water by solar energy is constructed to evaluate sources of inefficiency and their dependence on operating variables and system configuration. The process is based on effusional separation in the Knudsen flow regime. The model includes: solar collector, reactor-separator, heat recovery systems, and cooler and pumps. It was shown that irreversibility in the reactor-separator is small and essentially independent of the hydrogen demand and that the greatest losses occurred in heat exchangers. In practice, the cost of the hydrogen produced is more important than an arbitrarily defined system efficiency. The use of heat from the high temperature heat exchanger to drive a heat engine for operating pumps and the replacement of the heat pump by a low temperature solar collector might substantially improve the economy of the process. V.L.

A80-19474 **Prospects for the near-term commercialization of shale oil in the United States.** G. Marland (Oak Ridge Associated Universities, Inc., Oak Ridge, Tenn.). *Energy* (UK), vol. 4, Dec. 1979, p. 1161-1174. 38 refs. Research supported by the Exxon Research and Engineering Co.; Contract No. EY-76-C-05-0033.

Political, economic and environmental aspects of commercial exploitation of shale oil resources in the United States are discussed. The identified resources of the highest grade shale oil in the U.S. are estimated at more than 400 billion barrels and it is certain that oil can be produced with the energy yield greater than the energy investment. However, the cost of the oil and the environmental impact of its production are not known. Three bills providing economic incentives for the development of a shale oil industry have been introduced in the U.S. Congress and a $3 per barrel tax credit is debated. Differences exist over the incentives and the environmental issues, such as air and water quality impacts, water supply problems, and solid waste disposal. These problems and financial risks involved impede the commercialization of shale oil. V.L.

A80-19581 **Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2.** Symposium sponsored by EURATOM, CNR, Banca Cattolica del Veneto, Cassa di Risparmio di Padovae Rovigo, and Istituto di Credito Fondiario, et al. Oxford and New York, Pergamon Press, 1979. Vol. 1, 633 p.; vol. 2, 500 p. Price of two volumes, $178.50.

Papers are presented on the following subjects: the design of experimental fusion systems; fusion reactor system studies; plasma handling; power supplies; control of experimental systems and data processing; and toroidal magnet technology. Also considered are: tritium and blanket technology; vacuum and first wall technology; poloidal magnet systems; and large tokamaks. B.J.

A80-19585 **Testing and performance of the 30 kA ohmic heating system for ASDEX.** H. Wedler, J. Gernhardt, G. Klement, and E. v. Mark (EURATOM and Max-Planck-Institut fur Plasmaphysik, Garching, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 43-48. 7 refs.

After installation of the 18 inner coils for the ohmic heating system (90 of 100 turns) of ASDEX the coils were successively run up to the full current strength of 30 kA. At the same time the radial and vertical motions of the individual OH coils and leads were systematically investigated with 60 displacement pickups. In a further test phase the tilt motion of the toroidal coils at the full toroidal field (45 kA, 28 kG) was measured. The results of these investigations are discussed in detail and an account is given of experience with the breaker system. (Author)

A80-19587 **A new high beta reversed field pinch machine.** P. D. Wilcock (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 55-60. 5 refs.

The HBTX1A experiment is a toroidal reversed field pinch with a metal bellows vacuum vessel of major/minor radii of 802/259 mm, supported within a close-fitting aluminum stabilizing shell, with no external guard vacuum. A 1 volt second iron core is used on the experiment. The machine is currently under construction and will be powered primarily by a rearrangement of the capacitor banks of the HBTX1 machine. This paper lists the main parameters, describes the general layout of the machine and discusses the areas of conflict and difficulty in the design. (Author)

A80-19589 **Numerical computations in the design of compact ignition experiments.** G. Cenacchi, A. Taroni (Comitato Nazionale per l'Energia Nucleare, Centro di Calcolo, Bologna, Italy), and B. Coppi (MIT, Cambridge, Mass.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 77-82. 7 refs.

A series of interconnected physical and engineering problems have been solved numerically for the analysis of compact devices designed to produce and confine D-T plasmas in regimes where the alpha-particle heating is important. Codes have been developed and used for the following problems: plasma transport processes and heating cycles; ideal MHD equilibrium configurations; design of the equilibrium field and of the air core transformer systems; evaluation of the current density, magnetic field and temperature distribution in the toroidal magnet; stress distribution in the toroidal magnet. Results of the computations are presented. (Author)

A80-19592 **Poloidal magnetic field design of a pulsed tokamak reactor.** W. R. Spears (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 115-120. 9 refs.

This report considers the poloidal magnetic field design of a pulsed tokamak reactor with an air-cored transformer. Vertical field coil configurations are obtained for nominal plasma parameters by a Fourier analysis technique. The primary current configuration is calculated on the assumption that it creates zero field in the plasma region. After some general conclusions on conductor location have been reached, they are applied to the design of a 600 MWe reactor with noncircular plasma cross section and beta approximately equal to 8%. (Author)

A80-19593 **Optimization of stabilized imploding liner fusion reactors.** P. J. Turchi, D. L. Book (U.S. Navy, Naval Research Laboratory, Washington, D.C.), and R. L. Burton (JAYCOR, Alexandria, Va.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 121-125. 16 refs. Research supported by the U.S. Department of Energy and U.S. Navy.

In the NRL LINUS concept for controlled fusion systems, a rotating liquid metal cylinder or liner is imploded onto a trapped plasma/magnetic field payload to obtain fusion temperatures and near-megagauss magnetic field levels by adiabatic compression. The combined use of liner rotation and a free-piston driving technique eliminates Rayleigh-Taylor instabilities and permits safe, repetitive implosion-reexpansion cycles. Optimization of system size is accomplished in terms of the implosion radius-ratio and liner compressibility. Trade-offs between reactor size and initial plasma temperature are indicated. (Author)

A80-19594 **Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors.** G. Realini (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy) and F. Engelmann (EURATOM and Stichting voor Fundamenteel Onderzoek der Materie, Institut voor Plasma-fysica, Jutphaas, Netherlands; EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro sui Gas Ionizzati, Frascati, Italy). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 127-132. 7 refs. Research supported by the Nederlandse Organisatie voor Zuiver-Wetenschappelijk Onderzoek.

The importance of the scaling of energy confinement for reactor economy is discussed both qualitatively and quantitatively. For the latter, the neoclassical, trapped-ion Alcator and Hugill-Sheffield confinement models are considered. Confinement laws for which confinement impairs strongly with increasing temperature, are shown to be particularly favorable. In particular, trapped-ion scaling increases reactor economy by about a factor 2 with respect to the other models considered. Furthermore, at fixed wall loading, it permits units having a 3 to 4 times smaller power. (Author)

A80-19596 **The effect of classical and anomalous transport on the performance of Tandem Mirror reactors.** T. Kammash and D. L. Galbraith (Michigan, University, Ann Arbor, Mich.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 141-146. 8 refs. Research supported by the U.S. Department of Energy and Electric Power Research Institute.

The particle and energy balance equations for a multispecies plasma in a Tandem Mirror reactor are solved numerically to assess the impact of cross field classical and anomalous transport on the Q-value of the reactor. It is shown that for commonly chosen values of magnetic fields and solenoid to plugs volume ratio Q values of 4-5 are attainable if the alpha particles are completely and selectively removed. It is also shown that these Q-values are significantly reduced when all the species in the central cell are allowed to undergo classical and/or anomalous diffusion across the confining magnetic field. (Author)

A80-19597 **SISYFUS - A simulation model for systematic analyses of fusion power plants.** K. Borrass, R. Buende, and W. Daenner (EURATOM and Max-Planck-Institut fur Plasmaphysik, Garching, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 161-167. 7 refs. EURATOM-sponsored research.

The paper describes how the SISYFUS code, which simulates the performance of a fusion power plant as a function of time, is improved and extended. It is shown that as a first step a tokamak reactor was included and the useful plant output restricted to electricity. As a first application, the plant energy balance is used to calculate the influence of the accumulation of alpha particles and impurities, which is measured by differences in the plasma minor radius. Similarly, the influence of variations in beta, reactor idle time, and plant net power output is investigated. Finally, because of the trend towards very compact tokamak designs, assumptions and conditions are identified which yield a considerable reduction in size. M.E.P.

A80-19599 **Doublet III neutral beam injection system overview and status report.** M. M. Holland, E. W. Bailey, A. P. Colleraine, H. C. Courington, D. W. Doll, C. R. Harder, H. L. Horner, J. H. Kamperschroer, K. A. Koch, and J. C. Kohli (General Atomic Co., San Diego, Calif.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 199-206. Contract No. CY-76-C-03-0167.

It is noted that the Doublet III tokamak is designed to operate initially with a toroidal magnetic field of 2.6 T, 5 V-sec of ohmic heating flux swing, a plasma current of 2 MA, and a plasma temperature of 1 keV. Attention is given to a plan to add two 80 keV hydrogen neutral beam injectors to produce about 3 keV temperatures utilizing about 7 MW of auxiliary beam heating. This will lead to the ultimate construction of a 20 MW, six injector system to produce reactor-grade plasmas in excess of 5 keV which will simulate breakeven conditions. The system and facility design is surveyed with emphasis on the cryogenic system and test facility. Finally, a brief discussion of the schedule and the status of construction and fabrication is also presented. M.E.P.

A80-19600 **Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks.** J. H. Kamperschroer, A. P. Colleraine (General Atomic Co., San Diego, Calif.), and L. D. Stewart. In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 217-222. Contracts No. EY-76-C-03-0167; No. EY-76-C-02-3073.

Experimental evidence obtained with the Princeton Large Torus, PLT, neutral beam injectors at both the Oak Ridge National Laboratory and at Princeton has indicated that the transport of neutral beams through conductance limited drift ducts can induce exponentiating beam loss and subsequent beam blocking. Evidence indicates that beam loss on the drift duct wall causes thermally induced outgassing of absorbed hydrogen gas. Application of such a model will be shown to yield predictions which agree both in magnitude and time dependence with the observed results. (Author)

A80-19608 **Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency.** J. Adam, A. Darbandi, J. Jacquinot, and H. Kuus (EURATOM and Commissariat à l'Energie Atomique sur la Fusion, Département de Physique du Plasma et de la Fusion Contrôlée, Fontenay-aux-Roses, Hauts-de-Seine, France). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 263-267.

Additional heating of present day tokamak plasma in the ion cyclotron range of frequency requires coupling antennae located inside the vacuum chamber. Since the limiting factor in RF power transfer to the plasma is the voltage which can be supported by the antenna, efficient coupling calls for optimum current for a given RF supply voltage. Three antennae, designed for the TFR tokamak will be discussed. (Author)

A80-19611 **Refueling by means of pellets - Ablation rate and injection velocity considerations.** L. L. Lengyel and D. F. Düchs (EURATOM and Max-Planck-Institut für Plasmaphysik, Garching, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 283-288. 7 refs.

Pellet ablation rates computed with the help of different ablation models are compared. For investigating the response of the plasma to the injected pellet, the ablation models are combined with a multiregime tokamak transport code. The results indicate that the ionization dynamics of the ablated particles has a strong effect on the particle losses in divertor tokamaks: high pellet injection velocities may be required for compensating the substantial particle losses caused by supplying cold neutral particles to the plasma. (Author)

A80-19612 **MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy.** H. O. Moser (Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany), J. Martin, and R. Salin (Lyon, Institut de Physique Nucléaire, Lyons, France). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 289-294. 9 refs.

A system for the diagnostics of MeV cluster ion beams has been developed. It is based on time-of-flight mass spectrometry and calorimetric measurement of ion currents and allows for the measurement of the cluster ion mass spectrum and the ion and atom current profiles. The beam of the Lyon high-gradient cluster ion accelerator has been investigated. The results presented show mass spectra in the range of 1000-10,000 atoms per cluster. As a consequence of high-gradient acceleration the cluster ions exhibit a narrow kinetic energy spectrum. The minimum beam divergence is less than 1.2 deg. The atom currents and current densities lie in the range of 0.1-0.5 A and 0.2-1.0 A/sq cm, respectively, at a beam energy of 0.5 MeV per cluster ion and at a source-detector distance of about 1.9 m. The current densities exceed the space charge limit of a proton beam at the same kinetic energy and with the same beam geometry, by several orders of magnitude. (Author)

A80-19617 **150-kV, 80-A solid state power supply for neutral beam injection.** H. Owren, W. Baker, D. Hopkins, and K. Milnes (California, University, Berkeley, Calif.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 325-330.

A 150-kV, 80-A power supply and neutral beam test facility is now operational at the Lawrence Berkeley Laboratory, Berkeley, Calif. This supply uses banks of 450-V electrolytic capacitors for over one million joules of energy storage. SCR switches control the power flow to the neutral beam accelerator. Turn on and off times of a few microseconds are possible. An auxiliary capacitor bank also uses SCR switches to provide regulation ('flat-topping') of the main bank output by switching in additional capacitors as the main bank discharges. Air-operated switches are used to connect the main-bank sections in parallel for charging and series or parallel for discharge, depending on the operating voltage desired. (Author)

A80-19618 **Construction and test of a high power injector of hydrogen cluster ions.** E. W. Becker, H. D. Falter, O. F. Hagena, P. R. W. Henkes, R. Klingelhofer, H. O. Moser, W. Obert, and I. Poth (Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 331-337. 12 refs.

A high power injector of hydrogen cluster ions, rated for 1 MV and 100 kW, is described. The injector is split in three separate tanks connected by a 1 MV transfer line. The cluster ion beam source and all its auxiliary equipment is placed at high voltage, insulated by SF6 gas at a pressure of 4 bar. The main components of the injector are: The cluster ion beam source with integrated helium cryopumps, the CERN type acceleration tube with 750 mm i. d., the beam dump designed to handle the mass and energy flux under dc conditions, a 1 MV high voltage terminal for the auxiliary equipment supplied by its 40 kVA power supply with power, and the 1 MV 120 kW dc high voltage generator. This injector is installed in Karlsruhe. Performance tests were carried out successfully. It is intended to use this injector for refueling experiments at the ASDEX tokamak. (Author)

A80-19619 **The application of computers to fusion experimental facilities.** M. C. Crowley-Milling (Organisation Européenne pour la Recherche Nucléaire, Geneva, Switzerland). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 341-355.

The reasons for employing computers in control and data acquisition in fusion experimental facilities are discussed. Special requirements are examined when applying computers, interface equipment, software and other operator interfaces to fusion experiments. Some requirements that are mentioned are (1) the recording of maximum data amounts per shot, and (2) the archiving of data from previous shots with simple recall methods. Attention is given to various computer system layouts for fusion experiments including TEXTOR, TORUS II, and JET, and to the software and interface systems. The paper is concluded with a look at possible future developments such as towards simple and cheap devices that can be used to bring computing power into mass production with little cost increase. C.F.W.

A80-19620 **Electrical power system to TFTR poloidal coils.** G. Karady, P. Bellomo, F. Petree (Ebasco Services, Inc., Princeton, N.J.), and R. Cassel (Princeton University, Princeton, N.J.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 359-364. 6 refs. Contract No. EY-76-C-02-3093.

This paper describes the Tokamak Fusion Test Reactor Ohmic Heating (OH), Variable Curvature (VC), Equilibrium Field (EF) and Horizontal Field (HF) Systems. The system design consists of five OH coils, four EF coils, one VC coil, one HF coil and one shared EF-OH coil. Interlaced between OH coils are six 3 kV, 24 kA converters, shunted by an OH interrupter and coil overvoltage protection circuitry. Interlaced between EF coils are four 4 kV, 24 kA converters, a 3 MJ capacitor bank and coil overvoltage protection circuitry. The four 3 MJ capacitor banks are used for plasma compression. An interesting feature of the poloidal system is the application of switchgear which allows arrangement of the EF capacitor banks either for plasma compression during experimental operation or for aggressive discharge cleaning of the vacuum vessel. (Author)

A80-19621 **The combined d.c. power supply for JET.** D. Ciscato (EURATOM and CNR, Abingdon, Oxon, England) and E. Coccorese (Calabria, Università, Abingdon, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 365-370.

In view of the possibility that the Joint European Torus (JET) experiment could include a high energy pulse, a combined Power Supply scheme has been envisaged which makes use both of Flywheel-Generator-Convertors (FGC) and of the public network. The paper deals with the design of the new scheme, including two 400/33 kW step-down transformers, taking into account the limits on the reactive power and voltage drop at the 400 kV line. The analysis is performed through a comprehensive computer simulation program developed for this purpose. The results of the simulation and the final design with the rating of major equipment are given. (Author)

A80-19624 **Constant current and constant voltage excitation of large coils by flywheel-generator-converter.** J. Kodaira, A. Miyahara, K. Matsuura (Nagoya University, Nagoya, Japan), K. Hirayama, S. Nohara, and Y. Hirata (Toshiba Corp., Fuchu, Japan).

In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1.
Oxford and New York, Pergamon Press, 1979, p. 383-388.

The excitation of large dc coils by feedback to the exciter of the flywheel-generator-converter is an important problem regarding large fusion devices. This paper examines experimental data on the excitation of the toroidal and helical coils of the JIPP-T-2 tokamak-stellarator hybrid and the main solenoidal coils of the RFC-XX double cusped machine by a 100 MW flywheel-generator-converter. Results are presented on the direct-current and dc-voltage operation of these coils. B.J.

A80-19629 **Ignitron switching problems associated with a large reversed field pinch experiment.** P. M. Barnes, R. A. Burden, and J. W. Gray (EURATOM and U.K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1.
Oxford and New York, Pergamon Press, 1979, p. 413-418.

The switching requirements for the main toroidal (I sub theta) and poloidal (I sub z) field systems for a large reversed field pinch (FRP) experiment are discussed. Both field systems are capacitor driven with a total start bank energy of 5MJ at 8kV. Circuit analysis is given showing the requirement for partial oscillatory discharge currents from the start banks and also the need for an extended clamping range outside the conventional second quadrant. In order to meet these requirements using ignitron switching it is necessary to connect the ignitrons in 'inverse-parallel' pairs. This allows commutation of the main current at current zero in order to prevent any excess reverse current flow through the ignitron, and also prevents the extinction of main current as it passes through zero at low values of di/dt. This 'inverse-parallel' connection also allows the clamping range to be extended over the full 360 degrees. Test results are included showing the commutation limitations of type E (BK 496) ignitrons when connected in an 'inverse-parallel' configuration. The di/dt limitations for oscillatory discharge currents in single ignitrons are also given. (Author)

A80-19655 **Developments for the high voltage test of pulsed superconducting coils.** A. Ulbricht, G. Nöther, and L. Siewerdt (Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 1.
Oxford and New York, Pergamon Press, 1979, p. 609-614. 9 refs. EURATOM-supported research.

The paper presents some experimental results obtained with an inductive power pulse generator of 40 MW switching power at 47 kV. A special bushing and a complete protection system of the pulse generator were developed and tested. Attention is given to an investigation of the voltage rise during the switching process as well as of the energy balance, which are then compared with calculated values. Finally, a cost estimate based on the results of the experiment is given for the application of a superconducting switch in an ohmic heating circuit for tokamaks. M.E.P.

A80-19657 **Neutronics in the toroidal belt-geometry of a screw pinch reactor.** K. A. Verschuur (Netherlands Energy Research Foundation, Petten, Netherlands). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 623-629. 8 refs.

The neutronics characteristics of the Belt Screw Pinch Reactor, which differ markedly from those for a tokamak reactor, are studied. Transport calculations have been performed in the toroidal belt geometry using albedos and accompanying absorption data for the blanket, which are calculated with one-dimensional Sn. For this purpose the ANISN code has been modified (ANISN-ALB), and the code FURNACE developed. The results for the BSPR show a marked poloidal variation of the neutron wall loading, the heating and the tritium production. The experiences with the codes ANISN-ALB and FURNACE are promising. (Author)

A80-19658 **Blanket and power conversion system of NUWMAK.** D.-K. Sze (Wisconsin, University, Madison, Wis.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2.
Oxford and New York, Pergamon Press, 1979, p. 631-637. 8 refs. Research supported by the U.S. Department of Energy and Wisconsin Electric Research Foundation.

A blanket design based on titanium structure, boiling water cooling, and using a phase change material as energy storage and tritium breeder is presented. This design is aimed to solve many problems associated with a tokamak reactor. In particular, thermal fatigue, thermal energy storage, tritium leakage problems are much alleviated. A respectable thermal efficiency is obtainable. Such a blanket and power conversion system should be simple, safe and reliable. (Author)

A80-19660 **Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4.** D. Guggi, H. R. Ihle, and U. Kurz (EURATOM and Kernforschungsanlage Jülich GmbH, Institut für Chemie, Jülich, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 645-650. 6 refs.

A80-19662 **Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets.** T. K. Basu, P. Cloth, D. Filges, and V. R. Nargundkar (EURATOM and Kernforschungsanlage Julich GmbH, Institut für Reaktorentwicklung, Jülich, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 657-660. 6 refs.

A80-19663 **Some implications of a cellular structure in minimum thickness fusion reactor blankets.** L. J. Baker (Atomic Energy Research Establishment, Harwell, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 661-666. 7 refs.

Some results are presented of survey neutron and photon transport calculations aimed at minimizing the thickness of fusion reactor blankets. It is demonstrated that a 3 zone helium cooled model may be chosen to yield a blanket employing an 0.2 m thick breeding zone. The transport calculations are of an idealized representation in that they ignore the inevitable subdivision of the blanket into cells for practical manufacturing and maintenance reasons. Monte Carlo calculations are described in which the implications of this are investigated. Parameters explored include the tritium breeding rates and the local increases in neutron flux and radiation damage at the rear of the blanket due to inter-cell streaming. (Author)

A80-19664 **Possible improvements to a basic cellular thin blanket fusion reactor configuration.** G. Constantine (Atomic Energy Research Establishment, Harwell, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 667-672. 7 refs.

In a companion paper the implications of subdividing a thin fusion reactor blanket into discrete cells have been explored with particular reference to neutron streaming through the intercell spaces and the accompanying reduction in tritium breeding. A possible solution to both these problems is to fill these spaces with canned graphite blocks. Monte Carlo calculations are presented which demonstrate the effect of these graphite 'infillers' on the neutron economy of the blanket. Estimates are made of the nuclear heating of the infillers and the peak temperatures attained if cooling takes place only by radiative heat transfer to the cells and first wall. (Author)

A80-19665 **Two-dimensional heating analysis of fusion blankets for synfuel production.** O. W. Lazareth, J. S. K. Tsang, and J. R. Powell (Brookhaven National Laboratory, Upton, N.Y.). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 673-678. Research sponsored by the U.S. Department of Energy.

Fusion reactors could be used to generate electric power and produce synthetic fuels with relatively high efficiencies (about 60%). A two temperature zone blanket coupled to a high temperature electrolysis system would be used. An important parameter in this system is the ratio of the fusion neutron kerma energy absorbed by the hot interior (the higher temperature zone) to the total energy/fusion. This parameter is calculated as approximately 0.5 for both a one and two-dimensional model of the blanket module, and is a reasonable value for efficient energy production. (Author)

A80-19668 **A system for the control of tritium losses in primary and steam circuits of a fusion power plant.** F. Lanza, P. Rocco, and F. van Rutten (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Recerche, Ispra, Italy). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 691-695. 10 refs.

An analysis of the tritium pathway in the cooling system of a tokamak power reactor (FINTOR-D) shows the important role played by water impurities in the helium circuit. A dehydration system is described and the consequences on the tritium content in the cooling system are discussed. (Author)

A80-19669 **Investigations of isotope separation effects of a Ti-fluidized bed.** H. Weichselgartner and J. Perchermeier (EURATOM and Max-Planck-Institut für Plasmaphysik, Garching, West Germany). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 697-702. 8 refs.

Experimental data on separation effects by hydrogen isotopes of a Ti-fluidized bed are presented. Desorption measurements of H_2 and D_2 on solid samples (foils, wires, bulk material and Ti solid bed getters) are discussed in terms of diffusion processes and compared with the fluidized bed results. The isotopic separation behavior of a fluidized bed in order to separate T_2 from other hydrogen isotopes in fusion devices is evaluated. A proposal is made how a fluidized bed must be designed of meeting specific needs of fusion devices. (Author)

A80-19670 **Main power supplies for large toroidal fusion experiments.** E. Bertolini. In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 705-728. 23 refs.

The paper examines main power supplies for large toroidal fusion experiments. The tokamak loads, the toroidal magnetic field coils, the poloidal magnetic field system coils, and the plasma positioning system are discussed; in addition, energy storage by rotating machinery and by a static system are considered. The main power supplies for tokamaks use conventional synchronous alternators; however, since the operational duty is not conventional it is suggested that the power supply design be reassessed by examining Local Energy Storage, Flywheel-Generator-Converter (FGC), and Transformer Controlled Convertor (TCC) equipment. In FGC units the generator is mechanically coupled to a motor driver and to a high inertia rotor to store the energy; the TCC units have been considered for the large tokamaks with powers exceeding 500 MW. A.T.

A80-19672 **Behavior of SORB-AC wafer pumps in contaminated H_2 plasmas and during maintenance of plasma machines.** B. Ferrario and L. Rosai (SAES Getters S.p.A., Milan, Italy). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 737-744. 9 refs.

A80-19676 **The design of a thin walled toroidal vacuum chamber for a large RFP experiment.** K. E. Lavender, H. J. Crawley, J. E. Partridge, and S. Skellett (EURATOM and U. K. Atomic Energy Authority Fusion Association, Culham Laboratory, Abingdon, Oxon, England). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 771-775.

A80-19682 **Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400.** B. M. U. Scherzer, R. Behrisch, H. Schmidl (EURATOM and Max-Planck-Institut für Plasmaphysik, Garching, West Germany), and R. S. Blewer. In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 809-814. 7 refs.

The coverage of the liner of TFR 400 with B, C, O, Mo and W and the areal density of trapped deuterium have been measured on about 50 samples cut from the liner after shutdown. Spatial distributions around the outer periphery and around 4 small cross sections are reported. A very close correlation is found for the Mo-deposit and the trapped deuterium. Depth profiles measured by proton elastic scattering (PES) and D(He-3, He-4)H nuclear reaction show the same correlation. This behavior indicates that trapped deuterium is covered by fresh limiter material so that the greater part of trapped gas does not participate in the recycling process. (Author)

A80-19708 **Status of the JET project.** P. H. Rebut (EURATOM and Commissariat à l'Energie Atomique, Abingdon, Oxon., England). *(International Atomic Energy Agency, Technical Committee Meeting on Large Tokamak Experiments, Paris, France, Sept. 1-6, 1978.)* In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 1035-1048.

With regard to the JET project, the physics of the plasma is discussed in terms of a high beta (of 5 10 percent) plasma in equilibrium, reducing the plasma impurity level, and RF heating, particularly by magnetic pumping, and ion cyclotron and hybrid ion-ion resonance heating methods. Machine systems considered are first: a double wall inconel vacuum vessel utilizing a metal bakeable gate valve which is the vacuum vessel/neutral injector interface; and second, magnetic systems including toroidal field coils and the poloidal field system. Two identical flywheel generator convertor systems consitute the power supply system, each made up of a vertical shaft generator, motor drive, static excitation unit and diode convertor unit, and each capable of delivering 2.6 GJ/pulse (30 s every 10 minutes), and peak power of 400 MW. In addition, a temperature-controlled recirculatory ventilation system is employed. The torus hall is maintained at an underpressure 7 mbar below atmospheric, while the intermediate hall is maintained at 5 mbar below atmospheric. J.P.B.

A80-19709 **JT-60 project.** M. Yoshikawa (Japan Atomic Energy Research Institute, Tokai, Ibaraki, Japan). In: Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 1079-1083.

The status and design of the Japanese JT-60 tokamak are reported. Scaling studies on JT-60, a large tokamak for the production of reactor-grade plasmas and the investigation of their physical and technical aspects relative to fusion reactor development, were begun in about 1970, with formal initiation of the JT-60 Program in 1973. After the conceptual design, preliminary design, engineering development and preconstruction design phases, the construction of the device was started in April, 1978 and is expected to be completed in 1983. The tokamak is designed for non-DT studies at temperatures up to 10 keV and confinement times up to 1 sec with a long discharge duration. The device features a removable magnetic limiter for the control of current distribution and impurity content, a molybdenum liner, copper-based toroidal field coils with poloidal field coils inside them, and plasma heating by neutral beam injection at 75-keV and 20 MW and lower hybrid resonance heating at 10 MW; diagnostics are made along horizontal and vertical view lines and at an angle of 40 deg with the median plane. A.L.W.

A80-19716 # **Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles.** K. Akagawa, T. Fujii, T. Sakaguchi (Kobe University, Kobe, Japan), and M. Aota (Kinki Industry Co., Japan). *JSME, Bulletin,* vol. 22, Nov. 1979, p. 1595-1603. 12 refs.

Further improvements in thermal efficiency of steam and nuclear power plants are an important problem in the present energy crisis. This report presents the performance characteristics of two fundamental condensation cycles employing carbon dioxide as a working medium. The effects of cycle parameters on thermal efficiency in non-reheat and reheat condensation cycles and values of optimum reheat pressures are discussed. Furthermore, losses in each component in different CO2 cycles by utilizing the energy concept based on the second law of thermodynamics were analyzed and the effects of regenerating on irreversible losses were discussed. As the result, it was shown that at turbine inlet pressure of about 250 ata and turbine inlet temperatures higher than 650 C CO2 condensation cycles in double- or triple-reheating give a better performance than conventional steam power-plant cycles. (Author)

A80-19740 **Improved planar solar convertor based on uranyl neodymium and holmium glasses.** R. Reisfeld and Y. Kalisky (Jerusalem, Hebrew University, Jerusalem, Israel). *Nature,* vol. 283, Jan. 17, 1980, p. 281, 282. 7 refs.

The energy transfer between uranyl ions (UO2(+2)) and neodymium and holmium ions at concentrations suitable for use as glass dopants is calculated in order to evaluate the possibility of using uranyl-neodymium and uranyl-holmium codoped glasses in solar energy collectors. It is shown that, due to energy transfer from UO2(+2) to Nd(+3), the integrated fluorescence intensity of the 1.06-micron transition of Nd(+3) excited in the spectral range 360 to 500 nm is increased by a factor of 8.5, which corresponds to an increase of 150% over that of neodymium-only-doped glass excited in the range 360 to 800 nm. For excitation into the maximum absorption peak of UO2(+2) near 420 nm, emission spectra of ND(+3) and Ho(+3) glasses codoped with UO2(+2) indicate that collector efficiency can be improved by the utilization of energy transfer from uranyl ions, which absorb strongly in the solar spectrum, to Nd(+3), which emits in bands matching the maximum sensitivity of solar cells, however the application of Ho(+3)-codoped glasses may not be practical due to low branching ratios in holmium transitions. A.L.W.

A80-19844 **Solar cells in practice (Solarzellen in der Praxis).** H. Rechberger (ATEC Electronic GmbH, Munich, West Germany). *Elektronik,* vol. 29, Jan. 10, 1980, p. 72-78. 10 refs. In German.

The paper presents an overview of solar energy, its various types and its uses as an alternate energy source. Attention is given to the characteristic curves of solar cells that are determined by temperature, series resistance, and shunt resistance. The development, construction types, assembly, circuitry and dimensioning of solar cells are discussed in detail. The use of solar generators as an application where no power-supply voltage exists is also discussed. C.F.W.

A80-19847 # **Relativistic high-current microwave plasma electronics (Reliativistskaia sil'notochnaia SVCh plazmennaia elektronika).** L. S. Bogdankevich, M. S. Rabinovich, and A. A. Rukhadze (Akademia Nauk SSSR, Fizicheskii Institut, Moscow, USSR). *Fizika,* vol. 22, no. 10, 1979, p. 47-58. 21 refs. In Russian.

This review examines advances in the field of relativistic microwave plasma electronics associated with the utilization of high-current electron beams. Attention is given to classical (non-quantum) electronics and to the exploitation of the following radiation mechanisms: (1) transition radiation, (2) bremsstrahlung, (3) cyclotron radiation, (4) Cerenkov radiation, and (5) the Compton effect. The utilization of such effects in TWTs, BWTs, and magnetrons is discussed. B.J.

A80-19955 **Cavity enhancement by controlled directional scattering.** R. Winston (Chicago, University, Chicago, Ill.). *Applied Optics,* vol. 19, Jan. 15, 1980, p. 195-197. 10 refs.

A method for designing cavity enclosures is presented that can be applied to the design of a nonimaging concentrator. The method maintains high transmission at the expense of some concentration in the presence of a gap between the reflector and the receiver. The slight loss of concentration may be partly offset by enhanced absorption of radiation by the receiver, resulting from the cavity effect. C.F.W.

A80-19976 **New concept for a system suitable for solar simulation.** I. Powell (National Research Council, Ottawa, Canada). *Applied Optics,* vol. 19, Jan. 15, 1980, p. 329-334. 8 refs.

A theoretical study of a new approach for a solar simulator design capable of testing solar collectors is described. The technique involved in this design requires that the source have rotational symmetry and employs a 2-D approach in the calculation of the irradiance in the image plane. Reflecting surfaces to be used with two different types of light source are computed to illustrate practical applications of this method. (Author)

A80-19989 # **Open cycle air turbine solar thermal power system (Générateur solaire a turbine a air fonctionnant en cycle ouvert).** E. Le Grivès (ONERA, Châtillon-sous-Bagneux, Hauts-de-Seine, France). *La Recherche Aérospatiale,* Nov.-Dec. 1979, p. 355-373. 9 refs. In French.

Solar electrical power generation using a heated air turbine in conjunction with a tower-mounted central receiver and heliostat field can be hybrid fossil fuel fired so as to avoid thermal storage problems. Using a regenerative gas turbine open cycle, no cooling system is required. It is shown that with a solar receiver concept allowing a fast thermal response to transient radiation situations, a turbine inlet temperature of 1100 to 1150 K can be reached with an overall efficiency (power available on turbine shaft/power radiated into receiver) of 25 percent, with a 2000 sun concentration ratio. Solar receiver, turbocompressor and regenerator sizes are given for a thermal power input of 1 MW into the receiver. (Author)

A80-20058 # **Digital computer modeling of steady-state conditions of the magnetoplasmadynamic generator current layer (Modelirovanie na TSVM ustanovivshegosia rezhima tokovogo sloia magnitoplazmodinamicheskogo generatora).** N. V. Markovskii and G. L. Baranov (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Problemy Tekhnicheskoi Elektrodinamiki,* no. 69, 1979, p. 34-40. 14 refs. In Russian.

The paper examines a physical model of the high-temperature current layer which interacts with magnetoplasmadynamic generator duct walls. A mathematical model using nonlinear differential equations which depict this process is utilized, and the results of digital computer computations conforming to a block-diagram of this model for various operating conditions are presented. A.T.

A80-20066 # **Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core (Issledovanie vliianiia induktivnosti porshnia na energeticheskie kharakteristiki porshnevogo lineinogo generatora s ferromagnitnym serdechnikom).** S. S. Pignastii (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Problemy Tekhnicheskoi Elektrodinamiki,* no. 69, 1979, p. 109-114. 5 refs. In Russian.

A80-20069 # **Change in rate of conducting-piston motion and the characteristics of field-diffusion processes in a linear electromechanical energy converter (Izmenenie skorosti dvizheniia provodiashchego porshnia i osobennosti protsessov diffuzii polia v**

lineinom elektromekhanicheskom preobrazovatele energii). V. T. Chemeris and S. A. Gavrilko (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Problemy Tekhnicheskoi Elektrodinamiki,* no. 70, 1979, p. 94-99. In Russian.

A80-20128 * **Space applications of superconductivity - High field magnets.** F. R. Fickett (National Bureau of Standards, Thermophysical Properties Div., Boulder, Colo.). *Cryogenics,* vol. 19, Dec. 1979, p. 691-701. 20 refs. NASA Order A-437018.

The paper discusses developments in superconducting magnets and their applications in space technology. Superconducting magnets are characterized by high fields (to 15T and higher) and high current densities combined with low mass and small size. The superconducting materials and coil design are being improved and new high-strength composites are being used for magnet structural components. Such problems as maintaining low cooling temperatures (near 4 K) for long periods of time and degradation of existing high-field superconductors at low strain levels can be remedied by research and engineering. Some of the proposed space applications of superconducting magnets include: cosmic ray analysis with magnetic spectrometers, energy storage and conversion, energy generation by magnetohydrodynamic and thermonuclear fusion techniques, and propulsion. Several operational superconducting magnet systems are detailed. V.L.

A80-20141 Use of nuclear techniques in the characterization of chrome black solar absorber surfaces. Z. E. Switkowski (Kodak /Australasia/ Pty., Ltd., Coburg, Victoria, Australia), J. C. P. Heggie (Melbourne, University, Melbourne; St. Vincent's Hospital, Fitzroy, Victoria, Australia), G. J. Clark (Commonwealth Scientific and Industrial Research Organization, Div. of Mineral Physics, North Ryde, New South Wales, Australia), and R. J. Petty (Alfred Hospital, Prahran, Victoria, Australia). *Australian Journal of Physics,* vol. 32, Sept. 1979, p. 343-360. 36 refs.

A set of electrodeposited chrome black solar absorbers has been subjected to ion beam analysis in an attempt to determine the concentration depth profiles of the major elemental constituents. Chromium distributions were obtained using the Cr-52(p, gamma) Mn-53 nuclear reaction, which is resonant at Ep = 1005.2 keV. The possibility was investigated of inferring oxygen distributions from the gamma-ray lineshapes (measured with a Ge(Li) detector) of the direct capture reaction O-16(p, gamma)F-17. Concentration profiles were also obtained for fluorine and sodium contaminants in some chrome blacks. Complete experimental details are given of the various nuclear techniques used. The results of these measurements are discussed in terms of the microscopic physical features of the selective surfaces and are related to the known photothermal properties of the surfaces. (Author)

A80-20157 Steady-state currents driven by collisionally damped lower-hybrid waves. R. McWilliams, E. J. Valeo, R. W. Motley, W. M. Hooke, and L. Olson (Princeton University, Princeton, N.J.). *Physical Review Letters,* vol. 44, Jan. 28, 1980, p. 245-248. 24 refs. Contract No. EY-76-C-02-3073.

Experiments demonstrating the transfer of momentum from lower-hybrid (electron plasma) waves to electron currents, which offer a plausible alternative to pulsed Ohmic heating currents in tokamaks, by means of collisional absorption are reported. Lower-hybrid waves were excited by bursts of 60 to 70-MHz fields applied to phased loops mounted on the outside of a fused quartz tube surrounding a linear helium, neon or argon afterglow plasma, and the current was studied as a function of input power. It is found that lower-hybrid waves can generate current densities on the order of a saturation density which is on the order of the toroidal currents required in tokamaks. The electron current obtained is observed to be roughly half that predicted by an approximate solution of an electron kinetic equation with a Lorentz collision operator, and possible reasons for this discrepancy are discussed. The wavelength dependence of the current predicted by the theory is, however, verified. A.L.W.

A80-20158 Effect of finite beta on drift-wave turbulence and particle confinement. A. Hasegawa (Bell Telephone Laboratories, Inc., Murray Hill, N.J.), H. Okuda (Princeton University, Princeton, N.J.), and M. Wakatani (Kyoto University, Kyoto, Japan). *Physical Review Letters,* vol. 44, Jan. 28, 1980, p. 248-251. 11 refs. Research supported by the Yamada Foundation; Contract No. EY-76-C-02-3073.

Consideration is given to the effect of plasma beta on electric potential and diffusion in a toroidal plasma with magnetic shear. Mode-coupling equations are derived for a finite-beta plasma with magnetic shear which describe the coupling in finite-beta drift Alfven wave turbulence. It is shown that when beta is greater than the square of the inverse aspect ratio, cross-magnetic-field diffusion is enhanced by the appearance of convective cells, while if beta is much less that the square of the inverse aspect ratio, the electric potential obeys the Hasegawa-Mima mode-coupling equation for electrostatic drift waves, reducing plasma diffusion. Results of numerical experiments are presented which confirm the theoretical results. A.L.W.

A80-20159 Study of current-driven magnetohydrodynamic instability in the Heliotron-D device. O. Motojima, A. Iiyoshi, and K. Uo (Kyoto University, Uji, Japan). *Physical Review Letters,* vol. 44, Jan. 28, 1980, p. 251-255. 15 refs.

The magnetohydrodynamic stability of the Ohmically heated plasma in the Heliotron-D device, which has a large external rotational transform and strong shear, is investigated. Magnetohydrodynamic activity was analyzed in a helium plasma in the Pfirsh-Shlüter regime as the Ohmic current was varied from 0.5 to 2 in a direction chosen to increase the rotational transform by an array of magnetic probes outside the plasma. Instabilities are found to occur in the regions where the sum of the Ohmic current and the external rotational transform is an integer, however, the Ohmic current can exceed the unstable regimes, resulting in stable discharges for an Ohmic current greater than unity. It is found that there is no Ohmic current flow outside the plasma, and the stabilizing effect of the magnetic shear on the predicted MHD instabilities is demonstrated. A.L.W.

A80-20165 A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering. R. Behn (Stuttgart, Universität, Stuttgart, West Germany). *Physics Letters,* vol. 74A, Nov. 26, 1979, p. 316-318. 10 refs.

A repetitively Q-switched ruby laser employing a prototype system that uses six linear flashlamps, set up in a close-coupled configuration to pump a 5/8 in. by 6.5 in. ruby rod, is examined. The laser is capable of recording the temporal evolution of electron density and temperature of a tokamak-type plasma by Thomson scattering. Due to the repetition rates and the fact that inversion stays well below the level of single pulse operation, it is determined that the requirements concerning the contrast ratio of the optical switch can be reduced. It is shown that with a high density arc plasma a temporal resolution of 40 microsec has been achieved. C.F.W.

A80-20242 Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning. T. K. Budge and M. H. Inglis (New Mexico, University, Albuquerque, N. Mex.). In: American Society of Photogrammetry, Fall Technical Meeting, Albuquerque, N. Mex., October 15-20, 1978, Proceedings.
Falls Church, Va., American Society of Photogrammetry, 1978, p. 82-91. Research supported by the New Mexico Energy and Minerals Department and New Mexico Energy Institute.

A80-20274 Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage. G. Wilemski (Physical Sciences, Inc., Woburn, Mass.). *Journal of Chemical Physics,* vol. 72, Jan. 1, 1980, p. 369-377. 10 refs. Research supported by the U.S. Department of Energy.

Nonequilibrium thermodynamics is used to analyze the spatial distribution of heat release mechanisms occurring in fuel cells operating under load in nonisothermal steady states. Novel contributions to heat release in the bulk electrolyte are found which are analogous to Peltier and Thomson effects in metallic conductors. Expressions for the heat release at individual electrodes are presented. An equation for the voltage of these cells is also derived. (Author)

A80-20378 **Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens.** D. S. Sklarew (Arizona, University, Tucson, Ariz.). *Geochimica et Cosmochimica Acta,* vol. 43, Dec. 1979, p. 1949-1958. 40 refs. Grant No. NGR-03-002-171.

A80-20424 **OTEC - Solar energy from the sea.** R. H. Douglass, Jr. (TRW Defense and Space Systems Group, Systems Engineering and Integration Div., Redondo Beach, Calif.). *Quest,* vol. 3, Autumn 1979, p. 3-29.

The principles and history of ocean thermal energy conversion (OTEC) are discussed, along with U.S. and foreign OTEC programs, where all proposed OTEC plants use the Rankine cycle. Particular attention is given to OTEC components such as the mechanically durable 0.030 inch thick tube walls of the heat exchanger. The working fluid of modern closed cycle systems is ammonia, and mechanical cleaning and chlorination are used against biofouling. Heat exchanger types, including shell-and-tube, plate-fin, and trombone are considered, as well as the hull of the plant, its platform, sea water pumps, and differently designed cold water pipes. Moreover, computer models designed to study performance sensitivity to various operating parameters are discussed. J.P.B.

A80-20453 **The challenge of efficiently retorting very nonuniform beds of oil shale rubble.** T. R. Galloway (California, University, Livermore, Calif.). *In Situ,* vol. 3, no. 4, 1979, p. 279-330. 55 refs. Contract No. W-7405-eng-48.

The paper reviews current analyses of the problem, together with experimental evidence for the key fluid-mechanical, heat-transfer, and mass-transfer processes that cause these lower yields. It is found that loss in retort oil yield is dominated by the flow patterns in the matrix material around the large blocks and by the thermal transient characteristics within the blocks. The principal mechanism appears to be burning and cracking of the produced oil in the gas phase near the larger shale blocks. The use of process-control methods involving air/steam ratio, total flow, and flow variations coupled with monitored exit-gas composition appears feasible to maximize oil production. (Author)

A80-20454 **Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere.** E. Pedram, M. A. Hasanain, A. L. Hines (Colorado School of Mines, Golden, Colo.), and J. J. Duvall (U.S. Department of Energy, Laramie Energy Technology Center, Laramie, Wyo.). *In Situ,* vol. 3, no. 4, 1979, p. 331-352. 14 refs. Contract No. DE-AC20-79LC10020.

The recovery of oil from shale by in situ retorting eliminates mining a portion of the shale and the pollution problems related to the disposal of large quantities of spent shale. Spent shale beds offer a possible means of disposing of retort water and undesirable combustion gases. This study investigates the adsorption of hydrogen sulfide on oil shale retorted in nitrogen at temperatures from 250 to 950 C and the changes in the properties of shale during retorting. Chemical and X-ray diffraction analyses results indicate a strong influence of retorting on the properties of spent shale. Adsorption studies resulted in equilibrium isotherms modeled by the Langmuir, Freundlich, and Polanyi equations and the data for all temperatures showed good consistency. It is shown that while the use of spent shale beds as a means of disposing of undesirable retort gases appears feasible, a prediction as to the effectiveness of the retort zone as a disposal site would be premature. V.L.

A80-20455 **Mineral changes during oil shale retorting.** W. C. Park, A. E. Lindemanis, and G. A. Raab (Occidental Research Corp., Irvine, Calif.). *In Situ,* vol. 3, no. 4, 1979, p. 353-381. 34 refs.

Most shale oil processes operate well above 400 C and the elevated temperatures also cause various inorganic reactions. The paper investigates the solid-state mineral reactions which occur under conditions encountered during in situ retorting. These reactions are important in modeling the retorting process and in selecting operating parameters to minimize the environmental impact of spent shale on ground water. To characterize the mineral assemblages and compositions in the retorted spent shale several methods are used, such as X-ray powder diffraction, optical microscopy of polished-thin sections, and electron microprobe analysis. Some of the conclusions made as a result of the study are: 1) for extended retorting at over 700 C all carbonates are converted to silicates; 2) the decomposition of the carbonate minerals to the free oxides is highly endothermic but enthalpy is reduced during silication; and 3) ground water leachability can be minimized by the formation of the silicate minerals at the high temperatures and long times utilized for in situ retorting. V.L.

A80-20456 # **OTEC - A comprehensive energy analysis.** T. C. G. Carlson (Massachusetts, University, Amherst, Mass.). *Mechanical Engineering,* vol. 102, Jan. 1980, p. 32-39. 18 refs.

A comprehensive energy analysis is presented for a proposed Gulf-Stream-based Ocean Thermal Energy Conversion (OTEC) system designed to supply upon demand 148 billion kWh to New England by 1990. Basically, the system consists of one hundred and six 400-MW power plants, with factors of 0.93, generating hydrogen on-board which is transported by underwater pipe to deep-water storage or to terminals onshore for reconversion to electricity. The results of a net energy-input-output analysis show that the OTEC system compares favorably with other energy conversion systems: e.g. for the same net electric energy output it uses from 36 to 53 percent less fossil fuel than the two nuclear power plant systems used for comparison. A dynamic energy analysis indicates energy payoff times from 4.7 to 6.2 years and on-line times of 17 to 35 years. V.L.

A80-20495 # **Possibility of conversion of solar corpuscular radiation energy into electrical energy (O vozmozhnosti preobrazovaniia energii korpuskuliarnogo izlucheniia solntsa v elektricheskuiu).** S. Ibadov (Akademiia Nauk Tadzhikskoi SSR, Institut Astrofiziki, Dyushambe, Tadzhik SSR). *Akademiia Nauk Tadzhikskoi SSR, Doklady,* vol. 22, no. 7, 1979, p. 408-412. 12 refs. In Russian.

The paper considers the use of an electrical capacitor type device for the spaceborne conversion of corpuscular radiation energy from solar flares into electrical energy. Some calculations are presented for the case of such a device being located in interplanetary space or at the surface of a planet with a weak magnetosphere. B.J.

A80-20499 **The controlling production mechanism of methane gas from coalbeds.** T. M. Doscher (Southern California, University, Los Angeles, Calif.), V. A. Kuuskraa, and E. Hammershaib (Lewin and Associates, Washington, D.C.). *Energy Sources,* vol. 5, no. 1, 1980, p. 71-84.

Characteristics of the production of methane from coal and physical mechanisms controlling the production are investigated. It is shown that the recovery of methane is determined by the interaction of two controlling factors: diffusion of methane from coal into the fracture system and permeability within the fracture system, with ultimate recovery depending upon the concentration of methane and the effective drainage volume of the wellbore. At low diffusion constants recovery is limited by diffusion and increasing production requires connecting large additional surface areas to the wellbore. At higher diffusion constants recovery is permeability-limited and can be improved by increasing the wellbore radius or the permeability. V.L.

A80-20538 **New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium.** T. Saito (Soka University, Tokyo, Japan), T. Shimojo, and S. Goto (Tokyo Gakugei University, Tokyo, Japan). *Nuovo Cimento B, Serie 11,* vol. 53 B, Oct. 11, 1979, p. 301-310. 11 refs. Research supported by the Ministry of Education, Science and Culture of Japan.

The structure of an equilibrium, axially symmetric electron beam propagating in a plasma medium is studied in the framework of the relativistic Vlasov equations and the Maxwell equations. Instead of the usually adopted assumption that the neutralization fraction is independent of radial position, the more physical requirement that the energy of the electromagnetic fields produced by the particles takes its minimum value is proposed. The condition for the electron beam and plasma medium to be in equilibrium is expressed by a well-defined relation among the temperatures, the mean velocities and the neutralization fraction, and the Bennett distribution is obtained. (Author)

A80-20641 * **Weight optimization of ultra large space structures.** R. P. Reinert (Boeing Aerospace Co., Seattle, Wash.). *Society of Allied Weight Engineers, Annual Conference, 38th, New York, N.Y., May 7-9, 1979, Paper 1301.* 22 p. 5 refs. Contracts No. NAS9-15196; No. NAS9-15636.

The paper describes the optimization of a solar power satellite structure for minimum mass and system cost. The solar power satellite is an ultra large low frequency and lightly damped space structure; derivation of its structural design requirements required accommodation of gravity gradient torques which impose primary loads, life up to 100 years in the rigorous geosynchronous orbit radiation environment, and prevention of continuous wave motion in a solar array blanket suspended from a huge, lightly damped structure subject to periodic excitations. The satellite structural design required a parametric study of structural configurations and consideration of the fabrication and assembly techniques, which resulted in a final structure which met all requirements at a structural mass fraction of 10%. A.T.

A80-20643 **The satellite power system concept and program.** G. M. Hanley (Rockwell International Corp., El Segundo, Calif.). *Society of Allied Weight Engineers, Annual Conference, 38th, New York, N.Y., May 7-9, 1979, Paper 1305.* 14 p.

The paper summarizes the approaches that have been considered for the satellite power system (SPS) and the current reference concept defined by NASA and the Department of Energy (DOE). The overall system's characteristics are described. The NASA-DOE reference SPS system consists of two different satellite approaches, both of which utilize solar photovoltaic energy conversion and have 5-GW power outputs on the ground. One approach uses a silicon solar cell array without reflecting concentrators, while the other employs gallium arsenide solar cells in an array with flat concentrators. The approach to satellite construction and transportation system characteristics are also described. V.T.

A80-20686 # **Utilization of ocean heat for hydrogen production (Vikoristannia tepla okeanu dlia oderzhannia vodniu).** B. O. Troshen'kin. *Akademiia Nauk Ukrains'koi RSR, Visnik,* vol. 43, Oct. 1979, p. 22-30. 16 refs. In Ukrainian.

Methods of obtaining electrical energy from the temperature difference of ocean layers are reviewed, along with recent progress in the field of electrolytic hydrogen generators. The selection of chemical energy carriers for ocean thermal energy delivery systems is discussed. V.P.

A80-20714 **Coatings for enhanced photothermal energy collection. II - Non-selective and energy control films.** C. M. Lampert (California, University, Berkeley, Calif.). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 1-17. 23 refs. Research supported by the U.S. Department of Energy.

Several types of coatings and surface preparations, other than selective absorbers, can be utilized for economical collection and control of solar energy. These films can be used for both solar thermal collectors and for window systems in buildings. Numerous nonselective, hot and cold mirror, and antireflective coatings are reviewed and tabulated. Detailed reflectance, emittance and thermal stability data are presented for these various coatings. Both moderately selective and nonselective absorbers consist of black paint, chemical conversion finishes, electroplated and anodized coatings. Both hot and cold mirror coatings are selective transmitters of energy. They are considered for applications where light and heat need to be separated and trapped. Antireflective films are evaluated for use on glass surfaces. The findings of this study reveal many different types of inexpensive and promising coatings for efficient utilization of solar energy. (Author)

A80-20715 **The effect of fluorescent wavelength shifting on solar cell spectral response.** H. J. Hovel, R. T. Hodgson, and J. M. Woodall (IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y.). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 19-29. 7 refs.

Fluorescent wavelength shifting has been used to enhance the spectral response and AM0 conversion efficiency of several types of solar cells. Plastic fluorescent materials are useful for devices with a sharp cut-off in response, while ruby is suitable for devices with more gradual cut-offs. Efficiency improvements of 0.5 to 2 percentage points were measured on some cells, and greater improvements can be expected for optimized optical components. The optical efficiencies exceeded 50% for the plastic sheets and 75% for ruby. (Author)

A80-20716 **Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells.** Y. D. Shen and G. L. Pearson (Stanford University, Stanford, Calif.). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 31-43. 9 refs. NSF Grant No. DMR-84373.

The paper derives a model for Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells. Theoretical analyses indicate that a cell of this type can be designed to have a short circuit current density of the same magnitude as that of an ordinary Au-GaAs Schottky barrier solar cell, while the open circuit voltage is greater and increases with Al composition x. Analysis shows that a Au-/n/Al0.3Ga0.7As-/n/GaAs Schottky barrier solar cell with an appropriate antireflection coating can be designed to have an open circuit voltage of 0.76, a short circuit current density of 30 mA/sq cm, a fill factor of 0.87 and a conversion efficiency of 19.5% when irradiated with an input power density of 100mW/sq cm. In addition, it is shown that, in order to have good collection efficiency of the photogenerated electron-hole pairs in the GaAs layer, the AlGaAs layer thickness d must be less than 1000 A. This result was confirmed by spectral response measurements. M.E.P.

A80-20717 **Measurements of minority-carrier diffusion length in heterojunction solar cells.** L. Tarricone (CNR, Gruppo Nazionale di Struttura della Materia, Parma, Italy) and E. Gombia (CNR, Parma, Italy). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 45-52. 11 refs.

The minority carrier diffusion length in the base material of Zn(x)Cd(1-x)S/GaAs solar cells have been investigated by measuring the open-circuit voltage as a function of the wavelength of the incident light. An extension of the surface photovoltage method to heterojunctions has been tried, determining the condition by which the open-circuit voltage or the short-circuit current is a linear function of the reciprocal absorption coefficient for each wavelength. The diffusion length values, obtained by extrapolation to zero light intensity of this linear function, are reported for several heterojunctions and compared to the growth processes and to the photovoltaic performances. (Author)

A80-20719 **Cobalt oxide as a spectrally selective material for use in solar collectors.** W. Kruidhof and M. van der Leij (Delft, Technische Hogeschool, Delft, Netherlands). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 69-79. 10 refs.

Cobalt oxide on bright nickel-electroplated steel was investigated for its use as a spectrally selective material in solar collectors. Cobalt was formed electrochemically in a high efficiency cobalt sulphate bath and oxidized in air at 400 C. The bath pH-value had the greatest influence on the optical properties of the oxide with best results obtained at a pH of 2.3. Three types of cobalt oxide on bright nickel-plated steel, produced under optimal process conditions are presented. The high absorptance found at pH = 2.3 is mainly due to the structure of the upper part of the surface, which is needle-like without and rod-like with an iron(3) sulphate addition. Heating tests at different temperatures in air and in vacuum showed that of the two coatings with a high solar absorptance, the one made with an iron(3) addition to the bath seemed to be stable up to 300 C. (Author)

A80-20720 **The spectral selectivity of conducting micromeshes.** D. Pramanik, A. J. Sievers, and R. H. Silsbee (Cornell University, Ithaca, N.Y.). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 81-91. 24 refs. NSF-supported research; Contract No. EG-77-S-03-1456.

The intrinsic absorption produced by the texture and finite conductivity of thin micromeshes is shown to severely limit their potential as a new class of heat mirrors. For semiconducting meshes it is shown that a 90% transmissivity in the solar spectral region is not compatible with a 90% reflectivity in the thermal re-radiation region; for metallic meshes only Al and Mg with submicron wire diameters show a potential improvement in selectivity over that obtained with thin metallic films. (Author)

A80-20722 **Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion.** D. C. Booth, D. D. Allred, and B. O. Seraphin (Arizona, University, Tucson, Ariz.). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 107-124. 33 refs. Contract No. ER-78-S-02-4899.

By pyrolytic decomposition of silane in the presence of dopant gases, a set of amorphous silicon films was prepared that contains various concentrations of carbon, nitrogen, boron or germanium. The effect of these dopants on the crystallization process and the optical properties is investigated. Films containing about 18 at.% carbon show the properties most favorable for solar absorbers. The crystallization is retarded to temperatures near 1000 C, and the solar absorptance is greater than that of non-intentionally doped CVD amorphous silicon. From the experimentally determined activation energy of crystallization, the structural lifetime for such absorber films is extrapolated to be in excess of several decades for continuous operation at 700 C. For identical thicknesses of absorber layers, spectrally selective stacks of stabilized amorphous silicon deposited on top of a molybdenum reflector have higher solar absorptance than stacks composed of polycrystalline silicon on a silver reflector, amorphous silicon on molybdenum having been tested at temperatures in excess of 500 C. (Author)

A80-20723 **Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells.** J. Gobrecht and H. Gerischer (Max-Planck-Gesellschaft zur Förderung der Wissenschaften, Fritz-Haber-Institut, Berlin, West Germany). *Solar Energy Materials,* vol. 2, Sept.-Nov. 1979, p. 131-142. 24 refs.

The height of the Schottky barrier at a CdS electrode in contact with various redox electrolytes has been measured at electronic equilibrium and the open-circuit photovoltage was linearly related to this quantity at constant illumination intensity. The photocurrent-voltage curves of such redox electrolyte junctions with CdS, n-GaAs and n-MoSe2 electrodes have been studied as a function of the light intensity which was varied over three orders of magnitude. The photocurrent of such electrochemical solar cells is at the open-circuit voltage compensated by the forward current through the junction, and its magnitude in comparison to the saturation current provides information on whether the recombination or the forward current controls the open circuit voltage of solar cells is discussed. (Author)

A80-20727 **Temperature dependence of open-circuit photovoltage of a back-surface field semiconductor junction.** A. Sinha and S. K. Chattopadhyaya (Kurukshetra University, Kurukshetra, India). *Solid-State Electronics,* vol. 22, Oct. 1979, p. 849-852. 15 refs. Research supported by the Department of Atomic Energy of India.

Temperature dependence of the open-circuit photovoltage of a back surface field, diffused silicon junction has been studied analytically, including the effect of bandgap narrowing in the heavily doped back surface region. Open circuit voltage of a BSF structure has been found to be slightly less dependent on temperature as compared with that of a conventional cell. Further, the behavior of a BSF cell is found to be relatively insensitive to base layer resistivity. These results support the experimental data published by some investigators on temperature dependence of solar cells. (Author)

A80-20734 **Analysis and evaluation of isotype heterojunction solar cells.** H. J. Pauwels (Gent, Rijksuniversiteit, Ghent, Belgium). *Solid-State Electronics,* vol. 22, Nov. 1979, p. 988-990. 10 refs.

The I-V characteristics and maximum efficiency condition for isotype (n-n) heterojunction solar cells using n(+)-type semiconducting oxides as windows are analyzed. The band diagram of the n(+)-n heterojunction under forward bias is presented, and particle current densities are calculated from thermionic emission theory, diffusion theory and Shockley-Read recombination theory to obtain an expression for the j-V characteristics. Band bending is found to occur exclusively in the n-type semiconductor, with the dark saturation current at a minimum when the band bending is maximum. Band bending in both semiconductors is expected at conduction band discontinuities less than zero, and at zero the n-type semiconductor becomes inverted at the interface. An analysis of electron affinities of various semiconducting solar cell components indicates that while several n(+)-p anisotype structures fulfil the maximum efficiency conditions, only SnO2-Sn is an acceptable isotype solar cell structure. A.L.W.

A80-20862 **Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control.** Conference sponsored by the University of Pittsburgh. Edited by W. G. Vogt and M. H. Mickle. Pittsburgh, Pa., Instrument Society of America, 1979. 515 p. Price of five parts, $125.

Papers are presented on such topics as models in air transportation, time series applications in modeling and simulation, reduced order modeling, machine system selection and failure, missile modeling, fire control, and large-scale systems. Attention is also given to traffic operations and control, system identification, advanced estimation methods, and probabilistic reliability. B.J.

A80-20881 **Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment.** Conference sponsored by the University of Pittsburgh. Edited by W. G. Vogt and M. H. Mickle. Pittsburgh, Pa., Instrument Society of America, 1979. 603 p. Price of five parts, $125.

Papers are presented on the following subjects: an energy allocation model for periods of severe energy shortage; modeling and simulation of coal conversion for electric power; application of nonlinear programming algorithms to the modeling of energy systems; solar energy systems; the modeling of aquatic environments; optimization techniques in power distribution planning; and models for pest ecosystem management. Attention is also given to: the modeling of social impacts of energy related development; recent advances in the modeling and simulation of electrical power/energy systems; plasmas and lasers; and air and water environmental systems. B.J.

A80-20882 **Computer modeling of coal gasification reactors.** T. R. Blake (Systems, Science and Software, La Jolla, Calif.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 811-823. 19 refs. Research sponsored by the Electric Power Research Institute; Contract No. EX 76-C-01-1770.

The use of computer models in coal gasification reactor process development is discussed. In particular, the paper examines the merits of models for fluidized bed and entrained flow gasifiers wherein detailed representations of the internal gas dynamics, solid particle motion and chemical rate processes are incorporated.
(Author)

A80-20883 **Fixed-bed gasifier dynamic model for IGCCP control study.** B. C. B. Hsieh, D. J. Ahner (General Electric Co., Schenectady, N.Y.), and G. H. Quentin (Electric Power Research Institute, Palo Alto, Calif.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 825-831.

A mathematical model was formulated to predict the dynamic performance of a dry-ash, air-blown, fixed-bed gasifier to be used in an analytical simulation control study of an integrated gasification combined cycle power plant. The modeling technique, data preparation, objectives and approaches are discussed, as well as the dynamic responses of gasifier output to input variables. (Author)

A80-20884 **A single coal particle gasification model.** R. R. Cwiklinski, C. G. Vayenas, C. Georgakis, and J. Wei (MIT, Cambridge, Mass.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 833-842. 7 refs. Research supported by the Electric Power Research Institute.

An analytical model of carbon particle gasification in an oxygen-steam-CO2 environment is presented. The model assumes finite H2 diffusivity and CO and H2 are allowed to oxidize infinitely fast at a flame front surrounding the spherical carbon particle. The possibility of multiple steady state solutions is discussed. (Author)

A80-20885 **Dynamic modeling of H2S clean-up processes.** J. H. Alexander, W. D. Henline, T. R. Blake, and D. E. Wilkins (Systems, Science and Software, La Jolla, Calif.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 867-879. 7 refs. Research supported by the Electric Power Research Institute.

A mathematical model and associated computer program have been developed for the dynamic simulation of packed absorption columns, heat exchangers, and flash drums which typically comprise product gas H2S removal processes. Calculations and results appropriate to H2S removal systems which employ solvents that separate by purely physical absorption mechanisms are analyzed. These test calculations are based on process system data and physicochemical parameters estimated from existing published information. It is noted that the numerical structure is general enough to incorporate any data.
V.T.

A80-20886 **A thermodynamic assessment of OTEC open-cycle power systems.** F. C. Chen (Oak Ridge National Laboratory, Oak Ridge, Tenn.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 921-926. 7 refs. Contract No. W-7405-eng-26.

The thermodynamics of open-cycle OTEC power systems are reviewed, and the expected performance of open-cycle plants is assessed. A temperature-entropy diagram of the open-cycle process is presented and related to the various components of the system. Results of recent major open-cycle plant studies for floating platform systems in the submerged, semisubmerged and spar buoy configurations are summarized. An optimal thermal performance model is developed for a generalized open-cycle turbine on the basis of the range of operating parameters established in the system design studies and applied to a typical system. It is found that, for the given system, the performance (net power output per heat transfer area) tends to maximize at a small flashdown temperature and high water velocity in smooth condenser tubes.
A.L.W.

A80-20887 **Modeling and simulation of WECS assisted utility systems.** R. G. Deshmukh and R. Ramakumar (Oklahoma State University, Stillwater, Okla.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 927-933. 9 refs. Research supported by Oklahoma State University.

The paper discusses a probabilistic model for wind-electric conversion systems (WECS) and employs it in a simulation study to assess the reliability and capacity credit aspects of WECS operating in parallel with a conventional utility grid, feeding a common load. The major parameters involved and their influence are studied by simulation techniques for a typical WECS located in the site 'Kahuku Upper' on the Hawaiian island of Oahu. Wind speed data over a two-year period collected by the University of Hawaii at Manoa form the basis of this study. The results and discussion should be useful to utility system planners contemplating the incorporation of WECS as a component in their future generation mix. (Author)

A80-20888 **An applications analysis for the solar industrial process heat market.** S. A. Stadjuhar (Solar Energy Research Institute, Golden, Colo.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 935-942. 8 refs. Contract No. EG-77-C-01-4042.

The importance of the industrial process heat market in terms of energy consumption and amenability of this market to solar thermal technology are examined. An analytical method for evaluating solar industrial process heat systems has been developed and implemented in a flexible, fast calculating, computer code - PROSYS ECONMAT. The long-term average performance model PROSYS predicts annual energy output for several collector types, including flat-plate, nontracking concentrator, one-axis tracking concentrator, and two-axis tracking concentrator. The companion computer program ECONMAT calculates the solar equipment cost and generates a life cycle cost analysis. Analytical results demonstrate the software flexibility for use in feasibility and parametric sensitivity studies.
(Author)

A80-20889 **Analysis of resource pricing for geothermal electric power production.** P. Blair, M. Ervolini (Pennsylvania, University, Philadelphia, Pa.), and T. Cassel. In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 1075-1080. 9 refs. Contract No. ET-78-S-02-4713.

This paper discusses the structure of a decision model for analyzing investment behavior of geothermal resource developers involved in electric power production. In particular, the sensitivity of a number of key investment decision criteria to variations in the geothermal resource price is investigated using the model. In addition a number of alternative resource pricing alternatives being considered by the industry today are reviewed and discussed. (Author)

A80-20890 **Supply and demand in input-output analysis for energy modeling.** G. H. Mashayekhi (Hydro-Québec, Institut de Recherche, Varennes, Canada). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 1187-1192. 9 refs.

The paper examines the shortcomings of the input-output analysis for energy modeling where price and substitution effect is of great importance. Attention is given to the need for a systematic model which incorporates the demand and supply mechanism. A quadratic input-output analysis is introduced where the demand and supply functions can be incorporated directly into the model. In conclusion, it is noted that to implement the model, the product demand and factor supply function coefficients should be estimated which will require more work for estimation of these coefficients. M.E.P.

A80-20893 **Computer analysis of grids currently used for CdS/Cu2S solar cells.** N. K. Annamalai, C. H. Kolbenson, and D. Jensen (Clarkson College of Technology, Potsdam, N.Y.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 1273-1277. 7 refs. NSF Grant No. ENG-78-06263.

A grid is normally used to reduce the power loss in the sheet resistance of a cell. To minimize the power loss, grid geometry and grid spacings should be optimized. Grid optimization was analyzed by using a computer program and circuit model, considering the grid geometry, grid spacings and various light generated currents. The effect of the grid line voltage drop and the current distribution were determined by using a circuit model. (Author)

A80-20894 **Optimization of a solar heating system with integral compensation.** J. T. Pritchard (Westinghouse Electric Corp., Baltimore, Md.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 3. Pittsburgh, Pa., Instrument Society of America, 1979, p. 1295-1299. 7 refs.

A linearized fourth order model with deterministic parameters is derived for a solar heating system. An optimal regulator solution (ORS) is found for a quadratic cost functional, and the inverse eigenvalue method is used to solve the Riccati equation such that the optimal feedback gain matrix can be found. The regulator problem is converted to a tracking loop problem by having an integrator following the error signal in the forward path. Furthermore, by augmenting the state vector and the state weighting matrix, both the optimal feedback gains and the optimal forward loop integrator gains for a state variable system can be obtained using the standard ORS. Simulations of two quasi-optimally controlled systems demonstrated that much faster temperature response is attainable using the following error, but that the cost is more control energy. J.P.B.

A80-20913 **Mathematical modeling of coal gasification processes.** G. D. Andria, D. F. Ronallo, and F. L. Cleary (Bituminous Coal Research, Inc., Monroeville, Pa.). In: Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, Pittsburgh, Pa., April 25-27, 1979. Part 5. Pittsburgh, Pa., Instrument Society of America, 1979, p. 1991-1995. 8 refs. Contract No. EF-77-C-01-1207.

This paper describes recent developments in the mathematical modeling and computer simulation of coal gasification processes. Special emphasis is placed on thermodynamic equilibrium-type simulators. Such modeling schemes are briefly described in general and with respect to coal gasification processes under development at BCR. The conceptual simplicity and pragmatic utility of these macro-type models are contrasted with their more sophisticated kinetic and fluid dynamic counterparts. This paper conveys the effectiveness and relevance of thermodynamic systems as simple simulators for coal gasification reactors and as integral components of more complex models. Several recent developments in kinetic and fluid dynamic modeling are outlined. (Author)

A80-21010 **Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants.** D. A. Hegg and P. V. Hobbs (Washington, University, Seattle, Wash.). *Atmospheric Environment,* vol. 14, no. 1, 1980, p. 99-116. 48 refs. Research supported by the Electric Power Research Institute.

Airborne measurements of particles and trace gases have been obtained in the plumes from five coal-fired electric power plants situated in the West and Midwest of the United States. From these data, gas-to-particle (g-to-p) converstion rates are estimated from changes in total particle volume, changes in the ratio of the mass of particulate sulfur to the total mass of sulfur (particulate sulfur measured by two techniques), and from particle nucleation rates. The g-to-p conversion rates ranged from 0 to 5.7% + or - 2.0% of SO2/h for travel times of 10-162 min. The data suggest differences between plants in the partitioning of g-to-p conversion products between condensation onto existing particles and the nucleation of new particles. The relationship between particle surface area and the formation rate of particle volume at large reaction times in the plumes was similar to that found in smog chamber studies. Finally, the SO2-to-particulate sulfate conversion rate was found to correlate well (correlation coefficient - 0.9) with a parameter indicative of the reaction of SO2 in the plumes with ambient OH radicals. (Author)

STAR ENTRIES

N80-10022 Allerton Press, Inc., New York, N. Y.
STUDY OF HEAT-PIPE HEAT EXCHANGER IN THE SMALL GAS TURBINE ENGINE SYSTEM
V. K. Shchukin, I. I. Mosin, N. V. Lokai, and Yu. V. Matveev *In its* Soviet Aeron., Vol. 21, No. 3 1978 p 93-96 refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Aviats. Tekh. (USSR), v. 21, no. 3, 1978 p 127-132

Copyright. Avail: Allerton Press, Inc., 150 Fifth Ave., N.Y. 10011; $45.00

A theoretical optimization of the elements of heat-pipe heat exchangers in application to small gas turbine engines (SGTE), is presented in order to study the possibility of using this type of heat exchanger as a SGTE regenerator. The regeneration ratio sigma sub p approximately 0.82 with admissible pressure losses in the heat exchanger passages delta P 6% was obtained. In order to confirm the validity of the theoretical results, an experimental study was made of a heat exchanger matrix consisting of 49 ribbed sodium heat pipes on a specially developed test stand simulating SGTE regenerator operating conditions. This study confirms the possibility of using the heat-pipe heat exchanger as an SGTE regenerator. M.M.M.

N80-10068 Allerton Press, Inc., New York, N. Y.
SELECTION OF OPTIMAL PARAMETERS OF HEAT-PIPE HEAT EXCHANGER FOR A GAS TURBINE ENGINE
N. V. Lokai and I. I. Mosin *In its* Soviet Aeron., v. 22, no. 1 1979 p 30-34 refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Aviats. Tekhn. (USSR), v. 22, no. 1, 1979 p 41-46

Copyright. Avail: Allerton Press, Inc., 150 Fifth Ave., New York, N. Y. 10011; $50.00

Requirements that assist in achieving the maximal heat exchanger degree of regeneration are examined. It is shown that in a specific gas turbine engine equipped with a heat exchanger the degree of regeneration can be improved by observing the following conditions: (1) The heat transfer capacity of the heat exchanger heat pipes must exceed the rate of heat transfer from the gas and air sides; (2) the condition of equality of certain dimensionless groupings on the hot and cold sides of the heat exchanger must be satisfied. R.E.S.

N80-10074 Allerton Press, Inc., New York, N. Y.
DYNAMICS OF DIESEL FUEL COMBUSTION IN TURBULENT FLOW
F. A. Khamidullin, A. F. Kuzin, O. V. Strogonov, Yu. V. Troitskii, and A. V. Talantov *In its* Soviet Aeron., v. 22, no. 1 1979 p 58-63 refs Transl. into ENGLISH from Izv. Vyssh. Ucheb. Zaved. Aviats. Tekhn. (USSR), v. 22, no. 1, 1979 p 73-80

Copyright. Avail: Allerton Press, Inc., 150 Fifth Ave., New York, N. Y. 10011; $50.00

A study of diesel fuel and also TS-1 kerosene and B-70 gasoline combustion in a turbulent stream is presented. These fuels are compared and the dependence of the combustion zone length and the combustion time on mixture composition, velocity, and initial temperature under the model combustion chamber conditions was established. M.M.M.

N80-10206*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AIRCRAFT ENERGY EFFICIENCY (ACEE) STATUS REPORT
Donald L. Nored, James F. Dugan, Jr., Neal T. Saunders, and Joseph A. Ziemianski *In its* Aeropropulsion 1979 1979 p 1-58 refs
Avail: NTIS HC A20/MF A01 CSCL 21E

Fuel efficiency in aeronautics, for fuel conservation in general as well as for its effect on commercial aircraft operating economics is considered. Projects of the Aircraft Energy Efficiency Program related to propulsion are emphasized. These include: (1) engine component improvement, directed at performance improvement and engine diagnostics for prolonged service life; (2) energy efficient engine, directed at proving the technology base for the next generation of turbofan engines; and (3) advanced turboprop, directed at advancing the technology of turboprop powered aircraft to a point suitable for commercial airline service. Progress in these technology areas is reported. J.M.S.

N80-10209*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ALTERNATIVE JET AIRCRAFT FUELS
Jack Grobman *In its* Aeropropulsion 1979 1979 p 129-148 refs
Avail: NTIS HC A20/MF A01 CSCL 21E

Potential changes in jet aircraft fuel specifications due to shifts in supply and quality of refinery feedstocks are discussed with emphasis on the effects these changes would have on the performance and durability of aircraft engines and fuel systems. Combustion characteristics, fuel thermal stability, and fuel pumpability at low temperature are among the factors considered. Combustor and fuel system technology needs for broad specification fuels are reviewed including prevention of fuel system fouling and fuel system technology for fuels with higher freezing points. J.M.S.

N80-10263*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DEEP SPACE NETWORK FEASIBILITY STUDY OF TERMINATING SOUTHERN CALIFORNIA EDISON ELECTRICAL SERVICE TO GOLDSTONE
J. L. Koh *In its* The Deep Space Network 15 Oct. 1979 p 169-175
Avail: NTIS HC A09/MF A01 CSCL 14B

A cost comparison of purchased power versus generated power is discussed. Methods for waste energy recovery are examined and applications for the use of waste energy in heating and cooling systems are presented. A.W.H.

N80-10329# Grumman Aerospace Corp., Bethpage, N.Y.
THE JET MEMBRANE PROCESS FOR URANIUM SEPARATION AND ENRICHMENT
John W. Brook and Vincent Calia Sep. 1979 145 p refs
(RE-586) Avail: NTIS HC A07/MF A01

Isotopic enrichment of both SF6 and UF6 was successfully achieved using a scheme in which the working or carrier fluid is a condensible vapor, which can be thermally, rather than mechanically, pumped. The energy supply can be waste heat or solar energy. The process gas (UF6) is introduced into a chamber in which a heavy condensible gas (the jet) flows. Due to preferential penetration of the UF6 into the jet, the lighter species (U-235)F6 is enriched relative to the heavy species (U-238)F6. The enriched UF6 is collected by a probe facing downstream in the jet and is passed to another unit for further enrichment or to a mass spectrometer for analysis. Laboratory experiments were conducted using a variety of gas combinations to investigate system parameters that were identified as major capital and energy cost drivers. A theoretical study aided in the analysis of data and in providing scaling laws. Cost analysis, based upon the measured UF6 results and the supporting experiments, indicates that the jet membrane is a viable concept for enriching uranium industrially. A.R.H.

N80-10361*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MOLTEN SALT PYROLYSIS OF LATEX Patent Application

Albert J. Bauman, inventor (to NASA) (JPL) Filed 27 Apr. 1978 11 p Sponsored by NASA

(NASA-Case-NPO-14315-1; US-Patent-Appl-SN-900659) Avail: NTIS HC A02/MF A01 CSCL 07C

The production of synthetic hydrocarbon liquid fuel from latex rich plants is reported. The pyrolysis of high isoprene latex plants such as Guayule, or extracts thereof, in a molten inorganic salt at temperatures above 300 C is described. The pyrolysis process is examined using a number of inorganic salts and a reactor is described for the hydrogen fuel production. A.W.H.

N80-10374* National Aeronautics and Space Administration. Pasadena Office, Calif.

START UP SYSTEM FOR HYDROGEN GENERATOR USED WITH AN INTERNAL COMBUSTION ENGINE Patent

John Houseman (JPL) and Donald J. Cerini, inventors (to NASA) (JPL) Issued 5 Jul. 1977 13 p Filed 22 Mar. 1976 Sponsored by NASA

(NASA-Case-NPO-13849-1; NASA-Case-NPO-13907-1; US-Patent-4,033,133; US-Patent-Appl-SN-668783; US-Patent-Class-60-606; US-Patent-Class-23-288R; US-Patent-Class-48-61; US-Patent-Class-48-102A; US-Patent-Class-48-10-3; US-Patent-Class-48-107; US-Patent-Class-48-117; US-Patent-Class-48-DIG 8; US-Patent-Class-60-300; US-Patent-Class-123-3; US-Patent-Class-123-179R; US-Patent-Class-123-DIG 12; US-Patent-Class-423-650) Avail: US Patent and Trademark Office CSCL 21D

A hydrogen generator provides hydrogen rich product gases which are mixed with the fuel being supplied to an internal combustion engine for the purpose of enabling a very lean mixture of that fuel to be used, whereby nitrous oxides emitted by the engine are minimized. The hydrogen generator contains a catalyst which must be heated to a pre-determined temperature before it can react properly. To simplify the process of heating up the catalyst at start-up time, either some of the energy produced by the engine such as engine exhaust gas, or electrical energy produced by the engine, or the engine exhaust gas may be used to heat up air which is then used to heat the catalyst.

Official Gazette of the U.S. Patent and Trademark Office

N80-10377*# National Aeronautics and Space Administration. Pasadena Office, Calif.

CONTINUOUS COAL PROCESSING METHOD AND MEANS Patent Application

Porter R. Ryason, inventor (to NASA) (JPL) Filed 28 Sep. 1976 31 p Sponsored by NASA

(NASA-Case-NPO-13758-2; US-Patent-Appl-SN-727444) Avail: NTIS HC A03/MF A01 CSCL 21D

A coal pump is provided in which solid coal is heated in the barrel of an extruder under pressure to a temperature at which the coal assumes plastic properties. The coal is continuously extruded, without static zones, using, for example, screw extrusion preferably without venting through a reduced diameter die to form a dispersed spray. The dispersed coal may be continuously injected into vessels or combustors at any pressure up to the maximum pressure developed in the extrusion device. The coal may be premixed with other materials such as desulfurization aids or reducible metal ores so that reactions occur, during or after conversion to its plastic state. Alternatively, the coal may be processed and caused to react after extrusion, through the die, with liquid oxidizers, whereby a coal reactor is provided. Alternative utilization of the device may be to secure continuous pyrolysis of the coal or to feed the extruded coal into furnaces operating at pressures near ambient. NASA

N80-10379*# BDM Corp., McLean, Va.

COAL CONVERSION PROCESSES AND ANALYSIS METHODOLOGIES FOR SYNTHETIC FUELS PRODUCTION Final Report

5 Oct. 1979 285 p refs

(Contract NAS8-33608)

(NASA-CR-161322; BDM/W-79-548-TR) Avail: NTIS HC A13/MF A01 CSCL 21D

Information to identify viable coal gasification and utilization technologies is presented. Analysis capabilities required to support design and implementation of coal based synthetic fuels complexes are identified. The potential market in the Southeast United States for coal based synthetic fuels is investigated. A requirements analysis to identify the types of modeling and analysis capabilities required to conduct and monitor coal gasification project designs is discussed. Models and methodologies to satisfy these requirements are identified and evaluated, and recommendations are developed. Requirements for development of technology and data needed to improve gasification feasibility and economies are examined. A.W.H.

N80-10382# Battelle Pacific Northwest Labs., Richland, Wash.

ASSESSMENT OF SYNFUEL TRANSPORTATION TO YEAR 2000

W. Wakamiya, K. B. Sebelien, and M. A. Parkhurst Mar. 1979 113 p refs

(Contract EY-76-C-06-1830)

(PNL-2768) Avail: NTIS HC A06/MF A01

The potential problems in the transportation of synthetic fuels (synfuels) are discussed and identified. The emergence of transportation-related problems in shale oil and coal synfuel development expected to be highly dependent upon their chemical similitude with analagous fossil fuels. Definitive resolution of the question of whether new transportation problems exist is dependent upon clear characterization of the synfuels chemical composition. Hydrogen and methanol represent unique cases since these materials are already in commercial production. The major transportation problem identified with fuel economics based on these materials is related to bulk use. To date, shipment volumes are relatively small and, in the case of hydrogen, can be accommodated with costly, more specialized packaging. Scale-up for major energy use may introduce a new set of transportation problems. DOE

N80-10383# Escher Technology Associates, St. Johns, Mich.

SURVEY OF LIQUID HYDROGEN CONTAINER TECHNIQUES FOR HIGHWAY VEHICLE FUEL SYSTEM APPLICATIONS

W. J. D. Escher Nov. 1978 66 p refs

(Contract EC-77-X-01-2752)

(HCP/M2752-01) Avail: NTIS HC A04/MF A01

The design and operational features of four different liquid hydrogen container types, three of which have served operationally as vehicle fuel tanks, and rough production-lot cost estimates for a nominal 50 gallon horizontal cylindrical liquid hydrogen container applicable to vehicle service are reported. A unique semiautomatic liquid hydrogen service station developed in Germany is described. A general assessment of the state of technology of vehicle hydrogen containers and associated systems is given, including the identification of pacing items recommended to be addressed initially in prospective R and D activities in this field. DOE

N80-10384# Sandia Labs., Livermore, Calif.

APPLICATIONS ANALYSIS OF FIXED SITE HYDROGEN STORAGE

J. J. Iannucci and S. L. Robinson May 1979 23 p refs

(Contract EY-76-C-04-0789)

(SAND-78-8272) Avail: NTIS HC A02/MF A01

The potential applications and requirements for fixed site storage in a scenario of wide spread hydrogen use are examined and quantified. An envisioned hydrogen production/distribution/end-use cycle is scrutinized to identify the storage needs for both continuous and intermittent sources including solar. The most pressing need for storage is at the distribution point, in concurrence with current natural gas practice. Caverns and similar underground storage techniques are the most promising modes due to their low cost relative to all other options examined. Since a large volume of natural gas storage is presently in service, a pressing need to develop fixed site hydrogen storage technology (beyond the conversion of this underground storage to hydrogen) was not identified. DOE

N80-10386# Department of Energy, Morgantown, W. Va. Energy Technology Center.
FLUIDIZED-BED COMBUSTION OF HIGH SULFUR COALS
J. S. Mei, J. S. Halow, U. Grimm, and R. L. Rice Apr. 1979 149 p refs
(METC/RI-79/4) Avail: NTIS HC A07/MF A01

The sulfur retention capability of an atmospheric fluidized-bed combustor (AFBC) burning a high sulfur coal was evaluated in light of the EPA proposed New Source Performance Standards and their potential impact on AFBC technology. A high volatile bituminous Pittswick coal with 4.52 percent sulfur content was selected and Greer limestone and Tymochtee dolomite were used as sulfur sorbents. Combustion tests were carried out at various operating conditions to develop AFBC engineering and emissions data on this high sulfur coal. Ninety or greater percent of sulfur retention was attained in 9 of the 19 balance periods. Eighty-five or greater percent sulfur retention was attained in 14 of the 19 balance periods. Results demonstrate that the proposed new standards for sulfur dioxide emissions can be met by AFBC's. DOE

N80-10387# TRW Energy Systems Planning Div., McLean, Va.
METHANE RECOVERY FROM COALBEDS Annual Report, Dec. 1977 - Dec. 1978
1978 29 p
(Contract DE-AC21-78MC-08089)
(DOE/MC-08089-T1) Avail: NTIS HC A03/MF A01

Work done in the engineering and integration effort in the Morgantown Energy Technology Center program to recover and utilize methane from coalbeds is summarized. The contract requirements and approach are outlined. The work accomplished includes the development of the Unminable Drilling Plan, performance of testing and data analysis for wells into coal seams, development of three conceptual recovery and utilization designs. Milestone and expenditure charts are provided. DOE

N80-10388# Mobil Research and Development Corp., Princeton, N. J.
RESEARCH GUIDANCE STUDIES TO ASSESS GASOLINE FROM COAL BY METHANOL-TO-GASOLINE AND SASOL-TYPE FISCHER-TROPSCH TECHNOLOGIES Final Report
Max Schreiner Aug. 1978 324 p refs
(FE-2447-13) Avail: NTIS HC A14/MF A01

A technical and economic comparison between the new Mobil methanol-to-gasoline technology under development and the commercially available Fischer-Tropsch technology for the production of motor gasoline meeting U.S. quality standards is presented. Except for the Mobil process, processes used are commercially available. Coproduction of products, namely SNG, LPG and gasoline, is practiced. Four sensitivity cases were also developed in less detail from the two base cases. In all areas, the Mobil technology is superior to Fischer-Tropsch: process complexity, energy usage, thermal efficiency, gasoline selectivity, gasoline quality, investment and gasoline selectivity, investment and gasoline cost. Principal advantages of the Mobil process are its selective yield of excellent quality gasoline with minimum ancillary processing. DOE

N80-10389# Mitre Corp., McLean, Va.
NEAR TERM POTENTIAL OF WOOD AS A FUEL
Jan. 1979 71 p refs
(Contract EG-77-C-01-4101)
(HCP/C4101) Avail: NTIS HC A04/MF A01

The sources of wood as a fuel are cited. Technologies available to expand the near-term use of wood fuel include direct combustion, low-Btu gasification in the presence of air, pyrolysis to char, liquid fuel, and low-Btu gas in the absence of air, and densification. Life-Cycle costs were evaluated for these technologies. Incentives in increase the use of wood fuel in the near term are identified. Systems manufactures, architecture and engineering firms, and users are listed. DOE

N80-10390# Institute of Gas Technology, Chicago, Ill.
DEVELOPMENT OF COMBUSTION DATA TO UTILIZE LOW BTU GASES AS INDUSTRIAL PROCESS FUELS. PROJECT 61004 SPECIAL REPORT NO. 4: HIGH-FORWARD-MOMENTUM BURNER
R. T. Waibel and E. S. Fleming Nov. 1978 42 p refs
(Contract EX-76-C-01-2489)
(FE-2489-33) Avail: NTIS HC A03/MF A01

Data were gathered to determine the performance of a high-forward-momentum burner when retrofit with three low-to-medium-Btu gases. The burner was fired on the IGT pilot-scale test furnace with a load simulating one zone of a continuous refractory kiln or one instant during the heat-up of a batch kiln. The low- and medium-Btu gases simulated for these combustion trials were Koppers-Totzek oxygen, Wellman-Galusha air, and Winkler air fuel gases. All of the substitute fuels exhibited stable flames when directly retrofit on the burner. Koppers-Totzek oxygen gave a thermal efficiency slightly greater than that for natural gas, but Wellman-Galusha and Winkler air fuel gases each had lower efficiencies. Koppers-Totzek oxygen and Wellman-Galusha air fuel gases had flame lengths longer than that for natural gas, whereas Winkler air fuel gas had a flame length comparable to the natural gas flame. DOE

N80-10391# Institute of Gas Technology, Chicago, Ill.
DEVELOPMENT OF GAS TURBINE FUELS AND COMBUSTION; AN OVERVIEW
A. A. Fejer 1979 12 p refs Presented at New Fuels and Advances in Combustion Technologies, New Orleans, 26-30 Mar. 1979
(Contract EX-76-C-01-2433)
(CONF-790337-4) Avail: NTIS HC A02/MF A01

The characteristic features of gas turbine engines are described contrasting them with their chief competitor, the steam cycle. The focus is on the aerodynamic processes in the combustion chambers of traditional engines and includes an outline of the changes that are to be expected with the introduction of the synthetic and coal derived fuels. DOE

N80-10392# Institute of Gas Technology, Chicago, Ill.
COAL CONVERSION SYSTEMS: TECHNICAL DATA BOOK
1978 585 p
(Contract EX-76-C-01-2286)
(HCP/T2286-01; LC-78-606163; TP759.C52) Avail: NTIS HC A25/MF A01

Technical information necessary for the design and operation of coal conversion facilities is provided. Such facilities include the conversion of coal to environmentally acceptable fuel forms, or to electric power by way of advanced technologies. Physical, chemical, thermodynamic data, and correlations are included along with procedures necessary to develop a new process or to design, build, and operate a coal conversion plant. DOE

N80-10393# Mitre Corp., McLean, Va. METREK Div.
BIOMASS-BASED ALCOHOL FUELS: THE NEAR-TERM POTENTIAL FOR USE WITH GASOLINE
W. Park, G. Price, and D. J. Salo Aug. 1978 84 p refs
(Contract EG-77-C-01-4101)
(HCP/T4101-03) Avail: NTIS HC A05/MF A01

The requirements and prospects for a nationwide alcohol-gasoline fuel system based on alcohols derived from biomass resources are assessed. Technological and economic factors of the production and use of biomass-based methanol and ethanol fuels are evaluated relative to achieving 5 or 10 percent alcohol-gasoline blends by 1990. It is concluded the maximum attainable is a nationwide 5 percent methanol or ethanol-gasoline system replacing gasoline by 1990. Relative to existing gasoline systems, costs of alcohol-gasoline systems will be substantial. DOE

N80-10395# Battelle Columbus Labs., Ohio.
SUGAR CROPS AS A SOURCE OF FUELS. VOLUME 1: AGRICULTURAL RESEARCH Final Report
E. S. Lipinsky, S. Kresovich, T. A. McClure, D. R. Jackson, W. T. Lawhon, A. A. Kayloncu, and E. L. Daniels 31 Jul. 1978 222 p refs
(Contract W-7405-eng-92)
(TID-29400/1) Avail: NTIS HC A10/MF A01

Narrow-row spacing experiments were conducted. They promote more rapid canopy closure which helps a short season

location more than a long season location. Sweet sorghum experiments indicate favorable yields compared with sugarcane, and yield increases with close spacing in all areas. The project team concludes that sweet sorghum has considerable fuel potential, based on its ability to grow wherever corn or soybeans grow. Initial evaluation of the Tilby cane separator process, which separates the pith from the rind fiber without crushing and grinding, indicates that the process is promising as a means of obtaining fermentable sugars at low cost. The advantages of the Tilby process are low energy consumption, high value for the rind fiber coproducts in products that perform like plywood, pulp or paper making, and ability to use high fiber sugarcane or sweet sorghum.
DOE

N80-10396# Princeton Univ., N. J. Dept. of Mechanical and Aerospace Engineering.
BIOMASS ENERGY ENHANCEMENT: A REPORT TO THE PRESIDENT'S COUNCIL ON ENVIRONMENTAL QUALITY Final Report
Michael Jerry Antal, Jr. Jul. 1978 140 p refs
(Contract EQ9AD499; Grant EPA-R-804836)
(PB-296624/0) Avail: NTIS HC A07/MF A01 CSCL 21D

The technical and economic potential for enhancing the energy value of biomass is examined and the feasibility of using solar heat to gasify biomass is developed. With improved technology, this would permit the energy carried by the synthetic fuel leaving the conversion facility to exceed or equal the biomass fuel input. The potential impact of biomass energy enhancement technologies is examined in a case study for New Jersey. The outcome is favorable for solar heat.
GRA

N80-10397# New Mexico Univ., Albuquerque. Technology Application Center.
HYDROGEN AS A FUEL. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Progress Report, 1977 - Jul. 1979
Gerald F. Zollars Aug. 1979 24 p Sponsored in part by NTIS
(NTIS/PS-79/0771/0) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

The 219 citations concern the use of hydrogen as a fuel for aircraft and automobiles. Topics covered include storage, fuel combustion studies, gas mixtures, and energy conversion efficiency.
GRA

N80-10398# Wisconsin Univ. Center System, Rice Lake.
ENERGY AND ECONOMIC ASSESSMENT OF ANAEROBIC DIGESTERS AND BIOFUELS FOR RURAL WASTE MANAGEMENT Final Report
Tom P. Abeles, David Freedman, Laura A. DeBaere, and David A. Ellsworth Dec. 1978 176 p refs
(Grant EPA-R-804457)
(PB-296523/4; EPA-600/7-78-174) Avail: NTIS HC A09/MF A01 CSCL 21D

A technological and socioeconomic assessment of anaerobic digester feasibility for small to midsize livestock operations was undertaken. Three full scale digesters and one pilot scale facility were under various degrees of monitoring and evaluation to assess design and operational problems as they affect the adoption and establishment of farm scale anaerobic digestors. Materials handling presented the greatest obstacle to satisfactory operation of the full scale systems. The system becomes more economical if the biogas can be used on site for direct thermal loads, suggesting that the economic feasibility of anaerobic digesters is site specific and should be closely integrated with the total farming operation.
GRA

N80-10400# Economics, Statistics and Cooperatives Service, Washington, D. C. Natural Resource Economics Div.
GROWING ENERGY: LAND FOR BIOMASS FARMS Final Report
Kathryn A. Zeimetz Jun. 1979 41 p refs
(PB-296650/5; AER-425) Avail: NTIS HC A03/MF A01 CSCL 21D

The utilization of high quality land to maximize energy gain and minimize environmental hazards are considered. It was concluded that alternate sources of food and fiber production must be allocated as some lands are diverted to energy farms.
GRA

N80-10401# New Mexico Univ., Albuquerque. Technology Application Center.
HYDROGEN PRODUCTION. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Report, 1977 - Jul. 1979
Gerald F. Zollars Springfield, Va. NTIS Aug. 1979 45 p Sponsored by NTIS
(NTIS/PS-79/0773/6) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

This bibliography cites 169 articles from the international literature concerning hydrogen production. Techniques examined include solar energy conversion, coal gasification, thermal dissociation, and water electrolysis.
GRA

N80-10402# New Mexico Univ., Albuquerque. Technology Application Center.
HYDROGEN STORAGE AS A HYDRIDE. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Report, 1975 - Jul. 1979
Gerald F. Zollars Springfield, Va. NTIS Aug. 1979 29 p Sponsored by NTIS
(NTIS/PS-79/0772/8) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Articles from the international literature concerning the storage of hydrogen in various metal hydrides are cited. Binary and intermetallic hydrides are considered. Specific alloys discussed are iron-titanium, lanthanum-nickel, magnesium-copper, and magnesium-nickel among others. This bibliography contains 97 entries.
GRA

N80-10414# Grumman Aerospace Corp., Bethpage, N.Y. System Sciences.
MINIMUM COST TRANSMITTER-RECEIVER ANTENNA PAIRS
G. Moyer and H. Hinz Sep. 1979 26 p refs
(RM-690) Avail: NTIS HC A03/MF A01

There are two types of solutions when applying the optimal control theory to antenna design. The cost (C) is an arbitrary function of the radii of the receiver (R sub 0) and of the transmitter (R sub 1). When the received power (W sub 0) divided by the area is small, as happens in the proposed satellite solar power station (SSPS), the value of the power density at the center of the receiver should be left open. Then the problem simplifies to such an extent that it can be solved with considerable accuracy using only ordinary calculus and graphs provided. The product (R sub 0) (R sub 1) depends only on the power ratio (W sub 0) (W sub 1) and can be obtained from a graph. The radius of the transmitter can then be replaced in the cost function and the best value of the radius of the receiver can be found from dC/d (R sub 0) = 0. The transmitter and receiver power density distributions are proportional and resemble a truncated Gaussian distribution. As W sub 0/sq pi (R sub 0) becomes larger the power density at the center of the receiver reaches its upper limit. After this point the problem must be solved with an additional state variable and constraint using a computer program. Numerical results are presented for the SSPS.
A.R.H.

N80-10443# Los Alamos Scientific Lab., N. Mex.
THE 50kA FLUX PUMP FOR THE SUPERCONDUCTING TRANSMISSION LINE TEST BED
Stefan L. Wipf Aug. 1978 13 p refs
(Contract W-7405-eng-36)
(LA-6953-MS) Avail: NTIS HC A02/MF A01

A 50 kA, rotating field-type flux pump is suggested as a power supply for the superconducting transmission line test bed. A basic design was developed as an extension to a previous 12 kA pump. The important design principles are explained. Special emphasis is given to the less-certain aspects of the extrapolation and eight improvements are suggested. The three most important ones are choosing the material for a pump sheet, making the pump sheet out of a specially designed wire cloth, and arranging the return leads adjacent to the pump sheet through the pole gap. Other improvements easily incorporated into the basic design are shading poles, rare earth pole pieces, and superconducting outside windings. DOE

N80-10472# Los Alamos Scientific Lab., N. Mex.
PERFORMANCE LIMITS FOR LIQUID-METAL HEAT PIPES CONTAINING LONG ADIABATIC SECTIONS
F. Coyne Prenger, Jr. and J. E. Kemme 1979 6 p refs Presented at 14th Intersociety Energy Conversion Conf., Boston, 5-10 Aug. 1979
(Contract W-7405-eng-36)
(LA-UR-79-1241) Avail: NTIS HC A02/MF A01

Analytical and experimental investigation of the performance limits of liquid-metal heat pipes containing long adiabatic sections were made. An analytical model describing the vapor flow and including the effects of wall friction and compressibility is presented. Performance limits and axial temperature profiles of a sodium-filled, stainless steel heat pipe were measured for comparison with the analytical results. Complete validation of the analytical model requires further experiments. The results show that a transition from laminar turbulent vapor flow occurs in the adiabatic section with an accompanying decrease in the heat pipe performance limit. The reduced performance results from an increased wall friction factor for the turbulent flow DOE

N80-10502# Oak Ridge National Lab., Tenn.
STEAM TURBINES
John T. Meador Oct. 1978 110 p refs
(Contract W-31-109-eng-38)
(ANL/CES/TE-78-7) Avail: NTIS HC A06/MF A01

The selection, classification, and average shaft efficiencies are discussed of some small-to-medium size steam turbines that can be used for base-load, turbine-generator units to meet both the electrical and thermal energy demands of several communities, as specified in evaluations for Integrated Community Energy Systems (ICES). Shaft efficiencies are evaluated by combining the average internal turbine efficiencies and the Rankine steam-cycle efficiencies for several combinations of steam inlet conditions under conditions of both fully condensing and non condensing exhaust steam. Efficiencies of very small turbines for mechanical drive of compressors or power plant auxiliaries also are estimated. Two examples are given of the input data necessary to establish preliminary costs for an industrial-extraction type turbine that may be adapted to ICES. Some data on operational considerations and cost factors are included. DOE

N80-10504# Atomics International, Golden, Colo. Rockwell Hanford Operations.
QUALITY ASSURANCE IN ALTERNATIVE ENERGY SOURCES
R. D. Hammond 2 Feb. 1979 14 p Presented at the First Annual Western Energy Quality Assurance Seminar, San Francisco, 7 Apr. 1979
(Contract EY-77-C-06-1036; Contract EY-77-C-1030)
(RHO-SA-107) Avail: NTIS HC A02/MF A01

The Hanford history, description of the radwaste efforts taking place, future plans, and highlights of the increasing role of quality assurance are outlined. DOE

N80-10584# Oak Ridge National Lab., Tenn.
COMPUTER SOFTWARE TO CALCULATE AND MAP GEOLOGIC PARAMETERS REQUIRED IN ESTIMATING COAL PRODUCTION COSTS Final Report
R. B. Honea, C. H. Petrich, D. L. Wilson, C. A. Dillard, R. C. Durfee, and J. A. Faber (Denison Univ.) Apr. 1979 124 p refs Sponsored in part by Electric Power Research Inst.
(Contract W-7405-eng-26; EPRI Proj. 804)
(EPRI-EA-674) Avail: NTIS HC A06/MF A01

A general overview of the software and methodology developed to calculate parameters such as surface slope and coal seam thickness and depth is provided along with sample map output which indicates the geographical distribution of these geologic characteristics. A user guide for implementing the software is included. Coal production, coal recovery, and coal resource calculation studies are reviewed. This system will be useful to utilities and coal mine operators alike in estimating costs through comprehensive assessment before mining takes place. DOE

N80-10593 Drexel Univ., Philadelphia, Pa.
OPTIMAL CONTROL OF DISTRIBUTED PARAMETER SYSTEMS FOR SOLAR THERMAL APPLICATIONS Ph.D. Thesis
Abraham Orbach 1979 252 p
Avail: Univ. Microfilms Order No. 7923085

The necessary conditions for optimality, which generate a set of equations whose solution yields the optimal control, were derived. It was shown that if the system and the performance index were bilinear and if the control vector was constrained, the optimal solution yielded a bang-bang policy for which the switching functions were obtained. These results were applied to the optimal control of the solar collector loop systems where the objective was to control the fluid velocity so as to maximize the net energy collected. A sensitivity study of a nonlinear first order in time and space system is presented. Three types of distributed parameter models, which represent the dynamics of the flat plate solar collector were derived. Dissert. Abstr.

N80-10595*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NASA-LEWIS CLOSED-CYCLE MAGNETOHYDRODYNAMICS PLANT ANALYSIS
Paul F. Penko 1979 13 p refs Presented at Closed-Cycle Magnetohydrodynamics Specialists Meeting, Bozeman, Montana, 21 Jun. 1979
(Contract EF-77-A-01-2674)
(NASA-TM-79249; DOE/NASA-2674-79/7; E-159) Avail: NTIS HC A02/MF A01 CSCL 10A

A brief review of preliminary analyses of coal fired closed cycle MHD power plants is presented. The performance of three power plants with differing combustion systems were compared. The combustion systems considered were (1) a direct coal-fired combustor, (2) a coal gasifier with in-bed desulfurization and (3) a coal gasifier requiring external fuel gas cleanup. Power plant efficiencies (auxiliary power excluded) were 44.5, 43, and 41 percent for the three plants, respectively. R.E.S.

N80-10596# General Electric Co., Schenectady, N. Y. Energy Systems Programs Dept.
THE FIRST SMALL POWER SYSTEM EXPERIMENT, PHASE 1: ENGINEERING EXPERIMENT NO. 1 Final Report, 5 Jul. 1978 - 4 May 1979
H. E. Jones et al 1978 570 p Prepared for JPL
(Contract JPL-955116)
(NASA-CR-162417) Avail: NTIS HC A25/MF A01 CSCL 10A

Conceptual designs were generated for several small solar thermal electric power plant configurations with a nominal size of one MWe and 0.4 annual capacity factor. Three startup times for a near term engineering experiment were considered for an application involving a small community and utility system. System characteristics, performance, and costs were determined for the nominal size plants. Size variations of from 0.5 to 10 MWe and from zero storage capacity to 0.7 annual capacity factor were evaluated with respect to cost and performance impact. Basic design goals for all the near term systems were: (1) high operational reliability; (2) minimum risk of failure; (3) commercial potential; and (4) low total experiment cost. K.L.

N80-10599# Committee on Science and Technology (U. S. House).
PASSIVE SOLAR ENERGY PROGRAMS AND PLANS
Washington GPO 1978 432 p Hearing before the Subcomm. on Advanced Energy Technologies and Energy Conservation Res., Development and Demonstration of the Comm. on Sci. and Technol., 95th Congr., 2d Sess., 19 Sep. 1978
(GPO-36-211) Avail: Subcomm. on Advanced Energy Technologies and Energy Conservation Res., Development and Demonstration

Testimony delivered and statements received regarding passive solar energy systems development under the Solar Heating

and Cooling Demonstration Act (PL 93-409) are presented. Basic approaches are described as well as the use of specific heat absorbing materials in building construction and the use of windows and baffles to control the amount of sunlight received. Additional research needs are examined. Market demand, technology transfer, and technology utilization are also considered.
A.R.H.

N80-10600*# RCA Labs., Princeton, N. J. David Sarnoff Research Center.
ANALYSIS OF S-BAND SOLID-STATE TRANSMITTERS FOR THE SOLAR POWER SATELLITE Final Report, 1 Nov. 1978 - 1 Jun. 1979
E. F. Belohoubek, M. Ettenberg, H. C. Huang, M. Nowogrodzki, and F. N. Sechi 1 Jun. 1979 79 p refs
(Contract NAS9-15755)
(NASA-CR-160320) Avail: NTIS HC A05/MF A01 CSCL 10A

The possibility of replacing the Reference System antenna in which thermionic devices are used for the dc-to-microwave conversion, with solid-state elements was explored. System, device, and antenna module tradeoff investigations strongly point toward the desirability of changing the transmitter concept to a distributed array of relatively low power elements, deriving their dc power directly from the solar cell array and whose microwave power outputs are combined in space. The approach eliminates the thermal, weight, and dc-voltage distribution problems of a system in which high power tubes are simply replaced with clusters of solid state amplifiers. The proposed approach retains the important advantages of a solid state system: greatly enhanced reliability and graceful degradation of the system. A.R.H.

N80-10601*# Honeywell, Inc., Minneapolis, Minn.
OCMULGEE NATIONAL MONUMENT VISITOR CENTER SOLAR HEATING AND COOLING SYSTEM DESIGN REVIEW DATA
May 1978 72 p refs Prepared for NASA and DOE
(Contract NAS8-32093)
(NASA-CR-150706) Avail: NTIS HC A04/MF A01 CSCL 10A

The design of a solar heating and cooling system is documented. Solar collectors, design approaches, system trade studies, and preliminary specifications are discussed. K.L.

N80-10602*# Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.
SOLAR HEATING AND COOLING SYSTEMS DESIGN AND DEVELOPMENT Quarterly Report, 9 Jul. - 9 Oct. 1976
Oct. 1976 81 p Prepared for DOE
(Contract NAS8-32093)
(NASA-CR-150618; HONEYWELL-F3437-QR-101) Avail: NTIS HC A05/MF A01 CSCL 10A

Solar heating and heating/cooling systems were designed for single family, multifamily, and commercial applications. Subsystems considered included solar collectors, heat storage systems, auxiliary energy sources, working fluids, and supplementary controls, piping, and pumps. K.L.

N80-10603*# Energy Research Corp., Danbury, Conn.
TECHNOLOGY DEVELOPMENT FOR PHOSPHORIC ACID FUEL CELL POWERPLANT, PHASE 2 Quarterly Report
Larry Christner Jun. 1979 72 p Prepared for DOE
(Contract DEN3-67)
(NASA-CR-159705; DOE/NASA/0067-79-2; QR-3) Avail: NTIS HC A04/MF A01 CSCL 10A

A technique for producing an acid inventory control member by spraying FEP onto a partially screened carbon paper backing is discussed. Theoretical analysis of the acid management indicates that the vapor composition of 103% H3PO4 is approximately 1.0 ppm P4O10. An SEM evaluation of corrosion resistance of phenolic resins and graphite/phenolic resin composites in H3PO4 at 185 C shows specific surface etching. Carbonization of graphite/phenolic bipolar plates is achieved without blistering.
K.L.

N80-10604*# University of Western Kentucky, Bowling Green.
MSFC SOLAR HEATING AND COOLING HIGH SPEED PERFORMANCE (HISPER) CODE VALIDATION Final Report
Henry M. Healey 12 Oct. 1979 15 p
(Contract NAS8-33387)
(NASA-CR-161323) Avail: NTIS HC A02/MF A01 CSCL 10A

The status of the Solar Heating and Cooling Project is reported. Modifications to the HISPER program are outlined, and recommendations concerning the validation study of HISPER are included.
F.O.S.

N80-10605# Westinghouse Electric Corp., Eddystone, Pa.
SCREENING EVALUATION OF NOVEL POWER CYCLES INTEGRATED WITH GASIFICATION PLANTS Final Report
R. W. Foster-Pegg and R. V. Garland Feb. 1979 136 p
(Contract EPRI Proj. 990-3)
(EPRI-AF-1002) Avail: NTIS HC A07/MF A01

Three basic plant configurations were studied: (1) the condensing combined cycle, which includes combustion turbines, gas expanders and condensing steam turbines; (2) the single cycle, which is comprised of combustion turbines and gas expanders, but no steam turbines; and (3) the noncondensing combined cycle, which utilizes combustion turbines, gas expanders and a non-condensing steam turbine. The most efficient plant configuration studied included a non-condensing steam turbine. The best plant heat rate calculated for this configuration is 7956 Btu/Kwh.
DOE

N80-10606# Argonne National Lab., Ill. Materials Science Div.
MATERIALS TESTING FOR CENTRAL RECEIVER SOLAR-THERMAL POWER SYSTEMS
S. Majumdar 1979 14 p
(Contract W-31-109-eng-38)
(DOE/TIC-10103) Avail: NTIS HC A02/MF A01

The determination of specific elevated temperature mechanical properties of materials used for critical components in solar control receiver power systems is described. The biaxial creep fatigue testing of type 316H stainless steel superheater tubing is discussed. A survey of sodium effects on candidate materials for solar-thermal electric piping and steam generators is presented. The mechanical properties data generation is evaluated. DOE

N80-10607# Department of Energy, Washington, D. C. Energy Information Administration.
ECONOMIC STRUCTURE, AGGREGATE PRODUCTION FUNCTIONS AND THE DEMAND FOR ENERGY AS AN INTERMEDIATE PRODUCT: A PRELIMINARY ANALYSIS
G. M. Lady Dec. 1978 57 p refs
(DOE/EIA-0103/8) Avail: NTIS HC A04/MF A01

The relationship between the price elasticity of demand for energy as a factor of production and differences in economic structure was investigated. A model of general economic equilibrium is constructed utilizing a constant-elasticity-of-substitution production function. Using this model the price elasticity of demand for an intermediate product (energy) is determined under alternative structural assumptions (i.e., the degree to which the production process for the intermediate product directly utilizes primary factors of production). For an open economy and the case of energy, these assumptions could concern the degree to which the economy utilizes its own versus imported energy resources.
DOE

N80-10608# Sandia Labs., Albuquerque, N. Mex.
DISPERSED POWER SYSTEMS AND TOTAL ENERGY
V. L. Dugan Nov. 1978 3 p Presented at AIAA Conf. on Solar Energy, Phoenix, Ariz., 27 Nov. 1978
(Contract EY-76-C-04-0789)
(SAND-78-2006C; Conf-781133-3) Avail: NTIS HC A02/MF A01

The variations of solar systems considered for dispersed applications are defined, and their relative benefits and costs are examined. Also, the role and benefits of total energy systems in dispersed applications are discussed. Although dispersed solar power systems offer large stored energy multiplication factors, they exhibit a large materials and land dependency. The importance of using most plentiful and available materials and planning a recycling materials use strategy are emphasized. DOE

N80-10609# Sandia Labs., Albuquerque, N. Mex.
SAFETY AND ENVIRONMENTAL IMPLICATIONS DOE/SANDIA MIDTEMPERATURE SOLAR SYSTEMS TEST FACILITY
J. A. Leonard Nov. 1978 7 p Presented at Environ. Control Symp., Washington, D.C., 28 Nov. 1978
(Contract EY-76-C-04-0789)
(SAND-78-2292C; Conf-781109-8) Avail: NTIS HC A02/MF A01

The Midtemperature Solar Systems Test Facility (MSSTF) in Albuquerque, New Mexico, is presented. The MSSTF is, at 32 kWe, the largest solar electric power plant in the U.S. and also represents the world's first application of the solar total energy concept to an actual load, an 1100 sq m office building. DOE

N80-10610# Booz-Allen and Hamilton, Inc., Bethesda, Md.
EPRI NEW ENERGY RESOURCES DEPARTMENT STRATEGY PAPER Final Report, Jan. 1979
Michael Lotker 1979 114 p
(EPRI-ER-979) Avail: NTIS HC A06/MF A01

The rationale for national and utility industry involvement in new energy resources (NER) technology is presented. The procedures currently being used to formulate programs in each of the NER technologies are described. DOE

N80-10611# California Univ., Berkeley. Lawrence Berkeley Lab.
ANOTHER LOOK AT ENERGY CONSERVATION
L. Schipper 1978 24 p refs Presented at Amer. Econ. Assoc., Chicago, 30 Aug. 1978
(Contract W-7405-eng-48)
(LBL-7893; Conf-7808104-1) Avail: NTIS HC A02/MF A01

The need for energy conservation in U.S. buildings, industry and the transportation sector, the effects of the amount and cost of energy supplies on energy conservation, and goals of a national energy policy are discussed. DOE

N80-10612# System Development Corp., Santa Monica, Calif.
THE 10MW(e) SOLAR THERMAL CENTRAL RECEIVER PILOT PLANT: HELIOSTAT FOUNDATION AND INTERFACE STRUCTURE INVESTIGATION
R. K. Shogren and J. T. Phillips 28 Aug. 1978 87 p refs
Sponsored by Sandia Labs.
(Contract EY-76-C-04-0789)
(SAND-78-8180) Avail: NTIS HC A05/MF A01

Foundation design requirements for heliostats for the 10 MWe Solar Thermal Power Plant (STPP) were investigated. Soils data were reviewed and a soils investigation specification and recommendations were prepared as required. Foundation to collector interface requirements were studied. Candidate foundation designs were prepared with associated cost studies. Grading requirements recommendations consistent with technical and budgetary restrictions, and recommendations for construction and test of prototype foundations were developed. DOE

N80-10613# Battelle Pacific Northwest Labs., Richland, Wash.
SUMMARY REPORT OF THE SOLAR REFLECTIVE MATERIALS TECHNOLOGY WORKSHOP
M. A. Lind and L. E. Ault Oct. 1978 93 p Workshop held at Denver, 28-30 Mar. 1978
(Contract EY-76-C-06-1830)
(PNL-2763; Conf-780380) Avail: NTIS HC A05/MF A01

Solar reflector materials technology was assessed. Metals, metallic films and alloys, and dielectric or ceramic stacks were considered as reflecting surface materials. Protective coatings discussed included polymer paints and films, inorganic coatings, and thin glass. The mirror support structures considered were polymer foams, cellular glass, aluminum honeycomb, wood, and fiberglass and epoxy composites. The requirements and properties for reflector materials were discussed along with environmental tests and actual field experiences with solar collector structures. High concentration ratio and central receiver concepts were emphasized. K.L.

N80-10616# Combustion Engineering, Inc., Windsor, Conn. Power Systems Group.
MDAC/ROCKETDYNE SOLAR RECEIVER: DESIGN REVIEW
H. M. Payne Aug. 1978 130 p refs
(Contracts EY-76-C-04-0789; AT(29-1)-789)
(SAND-78-8188; ASA-78-06) Avail: NTIS HC A07/MF A01

The adequacy of the design in meeting the requirements of the solar central receiver (boiler) over a commercial lifetime of 30 years was assessed for an external solar heated receiver, composed of a multiple of modular panels arranged in parallel and operating on the once-through steam generation principle. Each panel is composed of welded tangent tubes, connected between inlet and outlet headers. Subcooled water enters the bottom headers, flows upward, absorbs heat, produces saturated steam throughout the two phase region, and exits at the top as superheated steam. Tube size and material are the same for both commercial and pilot plants. Panel sizes are different between the two plants. Commercial plant heat flux is approximately 2.8 times that of the pilot plant. Structural supports and attachments of both designs are similar. Control of final superheat temperature is maintained by varying the water flow to each of the panels, according to the thermal absorption of each panel. DOE

N80-10617# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY INFORMATION DATA BASE. CORPORATE AUTHOR ENTRIES Progress Report, Jun. 1978 - Mar. 1979
Mar. 1979 40 p
(DOE/TIC-4585-R1-Suppl-1) Avail: NTIS HC A03/MF A01

This supplement contains additions to TID-4585-R1 and is intended to be used with that publication. Future supplements will be cumulative from June 1978 until another revision is issued. DOE

N80-10618# Department of Energy, Washington, D. C.
NATIONAL ENERGY PLAN 2
1979 355 p
(DOE/TIC-10109) Avail: NTIS HC A16/MF A01

The Administration's second National Energy Plan is presented. The past, present, and future of energy supply and demand for the U.S. is discussed. DOE

N80-10619# California Univ., Livermore. Lawrence Livermore Lab.
ENERGY TRANSITION IN CALIFORNIA
M. N. Christensen 1979 25 p refs
(Contract W-7405-eng-48)
(UCRL-15003) Avail: NTIS HC A02/MF A01

Major elements of consensus within current energy debates are discussed. Implications of that consensus for development of large scale supply facilities, decisions by end-users of energy, and prospects for future demands for energy are also discussed. Events and circumstances in California are focused but relevant information from other places is also used. DOE

N80-10620# Department of Energy, Washington, D. C.
ENERGY SUPPLY AND DEMAND IN THE MIDTERM: 1985, 1990, AND 1995 Analysis Report
Apr. 1979 223 p
(DOE/EIA-0102/52) Avail: NTIS HC A10/MF A01

To account for the uncertainty inherent in projecting future energy production, consumption, prices, and associated variables, five basic projection series (A-E) are presented. These series constitute variations in assumptions influencing energy supply and demand curves. High demand is assumed for Series A and B, and low demand is assumed for D and E. High supply is assumed for Series A and D, and low supply is assumed for Series B and E. Series C assumes medium supply and demand. Two additional scenarios, C High and C Low, evaluate the sensitivity of the Series C forecasts to variations in the projected

world of oil price A computer model, called the 'midterm energy forecasting system', simulates the interactions of energy suppliers and consumers in the marketplace
DOE

N80-10621# California Univ., Berkeley Lawrence Berkeley Lab.

ENERGY CONSERVATION AND THE ENVIRONMENT: CONFLICT OR COMPLEMENT

L Schipper Sep 1978 84 p refs Presented at Conf on Impacts and Risks of Energy Strategies, Stockholm, Sweden, Sep 1978 and the Environmental Secretariate, Organization for Economic Cooperation and Development, Paris, Oct 1978
(Contract W-7406-eng-48)
(LBL-7882; Conf-7809141-1; Conf-7810167-1) Avail: NTIS HC A05/MF A01

The relationship among energy, the environment, and economic well-being is discussed. The confusing aspects were sorted out in order to show how goals relating to the efficient use of energy are aligned both with traditional economic goals and with modern environmental goals. The role of energy in the economy was analyzed and the origins of many of the misconceptions about that role were traced.
DOE

N80-10623# California Univ., Livermore Lawrence Livermore Lab.

METHODS OF ESTIMATING THE RELIABILITY OF WIND ENERGY SYSTEMS WITH STORAGE

C R Glassey and G F Moyer 1978 61 p refs
(Contract W-7405-eng-48)
(UCRL-15005) Avail: NTIS HC A05/MF A01

Some preliminary results obtained in analyzing the reliability of wind generator storage systems are presented. The investigation took two separate approaches, simulation and probabilistic modeling, to reveal the trade-offs which can be made between generating capacity and storage capacity to attain a desired level of reliability. The performance criterion used throughout this work was the frequency of occurrence of empty storage. This criterion was essentially the same as the frequency of loss of load. DOE

N80-10624# Brookhaven National Lab., Upton, N. Y.

SOLAR ASSISTED HEAT PUMP OVERVIEW AND SUMMARY OF IN-HOUSE RESEARCH

John W Andrews Sep 1978 5 p refs Presented at the 3rd Ann. Solar Heating and Cooling R and D Contractors' Meeting, Washington, D.C., 24 Sep. 1978
(Contract EY-76-C-02-0016)
(BNL-24911; Conf-780983-2) Avail: NTIS HC A02/MF A01

The following areas of solar assisted heat pump research and development are overviewed: (1) development of special heat pump tuned to take advantage of the 40 to 100 F source temperature range appropriate for solar assist, (2) identification of low cost, solar energy collection and storage subsystems appropriate for the solar assist function, and (3) analysis of solar assisted heat pump systems to determine what component parameters are required to produce economically competitive systems.
DOE

N80-10625# Battelle Pacific Northwest Labs., Richland, Wash.

METHODOLOGY FOR IDENTIFYING MATERIALS CONSTRAINTS TO IMPLEMENTATION OF SOLAR ENERGY TECHNOLOGIES

J W Litchfield, R L Watts, W E Gurwell, J N Hartley, and C H Bloomster Jul 1978 91 p refs
(Contract EY-76-C-06-1830)
(PNL-2711) Avail: NTIS HC A05/MF A01

A materials assessment methodology for identifying specific critical material requirements that could hinder the implementation of solar energy was developed and demonstrated. The methodology involves an initial screening process, followed by a more detailed materials assessment. The detailed assessment considers such materials concerns and constraints as process and production constraints, reserve and resource limitations, lack of alternative supply sources, geopolitical problems, environmental and energy concerns, time constraints, and economic constraints. Data for 55 bulk and 53 raw materials required in the example photovoltaic systems are available on the data base. Engineering and bulk material requirements were defined for one photovoltaic system, thirteen photovoltaic cells, ten solar heating and cooling systems, and two agricultural and industrial process heat systems.
DOE

N80-10626# Sandia Labs., Albuquerque, N. Mex.

SENSITIVITY STUDY OF BRAYTON CYCLE POWER PLANT PERFORMANCE

Carl C Hiller Aug 1978 36 p refs
(Contract EY-76-C-04-0789)
(SAND-78-8020) Avail: NTIS HC A03/MF A01

The efficiency of Brayton cycle power plants is investigated. The parameters and configurations examined include open and closed air cycles, optimum pressure ratio, helium versus air working fluids, turbine and compressor isentropic efficiencies, recuperator effectiveness, turbine inlet temperature, heat rejection temperature, pressure drop losses, with/without intercooling, and with/without reheat. Equation derivations, a computer listing, and a hand calculator program listing are included. DOE

N80-10627# Oak Ridge National Lab., Tenn.

SURVEY OF SOLAR THERMAL ENERGY STORAGE SUBSYSTEMS FOR THERMAL/ELECTRIC APPLICATIONS

C L Segaser Aug 1978 101 p refs
(Contract W-7405-eng-26)
(ORNL/TM-5758) Avail: NTIS HC A06/MF A01

The technology and estimated costs of subsystems for storing the thermal energy produced by solar collectors are discussed. The systems considered are capable of producing both electricity and space conditioning for a single family detached residence, an apartment complex of 100 units, and a city of 30,000 residents containing both single family residences and apartments. Up to 36 x 10 to the 5th power kWhr of thermal storage capacity is required. In addition to sensible heat and latent heat storage materials, several other media were investigated as potential thermal energy storage materials, including the clathrate and semiclathrate hydrates, various metal hydrides, and heat storage based on inorganic chemical reactions.
DOE

N80-10628# Public Service Electric and Gas Co., Newark, N. J.

BATTERY ENERGY STORAGE TEST (BEST) FACILITY Progress Report

Emile A Hyman Feb 1979 94 p refs
(Contract EY-76-C-02-2857)
(EPRI-EM-1005; PR-1) Avail: NTIS HC A05/MF A01

The activities of the first three phases during the time period March 1, 1976 to July 1, 1978 are presented. Included are a background review, key milestone dates, a description of activities for the three phases (including those associated with the future implementation of the second test bay), and a description of major interactions between the BEST Facility program and the advanced battery development programs.
DOE

N80-10629# Mitre Corp., McLean, Va. Metrek Div.

ENVIRONMENTAL DATA FOR ENERGY TECHNOLOGY POLICY ANALYSIS. VOLUME 1: SUMMARY

Joke Verhoeff, Robert Kline, William L Parker, Thomas F Wolfinger, David Adler (CONSAD Research Corp.), Gabriel Sucher (CONSAD Research Corp.), Marc Narkus-Kramer (International Research and Technology, Inc.), Nicklaus E Leggett (International Research and Technology, Inc.), and Tyrone Williams (International Research and Technology, Inc.) Jan 1979 106 p refs
(Contract EE-77-C-01-6119)
(HCP/EV6119-1) Avail: NTIS HC A06/MF A01

Qualitative and quantitative information on the environmental aspects of different energy technologies is provided. Data are given on nuclear energy, coal, synthetic fuels, oil shale, solar energy, geothermal energy, and hydroelectricity. Each category of technology is broken down into individual technology phases or base units for which environmental effects could reasonably be specified. Each base unit is described in terms of a typical unit or plant size and configuration.
DOE

N80-10630# Department of Energy, Washington, D. C. Office of Program Coordinator

COMPREHENSIVE ENVIRONMENT, HEALTH, AND SAFETY PROGRAM REPORT, FY 1978

Feb 1979 67 p refs
(DOE/EV-0035) Avail NTIS HC A04/MF A01

A description is given of the environment, health, and safety research, development, and demonstration activities carried out and in progress. Discussion is presented under the following section headings: a comprehensive environment, health, and safety program; concept and implementation approach; the DOE Office of Environmental - program and selected activities; environmental, health, and safety activities of other DOE offices; and, environmental, health, and safety activities of other Federal agencies. Titles of the four appendixes are: definition of research categories; summary of energy-related environment, health, and safety concerns; environment, health, and safety laws and regulations governing activities of the Department of Energy; and environmental, health, and safety activities of Federal agencies participating in the Federal Inventory. DOE

N80-10631# Department of Energy, Washington, D. C. Div. of Technology Assessments
ENVIRONMENTAL READINESS OF EMERGING ENERGY TECHNOLOGIES Summary Report
Jan. 1979 77 p
(DOE/ERD-0022) Avail: NTIS HC A05/MF A01

The principal conclusions of the 21 Environmental Readiness Documents, which assessed 24 technologies are presented. Seven technologies were judged to have minimal environmental constraints. Four are solar technologies. The minimally constrained technologies nevertheless have some potential environmental, health, and safety problems, which will require careful management. Eleven technologies, many of which are high-technology systems with great promise for meeting the Nation's energy needs, were judged to have moderate environmental constraints. The moderately constrained technologies are, with few exceptions, in the predemonstration stage, with demonstration and environmental readiness likely to be achieved by 1980-1990. Six technologies, enhanced oil recovery (micellar polymer), hydrothermal, coal gasification, coal liquefaction, diesel cogeneration, and in situ oil shale, were judged to have significant environmental constraints that will require extensive environmental research and development before they can be widely used or before they can be deployed in some environmentally sensitive areas. DOE

N80-10633# Brookhaven National Lab., Upton, N. Y.
DYNAMICS AND CONTROL: ENERGY CONVERSION, DELIVERY, AND DEMAND ANALYSIS
Kenneth C. Hoffman Apr. 1979 22 p refs Presented at the Workshop on Process and Systems Dyn. Control, Denver, 20 Jun. 1979
(Contract EY-76-C-02-0016)
(BNL-26045; Conf-790636-1) Avail: NTIS HC A02/MF A01

Techniques of mathematical modeling and modern control theory, using microprocessors and advanced measurement and control devices, are extensively applied to components and systems for the conversion and delivery of energy. The projection of energy demands, as a function of economic growth and energy price, is also the subject of active research and analysis. This position paper reviews the current state-of-the-art of analysis in these areas dealing with the planning and operation of energy systems that deliver fuels and electric power. Future research directions are also discussed. DOE

N80-10634# RAND Corp., Santa Monica, Calif.
SOVIET ENERGY BALANCES
Robert Campbell Dec. 1978 115 p refs
(Contract EX-76-C-01-2337)
(RAND/R-2257-DOE) Avail: NTIS HC A06/MF A01

The pattern of energy flows in the Soviet economy contrasts sharply with that in the U.S. and in Western Europe. Today, the flow of energy exports in the USSR amounts to about 12% of Soviet primary energy production in 1975, whereas the U.S. and Western Europe must relay heavily on imports to augment domestic production. The composition of primary energy production in the USSR has changed considerably since 1950, when 80% was accounted for by solid fuel and only 18.5% by hydrocarbons. By 1975, hydrocarbons accounted for 64%, and the share for solid fuels had fallen to 33%. Since most Soviet energy exports have consisted of oil, the emphasis on solid fuels in consumption in the USSR is still higher than in production; solid fuels now represent 37% of consumption compared with 21% in Western Europe and 19% in the U.S. Within solid fuels, there is heavy reliance on relatively low-grade fuels: lignite, peat, oil shale, and firewood constituted nearly a third of Soviet solid fuel production in 1975. DOE

N80-10635# Washington Scientific Marketing, Inc., Washington, D. C.
DEPARTMENT OF ENERGY WORKSHOPS ON INDUSTRIAL ENERGY CONSERVATION REPORTING Final Report
[1979] 190 p Workshops held at Washington, D. C., Atlanta, Houston, Tex., Chicago, New York, San Francisco, Nov. 1978 - Feb. 1979
(DOE/CS-1830-T3) Avail: NTIS HC A09/MF A01

A voluntary industrial energy-conservation program was initiated and now includes 50 trade organizations representing over 3,000 companies. Their current reporting system is an effort to respond to the Energy Policy and Conservation Act requirements, as now modified by the National Energy Conservation Policy Act. DOE's Office of Industrial Programs held six workshops in various key locations between November 1978 and February 1979 to enable energy managers to develop ideas and make suggestions that would improve the current and future energy-reporting programs. This report is a summary of the wide range of recommendations that the workshop participants offered as a means of meeting the NECPA requirements and the criticism of the current reporting program. It also reflects industry's views on potential approaches to future reporting. DOE

N80-10636# RAND Corp., Santa Monica, Calif.
RESOLVING ENVIRONMENTAL ISSUES IN ENERGY DEVELOPMENT: ROLES FOR THE DEPARTMENT OF ENERGY AND ITS FIELD OFFICES
Phyllis L. Ellickson and Edward W. Merrow Jan. 1979 62 p refs
(Contract EX-76-C-01-2337)
(RAND/R-2335-DOE) Avail: NTIS HC A04/MF A01

The role of the Department of Energy to resolve environmental conflicts that arise during the implementation of energy projects or programs was studied. The environmental concerns surrounding implementation and feasibility of national energy policies were also studied. The investigation reached the conclusion that the government's most effective role in resolving environmental conflicts and uncertainties is to improve communications among the concerned parties. This role requires flexibility and evenhandedness from the government as well as an understanding of the local conditions and a commitment to appropriate local solutions. Involving local sources at every stage of the environmental impact analysis can reduce the probability of conflicts and make those that do arise more easily resolvable. DOE

N80-10637# Los Alamos Scientific Lab., N. Mex.
SELECTED RESULTS FROM THE TECHNOLOGY ASSESSMENT OF SOLAR ENERGY PROGRAM
Milton C. Krupka and John H. Altseimer 1979 8 p refs Presented at AIAA Terrestrial Energy Systems Conf., Orlando, Fla., 4-6 Jun. 1979
(Contract W-7405-eng-36)
(LA-UR-79-950; Conf-790611-3) Avail: NTIS HC A02/MF A01

Emerging solar technologies and selected applications were studied from environmental, institutional and social viewpoints. The impacts resulting from the large scale deployment of decentralized solar technologies were assessed. Emphasis was placed upon technical characterization of the technology and the development of a representative model system for a given application upon which an environmental analysis could be made. DOE

N80-10638# Sandia Labs., Albuquerque, N. Mex.
ANALYTICAL EVALUATION OF A SOLAR THERMOPHOTOVOLTAIC (TPV) CONVERTER
Michael W. Edenburn 1979 5 p refs Presented at the International Solar Energy Society Meeting, Atlanta, 28 May 1979

(Contract EY-76-C-04-0789)
(SAND-79-0504C; Conf-790541-2) Avail: NTIS
HC A02/MF A01

A thermophotovoltaic converter was parametrically analyzed for emitter temperature, cell reflectance to radiation with energy below the cell's bandgap energy and concentration ratio requirements. Important conclusions are: (1) an emitter temperature of 2000 K is optimal; (2) a cell reflectance value of 0.98 is required for below bandgap irradiation; (3) a secondary concentrator must be used with a parabolic dish primary; and (4) a mirror quality resulting in a 4 mrad reflection-beam dispersion is required for a 24% conversion efficiency. DOE

N80-10639# Lincoln Lab., Mass. Inst. of Tech., Lexington.
FLYWHEEL ENERGY STORAGE AND CONVERSION SYSTEM FOR SOLAR PHOTOVOLTAIC APPLICATIONS
Alan R. Millner 1979 9 p Presented at the ASME Gas Turbine Conf., San Diego, Calif., 12-15 Mar. 1979
(Contract EY-76-C-02-4094)
(COO-4094-31; Conf-790305-6) Avail: NTIS
HC A02/MF A01

A low-drag, low-power magnetic bearing and a permanent magnet brushless DC motor-generator developed were developed for a satellite flywheel. These will be combined with a terrestrial flywheel and control electronics to make up a flywheel energy storage and conversion system for use in a stand-alone solar photovoltaic residence. Technical and economic performance analyses indicate that, contrary to general thought, a flywheel system will be competitive if not superior to more conventional systems utilizing either present day or advanced batteries. This derives from the ability of the flywheel to perform the functions of dc-to-ac inversion and optimal impedance matching between the PV arrays and the load in addition to providing energy storage. The structural topology, performance data, design parameters, and test measurements of the magnetic bearing and motor-generator are to be used as well as the flywheel and control electronics. A preliminary discussion of the economic aspects is also included. DOE

N80-10640# Sandia Labs., Albuquerque, N. Mex.
GRAPHICAL REPRESENTATION OF TMY SOLAR RADIATION AVAILABILITY FOR ONE- AND TWO-AXIS SOLAR COLLECTORS
L. L. Lukens and R. R. Peters May 1979 113 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0418) Avail: NTIS HC A06/MF A01

Information about the availability of direct normal radiation to three tracking modes of concentrating collectors (two-axis, east-west, and north-south horizontal axis tracking collectors) for the 26 typical meteorological year stations is presented. The data presented include energy availability, efficiency based on the direct normal radiation availability, and energy distribution. DOE

N80-10644# Department of Energy, Washington, D. C. Div. of Legislative Research and Analysis.
SUMMARY OF MAJOR ENERGY LEGISLATION OF THE 95TH CONGRESS
Dec. 1979 158 p
(DOE/TIC-10118) Avail: NTIS HC A08/MF A01

The title, sponsor, synopsis, and legislative status of major energy lesiglation of the 95th Congress includes the following subjects: Alaska lands, Alaska gas transportation, antiboycott legislation, backhauling, Canadian fuel imports, cargo preference/tanker safety, Clean Air Act, coal conversion, coal leasing, coal slurry pipelines, cogeneration, dealer protection, Department of Energy (organization), DOE FY-79 appropriations and authorizations, divestiture, electric energy and utilities, energy conservation, energy impact assistance, Energy Policy Institute, ERDA FY-78 authorizations, ERDA/FEA FY-78 appropriations, enhanced oil recovery, environment and safety, FEA FY-78 authorization, fuels transportation safety, gasohol, geothermal energy, insulation standards, liquefied natural gas, mine safety, National Energy Act, natural gas, nuclear energy, nuclear siting and licensing, nuclear waste management, oil and gas leasing, oil import fees, oil pollution liability, oil shale commercialization, outer continental shelf, pipeline destruction, Safe Drinking Water Act, solar energy, state energy management program, strip mining, and uranium mill tailings. DOE

N80-10645# Los Alamos Scientific Lab., N. Mex.
ECONOMIC PERFORMANCE OF PASSIVE SOLAR HEATING: A PRELIMINARY ANALYSIS
Fred Roach, Scott Noll (New Mexico Univ., Albuquerque), and Shaul Ben-David 1978 11 p refs Presented at AIAA/ASERC Conf. on Solar Energy, Phoenix, Arizona, 27-29 Nov. 1978
(LA-UR-78-2861; Conf-781133) Avail: NTIS
HC A02/MF A01

For the thermal storage wall two types of storage medium-masonry (Trombe) and water are examined. In addition, a night insulation option is included in the thermal storage wall concept, thus giving rise to four alternative passive designs. The economic performance of these alternative designs is evaluated on a state-by-state basis. The architectural design criteria, solar performance characteristics, and the incremental solar cost of each solar design are reviewed. Conventional energy costs are discussed as well as the optimal sizing/feasibility criterion employed in the economic performance analysis. Nationwide feasibility results are reviewed for each alternative design. In addition to contracting the solar systems themselves, the effects of two incentive proposals-the National Energy Act (NEA) income tax credits and low interest loads-upon each design are examined. Major conclusions are summarized for each design. DOE

N80-10646# Notre Dame Univ., Ind. Dept. of Electrical Engineering.
OPTIMAL CONTROL STUDIES OF A SOLAR HEATING SYSTEM
M. Somasundaram, James L. Melsa, and Donald R. Farris 1978 6 p refs Presented to IEEE Midcom on Electron., Dallas, Tex., 13 Dec. 1978
(Contract W-7405-eng-36)
(LA-UR-78-2556; Conf-781208) Avail: NTIS
HC A02/MF A01

Performance bounds were established for a heating, ventilating and air conditioning system in a solar heated and cooled building. Perfect knowledge of environmental conditions such as ambient temperature, wind velocity and insulation was assumed in order to determine whether prior knowledge of such information can be effectively employed to reduce the amount of auxiliary energy used. The optimal control study is based on a model of the 660000 sq. ft. National Security and Resources Study Center at the Los Alamos Scientific Laboratory. DOE

N80-10650# Sandia Labs., Albuquerque, N. Mex.
DETERMINATION OF THE TECHNICAL AND ECONOMIC FEASIBILITY OF LUMINESCENT SOLAR CONCENTRATORS
Final Report
C. F. Rapp, N. L. Boling, I. M. Thomas, G. L. Opdycke, R. B. Fechter, J. Chrysochoos, and P. S. Friedman Mar. 1979 213 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7005) Avail: NTIS HC A10/MF A01

A somewhat different concentrator configuration was investigated. In the configuration, a thin luminescent film is deposited on all undoped substrate. The luminescence then originates in the film but is trapped within the entire thicker structure. In this study, a large number of fluorescent dopant-host combinations were identified. These were primarily organic but inorganic materials were also included. Absorption spectra, emission spectra and quantum efficiencies were measured on various samples in order to identify the best candidates for the luminescent concentrator device. Six inch by six inch and twelve inch by twelve inch concentrator plates were made which demonstrated approximately 15% effective concentrator efficiencies. The major loss mechanisms responsible for decreases in collector efficiencies were identified and quantitatively evaluated. Efficiency improvement factors of several times appear possible. DOE

N80-10651# Brookhaven National Lab., Upton, N. Y.

STATE OF THE ART OF SENSIBLE HEAT STORAGE FOR SOLAR HEAT PUMP SYSTEMS

Philip D. Metz 1979 9 p refs Presented to Solar Energy Storage Options Workshop, San Antonio, Tex., 18 Mar. 1979
(Contract EY-76-C-02-0016)
(BNL-25909; Conf-790328-4) Avail: NTIS HC A02/MF A01

Factors which influence the storage characteristics of solar source heat pump systems are discussed including: solar collection devices, the heat pump, and the utility interface. Some of the characteristics of solar source heat pumps storage are specified such as: temperature range and thermal inertia. The storage options which are discussed are: rock beds, water tanks, ground coupled storage, swimming pools, and ponds. DOE

N80-10652# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.

ANALYSIS OF A LiCl OPEN-CYCLE ABSORPTION AIR CONDITIONER WHICH UTILIZES A PACKED BED FOR REGENERATION OF THE ABSORBENT SOLUTION DRIVEN BY SOLAR HEATED AIR **Final Report, Dec. 1977 - Sep. 1978**

Cecile M. Leboeuf and G. O. G. Loef Oct. 1978 32 p refs
(Contract EG-77-S-02-4546)
(COO-4546-1) Avail: NTIS HC A03/MF A01

The technical feasibility of lithium chloride open cycle absorption air conditioner which utilizes solar heated air for reconcentration of the absorbent solution is examined. The use of a packed bed concentrator was described. Operating conditions for a 3-ton residential unit are determined from equilibrium data, conservation of mass and energy, and transfer rate equations. Humidity, air temperature, and packing type are varied to determine their effect on packed bed performance and required packing volumes. The required operating temperatures, humidities, and flow rates are comparable to those which can be obtained from a conventional solar air-heating system during the summer, especially in dry climates. Construction and testing of a packed bed of appropriate design is recommended for validation of the analysis. DOE

N80-10653# Colorado State Univ., Fort Collins. Solar Energy Applications Labs.

PRELIMINARY ANALYSIS OF A TOTAL SOLAR HEATING SYSTEM **Final Report, Dec. 1977 - Sep. 1978**

James A. Leflar, P. Burns, and C. B. Winn Oct. 1978 28 p
(Contract EG-77-S-02-4546)
(COO-4546-4) Avail: NTIS HC A03/MF A01

A set of computer simulation programs was developed such that the programs provide a useful design tool for the design of total solar heating systems. DOE

N80-10654# Carrier Corp., Syracuse, N. Y. Energy Systems Div.

DEVELOPMENT OF A HIGH TEMPERATURE SOLAR POWERED WATER CHILLER. VOLUME 3: PHASE 1 **Technical Progress Report, 26 Sep. 1977 - 1 Jun. 1978**

Richard A. English Jun. 1978 121 p refs
(Contract EG-77-C-03-1590)
(SAN-1590-1/3-Vol-3) Avail: NTIS HC A06/MF A01

The conceptual design rationale and resulting design configuration are described as well as estimates of cost and performance. Because the development of the turbocompressor design paralleled the development of the chiller system design, all of the cost and performance data are based on intermediate turbo-compressor performance data, as well as on unoptimized components. Optimized performance was computed. DOE

N80-10655# Alabama Univ., Huntsville.

EXPERIMENTAL AND NUMERICAL STUDIES OF LIQUID STORAGE TANK THERMAL STRATIFICATION FOR A SOLAR ENERGY SYSTEM **Semiannual Progress Report, 1 Mar. - 31 Aug. 1978**

S. T. Wu 29 Sep. 1978 24 p
(Contract EG-77-S-02-4479)
(COO-4479-2) Avail: NTIS HC A02/MF A01

The construction of the thermal stratification system was completed and checked out. The details of this check-out procedure are included. The physical dimensions of the facility are shown. This storage tank is a modified septic tank with a capacity of 1500 gallons. This tank is installed with approximately half of the tank below ground. Insulation is 3 in of spray-on foam externally and 1 in internally, protected by a butyl rubber covering. The liquid level in the tank is 44 in. DOE

N80-10656# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.

SOLAR GENERATION OF INDUSTRIAL STEAM. INNOVATIVE RESEARCH PROGRAM SUBTASK **Final Report, Dec. 1977 - Sep. 1978**

Terry Lenz Oct. 1978 10 p refs
(Contract EG-77-S-02-4546)
(COO-4546-9) Avail: NTIS HC A02/MF A01

Comparison of hybrid solar-mechanical (vaporization at low pressure followed by compression), inorganic salt eutectic and polymer latent heat slurry, and solar-thermochemical schemes, pointed to the thermochemical approach as most promising. The condensed-phase reactions were studied. The following classes of reactions meet the set of criteria: reversibly-catalyzed thermal isomerizations, Diels-Alder additions, and esterifications. These particular reaction classes offer significant potential for lower temperature solar-thermochemical systems with condensed phase energy storage. DOE

N80-10657# PRC Energy Analysis Co., Los Angeles, Calif.

SATELLITE POWER SYSTEM (SPS) PRELIMINARY SOCIETAL ASSESSMENT

Charles Bloomquist, A. Daurio, and S. Shotland May 1979 69 p refs
(Contract EG-77-C-01-4024)
(HCP/R4024-01/14) Avail: NTIS HC A04/MF A01

The findings of fourteen papers dealing with SPS societal issues are presented. While numerous societal problems and potential concerns are delineated, no program stoppers were identified. Thus, in so far as the societal ramifications of an SPS are concerned, additional study of the concept is warranted. Societal topics which merit particular attention in the future are delineated. These include rectenna site availability, utility integration, and institutional/international considerations. Study findings that might be used in a comparative assessment of the SPS with alternative energy systems are presented. Methodological considerations for future SPS societal research are also discussed. DOE

N80-10658# Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.

COST-EFFECTIVE CONTROL SYSTEMS FOR SOLAR HEATING AND COOLING APPLICATIONS **Final Report**

Jane H. Pejsa, W. W. Bassett, S. A. Wenzler, K. H. Nguyen, and T. J. Olsen Sep. 1978 180 p refs
(SAN-1592-1) Avail: NTIS HC A09/MF A01

A methodology is defined and the results are presented to arrive at control recommendations for a variety of climate control system designs, applications and regions, strategies, functions, sensors, actuators, and the controllers themselves. The bulk of the study effort - an attempt to simulate and evaluate system performance for several representative residential and commercial heating and cooling designs and thus to derive improved performance techniques within cost-effective control systems - are discussed. DOE

N80-10659# International Business Machines Corp., Huntsville, Ala.

SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: A-FRAME INDUSTRIES, SINGLE FAMILY DWELLING, KANEOHE, HAWAII **Progress Report, Feb. - Sep. 1978**

D. L. Nemetz 1978 29 p refs
(Contract EG-77-C-01-4049)
(SOLAR/1010-78/14) Avail: NTIS HC A03/MF A01

The operation of the solar energy system is summarized. This system is designed to provide domestic hot water for a single family dwelling in Kaneohe, Hawaii. Measured system performance is evaluated and measured climatic data are compared with long term average conditions. Performance evaluations of each major subsystem are also presented. DOE

N80-10660# Pennsylvania Univ., Philadelphia. Dept. of Mechanical Engineering and Applied Mechanics.
OPTIMAL INSULATION OF PIPES AND TANKS FOR SOLAR HEATING SYSTEMS
Gerard F. Jones and N. Lior Feb. 1979 75 p refs
(Contract EM-78-C-04-5319)
(ALO-5319-2) Avail: NTIS HC A04/MF A01

A compact and time effective insulation design procedure for solar heating system piping and water-filled thermal storage tanks was developed. Recognizing the particular sensitivity of solar systems to cost, the economic aspect of the problem is treated by a comprehensive present-value life-cycle cost analysis. In the development of the method, a numerical sensitivity analysis was performed to determine the relative effects of all relevant independent variables (within their pertinent ranges) on piping and tank heat transfer coefficient values. DOE

N80-10661# Idaho National Engineering Lab., Idaho Falls.
OVERVIEW OF GEOTHERMAL ENERGY IN THE UNITED STATES
Robert J. Schultz and E. G. DiBello 1 May 1979 14 p refs Presented at the Energy Conserv. Symp., San Francisco, 1 May 1979
(Contract EY-76-C-07-1570)
(Conf-790530-1) Avail: NTIS HC A02/MF A01

The development of hydrothermal resources, hot igneous rock resources, and conduction dominated resources is reviewed. Geothermal power generation and direct applications in the U.S. are discussed. DOE

N80-10662# Westinghouse Research and Development Center, Pittsburgh, Pa.
PERFORMANCE MONITORING OF AN OFF-PEAK HEATING AND COOLING SYSTEM UTILIZING THERMAL STORAGE AND SOLAR AUGMENTED HEAT PUMP
W. C. Moreland Apr. 1979 39 p
(EPRI-ER-845) Avail: NTIS HC A03/MF A01

The instrumentation system (including sensors and data logging equipment) used in the demonstration system are described. A general description is also given of the modes of operation of the main heat pump/storage/solar system, the proposed methodology and format for data reduction, and the present status of the program. DOE

N80-10663# Midwest Research Inst., Golden, Colo.
SOLAR POND CONCEPTS: OLD AND NEW
T. S. Javadev, Michael Edesess, and Jon Henderson 1979 7 p refs Presented at the 14th Intersoc. Energy Conversion Eng. Conf., Boston, 5-10 Aug. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-35-208; Conf-790803-3) Avail: NTIS HC A02/MF A01

Different types of solar ponds were considered from the early 1900s to the present. Salty ponds use salt to create a nonconvecting pond. Shallow solar ponds were investigated by Shuman and Willsie in 1906 and 1907 and are currently being studied by Lawrence Livermore Laboratories. Swedish investigators are studying a combination of solar collectors and water storage in a pond-cover configuration. In addition, there are thermoclines created in large bodies of water, as in large reservoirs. The various types of solar ponds are surveyed and the best of the ideas are combined to synthesize new concepts. A new solar pond concept is presented which combines the good features of convecting and nonconvecting (salty) ponds. DOE

N80-10664# California Univ., Livermore. Lawrence Livermore Lab.
EFFECT OF MECHANICAL ENERGY STORAGE SYSTEMS ON THE CHARACTERISTICS OF ELECTRIC VEHICLES
Martin W. Schwartz 14 May 1979 7 p Presented at the 14th Intersoc. Energy Conversion Conf., Boston, 5-10 Aug. 1979. Sponsored by the Am. Chem. Soc.
(Contract W-7405-eng-48)
(UCRL-82710; Conf-790803-17) Avail: NTIS HC A02/MF A01

Batteries for electric vehicle propulsion were investigated to see if effective trade-offs between short term peak power capability and energy storage capacity are possible. It was found that batteries in combination with a mechanical energy storage device can optimize both power and range capability of an electric vehicle. Equations were derived for determining the vehicle mass fraction of the mechanical energy storage system that is required to achieve a vehicle mass saving or increase in range. The extent to which mechanical energy storage systems can improve electric vehicle performance was found to depend upon the battery type and the vehicle power/mass requirements. DOE

N80-10665# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
WASTE HEAT UTILIZATION: PROCEEDINGS OF 1978 ENGINEERING FOUNDATION CONFERENCE
Apr. 1979 327 p refs Conf. held at Henniker, N. H., 13-18 Aug. 1978
(CONF-7808102) Avail: NTIS HC A15/MF A01

Fifteen papers are presented containing engineering concepts, improved methods, and/or equipment descriptions pertaining to waste heat utilization. R.E.S.

N80-10667# New Mexico Univ., Albuquerque.
WASTE UTILIZATION AS AN ENERGY SOURCE. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Progress Report, 1974 - Jul. 1979
Gerald F. Zollars Jul. 1979 55 p
(NTIS/PS-79/0765/2) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Articles from the international literature concerning the processing of solid and organic wastes for use as an energy source are cited. Industrial, agricultural, and residential wastes are considered as sources of both gaseous and liquid fuels such as methane, methanol, ethanol, and synthane. This bibliography contains 219 entries. GRA

N80-10668# New Mexico Univ., Albuquerque. Technology Application Center.
AIRCRAFT FUEL. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Progress Report, 1974 - Jul. 1979
Gerald F. Zollars Jul. 1979 43 p Sponsored in part by NTIS, Springfield, Va.
(NTIS/PS-79/0764/5) Avail: NTIS HC $28.00/MF $28.00 CSCL 10A

These 160 citations concern means to conserve fuel in airline operations. Articles dealing with aircraft design, fuels, engine design, propulsion efficiency, and operating procedures which conserve fuel are included. GRA

N80-10674# National Technical Information Service, Springfield, Va.
MICROWAVE HEATING: INDUSTRIAL APPLICATIONS. CITATIONS FROM THE ENGINEERING DATA BASE Progress Report, 1970 - May 1979
William E. Reed Jul. 1979 209 p Supersedes NTIS/PS-78/0572; NTIS/PS-77/0515; NTIS/PS-76/0447
(NTIS/PS-79/0632/4; NTIS/PS-78/0572; NTIS/PS-77/0515; NTIS/PS-76/0447) Avail: NTIS HC $28.00/MF $28.00 CSCL 13A

Industrialized uses of microwave heating are covered in these citations of worldwide research. The topics include industrial heating and drying for processes such as paper drying, vulcanization, and textile processing. Equipment design and safety are also cited. This updated bibliography contains 203 abstracts, 29 of which are new entries to the previous edition. GRA

N80-10677# National Academy of Sciences - National Research Council, Washington, D. C. Committee on Nuclear and Alternative Energy Systems.

GEOTHERMAL RESOURCES AND TECHNOLOGY IN THE UNITED STATES
Feb. 1979 65 p refs
(PB-296623/2; ISBN-0-309-02874-4) Avail: NTIS MF A01;HC National Academy of Science, Washington, D. C., $5.50 CSCL 10B

The potentials and problems of geothermal energy are assessed with particular focus on current obstacles in the development of the geothermal industry. GRA

N80-10678# General Accounting Office, Washington, D. C. Energy and Minerals Div.
ENERGY SAVING STRATEGIES FOR FEDERAL PROCUREMENT
19 Jun. 1979 14 p
(PB-296969/9; EMD-79-68) Avail: NTIS HC A02/MF A01 CSCL 10A

Federal energy conservation measures are evaluated, and what Federal agencies have done to develop and implement procurement techniques which result in reduced energy consumption is reviewed. GRA

N80-10679# General Accounting Office, Washington, D. C. Energy and Minerals Div.
NATURAL GAS RESERVES ESTIMATES: A GOOD FEDERAL PROGRAM EMERGING, BUT PROBLEMS AND DUPLICATIONS PERSIST
15 Jun. 1979 85 p
(PB-296628/2; EMD-78-68) Avail: NTIS HC A05/MF A01 CSCL 10A

Improvements needed in the Government's efforts to estimate the Nation's natural gas reserves are discussed. GRA

N80-10681# National Technical Information Service, Springfield, Va.
LEAD BATTERIES, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1977 - Jul. 1979
Diane M. Cavagnaro Aug. 1979 121 p refs Supercedes NTIS/PS-78/0690; NTIS/PS-77/0634; NTIS/PS-76-0550
(NTIS/PS-77/0634; NTIS/PS-76/0550; NTIS/PS-79/0782/7; NTIS/PS-78/0690) Avail: NTIS HC $28.00/MF $28.00 CSCL 10C

Worldwide research on lead battery components, charging, corrosion, and testing is cited. The majority of studies concern battery use in electric vehicles. Studies on lead recovery from battery scrap and air pollution at battery factories are also included. This updated bibliography contains 115 abstracts, 59 of which are new entries to the previous edition. GRA

N80-10683# Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).
FLUID DYNAMIC ASPECTS OF WIND ENERGY CONVERSION
O. DeVries (Natl. Aerospace Lab., Amsterdam) Jul. 1979 145 p refs
(AGARD-AG-243; ISBN-92-835-1326-6) Avail: NTIS HC A07/MF A01

The theory of horizontal axis and vertical axis wind driven turbines is discussed. Inhomogeneous flow, turbulence effects, turbine control, wake interference effects, and wind concentrator concepts are surveyed. K.L.

N80-10688# California Univ., Livermore. Lawrence Livermore Lab.
THE IMPACT OF LNG SPILLS ON THE ENVIRONMENT: A COMPARISON OF DISPERSION MODELS AND EXPERIMENTAL DATA
B. R. Bowman, S. B. Sutton, and W. J. Comfort 9 Jan. 1979 6 p refs Presented at the 19th Ann. Meeting of the Inst. of Environ. Sci., Seattle, 29 Apr. - 2 May 1979
(Contract W-7405-eng-48)
(UCRL-81812; Conf-790445-1) Avail: NTIS HC A02/MF A01

Two dispersion model calculations are compared with experimental data collected for 5-cubic-meter spills of liquefied natural gas (LNG) on water. The models are a Gaussian dispersion model, which includes models for vapor generation and gravity spread, and a three dimensional solution of the compressible turbulent transient Navier-Stokes equations and associated equations for conservation of species and energy. The latter model was also run in a two dimensional mode to evaluate the utility of two dimensional calculations. These calculations are compared to data collected in LNG spill and dispersion experiments, which measured the concentration of hydrocarbons at several downwind locations. The adequacy of the models and differences between them are discussed. Areas for model improvement are indicated. DOE

N80-10689# Computer Genetics Corp., Wakefield, Mass.
REMOTE SENSING OF LNG SPILL VAPOR DISPERSION USING RAMAN LIDAR
D. A. Leonard and B. Caputo Mar. 1979 121 p
(Contract W-7405-eng-48)
(UCRL-13984) Avail: NTIS HC A06/MF A01

A field experiment which evaluated the remote sensing of hydrocarbon concentrations in the dispersing cloud of gas produced by a spill of LNG using a Raman LIDAR technique is described. The background and objectives of the effort; a description of the lidar equipment, a description of the test site and the test scenario; and sections on data analysis and recommendations are included. DOE

N80-10692# Decision Focus, Inc., Palo Alto, Calif.
PROPOSED RESEARCH PLANNING FORMAT FOR THE ENVIRONMENTAL ASSESSMENT DEPARTMENT Final Report
D. Cohan and D. W. North Mar. 1979 127 p refs Sponsored by Electric Power Research Inst.
(EPRI-EA-1018; TPS-78-798) Avail: NTIS HC A07/MF A01

Issues of concern to Environmental Assessment Department (EAD) clients are reviewed, and alternative roles for EAD research are defined. The proposed planning format describes explicitly the steps in the planning and research process: identifying broad needs of industry and society: defining specific forcing issues; detailing research needs and objectives; developing research programs and projects; and producing the research results and integrated products that form the EPRI response to the original needs. An illustrative application of the planning format to the current EAD research program is included. DOE

N80-10693# Oak Ridge National Lab., Tenn. Energy Div.
SOCIOECONOMIC DATA REQUIREMENTS FOR ENVIRONMENTAL ASSESSMENT: COAL GASIFICATION AND LIQUEFACTION PROJECTS
R. Steven Konkel 1978 28 p refs Presented at the Conf. on Net Energy Anal. and Energy Modeling, Colorado Springs, 21 Aug. 1978
(Contract W-7405-eng-26)
(CONF-780843-5) Avail: NTIS HC A03/MF A01

The development of data bases and monitoring programs will allow (1) identification of baseline conditions and existing levels of stress in the environment; (2) prediction of the potential impacts of construction, operation, and decommissioning of a coal conversion complex at a specific site; (3) determination of whether these or unanticipated impacts actually occur during these periods; and (4) evaluation of the effectiveness of mitigation measures designed to lessen adverse impacts on the environment. Socioeconomic data requirements include characterization of land uses, land-use management alternatives, demography and employment, economic and fiscal indicators, and infrastructure capacities for site-specific study areas. The monitoring program should be designed to identify appropriate study areas, and incorporate input from citizen groups and local planning officials. Author

N80-10694# Oak Ridge National Lab., Tenn. Environmental Sciences Div.
ENVIRONMENTAL IMPLICATIONS FOR GEOTHERMAL ENERGY DEVELOPMENT

Robert B. Craig and Glenn W. Suter, II 1979 8 p refs
Presented to the Inst. of Environ. Sci., Seattle, Wash., 29 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790445-3) Avail: NTIS HC A02/MF A01

The nature of hydrothermal, hot dry resources and the constraints that site characteristics place on their development are discussed. Effects on cultural, aesthetic, and wildlife resources are considered. DOE

N80-10700# Water Purification Associates, Cambridge, Mass.
WASTEWATER TREATMENT IN COAL CONVERSION Final Report, Oct. 1976 - Jan. 1979
R. E. Hicks, D. J. Goldstein, F. B. Seufert, and I. W. Wei Jun. 1979 287 p refs
(Contract EPA-68-03-2207)
(PB-297587/8; EPA-600/7-89-133) Avail: NTIS HC A13/MF A01 CSCL 07A

Water treatment control technology specific to fuel conversion plant sites in the western U.S. is described. Most plants converting coal to other fuels use a large quantity of clean water (as stream) and put out a large quantity of dirty water that is condensed when the products from the coal reactor are cooled. Procedures for removing phenolic compounds are discussed: they include distillation, extraction, and adsorption. Design equations, step-by-step design procedures, and calculations for a typical unit are included along with physical data that are required for design. GRA

N80-10701# Mitre Corp., McLean, Va. Metrek Div.
HEALTH AND ENVIROMENTAL EFFECTS OF COAL GASIFICATION AND LIQUEFACTION TECHNOLOGIES: A WORKSHOP SUMMARY AND PANEL REPORTS Final Report
Richard Brown, ed. and Alice Witter, ed. May 1979 374 p
Workshop held at Leesburg, Va., Aug. 1978
(Contract DE-AC01-79EV-10018)
(PB-297618/1; MTR-79W00137; DOE/HEW/EPA-03) Avail: NTIS HC A16/MF A01 CSCL 06F

Responses to President Carter's directive to identify health and environmental problems associated with advanced energy technologies are presented. The highlights of the issues and the detailed information requirements identified by panels of a workshop held in Leesburg, Virginia in August 1978 to address the health and environmental effects of coal gasification and liquefaction technologies are presented. The purposes of the workshop were to: (1) assemble multidisciplines of biomedical and environmental scientists to address current developments in these technologies, (2) review and identify specific health and environmental issues and problems associated with their development and commercialization, and (3) consider research strategies required to address them and to identify requisite information needs for resolving uncertainties of assessing the relevant impacts of coal gasification and liquefaction technologies. The six panels of the workshop were: occupational and public health and safety, air quality, water quality, water quantity, and aquatic ecology, terrestrial effects, ambient measurement and monitoring, and source characterization. Panel reports containing specific information on environmental and health effects, information requirements, and detailed research statements are included in this report. GRA

N80-10709* National Aeronautics and Space Administration. Pasadena Office, Calif.
BOREHOLE GEOLOGICAL ASSESSMENT Patent
William H. Spuck, III, inventor (to NASA) (JPL) Issued 11 Sep. 1979 10 p Filed 4 May 1978 Supersedes N79-19521 (17 - 10, p 1306) Sponsored by NASA
(NASA-Case-NPO-14231-1; US-Patent-4,167,111; US-Patent-Appl-SN-903019; US-Patent-Class-73-155; US-Patent-Class-175-78) Avail: US Patent and Trademark Office CSCL 08G

A method and apparatus are discussed for performing geological assessments of a formation located along a borehole, and a boring tool that bores a pair of holes into the walls of the borehole and into the surrounding strata along with a pair of probes which are installed in the holes. One of the probes applies an input such as a current or pressured fluid, and the other probe senses a corresponding input which it receives from the strata. Official Gazette of the U.S. Patent and Trademark Office

N80-10918# Argonne National Lab., Ill.
POWER SUPPLY REQUIREMENTS FOR A TOKAMAK FUSION REACTOR
Jeffrey N. Brooks and Robert L. Kustom Feb. 1979 63 p refs
(Contract W-31-109-eng-38)
(ANL/FPP/TM-119) Avail: NTIS HC A04/MF A01

A system approach combining models of the reactor and poloidal coil set, plasma burn cycle and MHD calculations, and power supply characteristics and cost data was used to determine power supply requirements for a 7-M major radius commercial reactor. A conventional system using an MGF set and solid-state rectifier/inverter power supplies was studied in addition to systems using a homopolar generator, superconducting energy storage inductor, and dump resistors. The requirements and cost of the power supplies depend on several factors but most critically on the ohmic heating ramp time used for startup. Long ramp times (approximately > 85) seems to be feasible, from the standpoint of resistive voltsecond losses, and would appear to make conventional systems quite competitive with nonconventional ones, which require further research and development. DOE

N80-10922# Brookhaven National Lab., Upton, N. Y. Dept. of Nuclear Energy.
ONE- AND TWO-DIMENSIONAL HEATING ANALYSES OF FUSION SYNFUEL BLANKETS
J. S. K. Tsang, O. W. Lazareth, and J. R. Powell 1979 5 p refs Presented to the Am. Nucl. Soc., Atlanta, Ga. 3-8 Jun. 1979
(Contract EY-76-C-02-0016)
(BNL-NUREG-25635; Conf-790602-14) Avail: NTIS HC A02/MF A01

Neutronics and heating analyses were performed on a fusion reactor blanket featuring synthetic fuel production. In this two temperature region blanket design, the structural shell is stainless steel. The interior of the module is a packed ball of high temperature ceramic material. The low temperature shell and the high temperature ceramic interior are separately cooled. Process steam (approximately 1500 C) is then produced in the ceramic core for the producion of H2 and H2-based synthetic fuels by a high temperature electrolysis (HTE) process. DOE

N80-10964# Committee on Commerce, Science, and Transportation (U. S. Senate).
NASA AUTHORIZATION FOR FISCAL YEAR 1980. PART 4: INDEX
Washington GPO 1979 122 p Hearings on S. 357 before the Comm. on Commerce, Sci., and Transportation, 96th Congr., 1st Sess., 1979
(GPO-51-336) Avail: Comm. on Commerce, Sci., and Transportation

Indexes to appropiations for space research and development, construction of facilities, and research and program management. A.W.H.

N80-10965# Unified Industries, Inc., Alexandria, Va.
MANAGERIAL PLAN: EXECUTIVE ORDER 12003 AND THE NATIONAL ENERGY ACT
Dec. 1978 96 p
(Contract EM-77-C-01-8962)
(DOE/TIC-10067) Avail: NTIS HC A05/MF A01

A management tool is provided to assist in planning and developing the Federal Energy-Conservation Program which requires that, by 1985, Executive Branch agencies that own or will own buildings reduce building energy-consumption substantially below 1975 levels. The order also requires that all agencies of the Branch conduct programs designed to reduce energy consumption in general operations of the agency. The program master plan defines goals, objectives strategies, and milestones within a structure that describes the framework, elements, phases, and roles of the agencies. Data requirements for the planning, implementing, evaluating, and reporting functional requirements of the executive order are included with an analysis of the DOE organizational management and resource requirements. DOE

N80-10970# California Univ., Livermore. Lawrence Livermore Lab.

ENERGY STORAGE SYSTEMS FOR AUTOMOBILE PROPULSION, 1978 STUDY. 1: OVERVIEW AND FINDINGS

C. J. Berhrim, C. J. Anderson, H. Bomelburg (Battelle Pacific Northwest Labs.), M. Farahat (Argonne National Lab.), H. C. Forsberg, C. L. Hudson (Interplan Corp.), B. C. Kullman (Cambridge Systematics, Inc., Mass.), L. G. OConnell, G. Strickland (Brookhaven National Lab.), and W. J. Walsh 15 Dec. 1978 57 p refs
(Contract W-7405-eng-48)
(UCRL-52553-Vol-1) Avail: NTIS HC A04/MF A01

Technical and cost analyses were made of electrochemical, mechanical, chemical, and thermal storage devices and power systems which are likely to provide credible alternatives to current and future internal combustion engine propulsion systems between now and the year 2000. These devices were used in conceptual designs of various energy storage propulsion systems. Their resultant performances and costs were calculated and compared against each other and against a baseline ICE vehicle system conceptually designed to provide the same performance. Aspects of concern were the effect on all-battery electric systems of optimizing batteries for the specific peak power and specific energy relationship, the effect on the relative results of using highly optimistic (10% confidence level) component characteristics; the national energy impact of the future introduction of energy storage automobiles; and the effect on prior results and conclusions of R and D achievements in the past year. DOE

N80-10975# National Bureau of Standards, Washington, D. C.

DIMENSIONS/NBS, VOLUME 63, NO. 6, JUNE 1979 Monthly Report

Jun. 1979 37 p
(PB-297836/9; NBS/DIM-63/6) Avail: NTIS HC A03/MF A01 CSCL 14B

Contents: Cities in Renaissance; Keeping Tabs on Toxicity; Wanted-Better Energy Ideas; NBS Publishes Updated Survey of State Solar Energy Legislation; Characterizing South Pole Aerosols with the Raman Microprobe; Conferences; Publications; News Briefs. GRA

N80-11053*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

MULTIROLE CARGO AIRCRAFT OPTIONS AND CONFIGURATIONS

D. William Conner and John C. Vaughan, III (USAF) Oct. 1979 15 p refs Presented at 1979 SAE Aerospace Meeting, 3-9 Dec. 1979
(NASA-TM-80177) Avail: NTIS HC A02/MF A01 CSCL 01C

A future requirements and advanced market evaluation study indicates derivatives of current wide-body aircraft, using 1980 advanced technology, would be economically attractive through 2008, but new dedicated airfreighters incorporating 1990 technology, would offer little or no economic incentive. They would be economically attractive for all payload sizes, however, if RD and T costs could be shared in a joint civil/military arrangement. For the 1994-2008 cargo market, option studies indicate Mach 0.7 propfans would be economically attractive in trip cost, aircraft price and airline ROI. Spanloaders would have an even lower price and higher ROI but would have a relatively high trip cost because of aerodynamic inefficiencies. Dedicated airfreighters using propfans at Mach 0.8 cruise, laminar flow control, or cryofuels, would not provide any great economic benefits. Air cushion landing gear configurations are identified as an option for avoiding runway constraints on airport requirements and/or operational constraints are noted. Author

N80-11066# National Aerospace Lab., Tokyo (Japan). V/STOL Div.

FUEL MINIMAL TAKE-OFF PATH OF JET LIFT VTOL AIRCRAFT, LOG NO. C3558

Hiroshi Nishimura 7 Aug. 1979 40 p refs Backup document for AIAA synoptic scheduled for publication in Journal of Aircraft on Feb. 1980
Avail: NTIS HC A03/MF A01

The fuel minimal take-off path analysis for jet lift type VTOL aircraft is presented. The study is made of two basic configurations, namely, separate type and swivel type. The fuel minimal take-off path problems of the two configurations are analyzed as nonlinear systems with the controls constrained by their magnitude. The solutions for both types are generally composed of two or three discontinuous segments connected by switching points. For the separate type, the singular part is analytically deterministic and unique, and plays a decisive role; but for the swivel type, the singular part is not unique. Two methods of solution involving different handling of singular parts are considered. Author

N80-11121*# Boeing Aerospace Co., Seattle, Wash. Ballistic Missiles and Space Div.

SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY, PHASE 2. Interim Report

9 Jul. 1979 265 p
(Contract NAS9-15636)
(NASA-CR-160377; D180-25381-1) Avail: NTIS HC A12/MF A01 CSCL 22B

A program plan for the Solar Power Satellite Program is presented. The plan includes research, development, and evaluation phase, engineering and development and cost verification phase, prototype construction, and commercialization. Cost estimates and task requirements are given for the following technology areas: (1) solar arrays; (2) thermal engines and thermal systems; (3) power transmission (to earth); (4) large space structures; (5) materials technology; (6) system control; (7) space construction; (8) space transportation; (9) power distribution, and space environment effects. J.M.S.

N80-11122*# Boeing Aerospace Co., Seattle, Wash. Ballistic Missiles and Space Div.

SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY, PHASE 2. PART 1: MIDTERM BRIEFING

27 Jun. 1979 543 p
(Contract NAS9-15636)
(NASA-CR-160378; D180-25402-1) Avail: NTIS HC A22/MF A01 CSCL 22B

An overview of the program plan for the Solar Power Satellite Program is given. Progress in the microwave power transmission system is reported. A description is given of the following: (1) launch and recovery site facilities, systems and operations; (2) cargo packaging; (3) earth-to-LEO cargo transportation operations; (4) LEO-to-GEO cargo transportation operations; (5) personnel transportation operations; (6) space vehicles in-space maintenance operations; and (7) SPS maintenance systems and operations. Other topics discussed include GEO base operations, satellite construction operations, intra-base logistics, and GEO base definition. A research and program plan is presented along with cost estimates. J.M.S.

N80-11168# Oak Ridge National Lab., Tenn.

CHEMICAL STRUCTURES AND REACTIVITIES OF COAL AS AN ORGANIC NATURAL PRODUCT

Clair J. Collins, H. P. Hombach, B. M. Benjamin, W. H. Roark, B. Maxwell, and V. F. Raaen 1979 6 p refs Presented at 177th ACS Natl. Meeting, Honolulu, Hawaii, 1 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790415-25) Avail: NTIS HC A02/MF A01

Some chemical reactions involved in coal liquefaction were studied using carbon 14 labelled compounds and nuclear magnetic resonance. It is concluded that the role of tetralin during coal conversion is (1) to act as a dispersion vehicle; (2) to supply hydrogen radicals, when needed, to trap coal radicals; and (3) in a very minor way to undergo intermolecular reaction with the coal through making and breaking of C-C (and possibly other) bonds. As a result of other experiments it is concluded that to the methods previously employed for breaking bonds in coal molecules and thereby lowering their molecular weights, must now be added the use of solvated-electrons for breaking -CH2-CH2-linkages. A possible mechanism for the cleavage of bibenzyl (used as a model compound for coal) is given. DOE

N80-11179# IEA Coal Research, London (England).
COMBUSTION OF LOW GRADE COAL
G. F. Morrison Jun. 1978 90 p refs
(ICTIS/TR-02; ISBN-92-9029-016-1) Avail: NTIS
HC A05/MF A01

A technical review of the literature is presented in order to assess the increasing extent to which lignite, brown coal, peat, and bituminous shale are combusted for power generation. Although the most common form of combustion in use today, the firing of pulverized low grade coal has presented major operational problems of erosion, corrosion, and fouling of heat exchange equipment. Recent developments in the design of pulverized-coal fired stations are discussed. Fluidized bed combustion has the potential to overcome many of these problems and a brief history of the development of this form of combustion and an assessment of current research is included. One important parameter in the future development of low grade coal combustion is the ability of power stations to comply with national emission standards. The influence of combustion mode on the emission of SO2, NO, and particulates is reviewed. Author (ESA)

N80-11180# IEA Coal Research, London (England).
TRACE ELEMENTS FROM COAL COMBUSTION: ATMOSPHERIC EMISSIONS
M. Y. Lim May 1979 58 p refs
(ICTIS/TR-05; ISBN-92-9029-024-2) Avail: NTIS
HC A04/MF A01

The literature relating to trace elements in coal combustion is reviewed from the point of view of atmospheric pollution. Some data on trace element concentration in coal are given and comparisons are made with atmospheric emissions from other sources. Environmental effects and potential health hazards are discussed. Radioactive emissions and trace element accumulation around power plants are also reviewed and types of equipment used for particulate control in power plants are summarized. It is concluded that the importance of coal combustion as a pollutant source depends on what type of regulations are established for emission control and on how well power plants comply with these regulations. Author (ESA)

N80-11238*# Union Carbide Corp., Tonawanda, N.Y. Linde Div.
ECONOMICS OF HYDROGEN PRODUCTION AND LIQUEFACTION UPDATED TO 1980
C. R. Baker Nov. 1979 41 p refs
(Contract NAS1-14698)
(NASA-CR-159163) Avail: NTIS HC A03/MF A01 CSCL 21D

Revised costs for generating and liquefying hydrogen in mid-1980 are presented. Plant investments were treated as straight-forward escalations resulting from inflation. Operating costs, however, were derived in terms of the unit cost of coal, fuel gas and electrical energy to permit the determination of the influence of these parameters on the cost of liquid hydrogen. Inflationary influence was recognized by requiring a 15% discounted rate of return on investment for Discounted Cash Flow financing analysis, up from 12% previously. Utility financing was revised to require an 11% interest rate on debt. The scope of operation of the hydrogen plant was revised from previous studies to include only the hydrogen generation and liquefaction facilities. On-site fuel gas and power generation, originally a part of the plant complex, was eliminated. Fuel gas and power are now treated as purchased utilities. Costs for on-site generation of fuel gas however, are included. A.R.H.

N80-11245# California Univ., Livermore. Lawrence Livermore Lab.
LABORATORY COAL GASIFIER FACILITY
W. R. Aiman, C. B. Thorsness, and R. J. Cena 16 Apr. 1979 35 p refs Presented at Spring Meeting on Western States Section, and the Combustion Inst., Provo, Utah, 23 Apr. 1979
(Contract W-7405-eng-48)
(UCRL-82602; Conf-790434-3) Avail: NTIS
HC A03/MF A01

A laboratory coal gasifier test facility consists of systems for metering gases into an experimental gasifier, condensing the tar and water out of the product gases and flaring them, sampling and analyzing the product gases, and monitoring the gasifier during an experiment. The major items of equipment include: a mass spectrometer, a process gas chromatograph, a minicomputer, and the experimental coal gasifiers--currently a 1.5 m fixed-bed gasifier and a 0.9 m bore-hole gasifier. This facility is described and the use of the facility in validating software and hardware for use in field experiments are discussed. The results of an experiment with the 1.5 m fixed-bed gasifier are described. Temperature profiles down the centerline of the reactor at various times during the experiment are discussed. Product gas compositions are discussed. DOE

N80-11246# Oak Ridge National Lab., Tenn.
ECONOMICS OF GASOLINE PRODUCTION FROM UNDERGROUND COAL GASIFICATION VIA MOBIL-M PROCESS
M. S. Edwards, W. C. Ulrich, and R. Salmon 1979 36 p refs Presented at AICE Meeting, Houston, Tex., 1 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790405-12) Avail: NTIS HC A03/MF A01

A conceptual process design and cost estimate is presented for a facility producing approximately 15,000 barrels per day of M-gasoline via methanol from synthesis gas generated by gasification of coal in situ. The design was based on experimental data obtained at the Laramie Energy Technology Center on the linked vertical well in situ coal gasification process. In-place coal consumption is 756 Mg/h (20,000 tons/day), based on a subbituminous Wyoming coal. The capital investment was estimated to be $535 million in first quarter 1978 dollars. The product price of M-gasoline (including mixed butane LPG) is about $240/cubed m ($0.90/gas) at the plant gate. Calculated overall thermal efficiency for the facility was 22%, based on in-place coal. DOE

N80-11248# Metal Properties Council, Inc., New York.
PROGRAM TO DISCOVER MATERIALS SUITABLE FOR SERVICE UNDER HOSTILE CONDITIONS OBTAINING IN EQUIPMENT FOR THE GASIFICATION OF COAL AND OTHER SOLID FUELS Quarterly Progress Report, 1 Apr. 1978 - 30 Jun. 1978
A. O. Schaefer, ed. DOE 16 Oct. 1978 238 p refs
(Contract EX-76-C-01-1784)
(FE-1784-42) Avail: NTIS HC A11/MF A01

Progress is reported in screening materials for use in such plants with corrosive environments and in providing useful corrosion data as well as reliable information on other properties needed for the design, construction, and operation of such plants. The program involves high temperature corrosion studies involving low concentration of H2S, exposure of metal coupons and refractories in coal gasification pilot plants, aqueous corrosion erosion and corrosion testing, and measurements of the mechanical and physical properties of materials. DOE

N80-11249# Institute of Gas Technology, Chicago, Ill.
RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS (RISER CRACKING OF COAL) Quarterly Report, 1 Apr. - 30 Jun. 1978
D. A. Duncan, J. L. Beeson, and R. D. Oberle Sep. 1978 25 p refs
(Contract EX-76-C-01-2307)
(FE-2307-38; QR-1) Avail: NTIS HC A02/MF A01

Runs were made in the bench-scale unit to investigate hydrocarbon yields from North Dakota lignite at operating pressures of 500 and 1000 psig. The base carbon conversions were reduced to approximately 26 and 33%, and hydrocarbon liquids yields were reduced to 6.4 and 9.2 grams per 100 grams of feed carbon, respectively. These values are considerably lower than those obtained from North Dakota lignite in bench-scale

unit operations at 2000 psig. At that pressure, base carbon conversions were approximately 50%, and hydrocarbon liquids yields were 18 grams per 100 grams of feed carbon. Runs were also made with Illinois No. 6 bituminous coal [free-swelling-index (FSI) = 4-1/2]. To avoid plugging the reactor, the coal was mixed with fine silica sand at levels of 10%, 20%, and 30% (by weight) coal with sand. The bench-scale unit was operated using an upsweeping temperature profile at coil outlet temperatures of 1450 and 1500 F and a system outlet pressure of 2000 psig. Runs with the 10% and 20% (by weight) coal were successful.
DOE

N80-11250# Electric Power Research Inst., Palo Alto, Calif.
BIOFUELS: A SURVEY
John R. Benemann Jun. 1978 96 p refs Sponsored by EPRI
(EPRI-ER-746-SR) Avail: NTIS HC A05/MF A01

Photosynthesis, plant productivity, waste and residue resources, 'energy farming,' processes for using biomass directly or converting it to fuels, and overall economics are discussed. Applications by U.S. industries and utilities are emphasized and current U.S. research and development programs presented. With foreseeable technologies and economics, approximately 5% of the fossil fuels now consumed in the United States could presently be replaced by available forestry, agricultural, and municipal wastes and residues.
DOE

N80-11251# Department of Energy, Washington, D. C. Energy Policy Office.
NATIONAL GAS SURVEY REPORT TO THE FEDERAL ENERGY REGULATORY COMMISSION BY THE SUPPLY-TECHNICAL ADVISORY TASK FORCE ON NONCONVENTIONAL NATURAL GAS RESOURCES
Jun. 1978 116 p refs
(DOE/FERC-0010) Avail: NTIS HC A06/MF A01

An analysis of the future energy situation in the U.S. with emphasis on the natural gas industry is presented. The analysis includes chapters on historical research efforts, industry criteria for commercialization of coal bed gas, technology for recovering methane from coal beds, identification of problems, legal concerns, and environmental considerations.
DOE

N80-11254# New York City Resource Recovery Task Force, N. Y.
METHANE RECOVERY FROM SANITARY LANDFILLS; GAS RECOVERY SYSTEM INSTALLATION AND TESTING Interim Report
Dec. 1978 45 p refs Prepared in cooperation with Brooklyn Union Gas Co., N. Y. and Wegman Co., Inc., Buffalo, N. Y.
(PB-296622/4; NYSERDA-78/18) Avail: NTIS HC A03/MF A01 CSCL 21D

A methane gas recovery program to mine this clean energy form from the municipal solid wastes deposited at the New York Fresh Kills Landfill in Staten Island, New York is described. Optics covered include the results of a six-week test program subsequent modifications made to the gas system, and the objectives and plans for the phase 3 landfill gas utilization program.
GRA

N80-11255# Mitre Corp., McLean, Va. Metrek Div.
ASSESSMENT OF LONG TERM RESEARCH NEEDS FOR COAL-GASIFICATION TECHNOLOGIES Final Report
Apr. 1979 201 p
(Contract ER-78-C-01063)
(PB-297853/4; MTR-79W00160) Avail: NTIS HC A10/MF A01 CSCL 07A

An assessment of research areas that affect long term development of coal gasification technologies is presented. Research recommendations and findings are discussed. Included are: an analysis of the major application areas for coal gasification technologies; discussion of the status and needs of the principal systems according to reactor type (fixed bed, fluidized bed, etc.); reports from site visits and communications with technology developers; and in-depth assessment of basic research needs in the critical areas of scaling and modeling, materials, effluent characterization, diagnosis and instrumentation, coal chemistry, catalytic chemistry, gas particle systems, and unit operations.
GRA

N80-11259# Army Construction Engineering Research Lab., Champaign, Ill.
THE BUILDING LOADS ANALYSIS SYSTEM THERMODYNAMICS (BLAST) PROGRAM, VERSION 2.0. INPUT BOOKLET Final Report
E. Sowell Jun. 1979 118 p
(AD-A072435; CERL-TR-E-153) Avail: NTIS HC A06/MF A01 CSCL 09/2

The Building Loads Analysis and System Thermodynamics (BLAST) program is a comprehensive set of subprograms for predicting energy consumption in buildings. There are three major subprograms: (1) the space load predicting subprogram, which computes hourly space loads in a building or zone based on user input and hourly weather data; (2) the air distribution system simulation subprogram, which uses the computed space load and user inputs describing the building air-handling system to calculate hot water or steam, chilled water, and electric energy demands; and (3) the central plant simulation program, which simulates boilers, chillers, onsite power generating equipment and solar energy systems and computes monthly and annual fuel and electrical power consumption and plant life cycle costs.
GRA

N80-11348# Los Alamos Scientific Lab., N. Mex.
SOME dc SUPERCONDUCTING CABLES
William E. Keller 1979 27 p refs Presented at the 1979 Workshop on Public Policy Aspects of High Capacity Electric Power Transmissions, Aspen, Colo., 14-16 May 1979
(Contract W-7405-eng-26)
(LA-UR-79-1057; Conf-790527-1) Avail: NTIS HC A03/MF A01

The general characteristics of dc superconducting cables as well as details of two specific designs, one coaxial and the other double monopolar, are discussed. The special advantages of these cables lie in the relative simplicity of construction, their extremely high operating efficiency, and their compactness when compared with other ac or dc high-capacity cables cooled by flowing fluids, either at ambient or cryogenic temperatures. These features are discussed in the context of economic, environmental, and power system considerations, including some of the possible trade-offs among conventional and superconducting ac and dc systems.
DOE

N80-11368# AEG-Telefunken, Berlin (West Germany). Forschunginst.
UNCONVENTIONAL CIRCUITS FOR STATIC VOLTAGE TRANSFORMERS Final Report
Johannes Nestler, Guenther Junge, Ingeborg Tzivelekas, and Hans Wrede Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 269 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-78-26) Avail: NTIS HC A12/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Ger. DM 56,90

The design and development of circuits for static converters are reported on. These include primarily thyristor/transistor circuits as well as a circuit for load-controlled converters. In thyristor/transistor circuits transistors are used for quenching and commutation purposes as well as to protect thyristors. With these circuits the rated current can be commuted down to very low imput voltages. The load-controlled converter by virtue of this method of commutation is characterized by simple design and by the fact that it displays high efficiency at high clock frequencies. Two load-controlled converters were constructed, one of which provided a power of 20 kW at a clock frequency of 7 kHz, the efficiency achieved being 90%. Modular systems were developed for voltage converters. In this connection the possible application of heat pipes was examined for such converters with respect to the dependence on mounting position and the start-up and peak load behavior.
Author (ESA)

N80-11384# Bendix Corp., Kansas City, Mo.
COOLING ALUMINUM MOLDS USING HEAT PIPES Final Report
D. R. Hahn Dec. 1978 49 p ref Revised
(Contract EY-76-C-04-0613)
(BDX-613-2039-Rev) Avail: NTIS HC A03/MF A01

A system was developed to provide zone cooling and more efficient heat removal from an aluminum mold used to make a polyurethane foam part. Heat removal with heat pipes and forced convection was four to six times faster than cooling without heat pipes in still air. Tests are planned to determine if zone cooling will reduce shrinkage depressions in parts fabricated in this mold.
DOE

N80-11386# California Univ., Livermore. Lawrence Livermore Lab.
TWO-DIMENSIONAL TRANSIENT DISPERSION AND ADSORPTION IN POROUS MEDIA
R. V. Homsy 23 Apr. 1979 11 p refs Presented at 5th Underground Coal Conversion Symp., Alexandria, Va., 18 Jun. 1979
(Contract W-7405-eng-48)
(UCRL-81970; Conf-790630) Avail: NTIS HC A02/MF A01

Contaminant transport model was made of an underground aquifer following in situ coal gasification to determine the environmental impact on ground water. The aquifer was treated as a semi-infinite porous medium, bounded on top and bottom by impermeable parallel walls. Line, plane and finite-volume sources were studied. The two-dimensional convective-dispersion equation, which governs the rate of contaminant transport, was reduced to an ordinary differential equation and solved for an instantaneous source. Asymptotic series solutions valid for short and long times are given for a continuous-line source.
DOE

N80-11387# Idaho National Engineering Lab., Idaho Falls.
HEAT TRANSFER CORRELATION DEVELOPMENT AND ASSESSMENT: A SUMMARY AND ASSESSMENT OF RETURN TO NUCLEATE BOILING PHENOMENA DURING BLOWDOWN TESTS CONDUCTED AT THE IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
A. M. Eaton and E. L. Tolman Apr. 1979 80 p refs
(Contract EY-76-C-07-1570)
(CDAP-TR-054) Avail: NTIS HC A05/MF A01

The data are presented which were obtained in Loss-of-Coolant Experiments (LOCE) which demonstrate the presence of cladding rewetting after the critical heat flux has been exceeded as a viable cooling mechanism during the blowdown phase of a LOCE. A brief review of the mechanisms associated with the boiling crisis and rewetting is also provided. The relevance of LOCE rewetting data to nuclear reactor licensing Evaluation Model Requirements is considered, and the conclusion is made that the elimination of rewetting and return to nucleate boiling in evaluation models represents a definite conservatism.
DOE

N80-11532*# Battelle Columbus Labs., Ohio.
SEASAT DEMONSTRATION EXPERIMENTS WITH THE OFFSHORE OIL, GAS AND MINING INDUSTRIES Final Report
A. G. Mourad, A. C. Robinson, and J. E. Balon Nov. 1979 145 p refs
(Contract NASw-2800)
(NASA-CR-162423; BCL-OA-TFR-79-6) Avail: NTIS HC A07/MF A01 CSCL 05B

Despite its failure, SEASAT-1 acquired a reasonable volume of data that can be used by industrial participants on a non-real-time basis to prove the concept of microwave sensing of the world's oceans from a satellite platform. The amended version of 8 experimental plans are presented, along with a description of the satellite, its instruments, and the data available. Case studies are summarized for the following experiments: (1) Beaufort Sea oil, gas, and Arctic operations; (2) Labrador Sea oil, gas, and sea ice; (3) Gulf of Mexico pipelines; (4) U.S. East Coast offshore oil and gas; (5) worldwide offshore drilling and production operations; (6) Equatorial East Pacific Ocean mining; (7) Bering Sea ice project; and (8) North Sea oil and gas. A.R.H.

N80-11543# Los Alamos Scientific Lab., N. Mex.
GEOTHERMAL EXPLORATION METHODS AND RESULTS: INLAND STATES
J. C. Maxwell 1979 3 p refs Presented at Symp. on Geothermal Energy and its Direct Uses in the Eastern United States, Hot Springs, Va., 5 Apr. 1979
(Contract W-7405-eng-36)
(LA-UR-79-665; Conf-790433-2) Avail: NTIS HC A02/MF A01

The Los Alamos Scientific Laboratory geothermal exploration sequence includes: (1) review of AAPG/USGS gradient maps; (2) literature search; (3) consideration of potential markets; (4) groundwater silica geothermometry; (5) analysis of bottom-hole temperatures; (6) heat flow measurement of available wells; and (7) drilling of new tests holes. Anomalies were located near Syracuse, NY (36 C/km, 56 C silica max.), near Buffalo, NY (36 C/km, 65 C silica max.), southeast Ohio, western and southwestern Nebraska, and three new warm springs in Arkansas. Other investigations found high heat generation (14 to 25 HGU) in the White Mountain batholith NH (170 C calculated at 6 km depth), uparching of the Adirondac Dome, NY, and potentially economic electricity from hot brines in southwest Arkansas. DOE

N80-11544# Texas Univ., Austin.
TERTIARY OIL RECOVERY PROCESSES RESEARCH AT THE UNIVERSITY OF TEXAS Annual Report, Oct. 1977 - Sep. 1978
R. S. Schechter and W. H. Wade Washington DOE Dec. 1978 61 p refs
(Contract EW-78-S-19-0001)
(BETC-0001-1) Avail: NTIS HC A04/MF A01

Many species of monoisomeric alkyl-substituted benzene sulfonates were synthesized and examined at low concentrations. Interfacial tension in particular was studied. Optimum salinity for high surfactant concentrations was defined as the middle of the 3-phase region. Work on surfactant adsorption was focused on a model that can explain maxima and minima in adsorption curves. A model for diffusion and stranding at the aqueous surfactant-oil interface was applied to spontaneous emulsification and extended to systems that form middle-phase microemulsions.
DOE

N80-11545# Pennzoil Co., Vienna, W. Va.
OIL RECOVERY BY CARBON DIOXIDE INJECTION Annual Report, Jul. 1977 - Jul. 1978
L. G. Guckert and G. P. SanFilippo DOE Sep. 1978 57 p
(Contract EF-76-C-05-5301)
(ORO-5301-34) Avail: NTIS HC A04/MF A01

A project to determine the feasibility of miscible carbon dioxide oil recovery in the Rock Creek Big Injun field in Roane County, West Virginia is now showing a response to waterflood. Water injection into the backup injection wells was initiated on October 16, 1976 and water injection into the six pattern injection wells commenced on April 22, 1977. As of July 1, 1978, the cumulative injection into the nineteen injection wells totaled 1,306,966 barrels.
DOE

N80-11546# Gary Operating Co., Englewood, Colo.
BELL CREEK RESIDUAL OIL SATURATION TECHNOLOGY TEST Quarterly Report, Oct. 1978 - Dec. 1978
D. Myal 18 Jan. 1979 7 p
(Contract ET-78-C-03-2180)
(BETC-2180-4) Avail: NTIS HC A02/MF A01

The capabilities of different techniques to measure residual oil saturation, in situ, in a consolidated sandstone reservoir were assessed to provide a basis for d selecting appropriate methods for determining oil saturation at tertiary recovery pilot test sites.
DOE

N80-11551# West Virginia Univ., Morgantown. Thermal-Hydraulics Lab.
EFFECT OF VERTICAL SCALE DISTORTION ON THE TEMPERATURE FIELD OF A THERMAL-HYDRAULIC MODEL

D. P. Michelotti, R. A. Bajura, and S. H. Swartz Nov. 1978 131 p refs
(Contract DI-14-34-0001-6214; OWRT Proj. C-7171(6214)(4))
(PB-297274/3; DPM-RAB/SHS-78-1; RR-9) Avail: NTIS HC A07/MF A01 CSCL 13B

The generation of electricity by pumped storage hydroelectric plants to supplement existing thermal power plant facilities for peak energy supply is discussed and the effects of a vertical scale distortion on the flow and temperature fields of a hydraulic model of a pumped storage reservoir system are assessed. Vertical to horizontal scale ratios of 1:1, 3:1, and 5:1 were considered. The model consisted of a submerged hot water jet discharging into an initially cold isothermal reservoir. The jet discharge geometry was patterned after what was considered to be a typical pumped storage outlet. Results are presented for various jet Froude numbers. GRA

N80-11554 International Institute for Applied Systems Analysis, Laxenburg (Austria).

MEDEE 2: A MODEL FOR LONG TERM ENERGY DEMAND EVALUATION

Bruno Lapillonne Nov. 1978 53 p refs
(IIASA-RR-78-17) Avail: Issuing Activity

A simulation model, MEDEE 2, designed to evaluate the long-term energy demand of a country in combination with a scenario description of the main aspects of the country's social, economic, and technological evolution is described. Parameters taken into consideration are end-use total demand by category (e.g., residential space heating, service sector cooling, gasoline for intercity cars)and the potential market (maximum demand that can be technically met) for each final energy form (electricity, coal, gas, solar, oil products, and district heat). The model also calculates useful energy demand in each end-use category for which several energy forms can be used, thus determining the substitution possibilities is energy use. The scenario description is complemented with technological parameters (e.g., insulation standards, efficiencies, fuel mix), the evolution of which is specified in a way consistent with the macroeconomic assumptions. Author (ESA)

N80-11556# Committee on Interstate and Foreign Commerce (U. S. House).

SOLAR COMMERCIALIZATION

Washington GPO 1979 548 p refs Hearings before the Subcomm. on Energy and Power of the Comm. on Interstate and Foreign Commerce, 96th Congr., 1st Sess., 10-11 Jan. 1979
(GPO-43-586) Avail: Subcomm. on Energy and Power

Government policies to commercialize solar energy and a program to encourage solar energy commercialization are examined. Solar energy technology and the applications of this technology are discussed. The role of government in solar energy commercialization is debated. A.W.H.

N80-11557# Committee on Energy and Natural Resources (U.S. Senate).

ENERGY INITIATIVES OF THE 95TH CONGRESS

Washington GPO 1979 342 p refs Rept. for Comm. on Energy and Natural Resources, 96th Congr., 1st Sess., May 1979
(GPO-42-797; Publ-96-10) Avail: SOD HC

Congressional response to the energy problem is defined and assessed. Actions toward the utilization of solar energy, nuclear energy, geothermal energy, and the production of alcohol fuels, natural gas, and crude oils is reported. A.W.H.

N80-11558*# General Electric Co., Philadelphia, Pa. Space Div.

EXECUTIVE SUMMARY: MOD-1 WIND TURBINE GENERATOR ANALYSIS AND DESIGN REPORT Final Report

Mar. 1979 61 p
(Contracts NAS3-20058; EC-77-A-29-1010)
(NASA-CR-159497; DOE/NASA/0058-79/3) Avail: NTIS HC A04/MF A01 CSCL 10A

Activities leading to the detail design of a wind turbine generator having a nominal rating of 1.8 megawatts are reported. Topics covered include (1) system description; (2) structural dynamics; (3) stability analysis; (4) mechanical subassemblies design; (5) power generation subsystem; and (6) control and instrumentation subsystem. A.R.H.

N80-11559*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AN EVALUATION OF THE NASA TECH HOUSE, INCLUDING LIVE-IN TEST RESULTS, VOLUME 1

Ira H. A. Abbott, Kenneth A. Hopping, and Warren D. Hypes Nov. 1979 72 p refs
(NASA-TP-1564; L-13440) Avail: NTIS HC A04/MF A01 CSCL 10A

The NASA Tech House was designed and constructed at the NASA Langley Research Center, Hampton, Virginia, to demonstrate and evaluate new technology potentially applicable for conservation of energy and resources and for improvements in safety and security in a single-family residence. All technology items, including solar-energy systems and a waste-water-reuse system, were evaluated under actual living conditions for a 1 year period with a family of four living in the house in their normal lifestyle. Results are presented which show overall savings in energy and resources compared with requirements for a defined similar conventional house under the same conditions. General operational experience and performance data are also included for all the various items and systems of technology incorporated into the house design. Author

N80-11560*# Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.

SOLAR HEATING AND COOLING SYSTEMS DESIGN AND DEVELOPMENT Quarterly Report, 9 Oct. 1976 - 9 Jan. 1977

Jan. 1977 198 p
(Contract NAS8-32093)
(NASA-CR-150873; F3737-QR-102) Avail: NTIS HC A09/MF A01 CSCL 10A

Progress in the development of prototype solar heating/cooling systems is reported. Results obtained from refinement/improvement of the single family, multifamily, and commercial systems configurations and generalized studies on several of the subsystems are presented. J.M.S.

N80-11561*# Optical Coating Lab., Inc., City of Industry, Calif. Photoelectronics Div.

SILICON SOLAR CELL PROCESS DEVELOPMENT, FABRICATION AND ANALYSIS, PHASE 1 Annual Report, 15 Jun. 1978 - 15 Jun. 1979

H. I. Yoo, P. A. Iles, and D. P. Tanner 15 Jun. 1979 174 p refs
(Contract JPL-955089)
(NASA-CR-162427; DOE/JPL-955089-79/4; DRL-74/DRD-SE) Avail: NTIS HC A08/MF A01 CSCL 10A

Solar cells from RTR ribbons, EFG (RF and RH) ribbons, dendritic webs, Silso wafers, cast silicon by HEM, silicon on ceramic, and continuous Czochralski ingots were fabricated using a standard process typical of those used currently in the silicon solar cell industry. Back surface field (BSF) processing and other process modifications were included to give preliminary indications of possible improved performance. The parameters measured included open circuit voltage, short circuit current, curve fill factor, and conversion efficiency (all taken under AM0 illumination). Also measured for typical cells were spectral response, dark I-V characteristics, minority carrier diffusion length, and photoresponse by fine light spot scanning. the results were compared to the properties of cells made from conventional single crystalline Czochralski silicon with an emphasis on statistical evaluation. Limited efforts were made to identify growth defects which will influence solar cell performance. A.R.H.

N80-11562*# Motorola, Inc., Scottsdale, Ariz.

THE AUTOMATED ARRAY ASSEMBLY TASK OF THE LOW-COST SILICON SOLAR ARRAY PROJECT, PHASE 2 Annual Report

M. G. Coleman, L. P. Grenon, E. M. Pastirik, R. A. Pryor, and T. G. Sparks Nov. 1978 213 p
(Contract JPL-954847; Proj. 2345)
(NASA-CR-162429; DOE/JPL-954847-78/4) Avail: NTIS HC A10/MF A01 CSCL 10A

An advanced process sequence for manufacturing high efficiency solar cells and modules in a cost-effective manner is discussed. Emphasis is on process simplicity and minimizing consumed materials. The process sequence incorporates texture etching, plasma processes for damage removal and patterning, ion implantation, low pressure silicon nitride deposition, and plated metal. A reliable module design is presented. Specific process step developments are given. A detailed cost analysis was performed to indicate future areas of fruitful cost reduction effort. Recommendations for advanced investigations are included.
A.R.H.

N80-11564*# Hughes Research Labs., Malibu, Calif.
ELECTRON RADIATION DAMAGE OF (AlGa) As-GaAs SOLAR CELLS Final Report, 25 Apr. 1978 - 24 Apr. 1979
R. Loo, G. S. Kamath, and R. Knechtli Oct. 1979 71 p refs
Prepared for JPL
(Contract NAS7-100)
(NASA-CR-162425) Avail: NTIS HC A04/MF A01 CSCL 10A

Solar cells (2 cm by 2 cm (AlGa) As-GaAs cells) were fabricated and then subjected to irradiation at normal incidence by electrons. The influence of junction depth and n-type buffer layer doping level on the cell's resistance to radiation damage was investigated. The study shows that (1) a 0.3 micrometer deep junction results in lower damage to the cells than does a 0.5 micrometer junction, and (2) lowering the n buffer layer doping density does not improve the radiation resistance of the cell. Rather, lowering the doping density decreases the solar cell's open circuit voltage. Some preliminary thermal annealing experiments in vacuum were performed on the (AlGa)As-GaAs solar cells damaged by 1-MeV electron irradiation. The results show that cell performance can be expected to partially recover at 200 C with more rapid and complete recovery occurring at higher temperature. For a 0.5hr anneal at 400 C, 90% of the initial power is recovered. The characteristics of the (AlGa)As-GaAs cells both before and after irradiation are described. R.E.S.

N80-11565*# Solarex Corp., Rockville, Md.
PHASE 2 OF THE ARRAY AUTOMATED ASSEMBLY TASK FOR THE LOW COST SILICON SOLAR ARRAY PROJECT
Manfred Wihl, John Torro, Alan Scheinine, and Jack Anderson Nov. 1978 86 p Sponsored by JPL and DOE
(Contract JPL-954854)
(NASA-CR-162426; DOE/JPL-954854-77/4) Avail: NTIS HC A05/MF A01 CSCL 10A

An automated process sequence, to manufacture photovoltaic modules at a capacity of approximately 500 MW per year at a cost of approximately $0.50 per peak watt is described. Verification tests were performed and are reported along with cost predictions.
R.E.S.

N80-11567# California Univ., Berkeley. Lawrence Berkeley Lab.
ON-LINE TESTS OF ORGANIC ADDITIVES FOR THE INHIBITION OF THE PRECIPITATION OF SILICA FROM HYPERSALINE GEOTHERMAL BRINE. 2: TESTS OF NITROGEN-CONTAINING COMPOUNDS, SILANES, AND ADDITIONAL ETHOXYLATED COMPOUNDS
J. E. Harrar, F. E. Locke, C. H. Otto, Jr., L. E. Lorensen, and W. P. Frey 1 Jun. 1979 24 p refs
(Contract W-7405-eng-48)
(UCID-18195) Avail: NTIS HC A02/MF A01

Several new classes of organic compounds were screened as potential geothermal scale control agents by examining their effect on the precipitation of silica from Magmamax No. 1 brine. The substances were tested using the Brine Treatment Test System at the Niland, California Test Site. Solutions of the test substances were injected into flowing brine at 210 C, the brine was flashed to 125 C, and then the kinetics of solids and silica precipitation from effluent brine held at 90 C were measured. Three new types of compounds were shown to have activity as precipitation inhibitors: polyethylene imines, polyethyloxazalines, and quaternary ammonium compounds containing polyoxyethylene. Among the latter, Ethoquad 18/24, which is methylpolyoxyethylene(15) octadecylammonium chloride, is the leading candidate antiscalant. It is a more powerful inhibitor of silica precipitation than the pure polyoxyethylene polymers, and it apparently has no high temperature solubility limitations. Measurements were made of the concentrations of monomeric silica and the effect of addition of inhibitor at various points in the Brine Treatment Test System.
DOE

N80-11570*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SAMICS: INPUT DATA PREPARATION
R. G. Chamberlain and R. W. Aster 1 Mar. 1979 35 p ref Revised
(NASA-CR-162421; DOE/JPL-1012-22-Rev-A) Avail: NTIS HC A03/MF A01 CSCL 10A

The Solar Array Manufacturing Industry Costing Standards (SAMICS) provide standard formats, data, assumptions, and procedures for estimating the price that a manufacturer would have to charge for the product of a specified manufacturing process sequence. A line-by-line explanation is given of those standard formats which describe the economically important characteristics of the manufacturing processes and the technological structure of the companies and the industry. This revision provides an updated presentation of Format A Process Description, consistent with the October 1978 version of that form. A checklist of items which should be entered on Format A as direct expenses is included.
DOE

N80-11571# Rocket Research Corp., Redmond, Wash.
HEAT PUMP CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS: SYSTEM DEVELOPMENT Interim Report
Feb. 1979 105 p refs
(Contract W-31-109-eng-38)
(ANL/ICES-TM-27) Avail: NTIS HC A06/MF A01

Heat pump centered intergrated community energy systems (HP-ICES) are energy systems for communities which provide heating, cooling, and/or other energy services through the use of heat pumps. Since heat pumps primarily transfer energy from existing and otherwise probably unused sources, rather than convert it from electrical or chemical to thermal form, HP-ICES are viewed as having significant potential for energy conservation. The System Development phase of the HP-ICES project is described and the results are reported.
DOE

N80-11573# Mechanical Technology, Inc., Latham, N. Y.
HIGH COP HEAT PUMP SYSTEM, PHASE 1, RESULTS
Apr. 1979 151 p
(Contract EC-77-C-01-5056)
(HCP/M5056-01; TR-1) Avail: NTIS HC A08/MF A01

The High COP Heat Pump System described is a device for recovering heat or energy usually lost in process streams by rejection to once-through cooling systems. The acetone recovers process makes use of river water to cool process streams, with the river water taking on heat in the heat exchange process. Heat or energy is thereby rejected from the process stream and is not recovered for reuse. The MTI Heat Pump System allows reuse of this energy. The estimated cost of a production Heat Pump System is $625,000 plus installation. The system can deliver 20 million BTU's per hour of latent steam energy. Based on a steam cost of $1.89 million BTU's for natural gas, the system being in service for 7884 hours per year (90% in-service rate), a 20% investment tax credit and installation costs at 50% of hardware costs; the discounted cash flow rate of return is 29.5%. Breakeven points are 2.6, 3.6, and 4 years for oil, gas and coal respectively. Details are provided about the Heat Pump System operation in the section entitled Process Description. Cycle Optimization is discussed, providing insight on the technique of determining the optimum system configuration. System Sensitivity shows how relatively little the output varies with changes in turbine and compressor efficiencies. Details of System Design are given, in which design objectives, applicable codes, working fluid, general arrangement, and component design features are discussed. Installation at the host site is analyzed.

as is System Cost. Under Environmental Effects, it is shown that the Heat Pump System will increase the quality of the environment. DOE

N80-11574# Georgia Inst. of Tech., Atlanta.
HEAT PUMP CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS; SYSTEM DEVELOPMENT Interim Report
D. W. Wade, B. C. Trammel, B. S. Dixit, D. C. McCurry (McCurry and Assoc., Atlanta), and B. A. Rindt (McCurry and Assoc., Atlanta) Feb. 1979 201 p refs Prepared for Argonne National Lab.
(Contract W-31-109-eng-38)
(ANL-ICES-TM-28) Avail: NTIS HC A10/MF A01

The heat pump - wastewater heat recovery (HP-WHR) scheme is one approach to heat pump centered integrated community energy systems that proposes to reclaim low grade thermal energy from a community's wastewater effluent. The concept of an HP-WHR system is developed, the potential performance and economics of such a system is evaluated and the potential for application is examined. A thermodynamic performance analysis of a hypothetical system projects an overall system coefficient of performance of from 2.181 to 2.264 for wastewater temperatures varying from 50 F to 80 F. Primary energy source savings from the implementation of this system is projected to be 5.014 QUADS, or the energy equivalent of 687 millions tons of coal, from 1980 to the year 2000. Economic analysis shows the HP-WHR scheme to be cost competitive, on the basis of a net present value life cycle cost comparison, with conventional residential and light commercial systems. DOE

N80-11576# Argonne National Lab., Ill. Energy and Environmental Systems Div.
TRANSFER OF ENERGY CONSERVATION TECHNOLOGY TO INDUSTRY. A PRELIMINARY SURVEY OF EXISTING MECHANISMS
Carolyn S. Colsher and Allan R. Evans Sep. 1978 55 p refs
(Contract W-31-109-eng-38)
(ANL/EES-TM-28) Avail: NTIS HC A04/MF A01

To ascertain the current level of interest, capabilities, and involvement in the dissemination of information on industrial energy conservation, a survey was conducted. Based upon 150 responses from major groups, it was found that although form and level of activity varied widely, the most frequently used communications channels were workshops, seminars, conferences, energy audits, energy committees, and distribution of literature. Among the areas cited as needing improvement was (1) awareness and acquisition of literature and (2) availability of industry or process specific technical manuals for plant managers or engineers. The most successful government/industry interfaces were felt to be workshops held cooperatively with trade associations, programs to encourage sharing of generic conservation techniques between firms, and published literature. DOE

N80-11577# Argonne National Lab., Ill. Energy and Environmental Systems Div.
IMPLEMENTING ENERGY CONSERVATION STRATEGIES IN ENERGY MATERIALS TRANSPORT: U. S. DEPARTMENT OF ENERGY AND OTHER GOVERNMENT AGENCY POLICY-MAKING DECISIONS
K. M. Bertram Nov. 1978 62 p refs
(Contract W-31-109-eng-38)
(ANL/EES-TM-32) Avail: NTIS HC A04/MF A01

The policy-making channels within Federal agencies for the strategy implementation efforts of U. S. Department of Energy conservation projects are defined. Government agency policy-making mechanisms are reviewed and analyzed. Emphasis was placed upon relevant Federal agencies and summary treatment given other federal, state, and local agencies. Brief case studies were made of states and localities which have significant effects upon energy materials transport systems. The main findings of the report are that two primary channels exist for effecting this project's policy-oriented strategies: inputs to legislation and inducement of regulatory involvements. DOE

N80-11578# Department of Energy, Washington, D. C. Office of Solar, Geothermal, Electric and Storage Systems.
WIND ENERGY SYSTEMS: PROGRAM SUMMARY
Dec. 1978 134 p refs
(DOE/ET-0093) Avail: NTIS HC A07/MF A01

Projects to develop reliable and economically viable wind energy systems and enable the earliest possible commercialization of wind power are described. The program's general organization is also described. DOE

N80-11579# California Univ., Berkeley. Lawrence Berkeley Lab.
GEOTHERMAL ENERGY FOR INDUSTRIAL APPLICATION
R. L. Fulton Mar. 1979 19 p refs Presented at Assoc. of Energy Engineers Conf., San Francisco, Calif., 21 Mar. 1979
(Contract W-7405-eng-48)
(LBL-8919; Conf-790358-1) Avail: NTIS HC A02/MF A01

The types of geothermal resources are reviewed briefly. The uses of geothermal energy for electrical generation and non-electric direct use are described. DOE

N80-11580# Sandia Labs., Albuquerque, N. Mex.
CONCENTRATING SOLAR COLLECTOR TEST RESULTS COLLECTOR MODULE TEST FACILITY (CMTF) Summary Report, Jan. - Dec. 1978
V. E. Dudley and R. M. Workhoven Mar. 1979 54 p refs
(Contract EY-76-C-04-0789)
(SAND-78-0977) Avail: NTIS HC A04/MF A01

The results are summarized of tests on four concentrating solar collectors at output fluid temperatures from 100 C to 300 C. DOE

N80-11581# Sandia Labs., Albuquerque, N. Mex.
HEAT LOSS REDUCTION TECHNIQUES FOR ANNULAR SOLAR RECEIVER DESIGNS
A. C. Ratzel and C. E. Simpson Feb. 1979 56 p refs
(Contract EY-76-C-04-0789)
(SAND-78-1769) Avail: NTIS HC A04/MF A01

Analytical and experimental work was undertaken to quantify thermal conduction and natural convection heat losses in annular solar receiver geometries. Techniques studied for reducing conduction heat loss include evacuation of the annulus gas, oversizing of the annular space while maintaining slight vacuum levels, and use of gases other than air in the annular space. DOE

N80-11582# Sandia Labs., Albuquerque, N. Mex.
DESIGN CONSIDERATIONS FOR A PROPOSED PASSIVE VACUUM SOLAR ANNULAR RECEIVER
T. D. Harrison, G. N. Bond, and A. C. Ratzel Apr. 1979 43 p refs
(Contract EY-76-C-04-0789)
(SAND-78-0982) Avail: NTIS HC A03/MF A01

Testing of an east-west 90 deg parabolic trough collector revealed problems associated with achieving and maintaining annulus pressures below 1 Pa along with other receiver problems and maintaining annulus pressures below 1 Pa along with other receiver problems (black chrome degradation) that reduced the performance of the collector. Analyses of the test results show that a vacuum in the annulus of the receiver assembly can significantly increase the amount of energy collected daily by at least 13% depending upon the reflector trough and tracking capabilities of the collector design. The problem associated with the current receiver are described and a modified passive vacuum design intended to correct the problems is presented. Test results will determine whether the value of the additional energy collected is greater than the cost of achieving the vacuum. DOE

N80-11585# Brookhaven National Lab., Upton, N. Y. National Center for Analysis of Energy Systems.
REGIONAL REFERENCE ENERGY SYSTEMS: ELECTRIC UTILITY APPLICATIONS
A. Hermelee Jan. 1979 106 p refs
(Contract EY-76-C-02-0016)
(BNL-50962) Avail: NTIS HC A06/MF A01

The Reference Energy Systems (RES) projection methodology is reformulated in order to apply the format to an electric utility region. The system's approach, incorporating all resources,

technologies and uses of energy, allows a utility to assess the impact of alternate technologies and policies across the entire energy system. Demand patterns for 25 end-use demand categories within the residential, commercial, industrial, and transportation sectors are developed for a base case scenario representing reasonable energy use patterns derived in a consistent manner by applying engineering techniques to the best available information. The impact of a new technology in terms of resource consumption is evaluated by modifying the energy flow paths to incorporate the new technology. Alternate paths through the network reflect the substitutability of resources and technologies for one another.
DOE

N80-11586# Argonne National Lab., Ill.

DOE HEAT PUMP CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS PROJECT

J. M. Calm 1979 17 p refs Presented at Heat Pump Technol. Inform. Exchange Meeting, Gaithersburg, Md., 7 Mar. 1979
(Contract W-31-109-eng-38)
(CONF-790362-1) Avail: NTIS HC A02/MF A01

The development of centralized, distributed, and cascaded heat pump centered integrated community energy systems using both waste and natural heat is discussed. These systems show promise for cost reduction, increased reliability, and avoidance of adverse environmental effects in providing process and space heating and cooling.
K.L.

N80-11587# Argonne National Lab., Ill.

WORLD ENERGY DATA SYSTEM (WENDS)

W. E. Lareau 1979 45 p refs Presented at the Spring Meeting of the Assoc. of System 2000 Users for Tech. Exchange (ASTUTE), Austin, Tex., 3 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790461-2) Avail: NTIS HC A03/MF A01

The storage of preformatted textual information in a completely user oriented data base, the World Energy Data System, is discussed. The system allows qualified users online access to nonclassified management level data on worldwide energy technology and research and development activities. WENDS transmits up-to-date information on foreign energy technology and research and development programs to DOE program divisions, the Congress, and other U.S. Government officials going abroad. The WENDS concept is described and the method storing and retrieving the textual information is discussed.
DOE

N80-11589# Department of Energy, Seattle, Wash.

INCREASED ENERGY FROM BIOMASS: 1985 POSSIBILITIES AND PROBLEM. WORKING PAPERS FOR PLANNERS

1978 202 p From Pacific Northwest Bioconversion Workshop, Portland, Oreg., 24-26 Oct. 1978; Sponsored in cooperation with the Energy Offices of Alaska, Idaho, Montana, Oregon and Washington, U. S. Forest Service and Oregon State Univ.
(RLO-788-5, Conf-7810132) Avail: NTIS HC A10/MF A01

Summaries, together with charts and data in some cases, of the talks given by panelists to the Conference are compiled. The first four sessions examined current agricultural and peat applications with emphasis on wood use. The resource base for agricultural wastes, peat, and wood was evaluated. In the fifth session the barriers and constraints on the use of biomass as an energy source were identified and some possible solutions suggested. The sixth session consisted of work groups on the production of gaseous and liquid fuels, utility applications of biomass and impacts, residential and small scale applications, and biomass supply systems. Extensive summaries were provided of the discussions of each work group; these included recommendations on private and public actions necessary to foster the use of biomass for energy.
DOE

N80-11590# Department of Energy, Washington, D. C.

DEPARTMENT OF ENERGY FOSSIL ENERGY EQUIPMENT DEVELOPMENT PROGRAMS

J. L. Powell, W. R. Williams (ORNL), T. K. Lau, and H. T. Jones Apr. 1979 13 p refs Presented at AICE Meeting, Houston, Tex., 1 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790405-14) Avail: NTIS HC A02/MF A01

Design, construction, and operation of synthetic fuel processing plants in the near future must consider equipment requirements to make such operations economically feasible and sound. The Department of Energy's approach is to use as much available equipment as practical, to modify and qualify equipment which is not expected to perform acceptably in its standard configuration, and to develop new equipment only if no current capability or acceptable alternative exists. Approaches, philosophy, goals, and implementation of fossil energy equipment development programs are discussed. Some results of a recent survey of industrial coal conversion equipment capabilities are presented as an example of current equipment, state-of-the-art and equipment development needs.
DOE

N80-11592# Los Alamos Scientific Lab., N. Mex.

DEVELOPMENT OF INTEGRATED THERMIONIC CIRCUITS FOR GEOTHERMAL HIGH-TEMPERATURE APPLICATIONS

J. Byron McCormick and D. Wilde 1979 6 p refs Presented at 20th Ann. Logging Symp., Tulsa, Okla., 3 Jun. 1979
(Contract W-7405-eng-36)
(LA-UR-79-723; Conf-790605-1) Avail: NTIS HC A02/MF A01

A new integrated thermionic device capable of withstanding ambient temperatures in excess of 500 C is reported. The evolution of the integrated thermionic circuit (ITC) is discussed and a set of practical device design and performance equations are demonstrated.
DOE

N80-11593# Department of Energy, Washington, D. C. Economic Regulatory Administration.

STANDBY CONSERVATION PLAN NO. 2: EMERGENCY BUILDING TEMPERATURE RESTRICTIONS. ECONOMIC ANALYSIS

Feb. 1979 39 p refs
(DOE/ERA-0047) Avail: NTIS HC A03/MF A01

The emergency building temperature restrictions plan is intended to be implemented in the event of a petroleum supply interruption or to satisfy the obligations of the United States under the International Energy Program. The economic impact of the measure was analyzed by assuming that the measure was implemented during 1980-1981 in a hypothetical petroleum shortfall of 15%. The plan is designed to reduce energy consumption by placing restrictions on thermostat settings for heating, cooling, and hot water in commercial, industrial, and public buildings. Specifically, the plan would mandate a maximum thermostat setting of 65 F for space heating, a minimum setting of 80 F for space cooling, and maximum setting of 105 F for hot water. Hotels and motels, hospitals, and areas of buildings where specific temperatures are required to maintain special equipment or supplies are exempt. Also exempt is hot water used for dishwashing and other uses where health codes require higher temperatures for sanitation. Effects of the measure on worker comfort and productivity are discussed in the appendices.
DOE

N80-11594# General Electric Co., Schenectady, N. Y. Corporate Research and Development Dept.

REGENERATIVE FLYWHEEL ENERGY STORAGE SYSTEM

E. L. Lustenader, I. H. Edelfelt, D. W. Jones, A. B. Plunkett, E. Richter, and F. G. Turnbull 1979 30 p refs
(Contract W-7405-eng-48)
(UCRL-13982) Avail: NTIS HC A03/MF A01

The current status of a program to develop and evaluate a regenerative flywheel energy storage system is described. The system was designed for a battery/flywheel electric vehicle in the 3000 pound class.
DOE

N80-11595# Edgerton, Germeshausen and Grier, Inc., Idaho Falls, Idaho

INEL GEOTHERMAL ENVIRONMENTAL PROGRAM Annual Report, 1978

Susan G. Spencer, J. F. Sullivan, and N. E. Stanley Apr. 1979 65 p refs
(Contract EY-76-C-07-1570)
(TREE-1340) Avail: NTIS HC A04/MF A01

The monitoring and research efforts were conducted to characterize the beneficial and detrimental impacts resulting from the development of moderate temperature geothermal resources in the Raft River Valley. DOE

N80-11596# Los Alamos Scientific Lab., N. Mex.

NIGHT STORAGE AND BACKUP GENERATION WITH ELECTROCHEMICAL ENGINES

G. R. B. Elliott and N. E. Vanderborgh 1978 15 p Presented at Solar Thermal Test Facilities Users Assoc. Meeting, Golden, Colo., 11 Apr. 1978
(Contract W-7405-eng-36)
(LA-UR-78-1149; Conf-780447-1) Avail: NTIS HC A02/MF A01

The design of Li-I2 electrochemical engines which both store and generate electric power is described. The conversion of heat energy to electrical energy in the electrochemical engines is examined. The laboratory performance of electrochemical engines based on the Li-I2 chemical system is discussed. The calculations for the expected performance of particular Li-I2 electrochemical engines used for storage and for each solar to electric conversion path are presented. A.W.H.

N80-11598# Midwest Research Inst., Golden, Colo.

PROCEEDINGS: SOLAR THERMAL POWER USER REVIEW PANEL MEETING

Mar. 1979 33 p Conf. held 1-2 Mar. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-69-221) Avail: NTIS HC A03/MF A01

Solar Energy Research Institute presentations on (1) the R&D mission in Solar Thermal technology; (2) TID management and organization; and (3) target audience characteristics are reviewed. Synopses of discussions on target audience needs are included. DOE

N80-11599# Ocean Data Systems, Inc., Monterey, Calif.

OTEC THERMAL RESOURCE REPORT FOR CARIBBEAN SEA PLANT SHIP 13-15 DEGREES N 75-80 DEGREES N

W. A. Wolff May 1979 41 p refs
(Contract ET-78-C-01-2898)
(HCP/T2898) Avail: NTIS HC A03/MF A01

A large and consistent thermal resource which exists in the area between 13-15 deg North latitude and 75-80 deg West longitude, was studied for possible use by a plant ship. The area is primarily in the Colombian Basin of the Caribbean Sea. The average annual delta T (surface temperature minus temperature at depth) for the area at 1000 meters is 22.4 C. At 650 meters, an adequate delta T exists, with no month of the year having a mean delta T less than 19 C. The total variability of temperature at all depths in this Caribbean area is small. Below 1000 meters, the total variation is extremely small. The area has a good mixed layer at all times of the year. It is occasionally exposed to strong winds from hurricanes. Currents generally show the same general pattern throughout the year with a predominant flow toward the west or northwest at average speeds of 40-50 cm/sec. DOE

N80-11601# Department of Energy, Washington, D. C. Energy Information Administration.

RESIDENTIAL SECTOR ENERGY FORECASTS, NATIONAL LEVEL FOR 1978-ELECTRICITY, NATURAL GAS, NUMBER TWO FUEL OIL AND PROPANE

P. DonVito and H. Walton Mar. 1979 23 p refs
(DOE/EIA-0102/50) Avail: NTIS HC A02/MF A01

Methods and results of estimating the average 1978 price of fuels used in the residential sector are given. Average (as opposed to marginal) prices were requested and are given for electricity, natural gas, No. 2 fuel oil, and propane. The projected 1978 average fuel prices resulting from the analysis are: electricity, 4 cents/kWh; natural gas, 27.5 cents/therm; No. 2 fuel oil, 49.2 cents/gallon; and propane, 44.9 cents/gallon. Regional and seasonal variations are not discussed here. DOE

N80-11602# Midwest Research Inst., Kansas City, Mo.

STATUS OF INFORMATION FOR CONSUMERS OF SMALL WIND ENERGY SYSTEMS

P. Weis Feb. 1979 19 p refs Presented at the Symp. on Commercialization of Solar and Conserv. Technol., Miami Beach, Fla., 11 Dec. 1978
(Contract EG-77-C-01-4042)
(SERI/TP-51-158; Conf-781235-3) Avail: NTIS HC A02/MF A01

Research efforts, existing information sources, and ongoing work to improve data necessary for potential consumers of small wind energy conversion systems are presented. DOE

N80-11603# Monsanto Research Corp., Dayton, Ohio.

ENERGY STORAGE FOR SOLAR AIR CONDITIONING APPLICATIONS UTILIZING A FORM-STABLE, HIGH DENSITY POLYETHYLENE PELLET BED

R. B. Whitaker, G. H. Jenkins, G. L. Ball, and I. O. Salyer (Dayton Univ. Res. Inst.) 1979 10 p refs Presented at the Solar Energy Storage Options Workshop, San Antonio, Tex., 18 Mar. 1979
(Contract EY-76-C-04-0053)
(MLM-2598(OP); Conf-790328-1) Avail: NTIS HC A02/MF A01

The results obtained from a cost effectiveness comparison of three different methods of crosslinking high density polyethylene (HDPE) to make it a form-stable, useful thermal energy storage (TES) material are presented in some detail. In addition, the projected costs of a proposed HDPE-liquid thermal transfer system are compared to those of other liquid and air thermal transfer TES systems operative in the same 100 to 150 C range. DOE

N80-11604# Stanford Linear Accelerator Center, Calif.

HYDROGEN-ELECTRIC POWER DRIVES

F. F. Hall Oct. 1978 10 p
(Contract EY-76-C-03-0515)
(SLAC-PUB-2203; Conf-781214-2) Avail: NTIS HC A02/MF A01

Hydrogen-electric power drives consist of most or all of the following: chilled hydrogen gas tank, liquid oxygen tank, a bank of fuel cells, dc/ac inverter, ac drive motors, solid state ac speed control, dc sputter-ion vacuum pumps, steam turbine generator set and steam condenser. Each component is described. Optional uses of low pressure extraction steam and warm condensate are listed. Power drive applications are listed. Impact on public utilities, fuel supplies, and users is discussed. DOE

N80-11605# Battelle Pacific Northwest Labs., Richland, Wash.

USER MANUAL FOR GEOCITY: A COMPUTER MODEL FOR GEOTHERMAL DISTRICT HEATING COST ANALYSIS

H. D. Huber, C. L. McDonald, and S. C. Schulte Oct. 1978 200 p refs
(Contract EY-76-C-06-1830)
(PNL-2742) Avail: NTIS HC A09/MF A01

A computer model called GEOCITY was developed to systematically calculate the potential cost of district heating using hydrothermal geothermal resources. GEOCITY combines climate, demographic factors, and heat demand of the city, resource conditions, well drilling costs, design of the distribution system, tax rates, and financial factors into one systematic model. The GEOCITY program provides the flexibility to individually or collectively evaluate the impact of different economic and technical parameters, assumptions, and uncertainties on the cost of providing district heat from a geothermal resource. Both the geothermal reservoir and distribution system are simulated to model the complete district heating system. GEOCITY calculates the unit cost of energy and the unit cost of heat for the district heating system based on the principle that the present worth of the revenues will be equal to the present worth of the expenses including investment return over the economic life of the distribution system. DOE

N80-11606# Fletcher (A. L.) and Associates, Gainesville, Fla.

ANALYSIS OF FINANCIAL PROGRAMS FOR ENERGY CONSERVATION: MARKET SIMULATION (PENETRATION) MODEL

G. S. Maddala, J. W. Milliman, and R. B. Roberts Aug. 1978 273 p refs
(Contract EC-76-C-01-8662)
(HCP/M8662-1) Avail: NTIS HC A12/MF A01

A simulation model was developed to evaluate the effects of Federal financial-incentive programs. Specifically the model was developed for two industries: primary metals and stone, clay, and glass. The model is designed to be a link between existing macro models of the economy and micro engineering models. The model is also designed as a prototype that could be easily adapted to a variety of industries. The model, as currently developed, performs the following major functions: (1) evaluates the impact of different financial incentive programs on the rate of market penetration of energy-saving technologies; (2) estimates the energy saved over-time because of these programs; (3) estimates the change in energy efficiency of the capital stock because of these programs; (4) estimates the value of the energy saved and the cost to the government of the program; and (5) calculates the social benefits and costs of the program. DOE

N80-11607# Fluor Engineers and Constructors, Inc., Irvine, Calif.

HEBER GEOTHERMAL DEMONSTRATION POWER PLANT Interim Report, Aug. 1977 - Jan. 1978

Aug. 1978 67 p refs Sponsored in part by San Diego Gas and Electric Company
(EPRI Proj. 580-2)
(EPRI-ER-863; IR-1) Avail: NTIS HC A04/MF A01

The work performed from August 1977 through January 1978 pertinent to the design of the demonstration plant is reported. The Heber project objective is to design, construct and operate a power plant to produce a net power output of 45 MW/sub e/, deriving energy from a low-salinity, moderate temperature (360 F, 182 C) brine heat source available from the Heber geothermal reservoir. A binary cycle conversion system employs a light alphatic hydrocarbon mixture to derive heat from the brine supply, through heat exchangers, and drive the turbine-generator to produce power. Power output will be distributed to California's Imperial Valley. DOE

N80-11608# Los Alamos Scientific Lab., N. Mex.

GENERAL-PURPOSE HEAT SOURCE DEVELOPMENT. PHASE 1: DESIGN REQUIREMENTS

E. C. Snow and R. W. Zocher Sep. 1979 24 p refs
(Contract W-7405-eng-36)
(LA-7385-SR) Avail: NTIS HC A02/MF A01

Studies were performed to determine the necessary design requirements for a PuO2 General Purpose Heat Source (GPHS). Systems and missions applications, as well as accident conditions, were considered. The results of these studies, along with the recommended GPHS design requirements, are presented and discussed. DOE

N80-11609# Addis Translations International, Portola Valley, Calif.

CONVERSION OF RADIANT ENERGY INTO CHEMICAL ENERGY

G. Calzaferri Nov. 1978 44 p refs Transl. into ENGLISH from Chimia, Switzerland, v. 32, no. 7, Nov. 1978 p 241-253
(UCRL-Trans-11427) Avail: NTIS HC A03/MF A01

The conversion of light into chemical energy as well as the conversion of chemical energy into light leads to exciting speculations and experiments. Reversible photoredox reactions appear to be the most promising chemical system for converting solar energy into chemical or electrochemical energy. Finding selective electrode material in photogalvanic cells is one of the problems to be solved. Selective electrode material for Fe(+3)/sub sq/Fe(+2)/sub sq was found in the thionine/iron system as well as in the iodine/iron system. Attention should now be focused on reversible two or more photon processes at low light intensities because clevage of water in the visible region cannot be done with one photon. DOE

N80-11612# Transportation and Economic Research Associates, Inc., Arlington, Va.

DISAGGREGATING PIES FUEL FORECASTS, VALIDATING PIES TRANSPORTATION MODEL DATA BASE, AND OTHER TECHNICAL SERVICES

15 Sep. 1978 84 p
(Contract EC-77-C-01-8578)
(TID-29000) Avail: NTIS HC A05/MF A01

Three research tasks concerned with modifications and/or alterations to the PIES (Project Independence Evaluation System) and one auxiliary research task are reported. The first task, a modification to the transportation data base for petroleum refining regions, was necessitated by a proposed change of the present seven refining districts to ten refining districts. Five of the Standard Tables on transportation costs required changes. Tariffs and route descriptions are given in interregional pipeline rates for crude oil and petroleum products. Pipeline tariffs and tanker costs for distribution of Alaskan oil to PIES refining regions are tabulated. In the second task the structure of the coal transportation submodel in PIES was changed by building a simplified transshipment network which makes it possible to easily track coal from the mine to the point of use. The third task is a brief description of natural gas rates and rate making practices in the U.S. The fourth task analyzes differences in actual wholesale prices in various other locations in a region (as opposed to the PIES centroid) with respect to the differences in transportation costs. DOE

N80-11613# Sandia Labs., Albuquerque, N. Mex. Midtemperature Solar Systems Test Div.

MIDTEMPERATURE SOLAR SYSTEMS TEST FACILITY (MSSTF) PROJECT TEST RESULTS: PHASE 4A MSSTF SYSTEM OPERATION

Thomas D. Harrison and William H. McCulloch Nov. 1978 53 p refs
(Contract EY-76-C-04-0789)
(SAND-78-1088) Avail: NTIS HC A04/MF A01

The results of testing the Department of Energy's Midtemperature Solar Systems Test Facility (MSSTF) at Sandia Laboratories, Albuquerque, New Mexico are summarized. The system is a dispersed power system that collects solar energy and supplies both the electrical and thermal energy demands of a representative load. Testing was done between July 1976 and March 1978. The Phase IVA MSSTF studied consists of: (1) a 200-m sq m (2160-sq ft) east-west parabolic trough collector field subsystem, which collects a measured 431-kWh thermal on a typical winter day and as estimated 483 kWh on a typical summer day; (2) a high-temperature thermocline storage subsystem, capable of storing 278-kWh thermal energy in Therminol 66 between 240 C and 310 C; (3) fluid-transfer equipment, including piping, pumps, and valves; (4) a prime-mover subsystem (toluene heat exchanger and turbine/generator) to convert thermal energy to electrical energy; and (5) a control and data-acquisition system. A brief description of each of these elements is given, and test results are reported. DOE

N80-11614# California Univ., Berkeley. Lawrence Berkeley Lab.

ENERGY CONSERVATION: POLICY ISSUES AND END-USE SCENARIOS OF SAVINGS POTENTIAL. PART 3: POLICY BARRIERS AND INVESTMENT DECISIONS IN INDUSTRY

Sep. 1978 54 p
(Contract W-7405-eng-48)
(LBL-7896-Pt-3) Avail: NTIS HC A04/MF A01

Industrial decision making was investigated with respect to energy conservation. It was concluded that government policy could be formulated to encourage conservation investments, but government intervention should be limited to those situations where it is both necessary and likely to be effective. To assist policy makers in understanding the industrial decision making process and recognizing the factors which prevent a measure from being adopted, a methodology is developed that can be applied to most conservation measures in all industrial subsectors. The methodology is summarized in two flow charts and a matrix. DOE

N80-11615# Institute of Gas Technology, Chicago, Ill.

INFLUENCE OF ELECTROLYTE COMPOSITION ON ELECTRODE KINETICS IN THE MOLTEN CARBONATE FUEL CELL

P. Ang and A. F. Sammells 1978 30 p refs Presented at the 2d Intern. Symp. on Molten Salts, Pittsburgh, Pa., 15-20 Oct. 1978; sponsored by the Electrochem. Soc., Inc.
(Contract EM-78-C-03-1735)
(CONF-781063-2) Avail: NTIS HC A03/MF A01

Electrode Kinetics for fuel oxidation on nickel and cobalt electrodes is discussed for three selected molten carbonate mixtures. Activation kinetics under the probable mixed-control conditions present in the electrochemical half-cell were determined using a potential step technique. With all melts, the highest exchange current values were found on nickel anodes, and the highest of these values were found for the melt comprised of 43.5 mole percent $Li_2CO_3$31.5 mole percent Na_2CO_3-25 mole percent K_2CO_3. For this ternary melt the exchange current density on nickel varied from 78 mA/sq cm for intermediate-Btu fuel to 22 mA/sq cm for low-Btu fuel at 650 C. The exchange current density was found to have a reaction order of around 0.25 for hydrogen, carbon dioxide, and water. Electrochemical performance on the two anode materials in the three melts is discussed, and a tentative reaction mechanism for the oxidation reaction is suggested. DOE

N80-11616# Los Alamos Scientific Lab., N. Mex.

ENERGY SAVINGS FOR A SOLAR HEATED AND COOLED BUILDING THROUGH ADAPTIVE OPTIMAL CONTROL

D. R. Farris and James L. Melsa Nov. 1978 9 p refs Presented at IEEE Conf. on Decision and Control, San Diego, Calif., 10 Jan. 1979 Prepared in cooperation with Notre Dame Univ.
(Contract W-7405-eng-36)
(LA-UR-78-2986; Conf-790105-1) Avail: NTIS HC A02/MF A01

The applicability of adaptive and optimal control techniques to the control of heating, ventilating, and air conditioning systems of solar heated and cooled buildings is described. The suitability of optimal and adaptive concepts is discussed and the selected approach is explained. An integral quadratic cost functional to define optimal performance and an identification process to produce a linearized building model are discussed. The building model is described and heating system simulations of three versions of the adaptive optimal controller are reported along with a simulation of a conventional controller for comparison. DOE

N80-11617# Midwest Research Inst., Golden, Colo.

RESEARCH OVERVIEW OF BIOLOGICAL AND CHEMICAL CONVERSION METHODS AND IDENTIFICATION OF KEY RESEARCH AREAS FOR SERI Final Report

T. A. Milne, John S. Connolly, Robert E. Inman, Thomas B. Reed, and Michael Seibert Sep. 1978 75 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-33-067) Avail: NTIS HC A04/MF A01

The current and future research areas of the biological and chemical conversion branch is presented. Energy and petrochemical substitutes from biomass, thermochemical conversion, and photoconversion are research areas examined. DOE

N80-11618# California Univ., Livermore. Lawrence Livermore Lab.

MATERIALS PROGRAM FOR FIBER COMPOSITE FLYWHEELS

J. A. Rinde 10 Oct. 1978 13 p refs Presented at 1st Inform. Exchange Conf., Luray, Va., 24 Oct. 1978
(Contract W-7405-eng-48)
(UCRL-81724; Conf-781046-9) Avail: NTIS HC A02/MF A01

A rubberized epoxy resin that offers improved fracture toughness and suitable performance at moderately elevated temperatures (up to 70 C) and six epoxy resins for service at 150 C were evaluated. In addition, the rubberized epoxy resin was used as a matrix in Kevlar 49 composites and engineering design data were generated. Stress rupture tests were initiated on E-glass composites at load levels of 60% to 85% of short term strength. Dynamic fatigue tests on Kevlar 49 composites in the tension-tension mode and fatigue tests on a Kevlar 49 composite ring specimen at 50% to 75% ultimate strength were begun. DOE

N80-11619# Argonne National Lab., Ill.

PRELIMINARY MATERIALS ASSESSMENT IN SOLAR DEMONSTRATION SYSTEMS

C. F. Cheng Nov. 1978 29 p refs Presented at the ASME Energy Technol. Conf., Houston, Tex., 5 Nov. 1978
(Contract W-31-109-eng-38)
(ANL/EES-CP-30; Conf-781112-8) Avail: NTIS HC A03/MF A01

Materials performance in solar demonstration systems is assessed from published literature and service experience. The solar demonstration systems and the materials used in the collector and transport systems are summarized. DOE

N80-11620# Chalmers Univ. of Technology, Goteborg (Sweden). Institutionen foer Fysik.

SPECTRALLY SELECTIVE SURFACES WITH COATINGS COMPRISED OF ULTRAFINE METAL PARTICLES

C. G. Granqvist 1978 15 p refs Presented at the Symp. on Solar-Thermal Power Stations, Cologne, 12 Apr. 1978
(AED-Conf-78-212-004; Conf-780425-7) Avail: NTIS HC A02/MF A01

Efficient photothermal conversion of solar energy requires high absorption at wavelengths lambda > lambda/sub c/ and low absorption at lambda > lambda/sub c/, where lambda/sub c/ is approximately 2 micro m. Such spectrally selective surfaces can be prepared by coating metal plates with films consisting of ultrafine metal particles dispersed in an insulating matrix. Gas evaporated Cr particles with diameters approximately 10 nm were used. Spectrophotometry in the range 0.3 < lambda 25 micron m displayed good spectral selectivity. The parameters governing the position of lambda/sub c/ were determined. The crucial importance of the shape of the particles was documented, and, in general, increased eccentricity shifted lambda/sub c/ toward larger wavelengths. A similar shift was obtained for nonhomogeneous spheres whose dielectric core size was enlarged. DOE

N80-11621# Department of Energy, Washington, D. C.

INTERNATIONAL COAL TECHNOLOGY SUMMARY DOCUMENT

Dec. 1978 113 p refs Prepared in cooperation with TRW, Inc., McLean, Va.
(Contract EX-76-C-10-3885)
(DOE/PE-0010; HCP/P3885) Avail: NTIS HC A06/MF A01

The status of coal technologies expected to be available for commercial application by 1990 is reviewed. Technologies discussed include direct combustion using flue gas desulfurization, fluidized bed combustion, gasification, liquefaction, and advanced power cycles. Coal mining and transportation are also reviewed. Social, environmental, safety, and health constraints on coal use are considered. K.L.

N80-11622# Oklahoma Univ., Norman. School of Aerospace, Mechanical and Nuclear Engineering.

LATERAL AND TILT WHIRL MODES OF FLEXIBLY MOUNTED FLYWHEEL SYSTEMS

C. W. Bert and T. L. C. Chen Dec. 1978 36 p refs Presented at the 49th Shock and Vibration Symp., Washington, D. C., 17-19 Oct. 1978 Prepared for Sandia Labs.
(Contract EY-76-C-04-0789)
(SAND-78-7070; OU-AMNE-78-5; Conf-7810154-1) Avail: NTIS HC A03/MF A01

High performance, composite material flywheel systems were driven by an air turbine at the Sandia Livermore spin test facility. An analysis of the systems considering six degrees of freedom was applied to two versions of a specific design. DOE

N80-11623# Oklahoma Univ., Norman. School of Aerospace, Mechanical and Nuclear Engineering.
WHIRLING RESPONSE AND STABILITY OF FLEXIBLY MOUNTED, RING-TYPE FLYWHEEL SYSTEMS
T. L. C. Chen and C. W. Bert Nov. 1978 122 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7073; OU-AMNE-78-6) Avail: NTIS HC A06/MF A01

Rim type composite material flywheels are examined. Free whirling, stability, and forced whirling are examined for these fly-wheel systems. In the free whirling analysis, predicted critical speeds are encountered in the design operating speed range. Practical ways to increase such critical speeds are suggested. Effects of material internal damping on the stability of the system are discussed. DOE

N80-11624# Argonne National Lab., Ill.
UNDERGROUND PUMPED HYDRO STORAGE: AN OVERVIEW
S. W. Tam, C. A. Blomquist, and G. T. Kartsounes 1978 13 p refs Presented at the 1st Inform. Exchange Conf., Luray, Va., 24 Oct. 1978
(Contract W-31-109-eng-38)
(CONF-781046-1) Avail: NTIS HC A02/MF A01

The status of underground pumped hydro storage (UPHS) for electric utility peaking and energy storage applications is reviewed. The salient features of major recent studies are reviewed. Turbomachinery options and advances in high head pump/turbines are discussed. The effect of head, capacity, turbomachinery unit size and type, and other performance variables on the cost of a UPHS plant are presented. Market potential, siting criteria, lower reservoir construction, and geological related issues are addressed. The environmental impact of a UPHS plant is reduced from comparable facilities, and these issues and other safety concerns are presented. DOE

N80-11626# Williams (O. G.) and Skaggs (R. L.), Las Vegas, Nev.
SOLAR PARABOLIC TROUGH FORMING PROCESS Final Report
O. G. Williams and R. L. Skaggs 31 May 1978 58 p refs
(Grant EG-77-G-04-4158)
(ALO-4158-1) Avail: NTIS HC A04/MF A01

A new forming process is presented which exceeds an 8/1 concentration. Expanding on work previously done, many variables were investigated. Using one foot long trough samples, a high degree of slope accuracy was obtained. The forming process eliminated the need for ribs, boxes or other devices now used to maintain the parabolic shape of a solar parabolic shell. The process, in brief, involves (1) alloy aluminum; (2) moments; (3) temperature; (4) time; (5) thickness; (6) bearings; (7) flange angle bend; (8) hardness; (9) lengthwise sag; (10) material flatness; and (11) aperture control. DOE

N80-11627# Lincoln Lab., Mass. Inst. of Tech., Lexington.
MAXIMUM POWER TRACKERS FOR PHOTOVOLTAIC ARRAYS
E. E. Landsman 1977 6 p refs Presented at the 13th IEEE Photovoltaic Specialists' Conf., Washington, D. C., 5-8 Jun. 1978
(Contract EY-76-C-02-4094)
(COO-4094-17) Avail: NTIS HC A02/MF A01

Progress is reported on the following tasks: agriculture applications; Natural Bridges National Monument, rooftop test bed; Chicago Museum of Science and Industry; data management; materials, processes, and testing, and power conditioning and handling. DOE

N80-11628# Argonne National Lab., Ill. Energy and Environmental Systems Div.
DESIGN OPTIMIZATION OF AQUIFER RESERVOIR-BASED COMPRESSED AIR STORAGE SYSTEMS
Frederick W. Aherns 1978 12 p refs Presented at the Mech. and Magnetic Energy Storage Contractors' Inform. Exchange Conf., Luray, Va., 24-16 Oct. 1978
(Contract W-31-109-eng-38)
(CONF-781046-5) Avail: NTIS HC A02/MF A01

The application of a general compressed air energy storage (CAES) power system design optimization methodology to the class of CAES plants having aquifer air storage reservoirs is discussed. Performance and economic models for the aquifer reservoir, wells, piping, and air compression system are described. Identification of designs which minimize the subsystem power generation cost, while satisfying constraints related to the geology, equipment, and utility load curve are presented. The design specification resulting from the optimization procedure includes: land area to be purchased, well depth, number of wells, well spacing, wellbore diameter, main pipeline diameter, required compressor system power and discharge pressure, and required compression time durations for each day of the week. DOE

N80-11630# Gesellschaft fuer Wirtschaftliche Bautechnik m.b.H., Munich (West Germany). Inst. fuer Angewandte Bauforschung.
INVESTIGATION OF THE APPLICABILITY OF TECHNICAL SYSTEMS UTILIZING SOLAR ENERGY FOR THE HEAT SUPPLY OF BUILDINGS Final Report
Josef Franz Holbl and Hannes Krack Bonn Bundesmin. fuer Forsch. u. Technol. Dec. 1978 240 p refs In GERMAN; ENGLISH summary
(Contract BMFT-ET-4056-A)
(BMFT-FB-T-78-48) Avail: NTIS HC A11/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Ger. DM 50,40

The use of solar energy to heat German army barracks was studied. Possibilities for the installation of solar energy systems for heating water and for general heating purposes were considered. Information on available building types, their construction, and intended use, as well as climatic parameters, was compiled. Four categories were analyzed. Results indicate that energy costs can be reduced by between 40 percent to 55 percent in the case of barracks. It is recommended to install four solar heating systems, two in buildings with flat roofs and two in buildings with pitched roofs. It is intended to study the influence of roof type on heating efficiency. Author (ESA)

N80-11631# Stockholm Univ. (Sweden). Dept. of Meteorology.
INTERACTION IN LIMITED ARRAYS OF WINDMILLS: REVIEW OF EARLIER RESULTS FROM A SIMPLE MODEL AND A PRESENTATION OF THE CAPABILITIES OF A DYNAMIC PBL MODEL
Carl Crafoord 27 Mar. 1979 57 p refs Prepared in cooperation with Intern. Meteorol. Inst.
(DM-26) Avail: NTIS HC A04/MF A01

The problem of how closely packed an array of windmills can be erected without unduly interfering with each other is considered. A general technical background for the behavior of a single windmill in a homogeneous flow, together with a list of important parameters for the general performance of a group, is given. Earlier results for neutral stratification are reviewed and presented in a slightly different manner more fully illustrating the trade-off between windmill density and mean efficiency as function of group size. The analogy between plumes and wakes as a basis for a model formulation is reviewed. Preliminary results indicate a variation in mean efficiency of 13% for a group with 80 units, which may correspond to a factor of 2.5 in area coverage. A dynamic one dimensional planetary boundary layer model is presented and redesigned for simulation experiments. Using it, the regeneration of the wind profiles behind a windmill unit is studied for different ambient conditions. Preliminary results indicate a variation of up to a factor of 9 in the rate of regeneration of the profiles. How this data might be considered in a statistical analysis is discussed. Author (ESA)

N80-11632# Austrian Solar and Space Agency, Vienna.
SOLAR ENERGY WITH LATENT HEAT STORAGE: FUNDAMENTALS AND APPLICATIONS [SONNENENERGIE

LATENTSPEICHER. GRUNDLAGEN AND ANWENDUNGEN]
Oct. 1978 78 p refs In GERMAN; ENGLISH summary
(ASSA-10/1978) Avail. NTIS HC A05/MF A01

Solar heating systems are examined in terms of their year-round efficiency. The desirability of storing the surplus of solar energy in summer for the heating period autumn and winter is mentioned. Possible storage schemes, such as water storage, ground storage, and latent heat storage, are examined. It is shown that water and ground as storage mediums have only small thermal storage capacity and, therefore, need large volumes. As far as latent-heat-storage is concerned, a phase-conversion (solid to liquid) is caused by the supply of heat and this process is reversed again by the withdrawal of heat. Thus, the heat is being stored in the form of conversion energy and the storage volumes become considerably lower since the energy density is much higher. Possible media for latent storage are compiled and their features described. The present state of technology is explained by illustrating applications. Economic aspects and conclusions are presented. Author (ESA)

N80-11633# Environmental Law Inst., Washington, D. C.
SOLAR ACCESS LAW. PROTECTING ACCESS TO SUNLIGHT FOR SOLAR ENERGY SYSTEMS
Gail Boyer Hayes May 1979 173 p refs Sponsored in part by DOE
(Grant HUD-H-8213G)
(PB-296532/5) Avail: NTIS HC A08/MF A01 CSCL 10A

Legal strategies to assure that owners of solar energy systems receive sunlight on their collectors are evaluated. The protection of solar access in developed urban and suburban areas is emphasized. Recommendations are made and conclusions are reached about laws and zoning and land use regulations that offer the best protection of solar rights. K.L.

N80-11634# National Field Research Center, Inc., Iowa City, Iowa.
NATIONAL ENVIRONMENTAL/ENERGY WORKSHOP ASSESSMENT. PHASE 3. ENERGY PROGRAMS Final Report
Aug. 1979 106 p
(Grant EPA-T-900591-03)
(PB-298587/7; EPA-600/8-79-023H) Avail: NTIS HC A06/MF A01; also available in set of 18 reports PC E99, PB-298579-SET CSCL 05I

In addition to well-established programs in nuclear engineering, mining, petroleum and natural gas technology and engineering, there are programs in energy conversion, energy engineering and policy, energy conversion and resources, energy resources management, and several others which represent recent innovative approaches to the broad spectrum of energy problems. GRA

N80-11639# Brookhaven National Lab., Upton, N. Y. Process Sciences Div.
ENVIRONMENTAL CONTROL TECHNOLOGY FOR CARBON DIOXIDE
Meyer Steinberg, A. S. Albanese, and Vi-Duong Dang Sep. 1978 36 p refs Presented at the 71st Ann. Meeting of the Am. Inst. of Chem. Engr., Miami, Fla., 12-16 Nov. 1978
(Contract EY-76-C-02-0016)
(BNL-24999; Conf-781110-10) Avail: NTIS HC A03/MF A01

Routes for removal, recovery, disposal, and reuse of CO2 from various control points in the global system are reviewed. The energy and mass balances for various routes are used as a criteria for evaluation. Alternative energy sources are assessed as a means of control. DOE

N80-11641# Los Alamos Scientific Lab., N. Mex.
ENERGY DEVELOPMENT vs WATER QUALITY IN THE UPPER COLORADO AND UPPER MISSOURI RIVER BASINS
A. B. Bishop, S. L. Klemetson, M. F. Torpy, and M. McKee Oct. 1978 84 p refs
(Contract W-7405-eng-36)
(LA-7497-MS) Avail: NTIS HC A05/MF A01

Impacts from energy developments are discussed in terms of the various pollutants generated by energy extraction and processing activities, and the pollution transport mechanisms and pathways by which they can enter surface and groundwater. The implications for energy development of the water quality aspects of legislative requirements and regulations are discussed. Many of the potential water pollution problems associated with energy development will occur through the transport of pollutants from air pollution and solid waste disposal. The consumptive use of all water withdrawn for energy processing as a pollution control measure raises three important issues-each of which represents a potential conflict between energy developers compliance with the legislation and western water law: (1) junior rights and water transfer, (2) the beneficial use question, and (3) the reasonable use measure of certain water quality practices. DOE

N80-11647# IEA Coal Research, London (England).
HOT GAS CLEANUP
G. F. Morrison Mar. 1979 53 p refs
(ICTIS/TR-03; ISBN-92-9029-017-X) Avail: NTIS HC A04/MF A01

The current technological status of hot gas cleanup systems for cleaning gases from coal gasifiers or fluidized bed combustors prior to their use in combined cycle power generating systems is reviewed. Self contained cleanup systems which can be applied to various gasifiers or combustors are emphasized. Contaminants in the gas stream are identified as sulphur compounds, particulates, nitrogen compounds, and trace elements. Hot gas desulphurization processes are classified according to the sorbent on which they are based (iron oxide or calcium). Particulate removal is subdivided according to the separation technique. Cyclones, surface and depth filters, and electrostatic precipitators are covered. Author (ESA)

N80-11656# Acurex Corp., Mountain View, Calif. Energy and Environmental Div.
TECHNICAL ASSESSMENT OF THERMAL DeNOx PROCESS Final Report, Nov. 1977 - Dec. 1978
C. Castaldini, K. G. Salvesen, and H. B. Mason May 1979 138 p
(Contract EPA-68-02-2611)
(PB-297947/4; EPA-600/7-79-117) Avail: NTIS HC A07/MF A01 CSCL 13B

The thermal deNOx process applied to coal fired utility boilers is assessed. It is concluded that the process is a promising technique for controlling NOx emissions. However, flue gas temperature fluctuations may limit NOx reductions to approximately 50%. In addition, operational and environmental impacts of NH3 emissions and ammonium bisulfate formation could further limit the performance of the process and effect is applicability. Costs depend primarily on boiler size, initial NOx concentration, and level of control required. The impact of widespread process implementation on the ammonia market, feedstock supplies, and their costs are considered and found to be small. GRA

N80-11670# National Field Research Center, Inc., Iowa City, Iowa.
NATIONAL ENVIRONMENTAL/ENERGY WORKFORCE ASSESSMENT. PHASE 3. AIR PROGRAMS Final Report
Aug. 1979 39 p
(Grant EPA-T-900591-03)
(PB-298580/2; EPA-600/8-79-023A) Avail: NTIS HC A03/MF A01; also available in set of 18 reports PC E99, PB-298579-SET CSCL 05I

Information on post-secondary environmental education programs in the United States is provided. Structured around information requests mailed to post-secondary education institutions, the directory provides the name and address of each institution listed, a contact person at each institution, the academic program title, and the degree offered at the institution (2-year, 4-year, etc.) Twelve such directories of post-secondary programs include: one each for air, noise, pesticides and toxicology, potable water, wastewater, radiation, solid waste, and energy; one for combined water/wastewater programs; and a composite volume on each of the three areas of environmental engineering/technology, environmental science/health, and environmental studies. GRA

N80-11711# California Univ., Riverside. Inst. of Geophysics and Planetary Physics.
SEISMIC REFRACTION INVESTIGATION OF THE SALTON SEA GEOTHERMAL AREA, IMPERIAL VALLEY, CALIFORNIA M.S. Thesis
Robert Frith Bruce Dec. 1978 106 p refs
(Grant NSF AER-72-03551)
(PB-296547/3; UCR/IGPP-78/19; NSF/RA-780511) Avail: NTIS HC A06/MF A01 CSCL 08G

Seven seismic refraction profiles and four long refraction shots were used to investigate the Salton Sea geothermal in preparation for energy resource development. From the data, two models of the geothermal and adjacent area were proposed. GRA

N80-11747*# Battelle Columbus Labs., Ohio.
PRELIMINARY ASSESSMENT OF INDUSTRIAL NEEDS FOR AN ADVANCED OCEAN TECHNOLOGY
A. G. Mourad, K. M. Maher, J. E. Balon, A. G. Coyle, and J. A. Henkener 15 Oct. 1979 59 p refs
(Contract NASw-2800)
(NASA-CR-162435; BCL-OA-TFR-79-4) Avail: NTIS HC A04/MF A01 CSCL 08C

A quick-look review of selected ocean industries is presented for the purpose of providing NASA OSTA with an assessment of technology needs and market potential. The size and growth potential, needs and problem areas, technology presently used and its suppliers, are given for industries involved in deep ocean mining, petrochemicals ocean energy conversion. Supporting services such as ocean bottom surveying; underwater transportation, data collection, and work systems; and inspection and diving services are included. Examples of key problem areas that are amenable to advanced technology solutions are included. Major companies are listed. A.R.H.

N80-11889# Los Alamos Scientific Lab., N. Mex.
GENERAL-PURPOSE HEAT SOURCE PROJECT SPACE NUCLEAR SAFETY PROGRAM AND RADIOISOTOPIC TERRESTRIAL SAFETY PROGRAM Progress Report
R. D. Baker, comp. Sep. 1978 55 p
(Contract W-7405-eng-36)
(LA-7519-PR) Avail: NTIS HC A04/MF A01

Studies related to the use of (Pu-238)O2 in radioisotopic power systems are reported. DOE

N80-11891# Technical Research Centre of Finland, Espoo.
EVALUATION OF NUCLEAR POWER PLANT SITING BY PROBABILISTIC ASSESSMENT OF ENVIRONMENTAL IMPACT Ph.D. Thesis - Helsinki Univ., Otaniemi, Finland
Seppo Vuori 1978 20 p refs
(VTT-EN-24; ISBN-951-38-0704-5) Avail: NTIS HC A02/MF A01

A probabilistic consequence assessment model ARANO and the individual calculation schemes therein included are described. This assessment model was applied to the risk/benefit and cost/benefit analyses of the siting of nuclear power plants. In addition, some comparisons with alternative fossil-fuelled energy production scenarios are made. Results indicate the model gives useful data in these applications. Author (ESA)

N80-11935# Braun (C. F.) and Co., Alhambra, Calif.
EXPERIMENTAL ENTHALPIES FOR A MIXTURE OF 80 MOLE PERCENT ISOBUTANE IN ISOPENTANE Final Report
C. R. Koppany and J. M. Lenoir Mar. 1979 52 p refs Sponsored by Electric Power Research Inst.
(EPRI Proj. 928-4)
(EPRI-ER-1034) Avail: NTIS HC A04/MF A01

Seven enthalpy isobars were measured for a nominal mixture of 80% isobutane/20% isopentane. A phase envelope was constructed for use in the design of a turbine expander and the heat exchangers for a geothermal power plant. The dew point values for the phase envelope are discussed for the region near the critical. DOE

N80-11941# Ohio Public Utilities Commission, Columbus.
DEMAND MANAGEMENT DEMONSTRATION PROJECT. STAGE 1: DEVELOPMENT OF RESIDENTIAL LOAD CHARACTERISTICS. STAGE 4: DEMONSTRATION OF RESIDENTIAL INCREMENTAL COST PRICING IMPLEMENTED BY TIME-OF-DAY METERING Final Report, Jan. 1979
Apr. 1979 144 p
(Contract EC-75-F-01-8072)
(HCP/B8072-01) Avail: NTIS HC A07/MF A01

Several load-management technologies were used in order to gather data necessary for further implementation, gain insight into customer reactions to the various techniques studied, and develop the computer codes necessary to process such data. The results are consistent with economic theory and will contribute to the further development of effective pricing structures for electricity. The customers on the time-of-day rate responded by reducing their peak-period consumption significantly below that of comparable control-group customers. Total energy use by customers in the pricing group declined about 3.5%. Customers in the time-of-use and radio-controlled groups reacted favorably to the techniques. DOE

N80-11946# California Univ., Berkeley. Lawrence Berkeley Lab.
A MANUAL FOR CATALOGING AND INDEXING DOCUMENTS
S. R. Schwartz, S. L. Phillips, and J. J. Perra Jul. 1978 85 p refs Revised
(Contract W-7405-eng-48)
(LBL-4432-Rev-1) Avail: NTIS HC A05/MF A01

The descriptive cataloging and subject indexing rules and methodology needed to process bibliographic information for the National Geothermal Information (GRID) database storage are documented. Data elements which may appear in a bibliographic record are tabulated. Examples of coded data entry forms are included in an appendix. Examples are given of unit records in the database corresponding to one bibliographic reference. DOE

N80-11954*# Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
A SURVEY OF ELECTRIC AND HYBRID VEHICLE SIMULATION PROGRAMS Final Report
J. Bevan, D. A. Heimburger, and M. A. Metcalfe Nov. 1978 110 p refs
(Contract EC-77-A-31-1011)
(NASA-CR-162457; HCP/M1011-04) Avail: NTIS HC A06/MF A01 CSCL 13F

Results of a survey conducted within the United States to determine the extent of development and capabilities of automotive performance simulation programs suitable for electric and hybrid vehicle studies are summarized. Altogether, 111 programs were identified as being in a usable state. The complexity of the existing programs spans a range from a page of simple desktop calculator instructions to 300,000 lines of a high-level programming language. The capability to simulate electric vehicles was most common, heat-engines second, and hybrid vehicles least common. Batch-operated programs are slightly more common than interactive ones, and one-third can be operated in either mode. The most commonly used language was FORTRAN, the language typically used by engineers. The higher-level simulation languages (e.g. SIMSCRIPT, GPSS, SIMULA) used by 'model builders' were conspicuously lacking. DOE

N80-11965# Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
SOUTHEASTERN FORUM ON APPROPRIATE TECHNOLOGY Final Report

Jeffrey S. Tiller, David S. Clifton, Jr., and Robert A. Cassanova Apr. 1979 98 p Conf. held at Atlanta, Ga., 17-18 Sep. 1978
(Grant NSF ISP-78-22994)
(PB-298796/4; GIT-B-519-F; NSF/RA-790007) Avail: NTIS HC A05/MF A01 CSCL 05A

The background and purpose of the forum are described as well as its structure and agenda. Results of the forum are presented and a strategy is proposed for NSF to follow in an appropriate technology program. The specific appropriate technologies that participants believed had the greatest potential for widespread implementation were passive solar energy, cooperative community projects, waterless toilets, an AT extension service, active solar equipment, utilization of local material and human resources in energy, resource recovery plants, conversion of biomass to fuel, recycling centers, techniques for passive and active space cooling, photovoltaics and marketing cooperatives for small farms. GRA

N80-11991# Technical Research Centre of Finland, Espoo.
[REPORT ON FINNISH TECHNOLOGICAL ACTIVITIES] Annual Report, 1978
1979 35 p Original contains color illustrations
Avail: NTIS HC A03/MF A01

Results of research and test programs in building, community, materials, processing, energy, and information processing technologies are reported. Specific topics covered include heat economy of buildings, road friction, plastics, lubricants, ceramics, metallic materials and metal production, biotechnology, food science, mineralogy, and measurement of impurities in flue gases. Other areas discussed include graphical processes, mechanical wood handling, ship building, nuclear engineering, measurement of electrical quantities, and data processing and transmission. K.L.

N80-12106*# Rockwell International Corp., Downey, Calif. Space Div.
SATELLITE POWER SYSTEMS (SPS) CONCEPT DEFINITION STUDY. VOLUME 4: SPS POINT DESIGN DEFINITION Final Report
G. Hanley Apr. 1978 220 p 5 Vol.
(Contract NAS8-32475)
(NASA-CR-150683; SD-78-AP-0023-4-Vol-4) Avail: NTIS HC A10/MF A01 CSCL 22B

The satellite power systems point design concept is described. The concept definition includes satellite, ground and space systems, and their relationships. Emphasis is placed on the definition of the GaAlAs photovoltaic satellite system. The major subsystems of the satellite system including power conversion, power distribution and control, microwave, attitude control and stationkeeping, thermal control, structures, and information management and control are discussed. A.W.H.

N80-12147# Hanford Engineering Development Lab., Richland, Wash.
MATERIALS COMPATIBILITY IN LIQUID SODIUM
W. F. Brehm Aug. 1978 38 p refs Presented at NACE Conf., Denver, Colo., 3 Oct. 1978
(Contract EY-76-C-14-2170)
(HEDL-SA-1559; Conf-781071-2) Avail: NTIS HC A03/MF A01

The types and rates of reaction of sodium with reactor materials are presented. Confident predictions on the corrosion behavior for steel in sodium were obtained. Deposition phenomena are not well defined, at least with respect to establishing quantitative correlation. The potential uses of liquid metal heat transfer systems in energy conversion systems other than nuclear reactors were considered. DOE

N80-12163# International Nickel Co., Inc., Suffern, N. Y. Inco Research and Development Center.
EVALUATION OF HIGH CHROMIUM OVERPLAYS TO PROTECT LESS ALLOYED SUBSTRATES FROM CORROSION IN A COAL GASIFICATION ATMOSPHERE Quarterly Report, 1 Mar. - 31 May 1978
E. P. Sadowski 1978 32 p
(Contract EF-77-C-01-2621)
(FE-2621-3) Avail: NTIS HC A03/MF A01

Three-quarters of the welding is complete and pre-exposure testing started on one-half of the completed weldments in this program to produce overlays resistant to corrosion in coal gasification atmospheres at 982 C. The welding processes were: submerged-arc, gas metal-arc and gas tungsten-arc with a hot wire addition. Pre-exposure testing was continued. The tests consisted of hardness surveys, bend, tensile, stress-rupture, bulk chemical analysis of the overlay and microprobe analysis for the distribution of major alloying elements from the outside edge of the overlay to the center of the base plate. The results are described. DOE

N80-12188 Utah Univ., Salt Lake City.
ELUCIDATION OF COAL STRUCTURAL COMPONENTS BY SHORT RESIDENCE-TIME EXTRACTIVE LIQUEFACTION Ph.D. Thesis
Doonee Kang 1979 202 p
Avail: Univ. Microfilms Order No. 7925040

Short contact time thermal reactions of bituminous coals with tetralin in hydrogen atmosphere were studied to ascertain the nature of the reaction such as the mechanism of the coal liquefaction process, the labile functional structures in the coal and the products, the hydrogen transfer reactions between coal and tetralin, and the kinetics of coal conversion. Yield and kinetic data indicated reaction paths of the coal conversion. A hybrid kinetic model containg first and second order rate equations was developed and tested for the data. Dissert. Abstr.

N80-12189# Toronto Univ. (Ontario). Inst. for Aerospace Studies.
THE FUTURE ROLE OF HYDROGEN FUEL IN AN ELECTRICAL SOCIETY
Gordon N. Patterson Oct. 1979 30 p refs
(UTIAS-241; CN-ISSN-0082-5255) Avail: NTIS HC A02/MF A01

The manufacture, storage, and use of hydrogen for peak-shaving purposes, vehicular power plants, and as a chemical raw material are discussed and programs for future development are indicated. It is concluded that plans for the future use of hydrogen on a large scale should be initiated now. M.M.M.

N80-12191# Texaco, Inc., El Monte, Calif. Montebello Research Lab.
GASIFICATION OF RESIDUAL MATERIALS FROM COAL LIQUEFACTION. EVALUATION OF SRC 2 VACUUM FLASH DRUM BOTTOMS FROM POWHATAN COAL AS A FEEDSTOCK FOR THE TEXACO GASIFICATION PROCESSES
A. M. Robin Mar. 1979 10 p
(Contract EX-76-C-01-2247)
(FE-2247-2) Avail: NTIS HC A02/MF A01

A 20 pound sample of vacuum flash drum bottoms, obtained from the liquefaction of Powhatan coal, was judged to be a suitable feedstock for a synthesis gas generation process. It can be charged directly to the gasifier at a temperature of about 615 F. The material is too viscous to be pumped with the pilot plant equipment, however, which is capable of maintaining a temperature of only 515 F. The addition of 3 to 5 percent cutter is required for the pilot plant tests. No cutter is required for a commercial plant. Based on these results, operating conditions and yields were estimated for gasifying 1000 pounds per hour of molten undiluted residue at 350 psig. A Type 2 preliminary pilot plant evaluation is planned. DOE

N80-12192# Babcock and Wilcox Co., Alliance, Ohio. Research Development Div.
CHARACTERIZATION AND COMBUSTION OF SRC 2 FUEL OIL Final Report
W. Downs and A. J. Kubasco Jun. 1979 131 p refs
(EPRI-FP-1028) Avail: NTIS HC A07/MF A01

An industrial boiler rated at a steam flow of 45,000 lbs/hr was used for combustion tests of solvent refined coal (SRC) fuel oil, No. 2 fuel oil, and No. 5 fuel oil. Operating variables included load, excess air, and burner register settings. The laboratory fuel analyses indicates that in most respects this SRC fuel oil sample behaved similarly to No. 2 fuel oil. The combustion test confirms that SRC fuel oil burns similarly to No. 2 fuel oil with one notable exception. NO/sub x/ emissions were substantially higher than for either the No. 2 or No. 5 fuel oils. The SRC fuel oil will require the application of NO/sub x/ combustion control techniques to meet the proposed New Source Performance Standards of 0.5 pound NO2/million Btu when burned in power boilers equipped with wall-mounted burners. DOE

N80-12197# Los Alamos Scientific Lab., N. Mex.

LASL THERMOCHEMICAL HYDROGEN PROGRAM STATUS ON OCTOBER 31, 1978

K. E. Cox and M. G. Bowman 31 Oct. 1978 9 p refs Presented at Chem. Hydrogen Energy Systems Contracts Rev., Washington, D.C., 28 Nov. 1978
(Contract W-7405-eng-36)
(LA-UR-78-2895; CONF-781142-4) Avail: NTIS HC A02/MF A01

Progress is reported in developing an efficient and economical thermochemical cycle for the production of hydrogen from water utilizing thermal energy sources that become available. Topics covered include: (1) continuing experiments in sulfate decomposition, sulfate formation, and hydrogen iodide electrolysis; (2) fusion-synfuel study (hydrogen); and (3) evaluation of thermochemical cycles. DOE

N80-12198# Oklahoma State Univ., Stillwater. Dept. of Chemistry.

CHARACTERIZATION OF COAL-DERIVED LIQUIDS AND OTHER FOSSIL FUEL RELATED MATERIALS EMPLOYING MASS SPECTROMETRY. MASS SPECTROMETRY AND FOSSIL-ENERGY CONVERSION TECHNOLOGY: A REVIEW Quarterly Report, 30 Mar. - 29 Jun. 1978

S. E. Scheppele 1978 141 p
(FE-2537-7) Avail: NTIS HC A07/MF A01

The following activities in regard to the development of micromolecular probe distillation in combination with field-ionization mass spectrometry (FI/MS) for quantitative analysis are reported. The temperature-control module for the direct-introduction probe was received and successfully interfaced to both the probe and the NOVA 3/12. Both temperatures and FI/MS data were minicomputer acquired for probe distillation of a 19 component synthetic blend, an asphaltene-acid fraction, and the base fraction from an anthracene-oil sample. The acquired temperatures and FI/MS data for the 19 component blend were processed on the IBM 370/158 to obtain a quantitative distribution which is in excellent agreement with both the known composition and the one obtained from the FI/MS data acquired using the batch-inlet system for sample introduction. Development of algorithms for correlating the acquired temperatures with the acquired FI/MS data using the NOVA 3/12 and for preparing the correlated data for remote job entry to the IBM 370/158 were initiated. DOE

N80-12199# Institute of Gas Technology, Chicago, Ill.

STATUS OF THE PEATGAS PROCESS

D. V. Punwani 1978 30 p refs Presented at Syn. Pipeline Gas Symp., Chicago, 30 Oct. 1978
(Contract EX-76-C-01-2469)
(CONF-781045-3) Avail: NTIS HC A03/MF A01

PDU-scale tests were conducted to determine the effects of initial scale-up from the laboratory-scale equipment. The hydrogasification PDU represents a scale-up of about 250 times the laboratory-scale hydrogasifier. The tests in the laboratory-scale equipment were conducted with hydrogen and/or helium, whereas the tests in the PDU were conducted with hydrogen, steam-hydrogen, and synthesis gas. The PDU test results are in very good agreement with the results obtained in the laboratory-scale equipment. A mathematical model describing the kinetics was developed for the PEATGAS Process. A complete process design has been prepared for a preliminary base case for producing 250 x 10 to the ninth power Btu/day of SNG from the Minnesota peat (containing 50 percent moisture content). The plant thermal efficiency of this process is estimated to be 67 percent. Process economics for the completed base-case process design as well as several modified designs are evaluated. DOE

N80-12200# Institute of Gas Technology, Chicago, Ill.

HYGAS PROCESS UPDATE

W. G. Bair 1978 20 p refs Presented at Syn. Pipeline Gas Symp., Chicago, 30 Oct. 1978
(Contract EX-76-C-01-2434)
(CONF-781045-4) Avail: NTIS HC A02/MF A01

Nine tests with Illinois No. 6 Seam coal from the Peabody No. 10 mine were completed at 900 and 500 psig with char conversions reaching 90%, and sinter-free gasifier conditions were achieved at both pressure levels. Fines elutriation was studied and a method of identifying fines sources is being developed so that higher percentages of the char fed to the reactor can be gasified. In addition, the steam--oxygen distributor in the steam--oxygen gasifier zone of the reactor was successfully modified to improve the gasifier's ability to achieve high char conversions under sinter-free conditions. All of these activities and the data obtained through them contributed to improving the data base from which a successful commercial/demonstration plant can be designed. DOE

N80-12201# California Univ., Livermore. Lawrence Livermore Lab.

ENVIRONMENTAL ASPECTS OF ALTERNATIVE FUELS UTILIZATION FOR HIGHWAY VEHICLES

C. J. Anderson 25 Oct. 1978 16 p refs Presented at Environ. Control Symp., Washington, D.C., 28 Nov. 1978
(Contract W-7405-eng-48)
(UCRL-81841; CONF-781109-22) Avail: NTIS HC A02/MF A01

Non-petroleum-derived transportation fuels being considered are derived from coal, oil shale, and biomass. The resultant synthetic liquid hydrocarbon fuels may or may not be identical to those derived from petroleum; the alcohols and hydrogen are certainly quite different. A number of environmental issues related to the alternative fuels utilization program are described as well as some of the various projects undertaken to resolve these issues. The accomplishments of these programs are emphasized (in some ways some of these fuels may be superior to existing fuels) and needs for further work are identified. DOE

N80-12202# Dynatech Corp., Cambridge, Mass.

COST ANALYSIS OF AQUATIC BIOMASS SYSTEMS

25 Jul. 1978 268 p refs
(Contract EG-77-C-01-4000)
(HCP/ET/4000-78/1) Avail: NTIS HC A12/MF A01

A cost analysis was conducted to provide the U.S. Department of Energy with engineering cost information on which to base decisions in the area of planning and executing research and development programs dealing with aquatic biomass as an alternative energy resource. Calculations show that several hundred 100 square mile aquatic biomass farms, the size selected for this analysis, would be needed to provide meaningful supplies of energy. It was found that the projections of costs for harvested open-ocean biomass, utilizing optimistic assumptions of scientific and engineering design parameters, appear to be above any practical costs to be considered for energy. One of the major limitations is due to the need to provide upwelled sub-surface water containing needed nutrients, for which pumping energy is required. It is concluded that large scale land-based aquatic biomass farms may merit development, but perhaps within a much narrower range than investigated. Aquatic plants which appear to have potential for development as an energy resource are the so-called emersed plants, or angiosperms, including many types of freshwater weeds such as duckweed, Hydrilla, and water hyacinths. DOE

N80-12204# TRW, Inc., Redondo Beach, Calif.

ENVIRONMENTAL ASSESSMENT REPORT: LURGI COAL GASIFICATION SYSTEMS FOR SNG Final Report, May 1978 - Apr. 1979

M. Ghassemi, K. Crawford, and S. Quinlivan May 1979 344 p refs

(Contract EPA-68-02-2635)
(PB-298109/0; EPA-600/7-79-120) Avail: NTIS
HC A15/MF A01 CSCL 21D

A compilation and analysis of data on the equipment and processes consituting the Lurgi Substitute Natural Gas (SNG) systems, the control/disposal alternatives for a media, the performance and cost of control alternatives, and present and proposed environmental requirements are presented. Data are provided on the characteristics of input materials, products, and waste streams associated with each process. Pollution control alternatives for air emissions, water effluents, solid wastes, and toxic substances in an integrated facility were examined for performance, costs, energy requirements, and ability to comply with current and anticipated environmental standards. GRA

N80-12291# Gutehoffnungshuette Sterkrade A.G. Oberhausen (West Germany).

ELECTRIC POWER GENERATION AND LNG EVAPORATION WITH THE AID OF GAS TURBINES WITHIN A CLOSED-CYCLE PROCESS

D. Weber 1978 19 p refs In GERMAN Presented at Systems Exhibition Energy - Hanover Fair, Hanover, 19 Apr. 1978
(AED-Conf-78-155-010; CONF-7804102-6) Avail: NTIS (US Sales Only) HC A02/MF A01; DOE Depository Libraries

In the proposed process the working fluid of a gas turbine plant with a closed circuit is cooled to -140 C with LNG before entering the compressor and heated to +720 C before entering the turbine by means of external heat gained by burning natural gas. With a 1 million cubic m/h throughput of LNG in its normal state, 237 MW of electric power can be generated with 53 percent efficiency with this simple circuit, which can be further developed. In a combination of closed gas turbine and diesel generator, almost 289 MW of electric power can be produced per 1 million cubic m/h LNG with an efficiency of 60 percent. DOE

N80-12300# National Bureau of Standards, Washington, D.C. Electron Devices Div.

MEASUREMENT TECHNIQUES FOR HIGH-POWER SEMICONDUCTOR MATERIALS AND DEVICES: Annual Report, 1 Oct. 1977 - 30 Sep. 1978

Frank F. Oettinger Jun. 1979 146 p refs
(Contract EA-77-A-01-6010)
(PB-298574/5; NBSIR-79-1756) Avail: NTIS HC A07/MF A01 CSCL 09A

The development of measurement methods for semiconductor materials and devices which will lead to more effective use of high power semiconductor devices in applications for energy technologies is described. The major tasks are: (1) to evaluate the use of thermally stimulated current and capacitance measurements and other deep level measurement techniques as a means for characterizing lifetime controlling or leakage source defects in power grade silicon material and devices; and (2) to develop procedures to enable spreading resistance measurements of thyristor starting material and layer profiles to be made on a reliable basis. GRA

N80-12338# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).

FLUID DYNAMICS OF POROUS MEDIA IN ENERGY APPLICATIONS, VOLUME 1

1979 433 p Lecture held at Rhode-Saint-Genese, Belgium, 12-16 Feb. 1979
(VKI-Lec-Ser-1979-4-Vol-1) Avail: NTIS HC A19/MF A01

The use of porous media in connection with energy storage or exchange is considered. Heat storage and transfer in packed beds, regenerators, moving bed heat exchangers, and natural convection in porous media are among the topics covered. Application to geothermics and solar energy is emphasized.

N80-12340# Michigan Univ., Ann Arbor. Heat Transfer Lab.

SURVEY AND DESCRIPTION OF TRANSPORT PHENOMENA IN PACKED-BEDS

John A. Clark *In* Von Karman Inst. for Fluid Dyn. Fluid Dyn. of Porous Media in Energy Appl., Vol. 1 1979 p 1-21 refs

Avail: NTIS HC A19/MF A01

A brief review of the literature pertaining to transport properties in packed beds, particulary as they apply to storage of thermal energy derived from solar energy conversion systems, is presented. Geometric and design parameters that influence the thermal and flow performance of a packed bed are discussed along with analytical models established to simulate the dynamic behavior of the bed. Single and two phase models are included. J.M.S.

N80-12341# Michigan Univ., Ann Arbor. Heat Transfer Lab.

DYNAMIC RESPONSE OF A PACKED-BED ENERGY STORAGE SYSTEM TO A TIME VARYING INLET TEMPERATURE

In Von Karman Inst. for Fluid Dyn. Fluid Dyn. of Porous Media in Energy Appl., Vol. 1 1979 p 1-7 refs

Avail: NTIS HC A19/MF A01

An analytical method for determining the response of a rock-bed energy storage system to temperature variations is outlined. Emphasis is on the case in which the inlet air temperature feeding the bed varies arbitrarily with time, a condition commonly expected in a solar energy supply system. J.M.S.

N80-12342# Michigan Univ., Ann Arbor. Dept. of Mechanical Engineering.

HEAT STORAGE AND THERMAL TRANSFER ASPECTS OF THE DYNAMIC BEHAVIOUR OF A PACKED BED

John A. Clark and Ronald L. Nabozny *In* von Karman Inst. for Fluid Dyn. Fluid Dyn. of Porous Media in Energy Appl., Vol. 1 1979 p 1-12 refs

Avail: NTIS HC A19/MF A01

The formulation of the dynamic response and thermal storage capacity of a packed bed storage unit for solar energy application is outlined for both the charging and recovery modes. Owing to the limitations of analytical procedures, the solutions to this problem are given in terms of an implicit, finite difference numerical formulation. The computer program for this solution is called ROCKBED. Comparison between the numerical results and those from experiment indicate the importance of improved knowledge of certain empirical data for pack beds, including heat transfer coefficients, effective particle size, void fraction, and wetted area per unit volume. J.M.S.

N80-12346# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).

FLUID DYNAMICS OF POROUS MEDIA IN ENERGY APPLICATIONS, VOLUME 2

1979 402 p refs Lecture held at Rhode-Saint-Genese, Belgium, 12-16 Feb. 1979
(VKI-Lec-Ser-1979-4-Vol-2) Avail: NTIS HC A18/MF A01

Topics are presented on heat exchangers, heat exchange processes, the post accident heat removal from a liquid metal fast breeder reactor, the influence of an obstruction on a fluid particle heat transfer, a fluorescence method for the local voidage in random packed beds, and the application of packed beds to energy storage use of latent heat of fusion.

N80-12353# Von Karman Inst. for Fluid Dynamics, Rhode-Saint-Genese (Belgium).

APPLICATION OF PACKED BEDS TO ENERGY STORAGE USE OF LATENT HEAT OF FUSION

J.-M. Buchlin and P. H. Theunissen *In* Von Karman Inst. for Fluid Dyn. Fluid Dyn. of Porous Media in Energy Appl., Vol. 2 1979 15 p refs

Avail: NTIS HC A18/MF A01

A design of thermal storage unit based on the use of latent heat in packed beds is presented. A theoretical model is described of the unsteady heat transfer in such pile where the particles are formed by heat of fusion material incapsulated in spherical containers. The temperature distributions of the circulating fluid and of the phase change material as well as the rate of melting are obtained by numerical procedure. The theoretical predictions are validated in comparison with experimental results. M.M.M.

N80-12538*# Bendix Corp., Englewood, Colo. Energy, Environment and Technology Office.
AUTOMATED LONGWALL GUIDANCE AND CONTROL SYSTEMS, PHASE 1
S. C. Rybak 6 Sep. 1978 410 p Sponsored in part by DOE
(Contract NAS8-32921)
(NASA-CR-161329) Avail: NTIS HC A18/MF A01 CSCL 08I

Candidate vertical control systems (VCS) and face advancement systems (FAS) required to satisfactorily automate the longwall system were analyzed and simulated in order to develop an overall longwall system configuration for preliminary design. R.E.S.

N80-12539*# Bendix Corp., Englewood, Colo. Energy, Environment and Technology Office.
AUTOMATED LONGWALL GUIDANCE AND CONTROL SYSTEMS, PHASE 2, PART 2: VERTICAL CONTROL SYSTEM (VCS) Final Report
5 Apr. 1979 196 p Sponsored in part by DOE
(Contract NAS8-32921)
(NASA-CR-161330) Avail: NTIS HC A09/MF A01 CSCL 08I

The prototype preliminary design of the vertical control system (VCS) of the 'automated longwall guidance and control system' is presented. R.E.S.

N80-12540*# Bendix Corp., Englewood, Colo.
AUTOMATED LONGWALL GUIDANCE AND CONTROL SYSTEMS, PHASE 2, PART 2: RCS, FAS, AND MCS Final Report
15 Jun. 1979 315 p Sponsored in part by DOE
(Contract NAS8-32921)
(NASA-CR-161331) Avail: NTIS HC A14/MF A01 CSCL 08I

The prototype preliminary design of the face advancement system (FAS) consisting of the yaw alignment system (YAS) and the roll control system (RCS), and the master control station (MCS) is outlined. R.E.S.

N80-12542# Department of Energy, Washington, D. C. Energy Information Administration.
IDENTIFICATION OF A METHODOLOGY FOR PROJECTING SHORT-TERM CRUDE PETROLEUM PRODUCTION IN THE UNITED STATES
N. D. Uri Dec. 1978 35 p
(DOE/EIA-0103/14) Avail: NTIS HC A03/MF A01

Box-Jenkins time series analysis is applied to state level monthly crude petroleum production data to forecast monthly production for 1978. Beyond supplying the requisite forecasts, the model is used to investigate the overall efficacy of the approach. The results indicate that the technique emulates past behavior. Further, for the aggregate United States, production is expected to be 0.65 percent above the level observed in the base period of July 1976 - June 1977 primarily due to a large anticipated growth in California production. DOE

N80-12543# Sandia Labs., Albuquerque, N. Mex. GEO Energy Technology Dept.
OVERVIEW OF IN SITU OIL SHALE TECHNOLOGY AND RECENT ADVANCES IN TRUE IN SITU RETORT MODELING
C. E. Tyner 1979 11 p refs Presented at the 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract EY-76-C-04-0789)
(SAND-78-2367C; CONF-790803-08) Avail: NTIS HC A02/MF A01

In view of current liquid fuel shortages, development of the oil shale resources of Colorado, Utah, and Wyoming, estimated to contain more than one trillion barrels of oil equivalent, is considered. The in situ processing of this resource offers a potentially attractive alternative, both economically and environmentally, to surface processing. True and modified in situ retorting technologies are described and current research in these areas briefly outlined. True in situ and related low-void in situ processes would minimize the mining and materials handling problems associated with other technologies. A comprehensive mathematical model developed to describe the retorting process in these beds is presented. Use of the model to investigate the effect of various retort geometries and bed conditions on the oil yield from true in situ and low-void in situ retorts is discussed. DOE

N80-12544# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
SHALE OIL: US AND WORLD RESOURCES AND PROSPECTS FOR NEAR-TERM COMMERCIALIZATION IN THE UNITED STATES
G. Marland Mar. 1979 59 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA-79-8(R)) Avail: NTIS HC A04/MF A01

Although the United States has large resources of shale oil, several decades of development effort have yet to result in a viable industry. Because both the cost of the oil and the environmental impact of its production are not well known and seem to remain perennially at the margin of acceptability, the matter of commercialization has become a political issue. A variety of economic incentives and government programs to encourage commercial development have been proposed - some implemented - and several industrial corporations are proceeding cautiously. Conflicting political, economic, and environmental views, however, continue to preclude a decisive commitment, and it does not appear at this time that significant quantities of shale oil will be avaiable in the next decade, or probably even longer. DOE

N80-12548 Carnegie-Mellon Univ., Pittsburgh, Pa.
FOAM SOLAR SEA POWER: A PHYSICAL INVESTIGATION Ph.D. Thesis
Martin Greenstein 1979 151 p
Avail: Univ. Microfilms Order No. 7925016

A 30 foot high, 4 in. diameter column of glass pipe was constructed. Apparatus to generate a stable fresh water foam was developed and installed at the bottom of the column. An alcohol drip was found to effectively break foam. This, along with a spray condenser, was installed at the column top. Noncondensible gases were removed from the system by a vacuum pump. Water at 25 C, injected into the bottom of the column, was converted to a foam which flowed towards the 5 C condenser. This flow was found to have a dissipative loss similar to that of laminar flow of liquids in pipes. It was concluded that flow losses should not prevent the successful construction of a scaled-up foam solar sea power plant. Dissert. Abstr.

N80-12550# Committee on Science and Technology (U. S. House).
INVENTORY OF ADVANCED ENERGY TECHNOLOGIES AND ENERGY CONSERVATION RESEARCH AND DEVELOPMENT, 1976-1978, VOLUME 1
Washington GPO 1979 859 p refs Prepared by ORNL and DOE for the Comm. on Sci. and Technol., 96th Congr., 1st Sess., Jan. 1979
(GPO-41-481) Avail: SOD HC

Each of 7,339 research projects is described and listed in one of the following nine sections into which the inventory is divided: solar energy, geothermal energy, hydro energy, basic physical research, biomass production/conversion and alternative fuels, electric power engineering, energy storage, energy conversion, and energy management, policy, and conservation. Each section is organized in a two- and three-level hierarchical arrangement. A.R.H.

N80-12551*# Ionics, Inc., Watertown, Mass. Research Div.
ANTON PERMSELECTIVE MEMBRANE
Samuel S. Alexander, Russell B. Hodgdon, and Warren A. Waite
Mar. 1979 52 p Sponsored by NASA

(Contract DEN3-1)
(NASA-CR-159599; DOE/NASA/0001-79/1) Avail: NTIS HC A04/MF A01 CSCL 10A

Experimental composite membranes were synthesized on a lab scale consisting of a thin layer of anion permselective resin supported by and bonded to a porous physically strong and conductive substrate film. These showed good selectivity and also substantially lower electrical resistivities than the homogenous candidate membranes optimized in the previous contract. A wide range of resin porosities were examined for three candidate membrane systems, CDIL, CP4L, and A3L to identify the formulation giving the best overall redox cell performance. Candidate anion membranes showed large increases in resistivity after a short time of immersion in concentrated FeCl/HCl solution. Largely on the basis of resistance stability the CDIL formulation was selected as prime candidate and about thirty-five membranes (one foot square) were produced for experimental static and dynamic evaluation. R.E.S.

N80-12552*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

A PHOTOVOLTAIC POWER SYSTEM IN THE REMOTE AFRICAN VILLAGE OF TANGAYE, UPPER VOLTA

William J. Bifano, Anthony F. Ratajczak, and James E. Martz 1979 17 p refs Presented at UNITAR Conf. on Long-Term Energy Resources, Montreal, 26 Nov. - 7 Dec. 1979 Sponsored in part by AID
(NASA-TM-79318; E-274) Avail: NTIS HC A02/MF A01 CSCL 10B

A photovoltaic (PV) system powering a grain mill and a water pump was installed in the remote West African village of Tangaye, Upper Volta. Village characteristics as well as system design, hardware, installation and operation to date are described. The PV system cost is discussed. A baseline socio-economic study performed and a follow-up study is planned to determine the impact of the system on the villagers. R.E.S.

N80-12553# Air Force Academy, Colo. Research Lab.

THE USAF ACADEMY FLYWHEEL-ELECTRIC CAR PRELIMINARY DESIGN REPORT Progress Report, 1 Oct. 1977 - 31 May 1979

David D. Ratcliff May 1979 47 p refs
(AF Proj. 2303)
(AD-A071242; FJSRL-TR-79-0006) Avail: NTIS HC A03/MF AQ1 CSCL 13/6

Although problems caused by pollution and declining petroleum reserves have caused renewed interest in electric vehicles, currently-available lead-acid batteries impose performance limitations which are unacceptable to most drivers. These limitations, specifically low range and acceleration, are greatly improved by the addition of a flywheel and continuously-variable transmission to the power train of the of the electric vehicle. This paper describes a low-technology flywheel-electric car built by U.S. Air Force Academy cadets and faculty members in the Department of Physics under funding provided by Frank J. Seiler Research Laboratory. The car design discussed appears to offer the possibility for a four-passenger urban vehicle with a range of 70-100 miles and acceleration performance comparable to that of current sub-compact cars. This performance is achieved with a simple driving system which is comparable to that in current automatic transmission cars. The paper also details the benefits and problems resulting from the low-technology design chosen and provides trade-off analyses on some of the specific problems inherent in the use of a flywheel in the power train of a vehicle. Finally, the paper suggests future improvements which could lower the weight of the vehicle, make the transmission shifting more precise, and improve the performance of the car on grades. GRA

N80-12554# American Univ., Washington, D. C.

ON THE PROPERTIES OF A FUEL CELL ELECTROLYTE Final Report, 10 Jul. 1978 - 15 Jan. 1979

Robert T. Foley Feb. 1979 124 p refs
(Contract DAAK70-78-C-0128)
(AD-A072864) Avail: NTIS HC A06/MF A01 CSCL 10/2

The field of fuel cell electrolytes is surveyed with the objective of learning the deficiencies and good properties of the available systems. The survey included a study of inorganic acids as phosphoric, sulfuric, hydrochloric, perchloric, hydrofluoric and other strong acids; organic acids including sulfonic and carboxylic, alkaline systems; ion exchange membrane systems, solid electrolytes; and molten carbonate systems. Some general and specific conclusions are listed indicating the technical questions to be answered to develop a low temperature organic sulfonic acid system. GRA

N80-12556# Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry.

PHOTOELECTROCHEMICAL CONVERSION OF OPTICAL ENERGY TO ELECTRICITY AND FUELS Interim Report

Mark S. Wrighton 8 Aug. 1979 37 p refs Submitted for publication
(Contract N00014-78-C-0630; NR Proj. 051-696)
(AD-A072861; TR-2-ONR) Avail: NTIS HC A03/MF A01 CSCL 10/2

Though the first documented photovoltaic effect is associated with a semiconductor/liquid junction, it has not been until very recently that significant solar energy conversion efficiency could be realized with a photoelectrochemical device. A semiconductor/liquid junction solar cell is one where one or both electrodes in an electrochemical cell is semiconductor such that irradiation of the semiconductor(s) results in the non-spontaneous flow of electric current in the external circuit. Photogeneration of storable chemical fuels in the form of electrolytic products is possible, in addition to the prospect of converting light only to electricity when the redox reaction occuring at one electrode is the reverse of that at the other. The aim of this report is to outline our recent research accomplishments in the field of photoelectrochemistry. Our work in this area began in late 1974 - more than a century after the first studies of photoeffects upon irradiation of an electrode in a cell, and a number of years after modern pioneering studies of semiconductor/liquid interfaces which led to the formulation of our present working hypotheses of such interfaces exposed to optical illumination. GRA

N80-12557# Institute of Gas Technology, Chicago, Ill.

COMMERCIAL APPLICATION OF MOLTEN CARBONATE FUEL CELL SYSTEM

K. F. Blurton and J. R. Peterson 1979 16 p Presented at Energy Technol. Conf. and Exposition, Washington, D.C., 26 Feb. 1979 Prepared in cooperation with Gen. Elec., Schenectady, N. Y.
(Contract EM-78-C-03-1735)
(CONF-790213-4) Avail: NTIS HC A02/MF A01

The potential applications of molten carbonate fuel cells are discussed with particular emphasis on the configuration of a dispersed, oil-fueled and a central, coal-fueled base-load power plant. The penetration of these power plants into the utility generation system is described. The status of this technology is reviewed, and the major technology areas currently under investigation are discussed. DOE

N80-12558# Washington State Univ., Pullman. Environmental Research Center.

COMPARISON OF GEOTHERMAL ENERGY WITH COAL, OIL, AND NATURAL GAS FOR SELECTED USES

G. W. Hinman and J. Robertson 1979 102 p refs
(Contract EY-76-S-06-2221)
(DOE/ET-27139-1; RLO/2221-T14/1) Avail: NTIS HC A06/MF A01

Environmental effects and energy efficiencies for geothermal energy, western strip-mined coal, and eastern underground mined coal applied to space heating, process heat, and electric drive were compared. The measure of an environmental effect is the amount of residual material released to the environment, and the measure of energy efficiency is the second law efficiency of the process involved. The results indicate that geothermal energy efficiencies (second law) are higher than those for coal for all three end uses. The environmental effects for geothermal supply systems are smaller than those for coal in the cases of space heat and process heat and are comparable in the case of electric

drive. The optimum allocation of a finite geothermal resource and a finite coal resource between space heat and drive has been evaluated from the viewpoint of maximum end use service. The results indicate that, to the extent that location factors permit, geothermal energy should be used for space heat and coal for electric drive.
DOE

N80-12560# Sandia Labs., Albuquerque, N. Mex.
BATTERIES FOR SPECIFIC SOLAR APPLICATIONS
R. P. Clark 17 Jul. 1979 24 p Presented at DOE/STOR Flow Battery Proj. Rev., Rockville, Md., 17 Jul. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1428C) Avail: NTIS HC A02/MF A01

Reproductions of slides used in an oral presentation are published. Thermal batteries are mentioned, and the program strategy for developing batteries for photovoltaic systems is outlined.
DOE

N80-12561# California Univ., Livermore.
USING SURFACE WATERS FOR SUPPLEMENTING INJECTION AT THE SALTON SEA GEOTHERMAL FIELD (SSGF), SOUTHERN CALIFORNIA
E. Raber, Lawrence B. Owen, and Jackson E. Harrar 10 Jul. 1979 5 p refs Presented at Geothermal Resources Council Ann. Meeting, Reno, Nev., 24 Sep. 1979
(Contract W-7405-eng-48)
(UCRL-83011; CONF-790906-15) Avail: NTIS HC A02/MF A01

It was found that direct injection of untreated makeup water is not feasible for cooling because of high suspended solids loading and potential incompatability problems. However, mixtures of ambient temperature makeup water and higher temperature (80 to 90 C) brine effluent, in a 1:4 mass ratio, are potentially injectable following processing by reaction clarification and granular media filtration.
DOE

N80-12562# Argonne National Lab., Ill.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 11: NUCLEAR FISSION PROGRAM SUMMARIES
Jun. 1979 345 p
(Contract W-31-109-eng-38)
(ANL-PMS-79-2-Vol-11) Avail: NTIS HC A15/MF A01

Brief management and technical summaries of nuclear fission power programs are presented for nineteen countries. The programs include the following: fuel supply, resource recovery, enrichment, fuel fabrication, light water reactors, heavy water reactors, gas cooled reactors, breeder reactors, research and test reactors, spent fuel processing, waste management, and safety and environment.
DOE

N80-12563# Sandia Labs., Albuquerque, N. Mex. Systems Analysis Div.
EFFECT OF OPERATING TEMPERATURES ON THE COST OF ENERGY FROM SOLAR THERMAL ELECTRIC POWER PLANTS
L. I. Lukens Jul. 1979 88 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0801) Avail: NTIS HC A05/MF A01

The operating temperature of a solar thermal electric power plant controls the efficiency of the collector field, the efficiency of the power generation system and the cost of the thermal energy storage system. The effect of these three systems, as temperature is varied, on the annualized cost of energy produced by the system was evaluated for both stand-alone solar and solar diesel hybrid power plants. The type of solar power plant considered was one using a linear focus distributed collector field and a Rankine cycle power generation system. Systems using different collector performance models, Rankine cycle working fluids and thermal energy storage concepts were included in the evaluation.
DOE

N80-12564# Midwest Research Inst., Golden, Colo.
THERMOELECTRIC OCEAN THERMAL ENERGY CONVERSION
T. S. Jayadev, D. K. Benson, and M. S. Bohn Jun. 1979 33 p refs Presented at the Sixth Intern. OTEC Conf., Washington, D.C., 19-22 Jun. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-35-254; CONF-790631-6) Avail: NTIS HC A03/MF A01

A novel thermoelectric ocean thermal energy conversion (OTEC) concept was proposed and compared with the ammonia closed-cycle designs. The thermoelectric OTEC was found to offer several potential advantages including: simpler and more easily mass produced components; higher reliability system performance through the use of a high level of redundancy and long-lived, solid state thermoelectric generators; greater safety for crew and environment by elimination of the pressurized safety for crew and environment by elimination of the pressurized working fluid; and the possibility of lower system costs.
DOE

N80-12565# Midwest Research Inst., Golden, Colo.
SYSTEMS ANALYSIS AND TESTING (SAT) PROGRAM Progress Report, 1 Oct. 1978 - 31 Mar. 1979
C. J. Bishop Jul. 1979 19 p refs
(Contract EG-77-C-01-4042)
(SERI/PR-35-313) Avail: NTIS HC A02/MF A01

Activities of the systems analysis and testing (SAT) program are described. These include: (1) a reevaluation of thermosiphon hot water systems; (2) a review of existing wind machine performance models; a study of the effects of wind transients, and control system and load management on energy capture; (3) a study of new concepts for solar ponds involving stratified ponds; (4) establishment of the computational methods center; (5) dissemination of F-chart; (6) a review of photovoltaic systems analysis methods; (7) development of a draft SAT program plan, SAT management plan, and an integrated system test and validation plan, and (8) transfer of technical management of contracts in the SAT program.
DOE

N80-12566# Lincoln Lab., Mass. Inst. of Tech., Lexington.
OPTIMIZATION OF PHOTOVOLTAIC/THERMAL COLLECTOR HEAT PUMP SYSTEMS
M. C. Russell and E. C. Kern, Jr. 1979 5 p refs Presented at the 1979 Intern. Solar Energy Soc., Atlanta, 28 May - 1 Jun. 1979
(Contract EG-77-S-02-4577)
(COO-4577-7; CONF-790541-20) Avail: NTIS HC A02/MF A01

Photovoltaic/thermal (PV/T) collector-heat pump systems were simulated for residences in New York and Fort Worth climates. Analysis of the technical and economic results are discussed. The parallel heat pump configuration with 40 square meters of PV/T collectors was found to be the least-cost system option for the New York residence.
DOE

N80-12567# Franklin Inst. Research Labs., Philadelphia, Pa.
THE GREAT ADVENTURE: A REPORT ON THE 10 REGIONAL PUBLIC HEARINGS ON SOLAR ENERGY FOR THE DOMESTIC POLICY REVIEW
Oct. 1978 52 p refs Prepared by the Inst. for Local Self Reliance
(Contract EU-78-C-01-6354)
(HCP/U6354-01) Avail: NTIS HC A04/MF A01

A report on the public hearings is presented along with policy recommendations. The recommendations are as follows: (1) the Federal government should move aggressively from research to commercialization, marketing, and public education; (2)decentralization both in program process and in context should be pursued vigorously; (3) the government should emphasize small scale systems, small businesses, individual inventors, community organizations, and small research groups in its funding programs; (4) solar energy systems that are decentralist are preferred over the more central-oriented; (5) passive solar design was the major technology recommended throughout; (6) DOE must streamline its grants process and reduce paperwork that proposals require; (7) the major item required for a successful solar industry is rapid passage of the solar income tax credit, either within, or separate from, the National Energy Act; (8) low interest loans and investment capital are required by small businesses; (9) public information on solar energy should be more available;

(10) the budget for solar should be increased substantially; and (11) solar programs should be related to job-creation programs. DOE

N80-12568# Oak Ridge National Lab., Tenn. Engineering Technology Div.

LOW-TEMPERATURE THERMAL ENERGY STORAGE PROGRAM ANNUAL OPERATING PLAN

H. W. Hoffman and D. M. Eissenberg Jan. 1979 130 p
(Contract W-7405-eng-26)
(ORNL/TM-6605) Avail: NTIS HC A07/MF A01

The LTTES program operating plans for FY 1978 are described in terms of general program objectives and the technical activities being implemented to achieve these objectives. The program structure provides emphasis on seasonal thermal storage, daily/short-term thermal storage, and waste heat recovery and reuse. A work breakdown structure organizes the efforts being carried out in-house or through subcontract within each thrust area. Fiscal data are summarized with respect to thrust area, individual efforts, and funding source. DOE

N80-12569# California Univ., Livermore. Lawrence Livermore Lab.

HYBRID STAGING OF GEOTHERMAL ENERGY CONVERSION PROCESSES

Robert F. Steidel Sep. 1978 27 p refs
(Contract W-7405-eng-48)
(UCID-17949) Avail: NTIS HC A03/MF A01

A hybrid system consists of two or more energy conversion processes. The use is examined of three energy conversion machines in hybrid systems: the conventional single-phase turbine, and the two-phase expanders known as the Lysholm engine and the radial outflow reaction turbine. Two hybrid systems are presented. The first is a two-stage, single-flash system with the Lysholm engine as the first stage, and a separator and conventional turbine as the second stage. The second system adds a radial outflow reaction turbine to recover a part of the energy rejected in the second stage. A theoretical specific power of 41.3 kW.s/lb is predicted for the two-stage, single-flash hybrid system. The addition of the radial outflow rotary turbine increases performance to 44.8 kW.s/lb. Both are superior to the double-flash system, with a specific power of 37.8 kW.s/lb. In addition, the hybrid system offers operating flexibility. DOE

N80-12570# California Univ., Livermore. Lawrence Livermore Lab.

NEW CONCEPTS FOR CONVERTING THE ENERGY IN LOW-TO MEDIUM-TEMPERATURE LIQUIDS, WITH EMPHASIS ON GEOTHERMAL APPLICATIONS

Arthur L. Austin and Palmer A. House 20 Sep. 1978 18 p refs
(Contract W-7405-eng-48)
(UCRL-52583) Avail: NTIS HC A02/MF A01

The Geothermal Development Program at Lawrence Livermore Laboratory has produced several novel expanders for liquids of low to medium temperatures (approximately 180 C). A unique radial outflow reaction turbine (RORT) was developed and laboratory-tested; results indicate that 50% engine efficiency is achievable. This work has led to a new concept called the velocity pump reaction turbine (VPRT), which could significantly increase the gross engine efficiency of the RORT. VPRT and its modifications are a unique family of turbines created specifically for expanding liquids to produce shaft work at potential engine efficiencies of up to 70%. Such devices, if used between the two separation stages of a double-flash system, could increase the overall power output by 15 to 20%, reducing power costs by at least 10% for about a 3% increase in capital costs. Geothermal applications are discussed with emphasis on geopressured resources. Also, these machines are suitable for utilizing solar heated fluids and waste heat sources from industrial processes. DOE

N80-12571# Sandia Labs., Albuquerque, N. Mex.

EVALUATION OF SOLAR RANKINE-CYCLE ENGINE SYSTEMS

Gilad Ramback (Ormat Turbines Ltd., Yavne, Israel) Jan. 1979 39 p refs
(Contract EY-76-C-04-0789)
(SAND-78-0986) Avail: NTIS HC A03/MF A01

Electrical parasitic losses are evaluated for two solar Rankine-cycle engine systems: (1) a total-energy solar system for the Midtemperature Solar Systems Test Facility (MSSTF), and (2) the Willard solar irrigation pump. Estimates are given of the minimal electrical parasitic losses that a commercialized total-energy solar system of the size of the MSSTF could have as well as minimal losses for the Willard solar irrigation pump. DOE

N80-12572# Sandia Labs., Albuquerque, N. Mex. Chemical Technology Div.

CLOSED-CYCLE HYDRIDE ENGINES

Thomas E. Hinkebein, Clyde J. Northrup, and Albert A. Heckes Dec. 1978 25 p refs
(Contract EY-76-C-04-0789)
(SAND-78-2228) Avail: NTIS HC A02/MF A01

Closed cycle hydride engines of 1/2 horsepower or less, which are capable of using a low quality heat source available from flat plate solar collectors or from process waste streams, are described. The engines are simple in concept and operation, potentially inexpensive, reliable, and capable of remote unattended operation. They perform work as hydrogen evolved from a heated metal hydride expands against a flexible member. The cycle is completed by the reabsorption of hydrogen in the metal upon cooling. Theoretical cycles are described and efficiencies are presented. A comparison is made to both Carnot and Rankine cycles. DOE

N80-12575# Oak Ridge National Lab., Tenn. Energy Div.

WASTE HEAT REJECTION FROM GEOTHERMAL POWER STATIONS

R. C. Robertson Dec. 1978 159 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6533) Avail: NTIS HC A08/MF A01

Waste heat rejection from geothermal power stations is concerned only with the heat rejected from the power cycle. The heat contained in reinjected or otherwise discharged geothermal fluids is not included with the waste heat considered here. The heat contained in the underflow from the flashtanks in such systems is not considered as part of the heat rejected from the power cycle. By following this definition of the waste heat to be rejected, various methods of waste heat dissipation are discussed without regard for the particular arrangement to obtain heat from the geothermal source. Recent conceptual design studies made for 50 MW(e) geothermal power stations at Heber and Niland, California, are of particular interest. The former uses a flashed-steam system and the latter a binary cycle that uses isopentane. In last-quarter 1976 dollars, the total estimated capital costs were about $750/kW and production costs about 50 mills/kWhr. If wet/dry towers were used to conserve 50% of the water evaporation at Heber, production costs would be about 65 mills/kWhr. DOE

N80-12576# Ames Lab., Iowa. Solar Div.

OPERATIONAL EXPERIENCE WITH DRAIN-DOWN SOLAR SYSTEMS

P. H. Sidles, R. G. Struss, and E. C. Brohl 1978 11 p ref
Presented at Solar Heating and Cooling Systems Operational Results Conf., Colorado Springs, Colo., 29 Nov. 1978
(Contract W-7405-eng-82)
(IS-M-166; CONF-781102-3) Avail: NTIS HC A02/MF A01

Drain-down solar collector systems offer substantial economic advantage over antifreeze/heat-exchange systems. Drain-down systems are simpler, have lower piping and plumbing costs, and operate at higher collector and system efficiencies. Properly designed and installed drain-down systems intrinsically should require less maintenance. These advantages have not yet been demonstrated in actual operating experience. A substantial number of the Solar Heating and Cooling Demonstration projects under Ames Laboratory cognizance are of drain-down design. Most projects are located in freezing climates; some suffered damage from freezing last winter. Operating experiences for these projects are presented, together with some design criteria for drain-down systems that these operating experiences reveal. DOE

N80-12577# Los Alamos Scientific Lab., N. Mex.
PERFORMANCE OF LOS ALAMOS SOLAR MOBILE/MODULAR HOME UNIT NO. 1
J. C. Hedstrom, S. W. Moore, and J. D. Balcomb 1978 7 p
Presented at Solar Heating and Cooling Systems Operational Results Conf., Colorado Springs, Colo., 29 Nov. 1978
(Contract W-7405-eng-36)
(LA-UR-78-2587; CONF-781102-1) Avail: NTIS
HC A02/MF A01

Mobile/Modular Home Unit No. 1 at the Los Alamos Scientific Laboratory is an active air system which incorporates 340 sq ft of flat black single-glazed flat-plate air collectors mounted at a 60 tilt on the south wall. The thermal storage is in 1536 pint jars of water spaced apart by 5/8 in. to allow air flow around the jars. Data have been obtained on the unit from October 1976, up to the present. Data acquisition is by a Hewlett-Packard 3050 system controlled with a HP9825 desk top calculator. Complete energy summaries for the heating seasons have been obtained. The solar energy system has provided about 70% of the heating requirements of the house each season. Although the solar energy system provides a major fraction of the space and domestic hot water requirements, the yearly total energy supplied is low. This is primarily because the house load was lower than expected due to passive gains and internal heat generation. Low performance is also due to a low storage mass (5.3 Btu/sq ft F) and several possible uncontrolled air leaks. DOE

N80-12578# Midwest Research Inst., Golden, Colo.
DIRECT LABOR REQUIREMENTS FOR SELECT SOLAR ENERGY TECHNOLOGIES: A REVIEW AND SYNTHESIS
B. Mason and K. Armington Aug. 1978 32 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-53-045) Avail: NTIS HC A03/MF A01

Various estimates of the labor requirements for the design, manufacture, installation, and maintenance of space heating and domestic hot water systems are presented. Total projected job requirements by year, calculated by multiplying person-hours per system times market penetration estimated, are provided. Limitations of previous studies and conclusions about needed research are discussed. DOE

N80-12579# Sandia Labs., Albuquerque, N. Mex. Div. 4715.
EFFORTS ON THE ECONOMIC ANALYSIS OF DARRIEUS VERTICAL AXIS WIND TURBINES
W. N. Sullivan 1978 8 p ref Presented at Am. Wind Energy Assoc. Conf., Hyannis, Mass., 25 Sep. 1978
(Contract EY-76-C-04-0789)
(SAND-78-1851C; CONF-780972-1) Avail: NTIS
HC A02/MF A01

There is an ongoing program designed to establish reasonable estimates for the cost of utility grid energy produced by Darrieus VAWT systems. The economic analysis is based on the detailed examination of actual point designs, which cover a range of system sizes. The approach is unique in that in addition to determining the direct costs of system components, an effort is made to include the indirect costs and profits of the manufacturing, marketing, distributions, and sales tasks of the enterprise producing the systems. The point design specifications and drawings were developed and provide the baseline for this study. The specifications represent optimum designs, as determined by an economic optimization model. This model, with mathematical formulas for the costs of major system elements, was used to select from many possibilities an optimum set of design specifications. DOE

N80-12580# Oak Ridge National Lab., Tenn. Energy Div.
FUEL CHOICE AND AGGREGATE ENERGY DEMAND IN THE COMMERCIAL SECTOR
Steve Cohn Dec. 1978 51 p refs
(Contract W-7405-eng-26)
(ORNL/CON-27) Avail: NTIS HC A04/MF A01

A fuel choice and aggregate demand model of energy use in the commercial sector of the United States is presented. The model structure is dynamic with short run fuel price responses estimated to be close to those of the residential sector. Of the three fuels analyzed, electricity consumption exhibits a greater response to its own price than either natural gas or fuel oil. In addition, electricity price increases have the largest effect on end use energy conservation in the commercial sector. An improved commercial energy use data base is developed which removes the residential portion of electricity and natural gas use that traditional energy consumption data sources assign to the commercial sector. In addition, household and commercial petroleum use is differentiated on a state by state basis. DOE

N80-12582# Department of Energy, Washington, D. C. Economic Regulatory Administration.
STANDBY CONSERVATION PLAN NO. 2: EMERGENCY BUILDING TEMPERATURE RESTRICTIONS. AUTHORITIES: NEED, RATIONALE, OPERATION
Feb. 1979 29 p
(DOE/ERA-0048) Avail: NTIS HC A03/MF A01

The text of the Emergency Building Temperature Restrictions is given. The text includes definitions, heating and cooling, hot water, reports and recordkeeping, operators, customer lists, relation to state law, administrative provisions, public information, and penalties. The statement of the need for rationale and operation of the plan is also given. The plan applies in each state or political subdivision thereof and preempt inconsistent state or local law. DOE

N80-12583# Department of Energy, Washington, D. C. Office of Fusion Energy.
UNITED STATES MAGNETIC FUSION ENERGY PROGRAM
S. O. Dean Aug. 1978 176 p
(DOE/ET-0072) Avail: NTIS HC A09/MF A01

The following topics are discussed: (1) policy; (2) magnetic fusion energy program; (3) physics proof-of-principle programs; (4) major scaling experiments; (5) energy producing experimental reactors: design studies and long lead time technology development; (6) commercialization: reactor designs and systems studies; and (7) enhancement studies. DOE

N80-12585# IBM Federal Systems Div., Huntsville, Ala.
OCTOBER 1978 ENVIRONMENTAL DATA FOR SITES IN THE NATIONAL SOLAR DATA NETWORK
Oct. 1978 176 p refs
(Contract EG-77-C-01-4049)
(SOLAR/0010-78-10) Avail: NTIS HC A09/MF A01

The thermal performance of selected solar energy systems was determined. The energy contribution of each solar energy system was also determined. DOE

N80-12586# California Univ., Berkeley. Lawrence Berkeley Lab.
EXPERIMENTAL TEST FACILITY FOR EVALUATION OF SOLAR CONTROL STRATEGIES
M. Majteles, H. Lee, M. Wahlig, and M. Warren 15 Aug. 1978 11 p Presented at Workshop on the Control of Solar Energy, Hyannis, Mass., 23 May 1978
(Contract W-7405-eng-48)
(LBL-8308; CONF-7805126-5) Avail: NTIS
HC A02/MF A01

An experimental solar heating and cooling system was constructed. It was designed to serve as a test system to check out the operation of a solar controller that looked promising in terms of its commercialization potential. Improvements were made in the experimental heating and cooling system to enable quantitative determination of the auxiliary energy savings made possible by using this type of controller. These improvements consisted of installation and calibration of accurate instrumentation, data acquisition capabilities, and development of simulated input and output devices that would allow repeated experiments using the same running conditions. In addition, the possibilities of further development of the heating and cooling system into an experimental test facility for a wide range of solar control strategies were investigated. DOE

N80-12588# California Univ., Berkeley. Lawrence Berkeley Lab.

RESIDENTIAL ON SITE SOLAR HEATING SYSTEMS. A PROJECT EVALUATION USING THE CAPITAL ASSET PRICING MODEL M.S. Thesis
S R Schutz Dec. 1978 60 p refs
(Contract W-7405-eng-48)
(LBL-8298) Avail NTIS HC A04/MF A01

The feasibility of 'on site solar heating' (OSSH) as a private utility investment was analyzed. The return on OSSH was calculated on the basis of the cost to the consumer of the equivalent amount of electrical energy that is displaced by the OSSH system. The hurdle rate for investment in OSSH was calculated using the Sharpe-Lintner Capital Asset Pricing Model. The results of this study indicate that OSSH is a low risk investment having an appropriate hurdle rate of 7.9%. At this rate, OSSH investment appears marginally acceptable in northern California and unambiguously acceptable in southern California. The results also suggest that utility investment in OSSH should lead to a higher degree of financial leverage for utility companies without a concurrent deterioration in the risk class of utility equity. DOE

N80-12589# California Univ., Berkeley. Lawrence Berkeley Lab.
ANALYSIS OF THE CALIFORNIA SOLAR RESOURCE, VOLUME 2 Final Report
P. Berdahl, D. F. Grether, M. Martin, and M. Wanig Nov. 1978 90 p refs
(Contract W-7405-eng-48)
(LBL-7860-Vol-2) Avail NTIS HC A05/MF A01

In order to assess the requirements for solar design data, several different paths were followed. The existing literature was consulted, analytical work was carried out within the project to determine the sensitivity of system design to errors in the solar data, and extensive contacts were made with potential users of solar data. Existing solar design techniques were evaluated in order to determine the types and quality of data needed. The determination of future solar data requirements for California was made on the basis of a regionalization of the state into solar zones, a familiarity with existing and proposed high-quality solar data networks, and knowledge of past data collection efforts. Recommendations for action by the state are presented. These recommendations are made to assure that adequate measures are taken now to meet solar data needs of the future. DOE

N80-12590# Sandia Labs., Albuquerque, N. Mex.
SOLAR MECHANICAL ENERGY STORAGE PROJECT
B. C. Caskey and H. M. Dodd 1978 6 p refs Presented at the First Inform. Exchange Conf., Luray, Va., 24 Oct. 1978
(Contract EY-76-C-04-0789)
(SAND-78-1982C; CONF-781046-10) Avail NTIS HC A02/MF A01

Systems analyses identified flywheel energy storage systems as the most promising technology for small to intermediate load applications. Detailed design studies to investigate this storage mode are described. DOE

N80-12591# PRC Energy Analysis Co., McLean, Va.
SOLAR ENERGY COMMERCIALIZATION FOR AFRICAN COUNTRIES
Dec. 1978 101 p refs
(Contract EG-77-C-01-2522)
(HCP/CS-2522) Avail NTIS HC A06/MF A01

Kenya, Cameroon, Nigeria, Niger, Ivory Coast, and Senegal were surveyed as part of the information acquisition task for the DOE International Solar Commercialization Working Group. All these countries are rich in solar energy and are friendly to the U.S. They represent a wide range of geographic features, climatic conditions, and energy resources. The main results are outlined. DOE

N80-12592# Lincoln Lab., Mass. Inst. of Tech., Lexington.
MEAD, NEBRASKA, 25-kW PHOTOVOLTAIC POWER SYSTEM
W. R. Romaine 5 Jan. 1979 43 p refs
(Contract EY-76-C-02-4094)
(COO-4094-10) Avail NTIS HC A03/MF A01

In 1977 MIT/Lincoln Laboratory designed, constructed, and put into operation a 25 kW peak solar photovoltaic power system in Mead, Nebraska. This system was to be used to provide power to an agricultural test facility operated by the University of Nebraska. The initial application of the PV system was to provide power to irrigate an 80 acre cornfield. The photovoltaic power system is described as it existed at the time of its inauguration, and as it will exist following the completion of presently planned modifications, which include more fully automated control and addition of an uninterruptible power supply. DOE

N80-12593# Drexel Univ., Philadelphia, Pa.
DOUBLE-EXPOSURE COLLECTOR SYSTEM Progress Report, 1 Jul. - 30 Sep. 1978
D. C. Larson and C. W. Savery 31 Oct. 1978 11 p
(Grant EG-77-G-04-4089)
(TID-28964) Avail: NTIS HC A02/MF A01

A retrofit solar water-heating system was installed in a three-story apartment building. The system employs two conventional collector banks (10 PPG collectors) mounted at the latitude angle for Philadelphia of 40 deg from the horizontal and two double-exposure collectors (DEC's) mounted vertically in mirrored enclosures. Although the DEC units are being used for year-round domestic water heating for the building, they are designed to provide maximum output in the winter and are therefore well-suited to solar space heating applications. Instrumentation for testing the collectors was available in the apartment building. New temperature sensors and a heat exchanger were installed and regular data collection was started. Every effort is being made to assure that reliable data are being obtained. A theoretical study of alternative mirror configurations was also completed. These calculations indicate that an optimal adjustable-mirror configuration exists which is optimal at latitudes 35, 40 and 45 deg. One mirror configuration, therefore, can be employed at diverse locations and is adaptable to a variety of solar energy applications. DOE

N80-12594# Institute for Energy Analysis, Oak Ridge, Tenn.
CONSTRAINTS ON ENERGY CONSERVATION
Willem vanGool Sep. 1978 21 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA-78-17(M)) Avail: NTIS HC A02/MF A01

Energy conservation achieved through technology is discussed and distinguished against energy conservation achieved through changes of lifestyle. In the technological approach, the objectives of energy consuming activities are not questioned; thus, it is accepted that society needs a certain amount of aluminum, polymers, transport, etc., per year. What is analyzed in this approach is how these materials and services can be provided more efficiently. Alternatively, in the change of lifestyle approach to conservation the demand as such is analyzed: do we need aluminum, can we decrease the temperature in homes, do we need to travel? The distinction between the two approaches is demonstrated by considering the rate of energy-consuming activities. R.E.S.

N80-12595# Institute for Energy Analysis, Oak Ridge, Tenn.
FUNDAMENTAL ASPECTS OF ENERGY CONSERVATION POLICY
W. VanGool Nov. 1978 39 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA-78-20(M)) Avail: NTIS HC A03/MF A01

The 'technological fix' approach to energy conservation is discussed. Higher capital investment can lead to a decrease in direct use of energy. Both the cost and the energy involved in these investments were analyzed along a conservation path, and a limited number of constants were used to direct the changes along this path. It was found that an increase in the price of energy will lead to higher capital investments in accordance with the economic lifecycles in the different sectors. For applications with a short lifetime, such as in the transport sector, energy conservation will mainly take place through the construction of new equipment. In sectors with long-lifetime investments (e.g., buildings), retrofitting will be important. DOE

N80-12596# California Univ., Livermore. Lawrence Livermore Lab.

MECHANICAL ENERGY STORAGE TECHNOLOGY DEVELOPMENT FOR ELECTRIC AND HYBRID VEHICLE APPLICATIONS

T. M. Barlow 17 Oct. 1978 10 p refs Presented at 1st Inform. Exchange Conf., Luray, Va., 24 Oct. 1978
(Contract W-7405-eng-48)
(UCRL-81786; CONF-781046-11) Avail: NTIS HC A02/MF A01

Flywheel concepts and one elastomeric energy storage concept all applicable to regenerative braking are developed. The performance and fuel economy of electric vehicles are improved. An experimental study of the effect of load leveling on battery life and analytical evaluations of mechanical energy storage technology are included. These activities are integrated in an overall plan and management structure designed to enhance the commercialization of electric vehicles. DOE

N80-12597# Oklahoma Univ., Norman. School of Aerospace, Mechanical and Nuclear Engineering.

RESEARCH ON THE DYNAMICS OF BAND-SUPPORTED FLYWHEEL SYSTEMS Final Report

C. W. Bert, C. A. Kocay, T. L. Chen, and J. P. Busby Nov. 1978 61 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7074) Avail: NTIS HC A04/MF A01

Analytical research is reported relating to various aspects of the dynamics of band-supported, composite-material-rim flywheel energy-storage systems for application in hybrid automotive vehicles. A parametric study is carried out for free whirling of a flywheel system with a flywheel shaft supported by ball bearings, typical of a class of configurations contemplated in vehicular application as distinguished from R and D spin tests. It is shown that for a wide range of combinations of hub location and bearing and shaft stiffnesses, it is possible to avoid having any potentially dangerous forward-precession critical speeds throughout the desired operating range of 8,000 to 32,000 rpm. Nonlinear analyses are presented to describe the behavior of the bands in both the translational and tilting modes. The primarily softening behavior is geometrically induced and can lead to buckling at relatively small amplitudes. The band behaviors are approximated by polynomial expansions and applied to analyses of the steady-state forced whirling response. An analysis is presented for the behavior of a ring-type containment system after failure of the bands. This analysis combines Hertzian impact theory with an analysis of ring response to a concentrated load of half-sine waveform. It is shown that a 1-inch thick aramid-epoxy ring should provide satisfactory containment. Small model studies were initiated to study some of the nonlinear and containment phenomena. DOE

N80-12598# Oak Ridge National Lab., Tenn.

CRYSTALLOGRAPHIC CONTRIBUTIONS TO THE ENERGY PROBLEM

M. K. Wilkinson 1978 51 p Presented at 11th Congr. of Crystallography, Warsaw, 2 Aug. 1978
(Contract W-7405-eng-26)
(CONF-780867-1) Avail: NTIS HC A04/MF A01

Areas in which studies of crystallography can contribute to development of new materials for energy technology are reviewed. DOE

N80-12599# Oak Ridge National Lab., Tenn.

REGIONAL ECONOMIC/DEMOGRAPHIC PROJECTIONS FOR ENERGY POLICY ANALYSIS

D. J. Bjornstad Jan. 1979 37 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6668) Avail: NTIS HC A03/MF A01

The importance of adequate population and employment projections for regional policy analysis related to energy, and whether energy policy may significantly modify existing trends is studied. It is concluded that energy is less likely to create new subnational socio-economic tendencies than to enhance or retard existing trends, but that to analyze these circumstances a growth-policy format is desirable. It is emphasized that a lack of past experience with many new energy technologies will make impact analysis difficult. For this reason, attempts should be made to anticipate possible impacts well in advance of technology deployment. DOE

N80-12600# Gibbs and Cox, Inc., Washington, D. C.

OCEAN THERMAL ENERGY CONVERSION (OTEC) PLATFORM CONFIGURATION AND INTEGRATION, EXECUTIVE SUMMARY Final Report

R. J. Scott Jul. 1978 205 p refs
(Contract EG-77-C-01-4064)
(DOE/ET-4064-1) Avail: NTIS HC A09/MF A01

Studies leading to the development of conceptual designs for two 400 MW Offshore Thermal Energy Conversion (OTEC) commercial plants are summarized. A detailed overview of the study is presented. The successful deployment of a commercial OTEC plant in the near term is dependent upon the optimization of the platform configuration and power plant output level. The optimization procedure is based on both technical and economic factors and is used to evaluate a relatively large number of alternatives, i.e., six hullforms, five plant outputs ranging from 50 to 500 megawatts (MW), and three deployment sites. The hullforms under consideration include the ship (barge), cylinder (disc), spar, submersible, semi-submersible, and sphere; while the deployment sites are Hawaii, New Orleans, and Key West. The second part of the summary describes the development of the two platforms selected by DOE to be carried through the conceptual design level: a 400 MW ship and semi-submersible. DOE

N80-12601# Department of Energy, Oak Ridge, Tenn. Technical Information Center.

ENERGY INFORMATION DATA BASE. SERIAL TITLES, FEBRUARY 1976 - MARCH 1979

Mar. 1979 87 p
(DOE/TIC-4579-R10-Suppl-4) Avail: NTIS HC A05/MF A01

This supplement contains changes and additions to TID-4579-R10 (Serial titles used by the DOE Technical Information Center) and is intended for use with that publication. DOE

N80-12602# Oak Ridge National Lab., Tenn. Computer Sciences Div.

ECONOMICS OF FUSION DRIVEN SYMBIOTIC ENERGY SYSTEMS

J. P. Renier, T. J. Hoffman, and J. G. Martin 1979 7 p refs Presented at ANS Ann. Meeting, Atlanta, Ga., 3 Jun. 1979 Prepared jointly with Lowell Univ., Mass.
(Contract W-7405-eng-26)
(CONF-790602-50) Avail: NTIS HC A02/MF A01

The economic analysis of symbiotic energy systems in which U233 (to fuel advanced converters burning U233 fuel) is generated in blankets surrounding fusioning D-T plasma's depends on factors such as the plasma performance parameters, ore costs, and the relative costs of Fusion Breaders (CTR) to Advanced Fusion Converters. The analysis also depends on detailed information such as initial, final makeup fuel requirements, fuel isotopics, reprocessing and fabrication costs, reprocessing losses (1%) and delays (2 years), the cost of money, and the effect of the underutilization of the factory thermal installation at the beginning of cycle. The results are presented of calculations of overall fuel cycle and power costs, ore requirements, proliferation resistance and possibilities for grid expansion, based on detailed mass and energy flow diagrams and standard US INFCE cost data and introduction constraints, for realistic symbiotic scenarios involving CTR's (used as drivers) and denatured CANDU's (used as U233 burners). The results are compared with those obtained for other strategies involving heterogeneous LMFBR's which burn Pu to produce U233 for U233-burners such as the advanced CANDU converters (MEU233-CANDU). DOE

N80-12603# Little (Arthur D.), Inc., Cambridge, Mass.

SOLAR HEATING AND COOLING OF BUILDINGS (SHACOB) COMMERCIALIZATION REPORT. PART B: ANALYSIS OF MARKET DEVELOPMENT, VOLUME 2 Final Report

Sep. 1977 88 p
(DOE/TIC-10071) Avail: NTIS HC A05/MF A01

The SHACOB Commercialization Model is designed to gauge the impacts of selected Federal incentive programs to encourage the development of solar energy equipment for hot water heating, space heating and space cooling in residential and commercial buildings. The model was implemented as a FORTRAN program and is presently running on the FEA computer system. It is used via the super WYLBUR data management system at FEA. Some modeling results are presented. DOE

N80-12604# Stockholm Univ. (Sweden). Forskningsgruppen foer Energisystestudier.

EFFECTS OF ENERGY POLICY ON INDUSTRY

Alf Carling and Joyce Dargay Jun. 1978 211 p refs In SWEDISH; ENGLISH summary

(USFFE-1978-8) Avail: NTIS (US Sales Only) HC A10/MF A01; DOE Depository Libraries

The results from a number of studies of energy consumption in Swedish manufacturing industries and of the sensitivity of different industrial sectors to energy taxation and other kinds of energy policy measures are presented. These studies were concentrated on three energy-intensive sectors, namely the pulp and paper industry; mining and metal production (especially iron mines and the steel industry); and the brick, cement, and lime industry. DOE

N80-12605# Los Alamos Scientific Lab., N. Mex.

PROCESS DESIGN OF THE LASL BISMUTH SULFATE THERMOCHEMICAL HYDROGEN CYCLE

K. E. Cox, J. H. Pendergrass, and W. M. Jones 1979 8 p refs Presented at Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979

(Contract W-7405-eng-36)

(LA-UR-79-1256; CONF-790803-25) Avail: NTIS HC A02/MF A01

A process engineering flowsheet for a design of the LASL bismuth sulfate thermochemical cycle is presented. The design is based on laboratory data that indicate a lowered endothermic heat load for a partial decomposition of the solid bismuth sulfate. The results of the flowsheeting analysis yield a thermal efficiency of 50% for the cycle when coupled to a conceptual fusion energy heat source at 1500 K. A parametric analysis shows a slight drop in efficiency as the temperature of the heat source is decreased. The LASL bismuth sulfate thermochemical cycle appears to have potential as a means of producing hydrogen from high temperature heat sources such as fusion, fission, and solar energy; it also appears to be competitive with alternative thermochemical cycles as well as with water electrolysis for hydrogen production. DOE

N80-12606# League of Women Voters, Washington, D. C.

ENERGY CONSERVATION TECHNOLOGY EDUCATION PROGRAM Final Report

Jan. 1979 106 p refs

(Contract EC-77-C-01-2165)

(HCP/M2165) Avail: NTIS HC A06/MF A01

A project on teaching the public how to use energy more efficiently in the home is described. The methodology of the project is discussed and the findings and achievements are highlighted. A.W.H.

N80-12607# Ehrenkrantz Group, New York, N. Y.

ARCHITECTURAL CONCERNS IN SOLAR SYSTEM DESIGN AND INSTALLATION

S. Weinstein Mar. 1979 34 p

(Contract EG-77-C-01-2522)

(SOLAR/0801-79-01) Avail: NTIS HC A03/MF A01

The physical (rather than the mechanical or electrical) aspects involved in the design and installation of solar systems are discussed. The typical physical factors and problems encountered in design are considered. The cost effectiveness of various approaches are analyzed. DOE's specific experience relative to what solar designers nationwide are designing in the installation of solar collectors, array structures, piping and storage equipment, with particular emphasis on cost-effective alternatives is discussed. DOE

N80-12608# Bechtel National, Inc., San Francisco, Calif.

TECHNICAL AND ECONOMIC ASSESSMENT OF SOLAR POWERED WATER PUMPING FOR REMOTE AREAS Final Report

Jul. 1979 110 p refs

(Contract EY-76-C-04-0789)

(SAND-79-8187) Avail: NTIS HC A06/MF A01

The technology of solar powered water pumping is reviewed. An overview of the technology and its economics is provided, based on a review and assessment of the open literature. It is shown that pumped water is used most extensively for irrigation, and that new irrigation methods, such as the center pivot system, have significantly increased the water pumping power demand in recent years. The coincidence of the peak irrigation season and peak seasonal insulation makes solar energy a good candidate to supplement or displace depletable energy sources currently used for water pumping. Solar powered water pumping demonstration systems utilizing solar thermal, photovoltaic and wind powered energy conversion are evaluated. The prime movers of these systems either drive the pumps directly or indirectly through electric power generation. A comparative evaluation of these and other proposed solar concepts was conducted and resulted in the selection of a reference system comprised of a number of individual parabolic dish collectors with integral Brayton cycle engines. DOE

N80-12609# Giner, Inc., Waltham, Mass.

STUDY OF CORROSION AND ITS CONTROL IN ALUMINUM SOLAR COLLECTORS Annual Report, 1 Jun. 1977 - 31 Jul. 1978

D. Wong, F. H. Cocks, J. Giner, and P. S. Majahad Aug. 1978 68 p refs

(Contract EY-76-C-02-2934)

(COO-2934-7) Avail: NTIS HC A04/MF A01

The development of corrosion control methods for aluminum solar collectors using ethylene glycol heat transfer fluids was studied. Corrosion inhibitors and impurity scavengers were tested and evaluated at temperatures up to 160 C under various laboratory conditions. A new corrosion rate measurement technique based on the use of thin foil samples was developed and adopted in this program to provide accelerated results. In addition to the development of corrosion control methods, the acquisition of baseline corrosion data was also extended to the aluminum/propylene glycol combination. Propylene glycol was chosen primarily because of its low toxicity. Aluminum corrosion characteristics were determined in 50, 85 and 100% propylene glycol solutions at temperatures between 25 to 160 C. Corrosion behavior of aluminum in more concentrated ethylene glycol solutions (up to 100%) at higher temperatures (up to 160 C) was also obtained in order to broaden the baseline. DOE

N80-12610# Brookhaven National Lab., Upton, N. Y. Accelerator Dept.

SOLAR-POWERED STEAM GENERATOR HELIOSTAT Final Report

J. G. Cottingham Dec. 1978 143 p refs

(Contract EY-76-C-02-0016)

(BNL-50974) Avail: NTIS HC A07/MF A01

A small-size central-receiver-type solar energy collecting system delivering commerical grade steam is analyzed and a wind avoidance type heliostat designed, built, and successfully tested. The heliostat design effort is described, including reflecting surface materials and measurements, optic considerations and mirror field arrangements, mechanical analysis and fabrication techniques, and economics and cost effectiveness. measurements of normal incident solar energy at Upton, N. Y., are reported and a method is proposed for estimating this input parameter for other locations proposed. DOE

N80-12611# Ames Lab., Iowa.

PHOTOTHERMAL CONVERSION SURFACE MEASUREMENTS USING PHOTOACOUSTIC AND PHOTOTHERMAL SPECTROSCOPIES

J. F. McClelland and R. N. Kniseley 1978 31 p refs Presented at Seminar on Testing Solar Energy Mater. and Systems,

Washington, D.C. 22 May 1978
(Contract W-7405-eng-82)
(IS-M-202: CONF-780550-10) Avail: NTIS HC A03/MF A01

Photoacoustic and photothermal spectroscopic techniques have recently been under development in a number of laboratories. When applied to solar materials studies these techniques have the potential of providing a more direct measurement of photothermal conversion efficiency than conventional reflection or transmission measurements. Measurements are made by modulating the intensity of an incident light beam, which causes a temperature oscillation in the irradiated material under study, with the oscillation amplitude proportional to the absorbed and subsequently thermalized light energy. In the photoacoustic method the oscillation amplitude is measured by a transducer which detects an acoustical signal driven by the temperature oscillation. A thermal transducer is used as the detector in the photothermal technique. Spectral or integrated measurements are made using a monochromatic or broadband source with no correction needed for the spectral dependence of a detector since the signal is generated by the interaction of light with the sample rather than with a detector. DOE

N80-12612# Comision Nacional de Energia Atomica, Buenos Aires (Argentina).

PHOTOTHERMAL CONVERSION OF SOLAR ENERGY INTO ELECTRICITY

Jaime A. Moragues 1978 37 p refs Transl into ENGLISH from unidentified Argentine report
(DOE-TR-159) Avail: NTIS HC A03/MF A01

Brief description of various collectors that can be used for electricity production by solar photothermal conversion are given including solar stills, shallow solar ponds, flat plate collectors, fixed collectors with moderate concentration, cylindrical-parabolic concentrators, fixed concentrators, fixed concentrators with faceted mirror, concentrations with concave rotating multiple mirrors, Fresnel lenses, paraboloidal rotating concentrators, semispherical fixed concentrators, central receiver system with linear focus, and central receiver system with point focus. Thermodynamic cycles, energy transport, energy storage, and economics are also discussed. A review of some of the programs throughout the world in development of solar thermal power conversion is included. DOE

N80-12613# Energy Utilization Systems, Inc., Pittsburgh, Pa.

RESEARCH AND DEVELOPMENT OF A HEAT AND PUMP WATER HEATER, VOLUME 1 Final Report

R. L. Dunning, F. R. Amthor, and E. J. Doyle Aug. 1978 69 p refs
(Contract W-7405-eng-26)
(ORNL/SUB-7321-1) Avail: NTIS HC A04/MF A01

An electric heat pump water heater with an operating efficiency of 2.5 in average conditions of 70 to 75 F ambient air and 55 to 60 F supply water was designed. Separate heat pump designs are available for new water heaters and for retrofitting of existing ones. The condenser is a dual tube direct immersion type which enters the tank through a special 4-in hole in the top of new tanks. For retrofit units, the condenser is in the form of a helix and is screwed into the tank through the hole normally used by the lower resistance element. The payback period is dependent on the amount of hot water consumption and the price of electricity. In warm climates, the benefit/cost ratio will be improved by higher efficiency from warmer ambient air and by the value of free air conditioning and dehumidification provided while the unit is operating. In colder climates, the improved efficiency from colder supply water and the higher operating savings from higher kilowatt-hour use because of the cold water tend to offset the effect of the less favorable climate. DOE

N80-12614# Centro de Estudios de la Energia, Madrid (Spain).

PROJECT CESA-1, A 1 MW SOLAR POWER PLANT IN ALMERIA

Juan Temboury 1978 13 p Presented at Symp. on Solar Thermal Power Stations, Koeln, West Germany, 11 Apr. 1978
(AED-CONF-78-212-011; CONF-7804108-3) Avail: NTIS HC A02/MF A01

A solar energy utilization project to be carried out in Spain is described. The plant, CESA-1, is designed for a power of 1 MW. The technical data are given. The plant will start operation in 1980. DOE

N80-12615# Northeastern Legislative Leaders Energy Research Project, Albany, N. Y.

NATIONAL ENERGY ACT OF 1978: A REGIONAL ASSESSMENT

Peter R. Smith Dec. 1978 23 p
(Grant NSF ISP-75-15817)
(PB-296479/9; NSF/RA-780608) Avail: NTIS HC A02/MF A01 CSCL 10A

The detailed requirements of the National Energy Act of 1978 is presented and the specific impacts for each of the requirements on the Northeastern states is discussed. GRA

N80-12619 Iowa State Univ. of Science and Technology, Ames.

A REGIONAL APPROACH TO FORECASTING ELECTRIC ENERGY REQUIREMENTS FOR ENVIRONMENTAL ASSESSMENTS Ph.D. Thesis

Gerald Ray Hill 1979 253 p
Avail: Univ. Microfilms Order No. 7924484

A series of investigations was performed and a multistate procedure developed for use by states in environmental reviews, in assessing the need for adding generating capacity. The multistate procedure enables states to collectively develop a regional forecast of energy requirements, while maintaining individual decision-making authority. A regional demonstration project was utilized as a means for determining what procedural problems exist in developing multistate capabilities. The demonstration project consisted of three sequential applications of the procedure to utility service areas which operate in the southeast in more than one state. Forecasts of electricity consumption were developed and information compiled on future growth of residential, commercial and industrial sectors, by state and by service area. The procedure was applied to a hypothetical midwest/southeast two-state assessment to evaluate its transferability. Performance standards were identified and acceptance criteria established for the procedure. Dissert. Abstr.

N80-12624# Gulf Universities Research Consortium, Bellaire, Tex.

NATURALLY OCCURING CARBON DIOXIDE SOURCES IN THE UNITED STATES. A GEOLOGIC APPRAISAL AND ECONOMIC SENSITIVITY STUDY OF DRILLING AND PRODUCING CARBON DIOXIDE FOR USE IN ENHANCED OIL RECOVERY

F. W. Zimmerman and C. W. Perry May 1979 137 p refs
(Contract EX-76-C-01-2025)
(FE-2025-38; GURC-Rept-165) Avail: NTIS HC A07/MF A01

Preliminary characterizations of reservoir rock quality and gas composition were performed for central Mississippi, West Virginia, the Delaware-Val Verde Basins of west Texas, and several locations in the Rocky Mountains. Four significant accumulations of carbon dioxide were chosen for in-depth geologic, reservoir, and economic analyses. Anticipated flowing pressure, sustained flow rates, recovery efficiencies, original gas in place, and reserves were determined. Sensitivity studies designed to bracket a possible range of prices were generated, utilizing estimated development and production costs, for each of the four areas. Projections of the potential supply, profitability of drilling and producing, and preliminary analysis of potential demand for naturally occurring carbon dioxide are presented. DOE

N80-12625# California Univ., Livermore. Lawrence Livermore Lab.

NUMERICAL MODELING OF LNG SPILL PHENOMENA

W. J. Hogan, B. R. Bowman, and L. C. Haselman 13 Dec. 1978 18 p refs Presented at the Seminar on LNG Peak Shaving, Washington, D. C., 5 Mar. 1978
(Contract W-7405-eng-48)
(UCRL-82031; CONF-780387-1) Avail: NTIS HC A02/MF A01

The phenomena that must be simulated in modeling postulated liquefied natural gas (LNG) spills are complex, and some are not thoroughly understood. These phenomena include differential boil-off, flameless vapor explosions, vapor dispersion, and various modes of combustion. Our modeling results indicate that differential boil-off will create an ethane-enriched portion of the vapor cloud and that this portion will persist for significant times. Dispersion-model predictions begin to disagree at spill sizes between 50 and 100 cu m. Thus, spill tests are needed for larger spills. Both simple and complex combustion models exist. However, uncertainties in the combustion efficiency, optical thickness of the fireball, and cooling effects make the results of these models difficult to interpret properly. They do show that the addition of as little as 5% ethane to a methane cloud would increase the detonability of the cloud eightfold. The state of numerical modeling for evaluating postulated LNG accidents indicates that the theoretical and experimental efforts must be carried out interactively. DOE

N80-12628# California Univ., Livermore. Lawrence Livermore Lab. Energy and Resources Group.

ENVIRONMENTAL ASPECTS OF ALTERNATIVE ENERGY TECHNOLOGIES FOR CALIFORNIA

J. P. Holdren, G. Morris, and G. Tanenbaum Nov. 1978 167 p refs
(Contract W-7405-eng-48)
(UCRL-15002) Avail: NTIS HC A08/MF A01

The following topics are discussed: (1) cost benefit analysis of energy impacts on biological, geophysical, and social environments; (2) impacts of soft and transition technologies such as solar heat, onsite/central wind systems, waste/farm biomass systems, geothermal heat/electricity, hydroelectric dams, and fluidized bed coal burners; (3) observations on increased efficiency; and (4) needs for further work. DOE

N80-12631# Argonne National Lab., Ill.

COMBINED EFFECTS OF POLYCYCLIC AROMATIC HYDROCARBONS AND SUNLIGHT

H. Utsumi, G. R. Lakas, and M. M. Elkind 1979 15 p refs
Presented at Park City Environ. Health Conf., Utah, 4-7 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790447-4) Avail: NTIS HC A02/MF A01

Chinese hamster V79 cells were made photosensitive by dimethylbenzanthracene (DMBA) if the cells were treated with this PAH before, and not after, light exposure at wavelengths from approximately 290 to 400 nm. Samples of PAH's generated from a bench-scale pressurized fluidized bed coal combustion unit sensitized mammalian cells to sunlight-simulating light, although to a lesser extent than the DMBA. In addition, the photosensitization was shown to be a true photodynamic effect. Since all three factors (PAH's sunlight, and oxygen) necessary for the production of the phototoxic agent(s) would be expected to interact in the environment, the results are of particular concern to human health. Both PAH's and sunlight are known carcinogens and their interaction may result in a potentiation of their carcinogenic activities. In addition, the cytotoxicity produced could conceivably have a tumor promoting effect due to the resultant cellular repopulation. DOE

N80-12637# TRW, Inc., Redondo Beach, Calif.

EMISSIONS ASSESSMENT OF CONVENTIONAL STATIONARY COMBUSTION SYSTEMS. VOLUME 1: GAS- AND OIL-FIRED RESIDENTIAL HEATING SOURCES Final Report, Sep. 1976 - Mar. 1979

N. F. Surprenant, R. R. Hall, K. T. McGregor, and A. S. Werner May 1979 177 p refs
(Contract EPA-68-02-2197)
(PB-298494/6; EPA-600/7-79-029B) Avail: NTIS HC A09/MF A01 CSCL 13B

Emissions from gas- and oil-fired residential heating sources were assessed through a critical examination of existing emissions data, followed by the conduct of a phased measurement program to fill gaps in the emissions data base. Mass emission rates of criteria pollutants, trace elements, and organics, including polycyclic organic matter (POM), were determined. Particulate sulfate, SO2, and SO3 emission data were also obtained at the oil-fired sites. The results of the emissions assessment indicate that residential sources are of potential significance based on multiple source severity factors calculated for an array of houses burning gas or oil. Pollutants for which multiple source severity factors exceed 0.05 are NOx from gas-fired sources and SO3, and NOx, and Ni from oil-fired sources. GRA

N80-12647# California Univ., Berkeley. Lawrence Berkeley Lab.

CIRCUMSOLAR RADIATION DATA FOR CENTRAL RECEIVER SIMULATION

A. Hunt, D. Grether, and M. Wahig Aug. 1978 14 p ref
Presented at ERDA Workshop on Methods for Optical Analysis of Central Receiver Systems, Houston, Tex., 10 Aug. 1978
(Contract W-7405-eng-48)
(LBL-8371; CONF-780885-1) Avail: NTIS HC A02/MF A01

The circumsolar measurement project carried out to provide data to assess the effects of circumsolar radiation on the operation of solar thermal conversion systems using concentrating collectors, especially central receiver systems is described. Four circumsolar telescopes were constructed and are providing detailed intensity vs. angle profiles of the solar and circumsolar region, as well as other solar and climatological data. Emphasis is on reducing the data and making it available to groups analyzing the performance of central receiver systems. In most highly concentrating solar systems, the size of the receiver is determined by the ray bundle originating from the most distant heliostat. If the bundle size is calculated by using the solar disc, it is clear that some fraction of the circumsolar radiation will fall outside the receiver aperture. The results provide the detailed type of input data for central receiver simulation codes that are necessary for determining these losses, optimizing the receiver or field size, and determining the distribution of stray flux due to circumsolar radiation. DOE

N80-12668# Stockholm Univ. (Sweden). Dept. of Meteorology.

GLOBAL ECOLOGY AND MAN

Bert Bolin *In* WMO On Climate and Mankind 1979 p 27-50 refs
Avail: NTIS HC A99/MF A01

The influence of man on regional and global processes within the biosphere is examined. Present knowledge on the carbon, nitrogen, sulphur and oxygen cycles is reviewed. An assessment of a possible future increase of atmospheric CO2 shows a large variation in predicted maximum concentration, depending on which assumption is adopted for CO2 adsorption by land biota. The response of the terrestrial and marine biota to a changing climate is discussed. Author (ESA)

N80-12677# International Institute for Applied Systems Analysis, Laxenburg (Austria).

ENERGY AND CLIMATE: A REVIEW WITH EMPHASIS ON GLOBAL INTERACTIONS

J. Williams, W. Haefele, and W. Sassin *In* WMO On Climate and Mankind 1979 p 267-289 refs

Avail: NTIS HC A99/MF A01

The potential impact of energy systems on climate and the implications of the present state of knowledge on energy policy decision making are discussed. The impact of climate on energy supply and demand is examined. The requirements for climate information necessary to improve the assessment of energy climate interaction are outlined. Author (ESA)

N80-12689# World Meteorological Organization, Geneva (Switzerland).

CLIMATIC VARIABILITY, MARINE RESOURCES AND OFFSHORE DEVELOPMENT

T. F. Gaskell (Oil Ind. Intern. Explor. and Produc. Forum, London) *In its* On Climate and Mankind 1979 p 633-651 refs

Avail: NTIS HC A99/MF A01

The activities being carried out in marine resource development are surveyed, indluding the construction of ports, harbors and other coastal facilities, and ship routing in difficult climate situations. The impact of climatic variation is usually more important when considering short-term weather forecasts, but extremes of climate and long-term trends are important if catastrophies of gross overdesign are to be avoided. Oil is likely to remain the most important marine resource for the next few decades. Manganese nodules and similar seabed mineral concentrations may be valuable in the future. Author (ESA)

N80-12707# Northrop Services, Inc., Huntsville, Ala.

SOLAR-CLIMATIC STATISTICAL STUDY. SUMMARY REPORT, VOLUME 1

Roger E. Bray Feb. 1979 60 p refs 2 Vol.
(Contract EG-77-C-01-4016)
(HCP/T4016-1) Avail: NTIS HC A04/MF A01

Data at 26 (SOLMET) National Weather Service stations were processed to provide preliminary planning data, in the form of statistical information, for selected daily average solar and wind conditions occurring and persisting for time periods of interest. Empirical probabilities were constructed from the historic solar and wind data to provide a reasonable inference of the chance of similar climatological conditions occurring at any given time. (Diurnal wind power variations were also considered). Data used to obtain the daily average solar and wind power probabilities were combined into monthly averages and are presented. Average monthly, seasonal and annual solar and wind power trends were prepared to provide an overview for identifying areas for further investigation. DOE

N80-12709# Sandia Labs., Albuquerque, N. Mex. Environmental Research Div.

WIND TIME SERIES ANALYSES FOR WECS APPLICATIONS

Jack W. Reed Dec. 1978 42 p refs
(Contract EY-76-C-04-0789)
(SAND-77-1701) Avail: NTIS HC A03/MF A01

A methodology for wind power analyses of wind speed time series is described, including computation flow diagrams and a FORTRAN program listing. Examples of results are presented but complete outputs will follow in specialized reports. Primary calculation states are: (1) data homogenization for moved anemometers; (2) extrapolations to selected standardized heights; (3) distribution smoothing for observation bias; (4) power distribution function calculation; (5) turbine speed limit effects analysis; (6) time variability assessment; and (7) analysis of light wind durations. DOE

N80-12710# Midwest Research Inst., Golden, Colo.

WIND RESOURCE ANALYSIS

Donald M. Hardy Dec. 1978 20 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-36-088) Avail: NTIS HC A02/MF A01

Modern atmosphere models of near-surface wind flow and primary data sets were developed from previous studies of national and regional wind resources. Because numerous assumptions are necessary to interpret available data in terms of wind energy potential, conclusions of previous studies differ considerably. The primary data sets and principal features of the models are discussed. DOE

N80-12881*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

RESULTS OF DUCT AREA RATIO CHANGES IN THE NASA LEWIS H2-O2 COMBUSTION MHD EXPERIMENT

J. Marlin Smith 1979 12 p refs Presented at 18th Aerospace Sci. Meeting, Pasadena, Calif., 14-16 Jan. 1980; sponsored by AIAA
(NASA-TM-79308; E-264) Avail: NTIS HC A02/MF A01 CSCL 20I

MHD power generation experiments utilizing a cesium-seeded H2-O2 working fluid were carried out using a diverging area Hall duct having an entrance Mach number of 2. The experiments were conducted in a high field strength cryomagnet facility at field strengths up to 5 tesla. The effects of power takeoff location, generator loading, B field strength, and electrode breakdown voltage were investigated. The effect of area ratio, multiple loading of the duct, and duct location within the magnetic field are considered. R.C.T.

N80-12882# Argonne National Lab., Ill. Engineering Div.

EXPERIMENTAL TWO-PHASE LIQUID-METAL MAGNETOHYDRODYNAMIC GENERATOR PROGRAM Final Report, Oct. 1977 - Sep. 1978

M. Petrick, G. Fabris, E. S. Pierson, A. K. Fischer, and C. E. Johnson Apr. 1979 214 p refs
(Contract N00014-78-F-0004)
(AD-A073128; ANL/MHD-79-1) Avail: NTIS HC A10/MF A01 CSCL 20/9

The experimental results presented herein satisfy one major goal in demonstrating the technical feasibility of two-phase LMMHD (liquid-metal MHD), i.e., operating an MHD generator at power densities equal to or above that anticipated for practical power systems. Power densities of up to 32 MWe/m(3) and efficiencies higher than 0.6 at high void fractions were attained for a small 20 kWe generator. Slip ratio data, and more extensive pressure distribution and voltage profile data are also given. Barium has been identified as an attractive additive for the generation

N80-12894# Sandia Labs., Albuquerque, N. Mex.

USER'S MANUAL FOR THE MAGNETOHYDRODYNAMIC GENERATOR CHANNEL CODE, MHDCHN

A. J. Russo Jan. 1979 52 p refs
(Contract EY-76-C-04-0789)
(SAND-78-1260) Avail: NTIS HC A04/MF A01

A two-dimensional steady state MHD generator channel code was developed to solve for the electric current density and potential field in a channel section. It was designed to operate with a companion fluid code, SCF, which supplies thermodynamic and velocity data as input; however, it may also be used independently or made to interact with other fluid codes. The program is currently operational on the CDC 6600-7600 computer system. The equations that are solved and the input and output data that are required for operation of the code are described. DOE

N80-12898# Westinghouse Electric Corp., Pittsburgh, Pa. Fusion Power Systems Dept.

CONCEPTUAL DESIGN OF A DEMONSTRATION TOKAMAK HYBRID REACTOR (DTHR)

J. L. Kelley Dec. 1978 195 p refs
(Contract EG-77-C-02-4544)
(WFPS-TME-107) Avail: NTIS HC A09/MF A01

The flexibility of the fusion hybrid reactor to function as a fuel production facility, power plant, waste disposal burner or combinations of all of these, as well as the reactor's ability to use proliferation resistant fuel cycles, has provided the incentive to assess the feasibility of a near-term demonstration plant. The goals for a Demonstration Tokamak Hybrid Reactor (DTHR) were established and an initial conceptual design was selected. Reactor performance and economics were evaluated and key developmental issues were assessed. The study has shown that a DTHR is feasible in the late 1980's, a significant quantity of fissile fuel could be produced from fertile thorium using present day fission reactor blanket technology, and a large number of commercially prototypical components and systems could be developed and operationally verified. The DTHR concept would not only serve as proof-of-principle for hybrid technology, but could be operated in the ignited mode and provide major advancements for pure fusion technology. DOE

N80-12900# California Univ., Livermore. Lawrence Livermore Lab.

SEARCH FOR FUSION POWER

R. F. Post 12 Oct. 1978 16 p
(Contract W-7405-eng-48)
(UCRL-81890) Avail: NTIS HC A02/MF A01

The basics of fusion power are reviewed. Both inertial confinement and magnetic confinement fusion are discussed. DOE

N80-12955# California Univ., Livermore. Lawrence Livermore Lab.

NATIONAL ENERGY ACT OF 1978: FAR WESTERN PERSPECTIVE. A STUDY FOR THE US DEPARTMENT OF ENERGY, FEDERAL REGION 9
D. Dorn and P. Moulthroup 15 Dec. 1978 77 p
(Contract W-7405-eng-48)
(UCID-17944-Rev-1) Avail: NTIS HC A05/MF A01

Information on the impact of the National Energy Act of 1978 (NEA) on Federal Region 9 was studied. The U.S. energy problem; the National Energy Act of 1978; the expected effects of the NEA on Federal Region 9 as a whole; and the expected impact of the NEA in Arizona, California, Hawaii, and Nevada are discussed. DOE

N80-12957*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
BALTIMORE APPLICATIONS PROJECT Annual Progress Report, Jun. 1978 - May 1979
Thomas S. Golden and Philip Yaffee Jun. 1979 16 p refs
(NASA-TM-80577; APR-5) Avail: NTIS HC A02/MF A01 CSCL 05A

An update is presented for the following projects: (1) asphalt pavement recycling; (2) data collection platform/water quality monitoring; (3) digital emergency traffic routing; (4) fire department communications and dispatch system; (5) health department management information system; (6) hazardous materials; (7) coal gasification; and (8) emergency vehicle proximity sensing. A.R.H.

N80-12960# Cambridge Systematics, Inc., Mass.
DEMAND FOR SPECIAL PERFORMANCE VEHICLES, 1975 - 2025
Sep. 1978 107 p refs
(Contract W-7405-eng-48)
(UCRL-13911) Avail: NTIS HC A06/MF A01

Concepts were developed for alternative energy storage and propulsion systems for passenger cars and light trucks. These conceptual designs include battery electric systems, hydrogen powered systems, and the quasi-electric-drive hybrid with a small internal combustion engine (ICE) for range extension. The difference between the cost and performance of the special performance vehicles (SPVs) and ICEs was determined. The vehicle miles travelled by each SPV type were forecasted for 1975, 1985, 2000, and 2025. Market forecasts of SPVs in light truck applications and regional ton mile forecasts for heavy truck use were made for use in energy consumption and flow models. National aggregate forecasts of population, auto ownership, per capita income, vehicle miles travelled, ton miles, and other variables were also made. DOE

N80-12962# Mitre Corp., McLean, Va.
THE STATUS OF ADVANCED PROPULSION SYSTEMS FOR URBAN RAIL VEHICLES Final Report, Oct. 1978 - May 1979
Vilas D. Nene May 1979 227 p refs
(Contract DOT-UT-9002)
(PB-297980/5; MTR-79W0022; UMTA-VA-06-0053-79-1)
Avail: NTIS HC A11/MF A01 CSCL 13F

With the advent of power electronics, more efficient alternate propulsion systems have been developed. These include chopper controls, ac drive with induction motors, systems using onboard energy storage, and ac drive with tabular axle motors. A technology review of advanced traction systems is presented, based on information and data gathered from propulsion equipment suppliers in Europe, Japan, and the United States. The status performance characteristics, significant advantages and disadvantages and the deployment of the hardware in revenue service for all these systems are discussed. GRA

N80-12982# California Univ., Berkeley. Lawrence Berkeley Lab.
MEASUREMENT OF CIRCUMSOLAR RADIATION: STATUS REPORT
D. F. Grether, A. Hunt, D. Evans, and M. Wahig Sep. 1978 4 p refs Presented at the 3d Solar Heating and Cooling R and D Branch Contractors Meeting, Washington, D. C., 24 Sep. 1978
(Contract W-7405-eng-48)
(LBL-8391; CONF-780983-7) Avail: NTIS HC A02/MF A01

Four instruments systems, each of which contains a scanning telescope to make the circumsolar measurements, and includes standard solar and meteorological instruments, were deployed at sites of interest to various DOE programs utilizing concentrating collectors systems. The telescope remain more or less in the same place for a period on the order of a year, so that seasonal variations can be quantified. The data obtained are stored and processed, and the results made available to the various solar concentrating collector projects in a form appropriate to each project. These forms include: (1) sample scans of the telescope for a particular time or for a variety of conditions; (2) variation in solar and circumsolar radiation over the course of a day, month or year; and (3) detailed data suitable for input to computer-based simulations or solar energy conversion systems. DOE

N80-12988*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DETECTION OF HIGH ENERGY X-RAYS FROM THE GALACTIC CENTER REGION
B. R. Dennis, J. H. Beall, E. P. Cutler, C. J. Crannell, J. G. Dolan, K. J. Frost, and L. E. Orwig Oct. 1979 25 p refs Submitted for publication
(NASA-TM-80584) Avail: NTIS HC A02/MF A01 CSCL 03B

Observations of the galactic center region made with the high energy X-ray detector on OSO-8 are discussed. A strong hard X-ray which was detected during these observations from the vicinity of the galactic center are examined. The counting rate spectrum and the photon number spectrum of the flux are determined. Comparisons with the high energy X-ray fluxes observed from sources in the region by others are discussed. A.W.H.

N80-13267 Kansas Univ., Lawrence.
BIOLOGICAL TRANSFORMATION OF LIGHT ENERGY INTO METHANE USING AN ANAEROBIC FILTER Ph.D. Thesis
Vicente JonguitudFalcon 1979 225 p
Avail: Univ. Microfilms Order No. 7925875

The feasibility of a biological system in converting solar energy into the chemical energy of methane is demonstrated. The proposed system consists of two biological reactors, an algae unit and an anaerobic filter, working together to fix solar energy in the form of algae photoplasm which is then anaerobically digested to produce methane. The algae fixes light energy by synthesizing inorganic materials into new protoplasm. The algae protoplasm is fed to an anaerobic filter where it is metabolized by anaerobic microorganisms producing methane, CO2, and inorganic end products. These inorganic end products are recycled back to the algae unit where they are reused to form more algae protoplasm. Dissert. Abstr.

N80-13272# Sandia Labs., Albuquerque, N. Mex.
COAL LIQUEFACTION SHORT RESIDENCE TIME PROCESS RESEARCH Quarterly Report, 1 Oct. - 31 Dec. 1978
R. K. Traeger and T. C. Bickel Jul. 1979 27 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1400; QR-1) Avail: NTIS HC A03/MF A01

Preliminary concepts have been identified for residence time measurements and further studies are underway to evaluate performance under reaction conditions. Current concepts include solid phase residence time-magnetic tracer particles or manganese oxide with neutron activation, and liquid phase residence time-reflectance IR or high speed sampling with an organic tracer, radioactive tracer. Limited viscosity and surface tension measurements have been performed in an effort to predict the reactor flow regime. DOE

N80-13273# Department of Energy, Bartlesville, Okla. Energy Technology Center.

PHYSICAL PROPERTIES OF GASOLINE/ALCOHOL AUTOMOTIVE FUELS

F. W. Cox 1979 14 p refs Presented at 3d Intern. Alcohol Fuels Technol. Symp., Asilomar, Calif., 28-31 May 1979
(CONF-790520-4) Avail: NTIS HC A02/MF A01

The physical property changes (both beneficial and detrimental) which occur when alcohols are added to gasoline as fuel extenders are considered. The experimental data and discussion of results cover four physical properly areas: water tolerance, vapor pressure, distillation characteristics, and octane quality. The alcohols include methanol, ethanol, n-propanol, i-butanol, and synthetic methyl fuel. Several additional alcohols were tested, but only as gasoline/methanol cosolvents. The interdependency among the variables which are responsible for the significant property changes was determined so that, where possible, gasoline/alcohol properties can be estimated from blend composition. Trends are also discussed in terms of the general influences of system variables. DOE

N80-13274# Department of Energy, Bartlesville, Okla.

DRIVING CYCLE COMPARISONS OF ENERGY ECONOMIES AND EMISSIONS FROM AN ALCOHOL AND GASOLINE FUELED VEHICLE

R. L. Bechtold and B. Pullman (Santa Clara Univ., Calif.) 1979 13 p refs Presented at 3d Intern. Alcohol Fuels Technol. Symp., Asilomar, Calif., 28 May 1979
(CONF-790520-7) Avail: NTIS HC A02/MF A01

A late-model vehicle was converted to operate using methanol, gasoline, or ethanol as fuel and experimental work was done to obtain energy economy and exhaust emissions data for each of the three fuels. Results are compared at equal equivalence ratios both with and without an oxidation catalyst in the exhaust system. Using a catalyst for emissions control, unburned hydrocarbon emissions were lowest during lean operating conditions and were nearly the same for all three fuels under those conditions. Oxides of nitrogen emissions typically were reduced by over 50 percent in changing from gasoline to methanol or ethanol. Photochemical reactivities were calculated and comparisons were made among the fuels during cold start and FTP weighted tests. Gasoline exhaust was often calculated to have the lowest total reactivity during the FTP, however, methanol exhaust reactivity was lowest for the stoichiometric condition with catalyst. DOE

N80-13275# Department of Energy, Bartlesville, Okla. Energy Technology Center.

THE 50,000 MILE METHANOL/GASOLINE BLEND FLEET STUDY Progress Report

K. R. Stamper 1979 14 p refs Presented at 3d Intern. Alcohol Fuels Technol. Symp., Asilomar, Calif., 28 May 1979
(CONF-790520-6) Avail: NTIS HC A02/MF A01

Seven current production automobiles are being used in a fleet study to obtain operational experience in using 10% methanol/90% gasoline blends as an automotive fuel. Data from chassis dynamometer tests (run according to the 1975-1978 Federal test procedure) show fuel economy and exhaust emissions of carbon monoxide, oxides of nitrogen, unburned fuel, methanol, and aldehydes. For each of the vehicles when operated on the 10% methanol blend, and on unleaded low octane Indolene. An average decrease in volumetric fuel economy (approximately 5%) and a reduction in carbon monoxide emissions were associated with the use of the 10% methanol blend. The most severe driveability problems encountered thus far are related to operating on a phase separated fuel and materials compatibility problems with an elastomer in the air-fuel control hardware of one vehicle. DOE

N80-13277# Brookhaven National Lab., Upton, N. Y.

REGENERATIVE PROCESS FOR DESULFURIZATION OF HIGH TEMPERATURE COMBUSTION AND FUEL GASES Quarterly Progress Report, 1 Jul. - 30 Sep. 1978

M.-S. Shen and J. M. Chen 1978 72 p refs
(Contract EY-76-C-02-0016)
(BNL-50944; QPR-10) Avail: NTIS HC A04/MF A01

A rotary kiln reactor was used to study the apparent solid-solid reaction between the sulfated limestone and the fly ash from a fluidized bed combustion. The experimental conditions were within the range for regeneration of the lime-based sorbents for fluidized-bed combustion. The measured SO2 concentrations were favorably interrelated with a derived mathematical model, with the major operating variables of the reactor, such as solid loading, temperature, gas flow rate, etc. The kinetic parameters of the regeneration reaction, the maximum attainable SO2 concentrations, and the effect of the molar ratio of C/S on the extent of CaSO4 conversion to CaO were obtained. Calcium silicate retained its activity when repeatedly cycled between sulfation and regeneration. A kiln reactor process for regenerating sulfated calcuim oxide reduces the environmental impact of fluid bed waste disposal and improves natural resource utilization. DOE

N80-13279# Department of Energy, Washington, D. C.

ENVIRONMENTAL ANALYSIS OF SYNTHETIC LIQUID FUELS

12 Jul. 1979 144 p refs
(DOE/EV-0044) Avail: NTIS HC A07/MF A01

There appears to be no absolute environmentally related constraint identified for any of the first-generation surface conversion technologies (shale oil, coal liquefaction, and biomass production of ethanol). Second-generation processes run greater risks of major environmental problems. For in situ processes, the major risk is leaching of hazardous materials into water; for direct liquefaction, concern is potential worker and public exposure to toxic substances. Yet-to-be-defined regulations are perceived by developers as major technology development impediments. These include air quality standards (visibility, short-term nitrogen oxide and new PSD regulations), regulation of hazardous wastes and toxic products, underground injection guidelines, and worker safety regulations. Some risk exists that environmental R and D programs cannot fully satisfy all existing and expected regulatory demands, but these risks should be known by 1985 and it is expected that appropriate control adjustments can be made. DOE

N80-13280# Institute of Gas Technology, Chicago, Ill.

RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS (RISER CRACKING OF COAL) Quarterly Report, 1 Oct. - 31 Dec. 1978

Dennis A. Duncan Mar. 1979 46 p refs
(Contract EX-76-C-01-2307)
(FE-2307-46; QR-3) Avail: NTIS HC A03/MF A01

Work on processing of caking coals was continued and methods of pretreating caking coals were developed and demonstrated by sucessful runs in the bench-scale unit. Exploratory work done to evaluate the effects of bentonite clay, iron oxide, and heating rate on the reaction system show that both bentonite clay and iron oxide have beneficial catalytic effects. Depth of carbon conversion was found to be more a function of severity of thermal treatment than heating rate over the range studied. Construction of the process development unit (PDU) continued, and much of the major equipment was received. Contracts were awarded for supplying high-pressure gases to the PDU. Fabrication of the preheater coil was completed, and construction of the preheater furnace is underway. Tests were continued in a low pressure simulator of a PDU combustor section, and for a coaxial construction, ceramic shields in the vicinity of the oxygen injection point do not appear to be necessary. DOE

N80-13281# Institute of Gas Technology, Chicago, Ill.

PREPARATION OF A COAL CONVERSION SYSTEMS TECHNICAL DATA BOOK, PROJECT 61003 Annual Report, 1 May 1977 - 30 Apr. 1978

Feb. 1979 577 p refs
(Contract EX-76-C-01-2286)
(FE-2286-32) Avail: NTIS HC A25/MF A01

The calculation of gas phase fugacity in NH3-H2S-H2O and NH3-CO2-H2O systems is described. Vapor-Liquid Equilibrium data on cyclohexane-water and four binary hydrogen-solvent systems have been presented. Data obtained on true densities of low rank coals and their chars are plotted as a function of hydrogen content (wt %, daf). Results of an investigation of formulas for calculating the heating value of coal from its composition are given. A formula, developed from the available data and having the least standard deviation is also presented. Data on minor and trace elements in coal are reviewed. A table of basic properties of pure components of coal liquids is included. Properties of benzene are presented in both S.I. and British Units. The theory of coal cleaning was discussed. DOE

N80-13283# Mueller Associates, Inc., Baltimore, Md.

STATUS OF ALCOHOL FUELS UTILIZATION TECHNOLOGY FOR STATIONARY GAS TURBINES

Richard L. Rentz and Thomas J. Timbario Apr. 1979 35 p refs
(Contract EX-76-C-01-2098)
(HCP/M2098-03) Avail: NTIS HC A03/MF A01

Efforts being made to establish the feasibility of alcohols as fuels for stationary gas turbines were reviewed to determine if the status of technology has been defined regarding modification necessary to convert existing stationary gas turbines for operation with alcohol fuels, and to determine if the status of technology has been defined for the design of new stationary gas turbines operating on alcohol fuels. Results are presented in a format which describes the test work performed and characterizes the status of alcohol fuels technology (relative to stationary gas turbines) based on this test work. An overview of various factors that, from a systems viewpoint, would need to be considered if a serious effort were made to utilize alcohols as fuels for stationary gas turbines is included. DOE

N80-13285# Department of Energy, Washington, D. C.

COMMERCIALIZATION STRATEGY REPORT FOR COAL LIQUEFACTION

E. A. Loyd, B. C. Almuala, A. K. Ingberman, L. M. Joseph, N. Lobe, J. S. Siegel, M. I. Singer, and J. H. Smithson 1979 35 p
(TID-28846) Avail: NTIS HC A03/MF A01

The commercial readiness of coal liquids is evaluated and barriers to be overcome are identified. It is concluded that: (1) coal liquids will address a major segment of the energy economy, petroleum and petroleum derived products; (2) methanol and Fischer-Tropsch processes are technically ready but economically uncompetitive; (3) scale up of direct hydrogenation processes to verify commercial feasibility requires major government funding; (4) federal assistance will probably be required for all first-of-a-kind commercial facilities; and (5) coal liquids will be economically competitive with imported petroleum by late 1980's or early 1990's. DOE

N80-13286# Department of Energy, Washington, D. C.

COMMERCIALIZATION TASK FORCE FOR HIGH Btu GASIFICATION

P. Gallo, Richard Passman, Dave Beecy, Allyn Hemenway, Arthur Ingberman, and John Pulice 1979 38 p
(TID-28849) Avail: NTIS HC A03/MF A01

The commercial readiness of high Btu gasification was investigated. It is found that the principal barriers to the commercialization of high Btu gas are: (1) the availability of capital, and (2) uncertainties regarding the marketability of supplies. Unless these barriers are removed, timely production of high-Btu gas is not likely to occur. A Federal role is recommended that would assist the private sector in capital formation with incentives that spread the financial risk appropriately among project beneficiaries. Of the incentives studied, two appear most effective: rolled-in pricing is seen as an important ingredient, especially in the early years of plant operation because of the high initial cost of gas; Federal loan guarantees are effective in assuring capital availability for the industry. Until loan guarantees become available, regulatory mechanisms provide the only remaining option. DOE

N80-13287# Gulf Research and Development Co., Pittsburgh, Pa.

RESEARCH AND DEVELOPMENT OF AN ADVANCED PROCESS FOR CONVERSION OF COAL TO SYNTHETIC GASOLINE AND OTHER DISTILLATE MOTOR FUELS Quarterly Report, Sep. 1978 - Nov. 1978

D. C. Succop and F. E. Wynne Dec. 1978 11 p
(Contracts EX-76-C-01-1800; E(49-18)-1800)
(FE-1800-33) Avail: NTIS HC A02/MF A01

Planned experiments to establish general ranges over which heater variables should be studied were completed. Unit modification was necessary to allow collection of high viscosity product from the heater outlet. Preliminary results indicate that increasing heater residence times and temperatures reduce the slurry viscosity by thermal cracking. At a low heater pressure of 1,000 psig and 2,000 scf/bbl of H_2, heater slurry temperatures above 950 F resulted in increased viscosity and coking. DOE

N80-13288# Bituminous Coal Research, Inc., Monroeville, Pa.

GAS GENERATOR RESEARCH AND DEVELOPMENT: BI-GAS PROCESS Monthly Progress Report, Apr. 1979

May 1979 233 p refs Prepared in cooperation with Phillips Petroleum Co., Homer City, Pa.
(Contract EX-76-C-01-1207)
(FE-1207-62; MPR-92) Avail: NTIS HC A10/MF A01

A life test of two Ni/Mo catalysts, as well as their predecessors, was completed. The results showed that the sample tested was essentially the same as its predecessor. Generally, the activity of the catalyst was close to that predicted by the life test data. Analytical and computer services continued in support of the overall program. A written description of the fluidized-bed methanation PEDU automated data acquisition and reduction systems was generated and is included. DOE

N80-13289# Texaco, Inc., Montebello, Calif.

GASIFICATION OF RESIDUAL MATERIALS FROM COAL LIQUEFACTION Quarterly Report, Oct. - Dec. 1978

Allen M. Robin Mar. 1979 13 p
(Contract EX-76-C-01-2247)
(FE-2247-22) Avail: NTIS HC A02/MF A01

Materials from several coal liquefaction pilot plants were evaluated to determine their suitability as feedstocks for proprietary gasification processes. The chemical composition and physical properties of each material were determined. A preliminary pilot plant test was conducted. The operability of the process on the candidate feedstock was evaluated and estimates of preferred processing conditions, product gas yield and composition were made. R.E.S.

N80-13290# TRW Systems Group, McLean, Va. Energy Systems Planning Div.

METHANE RECOVERY FROM COALBEDS PROJECT. TECHNOLOGY TEST PROJECTS: EVALUATION OF CANDIDATE PROJECTS

Feb. 1979 25 p
(Contract EW-78-C-21-8089)
(METC-8089-T4) Avail: NTIS HC A02/MF A01

Twelve system test concepts for the recovery of methane from coalbeds and utilization of the gas in one or more applications are presented and evaluated. Four projects are recommended for further design development and analysis. R.E.S.

N80-13291# Gulf Research and Development Co., Pittsburgh, Pa.

RESEARCH AND DEVELOPMENT OF AN ADVANCED PROCESS FOR CONVERSION OF COAL TO SYNTHETIC GASOLINE AND OTHER DISTILLATE MOTOR FUELS Quarterly Report, Jun. - Aug. 1978

D. C. Succop and F. E. Wynne Sep. 1978 13 p
(Contracts EX-76-C-01-1800; E(49-18)-1800)
(FE-1800-30) Avail: NTIS HC A02/MF A01

Experimental results confirmed the predicted product liquid and coke yields for delayed coking or bituminous coal with petroleum vacuum residue. The expected modest synergism for liquid production was accompanied by synergistic improvement in liquid quality. Synergism was somewhat greater when undried sub-bituminous coal was used, confirming that coal slurries can be charged to delayed cokers and thereby release residual oil for incremental charging to fluid catalytic cracking. These results were used as the basis for a preliminary economic assessment of this medium impact interim process when used in existing petroleum refinery delayed cokers. DOE

N80-13292# Amoco Oil Co., Naperville, Ill. Research and Development Dept.
CATALYST DEVELOPMENT FOR COAL LIQUEFACTION Final Annual Report
R. J. Bertolacini, L. C. Gutberlet, D. K. Kim, and K. K. Robinson Jun. 1979 179 p refs Sponsored by EPRI
(Research Proj. 408-1)
(EPRI-AF-1084; AR-3) Avail: NTIS HC A09/MF A01

New catalysts for the hydroliquefaction of coal to a clean-burning fuel for power generation were screened. The performance of the new catalysts is discussed along with the performance of various hydrogen donor solvents. Modifications in the product workup procedure are described. The effect of various impregnating aids, such as phosphoric acid, on initial performance was investigated. Numerous catalysts were tested further on the continuous pilot plant to establish how their aging behavior responds to changes in surface properties and catalytic metals. Aged catalysts were also characterized extensively to establish the reasons for deactivation. DOE

N80-13293# Department of Energy, Washington, D. C. Div. of Fossil Fuel Extraction.
UNDERGROUND COAL CONVERSION. PROGRAM DESCRIPTION
Jun. 1979 70 p refs
(DOE/ET-0100) Avail: NTIS HC A04/MF A01

Results of the program presented indicate that, while underground coal gasification (UCC) is technically feasible, it still contains some process unknowns, environmental risks, and economic risks that require R and D. In order to contribute to the national energy goals, a strong DOE program which incorporates maximum industry involvement is planned. Major projects are described in some detail. A strong program of supporting activities is expected to address specific problems identified in the field testing and in order to advance UCC technology. The elimination of the high-risk elements of UCC by resolving those technical, environmental, and economic uncertainties that remain, and to enable industry to assume responsibility for commercialization of the process was considered. DOE

N80-13294# Brookhaven National Lab., Upton, N. Y.
COAL CONVERSION IN FLASH HYDROPYROLYSIS REACTORS
Vi-Duong Dang and M. Steinberg May 1979 57 p refs Presented at the 87th AIChE Natl. Meeting, Boston, 19 Aug. 1979
(Contract EY-76-C-02-0016)
(BNL-26209; CONF-790822-5) Avail: NTIS HC A04/MF A01

Analytical correlations of the experimental results for the Flash Hydropyrolysis of coal to gaseous and liquid hydrocarbons are presented. A three step reaction mechanism together with a particle-fluid interaction model is used to describe the system. The application of nonlinear estimation methods produces fair agreement between the experimental results and the postulated model. Explicit kinetic expressions as a function of temperature, pressure and reaction time for the reaction yields are developed. Reaction parameters for fluidized bed, entrained bed and fast fluidized bed designs are derived from the kinetic model. DOE

N80-13295# Oak Ridge National Lab., Tenn.
REVIEW OF SUPPORTING RESEARCH AT OAK RIDGE NATIONAL LABORATORY FOR UNDERGROUND COAL CONVERSION
P. R. Westmoreland and L. S. Dickerson 1979 14 p refs Presented at the 5th Underground Coal Conversion Symp., Alexandria, Va., 18 Jun. 1979
(Contract W-7405-eng-26)
(CONF-790630-9) Avail: NTIS HC A02/MF A01

Chemical and physical properties of lignite, subbituminous coal, bituminous coal, and overburden were measured. Generally large, monolithic blocks of sample were dried and pyrolyzed. Thermal data and product yields can be correlated to provide an extrapolation from powder pyrolysis to the pyrolysis steps in underground coal gasification. Significant results include correlation of block pyrolysis data for low-rank coals, interpretation of mechanisms, and comparison between low-rank and bituminous coals; heating tests of overburden cores from the Hoe Creek field gasification site; and measurement of physical properties, particularly thermal diffusivity and thermal conductivity of low-rank coals. Correlations, mechanisms, and property measurements are reviewed, and applications to underground coal gasification are discussed. DOE

N80-13296# Los Alamos Scientific Lab., N. Mex.
SYNFUEL (HYDROGEN) PRODUCTION FROM FUSION POWER
R. A. Krakowski, K. E. Cox, J. H. Pendergrass, and L. A. Pooth 1979 6 p refs Presented at the 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract W-7405-eng-36)
(LA-UR-79-1115; CONF-790803-9) Avail: NTIS HC A02/MF A01

A potential use of fusion energy for the production of synthetic fuel (hydrogen) is described. The hybrid-thermochemical bismuth-sulfate cycle was as a vehicle to assess the technological and economic merits of this potential nonelectric application of fusion power. DOE

N80-13297# Los Alamos Scientific Lab., N. Mex.
LIQUID HYDROGEN AS AN AUTOMOTIVE FUEL
W. F. Stewart 1979 17 p refs Presented at the 1979 Cryog. Eng. Conf., Madison, Wis., 21-24 Aug. 1979
(Contract W-7405-eng-36)
(LA-UR-79-621; CONF-790815-2) Avail: NTIS HC A02/MF A01

Hydrogen fuel projects involving six vehicles and six hydrogen liquid container designs are discussed. It is shown that service (refueling) stations and bulk distribution systems can be built using present technology. These can be similar in concept to the present service stations and distribution systems. Vehicle refueling and bulk liquid hydrogen transfer will probably be computer controlled as completely as possible. Liquid hydrogen can begin its entry into the automotive fuel picture as a fuel for fixed base vehicles such as trucks, buses, taxis, etc., and expand into the private sector as its availability increases. DOE

N80-13318# National Engineering Lab., East Kilbride (Scotland) Systems Engineering Div.
ENERGY SAVING IN INJECTION MOLDING
G. Gardiner Jan. 1979 35 p Presented at Rubber and Plastics Res. Assoc. Seminar, 1 Feb. 1978
(NEL-662) Avail: NTIS HC A03/MF A01

Power consumption in an injection molding plant was studied and tests on an injection molding machine during a specific work cycle were made. The results clearly establish the energy losses which are present in many injection molding plants. By converting the plant to hydraulic drives and centralized hydraulic power supply, most of the losses could be eliminated. Supporting results of tests on a converted injection molding machine operating from a single hydraulic power source, simulating a centralized hydraulic power supply are also included. Author (ESA)

N80-13362*# TRW Defense and Space Systems Group, Redondo Beach, Calif. Power Conversion Electronics Dept.
HEAT PIPE COOLED POWER MAGNETICS Final Report
M. S. Chester Dec. 1979 176 p Revised
(NASA-CR-159659; TRW-33572-6001-RU-00) Avail: NTIS HC A09/MF A01 CSCL 09A

A high frequency, high power, low specific weight (0.57 kg/kW) transformer developed for space use was redesigned with heat pipe cooling allowing both a reduction in

weight and a lower internal temperature rise. The specific weight of the heat pipe cooled transformer was reduced to 0.4 kg/kW and the highest winding temperature rise was reduced from 40 C to 20 C in spite of 10 watts additional loss. The design loss/weight tradeoff was 18 W/kg. Additionally, allowing the same 40 C winding temperature rise as in the original design, the KVA rating is increased to 4.2 KVA, demonstrating a specific weight of 0.28 kg/kW with the internal loss increased by 50W. This space environment tested heat pipe cooled design performed as well electrically as the original conventional design, thus demonstrating the advantages of heat pipes integrated into a high power, high voltage magnetic. Another heat pipe cooled magnetic, a 3.7 kW, 20A input filter inductor was designed, developed, built, tested, and described. The heat pipe cooled magnetics are designed to be Earth operated in any orientation.
Author

N80-13375# Sandia Labs., Albuquerque, N. Mex.
EFFECTS OF METALLURGICAL MICROSTRUCTURE OF ARMATURES ON COMPRESSED MAGNETIC FIELD GENERATORS
A. E. Binder and T. V. Nordstrom 1979 27 p refs Presented at the 2d Intern. Conf. on Megagauss Magnetic Field Generation and Related Topics, Washington, D.C., 29 May 1979
(Contract EY-76-C-04-0789)
(SAND-79-0890C; CONF-790540-3) Avail: NTIS HC A03/MF A01

Methods for improving uniform expansion behavior of compressed magnetic field device armatures were studied. Initial microstructure of the copper tubes was altered in a controlled manner by using different forming techniques and alloying. Results show a 25 to 50 percent improvement in uniform explosive expansion radius for electroformed and spun copper armatures compared to standard armatures machined from drawn tubing. Expansion improvement was correlated with changes in the mechanical texture due to forming. The smoother expansion, however, did not result in a significantly higher electrical efficiency with the armature parameters tested.
DOE

N80-13377# Lincoln Lab., Mass. Inst. of Tech., Lexington.
CLASSIFICATION AND TECHNICAL REVIEW OF dc-ac INVERTERS FOR USE IN PHOTOVOLTAIC POWER SYSTEMS
E. E. Landsman 30 Apr. 1979 37 p refs
(Contract EY-76-C-02-4094)
(COO-4094-25) Avail: NTIS HC A03/MF A01

A classification system is presented for stand-alone and utility-interactive dc-to-ac inverters used in photovoltaic systems in the 1-to-100-kVA power range. Additional inverter topologies, noted during the classification process, are introduced. To provide background, generally used dc-to-ac inversion technology is reviewed. Relative merits and liabilities of available power devices are discussed and device protective techniques are reviewed. Maximum power point tracking can enhance system value in utility-interactive no-battery photovoltaic power systems. This general theory is reviewed and an improved implementation is described.
DOE

N80-13412# Oak Ridge National Lab., Tenn. Engineering Tech. Div.
CONDENSATION AND EVAPORATION HEAT TRANSFER WITH LOW-BOILING TEMPERATURE FLUIDS
R. W. Murphy and H. W. Hoffman 1979 4 p Presented at Southeastern Seminar on Thermal Sci., SESTS, Boca Raton, Fla., 10 May 1979
(Contract W-7405-eng-26)
(CONF-790539-1) Avail: NTIS HC A02/MF A01

Heat transfer research related to OTEC and geothermal energy conversion power cycles is reviewed.
DOE

N80-13431# Sandia Labs., Albuquerque, N. Mex.
DEVELOPMENT OF IN SITU MARINE SEISMIC AND GEOTECHNICAL INSTRUMENTATION SYSTEMS
E. W. Reece 1979 18 p refs Presented at DOE Symp. on Enhanced Oil and Gas Recovery and Improved Drillings Technol., Tulsa, Okla., 22 Aug. 1979
(Contract EY-76-C-04-0789)
(SAND-79-0868C; CONF-790805-3) Avail: NTIS HC A02/MF A01

A pair of in situ marine geotechnical instrumentation systems, capable of operating unattended for extended periods of time in remote locations, were designed and fabricated, and are currently undergoing testing. The seafloor earthquake measurement system measures the response of marine sediments to strong and moderate seismic activity. The geotechnically instrumented seafloor probe measures the in situ pore pressure in soft marine clays. The two systems have many common characteristics. Both systems consist of two principal subsystems: a seafloor data gathering package and a shipboard command and recording package. The seafloor packages are totally self-contained, and incorporate microprocessor-based electronics which control data collection, processing, and storage. Data collected and stored by the seafloor packages are transmitted on command to the command and recording package by a high-data-rate acoustic telemetry system.
DOE

N80-13480# McAlvery and Associates, Hoboken, N. J.
IMPACT OF FLYWHEEL-TRANSMISSIONS ON AUTOMOBILE PERFORMANCE: A LOGICAL BASIS FOR EVALUATION
R. F. McAlvery, III 9 Apr. 1979 31 p refs
(Contract W-7405-eng-48)
(UCRL-52758) Avail: NTIS HC A03/MF A01

The application of flywheel-transmissions to electric vehicles and to petroleum-fueled automobiles was analytically investigated. Simple algebraic equations were developed that describe an automobile's total (laden) mass and energy economy as a function of mission requirements (i.e., payload, range, and drive-cycle acceleration demand). The equations can be used to evaluate the impact of a flywheel-transmission on an automobile's mass and energy economy.
DOE

N80-13490*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MODIFIED AEROSPACE RELIABILITY AND QUALITY ASSURANCE METHOD FOR WIND TURBINES
William E. Klein 1980 9 p Proposed for presentation at the Ann. Reliability and Maintainability Symp., San Francisco, 22-24 Jan. 1980
(NASA-TM-79284; DOE/NASA/20370-79/18; E-211) Avail: NTIS HC A02/MF A01 CSCL 14D

The safety, reliability, and quality assurance (SR&QA) approach developed for the first large wind turbine generator project is described. The SR&QA approach was used to assure that the machine would not be hazardous to the public or operating personnel, would operate unattended on a utility grid, would demonstrate reliable operation and would help establish the quality assurance and maintainability requirements for future wind turbine projects. A modified failure modes and effects analysis during the design phase, minimal hardware inspections during parts fabrication, and three simple documents to control activities during machine construction and operation were presented.
R.C.T.

N80-13582# Department of Energy, Washington, D. C. Office of Basic Energy Sciences.
SUMMARIES OF PHYSICAL RESEARCH IN THE GEOSCIENCES
Aug. 1979 65 p refs
(DOE/ER-0030) Avail: NTIS HC A04/MF A01

The Earth, atmospheric, and solar/terrestrial sciences which relate to the development of energy technology are summarized. The topics covered include: geology, geophysics, and Earth dynamics; geochemistry; energy resource recognition, evaluation, and utilization; hydrologic and marine sciences; and solar-terrestrial/atmospheric interactions.
R.C.T.

N80-13601*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVELOPMENT OF MINING GUIDANCE AND CONTROL SYSTEMS Annual Report, Oct. 1976 - Sep. 1977

May 1979 225 p refs
(Contract DI-BM-H0155092)
(NASA-TM-78226; ALW-11) Avail NTIS HC A10/MF A01 CSCL 08I

New fundamental interface sensor concepts were identified and investigated including tabulation of the physical and performance characteristics of two new interface detector concepts: - natural background radiation and magnetic spin resonance. Studies of guidance and control techniques for the longwall miner identified three basic systems for use in automated/remote controlled longwall mining. The following projects were initiated: system study which will more completely define the longwall guidance and control system design concepts; integration of the various control functions (vertical, yaw, and roll); and hardware technical requirements. R.E.S.

N80-13605# Oak Ridge National Lab., Tenn.
GEOPRESSURE ENERGY RESOURCE EVALUATION
G. Samuels May 1979 76 p refs
(Contract W-7405-eng-26)
(ORNL/PPA-79/2) Avail NTIS HC A05/MF A01

The geopressured aquifers that extend along the northern Gulf of Mexico are perhaps the largest potential source of geothermal energy and natural gas in the United States. Because of the high cost of completing wells into these formations and their relatively low temperatures (200 to 400 F), the utilization of the geothermal energy will be highly dependent on, and of secondary importance to, the value of the methane. The economics of extracting either the geothermal energy or natural gas from these aquifers does not look promising. The combined requirements of high well flow rates (40,000 bbl/day), long life (20 years), and the necessity for close well spacing to minimize the cost of the collection system may be incompatible with the actual characteristics of the reservoirs. These factors place such stringent requirements on the reservoir size, permeability, and compressibility, or specific storage coefficient, that the number of promising production areas may be severely limited. DOE

N80-13607# Department of Energy, Washington, D. C. Energy Information Administration.
CURRENT U. S. PETROLEUM SITUATION AND SHORT-TERM SUPPLY/DEMAND OUTLOOK
Emil L. Nelson, G. D. Butler, C. Dwyer, and S. Wagner Jun. 1979 50 p
(DOE/EIA-0184/5) Avail NTIS HC A03/MF A01

Potential U.S. supply shortfalls indicate that U.S. consumption of petroleum products could not rise above the low end of the projected range without driving petroleum inventories down below generally accepted target levels to enter the 1979-1980 winter heating season. Preliminary data indicate that U.S. petroleum demand for the first quarter of 1979 appears to have been between the low and medium levels projected by the demand models. Estimated demand during April and May, when allocation of scarce supply appears to have limited the effective demand, falls below the low of the projected range by some 1/2 million barrels daily. Unless world supply conditions change significantly in the coming months, the analysis indicates that the United States may experience continual limitations on imports requiring effective efforts to limit consumption and make maximum use of alternative fuels. DOE

N80-13617 Pittsburgh Univ., Pa.
THEORETICAL ANALYSIS OF MULTI-CELL, HIGH EFFICIENCY BROAD SPECTRAL SENSITIVITY SOLAR CELLS Ph.D. Thesis
Richard Joseph McPartland 1978 227 p
Avail Univ. Microfilms Order No. 7924749

A new scheme for interconnecting cells with different band gaps is described. This scheme allows for epitaxial device fabrication without intervening metallic layers or grids by employing a tunnel junction as an interface between the cells. Using this interface, a two-cell solar cell structure is proposed: npp+n+pp+. The npp+n+ portion has a wider band gap than the pp+ portion of the cell. A theoretical model is developed to be used as a design aid prior to device fabrication, to allow optimization of the solar cell's design, and to predict conversion efficiencies. The three components of the model are: the npp+ low-high junction (L-H junction) homojunction solar cell model, the n+pp+ L-H junction heterojunction solar cell model; and the p+n+ tunnel junction model. The current-voltage characteristics of the tunnel junction are represented by surface-recombination-velocities (SRVs) at either side of the junction's space-charge-layer. Dissert. Abstr.

N80-13319*# National Bureau of Standards, Boulder, Colo. Electromagnetic Fields Div.
COMPARISON OF CENTRIFUGE AND FREEZING CALORIMETER METHODS FOR MEASURING FREE WATER IN SNOW
R. N. Jones May 1979 44 p refs Sponsored by NASA
(NASA-CR-162504; PB-296321/1; NBSIR-79-1604) Avail NTIS HC A03/MF A01 CSCL 14B

A comparison of two popular methods, namely, the centrifuge and the freezing calorimeter is presented. Results from measurements over a two-month period in the Colorado mountains in the winter of 1978 indicate serious disagreement between these two methods. Some reasons for the disagreement are presented and verified. This raises some important questions pertaining not only to what the two methods actually measure, but also which methods may be appropriate for particular applications. GRA

N80-13622*# TRW Defense and Space Systems Group, Redondo Beach, Calif.
PEP SOLAR ARRAY DEFINITION STUDY Final Programmatic Report
30 Oct. 1979 82 p refs
(Contract NAS9-15870)
(NASA-CR-160398; TRW-35515-6002-RU-00) Avail NTIS HC A05/MF A01 CSCL 10A

The power extension package (PEP) is a solar array system that will be used on the space transportation system to agument the power of the Orbiter vehicle and to extend the time the vehicle may stay in orbit. The baseline configuration of the PEP is reviewed. The programmatic aspects of the design covering the development plan, the manufacturing facility plan and the estimated costs and risks are presented. R.E.S.

N80-13623*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MODIFIED POWER LAW EQUATIONS FOR VERTICAL WIND PROFILES
D. A. Spera and T. R. Richards 1979 13 p refs Presented at the Wind Characteristics and Wind Energy Siting Conf., Portland, Oreg., 19-21 Jun. 1979 Sponsored by DOE, American Meteorological Soc., Pacific Northwest Lab.
(E(49-26)-1059)
(NASA-TM-79275; DOE/NASA/1059-79/4) Avail NTIS HC A02/MF A01 CSCL 10A

Equations are presented for calculating power law exponents from wind speed and surface roughness data. Results are evaluated by comparison with wind profile data measured at a variety of sites. Author

N80-13624*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
LOW NO(X) HEAVY FUEL COMBUSTOR PROGRAM
Eric Lister (DOE, Germantown, Md.), Richard W. Niedzwiecki, and Lester Nichols [1979] 15 p To be presented at 25th Ann. Intern. Gas Turbine Conf., New Orleans, 9-13 Mar. 1980; sponsored by ASME
(Contract EC-77-A-31-1062)
(NASA-TM-79313; E-269; DOE/NASA/1062-79/3) Avail NTIS HC A02/MF A01 CSCL 10B

The 'low nitrogen oxides heavy fuel combustor' program is described. Main program objectives are to generate and demonstrate the technology required to develop durable gas turbine combustors for utility and industrial applications, which are capable of sustained, environmentally acceptable operation with minimally processed petroleum residual fuels. The program will focus on 'dry' reductions of oxides of nitrogen, improved combustor durability, and satisfactory combustion of minimally processed petroleum residual fuels. Other technology advancements sought include: fuel flexibility for operation with petroleum distillates, blends of petroleum distillates and residual fuels, and synfuels (fuel oils derived from coal or shale); acceptable exhaust emissions of carbon monoxide, unburned hydrocarbons, sulfur oxides and smoke; and retrofit capability to existing engines. R.E.S.

N80-13625# Engelhard Minerals and Chemicals Corp., Edison, N.J. Research and Development Dept.

DESIGN AND DEVELOPMENT OF A 30 WATT SOLID POLYMER ELECTROLYTE FUEL CELL POWER SOURCE FUELED WITH CALCIUM HYDRIDE Final Technical Report

O. Adlhart 12 Dec. 1978 26 p
(Contract DAAK70-77-C-0222)
(AD-A071157) Avail: NTIS HC A03/MF A01 CSCL 10/2

In recent years MERDCOM has shown renewed interest in the Solid Polymer Electrolyte Hydrogen-Air Fuel Cell. It focuses on the broad spectrum of applications where power requirements are quite small ranging from fractions of a watt to a few hundred watts. Handling simplicity and versatility are of utmost importance in this power range. The SPE cell is uniquely suited. It is operative at ambient temperatures, is rugged and has excellent life characteristics. Combined with a solid hydrogen source such as calcium hydride or magnesium, high energy densities are attainable. A 24 volt, 30 watt device was developed under the contract consisting of a static SPE stack integrated with a hydrogen generator utilizing cartridge contained calcium hydride. Even in short missions of a few hours energy densities are well in excess of those obtained with secondary batteries. GRA

N80-13627# Idaho National Engineering Lab., Idaho Falls.

ANALYSIS OF BINARY THERMODYNAMIC CYCLES FOR A MODERATELY LOW-TEMPERATURE GEOTHERMAL RESOURCE

O. J. Demuth Jul. 1979 105 p refs
(Contract EY-76-C-07-1570)
(TREE-1365) Avail: NTIS HC A06/MF A01

Cycles were screened which included isobutane, pentane, cis-2-butene, and several mixed-hydrocarbon working fluids. Dual-and triple-boiling cycles were analyzed. Both shell-and-tube and direct-contact boilers, heaters, and condensers were assessed. A geothermal fluid (geo-fluid), typical of Raft River resource conditions was assumed, which has a temperature of 290 F and 52 parts per million dissolved nitrogen. Special emphasis in the analyses was directed toward investigation of several methods for keeping the loss of working fluid for the cycle at an acceptable level. It was concluded that for the Raft River geo-fluid, the direct-contact cycle has a potential for net geo-fluid utilization effectiveness values, (watt-hr/lbm geo-fluid) equivalent to those of the shell-and-tube cycle. Because of the lower cost of direct-contact components, a potential exists for the direct-contact plant to produce lower cost electrical energy than a comparable shell-and-tube plant. DOE

N80-13628# General Electric Co., Schenectady, N.Y. Electric Utility Systems Engineering Dept.

REQUIREMENTS ASSESSMENT OF WIND POWER PLANTS IN ELECTRIC UTILITY SYSTEMS. VOLUME 3: APPENDIXES Final Report

W. D. Marsh Jan. 1979 95 p refs Sponsored by Elec. Power Res. Inst.
(EPRI-ER-978-Vol-3) Avail: NTIS HC A05/MF A01

A rational approach to the consideration of wind power plants applied to electric utility systems was developed. Then a requirements assessment and preliminary impact and penetration analyses were performed by studying wind generation in three actual utility systems. Conventional utility loss-of-load probability and production simulation methods were used together with a wind turbine generator performance model developed for the study. Evaluations were based on comparison of total utility generation system costs with and without wind plants, and were expressed in terms of wind power plant value and cost. (Value is measured by the value of displaced energy and capacity of conventional power plants. Cost consists of the capital, and operating and maintenance costs of the wind plant.) DOE

N80-13629# Argonne National Lab., Ill.

WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 7: NUCLEAR FACILITY PROFILES, AG-CH

Jun. 1979 254 p
(Contract W-31-109-eng-38)
(ANL-PMS-79-2-Vol-7) Avail: NTIS HC A12/MF A01

Capsule summaries of pertinent facts regarding nuclear facilities are presented. The facilities described include the entire fuel cycle from resource recovery to waste management. Power plants and all U.S. facilities are excluded. DOE

N80-13630# Argonne National Lab., Ill.

WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 8: NUCLEAR FACILITY PROFILES, CO-HU

Jun. 1979 234 p refs
(Contract W-31-109-eng-38)
(ANL-PMS-79-2-Vol-8) Avail: NTIS HC A11/MF A01

Pertinent facts regarding nuclear facilities are summarized. The entire fuel cycle from resource recovery through waste management is covered. The profiles are ordered by country name, and then by facility code. DOE

N80-13631# Oak Ridge National Lab., Tenn.

LOW-TEMPERATURE THERMAL ENERGY STORAGE PROGRAM ANNUAL OPERATING PLAN

D. M. Eissenberg and H. W. Hoffman Aug. 1979 65 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6934) Avail: NTIS HC A04/MF A01

The development of technologies for storing thermal energy as low temperature sensible or latent heat is considered along with cost effective systems for collecting, storing, and discharging low thermal energy, which will have significant national impact on energy conservation in the near- and mid-term. Emphasis is placed on seasonal thermal storage, and recovery and reuse of waste heat. Fiscal data are summarized according to thrust area, individual efforts, and funding source. R.C.T.

N80-13632# Brookhaven National Lab., Upton, N.Y.

HYDROGEN-HALOGEN ENERGY STORAGE SYSTEM

J. McBreen, S. Srinivasan, F. J. Salzano, and A. H. Beaufrere Sep. 1978 60 p refs
(Contract EY-76-C-02-0016)
(BNL-50924) Avail: NTIS HC A04/MF A01

Electrochemical investigations, materials studies, and technoeconomic assessment were performed on the electrochemically regenerative hydrogen-chlorine energy storage system. Electrochemical studies confirmed the reversibility of the cell reactions and the possibility of using the same cell in the electrolysis and fuel cell mode. A detailed heat and mass balance analysis was carried out for the H2/Cl2 system for one method of reactant storage and two schemes of heat exchange between the hydrochloric acid storage subsystem and the reactant storage subsystems. Nafion membranes in H2/Cl2 cell were characterized. From a cost comparison on a 20 MW/200 MWh electrochemically regenerative hydrogen-halogen system it was concluded that the use of either chlorine or bromine or alternative methods of chlorine storage had an insignificant effect on the overall cost of the system. The most cost effective method of hydrogen storage is very dependent on the cost activated metal hydrides. DOE

N80-13633# Planco, Inc., Dallas, Tex.

SURVEY OF THE RESEARCH INTO ENERGY-ECONOMY INTERACTIONS. VOLUME 1: SURVEY

R. Coates, D. Hanson, S. Juenger, and J. Kennington Apr. 1979 248 p refs
(Contract EI-78-C-01-6346)
(HCP/I6346-01-1-Vol-1) Avail: NTIS HC A11/MF A01

A detailed and comprehensive review of recent (1960 to present) and on-going research into energy-economy interactions is presented. The results form theoretical and empirical analyses of energy-macroeconomics interactions, the different methodologies used, and the conceptual problems in this research are emphasized. The supply of energy, the price of energy, the world price of oil, energy capital requirements, energy R and D, conservation regulations, and stockpiling are among the variables studied. A conceptual framework for analyzing energy-economy models, the general features and methodologies of a large number of models, and the state of the art in modeling energy-economy interactions are included. Six different energy-economy models: Manne's ETA-MACRO and ETA, Hudson-Jorgenson's LITM, PILOT, Wharton Annual Energy, Reister-Edmonds, and Berkeley (Giassey-Benenson) are reviewed. Each review describes the methodology and general features embodied in the model, summarizes the types of energy-economy interactions addressed, and assesses the capabilities of the model. DOE

N80-13634# Los Alamos Scientific Lab., N. Mex.

ENERGY POLICY AND DECISION ANALYSIS: NEW CONCEPTS AND MECHANISMS

E. L. Kaufman and R. W. Vogel Jul. 1979 52 p refs
(Contract W-7405-eng-36)
(LA-7909-MS) Avail: NTIS HC A04/MF A01

Relevant portions of the energy-management problem and a technique wherein objective energy policy analysis can be performed in a short time frame are described. A precept for decision criteria is proposed and a set of fundamental concepts are described that allow quantitative assessment of policy and decision consequences for the total energy system. A decision conferencing is described wherein the technical assessment is combined with the political acumen of experienced decision makers to allow the best public-interest choice to be made. A rationale is also presented for the organizational placement of the analysis function, outside of government or industry. This placement provides a much needed level of credibility, higher than that which presently exists, and reduces bias and equitably balance the needs of the public, government, and industry. DOE

N80-13635# Midwest Research Inst., Golden, Colo.

SOLAR ENERGY PERSPECTIVES FOR PUBLIC POWER

N. H. Woodley Jun. 1979 22 p refs Presented at Am. Public Power Assoc. 1979 Natl. Conf., Seattle, 19 Jun. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-35-300; CONF-790685-1) Avail: NTIS HC A02/MF A01

Perspectives on the utilization of solar energy for electricity production and thermal energy utilization by the public are briefly summarized. Wind energy conversion, biomass conversion, solar thermal, OTEC, photovoltaics, and solar heating and cooling are discussed. DOE

N80-13636# Argonne National Lab., Ill.

ASSESSMENT OF STIRLING ENGINE POTENTIAL IN TOTAL AND INTEGRATED ENERGY SYSTEMS

T. J. Marciniak, J. C. Bratis, A. Davis, and C. Lee Feb. 1979 167 p refs
(Contract W-31-109-eng-38)
(ANL/ES-76) Avail: NTIS HC A08/MF A01

The advantages and disadvantages of large Stirling engines in total, or integrated, energy systems are discussed and the performance and cost characteristics of such engines are analyzed and compared with the main competitors (diesel engines and gas turbines) for such applications. The comparisons are made through simplified and detailed systems analyses. The requirements for the development of a large Stirling engine are outlined along with a suggested developmental program based on the systems studied and intercomparisons of competing technologies. Results indicate that, given the attributes of the competing technologies involved, the main advantage of the Stirling engine lies in its ability to use fuels other than distillates. This attribute must be developed further in order to provide engine technologies which can burn abundant fuels such as coal or coal-derived fuels. The potentially high efficiency of Stirlings would be especially advantageous in applications where a high electrical-to-thermal energy demand ratio exists. DOE

N80-13637# Department of Energy, Washington, D. C. Div. of Electric Energy Systems.

SYSTEMS ENGINEERING FOR POWER, PROGRAM REPORT

Jun. 1979 372 p
(DOE/ET-0012/2-Rev) Avail: NTIS HC A16/MF A01

The development of the conceptual tools needed for the planning, engineering, and operation of the electric energy systems of the future is discussed. Three areas of increased complexity in the electric energy field are addressed. They are the increasing degree of interconnection between operating areas, the development of new technologies, and a continual tightening of the constraints within which the electric energy system must operate, including financial, environmental and conservation constraints. Each of these driving forces has implication for system operation (control) and for system design (planning). The subprograms which have thus far been developed for control and planning are defined. DOE

N80-13638# California Univ., Livermore. Lawrence Livermore Lab.

ENERGY SYSTEM IN THE FAR WEST: IMPACTS OF THE NATIONAL ENERGY ACT OF 1978

B. Hammond (California Univ., Berkeley), T. Bradshaw (California Univ., Berkeley), and D. Dorn 6 Apr. 1979 46 p refs
(Contract W-7405-eng-48)
(UCRL-52754) Avail: NTIS HC A03/MF A01

The impact of the National Energy Act of 1978 (NEA) on state energy systems in Federal Region IX (Arizona, California, Hawaii, and Nevada) is discussed. Data on the demographic and economic character of the region are presented along with an overview of the impact of the NEA on each energy industry in the region. The act's impact on interstate linkages and the reliability of energy supplies is also assessed. It is concluded that the NEA will serve to encourage actions already being taken by many of the utilities, but that it will not effect major changes in existing patterns of energy use. DOE

N80-13640# Sandia Labs., Albuquerque, N. Mex. Applied Mechanics Div.

RECENT SPIN TEST OF TWO COMPOSITE WAGON WHEEL FLYWHEELS

A. K. Miller 1979 12 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1669C) Avail: NTIS HC A02/MF A01

The dynamic behavior of two structurally dissimilar flywheels was compared. In one design, the graphite/epoxy rim was attached to the aluminum hub with twenty-four thin Kevlar-49/epoxy spokes, while in the other design eight thicker graphite/epoxy spokes connected the rim to the hub. Horizontal disturbances of the flywheel hub were detected for speeds less than approximately 6,000 rpm. These disturbances are believed to be associated with predicted modes of vibration for the flywheel-spin-turbine system. No modes of vibration were sensed for the predicted possible whirl and torsional resonances in the speed range between 6,000 rpm and 22,000 rpm. A squeeze film damper assembly successfully stabilized the flywheel-spin-turbine system when the damper functioned properly, however, low frequency retrograde instabilities were induced into the system by the damper assembly when it was not operated within prescribed parameters. DOE

N80-13642# Sandia Labs., Albuquerque, N. Mex.

SOLAR THERMAL TEST FACILITY HELIOSTAT DEVELOPMENT

D. E. Arvizu Jun. 1979 57 p refs Presented at Intern. Symp. on Concentrating Solar Collector Technol., Albuquerque, N. Mex., 14 Jun. 1978
(Contract EY-76-C-04-0789)
(SAND-78-1177; CONF-7806153-1) Avail: NTIS HC A04/MF A01

The STTF heliostat system is described, and performance data are discussed. The STTF, which uses an array of 222 heliostats in a north field configuration, is capable of supplying 5 MWth energy onto a target on the tower. DOE

N80-13643# California Univ., San Diego

NATIONAL ENERGY POLICY AND STATE COASTAL PROGRAMS: A CRITIQUE OF CURRENT EFFORTS TO BALANCE ENVIRONMENTAL PROTECTION AND ENERGY PRODUCTION ALONG THE COAST

R Kanouse and J Sorensen Apr 1979 394 p refs
(Contract EY-76-S-03-0034)
(SAN-0034/263-1) Avail NTIS HC A17/MF A01

Modifications to the Coastal Zone Management Act (CZMA) are proposed The first four modifications clarify key provisions in the current Act The latter four modifications focus upon attributes of the energy facility siting regulatory process that are either ignored or inadequately addressed in the current CZMA These four proposed modifications are designed to minimize the impediments to an effective and efficient siting process that are caused by the inherent complexities of national energy policy and environmental protection programs Two legislative options for amending the CZMA, both of which incorporate the eight suggested modifications, are proposed DOE

N80-13644# Boeing Engineering and Construction Seattle, Wash

LINEAR CONCENTRATION SOLAR COLLECTOR IN AN AIR SUPPORTED ENCLOSURE. PRELIMINARY DESIGN STUDY Final Report

J H Laasko and D K Zimmerman Mar 1979 96 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7022) Avail NTIS HC A05/MF A01

A preliminary design for a low cost linear parabolic concentrating solar collector in a pneumatically stabilized cylindrical plastic film enclosure is described The collector configuration structural analyses, thermal performance modeling, mass-produced component costs, field assembly methods and maintenance requirements are discussed Daily efficiencies in excess of 45% are predicted with estimated installed field collector costs of $90/sq m ($8 34/sq ft) Results of cost and performance studies indicate that the collector has potential for low cost and offers attractive cost/performance figures-of-merit with further development DOE

N80-13645# Sandia Labs, Albuquerque, N Mex

PERFORMANCE TESTING OF THE GENERAL ELECTRIC ENGINEERING PROTOTYPE COLLECTOR

V E Dudley and V E Workhoven Jul 1979 35 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0514) Avail NTIS HC A03/MF A01

The performance of a 5 meter parabolic dish solar concentrator was characterized Thermal efficiency and thermal losses were investigated at temperatures from 100 C to 300 C Significant improvements were made in the performance of the collector during the test cycle Final efficiency performance ranged from about 60% at 100 C to about 53% at 300 C Thermal losses varied significantly with changes in wind velocity R E S

N80-13646# United Technologies Corp., South Windsor, Conn Power Systems Div

INTEGRAL CELL SCALE-UP AND PERFORMANCE VERIFICATION Final Report

L M Handley, W E Houghby, W H Johnson, T G Schiller, and H Y Stryker Jun 1979 57 p ref Sponsored by Elec Power Res Inst
(EPRI-EM-1134) Avail NTIS HC A04/MF A01

The integral cell configuration of the 4 8 MW demonstrator cell size was scaled and the full size packages were tested in short cell stacks to verify the acid management capability and document performance Low cost cell stack construction techniques were refined and materials were modified to produce improved cell stack components A 1530-hour test of a 20-cell stack demonstrated that the performance of the integral cell configuration was equivalent to that of the 4 8-MW demonstrator configuration, and that increased acid inventories could be accommodated in the electrodes without severe performance penalties Improvements in acid cell stack technology that would be sufficient to allow a 20 percent reduction in total active cell area relative to the demonstrator were investigated Improvements to previously developed catalysts, catalyst layers, and application techniques were investigated, and subscale single cell endurance tests were conducted A cell stack conceptual design incorporating the integral cell concept was initiated DOE

N80-13647# California Univ., Livermore Lawrence Livermore Lab

TIDAL PRESSURE RESPONSE AS A RESERVOIR ENGINEERING TOOL

J M Hanson Jul 1979 5 p refs Presented at Geothermal Resources Council Ann Meeting, Reno, Nev., 24 Sep 1979
(Contract W-7405-eng-48)
(UCRL-83012; CONF-790906-10) Avail NTIS HC A02/MF A01

Fluid pressure oscillations resulting from tidal strain reflect hydrologic and elastic properties of a reservoir. Precise measurement and interpretation of these pressure fluctuations has the potential of being a useful quantitative reservoir engineering tool A procedure was developed that quantifies the spectral resolution in terms of an absolute confidence level in both amplitude and phase of the spectral estimate Analysis of one week of data from a well in the Salton Sea is presented DOE

N80-13648# California Univ., Berkeley Lawrence Berkeley Lab Energy and Environment Div

CHARACTERIZATION OF SOLID-WASTE CONVERSION AND COGENERATION SYSTEMS

Ronald L Ritschard, Kendall F Haven, Mark Henriquez, Josh Kay, and William Walzer 15 Aug 1978 226 p refs
(Contract W-7405-eng-48)
(LBL-7883) Avail NTIS HC A11/MF A01

Three basic technologies for recovering energy from municipal solid wastes (MSW) are considered (1) direct combustion using a waterwall incinerator in which heat from burning refuse is converted to steam by circulating water in steel tubes jacketing the interior of the incinerator; (2) manufacture of a relatively uniform shredded, pulverized, or pelleted refuse derived fuel for supplemental firing in a utility boiler; and (3) pyrolysis or destructive distillation of MSW to extract a low Btu fuel gas End use applications of cogeneration systems include fluidized bed systems for use in the pulp and paper industry, diesel systems using the digested sewage gas of a sewage treatment plant for electricity generation, heating and pumping; and an enhanced oil recovery system Comparisons are made of Landguard pyrolysis, Garrett flash pyrolysis, Union Carbide Purox process, direct combustion, refuse derived fuels, fluidized bed cogeneration, diesel cogeneration, and enhanced oil recovery DOE

N80-13649# Midwest Research Inst., Golden, Colo

REVIEW OF THE ENVIRONMENT EFFECTS AND BENEFITS OF SELECTED SOLAR ENERGY TECHNOLOGIES

Kathryn A Lawrence May 1979 18 p refs
(Contract EG-77-C-01-4042)
(SERI/TP-53-114R) Avail NTIS HC A02/MF A01

The environmental effects of photovoltaic cells, wind energy conversion (WEC), and the solar thermal central receiver are reviewed and summarized The solar energy technologies are assumed to be deployed as centralized energy production facilities The phase of resource extraction and component production is the most environmentally hazardous Impacts of plant construction will be somewhat site specific but should approximate impacts associated with any large construction activity The operation phase is relatively environmentally benign The WEC operation produces low level noise pollution and presents minimal hazards to flying species Solar thermal facilities equipped with wet cooling towers may affect local air quality via cooling tower drift In addition, large installations of each option may alter local microclimate Decommission of WEC, solar thermal, and photovoltaic facilities should prevent no environmental hazards, although disposal of CdS or GaAs cells will require care DOE

N80-13650# Brookhaven National Lab, Upton, N Y

PROCESS OPTIMIZATION OF INDUSTRIAL ENERGY USE

D A Pilati and F T Sparrow (Purdue Univ) 1979 7 p refs Presented at the Intern Conf on Energy Use Management, ICEUM-2, Los Angeles, 22-26 Oct 1979 Submitted for publication

(Contract EY-76-C-02-0016)
(BNL-26482; CONF-791009-3) Avail: NTIS
HC A02/MF A01

A set of industry-specific process optimization models are developed. These models are to be used for energy use projections, energy policy analyses, and process technology assessments. Applications of the models currently under development show that: (1) system wide energy impacts may be very different from engineering estimates; (2) selected conservation strategies may have the perverse effect of increasing energy use; and (3) a proper combination of energy taxes and investment tax credits is more socially desirable than either policy alone. DOE

N80-13651# Brookhaven National Lab., Upton, N. Y.
CASE STUDY OF THE BROWNELL LOW ENERGY REQUIREMENT HOUSE
R. F. Jones, R. F. Krajewski, and G. Dennehy May 1979 78 p refs
(Contract EY-76-C-02-0016)
(BNL-50968) Avail: NTIS HC A05/MF A01

The design and thermal performance of an innovative house built in 1977 in the Adirondacks area of New York State was evaluated. The house has a very tight and well-insulated envelope, with the rigid insulation board applied to the outside of the frame. Passive solar gain through south-facing glass, along with internal free sources of heat, are shown to provide a substantial part of the building's heating requirements. Effective integral thermal storage, provided by the exposed interior structure, serves to keep interior temperature excursions within acceptable limits. Additional remote storage is provided in the form of a large thermal storage sand bed, with air ducts, located below the basement floor. Calculations and measured performance data show that the house's space heating needs are only about 40 percent of those of a similar size house built to minimum property standards, and less than 25 percent of those of a typical inventory house in the Northeast United States. DOE

N80-13653# Los Alamos Scientific Lab., N. Mex.
ENERGY PLANNING WITH SOLAR AND CONSERVATIONS: INDIVIDUAL VALUES AND COMMUNITY CHOICE
S. A. Noll, F. Roach, and L. Palmiter 1979 6 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-1599; CONF-790541-24) Avail: NTIS
HC A02/MF A01

Conflict among the priorities of individuals, private sector businesses, and government entities involving the transition to a renewable energy-resource base is considered. These conflicts are intensified by the overwhelming number of externalities created by the actions of each of these decision making groups. An illustrative example of the benefits to be derived from community energy planning is given. It is shown that community energy programs have the potential to stimulate household and community income, create job opportunities, develop a more resilient energy economy, and help mitigate environmental deterioration. DOE

N80-13654# Brookhaven National Lab., Upton, N. Y.
DESIGN, CONSTRUCTION, AND OPERATION OF THE SOLAR ASSISTED HEAT PUMP GROUND COUPLED STORAGE EXPERIMENTS AT BROOKHAVEN NATIONAL LABORATORY
P. D. Metz 1979 8 p refs Presented at the 4th Ann. Heat Pump Technol. Conf., Stillwater, Okla., 9 Apr. 1979
(Contract EY-76-C-02-0016)
(BNL-25908; CONF-790446-3) Avail: NTIS
HC A05/MF A01

The design, construction, and initial operation of the first generation experiments are discussed. Four of these experiments involve buried tanks, and four use buried serpentine coils of 1 1/2 inch diameter flexible polyethylene pipe in various configurations and lengths. Heat is added to or removed from each experiment by hot water heaters or heat pumps. The amount of heat added or removed is determined by a computer program which simulates all parts of the solar system except for the ground coupling device. Experiments conducted to determine ground thermal conductivity, heat capacity, diffusivity, and moisture content are also discussed. The overall research program plan and some early results are presented. DOE

N80-13655# Rosenblatt (M.) and Son, Inc., New York.
OTEC PLATFORM CONFIGURATION AND INTEGRATION. VOLUME 1: SYSTEMS ENGINEERING AND INTEGRATION Final Report
7 Jul. 1978 228 p refs
(Contract EG-77-C-01-4065)
(TID-29418) Avail: NTIS HC A11/MF A01

An evaluation methodology was developed for the purpose of analyzing the ocean system requirements against the site criteria and in arriving at the conclusions as far as hull, seawater system, positioning system, and other ocean systems characteristics. Feasibility studies and cold water pipe/hull stress analyses indicated that the best platform hull shape would be one that would have a submerged main body and the cold water pipe would be attached to it in a flexible joint type configuration, possibly with flexible joints along the length as well. The best positioning system would be a static mooring system, possibly 3-leg, using hollow cylindrical links for lines. DOE

N80-13656# Ocean Data Systems, Inc., Monterey, Calif.
OTEC THERMAL RESPONSE REPORT FOR PACIFIC PLANT SHIP, 5 TO 10 DEG N 90 TO 95 DEG W
W. A. Wolff May 1979 44 p refs
(Contract ET-78-C-01-2898)
(HCP/T2898-01/3) Avail: NTIS HC A03/MF A01

The temperature difference resource for the plant ship region between 5 to 10 North latitude and 90 to 95 West longitude is evaluated for potential OTEC use. Surface temperatures are consistently high with the monthly mean temperatures ranging from 26.5 C to 28.5 C. An annual mean delta T greater than 20 C is available at 550 meters. Bottom depths are much greater than 1500 meters for the entire plant ship region. The mixed layer depth is very shallow throughout the year, and may be nonexistent at times indicating a warm water intake near the surface. High winds and storms are not a major problem for this site, due in part to the proximity to the equator. Mean surface currents are somewhat larger in magnitude than other Pacific sites. The site chosen is located near the approximate limits of the North Equatorial Current and the Pacific Equatorial Countercurrent. Current shear may cause problems. DOE

N80-13658# Department of Energy, Washington, D. C. Energy Storage Systems Div.
MULTI-YEAR PLAN FOR THERMAL AND MECHANICAL ENERGY STORAGE PROGRAM
Jun. 1979 79 p refs
(DOE/ET-0109) Avail: NTIS HC A05/MF A01

Reliable, efficient, and inexpensive energy storage technologies to support other DOE end-use divisions in their substitution and energy-savings missions are discussed. In addition to thermal and mechanical technology development, the Technical and Economic Analysis subprogram which supports both the Thermal and Mechanical Storage Program and the Electrochemical (Battery) Storage Program is described. The DOE end-use organizations that benefit from development of thermal and mechanical storage technologies are: Central Solar Technology, Distributed Solar Technology, Solar Applications, Transportation Programs, Buildings and Community Systems, Industrial Energy Conservation, and Resource Applications. DOE

N80-13660# Aerojet Energy Conservation Co., Sacramento, Calif.
MULTI-USE GEOTHERMAL ENERGY SYSTEM WITH AUGMENTATION FOR ENHANCED UTILIZATION. NON-ELECTRIC APPLICATION OF GEOTHERMAL ENERGY IN SUSANVILLE, CALIFORNIA Final Report
G. K. Olsonn, D. L. Benner-Drury, and G. R. Cunnington Feb. 1979 200 p refs
(Contract ET-78-C-03-1740)
(DOE/ET-248447/1) Avail: NTIS HC A09/MF A01

Multi-use, augmented geothermal space/water heating and cooling systems were studied. The overall benefits in both the public and private sectors, of using low temperature (150 F to

240 F) geothermal resources are explored. Options considered, alone and in combination, include heat pumps, fossil-fuel peaking, user load balancing, and cascading from the geothermal system serving the public buildings into a private Park of Commerce development. A range of well temperatures, depths, flow rates, and drilling costs are considered to provide system cost sensitivites. A planned development is emphasized for ease of financing and expansion. A preliminary design of Phase A of a Susanville Public Building Energy System and a conceptual design of an integrated Park of Commerce, Phase 1, are included. This system was designed for a 150 F resource and can be used as a model for other communities with similar resource temperatures. DOE

N80-13661# Research Triangle Inst., Research Triangle Park, N. C.
NOVEL CONCENTRATOR PHOTOVOLTAIC CONVERTER SYSTEM DEVELOPMENT Final Report
S. M. Bedair, M. F. Lamorte, and J. R. Hauser Jul. 1979 207 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7040) Avail: NTIS HC A10/MF A01

The development, synthesis, and evaluation of a cascade solar cell having an AM 1 conversion efficiency of 30 percent or greater and capable of operating at both high illumination levels and elevated temperatures is discussed. A comparison of the cascade solar cells with conventional single junction solar cells is presented. A number of ternary and quaternary material systems which have potential application to the cascade solar cell are discussed. Demonstration cells built in the GaAs/AlGaAs material systems are examined. A.W.H.

N80-13662# Department of Energy, Washington, D. C. Office of Solar, Geothermal, Electric and Storage Systems.
SOLAR THERMAL POWER SYSTEMS Annual Technical Progress Report, 1978
Jun. 1979 144 p refs
(DOE/ET-0078/T1) Avail: NTIS HC A07/MF A01

The development of solar thermal power system technology for midtemperature, solar total energy, small community, irrigation, and large power systems is discussed. Subsystem and component development is also described. K.L.

N80-13663# Bureau of Reclamation, Boulder City, Nev.
SOLAR THERMAL ELECTRIC PLANTS IN HYDROELECTRIC GRID Technical Progress Report, 9 Feb. - 9 May 1979
17 Jul. 1979 26 p refs
(Contract DE-AI03-79SF-10505)
(DOE/SF/10505-1) Avail: NTIS HC A03/MF A01

Factors to be used in candidate site selection were determined, factor maps were compiled, and the development of a hydrologic model of the river/reservoir system was initiated. In addition, initial performance and cost data were reviewed for three solar power systems. K.L.

N80-13665# Lincoln Lab., Mass. Inst. of Tech., Lexington.
EVALUATION OF COMBINED PHOTOVOLTAIC/THERMAL COLLECTORS
S. D. Hendrie 1979 6 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract EG-77-S-02-4577)
(COO-4577-8; CONF-790541-54) Avail: NTIS HC A02/MF A01

The thermal and electric performance of an air and a liquid type combined photovoltaic/thermal solar collector was evaluated, yielding close correlation with theoretical results. Maximum thermal efficiencies of 42.5% and 40% for the liquid and air collectors without electric power production decreased to 40.4% and 32.9% when electrical power were produced. Maximum electrical efficiencies of 6.8% were measured. DOE

N80-13666# Oak Ridge National Lab., Tenn.
EXPERIMENTAL AND ANALYTICAL OTEC STUDIES AT ORNL
J. W. Michel 1979 8 p refs Presented at 6th OTEC Conf., Washington, D. C., 19 Jun. 1979
(Contract W-7405-eng-26)
(CONF-790631-1) Avail: NTIS HC A02/MF A01

Ammonia condensation tests were performed on several vertical fluted tubes and on tubes inclined at 30 deg from the vertical position. The high condensation coefficients reported for fluted tubes were verified. They seemed to be insensitive to tube length over the range tested. Also, tilting the tubes significantly improved the performance of smooth tubes and caused a slight decrease in the performance of fluted tubes. The cost effectiveness of various types of heat transfer enhancement were evaluated and heat exchanger joinability was surveyed. DOE

N80-13667# Franklin Pierce Law Center, Concord, N. H. Energy Law Inst.
FUNDAMENTAL ECONOMIC ISSUES IN THE DEVELOPMENT OF SMALL-SCALE HYDRO
Peter W. Brown and M. Ringo 15 Mar. 1979 28 p
(Contract RA-23-216.00.0)
(DOE/RA-23-216.00.0-02) Avail: NTIS HC A03/MF A01

The analysis presented is based on literature reviews, case studies, on-site visits, and particularly information from the Franklin Pierce - Thayer project. Broadly stated, economic analysis to data suggests that legal and regulatory constraints are the major obstacles for the slow development of SSH development. The economic picture of a hydro site as if it were a typical small business is described. The discussion is broken down into four parts, namely: costs, supply, demand and profitability. DOE

N80-13668# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
SOLAR COOLING PERFORMANCE IN CSU SOLAR HOUSE 3
D. S. Ward, J. C. Ward, and H. S. Oberoi Jan. 1979 20 p refs
(Contract EY-76-S-02-2858)
(COO-2858-23) Avail: NTIS HC A02/MF A01

Preliminary performance and pertinent operating experience with a liquid-heating flat-plate solar collector integrated with a residential solar heating and cooling system is presented. Data for the months of July and August (1978) are included, along with an analysis of the operation of the solar cooling system which utilizes the Yazaki 2-ton lithium bromide absorption chiller and a cool storage subsystem. Results of the analysis provide clear indications of the critical importance of temperature differentials between the collector outlet and the absorption chiller generator inlet, the effects of alternative control strategies, the marginal feasibility of cool storage, the devastating effect on system performance of the heat losses from the thermal storage unit, and the importance of parasitic power requirements on the ultimate feasibility of solar absorption cooling. DOE

N80-13669# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
TECHNOLOGY DEVELOPMENT NEEDS FOR HIGH TEMPERATURE PROCESS HEAT
Robert J. Copeland Aug. 1978 62 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-35-047) Avail: NTIS HC A04/MF A01

The potential utilization of high temperature solar thermal process heat was investigated. The petroleum industry was reviewed in some detail, and one candidate technology using hydrogen for energy transport was also investigated. Costs, land availability, and energy transfer were the key problem areas. With appropriate development all problems appeared solvable. More detailed evaluations of each large user industry were recommended. DOE

N80-13670# RCA Labs., Princeton, N. J.
MATERIALS FOR SOLAR THERMAL CONVERSION Final Report, 1 Sep. 1977 - 31 Aug. 1978
J. I. Gittleman and E. K. Sichel Sep. 1978 22 p refs
(Contract EG-77-C-02-4557)
(COO-4557-1; PRRL-78-CR-42) Avail: NTIS HC A02/MF A01

Composite semiconductors were produced by cosputtering Ge and Si with CaF2 and their optical constants were measured. The normal specular reflectance of films sputtered on mirrored surfaces was measured. These data were used to compute the solar absorptance alpha/sub s/ and thermal emittance epsilon/sub th/. Thus at T = 500 C a conversion efficiency of 50 percent is possible at solar concentration ratios C of 7 to 8, and about 70 percent is possible for C approximately 40. It was concluded that a parabolic trough, a distributed receiver with a concentration ratio of 50 or less could be more economical for some applications than a central receiver for which C > 500, but the possiblity of using these and other highly selective absorbers for the economical conversion of solar energy should be considered. DOE

N80-13671# Virginia Univ., Charlottesville.
EXPERIMENTAL AND THEORETICAL EVALUATIOM OF A NOVEL CONCENTRATING SOLAR ENERGY COLLECTION SYSTEM
Alexander B. Maish and J. Taylor Beard 1979 5 p refs Presented at the 1979 Intern. Solar Energy Congr., Atlanta, 28-30 May 1979
(Contract EY-76-C-04-0789)
(SAND-79-1053C; CONF-790541-3) Avail: NTIS HC A02/MF A01

A new concentrating solar energy system was evaluated theoretically and experimentally. The modular, two-axis tracking collector combined an aluminized mylar reflector with a flat plate absorber. Radiation collected from the 7 sq m frontal area was concentrated by a factor of five, making the collector suitable for intermediate temperature applications. The thermal performance of the collector was determined theoretically on a digital computer using a nodal approach to model the heat transfer processes. Collector sensitivies to environmental parameters were calculated. An experimental testing program conducted according to testing standards verified the predicted results. DOE

N80-13672# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
TRANS-SEASONAL STORAGE OF SOLAR ENERGY: INNOVATIVE RESEARCH PROGRAM SUBTASK Final Report, Dec. 1977 - Sep. 1978
W. D. Kemper and W. R. Walker Oct. 1978 27 p refs
(Contract EG-77-S-02-4546)
(COO-4546-3) Avail: NTIS HC A03/MF A01

The efficiencies and economics of long term storage of solar energy as low temperature heat in shallow underground reservoirs constructed using in situ soil materials are evaluated. Simulation models for predicting the movement of water and heat in response to temperature and capillary pressure gradients in partially saturated porous media are developed and conditions which might predict the rate and extent to which dry insulating blankets of soil form around hot buried reservoirs are simulated. The effect of confining barriers which restrict vapor and liquid flow of water is also simulated. The thermal conductivities of low cost and in situ materials which may be used in the construction of underground heat reservoirs are evaluated and methods of optimizing the thermal conductivities of these materials are developed.
DOE

N80-13673# Los Alamos Scientific Lab., N. Mex.
HOT DRY ROCK GEOTHERMAL ENERGY DEVELOPMENT PROGRAM Annual Report, 1978
M. C. Brown, comp., R. B. Duffield, comp., C. L. B. Siciliano, comp., and M. C. Smith, comp. Apr. 1979 132 p refs
(Contract W-7405-eng-36)
(LA-7807-HDR) Avail: NTIS HC A07/MF A01

Run segments were completed in the prototype reservoir of the energy-extraction system at Fenton Hill, New Mexico. The tests yielded significant data on system flow parameters, water loss rates, geofluid chemistry, downhole flow impedance, operational constraints, mathematical modeling, technology and instrument capabilities, and environmental effects of operation. The technical results indicated that energy (thermal or electrical) from hot dry rock may be a feasible alternate energy source. Also, plans were prepared for a system with a commercial size reservoir that can demonstrate the production lifetime of such a system. DOE

N80-13674# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
WIND ENERGY INNOVATIVE SYSTEMS Technical Status Report, Jul. 1978
Irwin E. Vas Aug. 1978 58 p refs
(Contract EG-77-C-01-4042)
(SERI/PR-13-054) Avail: NTIS HC A04/MF A01

Economic and technical feasibility of innovative concepts and systems utilizing wind energy were investigated. Technical management of the 'wind energy innovative systems' program is discussed. The efforts of the current contracts are included within four major task areas: (1) theoretical thermodynamic and aerodynamic studies, (2) model design, fabrication, and test, (3) performance projections, and (4) economic evaluations.
R.E.S.

N80-13675# Power Technologies, Inc., Schenectady, N. Y.
INDUCTION AND SYNCHRONOUS MACHINES FOR VERTICAL AXIS WIND TURBINES Final Report
E. N. Hinrichsen Jun. 1979 123 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7017) Avail: NTIS HC A06/MF A01

The behavior of synchronous and induction generators driven by vertical axis wind turbines is described. The merits of the two types of machines are assessed. Major advantages of the synchronous generator are reactive power control and general acceptance by utility companies. The major advantage of the induction generator is excellent damping of torque pulsations. There is no significant difference in starting ability, efficiency, or voltage ripple.
DOE

N80-13676# Oak Ridge National Lab., Tenn.
LAND-BASED APPLICATION OF AN OTEC OPEN-CYCLE POWER SYSTEM
F. C. Chen 1979 6 p refs Presented at 6th OTEC Conf., Washington, D.C., 19 Jun. 1979
(Contract W-7405-eng-26)
(CONF-790631-3) Avail: NTIS HC A02/MF A01

Application of OTEC power component technology to many land-based low temperature heat resources including rejected heat from thermal plants and Federal nuclear facilities, as well as freshwater thermoclines is considered. For utilizing rejected heat from large thermal power plants where OTEC range cold water is economically available, it is more cost-effective to apply OTEC open-cycle steam turbine technology for additional turbine stages for the conventional thermal power plant cycle rather than to add a separate bottoming cycle system. For utilizing rejected heat from Federal nuclear facilities, the open-cycle power system has its advantage because it does not need isolation heat exchangers to avoid cross contamination between the working fluid and the hot water supply. A simple thermal performance model and the thermal analysis of a conceptual rejected heat open-cycle power system corresponding to binary cycle system studies are presented.
DOE

N80-13677# Los Alamos Scientific Lab., N. Mex.
CONCEPTUAL DESIGNS FOR TWO REJECT HEAT SYSTEMS FOR A BRAYTON CLOSED-CYCLE CONVERTER
G. A. Bennett May 1979 32 p refs
(Contract W-7405-eng-36)
(LA-7821-MS) Avail: NTIS HC A03/MF A01

Designs for two candidate reject heat systems (RHS) developed for a Brayton closed-cycle space nuclear power system are described. The most important constraints imposed on the design are the size and mass limits and the rigid survival standard of 99% probability that the RHS be functional at full power at the end of a seven-year mission. The secondary loop design includes a pumped-NaK radiator and a heat-pipe heat exchanger. The radiator is of conventional design with armored flow tube passages and fins arranged in rectangular panels placed at right angles to each other. The heat exchanger is a cylindrical pressure vessel with four radiator loops and two converter loops. The direct-pumped gas RHS is designed with many thin-walled, finned heat pipes placed side by side to form rectangular radiator panels that are arranged at right angles to each other. The gas heat exchanger is an armored manifold composed of multiple parallel flow tubes placed at the evaporator end of the radiator heat pipes. J.M.S.

N80-13678# University of Southern California, Los Angeles. Dept. of Materials Science.

LOW COST SOLAR CELLS BASED ON AMORPHOUS SILICON ELECTRODEPOSITED FROM ORGANIC SOLVENTS Technical Quarterly Progress Report, 1 Dec. 1978 - 28 Feb. 1979

F. A. Kroeger 1979 5 p refs
(Contract EY-76-S-03-0113)
(SAN-0113-T3; TQPR-2) Avail: NTIS HC A02/MF A01

Electrodeposition studies using three possible silicon sources are reported. Improvements of the apparatus for the cathodic deposition of a-Si with the exclusion of air are discussed. Experiments are described which attempt to characterize the structure of the deposits. These include mass spectroscopy and X-ray diffraction analysis. DOE

N80-13679# Ames Lab., Iowa.

FOSSIL ENERGY PROGRAM. 1. MINING RESEARCH AND DEVELOPMENT: COAL PREPARATION AND ANALYSIS Technical Progress Report, 1 Oct. - 31 Dec. 1978

May 1979 112 p
(Contract W-7405-eng-82)
(IS-4655) Avail: NTIS HC A06/MF A01

The objectives and progress for eight areas of the fossil energy program are reported. Research topics presented include the development of fine coal desulfurization and recovery technology, the microstructure of coal, the recovery of minerals from coal fly ash, and alloy evaluation for fossil fuel process plants. A.W.H.

N80-13680# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.

THERMAL PERFORMANCE OF BUILDINGS AND BUILDING ENVELOPE SYSTEMS: AN ANNOTATED BIBLIOGRAPHY

William L. Carroll Apr. 1979 41 p Presented at the DOE/ASTM Thermal Insulation Conf., Tampa, Fla., 23-24 Oct. 1978
(Contract W-7405-eng-48)
(LBL-8925) Avail: NTIS HC A03/MF A01

A bibliography of published papers describing models, measurement techniques, apparatus, and data for the thermal performance of whole buildings and building envelope systems is presented. Summary descriptions of the content of each citation are provided. Citations on analytical models are selective and concentrate on methodology that forms the basis of computer programs for whole building energy analysis. Approached to dynamic measurements, both in the laboratory and in the field, for envelope systems and for whole buildings are included. DOE

N80-13681# Department of Energy, Oak Ridge, Tenn. Technical Information Center.

COGENERATION OPPORTUNITIES

1978 268 p refs Presented at Cogeneration Opportunities: A Symp. on Prospects for Ind. and Utility Gas, Oil and Coal-Fired Cogeneration, St. Louis, 6-7 Jun. 1978
(CONF-7806118) Avail: NTIS HC A12/MF A01

Thirteen unedited papers from a symposium covering government, industry, and utility cooperation in the use of waste energy for generating electricity and heat are presented. Specific topics discussed include process economics, institutional barriers to cogeneration, industrial cogeneration options, and utility experiences in cogeneration. K.L.

N80-13686# General Electric Co., Santa Barbara, Calif. Center for Advanced Studies.

LARGE-SCALE ANNUAL-CYCLE THERMAL ENERGY STORAGE IN AQUIFERS

C. F. Meyer Apr. 1979 19 p refs Presented at Intern. Assembly on Energy Storage, Dubrovnik, Yugoslavia, 27 May 1979
(Contract W-7405-eng-26)
(CONF-790515-3) Avail: NTIS HC A02/MF A01

Thermal energy storage in aquifers is examined. Potential benefits of aquifer storage in a large district heating/cogeneration system proposed for an urban area are discussed. DOE

N80-13687# Lincoln Lab., Mass. Inst. of Tech., Lexington.

COST ANALYSIS OF PACKED BEDS FOR THERMAL ENERGY STORAGE

N. I. Hamilton 3 Dec. 1978 36 p refs
(Contract EX-76-A-01-2295)
(CAES-11) Avail: NTIS HC A03/MF A01

A cost analysis of packed beds for thermal-energy storage (TES) in an adiabatic compressed-air-energy storage system is given. Capital costs based on the conceptual design of a TES unit are estimated and their sensitivity to system parameter variation is studied. Two TES conceptual designs were considered for: an excavated cavity, and an abandoned mine. A cost comparison is made between surface-sited and underground TES. A cost model was constructed to study the effect of pebble size, insulation thickness, temperature, storage pressure, storage capacity, and other TES components on the TES capital cost. DOE

N80-13688# Battelle Columbus Labs., Ohio.

PHOTOVOLTAIC CONCENTRATOR APPLICATION EXPERIMENT. PHASE 1: A 150 kW PHOTOVOLTAIC CONCENTRATOR POWER SYSTEM FOR LOAD-CENTER APPLICATIONS WITH FEEDBACK INTO THE UTILITY GRID Final Report, 1 Jun. 1978 - 31 Mar. 1979

G. T. Noel, G. Alexander, L. H. Stember, G. H. Stickford, H. E. Small, J. H. Broehl, and D. C. Carmichael Apr. 1979 123 p refs
(Contract ET-78-C-04-4267)
(DOE/CS-34267/1) Avail: NTIS HC A06/MF A01

A 150 kW peak concentrator-type photovoltaic power system was designed for multiple building load application. The system will operate in parallel with the utility grid (which provides backup power) to supply either or both of two service commercial buildings and will feed surplus power into the utility grid. System performance analysis indicates that the system will supply approximately 147,000 kWh/year to the primary load and an additional 55,000 kWh/year to the utility grid, in the single-load operational mode. The system design and the daily and seasonal match of system output with the load are described in detail. Plans are also discussed for installation and for operational evaluation of performance, economics, and institutional issues. DOE

N80-13689# Argonne National Lab., Ill.

STATUS OF DEVELOPMENT, ENERGY AND ECONOMICS ASPECTS OF ALTERNATIVE TECHNOLOGIES

P. S. Farber, C. D. Livengood, K. E. Wilzbach, W. L. Buck, and H. Huang 1979 49 p refs Presented at 5th Flue Gas Desulfurization Symp., Las Vegas, Nev., 5 Mar. 1979
(Contract W-31-109-eng-38)
(CONF-790371-1) Avail: NTIS HC A03/MF A01

Several energy technologies under development throughout the world which either totally negate the need for flue gas desulfurization or require less than full flue gas scrubbing are examined. These processes remove sulfur either prior to coal combustion during combustion, or between two combustion stages. The status of development and/or demonstration of these technologies with respect to the possible application to the generation of electricity is reviewed. The overall coal to electrical energy efficiency and economics (capital costs and total annualized costs, mills/kWh) are explored, and compared for the various alternatives. DOE

N80-13690# Los Alamos Scientific Lab., N. Mex.

CRITICAL REVIEW AND ASSESSMENT OF ENVIRONMENTAL AND SAFETY PROBLEMS IN HYDROGEN ENERGY SYSTEMS Progress Report, 1 Oct. 1977 - 30 Sep. 1979

F. J. Edeskuty, comp. and N. N. Sheheen, comp. May 1979 249 p refs
(Contract W-7405-eng-36)
(LA-7820-PR) Avail: NTIS HC A11/MF A01

The safety aspects and environmental problems of using hydrogen in energy systems are examined. Topics include hydrogen embrittlement, hydrogen dispersion after a gas leak of liquid spill, hydrogen combustion, an assessment of regulations and standards for hydrogen development, and hydrogen transmission through pipelines. A.W.H.

N80-13691# Department of Energy, Washington, D. C. Office of Solar, Geothermal, Electric and Storage Systems.
PHOTOVOLTAIC SYSTEMS. PROGRAM SUMMARY
Dec. 1978 366 p refs
(DOE/ET-0019/2) Avail: NTIS HC A16/MF A01

The photovoltaic systems program projects during fiscal year 1978 are described. The project sheets list the contractor, principal investigator, contract number and funding, and summarize the programs and status. The program is divided into various elements: program assessment and integration, research and advanced development, technology development, system definition and development, system application experiments, and standards and performance criteria. DOE

N80-13692# Lincoln Lab., Mass. Inst. of Tech., Lexington.
TEST PLAN FOR THE MEAD 25-kW PHOTOVOLTAIC FLEXIBLE TEST FACILITY, 1979
R. F. Hopkinson 15 Mar. 1979 21 p ref
(Contract EY-76-C-02-4094)
(COO-4094-53) Avail: NTIS HC A03/MF A01

The operations of the Mead 25-kW Photovoltaic System are reported along with descriptions on how the flexible test bed is expected to be used in experiments with a variety of PV applications, including irrigation, crop drying and fertilizer manufacturing. The planned operations for the Mead site during 1979 are given, and a schedule is attached. DOE

N80-13693# Sandia Labs., Albuquerque, N. Mex.
SANDIA LABORATORIES OPERATIONAL EXPERIENCE WITH SMALL HEAT ENGINES IN SOLAR THERMAL POWER SYSTEMS
Joseph P. Abbin, Jr. 1979 5 p refs Presented at 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contracts EY-76-C-04-0789; DE-AC04-76DP-00789)
(SAND-78-2163C; CONF-790803-23) Avail: NTIS HC A02/MF A01

Hardware and operating experience obtained from the construction and testing of two small Rankine-cycle solar thermal power plants are described. The first plant is part of a prototype solar total energy system with an electrical generating capacity of 32 kW, and the second plant is part of a prototype solar irrigation unit with a shaft power output of 19 kW or an electrical output of 15 kW. DOE

N80-13694# Lincoln Lab., Mass. Inst. of Tech., Lexington.
NOVEL CERAMIC RECEIVER FOR SOLAR BRAYTON SYSTEMS
Philip O. Jarvinen 1979 7 p Presented at ASME Gas Turbine Closed-Cycle Session, San Diego, Calif., 12-15 Mar. 1979
(Contract ET-78-S-02-4878)
(COO-4878-3; CONF-790305-7) Avail: NTIS HC A02/MF A01

Receivers for solar thermal heated air Brayton power systems are discussed. The ceramic domed cavity receiver concept is examined. The development of a high temperature seal for the solar heating air cavity receiver is reported. Mechanical dome sealing methods for this purpose are reviewed and investigations to establish the technological foundation of the seal concepts by demonstrating that ceramic domes can be designed to support the combined pressure, thermal stress, and temperature loads of a heated air receiver are presented. A.W.H.

N80-13695# Argonne National Lab., Ill.
MATERIALS TESTING FOR CENTRAL RECEIVER SOLAR THERMAL POWER SYSTEMS
S. Majumdar 1978 13 p
(Contract W-31-109-eng-38)
(TID-29443) Avail: NTIS HC A02/MF A01

Biaxial creep-fatigue tests (constant tensile hoop stress and cyclic axial strain with hold times in compression) were performed on type 316H stainless steel superheater tubing. A comprehensive survey of information on sodium effects on candidate materials for solar-thermal electric piping and steam generators was conducted. Mechanical property data were generated in support of the ASME code development. DOE

N80-13696# Argonne National Lab., Ill.
OTEC POWER SYSTEMS
1979 14 p refs Presented at Offshore Technol. Conf., Houston, Tex., 30 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790444-2) Avail: NTIS HC A02/MF A01

The technical features of design studies of power systems using shell and tube heat exchangers and shell-less heat exchangers are presented. Heat exchanger design, biofouling control, rotating equipment, auxiliaries, plant layout, and system cost are among the areas discussed. The role of the power systems development program in the larger OTEC program is also discussed. DOE

N80-13697# Solarex Corp., Rockville, Md.
SILICON CONCENTRATOR SOLAR CELL MANUFACTURING DEVELOPMENT
C. Wrigley, G. Storti, and J. Wohlgemuth Nov. 1978 69 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7021) Avail: NTIS HC A04/MF A01

The program to design and develop the manufacturing technology for silicon solar cells suitable for low-cost photovoltaic concentrator systems is summarized. Detailed discussions are presented for the following tasks: concentrator design, manufacturing process development, solar cell measurement and evaluation, results experienced in cell manufacturing, and production cost estimates. Conclusions and recommendations are given. In particular, it is found that (1) large area concentrator cells with 15% efficiency at 50 suns are readily manufacturable, (2) DOE cost goals for 1981 to 1982 can be met today with market volumes at 200 to 1000 sq m per year, and (3) respectable manufacturing yields are achievable with the technology now developed. DOE

N80-13698# Foster Wheeler Corp., Livingston, N.J.
INTERIM STRUCTURAL DESIGN STANDARD FOR SOLAR ENERGY APPLICATIONS, PHASES 1 AND 2 Final Report
I. Berman, A. C. Gangadharan, G. D. Gupta, and T. V. Narayanan Jan. 1979 148 p refs
(Contract DE-AC04-76DP-00789)
(SAND-79-8183) Avail: NTIS HC A07/MF A01

Central receiver solar thermal power systems, relevant ASME codes, reliability considerations, and the criteria used to develop the interim design standard is reviewed. The interim design standard is presented. All criteria or rules chosen or adapted from other codes are fully stated including all design data. A detailed paragraph-by-paragraph explanation of the interim design standard is provided. The test and development program needed to generate design data and to update the interim design standard are identified. DOE

N80-13699# Midwest Research Inst., Golden, Colo.
REVIEW OF SOLAR ENERGY Annual Report, 1977
Oct. 1978 179 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-54-066) Avail: NTIS HC A09/MF A01

A general review of national solar energy programs is provided. An executive summary and a brief history of the Federal solar energy program are presented. The issues and implications of the National Energy Plan that relate to solar energy development are discussed. The present Federal solar energy program is discussed, including the activities of several Federal agencies outside the Department of Energy. Some of the non-Federal solar energy programs are reviewed, including international programs in which the U.S. has some role, programs of state and local governments, college and university programs, the work of private industry, and individual and small scale activities. A synopsis of the major categories of solar technology is provided. A synopsis of major energy events of 1977, a glossary of technical terms, abbreviations, and acronyms, and a table of conversion factors are included. DOE

N80-13700# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
SOLAR CENTRAL RECEIVER PROTOTYPE HELIOSTAT CDRL ITEM B.D., VOLUME 1 Final Report

C R Easton Aug 1978 339 p
(Contract EG-77-C-03-1605)
(SAN-1605/7-Vol-1; MDC-G7399-Vol-1) Avail: NTIS HC A15/MF A01

The preliminary design of a heliostat for central receiver solar thermal power systems which projects to meet the DOE's goal of $72/square m R at production volumes as low as 25,000 units per year and reduces to less than $60/square m R in very high volume production (approximately 1,000,000 units per year) is presented. The manufacturing process, installation and checkout procedures, operation and maintenance procedures, and specification verification and optimization are described. DOE

N80-13701# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN: WIND ENERGY CONVERSION
Jul. 1979 34 p refs
(DOE/EDP-0030) Avail: NTIS HC A03/MF A01

Projects or subprograms pertaining to windpower utilization that are likely to result in a demonstration or commercialization within the near term are presented. Projects that are expected to be considered in greater detail in the Environmental Development Plan update are identified. DOE

N80-13702# Ames Lab., Iowa
FOSSIL ENERGY PROGRAM, 1. MINING RESEARCH AND DEVELOPMENT: COAL PREPARATION AND ANALYSIS Technical Progress Report, 1 Jan. - 31 Mar. 1979
Jun 1979 31 p refs
(Contract W-7405-eng-82)
(IS-4703) Avail: NTIS HC A03/MF A01

The research and development technology in a number of areas in the fossil energy program are examined. Research topics discussed include the microstructure of coal, the development of an online monitoring instrument for pyrite and ash in coal, and coal blending experiments. A.W.H.

N80-13703# Electric Power Research Inst., Palo Alto, Calif.
SOLAR HEATING AND COOLING RESEARCH PROJECTS: A SUMMARY
Neal Lansing May 1979 30 p
(EPRI-ER-1095-SR) Avail: NTIS HC A03/MF A01

The major EPRI solar heating and cooling experiment projects are summarized. In addition to outlining each project and its purpose, the major features of the solar system are described. Also included are relatively detailed descriptions of the performance-monitoring equipment. As additional technical performance results are obtained and new projects added to the program, this document can be updated to include the new information. A basis for verification of analytic work aimed at determining the preferred solar system for any given utility service is provided, i.e., the system that provides the lowest total cost to the consumer and the utility. DOE

N80-13705# Department of Energy, Washington, D. C. Office of Energy Research.
THIN FILM PROBLEMS AND RESEARCH IN ENERGY SYSTEMS
Jan. 1979 159 p refs Presented at ERDA/DPR Symp. on Thin Film Res., Pacific Grove, Calif., 1 Nov. 1976
(CONF-761168-Summ) Avail: NTIS HC A08/MF A01

Presentations and recommendations for future efforts in thin film research for energy related applications are presented. Long term thin film coating needs of three programs whose purpose is to develop national energy sources, are described along with the current state of the art of thin film related technologies. DOE

N80-13706# Argonne National Lab., Ill.
COMMUNITY HEATING AND COOLING SYSTEMS
J. M. Calm Apr. 1979 9 p refs Presented at 4th Ann. Heat Pump Technol. Conf., Stillwater, Okla., 9 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790446-6) Avail: NTIS HC A02/MF A01

Centralized, distributed, and cascaded heat pump centered integrated community energy systems (HP-ICES) approaches are discussed and an analysis showing their conservation potential is presented. Benefits of HP-ICES include reduction of adverse environmental effects, reliable production of services in view of increasingly frequent utility curtailments and interruptions, and provision of services at costs more favorable to consumers. DOE

N80-13707# Iowa State Univ. of Science and Technology, Ames.
ENERGY CONSERVATION VIA HEAT TRANSFER ENHANCEMENT Quarterly Progress Report, 1 Oct. - 31 Dec. 1978
A. E. Bergles, G. H. Junkhan, and R. L. Webb Mar. 1979 21 p refs
(Contract ET-78-S-02-4649)
(COO-4649-4) Avail: NTIS HC A02/MF A01

Research on energy conservation via heat transfer enhancement is summarized. Computerized retrieval files on technical literature, patents, and manufacturers were developed. DOE

N80-13708# Oak Ridge National Lab., Tenn.
INDUSTRIAL APPLICATIONS OF ADVANCED ENERGY SYSTEMS
J. E. Jones, Jr. 1979 3 p refs Presented at ANS Ann. Meeting, Atlanta, 3 Jun. 1979
(Contract W-7405-eng-26)
(CONF-790602-54) Avail: NTIS HC A02/MF A01

Industrial energy options based on coal and nuclear systems were assessed. Both high-temperature and low-temperature reactors were analyzed for heat process applications. In coal systems, a comparison was made of advanced energy conversion systems based on research and development experience. The important factors restricting the use of coal in industry were assessed. An atmospheric fluidized-bed combustion system for industrial cogeneration is discussed along with a preliminary market assessment for the technology. DOE

N80-13710# Sandia Labs., Albuquerque, N. Mex.
WEIGHT MINIMIZATION OF SANDWICH TYPE SOLAR COLLECTOR PANELS
R. C. Reuter, Jr. 1979 13 p refs Presented at 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract EY-76-C-04-0789)
(SAND-78-2305C; CONF-790803-27) Avail: NTIS HC A02/MF A01

The existence, utilization and practicality of a minimum weight, adequately stiff design for sandwich panel construction in solar collector application was analytically evaluated. DOE

N80-13711# Rosenblatt (M.) and Son, Inc., New York.
OTEC PLATFORM CONFIGURATION AND INTEGRATION, EXECUTIVE SUMMARY Final Report
26 Jul. 1978 97 p
(Contract EG-76-C-01-4065)
(DOE/ET-4065/1) Avail: NTIS HC A05/MF A01

The commercialization of the ocean thermal energy conversion (OTEC) concept is discussed. Various areas of the OTEC plant development are examined. These include the design of a marine vessel to house the OTEC power cycle, the development of an OTEC power cycle, studies of the site environment, and the effects of biofouling and corrosion on any of the OTEC components. A.W.H.

N80-13713# Rosenblatt (M.) and Son, Inc., New York.
OTEC PLATFORM CONFIGURATION AND INTEGRATION, APPENDIXES TO VOLUME 2 Final Report
7 Jul. 1978 159 p
(Contract EG-76-C-01-4065)
(DOE/ET-4065/1-Vol-2-App) Avail: NTIS HC A08/MF A01

Detailed information and conceptual design drawings for the spar and sphere platforms for an OTEC commercial plant are presented. A work breakdown structure and a detailed estimate of the spar platform weight are included. DOE

N80-13714# Rosenblatt (M.) and Son, Inc., New York.
OTEC PLATFORM CONFIGURATION AND INTEGATION. VOLUME 3: PROJECT PLAN Final Report
7 Jul. 1978 64 p refs
(DOE/ET-4065/1-Vol-3) Avail: NTIS HC A04/MF A01

The spar and sphere offshore platforms were used to demonstrate the feasibility of a near full size ocean thermal energy conversion (OTEC) plant and to gather data for use in the construction, design and operation of commercial OTEC plants. A hull size suitable to support a 100 MWe net output plant was chosen. Construction of the hull and installation of all equipment is proposed for three sites: (1) a shoreside construction site; (2) an offshore site in sufficient water depth to complete the hull erection; and (3) installation of the cold water pipe at the demonstration site. DOE

N80-13715# National Technical Information Service, Springfield, Va.
GEOTHERMAL ENERGY. PART 1: EXPLORATION, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, May 1976 - Jun. 1979
Audrey S. Hundemann Aug. 1979 264 p Supersedes NTIS/PS-78/0664; NTIS/PS-77/0561 Updates NTIS/PS-76/0463
(NTIS/PS-79/0814/8; NTIS/PS-78/0664; NTIS/PS-77/0561) Avail: NTIS HC $28.00/MF $28.00 CSCL 08I

The bibliography cites Federally-funded research on geophysical methods, such as electrical resistivity, seismology, magnetic anomaly, and electromagnetic measurements in geothermal site survey determination. Studies on well logging, remote sensing, geochemistry, mineralogy, radioactivity, mapping, volcanism, and structural geology are also cited. Criteria for location of geothermal areas are suggested in these abstracts. This updated bibliography contains 256 abstracts, 81 of which are new entries to the previous edition. GRA

N80-13716# National Technical Information Service, Springfield, Va.
GEOTHERMAL ENERGY. PART 2: CORROSION AND EQUIPMENT, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, May 1976 - Jul. 1979
Audrey S. Hundemann Aug. 1979 165 p Supersedes NTIS/PS-78/0665; NTIS/PS-77/0562 Updates NTIS/PS-76/0463
(NTIS/PS-79/0815/5; NTIS/PS-78/0665; NTIS/PS-77/0562) Avail: NTIS HC $28.00/MF $28.00 CSCL 08I

Citations of Government-sponsored research reports on corrosion and equipment studies related to geothermal energy are presented. Studies on pumps, turbines, drilling equipment, pipes, nozzles, and well casings are covered, along with studies on materials including concretes, steels and nonferrous alloys. Silica precipitation and scale formation on equipment are also cited. Performance of equipment in working fluids and brines and the chemical processes affecting performance are included. This updated bibliography contains 157 abstracts, 70 of which are new entries to the previous edition. GRA

N80-13717# National Technical Information Service, Springfield, Va.
GEOTHERMAL ENERGY. PART 3: TECHNOLOGY AND GENERAL STUDIES, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, May 1976 - Dec. 1977
Mona F. Smith Aug. 1979 247 p Updates NTIS/PS-76/0463
(NTIS/PS-79/0816/3) Avail: NTIS HC $28.00/MF $28.00 CSCL 08I

The bibliography covers Government-sponsored research on geothermal energy conversion, power plants, heat extraction, and space heating. Studies on fluid flow, heat transfer, rock fracturing, computerized simulation, pressure, and reservoir engineering are included. Reports on economics, legislation, technology assessment, comparative evaluation with other energy sources, Government policies, and planning are also cited. This updated bibliography contains 239 abstracts, none of which are new entries to the previous edition. GRA

N80-13718# National Technical Information Service, Springfield, Va.
GEOTHERMAL ENERGY, VOLUME 3. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, May 1976 - Jul. 1978
Mona F. Smith Aug. 1979 329 p
(NTIS/PS-79/0818/9) Avail: NTIS HC $28.00/MF $28.00 CSCL 08I

Citations from worldwide literature on geothermal energy conversion, feasibility, development, and cost estimates are presented. Studies on geothermal exploration, drilling technology, fluid flow, convection, thermodynamics, heat extraction, and electric power plants are covered. Equipment, corrosion, reservoir engineering, and remote sensing are included. This updated bibliography contains 323 abstracts, none of which are new entries to the previous edition. GRA

N80-13719# National Technical Information Service, Springfield, Va.
GEOTHERMAL ENERGY. PART 3: TECHNOLOGY AND GENERAL STUDIES, VOLUME 4. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1978 - Jun. 1979
Audrey S. Hundemann Aug. 1979 203 p Supersedes NTIS/PS-78/0666; NTIS/PS-77/0563 Updates NTIS/PS-76/0463
(NTIS/PS-79/0817/1; NTIS/PS-78/0666; NTIS/PS-77/0563; NTIS/PS-76/0463) Avail: NTIS HC $28.00/MF $28.00 CSCL 08I

Research on geothermal energy conversion, power plants, heat extraction, and space heating is reported. Studies on fluid flow, heat transfer, rock fracturing, computerized simulation, pressure, and reservoir engineering are included. Reports on economics, legislation, technology assessment, and comparative evaluation with other energy sources, are presented. This updated bibliography contains 195 abstracts, all of which are new entries to the previous edition. GRA

N80-13720# National Technical Information Service, Springfield, Va.
GEOTHERMAL ENERGY, VOLUME 4. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, Aug. 1978 - Jul. 1979
Audrey S. Hundemann Aug. 1979 149 p Supersedes NTIS/PS-78/0667; NTIS/PS-77/0565; NTIS/PS-76/0465
(NTIS/PS-79/0819/7; NTIS/PS-78/0667; NTIS/PS-77/0565; NTIS/PS-76/0465) Avail: NTIS HC $28.00/MF $28.00 CSCL 08I

Citations from worldwide literature on geothermal energy conversion, feasibility, development and cost estimates are presented. Studies on geothermal exploration, drilling technology, fluid flow, convection, thermodynamics, heat extraction, and electric power plants are covered. Equipment, corrosion, reservoir engineering, and remote sensing are included. This updated bibliography contains 143 abstracts, all of which are new entries to the previous edition. GRA

N80-13723# Oregon State Univ., Corvallis. Air Resources Center.
CRITIQUE OF THE METEOROLOGICAL AND AIR QUALITY BASELINE MONITORING PROGRAM FOR THE PROTOTYPE OIL SHALE LEASEHOLDS. PART A: COMMENTS ON THE APPROACH TAKEN AND RECOMMENDATIONS FOR CONTINUING PROGRAM. PART B: COMMENTS ON THE DATA ACQUISITION AND MANAGEMENT
W. G. N. Slinn, M. A. Wolf, and J. P. Hennessey, Jr. Nov. 1978 58 p refs
(Contract EY-76-S-06-2227)
(DOE/EV-70031/4-Pt-A/B; RLO-2227-T31-4-Pt-A/B) Avail: NTIS HC A04/MF A01

The environmental impact is considered in the event that extensive oil shale resources of Colorado, Utah, and Wyoming are developed to augment the nation's energy needs. Reasons are suggested why existing knowledge is inadequate to provide a valid answer. A means is proposed for accomplishing this important task within a suitable time-period and at a reasonable level of funding. The probable cause of deficiences is identified in the meteorological and air quality data which were acquired over a two-year period on the Federal oil shale leaseholds and improved procedures for future data acquisition efforts are recommended. DOE

N80-13735# Cincinnati Univ., Ohio. Sedimentology Lab.
DEVONIAN PALEOCURRENTS OF THE APPLACHIAN BASIN
Paul Edwin Potter, Wayne A. Pryor, Paul Lundegard, Neil Samuels, and J. Barry Maynard May 1979 66 p refs
(Contract DE-AC21-76MC-05201)
(METC/CR-79/22) Avail: NTIS HC A04/MF A01

The methodology of paleocurrent studies in shaly basins based on both outcrops and oriented cores is set forth as is the relationship between paleocurrents and gas potential. The paleocurrent system of the central and northern Appalachian basin was found to be uniformly oriented to the west. Paleocurrent indicators are at right angles to isopach of total Devonian thickness, which decreases westward from 12,000 ft in eastern Pennsylvania to a few hundred ft in west central Ohio. This clastic wedge is largely of Upper Devonian age and includes alluvial and delta plain environments as well as shelf turbidite slope, and basin plain environments, the latter representing most of the black shales. The gradient of carbon isotopes, which shows more marine than terrestrial carbon in the western part of the basin, closely parallels the average paleocurrent direction of the basin. DOE

N80-13747# Northrop Services, Inc., Huntsville, Ala.
SOLAR-CLIMACTIC STATISTICAL STUDY
Roger E. Bray Feb. 1979 570 p refs
(Contract EG-77-C-01-4016)
(HCP/T4016-01/2) Avail: NTIS HC A24/MF A01

Historic data (SOLMET) at 26 National Weather Service stations reporting hourly solar insolation and collateral meteorological information were examined to provide an estimate of future trends. Selected insolation and wind power conditions were investigated for their occurrence and persistence for defined periods of time on a monthly basis. Diurnal variations of wind power were also considered. Probability estimates of solar insolation and wind power, alone and in combination, occurring and persisting at or above specified thresholds are presented. Selected probability data for each station are presented graphically, and comprehensive plots for all stations are provided. Information of this nature is intended as an aid to preliminary planning activities for the design of solar and wind energy utilization systems. DOE

N80-13754# Mississippi State Univ., State College.
THE ANALYSIS OF SEDIMENT SAMPLES FOR HYDROCARBONS Final Report
Lewis Raymond Brown and Charles Douglas Minchew 30 Oct. 1978 72 p
(Contract DOT-CG-81-76-1476)
(AD-A073822; USCG-D-46-79; CGR/DC-12/79) Avail: NTIS HC A04/MF A01 CSCL 08/8

This document is a report on the hydrocarbon content of 1380 individual surficial samples obtained from areas in the vicinity of three proposed Deep Water Port (DWP) Sites in the Gulf of Mexico during six cruises taken between 1975 and 1978. The samples were analyzed using 2 different LC-fluorescent methods, one of which was selective for petrogenic hydrocarbons and one of which detected both petrogenic and biogenic hydrocarbons. Additionally, nutrient chemical analyses and microbiological analyses were performed on sediment obtained during the first two cruises. All data were evaluated statistically and discussed in terms of sources of inputs, effect on season, and significance for formulating an overall monitoring program for the DWP sites. The results of this study suggest that analysis for both petrogenic and biogenic hydrocarbons should be undertaken in order to more accurately reflect the sources of seasonal variation in hydrocarbon levels at sites of interest. A method of displaying the data is illustrated and discussed. It allows rapid comparisons of the hydrocarbon content of sediments from the various stations. GRA

N80-13872 Wisconsin Univ. - Madison.
NEWTON'S METHOD FOR GENERALIZED EQUATIONS AND THE PIES ENERGY MODEL Ph.D. Thesis
Norman Harold Josephy 1979 108 p
Avail: Univ. Microfilms Order No. 7922122

A number of results concerning the convergence and convergence rates of Newton and quasi-Newton methods for generalized equations are proven. Examples are given to emphasize the application of these methods to generalized equations representing the nonlinear programming problem and the nonlinear complementarity problem. Computational results of Newton's method are presented as applied to the economic equilibrium problem of the Project Independence Evaluation System (PIES) Energy Model. Solutions to a simplified version of PIES are obtained using a Newton method, and comparisons are made to solutions which appeared in the literature. Dissert. Abstr.

N80-13906# Los Alamos Scientific Lab., N. Mex.
BASELINE DESIGN OF THE THERMOELECTRIC REACTOR SPACE POWER SYSTEM
W. A. Ranken and D. R. Koenig 1979 8 p refs Presented at 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract W-7405-eng-36)
(LA-UR-79-1242; CONF-790803-21) Avail: NTIS HC A02/MF A01

An extensive review of design alternatives for a nuclear reactor space power system capable of delivering 10 to 100 kW/sub e/ has led to the selection of a heat-pipe-cooled fast spectrum reactor with a thermoelectric power conversion system. The reactor design features a laminated core configuration with sheets of molybdenum - extending across the full diameter of the core - interspersed between layers of UO2. Reactor heat is transferred by these sheets from the UO2 to an array of 90 Mo/Na heat pipes that are spaced so that each receives equal power from an essentially uniform fuel loading in the core. This heat is transported by these heat pipes around the LiH shield to a ring of high-power-density thermoelectric modules constructed from modified SiGe alloys. Conversion takes place over a temperature interval of 1375 to 775 K with an efficiency of 9 percent. Residual heat is rejected by a conical radiator that is constructed from cross-coupled beryllium heat pipes. DOE

N80-13917# Du Pont de Nemours (E. I.) and Co., Aiken, S. C.
US PROGRAM FOR THE IMMOBILIZATION OF HIGH-LEVEL NUCLEAR WASTES
J. L. Crandall 8 Jun. 1979 25 p Presented at the Am. Nucl. Soc. Meeting, Atlanta, 3-8 Jun. 1979
(Contract EY-76-C-09-0001)
(DP-MS-79-2; CONF-790602-69) Avail: NTIS HC A02/MF A01

A program developed for the term management of high level nuclear waste is described. The program is designed to immobilize the high level waste in forms that act as highly efficient barriers against radionuclide release to the disposal site and to provide technology for similar treatment of commercial high level waste in case reprocessing of commercial nuclear fuels is ever resumed. Descriptions of commercial wastes, program strategy, program expenditures, development of waste forms, evaluation and selection of waste forms, regulatory aspects of waste form selection, project schedules, and cost estimates for immobilization facilities are discussed. DOE

N80-13941# Argonne National Lab., Ill.
FUSION POWER PROGRAM Quarterly Progress Report, Oct. - Dec. 1978
Apr. 1979 94 p refs
(Contract W-31-109-eng-38)
(ANL/FPP-78-4) Avail: NTIS HC A05/MF A01

Research and development areas in nuclear fusion are presented. Areas include: materials, energy storage and transfer, tritium containment, recovery and control, advanced reactor design, atomic data, reactor safety, fusion-fission hybrid systems, and alternate applications of fusion energy. Research progress

is reported for each of the following areas. (1) savings in plasma support systems for a Tokamak hybrid reactor; (2) fusion reactor safety studies; (3) energy storage and transfer; (4) test results of the 1.5 MJ pulsed superconducting coil; and (5) atomic data studies.
DOE

N80-13989*# Mechanical Technology, Inc., Latham, N. Y. Stirling Engine Systems Div.
ASSESSMENT OF THE STATE OF TECHNOLOGY OF AUTOMOTIVE STIRLING ENGINES
Sep. 1979 329 p refs
(Contracts DEN3-32; EC-77-A-31-10040)
(NASA-CR-159631; DOE/NASA/0032-79/4;
MTI-79ASE77RE2) Avail: NTIS HC A15/MF A01 CSCL 13F

The current status of automotive Stirling engine technology is considered. The energy is described and the history of its evolution is reviewed. Overall engine, component, subsystem and material problem areas are identified and recommendations are made for further development and testing. Potential improvements are also identified. Projected Stirling engine/vehicle performance is compared to that of vehicles using current internal combustion engine in terms of performance, fuel consumption, multifuel capability, emissions, and noise level. It is concluded that the potential for achieving 1984 program goals is clearly discernible. The program goals require at least a 30 percent reduction in fuel consumption, acceptable emissions, and the capability of satisfactorily operating with a variety of alternate fuels.
A.R.H.

N80-14114*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PRELIMINARY TEST RESULTS OF A FLIGHT MANAGEMENT ALGORITHM FOR FUEL CONSERVATIVE DESCENTS IN A TIME BASED METERED TRAFFIC ENVIRONMENT
Charles E. Knox and Dennis G. Cannon (Boeing Commercial Airplane Co., Seattle, Wash.) Nov. 1979 34 p refs
(NASA-TM-80194) Avail: NTIS HC A03/MF A01 CSCL 01D

A flight management algorithm designed to improve the accuracy of delivering the airplane fuel efficiently to a metering fix at a time designated by air traffic control is discussed. The algorithm provides a 3-D path with time control (4-D) for a test B 737 airplane to make an idle thrust, clean configured descent to arrive at the metering fix at a predetermined time, altitude, and airspeed. The descent path is calculated for a constant Mach/airspeed schedule from linear approximations of airplane performance with considerations given for gross weight, wind, and nonstandard pressure and temperature effects. The flight management descent algorithms and the results of the flight tests are discussed.
A.W.H.

N80-14258# Institute of Gas Technology, Chicago, Ill.
DEVELOPMENT OF THE STEAM-IRON PROCESS FOR HYDROGEN PRODUCTION, 9010 Quarterly Report, 1 Apr. - 30 Jun. 1978
Feb. 1979 62 p
(Contract EX-76-C-01-2435)
(FE-2435-32; QR-8) HC A04/MF A01

The operability of the two reactor steam-iron process was demonstrated for an extended period of time, and hydrogen was produced for the first time. Test 15 spanned a period of 24 days and included 106 hours of ore circulation, 36 hours of char feed, and 24 hours of self-sustained hydrogen production. The primary objective of this test was to demonstrate the operability of the steam-iron process. Producer bed temperatures were limited to 1600 F at 200 psig reactor pressure. The quantity of hydrogen produced, therefore, was low. Test 16, the second consecutive hydrogen-producing test, spanned a period of 7 days. Producer bed temperatures were increased to 1650 F to raise the production of hydrogen in the steam-iron reactor. As in Test 15, the reactor internals were completely clean and in excellent condition following the test.
DOE

N80-14259# Naval Research Lab., Washington, D. C.
MICROBIAL DETERIORATION OF HYDROCARBON FUELS FROM OIL SHALE, COAL, AND PETROLEUM. 1: EXPLORATORY EXPERIMENTS Interim Report
Marian E. May and Rex A. Neihof 20 Aug. 1979 28 p refs
(ZF57571004)
(AD-A073761; AD-E000316; NRL-MR-4060) Avail: NTIS HC A03/MF A01 CSCL 21/4

As part of the Navy's program on alternative sources of hydrocarbon fuel, the susceptibility to microbial deterioration of JP-5 derived from oil shale and coal (referred to as synthetic fuels) was investigated and compared with that of petroleum JP-5. Six fungi, including three strains of Cladosporium resinae, a yeast (Candida) and a bacterium (Pseudomonas) which normally grow well in association with petroleum JP-5 were used as test organisms in two-phase systems containing fuel/aqueous media. Most of the test organisms were inhibited to various extents in the presence of the synthetic fuels. An exception was a Fusarium species (fungus) which grew equally well under all three fuels. In mixtures of 75% petroleum and 25% synthetic fuels, microbial growth was generally equivalent to that in 100% petroleum JP-5. A search was made among samples of soil, creosoted wood and tree resins for microorganisms that could thrive in the presence of synthetic fuels. This endeavor produced a strain of C. resinae that grew as well with oil shale JP-5 as with petroleum JP-5. These exploratory experiments indicate that microorganisms adapted to growth with conventional petroleum fuel tend to be inhibited by synthetic fuels, but that organisms probably exist in nature which can readily adapt to and grow in the presence of synthetic fuels.
GRA

N80-14263# Institute of Gas Technology, Chicago, Ill.
HIGH-Btu COAL GASIFICATION PROCESSES
C. F. Blazek, N. R. Baker, and R. R. Tison Jan. 1979 82 p refs Prepared for Argonne National Lab.
(Contract W-31-109-eng-38)
(ANL/CES/TE-79-2) Avail: NTIS HC A05/MF A01

Estimates of performance and cost data for advanced technology, high-Btu, coal gasification facilities are provided. The six processes discussed reflect the current state-of-the-art development. The information presented is based only on pilot-plant experience. Performance characteristics that were investigated include unit efficiencies, product output, and pollution aspects. Total installed plant costs and operating costs are tabulated for the various processes. The information supplied is expected to assist in selecting energy conversion units for an Integrated Community Energy System.
DOE

N80-14264# SRI International Corp., Menlo Park, Calif.
PROCEEDINGS OF THE 1978 COAL CHEMISTRY WORKSHOP
S. B. Radding and Howard M. Peters Nov. 1978 204 p refs Conf. held at Menlo Park, Calif., 8-10 Mar. 1978
(Contract ET-78-X-01-2402)
(CONF-780372) Avail: NTIS HC A10/MF A01

The structural chemical analysis of coal and the chemistry of coal gasification and coal liquefaction are discussed. The DOE Fossil Energy Program is discussed in detail and recommendations for further research in coal gasification and coal liquefaction are made.
DOE

N80-14265# Argonne National Lab., Ill.
EXPERIMENTAL VERIFICATION OF THE MERCURY-IODINE THERMOCHEMICAL CYCLE FOR THE PRODUCTION OF HYDROGEN FROM WATER, ANL-4
E. H. Appelman, F. Schreiner, and B. M. Abraham 1978 58 p refs Presented at the World Hydrogen Energy Conf., Zurich, 21 Aug. 1978
(Contract W-31-109-eng-38)
(CONF-780807-11) Avail: NTIS HC A04/MF A01

A flow diagram for the cycle described was constructed and an overall practical efficiency of 28% in terms of delta G/sub f (H2O)/total heat input) was estimated from the new data. A substantial portion of the total heat input is required for the isolation of the ammonium iodide. The cycle should be capable of producing hydrogen from water with reasonable efficiency and without requiring heat at an unduly high temperature. The cycle should therefore be suitable for a practical demonstration of the technical feasibility of thermochemical hydrogen generation.
DOE

N80-14266# Department of Energy, Washington, D. C. Div. of Environmental Control Technology.

LIQUEFIED GASEOUS FUELS SAFETY AND ENVIRONMENTAL CONTROL ASSESSMENT PROGRAM Progress Report

May 1979 725 p refs

(Contracts EP-78-C-03-2057; EP-78-C-05-6020; EP-78-C-02-4734, EE-77-S-02-4204; EE-77-S-02-4447; EE-77-S-02-4548; EY-76-C-06-1830)

(DOE/EV-0036) Avail: NTIS HC A99/MF A01

Research is reported on the safety and environmental aspects of liquefied gaseous fuels including natural gas, petroleum gas, hydrogen, and ammonia. Spills and fires are among the handling, storage, and transportation hazards assessed. K.L.

N80-14269# Midwest Research Inst., Golden, Colo.

ROUGH COST ESTIMATES OF SOLAR THERMAL/COAL OR BIOMASS-DERIVED FUELS

R. J. Copeland 1979 8 p refs Presented at AIAA Terrestrial Energy Systems Conf., Orlando, Fla., 4 Jun. 1979

(Contract EG-77-C-01-4042)

(SERI/TP-35-279; CONF-790611-5) Avail: NTIS HC A02/MF A01

Cost data for one method of producing synthetic methane is presented. A hybrid approach was chosen, a combination of solar thermal and either coal or biomass. The magnitude of the solar thermal resource is estimated as well as projected cost. Cost projections for coal and biomass are accumulated. The cost of synthetic gas from a hybrid and a conventional fuel source are compared. DOE

N80-14271# Argonne National Lab., Ill.

FUSARIUM SPECIES: THEIR POTENTIAL FOR TRANSFORMING BIOMASS TO ETHANOL

Antonios A. Antonopoulos Feb. 1979 26 p refs

(Contract W-31-109-eng-38)

(ANL/EES-TM-38) Avail: NTIS HC A03/MF A01

Unlike yeasts and other fungi, Fusaria can ferment both pentoses and hexoses (yeast can ferment only hexoses), and are able to saccharify the cell wall and middle lamella constituents and ferment the released sugar units. Existing research data support well the idea of utilizing selected Fusarium strains to decompose and convert biomass to ethyl alcohol. Since ethanol blends and performs effectively with gasoline (as gasohol), its yield through the Fusarium fermentative action should be exploited. Certain biological, technological, and economic limitations that constrain the application of biomass conversion to ethanol by Fusarium strains today, on a large scale, could be overcome through additional research and development. DOE

N80-14272# California Univ., Davis. Dept. of Agricultural Engineering.

PILOT PLANT GASIFICATION TEST ON BIOMASS FUELS Interim Report, Jun. - Nov. 1978

John R. Goss Jun. 1979 79 p Sponsored by Calif. State Energy Resources Conserv. and Develop. Comm.

(PB-299077/8; CAEC-36; CAEC-500-79-007) Avail: NTIS HC A05/MF A01 CSCL 07A

A scaled-up version of Swedish down-draft gasifiers, capable of producing 8 million Btu of gas per hour from agricultural and forestry residues, operated over 500 hours which included a continuous run of 330 hours. The gas from the gasifier was burned in a boiler to produce steam, burned in a low-Btu burner to produce heated air, and burned in a 60 kw diesel engine to generate electricity. Data are presented on the operating characteristics, environmental impacts, and equipment costs of the gasifier system. The technical feasibility and requirements of firing steam boilers with low-Btu gas from a gasifier fueled with wood chips was demonstrated. GRA

N80-14273*# Optical Coating Lab., Inc., City of Industry, Calif. Photoelectronics Div.

ASSESSMENT OF PRESENT STATE-OF-THE-ART SAWING TECHNOLOGY OF LARGE DIAMETER INGOTS FOR SOLAR SHEET MATERIAL Final Report, 1 Sep. 1977 - 28 Feb. 1978

H. I. Yoo 1978 126 p refs

(Contract JPL-954830)

(NASA-CR-162535; DOE/JPL-954830-78/2) Avail: NTIS HC A07/MF A01 CSCL 13H

Work is reported on: (1) slicing of the ingots with the multiblade slurry saw, the multiwire slurry saw and the I.D. saw, (2) characterization of the sliced wafers, and (3) analysis of add-on slicing cost based on Solar Array Manufacturing Industry Costing Standard. M.M.M.

N80-14279# General Accounting Office, Washington, D. C. Energy and Minerals Div.

THE SOLAR IN FEDERAL BUILDINGS DEMONSTRATION PROGRAM

10 Aug. 1979 24 p

(PB-298535/6; EMD-79-84) Avail: NTIS HC A02/MF A01 CSCL 13A

Recommendations are presented for DOE to develop a comprehensive strategy and plan for guiding and integrating conservation and solar efforts for Federal buildings in order to implement the Federal buildings solar program on the scale envisioned by the National Energy Plan and the Congress. GRA

N80-14346# Los Alamos Scientific Lab., N. Mex.

WAVE PROPAGATION IN A dc SUPERCONDUCTING CABLE. PART 1: ANALYSIS

P. Chowdhuri and Mary-Anne Mahaffy 1979 7 p refs Presented at the IEEE Summer Power Meeting, Vancouver, Canada, Jul. 1979

(Contract W-7405-eng-36)

(LA-UR-79-226; CONF-790713-1) Avail: NTIS HC A02/MF A01

A dc superconducting cable design consisting of four concentric metallic cylinders, of which two carry the load current and two comprise the cryogenic enclosure, was studied. The surge-voltage propagation characteristics of a four-conductor dc superconducting cable for a step-function input voltage was analyzed. This analysis, although mainly directed to superconducting cables, is also applicable to other multiconductor transmission lines. DOE

N80-14349# Department of Energy, Washington, D. C.

ELECTRIC AND HYBRID VEHICLES: COMMERCIALIZATION PHASE 3 PLANNING

R. C. Clusen Sep. 1978 37 p refs

(DOE/ERD-0004) Avail: NTIS HC A03/MF A01

A program to stimulate the commercialization of electric and hybrid vehicles (EHVs) as a partial solution to the oil consumption problem is presented. The commercialization of EHVs by the purchase or lease and demonstration of state-of-the-art and advanced vehicles through 1985 is described. The major vehicle categories are: (1) specific-mission electric vehicles; (2) general purpose electric vehicles; and (3) general purpose hybrid vehicles. The subjects covered are: the characteristics of the technology, status information on the technical and environmental research and development programs; a milestone chart representing a relationship between a considered commercialization schedule and relevant environmental research and development; and the environmental concerns significant to the technology. DOE

N80-14386*# Rasor Associates, Inc., Sunnyvale, Calif.

A CESIUM TELEC EXPERIMENT AT LEWIS RESEARCH CENTER Final Report

E. J. Britt Sep. 1979 59 p refs

(Contract NAS3-21149)

(NASA-CR-159729; NSR-8-1) Avail: NTIS HC A04/MF A01 CSCL 20E

The thermoelectronic laser energy converter (TELEC), was studied as a method of converting a 10.6 mm CO2 laser beam into electric power. The calculated characteristics of a TELEC seem to be well matched to the requirements of a spacecraft laser energy conversion system. The TELEC is a high power density plasma device which absorbs an intense laser beam by inverse bremsstrahlung with the plasma electrons. In the TELEC process, electromagnetic radiation is absorbed directly in the plasma electrons producing a high electron temperature. The energetic electrons diffuse out of the plasma striking two electrodes which are in contact with the plasma at the boundaries. These two electrodes have different areas: the larger one is designated as the collector, the smaller one is designated as the emitter. The smaller electrode functions as an electron emitter to provide continuity of the current. Waste heat is rejected from the collector electrode. An experiment was carried out with a high power laser using a cesium vapor TELEC cell with 30 cm active length. Laser supported plasma was produced in the TELEC device during a number of laser runs over a period of several days. Electric power from the TELEC was observed with currents in the range of several amperes and output potentials of less than 1 volt. The magnitudes of these electric outputs were smaller than anticipated but consistent with the power levels of the laser during this experiment. J.M.S.

N80-14423* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COAL-SHALE INTERFACE DETECTION SYSTEM Patent
Richard A. Campbell, Jerry L. Hudgins, Paul W. Morris, Harry Reid, Jr., and Joe E. Zimmerman, inventors (to NASA) Issued 12 Jun. 1979 9 p Filed 3 Nov. 1977
(NASA-Case-MFS-23720-2; US-Patent-4,157,655;
US-Patent-Appl-SN-848421; US-Patent-Class-73-12;
US-Patent-Class-73-82) Avail: US Patent and Trademark Office CSCL 08I

A coal-shale interface detection system for use with coal cutting equipment consists of a reciprocating hammer on which an accelerometer is mounted to measure the impact of the hammer as it penetrates the ceiling or floor surface of a mine. A pair of reflectometers simultaneously view the same surface. The outputs of the accelerometer and reflectometers are detected and jointly registered to determine when an interface between coal and shale is being cut through.

Official Gazette of the U.S. Patent and Trademark Office

N80-14463# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: ENERGY RESOURCE DEVELOPMENT SYSTEMS REPORT. VOLUME 1: INTRODUCTION AND GENERAL SOCIAL CONTROLS Final Report, 1975 - 1978
Irving L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, Martha Gilliland, Timothy A. Hall, Edward J. Malecki, Edward B. Rappaport, Robert W. Rycroft, Rodney K. Freed et al Mar. 1979 180 p refs Prepared in cooperation with Radian Corp., Austin, Tex. 6 Vol.
(Contract EPA-68-01-1916)
(PB-299177/6; EPA-600/7-79-060A-Vol-1) Avail: NTIS HC A09/MF A01 CSCL 08I

The technologies likely to be used for development of coal, oil shale, uranium, oil, natural gas, and geothermal resources in eight western states (Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming) are described. The technological activites such as exploration, extraction, and conversion for developing the resource, and laws and regulations which affect the development of more than one of the six resources are considered. GRA

N80-14464# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: ENERGY RESOURCE DEVELOPMENT SYSTEMS REPORT. VOLUME 2: COAL Final Report, 1975 - 1978
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, Martha Gilliland, Timothy A. Hall, Edward J. Malecki, Edward B. Rappaport, Robert W. Rycroft, Rodney K. Freed et al Mar. 1979 395 p refs Prepared in cooperation with Radian Corp., Austin, Tex. 6 Vol.
(Contract EPA-68-01-1916)
(PB-299178/4; EPA-600/7-79-060B-Vol-2) Avail: NTIS HC A17/MF A01 CSCL 08I

The characteristics of coal resources in the western United States are described. A regional overview of number, size, and types of the coal mining operations conducted in Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming, is presented. Conversion technologies such as coal gasification, liquefaction, and electrical generation are discussed. R.C.T.

N80-14465# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: ENERGY RESOURCE DEVELOPMENT SYSTEMS REPORT. VOLUME 3: OIL SHALE Final Report, 1975 - 1978
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, Martha Gilliland, Timothy A. Hall, Edward J. Malecki, Edward B. Rappaport, Robert W. Rycroft, Rodney K. Freed et al Mar. 1979 328 p refs Prepared in cooperation with Radian Corp., Austin, Tex. 6 Vol.
(Contract EPA-68-01-1916)
(PB-299179/2; EPA-600/7-79-060C-Vol-3) Avail: NTIS HC A15/MF A01 CSCL 08I

The development of oil shale resources in eight Western states (Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming) is discussed. The energy resource base, the technologies used to develop the resource, and the inputs and outputs for each technology development are summarized. The laws and regulations applying to the deployment and operation of each technology are examined. R.C.T.

N80-14466# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: ENERGY RESOURCE DEVELOPMENT SYSTEMS REPORT. VOLUME 4: URANIUM Final Report, 1975 - 1978
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, Martha Gilliland, Timothy A. Hall, Edward J. Malecki, Edward B. Rappaport, Robert W. Rycroft, and Rodney K. Freed Mar. 1979 255 p refs Prepared in cooperation with Radian Corp., Austin, Tex. 6 Vol.
(Contract EPA-68-01-1916)
(PB-299180/0; EPA-600/7-79-060D-Vol-4) Avail: NTIS HC A12/MF A01 CSCL 08I

The technologies, inputs, outputs, laws and regulations associated with the development of uranium resources in eight western States (Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming) are described. The exploration, mining, and milling of uranium are discussed and technological alternatives which represent potential development options are sited. Input requirements such as manpower, materials and equipment, economics, water, land, and ancillary energy are reported. Residuals that may pose environmental hazards are surveyed. R.C.T.

N80-14467# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: ENERGY RESOURCE DEVELOPMENT SYSTEMS REPORT. VOLUME 5: OIL AND NATURAL GAS Final Report, 1975 - 1978
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, Martha Gilliland, Timothy A. Hall, Edward J. Malecki, Edward B. Rappaport, Robert W. Rycroft, and Rodney K. Freed Mar. 1979 231 p refs Prepared in cooperation with Radian Corp., Austin, Tex. 6 Vol.
(Contract EPA-68-01-1916)
(PB-299181/8; EPA-600/7-79-060E-Vol-5) Avail: NTIS HC A11/MF A01 CSCL 08I

The quantity and location of crude oil are discussed. The development of crude oil from exploration to treatment of finished products and enhanced recovery techniques are described. The social controls for crude oil transportation are reported. R.C.T.

N80-14468# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: ENERGY RESOURCE DEVELOPMENT SYSTEMS REPORT. VOLUME 6: GEOTHERMAL Final Report, 1975 - 1978
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, Marth Gilliland, Timothy A. Hall, Edward J. Malecki,

Edward B. Rappaport, Robert W. Rycroft, Rodney K. Freed et al Mar. 1979 221 p refs Prepared in cooperation with Radian Corp., Austin, Tex. 6 Vol.
(Contract EPA-68-01-1916)
(PB-299182/6; EPA-600/7-79-060F-Vol-6) Avail: NTIS HC A10/MF A01 CSCL 08I

The input requirements and outputs identified with the development and utilization of the geothermal resources of Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming are summarized. The characteristics of geothermal resources are discussed in terms of geology, location, quantity, physical and chemical characteristics and ownership. R.C.T.

N80-14470# Environmental Monitoring and Support Lab., Las Vegas, Nev.
SURFACE WATER QUALITY PARAMETERS FOR MONITORING OIL SHALE DEVELOPMENT Final Report
W. L. Kinney, A. N. Brecheisen, and V. W. Lambou Mar. 1979 157 p refs
(PB-297984/7; EPA-600/4-79-018) Avail: NTIS HC A08/MF A01 CSCL 13B

Listings of chemical, physical, and biological parameters which can be used to assess the environmental impact of oil shale development on surface water resources are given. Each of the potential water-related problems is addressed in the context of the probable cumulative regional impact of a maturing, commercial oil shale industry and in terms of local impact resulting from the prototype operation initially planned on leased public lands. The possible effects of potential pollutants on ambient water quality and the resulting impact on aquatic life, public water supplies, livestock, irrigation agriculture, and selected industries are evaluated. GRA

N80-14471# New Mexico State Univ., Las Cruces.
DEEP TERRESTRIAL HEAT FLOW MEASUREMENTS IN NEW MEXICO AND NEIGHBORING GEOLOGIC AREAS Final Report, 1 Sep. 1976 - 30 Jun. 1978
Marshall Reiter Jun. 1979 85 p refs Prepared jointly with New Mexico Energy and Minerals Dept., Santa Fe and New Mexico Inst. of the Mining and Technology, Socorro
(Grant NSF GI-32482)
(PB-299489/5; NMEI-38) Avail: NTIS HC A05/MF A01 CSCL 08I

Experimental aspects of continuous temperature logging, vertical groundwater movement correction for heat flow, and terrestrial heat flow and crustal radioactivity in northeastern New Mexico and southern Colorado are described. GRA

N80-14472* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SELF-RECONFIGURING SOLAR CELL SYSTEM Patent
Robert P. Gruber, inventor (to NASA) Issued 20 Nov. 1979 10 p filed 19 Jun. 1978 Supersedes N78-27520 (16 - 18, p 2408)
(NASA-Case-LEW-12586-1; US-Patent-4,175,249;
US-Patent-Appl-SN-916655; US-Patent-Class-323-15;
US-Patent-Class-307-63; US-Patent-Class-307-66;
US-Patent-Class-323-19) Avail: US Patent and Trademark Office CSCL 10A

A self-reconfiguring solar cell array is disclosed wherein some of the cells are switched so that they can be either in series or in shunt within the array. This feature of series or parallel switching of cells allows the array to match the load to achieve maximum power transfer. Automatic control is used to determine the conditions for maximum power operation and to switch the array into the appropriate configuration necessary to transfer maximum power to the load.
Official Gazette of the U.S. Patent and Trademark Office

N80-14473* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SOLAR CONCENTRATOR Patent
John G. Simpson, inventor (to NASA) Issued 6 Nov. 1979 6 p Filed 30 Nov. 1977 Supersedes N78-13556 (16 - 04, p 0499)
(NASA-Case-MFS-23727-1; US-Patent-4,173,397;
US-Patent-Appl-SN-856465; US-Patent-Class-350-295;
US-Patent-Class-126-438; US-Patent-Class-350-296;
US-Patent-Class-126-442) Avail: US Patent and Trademark Office CSCL 10A

An improved solar concentrator is characterized by a number of elongated supporting members arranged in substantial horizontal parallelism with the axis and intersecting a common curve. A tensioned sheet of flexible reflective material is disposed in engaging relation with the supporting members in order to impart to the tensioned sheet a catenary configuration.
Official Gazette of the U.S. Patent and Trademark Office

N80-14474* National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD FOR FORMING A SOLAR ARRAY STRIP Patent
Robert I. Mueller (JPL) and Robert K. Yasui, inventors (to NASA) (JPL) Issued 13 Nov. 1979 7 p Filed 29 Mar. 1978 Supersedes N78-25560 (16 - 16, p 2138) Division of US Patent Appl. SN-809890, filed 24 Jun. 1977, US Patent-4,133,697 sponsored by NASA
(NASA-Case-NPO-13652-3; US-Patent-4,173,820;
US-Patent-Appl-SN-891358; US-Patent-Class-29-572;
US-Patent-Class-29-588; US-Patent-Class-29-627;
US-Patent-Class-136-89P; US-Patent-Appl-SN-809890;
US-Patent-4,133,697) Avail: US Patent and Trademark Office CSCL 10A

A flexible solar array strip is formed by a method which lends itself to automatic production techniques. Solder pads are deposited on printed circuitry deposited on a flexible structure. The resultant substrate is stored on a drum from which it is withdrawn and incrementally advanced along a linear path. Solderless solar cells are serially transported into engagement with the pads which are then heated in order to attach the cells to the circuitry. Excess flux is cleaned from the cells which are encapsulated in a protective coating. The resultant array is then spirally wound on a drum.
Official Gazette of the U.S. Patent and Trademark Office

N80-14475 Oklahoma State Univ., Stillwater.
A PROBABILISTIC STUDY OF WIND-ELECTRIC CONVERSION SYSTEMS FROM THE POINT OF VIEW OF RELIABILITY AND CAPACITY CREDIT Ph.D. Thesis
Raghvendrarao Girirao Deshmukh 1979 167 p
Avail: Univ. Microfilms Order No. 7928197

Probabilistic models developed for wind energy conversion systems (WECS) are integrated with models of other power system components in order to evaluate the reliability of WECS assisted utility systems. A mathematical Weibull distribution function is used to model the actual wind speed distribution. It is shown that with a fixed wind regime and generation mix, an increase in the load demand causes only a slight increase in the risk index as long as the load value is less than or equal to the conventional generation capacity in the system. A load model based on the Markov chain with hourly peak load values is utilized in determining the load carrying capability of WECS assisted systems. The effect of including a transmission line is studied using two basic system configurations. It is shown that the interconnection of two WECS located in different wind regimes increases the availabilities of different capacities. Dissert. Abstr.

N80-14476 Mississippi State Univ., State College.
VISUALIZATION OF NATURAL CONVECTION IN FLAT PLATE SOLAR COLLECTORS Ph.D. Thesis
Benjamin Okechukwu Okeke 1979 154 p
Avail: Univ. Microfilms Order No. 7927095

The effects of variations in gap spacing on the convective heat flow patterns between the collector surface and the glazing were determined. Visual and photographic observations were made through transparent plexiglas side walls, using tobacco smoke to make the flow patterns visible. Results indicate that the critical Rayleigh number was only marginally dependent on variations to the air gap width. A substantial increase in the critical Rayleigh number was observed as the horizontal temperature gradient was increased. The first sign of natural convection was seen to be a set of steady side-by-side transverse rolls increasing in size towards the higher temperature end of the test enclosure. Representative still photographs of the observed flow patterns are presented. Dissert. Abstr.

N80-14477 Kentucky Univ., Lexington.
PHOTOVOLTAIC ENERGY CONVERSION IN POLYMER FILMS Ph.D. Thesis
Harin Shrinivas Ullal 1979 219 p
Avail: Univ. Microfilms Order No. 7927725

Photovoltaic energy conversion in poly-n-vinyl carbazole (PVK) and 2,4,7-trinitro-9-fluorenone (TNF) in the ratio (1:1) was investigated. It was determined that the maximum photovoltaic energy conversion efficiency is controlled by two critical parameters, namely the barrier height and the film thickness. The energy conversion efficiency was found to increase significantly by using low work function metal electrodes such as Sm. Conversely, by using high work function metal electrodes such as Pt, there is a marked decrease in the energy conversion efficiency. Also, there is a dramatic change in the energy conversion efficiency when there is a change in the film thickness. Model predictions and results of photoemission, dark current, and photocurrent studies are given. Dissert. Abstr.

N80-14478# PRC Energy Analysis Co., McLean, Va.
SATELLITE POWER SYSTEM (SPS): AN OVERVIEW OF PROSPECTIVE ORGANIZATIONAL STRUCTURES IN THE SOLAR SATELLITE FIELD
H. G. Edler Oct. 1978 19 p refs
(Contract EG-77-C-01-4024)
(TID-29094) HC A02/MF A01

A literature survey, interviews with acknowledged experts in the fields of organizational entities, space, solar energy, and the SPS concept, and an analysis of these inputs to identify the organizational alternatives and make judgments as to their feasibility to serve as patterns for a future SPS entity are presented. Selection and evaluation criteria were determined to include timeliness, reliability, and adequacy to contribute meaningfully to the U.S. supply; political feasibility (both national and international) and cost-effectiveness (including environmental and other external costs). Based on these criteria, four organizational alternatives are discussed which offer reasonable promise as potential options for SPS. These included three domestic alternatives and one international alternative. DOE

N80-14480*# Power Electronics Associates, Inc., Lincoln, Mass.
BI-DIRECTIONAL FOUR QUADRANT (BDQ4) POWER CONVERTER DEVELOPMENT Final Report
Francis C. Schwarz 20 Dec. 1979 249 p refs
(Contract NAS3-30363)
(NASA-CR-159660) Avail: NTIS HC A11/MF A01 CSCL 10B

The feasibility for implementation of a concept for direct ac/dc multikilowatt power conversion with bidirectional transfer of energy was investigated. A 10 kHz current carrier was derived directly from a common 60 Hz three phase power system. This carrier was modulated to remove the 360 Hz ripple, inherent in the three phase power supply and then demodulated and processed by a high frequency filter. The resulting dc power was then supplied to a load. The process was implemented without the use of low frequency transformers and filters. This power conversion processes was reversible and can operate in the four quadrants as viewed from any of the two of the converter's ports. Areas of application include: power systems on air and spacecraft; terrestrial traction; integration of solar and wind powered systems with utility networks; HVDC; asynchronous coupling of polyphase networks; heat treatment; industrial machine drives; and power supplies for any use including instrumentation. R.C.T.

N80-14481*# Burt, Hill, Kosar, Rittleman, and Associates, Butler, Pa.
RESIDENTIAL PHOTOVOLTAIC MODULE AND ARRAY REQUIREMENTS STUDY, APPENDICES Final Report
S. L. Nearhoof and J. R. Oster Jun. 1979 560 p Sponsored by NASA Prepared for JPL and DOE
(Contract JPL-955149)
(NASA-CR-162529; DOE/JPL-955149-79/1-Appl) Avail: NTIS HC A24/MF A01 CSCL 10B

Regional building code variations, federal and city codes, and the national electric code are reviewed for their possible effects on the design of photovoltaic modules. Problems that photovoltaic arrays may impose on the insurability of residences are also discussed. Mounting configurations are developed for the modules, and grounding, wiring, terminal, and voltage requirements are established. Installation and materials costs are presented along with performance criteria. K.L.

N80-14482*# Burt, Hill, Kosar, Rittleman, and Associates, Butler, Pa.
RESIDENTIAL PHOTOVOLTAIC MODULE AND ARRAY REQUIREMENTS STUDY Final Report
S. L. Nearhoof and J. R. Oster Jun. 1979 64 p refs Prepared for JPL and DOE
(Contract JPL-955149)
(NASA-CR-162528; DOE/JPL-955149-79/1) Avail: NTIS HC A04/MF A01 CSCL 10B

Design requirements for photovoltaic modules and arrays used in residential applications were identified. Building codes and referenced standards were reviewed for their applicability to residential photovoltaic array installations. Four installation types were identified - integral (replaces roofing), direct (mounted on top of roofing), stand-off (mounted away from roofing), and rack (for flat or low slope roofs, or ground mounted). Installation costs were developed for these mounting types as a function of panel/module size. Studies were performed to identify optimum module shapes and sizes and operating voltage cost drivers. It is concluded that there are no perceived major obstacles to the use of photovoltaic modules in residential arrays. However, there is no applicable building code category for residential photovoltaic modules and arrays and additional work with standards writing organizations is needed to develop residential module and array requirements. K.L.

N80-14483*# Battelle Columbus Labs., Ohio.
DEVELOPMENT OF AN ACCELERATED TEST DESIGN FOR PREDICTING THE SERVICE LIFE OF THE SOLAR ARRAY AT MEAD, NEBRASKA Final Report
G. B. Gaines, R. E. Thomas, G. T. Noel, T. S. Shilliday, V. E. Wood, and D. C. Carmichael 7 Jun. 1979 61 p refs Prepared for JPL and DOE
(Contract JPL-954328)
(NASA-CR-162534; DOE/JPL-954328-79/13) Avail: NTIS HC A04/MF A01 CSCL 10A

An accelerated life test is described which was developed to predict the life of the 25 kW photovoltaic array installed near Mead, Nebraska. A quantitative model for accelerating testing using multiple environmental stresses was used to develop the test design. The model accounts for the effects of thermal stress by a relation of the Arrhenius form. This relation was then corrected for the effects of nonthermal environmental stresses, such as relative humidity, atmospheric pollutants, and ultraviolet radiation. The correction factors for the nonthermal stresses included temperature-dependent exponents to account for the effects of interactions between thermal and nonthermal stresses on the rate of degradation of power output. The test conditions, measurements, and data analyses for the accelerated tests are presented. Constant-temperature, cyclic-temperature, and UV types of tests are specified, incorporating selected levels of relative humidity and chemical contamination and an imposed forward-bias current and static electric field. R.E.S.

N80-14484*# General Electric Co., Cincinnati, Ohio.
A CONCEPTUAL DESIGN STUDY ON THE APPLICATION OF LIQUID METAL HEAT TRANSFER TECHNOLOGY TO THE SOLAR THERMAL POWER PLANT Final Report
W. F. Zimmerman, C. S. Robertson, C. L. Ehde, S. M. Diwakaruni, and L. E. Stacy 25 Sep. 1979 166 p refs Sponsored by NASA Prepared for JPL and DOE
(Contract JPL-955018)
(NASA-CR-162544; DOE/JPL-1060/28; GEAEP-54) Avail: NTIS HC A08/MF 01 CSCL 10A

Alkali metal heat transfer technology was used in the development of conceptual designs for the transport and storage of sensible and latent heat thermal energy in distributed concentrator, solar Stirling power conversion systems at a power level of 15 kWe per unit. Both liquid metal pumped loop and heat pipe thermal transport were considered; system configurations included: (1) an integrated, focal mounted sodium heat pipe solar receiver (HPSR) with latent heat thermal energy storage; (2) a liquid sodium pumped loop with the latent heat storage, Stirling engine-generator, pump and valves located on the back side of the concentrator; and (3) similar pumped loops serving several concentrators with more centralized power conversion and storage. The focus mounted HPSR was most efficient, lightest and lowest in estimated cost. Design confirmation testing indicated satisfactory performance at all angles of inclination of the primary heat pipes to be used in the solar receiver. Author

N80-14487*# Purdue Univ., Lafayette, Ind.
ANALYSIS AND SIMULATION OF WIND ENERGY SYSTEMS Final Report
P. C. Krause Nov. 1979 60 p refs
(Grant NsG-3237)
(NASA-CR-162538) Avail: NTIS HC A04/MF A01 CSCL 10A

Using a wind fluctuation model, simulation results of the mechanical and electrical systems were obtained for the MOD-2 wind turbine generator system. The dynamic performance of the MOD-2 was studied during wind gusts of the 1-cos form from a constant wind velocity. If these are the type of wind fluctuations to which the wind systems will be subjected to, then the design of the MOD-2 appears adequate. There was one exception to this; with a rate limit incorporated in the pitch controller, an instability occurred during a 'down' gust which caused continuous, unbounded switching between the high and low modes. This is a control design problem which appears to be correctable. R.E.S.

N80-14488*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
APPLICATION OF FIELD-MODULATED GENERATOR SYSTEMS TO DISPERSED SOLAR THERMAL ELECTRIC GENERATION
R. Ramakumar 15 Aug. 1979 94 p refs Sponsored in part by DOE
(Contract NAS7-100; JPL Proj. 5102-136)
(NASA-CR-162536; JPL-Pub-79-83; DOE/JPL-1060-25) Avail: NTIS HC A05/MF A01 CSCL 10A

The state-of-the-art of field modulated generation system (FMGS) is presented, and the application of FMGS to dispersed solar thermal electric generation is discussed. The control and monitoring requirements for solar generation system are defined. A comparison is presented between the FMGS approach and other options and the technological development needs are discussed. R.E.S.

N80-14491*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SOLAR THERMAL POWER SYSTEMS ADVANCED SOLAR THERMAL TECHNOLOGY PROJECT, ADVANCED SUBSYSTEMS DEVELOPMENT Semiannual Progress Report, 1 Oct. 1978 - 1 Apr. 1979
15 Aug. 1979 110 p Original contains color illustrations
(Contracts NAS7-100; DE-AI01-79ET-20307; JPL Proj. 5102-117)
(NASA-CR-162546; DOE/JPL-1060-20; JPL-Pub-79-107; SAPR-3) Avail: NTIS HC A06/MF A01 CSCL 10B

The preliminary design for a prototype small (20 kWe) solar thermal electric generating unit was completed, consisting of several subsystems. The concentrator and the receiver collect solar energy and a thermal buffer storage with a transport system is used to provide a partially smoothed heat input to the Stirling engine. A fossil-fuel combustor is included in the receiver designs to permit operation with partial or no solar insolation (hybrid). The engine converts the heat input into mechanical action that powers a generator. To obtain electric power on a large scale, multiple solar modules will be required to operate in parallel. The small solar electric power plant used as a baseline design will provide electricity at remote sites and small communities. Author

N80-14492*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SILICON MATERIALS OUTLOOK STUDY FOR 1980-1985 CALENDAR YEARS
E. Costogue, R. Ferber, W. Hasbach, R. Pellin, and C. Yaws 1 Nov. 1979 74 p refs Sponsored in part by DOE
(Contract NAS7-100; JPL Proj. 5230-1-Rev-A)
(NASA-CR-162541; JPL-Pub-79-110; DOE/JPL-1012-33) Avail: NTIS HC A04/MF A01 CSCL 10A

The polycrystalline silicon industry was studied in relation to future market needs. Analysis of the data obtained indicates that there is a high probability of polycrystalline silicon shortage by the end of 1982 and a strong seller's market after 1981 which will foster price competition for available silicon. R.E.S.

N80-14493*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
STATUS OF THE DOE/NASA CRITICAL GAS TURBINE RESEARCH AND TECHNOLOGY PROJECT
John S. Clark 1980 21 p refs Proposed for presentation at the 25th Annual Gas Turbine Conf., New Orleans, 9-13 Mar. 1980; sponsored by the Am. Soc. of Mech. Engineers
(Contract EF-77-A-01-2593)
(NASA-TM-79307; DOE/NASA/2593-79/11; E-263) Avail: NTIS HC A02/MF A01 CSCL 10B

Activities performed in order to provide an R&T data base for utility gas turbine systems burning coal-derived fuels are described. Experiments were run to determine the corrosivity effects of trace metal contaminants (and potential fuel additives) on gas turbine materials and these results were correlated in a corrosion-life prediction model. Actual fuels were burned in a burner rig hot corrosion test to verify the model. A deposition prediction model was assembled and compared with results of actual coal-derived fuel deposition tests. Thermal barrier coatings were tested to determine their potential for protecting gas turbine hardware from the corrosive contaminants. Several coatings were identified with significantly improved spallation-resistance (and, hence, corrosion resistance). A.R.H.

N80-14494# Rensselaer Polytechnic Inst., Troy, N. Y. Center for Architectual Research.
BARRIERS TO THE APPLICATION OF WIND ENERGY CONVERSION SYSTEMS IN URBAN SETTINGS
Robert E. Duffy, Walter M. Kroner, ed., Michael Kwartler, and George W. Ulseth Dec. 1979 176 p refs Sponsored by New York State Energy Res. and Develop. Authority
Avail: NTIS HC A09/MF A01

The issues which arise through such activities as the planning/building regulatory process, location selection, mounting or installation, and operation and maintenance of wind energy conversion systems (WECS) were identified and analyzed in relation to their legal environmental, technical, institutional, economic, safety, and social impacts. Case studies and simulation were performed, and potential differences in barriers described in national publications were compared with conditions unique to the northeast region and/or to New York State. Those urban areas in New York State where sufficiant wind power is available for WECS consideration were identified, and the legal instruments and jurisdictional constraints relevant to them were analyzed. A.R.H.

N80-14495*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVELOPMENT AND TESTING OF THE JUNKEEPER CONTROL CORPORATION INTEGRATED PROGRAMMABLE ELECTRONIC CONTROLLER AND HYDRONICS PACKAGE Final Report
James D. Hankins Aug. 1979 21 p refs
(NASA-TM-78244) Avail: NTIS HC A02/MF A01 CSCL 10A

Additional developmental work on the existing programmable electronic controller and hydronic package for use with solar heating and cooling systems is summarized. The controller/hydronics subsystems passed all acceptance tests and performance criteria. The subsystems were shown marketable for public use. R.E.S.

N80-14496*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVELOPMENT AND TESTING OF THE RHO SIGMA INCORPORATED MICROPROCESSOR CONTROL SUBSYSTEM Final Report
James D. Hankins Oct. 1979 23 p refs Sponsored in part by DOE
(Contract NAS8-32256)
(NASA-TM-78246) Avail: NTIS HC A02/MF A01 CSCL 10A

Product development and performance tests of three programmable microprocessor controllers for use with solar heating and cooling systems are presented. The products were developed to be marketable for public use. R.E.S.

N80-14497*# Wyle Labs., Inc., Huntsville, Ala. Solar Energy Systems Div.
THERMAL PERFORMANCE EVALUATION OF THE SUNCATCHER SH-11 (LIQUID) SOLAR COLLECTOR
Jul. 1980 22 p Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-161253) Avail: NTIS HC A02/MF A01 CSCL 10A

The procedures used and the results obtained during the evaluation test program on the Solar Unlimited, Inc., Suncatcher SH-11 (liquid) solar collector are presented. The flat-plate collector case assembly is made of .08 inch aluminum 3003 H14 riveted with fiberglass board insulation. The absorber consists of collared aluminum fins mechanically bonded to 3/8 inch copper tubing and coated with 3M Nextel black. Water is used as the working fluid. The glazing is made of a single glass, 1/8 inch water white, tempered and antireflective. The collector weight is 85 pounds with overall external dimensions of about 35.4 in x 82.0 in x 4.0 in. Thermal performance data on the Solar Unlimited Suncatcher SH-11 solar collector under simulated conditions were conducted using the MSFC Solar Simulator. M.M.M.

N80-14498*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVELOPMENT AND TESTING OF THE SOLAR CONTROL CORPORATION MODULAR CONTROLLER AND SOLARSTAT SUBSYSTEM Final Report
James D. Hankins Aug. 1979 15 p refs Prepared for DOE Prepared by Solar Control Corp., Boulder, Colo.
(Contract NAS8-32258)
(NASA-TM-78243) Avail: NTIS HC A02/MF A01 CSCL 10A

Results of development work on an existing controller and solarstat subsystem for use with solar heating and cooling systems are presented. The deliverable end items, program objectives, and how they were accomplished are described. It is shown that the products developed are marketable and suitable for public use. J.M.S.

N80-14499*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DEVELOPMENT, TESTING AND CERTIFICATION OF THE SIGMA RESEARCH, MAXI-THERM-S-101 THERMOSYPHON HEAT EXCHANGER Final Report
James D. Hankins Oct. 1979 19 p refs
(NASA-TM-78245) Avail: NTIS HC A02/MF A01 CSCL 10A

A thermosyphon liquid-to-air heat exchanger developed for use in heating systems in residential single family dwellings and small commercial applications is described. The cabinet design, rationale for the horizontal positioning of the exchanger, and design of the shut-off valve are discussed. The performance of the heating module is given in tabular form. J.M.S.

N80-14500*# Wyle Labs., Inc., Huntsville, Ala.
RESULTS OF THERMAL PERFORMANCE EVALUATION OF THE OWENS-ILLINOIS SUNPACK LIQUID SOLAR COLLECTOR AT INDOOR CONDITIONS
10 Oct. 1979 28 p refs Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-161189) Avail: NTIS HC A03/MF A01 CSCL 10A

Test procedures and results of the thermal performance of a liquid, evacuated tube, solar collector under simulated conditions are presented. The collector tested was a module used on the early demonstration projects. R.E.S.

N80-14501*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COMPUTER PROGRAM FOR ASSESSING THE ECONOMIC FEASIBILITY OF SOLAR ENERGY FOR SINGLE FAMILY RESIDENCES AND LIGHT COMMERCIAL APPLICATIONS
J. Alan Forney (Systems Analysis and Integration Lab.), David Walker (Computer Sciences Corp., Huntsville, Ala.), and Mike Lanier (Computer Sciences Corp., Huntsville, Ala.) Sep. 1979 147 p
(NASA-TM-78251) Avail: NTIS HC A07/MF A01 CSCL 10B

Computer program, SHCOST, was used to perform economic analyses of operational test sites. The program allows consideration of the economic parameters which are important to the solar system user. A life cycle cost and cash flow comparison is made between a solar heating system and a conventional system. The program assists in sizing the solar heating system. A sensitivity study and plot capability allow the user to select the most cost effective system configuration. M.G.

N80-14502# Boston Univ., Mass. Dept. of Chemistry.
PHOTOSENSITIZATION MECHANISMS FOR ENERGY STORING ISOMERIZATIONS Technical Report, 1 Nov. 1976 - 28 Feb. 1979
Guilford Jones, II, Phan Thanh Xuan, and Sheau Hwa Chiang 1 Jul. 1979 32 p refs
(Contract N00014-76-C-0442)
(AD-A074968; TR-9) Avail: NTIS HC A03/MF A01 CSCL 07/4

The results of a study of photochemical storage of radiant energy in organic molecules are reviewed and prospects for the reversible storage of solar energy outlined. A number of intramolecular cycloaddition reactions are identified as candidates for efficient photochemical energy storage and findings concerning the mechanisms of these reactions are discussed. Strategies for the photosensitization of reactions to visible light are evaluated. The use of wavelengths past 500 nm is demonstrated for an energy storing isomerization which is efficiently driven by a triplet energy transfer mechanism. GRA

N80-14503# Boston Univ., Mass. Dept. of Chemistry.
ENERGY STORING ORGANIC PHOTOREACTIONS Final Report, 1 Nov. 1975 - 28 Feb. 1979
G. Jones, II 1 Aug. 1979 11 p refs
(Contract N00014-76-C-0442)
(AD-A074915) Avail: NTIS HC A02/MF A01 CSCL 10/3

Results of a study of energy storing organic photoreactions are summarized. Discussion includes criteria for efficient photon energy storage, quantum yield and other quantitative results for a variety of photoisomerization and photoaddition reactions, the nature of intermediates for these photoreactions, photochemistry of charge-transfer complexes, and prospects for photochemical storage of solar energy. GRA

N80-14504# Dayton Univ., Ohio. School of Engineering.
ANALYSIS OF REMOTE SITE ENERGY STORAGE AND GENERATION SYSTEMS Final Technical Report, Jul. 1978 - Jun. 1979
J. N. Crisp, W. S. Bishop, J. D. Pinson, and L. A. Anderson Jul. 1979 148 p refs
(Contract F33615-77-C-2004)

(AD-A074869; UDR-TR-79-35; UDSE-TR-79-02; AFESC/ESL-TR-79-20) Avail: NTIS HC A07/MF A01 CSCL 10/2

This report presents the results of an investigation and analysis of energy storage systems and alternate energy sources for remote site applications. The first phase of the effort centered on the broad based study of hydrogen storage, thermal storage, batteries, and flywheels as energy storage systems along with wind turbine, solar photovoltaic, and solar thermionic energy converters. A wind turbine battery system was recommended based on performance, cost and availability. Effort under the second phase of the program concentrated on a system using two separate nominal eight kilowatt wind turbine modules in conjunction with a lead-acid battery energy storage unit. The system was specified to operate in conjunction with an existing power grid system located at Bar Main, Barter Island, Alaska. Specific system concepts and recommendations are presented with supporting analyses. A design checklist is included with specific items for consideration in the preparation of a design specification. GRA

N80-14505# GTE Sylvania, Inc., Needham Heights, Mass. Communications Systems Div.

LITHIUM INORGANIC ELECTROLYTE BATTERY DEVELOPMENT Interim Report, Jun. 1977 - Oct. 1978

F. Goebel Apr. 1979 60 p refs
(Contract F33615-77-C-2021; AF Proj. 3145)
(AD-A073858; AFAPL-TR-79-2026) Avail: NTIS HC A04/MF A01 CSCL 10/3

This report presents the results of the first half of a three year program to conduct exploratory development to improve the safety/performance characteristics of lithium anode/inorganic electrolyte batteries. Development has been conducted in 3 major areas: capacity retention of cylindrical cells, low temperature capability of cylindrical cells, and abuse tests of cylindrical and prismatic cells. Significant accomplishments include providing capacity down to the 3.0 volt level cutoff at -40 degrees and no venting or explosion of cells during abuse tests, except during incineration when it is expected. GRA

N80-14508# Department of Energy, Washington, D. C.

COMMERCIALIZATION STRATEGY REPORT FOR HYDROTHERMAL ELECTRIC AND DIRECT HEAT APPLICATION

R. A. Black, J. V. Dionne, L. Falick, and E. B. Harvey [1979] 98 p
(TID-2884-Draft) Avail: NTIS HC A05/MF A01

The use of vapor dominated hydrothermal resources for production of electric power is discussed. The ability to handle high temperature, low to moderate-salinity geofluids and convert the heat to usable power using existing technology is reviewed. The use of high temperature, high salinity brines, and moderate temperature resources is examined for economic operation. Technical risks and environmental acceptability are discussed along with technical, market/economic, environmental, institutional readiness, and benefit analysis. A commercialization plan for hydrothermal electric and direct heat applications is presented. DOE

N80-14509# Oak Ridge National Lab., Tenn.

OUTLOOK FOR NUCLEAR FISSION ENERGY

T. D. Anderson 1978 14 p refs Presented at 2d Ann. Intern. Conf. on Energy, Washington, D.C.
(Contract W-7405-eng-26)
(CONF-7811126-1) Avail: NTIS HC A02/MF A01

The status of nuclear power as an energy source is discussed. The development of light water breeder reactors for electric power generation is examined. Present nuclear energy research and development are reported. The electric utility industry's commitment to nuclear power and the effects of the energy crisis on the nuclear power inudstry are examined. A.W.H.

N80-14510# Little (Arthur D.), Inc., Cambridge, Mass.

ENERGY ANALYSIS OF THE BASIC MATERIALS UTILIZED IN ELECTRIC POWER TRANSMISSION SYSTEMS

30 Apr. 1979 353 p
(Contract EC-77-C-01-5043)
(HCP/T5043-01) Avail: NTIS HC A16/MF A01

The energy content per mile of installed underground and overhead power transmission systems was calculated for the following types of systems: self contained oil filled cables; HPOF pipe type cables; extruded dielectric cables; compressed gas insulated systems; overhead lines (ac and dc); and two proposed superconducting systems (ac and dc). The system operating voltages analyzed included 138, 230, 345, 500, 765 and 1,200 kV for ac systems. Systems were not analyzed at the higher voltages. Installation energy requirements, generally 10% or less of the inherent system energy content based on the materials used in each system, are discussed. The energy content of 36 materials and basic products, in terms of Btu per ton, was calculated. Substitution of conductor materials (e.g., aluminum for copper) in cable systems are examined in relation to total system energy content. DOE

N80-14511# Tennessee Univ., Knoxville. Dept. of Civil Engineering.

SIMULATION APPROACH FOR BASE-LINE ENERGY-SITING ANALYSIS

R. L. Church and E. L. Hillsman (Oak Ridge Natl. Lab., Tenn.) 1979 16 p refs Presented at Instrument Soc. of Am., Pittsburgh Modeling and Simulation Conf., Pittsburgh, 25 Apr. 1979
(Contract W-7405-eng-26)
(CONF-790459-22) Avail: NTIS HC A02/MF A01

A simulation model for predicting regional energy-siting patterns is discussed. The model results are used to project regional environmental and economic impacts for DOE. Emphasis is placed on modifications, which include casting the siting decision within a multiobjective framework and including intermediate optimizing capabilities to meet water resource and other constraints. DOE

N80-14512# Brookhaven National Lab., Upton, N. Y.

HIGHLIGHTS OF THE ENERGY TECHNOLOGY PROGRAMS Annual Report

Dec. 1978 49 p
(Contract EY-76-C-02-0016)
(BNL-50959) Avail: NTIS HC A03/MF A01

Activities in: electrolysis based hydrogen energy storage systems; an electrochemically regenerative hydrogen-halogen energy storage system; fuel cells (materials and electrolysis); high temperature water electrolysis; and hydrogen energy storage systems for automobile propulsion are summarized. Energy programs reported on include: solar assisted heat pump systems; solar cooling subsystems and systems; solar demonstration projects; hardware simulators for tests of solar cooling/heating systems; fossil energy programs; catalytic process for conversion of synthesis gas to methanol; coal fired heater; coal/oil mixture combustion; rotating fluidized bed containing limestone for removal of sulfur from hot gases; improved oil and gas burners; and residue and waste fuels. DOE

N80-14514# Brookhaven National Lab., Upton, N. Y. National Center for Analysis of Energy Systems.

DYNAMIC ENERGY SYSTEM OPTIMIZATION MODEL

E. A. Cherniavsky, L. L. Juang, and H. Abilock May 1979 119 p
(Contract EY-76-C-02-0016)
(EPRI-EA-1079) Avail: NTIS HC A06/MF A01

The dynamic energy system optimization model (DESOM) developed to investigate the roles of different technologies in the energy system over an extended period of time is discussed. Means to improve computational features of the program, to incorporate electric sector detail into the existing version of DESOM, and to transfer the DESOM model to EPRI are examined. DOE

N80-14515# Department of Energy, Washington, D. C. Office of State and Local Governments.

REPORT TO THE CONGRESS ON THE COORDINATION OF FEDERAL ENERGY CONSERVATION PROGRAMS INVOLVING STATE AND LOCAL GOVERNMENTS

May 1979 117 p
(DOE/TIC-10127) Avail: NTIS HC A06/MF A01

Four laws which authorize the government to develop and implement specific energy conservation programs are discussed.

The development, implementation, and administration of the energy programs are examined and the coordination activities between Federal, State, and Local governments on the energy programs are analyzed. A.W.H.

N80-14516# Illinois Univ., Urbana. Center for Advanced Computation.
NEW HYBRID 1971 ENERGY INTENSITIES, PART 1 Final Report
P. S. Penner, R. A. Herendeen, and T. Milke Dec. 1978 9 p refs
(Contract EM-78-S-02-4628)
(COO-4628-4-Pt-1) Avail: NTIS HC A02/MF A01

A set of hybrid energy intensities from 1971 direct energy use data and 1967 economic input/output information are computed and discussed. Energy intensities represent the total energy used through the economy to produce one unit of output from each of the 90 sectors defined as spanning the U.S. economy in 1967. The data base discussed contains, among other items, data on the consumption of over 100 fuel types by 154 consuming sectors in the U.S. economy. DOE

N80-14517# California Univ., Livermore. Lawrence Livermore Lab.
US ENERGY FLOW IN 1978
W. J. Ramsey 11 Jun. 1979 6 p
(Contract W-7405-eng-48)
Avail: NTIS HC A02/MF A01

An energy flow diagram for the U.S. for 1978 is presented. Some significant differences between 1977 and 1978 are: total energy use increased 1.8%; oil imports decreased to 17.4 quads, more than 7% below 1977; coal and natural gas remained about constant; the industrial sector remains unique in that its energy use decreased somewhat due to conservation efforts; delivered nuclear power increased by 8%, supplying one-eighth of all electricity; and a trend toward electrification continued with distributed electrical energy increasing by 3.9%. DOE

N80-14518# Midwest Research Inst., Golden, Colo.
APPLICATION OF DIFFUSION RESEARCH TO SOLAR ENERGY POLICY ISSUES
J. D. Roessner Mar. 1979 35 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-51-194) Avail: NTIS HC A03/MF A01

Two types of information requirements that appear to be basic to DOE solar energy policy decisions are examined: (1) how can the future market success of solar energy technologies be estimated, and (2) what factors influence the adoption of solar energy technologies, and what specific programs could promote solar energy adoption most effectively? The ability of a body of research, referred to here as diffusion research, to supply information that could partially satisfy these requirements is assessed. The strengths and limitations of current knowledge about the diffusion of innovations are summarized, the applicability of both existing knowledge and the diffusion approach to the identified solar energy policy issues are discussed, and ways are suggested in which diffusion approaches can be modified and existing knowledge employed to meet short and long term goals of DOE. DOE

N80-14519# Midwest Research Inst., Golden, Colo.
IMPLEMENTATION OF STATE SOLAR INCENTIVES: LAND-USE PLANNING TO ENSURE SOLAR ACCESS
P. Pollock Mar. 1979 41 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-51-163) Avail: NTIS HC A03/MF A01

State incentives in land use planning to ensure solar access are examined to determine issues in program design and implementation. These incentives include broad legislative grants of solar rights, application of nuisance law to solar collector shading, removal of restrictive covenants or establishment of covenants to protect solar access, provision for privately negotiated solar easements, and land use planning and regulation to include passive solar design and provision for active solar collection in land use development. Oregon is engaged in a statewide, mandated local comprehensive planning process which includes consideration of energy conservation and renewable energy sources. California has two solar access related bills which address private solar easements, subdivision design, restrictive covenants, and shading by vegetation. New Mexico has a broad legislative grant of solar rights based on water rights law. Minnesota authorized the inclusion of solar energy as a factor in local land use planning and established a private easement procedure. DOE

N80-14520# Midwest Research Inst., Golden, Colo.
IMPLEMENTATION OF STATE SOLAR INCENTIVES: A PRELIMINARY ASSESSMENT
J. Ashworth, B. Green, P. Pollock, R. Odland, R. Saltonstall, and L. J. Perelman Jan. 1979 238 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-51-159) Avail: NTIS HC A11/MF A01

The implementation of official state solar energy incentives programs was investigated. Questions of incentive design and program effectiveness are addressed in certain portions of the text, but the bulk of the research effort is directed toward examining how laws and legislative mandates have been transformed into rules, regulations, eligibility criteria, standards, comprehensive land use plans, grants, tax deductions, and demonstration projects. Most of the programs discussed will be official governmental actions, although the roles of private groups, advisory councils, and universities are addressed. Programs were examined in Arizona, California, Florida, Maine, Massachusetts, Minnesota, Montana, New Mexico, and Oregon. DOE

N80-14521# Department of Energy, Washington, D. C.
COMMERCIALIZATION STRATEGY REPORT FOR ENERGY FROM URBAN WASTES
D. Walter, S. Levy, and C. Rines [1979] 48 p
(TID-28852-Draft) Avail: NTIS HC A03/MF A01

Three broad technologies are potentially available to recover energy and energy-intensive materials from urban wastes: mechanical, thermal, and biological. Worldwide experience indicates that commercialization is feasible although there are a number of technical, economic, and institutional barriers that currently limit the use of wastes. From a technical standpoint the daily variability of urban waste makes control and optimization of any process difficult. Further development and optimization of equipment is necessary to improve efficiency and reduce capital costs although there are no foreseen technological barriers and basic breakthroughs are not needed. Technical, market/economic, environmental, and insitutional readiness and benefits analysis are discussed. The commercializations strategy is summarized. DOE

N80-14522# Brookhaven National Lab., Upton, N. Y. Energy and Environment Dept.
SOLID ELECTROLYTE FUEL CELL FOR ELECTRIC POWER GENERATION
S. Srinivasan and H. S. Isaacs 1979 10 p refs Presented at the 14th Intersoc. Energy Conversion Conf., Boston, 5-10 Aug. 1979
(Contract EY-76-C-02-0016)
(BNL-26238; CONF-790803-29) Avail: NTIS HC A02/MF A01

The development of high temperature fuel cells with molten carbonates or solid electrolytes are described. The advantages of solid electrolyte over the molten electrolyte fuel cells including: higher projected efficiencies; higher attainable current densities, and no cell corrosion problems are discussed. The design, fabrication, and testing of multicell stacks (5 cells) are discussed. The operating cell characteristics are examined in respect to meeting power plant performance goals. A.W.H.

N80-14523# Institute of Gas Technology, Chicago, Ill.
FUEL CELL OPTION
K. F. Blurton Oct. 1978 13 p Presented at Conf. on Nat. Energy Econ. 2, Tulsa, Okla., 18-20 Sep. 1978
(Contract EM-78-C-03-1735)
(CONF-7809137-1) Avail: NTIS HC A02/MF A01

Fuel cell technology and its potential application is discussed. The strategy of fuel cell development is examined and the attributes of fuel cell power plants are described. DOE

N80-14524# Illinois Univ., Urbana. Center for Advanced Computation.
ENERGY CONSERVATION IN THE US ECONOMY FROM INCREASED RECYCLE OF OBSOLETE STEEL SCRAP Final Report
J. R. Brodrick Nov. 1978 110 p refs
(Contract EY-76-S-02-2893)
(COO-2893-10) Avail: NTIS HC A06/MF A01

Energy consumption in the steel industry is discussed and a recycling method is proposed for energy conservation. A model is presented to define the energy savings for the steel industry, the labor impact, and the economic factors of recycling scrap metal. A.W.H.

N80-14525# Argonne National Lab., Ill.
DEFINITION AND ANALYSIS OF THE BARRIERS TO THE IMPLEMENTATION OF URBAN ENERGY RECOVERY SYSTEMS
May 1979 22 p
(Contract W-31-109-eng-38)
(ANL/CNSV/TM-2) Avail: NTIS HC A02/MF A01

Major barriers to the implementation of urban energy recovery systems and the identification of Federal programs believed to be the most effective in developing these systems are presented. A survey of 40 persons experienced in the implementation of urban energy recovery systems, which provides the results, is analyzed. DOE

N80-14526# Los Alamos Scientific Lab., N. Mex.
APPLICATIONS OF FUEL CELLS IN TRANSPORTATION
B. McCormick, R. Bobbett, D. Lynn, S. Nelson (DOE, Washington, D.C.), S. Srinivasan (Brookhaven National Lab.), and J. McBreen (Brookhaven National Lab.) 1979 11 p Presented at the 14th Intersoc. Energy Conversion Conf., Boston, 5-10 Aug. 1979
(Contract W-7405-eng-36)
(LA-UR-79-628; CONF-790803-16) Avail: NTIS HC A02/MF A01

A detailed technical and economic evaluation of potential applications for fuel cells in transportation is given. Four vehicle types were evaluated: city bus, highway bus, delivery van, and consumer car, using fuel cell and reformer data. Various fuel options and performance vs economic tradeoffs were considered and final recommendations are presented. DOE

N80-14527# Sandia Labs., Albuquerque, N. Mex.
THERMAL AGING CHARACTERISTICS OF ELECTRODEPOSITED BLACK CHROME SOLAR COATINGS
R. B. Pettit and R. R. Sowell 1979 5 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract EY-76-C-04-0789)
(SAND-78-2094C; CONF-790541-32) Avail: NTIS HC A02/MF A01

By reducing the trivalent chromium concentration of Chromonyx black chrome plating bath, coatings with improved thermal stability characteristics were obtained. For trivalent chromium concentrations as low as 8 g/l, solar absorptance values decreased only a few percent from initial values of approximately 0.97 after heating in air at 400 C for over 3600 hours. Coating composition and structure were studied using transmission electron microscopy, scanning electron microscopy, and sputter Auger-profiling. Initial results indicate that the coatings from the nominal bath composition are composed of small particles, with diameters in the range 65 to 90 nm. When the trivalent chromium concentration is reduced, these particles agglomerate into larger clusters that are 150 to 250 nm in size. Upon heating in air, all coatings experience a substantial amount of oxidation, but the stable coatings maintain a significantly higher metallic chromium content. DOE

N80-14528# California Univ., Livermore. Lawrence Livermore Lab.
NON-TRACKING INFLATED CYLINDRICAL SOLAR CONCENTRATOR
J. W. Gerich 22 May 1979 18 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract W-7405-eng-48)
(UCRL-82721; CONF-790541-12) Avail: NTIS HC A02/MF A01

A concentrating solar collector able to produce pressurized hot water up to a temperature of 175 C was developed. The collector structure consists mainly of an inflated thin film plastic cylinder that is clear on the upper portion and is an aluminized reflector on the lower portion. The reflector concentrates sunlight on a receiver tube which is jacketed with a heat transfer suppressing, thin film plastic cylinder. The first experimental collectors verified performance modeling codes. The second generation collectors now being constructed address cost considerations and ease of fabrication, installation, and maintenance. It was found that the installed cost of the inflated concentrator is likely to be one-fifth that of parabolic trough concentrators. An experimental apparatus was developed to measure the total hemispherical emittance of full size receiver tubes. Test results indicate a rather dramatic increase in the room temperature value at typical concentrator operating temperatures. R.E.S.

N80-14529# California Univ., Livermore. Lawrence Livermore Lab.
LAWRENCE LIVERMORE LABORATORY GEOTHERMAL ENERGY PROGRAM: A STATUS REPORT ON THE DEVELOPMENT OF THE TOTAL-FLOW CONCEPT M.S. Thesis
A. L. Austin and A. W. Lundberg 2 Oct. 1978 77 p refs
(Contract W-7405-eng-48)
(UCRL-50046-77) Avail: NTIS HC A05/MF A01

The technology development activities of the Geothermal Energy Program at the Lawrence Livermore Laboratory are summarized. Significant progress toward development of the total-flow concept was made. The results show that the original goal of 70% engine efficiency for the total-flow impulse turbine is achievable; that a total-flow system is competitive economically with conventional systems; and that the total-flow concept offers the benefit of more efficient utilization of geothermal resources for electric power production. The evaluation of several liquid expanders designed for low-temperature (including geopressured) resources suggests that if development were continued, these expanders could be used in combination with conventional systems to increase overall system efficiency. DOE

N80-14530# Argonne National Lab., Ill.
LITHIUM/METAL SULFIDE BATTERY DEVELOPMENT
R. K. Steunenberg 1979 15 p refs Presented at Fast Ion Transport in Solids-Electrode and Electrolytes Conf., Lake Geneva, Wis., 21 May 1979
(Contract W-31-109-eng-38)
(CONF-790538-10) Avail: NTIS HC A02/MF A01

Lithium/metal sulfide batteries developed for electric vehicle propulsion and for stationary energy storage applications such as load leveling are described. The battery cells consist of lithium-aluminum or lithium-silicon negative electrodes, iron sulfide (FeS or FeS2) positive electrodes, and molten LiCl-KCl electrolyte. The cells are enclosed in a thermally insulated jacket to maintain an operating temperature of 400 to 500 C. A 40 kWh electric vehicle battery consisting of 120 Li-Al/FeS cells is described. DOE

N80-14531# Argonne National Lab., Ill.
ADVANCED BATTERIES FOR ELECTRIC VEHICLES: A LOOK AT THE FUTURE
William J. Walsh 23 Apr. 1979 23 p refs Presented at the APS Meeting, Washington, D.C., 23 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790484-1) Avail: NTIS HC A02/MF A01

Battery systems which are potential candidates for electric motor vehicles are discussed. These include lead acid, nickel-iron, nickel-zinc, zinc-chlorine, lithium-metal sulfide and sodium-sulfur (ceramic electrolyte). The characteristics of these batteries are discussed. Each individual battery system is found to have less than 50% probability of successful development and commercialization; however, the cumulative probability that at least one of the batteries would be successfully developed is judged to be greater than 75%. It is predicted that the magnitude of the market penetration of electric motor vehicles will depend on the severity of future liquid-fuel shortages along with the cost and quality of the advanced batteries. DOE

N80-14532# Sandia Labs., Livermore, Calif.

DISSOCIATION PRESSURE MEASUREMENTS ON SALTS PROPOSED FOR THERMOCHEMICAL ENERGY STORAGE

Robert W. Carling Jul. 1979 40 p refs
(Contract EY-76-C-04-0789)
(SAND-79-8033) Avail: NTIS HC A03/MF A01

Chemical heat pumps employ salt hydrates, ammoniates, or methanolates for energy storage. The efficient operation of a chemical heat pump depends strongly upon the reaction energies and pressure/temperature relationships of these salts. An apparatus was assembled to measure pressure/temperature relationships and derive reaction energies. A sensitive cantilever balance used to prepare salt samples in situ so that the stoichiometry of the salt hydrate, ammoniate, or methanolate is known prior to the pressure measurements is incorporated in this apparatus. The apparatus is described and results on two systems are presented: $MgCl_2 \cdot nH_2O$ (where n = 6.1, 6, or 4) and $CaCl_2 \cdot nNH_3$ (where n = 8, 4, 2, or 1). DOE

N80-14533# California Univ., Berkeley. Lawrence Berkeley Lab. Earth Sciences Div.

PROCEEDINGS OF THE THERMAL ENERGY STORAGE IN AQUIFERS WORKSHOP

Dec. 1978 134 p refs Conf. held at Berkeley, Calif., 10-12 May 1978
(Contract W-7405-eng-48)
(LBL-8431; CONF-7805140) Avail: NTIS HC A07/MF A01

Contents: thermal energy storage in aquifer workshop; seasonal storage--prospects and problems; hydrogeology and reservoir engineering; energy management objectives and economics of heat storage wells; institutional aspects of utilizing heat storage in aquifers--a proposal for a prototype test; environmental aspects of low temperature thermal energy storage in aquifers; mathematical modeling of thermal energy storage in aquifers; confined aquifer experiment; thermal storage of cold water in ground water aquifers for cooling purposes; air conditioning Kennedy Airport with winter cold; high temperature underground thermal energy storage. R.E.S.

N80-14534# Battelle Pacific Northwest Labs., Richland, Wash.

COMPRESSED AIR ENERGY STORAGE TECHNOLOGY PROGRAM Annual Report, 1978

W. V. Loscutoff Jun. 1979 180 p refs
(Contract EY-76-C-06-1830)
(PNL-2935) Avail: NTIS HC A09/MF A01

Results of studies performed to establish design and stability criteria for compressed air energy storage (CAES) underground reservoirs are presented along with advanced concepts that will eliminate dependence of the CAES concept on petroleum fuels. Reservoirs examined include aquifers, hard rock caverns, and salt caverns. Equipment evaluation and development studies are cited together with feasibility studies of alternative fuels and technologies such as adiabatic systems, hybrid systems utilizing thermal energy storage and fuel, coal fired fluidized processes, and coal fired low Btu gasifiers. J.M.S.

N80-14535# Los Alamos Scientific Lab., N. Mex.

SUPERCONDUCTING MAGNETIC ENERGY STORAGE FOR ELECTRIC POWER SYSTEM DYNAMIC STABILIZATION

Robert Turner 1979 7 p refs Presented at Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract W-7405-eng-36)
(LA-UR-79-1220; CONF-790803-07) Avail: NTIS HC A02/MF A01

A superconducting magnetic energy storage (SMES) system developed for a dynamic stabilizer to be installed in the Bonneville Power Administration (BPA) power system at Tacoma, Washington, by 1982 is described. This unit is an alternate stabilization method to the dc modulator now used to stabilize the 900 mile, ac intertie between BPA and Southern California. The SMES unit consists of a 30 MJ solenoid, a 10 MW convertor, a liquid helium dewar and auxilary systems. The SMS dynamic stabilizer design is presented with status information about the superconducting coil, the converter, and other components of the SMES dynamic stabilizer summarized. DOE

N80-14536# Elliott Co., Jeannette, Pa.

PRELIMINARY DESIGN OF AXIAL FLOW HYDROCARBON TURBINE/GENERATOR SET FOR GEOTHERMAL APPLICATIONS Final Report

N. A. Samurin and J. R. Shields May 1979 179 p refs Sponsored by Elec. Power Res. Inst.
(EPRI-ER-513) Avail: NTIS HC A09/MF A01

The design of a 65 MW (e) gross turbine generator set in which a hydrocarbon gas mixture is used as the motive fluid is outlined. The turbine generator set is part of a geothermal binary cycle electric power plant proposed for the Heber site in the Imperial Valley, California. Aerodynamic design considerations and estimated unit performance for three hydrocarbon gas mixtures are presented. Real gas properties and equations of state are reviewed as they affect the turbine design and the thermodynamic cycle. The mechanical designs for the casing, rotor dynamics, shaft sealing and unit construction are detailed. Support systems such as the lube and seal supply system, turbine controls, etc., are reviewed. An extensive hydrocarbon turbine general specification is also included. DOE

N80-14537# Southern California Edison Co., Rosemead.

COMMERCIAL SOLAR AUGMENTED HEAT PUMP SYSTEM

J. Wilborn Mar. 1979 79 p refs Sponsored by Elec. Power Res. Inst.
(EPRI-ER-1004) Avail: NTIS HC A05/MF A01

A solar energy augmented water source heat pump system was installed on an administration building located on the campus of the Golden West College in Huntington Beach, California. Testing began in mid-1978 and will continue for two years. Solar energy is collected from 600 square feet of solar collector panels mounted on the administration building roof. Buried tanks having a total capacity of 4,000 gallons store thermal energy. A complete and automated operation control system and instrumentation package are included. The system features flexible operation and operates in multiple modes. These modes of operation allow testing with and without solar collectors and with and without thermal storage. Solar augmentation, thermal storage, and heat pumps are to be evaluated. DOE

N80-14538# Sandia Labs., Albuquerque, N. Mex.

DARRIEUS WIND TURBINE PROGRAM AT SANDIA LABORATORIES

P. C. Klimas 1979 12 p refs Presented at Wind Energy Innovative Sys. Conf., Colorado Springs, 23 May 1979
(Contract EY-76-C-04-0789)
(SAND-79-0997C; CONF-790501-2) Avail: NTIS HC A02/MF A01

The design and development of vertical axis wind turbines (VAWTs) are discussed. Aerodynamic, structural, testing, and systems analyses capabilites for the development program are reported. The aerodynamic and structural characteristics of the VAWT are presented. A.W.H.

N80-14539# PRC Energy Analysis Co., McLean, Va.

ENGINEERING CONCERNS IN SOLAR SYSTEM DESIGN AND OPERATION

James L. Easterly Mar. 1979 24 p refs
(Contract EG-77-C-01-2522)
(SOLAR/0811-79/01) Avail: NTIS HC A02/MF A01

Engineering concerns associated with the startup and operation of solar heating and cooling installations are discussed. Recommendations are also made regarding the design and installation phases to help in avoiding these problems. DOE

N80-14540# Mound Lab., Miamisburg, Ohio.

STUDIES OF DIRECTLY ABSORBING FLUIDS FOR MID-TEMPERATURE SOLAR THERMAL APPLICATIONS

A. R. Burke, D. E. Etter, C. J. Wiedenheft, and L. J. Wittenberg 1979 6 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979

(Contract EY-76-C-04-0053)
(MLM-2625-OP; CONF-790541-17) Avail: NTIS HC A02/MF A01

Thermal, photochemical, and optical absorptivity studies at elevated temperatures on various heat transfer fluids containing chromophoric materials are discussed. The solar absorption efficiency of the fluids and chromophores were calculated at ambient and elevated temperatures. Density, viscosity, and heat capacity measurements for specific solutions were determined. Eight chromophoric solutions are identified as candidates for directly absorbing fluids for use up to 300 C. DOE

N80-14541# Mound Lab., Miamisburg, Ohio.
CONSTRUCTION AND INITIAL OPERATION OF THE MIAMISBURG SALT-GRADIENT SOLAR POND
R. S. Bryant, R. P. Bowser, and L. J. Wittenberg 1979 5 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract EY-76-C-04-0053)
(MLM-2626-OP; CONF-790541-16) Avail: NTIS HC A02/MF A01

The largest salt-gradient solar pond in the U.S. occupies an area of 2020 sq mi in Ohio and was installed for only $35/sq mi. A technique was successfully demonstrated for the formation of the gradient zone, approximately 1 m thick, in which fresh water was injected horizontally below the surface of the concentrated salt solution. Without any useful heat removed, the storage layer water, approximately 18.5% NaCl, reached a peak temperature of 51.1 C in October 1978 and a minimum temperature of 28.4 C during February 1979. The pond is predicted to deliver 281,000 kW hr/yr to be used principally for heating an outdoor swimming pool in the summer and a recreation building from October to December. The projected heat cost is 2.5 cents/kW hr, based upon amortization of 10%/yr. DOE

N80-14542# Department of Energy, Washington, D. C.
GEOTHERMAL ENERGY: PROGRAM SUMMARY
Jun. 1979 316 p refs
(DOE/ET-0101) Avail: NTIS HC A14/MF A01

Descriptions of geothermal projects for the fiscal year 1978 are presented. Each summary gives the project title, contractor name, contract number, funding level, dates, location, and name of the principal investigator. Objectives and strategies for each program are provided. DOE

N80-14543# Department of Energy, Washington, D. C.
COMMERCIALIZATION STRATEGY REPORT FOR SMALL WIND SYSTEMS
Louis V. Divone, R. Blaunstein, J. Gros, A. K. Ingberman, W. L. R. Rice, and S. J. Taylor [1979] 46 p refs
(TID-28844-Draft) Avail: NTIS HC A03/MF A01

The commercial readiness of small wind systems is addressed. Barriers to be overcome before this technology is ready to be used commercially are cited and possible actions that might be considered to remove specific barriers are identified. The full implications of the various proposed actions have not been fully developed and many actions listed undoubtedly have substantial problems associated with them. DOE

N80-14544# Department of Energy, Washington, D. C.
COMMERCIALIZATION STRATEGY REPORT FOR LARGE WIND SYSTEMS
Louis V. Divone, R. Blaunstein, J. Gros, A. K. Ingberman, W. L. R. Rice, and S. J. Taylor [1979] 41 p
(TID-28843-Draft) Avail: NTIS HC A03/MF A01

The commercialization of wind turbines is analyzed concerning technical readiness; market and economic aspects; environmental impacts; institutional acceptance; benefit analysis; and commercialization development strategy. DOE

N80-14545# Department of Energy, Washington, D. C.
COMMERCIALIZATION STRATEGY REPORT FOR SOLAR WATER HEATING
Frederick H. Morse and J. M. Davis [1979] 35 p refs
(TID-28856-Draft) Avail: NTIS HC A03/MF A01

The commercial readiness of solar hot water heating is discussed. Some barriers to be overcome before this technology is ready to be used commercially are identified. Also identified are possible actions that might be considered to remove specific barriers. Technical, market/economics, environmental, and institutional readiness, and benefits analysis are discussed. DOE

N80-14546# Midwest Research Inst., Golden, Colo.
THERMAL ENERGY STORAGE FOR SOLAR APPLICATIONS: AN OVERVIEW
Charles Wyman Mar. 1979 123 p refs
(Contract EG-77-C-01-4042)
(SERI/TP-34-089) Avail: NTIS HC A06/MF A01

The economic role of storage for solar home heating and stand-alone electric plants are examined. Factors which affect the economics of storage are discussed. The costs and storage capacities of representative sensible and latent heat storage materials are summarized. Various modes of operation are also presented for thermal storage by reversible chemical reactions. Containers and heat exchangers are reviewed to illustrate possible approaches to reducing storage costs. Reversible reaction storage, and gas-solid reactions are shown to have desirable attributes for solar energy storage. DOE

N80-14547# Midwest Research Inst., Golden, Colo.
A REVIEW OF THE ECONOMICS OF SELECTED PASSIVE AND HYBRID SYSTEMS
Deborah L. Buchanan Jan. 1979 27 p refs
(Contract EG-77-C-01-4042)
(SERI/TP-61-144) Avail: NTIS HC A03/MF A01

Performance and economic information on passive and hybrid systems were compiled as part of solar commercial readiness activities. The results of selected performance simulation and cost estimate studies are presented as well as actual cost and performance data from operating buildings. Systems representative of each major passive design concept are included: direct gain, indirect gain (thermal storage wall, thermal storage roof), and isolated gain (convective loop/thermosiphon, attached sunspace/greenhouse). Results are presented in tables structured by major design concept. Data for simulated and actual systems are presented separately. Comparison of individual system design specifications, performance, incremental solar cost, and cost of delivered energy are made by major design concept and by simulated or actual data source. In addition, results are aggregated to derive cost and performance ranges over all data sources, by design concept and by simulated or actual system. DOE

N80-14548# Midwest Research Inst., Golden, Colo.
COMMERCIALIZING SOLAR ARCHITECTURE
Gregory Franta Mar. 1979 38 p refs Presented at SERI Architectural Planning Seminar, Golden, Colo., 10 Jul. 1978
(Contract EG-77-C-01-4042)
(SERI/TP-62-113; CONF-780792) Avail: NTIS HC A03/MF A01

Barriers to solar technology commercialization through architecture are considered. Attitudes of architects, their clients, government officials, and design/construction professionals are discussed along with technical issues related to the environment, building design and construction, operation, and maintenance. Performance evaluation of solar heating and cooling of buildings (SHACOB) and the general lack of technical awareness by architects regarding non-SHACOB technologies (wind, biomass, process heat, and photovoltaic cells) are included. Institutional issues related to law and government and the solar infrastructure are identified as important. Suggestions related to information, development, acquisition, and dissemination, education and training, demonstrations and design competitions, and other actions aimed at integration of solar technology into the total energy-conscious design process are given. J.M.S.

N80-14549# California Univ., Berkeley. Lawrence Berkeley Lab.
THERMAL DEGRADATION OF A BLACK CHROME SOLAR SELECTIVE ABSORBER COATING: SHORT TERM
Carl M. Lampert May 1979 6 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979

(Contract W-7405-eng-48)
(LBL-8857; CONF-790541-37) Avail: NTIS
HC A02/MF A01

The energy absorption properties and chemical microstructure of Chrom Onyx were investigated using electron microscopy and X-ray diffraction techniques. Different temperatures for short annealing times were used to evaluate the coating's temperature resistance limitations, along with possible degradation mechanisms for various stagnation situations. Samples were tested in both air and vacuum. It is concluded that for all practical considerations, black chrome optically degrades between 500 - 600 C during short exposure times. M.G.

N80-14550# Aerospace Corp., El Segundo, Calif.
THE 10 MW SOLAR THERMAL PILOT PLANT DYNAMIC SIMULATION. VOLUME 1: COMPUTER PROGRAM DESCRIPTION
1 Dec. 1978 154 p refs 2 Vol.
(Contract ET-78-C-03-2028)
(ATR-78(7747)-1-Vol-1) Avail: NTIS HC A08/MF A01

A digital computer simulation of a prototype solar 10 MW (electric) pilot power plant near Barstow, California is presented. The simulation program has been designated STMPPS (Solar Ten Megawatt Pilot Plant Simulation). This simulation is operative on the Control Data Corporation (CDC) 7600 digital computer, with use of the CDC SCOPE 2.1 operating system. Logic and analytical details on which the program is based are described. DOE

N80-14551# Aerospace Corp., El Segundo, Calif.
THE 10 MW SOLAR THERMAL PILOT PLANT DYNAMIC SIMULATION. VOLUME 2: COMPUTER PROGRAM SOURCE LISTING
1 Dec. 1978 271 p 2 Vol.
(Contract ET-78-C-03-2028)
(ATR-78-(7747)-2-Vol-2) Avail: NTIS HC A12/MF A01

The actual computer source listing of program STMPPS is presented. All routines specifically developed to simulate the solar thermal pilot plant are included. The listing contains a generous amount of nonprogrammatic comment lines to aid in interpretation of program logic. DOE

N80-14552# Brookhaven National Lab., Upton, N. Y.
EVLAUTION OF PERFORMANCE ENHANCEMENT OF SOLAR POWERED ABSORPTION CHILLER WITH AN IMPROVED CONTROL STRATEGY USING THE BNL-BUILT HARDWARE SIMULATOR
P. C. Auh 1979 5 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract EY-76-C-02-0016)
(BNL-26218; CONF-790541-21) Avail: NTIS
HC A02/MF A01

Transient and cycling performance characteristics of an advanced, solar absorption chiller were investigated. The results of the various combinations of on/off cycling runs showed that the net capacity loss during the start-up transient period could be significantly reduced when the residual cooling capacity generated during the off-period is compensated to the initial loss. Furthermore, the experimental investigation showed that the performance degradation, due to inherent transient behavior of a chiller, could be significantly improved by a simple control modification. The degree of performance under the modified control mode, as a function of the cycle period and such effects on the integrated chiller performance, were investigated. Under the modified control mode, the need of a large cold-side storage may no longer exist. This may offer significant economical advantages, especially for small residential cooling systems, without sacrifice in their performances. DOE

N80-14553# Miami Univ., Coral Gables, Fla. Clean Energy Research Inst.
FIFTH OCEAN THERMAL ENERGY CONVERSION CONFERENCE. VOLUME 2, SECTIONS 4-5
A. Lavi, ed. and T. N. Veziroglu, ed. Sep. 1978 592 p refs Conf. held at Miami Beach, Fla., 20-22 Feb. 1978
(Grant EG-77-G-05-5550)
(CONF-780236-P2) Avail: NTIS HC A25/MF A01

Contents: ocean thermal energy conversion (OTEC) platform design optimization; considerations in selection of OTEC platform size and configuration; OTEC-1 early ocean test project; preliminary engineering design of an OTEC pilot plant; operational sea state and design wave criteria; OTEC platform station keeping analysis; OTEC cold water pipe design loads; dynamic loads induced by severe storms in elastic cold water pipes attached to OTEC ships by fixed and hinged connections; conceptual design of an OTEC power system using modular heat exchangers; power system module configuration using aluminum heat exchangers. R.E.S.

N80-14557# Sandia Labs., Albuquerque, N. Mex.
HELIOS AND RECONCENTRATORS
C. N. Vittitoe, F. Biggs, L. K. Matthews, and L. O. Seamons 1979 6 p refs Presented at Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract EY-76-C-04-0789)
(SAND-78-1600C; CONF-790541-18) Avail: NTIS
HC A02/MF A01

The HELIOS computer code for modeling solar energy collection by reflecting systems is discussed. Extensions to HELIOS which include application to reconcentrators and to the evaluation of heliostats are described. The comparison of HELIOS predictions with image data produced by 23 heliostats and with data from a single facet, chosen partially because of exceptionally large distortion, is discussed. The method of treating reconcentrators is presented. DOE

N80-14558# Sandia Labs., Livermore, Calif.
SYSTEMS STUDIES FOR CENTRAL SOLAR THERMAL ELECTRIC
Oct. 1978 492 p refs Workshop held at Houston, Tex., 27-30 Mar. 1978
(Contracts EY-76-C-04-0789; AT(29-1)-789)
(CONF-780383) Avail: NTIS HC A21/MF A01

Twenty-one articles are presented which focus on the current technical and economic status of central receiver solar thermal electric systems and future program direction. The planning and operational differences which the electric utilities foresee solar electric will encounter are discussed. Methodologies associated with utility network planning and operation are presented. National energy models are discussed along with their implications with respect to the future of various solar electric options. R.E.S.

N80-14559# InterTechnology Corp., Warrenton, Va.
PHOTOVOLTAIC POWER SYSTEMS MARKET IDENTIFICATION AND ANALYSIS Final Report, Jan. 1977 - Feb. 1978
May 1979 551 p refs
(Contract EG-77-C-01-4022)
(HCP/T4022-01) Avail: NTIS HC A23/MF A01

The marketing of near and intermediate term photovoltaic power applications was analyzed. The current uses of photovoltaic systems, both domestic and international, were surveyed and the usage of those systems was projected into the future. Products were defined and a market survey was carried out. A detailed scenario which forecasts sales, barriers to market acceptance, and technological innovations required for proper introduction of the products was developed. DOE

N80-14560# Electric Power Research Inst., Palo Alto, Calif.
ELECTRIC UTILITY SOLAR ENERGY ACTIVITIES, 1978
W. L. York May 1979 197 p
(EPRI-ER-966-SR) Avail: NTIS HC A09/MF A01

The scope of solar energy projects sponsored by electric utilities in the United States is presented. Brief descriptions of 600 projects being conducted by 165 utility companies are given. Also included are a list of participating utilities with information contacts and addresses, a list of utilities with projects designated by category, a list of utilities organized by states, and a list of available reports on utility-sponsored projects. DOE

N80-14561# Department of Energy, Washington, D. C. Div. of Solar Applications Developments.
PHOTOVOLTAIC INCENTIVES OPTIONS
R. M. Terry Aug. 1978 227 p
(HCP/CS-0023) Avail: NTIS HC A11/MF A01

The options available to the Federal Government to encourage adequate growth of the solar photovoltaic industry are identified. Appropriate incentives, strategies and options (combinations of strategies) were identified by defining the policy objectives to be achieved by promoting the growth of the photovoltaic industry. Policy objectives, defined by interpreting: (1) general policy statements on energy policy and on the commercialization of new energy technologies; (2) general and specific policy statements on solar energy and on photovoltaics; and (3) specific photovoltaic program goals, are discussed. The definitions of policy objectives derived from these sources were treated as assumptions for the purpose of this study. A determination of the steps for the attainment of policy objectives is presented. DOE

N80-14562# Argonne National Lab., Ill.
OVERVIEW OF THE DEPARTMENT OF ENERGY'S RESEARCH, DEVELOPMENT AND DEMONSTRATION PROGRAM FOR THE RECOVERY OF ENERGY AND MATERIALS FROM URBAN WASTE
Alan S. Cohen 1979 15 p refs Presented at the US EPA Res. Symp. on Res. on Gas and Leachate and Landfills and Resource Recovery, Orlando, Fla., Mar. 1979
(Contract W-31-109-eng-38)
(CONF-790373-1) Avail: NTIS HC A02/MF A01

Technological options available for reprocessing waste into fuels, metals, glass, paper, ammonia, glucose, fertilizer, and other energy-intensive products are discussed with emphasis on some of the approximate 80 projects comprising the Urban Waste Technology Branch's R, D, and D program. Projects are grouped as being primarily related to mechanical, thermal, or biological processes. To date, the majority of R and D funding is devoted to biological processes including anaerobic and enzymatic digestion, energy production and conservation in water and waste water treatment, and energy generation and recovery in sanitary landfills. However, demonstration activities, representing slightly less than half the program effort, are focused on the thermal/mechanical systems. If successful, approximately 3% of the nation's energy needs could be supplied by reprocessing wastes. DOE

N80-14563# Energy Technology Engineering Center, Canoga Park, Calif.
OTEC-1 TEST CONDUCTOR PROGRAM
P. Archbold and J. O. Bates 1978 13 p Presented at Seminar on Testing Solar Energy Mater. and Systems, Washington, D.C., 22 May 1978
(Contract EY-76-C-03-0700)
(CONF-780550-9) Avail: NTIS HC A02/MF A01

The involvement of the test director contractor (TDC) in the OTEC-1 test program is outlined. The preparation for and testing of the initial test heat exchangers and auxiliary equipment are considered. Interfaces, TDC/SIC (Systems Integration Contractor) test relationship, test request, test procedures, data handling, and biofouling laboratory are discussed. DOE

N80-14565# Sandia Labs., Albuquerque, N. Mex.
HAZARDOUS PROPERTIES AND ENVIRONMENTAL EFFECTS OF MATERIALS USED IN SOLAR HEATING AND COOLING (SHAC) TECHNOLOGIES: INTERIM HANDBOOK
J. Q. Searcy Dec. 1978 225 p refs
(DOE/EV-0028) Avail: NTIS HC A11/MF A01

General background information related to SHAC systems and codes and standards are given. Materials are categorized according to their functional use in SHAC systems as follows: (1) heat transfer fluids and fluid treatment chemicals; (2) insulation materials; (3) seals and sealant materials; (4) glazing materials; (5) collector materials; and (6) storage media. The information presented includes general properties, chemical composition, thermal degradation products, and thermoxidative products of some commerical materials. Toxic properties and other potential health effects, fire hazard properties, and environmental effects of and disposal methods for SHAC materials are also presented. DOE

N80-14566# PRC Energy Analysis Co., McLean, Va.
SYSTEM TESTS AND APPLICATIONS PHOTOVOLTAIC PROGRAM
May 1979 336 p refs
(Contract EG-77-C-01-4024)
(HCP/T4024-01/15) Avail: NTIS HC A15/MF A01

Progress in developing photovoltaic solar energy conversion systems to reduce dependence on fossil fuels is summarized. Exhibits designed to acquaint the general public to photovoltaics are included along with component field tests conducted to monitor module reliability under actual environmental conditions. Major test facilities are described. DOE

N80-14567# Department of Energy, Washington, D. C.
ENERGY POLICY AND CONSERVATION ACT (PUBLIC LAW 94-163) AS AMENDED BY THE NATIONAL ENERGY CONSERVATION POLICY ACT (PUBLIC LAW 95-619). TITLE 10: ENERGY. CHAPTER 2: DEPARTMENT OF ENERGY. SUBCHAPTER D: ENERGY CONSERVATION. PART 430: ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS
1979 19 p
(DOE/CS-0056) Avail: NTIS HC A02/MF A01

The text of Part B, Energy Conservation Program for Consumer Products Other Than Automobiles, from Energy Policy and Conservation Act as amended by National Energy Conservation Policy Act (PL-619) is presented. The text includes the following subjects: coverage, test procedures, labeling, energy efficiency standards, requirements of manufacturers, effect on other law, rules, authority to obtain information, exports, imports, prohibited acts, enforcement, injunctive enforcement, citizen suits, administrative procedure and judicial review, consumer education, annual report, and authorization of appropriations. DOE

N80-14568# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
PERFORMANCE OF RESIDENTIAL SOLAR HEATING AND COOLING SYSTEM WITH FLAT-PLATE AND EVACUATED TUBULAR COLLECTORS: CSU SOLAR HOUSE 1
W. S. Duff, T. M. Conway, G. O. G. Loef, D. B. Meredith, and R. B. Pratt 1978 8 p refs Presented at Meeting of the Am. Section of the Intern. Solar Energy Soc., Denver, 28 Aug. 1978
(Contract EY-76-S-02-2577)
(COO-2577-16; CONF-780808-24) Avail: NTIS HC A02/MF A01

Measurements in Solar House One at Colorado State University provided comparison data on space heating, water heating, and cooling by systems in which flat plate collectors and evacuated tube collectors were used. Data were procured on 47 days during operation of the flat plate collector and on 112 days when the house was heated or cooled by the evacuated tube collector system. It is concluded that the system comprising an evacuated tubular collector, lithium bromide absorption water chiller, and associated equipment is highly effective in providing solar heating and cooling to a small building, that it can supply up to twice the space heating and several times the cooling obtainable from an equal occupied area of good quality flat-plate collectors, and that a greater fraction of the domestic hot water can be obtained by supplying its heat from main storage. DOE

N80-14569# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
REALISTIC SIZING OF RESIDENTIAL SOLAR HEATING AND COOLING SYSTEMS
D. S. Ward 1978 10 p refs Presented at Meeting of the Am. Section of the Intern. Solar Energy Soc., Denver, 28 Aug. 1978
(Contract EY-76-S-02-2858)
(COO-2858-14; CONF-780808-23) Avail: NTIS HC A02/MF A01

The accuracy of technical and economic sizing methods for solar heating and cooling systems in specific installations is demonstrated to be strongly dependent upon the accuracy of the input data. Variations in the solar radiation data due to the inherent errors in previous solar measurements, and the difficulty in calculating heating and cooling loads to a desired level of accuracy are shown to result in calculated fractions of the load, f, of values with 10 to 15% errors. For specific installations where the heating load was calculated (and not measured experimentally), the fraction of the load carried by solar could therefore, be calculated to only one significant figure. Similarly, the inability to accurately predict inflation rates and certain other costs of the life cycle of a solar system, in addition to errors in the calculated heating load and fraction of the load, f, were shown to reduce the accuracy of economic costs of a solar system to values of + or - 25%. DOE

N80-14570# Mound Lab., Miamisburg, Ohio.
EVALUATION OF FUEL RESOURCES AND REQUIREMENTS FOR THE MAGNETIC FUSION ENERGY PROGRAM
T. B. Rhinehammer and L. J. Wittenberg 31 Oct. 1978 106 p refs
(Contract EY-76-C-04-0053)
(MLM-2419) Avail: NTIS HC A06/MF A01

The potential tritium requirements in the presently formulated development plan were assessed and possible sources for the required tritium were identified. The availability of lithium was surveyed also because the only practical production method for tritium is the neutron irradiation of lithium. The estimates of world-wide resources of lithium available to supply such an industry are reviewed. Additionally, the isotopic separation techniques for lithium-6 enrichment are discussed. The resources and requirements for mercury are included because of its potential use in a lithium isotopic separation technique. The availability of helium-3 and helium-4 is briefly discussed. R.E.S.

N80-14571# California Univ., Livermore. Lawrence Livermore Lab.
PROCESS DESIGN AND ECONOMIC ANALYSIS OF THE ZINC SELENIDE THERMOCHEMICAL HYDROGEN CYCLE
H. H. Otsuki and O. H. Krikorian 6 Sep. 1978 35 p refs
(Contract W-7405-eng-48)
(UCRL-52546) Avail: NTIS HC A03/MF A01

A detailed preliminary design for a hydrogen production plant was developed based on an improved version of the ZnSe thermochemical cycle for decomposing water. In the latest version of the cycle, ZnCl2 is converted directly to ZnO through high temperature steam hydrolysis. This eliminates the need for first converting ZnCl2 to ZnSO4 and also slightly reduces the overall heat requirement. The ZnSe cycle is driven by a very high temperature nuclear reactor (VHTR) that provides a high temperature (1283 K) helium working gas for process heat and power. The plant is sized to produce 27.3 Mg/Hs/h and requires specially designed equipment to perform the critical reaction steps in the cycle. Conceptual designs were developed for several of the important process steps to make cost estimates. A cycle efficiency of about 40% and a hydrogen production cost of about $14/GJ were obtained. DOE

N80-14572# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
PROCEEDINGS OF THE DOE CHEMICAL/HYDROGEN ENERGY CONTRACTOR REVIEW SYSTEMS
Aug. 1978 380 p refs Presented at DOE Ann. Chem. Energy Storage and Hydrogen Energy System Contracts Rev., Baltimore, 16 Nov., 1977
(Contract EC-77-A-31-1035)
(CONF-771131) Avail: NTIS HC A17/MF A01

Chemical/hydrogen energy system contracts were reviewed. The review served as an effective means to (1) give all contracts an insight into the background and objectives of thirty-nine hydrogen-related tasks, (2) show the status of the studies or technical effort, (3) relate any problems that had impeded the progress, and (4) state projected solutions for resolving the identified problems. DOE

N80-14573# Argonne National Lab., Ill.
REVIEW OF INDUSTRIAL PARTICIPATION ON THE ANL LITHIUM/IRON SULFIDE BATTERY DEVELOPMENT PROGRAM
E. C. Gay, W. E. Miller, and R. F. Malecha 1978 30 p refs Presented at 13th IECEC Conf. of the Soc. of Automotive Engr., Detroit, 20-25 Aug. 1978
(Contract W-31-109-eng-38)
(CONF-780852-1) Avail: NTIS HC A03/MF A01

The development and fabrication of industrial cells is reviewed. Industrial cells that contained FeS2 in the positive electrode achieved a specific energy of 100 Wh/kg at a 4 hr discharge rate and a peak power of 100 W/kg. Some of these cells showed good performance for up to 300 deep discharge cycles. Industrial cells that contained FeS in the positive electrode maintained good performance through 1000 deep discharge cycles. Present cell development efforts are directed toward improving specific energy and power in the cells that contain FeS and improving cycle life in cells that contain FeS2. DOE

N80-14574# Solar Energy Information Services, San Mateo, Calif.
ENGINEERS GUIDE TO SOLAR ENERGY
Yvonne Howell and Justin A. Bereny Feb. 1979 328 p
(PB-297043/2; SEIS-79/1; ISBN-0-930978-04-8; LC-78-62956) Copyright. Avail: NTIS HC $28.00/MF $28.00 CSCL 13A

Information on solar heating technology is presented. The following subjects are covered: (1) an overview of the six basic solar technologies; (2) a comprehensive discussion of the solar resource, including a compendium of worldwide solar radiation data; (3) an introduction to passive solar technology; (4) extensive discussion of active solar systems, including applications for heating swimming pools, domestic hot water, and space heating; (5) methodology for calculating building heat loss and gain, including worldwide design temperature data; (6) an introduction to solar systems sizing through utilization of the f-chart method, including examples and worksheets; (7) a solar heating product directory divided into four sections: collectors, controls, pumps, and storage. GRA

N80-14575# General Accounting Office, Washington, D. C. Energy and Minerals Div.
COMMERCIALIZING SOLAR HEATING: A NATIONAL STRATEGY NEEDED Report to the Congress
20 Jul. 1979 86 p refs
(PB-297882/3; EMD-79-19) Avail: NTIS HC A05/MF A01 CSCL 13A

The adequacy of the Nation's efforts to commercialize solar heating systems is discussed. Constraints facing the use of solar heating systems, the effectiveness of ongoing efforts to overcome these constraints, and the potential effectiveness of the National Energy Act in encouraging the use of solar heating systems are covered. GRA

N80-14576# Massachusetts Inst. of Tech., Cambridge. Marine Industry Advisory Services.
WAVE POWER SYSTEMS
Norman Doelling 1 Jul. 1979 33 p refs
(PB-299851/6; MITSG-79/16; NOAA-79080910; Opportunity-Brief-15) Avail: NTIS HC A03/MF A01 CSCL 10A

Ocean wave power was investigated as a usable, renewable, alternative energy source. The results suggest that both Salter cams and Cockerell rafts can be designed to convert wave motion to relative mechanical motion and mechanical forces. Mooring problems and costs suggest that Salter cams will be much more expensive than Cockerell rafts. A major problem is converting the available mechanical power to a more useful form, i.e., hydraulic or electric power. Upper limits on the amount of power that can be extracted from waves were investigated along with lower cost bounds. GRA

N80-14577# Ohio State Univ., Columbus. Solar Energy Lab.
OHIO EXPOSITION CENTER SOLAR HOME PROJECT Final Progress Report
R. V. DeVore, P. D. McWane, and D. L. Wineland 15 Jun. 1979 186 p refs
(PB-298541/4; OSU-SEL-5-510X) Avail: NTIS HC A09/MF A01 CSCL 13A

The operation of an active liquid-based 615 square foot solar collector array installed on a 2200 square foot residence is reported. Data are presented for the four solar energy utilization subsystems: domestic hot water, direct solar heating, LiBr water absorption air conditioner, and solar-assisted heat pump. Daily insolation records are included for a one year period. GRA

N80-14578# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.

GEOTHERMAL ENERGY MARKET STUDY ON THE ATLANTIC COASTAL PLAIN. ECONOMIC EVALUATION MODEL FOR DIRECT USE OF MODERATE TEMPERATURE, UP TO 250 F, GEOTHERMAL RESOURCES IN THE NORTHERN ATLANTIC COASTAL PLAIN

Richard Weissbrod (Johns Hopkins Univ., Baltimore, Md.), William Barron (Johns Hopkins Univ., Baltimore, Md.), Peter Kroll (Johns Hopkins Univ., Baltimore, Md.), and William J. Toth Jun. 1979 71 p refs
(Contract EX-76-A-36-1008)
(PB-298785/7; APL/JHU/GEMS-003; APL/JHU/QM-79-002)
Avail: NTIS HC A04/MF A01 CSCL 13A

The Geothermal Resource Economic Evaluation System developed to calculate the average cost per million Btu of geothermal energy that is delivered either to residential and commercial users through a community heating system or to industrial process heat users is examined. The basic assumptions and the methods used in the model are presented. Results of the current studies indicate that, under a number of market conditions, i.e., for high-density residential housing or for large industrial users, and for a large range of resource conditions, geothermal energy costs are well below the costs of electrical space heating. GRA

N80-14584# Los Alamos Scientific Lab., N. Mex.

ENVIRONMENTAL OPTIONS FOR COAL USE

J. R. Bartlit 1979 13 p refs Presented at Energy and Environ. Technol. Training Conf., Tsaile, Ariz., 29 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-1393; CONF-790550-1) Avail: NTIS HC A02/MF A01

The options for coal development are described and their environmental impacts discussed. The various options for better or worse air pollution controls are discussed including the legal options available for requiring the better (cleaner) levels of control if those are desired. DOE

N80-14587# Princeton Univ., N. J. Guggenheim Labs. for the Aerospace Propulsion Sciences.

FUNDAMENTAL AND SEMI-GLOBAL KINETIC MECHANISMS OF HYDROCARBON COMBUSTION Annual Report, 1 Oct. 1977 - 30 Sep. 1978

F. L. Dryer and I. Glassman 1 Dec. 1978 30 p refs
(Contract EC-77-S-02-4372)
(COO-4272-3) Avail: NTIS HC A03/MF A01

The development of simplified chemical kinetic models to represent combustion chemistry is discussed. Studies of paraffin, olefin, and alcohol hydrocarbons are reviewed. Appropriate global models are presented and compared with experimental data. The results clearly demonstrate that the turbulent flow reactor facility can be used to develop accurate global models for a variety of important fuels. DOE

N80-14590# Air Pollution Technology, Inc., San Diego, Calif.

EFFECTS OF CONDITIONING AGENTS ON EMISSIONS FROM COAL-FIRED BOILERS: TEST REPORT NO. 1 Final Report, Jan. - Apr. 1978

R. G. Patterson, P. Riersgard, R. Parker, and S. Calvert Apr. 1979 72 p refs 2 Vol.
(Contract EPA-68-02-2628; EPA Proj. EHE624A)
(PB-299191/7; EPA-600/7-79-104A) Avail: NTIS HC A04/MF A01 CSCL 13B

A field performance test of an electrostatic precipitator (ESP) which uses SO3 as the conditioning agent was conducted. The ESP was at an electric utility power plant burning approximately 1% sulfur coal. The ESP performance was characterized in terms of particle collection efficiency and the chemical composition of particulate and gaseous emissions. Fly ash resistivity and dust opacity were also measured. Results show an average increase in overall efficiency from 80% to 95% with injection of the SO3. This is accompanied by a decrease in fly ash resistivity, a decrease in opacity, and an increase in SO3 concentration entering and leaving the ESP. Approximately 80% of the injected SO3 escaped the ESP. GRA

N80-14591# Air Pollution Technology, Inc., San Diego, Calif.

EFFECTS OF CONDITIONING AGENTS ON EMISSIONS FROM COAL-FIRED BOILERS: TEST REPORT NO. 2 Final Report, Apr. - Jul. 1978

R. G. Patterson, J. Long, R. Parker, and S. Calvert Apr. 1979 59 p 2 Vol.
(Contract EPA-68-02-2628; EPA Proj. EHE624A)
(PB-299192/5; EPA-600/7-79-104B) Avail: NTIS HC A04/MF A01 CSCL 13B

A field performance test of an electrostatic precipitator (ESP) which uses LPA 445 and LAC 51B flue gas conditioning agents was performed. The ESP is at an electric utility power plant burning approximately 1% to 2% sulfur coal. The ESP performance was characterized in terms of particle collection efficiency, chemical composition of particulate and gaseous emissions, fly ash resistivity, and dust opacity. Measurements show that there was no significant change in overall efficiency (99.6%) between the conditioned and unconditioned tests. There was some evidence that the conditioning agents reduced entrainment during electrode rapping and possibly improved the fractional efficiency slightly for particles smaller than about 5 micrometers in diameter. GRA

N80-14595# Battelle Columbus Labs., Ohio.

ENVIRONMENTAL ASSESSMENT OF THE FLUIDIZED-BED COMBUSTION OF COAL: METHODOLOGY AND INITIAL RESULTS

Keshava S. Murthy, Herman Nack, and D. Bruce Henschel (EPA) 1978 10 p refs Repr. from J. of Air Pollution Control Assoc., v. 28, no. 3, Mar. 1978 p 213-220 Presented at 70th Ann. APCA Meeting, Toronto, Jun. 1977 Revised Prepared in cooperation with Ind. Environ. Res. Lab.
(Contract EPA-68-02-2138)
(PB-298473/0; EPA-600/J-78-111; Paper-77-26.6-Rev) Avail: NTIS HC A02/MF A01 CSCL 13B

A program being conducted by the U.S. Environmental Protection Agency (EPA), aimed at complete environmental assessment (EA) of the fluidized-bed combustion (FBC) of coal is discussed. It reviews the EA methodology being developed by EPA: (1) identification of current technology and environmental background, including development of a list of the universe of potential pollutants; (2) development of environmental objectives via the Multimedia Environmental Goals chart. (3) comprehensive analysis of emissions from operating FBC systems; (4) assessment of existing control technology analysis of environmental control alternatives, using a Source Analysis Model approach; and (5) identification of further data and technology. GRA

N80-14617# Midwest Research Inst., Golden, Colo.

INSOLATION MODELS, DATA AND ALGORITHMS Annual Report, 1978

R. L. Hulstrom Dec. 1978 83 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-36-110) Avail: NTIS HC A05/MF A01

Operational computer models for thermal (broadband) and spectral insolation were developed along with a data base (SOLMET) for the U.S. geographical distribution of thermal insolation. Preliminary research measurements of the thermal insolation on tilted surfaces were performed and a complete design concept of advanced instrumentation to measure automatically the insolation on 37 tilted surfaces at various orientations was developed. DOE

N80-14655# Marlatt and Associates, Fort Collins, Colo.

ASSESSMENT OF THE APPLICABILITY OF THE NATIONAL FIRE WEATHER DATA LIBRARY TO WIND ENERGY ANALYSES Final Report

W. E. Marlatt, P. Tierney, P. Meilke, M. Baer, and J. Childs May 1979 115 p refs
(Contract EY-76-C-06-1830)
(PNL-2538) Avail: NTIS HC A06/MF A01

A program to review the fire weather library for stations with usable records, develop statistical summaries for selected individual stations and screen summaries for common windy areas, develop statistical comparisons of fire weather stations with nonfire weather stations having multiple observations per day, develop frequency spectra of wind periods above threshold values, and estimate seasonal and geographic distributions of wind energy is described. The use of the data from the program for selection of sites with wind characteristics favorable for maximizing the wind energy potential is discussed. DOE

N80-14894# Department of Energy, Washington, D. C. Div. of Nuclear Power Development.

NUCLEAR POWER PROGRAM INFORMATION AND DATA: UPDATE, MARCH - APRIL 1979

1979 153 p refs
(DOE/TIC-10119) Avail: NTIS HC A08/MF A01

Information on nuclear power development, nuclear power plant construction, and nuclear power plant operation is presented. The economics of nuclear power and the fuel requirements and performance of nuclear generating units are discussed. The NRC review of the Three Mile Island accident is presented. A.W.H.

N80-14922*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF VELOCITY OVERSHOOT ON THE PERFORMANCE OF MAGNETOHYDRODYNAMIC SUBSONIC DIFFUSERS

Mahesh S. Greywall (Wichita State Univ.) and J. Marlin Smith 1980 10 p refs Presented at Aerospace Sci. Meeting, Pasadena, Calif., 14-16 Jan. 1980; Sponsored by AIAA
(Contract EF-77-A-01-2674)
(NASA-TM-79305; DOE/NASA/2674-79/8; E-257) Avail: NTIS HC A02/MF A01 CSCL 20I

The evolution of an overshoot velocity distribution was studied in a plane two dimensional diffuser as a function of diffuser divergence angle. The diffuser performance for velocity overshoot was compared to that for a fully developed inlet velocity profile. Results indicate that the ratio of peak-to-center line velocity increases along the diffuser for a diffuser half angle greater than some critical value. It was also found that irrespective of the accompanying inlet temperature distribution, the wall shear stress and the wall heat flux is substantially larger when the inlet velocity profile has an overshoot than that for a fully developed inlet velocity profile. R.C.T.

N80-14954# Argonne National Lab., Ill.

DISTRIBUTION AND CLASSIFICATION OF LOCAL SOCIOECONOMIC IMPACTS FROM ENERGY DEVELOPMENT

D. J. Santini and D. W. South 1979 20 p refs Presented at the 2nd Ann. Conf. on the Small City and Regional Community, Stevens Point, Wis., 15 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790481-1) Avail: NTIS HC A02/MF A01

Present and proposed energy facility siting patterns are examined and their socio-economic impact is assessed. Results show that: (1) new electric capacity will shift from oil and gas to coal and nuclear fuels; (2) coal and nuclear plants require more labor per megawatt than oil and gas plants; (3) coal and nuclear plants are larger than gas or oil plants; (4) new coal and nuclear plants will be larger than such existing plants; (5) among regions, greater shares of energy production will occur in those regions less able to assimilate employment growth; and (6) within regions, greater shares of energy production will occur in counties less able to assimilate employment growth. These results clearly demonstrate that socio-economic impact from energy development will be greater in the future than in the past. DOE

N80-14962# Arizona Univ., Tucson. Office of Arid Lands Studies.

WEST COAST FORUM ON APPROPRIATE TECHNOLOGY Final Report

Kennith E. Foster, Roger L. Caldwell, Terry Triffet, and Lina K. Robinson Feb. 1979 56 p Forum held at Tucson, Ariz., 21 Sep. 1978
(Contract NSF CISP-78-22989)
(PB-298986/1; NSF/RA-790003) Avail: NTIS HC A04/MF A01 CSCL 05A

Scientific research support to promote successful performance of appropriate technology (AT) projects is considered including the provision of a scientific educational base as well as an understanding of the societal and economic impacts related to the adoption of AT. Some of the predominant topic areas identified for research include alternative energy sources, small-scale urban organic agriculture technology, alternative waste disposal systems, and water conservation technology. GRA

N80-14972# Department of Energy, Washington, D. C.

COMMERCIALIZATION STRATEGY REPORT FOR ELECTRIC AND HYBRID VEHICLES

P. Brown, P. Davis, G. Hagey, and M. Katz [1979] 91 p
(TID-28858-Draft) Avail: NTIS HC A05/MF A01

Barriers to the commercialization of electric powered vehicle technology are identified, along with possible actions to remove specific barriers. Technical, economic, environmental, and institutional readiness are assessed. Recommended commercialization strategies and goals are presented. K.L.

N80-14973# California Univ., Livermore. Lawrence Livermore Lab.

ASSESSMENT OF THE APPLICABILITY OF MECHANICAL ENERGY STORAGE DEVICES TO ELECTRIC AND HYBRID VEHICLES. VOLUME 1: EXECUTIVE SUMMARY M.S. Thesis

M. W. Schwartz 1 May 1979 17 p refs
(Contract W-7405-eng-48)
(UCRL-52773-Vol-1) Avail: NTIS HC A02/MF A01

The power and energy required in a storage device to realize specific improvements upon current and near-term electric vehicle performance specifications are calculated. A review of candidate mechanical energy storage devices concludes that only flywheels and, for some applications, hydraulic accumulators are practical in this context. With respect to each performance specification, data is presented on the vehicle-mass fraction of the mechanical energy storage system as a function of its specific energy and the overall vehicle mass. Mechanical energy storage devices may or may not improve range, depending on the particular configuration of the vehicle and the driving cycle. DOE

N80-14976# Department of Energy, Bartlesville, Okla. Bartlesville Energy Research Center.

AMBIENT TEMPERATURE, FUEL ECONOMY, EMISSIONS, AND TRIP LENGTH Final Report, Feb. - Sep. 1977

B. H. Eccleston Aug. 1979 123 p
(Contract DOT-TSC-RA-76-48)
(PB-298847/5; DOT-TSC-NHTSA-79-43; DOT-HS-803-668) Avail: NTIS HC A06/MF A01 CSCL 13F

The relationship among automotive fuel economy, ambient temperature, cold start trip length, and drive-train component temperatures of four 1977 vehicles is examined. Fuel economy, exhaust emission, and drive-train temperatures were measured at temperatures of 20 F, 45 F, 70 F, and 100 F using the 1975 Federal Test Procedure and EPA highway fuel economy test. GRA

N80-15133*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

IMPACT OF NEW INSTRUMENTATION ON ADVANCED TURBINE RESEARCH

Robert W. Graham Mar. 1980 25 p refs Proposed for presentation at the 1980 Spring Ann. Meeting, New Orleans, 5-13 Mar. 1980; sponsored by ASME
(NASA-TM-79301; E-251) Avail: NTIS HC A02/MF A01 CSCL 21E

A description is presented of an orderly test program that progresses from the simplest stationary geometry to the more complex, three dimensional, rotating turbine stage. The instrumentation requirements for this evolution of testing are described

The heat transfer instrumentation is emphasized. Recent progress made in devising new measurement techniques has greatly improved the development and confirmation of more accurate analytical methods for the prediction of turbine performance and heat transfer. However, there remain challenging requirements for novel measurement techniques that could advance the future research to be done in rotating blade rows of turbomachines. M.M.M.

N80-15195*# Boeing Aerospace Co., Seattle, Wash.

SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 1: EXECUTIVE SUMMARY

Nov. 1979 39 p Prepared in cooperation with General Elec. Co., Fairfield, Conn.; Grumman Aerospace Corp., N. Y.; Little (Arthur D.), Inc., Cambridge, Mass.; TRW, Inc., Cleveland, Ohio; Brown and Root, Inc., Houston, Tex.
(Contract NAS9-15636)
(NASA-CR-160442; D180-25461-1) Avail: NTIS HC A03/MF A01 CSCL 11B

Configuration concepts, option sizes, and systems definitions study design evolutions are reviewed. The main features of the present reference design silicon solar cell solar power satellite are described, as well as the provisions for space construction and support systems. The principal study accomplishments and conclusions are summarized according to the following tasks: (1) baseline critique; (2) construction and maintenance; (3) industrial complex needs, cost estimates, and production capacity; (4) launch complex requirements at KSC or at an offshore facility; (5) integration of the SPS/ground power network; (6) technology advancement and development; (7) costs and schedules; and (8) exploratory technology: laser annealing of solar cells degraded by proton irradiation, and a fiber-optic phase distribution link at 980 MHz. A.R.H.

N80-15204*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ANALYSIS OF GaAs AND Si SOLAR CELL ARRAYS FOR EARTH ORBITAL AND ORBIT TRANSFER MISSIONS

Kent D. Jeffries 1980 9 p refs Presented at 14th Photovoltaic Specialists Conf., San Diego, Calif., 7-10 Jan. 1980; sponsored by IEEE
(NASA-TM-81383; E-291) Avail: NTIS HC A02/MF A01 CSCL 21C

Silicon and gallium arsenide arrays were studied and compared for low earth orbit (LE), geosynchronous orbit (GEO), and LEO to GEO electric propulsion orbit transfer missions. The sensitivities of total cost to parameters such as mission duration, array cost, cover glass thickness, and concentration ratio were determined along with cost tradeoffs between silicon and gallium arsenide arrays for selected mission classes. Results indicate that development of the technology for low cost, light weight concentrators should be increased and that cost reduction efforts for gallium arsenide cells be pursued. R.C.T.

N80-15220# Department of Energy, Washington, D. C.

ANALYSIS OF HYDROGEN IN SOLIDS

R. L. Schowebel, ed. and J. L. Warren, ed. Apr. 1979 181 p refs Presented at the Workshop on Analysis of Hydrogen in Solids, Albuquerque, N. Mex., 23 Jan. 1979
(Contract DE-AC04-76DP-00789)
(DOE/ER-0026; CONF-790127) Avail: NTIS HC A09/MF A01

The ways to determine the state and dynamics of hydrogen in solids are presented and requirements are formulated for techniques in this capacity. Topics include: the properties of hydrogen in insulating materials, ion channeling studies of hydrogen lattice location, hydrogen depth profiling using elastic recoil detection; and neutron scattering as a technique for the study of hydrogen in metals. A.W.H.

N80-15227# Brookhaven National Lab., Upton, N. Y.

HIGH TEMPERATURE ELECTROLYSIS

J. R. Powell 1978 6 p refs Presented at the Am. Nucl. Soc. Meeting, San Francisco, 12 Nov. 1979
(Contract EY-76-C-02-0016)
(BNL-26331; CONF-791103-16) Avail: NTIS HC A02/MF A01

An idealized flowsheet for a high temperature electrolysis fusion synthetic fuel plant is given. Two blanket module types are indicated: the first type heats steam or CO_2 to high temperatures for the HTE cells (T - or 1000 C) while the second heats a working fluid for an electrical power cycle and breeds tritium. DOE

N80-15259# Argonne National Lab., Ill.

LONG-TERM EROSION MONITORING OF METALLIC CONDUITS BY ULTRASONIC PULSE-ECHO TECHNIQUES

C. A. Youngsdahl and W. A. Ellingson 1979 11 p refs Presented at 12th Symp. on Nondestructive Evaluation, San Antonio, Tex., 24 Apr. 1979
(Contract W-31-109-eng-38)
(CONF-790480-1) Avail: NTIS HC A02/MF A01

Monitoring metallic transfer lines and fittings in pressurized equipment used to process particulate matter, such as pulverized coal or ash, can prevent unexpected component failures and contribute to improved equipment designs. Nondestructive, ultrasonic pulse-echo techniques to detect erosion were developed for high-temperature (approximately 650 C) on-line measurements and applied to various stainless steel and carbon steel components of coal-gasification and liquefaction pilot plants. The techniques are described, together with successful methods of accounting for varying specimen temperatures, long monitoring times (months to years), and exposure of transducers and couplant to weather. Measurement characteristics peculiar to erosion monitoring are discussed. DOE

N80-15263*# General Electric Co., Philadelphia, Pa. Space Sciences Lab.

SINTERED SILICON NITRODE RECUPERATOR FABRICATION Final Report

A. Gatti, W. S. Chiu, and L. R. McCreight Jan. 1980 40 p refs
(Contract DEN3-54)
(NASA-CR-159706; DOE/NASA/0054-79/1) Avail: NTIS HC A03/MF A01 CSCL 11B

The preliminary design anp a demonstration of the feasibility of fabricating submodules of an automotive Stirling engine recuperator for waste heat recovery at 370 C are described. Sinterable silicon nitride (Sialon) tubing and plates were fabricated by extrusion and hydrostatic pressing, respectively, suitable for demonstrating a potential method of constructing ceramic recuperator-type heat exchangers. These components were fired in nitrogen atmosphere to 1800 C without significant scale formation so that they can be used in the as-fired condition. A refractory glass composition (Al_2O_3 x 4.5 CaO.MgO x 11SiO_2) was used to join and seal component parts by a brazing technique which formed strong recuperator submodules capable of withstanding repeated thermal cycling to 1370 C. The corrosion resistance of these materials to Na_2SO_4 - NaCl carbon mixtures was also assessed in atmospheres of air, hydrogen and CO_2-N_2-H_2O mixtures at both 870 C and 1370 C for times to 1000 hours. No significant reaction was observed under any of these test conditions. M.M.M.

N80-15275# National Bureau of Standards, Washington, D.C.

MEASUREMENTS AND STANDARDS FOR RECYCLED OIL - 2

Donald A. Becker, ed. and Helen Anne Hurd Sep. 1979 218 p refs Presented at NBS Conf., Gaithersburg, Md., 29-30 Nov. 1977
(PB-299951/4; NBS-SP-556; LC-79-600126) Avail: NTIS HC A10/MF A01 CSCL 11H

Progress in the development of measurement methods and test procedures, as well as standards, for recycled oil is reported. Areas of legislation which affect the recycled oil program are discussed along with environmental issues. Other topics covered include oil recycled as engine oils, nonlubricating end uses, and additional recycled oil activities. GRA

N80-15276# SRI International Corp., Menlo Park, Calif.
MISSION ANALYSIS FOR THE FEDERAL FUELS FROM BIOMASS PROGRAM. VOLUME 3: FEEDSTOCK AVAILABILITY Final Report
R. K. Ernest, R. H. Hamilton, N. S. Borgeson, F. A. Schooley, and R. L. Dickenson Jan. 1979 79 p refs
(Contract EY-76-C-03-0115)
(SAN-0115-T1) Avail: NTIS HC A05/MF A01

The biomass supply in the United States is estimated through the year 2020. The biomass supply represents the combined tonnages of agricultural, logging, and mill residues, other forest residues, and energy crop output. Two scenarios were used for the projections: a base case and an optimistic case reflecting increases in land and water availability for production of energy crops resulting from an array of government incentives. An appendix tabulates the feedstock availability by region, type, price, year, and scenario. DOE

N80-15277# Puerto Rico Scientific Research Lab., Inc., Rio Piedras. Agricultural Experiment Station.
PRODUCTION OF SUGARCANE AND TROPICAL GRASSES AS A RENEWABLE ENERGY SOURCE Quarterly Report, 1978 - 1979
A. G. Alexander, M. Garcia, C. Gonzalex-Molina, and J. Ortez-Velez 1979 62 p refs
(Contract ET-78-S-05-5912)
(DOE/CS/5912-T1; QR-2) Avail: NTIS HC A04/MF A01

Candidate grasses were identified for short-rotation crops having potentially greater versatility than Sordan 70A. Field-plot studies were performed on the optimization of N-fertilization and seeding rates for Sordan 70A. Field-plot data were recorded on sugarcane and napier grass responses to harvest frequency and row spacing. These results underscore a superiority of first-ratoon yields over plant-crop yields, of napier grass over sugarcane (up to 4 months), and delayed harvests over frequent harvests. Breeding tests were successful in producing F1 seedlings from crosses between an unknown and early-tasseling wild S. Spontaneum hybrid and late-tasseling commercial sugarcane hybrids. DOE

N80-15278# Institute of Gas Technology, Chicago, Ill.
LNG INDUSTRY: AN OVERVIEW OF PROJECTS AND COSTS
J. Glenn Seay, Philip J. Anderson, and Edward J. Daniels 1978 29 p Presented at ASME Energy Tech. Conf., Houston, Tex., 5 Nov. 1978
(Contract EE-76-C-02-4234)
(CONF-7811112-2) Avail: NTIS HC A03/MF A01

A summary of the LNG projects that are currently in various stages of development is presented. These projects account for a potential international LNG trade of about 765 million cu m (27 billion CF) per day. The operating experiences of some of the currently operational projects are reviewed with an emphasis on the natural gas liquefaction facilities. DOE

N80-15279# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
PROJECT PLANNING DOCUMENT: HIGHWAY VEHICLE ALTERNATIVE FUELS UTILIZATION PROGRAM (AFUP)
Jul. 1979 66 p
(DOE/CS-0093) Avail: NTIS HC A04/MF A01

Criteria and guidelines for the evaluation and development of nonpetroleum based highway vehicle fuels derived from domestic resources are developed. Five basic classes of alternative fuels are presented. Within each class, general areas of R & D that were addressed are illustrated in terms of a matrix format, while specific project relationships are identified by a corresponding flow chart. An overview of the evaluation of and relationships between these several alternative fuels classes intended to progress toward a uniform and independent domestic highway transportation system is presented. The mechanism for implementation is outlined. DOE

N80-15280# Department of Energy, Washington, D. C.
ETHANOL/GASOLINE BLENDS AS AUTOMOTIVE FUELS
J. R. Allsup and D. B. Eccleston 1979 13 p refs Presented at the 3rd Intern. Alcohol Fuels Technol., Asilomar, Calif., 28 May 1979
(CONF-790520-5) Avail: NTIS HC A02/MF A01

An experimental study of gasoline and 10% ethanol/90% gasoline blends was made using five late-model vehicles operated on a climate controlled chasis dynamometer. Data were obtained to permit comparisons of fuel economy, emissions, and other significant operational characteristics observed in tests with the two fuels. Volumetric fuel economy was shown to be slightly decreased, while energy economy was slightly increased using the ethanol/gasoline blend. Compared with the results using base gasoline, the use of the ethanol/gasoline blend had no adverse effect upon regulated emissions at test temperatures within the range 20 to 75 F; at 100 F there were mirror increases in emissions using the ethanol/gasoline blends. DOE

N80-15281# Argonne National Lab., Ill.
ENVIRONMENTAL PLANNING AND ASSESSMENT FOR HIGHWAY VEHICLE USE TO ALCOHOL FUELS
M. J. Bernard, III and O. M. Bevilaqua 1979 12 p refs Presented at 3d Intern. Alcohol Fuels Technol., Asilomar, Calif., 28 May 1979
(Contract W-31-109-eng-38)
(CONF-790520-2) Avail: NTIS HC A02/MF A01

The DOE environmental evaluation process designed to implement the National Evnironmental Policy Act policies and guidance is presented. In particular, it focused on that process as it is being used for DOE's alcohol fuels project within the Office. DOE

N80-15282# California Univ., Livermore. Lawrence Livermore Lab.
SIMULATION OF LNG VAPOR SPREAD AND DISPERSION BY FINITE ELEMENT METHODS
S. T. Chan, P. M. Gresho, and R. L. Lee Jul. 1979 36 p refs Presented at Natl. Conf. on Numerical Methods in Heat Transfer, College Park, Md., 24 Sep. 1979
(Contract W-7405-eng-48)
(UCRL-82441; CONF-790915-1) Avail: NTIS HC A03/MF A01

Two finite element models (one based on solving the time dependent, two dimensional conservation equations of mass, momentum, and energy, with buoyancy effects included via the Boussinesq approximation; the other based on solving the otherwise identical set of equations except using the hydrostatic assumption) are described and applied to predict some aspects of the vapor dispersion phenomena associated with liquefied natural gas (LNG) spills. A number of controlled numerical experiments, representing a reasonable expected range of LNG spill scenarios and atmospheric conditions, were carried out. Data regarding the applicability and limitations of the hydrostatic assumption for predicting LNG vapor spread and dispersion are established on comparing the results obtained with these finite element models. DOE

N80-15287# Department of Energy, Washington, D. C.
COMMERCIALIZATION STRATEGY REPORT FOR RECOVERY OF NATURAL GAS FROM UNCONVENTIONAL SOURCES
J. Ham, S. E. Atkinson, and L. Dewey 1978 90 p refs
(TID-28848-Draft) Avail: NTIS HC A05/MF A01

Tight gas sands and Devonian shale are ready for commercialization, although higher than historical gas prices, improved recovery technology, and an aggressive commercialization program are required to fully develop these resources. Coalbed methane for local (non-pipeline) markets appears ready for commercialization for the local (self-help) industrial or municipal market. Coalbed methane for pipeline markets does not appear ready for commercialization in the near term due to highly uncertain geologic properties, economic uncertainties, perceived safety hazards, and limited interest by mine operators. Geopressured aquifers do not appear ready for commercialization in the near term because of vast geologic, technical, and environmental uncertainties and high production costs. Given a gap in domestic supplies to 6 to 8 Tcf in 1990, gas from the unconventional, domestic sources could fill 3 to 6 Tcf of this gap. DOE

N80-15288# Sandia Labs., Albuquerque, N. Mex.
LOW TEMPERATURE REACTION PATH FOR COAL LIQUEFACTION
M. G. Thomas and R. K. Traeger 1979 14 p refs Presented at the Am. Chem. Soc. Natl. Meeting, Washington, D.C., 10 Sep. 1979
(Contract EY-76-C-04-0789)
(SAND-79-0738C; CONF-790917-7) Avail: NTIS HC A02/MF A01

The applicability of advanced, two-stage liquefaction processes which could lead to the development of new, low temperature and pressure liquefaction schemes is evaluated. DOE

N80-15289# Los Alamos Scientific Lab., N. Mex.
NEW HEAT TRANSFER GEOMETRY FOR HYDRIDE HEAT ENGINES AND HEAT PUMPS
W. A. Steyert Jul. 1979 7 p refs
(Contract W-7405-eng-36)
(LA-7822) Avail: NTIS HC A02/MF A01

A porous metal hydride (LiNi5H6) composite is presented that provides both mechanical stability to hydride beds and excellent heat transfer to the hydride when used in the appropriate configuration. DOE

N80-15290# Department of Energy, Washington, D. C.
REPORT OF THE ALCOHOL FUEL POLICY REVIEW
Jun. 1979 117 p
(DOE/PE-0012) Avail: NTIS HC A06/MF A01

Policy studies were conducted to assess the potential of alcohol fuels as an alternative source of energy. The conclusions of the analysis are summarized and recommendations to stimulate the use of alcohol fuels from renewable resources are presented, including major policies that the President has endorsed. R.E.S.

N80-15291# Arizona State Univ., Tempe. College of Engineering and Applied Sciences.
CONVERSION OF CELLULOSIC AND WASTE POLYMER MATERIAL TO GASOLINE
J. L. Kuester 28 Mar. 1979 52 p refs
(COO-2982-38) Avail: NTIS HC A04/MF A01

The present status and future plans for a project to convert cellulosic (biomass) and waste synthetic polymer materials to quality liquid fuels is presented. A thermal gasification approach was utilized followed by catalytic liquid fuels synthesis steps. Potential products include a medium quality substitute for natural gas or liquid fuel equivalents of diesel fuel, kerosene or high octane gasoline. The process appears very flexible with regard to ability to handle different sources of feedstock. Results to date indicate quality products can be produced. Product yields need to be improved with the main thrust centered on improvement of pyrolysis gas composition. Other items to be addressed are study of alternate economic feedstocks, waste stream characterization, and liquid fuels synthesis and tailoring with particular attention on the effects of alternate feedstocks. A description of a proposed 10 ton/day pilot plant is presented with flow sheet, material balance and cost estimates. DOE

N80-15293# Oregon State Univ., Corvallis.
INVESTIGATION OF THE VIABILITY AND COST EFFECTIVENESS OF SOLID FUEL GASIFIERS CLOSE COUPLED TO INTERNAL COMBUSTION ENGINES FOR 200 kWe POWER GENERATION Progress Report
J. G. Mingle and D. C. Junge Jan. 1979 52 p refs
(Contract EY-76-S-06-2227)
(DOE/RL-90476-13; PR-9; RLO-2227-T22-13) Avail: NTIS HC A04/MF A01

The viability and cost effectiveness of a 200 kWe engine generator unit fueled by a direct coupled, solid fuel gasifier were studied. Fuel and gasifier technology, gas treatment (clean up) for engine use, engine use technology, other uses for gasifiers, the viability of close coupled units, and an estimate of cost effectiveness are discussed. Present small experimental gasifier systems were found to perform as expected and have served to demonstrate the technology. Certain needed development efforts are discussed. DOE

N80-15294# TRW Defense and Space Systems Group, Redondo Beach, Calif.
COAL SULFUR MEASUREMENTS Final Report, Jan. 1976 - Dec. 1978
J. W. Hamersma and M. L. Kraft Jul. 1979 76 p refs
(Contract EPA-68-02-2165)
(PB-299575/1; EPA-600/7-79-150) Avail: NTIS HC A05/MF A01 CSCL 08I

A technique for sulfur forms analysis based on low temperature oxygen plasma ashing is presented. It involves analyzing the low-temperature plasma ash by modified ASTM techniques after selectively removing the organic material. The procedure was tested on 25 coals and compared with ASTM analyses with excellent results. A separate set of experiments showed that it is also feasible to determine organic sulfur directly by trapping SOx in the plasma ash effluent. GRA

N80-15296# Purdue Univ., Lafayette, Ind. School of Materials Engineering.
SULFUR FIXATION DURING COAL GASIFICATION Final Report, 1 Mar. 1975 - 28 Feb. 1978
R. Schuhmann, Jr., R. H. Spitzer, and A. J. Mehta 15 Dec. 1978 107 p refs
(Grant NSF AER-75-02665)
(PB-301104/6; PRF-8601) Avail: NTIS HC A06/MF A01 CSCL 07A

The development of basic engineering data for design of a coal gasification process in which the sulfur is fixed and separated in chemical combination with iron is reported. Results of thermodynamic calculations and phase equilibrium studies conducted for the ternary condensed systems Fe-O-S and Fe-C-S, and for equilibria of condensed phases in these systems with gases containing various combinations of C, O, H, and S are given. It is shown that iron oxides, metallic iron, and iron silicates should be effective sulfur fixation agents over wide ranges of gas compositions and gasification temperature, both below and above the melting point of iron sulfide. GRA

N80-15297# Texas A&M Research Foundation, College Station. Dept. of Chemical Engineering.
CONVERSION OF COAL-BASED METHANOL TO ETHYLENE AND A GASEOUS FUEL Final Report, 1 Oct. 1975 - 30 Sep. 1978
Rayford G. Anthony 1 Dec. 1978 47 p ref
(Grant NSF AER-74-20135)
(PB-301256/4; NSF/RA-780616) Avail: NTIS HC A03/MF A01 CSCL 07A

Development of a catalytic process which converts methanol into ethylene and a gaseous fuel similar to natural gas is reported. An AW500 type catalyst proved to be the best catalyst for converting methanol into ethylene, 80 to 98 percent of the alcohol being converted into 16 to 60 percent yields of ethylene. Coal-based methanol was converted into a gaseous mixture composed of 50 percent dimethyl ether, 33.3 percent hydrogen and 16.7 percent carbon monoxide by passing the alcohol over alumina and zinc chromite catalysts at 300-500 C. The major cost of producing ethylene or gaseous fuel is the initial cost of synthesis gas produced from coal that is subsequently used to produce methanol. GRA

N80-15298# New Mexico Energy Inst., Las Cruces.
ECONOMIC ANALYSIS OF SMALL SCALE BIOCONVERSION UNITS IN NEW MEXICO Final Report, 1 Sep. 1977 - 31 May 1979
Wendell Hull and Eugene E. Staffeldt Jun. 1979 156 p refs
(Contract EMD-77-2202)
(PB-301390/1; NMEI-37) Avail: NTIS HC A08/MF A01 CSCL 21D

Three New Mexico agribusinesses were analyzed to find an economic method for converting biomass from agricultural sources to methane. Primary design goals were simplicity, least-cost construction, and safe operation. Two basic digestion systems were designed. They vary only in digester vessel and related component size, not in operation. Each system was evaluated with respect to cost and operational characteristics. Recommendations are given for each business studied. GRA

N80-15304# New Brunswick Electric Power Commission, Fredericton. Commercial Div.
MEASUREMENT OF ENERGY TO HEAT HOUSES: INITIAL STUDY
Verne Ireton 6 Jun. 1979 35 p refs
(PB-299448/2) Avail: NTIS HC A03/MF A01 CSCL 13A

A program of measurement of the energy consumed for residential space heating was instituted during the summer of 1978. It was felt that heat loss calculations are very conservative and that there is a much larger difference between the energy consumed by a combustion system and an electrical system than that calculated by assuming a 'furnace efficiency' or a 'seasonal performance factor'. The results obtained during the 1978/79 heating season are presented. GRA

N80-15346# Brookhaven National Lab., Upton, N. Y.
PARTIAL DISCHARGE PERFORMANCE OF LAPPED PLASTIC INSULATION FOR SUPERCONDUCTING POWER TRANSMISSION CABLES AND THE DIELECTRIC STRENGTH OF SUPERCRITICAL HELIUM GAS
A. J. Pearmain (University College, Dublin, Ireland), M. Kosaki (Nagoya Univ., Japan), and R. A. Thomas 1978 11 p refs Presented at Conf. on Elec. Insulation and Dielectric Phenomena, Pocono Manor, Pa., 29 Oct. 1978
(Contract EY-76-C-02-0016)
(BNL-24779; CONF-781027-2) Avail: NTIS HC A02/MF A01

A superconducting power transmission cable was designed using a flexible ac cable with Nb3Sn superconductor force cooled by supercritical helium. A lapped, multilayer plastic tape construction was selected for the electrical insulation with supercritical helium gas filling the butt spaces between tapes. Evaluation of many different tapes showed biaxially oriented laminated polypropylene tape to be a promising dielectric. A series of tests on short samples of insulation wound in a cable-type configuration enabled improvements to be made in screen design and winding techniques. Some partial discharge results from short sample tests are described, and an apparatus with variable electrode spacing developed for studying the effect of electrode material, spacing and area on the breakdown strength of supercritical helium is discussed. DOE

N80-15420# Environmental Protection Agency, Ann Arbor, Mich. Inspection and Maintenance Staff.
EFFECTS OF INSPECTION AND MAINTENANCE PROGRAMS ON FUEL ECONOMY
Mar. 1979 15 p refs
(PB-297583/7; IMS-001/FE/1) Avail: NTIS HC A02/MF A01 CSCL 13B

The primary goal of inspection and maintenance (I/M) programs is to improve air quality by reducing emissions from motor vehicles. Many studies indicate that I/M programs will achieve this goal. In addition several studies indicate that fuel economy improvement can be expected to occur as a result of maintenance performed on vehicles failing an I/M test. Most studies looked at pre-1975 model year vehicles and had expert mechanics performing the maintenance work. Both the results from past studies and the results from more recent studies are considered to provide EPA's best estimates of fuel economy benefit which can be attributed to I/M maintenance. GRA

N80-15422*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PHOTOVOLTAIC POWER SYSTEM RELIABILITY CONSIDERATIONS
Vincent R. Lalli 1980 9 p refs Presented at the Ann. Reliability and Maintainability Symp., San Francisco, 22-24 Jan. 1980
(Contract DE-AB29-76EI-20370)
(NASA-TM-79291; DOE/NASA/20370-79/19; E-235) Avail: NTIS HC A02/MF A01 CSCL 14D

An example of how modern engineering and safety techniques can be used to assure the reliable and safe operation of photovoltaic power systems is presented. This particular application is for a solar cell power system demonstration project designed to provide electric power requirements for remote villages. The techniques utilized involve a definition of the power system natural and operating environment, use of design criteria and analysis techniques, an awareness of potential problems via the inherent reliability and FMEA methods, and use of fail-safe and planned spare parts engineering philosophy. J.M.S.

N80-15428*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A RELATION BETWEEN SEMIEMPIRICAL FRACTURE ANALYSES AND R-CURVES
Thomas W. Orange Jan. 1980 45 p refs
(NASA-TP-1600; E-9963) Avail: NTIS HC A03/MF A01 CSCL 20K

The relations between several semiempirical fracture analyses (SEFA) and the R-curve concept of fracture mechanics are examined and the conditions for equivalence between a SEFA and an R-curve are derived. A hypothetical material is employed to study the relation analytically. Equivalent R-curves are developed for several real materials using data from the literature. For each SEFA there is an equivalent R-curve whose magnitude and shape are determined by the SEFA formulation and its empirical parameters. If the R-curve is indeed unique, then the various empirical parameters cannot be constant, and vice versa. However, for one SEFA the differences are small enough that they may be within the range of normal data scatter for real materials. Author

N80-15544# Bureau of Mines, Denver, Colo. Mining Research Center.
THREE POTENTIAL LONGWALL MINING METHODS FOR THICK COAL SEAMS IN THE WESTERN UNITED STATES
Richard H. Oitto 1979 41 p refs
(PB-299568/6; BM-IC-8792) Avail: NTIS HC A03/MF A01 CSCL 08I

Three longwall mining methods practiced in foreign countries are described. Potential for increasing underground recovery and productivity in thick coalbeds of the western United States is emphasized. The methods are multislice longwalling, longwall caving, and high-face longwalling. Foreign practices and possible application in the United States are discussed. GRA

N80-15553*# Technical Report Services, Rocky River, Ohio.
EVALUATION OF FEASIBILITY OF PRESTRESSED CONCRETE FOR USE IN WIND TURBINE BLADES
Seymour Leiblein, D. S. Londahl, Donn B. Furlong, and Mark E. Dreier Sep. 1979 119 p refs Prepared in cooperation with Tuthill Pump Co., San Rafael, Calif. and Paragon Pacific, Inc., El Segundo, Calif.
(Contracts NAS3-20596; NAS3-30813; EX-76-I-01-1028; NASA Order C-25906)
(NASA-CR-159725; DOE/NASA/5906-79/1) Avail: NTIS HC A06/MF A01 CSCL 10B

A preliminary evaluation of the feasibility of the use of prestressed concrete as a material for low cost blades for wind turbines was conducted. A baseline blade design was achieved for an experimental wind turbine that met aerodynamic and structural requirements. Significant cost reductions were indicated for volume production. Casting of a model blade section showed no fabrication problems. Coupled dynamic analysis revealed that adverse rotor tower interactions can be significant with heavy rotor blades. R.C.T.

N80-15554*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SPACE SOLAR CELLS: HIGH EFFICIENCY AND RADIATION DAMAGE

Henry W. Brandhorst, Jr. and Daniel T. Bernatowicz 1980 12 p refs Presented at 14th Photovoltaic Specialists Conf., San Diego, Calif., 7-10 Jan. 1980; sponsored by IEEE
(NASA-TM-81387; E-297) Avail: NTIS HC A02/MF A01 CSCL 10A

The progress and status of efforts to increase the end-of-life efficiency of solar cells for space use is assessed. High efficiency silicon solar cells, silicon solar cell radiation damage, GaAs solar cell performance and radiation damage and 30 percent devices are discussed. R.E.S.

N80-15560*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CANDIDATE THERMAL ENERGY STORAGE TECHNOLOGIES FOR SOLAR INDUSTRIAL PROCESS HEAT APPLICATIONS
Edward R. Furman 1979 12 p refs Presented at Solar Industrial Process Heat Conf., Oakland, Calif., 31 Oct. - 2 Nov. 1979; sponsored by Solar Energy Res. Inst.
(Contract EC-77-A-31-1034)
(NASA-TM-81380; DOE/NASA/1034-79/6; E-285) Avail: NTIS HC A02/MF A01 CSCL 10A

A number of candidate thermal energy storage system elements were identified as having the potential for the successful application of solar industrial process heat. These elements which include storage media, containment and heat exchange are shown. R.C.T.

N80-15562*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala. Materials and Processes Lab.
CHARACTERIZATION OF THREE TYPES OF SILICON SOLAR CELLS FOR SEPS DEEP SPACE MISSIONS. VOLUME 1: CURRENT-VOLTAGE CHARACTERISTICS OF OCLI BSF/BSR 10 ohm-cm, AND BSR 2 ohm-cm CELLS AS A FUNCTION OF TEMPERATURE AND INTENSITY
A. F. Whitaker, S. A. Little, C. F. Smith, Jr., and V. A. Wooden Nov. 1979 93 p refs
(NASA-TM-78253) Avail: NTIS HC A05/MF A01 CSCL 10A

Three types of high performance silicon solar cells, BSF/BSR 10 ohm-cm, BSR 10 ohm-cm, and BSR 2 ohm-cm, were evaluated for their low temperature and low intensity performance. Sixteen cells of each type were subjected to ten temperatures and nine intensities. The BSF/BSR 10 ohm-cm cells provided the best performance at 1 solar constant and -25 C with an efficiency of 14.1% while the BSR 2 ohm-cm cells had the highest low temperature and low intensity performance with an efficiency of 22.2% at 0.04 solar constant and -170 C and the most consistent cell-to-cell characteristics. R.E.S.

N80-15563*# Alabama Univ., Huntsville.
A SURVEY OF PHOTOVOLTAIC SYSTEMS
Aug. 1979 213 p Sponsored in part by DOE
(Contract NAS8-31293)
(NASA-CR-150696) Avail: NTIS HC A10/MF A01 CSCL 10A

Solar photovoltaic manufacturers and suppliers are listed. Data sheets on specific products and typical operating, installation, or maintenance instructions and procedures are appended. R.E.S.

N80-15564# California Univ., Livermore. Lawrence Livermore Lab.
NOVEL SCHEME FOR MAKING CHEAP ELECTRICITY WITH NUCLEAR ENERGY
J. A. Pettibone 24 Aug. 1979 23 p refs
(Contract W-7405-eng-48)
(UCID-18153-Rev-1) Avail: NTIS HC A02/MF A01

Nuclear fuels should produce cheaper electricity than coal, considering their high specific energy and low cost. To exploit these properties, the scheme proposed here replaces the expensive reactor/steam-turbine system with an engine in which the expansion of a gas heated by a nuclear explosion raises a mass of liquid, thereby producing stored hydraulic energy. This energy could be converted to electricity by hydroelectric generation with water as the working fluid or by magnetohydrodynamic (MHD) generation with molten metal. A rough cost analysis suggests the hydroelectric system could reduce the present cost of electricity by two-thirds, and the MHD system by even more. Such cheap power would make feasible large-scale electrolysis to produce hydrogen and other fuels and chemical raw materials. DOE

N80-15565# Los Alamos Scientific Lab., N. Mex.
DECENTRALIZED SOLAR PHOTOVOLTAIC ENERGY SYSTEMS
M. C. Krupta Jun. 1979 110 p refs
(Contract W-7405-eng-36)
(LA-7866-TASE) Avail: NTIS HC A06/MF A01

A model residential photovoltaic system which utilizes a solar cell array roof shingle combination is discussed in relation to developing and generating the environmental data for decentralized solar photovoltaic systems. Material requirements, operating residuals, land requirements, water requirements, production processes, and production residuals for the systems operation are examined. Environmental, health, safety, and resource availability impacts are reported. A.W.H.

N80-15566# Sandia Labs., Albuquerque, N. Mex.
DESIGN OF PHOTOVOLTAIC SYSTEMS FOR RESIDENTIAL APPLICATIONS IN THE UNITED STATES
G. J. Jones 1979 7 p refs Presented at the Photovoltaic Solar Energy Conf., West Berlin, 23 Apr. 1979
(Contract DE-AC04-76DP-00789)
(SAND-78-2186C; CONF-790457-3) Avail: NTIS HC A02/MF A01

Photovoltaic system configurations for single family residences were analyzed to determine the optimum design. Cost effectiveness and the effect of climate on the 15 regions studied were determined as factors in the analysis. The interaction of the residential photovoltaic system with the local utility is discussed and the economic viability of onsite energy storage is examined. A.W.H.

N80-15568# California Univ., Berkeley. Lawrence Berkeley Lab.
GEOTHERMAL ENERGY DEVELOPMENT FROM THE SALTON TROUGH TO THE HIGH CASCADES
N. E. Goldstein Jan. 1979 15 p refs Presented at the 3rd Natl. Conf. and Exhibition on Technol. for Energy Conserv., Tucson, Ariz., 23-25 Jan. 1979
(Contract W-7405-eng-48)
(LBL-8703; CONF-790107-10) Avail: NTIS HC A02/MF A01

Operations at Cerro Preto, the only water-dominated geothermal field currently generating electric power in North America, were assessed to identify potential problems which might face U.S. producers in the Imperial Valley. Geological, hydrogeological, geochemical, and geophysical characteristics of the Salton Trough were investigated, as well as those of Mt. Hood, Oregon, where drilling was conducted, as a preliminary to determining the geothermal potential of the entire Cascade Range. A.R.H.

N80-15569# EIC, Inc., Newton, Mass.
CORROSION PROTECTION OF SOLAR-COLLECTOR HEAT EXCHANGERS WITH ELECTROCHEMICALLY DEPOSITED FILMS Semiannual Report, 15 May - 30 Nov. 1978
S. B. Brummer, V. R. Koch, and G. H. Schnaper Jan. 1979 44 p refs
(Contract EM-78-C-04-4297)
(COO-4297-1; SAR-1) Avail: NTIS HC A03/MF A01

A novel corrosion protection technique is presented for the common solar collector metals Al, Cu, and Fe as mild steel. The technique involves the potentiostatic electrochemical deposition of thin, adherent polymer films on the interior of heat exchanger tubes by application of a current in the presence of a suitable dissolved organic monomer. Tetramethylphenol (TMP) was shown to film Al/Zn samples, although complete coverage was not achieved. Copper and iron readily accommodate dimethylphenol and metaphenylenediamine as well as TMP films. As in the case of Al, holidays or cracks in the film were apparent thus precluding good corrosion protection. DOE

N80-15570# Midwest Research Inst., Golden, Colo.
SERAPH IMPLEMENTATION PLANS
J. Castle, W. Su, D. A. Dougherty, and J. D. Wright May 1979 45 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-34-152) Avail: NTIS HC A03/MF A01

The Solar Energy Research and Applications in Process Heat test facility (SERAPH) will provide the capability of addressing many of the technical issues that currently hamper industrial solar thermal energy system implementation. The initial capability of producing steam will be at a rate of 900 lb/h (410 kg/h) which corresponds to an energy delivery rate of 1.5 million Btu/h (1.6 x 10 to the 6th power) at 430 F (220 C) with expansion capability to approximately 600 F (315 C). The initial system controls will be analog with supervisory and direct digital control to follow. The issues to be addressed at SERAPH will be computer predictive model validation and refinement, control strategy development, solar equipment evaluation, and the accumulation of operating and maintenance experience. A consistent theme throughout the planning and operation of SERAPH is the need to develop and follow practices that are consistent with conventional industrial operating procedures. DOE

N80-15571# Midwest Research Inst., Golden, Colo.
ALTERNATE CYCLES APPLIED TO OCEAN THERMAL ENERGY CONVERSION
B. Shelpuk and A. Lewandowski Feb. 1979 14 p refs Presented at the 11th Ann. Offshore Technol. Conf., Houston, Tex., 30 Apr. - 3 May 1979
(Contract EG-77-C-01-4042)
(SERI/TP-34-180; CONF-790444-3) Avail: NTIS HC A02/MF A01

Four open cycle OTEC concepts are described. These are (1) single, vertical-axis turbine, (2) multiple, horizontal-axis turbine, (3) foam lift/hydraulic turbine, and (4) mist lift/hydraulic turbine. A preliminary assessment of achievable performance is made in addition to a description of the subsystem performance objectives which would support the achievement of the full potential inherent in these concepts. The results and conclusions include a description of the research objectives, achievement of which make open cycle OTEC a viable alternative as a national energy source. DOE

N80-15574# Sandia Labs., Albuquerque, N. Mex.
METHODOLOGY FOR DETERMINING THE CONFIGURATION OF THE OPTIMUM SOLAR TOTAL ENERGY SYSTEM
R. R. Peters May 1979 59 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0422) Avail: NTIS HC A04/MF A01

A methodology for determining the configuration of the most economical solar total energy system (STES) for a particular application is presented. The methodology is examined by using it to design a STES for a certain function. The results are presented and the sensitivity of the system design to changes in economic parameters, system location, and limits on the amount of purchased energy are discussed. A.W.H.

N80-15576# Gilbert Associates, Inc., Reading, Pa.
RESEARCH AND EVALUATION OF BIOMASS RESOURCES/CONVERSION/UTILIZATION SYSTEMS (MARKET/EXPERIMENTAL ANALYSIS FOR DEVELOPMENT OF A DATA BASE FOR A FUELS FROM BIOMASS MODEL)
Quarterly Technical Progress Report, 1 Jan. - 31 Mar. 1979
Y. K. Ahn, R. J. Brumberg, H. C. Chen, E. T. Nelson, R. P. Stringer, and R. C. Bailie (Environmental Energy Engineering, Inc., Morgantown, W. Va.) 1979 23 p
(Contract ET-78-C-02-5022)
(COO-5022-5) Avail: NTIS HC A02/MF A01

The development of a linear programming model to determine the mix of biomass resources an conversion processes to produce fuel is summarized. A market analysis of the need for biomass derived fuel and the regional availability of biomass resources on seasonal bases is discussed. Biomass conversion profiles (gasification, pyrolysis, and direct combustion) are discussed for 100 biomass materials. The materials include wood species, bagasse, sugar cane, wheat, and rice straw. A.W.H.

N80-15577# Sandia Labs., Albuquerque, N. Mex.
DESIGN AND PERFORMANCE OF SILICON SOLAR CELLS UNDER CONCENTRATED SUNLIGHT
H. T. Weaver and R. D. Nasby 1979 4 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract EY-76-C-04-0789)
(SAND-79-1165C; CONF-790541-39) Avail: NTIS HC A02/MF A01

Measurements and numerical calculations of performance of silicon solar cells, designed for operation under concentrated sunlight, are presented. Two design strategies are discussed and data from cells of each type are used for comparison with theory. The calculations ignore degeneracy and high effects but include Auger and trap recombination. Experimental base lifetimes are used for modeling. DOE

N80-15578# Sandia Labs., Albuquerque, N. Mex.
STATUS OF THE US DEPARTMENT OF ENERGY PHOTOVOLTAIC CONCENTRATOR DEVELOPMENT PROJECT
B. D. Shafer, E. C. Boes, M. W. Edenburn, and D. G. Schueler 1979 8 p refs Presented at the 1979 Photovoltaic Solar Energy Conf., West Berlin, 23 Apr. 1979
(Contract DE-AC04-76DP-00789)
(SAND-78-2187C; CONF-790457-2) Avail: NTIS HC A02/MF A01

The development of a photovoltaic concentrator technology which results in low costs, long life photovoltaic arrays at a price of less than $0.50 per peak watt is discussed. The development work in the areas of concentrator cells, concentrator modules, and complete arrays is surveyed. The various designs of the concentrator cells and concentrator modules are presented and evaluated in regard to their ability to produce cost effective energy. A.W.H.

N80-15582# New Mexico Univ., Albuquerque. Dept. of Economics.
DISTRICT SPACE HEATING POTENTIAL OF LOW TEMPERATURE HYDROTHERMAL GEOTHERMAL RESOURCES IN THE SOUTHWESTERN UNITED STATES
P. K. McDevitt and C. R. Rao (New Mexico Energy Inst.) Oct. 1978 74 p refs Prepared jointly with New Mexico State Univ., Las Cruces
(Contract EC-77-S-04-3992)
(NMEI-10-1) Avail: NTIS HC A04/MF A01

A computer simulation model (GIRORA-Nonelectric) developed to study the economics of district space heating using geothermal energy is described. GIRORA-Nonelectric is a discounted cashflow investment model which evaluates the financial return on investment for space heating. The model consists of two major submodels: the exploration for and development of a geothermal anomaly by a geothermal producer, and the purchase of geothermal fluid by a district heating unit. A sensitivity analysis of the model subject to changes in physical and economic parameters is presented. The economic analysis and technological screening criteria are used to examine all the low temperature geothermal sites in Southwestern United States for economic viability for space heating application. DOE

N80-15583# Midwest Research Inst., Golden, Colo.
LOW TEMPERATURE THERMAL ENERGY STORAGE: A STATE-OF-THE-ART SURVEY
F. Baylin Jul. 1979 120 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-54-164) Avail: NTIS HC A06/MF A01

The preliminary version of an analysis of activities in research, development, and demonstration of low temperature thermal energy storage (TES) technologies having applications in renewable energy systems is presented. Three major categories of thermal storage devices are considered: sensible heat; phase change materials; and reversible thermochemical reactions. Both short-term and annual thermal energy storage technologies based on principles of sensible heat are discussed. Storage media considered are water, earth, and rocks. Annual storage technologies include solar ponds, aquifers, and large tanks or beds of water, earth, or rocks. All program processes from basic research through commercialization efforts are investigated. Nongovernment-funded industrial programs and foreign efforts are outlined as well. Data describing low temperature TES activities are presented also as project descriptions. DOE

N80-15584# Minnesota Univ., Minneapolis. Dept. of Mechanical Engineering.
MELTING IN PHASE-CHANGE THERMAL STORAGE MEDIA Final Report
E. M. Sparrow and J. W. Ramsey 1978 90 p refs
(Contract EY-76-S-02-2993)
(COO-2993-1) Avail: NTIS HC A05/MF A01

Research on melting caused by a tubular heat source embedded in a solid phase-change medium is presented. Separate studies were performed with the heater positioned with its axis horizontal and with its axis vertical. Both orientations were investigated because they correspond to those of proposed bulk-type storage configurations. In addition, the direction of the gravity force relative to the heating surface is different in the two cases and this causes differences in the buoyancy forces that act on the liquid generated by the melting process. Two phase-change media were employed in the experiments: (1) the eutectic mixture of sodium nitrate and sodium hydroxide--melting temperature of 244 C; and (2) naphthalene--melting temperature of 80 C. The analysis was carried out on a specific fluid or a temperature level. The experimental results encompass information on both the heat transfer coefficient at the heated surface and on the size and shape of the melt zone. DOE

N80-15585# Sandia Labs., Albuquerque, N. Mex. Fluid Mechanics and Heat Transfer Div.
EVALUATION OF THE EVACUATED SOLAR ANNULAR RECEIVERS USED AT THE MIDTEMPERATURE SOLAR SYSTEMS TEST FACILITY (MSSTF)
A. C. Ratzel Jul. 1979 56 p refs
(Contract EY-76-C-04-0789)
(SAND-78-0983) Avail: NTIS HC A04/MF A01

A parabolic cyclindrical collector field subsystem used in tests to evaluate the vacuum integrity characteristics of ten glass to metal sealed concentric cylinder receivers is described. Tests and test results on the vacuum integrity and the collector system performance with evaluated receiver annuli and with receiver annuli maintained at atmospheric pressure are described. Heat loss reductions for different annulus gas pressures and under different receiver tube operating temperatures are presented. The collector's efficiency dependence upon operating temperature, annulus pressures, and insolation is discussed. A.W.H.

N80-15586# Higgins, Auld and Associates, Albuquerque, N. Mex.
ANALYSIS OF FIELD TEST RESULTS FOR SINGLE-AXIS-TRACKING SOLAR COLLECTOR FOUNDATIONS
H. E. Auld Jul. 1979 36 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7023) Avail: NTIS HC A03/MF A01

Five reinforced concrete cylindrical piers, typical of foundations utilized for single-axis-tracking solar collector systems, were tested to determine eccentric horizontal and vertical failure loads. The results from these tests were found to compare favorably with the results from theoretical calculations which incorporate the geotechnical parameters of the test site. Recommendations are made for the incorporation of these results into the design of foundations for future solar collector systems. DOE

N80-15588# Alabama Univ., University. Bureau of Engineering Research.
HEAT PUMP CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS: SYSTEMS DEVELOPMENT
W. J. Schaetzle and C. Everett Brett Mar. 1979 174 p refs
Prepared for Argonne Natl. Lab., Ill.
(Contract W-31-109-eng-38)
(ANL/ICES-TM-30) Avail: NTIS HC A08/MF A01

The design, operation, economics, environmental impacts, and expected performance of heat pump centered integrated community energy systems are discussed in detail. DOE

N80-15589# Argonne National Lab., Ill. Energy and Environmental Systems Div.
HEAT PUMP CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS: SYSTEM DEVELOPMENT Interim Report
R. E. Crane (Franklin Res. Center), H. G. Lorsch (Franklin Res. Center), and R. G. Werden Feb. 1979 196 p refs
(Contract W-31-109-eng-38)
(ANL/ICES-TM-26) Avail: NTIS HC A09/MF A01

The concept of a heat pump centered integrated community energy system (HP-ICES) was explored based on a reference community located in the Northeast with a population of 10,000. Engineering and economic analyses were performed for the HP-ICES and for conventional heating/cooling systems. Sensitivity analyses were used to determine variations in results from changes in: community size; community energy density; waste heat utilization; energy cost escalation; maintenance and operating personnel; and central HP-ICES ownership. The effect of each of the critical parameters on the economic viability of HP-ICES is shown. Conditions of equal 20-year life cycle costs for HP-ICES and for conventional systems are given. DOE

N80-15590# Little (Arthur D.), Inc., Cambridge, Mass.
UTILIZATION OF WASTE HEAT FROM FEDERAL FACILITIES Final Report
Feb. 1979 182 p refs
(Contract EC-77-C-05-5523)
(ORO-5523-T1) Avail: NTIS HC A09/MF A01

The technical and economic feasibility of using waste heat from the Oak Ridge Gaseous Diffusion Plant (ORGDP), Paducah Plant, Portsmouth Gaseous Diffusion Plant (PFDP), and the Savannah River Plant (SRP) for industrial process heat, space heating, power generation, or in agriculture or aquaculture is evaluated. Recommended uses and the cost of implementing waste heat utilization near each site are discussed. The recommended uses at Oak Ridge include district heating, greenhouse heating, and heat pump enhanced temperature elevation of the ORGDP waste heat for subsequent process heat use in a textile mill. At Paducah, the recommendation is to use heat pumps to raise the waste heat temperature for preheating feedwater for a 1000 MW coal-fired power plant. At Portsmouth, greenhouse heating is recommended. At the SRP aquacultural and greenhouse, uses and utilization for power generation by means of a Rankine cycle process are recommended. DOE

N80-15591# Air Products and Chemicals, Inc., Allentown, Pa.
DEMONSTRATION OF A NITROGEN BASED CARBURIZING ATMOSPHERE: ENERGY CONSUMPTION OF THE ENDOTHERMIC GENERATOR Quarterly Report, 1 Oct. - 30 Dec. 1978
R. J. Peartree Jan. 1979 22 p
(Contract EM-78-C-01-5058)
(CONS/5058-T1; QR-1; ID-12027-1) Avail: NTIS HC A02/MF A01

The energy consumption of an endothermic generator is documented. Two different sized generators were studied and found to have basically the same energy usage characteristics. The energy consumption was found to be dependent on generator output, with less energy consumption per unit volume at higher outputs. DOE

N80-15592# Department of Energy, Washington, D. C. Energy Information Administration.
THE 1985, 1990 AND 1995 MIDTERM ENERGY MARKET MODEL RESULTS UNDER THREE SCENARIOS OF FUEL USE ACT REGULATIONS
W. D. Montgomery, III May 1979 621 p refs
(DOE/EIA-0182/2) Avail: NTIS HC A99/MF A01

The incremental impacts of the Powerplant and Industrial Fuel Use Act regulations are analyzed as a function of the stringency of the economic test under which exemptions are granted. To carry out this analysis, the Mid-Term Energy Market Model (MEMM) is used to generate projections of energy supply, demand, and price under the specified assumptions. Industrial fuel demand is modeled by using a separate fuel-choice model to determine the share of oil, gas, and coal; these shares are then imposed on the MEMM solution. For electric utilities, impacts are modeled by altering the capital costs in the MEMM submodel. Preliminary numerical results of some of the model runs are presented. DOE

N80-15593# Department of Energy, Washington, D.C. Energy Information Administration.

ENERGY SUPPLY AND DEMAND IN THE SHORT TERM: 1979 AND 1980

Jun. 1979 127 p refs

(DOE/EIA-0184/4) Avail: NTIS HC A07/MF A01

Overall energy supply and demand balances as well as a detailed discussion of the elements of end-use consumption of coal, natural gas, petroleum products, and electricity are presented. Analyses of the operations of utilities and refineries, the domestic production of coal, natural gas, crude oil, and electricity, and the supply and demand balances for each fuel are provided. Projections of domestic production as well as supply and demand balances, synthetics and imports, and projections for the electric utility sector are included for the short-term. DOE

N80-15594# Department of Energy, Washington, D. C. International Energy Analysis Div.

INTERNATIONAL ENERGY ASSESSMENT Analysis Report

W. C. Kilgore May 1979 74 p refs

(DOE/EIA-0184/1; AR/IA/79-27) Avail: NTIS HC A04/MF A01

A comprehensive assessment of the international energy situation between now and the year 1995 is given. Forecasts of energy supply and demand for each region of the world are included along with estimates of future world oil prices and a sensitivity analysis of the critical factors affecting those prices. The analysis projects that world energy consumption will rise at a rate of between 2.8 and 3.9% per year, over the forecast period, while the demand for petroleum is expected to grow at a rate of 2.0 to 3.5% per year. This growth in consumption is projected to occur during a period in which world economic activity is increasing at the rate of 3.8 to 4.6% per year, such that the estimated ratio of world energy growth to economic growth falls from its historic 1960-1976 ratio of 0.94, to a ratio of 0.71 to 0.85 over the 1976-1995 period. World oil prices are found to be highly uncertain with real prices by 1995 ranging between $16.50 and $31.50 per barrel across five projection series. DOE

N80-15595# Illinois Univ., Urbana. Office of Vice Chancellor for Research.

ENERGY OPTIMAL USE OF WASTE PAPER Final Report

T. L. Gunn Nov. 1978 188 p refs

(Contract EY-76-S-02-2893)

(COO-2893-9) Avail: NTIS HC A09/MF A01

The mix of burning and recycling of waste paper that would minimize the total US energy used to make and dispose of the 1974 production of paper is assessed. Five cases are analyzed to determine the effects of various assumptions about how the energy in wood and paper will be treated. In one case, both wood and paper are assumed to have an energy value. In another, neither wood nor paper is assumed to have an energy value. In the other three cases, paper, but not wood, is assumed to have an energy value which is utilized differently in each case. It is found in each case that it is worthwhile in terms of energy conservation to recycle as much high grade de-inking waste paper as can be collected. How much of the other grades of waste paper would be recycled depends on which of the various energy accounting schemes is used. It is further found that the greatest energy savings are accomplished when both wood and waste paper are acknowledged to have an energy value. DOE

N80-15596# Acres American, Inc., Buffalo, N. Y.

FEASIBILITY OF COMPRESSED AIR ENERGY STORAGE AS A PEAK SHAVING TECHNIQUE IN CALIFORNIA, VOLUME 2 Final Report

Sep. 1978 523 p refs

(Contract EY-76-C-03-1331)

(SAN-1331-T1) Avail: NTIS HC A22/MF A01

The technical, economic, and siting feasibility, on a preliminary basis, of the use of compressed air energy storage in the state of California was investigated. The analysis was performed on a parametric basis using gas turbines and combined cycle plants as a comparison. The methodology, base data, and results are presented along with the computer program used. The design sites for porous media and compensated hard rock are documented along with an alternate site for each type of plant and the plant designs for porous media and hard rock storage. Developments in gas turbine generators and CAES plant designs are projected as both technologies are expected to advance in the near term. Cost estimates and construction schedules prepared for the plant designs are presented. Results and conclusions are given. DOE

N80-15597# Institute of Gas Technology, Chicago, Ill.

APPLICATION ANALYSIS OF SOLAR TOTAL ENERGY SYSTEMS TO THE RESIDENTIAL SECTOR. VOLUME 4: MARKET PENETRATION Final Report

Jul. 1979 320 p refs

(Contract EG-77-C-04-3787; Proj. 8987)

(ALO-3787-4) Avail: NTIS HC A15/MF A01

The residential consumption of energy in each of the 11 solar total energy systems (STES) regions is given by fuel type and end-use category. The current and projected costs and availability of fossil fuels and electricity for the STES regions are reported. Projections are made concerning residential building construction and the potential market for residential STES. The effects of STES ownership options, institutional constraints, and possible government actions on market penetration potential are considered. Capital costs for two types of STES are determined, those based on organic Rankine cycle (ORC) heat engines and those based on flat plate, water-cooled photovoltaic arrays. Both types of systems utilize parabolic trough collectors. The capital cost differential between conventional and STE systems is calculated on an incremental cost per dwelling unit for comparison with projected fuel savings in the market penetration analysis. Results of a market analysis are summarized. DOE

N80-15598# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.

NATIONAL PROGRAM PLAN FOR PASSIVE AND HYBRID SOLAR HEATING AND COOLING Interim Report

Jun. 1979 131 p

(DOE/CS-0089) Avail: NTIS HC A07/MF A01

A definition of a passive solar system is given, as well as background of Federal involvement in passive solar heating and cooling, program goals and objectives, and an overall implementation approach. Background information on the status of and the strategy and emphasis for technology development is provided, followed by descriptions of passive heating and passive cooling systems and an overview of task classifications for technology development. The technology utilization program is also presented. DOE

N80-15599# Utah Univ., Salt Lake City.

CONFERENCE ON PERFORMANCE MONITORING TECHNIQUES FOR EVALUATION OF SOLAR HEATING AND COOLING SYSTEMS

1978 353 p refs Conf. held in Washington, D.C., 3 Apr. 1978

(Contract EG-77-S-04-4094)

(CONF-780432) Avail: NTIS HC A16/MF A01

A general review of solar energy monitoring systems, their relationship to data users and their needs, and a methodology for developing instrumentation systems and performance evaluation techniques based on a systematic procedure for addressing the actual needs of the data user are provided. DOE

N80-15600# Sandia Labs., Albuquerque, N. Mex. Solar Technical Liaison Div.

DYNAMIC STORAGE IN SOLAR TOTAL ENERGY PROGRAMS

R. P. Stromberg 1978 27 p refs Presented at the Seminar on Solar Energy Storage, Trieste, Italy, 4 Sep. 1978

(Contract EY-76-C-04-0789)

(SAND-78-0958C; CONF-780944-1) Avail: NTIS HC A03/MF A01

A program of research and development to establish the feasibility of the Solar Total Energy Concept is described. The major items of actual hardware are a 32 kW Midtemperature Solar Systems Test Facility at Albuquerque, NM; and two planned Large Scale Experiments at Shenandoah, GA, and Ft. Hood, TX. These programs are described with reference to current literature. DOE

N80-15601# Sandia Labs., Albuquerque, N. Mex.
DEPARTMENT OF ENERGY LARGE SOLAR CENTRAL POWER SYSTEMS SEMIANNUAL REVIEW
Nov. 1978 305 p refs Conf. held at Dallas, 19-21 Sep. 1978
(Contract EY-76-C-04-0789)
(SAND-78-8511) Avail: NTIS HC A14/MF A01

Progress in the development of large solar power systems is reported. Hydraulic stability of solar boilers, closed cycle Brayton solar thermal electric power plants, heliostat development, and central receiver systems are discussed along with distributed collectors and total energy and hybrid systems. J.M.S.

N80-15602# Sandia Labs., Albuquerque, N. Mex.
DEPARTMENT OF ENERGY LARGE SOLAR CENTRAL POWER SYSTEMS SEMIANNUAL REVIEW
May 1978 262 p refs Conf. held at Reston, Va., 21-22 Mar. 1979
(Contract EY-76-C-04-0789)
(SAND-79-8508) Avail: NTIS HC A12/MF A01

Thirty papers are presented each discussing various aspects of the large solar central power systems program. R.E.S.

N80-15604# Ohio State Univ., Columbus. Engineering Experiment Station.
FUEL UTILIZATION IN RESIDENCES
C. Sepsy, M. F. McBride, R. S. Blanchett, and C. D. Jones Sep. 1978 251 p Presented at ASHRAE, Philadelphia, 28 Jan. - 1 Feb. 1979
(EPRI Proj. 137-1)
(EPRI-EA-894) Avail: NTIS HC A12/MF A01

A mathematical model and digital computer program were developed for accurately calculating the energy required by residential housing units on an hourly, daily, monthly, and seasonal basis. The model and program were used to establish an accurate procedure for determining the monthly and seasonal energy requirements of all types of residential structures. The response-factor technique was used to calculate the dynamic load responses of a residential structure. The model and program take into account all the internal and external dynamic loads imposed on the structure; they were verified by extensive calculations and field measurements applied to nine residential dwelling units in the Columbus, Ohio, area. All contained conventional space heating and cooling equipment, either natural gas or electric forced-air furnaces. A dynamic model for simulating hourly attic space air temperatures was developed and incorporated in the thermal-load calculation procedures. DOE

N80-15605# Department of Energy, Washington, D. C.
NUCLEAR STRATEGY OF THE DEPARTMENT OF ENERGY
Apr. 1979 89 p
(DOE/ER-0025/D) Avail: NTIS HC A05/MF A01

An analysis of the technical and economic parameters related to the timing and future deployment of nuclear power is presented. A set of alternative nuclear strategies are presented and evaluated. The strategies involve decisions on breeder commercialization, fuel cycle development, and strengthening the nuclear option. A.W.H.

N80-15606# Wharton (E. F. A.), Inc., Philadelphia, Pa.
WHARTON ANNUAL ENERGY MODEL: DEVELOPMENT AND SIMULATION RESULTS Final Report
W. Finan and G. R. Schink Jul. 1979 93 p refs
(EPRI Proj. 440-1)
(EPRI-EA-1115) Avail: NTIS HC A05/MF A01

The energy sector of a commercially available macroeconomic model was expanded in order to develop a tool for examining future energy-economy interactions. The specific methodologies employed are described and a set of energy policy simulations using the newly expanded model is presented. DOE

N80-15609# Lincoln Lab., Mass. Inst. of Tech., Lexington.
FLYWHEEL ENERGY STORAGE INTERFACE UNIT FOR PHOTOVOLTAIC APPLICATIONS
A. R. Millner and R. D. Hay 1979 6 p refs Presented at the Intersociety Energy Conf., Boston 5 Aug. 1979
(Contract EY-76-C-02-4094)
(COO-4094-44; CONF-790803-42) Avail: NTIS HC A02/MF A01

The design of a flywheel energy storage and conversion system is presented. The system which will serve as an interface between a solar photovoltaic array and an ac load, providing output waveform regulation as well as energy storage is evaluated. Features of the system include magnetic bearings, an ironless armature motor generator, and a low cost flywheel rotor. A preliminary economic analysis is provided. DOE

N80-15611# Argonne National Lab., Ill. Chemical Engineering Div.
LITHIUM/IRON SULFIDE BATTERIES FOR ELECTRIC VEHICLES
P. A. Nelson, A. A. Chilenskas, and R. K. Steunenberg 1978 24 p refs Presented at the 5th Intern. Electric Vehicle Symp., Philadelphia, 2-5 Oct. 1978
(Contract W-31-109-eng-38)
(CONF-781006-2) Avail: NTIS HC A02/MF A01

Recent progress in the development of LiAl/FeS/sub x/ batteries for electric vehicles is assessed. The possibility of near-term commercialization of a version of the battery that utilizes monosulfide (FeS) positive electrodes in conjunction with low cost, iron alloy current collectors is indicated. Multiple-electrode cells having a specific energy of about 100 Wh/kg are now under test. Conceptual design problems for a compact insulating jacket, which will maintain the battery temperature at 450 C, appear to be solved. Work is also underway on a version of the battery that would utilize FeS2 positive electrodes, which use molybdenum current collectors at present and may require the future development of less expensive current collectors to be commercially attractive. These batteries would ultimately have about 30 to 40% higher specific energy and 50 to 75% higher specific power than the FeS-type batteries. DOE

N80-15612# California Univ., Livermore. Lawrence Livermore Lab.
LAMINATED DISK FLYWHEEL PROGRAM
Richard G. Stone 24 Oct. 1978 9 p refs Presented at the Inform. Exchange Conf., Luray, Va., 24 Oct. 1978
(Contract W-7405-eng-48)
(UCRL-81772; CONF-781046-4) Avail: NTIS HC A02/MF A01

A program to develop the technology for high energy density, fiber composite flywheels based on the laminated disk concept is described. Progress toward optimizing the flywheel energy system with respect to low volume, low weight, manufacturability, and economy is reported. Program planning areas including the manufacturing of test model flywheels and developing a hub attachment are discussed. A.W.H.

N80-15613# Institute of Gas Technology, Chicago, Ill.
PREDICTION OF CURRENT DISTRIBUTION IN A MOLTEN CARBONATE FUEL CELL
V. Sampath, J. R. Selman, and A. F. Sammells 1978 30 p refs Presented at the 2d Intern. Symp. on Molten Salts, Pittsburgh, 15-20 Oct. 1978. Sponsored by the Electrochem. Soc., Inc.
(Contract EM-78-C-03-1735)
(CONF-781063-1) Avail: NTIS HC A03/MF A01

A mathematical model was developed to predict the performance of a molten carbonate fuel cell as a function of anode and cathode gas compositions, gas flow rates, and polarization characteristics. The effect of gas flow modes such as crossflow and coflow and the effect of higher pressures on

the current distribution were studied. The predicted polarization curves agree well with the experimentally generated polarization curves. Conditions for incorporating a microscopic porous electrode model into the overall model development are briefly outlined.
DOE

N80-15614# Argonne National Lab., Ill.
DEVELOPMENT OF Li-Al/FeS CELLS WITH LiCl-RICH ELECTROLYTE
F. J. Martino, L. G. Bartholme, E. C. Gay, and H. Shimotake 1978 15 p refs Presented at the Symp. on Battery Design and Optimization, Pittsburgh, 15-20 Oct. 1978
(Contract W-31-109-eng-38)
(CONF-7810135-2) Avail: NTIS HC A02/MF A01

Rechargeable lithium-aluminum/iron sulfide cells using the LiCl-KCl eutectic (44 wt % LiCl) electrolyte were developed. The utilization of these cells at high discharge rates was hindered by the formation of J phase LiK6FeS26Cl in the FeS electrodes. To overcome this problem, four engineering size cells (approximately 100 Ah theoretical capacity) were built with LiCl-rich electrolyte (54 wt % LiCl). At the 4-h rate, the utilization of these cells was improved by more than 40% over that of cells containing the eutectic electrolyte.
DOE

N80-15615# Department of Energy, Washington, D. C.
ALL-UNION SCIENTIFIC AND TECHNICAL CONFERENCE ON USE OF THE EARTH'S HEAT FOR THE PRODUCTION OF ELECTRIC POWER - SUMMARY OF REPORTS
Oct. 1978 138 p refs Transl. into ENGLISH of Vsesoyuznoye Naucho-Tekhnicheskoye Soveshchaniye. Ispol'zovaniye tepla zemli dlya Proizvodstva Electroenergii (Tezisy Dokladov), USSR Ministry of Power and Electrification, 1975 186 p Conf. held at Moscow, 10-14 Dec. 1975
(CONF-751270-Summ) Avail: NTIS HC A07/MF A01

The use and effectiveness of geothermal energy for producing electric power is discussed. Topics include the operation of geothermal electric stations and power plants, systems for the extraction of heat from the Earth's crust, drilling of geological prospecting boreholes for steam, and geophysical methods for monitoring the parameters of underground heat boilers. A.W.H.

N80-15616# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
PERFORMANCE OF RESIDENTIAL SOLAR HEATING AND COOLING SYSTEM WITH FLAT-PLATE AND EVACUATED TUBULAR COLLECTORS: CSU SOLAR HOUSE 1
W. S. Duff, T. M. Conway, G. O. G. Loef, D. B. Meredith, and R. B. Pratt 1978 14 p refs Presented at the CCMS Meeting, Dusseldorf, W. Germany, 19 Apr. 1978
(Contract EY-76-S-02-2577)
(COO-2577-17; CONF-7804101-1) Avail: NTIS HC A02/MF A01

Performance data were procured on 47 days during operation of the flat plate collector and on 112 days when the house was heated or cooled by the evacuated tube collector system. It was concluded that the system comprising an evacuated tubular collector, lithium bromide absorption water chiller, and associated equipment is highly effective in providing space heating and cooling to a small building, that it can supply up to twice the space heating and several times the cooling obtainable from an equal occupied area of good quality flat plate collectors, and that a greater fraction of the the domestic hot water can be obtained by supplying its heat from main storage. A summary of monthly and annual energy use for space heating, domestic hot water heating, and space cooling is presented.
DOE

N80-15618# California Univ., Berkeley. Lawrence Berkeley Lab.
AQUIFER THERMAL ENERGY STORAGE
C. F. Tsang 1978 27 p refs Presented at the Symp. on Advanced Technol. for Storing Energy, Chicago, 10 Jul. 1978
(Contract W-7405-eng-48)
(LBL-7070; CONF-780714-2) Avail: NTIS HC A03/MF A01

The concept of thermal energy storage is examined through the storage of waste hot water from power plants or from solar energy collectors in aquifers. The hydrodynamic and thermal behaviors of the storage system are analyzed and illustrated. A computer model developed to study the physical conditions and parameters and to make realistic predictions of the energy storage and retrieval efficiencies is described.
A.W.H.

N80-15619# Oak Ridge National Lab., Tenn.
INTERMEDIATE REPORT ON THE PERFORMANCE OF PLATE-TYPE ICE-MAKER HEAT PUMPS Progress Report
V. D. Baxter Oct. 1978 43 p refs
(Contract W-7405-eng-26)
(ORNL/CON-23) Avail: NTIS HC A03/MF A01

Two ice maker heat pumps were tested and compared for the effect of harvesting scheme and evaporator plate loading on performance in both water chilling and ice making modes. The systems design of each heat pump is reported with two major differences, the type of harvest scheme employed and the evaporator and compressor size, examined for efficiency and relative performance. The effect of thermostatic type cyclic operation on performance of the pumps is investigated. A.W.H.

N80-15620# Oak Ridge National Lab., Tenn. Engineering Technology Div.
CHARACTERIZATION OF OPERATING CONDITIONS FOR GAS/WATER HEAT RECOVERY STEAM GENERATORS
R. L. Graves 13 Oct. 1978 21 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6622) Avail: NTIS HC A02/MF A01

The possible operating points of air/water and helium/water steam generators are parametrically presented. Calculation procedures and a sample computer program listing are provided. Multiple saturated steam conditions are shown to be attainable with the same gas inlet and exit temperatures. Design considerations of heat transfer surface area and pumping requirements are also discussed.
DOE

N80-15621# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN OCEAN THERMAL ENERGY CONVERSION
Aug. 1979 53 p
(DOE/EDP-0034) Avail: NTIS HC A04/MF A01

The present status and goals of the OTEC program are described, and potential environmental, health, safety, and sociolegal-economic impacts relevant to the program are identified. A management plan is presented for conducting and coordinating environmental research in concert with the development of appropriate technology. Five major classes of environmental concerns associated with the deployment and operation of an OTEC system are discussed. They are changes in oceanic properties, chemical pollution, operation of a manned platform, legal and institutional matters, and secondary impacts associated with site selection, construction, and operation of OTEC plants.
DOE

N80-15622# Oklahoma Univ., Norman.
CRITICAL SPEEDS AND NATURAL FREQUENCIES OF RIM-TYPE COMPOSITE-MATERIAL FLYWHEELS
C. W. Bert, T. L. C. Chen, and C. A. Kocay Sep. 1978 108 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7049) Avail: NTIS HC A06/MF A01

An analytical investigation conducted on a 0.56 kWh composite material flywheel energy storage system for application in hybrid automotive vehicles is reported. The investigation calculated the *critical speeds and natural frequencies* of a rim type flywheel which is flexibly mounted on a finite hub, which in turn, is attached to an elastic shaft. The specific modes covered include whirling, torsional, and axial modes involving band, shaft and support flexibilities and in-plane bending, combined out of plane bending/twisting, and extensional modes of the flywheel rim. The phenomena occurring during acceleration through critical speeds and the effect of creep stress relaxation on the supporting bands are examined.
DOE

N80-15623# Sandia Labs., Albuquerque, N. Mex.
OVERVIEW OF FLYWHEEL ENERGY STORAGE COMPONENT DEVELOPMENT

R. O. Woods [1978] 7 p refs Presented at 1st Inform. Exchange Conf., Luray, Va. 24 Oct. 1978
(Contract EY-76-C-04-0789)
(SAND-78-1999C; CONF-781046-8) Avail: NTIS HC A02/MF A01

Composite flywheel design, bearings, shaft seals, and general vacuum technology are reviewed. K.L.

N80-15624# Sandia Labs., Albuquerque, N. Mex.
SANDIA COMPOSITE-RIM FLYWHEEL DEVELOPMENT
E. D. Reedy, Jr. [1978] 13 p refs Presented at 1st Inform. Exchange Conf., Luray, Va., 24 Oct. 1978
(Contract EY-76-C-04-0789)
(SAND-78-1865C; CONF-781046-3) Avail: NTIS HC A02/MF A01

A series of flywheel spin tests and the status of the rotor development program are discussed. Two designs incorporating a 20 in. OD graphite/epoxy rim were tested. Each design utilized a different method of attaching the rim to an aluminum hub with Kevlar 49/epoxy bands. Data on rotor performance, dynamics, and failure modes are presented. DOE

N80-15625# Oak Ridge National Lab., Tenn.
ANALYSIS OF POTENTIAL IMPLEMENTATION LEVELS FOR WASTE HEAT UTILIZATION IN THE NUCLEAR POWER INDUSTRY
M. Olszewski and H. R. Bigelow Oct. 1978 34 p refs
(Contract W-7405-eng-26)
(ORNL/TM-63-2) Avail: NTIS HC A03/MF A01

An assessment of land available at nuclear power stations was performed in an effort to determine the limitations land availability would impose on the implementation of reject heat utilization systems. A waste heat utilization factor was defined for all operating and planned nuclear power stations. This factor is the percentage of the station's reject heat that could be utilized on the land available for such use at the site. An estimate of the potential for implementation at fossil stations was performed. DOE

N80-15626# California Univ., Livermore. Lawrence Livermore Lab.
ENVIRONMENTAL OVERVIEW OF GEOTHERMAL DEVELOPMENT: THE GEYSERS-CALISTOGA KGRA. VOLUME 1: ISSUES AND RECOMMENDATIONS
D. L. Ermak and P. L. Phelps 4 Oct. 1978 21 p refs
(Contract W-7405-eng-48)
(UCRL-52496-Vol-1) Avail: NTIS HC A02/MF A01

Priorities of the impacts of geothermal resource development on local communities and environments are assessed and recommendations are given particularly in the hydrogen sulfide emissions from the geysers steam evolved. Other high priority needs are related to controlling noise from geothermal development, land-use conflicts between geothermal and other potential uses, impacts from landslide and soil erosion induced by geothermal development and protection of rare and endangered species in the region. DOE

N80-15627# Sandia Labs., Albuquerque, N. Mex.
PULSAR: AN INDUCTIVE PULSE POWER SOURCE
E. C. Cnare, W. P. Brooks, and M. Cowan 1979 4 p refs Presented at the Pulsed Power Conf., Lubbock, Tex., 12 Jun. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1246C; CONF-790622-19) Avail: NTIS HC A02/MF A01

The pulsar concept of inductive pulsed power source which uses a flux compressing metallic or plasma armature rather than a fast opening switch to transfer magnetic flux to a load is discussed. The inductive store is a relatively unsophisticated dc superconducting magnet. The development of much faster plasma armatures for use in larger systems of one and two meters diameter is examined. Techniques used to generate the required high magnetic Reynolds number flow are described. DOE

N80-15628# Hawaii Univ. at Manoa, Honolulu. Hawaii Natural Energy Inst.
SOLAR/WIND HANDBOOK FOR HAWAII: TECHNICAL APPLICATIONS FOR HAWAII, THE PACIFIC BASIN AND SITES WORLDWIDE WITH SIMILAR CLIMATIC CONDITIONS
W. Falicoff, G. Koide, and P. Takahashi May 1979 647 p refs Prepared jointly with Hawaii Univ., Hilo and Hawaii State Dept. of Planning and Economic Development
(Contract W-7405-eng-48)
(UCRL-15053) Avail: NTIS HC A99/MF A01

The techniques are presented for using solar energy and wind power in applications such as domestic hot water production, space cooling, process heating, and power generation. The findings and information are based upon conditions in Hawaii, but can apply to locations with similar environments such as the entire Pacific area. DOE

N80-15629# Argonne National Lab., Ill.
TURBOMACHINERY OPTIONS FOR AN UNDERGROUND PUMPED HYDROELECTRIC STORAGE PLANT
C. A. Blomquist, S. W. Tam, and A. A. Frigo 1979 11 p refs Presented at 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract W-31-109-eng-38)
(CONF-790803-50) Avail: NTIS HC A02/MF A01

Various turbomachinery options for underground pumped hydroelectric storage (UPHS) plants are reviewed. Current technology indicates that the maximum head for single-stage, reversible, Francis-type pump turbines is 625 m; for separate, single-stage, Francis-type turbines and multistage pumps, 672 m; for tandem units consisting of separate multijet impulse turbines and multistage pumps, 1440 m; and for multistage, reversible, ungated Francis-type pump turbines, 1290 m. Engineering design studies indicate that heads for the single-stage reversible units could be extended to 1000 m, developing 500 MW output per unit. The studies also indicate that two stage, reversible, Francis-type pump turbines with adjustable wicket gates could be developed for power outputs up to 500 MW at operating heads as high as 1500 m. DOE

N80-15630# Department of Energy, Washington, D. C. Office of Consumption Data System.
FEDERAL ENERGY DATA SYSTEM (FEDS) STATISTICAL SUMMARY UPDATE
J. P. Galliker Jul. 1979 854 p
(DOE/EIA-0192) Avail: NTIS HC A99/MF A01

The Federal energy data system statistical summary update displays state level energy consumption by major economic sectors for the years 1960 to 1977. The data are displayed in both calorific units and physical units. Fuels are divided into categories, i.e., highway gasoline in the transportation sector; kerosene in the residential sector; coking coal and petroleum coke in the industrial sector; and diesel in the transportation sector. DOE

N80-15631# Department of Energy, Washington, D. C. International Energy Analysis Div.
ENERGY DEMAND IN THE DEVELOPING COUNTRIES
J. Child and Mark Rodekohr Apr. 1979 20 p refs
(DOE/EIA-0183/10) Avail: NTIS HC A02/MF A01

An analysis of the demand for energy in developing countries is summarized. A model of developing country energy demand which is econometric in nature and is designed to forecast demand for oil, coal, and natural gas - excluding non-fossil fuels is described. The model and data used in the analysis are defined, and results generated with the 1978 model and the 1977 model based on identical sets of assumptions are compared. DOE

N80-15633# SRI International Corp., Menlo Park, Calif.
ECONOMIC IMPACTS OF ENERGY CONSERVATION AND RENEWABLE ENERGY SOURCES
R. C. Carlson 1979 21 p refs
(Contract W-7405-eng-48)
(UCRL-15087) Avail: NTIS HC A02/MF A01

An overall theory of the economic impacts of alternative energy developments is developed. Literature on such impacts is reviewed and economic impacts of alternative energy development scenarios for California are projected. Economic impacts include changes in aggregate employment, unemployment, real income, and real output. Changes in each of these measures are analyzed in circumstances that include incentives or mandates for increased energy conservation or use of renewable energy resources. DOE

N80-15634# Brookhaven National Lab., Upton, N. Y.
MARKAL: A MULTIPERIOD LINEAR-PROGRAMMING MODEL FOR ENERGY SYSTEMS ANALYSIS (BNL VERSION)
H. Abilock, C. Bergstrom, J. Brady et al 1979 23 p refs Presented at the Energy Systems Analysis Intern. Conf., Dublin, 9 Oct. 1979
(Contract EY-76-C-02-0016)
(BNL-26390; CONF-791007-3) Avail: NTIS HC A02/MF A01

A computer program, MARKAL, a demand-driven, multiperiod, LP model of energy supplies and demands, is described. Its intended application is at the level of an entire nation. MARKAL takes exogenously supplied energy-demand figures and determines the optimal energy-supply and end-use-device network that can meet the demand. The computer systems design and requirements are discussed. The use of MARKAL for assessing the merits of energy technologies and characterizing their likely technological and economic characteristics is examined. DOE

N80-15635# Lincoln Lab., Mass. Inst. of Tech., Lexington.
FLYWHEEL ENERGY STORAGE AND CONVERSION SYSTEM FOR PHOTOVOLTAIC APPLICATIONS
A. R. Millner 1979 15 p Presented at the Intern. Assembly on Energy Storage, Dubrovnik, Yugoslavia, 27 May 1979
(Contract EY-76-C-02-4094)
(COO-4094-48; CONF-790515-4) Avail: NTIS HC A02/MF A01

The design of a flywheel energy storage and conversion system is examined. The system serves as an interface between a solar photovoltaic array and an ac load, providing output waveform regulation as well as energy storage. Characteristics of the system include magnetic bearings, an ironless armature motor generator, and a low cost flywheel rotor. An economic analysis is presented. DOE

N80-15637# Sandia Labs., Albuquerque, N. Mex. Systems Analysis Div.
SOLAR MECHANICAL ENERGY STORAGE PROGRAM OVERVIEW AND SYSTEMS ANALYSIS RESULTS
B. C. Caskey 1979 6 p refs Presented at the Mechanical and Mag. Energy Storage Contractor, Washington, D.C., 19 Aug. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1642C; CONF-790854-1) Avail: NTIS HC A02/MF A01

The mechanical energy storage modes that are used in conjunction with solar inputs supplying small to intermediate loads are evaluated. Energy storage systems considered are flywheels, a pneumatic energy storage system, and low head pumped hydro storage. The development of low cost stationary flywheel technology is discussed. A computer program for systems analysis of the energy storage systems is described which uses economic parameters, system size, collector output and load demand based on hourly weather data for input data. A.W.H.

N80-15638# Lincoln Lab., Mass. Inst. of Tech., Lexington.
DESCRIPTION OF THE MIT/LINCOLN LABORATORY PHOTOVOLTAIC SYSTEMS TEST FACILITY
S. B. Sacco 30 Jun. 1979 25 p ref
(Contract EY-76-C-02-4094)
(COO-4094-41) Avail: NTIS HC A02/MF A01

The test facility and the mechanical and electrical interfaces for items to be tested are described. These interfaces include those for the solar array, batteries, inverters, and for backup dc power sources. Permanent power and instrumentation wiring at the facility are depicted in sufficient detail to permit test plans to be drawn up from these descriptions. DOE

N80-15639# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
ROLE OF THE GOVERNMENT IN THE DEVELOPMENT OF SOLAR ENERGY
M. D. Yokell 1979 29 p refs Presented at the Ann. Meeting Assoc. for the Advan. of Sci., Houston, Tex., 4 Jan. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-52-138; CONF-790122-3) Avail: NTIS HC A03/MF A01

The economic rationale for a Federal solar energy subsidy program, the type of program required, and methods for determining the proper funding level for each program are discussed. An introduction offers a brief description of solar technologies. A summary of the current Federal solar subsidy program is also provided. DOE

N80-15640# Department of Energy, Washington, D. C. Office of Leasing Policy Development.
FEDERAL LEASING AND OUTER CONTINENTAL SHELF ENERGY PRODUCTION GOALS
Jun. 1979 426 p refs
(DOE/RA-0037) Avail: NTIS HC A19/MF A01

The growing U.S. dependence on foreign energy sources, coupled with a limited mid-term supply of newer energy sources, has focused national energy policy on expanding domestic production of fossil fuels. Considering that up to 60 percent of the nation's undiscovered energy resources may be located on the Outer Continental Shelf (OCS) and that new opportunities exist for redirecting Federal management of OCS lands, the energy potential of the OCS was assessed. Oil and natural gas production goals for the OCS were established and are presented. The goals were determined by adding the production from existing OCS leases and estimated production from lease sales appearing on proposed lease schedules. R.E.S.

N80-15641# Sandia Labs., Albuquerque, N. Mex. System Analysis Div.
SOLAR ENHANCED OIL RECOVERY: AN ASSESSMENT OF ECONOMIC FEASIBILITY
K. D. Bergeron May 1979 51 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0787) HC A04/MF A01

An assessment of the potential economic viability of solar enhanced oil recovery (EOH) is presented. The technical and physical aspects of the merging of solar energy with EOR are examined. A cost model of the system based on a number of assumptions including operating lifetime, nonsteam costs, tax credits, and fuel prices is presented. A.W.H.

N80-15642# Electric Power Research Inst., Palo Alto, Calif. Fossil Fuel and Advanced Systems Div.
FEASIBILITY STUDY FOR ENHANCING THE DEVELOPMENT OF FUSION ENERGY
N. A. Amherd, ed. and J. H. Vanston, ed. Mar. 1979 158 p refs
(EPRI-ER-778-SR) Avail: NTIS HC A08/MF A01

Areas of work, as well as contributions to fusion program planning are presented. The feasibility of a comprehensive project addressing programmatic issues was investigated. A historical examination of the commercial development of selected large scale technologies, together with the specification of the methods for examining the compatibility of the fusion program with the electric utilities needs, and a plan for a detailed study of the safety and environmental issues of fusion power is given. Summaries of interviews with several people who have played key roles in the management of high technology development programs are reported. R.C.T.

N80-15643# Los Alamos Scientific Lab., N. Mex.
WATER USE ALTERNATIVES FOR NAVAJO ENERGY PRODUCTION
D. Abbey 1979 17 p refs Presented at the Navajo Energy and Environ. Technol. Training Conf., Tsaile, Ariz., 30 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-1598; CONF-790550-3) Avail: NTIS HC A02/MF A01

The technologies and estimate costs ($/af saved) for those activities for which water conservation is feasible are described. The range of water requirements compared to energy and water resource estimates, alternative criteria for energy and water resource management are discussed: (1) promote energy activities with the lowest minimum water requirements; (2) require industry to use low quality water resources and the most effective water conservation technology; and (3) maximize the economic return on Navajo water reqources ($/af consumed). DOE

N80-15645# New Mexico Energy Inst., Las Cruces.
USE OF GEOTHERMAL ENERGY FOR DESALINATION IN NEW MEXICO: A FEASIBILITY STUDY Final Report, 7 Jan. 1977 - 30 May 1979
Lokesh Chaturvedi, Conrad G. Keyes, Jr., Chandler A. Swanberg, Yash P. Gupta, Marion Michael Hightower, and Ray Jay Davis (Arizona Univ.) Jun. 1979 142 p refs
(PB-299271/7; NMEI-42) Avail: NTIS HC A07/MF A01 CSCL 07C

The availability versus the requirements of water in the New Mexico area is examined. The use of geothermal energy for the desalinization of water in order to increase the water supply to the area is studied. Geothermal desalinization technology is reported along with potential geothermal desalinization sites. Saline and geothermal aquifer well fields design are described. Environmental, legal, and institutional considerations are outlined. A.W.H.

N80-15648# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
ENERGY PROGRAM AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY Quarterly Report, Apr. - Jun. 1979
W. J. Toth, R. W. Henderson, W. F. Barron, A. C. Goodman, and C. S. Leffel, Jr. Jul. 1979 46 p refs
(PB-310245/7; APL/JHU/EQR-79-2) Avail: NTIS HC A03/MF A01 CSCL 10A

Topic areas covered include: geothermal energy development planning, hydroelectric power development, energy conversion and storage techniques, power plant site evaluation, and ocean thermal energy conversion development. GRA

N80-15668# California Univ., Livermore. Lawrence Livermore Lab.
IDENTIFICATION OF ENVIRONMENTAL CONTROL TECHNOLOGIES FOR GEOTHERMAL DEVELOPMENT IN THE IMPERIAL VALLEY OF CALIFORNIA
D. F. Snoeberger and J. H. Hill 5 Oct. 1978 33 p refs
(Contract W-7405-eng-48)
(UCRL-52548) Avail: NTIS HC A03/MF A01

Control technologies to manage environmental impacts from geothermal developments in California's Imperial Valley are discussed. Included are descriptions of methods for managing land subsidence by fluid injection; for preventing undesirable induced seismicity or mitigating the effects of seismic events; for managing liquid wastes through pretreament or subsurface injection; for controlling H2S by dispersal, reinjection, and chemical treatment of effluents; and for minimizing the impact of noise from power plants by setting up buffer zones and exclusion areas. DOE

N80-15669# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN: ELECTRIC ENERGY SYSTEMS
Aug. 1979 58 p refs
(DOE/EDP-0038) Avail: NTIS HC A04/MF A01

The Electric Energy Systems (EES) program is discussed. The program includes the following projects: electric field effects, underground transmission, high-voltage dc technology, advanced transformer and generator concepts, compact stations, and dispersed storage and generation. The projects were examined to identify their environmental impact and the resulting concerns. Management plans for meeting the environmental requirements are identified, along with the organizations responsible for managing the environmental research associated with the EES program. DOE

N80-15670# Oak Ridge Associated Universities, Tenn.
DEVELOPMENT OF THE ROCKY MOUNTAIN ENERGY AND ENVIRONMENTAL TECHNOLOGY CENTER: A PRELIMINARY ANALYSIS
T. McKinley, J. Doggett, and J. Little Jun. 1979 34 p
(Contract EY-76-C-05-0033)
(ORAU-158) Avail: NTIS HC A03/MF A01

The events that contributed to the evolution of RME and ETC are emphasized. All of the organizations which have aided the development of RME and ETC are identified. The private and shared agendas of each are explored. A historical synopsis is presented to provide a chronological time frame for program development. Training programs in machining, word processing, and chemical operating are described. Characteristics of the total 79 trainees enrolled are presented, terminations and placements to date are cited. RME and ETC represents one coordinated approach to industry-based CETA skills training. The key elements that contributed to the current RME and ETC are identified. Recommendations are offered for present and future program implementation. DOE

N80-15676# Hittman Associates, Inc., Columbia, Md.
ENVIRONMENTAL ASSESSMENT REPORT: SOLVENT REFINED COAL (SRC) SYSTEMS Final Report, May 1978 - May 1979
K. J. Shields, H. T. Hopkins, E. E. Weir, and Carolyn Thompson Jun. 1979 847 p
(Contract EPA-68-02-2162)
(PB-300383/7; EPA-600/7-79-146) Avail: NTIS HC A99/MF A01 CSCL 13B

Air emissions, water effluents, solid wastes, toxic substances, control/disposal alternatives, environmental regulatory requirements, and environmental effects associated with solvent refined coal (SRC) systems are evaluated. The SRC-1(solid product) and SRC-11(liquid product) variations of solvent refining are considered in terms of a hypothetical facility to produce 7950 cum/day liquefied coal products. Control and disposal options are surveyed to determine their applicability to subject discharges. Potentially applicable regulatory requirements are reviewed and compared to estimated after-treatment discharge levels. Analyses indicate that solid wastes produced by SRC systems are the greatest source of current environmental concern. GRA

N80-15681# Mathtech, Inc., Princeton, N. J.
EVALUATION OF THE ENVIRONMENTAL EFFECTS OF WESTERN SURFACE COAL MINING, VOLUME 1 Final Report, Jun. 1975 - Jun. 1977
Frank Cook May 1979 154 p refs
(Contract EPA-68-03-2226)
(PB-300375/3; EPA-600/7-79-110-Vol-1) Avail: NTIS HC A08/MF A01 CSCL 13B

The methods presently used for surface mining of coal in the western United States are described and evaluated. The effects that use of those methods have on the environment are described and ways in which the methods might be altered to reduce both long term and short term environmental damage are presented. GRA

N80-15682# PEDCo-Environmental, Inc., Cincinnati, Ohio.
EPA UTILITY FGD (FLUE GAS DESULFURIZATION) SURVEY: DECEMBER 1978 - JANUARY 1979
M. Smith, M. Melia, T. Koger, R. McKibben, and J. Uihlein May 1979 453 p refs
(Contract EPA-68-02-2603)
(PB-299399/6; EPA-600/7-79-022C) Avail: NTIS HC A20/MF A01 CSCL 10B

The scope of design data for operating flue gas desulfurization (FGD) systems is expanded, section formats are revised, and a new section includes operational particulate scrubbers. Information contributed by the utility industry, process suppliers, regulatory agencies, and consulting engineering firms is summarized. Systems are tabulated alphabetically by development status (operational, under construction, or in planning stages), utility company, process supplier, process, waste disposal practice, and regulatory class. Data on system design, fuel sulfur content, operating history, and actual performance are presented as well as unit by unit dependability parameters. Problems and solutions associated with the boilers and FGD systems are considered. Process flow diagrams and FGD system economic data are appended. Current data show 46 operating FGD systems, 45 systems under construction, and 67 planned units. Projected 1988 FGD capacity is about 70,000 MW. GRA

N80-15685# Environmental Monitoring and Support Lab., Las Vegas, Nev.

WESTERN ENERGY SULFATE/NITRATE MONITORING NETWORK Progress Report, Jan. 1975 - Jun. 1978

Michael J. Pearson, Marc Pitchford, and Robert Snelling Mar. 1979 50 p refs

(PB-299238/6; EPA-600/7-79-074) Avail: NTIS HC A03/MF A01 CSCL 13B

Little sulfate-nitrate data are available to establish a baseline and evaluate the impact of coal utilization. The number of locations monitoring sulfate and nitrate in the Western Energy Resource Development Area was increased by augmenting the existing particulate sampling networks. To evaluate and improve the quality of data obtained, a quality assurance program was established. The data reported thus far indicate generally low values in this area. Typically, sulfate values are less than 6 micrograms per cubic meter (microgram/cu m) and nitrate values are less than 3 microgram/cu m. GRA

N80-15687# Acurex Corp., Mountain View, Calif. Energy and Environmental Div.

PILOT SCALE EVALUATION OF NOx COMBUSTION CONTROL FOR PULVERIZED COAL, PHASE 2 Final Report, Jun. 1973 - Jan. 1978

R. A. Brown, J. T. Kelly, and Peter Neubauer Jun. 1979 321 p

(Contract EPA-68-02-1885)

(PB-299325/1; EPA-600/7-79-132; Rept-78/293) Avail: NTIS HC A14/MF A01 CSCL 13B

Advanced NOx control techniques were investigated on a pilot scale test facility firing pulverized coal. Baseline and control technology tests were performed on three coal types over a range of parameters. First and second stage parameters investigated include stoichiometry, excess air, temperature, mixing residence time, and coal composition. A minimum NO level was achieved at a stoichiometric ratio between 0.75 and 0.85, depending on fuel and furnace configuraton, and the longer first-stage residence times gave lower stack NO levels. To obtain NO levels below 150 ppm, first-stage residence times of up to 3 seconds were required. Second-stage parameters were found to be of second-order importance. GRA

N80-15688# Clemson Univ., S.C. Dept. of Mechanical Engineering.

ENERGY CONSERVATION THROUGH POINT SOURCE RECYCLE WITH HIGH TEMPERATURE HYPERFILTRATION Final Report, Jul. 1975 - Dec. 1978

J. L. Gaddis, C. A. Brandon, and J. J. Porter Jun. 1979 187 p refs

(Grant EPA-R-803875)

(PB-299183/4; EPA-600/7-79-131) Avail: NTIS HC A09/MF A01 CSCL 13B

The reuse of water, energy, and chemicals in the textile industry can be best achieved if separations are applied to individual point-source streams rather than to total-plant mixed effluents. Five wet processes comprise a large fraction of total textile operations and require over half of the total energy used. Each process effluent was sampled and analyzed to determine which membrane, hyperfiltration or ultrafiltration, should be used. Two small equipment skids allowed membrane operation at the plant sites. The permeable water in each case was reusable. Estimates of energy recoverable per mass of cloth processed (kJ/kg) for each operation are: rope preparation, 2646; open-width preparation, 5766; continuous dyeing, 2449; atmospheric beck dyeing, 20115; high-pressure dyeing, 3910; and low-pressure beck dyeing, 1964. GRA

N80-15691# Dravo Corp., Pittsburgh, Pa.

MANAGEMENT OF COAL PREPARATION FINE WASTES WITHOUT DISPOSAL PONDS Final Report, Jul. 1977 - Jun. 1978

D. C. Hoffman, R. W. Briggs, and S. R. Michalski Jan. 1979 63 p refs

(Contract DI-G-ET-79-11270)

(PB-299100/8; EPA-600/7-79-007; FE-11270-1) Avail: NTIS HC A04/MF A01 CSCL 13B

The physical/chemical properties of a diverse sampling of fine coal refuse were investigated along with the effect of chemical stabilization. It was shown that chemical stability can be employed to drastically improve some physical/chemical properties of the fine refuse for better handling and disposal. The proprietary chemical, Calcilox (Trademark) additive, is the most effective over the range of samples tested. Portland Type 1 cement is also effective but greatly influenced by waste solids concentration. The final chemical tested, lime, is inferior to the other two chemicals and generally ineffective in improving the fine waste's physical/chemical properties. GRA

N80-15699# Environmental Protection Agency, Ann Arbor, Mich. Technology Assessment and Evaluation Branch.

INVESTIGATION OF THE EFFECTS OF THE INSTALLATION OF AN OXIDATION CATALYST ON A DIESEL POWERED VEHICLE

Edward Anthony Barth Mar. 1979 20 p

(PB-299928/2; TAEB-79-7) Avail: NTIS HC A02/MF A01 CSCL 13B

The use of an oxidation catalyst in diesel powered vehicles was investigated for it's effects on gaseous and particulate emissions, fuel economy, and vehicle performance. K.L.

N80-15758# National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.

METEOROLOGICAL EFFECTS OF OIL REFINERY OPERATIONS IN LOS ANGELES

R. F. Pueschel, F. P. Parungo, E. W. Barrett, D. L. Wellman, and H. Proulx Jul. 1979 68 p refs

(PB-300720/0; NOAA-TM-ERL-APCL-22; NOAA-79081403) Avail: NTIS HC A04/MF A01 CSCL 04B

From airborne in situ measurements of gases and aerosol size distributions and from post-flight chemical analyses of sample particles, it was found that oil refinery operations in southern Los Angeles can modify clouds in the vicinity. The refinery effluents increased the concentration of aerosols in the size range between 0.05 micro m and 23.5 micro m particle radius. Furthermore, although the sulfate aerosol in the area has a stabilizing effect on clouds, the clouds downwind of the refineries were found to be destabilized by the nitrate aerosol. GRA

N80-15893# Department of Energy, Washington, D.C. Office of Nuclear Energy Programs.

FISSION ENERGY PROGRAM OF THE U.S. DEPARTMENT OF ENERGY, FY 1980

Apr. 1979 315 p refs

(DOE/ET-0089) Avail: NTIS HC A14/MF A01

The fission energy program and program objectives are discussed. The program management and program strategy are described and the program budget is presented. The topics in the program which are discussed include thermal reactor technology, advanced isotope separation technology, water cooled breeders, gas cooled breeders, and space power applications. A.W.H.

N80-15897# Brookhaven National Lab., Upton, N.Y.

FUSION ENERGY FOR HYDROGEN PRODUCTION

J. A. Fillo, J. R. Powell, M. Steinberg, R. Benenati (N.Y. Polytechnic Inst.), V. Dang (Burns and Roe), S. Fogelson (Burns and Roe), H. Isaacs (Burns and Roe), H. Kouts (Burns and Roe), M. Kuschner (Burns and Roe), and O. Lazareth 1978 7 p refs Presented at the 10th Symp. on Fusion Technol., Padova, Italy, 4-8 Sep. 1978

(Contract EY-76-C-02-0016)

(BNL-24906; CONF-780953-6) Avail: NTIS HC A02/MF A01

The use of thermonuclear fusion for the production of hydrogen from water is described. A conceptual design coupling fusion with high temperature electrolysis for the production of hydrogen is examined. Elements in the systems' design discussed are the fusion blanket, the high temperature electrolyzers, the coupling of the fusion and electrolyzer systems, and the power conversion system. A.W.H.

N80-15908# Sandia Labs., Albuquerque, N. Mex.
PULSED POWER FOR FUSION
T. H. Martin 1979 7 p refs Presented at the Pulsed Power Conf., Lubbock, Tex., 12 Jun. 1979
(Contract EY-76-C-04-0789)
(SAND-79-0933C; CONF-790622-7) Avail: NTIS HC A02/MF A01

Research conducted in support of the pulsed power approach to fusion resulted in the creation of an extendable accelerator technology that could be used at levels up to 100 TW and 30 MJ. These types of accelerators are efficient (about 30 to 50 percent) and for ion outputs in the 1 to 3 MJ range they may provide an approach to economically feasible 200 MW electric power reactor. Repetitive pulsing of the pulsed power system for > 10 to the 9th power short lifetimes must be solved along with ion beam concentration, bunching, and drifting. DOE

N80-15933# California Univ., Livermore. Lawrence Livermore Lab.
SUPERCONDUCTIVITY FOR MIRROR FUSION
C. D. Henning Sep. 1978 23 p Presented at Appl. Superconductivity Conf., Pittsburgh, 25 Sep. 1978
(Contract W-7405-eng-48)
(UCRL-81693; CONF-780952-39) Avail: NTIS HC A02/MF A01

The use of mirror magnets in fusion reactors due to the high and steady magnetic fields they generate and the capacity to negate pulsed field is discussed. The past and present development of mirror magnets is reviewed and mirror fusion experiments are reported. A.W.H.

N80-15942# Argonne National Lab., Ill.
TECHNICAL SUPPORT FOR OPEN-CYCLE MHD PROGRAM Progress Report, Apr. - Jun. 1978
D. H. Bomkamp, ed. Jul. 1979 76 p ref
(Contract W-31-109-eng-38)
(ANL/MHD-78-11) Avail: NTIS HC A05/MF A01

The analysis of a magnetohydrodynamic/steam system is discussed. The major components of the system are examined including the combustor, the nozzle channel diffuser, the slag separator, and the high temperature air heaters. The development of a model for the heat transfer and slag flow and a model to estimate the effective emissivities and absorptivities of coal combustion gas containing slag droplets are discussed. A.W.H.

N80-15946# General Accounting Office, Washington, D. C. Energy and Minerals Div.
FUSION: A POSSIBLE OPTION FOR SOLVING LONG-TERM ENERGY PROBLEMS
28 Sep. 1979 60 p
(PB-300692/1; EMD-79-27) Avail: NTIS HC A04/MF A01 CSCL 18A

The concepts of nuclear fusion and the nuclear fusion reactor are reviewed. The topics addressed are plasma confinement, fusion-fission hybrid reactors, and thermonuclear power generation. A.W.H.

N80-15992# Commerce Dept., Washington, D.C. Industry and Trade Administration.
PETROCHEMICALS: THEIR ECONOMIC SIGNIFICANCE IN THE DOMESTIC ECONOMY
Harry Pfann Jul. 1979 91 p refs
(PB-299733/6) Avail: NTIS HC A05/MF A01 CSCL 05C

The economic significance of petrochemicals within the domestic economy is considered along with their importance in U.S. export trade and their requirements for energy and feedstocks. The importance of fuels and of feedstocks to the industry is noted and data are presented on the quantity of hydrocarbons which are used by the industry for both feedstocks and as energy. GRA

N80-15993# Department of Energy, Washington, D. C. Office of Analytical Services.
REPORT TO CONGRESS ON THE ECONOMIC IMPACT OF ENERGY ACTIONS AS REQUIRED BY PUBLIC LAW 93-275, SECTION 18-D
Sep. 1978 198 p
(DOE/PE-0007) Avail: NTIS HC A09/MF A01

Economic impact analyses are summarized for: (1) two regulatory changes pertaining to crude oil production in California, (2) a change in price regulations for resale of crude oil, and (3) energy efficiency targets for 13 appliances. A recommendation is presented for Federal Programs of employment or economic assistance to minimize the effect of energy shortages or energy actions. K.L.

N80-15994# Committee on Science and Technology (U. S. House).
TOWARD THE ENDLESS FRONTIER: HISTORY OF THE COMMITTEE ON SCIENCE AND TECHNOLOGY 1959 - 1979
Ken Hechler 1980 1107 p refs
(GPO-35-120) Avail: SOD HC

The history of the Committee on Science and Technology is reviewed from its beginning in 1959 through the year 1979. Topics include space missions, space science, international scientific cooperation, energy technology, aeronautics and transportation, and natural resources and the environment. A.W.H.

N80-15995# California Univ., Livermore. Lawrence Livermore Lab.
ENERGY STORAGE SYSTEM FOR AUTOMOBILE PROPULSION, 1978 STUDY. 2: DETAILED REPORT
E. Behrin, C. J. Anderson, H. Bomelburg, M. Farahat, H. C. Forsberg, C. L. Hudson, B. C. Kullman, L. G. OConnell, G. Strickland, and W. J. Walsh 15 Dec. 1978 294 p refs
(Contract W-7405-eng-48)
(UCRL-52553-Vol-2) Avail: NTIS HC A13/MF A01

The results for FY 1978 of a national, multilaboratory study of energy storage propulsion systems for automobiles are presented including an evaluation of how changing the relationship between specific peak power and specific energy affects electric vehicle performance. Also included are an update of previous results based on new information obtained from ongoing research and development programs, as well as the results of a national energy impact and market penetration analysis of representative future energy storage vehicles. DOE

N80-16004# National Bureau of Standards, Washington, D.C. National Engineering Lab.
INTERNATIONAL ACTIVITIES: THE FISCAL YEAR 1978 SURVEY OF INTERNATIONAL PROGRAMS AT NEL
Samuel Kramer and Michael Olmert Aug. 1979 122 p
(PB-300491/8; NBSIR-79-1792) Avail: NTIS HC A06/MF A01 CSCL 05A

An international survey of engineering research activities is presented. Production engineering, communications, electron devices, fiber optics, ergonomics, housing and construction, fire safety engineering, materials engineering, cryogenics, alternative energy sources, electron microscopy, and superconductors are included. M.G.

N80-16022# National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT Quarterly Report, 1 Apr. - 30 Jun. 1979

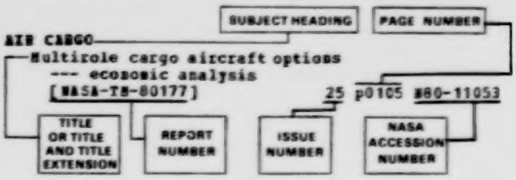
30 Jun. 1979 103 p
(AD-A074885; DME/NAE-1979-2) Avail: NTIS
HC A06/MF A01 CSCL 01/3

Progress in research applicable to aeronautics is summarized. Specific attention is given to the development of a minicomputer based controller designed for gas pipeline station control. The role of computer models and simulation techniques is emphasized. A railway switch car designed to operate in snow and ice is also described. Design modifications recommended to improve the mechanical performance and endurance of the switch are included. J.M.S.

SUBJECT INDEX

ENERGY/ *A Continuing Bibliography (Issue 25)* APRIL 1980

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title or title and title extension provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The issue page and accession numbers are located beneath and to the right of the title e.g., **25 p0105 N80-11053**. Under any subject heading the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABLATION
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218

ABSORBENTS
Hydrogen storage by use of cryoadsorbents in comparison to alternatives
25 p0042 A80-15992

ABSORBERS (EQUIPMENT)
Evlaution of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
[BNL-26218] 25 p0162 N80-14552

ABSORBERS (MATERIALS)
Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125
Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1] 25 p0101 N80-10652

ABSORPTANCE
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980

ABSORPTION
The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825

ABSORPTION SPECTRA
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781

ABSORPTIVITY
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[SLM-2625-OP] 25 p0160 N80-14540

ACCELERATED LIFE TESTS
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483

ACCUMULATORS
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147

ACIDS
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146

ACOUSTIC PROPAGATION
A pistonless Stirling engine - The traveling wave heat engine
25 p0031 A80-13011

ADHESIVE BONDING
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839

ADIABATIC FLOW
Performance limits for liquid-metal heat pipes containing long adiabatic sections
[LA-UR-79-1241] 25 p0095 N80-10472

ADMIXTURES
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

ADSORPTION
Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454
Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386
Hot gas cleanup
[ICTIS/TR-03] 25 p0117 N80-11647

AERIAL RECONNAISSANCE
Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning
25 p0084 A80-20242

AERODYNAMIC DRAG
Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948
Energy conservation - Aerodynamic drag reduction of intercity buses
25 p0050 A80-17227

AERODYNAMIC STABILITY
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

AEROELASTICITY
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

AERONAUTICAL ENGINEERING
Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment --- design of a gas pipeline station control system and a railway switch car
[AD-A074885] 25 p0182 N80-16022

AEROSOLS
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

AEROSPACE ENGINEERING
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

AEROSPACE ENVIRONMENTS
Space light - Space industrial enhancement of the solar option
25 p0073 A80-18797

AEROSPACE SCIENCES
Toward the endless frontier: History of the Committee on Science and Technology 1959 - 1979
[GPO-35-120] 25 p0181 N80-15994

AEROSPACE SYSTEMS
Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings
25 p0037 A80-14701
Space applications of superconductivity - High field magnets
25 p0084 A80-20128

AEROSPACE TECHNOLOGY TRANSFER
Modified aerospace reliability and quality assurance method for wind turbines
[NASA-TM-79284] 25 p0137 N80-13490

AGING (METALLURGY)
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527

AGRICULTURE
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398

AIR
An indirect ammonia-air fuel system
25 p0013 A80-11868

AIR CARGO
Multirole cargo aircraft options and configurations --- economic analysis
[NASA-TM-80177] 25 p0105 N80-11053

AIR CONDITIONING
Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631
An evaluation of thermal energy storage for residential air conditioning applications
[ASME PAPER 79-WA/HT-31] 25 p0071 A80-18631
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
MSFC solar heating and cooling high speed performance (Hisper) code validation
[NASA-CR-161323] 25 p0096 N80-10604
Performance monitoring of an off-peak heating and cooling system utilizing thermal storage and solar augmented heat pump
[EPRI-ER-845] 25 p0102 N80-10662

AIR CONDITIONING EQUIPMENT
Design of 1-ton solar operated LiBr-water air-conditioning system with special reference to solar part
25 p0025 A80-12759

AIR FLOW
Energy meter for solar air systems
25 p0022 A80-12609
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705

AIR POLLUTION
Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal
25 p0007 A80-11448
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128
Vehicle emissions control and its effect on engine development
25 p0037 A80-14708
Hydrogen - The Denver story
25 p0038 A80-14709
Automobile transportation and the environment
25 p0072 A80-18734
Pollution aspects of oilfired and coalfired boilers
25 p0074 A80-18849
First experiences with the use of impactors in large power plants
25 p0074 A80-18859
Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites
25 p0074 A80-18861
Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883
Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants
25 p0089 A80-21010
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
Combustion of low grade coal
[ICTIS/TR-02] 25 p0106 N80-11179
Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180
Technical assessment of thermal DeNOx process --- for coal fired boilers
[PB-297947/4] 25 p0117 N80-11656
Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294
Sulfur fixation during coal gasification --- desulfurizing to reduce air pollution
[PB-301104/6] 25 p0169 N80-15296
Effects of inspection and maintenance programs on fuel economy
[PB-297583/7] 25 p0170 N80-15420
Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979 --- electric power plants
[PB-299399/6] 25 p0179 N80-15682
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691
Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle
[PB-299928/2] 25 p0180 N80-15699
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

AIR QUALITY
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723
Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626

AIR SAMPLING
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992

AIR TRAFFIC CONTROL
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment --- flight tests of an algorithm to minimize fuel consumption of aircraft based on flight time
[NASA-TM-80194] 25 p0150 N80-14114

AIR TRANSPORTATION
- The role of technology as air transportation faces the fuel situation 25 p0037 A80-14700

AIRCRAFT CONFIGURATIONS
- Multirole cargo aircraft options and configurations --- economic analysis [NASA-TM-80177] 25 p0105 N80-11053

AIRCRAFT ENGINES
- Preparing aircraft propulsion for a new era in energy and the environment 25 p0053 A80-17737
- Thermal barrier coatings for aircraft gas turbines [AIAA PAPER 80-0302] 25 p0064 A80-18303
- Aircraft Energy Efficiency (ACEE) status report 25 p0091 N80-10206

AIRCRAFT FUELS
- An engine fuel chemistry solution to the problem of jet fuel supplies 25 p0001 A80-10199
- The role of technology as air transportation faces the fuel situation 25 p0037 A80-14700
- Alternative jet aircraft fuels 25 p0091 N80-10209
- Hydrogen as a fuel. Citations from the international aerospace abstracts data base [NTIS/PS-79/0771/0] 25 p0094 N80-10397
- Aircraft fuel. Citations from the International Aerospace Abstracts Data Base [NTIS/PS-79/0764/5] 25 p0102 N80-10668
- Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment --- flight tests of an algorithm to minimize fuel consumption of aircraft based on flight time [NASA-TM-80194] 25 p0150 N80-14114

ALABAMA
- Development of mining guidance and control systems [NASA-TM-78226] 25 p0137 N80-13601

ALASKA
- Summary of major energy legislation of the 95th Congress [DOE/TIC-10118] 25 p0100 N80-10644

ALCOHOLS
- Status of alcohol fuels utilization technology for stationary gas turbines [HCP/M2098-03] 25 p0135 N80-13283

ALGAE
- The turnover times and pool sizes of photosynthetic hydrogen production by green algae 25 p0029 A80-12819
- Biological transformation of light energy into methane using an anaerobic filter 25 p0133 N80-13267

ALGORITHMS
- Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment --- flight tests of an algorithm to minimize fuel consumption of aircraft based on flight time [NASA-TM-80194] 25 p0150 N80-14114
- Insolation models, data and algorithms [SERI/TR-36-110] 25 p0165 N80-14617

ALKALINE BATTERIES
- Cadmium electrodes with improved surface characteristics for alkaline storage batteries 25 p0009 A80-11838
- Improvement of the high-rate discharge behaviour of the nickel electrode 25 p0010 A80-11841
- High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid 25 p0010 A80-11842
- The conversion of ethylene glycol with air in alkaline fuel cells 25 p0011 A80-11850

ALKYL COMPOUNDS
- Tertiary oil recovery processes research at the University of Texas [BETC-0001-1] 25 p0108 N80-11544

ALLOYS
- The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion 25 p0046 A80-16786

ALTERNATING CURRENT
- Semiconductor alternating-current motor drives and energy conservation 25 p0034 A80-13861

ALUMINATES
- Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4 25 p0081 A80-19660

ALUMINUM
- Neutral electrolyte aluminium-air battery 25 p0011 A80-11849
- Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications 25 p0012 A80-11854
- Performance studies on uniform illumination type nontracking concentrators 25 p0026 A80-12766
- Solar absorption spectra of PbS-Al and PbSe-Al systems 25 p0027 A80-12781
- Cooling aluminum molds using heat pipes [BDX-613-2039-REV] 25 p0108 N80-11384
- Study of corrosion and its control in aluminum solar collectors [COO-2934-7] 25 p0129 N80-12609
- Development of Li-Al/FeS cells with LiCl-rich electrolyte [CONF-7810135-2] 25 p0176 N80-15614

ALUMINUM COATINGS
- Solar concentrators using vacuum-contoured surfaces for tracking [AIAA PAPER 80-0399] 25 p0077 A80-19326

ALUMINUM GALLIUM ARSENIDES
- Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region 25 p0044 A80-16626
- A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures 25 p0046 A80-16794
- AlGaAs tunnel diode 25 p0046 A80-16799
- Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells 25 p0086 A80-20716

AMMONIA
- An indirect ammonia-air fuel system 25 p0013 A80-11868

AMORPHOUS SEMICONDUCTORS
- Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion 25 p0087 A80-20722

ANAEROBES
- Microbial hydrogen production from replenishable resources 25 p0032 A80-13197
- Methane fermentation of aquatic biomass 25 p0043 A80-16148
- The microbial production of methane from household wastes - Fixed-bed anaerobic digestion 25 p0074 A80-18870
- Biological transformation of light energy into methane using an anaerobic filter 25 p0133 N80-13267

ANNEALING
- Annealing and degradation studies of ceramic CdS solar cells 25 p0026 A80-12771

ANNUAL VARIATIONS
- A seasonally adjusted concentrating collector made of mirror strips 25 p0024 A80-12750
- A method of estimating monthly average solar radiation on shaded receivers 25 p0060 A80-18123
- Climatic variability, marine resources and offshore development 25 p0131 N80-12689

ANTENNA DESIGN
- Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency 25 p0079 A80-19608
- Minimum cost transmitter-receiver antenna pairs --- antenna design for the satellite solar power station using optimal control theory [RM-690] 25 p0094 N80-10414

ANTIREFLECTION COATINGS
Some experimental studies on the technical developments of low cost silicon solar cells
25 p0028 A80-12789
The effect of fluorescent wavelength shifting on solar cell spectral response
25 p0086 A80-20715
Spectrally selective surfaces with coatings comprised of ultrafine metal particles --- solar collectors
[AED-CONF-78-212-004] 25 p0115 N80-11620
Thermal degradation of a black chrome solar selective absorber coating: Short term
[LBL-8957] 25 p0161 N80-14549
APPALACHIAN MOUNTAINS (NORTH AMERICA)
Devonian paleocurrents of the Applachian basin --- gas production
[METC/CR-79/22] 25 p0149 N80-13735
APPROPRIATIONS
NASA authorization for fiscal year 1980. Part 4: Index
[GPO-51-336] 25 p0104 N80-10964
APPROXIMATION
Truncation of nonimaging cusp concentrators --- solar collector geometry
25 p0029 A80-12824
AQUICULTURE
Methane fermentation of aquatic biomass
25 p0043 A80-16148
Fuels from marine biomass
25 p0045 A80-16656
Chemosynthetic production of biomass - An idea from a recent oceanographic discovery
25 p0045 A80-16657
AQUIFERS
A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560
Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386
Design optimization of aquifer reservoir-based compressed air storage systems
[CONF-781046-5] 25 p0116 N80-11628
Geopressure energy resource evaluation --- Texas and Louisiana
[ORNL/PPA-79/2] 25 p0138 N80-13605
Large-scale annual-cycle thermal energy storage in aquifers
[CONF-790515-3] 25 p0145 N80-13686
Proceedings of the Thermal Energy Storage in Aquifers Workshop
[LBL-8431] 25 p0160 N80-14533
Aquifer thermal energy storage
[LBL-7070] 25 p0176 N80-15618
ARCHITECTURE
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
Colloquium on the Microclimatic Environment and Habitat, Reims, France, May 21-23, 1979, Proceedings
25 p0041 A80-15968
Architectural concerns in solar system design and installation
[SOLAR/0801-79-01] 25 p0125 N80-12607
Commercializing solar architecture
[SERI/TP-62-113] 25 p0161 N80-14548
ARGON
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546
ARIZONA
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
ARMATURES
Effects of metallurgical microstructure of armatures on compressed magnetic field generators
[SAND-79-0890C] 25 p0137 N80-13375
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627
ARRAYS
Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model
[DM-26] 25 p0116 N80-11631
ASHES
Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash
25 p0053 A80-17710
ASTRIONICS
Space applications of superconductivity - High field magnets
25 p0084 A80-20128
ATLANTIC OCEAN
Geothermal resources of the Atlantic Coastal Plain
25 p0016 A80-11977
ATMOSPHERIC CIRCULATION
Modified power law equations for vertical wind profiles
[NASA-TM-79275] 25 p0138 N80-13623
ATMOSPHERIC COMPOSITION
Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash
25 p0053 A80-17710
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639
Global ecology and man
25 p0131 N80-12668
ATMOSPHERIC DIFFUSION
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
ATMOSPHERIC ENERGY SOURCES
Electricity generation from jet-stream winds
25 p0007 A80-11644
ATMOSPHERIC MODELS
The assessment of actual wind power availability in Ireland
25 p0003 A80-10844
Wind resource analysis
[SERI/TR-36-088] 25 p0132 N80-12710
ATOM CONCENTRATION
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728
ATOMIC COLLISIONS
Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas
25 p0007 A80-11612
ATTENUATION COEFFICIENTS
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600
ATTITUDE (INCLINATION)
Lateral and tilt whirl modes of flexibly mounted flywheel systems --- for energy storage
[SAND-78-7070] 25 p0115 N80-11622
AUTOMATIC CONTROL
A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volumes 1, 2, 3 & 4
25 p0038 A80-14794
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474
AUTOMATIC FREQUENCY CONTROL
Area load-frequency control --- software package for electric power system operation
25 p0022 A80-12735
AUTOMATIC GAIN CONTROL
Area load-frequency control --- software package for electric power system operation
25 p0022 A80-12735
AUTOMOBILE ENGINES
Vehicle emissions control and its effect on engine development
25 p0037 A80-14708
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Assessment of the state of technology of automotive Stirling engines
[NASA-CR-159631] 25 p0150 N80-13989
Effects of inspection and maintenance programs on fuel economy
[PB-297583/7] 25 p0170 N80-15420
AUTOMOBILE FUELS
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019

Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
Hydrogen as a fuel. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0771/0] 25 p0094 N80-10397
Environmental aspects of alternative fuels utilization for highway vehicles
[UCRL-81841] 25 p0120 N80-12201
Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274
The 50,000 mile methanol/gasoline blend fleet study --- fuel efficiency and exhaust emissions
[CONF-790520-6] 25 p0134 N80-13275
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-46] 25 p0134 N80-13280
Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0136 N80-13297
Project planning document: Highway vehicle Alternative Fuels Utilization Program (AFUP)
[DOE/CS-0093] 25 p0168 N80-15279
Ethanol/gasoline blends as automotive fuels
[CONF-790520-5] 25 p0168 N80-15280

AUTOMOBILES
Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324
New technology and vehicle operation on roadways
25 p0037 A80-14702
The promise and puzzle of electric vehicles
25 p0039 A80-15175
Energy conservation - Aerodynamic drag reduction of intercity buses
25 p0050 A80-17227
Automobile transportation and the environment
25 p0072 A80-18734
Ranking tires using a transient speed-time cycle
[PB-297756/9] 25 p0108 N80-11487
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
Demand for special performance vehicles, 1975 - 2025
[UCRL-13911] 25 p0133 N80-12960
Impact of flywheel-transmissions on automobile performance: A logical basis for evaluation
[UCRL-52758] 25 p0137 N80-13480
Ambient temperature, fuel economy, emissions, and trip length
[PB-298847/5] 25 p0166 N80-14976

AUXILIARY POWER SOURCES
Photovoltaic solar cell array used for supplemental power generation
25 p0061 A80-18129

AVAILABILITY
Materials resource requirements and potential limitations in solar energy products
25 p0018 A80-11990

AXIAL FLOW TURBINES
Preliminary design of axial flow hydrocarbon turbine/generator set for geothermal applications
[EPRI-ER-513] 25 p0160 N80-14536

AXISYMMETRIC FLOW
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

B

BACTERIA
Chemosynthetic production of biomass - An idea from a recent oceanographic discovery
25 p0045 A80-16657

BAND STRUCTURE OF SOLIDS
Analysis and evaluation of isotype heterojunction solar cells
25 p0087 A80-20734

BARRIER LAYERS
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785

BASE FLOW
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

BEDS (PROCESS ENGINEERING)
The challenge of efficiently retorting very nonuniform beds of oil shale rubble
25 p0085 A80-20453
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
Preparation of a coal conversion systems technical data book, project 61003
[FE-2286-32] 25 p0134 N80-13281
Coal conversion in flash hydropyrolysis reactors
[BNL-26209] 25 p0136 N80-13294
Cost analysis of packed beds for thermal energy storage
[CAES-11] 25 p0145 N80-13687
Development of the steam-iron process for hydrogen production, 9010
[FE-2435-32] 25 p0150 N80-14258

BENEFICIATION
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691

BERYLLIUM
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662

BIBLIOGRAPHIES
Hydrogen as a fuel. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0771/0] 25 p0094 N80-10397
Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401
Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0772/8] 25 p0094 N80-10402
Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0765/2] 25 p0102 N80-10667
Aircraft fuel. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0764/5] 25 p0102 N80-10668
Microwave heating: Industrial applications. Citations from the engineering data base
[NTIS/PS-79/0632/4] 25 p0102 N80-10674
Lead batteries, volume 2. Citations from the engineering index data base
[NTIS/PS-77/0634] 25 p0103 N80-10681
National environmental/energy workforce assessment, phase 3. Air programs --- bibliography
[PB-298580/2] 25 p0117 N80-11670
Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680
Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0814/8] 25 p0148 N80-13715
Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716
Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0816/3] 25 p0148 N80-13717
Geothermal energy, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0818/9] 25 p0148 N80-13718
Geothermal energy. Part 3: Technology and general studies, volume 4. Citations from the NTIS data base
[NTIS/PS-79/0817/1] 25 p0148 N80-13719
Geothermal energy, volume 4. Citations from the Engineering Index data base
[NTIS/PS-79/0819/7] 25 p0148 N80-13720

BINARY FLUIDS
Analysis of binary thermodynamic cycles for a moderately low-temperature geothermal resource
[TREE-1365] 25 p0139 N80-13627

BIOCHEMISTRY
Fusarium species: Their potential for transforming biomass to ethanol
[ANL/EES/TM-38] 25 p0151 N80-14271

BIOCLIMATOLOGY
Global ecology and man
25 p0131 N80-12668

BIODEGRADATION
Fusarium species: Their potential for
transforming biomass to ethanol
[ANL/EES/TM-38] 25 p0151 N80-14271
BIOLOGICAL EFFECTS
Combined effects of polycyclic aromatic
hydrocarbons and sunlight --- on Chinese hamster
V79 cells
[CONF-790447-4] 25 p0131 N80-12631
BIOMASS
Biomass-based alcohol fuels: The near-term
potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393
Energy and economic assessment of anaerobic
digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398
Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400
Pilot plant gasification test on biomass fuels
[PB-299077/8] 25 p0151 N80-14272
Research and evaluation of biomass
resources/conversion/utilization systems
(market/experimental analysis for development of
a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576
BIOMASS ENERGY PRODUCTION
Pelletized wood /Woodex/ - Applications and
potential --- from biomass waste products
25 p0017 A80-11981
Supply, harvesting and nature of forest biomass as
a fuel
25 p0017 A80-11982
Energy plantation for coromandel littoral ---
growing plant materials for fuel value in India
25 p0023 A80-12742
Microbial hydrogen production from replenishable
resources
25 p0032 A80-13197
Gasohol - Does it or doesn't it produce positive
net energy
25 p0034 A80-13863
Methane fermentation of aquatic biomass
25 p0043 A80-16148
Fuels from marine biomass
25 p0045 A80-16656
Chemosynthetic production of biomass - An idea
from a recent oceanographic discovery
25 p0045 A80-16657
Efficiency improvements in bioenergy conversion
systems
25 p0047 A80-16995
Global options for short-range alternative energy
strategies
25 p0048 A80-17129
Global aspects of sunlight as a major energy source
25 p0048 A80-17131
Ethyl alcohol production and use as a motor fuel
--- Book
25 p0050 A80-17241
Biological and biochemical hydrogen production
25 p0053 A80-17581
Net energy analysis of alcohol production from
sugarcane
25 p0062 A80-18165
The microbial production of methane from household
wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870
Biomass energy enhancement: A report to the
President's Council on Environmental Quality ---
solar heat gasification
[PB-296624/0] 25 p0094 N80-10396
Biofuels: A survey
[EPRI-ER-746-SR] 25 p0107 N80-11250
Increased energy from biomass: 1985 possibilities
and problem. Working papers for planners
[BLO-788-5] 25 p0112 N80-11589
Research overview of biological and chemical
conversion methods and identification of key
research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
Cost analysis of aquatic biomass systems
[HCP/ET/4000-78/1] 25 p0120 N80-12202
Environmental analysis of synthetic liquid fuels
--- shale oil, coal liquefaction, and biomass
production of ethanol
[DOE/EV-0044] 25 p0134 N80-13279
Rough cost estimates of solar thermal/coal or
biomass-derived fuels
[SERI/TP-35-279] 25 p0151 N80-14269
Fusarium species: Their potential for
transforming biomass to ethanol
[ANL/EES/TM-38] 25 p0151 N80-14271
Mission analysis for the Federal fuels from
biomass program. Volume 3: Feedstock
availability
[SAN-0115-T1] 25 p0168 N80-15276
Production of sugarcane and tropical grasses as a
renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277
Conversion of cellulosic and waste polymer
material to gasoline
[COO-2982-38] 25 p0169 N80-15291
Investigation of the viability and cost
effectiveness of solid fuel gasifiers close
coupled to internal combustion engines for 200
kWe power generation
[DOE/RL-90476-13] 25 p0169 N80-15293
Economic analysis of small scale bioconversion
units in New Mexico
[PB-301390/1] 25 p0169 N80-15298
Research and evaluation of biomass
resources/conversion/utilization systems
(market/experimental analysis for development of
a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576
BIOSPHERE
Global ecology and man
25 p0131 N80-12668
BISMUTH COMPOUNDS
Process design of the LASL bismuth sulfate
thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605
BISMUTH OXIDES
Lead oxides-lithium cells
25 p0012 A80-11859
BLANKETS (FUSION REACTORS)
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877
Concept of tokamak-type reactor with
high-temperature blanket
25 p0059 A80-17885
Neutronics in the toroidal belt-geometry of a
screw pinch reactor
25 p0081 A80-19657
Blanket and power conversion system of NUWMAK ---
tokamak reactor
25 p0081 A80-19658
Diffusion of tritium in neutron-irradiated
microcrystalline Beta-LiSAlO4
25 p0081 A80-19660
Experimental studies of neutron multiplication
from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662
Some implications of a cellular structure in
minimum thickness fusion reactor blankets
25 p0081 A80-19663
Possible improvements to a basic cellular thin
blanket fusion reactor configuration
25 p0081 A80-19664
Two-dimensional heating analysis of fusion
blankets for synfuel production
25 p0082 A80-19665
One- and two-dimensional heating analyses of
fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922
LASL thermochemical hydrogen program status on
October 31, 1978 --- fusion-synfuel
[LA-UR-78-2895] 25 p0120 N80-12197
BOILERS
Combustion of anthracite culm in a fluidized bed
boiler
25 p0014 A80-11959
SRC solids - Boiler fuel and building block ---
Solvent Refined Coal
25 p0015 A80-11967
SRC solids - A preferred compliance boiler fuel
--- Solvent Refined Coal
25 p0015 A80-11968
Calculation of steam generation with parabolic
solar collectors
25 p0039 A80-15328
Superheated steam generation in a Fresnel lens
concentrating collector
[ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567
The thermal design and analysis of an integrated
sodium boiler/receiver for solar energy conversion
[ASME PAPER 79-WA/SOL-10] 25 p0067 A80-18569

Pollution aspects of oilfired and coalfired boilers
25 p0074 A80-18849

Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883

MDAC/Rocketdyne solar receiver: Design review
[SAND-78-8188] 25 p0097 N80-10616

Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656

Technical assessment of thermal DeNOx process --- for coal fired boilers
[PB-297947/4] 25 p0117 N80-11656

Solar-powered steam generator heliostat
[BNL-50974] 25 p0125 N80-12610

Interim structural design standard for solar energy applications, phases 1 and 2 --- boiler and pressure vessel code
[SAND-79-8183] 25 p0146 N80-13698

Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590

Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591

Characterization of operating conditions for gas/water heat recovery steam generators
[ORNL/TM-6622] 25 p0176 N80-15620

BORING MACHINES

Borehole geological assessment
[NASA-CASE-NPO-14231-1] 25 p0104 N80-10709

BOUNDARY LAYER PLASMAS

MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004

Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877

Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353

Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355

BOUNDARY VALUE PROBLEMS

Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307

BRAKES (FOR ARRESTING MOTION)

Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004

BRAYTON CYCLE

Performance characteristics of point-focusing distributed-receiver solar Brayton systems
[AIAA PAPER 80-0293] 25 p0063 A80-18298

Conceptual designs for two reject heat systems for a Brayton closed-cycle converter
[LA-7821-MS] 25 p0144 N80-13677

Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694

BREEDER REACTORS

Blanket and power conversion system of NUWMAK --- tokamak reactor
25 p0081 A80-19658

Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662

Some implications of a cellular structure in minimum thickness fusion reactor blankets
25 p0081 A80-19663

Possible improvements to a basic cellular thin blanket fusion reactor configuration
25 p0081 A80-19664

Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602

Outlook for nuclear fission energy
[CONF-7811126-1] 25 p0157 N80-14509

BREMSSTRAHLUNG

Hard X-ray measurements --- performed on plasma confinement devices
25 p0045 A80-16722

Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875

BRINES

On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567

Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716

Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541

BROADBAND

Theoretical analysis of multi-cell, high efficiency broad spectral sensitivity solar cells
25 p0138 N80-13617

BROMINE

Zinc-bromine battery studies
25 p0010 A80-11845

Recent advances in zinc-bromine batteries
25 p0010 A80-11846

A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327

BUILDINGS

An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559

Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680

BURNERS

Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner
[FE-2489-33] 25 p0093 N80-10390

BUTANES

Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935

Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286

C

CADMIUM

Cadmium electrodes with improved surface characteristics for alkaline storage batteries
25 p0009 A80-11838

CADMIUM SULFIDES

Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771

Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775

Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788

Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204

Measurement of insolation using CdS photoresistor
25 p0047 A80-16998

CADMIUM TELLURIDES

Cadmium telluride solar cells
25 p0026 A80-12765

CALCIUM

Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854

CALCIUM CHLORIDES

An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting
25 p0029 A80-12823

CALCIUM COMPOUNDS
Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride [AD-A071157] 25 p0139 N80-13625

CALIFORNIA
Energy transition in California [UCRL-15003] 25 p0097 N80-10619
Residential on site solar heating systems. A project evaluation using the capital asset pricing model [LBL-8298] 25 p0126 N80-12588
Analysis of the California solar resource, volume 2 [LBL-7860-VOL-2] 25 p0127 N80-12589
Environmental aspects of alternative energy technologies for California [UCRL-15002] 25 p0131 N80-12628
Energy system in the Far West: Impacts of the National Energy Act of 1978 [UCRL-52754] 25 p0140 N80-13638
Meteorological effects of oil refinery operations in Los Angeles [PB-300720/0] 25 p0180 N80-15758

CAMEROON
Solar energy commercialization for African countries [HCP/CS-2522] 25 p0127 N80-12591

CANADA
Calculation of monthly mean solar radiation for horizontal and inclined surfaces 25 p0028 A80-12817
Geology of the Athabasca oil sands 25 p0050 A80-17236

CAPACITANCE SWITCHES
Improving the reliability of capacitance batteries in power grids with higher-harmonic sources 25 p0008 A80-11671

CARBOHYDRATES
Microbial hydrogen production from replenishable resources 25 p0032 A80-13197

CARBON
Current collectors for sodium-sulphur batteries 25 p0013 A80-11867
Hydrogen evolution from water using solid carbon and light energy 25 p0032 A80-13109
A single coal particle gasification model 25 p0088 A80-20884

CARBON DIOXIDE
The photo-electrochemical production of C-C bonds from carbon dioxide 25 p0004 A80-10848
The turnover times and pool sizes of photosynthetic hydrogen production by green algae 25 p0029 A80-12819
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles 25 p0083 A80-19716
Oil recovery by carbon dioxide injection --- West Virginia [ORC-5301-34] 25 p0108 N80-11545
Environmental control technology for carbon dioxide [BNL-24999] 25 p0117 N80-11639
Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery [FE-2025-38] 25 p0130 N80-12624

CARBON DIOXIDE LASERS
CO_2 electric discharge lasers - Present status and future applications 25 p0039 A80-14960
Evidence of nonlinear processes from X-ray spectra of CO_2 laser-irradiated targets 25 p0046 A80-16776
Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory 25 p0056 A80-17862
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions 25 p0058 A80-17875
A cesium TELEC experiment at Lewis Research Center [NASA-CR-159729] 25 p0151 N80-14386

CARBONACEOUS MATERIALS
Environmental protection in the processing of coal - The utilization or disposal of coal processing residues 25 p0030 A80-12942
Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes [FE-2247-2] 25 p0119 N80-12191

CARBONATES
The performance of molten-carbonate fuel cells 25 p0011 A80-11851
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes 25 p0012 A80-11857
Commercial applications of molten carbonate fuel cell systems 25 p0016 A80-11974
A performance and current distribution model for scaled-up molten carbonate fuel cells 25 p0062 A80-18213
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell [CONF-781063-2] 25 p0115 N80-11615
Commercial application of molten carbonate fuel cell system [CONF-790213-4] 25 p0123 N80-12557
Prediction of current distribution in a molten carbonate fuel cell [CONF-781063-1] 25 p0175 N80-15613

CARGO AIRCRAFT
Multirole cargo aircraft options and configurations --- economic analysis [NASA-TM-80177] 25 p0105 N80-11053

CARIBBEAN SEA
OTEC thermal resource report for Caribbean Sea Plant Ship 13-15 degrees N 75-80 degrees W [HCP/T2898] 25 p0113 N80-11599

CARRIER INJECTION
A 30-ps Josephson current injection logic /CIL/ 25 p0030 A80-12853

CARRIER MOBILITY
Measurements of minority-carrier diffusion length in heterojunction solar cells 25 p0086 A80-20717

CASCADE RANGE (CA-OR-WA)
Geothermal energy development from the Salton Trough to the High Cascades --- Cerro Preto, Lower California and Mt. Hood, Oregon [LBL-8703] 25 p0171 N80-15568

CATALOGS (PUBLICATIONS)
A manual for cataloging and indexing documents --- geothermal energy data base [LBL-4432-REV-1] 25 p0118 N80-11946

CATALYSIS
Catalysis of hydrogen transfer in a tetralin-coal system 25 p0019 A80-12246
Photoelectrochemistry and heterogeneous photocatalysis at semiconductors 25 p0073 A80-18750
Start up system for hydrogen generator used with an internal combustion engine [NASA-CASE-NPO-13849-1] 25 p0092 N80-10374

CATALYSTS
An update of German non-isothermal coal pyrolysis work 25 p0019 A80-12245
Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So_2-I_2 system for H_2O decomposition 25 p0032 A80-13196
Gas generator research and development: BI-GAS process [FE-1207-62] 25 p0135 N80-13288
Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle [PB-299928/2] 25 p0180 N80-15699

CATALYTIC ACTIVITY
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis 25 p0019 A80-12244
Catalyst development for coal liquefaction [EPRI-AP-1084] 25 p0136 N80-13292

CELL CATHODES
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856
Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858

CELLS (BIOLOGY)
Combined effects of polycyclic aromatic hydrocarbons and sunlight --- on Chinese hamster V79 cells
[CONF-790447-4] 25 p0131 N80-12631

CENTRAL ATLANTIC REGION (US)
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978
National Energy Act of 1978: A regional assessment
[PB-296479/9] 25 p0130 N80-12615

CERAMIC COATINGS
Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303

CERAMIC NUCLEAR FUELS
General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608

CERAMICS
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861
Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694

CHANNEL FLOW
Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516
High interaction subsonic MHD channel operation
[AIAA PAPER 80-0022] 25 p0062 A80-18242
Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353
Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354
Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355
Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304
Power take-off analysis for diagonally connected MHD channels
[AIAA PAPER 80-0253] 25 p0077 A80-19309

CHEMICAL ANALYSIS
Proceedings of the 1978 Coal Chemistry Workshop
[CONF-780372] 25 p0150 N80-14264

CHEMICAL ATTACK
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

CHEMICAL BONDS
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168

CHEMICAL ENERGY
Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756
Study of photochemical processes in the ferrous-thionine system --- photogalvanic effect in dye redox systems for chemical energy conversion
25 p0027 A80-12783
Conversion of radiant energy into chemical energy
[UCRL-TRANS-11427] 25 p0114 N80-11609
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617

CHEMICAL ENGINEERING
Coal as a source of chemical raw materials - Prospects for chemical synthesis based on gas from coal
25 p0031 A80-12944
Thermochemical hydrogen production
25 p0052 A80-17578

CHEMICAL FRACTIONATION
Elucidation of coal structural components by short residence-time extractive liquefaction
25 p0119 N80-12188

CHEMICAL PROPERTIES
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862
The physics and chemistry of solar cells
25 p0073 A80-18751

CHEMICAL REACTIONS
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265

CHEMICAL REACTORS
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338
Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice
25 p0078 A80-19473
Laboratory coal gasifier facility
[UCRL-82602] 25 p0106 N80-11245
HYGAS process update
[CONF-781045-4] 25 p0120 N80-12200
Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272
Development of the steam-iron process for hydrogen production, 9010
[FE-2435-32] 25 p0150 N80-14258

CHEMICALS
Kentucky's coal-based chemical/energy park
25 p0013 A80-11954

CHLORINE
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632

CHLORINE COMPOUNDS
Heat generation in Li/SOCl2 cells
25 p0012 A80-11855

CHLOROBENZENES
Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash
25 p0053 A80-17710

CHLOROPHYLLS
The water splitting light reaction of chlorophyll a dihydrate. Visible light solar energy conversion after the primary reaction in plant photosynthesis
25 p0133 N80-13188

CHLOROPLASTS
Petroleum plantations and synthetic chloroplasts
25 p0049 A80-17137

CHROMATES
Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854

CHROMIUM
The scope of effective medium theory for fine metal particle solar absorbers
25 p0029 A80-12835
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141
Spectrally selective surfaces with coatings comprised of ultrafine metal particles --- solar collectors
[AED-CONF-78-212-004] 25 p0115 N80-11620
Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-3] 25 p0119 N80-12163
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540

Thermal degradation of a black chrome solar selective absorber coating: Short term [LBL-8857] 25 p0161 N80-14549

CIRCUITS
Computer analysis of grids currently used for CdS/Cu2S solar cells 25 p0089 A80-20893

CIRCUMSOLAR RADIATION
Circumsolar radiation data for central receiver simulation [LBL-8371] 25 p0131 N80-12647
Measurement of circumsolar radiation: Status report [LBL-8391] 25 p0133 N80-12982

CITIES
Back to the central city - Myths and realities 25 p0002 A80-10323
Baltimore applications project [NASA-TM-80577] 25 p0133 N80-12957
Barriers to the application of wind energy conversion systems in urban settings 25 p0155 N80-14494
Commercialization strategy report for energy from urban wastes [TID-28852-DRAFT] 25 p0158 N80-14521
Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste [CONF-790373-1] 25 p0163 N80-14562

CIVIL AVIATION
The role of technology as air transportation faces the fuel situation 25 p0037 A80-14700

CLEAN ENERGY
Rapid devolatilization and partial gasification of coal in an entrained dust reactor 25 p0002 A80-10226
Hydrogen - The fuel of the future --- Russian book 25 p0002 A80-10349
Salinity gradient power - Utilizing vapor pressure differences 25 p0003 A80-10524
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors 25 p0005 A80-11340
Pelletized wood /Woodex/ - Applications and potential --- from biomass waste products 25 p0017 A80-11981
Materials research - Probable impacts on solar energy 25 p0018 A80-11991
SSPS project - Two solar power plants in Spain 25 p0032 A80-13180
Hydrogen fuel applications for urban transit 25 p0037 A80-14703
Application of solar and fuel cell technology to industrial users 25 p0037 A80-14707
A review of the U.S. wind energy programme 25 p0042 A80-16083
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979 25 p0047 A80-17126
Ocean thermal energy conversion /OTEC/ - Social and environmental issues 25 p0049 A80-17135
The application potential of hydro power 25 p0049 A80-17136
Climatic impact of alternative energy sources 25 p0050 A80-17140
Dynamic modeling of H2S clean-up processes --- in coal gasification 25 p0088 A80-20885
Economic impacts of energy conservation and renewable energy sources [UCRL-15087] 25 p0177 N80-15633

CLIMATE
Calculation of climatic solar heating performance 25 p0029 A80-12820
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates 25 p0029 A80-12821
Energy and climate: A review with emphasis on global interactions 25 p0131 N80-12677
Climatic variability, marine resources and offshore development 25 p0131 N80-12689
Solar-climatic statistical study. Summary report, volume 1 [HCP/T4016-1] 25 p0132 N80-12707

CLIMATOLOGY
Insolation modeling overview 25 p0020 A80-12428
Climatic impact of alternative energy sources 25 p0050 A80-17140

CLOSED CYCLES
The physics of closed cycle MHD power generation 25 p0043 A80-16264
A small hybrid solar closed-cycle gas turbine cogeneration plant concept based on today's technology [ASME PAPER 79-WA/GT-3] 25 p0071 A80-18637
Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process [AED-CONF-78-155-010] 25 p0121 N80-12291
Closed-cycle hydride engines [SAND-78-2228] 25 p0125 N80-12572

COAL
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields 25 p0019 A80-12310
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal 25 p0074 A80-18833
Methane recovery from coalbeds [DOE/MC-08089-T1] 25 p0093 N80-10387
Computer software to calculate and map geologic parameters required in estimating coal production costs [EPRI-EA-674] 25 p0095 N80-10584
Automated longwall guidance and control systems, phase 1 [NASA-CR-161329] 25 p0122 N80-12538
Automated longwall guidance and control systems, phase 2, part 2: Vertical control system (VCS) [NASA-CR-161330] 25 p0122 N80-12539
Automated longwall guidance and control systems, phase 2, part 2: RCS, FAS, and MCS [NASA-CR-161331] 25 p0122 N80-12540
Methane recovery from coalbeds project. Technology test projects: Evaluation of candidate projects [METC-8089-T4] 25 p0135 N80-13290
Development of mining guidance and control systems [NASA-TM-78226] 25 p0137 N80-13601
Fossil energy program, 1. Mining research and development: Coal preparation and analysis [IS-4703] 25 p0147 N80-13702
Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments [AD-A073761] 25 p0150 N80-14259
Coal-shale interface detection system [NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
Energy from the West: Energy resource development systems report. Volume 2: Coal [PB-299178/4] 25 p0152 N80-14464
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results [PB-298473/0] 25 p0165 N80-14595
Coal sulfur measurements [PB-299575/1] 25 p0169 N80-15294
Three potential longwall mining methods for thick coal seams in the western United States [PB-299568/6] 25 p0170 N80-15544
Evaluation of the environmental effects of western surface coal mining, volume 1 [PB-300375/3] 25 p0179 N80-15681
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2 [PB-299325/1] 25 p0180 N80-15687
Management of coal preparation fine wastes without disposal ponds [PB-299100/8] 25 p0180 N80-15691

COAL GASIFICATION
Rapid devolatilization and partial gasification of coal in an entrained dust reactor 25 p0002 A80-10226
Low/medium BTU coal gasification - Perspective of the gas industry 25 p0015 A80-11969

The near term potential for gasification-combined cycle electric power generation 25 p0015 A80-11970
Coal to electricity - Integrated gasification combined cycle 25 p0015 A80-11971
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis 25 p0019 A80-12244
Coal as a source of chemical raw materials - Prospects for chemical synthesis based on gas from coal 25 p0031 A80-12944
Progress and development trends in coal gasification and liquefaction technologies 25 p0031 A80-12945
Progress and development trends in coal gasification and liquefaction technologies - New gasification methods developed on a laboratory or large scale 25 p0031 A80-12946
Progress and development trends in coal gasification and liquefaction technologies - Recent achievements in conventional coal gasification processes 25 p0031 A80-12947
Progress and development trends in coal gasification and liquefaction technologies - Underground coal gasification 25 p0031 A80-12948
Technical possibilities and economic prospects for coal refining 25 p0043 A80-16175
The present status of coal gasification following the 14th World Gas Congress Toronto 1979 25 p0050 A80-17222
Screening evaluation of electric power cycles integrated with coal gasification plants [ASME PAPER 79-WA/ENER-4] 25 p0071 A80-18644
Novel power generation cycles using coal gas [ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
Novel gas turbine cycles with coal gasification [ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646
The controlling production mechanism of methane gas from coalbeds 25 p0085 A80-20499
Computer modeling of coal gasification reactors 25 p0087 A80-20882
Fixed-bed gasifier dynamic model for IGCCP control study --- Integrated Gasification Combined Cycle Plant 25 p0088 A80-20883
A single coal particle gasification model 25 p0088 A80-20884
Dynamic modeling of H2S clean-up processes --- in coal gasification 25 p0088 A80-20885
Mathematical modeling of coal gasification processes 25 p0089 A80-20913
Coal conversion processes and analysis methodologies for synthetic fuels production --- technology assessment and economic analysis of reactor design for coal gasification [NASA-CR-161322] 25 p0092 N80-10379
Screening evaluation of novel power cycles integrated with gasification plants [EPRI-AF-1002] 25 p0096 N80-10605
Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects [CONF-780843-5] 25 p0103 N80-10693
Wastewater treatment in coal conversion [PB-297587/8] 25 p0104 N80-10700
Health and enviromental effects of coal gasification and liquefaction technologies: A workshop summary and panel reports [PB-297618/1] 25 p0104 N80-10701
Laboratory coal gasifier facility [UCRL-82602] 25 p0106 N80-11245
Economics of gasoline production from underground coal gasification via mobil-M process [CONF-790405-12] 25 p0106 N80-11246
Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels [FE-1784-42] 25 p0106 N80-11248
Assessment of long term research needs for coal-gasification technologies [PB-297853/4] 25 p0107 N80-11255
Two-dimensional transient dispersion and adsorption in porous media [UCRL-81970] 25 p0108 N80-11386
International coal technology summary document [DOE/PE-0010] 25 p0115 N80-11621
Hot gas cleanup [ICTIS/TR-03] 25 p0117 N80-11647
Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-3] 25 p0119 N80-12163
HYGAS process update [CONF-781045-4] 25 p0120 N80-12200
Environmental assessment report: Lurgi coal gasification systems for SNG [PB-298109/0] 25 p0120 N80-12204
Preparation of a coal conversion systems technical data book, project 61003 [FE-2286-32] 25 p0134 N80-13281
Gas generator research and development: BI-GAS process [FE-1207-62] 25 p0135 N80-13288
Underground coal conversion. Program description [DOE/ET-0100] 25 p0136 N80-13293
Coal conversion in flash hydropyrolysis reactors [BNL-26209] 25 p0136 N80-13294
Review of supporting research at Oak Ridge National Laboratory for underground coal conversion [CONF-790630-9] 25 p0136 N80-13295
High-BTU coal gasification processes [ANL/CES/TE-79-2] 25 p0150 N80-14263
Proceedings of the 1978 Coal Chemistry Workshop [CONF-780372] 25 p0150 N80-14264
Rough cost estimates of solar thermal/coal or biomass-derived fuels [SERI/TP-35-279] 25 p0151 N80-14269
Sulfur fixation during coal gasification --- desulfurizing to reduce air pollution [PB-301104/6] 25 p0169 N80-15296

COAL LIQUEFACTION
Coal liquefaction - An international perspective 25 p0015 A80-11964
Current German developments in coal liquefaction technology 25 p0015 A80-11965
Recent developments in coal liquefaction in the United States 25 p0015 A80-11966
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis 25 p0019 A80-12244
Catalysis of hydrogen transfer in a tetralin-coal system 25 p0019 A80-12246
Progress in R and D on coal liquefaction - Progress in research-development on coal liquefaction 25 p0030 A80-12940
Progress and development trends in coal gasification and liquefaction technologies 25 p0031 A80-12945
Progress and development trends in coal gasification and liquefaction technologies - New gasification methods developed on a laboratory or large scale 25 p0031 A80-12946
Progress and development trends in coal gasification and liquefaction technologies - Recent achievements in conventional coal gasification processes 25 p0031 A80-12947
Progress and development trends in coal gasification and liquefaction technologies - Underground coal gasification 25 p0031 A80-12948
Gasoline's alternatives are feasible 25 p0034 A80-13225
Technical possibilities and economic prospects for coal refining 25 p0043 A80-16175
Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects [CONF-780843-5] 25 p0103 N80-10693

Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-38] 25 p0106 N80-11249

International coal technology summary document
[DOE/PE-0010] 25 p0115 N80-11621

Elucidation of coal structural components by short residence-time extractive liquefaction
25 p0119 N80-12188

Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes
[FE-2247-2] 25 p0119 N80-12191

Characterization and combustion of SRC 2 fuel oil
[EPRI-FP-1028] 25 p0119 N80-12192

Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry. Mass spectrometry and fossil-energy conversion technology: A review
[FE-2537-7] 25 p0120 N80-12198

Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272

Environmental analysis of synthetic liquid fuels --- shale oil, coal liquefaction, and biomass production of ethanol
[DOE/EV-0044] 25 p0134 N80-13279

Preparation of a coal conversion systems technical data book, project 61003
[FE-2286-32] 25 p0134 N80-13281

Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285

Gasification of residual materials from coal liquefaction
[FE-2247-22] 25 p0135 N80-13289

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-30] 25 p0135 N80-13291

Catalyst development for coal liquefaction
[EPRI-AF-1084] 25 p0136 N80-13292

Coal conversion in flash hydropyrolysis reactors
[BNL-26209] 25 p0136 N80-13294

Proceedings of the 1978 Coal Chemistry Workshop
[CONF-780372] 25 p0150 N80-14264

Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288

Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676

COAL UTILIZATION

The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

Lignite fuel and power-plant availability
25 p0004 A80-10944

Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369

Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal
25 p0007 A80-11448

Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642

Kentucky's coal-based chemical/energy park
25 p0013 A80-11954

Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959

The prospect for anthracite as a national energy resource
25 p0014 A80-11960

Economics of Pullman Kellogg's magnesium promoted FGD system --- Flue Gas Desulfurization
25 p0014 A80-11961

170 MW pressurized fluidized bed combustion electric plant
25 p0014 A80-11962

Development of fluidised bed combustion in the United Kingdom
25 p0015 A80-11963

SRC solids - Boiler fuel and building block --- Solvent Refined Coal
25 p0015 A80-11967

SRC solids - A preferred compliance boiler fuel --- Solvent Refined Coal
25 p0015 A80-11968

Survey of MHD plant applications
25 p0015 A80-11972

Commercial applications of molten carbonate fuel cell systems
25 p0016 A80-11974

Economics/reliability trade-offs in materials for various coal conversion and utilization processes
25 p0016 A80-11975

An update of German non-isothermal coal pyrolysis work
25 p0019 A80-12245

The role of coal gasification and liquefaction in improving the efficiency of energy use - Comparative end use efficiency of the use of coal: Substitute natural gas and other gases versus electric power production
25 p0030 A80-12941

Environmental protection in the processing of coal - The utilization or disposal of coal processing residues
25 p0030 A80-12942

Environmental protection in the processing of coal
25 p0030 A80-12943

The European economic community's policy concerning natural gas, coal and new sources of energy
25 p0032 A80-13175

Methanol from coal - An adaption from the past
25 p0033 A80-13224

The role of coal in the world energy picture up to the year 2000 - Reserves, resources, and availability from the Western European viewpoint
25 p0040 A80-15625

Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash
25 p0053 A80-17710

Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results
[AIAA PAPER 80-0091] 25 p0063 A80-18265

The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505

Pollution aspects of oilfired and coalfired boilers
25 p0074 A80-18849

Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883

The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421

Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377

Coal conversion processes and analysis methodologies for synthetic fuels production --- technology assessment and economic analysis of reactor design for coal gasification
[NASA-CR-161322] 25 p0092 N80-10379

Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386

Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
[FE-2447-13] 25 p0093 N80-10388

Coal conversion systems: Technical data book
[HCP/T2286-01] 25 p0093 N80-10392

NASA-Lewis closed-cycle magnetohydrodynamics plant analysis
[NASA-TM-79249] 25 p0095 N80-10595

Combustion of low grade coal
[ICTIS/TR-02] 25 p0106 N80-11179

Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180

International coal technology summary document
[DOE/PE-0010] 25 p0115 N80-11621

Technical assessment of thermal DeNOx process --- for coal fired boilers
[PB-297947/4] 25 p0117 N80-11656

Commercial application of molten carbonate fuel cell system
[CONF-790213-4] 25 p0123 N80-12557
Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-46] 25 p0134 N80-13280
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287
Status of development, energy and economics aspects of alternative technologies --- energy policy and technology with respect to coal utilization
[CONF-790371-1] 25 p0145 N80-13689
Status of the DOE/NASA critical gas turbine research and technology project
[NASA-TM-79307] 25 p0155 N80-14493
Environmental options for coal use
[LA-UR-79-1393] 25 p0165 N80-14584
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591
Conversion of coal-based methanol to ethylene and a gaseous fuel
[PB-301256/4] 25 p0169 N80-15297

COASTAL PLAINS
Geothermal resources of the Atlantic Coastal Plain
25 p0016 A80-11977

COASTAL WATER
Salt power - Is Neptune's ole salt a tiger in the tank --- fresh/salt water osmotic pressure difference for electrical generation
25 p0045 A80-16654

COASTS
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643

COATINGS
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343
A simplified technique for comparing the effectiveness of collector absorber coatings
25 p0061 A80-18133

COAXIAL CABLES
Stability of a system of coaxial superconducting shells
25 p0018 A80-12027

COBALT OXIDES
Cobalt oxide as a spectrally selective material for use in solar collectors
25 p0086 A80-20719

COLLISIONLESS PLASMAS
The effect of current shear on the tearing instability
25 p0059 A80-18086

COLORADO
Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471

COLORADO RIVER (NORTH AMERICA)
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641
Solar thermal electric plants in hydroelectric grid --- Lower Colorado region
[DOE/SF/10505-1] 25 p0143 N80-13663

COMBUSTIBLE FLOW
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

COMBUSTION CHAMBERS
170 MW pressurized fluidized bed combustion electric plant
25 p0014 A80-11962
Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels
[AIAA PAPER 80-0075] 25 p0076 A80-19275
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421
Fixed-bed gasifier dynamic model for IGCCP control study --- Integrated Gasification Combined Cycle Plant
25 p0088 A80-20883

COMBUSTION CONTROL
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687

COMBUSTION EFFICIENCY
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074
Near term potential of wood as a fuel
[HCP/C4101] 25 p0093 N80-10389
Development of gas turbine fuels and combustion; An overview
[CONF-790337-4] 25 p0093 N80-10391
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[NASA-TM-79308] 25 p0132 N80-12881

COMBUSTION PHYSICS
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311
A single coal particle gasification model
25 p0088 A80-20884

COMBUSTION PRODUCTS
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544
Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642
Source, supply and nature of municipal and industrial waste as a fuel
25 p0017 A80-11983
Pollution aspects of oilfired and coalfired boilers
25 p0074 A80-18849
Effect of off-design operation of MHD generators on NO/x/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310
Fixed-bed gasifier dynamic model for IGCCP control study --- Integrated Gasification Combined Cycle Plant
25 p0088 A80-20883
Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386
Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180
Characterization and combustion of SRC 2 fuel oil
[EPRI-FP-1028] 25 p0119 N80-12192
Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277

COMMAND AND CONTROL
Color graphic controls for the solar central receiver test facility
25 p0022 A80-12626

COMMERCE
Shale oil: US and world resources and prospects for near-term commercialization in the United States
[ORAU/IEA-79-8(R)] 25 p0122 N80-12544
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521
Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972
Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287

COMMERCIAL AIRCRAFT
The role of technology as air transportation faces the fuel situation
25 p0037 A80-14700
Aircraft Energy Efficiency (ACEE) status report
25 p0091 N80-10206

COMMERCIAL ENERGY
Commercial applications of molten carbonate fuel cell systems
25 p0016 A80-11974

Commercial building and industrial applications for solar energy 25 p0017 A80-11985

Materials research - Probable impacts on solar energy 25 p0018 A80-11991

Small solar thermal electric power plants with early commercial potential [ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586

Fuel choice and aggregate energy demand in the commercial sector --- electricity, natural gas, and fuel oil [ORNL/CCN-27] 25 p0126 N80-12580

Commercialization strategy report for coal liquefaction [TID-28846] 25 p0135 N80-13285

Commercial solar augmented heat pump system [EPRI-EM-1004] 25 p0160 N80-14537

COMMUNICATION EQUIPMENT

Autonomous power supplies for telecommunications 25 p0033 A80-13211

COMMUTATORS

Determination of the geometry of the transition region of a series MHD generator 25 p0030 A80-12900

COMPOSITE MATERIALS

New development and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978 25 p0040 A80-15501

Superconducting composites fabrication and properties 25 p0040 A80-15511

Critical speeds and natural frequencies of rim-type composite-material flywheels [SAND-78-7049] 25 p0176 N80-15622

COMPRESSED AIR

Design optimization of aquifer reservoir-based compressed air storage systems [CONF-781046-5] 25 p0116 N80-11628

Compressed air energy storage technology program --- concept for supplying electric power to meet peak load demands [PNL-2935] 25 p0160 N80-14534

Feasibility of compressed air energy storage as a peak shaving technique in California, Volume 2 [SAN-1331-T1] 25 p0174 N80-15596

COMPRESSED GAS

Optimization of neutron yield in conical system at explosion-induced compression 25 p0007 A80-11545

COMPRESSIVE STRENGTH

Effects of metallurgical microstructure of armatures on compressed magnetic field generators [SAND-79-0890C] 25 p0137 N80-13375

COMPUTATIONAL FLUID DYNAMICS

Computer modeling of coal gasification reactors 25 p0087 A80-20882

Fixed-bed gasifier dynamic model for IGCCP control study --- Integrated Gasification Combined Cycle Plant 25 p0088 A80-20883

COMPUTER COMPONENTS

A 30-ps Josephson current injection logic /CIL/ 25 p0030 A80-12853

COMPUTER GRAPHICS

Color graphic controls for the solar central receiver test facility 25 p0022 A80-12626

COMPUTER PROGRAMS

Materials resource requirements and potential limitations in solar energy products 25 p0018 A80-11990

Area load-frequency control --- software package for electric power system operation 25 p0022 A80-12735

Computer software to calculate and map geologic parameters required in estimating coal production costs [EPRI-EA-674] 25 p0095 N80-10584

MSFC solar heating and cooling high speed performance (Hisper) code validation [NASA-CR-161323] 25 p0096 N80-10604

SAMICS: Input data preparation --- Solar Array Manufacturing Industry Costing Standards [NASA-CR-162421] 25 p0110 N80-11570

A survey of electric and hybrid vehicle simulation programs [NASA-CR-162457] 25 p0118 N80-11954

User's manual for the magnetohydrodynamic generator channel code, MHDCHN [SAND-78-1260] 25 p0132 N80-12894

Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications [NASA-TM-78251] 25 p0156 N80-14501

Fuel utilization in residences [EPRI-EA-894] 25 p0175 N80-15604

COMPUTER SYSTEMS DESIGN

Color graphic controls for the solar central receiver test facility 25 p0022 A80-12626

An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory 25 p0022 A80-12628

The application of computers to fusion experimental facilities 25 p0080 A80-19619

COMPUTER TECHNIQUES

Interactive analysis methods for resource mapping 25 p0008 A80-11709

Economic performance - Evaluations for solar energy 25 p0014 A80-11956

Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector 25 p0022 A80-12627

COMPUTERIZED DESIGN

Computers in the design of solar energy systems 25 p0020 A80-12426

The influence of thermophysical properties on the design and sizing of geothermal power plant components [ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593

Numerical computations in the design of compact ignition experiments --- of D-T toroidal plasma heating 25 p0078 A80-19589

COMPUTERIZED SIMULATION

Computer modelling of electrically parallel arrays of sodium-sulphur cells 25 p0013 A80-11865

Validation of computer models for predicting radiation levels on tilted surfaces 25 p0020 A80-12429

Solar cooling performance predictions via stochastic weather algorithms 25 p0020 A80-12430

Validation methodology for solar heating and cooling systems 25 p0020 A80-12431

Sensitivity of direct gain space heating performance to fundamental parameter variations 25 p0060 A80-18128

Relating computer simulation studies with interface state measurements on MIS solar cells 25 p0062 A80-18231

Off-design performance analysis of MHD generator channels [AIAA PAPER 80-0176] 25 p0064 A80-18354

Computer simulation results for planar reflectors and flat plate solar collectors [ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559

The simulation of building heat transfer for passive solar systems [ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574

Evaluation of a solar heating system installed in the LSU Field House [ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576

Preliminary analysis of a total solar heating system [ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

Comparisons of measured and simulated performance for CSU Solar House I [ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590

SISYFUS - A simulation model for systematic analyses of fusion power plants 25 p0079 A80-19597

The combined d.c. power supply for JET --- Joint European Torus 25 p0080 A80-19621

Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment 25 p0087 A80-20881

Computer modeling of coal gasification reactors 25 p0087 A80-20882

An applications analysis for the solar industrial process heat market
25 p0088 A80-20888
Computer analysis of grids currently used for CdS/Cu2S solar cells
25 p0089 A80-20893
Mathematical modeling of coal gasification processes
25 p0089 A80-20913
A survey of electric and hybrid vehicle simulation programs
[NASA-CR-162457] 25 p0118 N80-11954
Dynamic energy system optimization model --- study of computerized simulation domestic energy models
[EPRI-EA-1079] 25 p0157 N80-14514
District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States --- using computerized simulation
[NMEI-10-1] 25 p0172 N80-15582
Wharton annual energy model: Development and simulation results
[EPRI-EA-1115] 25 p0175 N80-15606

CONCENTRATION
Bell Creek residual oil saturation technology test
[BETC-2180-4] 25 p0108 N80-11546

CONCENTRATION (COMPOSITION)
Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10689

CONCENTRATORS
Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype --- French thesis
25 p0001 A80-10109
Using a fin with a parabolic concentrator
25 p0004 A80-10847
Concentration ratio and efficiency in thermophotovoltaics
25 p0005 A80-11336
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749
A seasonally adjusted concentrating collector made of mirror strips
25 p0024 A80-12750
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777
Design and development of a 100 peak watt photovoltaic concentrator system
25 p0027 A80-12778
Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement
25 p0027 A80-12784
Truncation of nonimaging cusp concentrators --- solar collector geometry
25 p0029 A80-12824
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629
High temperature solar collector with optimal concentration - Non-focusing Fresnel lens with secondary concentrator
25 p0060 A80-18127
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650
Concentrating solar collector test results Collector Module Test Facility (CMTF)
[SAND-78-0977] 25 p0111 N80-11580
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688
Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473
Status of the US Department of Energy photovoltaic concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578

CONCRETES
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553
Analysis of field test results for single-axis-tracking solar collector foundations
[SAND-79-7023] 25 p0173 N80-15586

CONDUCTING FLUIDS
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138

CONDUCTIVE HEAT TRANSFER
The effects of axial conduction on collector heat removal factor
25 p0004 A80-11333
Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction
[ASME PAPER 79-WA/SOL-18] 25 p0065 A80-18557
Helium penetration in evacuated solar collectors - Theory and effect on their performance
[ASME PAPER 79-WA/SOL-17] 25 p0066 A80-18563
Feasible thermophysical conditions for gas receiver tubes in solar power stations
[ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627

CONFERENCES
Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978
25 p0009 A80-11837
Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979
25 p0013 A80-11953
Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings
25 p0037 A80-14701
A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volumes 1, 2, 3 & 4
25 p0038 A80-14794
New development and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978
25 p0040 A80-15501
Colloquium on the Microclimatic Environment and Habitat, Reims, France, May 21-23, 1979, Proceedings
25 p0041 A80-15968
Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings
25 p0041 A80-15976
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979
25 p0047 A80-17126
Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volumes 1, 2 & 3
25 p0053 A80-17751

International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge University, Cambridge, England, August 10-12, 1978, Lectures 25 p0072 A80-18746
Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, September 12-16, 1977, Proceedings 25 p0075 A80-19201
Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2 25 p0078 A80-19581
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control 25 p0087 A80-20862
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment 25 p0087 A80-20881
Waste Heat Utilization: Proceedings of 1978 Engineering Foundation Conference [CONF-7808102] 25 p0102 N80-10665
Increased energy from biomass: 1985 possibilities and problem. Working papers for planners [RLC-788-5] 25 p0112 N80-11589
Proceedings: Solar Thermal Power User Review Panel Meeting [SERI/TP-69-221] 25 p0113 N80-11598
Southeastern forum on appropriate technology [PB-298796/4] 25 p0118 N80-11965
Cogeneration opportunities --- conferences [CONF-7806118] 25 p0145 N80-13681
Proceedings of the 1978 Coal Chemistry Workshop [CONF-780372] 25 p0150 N80-14264
Proceedings of the Thermal Energy Storage in Aquifers Workshop [LBL-8431] 25 p0160 N80-14533
Fifth Ocean Thermal Energy Conversion Conference, volume 2, sections 4-5 [CONF-780236-P2] 25 p0162 N80-14553
Proceedings of the DOE chemical/hydrogen energy contractor review systems [CONF-771131] 25 p0164 N80-14572
West Coast Forum on Appropriate Technology --- research in energy and environmental areas [PB-298986/1] 25 p0166 N80-14962
Measurements and standards for recycled oil - 2 [PB-299951/4] 25 p0167 N80-15275
Conference on performance monitoring techniques for evaluation of solar heating and cooling systems [CONF-780432] 25 p0174 N80-15599
All-union scientific and technical conference on use of the earth's heat for the production of electric power - summary of reports [CONF-751270-SUMM] 25 p0176 N80-15615

CONFIDENCE LIMITS
Validation methodology for solar heating and cooling systems 25 p0020 A80-12431

CONGRESSIONAL REPORTS
Passive solar energy programs and plans [GPO-36-211] 25 p0095 N80-10599
NASA authorization for fiscal year 1980. Part 4: Index [GPO-51-336] 25 p0104 N80-10964
Solar commercialization [GPO-43-586] 25 p0109 N80-11556
Energy initiatives of the 95th Congress [GPO-42-797] 25 p0109 N80-11557
Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1 [GPO-41-481] 25 p0122 N80-12550
Report to Congress on the economic impact of energy actions as required by public law 93-275, section 18-d [DOE/PE-0007] 25 p0181 N80-15993

CONSTRAINTS
Barriers to the application of wind energy conversion systems in urban settings 25 p0155 N80-14494

CONSTRUCTION MATERIALS
Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook [DOE/EV-0028] 25 p0163 N80-14565
International activities: The fiscal year 1978 survey of international programs at NEL [PB-300491/8] 25 p0181 N80-16004

CONSUMERS
Status of information for consumers of small wind energy systems [SERI/TP-51-158] 25 p0113 N80-11602
Demand management demonstration project. Stage 1: Development of residential load characteristics. Stage 4: Demonstration of residential incremental cost pricing implemented by time-of-day metering [HCP/B8072-01] 25 p0118 N80-11941

CONTINENTAL SHELVES
Federal leasing and outer continental shelf energy production goals [DOE/RA-0037] 25 p0178 N80-15640

CONTROL
Cost-effective control systems for solar heating and cooling applications [SAN-1592-1] 25 p0101 N80-10658

CONTROL SIMULATION
Mathematical modeling of coal gasification processes 25 p0089 A80-20913

CONTROL THEORY
Dynamics and control: Energy conversion, delivery, and demand analysis [BNL-26045] 25 p0099 N80-10633

CONTROLLED FUSION
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters 25 p0007 A80-11544
Optimization of neutron yield in conical system at explosion-induced compression 25 p0007 A80-11545
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves 25 p0007 A80-11546
Status of inertial confinement fusion 25 p0016 A80-11976
A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour 25 p0022 A80-12453
Review of tokamak experiments 25 p0034 A80-13342
Volt-second consumption during the start-up phase of PLT 25 p0040 A80-15532
Selected topics on surface effects in fusion devices - Neutral-beam injectors and beam-direct converters 25 p0043 A80-16262
Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volumes 1, 2 & 3 25 p0053 A80-17751
Results from the Divertor Injection Tokamak Experiment /DITE/ 25 p0054 A80-17754
The Elmo Bumpy Torus /EBT/ reactor 25 p0058 A80-17883
Tandem mirror reactors --- for controlled fusion 25 p0059 A80-17887
Summary on reactor systems --- tokamak devices 25 p0059 A80-17894
Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2 25 p0078 A80-19581
Optimization of stabilized imploding liner fusion reactors 25 p0079 A80-19593
SISYFUS - A simulation model for systematic analyses of fusion power plants 25 p0079 A80-19597
Doublet III neutral beam injection system overview and status report 25 p0079 A80-19599
The application of computers to fusion experimental facilities 25 p0080 A80-19619

Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662

A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668

Main power supplies for large toroidal fusion experiments
25 p0082 A80-19670

Status of the JET project --- Joint European Torus
25 p0082 A80-19708

JT-60 project --- tokamak fusion reactor design analysis
25 p0082 A80-19709

CONTROLLERS

Development and testing of the Junkeeper Control Corporation integrated programmable electronic controller and hydronics package
[NASA-TM-78244] 25 p0155 N80-14495

Development and testing of the Rho Sigma Incorporated microprocessor control subsystem
[NASA-TM-78246] 25 p0156 N80-14496

CONVECTIVE HEAT TRANSFER

Solar energy flat plate collectors - Optimization of air gap
25 p0023 A80-12745

Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516

Studies in heat transfer: A Festschrift for E. R. G. Eckert --- Book
25 p0036 A80-14655

Influence of the working fluid on heat transfer and layout of solar tower receivers
25 p0036 A80-14671

Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355

Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction
[ASME PAPER 79-WA/SOL-18] 25 p0065 A80-18557

Analysis of convective heat loss from the receiver of solar power plants
[ASME PAPER 79-WA/HT-36] 25 p0068 A80-18582

Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304

Visualization of natural convection in flat plate solar collectors
25 p0153 N80-14476

Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499

CONVERSION

Solar energy perspectives for public power
[SERI/TP-35-300] 25 p0140 N80-13635

COOLING

Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction
[ASME PAPER 79-WA/SOL-18] 25 p0065 A80-18557

Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658

Cooling aluminum molds using heat pipes
[BDX-613-2039-REV] 25 p0108 N80-11384

Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362

Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668

COOLING SYSTEMS

The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825

Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267

Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick
[AIAA PAPER 80-0148] 25 p0064 A80-18366

A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562

A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668

Development of a high temperature solar powered water chiller. Volume 3: Phase 1
[SAN-1590-1/3-VOL-3] 25 p0101 N80-10654

High COP heat pump system, phase 1, results
[HCP/M5056-01] 25 p0110 N80-11573

Evlaution of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
[BNL-26218] 25 p0162 N80-14552

COPPER

Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204

COPPER COMPOUNDS

A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845

COPPER SULFIDES

Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788

CORE FLOW

Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354

CORE SAMPLING

The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754

CORIOLIS EFFECT

The Coriolis program --- electric power from moored counterrotating turbine arrays in warm water current
25 p0044 A80-16653

CORROSION

Materials compatibility in liquid sodium
[HEDL-SA-1559] 25 p0119 N80-12147

Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716

CORROSION PREVENTION

Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-3] 25 p0119 N80-12163

Study of corrosion and its control in aluminum solar collectors
[COO-2934-7] 25 p0129 N80-12609

CORROSION RESISTANCE

Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels
[FE-1784-42] 25 p0106 N80-11248

Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

CORROSION TESTS

Preliminary materials assessment in solar demonstration systems
[ANL/EES-CP-30] 25 p0115 N80-11619

CORRUGATED SHELLS

An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822

COSMIC RAYS

Solar panels exposed to cosmic rays
25 p0008 A80-11825

COST ANALYSIS

Resource recovery systems costs
25 p0001 A80-10029

Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434

The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436

The uncertain costs of waste disposal and resource recovery
25 p0043 A80-16150

The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588

Deep space network feasibility study of terminating Southern California Edison electrical service to Goldstone --- cost analysis of electric power supplies and waste energy utilization
25 p0091 N80-10263

Cost analysis of aquatic biomass systems
[HCP/ET/4000-78/1] 25 p0120 N80-12202

Cost analysis of packed beds for thermal energy storage
[CAES-11] 25 p0145 N80-13687

LNG industry: An overview of projects and costs
[CONF-7811112-2] 25 p0168 N80-15278

COST EFFECTIVENESS

Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706

A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560

Cost effectiveness requirements for space power stations
25 p0073 A80-18800

Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors
25 p0079 A80-19594

Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658

The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562

Application analysis of solar total energy systems to the residential sector. Volume 4: Market penetration
[ALC-3787-4] 25 p0174 N80-15597

COST ESTIMATES

The reality of on-site fuel cells
25 p0016 A80-11973

Methanol from coal - An adaption from the past
25 p0033 A80-13224

Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584

Economics of hydrogen production and liquefaction updated to 1980
[NASA-CR-159163] 25 p0106 N80-11238

Rough cost estimates of solar thermal/coal or biomass-derived fuels
[SERI/TP-35-279] 25 p0151 N80-14269

COST REDUCTION

A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845

Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846

Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641

COSTS

Minimum cost transmitter-receiver antenna pairs --- antenna design for the satellite solar power station using optimal control theory
[RM-690] 25 p0094 N80-10414

SAMICS: Input data preparation --- Solar Array Manufacturing Industry Costing Standards
[NASA-CR-162421] 25 p0110 N80-11570

Demand management demonstration project. Stage 1: Development of residential load characteristics. Stage 4: Demonstration of residential incremental cost pricing implemented by time-of-day metering
[HCP/B8072-01] 25 p0118 N80-11941

COULOMB COLLISIONS

Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen --- electron transfer reactions in solar energy conversion processes
25 p0040 A80-15358

COUPLED MODES

Effect of finite beta on drift-wave turbulence and particle confinement --- of toroidal plasma
25 p0084 A80-20158

COUPLINGS

Theory of the direct coupling between D.C. motors and photovoltaic solar arrays
25 p0005 A80-11334

CRACKING (CHEMICAL ENGINEERING)

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-46] 25 p0134 N80-13280

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287

CREEP ANALYSIS

Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606

CREEP TESTS

Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606

CRITICAL LOADING

Linear synchronous motor development for urban and rapid transit systems
25 p0062 A80-18167

CRITICAL TEMPERATURE

Preparation of superconducting coil through composite
25 p0040 A80-15512

CRITICAL VELOCITY

Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622

CROP GROWTH

Energy plantation for coromandel littoral --- growing plant materials for fuel value in India
25 p0023 A80-12742

CRUDE OIL

Geology of the Athabasca oil sands
25 p0050 A80-17236

On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example
25 p0074 A80-19000

Alternative jet aircraft fuels
25 p0091 N80-10209

Oil recovery by carbon dioxide injection --- West Virginia
[ORO-5301-34] 25 p0108 N80-11545

Bell Creek residual oil saturation technology test
[BETC-2180-4] 25 p0108 N80-11546

Standby conservation plan no. 2: Emergency building temperature restrictions. Economic analysis
[DOE/ERA-0047] 25 p0112 N80-11593

Identification of a methodology for projecting short-term crude petroleum production in the United States
[DOE/EIA-0103/14] 25 p0122 N80-12542

Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607

The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754

Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259

Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467

International energy assessment
[DOE/EIA-0184/1] 25 p0174 N80-15594

Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

CRYOGENIC EQUIPMENT

Superconducting composites fabrication and properties
25 p0040 A80-15511

Preparation of superconducting coil through composite
25 p0040 A80-15512

CRYOGENIC STORAGE

Hydrogen storage by use of cryoadsorbents in comparison to alternatives
25 p0042 A80-15992

CRYOGENICS

International activities: The fiscal year 1978 survey of international programs at NEL
[PB-300491/8] 25 p0181 N80-16004

CRYSTALLOGRAPHY

Crystallographic contributions to the energy problem
[CONF-780867-1] 25 p0128 N80-12598

CULTURE TECHNIQUES

Microbial hydrogen production from replenishable resources
25 p0032 A80-13197

CURRENT CONVERTERS (AC TO DC)

Bi-directional four quadrant (BDQ4) power converter development
[NASA-CR-159660] 25 p0154 N80-14480

CURRENT DENSITY

Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

Power take-off analysis for diagonally connected MHD channels
[AIAA PAPER 80-0253] 25 p0077 A80-19309

CURRENT DISTRIBUTION

Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

Prediction of current distribution in a molten carbonate fuel cell
[CONF-781063-1] 25 p0175 N80-15613

CURRENT SHEETS

The effect of current shear on the tearing instability
25 p0059 A80-18086

Digital computer modeling of steady-state conditions of the magnetoplasmadynamic generator current layer
25 p0083 A80-20058

CURVE FITTING

X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110

CUSPS (MATHEMATICS)

Truncation of nonimaging cusp concentrators --- solar collector geometry
25 p0029 A80-12824

CYCLES

Alternate cycles applied to ocean thermal energy conversion
[SERI/TP-34-180] 25 p0172 N80-15571

CYCLIC HYDROCARBONS

Combined effects of polycyclic aromatic hydrocarbons and sunlight --- on Chinese hamster V79 cells
[CONF-790447-4] 25 p0131 N80-12631

CYLINDRICAL SHELLS

Stability of a system of coaxial superconducting shells
25 p0018 A80-12027

D

DAMPING

Steady-state currents driven by collisionally damped lower-hybrid waves --- in plasma
25 p0084 A80-20157

DATA ACQUISITION

Monitoring of the solar-heated modular homes at Los Alamos
25 p0022 A80-12607

An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628

The application of computers to fusion experimental facilities
25 p0080 A80-19619

DATA BASES

Energy information data base. Corporate author entries
[DOE/TIC-4585-R1-SUPPL-1] 25 p0097 N80-10617

World Energy Data System (WENDS)
[CONF-790461-2] 25 p0112 N80-11587

Disaggregating PIES fuel forecasts, validating PIES transportation model data base, and other technical services
[TID-29000] 25 p0114 N80-11612

A manual for cataloging and indexing documents --- geothermal energy data base
[LBL-4432-REV-1] 25 p0118 N80-11946

Energy information data base. Serial titles, February 1976 - March 1979
[DOE/TIC-4579-R10-SUPPL-4] 25 p0128 N80-12601

DATA MANAGEMENT

Rough cost estimates of solar thermal/coal or biomass-derived fuels
[SERI/TP-35-279] 25 p0151 N80-14269

DATA PROCESSING EQUIPMENT

Report on Finnish technological activities
25 p0119 N80-11991

DECISION MAKING

Review of scenarios of future U.S. energy use
25 p0009 A80-11832

Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657

Managerial plan: Executive order 12003 and the National Energy Act
[DOE/TIC-10067] 25 p0104 N80-10965

Implementing energy conservation strategies in energy materials transport: U. S. Department of Energy and other government agency policy-making decisions
[ANL/EES-TM-32] 25 p0111 N80-11577

DEEP SPACE NETWORK

Deep space network feasibility study of terminating Southern California Edison electrical service to Goldstone --- cost analysis of electric power supplies and waste energy utilization
25 p0091 N80-10263

DEMAND (ECONOMICS)

Frontiers in energy demand modeling
25 p0009 A80-11830

Supply and demand in input-output analysis for energy modeling
25 p0088 A80-20890

Economic structure, aggregate production functions and the demand for energy as an intermediate product: A preliminary analysis
[DOE/EIA-0103/8] 25 p0096 N80-10607

Energy supply and demand in the midterm: 1985, 1990, and 1995
[DOE/EIA-0102/52] 25 p0097 N80-10620

Demand management demonstration project. Stage 1: Development of residential load characteristics. Stage 4: Demonstration of residential incremental cost pricing implemented by time-of-day metering
[HCP/E8072-01] 25 p0118 N80-11941

Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607

The 1985, 1990 and 1995 midterm energy market model results under three scenarios of Fuel Use Act regulations
[DOE/EIA-0182/2] 25 p0173 N80-15592

Energy supply and demand in the short term: 1979 and 1980
[DOE/EIA-0184/4] 25 p0174 N80-15593

DENSE PLASMAS

Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas
25 p0007 A80-11612

Survey of mirror machine reactors
25 p0046 A80-16752

Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

DENSITY MEASUREMENT

Measurements of the density fluctuations using the microwave scattering method --- for toroidal plasmas
25 p0046 A80-16731

DESALINIZATION

A cheap method of improving the performance of roof type solar stills
25 p0006 A80-11343

Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

DESIGN ANALYSIS

Solar collectors as energy converters
25 p0036 A80-14670

Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector
[ASME PAPER 79-WA/SOL-3] 25 p0067 A80-18570

A design method for optimizing collector systems for small solar center receivers
[ASME PAPER 79-WA/SOL-14] 25 p0068 A80-18580

Design of the International Energy Agency 500 kWe distributed-collector solar thermal-electric powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592

MDAC/Rocketdyne solar receiver: Design review
[SAND-78-8188] 25 p0097 N80-10616

Battery Energy Storage Test (BEST) facility
[EPRI-EM-1005] 25 p0098 N80-10628

Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11561

Design optimization of aquifer reservoir-based compressed air storage systems
[CONF-781046-5] 25 p0116 N80-11628

Satellite Power Systems (SPS) concept definition study. Volume 4: SPS point design definition
[NASA-CR-150683] 25 p0119 N80-12106

Weight minimization of sandwich type solar collector panels
[SAND-78-2305C] 25 p0147 N80-13710

A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484

Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577

Evaluation of the evacuated solar annular receivers used at the Midtemperature Solar Systems Test Facility (MSSTF)
[SAND-78-0983] 25 p0173 N80-15585

Sandia composite-rim flywheel development
[SAND-78-1865C] 25 p0177 N80-15624

DESULFURIZING

Rapid devolatilization and partial gasification of coal in an entrained dust reactor
25 p0002 A80-10226

Economics of Pullman Kellogg's magnesium promoted FGD system --- Flue Gas Desulfurization
25 p0014 A80-11961

Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623

Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377

Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277

Sulfur fixation during coal gasification --- desulfurizing to reduce air pollution
[PB-301104/6] 25 p0169 N80-15296

EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979 --- electric power plants
[PB-299399/6] 25 p0179 N80-15682

DETERIORATION

Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259

DEUTERIUM

Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682

DEUTERIUM PLASMA

Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544

Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

Tandem mirror reactors --- for controlled fusion
25 p0059 A80-17887

Numerical computations in the design of compact ignition experiments --- of D-T toroidal plasma heating
25 p0078 A80-19589

SISYFUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597

DEVELOPING NATIONS

Global options for short-range alternative energy strategies
25 p0048 A80-17129

A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552

DIAMAGNETISM

What is the mechanism responsible for the precursors of internal disruptions --- as observed in Tokamak plasma
25 p0054 A80-17807

DIELECTRICS

Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346

DIESEL ENGINES

Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle
[PB-299928/2] 25 p0180 N80-15699

DIESEL FUELS

Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

DIFFERENTIAL THERMAL ANALYSIS

Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

An update of German non-isothermal coal pyrolysis work
25 p0019 A80-12245

DIFFUSERS

Experimental demonstration of the diffuser-augmented wind turbine concept
25 p0007 A80-11643

DIGITAL SIMULATION

Computers in the design of solar energy systems
25 p0020 A80-12426

The effect of current shear on the tearing instability
25 p0059 A80-18086

Digital computer modeling of steady-state conditions of the magnetoplasmadynamic generator current layer
25 p0083 A80-20058

MEDEE 2: A model for long term energy demand evaluation
[IIASA-RR-78-17] 25 p0109 N80-11554

The 10 MW solar thermal pilot plant dynamic simulation. Volume 1: Computer program description
[ATR-78(7747)-1-VOL-1] 25 p0162 N80-14550

The 10 MW solar thermal pilot plant dynamic simulation. Volume 2: Computer program source listing
[ATR-78(7747)-2-VOL-2] 25 p0162 N80-14551

DIRECT CURRENT

Controllable d.c. power supply from wind-driven self-excited induction machines
25 p0075 A80-19031

The combined d.c. power supply for JET --- Joint European Torus
25 p0080 A80-19621

Some dc superconducting cables --- for underground power transmission
[LA-UR-79-1057] 25 p0107 N80-11348

Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346

DIRECT POWER GENERATORS

Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705

DIRECTIONAL SOLIDIFICATION (CRYSTALS)

A review of in situ composites for nonstructural applications
25 p0002 A80-10285

DISPLAY DEVICES

Color graphic controls for the solar central receiver test facility
25 p0022 A80-12626

DISSOCIATION

Dissociation pressure measurements on salts proposed for thermochemical energy storage
[SAND-79-8033] 25 p0160 N80-14532

DISTILLATION

Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287

DISTILLATION EQUIPMENT
A cheap method of improving the performance of roof type solar stills
25 p0006 A80-11343
DISTRIBUTED PARAMETER SYSTEMS
Optimal control of distributed parameter systems for solar thermal applications
25 p0095 N80-10593
DOCUMENTS
A manual for cataloging and indexing documents --- geothermal energy data base
[LBL-4432-REV-1] 25 p0118 N80-11946
DOMESTIC ENERGY
Annual review of energy. Volume 4 --- Book
25 p0008 A80-11826
United States energy alternatives to 2010 and beyond - The CONAES study
25 p0008 A80-11827
Assessing energy policy models - Current state and future directions
25 p0009 A80-11831
Review of scenarios of future U.S. energy use
25 p0009 A80-11832
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
Testing of three installed solar domestic water heaters
25 p0025 A80-12758
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773
Performance and analysis of a 'series' heat pump-assisted solar heated residence in Madison, Wisconsin
25 p0061 A80-18132
Electric heat - The right price at the right time
25 p0062 A80-18184
Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555
A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590
Residential solar heat pump systems - Thermal and economic performance
[ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591
A solar assisted and wind powered heat pump for residential dwellings
[ASME PAPER 79-WA/HT-33] 25 p0070 A80-18595
On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example
25 p0074 A80-19000
Prospects for the near-term commercialization of shale oil in the United States
25 p0078 A80-19474
Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning
25 p0084 A80-20242
Energy initiatives of the 95th Congress
[GPO-42-797] 25 p0109 N80-11557
Residential sector energy forecasts, national level for 1978-electricity, natural gas, number two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601
The great adventure: A report on the 10 regional public hearings on solar energy for the domestic policy review
[HCP/U6354-01] 25 p0124 N80-12567
Dynamic energy system optimization model --- study of computerized simulation domestic energy models
[EPRI-EA-1079] 25 p0157 N80-14514
New hybrid 1971 energy intensities, part 1 --- computation of domestic energy consumption versus economic factors
[COO-4628-4-PT-1] 25 p0158 N80-14516
Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287
Measurement of energy to heat houses: Initial study
[PB-299448/2] 25 p0170 N80-15304
DRAG REDUCTION
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948
Energy conservation - Aerodynamic drag reduction of intercity buses
25 p0050 A80-17227
DRILLING
Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery
[FE-2025-38] 25 p0130 N80-12624
DROP SIZE
An in-situ optical particle sizing technique --- for fuel droplets
[AIAA PAPER 80-0020] 25 p0062 A80-18240
DRY HEAT
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
DRYING APPARATUS
Microwave heating: Industrial applications. Citations from the engineering data base
[NTIS/PS-79/0632/4] 25 p0102 N80-10674
DUCT GEOMETRY
Experimental demonstration of the diffuser-augmented wind turbine concept
25 p0007 A80-11643
DUCTED FLOW
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[AIAA PAPER 80-0023] 25 p0063 A80-18243
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600
DYES
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
Study of photochemical processes in the ferrous-thionine system --- photogalvanic effect in dye redox systems for chemical energy conversion
25 p0027 A80-12783
DYNAMIC MODELS
Dynamic modeling of H2S clean-up processes --- in coal gasification
25 p0088 A80-20885
DYNAMIC STRUCTURAL ANALYSIS
Executive summary: Mod-1 wind turbine generator analysis and design report
[NASA-CR-159497] 25 p0109 N80-11558

E

EARTH ORBITS
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204
EARTH RESOURCES
Interactive analysis methods for resource mapping
25 p0008 A80-11709
OTEC thermal resource report for Caribbean Sea Plant Ship 13-15 degrees N 75-80 degrees W
[HCP/T2898] 25 p0113 N80-11599
EARTHQUAKES
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431
ECOLOGY
Prospects - A social context for natural science --- global energy resource review
25 p0044 A80-16651
ECONOMETRICS
Frontiers in energy demand modeling
25 p0009 A80-11830
Assessing energy policy models - Current state and future directions
25 p0009 A80-11831
Supply and demand in input-output analysis for energy modeling
25 p0088 A80-20890
The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329

Computer software to calculate and map geologic parameters required in estimating coal production costs [EPRI-EA-674] 25 p0095 N80-10584
Survey of the research into energy-economy interactions. Volume 1: Survey [HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633
Energy demand in the developing countries [DOE/EIA-0183/10] 25 p0177 N80-15631

ECONOMIC ANALYSIS
Assessing energy policy models - Current state and future directions 25 p0009 A80-11831
Economic performance - Evaluations for solar energy 25 p0014 A80-11956
The near term potential for gasification-combined cycle electric power generation 25 p0015 A80-11970
Economics/reliability trade-offs in materials for various coal conversion and utilization processes 25 p0016 A80-11975
A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis 25 p0021 A80-12433
Passive and active residential solar heating: A comparative economic analysis of select designs 25 p0021 A80-12435
Economics of small solar power plants --- in rural areas 25 p0024 A80-12754
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting 25 p0026 A80-12773
Application of solar and fuel cell technology to industrial users 25 p0037 A80-14707
Earth benefits of solar power satellites 25 p0038 A80-14791
Technico economic study of the use of hydrogen and methanol for road transport 25 p0042 A80-15993
Technical possibilities and economic prospects for coal refining 25 p0043 A80-16175
Net energy analysis of alcohol production from sugarcane 25 p0062 A80-18165
Electric heat - The right price at the right time 25 p0062 A80-18184
Economic comparisons of solar and fossil total energy systems for industrial applications [ASME PAPER 79-WA/TS-6] 25 p0065 A80-18552
Optimization and comparison strategies for solar energy systems [ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573
SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants [ASME PAPER 79-WA/SOL-12] 25 p0068 A80-18579
Residential solar heat pump systems - Thermal and economic performance [ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591
Screening evaluation of electric power cycles integrated with coal gasification plants [ASME PAPER 79-WA/ENER-4] 25 p0071 A80-18644
OTEC - A comprehensive energy analysis 25 p0085 A80-20456
An applications analysis for the solar industrial process heat market 25 p0088 A80-20888
Analysis of resource pricing for geothermal electric power production 25 p0088 A80-20889
Supply and demand in input-output analysis for energy modeling 25 p0088 A80-20890
Coal conversion processes and analysis methodologies for synthetic fuels production --- technology assessment and economic analysis of reactor design for coal gasification [NASA-CR-161322] 25 p0092 N80-10379
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management [PB-296523/4] 25 p0094 N80-10398
Economic structure, aggregate production functions and the demand for energy as an intermediate product: A preliminary analysis [DOE/EIA-0103/8] 25 p0096 N80-10607
Economic performance of passive solar heating: A preliminary analysis [LA-UR-78-2861] 25 p0100 N80-10645
Geothermal resources and technology in the United States [PB-296623/2] 25 p0102 N80-10677
Multirole cargo aircraft options and configurations --- economic analysis [NASA-TM-80177] 25 p0105 N80-11053
Economics of hydrogen production and liquefaction updated to 1980 [NASA-CR-159163] 25 p0106 N80-11238
Efforts on the economic analysis of Darrieus vertical axis wind turbines [SAND-78-1851C] 25 p0126 N80-12579
Economics of fusion driven symbiotic energy systems [CONF-790602-50] 25 p0128 N80-12602
Technical and economic assessment of solar powered water pumping for remote areas [SAND-79-8187] 25 p0129 N80-12608
Multi-year plan for thermal and mechanical energy storage program [DOE/ET-0109] 25 p0142 N80-13658
Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications [NASA-TM-78251] 25 p0156 N80-14501
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain [PB-298785/7] 25 p0165 N80-14578
Economic analysis of small scale bioconversion units in New Mexico [PB-301390/1] 25 p0169 N80-15298
Solar enhanced oil recovery: An assessment of economic feasibility [SAND-79-0787] 25 p0178 N80-15641

ECONOMIC DEVELOPMENT
Exploring alternative energy strategies 25 p0047 A80-17127
Distribution and classification of local socio-economic impacts from energy development [CONF-790481-1] 25 p0166 N80-14954

ECONOMIC FACTORS
Back to the central city - Myths and realities 25 p0002 A80-10323
Soft and hard energy paths - The roads not taken --- political, technical and philosophical aspects of energy problem 25 p0007 A80-11400
The compatibility of wind and solar technology with conventional energy systems 25 p0008 A80-11828
Economics of Pullman Kellogg's magnesium promoted FGD system --- Flue Gas Desulfurization 25 p0014 A80-11961
Low/medium BTU coal gasification - Perspective of the gas industry 25 p0015 A80-11969
The reality of on-site fuel cells 25 p0016 A80-11973
Geothermal energy markets on the Atlantic coastal plain 25 p0016 A80-11978
The financing problems of Europe's gas industry 25 p0032 A80-13174
Fuel cell sesquicentennial 25 p0033 A80-13223
Methanol from coal - An adaption from the past 25 p0033 A80-13224
Global perspectives and options for long-range energy strategies 25 p0048 A80-17130
Impact of technology and maintainability on economic aspects of tokamak power plants 25 p0059 A80-17884
Solar enhanced oil recovery - An assessment of economic feasibility 25 p0078 A80-19472
Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects [CONF-780843-5] 25 p0103 N80-10693

Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246
Biofuels: A survey
[EPRI-ER-746-SR] 25 p0107 N80-11250
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633
Fundamental economic issues in the development of small-scale hydro
[DOE/RA-23-216.00.0-02] 25 p0143 N80-13667
New hybrid 1971 energy intensities, part 1 --- computation of domestic energy consumption versus economic factors
[COO-4628-4-PT-1] 25 p0158 N80-14516
A review of the economics of selected passive and hybrid systems --- design concepts for solar energy utilization
[SERI/TP-61-144] 25 p0161 N80-14547
International energy assessment
[DOE/EIA-0184/1] 25 p0174 N80-15594
Nuclear strategy of the Department of Energy
[DOE/ER-0025/D] 25 p0175 N80-15605

ECONOMIC IMPACT
Regional economic/demographic projections for energy policy analysis
[ORNL/TM-6668] 25 p0128 N80-12599
Distribution and classification of local socio-economic impacts from energy development
[CONF-790481-1] 25 p0166 N80-14954
Wharton annual energy model: Development and simulation results
[EPRI-EA-1115] 25 p0175 N80-15606
Economic impacts of energy conservation and renewable energy sources
[UCRL-15087] 25 p0177 N80-15633
Petrochemicals: Their economic significance in the domestic economy
[PB-299733/6] 25 p0181 N80-15992
Report to Congress on the economic impact of energy actions as required by public law 93-275, section 18-d
[DOE/PE-0007] 25 p0181 N80-15993

ECONOMICS
National energy plan 2
[DOE/TIC-10109] 25 p0097 N80-10618
Newton's method for generalized equations and the PIES energy model
25 p0149 N80-13872

ECONOMY
Energy conservation and the environment: conflict or complement
[LBL-7882] 25 p0098 N80-10621

ECOSYSTEMS
Global ecology and man
25 p0131 N80-12668

EDUCATION
National environmental/energy workshop assessment, phase 3. Energy programs --- directory of courses available
[PB-298587/7] 25 p0117 N80-11634
National environmental/energy workforce assessment, phase 3. Air programs --- bibliography
[PB-298580/2] 25 p0117 N80-11670
Energy conservation technology education program
[HCP/M2165] 25 p0129 N80-12606
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158] 25 p0179 N80-15670

ELASTODYNAMICS
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729

ELASTOMERS
Petrochemicals: Their economic significance in the domestic economy
[PB-299733/6] 25 p0181 N80-15992

ELECTRIC AUTOMOBILES
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199
Electric and hybrid vehicles --- Book
25 p0041 A80-15658
Mechanical energy storage technology development for electric and hybrid vehicle applications
[UCRL-81786] 25 p0128 N80-12596

ELECTRIC BATTERIES
Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978
25 p0009 A80-11837
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847
Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858
Energy-storage systems --- pumped-storage hydroelectric plants, compressed-air energy-storage plants, electric batteries and hot water storage
25 p0034 A80-13513
Battery Energy Storage Test (BEST) facility
[EPRI-EM-1005] 25 p0098 N80-10628
Effect of mechanical energy storage systems on the characteristics of electric vehicles
[UCRL-82710] 25 p0102 N80-10664
Lead batteries, volume 2. Citations from the engineering index data base
[NTIS/PS-77/0634] 25 p0103 N80-10681
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594
Distribution and movement of electrolyte in fuel cells and batteries
25 p0138 N80-13619

ELECTRIC BRIDGES
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430

ELECTRIC CONDUCTORS
Evaluation of conductor mass and necessary voltage level for large satellite solar arrays
25 p0036 A80-14595

ELECTRIC CONTACTS
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
Determination of the geometry of the transition region of a series MHD generator
25 p0030 A80-12900

ELECTRIC CONTROL
Semiconductor alternating-current motor drives and energy conservation
25 p0034 A80-13861
The thermal triode --- construction by adding controlling zone to heat pipe
25 p0037 A80-14675

ELECTRIC CORONA
The KMSF laser fusion programme
25 p0056 A80-17860

ELECTRIC CURRENT
Current collectors for sodium-sulphur batteries
25 p0013 A80-11867
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159
Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells
25 p0087 A80-20723
Bi-directional four quadrant (BDQ4) power converter development
[NASA-CR-159660] 25 p0154 N80-14480

ELECTRIC DISCHARGES
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841
Lead oxides-lithium cells
25 p0012 A80-11859

ELECTRIC ENERGY STORAGE
Energy-storage systems --- pumped-storage hydroelectric plants, compressed-air energy-storage plants, electric batteries and hot water storage
25 p0034 A80-13513

ELECTRIC FIELDS
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields
25 p0019 A80-12310
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869

Influence of the loading factor on the performance characteristics of series MHD generators 25 p0061 A80-18137

ELECTRIC GENERATORS

Measurements on a 15 kW wind energy conversion system 25 p0039 A80-15329
Modeling and experimental analysis of a fluidic generator [ASME PAPER 79-DET-9] 25 p0041 A80-15705
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core 25 p0083 A80-20066
Night storage and backup generation with electrochemical engines --- study of electric generators for electrochemical engines using photovoltaic energy conversion [LA-UR-78-1149] 25 p0113 N80-11596
Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process [AED-CONF-78-155-010] 25 p0121 N80-12291
Bi-directional four quadrant (BDQ4) power converter development [NASA-CR-159660] 25 p0154 N80-14480
Commercialization strategy report for hydrothermal electric and direct heat application --- project planning of geothermal resources for geothermal energy conversion for heating electricity generation [TID-28840-DRAFT] 25 p0157 N80-14508
Preliminary design of axial flow hydrocarbon turbine/generator set for geothermal applications [EPRI-ER-513] 25 p0160 N80-14536
Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation [DOE/RL-90476-13] 25 p0169 N80-15293
Demonstration of a nitrogen based carburizing atmosphere: Energy consumption of the endothermic generator [CONS/5058-T1] 25 p0173 N80-15591

ELECTRIC HYBRID VEHICLES

Electric and hybrid vehicles --- Book 25 p0041 A80-15658
A survey of electric and hybrid vehicle simulation programs [NASA-CR-162457] 25 p0118 N80-11954
Mechanical energy storage technology development for electric and hybrid vehicle applications [UCRL-81786] 25 p0128 N80-12596
Electric and hybrid vehicles: Commercialization phase 3 planning [DOE/ERD-0004] 25 p0151 N80-14349
Commercialization strategy report for electric and hybrid vehicles [TID-28858-DRAFT] 25 p0166 N80-14972

ELECTRIC MOTOR VEHICLES

The electric trolley bus - Revisited 25 p0002 A80-10321
Gasoline's alternatives are feasible 25 p0034 A80-13225
The promise and puzzle of electric vehicles 25 p0039 A80-15175
Electric and hybrid vehicles --- Book 25 p0041 A80-15658
Effect of mechanical energy storage systems on the characteristics of electric vehicles [UCRL-82710] 25 p0102 N80-10664
A survey of electric and hybrid vehicle simulation programs [NASA-CR-162457] 25 p0118 N80-11954
The USAF Academy flywheel-electric car preliminary design report [AD-A071242] 25 p0123 N80-12553
Demand for special performance vehicles, 1975 - 2025 [UCRL-13911] 25 p0133 N80-12960
Advanced batteries for electric vehicles: A look at the future [CONF-790484-1] 25 p0159 N80-14531
Review of industrial participation on the ANL lithium/iron sulfide battery development program --- for energy storage and electric vehicles [CONF-780852-1] 25 p0164 N80-14573
Commercialization strategy report for electric and hybrid vehicles [TID-28858-DRAFT] 25 p0166 N80-14972
Assessment of the applicability of mechanical energy storage devices to electric and hybrid vehicles. Volume 1: Executive summary [UCRL-52773-VOL-1] 25 p0166 N80-14973
Lithium/iron sulfide batteries for electric vehicles [CONF-781006-2] 25 p0175 N80-15611
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report [UCRL-52553-VOL-2] 25 p0181 N80-15995

ELECTRIC MOTORS

Theory of the direct coupling between D.C. motors and photovoltaic solar arrays 25 p0005 A80-11334
Semiconductor alternating-current motor drives and energy conservation 25 p0034 A80-13861
Hydrogen-electric power drives [SLAC-PUB-2203] 25 p0113 N80-11604

ELECTRIC POTENTIAL

Current collectors for sodium-sulphur batteries 25 p0013 A80-11867
Calculation of the low-frequency electromagnetic field of MHD machines encapsulated in a common screening shell 25 p0030 A80-12896
Volt-second consumption during the start-up phase of PLT 25 p0040 A80-15532
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage 25 p0084 A80-20274

ELECTRIC POWER

Recent advances in zinc-bromine batteries 25 p0010 A80-11846
Power from ocean waves 25 p0045 A80-16655
Photovoltaic solar cell array used for supplemental power generation 25 p0061 A80-18129
An electrochemical heat engine for direct solar energy conversion 25 p0061 A80-18131
EPRI new energy resources department strategy paper [EPRI-ER-979] 25 p0097 N80-10610
Systems engineering for power, program report [DOE/ET-0012/2-REV] 25 p0140 N80-13637

ELECTRIC POWER PLANTS

Lignite fuel and power-plant availability 25 p0004 A80-10944
170 MW pressurized fluidized bed combustion electric plant 25 p0014 A80-11962
The near term potential for gasification-combined cycle electric power generation 25 p0015 A80-11970
Coal to electricity - Integrated gasification combined cycle 25 p0015 A80-11971
Survey of MHD plant applications 25 p0015 A80-11972
Low-cost central receiver solar power plant using molten salt as a heat transfer and storage medium 25 p0017 A80-11986
Area load-frequency control --- software package for electric power system operation 25 p0022 A80-12735
Economics of small solar power plants --- in rural areas 25 p0024 A80-12754
SSPS project - Two solar power plants in Spain 25 p0032 A80-13180
Energy-storage systems --- pumped-storage hydroelectric plants, compressed-air energy-storage plants, electric batteries and hot water storage 25 p0034 A80-13513
Heat and electricity from the sun using parabolic dish collector systems 25 p0037 A80-14706
The physics of closed cycle MHD power generation 25 p0043 A80-16264
Energy from ocean thermal gradients 25 p0044 A80-16652
The Coriolis program --- electric power from moored counterrotating turbine arrays in warm water current 25 p0044 A80-16653

Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant
25 p0051 A80-17246
Structure of an averaged statistical pencil of rays reflected from a heliostat
25 p0051 A80-17247
Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory
25 p0056 A80-17862
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884
Analysis of systems for the generation of electricity from solar radiation
25 p0060 A80-18124
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125
Optimization of a point-focusing, distributed receiver solar thermal electric system
[ASME PAPER 79-WA/SOL-11] 25 p0065 A80-18553
SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants
[ASME PAPER 79-WA/SOL-12] 25 p0068 A80-18579
Analysis of convective heat loss from the receiver of solar power plants
[ASME PAPER 79-WA/HT-36] 25 p0068 A80-18582
A solar thermal electric power plant for small communities
[ASME PAPER 79-WA/SOL-7] 25 p0069 A80-18584
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
Design of the International Energy Agency 500 kWe distributed-collector solar thermal-electric powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592
Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596
A small hybrid solar closed-cycle gas turbine cogeneration plant concept based on today's technology
[ASME PAPER 79-WA/GT-3] 25 p0071 A80-18637
Screening evaluation of electric power cycles integrated with coal gasification plants
[ASME PAPER 79-WA/ENER-4] 25 p0071 A80-18644
First experiences with the use of impactors in large power plants
25 p0074 A80-18859
Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883
SISYFUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668
OTEC - Solar energy from the sea
25 p0085 A80-20424
Possibility of conversion of solar corpuscular radiation energy into electrical energy
25 p0085 A80-20495
A thermodynamic assessment of OTEC open-cycle power systems
25 p0088 A80-20886
Analysis of resource pricing for geothermal electric power production
25 p0088 A80-20889
Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants
25 p0089 A80-21010
NASA-Lewis closed-cycle magnetohydrodynamics plant analysis
[NASA-TM-79249] 25 p0095 N80-10595
The first small power system experiment, Phase 1: Engineering experiment no. 1 --- solar thermal electric power plants
[NASA-CR-162417] 25 p0095 N80-10596
Screening evaluation of novel power cycles integrated with gasification plants
[EPRI-AF-1002] 25 p0096 N80-10605
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0097 N80-10609
Sensitivity study of Brayton cycle power plant performance
[SAND-78-8020] 25 p0098 N80-10626
Geothermal resources and technology in the United States
[PB-296623/2] 25 p0102 N80-10677
Effect of operating temperatures on the cost of energy from solar thermal electric power plants
[SAND-79-0801] 25 p0124 N80-12563
Project CESA-1, a 1 MW solar power plant in Almeria
[AED-CONF-78-212-011] 25 p0130 N80-12614
Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes
[EPRI-ER-978-VOL-3] 25 p0139 N80-13628
OTEC platform configuration and integration, appendixes to volume 2
[DOE/ET-4065/1-VOL-2-APP] 25 p0147 N80-13713
OTEC platform configuration and integation. Volume 3: Project plan
[DOE/ET-4065/1-VOL-3] 25 p0148 N80-13714
solar thermal power systems advanced solar thermal technology project, advanced subsystems development
[NASA-CR-162546] 25 p0155 N80-14491
Simulation approach for base-line energy-siting analysis
[CCNF-790459-22] 25 p0157 N80-14511
Solid electrolyte fuel cell for electric power generation --- nonaqueous electrolyte fuel cells development for electric power plants
[BNL-26238] 25 p0158 N80-14522
Compressed air energy storage technology program --- concept for supplying electric power to meet peak load demands
[PNL-2935] 25 p0160 N80-14534
Superconducting magnetic energy storage for electric power system dynamic stabilization
[LA-UR-79-1220] 25 p0160 N80-14535
The 10 MW solar thermal pilot plant dynamic simulation. Volume 1: Computer program description
[ATR-78(7747)-1-VOL-1] 25 p0162 N80-14550
The 10 MW solar thermal pilot plant dynamic simulation. Volume 2: Computer program source listing
[ATR-78(7747)-2-VOL-2] 25 p0162 N80-14551
Systems Studies for Central Solar Thermal Electric
[CONF-780383] 25 p0162 N80-14559
Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion --- models for environmentally clean power plant design
[COO-4272-3] 25 p0165 N80-14587
Photovoltaic power system reliability considerations
[NASA-TM-79291] 25 p0170 N80-15422
Department of Energy large solar central power systems semiannual review
[SAND-78-8511] 25 p0175 N80-15601
Department of Energy large solar central power systems semiannual review
[SAND-79-8508] 25 p0175 N80-15602
Environmental development plan: Electric Energy Systems
[DOE/EDP-0038] 25 p0179 N80-15669
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979 --- electric power plants
[PB-299399/6] 25 p0179 N80-15682

ELECTRIC POWER SUPPLIES
Power supply requirements for a tokamak fusion reactor
25 p0003 A80-10474
Improving the reliability of capacitance batteries in power grids with higher-harmonic sources
25 p0008 A80-11671
Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978
25 p0009 A80-11837

Development of a sodium/sulphur battery for rail applications
25 p0031 A80-13003

Autonomous power supplies for telecommunications
25 p0033 A80-13211

Controllable d.c. power supply from wind-driven self-excited induction machines
25 p0075 A80-19031

150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617

The combined d.c. power supply for JET --- Joint European Torus
25 p0080 A80-19621

Main power supplies for large toroidal fusion experiments
25 p0082 A80-19670

Solar cells in practice
25 p0083 A80-19844

Deep space network feasibility study of terminating Southern California Edison electrical service to Goldstone --- cost analysis of electric power supplies and waste energy utilization
25 p0091 N80-10263

Power supply requirements for a tokamak fusion reactor
[ANL/FPP/TM-119]
25 p0104 N80-10918

Demand management demonstration project. Stage 1: Development of residential load characteristics. Stage 4: Demonstration of residential incremental cost pricing implemented by time-of-day metering
[HCP/B8072-01]
25 p0118 N80-11941

Feasibility of compressed air energy storage as a peak shaving technique in California, Volume 2
[SAN-1331-T1]
25 p0174 N80-15596

ELECTRIC POWER TRANSMISSION

Energy analysis of the basic materials utilized in electric power transmission systems
[HCP/T5043-01]
25 p0157 N80-14510

Environmental development plan: Electric Energy Systems
[DOE/EDP-0038]
25 p0179 N80-15669

ELECTRIC SWITCHES

Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment --- design of a gas pipeline station control system and a railway switch car
[AD-A074885]
25 p0182 N80-16022

ELECTRICAL FAULTS

Power loss in photovoltaic arrays due to mismatch in cell characteristics
25 p0028 A80-12815

Optimization of multi-layer front-contact grid patterns for solar cells
25 p0028 A80-12816

ELECTRICAL INSULATION

Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779]
25 p0170 N80-15346

ELECTRICAL MEASUREMENT

Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers
25 p0046 A80-16745

Measurements of minority-carrier diffusion length in heterojunction solar cells
25 p0086 A80-20717

Measurement techniques for high-power semiconductor materials and devices: --- application to energy technologies
[PB-298574/5]
25 p0121 N80-12300

Description of the MIT/Lincoln Laboratory photovoltaic systems test facility
[COO-4094-41]
25 p0178 N80-15638

ELECTRICAL PROPERTIES

The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862

Computer modelling of electrically parallel arrays of sodium-sulphur cells
25 p0013 A80-11865

Some aspects of sodium-sulphur batteries
25 p0013 A80-11866

Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747

Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762

GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774

Influence of the loading factor on the performance characteristics of series MHD generators
25 p0061 A80-18137

Characteristics of series channels with a diminishing electrode-commutation angle in the transition section --- MHD generators
25 p0061 A80-18139

ELECTRICITY

The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436

Fuel choice and aggregate energy demand in the commercial sector --- electricity, natural gas, and fuel oil
[ORNL/CON-27]
25 p0126 N80-12580

A regional approach to forecasting electric energy requirements for environmental assessments
25 p0130 N80-12619

Cogeneration opportunities --- conferences
[CONF-7806118]
25 p0145 N80-13681

ELECTROCATALYSTS

Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861

ELECTROCHEMICAL CELLS

Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839

Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848

Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854

Heat generation in Li/SOCl2 cells
25 p0012 A80-11855

Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856

Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857

Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858

The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862

Electrochemical storage of photovoltaic solar energy
25 p0025 A80-12757

Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147

An electrochemical heat engine for direct solar energy conversion
25 p0061 A80-18131

Photoelectrochemistry and heterogeneous photocatalysis at semiconductors
25 p0073 A80-18750

Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage
25 p0084 A80-20274

Multi-year plan for thermal and mechanical energy storage program
[DOE/ET-0109]
25 p0142 N80-13658

ELECTROCHEMICAL OXIDATION

The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146

ELECTROCHEMISTRY

Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856

Night storage and backup generation with electrochemical engines --- study of electric generators for electrochemical engines using photovoltaic energy conversion
[LA-UR-78-1149]
25 p0113 N80-11596

On the properties of a fuel cell electrolyte
[AD-A072864] 25 p0123 N80-12554
Solid electrolyte fuel cell for electric power generation --- nonaqueous electrolyte fuel cells development for electric power plants
[BNL-26238] 25 p0158 N80-14522

ELECTROCONDUCTIVITY
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997

ELECTRODEPOSITION
Cadmium electrodes with improved surface characteristics for alkaline storage batteries
25 p0009 A80-11838
Selective black nickel coatings on zinc surfaces by chemical conversion --- for high solar energy absorption
25 p0060 A80-18126
Low cost solar cells based on amorphous silicon electrodeposited from organic solvents
[SAN-0113-T3] 25 p0145 N80-13678

ELECTRODES
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
Cadmium electrodes with improved surface characteristics for alkaline storage batteries
25 p0009 A80-11838
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842
Zinc-bromine battery studies
25 p0010 A80-11845
Recent advances in zinc-bromine batteries
25 p0010 A80-11846
Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848
Utility fuel cells for Sweden
25 p0011 A80-11852
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857
Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343
Photoelectrochemistry and heterogeneous photocatalysis at semiconductors
25 p0073 A80-18750
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
[CONF-781063-2] 25 p0115 N80-11615

ELECTRODYNAMICS
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core
25 p0083 A80-20066
User's manual for the magnetohydrodynamic generator channel code, MHDCHN
[SAND-78-1260] 25 p0132 N80-12894

ELECTROLYSIS
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195
Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings
25 p0041 A80-15976
Water electrolysis --- for hydrogen production
25 p0052 A80-17576
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665
Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401
High temperature electrolysis --- synthetic fuel production
[BNL-26331] 25 p0167 N80-15227

ELECTROLYTES
Development of silver-hydrogen cells
25 p0010 A80-11843
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862
Water electrolysis --- for hydrogen production
25 p0052 A80-17576
Principles of photoelectrochemical solar energy conversion
25 p0074 A80-18990
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
[CONF-781063-2] 25 p0115 N80-11615
On the properties of a fuel cell electrolyte
[AD-A072864] 25 p0123 N80-12554
Distribution and movement of electrolyte in fuel cells and batteries
25 p0138 N80-13619

ELECTROLYTIC CELLS
Lead oxides-lithium cells
25 p0012 A80-11859
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862
GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343
Photogalvanic cells
25 p0073 A80-18749
Lithium inorganic electrolyte battery development
[AD-A073858] 25 p0157 N80-14505
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614

ELECTROMAGNETIC ABSORPTION
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871

ELECTROMAGNETIC FIELDS
Calculation of the low-frequency electromagnetic field of MHD machines encapsulated in a common screening shell
25 p0030 A80-12896
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138

ELECTROMAGNETIC PUMPS
Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

ELECTROMAGNETIC RADIATION
Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials
25 p0020 A80-12311

ELECTROMAGNETS
Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004

ELECTROMECHANICAL DEVICES
Change in rate of conducting-piston motion and the characteristics of field-diffusion processes in a linear electromechanical energy converter
25 p0083 A80-20069
Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
ELECTRON BEAMS
Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas
25 p0007 A80-11612
Developments in Sandia Laboratories particle beam fusion programme
25 p0057 A80-17867
Pulsed power for fusion
[SAND-79-0933C] 25 p0161 N80-15908
ELECTRON IRRADIATION
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564
ELECTRON SCATTERING
Steady-state currents driven by collisionally damped lower-hybrid waves --- in plasma
25 p0084 A80-20157
ELECTRONIC CONTROL
Vehicle emissions control and its effect on engine development
25 p0037 A80-14708
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617
ELECTROPLATING
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857
Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788
ELECTROSTATIC WAVES
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
EMERGENCIES
Standby conservation plan no. 2: Emergency building temperature restrictions. Authorities: Need, rationale, operation
[DOE/ERA-0048] 25 p0126 N80-12582
EMISSION SPECTRA
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964
Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740
ENDOTHERMIC REACTIONS
Demonstration of a nitrogen based carburizing atmosphere: Energy consumption of the endothermic generator
[CONS/5058-T1] 25 p0173 N80-15591
ENERGY ABSORPTION FILMS
The scope of effective medium theory for fine metal particle solar absorbers
25 p0029 A80-12835
Flat-plate solar collector materials
25 p0035 A80-14409
Selective black nickel coatings on zinc surfaces by chemical conversion --- for high solar energy absorption
25 p0060 A80-18126
A simplified technique for comparing the effectiveness of collector absorber coatings
25 p0061 A80-18133
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540
Thermal degradation of a black chrome solar selective absorber coating: Short term
[LBL-8857] 25 p0161 N80-14545
Design of photovoltaic systems for residential applications in the United States
[SAND-78-2186C] 25 p0171 N80-15566
Status of the US Department of Energy photovoltaic concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578
Flywheel energy storage interface unit for photovoltaic applications
[COO-4094-44] 25 p0175 N80-15609
ENERGY BANDS
Analysis and evaluation of isotype heterojunction solar cells
25 p0087 A80-20734
ENERGY CONSERVATION
Energy conservation through recycling
25 p0003 A80-10842
Semiconductor alternating-current motor drives and energy conservation
25 p0034 A80-13861
Energy conservation - Aerodynamic drag reduction of intercity buses
25 p0050 A80-17227
An evaluation of thermal energy storage for residential air conditioning applications
[ASME PAPER 79-WA/HT-31] 25 p0071 A80-18631
Aircraft Energy Efficiency (ACEE) status report
25 p0091 N80-10206
Another look at energy conservation
[LBL-7093] 25 p0097 N80-10611
Energy conservation and the environment: conflict or complement
[LBL-7882] 25 p0098 N80-10621
Department of Energy workshops on industrial energy conservation reporting
[DOE/CS-1830-T3] 25 p0099 N80-10635
Aircraft fuel. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0764/5] 25 p0102 N80-10668
Energy saving strategies for federal procurement
[PB-296969/9] 25 p0103 N80-10678
Energy initiatives of the 95th Congress
[GPO-42-797] 25 p0109 N80-11557
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559
Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576
Implementing energy conservation strategies in energy materials transport: U. S. Department of Energy and other government agency policy-making decisions
[ANL/EES-TM-32] 25 p0111 N80-11577
Standby conservation plan no. 2: Emergency building temperature restrictions. Economic analysis
[DOE/ERA-0047] 25 p0112 N80-11593
Analysis of financial programs for energy conservation: Market simulation (penetration) model
[HCP/M8662-1] 25 p0114 N80-11606
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 3: Policy barriers and investment decisions in industry
[LBL-7896-PT-3] 25 p0114 N80-11614
National environmental/energy workshop assessment, phase 3. Energy programs --- directory of courses available
[PB-298587/7] 25 p0117 N80-11634
Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1
[GEC-41-481] 25 p0122 N80-12550
Standby conservation plan no. 2: Emergency building temperature restrictions. Authorities: Need, rationale, operation
[DOE/ERA-0048] 25 p0126 N80-12582
Constraints on energy conservation
[ORAU/IEA-78-17(M)] 25 p0127 N80-12594
Fundamental aspects of energy conservation policy
[ORAU/IEA-78-20(M)] 25 p0127 N80-12595
Energy conservation technology education program
[HCP/M2165] 25 p0129 N80-12606
National Energy Act of 1978: A regional assessment
[PB-296479/9] 25 p0130 N80-12615
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653

Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707
Highlights of the energy technology programs
[BNL-50959] 25 p0157 N80-14512
Report to the Congress on the coordination of
Federal energy conservation programs involving
state and local governments
[DOE/TIC-10127] 25 p0157 N80-14515
Energy conservation in the US economy from
increased recycle of obsolete steel scrap
[COO-2893-10] 25 p0159 N80-14524
Energy Policy and Conservation Act (Public Law
94-163) as amended by the National Energy
Conservation Policy Act (Public Law 95-619).
Title 10: Energy. Chapter 2: Department of
Energy. Subchapter D: Energy Conservation.
Part 430: Energy conservation program for
consumer products
[DOE/CS-0056] 25 p0163 N80-14567
Impact of new instrumentation on advanced turbine
research
[NASA-TM-79301] 25 p0166 N80-15133
Energy optimal use of waste paper
[COO-2893-9] 25 p0174 N80-15595
National program plan for passive and hybrid solar
heating and cooling
[DOE/CS-0089] 25 p0174 N80-15598
Economic impacts of energy conservation and
renewable energy sources
[UCRL-15087] 25 p0177 N80-15633
Energy conservation through point source recycle
with high temperature hyperfiltration ---
textile industry
[PB-299183/4] 25 p0180 N80-15688

ENERGY CONSUMPTION

Models of worldwide energy demand and consumption
25 p0002 A80-10228
Review of scenarios of future U.S. energy use
25 p0009 A80-11832
Volt-second consumption during the start-up phase
of PLT
25 p0040 A80-15532
Global perspectives and options for long-range
energy strategies
25 p0048 A80-17130
On the substitution of petroleum by other energy
sources - Using the energy economics of West
Germany as an example
25 p0074 A80-19000
Residential heat loss mapping of Farmington, New
Mexico using airborne thermal scanning
25 p0084 A80-20242
Another look at energy conservation
[LBL-7893] 25 p0097 N80-10611
National energy plan 2
[DOE/TIC-10109] 25 p0097 N80-10618
Energy transition in California
[UCRL-15003] 25 p0097 N80-10619
Energy supply and demand in the midterm: 1985,
1990, and 1995
[DOE/EIA-0102/52] 25 p0097 N80-10620
The Building Loads Analysis System Thermodynamics
(BLAST) program, version 2.0 Input booklet ---
for predicting energy consumption based on
structural size and meteorological data
[AD-A072435] 25 p0107 N80-11259
Residential sector energy forecasts, national
level for 1978-electricity, natural gas, number
two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601
Demand management demonstration project. Stage 1:
Development of residential load characteristics.
Stage 4: Demonstration of residential
incremental cost pricing implemented by
time-of-day metering
[HCP/B8672-01] 25 p0116 N80-11941
Constraints on energy conservation
[ORAU/IEA-78-17(M)] 25 p0127 N80-12594
Fundamental aspects of energy conservation policy
[ORAU/IEA-78-20(M)] 25 p0127 N80-12595
New hybrid 1971 energy intensities, part 1 ---
computation of domestic energy consumption
versus economic factors
[COO-4628-4-PT-1] 25 p0158 N80-14516
US energy flow in 1978
25 p0158 N80-14517
Mission analysis for the Federal fuels from
biomass program. Volume 3: Feedstock
availability
[SAN-0115-T1] 25 p0168 N80-15276
Measurement of energy to heat houses: Initial study
[PB-299448/2] 25 p0170 N80-15304
Demonstration of a nitrogen based carburizing
atmosphere: Energy consumption of the
endothermic generator
[CONS/5058-T1] 25 p0173 N80-15591
Energy supply and demand in the short term: 1979
and 1980
[DOE/EIA-0184/4] 25 p0174 N80-15593
International energy assessment
[DOE/EIA-0184/1] 25 p0174 N80-15594
Federal Energy Data System (FEDS) statistical
summary update
[DOE/EIA-0192] 25 p0177 N80-15630
Energy demand in the developing countries
[DOE/EIA-0183/10] 25 p0177 N80-15631

ENERGY CONVERSION

Coal conversion technologies - Some health and
environmental effects
25 p0006 A80-11369
Annual review of energy. Volume 4 --- Book
25 p0008 A80-11826
The conversion of ethylene glycol with air in
alkaline fuel cells
25 p0011 A80-11850
Survey of MHD plant applications
25 p0015 A80-11972
Study of photochemical processes in the
ferrous-thionine system --- photogalvanic effect
in dye redox systems for chemical energy
conversion
25 p0027 A80-12783
Measurements on a 15 kW wind energy conversion
system
25 p0039 A80-15329
Modeling and experimental analysis of a fluidic
generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705
Global options for short-range alternative energy
strategies
25 p0048 A80-17129
Are large concentration of atomic H storable in
tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728
Change in rate of conducting-piston motion and the
characteristics of field-diffusion processes in
a linear electromechanical energy converter
25 p0083 A80-20069
Coal conversion systems: Technical data book
[HCP/T2286-01] 25 p0093 N80-10392
Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400
Dynamics and control: Energy conversion,
delivery, and demand analysis
[BNL-26045] 25 p0099 N80-10633
Effect of mechanical energy storage systems on the
characteristics of electric vehicles
[UCRL-82710] 25 p0102 N80-10664
Waste Heat Utilization: Proceedings of 1978
Engineering Foundation Conference
[CONF-7808102] 25 p0102 N80-10665
Wind energy systems: Program summary
[DOE/ET-0093] 25 p0111 N80-11578
Conversion of radiant energy into chemical energy
[UCRL-TRANS-11427] 25 p0114 N80-11609
Characterization of coal-derived liquids and other
fossil fuel related materials employing mass
spectrometry. Mass spectrometry and
fossil-energy conversion technology: A review
[FE-2537-7] 25 p0120 N80-12198
Photoelectrochemical conversion of optical energy
to electricity and fuels
[AD-A072861] 25 p0123 N80-12556
Commercial application of molten carbonate fuel
cell system
[CONF-790213-4] 25 p0123 N80-12557
Commercialization task force for high Btu
gasification
[TID-28849] 25 p0135 N80-13286
Research and development of an advanced process
for conversion of coal to synthetic gasoline and
other distillate motor fuels
[FE-1800-30] 25 p0135 N80-13291
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296

Analysis of binary thermodynamic cycles for a moderately low-temperature geothermal resource
[TREE-1365] 25 p0139 N80-13627
Solar thermal electric plants in hydroelectric grid --- Lower Colorado region
[DOE/SF/10505-1] 25 p0143 N80-13663
Conceptual designs for two reject heat systems for a Brayton closed-cycle converter
[LA-7821-MS] 25 p0144 N80-13677
Fossil energy program. 1. Mining research and development: Coal preparation and analysis
[IS-4655] 25 p0145 N80-13679
Critical review and assessment of environmental and safety problems in hydrogen energy systems
[LA-7820-PR] 25 p0145 N80-13690
Environmental development plan: Wind energy conversion
[DOE/EDP-0030] 25 p0147 N80-13701
A cesium TELEC experiment at Lewis Research Center
[NASA-CR-159729] 25 p0151 N80-14386
A probabilistic study of wind-electric conversion systems from the point of view of reliability and capacity credit
25 p0153 N80-14475
Highlights of the energy technology programs
[BNL-50959] 25 p0157 N80-14512
Proceedings of the Thermal Energy Storage in Aquifers Workshop
[LBL-8431] 25 p0160 N80-14533
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574
Environmental options for coal use
[LA-UR-79-1393] 25 p0165 N80-14584
Conversion of cellulosic and waste polymer material to gasoline
[COO-2982-38] 25 p0169 N80-15291
Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation
[DOE/RL-90476-13] 25 p0169 N80-15293
Novel scheme for making cheap electricity with nuclear energy
[UCID-18153-REV-1] 25 p0171 N80-15564
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576
Heat pump centered integrated community energy systems: System development
[ANL/ICES-TM-26] 25 p0173 N80-15589
Utilization of waste heat from Federal facilities
[ORO-5523-T1] 25 p0173 N80-15590
Turbomachinery options for an underground pumped hydroelectric storage plant
[CONF-790803-50] 25 p0177 N80-15629
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-48] 25 p0178 N80-15635

ENERGY CONVERSION EFFICIENCY

Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524
Second-law analysis of solar-thermal processes
25 p0003 A80-10843
The optimal design of solar cell grid lines
25 p0005 A80-11335
Concentration ratio and efficiency in thermophotovoltaics
25 p0005 A80-11336
Derivation of method for predicting long term average energy delivery of solar collectors
25 p0005 A80-11339
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
Solar panels exposed to cosmic rays
25 p0008 A80-11825
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841
Utility fuel cells for Sweden
25 p0011 A80-11852
Economic performance - Evaluations for solar energy
25 p0014 A80-11956
Techniques for evaluation of advanced cogeneration technologies
25 p0014 A80-11957
Coal to electricity - Integrated gasification combined cycle
25 p0015 A80-11971
Supply, harvesting and nature of forest biomass as a fuel
25 p0017 A80-11982
Commercial building and industrial applications for solar energy
25 p0017 A80-11985
Near-term prospects for solar industrial process heat
25 p0018 A80-11988
Improvements in the performance of a low cost thin film solar cell
25 p0018 A80-11989
Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields
25 p0019 A80-12310
A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis
25 p0021 A80-12433
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
A high performance porous flat-plate solar collector
25 p0021 A80-12438
Energy meter for solar air systems
25 p0022 A80-12609
Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector
25 p0022 A80-12627
Studies of photogalvanic cells
25 p0023 A80-12743
Effect of boosters on the performance of flat plate collector
25 p0023 A80-12744
Solar energy flat plate collectors - Optimization of air gap
25 p0023 A80-12745
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748
Storage of solar heat by solid-liquid phase change
25 p0024 A80-12755
Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
Effect of concentrated sunlight on the various parameters of the p-n junction solar cell
25 p0025 A80-12764
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771
Efficiency of quantum-utilizing solar energy converters in the absence of intraband thermalization
25 p0030 A80-12838
The role of coal gasification and liquefaction in improving the efficiency of energy use - Comparative end use efficiency of the use of coal: Substitute natural gas and other gases versus electric power production
25 p0030 A80-12941
A pistonless Stirling engine - The traveling wave heat engine
25 p0031 A80-13011
The possibilities of increasing gas turbine efficiency
25 p0032 A80-13024
Gasohol - Does it or doesn't it produce positive net energy
25 p0034 A80-13863

Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
25 p0035 A80-13986
Some problems with variable operation of an MHD generator
25 p0035 A80-14530
Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells
25 p0035 A80-14592
Solar collectors as energy converters
25 p0036 A80-14670
Solar cell spectral response characterization
25 p0037 A80-14685
Efficient indium tin oxide/polycrystalline silicon solar cells
25 p0039 A80-15136
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141
Calculation of steam generation with parabolic solar collectors
25 p0039 A80-15328
The Kirsten rotor as a wind turbine
25 p0039 A80-15330
Investigation of absorptive and radiative characteristics of an ideal selective surface --- for solar energy absorbers
25 p0044 A80-16632
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786
Efficiency improvements in bioenergy conversion systems
25 p0047 A80-16995
The relative value of energy derived from municipal refuse
25 p0051 A80-17352
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857
Developments in Sandia Laboratories particle beam fusion programme
25 p0057 A80-17867
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
Analysis of systems for the generation of electricity from solar radiation
25 p0060 A80-18124
Solar heating system performance estimation using sinusoidal inputs
25 p0061 A80-18130
Performance and analysis of a 'series' heat pump-assisted solar heated residence in Madison, Wisconsin
25 p0061 A80-18132
Linear synchronous motor development for urban and rapid transit systems
25 p0062 A80-18167
Power conversion efficiency monitoring in photoelectrochemical and other solar cells
25 p0062 A80-18214
Relating computer simulation studies with interface state measurements on MIS solar cells
25 p0062 A80-18231
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[AIAA PAPER 80-0023] 25 p0063 A80-18243
Helium penetration in evacuated solar collectors - Theory and effect on their performance
[ASME PAPER 79-WA/SOL-17] 25 p0066 A80-18563
Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector
[ASME PAPER 79-WA/SOL-3] 25 p0067 A80-18570
Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation
[ASME PAPER 79-WA/SOL-2] 25 p0067 A80-18571
Optimization and comparison strategies for solar energy systems
[ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573
SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants
[ASME PAPER 79-WA/SOL-12] 25 p0068 A80-18579
SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators
[ASME PAPER 79-WA/SOL-13] 25 p0068 A80-18581
Analysis of convective heat loss from the receiver of solar power plants
[ASME PAPER 79-WA/HT-36] 25 p0068 A80-18582
A comparison of test results for flat-plate water-heating solar collectors using the BSE and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585
Performance of heat pumps at elevated evaporating temperatures - With application to solar input
[ASME PAPER 79-WA/SOL-19] 25 p0069 A80-18587
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600
Blanket and power conversion system of NUWMAK --- tokamak reactor
25 p0081 A80-19658
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665
New concept for a system suitable for solar simulation
25 p0083 A80-19976
Open cycle air turbine solar thermal power system
25 p0083 A80-19989
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core
25 p0083 A80-20066
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141
OTEC - A comprehensive energy analysis
25 p0085 A80-20456
The effect of fluorescent wavelength shifting on solar cell spectral response
25 p0086 A80-20715
Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells
25 p0086 A80-20716
Analysis and evaluation of isotype heterojunction solar cells
25 p0087 A80-20734
NASA-Lewis closed-cycle magnetohydrodynamics plant analysis
[NASA-TM-79249] 25 p0095 N80-10595
Sensitivity study of Brayton cycle power plant performance
[SAND-78-8020] 25 p0098 N80-10626
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561
Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model
[DM-26] 25 p0116 N80-11631
Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558
Systems Analysis and testing (SAT) program
[SERI/PR-35-313] 25 p0124 N80-12565
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CCNP-790520-7] 25 p0134 N80-13274
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377
Theoretical analysis of multi-cell, high efficiency broad spectral sensitivity solar cells
25 p0138 N80-13617
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661
Evaluation of combined photovoltaic/thermal collectors
[COO-4577-8] 25 p0143 N80-13665

Materials for solar thermal conversion
[COO-4557-1] 25 p0143 N80-13670
Self-reconfiguring solar cell system
[NASA-CASE-LEW-12586-1] 25 p0153 N80-14472
Photovoltaic energy conversion in polymer films
25 p0154 N80-14477
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Space solar cells: High efficiency and radiation damage
[NASA-TM-81387] 25 p0170 N80-15554
Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253] 25 p0171 N80-15562

ENERGY DISSIPATION
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
LASL toroidal reversed-field pinch programme
25 p0054 A80-17609
Energy saving in injection molding
[NEL-662] 25 p0136 N80-13318

ENERGY LEVELS
Principles of photoelectrochemical solar energy conversion
25 p0074 A80-18990

ENERGY POLICY
Models of worldwide energy demand and consumption
25 p0002 A80-10228
Some solar energy programmes in the United Nations system
25 p0006 A80-11342
Soft and hard energy paths - The roads not taken --- political, technical and philosophical aspects of energy problem
25 p0007 A80-11400
Annual review of energy. Volume 4 --- Book
25 p0008 A80-11826
United States energy alternatives to 2010 and beyond - The CONAES study
25 p0008 A80-11827
Frontiers in energy demand modeling
25 p0009 A80-11830
Assessing energy policy models - Current state and future directions
25 p0009 A80-11831
Review of scenarios of future U.S. energy use
25 p0009 A80-11832
Hydrogen - A means of integrating competing technology into a unified energy system
25 p0014 A80-11955
The prospect for anthracite as a national energy resource
25 p0014 A80-11960
The reality of on-site fuel cells
25 p0016 A80-11973
Economics/reliability trade-offs in materials for various coal conversion and utilization processes
25 p0016 A80-11975
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978
Development of renewable energy sources in the United Kingdom
25 p0017 A80-11980
Source, supply and nature of municipal and industrial waste as a fuel
25 p0017 A80-11983
Near-term prospects for solar industrial process heat
25 p0018 A80-11988
A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis
25 p0021 A80-12433
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
Programme and progress of DST sponsored solar photovoltaic work in India
25 p0025 A80-12760
Industrial applications of solar energy in India
25 p0027 A80-12780
The financing problems of Europe's gas industry
25 p0032 A80-13174
The European economic community's policy concerning natural gas, coal and new sources of energy
25 p0032 A80-13175
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195
A review of the U.S. wind energy programme
25 p0042 A80-16083
Prospects - A social context for natural science --- global energy resource review
25 p0044 A80-16651
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979
25 p0047 A80-17126
Exploring alternative energy strategies
25 p0047 A80-17127
Global options for short-range alternative energy strategies
25 p0048 A80-17129
Global perspectives and options for long-range energy strategies
25 p0048 A80-17130
Waves, currents, tides - Problems and prospects
25 p0049 A80-17134
Prospects of future geothermal energy development
25 p0049 A80-17138
The present status of coal gasification following the 14th World Gas Congress Toronto 1979
25 p0050 A80-17222
The policy of the European Economic Community in the field of energy savings
25 p0050 A80-17223
Screening evaluation of electric power cycles integrated with coal gasification plants
[ASME PAPER 79-WA/ENER-4] 25 p0071 A80-18644
On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example
25 p0074 A80-19000
The United Nations' approach to geothermal resource assessment
25 p0076 A80-19207
Prospects for the near-term commercialization of shale oil in the United States
25 p0078 A80-19474
Supply and demand in input-output analysis for energy modeling
25 p0088 A80-20890
Applications analysis of fixed site hydrogen storage
[SAND-78-8272] 25 p0092 N80-10384
Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
[FE-2447-13] 25 p0093 N80-10388
Near term potential of wood as a fuel
[HCP/C4101] 25 p0093 N80-10389
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395
Biomass energy enhancement: A report to the President's Council on Environmental Quality --- solar heat gasification
[PB-296624/0] 25 p0094 N80-10396
Steam turbines --- thermoelectric power generation
[ANL/CES/TE-78-7] 25 p0095 N80-10502
Quality assurance in alternative energy sources
[RHO-SA-107] 25 p0095 N80-10504
The first small power system experiment, Phase 1: Engineering experiment no. 1 --- solar thermal electric power plants
[NASA-CR-162417] 25 p0095 N80-10596
Passive solar energy programs and plans
[GPC-36-211] 25 p0095 N80-10599
Ocmulgee national monument visitor center solar heating and cooling system design review data
[NASA-CR-150706] 25 p0096 N80-10601
Solar heating and cooling systems design and development
[NASA-CR-150618] 25 p0096 N80-10602
Economic structure, aggregate production functions and the demand for energy as an intermediate product: A preliminary analysis
[DOE/EIA-0103/8] 25 p0096 N80-10607

Dispersed power systems and total energy
[SAND-78-2006C] 25 p0096 N80-10608
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0097 N80-10609
EPRI new energy resources department strategy paper
[EPRI-ER-979] 25 p0097 N80-10610
Another look at energy conservation
[LBL-7893] 25 p0097 N80-10611
Summary report of the Solar Reflective Materials Technology Workshop
[PNL-2763] 25 p0097 N80-10613
National energy plan 2
[DOE/TIC-10109] 25 p0097 N80-10618
Energy transition in California
[UCRL-15003] 25 p0097 N80-10619
Energy conservation and the environment: conflict or complement
[LBL-7882] 25 p0098 N80-10621
Solar assisted heat pump overview and summary of in-house research
[BNL-24911] 25 p0098 N80-10624
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625
Survey of solar thermal energy storage subsystems for thermal/electric applications
[ORNL/TM-5758] 25 p0098 N80-10627
Comprehensive environment, health, and safety program report, FY 1978
[DOE/EV-0035] 25 p0098 N80-10630
Soviet energy balances
[RAND/R-2257-DOE] 25 p0099 N80-10634
Department of Energy workshops on industrial energy conservation reporting
[DOE/CS-1830-T3] 25 p0099 N80-10635
Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices
[RAND/R-2335-DOE] 25 p0099 N80-10636
Summary of major energy legislation of the 95th Congress
[DOE/TIC-10118] 25 p0100 N80-10644
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650
Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1] 25 p0101 N80-10652
Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653
Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658
Solar energy system performance evaluation: A-Frame Industries, single family dwelling, Kaneohe, Hawaii
[SOLAR/1010-78/14] 25 p0101 N80-10659
Natural gas reserves estimates: A good federal program emerging, but problems and duplications persist
[PB-296628/2] 25 p0103 N80-10679
Managerial plan: Executive order 12003 and the National Energy Act
[DOE/TIC-10067] 25 p0104 N80-10965
Dimensions/NBS, volume 63, no. 6, June 1979
[PB-297636/9] 25 p0105 N80-10975
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168
Combustion of low grade coal
[ICTIS/TR-02] 25 p0106 N80-11179
Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246
Biofuels: A survey
[EPRI-ER-746-SR] 25 p0107 N80-11250
National Gas Survey report to the Federal Energy Regulatory Commission by the Supply-Technical Advisory Task Force on nonconventional natural gas resources
[DOE/FERC-0010] 25 p0107 N80-11251
Unconventional circuits for static voltage transformers
[BMFT-FE-T-78-26] 25 p0107 N80-11368
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544
MEDEE 2: A model for long term energy demand evaluation
[IIASA-RR-78-17] 25 p0109 N80-11554
Solar commercialization
[GPO-43-586] 25 p0109 N80-11556
Energy initiatives of the 95th Congress
[GPO-42-797] 25 p0109 N80-11557
Heat pump centered integrated community energy systems: System development
[ANL/ICES-TM-27] 25 p0110 N80-11571
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
Implementing energy conservation strategies in energy materials transport: U. S. Department of Energy and other government agency policy-making decisions
[ANL/EES-TM-32] 25 p0111 N80-11577
Wind energy systems: Program summary
[DOE/ET-0093] 25 p0111 N80-11578
Geothermal energy for industrial application
[LBL-8919] 25 p0111 N80-11579
Concentrating solar collector test results Collector Module Test Facility (CMTF)
[SAND-78-0977] 25 p0111 N80-11580
Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11581
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
Regional reference energy systems: Electric utility applications
[BNL-50962] 25 p0111 N80-11585
DOE heat pump centered integrated community energy systems project
[CONF-790362-1] 25 p0112 N80-11586
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590
Standby conservation plan no. 2: Emergency building temperature restrictions. Economic analysis
[DOE/ERA-0047] 25 p0112 N80-11593
Residential sector energy forecasts, national level for 1978-electricity, natural gas, number two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601
Status of information for consumers of small wind energy systems
[SERI/TP-51-158] 25 p0113 N80-11602
Analysis of financial programs for energy conservation: Market simulation (penetration) model
[HCP/M8662-1] 25 p0114 N80-11606
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 3: Policy barriers and investment decisions in industry
[LBL-7896-PT-3] 25 p0114 N80-11614
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
International coal technology summary document
[DOE/PE-0010] 25 p0115 N80-11621
Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings
[BMFT-FB-T-78-48] 25 p0116 N80-11630
Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model
[DM-26] 25 p0116 N80-11631
Solar energy with latent heat storage: Fundamentals and applications
[ASSA-10/1978] 25 p0116 N80-11632

ENERGY POLICY CONTD

Solar access law. Protecting access to sunlight for solar energy systems
[PB-296532/5] 25 p0117 N80-11633
National environmental/energy workforce assessment, phase 3. Air programs --- bibliography
[PB-298580/2] 25 p0117 N80-11670
Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891
The future role of hydrogen fuel in an electrical society
[UTIAS-241] 25 p0119 N80-12189
Characterization and combustion of SRC 2 fuel oil
[EPRI-FP-1028] 25 p0119 N80-12192
Environmental aspects of alternative fuels utilization for highway vehicles
[UCRL-81841] 25 p0120 N80-12201
Shale oil: US and world resources and prospects for near-term commercialization in the United States
[ORAU/IEA-79-8(R)] 25 p0122 N80-12544
Foam solar sea power: A physical investigation
25 p0122 N80-12548
Effect of operating temperatures on the cost of energy from solar thermal electric power plants
[SAND-79-0801] 25 p0124 N80-12563
Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566
The great adventure: A report on the 10 regional public hearings on solar energy for the domestic policy review
[HCP/U6354-01] 25 p0124 N80-12567
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6605] 25 p0125 N80-12568
Fuel choice and aggregate energy demand in the commercial sector --- electricity, natural gas, and fuel oil
[ORNL/CCN-27] 25 p0126 N80-12580
Standby conservation plan no. 2: Emergency building temperature restrictions. Authorities: Need, rationale, operation
[DOE/ERA-0048] 25 p0126 N80-12582
United States magnetic fusion energy program
[DOE/ET-0072] 25 p0126 N80-12583
October 1978 environmental data for sites in the National Solar Data Network
[SOLAR/0010-78-10] 25 p0126 N80-12585
Residential on site solar heating systems. A project evaluation using the capital asset pricing model
[LBL-8298] 25 p0126 N80-12588
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12589
Constraints on energy conservation
[ORAU/IEA-78-17(M)] 25 p0127 N80-12594
Fundamental aspects of energy conservation policy
[ORAU/IEA-78-20(M)] 25 p0127 N80-12595
Regional economic/demographic projections for energy policy analysis
[ORNL/TM-6668] 25 p0128 N80-12599
Solar Heating And Cooling Of Buildings (SHACOB) Commercialization report. Part B: Analysis of market development, volume 2
[DOE/TIC-10071] 25 p0128 N80-12603
Effects of energy policy on industry
[USFFE-1978-8] 25 p0129 N80-12604
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605
Energy conservation technology education program
[HCP/M2165] 25 p0129 N80-12606
Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1] 25 p0130 N80-12613
National Energy Act of 1978: A regional assessment
[PB-296479/9] 25 p0130 N80-12615
Environmental aspects of alternative energy technologies for California
[UCRL-15002] 25 p0131 N80-12628
Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677
National energy act of 1978: Far western perspective. A study for the US Department of Energy, Federal Region 9
[UCID-17944-REV-1] 25 p0132 N80-12955

Environmental analysis of synthetic liquid fuels --- shale oil, coal liquefaction, and biomass production of ethanol
[DOE/EV-0044] 25 p0134 N80-13279
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-46] 25 p0134 N80-13280
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287
Underground coal conversion. Program description
[DOE/ET-0100] 25 p0136 N80-13293
Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
[CONF-790630-9] 25 p0136 N80-13295
Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0136 N80-13297
Energy saving in injection molding
[NEL-662] 25 p0136 N80-13318
Condensation and evaporation heat transfer with low-boiling temperature fluids --- for ocean thermal and geothermal energy conversion
[CONF-790539-1] 25 p0137 N80-13412
Geopressure energy resource evaluation --- Texas and Louisiana
[ORNL/PPA-79/2] 25 p0138 N80-13605
Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607
World Energy Data System (WENDS). Volume 7: Nuclear facility profiles, AG-CH
[ANL-PMS-79-2-VOL-7] 25 p0139 N80-13629
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6934] 25 p0139 N80-13631
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633
Energy policy and decision analysis; new concepts and mechanisms
[LA-7909-MS] 25 p0140 N80-13634
Systems engineering for power, program report
[DOE/ET-0012/2-REV] 25 p0140 N80-13637
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
Solar thermal test facility heliostat development
[SAND-78-1177] 25 p0140 N80-13642
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644
Performance testing of the General Electric Engineering Prototype Collector
[SAND-79-0514] 25 p0141 N80-13645
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648
Review of the environment effects and benefits of selected solar energy technologies
[SERI/TP-53-114R] 25 p0141 N80-13649
Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650
Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651
Design, construction, and operation of the solar assisted heat pump ground coupled storage experiments at Brookhaven National Laboratory
[BNL-25908] 25 p0142 N80-13654
OTEC platform configuration and integration. Volume 1: Systems engineering and integration
[TID-29418] 25 p0142 N80-13655
OTEC thermal response report for Pacific plant ship, 5 to 10 deg N 90 to 95 deg W
[HCP/T2898-01/3] 25 p0142 N80-13656
Solar thermal power systems
[DOE/ET-0078/T1] 25 p0143 N80-13662

Solar thermal electric plants in hydroelectric grid --- Lower Colorado region
[DOE/SF/10505-1] 25 p0143 N80-13663
Fundamental economic issues in the development of small-scale hydro
[DOE/RA-23-216.00.0-02] 25 p0143 N80-13667
Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671
Trans-seasonal storage of solar energy: Innovative research program subtask --- underground storage
[COO-4546-3] 25 p0144 N80-13672
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
Low cost solar cells based on amorphous silicon electrodeposited from organic solvents
[SAN-0113-T3] 25 p0145 N80-13678
Fossil energy program. 1. Mining research and development: Coal preparation and analysis
[IS-4655] 25 p0145 N80-13679
Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680
Cogeneration opportunities --- conferences
[CONF-7806118] 25 p0145 N80-13681
Cost analysis of packed beds for thermal energy storage
[CAES-11] 25 p0145 N80-13687
Status of development, energy and economics aspects of alternative technologies --- energy policy and technology with respect to coal utilization
[CONF-790371-1] 25 p0145 N80-13689
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
[SAND-78-2163C] 25 p0146 N80-13693
OTEC power systems
[CONF-790444-2] 25 p0146 N80-13696
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697
Review of solar energy
[SERI/TR-54-066] 25 p0146 N80-13699
Solar central receiver prototype heliostat CDRL item B.D., volume 1
[SAN-1605/7-VOL-1] 25 p0146 N80-13700
Fossil energy program, 1. Mining research and development: Coal preparation and analysis
[IS-4703] 25 p0147 N80-13702
Solar heating and cooling research projects: A summary
[EPRI-ER-1095-SR] 25 p0147 N80-13703
Community heating and cooling systems
[CONF-790446-6] 25 p0147 N80-13706
Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707
Industrial applications of advanced energy systems
[CONF-790602-54] 25 p0147 N80-13708
OTEC platform configuration and integration, executive summary
[DOE/ET-4065/1] 25 p0147 N80-13711
OTEC platform configuration and integration, appendixes to volume 2
[DOE/ET-4065/1-VOL-2-APP] 25 p0147 N80-13713
OTEC platform configuration and integation. Volume 3: Project plan
[DOE/ET-4065/1-VOL-3] 25 p0148 N80-13714
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723
The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754
Newton's method for generalized equations and the PIES energy model
25 p0149 N80-13872
US program for the immobilization of high-level nuclear wastes
[DP-MS-79-2] 25 p0149 N80-13917
Fusion power program
[ANL/FPP-78-4] 25 p0149 N80-13941
Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263
Proceedings of the 1978 Coal Chemistry Workshop
[CONF-780372] 25 p0150 N80-14264
The solar in Federal buildings demonstration program
[PB-298535/6] 25 p0151 N80-14279
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482
A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484
Application of field-modulated generator systems to dispersed solar thermal electric generation
[NASA-CR-162536] 25 p0155 N80-14488
Results of thermal performance evaluation of the Owens-Illinois sunpack liquid solar collector at indoor conditions
[NASA-CR-161189] 25 p0156 N80-14500
Outlook for nuclear fission energy
[CONF-7811126-1] 25 p0157 N80-14509
Simulation approach for base-line energy-siting analysis
[CONF-790459-22] 25 p0157 N80-14511
Highlights of the energy technology programs
[BNL-50959] 25 p0157 N80-14512
Dynamic energy system optimization model --- study of computerized simulation domestic energy models
[EPRI-EA-1079] 25 p0157 N80-14514
Report to the Congress on the coordination of Federal energy conservation programs involving state and local governments
[DOE/TIC-10127] 25 p0157 N80-14515
New hybrid 1971 energy intensities, part 1 --- computation of domestic energy consumption versus economic factors
[COO-4628-4-PT-1] 25 p0158 N80-14516
Application of diffusion research to solar energy policy issues
[SERI/TR-51-194] 25 p0158 N80-14518
Implementation of state solar incentives: Land-use planning to ensure solar access
[SERI/TR-51-163] 25 p0158 N80-14519
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520
Energy conservation in the US economy from increased recycle of obsolete steel scrap
[COO-2893-10] 25 p0159 N80-14524
Definition and analysis of the barriers to the implementation of urban energy recovery systems
[ANL/CNSV/TM-2] 25 p0159 N80-14525
Non-tracking inflated cylindrical solar concentrator
[UCRL-82721] 25 p0159 N80-14528
Commercial solar augmented heat pump system
[EPRI-ER-1004] 25 p0160 N80-14537
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541
Geothermal energy: Program summary
[DOE/ET-0101] 25 p0161 N80-14542

Fifth Ocean Thermal Energy Conversion Conference,
volume 2, sections 4-5
[CONF-780236-P2] 25 p0162 N80-14553
Systems Studies for Central Solar Thermal Electric
[CONF-780383] 25 p0162 N80-14558
Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560
Photovoltaic incentives options
[HCP/CS-0023] 25 p0162 N80-14561
Overview of the Department of Energy's research,
development and demonstration program for the
recovery of energy and materials from urban waste
[CONF-790373-1] 25 p0163 N80-14562
Energy Policy and Conservation Act (Public Law
94-163) as amended by the National Energy
Conservation Policy Act (Public Law 95-619).
Title 10: Energy. Chapter 2: Department of
Energy. Subchapter D: Energy Conservation.
Part 430: Energy conservation program for
consumer products
[DOE/CS-0056] 25 p0163 N80-14567
Performance of residential solar heating and
cooling system with flat-plate and evacuated
tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Realistic sizing of residential solar heating and
cooling systems
[COO-2858-14] 25 p0163 N80-14569
Evaluation of fuel resources and requirements for
the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570
Proceedings of the DOE chemical/hydrogen energy
contractor review systems
[CONF-771131] 25 p0164 N80-14572
Commercializing solar heating: A national
strategy needed
[PB-297882/3] 25 p0164 N80-14575
Insolation models, data and algorithms
[SERI/TR-36-110] 25 p0165 N80-14617
Assessment of the applicability of the national
fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655
Distribution and classification of local
socio-economic impacts from energy development
[CONF-790481-1] 25 p0166 N80-14954
Mission analysis for the Federal fuels from
biomass program. Volume 3: Feedstock
availability
[SAN-0115-T1] 25 p0168 N80-15276
Production of sugarcane and tropical grasses as a
renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277
Report of the Alcohol Fuel Policy Review
[DOE/PE-0012] 25 p0169 N80-15290
Economic analysis of small scale bioconversion
units in New Mexico
[PB-301390/1] 25 p0169 N80-15298
Decentralized solar photovoltaic energy systems
[LA-7866-TASE] 25 p0171 N80-15565
Design of photovoltaic systems for residential
applications in the United States
[SAND-78-2186C] 25 p0171 N80-15566
Methodology for determining the configuration of
the optimum solar total energy system
[SAND-79-0422] 25 p0172 N80-15574
Research and evaluation of biomass
resources/conversion/utilization systems
(market/experimental analysis for development of
a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576
Status of the US Department of Energy photovoltaic
concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578
Heat pump centered integrated community energy
systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588
Heat pump centered integrated community energy
systems; System development
[ANL/ICES-TM-26] 25 p0173 N80-15589
Utilization of waste heat from Federal facilities
[ORO-5523-T1] 25 p0173 N80-15590
National program plan for passive and hybrid solar
heating and cooling
[DOE/CS-0089] 25 p0174 N80-15598
Department of Energy large solar central power
systems semiannual review
[SAND-79-8508] 25 p0175 N80-15602
Nuclear strategy of the Department of Energy
[DOE/ER-0025/D] 25 p0175 N80-15605
Wharton annual energy model: Development and
simulation results
[EPRI-EA-1115] 25 p0175 N80-15606
Performance of residential solar heating and
cooling system with flat-plate and evacuated
tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616
Characterization of operating conditions for
gas/water heat recovery steam generators
[ORNL/TM-6622] 25 p0176 N80-15620
Environmental development plan ocean thermal
energy conversion
[DOE/EDP-0034] 25 p0176 N80-15621
Economic impacts of energy conservation and
renewable energy sources
[UCRL-15087] 25 p0177 N80-15633
Role of the government in the development of solar
energy
[SERI/TP-52-138] 25 p0178 N80-15639
Federal leasing and outer continental shelf energy
production goals
[DOE/RA-0037] 25 p0178 N80-15640
Fission energy program of the U.S. Department of
Energy, FY 1980
[DOE/ET-0089] 25 p0180 N80-15893
Fusion: A possible option for solving long-term
energy problems
[PB-300692/1] 25 p0181 N80-15946
Report to Congress on the economic impact of
energy actions as required by public law 93-275,
section 18-d
[DOE/PE-0007] 25 p0181 N80-15993

ENERGY REQUIREMENTS

Models of worldwide energy demand and consumption
25 p0002 A80-10228
Power supply requirements for a tokamak fusion
reactor
25 p0003 A80-10474
Frontiers in energy demand modeling
25 p0009 A80-11830
Economics/reliability trade-offs in materials for
various coal conversion and utilization processes
25 p0016 A80-11975
Industrial solar total energy systems
25 p0017 A80-11987
The role of coal in the world energy picture up to
the year 2000 - Reserves, resources, and
availability from the Western European viewpoint
25 p0040 A80-15625
Seminar on Hydrogen as an Energy Vector: Its
Production, Use and Transportation, 1st,
Brussels, Belgium, October 3, 4, 1978, Proceedings
25 p0041 A80-15976
Prospects - A social context for natural science
--- global energy resource review
25 p0044 A80-16651
The policy of the European Economic Community in
the field of energy savings
25 p0050 A80-17223
Net energy analysis of alcohol production from
sugarcane
25 p0062 A80-18165
Economic comparisons of solar and fossil total
energy systems for industrial applications
[ASME PAPER 79-WA/TS-6] 25 p0065 A80-18552
A simplified procedure for performance of solar
systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555
Energy transition in California
[UCRL-15003] 25 p0097 N80-10619
Soviet energy balances
[RAND/R-2257-DOE] 25 p0099 N80-10634
Power supply requirements for a tokamak fusion
reactor
[ANL/FPP/TM-119] 25 p0104 N80-10918
MEDEE 2: A model for long term energy demand
evaluation
[IIASA-RR-78-17] 25 p0109 N80-11554
Energy initiatives of the 95th Congress
[GPO-42-797] 25 p0109 N80-11557
Disaggregating PIES fuel forecasts, validating
PIES transportation model data base, and other
technical services
[TID-29000] 25 p0114 N80-11612
Fuel choice and aggregate energy demand in the
commercial sector --- electricity, natural gas,
and fuel oil
[ORNL/CCN-27] 25 p0126 N80-12580

- Constraints on energy conservation [ORAU/IEA-78-17(M)] 25 p0127 N80-12594
- A regional approach to forecasting electric energy requirements for environmental assessments 25 p0130 N80-12619
- Case study of the Brownell low energy requirement house [BNL-50968] 25 p0142 N80-13651
- Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability [SAN-0115-T1] 25 p0168 N80-15276
- Fuel utilization in residences [EPRI-EA-894] 25 p0175 N80-15604
- Nuclear strategy of the Department of Energy [DOE/ER-0025/D] 25 p0175 N80-15605
- Energy demand in the developing countries [DOE/EIA-0183/10] 25 p0177 N80-15631
- MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version) [BNL-26390] 25 p0178 N80-15634

ENERGY SOURCES

- United States energy alternatives to 2010 and beyond - The CONAES study 25 p0008 A80-11827
- Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978 25 p0009 A80-11837
- Gas recovery from unconventional sources 25 p0014 A80-11958
- Development of renewable energy sources in the United Kingdom 25 p0017 A80-11980
- Energy plantation for coromandel littoral --- growing plant materials for fuel value in India 25 p0023 A80-12742
- The European economic community's policy concerning natural gas, coal and new sources of energy 25 p0032 A80-13175
- The helium question --- future domestic consumption vs storage of current natural gas derived supplies 25 p0034 A80-13589
- Hydrogen fuel applications for urban transit 25 p0037 A80-14703
- An optimization model for overall urban energy planning 25 p0038 A80-14844
- Harnessing power from tides - State of the art 25 p0045 A80-16658
- Can alternative energy resources be brought into large-scale use in the United States by the year 2000 25 p0048 A80-17128
- Global perspectives and options for long-range energy strategies 25 p0048 A80-17130
- Global aspects of sunlight as a major energy source 25 p0048 A80-17131
- Climatic impact of alternative energy sources 25 p0050 A80-17140
- Geology of the Athabasca oil sands 25 p0050 A80-17236
- Ethyl alcohol production and use as a motor fuel --- Book 25 p0050 A80-17241
- Ocean energy - Forms and prospects 25 p0061 A80-18162
- On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example 25 p0074 A80-19000
- Near term potential of wood as a fuel [HCP/C4101] 25 p0093 N80-10389
- EPRI new energy resources department strategy paper [EPRI-ER-979] 25 p0097 N80-10610
- Health and enviromental effects of coal gasification and liquefaction technologies: A workshop summary and panel reports [PB-297618/1] 25 p0104 N80-10701
- Increased energy from biomass: 1985 possibilities and problem. Working papers for planners [RLO-788-5] 25 p0112 N80-11589
- Cost analysis of aquatic biomass systems [HCP/ET/4000-78/1] 25 p0120 N80-12202
- Report of the Alcohol Fuel Policy Review [DOE/PE-0012] 25 p0169 N80-15290
- Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations [UCRL-52496-VOL-1] 25 p0177 N80-15626

ENERGY STORAGE

- Photochemical conversion and storage of solar energy 25 p0009 A80-11829
- Overview of division of energy storage program Department of energy 25 p0016 A80-11979
- Flywheels for energy storage 25 p0019 A80-12166
- A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis 25 p0021 A80-12433
- Electrochemical storage of photovoltaic solar energy 25 p0025 A80-12757
- Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides 25 p0033 A80-13200
- Heat transfer to a melting solid with application to thermal energy storage systems 25 p0036 A80-14667
- Hydrogen storage by means of reversible magnesium alloy 25 p0041 A80-15990
- Use of reversible hydrides for hydrogen storage 25 p0042 A80-15991
- Hydrogen storage by use of cryoadsorbents in comparison to alternatives 25 p0042 A80-15992
- Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages [ASME PAPER 79-WA/SOL-27] 25 p0067 A80-18568
- Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K 25 p0072 A80-18728
- International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge University, Cambridge, England, August 10-12, 1978, Lectures 25 p0072 A80-18746
- Energy storage in organic photoisomers 25 p0072 A80-18747
- Applications analysis of fixed site hydrogen storage [SAND-78-8272] 25 p0092 N80-10384
- Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base [NTIS/PS-79/0772/8] 25 p0094 N80-10402
- Methods of estimating the reliability of wind energy systems with storage [UCRL-15005] 25 p0098 N80-10623
- Battery Energy Storage Test (BEST) facility [EPRI-EM-1005] 25 p0098 N80-10628
- Flywheel energy storage and conversion system for solar photovoltaic applications [COO-4094-31] 25 p0100 N80-10639
- Experimental and numerical studies of liquid storage tank thermal stratification for a solar energy system [COO-4479-2] 25 p0101 N80-10655
- Solar generation of industrial steam. Innovative research program subtask [COO-4546-9] 25 p0101 N80-10656
- Solar pond concepts: Old and new [SERI/TP-35-208] 25 p0102 N80-10663
- Effect of mechanical energy storage systems on the characteristics of electric vehicles [UCRL-82710] 25 p0102 N80-10664
- Lead batteries, volume 2. Citations from the engineering index data base [NTIS/PS-77/0634] 25 p0103 N80-10681
- Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings [UCRL-52553-VOL-1] 25 p0105 N80-10970
- Design considerations for a proposed passive vacuum solar annular receiver [SAND-78-0982] 25 p0111 N80-11582
- Regenerative flywheel energy storage system [UCRL-13982] 25 p0112 N80-11594
- Materials program for fiber composite flywheels [UCRL-81724] 25 p0115 N80-11618
- Lateral and tilt whirl modes of flexibly mounted flywheel systems --- for energy storage [SAND-78-7070] 25 p0115 N80-11622

Underground pumped hydro storage: An overview [CONF-781046-1] 25 p0116 N80-11624

Design optimization of aquifer reservoir-based compressed air storage systems [CONF-781046-5] 25 p0116 N80-11628

Application of packed beds to energy storage use of latent heat of fusion 25 p0121 N80-12353

Anton permselective membrane [NASA-CR-159599] 25 p0122 N80-12551

The USAF Academy flywheel-electric car preliminary design report [AD-A071242] 25 p0123 N80-12553

Batteries for specific solar applications [SAND-79-1428C] 25 p0124 N80-12559

Solar mechanical energy storage project [SAND-78-1982C] 25 p0127 N80-12590

Mechanical energy storage technology development for electric and hybrid vehicle applications [UCRL-81786] 25 p0128 N80-12596

Research on the dynamics of band-supported flywheel systems [SAND-78-7074] 25 p0128 N80-12597

Hydrogen-halogen energy storage system [BNL-50924] 25 p0139 N80-13632

Multi-year plan for thermal and mechanical energy storage program [DOE/ET-0109] 25 p0142 N80-13658

Large-scale annual-cycle thermal energy storage in aquifers [CONF-790515-3] 25 p0145 N80-13686

Photosensitization mechanisms for energy storing isomerizations [AD-A074968] 25 p0156 N80-14502

Energy storing organic photoreactions [AD-A074915] 25 p0156 N80-14503

Analysis of remote site energy storage and generation systems --- systems analysis of solar energy conversion and windpower utilization energy storage systems [AD-A074869] 25 p0156 N80-14504

Lithium/metal sulfide battery development [CONF-790538-10] 25 p0159 N80-14530

Dissociation pressure measurements on salts proposed for thermochemical energy storage [SAND-79-8033] 25 p0160 N80-14532

Compressed air energy storage technology program --- concept for supplying electric power to meet peak load demands [PNL-2935] 25 p0160 N80-14534

Superconducting magnetic energy storage for electric power system dynamic stabilization [LA-UR-79-1220] 25 p0160 N80-14535

Proceedings of the DOE chemical/hydrogen energy contractor review systems [CONF-771131] 25 p0164 N80-14572

Review of industrial participation on the ANL lithium/iron sulfide battery development program --- for energy storage and electric vehicles [CONF-780852-1] 25 p0164 N80-14573

Assessment of the applicability of mechanical energy storage devices to electric and hybrid vehicles. Volume 1: Executive summary [UCRL-52773-VOL-1] 25 p0166 N80-14973

Novel scheme for making cheap electricity with nuclear energy [UCID-18153-REV-1] 25 p0171 N80-15564

Feasibility of compressed air energy storage as a peak shaving technique in California, Volume 2 [SAN-1331-T1] 25 p0174 N80-15596

Dynamic storage in solar total energy programs [SAND-78-0958C] 25 p0174 N80-15600

Flywheel energy storage interface unit for photovoltaic applications [COO-4094-44] 25 p0175 N80-15609

Lithium/iron sulfide batteries for electric vehicles [CONF-781006-2] 25 p0175 N80-15611

Laminated disk flywheel program [UCRL-81772] 25 p0175 N80-15612

Overview of flywheel energy storage component development [SAND-78-1999C] 25 p0176 N80-15623

Sandia composite-rim flywheel development [SAND-78-1865C] 25 p0177 N80-15624

Turbomachinery options for an underground pumped hydroelectric storage plant [CONF-790803-50] 25 p0177 N80-15629

Flywheel energy storage and conversion system for photovoltaic applications [COO-4094-48] 25 p0178 N80-15635

Solar mechanical energy storage program overview and systems analysis results [SAND-79-1642C] 25 p0178 N80-15637

Energy program at the Johns Hopkins University Applied Physics Laboratory [PB-310245/7] 25 p0179 N80-15648

Environmental development plan: Electric Energy Systems [DOE/EDP-0038] 25 p0179 N80-15669

Energy storage system for automobile propulsion, 1978 study. 2: Detailed report [UCRL-52553-VOL-2] 25 p0181 N80-15995

ENERGY TECHNOLOGY

Microstructural objectives for high-temperature alloys in advanced energy systems 25 p0002 A80-10306

Hydrogen - The fuel of the future --- Russian book 25 p0002 A80-10349

A cheap method of improving the performance of roof type solar stills 25 p0006 A80-11343

Is there a chance for OTEC 25 p0007 A80-11394

Soft and hard energy paths - The roads not taken --- political, technical and philosophical aspects of energy problem 25 p0007 A80-11400

Annual review of energy. Volume 4 --- Book 25 p0008 A80-11826

United States energy alternatives to 2010 and beyond - The CONAES study 25 p0008 A80-11827

The compatibility of wind and solar technology with conventional energy systems 25 p0008 A80-11828

Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978 25 p0009 A80-11837

Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979 25 p0013 A80-11953

Economics/reliability trade-offs in materials for various coal conversion and utilization processes 25 p0016 A80-11975

Materials research - Probable impacts on solar energy 25 p0018 A80-11991

Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields 25 p0019 A80-12310

Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials 25 p0020 A80-12311

Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector 25 p0022 A80-12627

Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978 25 p0023 A80-12739

Cadmium telluride solar cells 25 p0026 A80-12765

Theoretical consideration of curve fill factor in solar cells 25 p0026 A80-12768

Laser fusion - Energy application perspectives 25 p0030 A80-12883

Progress in R and D on coal liquefaction - Progress in research-development on coal liquefaction 25 p0030 A80-12940

Progress and development trends in coal gasification and liquefaction technologies 25 p0031 A80-12945

Progress and development trends in coal gasification and liquefaction technologies - Recent achievements in conventional coal gasification processes 25 p0031 A80-12947

Progress and development trends in coal gasification and liquefaction technologies - Underground coal gasification 25 p0031 A80-12948

Fuel cell sesquicentennial 25 p0033 A80-13223

Earth benefits of solar power satellites 25 p0038 A80-14791

A review of the U.S. wind energy programme 25 p0042 A80-16083

Efficiency improvements in bioenergy conversion systems 25 p0047 A80-16995

Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979 25 p0047 A80-17126

Exploring alternative energy strategies 25 p0047 A80-17127

Can alternative energy resources be brought into large-scale use in the United States by the year 2000 25 p0048 A80-17128

Ocean thermal energy conversion /OTEC/ - Social and environmental issues 25 p0049 A80-17135

The application potential of hydro power 25 p0049 A80-17136

Petroleum plantations and synthetic chloroplasts 25 p0049 A80-17137

Prospects of future geothermal energy development 25 p0049 A80-17138

Comparative risk assessment of energy systems 25 p0049 A80-17139

The present status of coal gasification following the 14th World Gas Congress Toronto 1979 25 p0050 A80-17222

The relative value of energy derived from municipal refuse 25 p0051 A80-17352

Solar-hydrogen energy systems --- Book 25 p0051 A80-17573

Introduction - A review of the scope --- solar-hydrogen energy conversion 25 p0052 A80-17574

Solar-powered liquid-metal MHD power systems [ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554

Superheated steam generation in a Fresnel lens concentrating collector [ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567

A small hybrid solar closed-cycle gas turbine cogeneration plant concept based on today's technology [ASME PAPER 79-WA/GT-3] 25 p0071 A80-18637

International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge University, Cambridge, England, August 10-12, 1978, Lectures 25 p0072 A80-18746

Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment 25 p0087 A80-20881

Coal conversion systems: Technical data book [HCP/T2286-01] 25 p0093 N80-10392

Ocmulgee national monument visitor center solar heating and cooling system design review data [NASA-CR-150706] 25 p0096 N80-10601

Solar heating and cooling systems design and development [NASA-CR-150618] 25 p0096 N80-10602

Technology development for phosphoric acid fuel cell powerplant, phase 2 [NASA-CR-159705] 25 p0096 N80-10603

Dispersed power systems and total energy [SAND-78-2006C] 25 p0096 N80-10608

EPRI new energy resources department strategy paper [EPRI-ER-979] 25 p0097 N80-10610

Summary report of the Solar Reflective Materials Technology Workshop [PNL-2763] 25 p0097 N80-10613

Energy information data base. Corporate author entries [DOE/TIC-4585-R1-SUPPL-1] 25 p0097 N80-10617

Methods of estimating the reliability of wind energy systems with storage [UCRL-15005] 25 p0098 N80-10623

Solar assisted heat pump overview and summary of in-house research [BNL-24911] 25 p0098 N80-10624

Methodology for identifying materials constraints to implementation of solar energy technologies [PNL-2711] 25 p0098 N80-10625

Sensitivity study of Brayton cycle power plant performance [SAND-78-8020] 25 p0098 N80-10626

Survey of solar thermal energy storage subsystems for thermal/electric applications [ORNL/TM-5758] 25 p0098 N80-10627

Environmental data for energy technology policy analysis. Volume 1: Summary [HCP/EV6119-1] 25 p0098 N80-10629

Environmental readiness of emerging energy technologies [DOE/ERD-0022] 25 p0099 N80-10631

Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices [RAND/R-2335-DOE] 25 p0099 N80-10636

Selected results from the technology assessment of solar energy program [LA-UR-79-950] 25 p0099 N80-10637

Optimal control studies of a solar heating system [LA-UR-78-2556] 25 p0100 N80-10646

Determination of the technical and economic feasibility of luminescent solar concentrators [SAND-79-7005] 25 p0100 N80-10650

Solar energy system performance evaluation: A-Frame Industries, single family dwelling, Kaneohe, Hawaii [SOLAR/1010-78/14] 25 p0101 N80-10659

Waste Heat Utilization: Proceedings of 1978 Engineering Foundation Conference [CONF-7808102] 25 p0102 N80-10665

Geothermal resources and technology in the United States [PB-296623/2] 25 p0102 N80-10677

Proposed research planning format for the Environmental Assessment Department --- needs and concerns of groups concerned with environment and energy issues [EPRI-EA-1018] 25 p0103 N80-10692

Environmental implications for geothermal energy development [CONF-790445-3] 25 p0103 N80-10694

National Gas Survey report to the Federal Energy Regulatory Commission by the Supply-Technical Advisory Task Force on nonconventional natural gas resources [DOE/FERC-0010] 25 p0107 N80-11251

The automated array assembly task of the low-cost silicon solar array project, phase 2 [NASA-CR-162429] 25 p0109 N80-11562

Heat pump centered integrated community energy systems: System development [ANL/ICES-TM-27] 25 p0110 N80-11571

Heat pump centered integrated community energy systems; System development [ANL-ICES-TM-28] 25 p0111 N80-11574

Wind energy systems: Program summary [DOE/ET-0093] 25 p0111 N80-11578

Regional reference energy systems: Electric utility applications [BNL-50962] 25 p0111 N80-11585

DOE heat pump centered integrated community energy systems project [CONF-790362-1] 25 p0112 N80-11586

World Energy Data System (WENDS) [CONF-790461-2] 25 p0112 N80-11587

Regenerative flywheel energy storage system [UCRL-13982] 25 p0112 N80-11594

OTEC thermal resource report for Caribbean Sea Plant Ship 13-15 degrees N 75-80 degrees N [HCP/T2898] 25 p0113 N80-11599

Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed [MLM-2598(OP)] 25 p0113 N80-11603

Hydrogen-electric power drives [SLAC-PUB-2203] 25 p0113 N80-11604

International coal technology summary document [DOE/PE-0010] 25 p0115 N80-11621

Underground pumped hydro storage: An overview [CONF-781046-1] 25 p0116 N80-11624

National environmental/energy workshop assessment, phase 3. Energy programs --- directory of courses available
[PB-298587/7]
25 p0117 N80-11634
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS]
25 p0117 N80-11641
Report on Finnish technological activities
25 p0119 N80-11991
Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes
[FE-2247-2]
25 p0119 N80-12191
Status of the PEATGAS process
[CONF-781045-3]
25 p0120 N80-12199
Measurement techniques for high-power semiconductor materials and devices: --- application to energy technologies
[PB-298574/5]
25 p0121 N80-12300
Automated longwall guidance and control systems, phase 1
[NASA-CR-161329]
25 p0122 N80-12538
Automated longwall guidance and control systems, phase 2, part 2: Vertical control system (VCS)
[NASA-CR-161330]
25 p0122 N80-12539
Automated longwall guidance and control systems, phase 2, part 2: RCS, FAS, and MCS
[NASA-CR-161331]
25 p0122 N80-12540
Overview of in situ oil shale technology and recent advances in true in situ retort modeling
[SAND-78-2367C]
25 p0122 N80-12543
Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1
[GPO-41-481]
25 p0122 N80-12550
The USAF Academy flywheel-electric car preliminary design report
[AD-A071242]
25 p0123 N80-12553
Batteries for specific solar applications
[SAND-79-1428C]
25 p0124 N80-12559
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254]
25 p0124 N80-12564
Systems Analysis and testing (SAT) program
[SERI/PR-35-313]
25 p0124 N80-12565
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6605]
25 p0125 N80-12568
Evaluation of solar Rankine-cycle engine systems
[SAND-78-0986]
25 p0125 N80-12571
Direct labor requirements for select solar energy technologies: A review and synthesis
[SERI/RR-53-045]
25 p0126 N80-12578
United States magnetic fusion energy program
[DOE/ET-0072]
25 p0126 N80-12583
Experimental test facility for evaluation of solar control strategies
[LBL-8308]
25 p0126 N80-12586
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2]
25 p0127 N80-12589
Solar mechanical energy storage project
[SAND-78-1982C]
25 p0127 N80-12590
Crystallographic contributions to the energy problem
[CONF-780867-1]
25 p0128 N80-12598
Energy information data base. Serial titles, February 1976 - March 1979
[DOE/TIC-4579-R10-SUPPL-4]
25 p0128 N80-12601
Energy conservation technology education program
[HCP/M2165]
25 p0129 N80-12606
Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1]
25 p0130 N80-12613
Environmental aspects of alternative energy technologies for California
[UCRL-15002]
25 p0131 N80-12628
Wind resource analysis
[SERI/TR-36-088]
25 p0132 N80-12710
Search for fusion power
[UCRL-81890]
25 p0132 N80-12900
Demand for special performance vehicles, 1975 - 2025
[UCRL-13911]
25 p0133 N80-12960
Biological transformation of light energy into methane using an anaerobic filter
25 p0133 N80-13267
Gas generator research and development: BI-GAS process
[FE-1207-62]
25 p0135 N80-13288
Methane recovery from coalbeds project. Technology test projects: Evaluation of candidate projects
[METC-8089-T4]
25 p0135 N80-13290
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-30]
25 p0135 N80-13291
Catalyst development for coal liquefaction
[EPRI-AF-1084]
25 p0136 N80-13292
Modified aerospace reliability and quality assurance method for wind turbines
[NASA-TM-79284]
25 p0137 N80-13490
Summaries of physical research in the geosciences
[DOE/ER-0030]
25 p0137 N80-13582
Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes
[EPRI-ER-978-VOL-3]
25 p0139 N80-13628
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76]
25 p0140 N80-13636
Integral cell scale-up and performance verification
[EPRI-EM-1134]
25 p0141 N80-13646
Review of the environment effects and benefits of selected solar energy technologies
[SERI/TP-53-114R]
25 p0141 N80-13649
Solar thermal power systems
[DOE/ET-0078/T1]
25 p0143 N80-13662
Experimental and analytical OTEC studies at ORNL
[CONF-790631-1]
25 p0143 N80-13666
Technology development needs for high temperature process heat
[SERI/TR-35-047]
25 p0143 N80-13669
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C]
25 p0144 N80-13671
Hot dry rock geothermal energy development program
[LA-7807-HDR]
25 p0144 N80-13673
Wind energy innovative systems
[SERI/PR-13-054]
25 p0144 N80-13674
Fossil energy program. 1. Mining research and development: Coal preparation and analysis
[IS-4655]
25 p0145 N80-13679
Cogeneration opportunities --- conferences
[CONF-7806118]
25 p0145 N80-13681
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1]
25 p0145 N80-13688
Status of development, energy and economics aspects of alternative technologies --- energy policy and technology with respect to coal utilization
[CONF-790371-1]
25 p0145 N80-13689
OTEC power systems
[CONF-790444-2]
25 p0146 N80-13696
Review of solar energy
[SERI/TR-54-066]
25 p0146 N80-13699
Environmental development plan: Wind energy conversion
[DOE/EDP-0030]
25 p0147 N80-13701
Thin film problems and research in energy systems
[CONF-761168-SUMM]
25 p0147 N80-13705
Energy conservation via heat transfer enhancement
[COO-4649-4]
25 p0147 N80-13707
Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0816/3]
25 p0148 N80-13717
Geothermal energy, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0818/9]
25 p0148 N80-13718
Geothermal energy, volume 4. Citations from the Engineering Index data base
[NTIS/PS-79/0819/7]
25 p0148 N80-13720
Development of the steam-iron process for hydrogen production, 9010
[FE-2435-32]
25 p0150 N80-14258
The solar in Federal buildings demonstration program
[PB-298535/6]
25 p0151 N80-14279
Electric and hybrid vehicles: Commercialization phase 3 planning
[DOE/ERD-0004]
25 p0151 N80-14349
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6]
25 p0152 N80-14463

Energy from the West: Energy resource development
systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development
systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development
systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development
systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474
A conceptual design study on the application of
liquid metal heat transfer technology to the
solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484
Application of field-modulated generator systems
to dispersed solar thermal electric generation
[NASA-CR-162536] 25 p0155 N80-14488
solar thermal power systems advanced solar thermal
technology project, advanced subsystems
development
[NASA-CR-162546] 25 p0155 N80-14491
Status of the DOE/NASA critical gas turbine
research and technology project
[NASA-TM-79307] 25 p0155 N80-14493
Development and testing of the Junkeeper Control
Corporation integrated programmable electronic
controller and hydronics package
[NASA-TM-78244] 25 p0155 N80-14495
Highlights of the energy technology programs
[BNL-50959] 25 p0157 N80-14512
Application of diffusion research to solar energy
policy issues
[SERI/TR-51-194] 25 p0158 N80-14518
Commercialization strategy report for energy from
urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521
Fuel cell option
[CONF-7809137-1] 25 p0158 N80-14523
Lawrence Livermore Laboratory geothermal energy
program: A status report on the development of
the Total-Flow concept
[UCRL-50046-77] 25 p0159 N80-14529
Proceedings of the Thermal Energy Storage in
Aquifers Workshop
[LBL-8431] 25 p0160 N80-14533
Commercialization strategy report for small wind
systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind
systems
[TID-28843-DRAFT] 25 p0161 N80-14544
Commercialization strategy report for solar water
heating
[TID-28856-DRAFT] 25 p0161 N80-14545
Thermal energy storage for solar applications: An
overview
[SERI/TP-34-089] 25 p0161 N80-14546
A review of the economics of selected passive and
hybrid systems --- design concepts for solar
energy utilization
[SERI/TP-61-144] 25 p0161 N80-14547
Commercializing solar architecture
[SERI/TP-62-113] 25 p0161 N80-14548
Fifth Ocean Thermal Energy Conversion Conference,
volume 2, sections 4-5
[CONF-780236-P2] 25 p0162 N80-14553
Systems Studies for Central Solar Thermal Electric
[CONF-780383] 25 p0162 N80-14558
Photovoltaic power systems market identification
and analysis
[HCP/T4022-01] 25 p0162 N80-14559
Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560
System tests and applications photovoltaic program
[HCP/T4024-01/15] 25 p0163 N80-14566
Performance of residential solar heating and
cooling system with flat-plate and evacuated
tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Process design and economic analysis of the zinc
selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571
Proceedings of the DOE chemical/hydrogen energy
contractor review systems
[CONF-771131] 25 p0164 N80-14572
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574
Wave power systems
[PB-299851/6] 25 p0164 N80-14576
West Coast Forum on Appropriate Technology ---
research in energy and environmental areas
[PB-298986/1] 25 p0166 N80-14962
High temperature electrolysis --- synthetic fuel
production
[BNL-26331] 25 p0167 N80-15227
Project planning document: Highway vehicle
Alternative Fuels Utilization Program (AFUP)
[DOE/CS-0093] 25 p0168 N80-15279
Ethanol/gasoline blends as automotive fuels
[CONF-790520-5] 25 p0168 N80-15280
Commercialization strategy report for recovery of
natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287
Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288
Report of the Alcohol Fuel Policy Review
[DOE/PE-0012] 25 p0169 N80-15290
Conversion of coal-based methanol to ethylene and
a gaseous fuel
[PB-301256/4] 25 p0169 N80-15297
Candidate thermal energy storage technologies for
solar industrial process heat applications
[NASA-TM-81380] 25 p0171 N80-15560
Novel scheme for making cheap electricity with
nuclear energy
[UCID-18153-REV-1] 25 p0171 N80-15564
SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
Alternate cycles applied to ocean thermal energy
conversion
[SERI/TP-34-180] 25 p0172 N80-15571
Low temperature thermal energy storage: A
state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583
Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584
Energy supply and demand in the short term: 1979
and 1980
[DOE/EIA-0184/4] 25 p0174 N80-15593
Department of Energy large solar central power
systems semiannual review
[SAND-79-8508] 25 p0175 N80-15602
All-union scientific and technical conference on
use of the earth's heat for the production of
electric power - summary of reports
[CONF-751270-SUMM] 25 p0176 N80-15615
Overview of flywheel energy storage component
development
[SAND-78-1999C] 25 p0176 N80-15623
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627
Solar/wind handbook for Hawaii: Technical
applications for Hawaii, the Pacific Basin and
sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628
Feasibility study for enhancing the development of
fusion energy
[EPRI-ER-778-SR] 25 p0178 N80-15642
Water use alternatives for Navajo energy production
[LA-UR-79-1598] 25 p0178 N80-15643
Energy program at the Johns Hopkins University
Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648
Environmental development plan: Electric Energy
Systems
[DOE/EDP-0038] 25 p0179 N80-15669
Development of the Rocky Mountain Energy and
Environmental Technology Center: A preliminary
analysis
[ORAU-158] 25 p0179 N80-15670

ENERGY TRANSFER
Experimental studies of interaction and transport
processes in laser fusion
25 p0057 A80-17864
Fluid bed combustion in processing, environmental
protection and energy supply
25 p0072 A80-18735

ENGINE DESIGN
Selection of optimal parameters of heat-pipe heat
exchanger for a gas turbine engine
25 p0003 A80-10613

Development of an aircraft-derivative gas turbine with high performance and large output
25 p0003 A80-10823

A pistonless Stirling engine - The traveling wave heat engine
25 p0031 A80-13011

Vehicle emissions control and its effect on engine development
25 p0037 A80-14708

Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737

Night storage and backup generation with electrochemical engines --- study of electric generators for electrochemical engines using photovoltaic energy conversion
[LA-UR-78-1149] 25 p0113 N80-11596

Evaluation of solar Rankine-cycle engine systems
[SAND-78-0986] 25 p0125 N80-12571

Closed-cycle hydride engines
[SAND-78-2228] 25 p0125 N80-12572

Lawrence Livermore Laboratory geothermal energy program: A status report on the development of the Total-Flow concept
[UCRL-50046-77] 25 p0159 N80-14529

Darrieus wind turbine program at Sandia Laboratories
[SAND-79-0997C] 25 p0160 N80-14538

ENRICHMENT

The jet membrane process for uranium separation and enrichment
[BE-586] 25 p0091 N80-10329

ENTHALPY

Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935

ENTROPY

Second-law analysis of solar-thermal processes
25 p0003 A80-10843

ENVIRONMENT EFFECTS

Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369

Source, supply and nature of municipal and industrial waste as a fuel
25 p0017 A80-11983

Environmental protection in the processing of coal
25 p0030 A80-12943

Ocean thermal energy conversion /OTEC/ - Social and environmental issues
25 p0049 A80-17135

Climatic impact of alternative energy sources
25 p0050 A80-17140

Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices
[RAND/R-2335-DOE] 25 p0099 N80-10636

The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688

Proposed research planning format for the Environmental Assessment Department --- needs and concerns of groups concerned with environment and energy issues
[EPRI-EA-1018] 25 p0103 N80-10692

Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects
[CONF-780843-5] 25 p0103 N80-10693

Environmental implications for geothermal energy development
[CONF-790445-3] 25 p0103 N80-10694

Health and enviromental effects of coal gasification and liquefaction technologies: A workshop summary and panel reports
[PB-297618/1] 25 p0104 N80-10701

Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386

INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595

Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891

Environmental aspects of alternative fuels utilization for highway vehicles
[UCRL-81841] 25 p0120 N80-12201

Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558

Environmental aspects of alternative energy technologies for California
[UCRL-15002] 25 p0131 N80-12628

Global ecology and man
25 p0131 N80-12668

Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677

Environmental analysis of synthetic liquid fuels --- shale oil, coal liquefaction, and biomass production of ethanol
[DOE/EV-0044] 25 p0134 N80-13279

Preparation of a coal conversion systems technical data book, project 61003
[FE-2286-32] 25 p0134 N80-13281

Review of the environment effects and benefits of selected solar energy technologies
[SERI/TR-53-114R] 25 p0141 N80-13649

Critical review and assessment of environmental and safety problems in hydrogen energy systems
[LA-7820-PR] 25 p0145 N80-13690

Environmental development plan: Wind energy conversion
[DOE/EDP-0030] 25 p0147 N80-13701

Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723

Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266

Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465

Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466

Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467

Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470

Simulation approach for base-line energy-siting analysis
[CONF-790459-22] 25 p0157 N80-14511

Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook
[DOE/EV-0028] 25 p0163 N80-14565

Environmental options for coal use
[LA-UR-79-1393] 25 p0165 N80-14584

Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281

Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626

Identification of environmental control technologies for geothermal development in the Imperial Valley of California
[UCRL-52548] 25 p0179 N80-15668

Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676

Evaluation of the environmental effects of western surface coal mining, volume 1
[PB-300375/3] 25 p0179 N80-15681

ENVIRONMENT MANAGEMENT

Interactive analysis methods for resource mapping
25 p0008 A80-11709

The scope of environmental risk management
25 p0053 A80-17743

Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
West Coast Forum on Appropriate Technology --- research in energy and environmental areas
[PB-298986/1] 25 p0166 N80-14962

ENVIRONMENT MODELS
Insolation modeling overview
25 p0020 A80-12428
Calculation of monthly mean solar radiation for horizontal and inclined surfaces
25 p0028 A80-12817
An optimization model for overall urban energy planning
25 p0038 A80-14844
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment
25 p0087 A80-20881

ENVIRONMENT POLLUTION
Environmental protection in the processing of coal - The utilization or disposal of coal processing residues
25 p0030 A80-12942
Environmental protection in the processing of coal
25 p0030 A80-12943
Fluid bed combustion in processing, environmental protection and energy supply
25 p0072 A80-18735

ENVIRONMENT PROTECTION
A policy-sensitive model of technology assessment
25 p0004 A80-11140
Environmental protection in the processing of coal - The utilization or disposal of coal processing residues
25 p0030 A80-12942
Environmental protection in the processing of coal
25 p0030 A80-12943
Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737
Energetics aspects of environmental protection
25 p0072 A80-18733
Fluid bed combustion in processing, environmental protection and energy supply
25 p0072 A80-18735
Comprehensive environment, health, and safety program report, FY 1978
[DOE/EV-0035] 25 p0098 N80-10630
Summary of major energy legislation of the 95th Congress
[DOE/TIC-10118] 25 p0100 N80-10644
National environmental/energy workshop assessment, phase 3. Energy programs --- directory of courses available
[PB-298587/7] 25 p0117 N80-11634
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643
Electric and hybrid vehicles: Commercialization phase 3 planning
[DOE/ERD-0004] 25 p0151 N80-14389
Environmental development plan ocean thermal energy conversion
[DOE/EDP-0034] 25 p0176 N80-15621

ENVIRONMENT SIMULATORS
New concept for a system suitable for solar simulation
25 p0083 A80-19976

ENVIRONMENTAL CONTROL
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639

ENVIRONMENTAL ENGINEERING
The scope of environmental risk management
25 p0053 A80-17743
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158] 25 p0179 N80-15670

ENVIRONMENTAL MONITORING
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

ENVIRONMENTAL QUALITY
Energy conservation and the environment: conflict or complement
[LBL-7882] 25 p0098 N80-10621

ENVIRONMENTAL SURVEYS
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

ENVIRONMENTS
National environmental/energy workforce assessment, phase 3. Air programs --- bibliography
[PB-298580/2] 25 p0117 N80-11670

EPITAXY
Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
25 p0035 A80-13986

EPOXY RESINS
Materials program for fiber composite flywheels
[UCRL-81724] 25 p0115 N80-11618

EQUIPMENT
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590

EQUIPMENT SPECIFICATIONS
Steam turbines --- thermoelectric power generation
[ANL/CES/TE-78-7] 25 p0095 N80-10502
Assessment of the applicability of mechanical energy storage devices to electric and hybrid vehicles. Volume 1: Executive summary
[UCRL-52773-VOL-1] 25 p0166 N80-14973

EROSION
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

ETHYL ALCOHOL
Ethyl alcohol production and use as a motor fuel --- Book
25 p0050 A80-17241
Net energy analysis of alcohol production from sugarcane
25 p0062 A80-18165
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274
Fusarium species: Their potential for transforming biomass to ethanol
[ANL/EES/TM-38] 25 p0151 N80-14271
Ethanol/gasoline blends as automotive fuels
[CONF-790520-5] 25 p0168 N80-15280

ETHYLENE
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850
Conversion of coal-based methanol to ethylene and a gaseous fuel
[PB-301256/4] 25 p0169 N80-15297

EUROPE
The financing problems of Europe's gas industry
25 p0032 A80-13174
The European economic community's policy concerning natural gas, coal and new sources of energy
25 p0032 A80-13175
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195

EUTECTIC ALLOYS
A review of in situ composites for nonstructural applications
25 p0002 A80-10285

EVALUATION
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377

EVAPORATION
Performance of heat pumps at elevated evaporating temperatures - With application to solar input
[ASME PAPER 79-WA/SOL-19] 25 p0069 A80-18587

Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process
[AED-CONF-78-155-010] 25 p0121 N80-12291

EXHAUST DIFFUSERS
Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922

EXHAUST EMISSION
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274
The 50,000 mile methanol/gasoline blend fleet study --- fuel efficiency and exhaust emissions
[CONF-790520-6] 25 p0134 N80-13275
Low NO(x) heavy fuel combustor program
[NASA-TM-79313] 25 p0138 N80-13624
Ambient temperature, fuel economy, emissions, and trip length
[PB-298847/5] 25 p0166 N80-14976
Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281

EXHAUST GASES
Environmental protection in the processing of coal
25 p0030 A80-12943
Vehicle emissions control and its effect on engine development
25 p0037 A80-14708
Automobile transportation and the environment
25 p0072 A80-18734
Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites
25 p0074 A80-18861
Effects of inspection and maintenance programs on fuel economy
[PB-297583/7] 25 p0170 N80-15420
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979 --- electric power plants
[PB-299399/6] 25 p0179 N80-15682

EXOTHERMIC REACTIONS
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage
25 p0084 A80-20274

EXPLORATION
Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543
Development of mining guidance and control systems
[NASA-TM-78226] 25 p0137 N80-13601

EXPLOSIONS
Effects of metallurgical microstructure of armatures on compressed magnetic field generators
[SAND-79-0890C] 25 p0137 N80-13375

EXTRATERRESTRIAL RESOURCES
Impacts of satellite power system technology
25 p0048 A80-17132

EXTRUDING
Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377

F

FABRICATION
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474

FAILURE MODES
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840

FARM CROPS
Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400

FARMLANDS
Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400

FATIGUE (MATERIALS)
Materials testing for central receiver solar-thermal power systems
[TID-29443] 25 p0146 N80-13695

FATIGUE TESTS
Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606

FEASIBILITY ANALYSIS
Hydrogen - A means of integrating competing technology into a unified energy system
25 p0014 A80-11955
The prospect for anthracite as a national energy resource
25 p0014 A80-11960
Industrial solar total energy systems
25 p0017 A80-11987
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields
25 p0019 A80-12310
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773
Gasohol - Does it or doesn't it produce positive net energy
25 p0034 A80-13863
Solar enhanced oil recovery - An assessment of economic feasibility
25 p0078 A80-19472
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553
Feasibility study for enhancing the development of fusion energy
[EPRI-ER-778-SR] 25 p0178 N80-15642

FEDERAL BUDGETS
Role of the government in the development of solar energy
[SERI/TP-52-138] 25 p0178 N80-15639

FEED SYSTEMS
Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377

FEEDBACK CONTROL
Optimization of a solar heating system with integral compensation
25 p0089 A80-20894

FERMENTATION
Methane fermentation of aquatic biomass
25 p0043 A80-16148
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395

FERRIC IONS
Study of photochemical processes in the ferrous-thionine system --- photogalvanic effect in dye redox systems for chemical energy conversion
25 p0027 A80-12783

FERROUS METALS
The basics of magnetic separation as applied to municipal solid waste reclamation plants
25 p0074 A80-18871

FIBER OPTICS
A review of in situ composites for nonstructural applications
25 p0002 A80-10285

FIELD COILS
Constant current and constant voltage excitation of large coils by flywheel-generator-converter --- for fusion reactors
25 p0080 A80-19624
Developments for the high voltage test of pulsed superconducting coils --- used in tokamak switches
25 p0081 A80-19655

FILM THICKNESS
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772

FILTRATION
Energy conservation through point source recycle with high temperature hyperfiltration --- textile industry
[PB-299183/4] 25 p0180 N80-15688
FINANCE
The financing problems of Europe's gas industry
25 p0032 A80-13174
FINANCIAL MANAGEMENT
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
Analysis of resource pricing for geothermal electric power production
25 p0088 A80-20889
FINITE DIFFERENCE THEORY
Feasible thermophysical conditions for gas receiver tubes in solar power stations
[ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627
FINITE ELEMENT METHOD
Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282
FINS
Using a fin with a parabolic concentrator
25 p0004 A80-10847
FISSIONABLE MATERIALS
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888
FLAME PROPAGATION
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816
An in-situ optical particle sizing technique --- for fuel droplets
[AIAA PAPER 80-0020] 25 p0062 A80-18240
A single coal particle gasification model
25 p0088 A80-20884
FLAT PLATES
A high performance porous flat-plate solar collector
25 p0021 A80-12438
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
Flat-plate solar collector materials
25 p0035 A80-14409
Noniterative solution of heat transfer equation of fluid flow in solar collector
[ASME PAPER 79-WA/SOL-24] 25 p0068 A80-18577
A comparison of test results for flat-plate water-heating solar collectors using the BSE and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585
Visualization of natural convection in flat plate solar collectors
25 p0153 N80-14476
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497
FLIGHT PATHS
Fuel minimal take-off path of jet lift VTOL aircraft, log no. C3558
25 p0105 N80-11066
FLIGHT TESTS
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment --- flight tests of an algorithm to minimize fuel consumption of aircraft based on flight time
[NASA-TM-80194] 25 p0150 N80-14114
FLIGHT TIME
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment --- flight tests of an algorithm to minimize fuel consumption of aircraft based on flight time
[NASA-TM-80194] 25 p0150 N80-14114
FLOW VISUALIZATION
Visualization of natural convection in flat plate solar collectors
25 p0153 N80-14476
FLOWMETERS
Heat flow meters for solar system performance monitoring
25 p0022 A80-12608
FLUES
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979 --- electric power plants
[PB-299399/6] 25 p0179 N80-15682
FLUID DYNAMICS
Fluid dynamic aspects of wind energy conversion
[AGARD-AG-243] 25 p0103 N80-10683
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
FLUID FILTERS
Hot gas cleanup
[ICTIS/TR-03] 25 p0117 N80-11647
FLUID FLOW
Heat exchange fluids and techniques --- Book
25 p0041 A80-15659
Noniterative solution of heat transfer equation of fluid flow in solar collector
[ASME PAPER 79-WA/SOL-24] 25 p0068 A80-18577
FLUID INJECTION
Bell Creek residual oil saturation technology test
[BETC-2180-4] 25 p0108 N80-11546
FLUID PRESSURE
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase
25 p0076 A80-19209
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647
FLUID TRANSMISSION LINES
Energy analysis of the basic materials utilized in electric power transmission systems
[HCP/T5043-01] 25 p0157 N80-14510
FLUIDIZED BED PROCESSORS
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043
Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959
170 MW pressurized fluidized bed combustion electric plant
25 p0014 A80-11962
Development of fluidised bed combustion in the United Kingdom
25 p0015 A80-11963
Economics/reliability trade-offs in materials for various coal conversion and utilization processes
25 p0016 A80-11975
The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505
Fluid bed combustion in processing, environmental protection and energy supply
25 p0072 A80-18735
Gasification of solid waste in a fluidized bed reactor with circulating sand
25 p0074 A80-18868
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421
Investigations of isotope separation effects of a Ti-fluidized bed
25 p0082 A80-19669
Computer modeling of coal gasification reactors
25 p0087 A80-20882
Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377
Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386
Combustion of low grade coal
[ICTIS/TR-02] 25 p0106 N80-11179
Hot gas cleanup
[ICTIS/TR-03] 25 p0117 N80-11647
Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277
Gas generator research and development: BI-GAS process
[FE-1207-62] 25 p0135 N80-13288

Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

FLUORESCENCE
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964

FLUX PUMPS
The 50kA flux pump for the superconducting transmission line test bed
[LA-6953-MS] 25 p0094 N80-10443

FLYWHEELS
Flywheels for energy storage
25 p0019 A80-12166
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729
Constant current and constant voltage excitation of large coils by flywheel-generator-converter --- for fusion reactors
25 p0080 A80-19624
Flywheel energy storage and conversion system for solar photovoltaic applications
[COO-4094-31] 25 p0100 N80-10639
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594
Materials program for fiber composite flywheels
[UCRL-81724] 25 p0115 N80-11618
Lateral and tilt whirl modes of flexibly mounted flywheel systems --- for energy storage
[SAND-78-7070] 25 p0115 N80-11622
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[SAND-78-7073] 25 p0116 N80-11623
The USAF Academy flywheel-electric car preliminary design report
[AD-A071242] 25 p0123 N80-12553
Mechanical energy storage technology development for electric and hybrid vehicle applications
[UCRL-81786] 25 p0128 N80-12596
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
Impact of flywheel-transmissions on automobile performance: A logical basis for evaluation
[UCRL-52758] 25 p0137 N80-13480
Recent spin test of two composite wagon wheel flywheels
[SAND-79-1669C] 25 p0140 N80-13640
Flywheel energy storage interface unit for photovoltaic applications
[COO-4094-44] 25 p0175 N80-15609
Laminated disk flywheel program
[UCRL-81772] 25 p0175 N80-15612
Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622
Overview of flywheel energy storage component development
[SAND-78-1999C] 25 p0176 N80-15623
Sandia composite-rim flywheel development
[SAND-78-1865C] 25 p0177 N80-15624
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-48] 25 p0178 N80-15635
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648

FOAMING
Foam solar sea power: A physical investigation
25 p0122 N80-12548

FORECASTING
Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324
Energy supply and demand in the midterm: 1985, 1990, and 1995
[DOE/EIA-0102/52] 25 p0097 N80-10620

FOREST MANAGEMENT
Energy plantation for coromandel littoral --- growing plant materials for fuel value in India
25 p0023 A80-12742

FORESTS
Supply, harvesting and nature of forest biomass as a fuel
25 p0017 A80-11982

FORMAT
SAMICS: Input data preparation --- Solar Array Manufacturing Industry Costing Standards
[NASA-CR-162421] 25 p0110 N80-11570

FOSSIL FUELS
Lignite fuel and power-plant availability
25 p0004 A80-10944
The prospect for anthracite as a national energy resource
25 p0014 A80-11960
Economic comparisons of solar and fossil total energy systems for industrial applications
[ASME PAPER 79-WA/TS-6] 25 p0065 A80-18552
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639
Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry. Mass spectrometry and fossil-energy conversion technology: A review
[FE-2537-7] 25 p0120 N80-12198
Low NO(X) heavy fuel combustor program
[NASA-TM-79313] 25 p0138 N80-13624
Fossil energy program. 1. Mining research and development: Coal preparation and analysis
[IS-4655] 25 p0145 N80-13679
Fossil energy program, 1. Mining research and development: Coal preparation and analysis
[IS-4703] 25 p0147 N80-13702
Federal leasing and outer continental shelf energy production goals
[DOE/RA-0037] 25 p0178 N80-15640

FOUNDATIONS
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation
[SAND-78-8180] 25 p0097 N80-10612
Analysis of field test results for single-axis-tracking solar collector foundations
[SAND-79-7023] 25 p0173 N80-15586

FREE CONVECTION
A theoretical study of laminar free convection in 1-D solar induced flows
25 p0005 A80-11337

FREE VIBRATION
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729

FREON
Prime mover for solar power plant
25 p0024 A80-12752

FREQUENCY RESPONSE
Theoretical analysis of multi-cell, high efficiency broad spectral sensitivity solar cells
25 p0138 N80-13617

FREQUENCY STABILITY
Area load-frequency control --- software package for electric power system operation
25 p0022 A80-12735

FRESNEL LENSES
High temperature solar collector with optimal concentration - Non-focusing Fresnel lens with secondary concentrator
25 p0060 A80-18127

FRESNEL REFLECTORS
Superheated steam generation in a Fresnel lens concentrating collector
[ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567

FRICTION
Ranking tires using a transient speed-time cycle
[PB-297756/9] 25 p0108 N80-11487

FUEL CAPSULES
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218

FUEL CELLS
Development of silver-hydrogen cells
25 p0010 A80-11843
Development of silver-hydrogen cells
25 p0010 A80-11844

The conversion of ethylene glycol with air in alkaline fuel cells 25 p0011 A80-11850
The performance of molten-carbonate fuel cells 25 p0011 A80-11851
Utility fuel cells for Sweden 25 p0011 A80-11852
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites 25 p0012 A80-11861
An indirect ammonia-air fuel system 25 p0013 A80-11868
The reality of on-site fuel cells 25 p0016 A80-11973
Commercial applications of molten carbonate fuel cell systems 25 p0016 A80-11974
Fuel cell sesquicentennial 25 p0033 A80-13223
Application of solar and fuel cell technology to industrial users 25 p0037 A80-14707
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes 25 p0042 A80-16146
A performance and current distribution model for scaled-up molten carbonate fuel cells 25 p0062 A80-18213
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage 25 p0084 A80-20274
Technology development for phosphoric acid fuel cell powerplant, phase 2 [NASA-CR-159705] 25 p0096 N80-10603
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell [CONF-781063-2] 25 p0115 N80-11615
Anton permselective membrane [NASA-CR-159599] 25 p0122 N80-12551
On the properties of a fuel cell electrolyte [AD-A072864] 25 p0123 N80-12554
Commercial application of molten carbonate fuel cell system [CONF-790213-4] 25 p0123 N80-12557
Distribution and movement of electrolyte in fuel cells and batteries 25 p0138 N80-13619
Integral cell scale-up and performance verification [EPRI-EM-1134] 25 p0141 N80-13646
Solid electrolyte fuel cell for electric power generation --- nonaqueous electrolyte fuel cells development for electric power plants [BNL-26238] 25 p0158 N80-14522
Fuel cell option [CONF-7809137-1] 25 p0158 N80-14523
Applications of fuel cells in transportation [LA-UR-79-628] 25 p0159 N80-14526
Prediction of current distribution in a molten carbonate fuel cell [CONF-781063-1] 25 p0175 N80-15613

FUEL COMBUSTION
Minimum ignition energies and quenching distances of methanol blends 25 p0004 A80-11331
Development of fluidised bed combustion in the United Kingdom 25 p0015 A80-11963
MHD boundary layer of the seeded combustion gas near cold electrodes 25 p0047 A80-17004
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment [AIAA PAPER 80-0023] 25 p0063 A80-18243
A chromatographic peak profiling technique for interpretation and analysis of combustion processes [AIAA PAPER 80-0284] 25 p0063 A80-18291
Fluid bed combustion in processing, environmental protection and energy supply 25 p0072 A80-18735
Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels [AIAA PAPER 80-0075] 25 p0076 A80-19275
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor 25 p0077 A80-19421
Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner [FE-2489-33] 25 p0093 N80-10390
Development of gas turbine fuels and combustion; An overview [CONF-790337-4] 25 p0093 N80-10391
Characterization and combustion of SRC 2 fuel oil [EPRI-FP-1028] 25 p0119 N80-12192
Status of the DOE/NASA critical gas turbine research and technology project [NASA-TM-79307] 25 p0155 N80-14493

FUEL CONSUMPTION
An engine fuel chemistry solution to the problem of jet fuel supplies 25 p0001 A80-10199
Forecasting automobile fleet fuel efficiency 25 p0002 A80-10324
The role of technology as air transportation faces the fuel situation 25 p0037 A80-14700
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles 25 p0046 A80-16948
Preparing aircraft propulsion for a new era in energy and the environment 25 p0053 A80-17737
Aircraft Energy Efficiency (ACEE) status report 25 p0091 N80-10206
Fuel minimal take-off path of jet lift VTOL aircraft, log no. C3558 25 p0105 N80-11066
The 50,000 mile methanol/gasoline blend fleet study --- fuel efficiency and exhaust emissions [CONF-790520-6] 25 p0134 N80-13275
Current U. S. petroleum situation and short-term supply/demand outlook [DOE/EIA-0184/5] 25 p0138 N80-13607
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment --- flight tests of an algorithm to minimize fuel consumption of aircraft based on flight time [NASA-TM-80194] 25 p0150 N80-14114
US energy flow in 1978 25 p0158 N80-14517
Evaluation of fuel resources and requirements for the magnetic fusion energy program [MLM-2419] 25 p0164 N80-14570
Ambient temperature, fuel economy, emissions, and trip length [PB-298847/5] 25 p0166 N80-14976
Fuel utilization in residences [EPRI-EA-894] 25 p0175 N80-15604

FUEL CORROSION
Combustion of low grade coal [ICTIS/TR-02] 25 p0106 N80-11179

FUEL INJECTION
Mach 3 hydrogen external/base burning [AIAA PAPER 80-0280] 25 p0077 A80-19311

FUEL OILS
SRC solids - Boiler fuel and building block --- Solvent Refined Coal 25 p0015 A80-11967
SRC solids - A preferred compliance boiler fuel --- Solvent Refined Coal 25 p0015 A80-11968
Commercial applications of molten carbonate fuel cell systems 25 p0016 A80-11974
Pollution aspects of oilfired and coalfired boilers 25 p0074 A80-18849
Characterization and combustion of SRC 2 fuel oil [EPRI-FP-1028] 25 p0119 N80-12192
Fuel choice and aggregate energy demand in the commercial sector --- electricity, natural gas, and fuel oil [ORNL/CON-27] 25 p0126 N80-12580

FUEL SPRAYS
An in-situ optical particle sizing technique --- for fuel droplets [AIAA PAPER 80-0020] 25 p0062 A80-18240

FUEL SYSTEMS
Combustion of low grade coal [ICTIS/TR-02] 25 p0106 N80-11179

FUEL TESTS
Project planning document: Highway vehicle Alternative Fuels Utilization Program (AFUP)
[DOE/CS-0093]
FUELS 25 p0168 N80-15279
Status of alcohol fuels utilization technology for stationary gas turbines
[HCP/M2098-03]
FUNGI 25 p0135 N80-13283
Fusarium species: Their potential for transforming biomass to ethanol
[ANL/EES/TM-38]
FURNACES 25 p0151 N80-14271
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6]
FUSION (MELTING) 25 p0131 N80-12637
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting
FUSION REACTORS 25 p0029 A80-12823
Power supply requirements for a tokamak fusion reactor
25 p0003 A80-10474
An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628
Laser fusion - Energy application perspectives
25 p0030 A80-12883
Review of tokamak experiments
25 p0034 A80-13342
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883
Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2
25 p0078 A80-19581
Optimization of stabilized imploding liner fusion reactors
25 p0079 A80-19593
The effect of classical and anomalous transport on the performance of Tandem Mirror reactors
25 p0079 A80-19596
Refueling by means of pellets - Ablation rate and injection velocity considerations --- effects on plasma confinement in tokamak
25 p0080 A80-19611
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
Neutronics in the toroidal belt-geometry of a screw pinch reactor
25 p0081 A80-19657
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682
Status of the JET project --- Joint European Torus
25 p0082 A80-19708
JT-60 project --- tokamak fusion reactor design analysis
25 p0082 A80-19709
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602
Conceptual design of a Demonstration Tokamak Hybrid Reactor (DTHR)
[WFPS-TME-107] 25 p0132 N80-12898
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296
Fusion power program
[ANL/FPP-78-4] 25 p0149 N80-13941
Feasibility study for enhancing the development of fusion energy
[EPRI-ER-778-SR] 25 p0178 N80-15642
Fusion: A possible option for solving long-term energy problems
[PB-300692/1] 25 p0181 N80-15946
FUSION-FISSION HYBRID REACTORS
Survey of mirror machine reactors
25 p0046 A80-16752
Tandem mirror reactors --- for controlled fusion
25 p0059 A80-17887
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

G

GALLIUM ARSENIDES
GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774
Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
25 p0035 A80-13986
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141
A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures
25 p0046 A80-16794
Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells
25 p0086 A80-20716
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204
GAS ANALYSIS
Rapid devolatilization and partial gasification of coal in an entrained dust reactor
25 p0002 A80-10226
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128
Laboratory coal gasifier facility
[UCRL-82602] 25 p0106 N80-11245
GAS CHROMATOGRAPHY
A chromatographic peak profiling technique for interpretation and analysis of combustion processes
[AIAA PAPER 80-0284] 25 p0063 A80-18291
GAS COMPOSITION
Effect of off-design operation of MHD generators on NO/x/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310
GAS DISCHARGES
CO2 electric discharge lasers - Present status and future applications
25 p0039 A80-14960
GAS DYNAMICS
Fixed-bed gasifier dynamic model for IGCCP control study --- Integrated Gasification Combined Cycle Plant
25 p0088 A80-20883
The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329
GAS EVOLUTION
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840
GAS EXPLOSIONS
Optimization of neutron yield in conical system at explosion-induced compression
25 p0007 A80-11545
GAS FLOW
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0003 A80-10613
MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004
GAS GENERATORS
Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice
25 p0078 A80-19473
GAS HEATING
Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631
GAS INJECTION
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996

Oil recovery by carbon dioxide injection --- West Virginia
[ORO-5301-34] 25 p0108 N80-11545

GAS IONIZATION

Dynamic suppression of ionization instability --- in MHD devices of Faraday and Hall types 25 p0043 A80-16484

Studies on plasma formation, relaxation and heating in a reversed-field pinch 25 p0054 A80-17811

GAS JETS

Influence of wall-jet gas injection on liquid-metal MHD generator performance 25 p0047 A80-16996

The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329

GAS MIXTURES

Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves 25 p0007 A80-11546

Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures 25 p0008 A80-11816

Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner
[FE-2489-33] 25 p0093 N80-10390

GAS PIPES

Feasible thermophysical conditions for gas receiver tubes in solar power stations
[ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627

GAS PRESSURE

Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field 25 p0075 A80-19204

GAS RECOVERY

Methane recovery from sanitary landfills; gas recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254

GAS TURBINE ENGINES

Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine 25 p0003 A80-10613

Development of an aircraft-derivative gas turbine with high performance and large output 25 p0003 A80-10823

Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303

Study of heat-pipe heat exchanger in the small gas turbine engine system 25 p0091 N80-10022

Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine 25 p0091 N80-10068

Dynamics of diesel fuel combustion in turbulent flow 25 p0091 N80-10074

Development of gas turbine fuels and combustion: An overview
[CONF-790337-4] 25 p0093 N80-10391

Impact of new instrumentation on advanced turbine research
[NASA-TM-79301] 25 p0166 N80-15133

Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263

GAS TURBINES

The possibilities of increasing gas turbine efficiency 25 p0032 A80-13024

A small hybrid solar closed-cycle gas turbine cogeneration plant concept based on today's technology
[ASME PAPER 79-WA/GT-3] 25 p0071 A80-18637

Novel power generation cycles using coal gas
[ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645

Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646

Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles 25 p0083 A80-19716

Open cycle air turbine solar thermal power system 25 p0083 A80-19989

Screening evaluation of novel power cycles integrated with gasification plants
[EPRI-AF-1002] 25 p0096 N80-10605

Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process
[AED-CONF-78-155-010] 25 p0121 N80-12291

Status of alcohol fuels utilization technology for stationary gas turbines
[HCP/M2098-03] 25 p0135 N80-13283

Low NO(x) heavy fuel combustor program
[NASA-TM-79313] 25 p0138 N80-13624

Status of the DOE/NASA critical gas turbine research and technology project
[NASA-TM-79307] 25 p0155 N80-14493

GAS-LIQUID INTERACTIONS

Preparation of a coal conversion systems technical data book, project 61003
[FE-2286-32] 25 p0134 N80-13281

GAS-METAL INTERACTIONS

Ion-stimulated sorption of nitrogen on a continuously deposited titanium film 25 p0051 A80-17252

GAS-SOLID INTERACTIONS

Helium penetration in evacuated solar collectors - Theory and effect on their performance
[ASME PAPER 79-WA/SOL-17] 25 p0066 A80-18563

GASEOUS DIFFUSION

Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282

GASEOUS FUELS

The performance of molten-carbonate fuel cells 25 p0011 A80-11851

Gas recovery from unconventional sources 25 p0014 A80-11958

The role of coal gasification and liquefaction in improving the efficiency of energy use - Comparative end use efficiency of the use of coal: Substitute natural gas and other gases versus electric power production 25 p0030 A80-12941

The financing problems of Europe's gas industry 25 p0032 A80-13174

Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels 25 p0073 A80-18832

Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels
[AIAA PAPER 80-0075] 25 p0076 A80-19275

The controlling production mechanism of methane gas from coalbeds 25 p0085 A80-20499

Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266

GASIFICATION

Experimental techniques and mathematical models in the study of waste pyrolysis and gasification 25 p0001 A80-10028

Gasification of solid waste in a fluidized bed reactor with circulating sand 25 p0074 A80-18868

Biomass energy enhancement: A report to the President's Council on Environmental Quality --- solar heat gasification
[PB-296624/0] 25 p0094 N80-10396

Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes
[FE-2247-2] 25 p0119 N80-12191

Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286

Gasification of residual materials from coal liquefaction
[FE-2247-22] 25 p0135 N80-13289

Pilot plant gasification test on biomass fuels
[PB-299077/8] 25 p0151 N80-14272

Conversion of cellulosic and waste polymer material to gasoline
[COO-2982-38] 25 p0169 N80-15291

Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation
[DOE/BL-90476-13] 25 p0169 N80-15293

GASOHOL (FUEL)
Minimum ignition energies and quenching distances of methanol blends
25 p0004 A80-11331
Gasoline's alternatives are feasible
25 p0034 A80-13225
Gasohol - Does it or doesn't it produce positive net energy
25 p0034 A80-13863
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
Net energy analysis of alcohol production from sugarcane
25 p0062 A80-18165
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393
Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273
The 50,000 mile methanol/gasoline blend fleet study --- fuel efficiency and exhaust emissions
[CONF-790520-6] 25 p0134 N80-13275
Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281
Report of the Alcohol Fuel Policy Review
[DOE/PE-0012] 25 p0169 N80-15290

GASOLINE
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019
Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
[FE-2447-13] 25 p0093 N80-10388
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393
Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274
The 50,000 mile methanol/gasoline blend fleet study --- fuel efficiency and exhaust emissions
[CONF-790520-6] 25 p0134 N80-13275
Ethanol/gasoline blends as automotive fuels
[CONF-790520-5] 25 p0168 N80-15280

GEOCHEMISTRY
Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens
25 p0085 A80-20378
Summaries of physical research in the geosciences
[DOE/ER-0030] 25 p0137 N80-13582
Geothermal energy development from the Salton Trough to the High Cascades --- Cerro Preto, Lower California and Mt. Hood, Oregon
[LBL-8703] 25 p0171 N80-15568

GEOLOGICAL FAULTS
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049

GEOLOGICAL SURVEYS
Geology of the Athabasca oil sands
25 p0050 A80-17236
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203
Evaluation of Baltazor known geothermal resources area, Nevada
25 p0076 A80-19206
Borehole geological assessment
[NASA-CASE-NPO-14231-1] 25 p0104 N80-10709
Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543
Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0814/8] 25 p0148 N80-13715
Geothermal energy development from the Salton Trough to the High Cascades --- Cerro Preto, Lower California and Mt. Hood, Oregon
[LBL-8703] 25 p0171 N80-15568

GEOLOGY
Summaries of physical research in the geosciences
[DOE/ER-0030] 25 p0137 N80-13582

GEOPHYSICS
Summaries of physical research in the geosciences
[DOE/ER-0030] 25 p0137 N80-13582

GEOSYNCHRONOUS ORBITS
The satellite power system concept and program
[SAWE PAPER 1305] 25 p0086 A80-20643
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204

GEOTHERMAL ENERGY CONVERSION
The influence of thermophysical properties on the design and sizing of geothermal power plant components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593
Methods for regional assessment of geothermal resources
25 p0075 A80-19202
An estimate of the resource potential of New Zealand geothermal fields for power generation
25 p0076 A80-19208
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase
25 p0076 A80-19209
Overview of geothermal energy in the United States
[CONF-790530-1] 25 p0102 N80-10661
Geothermal resources and technology in the United States
[PB-296623/2] 25 p0102 N80-10677
Environmental implications for geothermal energy development
[CONF-790445-3] 25 p0103 N80-10694
Geothermal energy for industrial application
[LBL-8919] 25 p0111 N80-11579
Development of integrated thermionic circuits for geothermal high-temperature applications
[LA-UR-79-723] 25 p0112 N80-11592
INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595
User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605
Heber geothermal demonstration power plant
[EPRI-ER-863] 25 p0114 N80-11607
A manual for cataloging and indexing documents --- geothermal energy data base
[LBL-4432-REV-1] 25 p0118 N80-11946
Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558
Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561
Hybrid staging of geothermal energy conversion processes
[UCID-17949] 25 p0125 N80-12569
New concepts for converting the energy in low-to medium-temperature liquids, with emphasis on geothermal applications
[UCRL-52583] 25 p0125 N80-12570
Waste heat rejection from geothermal power stations
[ORNL/TM-6533] 25 p0125 N80-12575
Condensation and evaporation heat transfer with low-boiling temperature fluids --- for ocean thermal and geothermal energy conversion
[CONF-790539-1] 25 p0137 N80-13412
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716
Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0816/3] 25 p0148 N80-13717
Geothermal energy, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0818/9] 25 p0148 N80-13718

Geothermal energy. Part 3: Technology and general studies, volume 4. Citations from the NTIS data base
[NTIS/PS-79/0817/1] 25 p0148 N80-13719
Geothermal energy, volume 4. Citations from the Engineering Index data base
[NTIS/PS-79/0819/7] 25 p0148 N80-13720
Commercialization strategy report for hydrothermal electric and direct heat application --- project planning of geothermal resources for geothermal energy conversion for heating electricity generation
[TID-28840-DRAFT] 25 p0157 N80-14508
Lawrence Livermore Laboratory geothermal energy program: A status report on the development of the Total-Flow concept
[UCRL-50046-77] 25 p0159 N80-14529
Preliminary design of axial flow hydrocarbon turbine/generator set for geothermal applications
[EPRI-ER-513] 25 p0160 N80-14536
Geothermal energy: Program summary
[DOE/ET-0101] 25 p0161 N80-14542
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578
All-union scientific and technical conference on use of the earth's heat for the production of electric power - summary of reports
[CONF-751270-SUMM] 25 p0176 N80-15615
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645
Identification of environmental control technologies for geothermal development in the Imperial Valley of California
[UCRL-52548] 25 p0179 N80-15668

GEOTHERMAL RESOURCES
Geothermal resources of the Atlantic Coastal Plain
25 p0016 A80-11977
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978
Prospects of future geothermal energy development
25 p0049 A80-17138
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049
Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, September 12-16, 1977, Proceedings
25 p0075 A80-19201
Methods for regional assessment of geothermal resources
25 p0075 A80-19202
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205
Evaluation of Baltazor known geothermal resources area, Nevada
25 p0076 A80-19206
The United Nations' approach to geothermal resource assessment
25 p0076 A80-19207
An estimate of the resource potential of New Zealand geothermal fields for power generation
25 p0076 A80-19208
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase
25 p0076 A80-19209
Analysis of resource pricing for geothermal electric power production
25 p0088 A80-20889
Environmental implications for geothermal energy development
[CONF-790445-3] 25 p0103 N80-10694
Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543
Geothermal energy for industrial application
[LBL-8919] 25 p0111 N80-11579
INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595
User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605
Seismic refraction investigation of the Salton Sea geothermal area, Imperial Valley, California
[PB-296547/3] 25 p0118 N80-11711
Geopressure energy resource evaluation --- Texas and Louisiana
[ORNL/PPA-79/2] 25 p0138 N80-13605
Analysis of binary thermodynamic cycles for a moderately low-temperature geothermal resource
[TREE-1365] 25 p0139 N80-13627
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0814/8] 25 p0148 N80-13715
Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716
Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0816/3] 25 p0148 N80-13717
Geothermal energy, volume 4. Citations from the Engineering Index data base
[NTIS/PS-79/0819/7] 25 p0148 N80-13720
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471
Commercialization strategy report for hydrothermal electric and direct heat application --- project planning of geothermal resources for geothermal energy conversion for heating electricity generation
[TID-28840-DRAFT] 25 p0157 N80-14508
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E80-10033] 25 p0170 N80-15528
Geothermal energy development from the Salton Trough to the High Cascades --- Cerro Preto, Lower California and Mt. Hood, Oregon
[LBL-8703] 25 p0171 N80-15568
District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States --- using computerized simulation
[NMEI-10-1] 25 p0172 N80-15582
All-union scientific and technical conference on use of the earth's heat for the production of electric power - summary of reports
[CONF-751270-SUMM] 25 p0176 N80-15615
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

GERMANIUM
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141

GERMANY
On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example
25 p0074 A80-19000

GEYSERS
Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626

GLASS
Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740

GLYCOLS
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850

GOAL THEORY
Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices
[RAND/R-2335-DOE] 25 p0099 N80-10636

GOLD COATINGS
Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells
25 p0086 A80-20716

GOVERNMENT PROCUREMENT
Energy saving strategies for federal procurement
[PB-296969/9] 25 p0103 N80-10678

GOVERNMENT/INDUSTRY RELATIONS
Prospects for the near-term commercialization of shale oil in the United States
25 p0078 A80-19474
The great adventure: A report on the 10 regional public hearings on solar energy for the domestic policy review
[HCP/U6354-01] 25 p0124 N80-12567
Role of the government in the development of solar energy
[SERI/TP-52-138] 25 p0178 N80-15639

GRAPHITE-EPOXY COMPOSITE MATERIALS
Recent spin test of two composite wagon wheel flywheels
[SAND-79-1669C] 25 p0140 N80-13640

GRAPHS (CHARTS)
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821

GRASSES
Production of sugarcane and tropical grasses as a renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277

GRIDS
The optimal design of solar cell grid lines
25 p0005 A80-11335
Computer analysis of grids currently used for CdS/Cu2S solar cells
25 p0089 A80-20893

GROUND WATER
Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386
Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470

H

HAMSTERS
Combined effects of polycyclic aromatic hydrocarbons and sunlight --- on Chinese hamster V79 cells
[CONF-790447-4] 25 p0131 N80-12631

HANFORD REACTORS
Quality assurance in alternative energy sources
[RHC-SA-107] 25 p0095 N80-10504

HARMONIC GENERATORS
Improving the reliability of capacitance batteries in power grids with higher-harmonic sources
25 p0008 A80-11671

HAWAII
Solar energy system performance evaluation: A-Frame Industries, single family dwelling, Kaneohe, Hawaii
[SOLAR/1010-78/14] 25 p0101 N80-10659
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628

HAZARDS
Comparative risk assessment of energy systems
25 p0049 A80-17139
Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook
[DOE/EV-0028] 25 p0163 N80-14565

HEAT CAPACITY MAPPING MISSION
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E80-10033] 25 p0170 N80-15528

HEAT EXCHANGERS
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0003 A80-10613
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338
Heat exchange fluids and techniques --- Book
25 p0041 A80-15659
Effectiveness - NTU charts for latent heat storage units --- heat exchangers
[ASME PAPER 79-WA/SOL-16] 25 p0066 A80-18561
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0091 N80-10068
Survey and description of transport phenomena in packed-beds --- for thermal energy storage
25 p0121 N80-12340
Dynamic response of a packed-bed energy storage system to a time varying inlet temperature
25 p0121 N80-12341
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564
Operational experience with drain-down solar systems
[IS-M-166] 25 p0125 N80-12576
Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

HEAT GENERATION
Heat generation in Li/SCCl2 cells
25 p0012 A80-11855
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706

HEAT MEASUREMENT
MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy
25 p0080 A80-19612

HEAT OF COMBUSTION
Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263

HEAT OF FORMATION
Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353

HEAT PIPES
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0003 A80-10613
Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434
The thermal triode --- construction by adding controlling zone to heat pipe
25 p0037 A80-14675
Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick
[AIAA PAPER 80-0148] 25 p0064 A80-18366

Osmotically pumped energy transport system
[AIAA PAPER 80-0210] 25 p0064 A80-18378

Performance testing of a hydrogen heat pipe
[AIAA PAPER 80-0212] 25 p0064 A80-18379

Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022

Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0091 N80-10068

Performance limits for liquid-metal heat pipes containing long adiabatic sections
[LA-UR-79-1241] 25 p0095 N80-10472

Cooling aluminum molds using heat pipes
[BDX-613-2039-REV] 25 p0108 N80-11384

Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362

HEAT PUMPS

Absorption heat pumps for solar space heating systems
25 p0036 A80-14672

Performance and analysis of a 'series' heat pump-assisted solar heated residence in Madison, Wisconsin
25 p0061 A80-18132

A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555

Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages
[ASME PAPER 79-WA/SOL-27] 25 p0067 A80-18568

Optimization and comparison strategies for solar energy systems
[ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573

Performance of heat pumps at elevated evaporating temperatures - With application to solar input
[ASME PAPER 79-WA/SOL-19] 25 p0069 A80-18587

Residential solar heat pump systems - Thermal and economic performance
[ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591

A solar assisted and wind powered heat pump for residential dwellings
[ASME PAPER 79-WA/HT-33] 25 p0070 A80-18595

Solar assisted heat pump overview and summary of in-house research
[BNL-24911] 25 p0098 N80-10624

Heat pump centered integrated community energy systems: System development
[ANL/ICES-TM-27] 25 p0110 N80-11571

High COP heat pump system, phase 1, results
[HCP/M5056-01] 25 p0110 N80-11573

Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574

DOE heat pump centered integrated community energy systems project
[CONF-790362-1] 25 p0112 N80-11586

Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566

Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1] 25 p0130 N80-12613

Design, construction, and operation of the solar assisted heat pump ground coupled storage experiments at Brookhaven National Laboratory
[BNL-25908] 25 p0142 N80-13654

Community heating and cooling systems
[CONF-790446-6] 25 p0147 N80-13706

Dissociation pressure measurements on salts proposed for thermochemical energy storage
[SAND-79-8033] 25 p0160 N80-14532

Commercial solar augmented heat pump system
[EPRI-ER-1004] 25 p0160 N80-14537

New heat transfer geometry for hydride heat engines and heat pumps
[LA-7822] 25 p0169 N80-15289

Heat pump centered integrated community energy systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588

Heat pump centered integrated community energy systems; System development
[ANL/ICES-TM-26] 25 p0173 N80-15589

Intermediate report on the performance of plate-type ice-maker heat pumps
[ORNL/CON-23] 25 p0176 N80-15619

HEAT RESISTANT ALLOYS

The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

Microstructural objectives for high-temperature alloys in advanced energy systems
25 p0002 A80-10306

HEAT SOURCES

General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608

General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program --- plutonium oxide
[LA-7519-PR] 25 p0118 N80-11889

Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584

HEAT STORAGE

Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846

Overview of division of energy storage program Department of energy
25 p0016 A80-11979

Low-cost central receiver solar power plant using molten salt as a heat transfer and storage medium
25 p0017 A80-11986

On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427

Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434

Modeling of a thermal wall panel using phase change materials
25 p0021 A80-12439

Design criteria in PCM wall thermal storage --- Phase Change Materials
25 p0021 A80-12440

Storage of solar heat by solid-liquid phase change
25 p0024 A80-12755

Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756

An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting
25 p0029 A80-12823

Energy-storage systems --- pumped-storage hydroelectric plants, compressed-air energy-storage plants, electric batteries and hot water storage
25 p0034 A80-13513

Heat exchange fluids and techniques --- Book
25 p0041 A80-15659

On a calculation procedure for a heat accumulator in a solar heating system
25 p0044 A80-16630

Solar energy storage by metal hydride
25 p0053 A80-17582

A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560

Effectiveness - NTU charts for latent heat storage units --- heat exchangers
[ASME PAPER 79-WA/SOL-16] 25 p0066 A80-18561

Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596

An evaluation of thermal energy storage for residential air conditioning applications
[ASME PAPER 79-WA/HT-31] 25 p0071 A80-18631

Under ground thermal storage in the operation of solar ponds
25 p0077 A80-19471

Survey of solar thermal energy storage subsystems for thermal/electric applications
[ORNL/TM-5758] 25 p0098 N80-10627

Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645

State of the art of sensible heat storage for solar heat pump systems
[BNL-25909] 25 p0101 N80-10651

Performance monitoring of an off-peak heating and cooling system utilizing thermal storage and solar augmented heat pump
[EPRI-ER-845] 25 p0102 N80-10662

Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603

Solar energy with latent heat storage: Fundamentals and applications
[ASSA-10/1978] 25 p0116 N80-11632

Fluid Dynamics of Porous Media in Energy Applications, volume 1 --- heat storage and transfer in solar energy conversion systems
[VKI-LEC-SER-1979-4-VOL-1] 25 p0121 N80-12338

Survey and description of transport phenomena in packed-beds --- for thermal energy storage
25 p0121 N80-12340

Dynamic response of a packed-bed energy storage system to a time varying inlet temperature
25 p0121 N80-12341

Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342

Effect of operating temperatures on the cost of energy from solar thermal electric power plants
[SAND-79-0801] 25 p0124 N80-12563

Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6605] 25 p0125 N80-12568

Performance of Los Alamos solar Mobile/Modular Home Unit no. 1
[LA-UR-78-2587] 25 p0126 N80-12577

Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6934] 25 p0139 N80-13631

Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651

Design, construction, and operation of the solar assisted heat pump ground coupled storage experiments at Brookhaven National Laboratory
[BNL-25908] 25 p0142 N80-13654

Trans-seasonal storage of solar energy: Innovative research program subtask --- underground storage
[COO-4546-3] 25 p0144 N80-13672

Large-scale annual-cycle thermal energy storage in aquifers
[CONF-790515-3] 25 p0145 N80-13686

Cost analysis of packed beds for thermal energy storage
[CAES-11] 25 p0145 N80-13687

A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484

Proceedings of the Thermal Energy Storage in Aquifers Workshop
[LBL-8431] 25 p0160 N80-14533

Thermal energy storage for solar applications: An overview
[SERI/TP-34-089] 25 p0161 N80-14546

Candidate thermal energy storage technologies for solar industrial process heat applications
[NASA-TM-81380] 25 p0171 N80-15560

Low temperature thermal energy storage: A state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583

Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584

Aquifer thermal energy storage
[LBL-7070] 25 p0176 N80-15618

HEAT TRANSFER

An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822

Heat transfer to a melting solid with application to thermal energy storage systems
25 p0036 A80-14667

Heat exchange fluids and techniques --- Book
25 p0041 A80-15659

Osmotically pumped energy transport system
[AIAA PAPER 80-0210] 25 p0064 A80-18378

Performance testing of a hydrogen heat pipe
[AIAA PAPER 80-0212] 25 p0064 A80-18379

The thermal design and analysis of an integrated sodium boiler/receiver for solar energy conversion
[ASME PAPER 79-WA/SOL-10] 25 p0067 A80-18569

Noniterative solution of heat transfer equation of fluid flow in solar collector
[ASME PAPER 79-WA/SOL-24] 25 p0068 A80-18577

Proceedings: Solar Thermal Power User Review Panel Meeting
[SERI/TP-69-221] 25 p0113 N80-11598

Fluid Dynamics of Porous Media in Energy Applications, volume 1 --- heat storage and transfer in solar energy conversion systems
[VKI-LEC-SER-1979-4-VOL-1] 25 p0121 N80-12338

Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342

Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353

Condensation and evaporation heat transfer with low-boiling temperature fluids --- for ocean thermal and geothermal energy conversion
[CONF-790539-1] 25 p0137 N80-13412

Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707

Impact of new instrumentation on advanced turbine research
[NASA-TM-79301] 25 p0166 N80-15133

New heat transfer geometry for hydride heat engines and heat pumps
[LA-7822] 25 p0169 N80-15289

HEAT TRANSMISSION

Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048

One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922

Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543

Experimental and analytical OTEC studies at ORNL
[CONF-790631-1] 25 p0143 N80-13666

Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471

HEAT TREATMENT

Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788

HEATING

Performance monitoring of an off-peak heating and cooling system utilizing thermal storage and solar augmented heat pump
[EPRI-ER-845] 25 p0102 N80-10662

User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605

Commercialization strategy report for hydrothermal electric and direct heat application --- project planning of geothermal resources for geothermal energy conversion for heating electricity generation
[TID-28840-DRAFT] 25 p0157 N80-14508

District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States --- using computerized simulation
[NMEI-10-1] 25 p0172 N80-15582

HEATING EQUIPMENT

Techniques for evaluation of advanced cogeneration technologies
25 p0014 A80-11957

Economy of a retrofit solar system --- water heating
25 p0017 A80-11984

Instrumentation principles for performance measurement of solar heating systems
25 p0020 A80-12432

An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822

Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646

Optimal insulation of pipes and tanks for solar heating systems
[ALC-5319-2] 25 p0102 N80-10660

Microwave heating: Industrial applications. Citations from the engineering data base
[NTIS/PS-79/0632/4] 25 p0102 N80-10674

Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources [PB-298494/6] 25 p0131 N80-12637
Intermediate report on the performance of plate-type ice-maker heat pumps [ORNL/CCN-23] 25 p0176 N80-15619

HEAVY IONS
The United States programme in heavy ion beam fusion 25 p0058 A80-17873

HELIOSTATS
Color graphic controls for the solar central receiver test facility 25 p0022 A80-12626
Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector 25 p0022 A80-12627
Calculation of the optical characteristics of high-power two-mirror solar furnaces 25 p0044 A80-16629
Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant 25 p0051 A80-17246
Structure of an averaged statistical pencil of rays reflected from a heliostat 25 p0051 A80-17247
SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators [ASME PAPER 79-WA/SOL-13] 25 p0068 A80-18581
Solar thermal central receiver systems [ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation [SAND-78-8180] 25 p0097 N80-10612
Solar-powered steam generator heliostat [BNL-50974] 25 p0129 N80-12610
Solar thermal test facility heliostat development [SAND-78-1177] 25 p0140 N80-13642
Solar central receiver prototype heliostat CDRL item B.D., volume 1 [SAN-1605/7-VOL-1] 25 p0146 N80-13700

HELIUM
The helium question --- future domestic consumption vs storage of current natural gas derived supplies 25 p0034 A80-13589
Influence of the working fluid on heat transfer and layout of solar tower receivers 25 p0036 A80-14671
Helium penetration in evacuated solar collectors - Theory and effect on their performance [ASME PAPER 79-WA/SOL-17] 25 p0066 A80-18563

HERMETIC SEALS
Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices 25 p0051 A80-17244

HETEROJUNCTION DEVICES
GaAs-electrolyte photovoltaic cells 25 p0026 A80-12774
Efficient indium tin oxide/polycrystalline silicon solar cells 25 p0039 A80-15136
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion 25 p0046 A80-16786
A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures 25 p0046 A80-16794
Measurements of minority-carrier diffusion length in heterojunction solar cells 25 p0086 A80-20717
Analysis and evaluation of isotype heterojunction solar cells 25 p0087 A80-20734

HIGH CURRENT
Relativistic high-current microwave plasma electronics 25 p0083 A80-19847

HIGH FIELD MAGNETS
Space applications of superconductivity - High field magnets 25 p0084 A80-20128

HIGH POWER LASERS
CO2 electric discharge lasers - Present status and future applications 25 p0039 A80-14960
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets 25 p0046 A80-16776
Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory 25 p0056 A80-17862

HIGH PRESSURE
170 MW pressurized fluidized bed combustion electric plant 25 p0014 A80-11962
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis 25 p0019 A80-12244

HIGH STRENGTH ALLOYS
Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-3] 25 p0119 N80-12163

HIGH TEMPERATURE
The KMSF laser fusion programme 25 p0056 A80-17860
High temperature electrolysis --- synthetic fuel production [BNL-26331] 25 p0167 N80-15227

HIGH TEMPERATURE GASES
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine 25 p0003 A80-10613
Start up system for hydrogen generator used with an internal combustion engine [NASA-CASE-NPO-13849-1] 25 p0092 N80-10374
Hot gas cleanup [ICTIS/TR-03] 25 p0117 N80-11647

HIGH TEMPERATURE PLASMAS
End plugging of a hot linear theta pinch 25 p0055 A80-17824
Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results [AIAA PAPER 80-0091] 25 p0063 A80-18265

HIGH TEMPERATURE RESEARCH
Microstructural objectives for high-temperature alloys in advanced energy systems 25 p0002 A80-10306

HIGH TEMPERATURE TESTS
Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels [FE-1784-42] 25 p0106 N80-11248

HIGH VOLTAGES
High-voltage multijunction solar cell 25 p0035 A80-14593

HIGHWAYS
New technology and vehicle operation on roadways 25 p0037 A80-14702

HISTORIES
Toward the endless frontier: History of the Committee on Science and Technology 1959 - 1979 [GPO-35-120] 25 p0181 N80-15994

HOMOPOLAR GENERATORS
Power supply requirements for a tokamak fusion reactor 25 p0003 A80-10474
Power supply requirements for a tokamak fusion reactor [ANL/FPP/TM-119] 25 p0104 N80-10918

HOT ELECTRONS
Experimental studies of interaction and transport processes in laser fusion 25 p0057 A80-17864

HUMAN FACTORS ENGINEERING
International activities: The fiscal year 1978 survey of international programs at NRL [PB-300491/8] 25 p0181 N80-16004

HYBRID PROPULSION
Hydrogen-electric power drives [SLAC-PUB-2203] 25 p0113 N80-11604

HYDRATES
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting 25 p0029 A80-12823

HYDRAULIC EQUIPMENT
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model [PB-297274/3] 25 p0108 N80-11551

HYDRIDES
Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride [AD-A071157] 25 p0139 N80-13625

HYDROCARBON COMBUSTION
Low NO(x) heavy fuel combustor program [NASA-TM-79313] 25 p0138 N80-13624
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion --- models for environmentally clean power plant design [COO-4272-3] 25 p0165 N80-14587

HYDROCARBON FUEL PRODUCTION
The photo-electrochemical production of C-C bonds from carbon dioxide 25 p0004 A80-10848
SRC solids - Boiler fuel and building block --- Solvent Refined Coal 25 p0015 A80-11967
SRC solids - A preferred compliance boiler fuel --- Solvent Refined Coal 25 p0015 A80-11968
Pelletized wood /Woodex/ - Applications and potential --- from biomass waste products 25 p0017 A80-11981
Progress in R and D on coal liquefaction - Progress in research-development on coal liquefaction 25 p0030 A80-12940
The role of coal gasification and liquefaction in improving the efficiency of energy use - Comparative end use efficiency of the use of coal: Substitute natural gas and other gases versus electric power production 25 p0030 A80-12941
Coal as a source of chemical raw materials - Prospects for chemical synthesis based on gas from coal 25 p0031 A80-12944
Progress and development trends in coal gasification and liquefaction technologies - New gasification methods developed on a laboratory or large scale 25 p0031 A80-12946
Gasoline's alternatives are feasible 25 p0034 A80-13225
Methane fermentation of aquatic biomass 25 p0043 A80-16148
Technical possibilities and economic prospects for coal refining 25 p0043 A80-16175
Petroleum plantations and synthetic chloroplasts 25 p0049 A80-17137
Ethyl alcohol production and use as a motor fuel --- Book 25 p0050 A80-17241
The controlling production mechanism of methane gas from coalbeds 25 p0085 A80-20499
Molten salt pyrolysis of latex --- for hydrocarbon fuel production [NASA-CASE-NPO-14315-1] 25 p0092 N80-10361
Conversion of cellulosic and waste polymer material to gasoline [COO-2982-38] 25 p0169 N80-15291

HYDROCARBON FUELS
An engine fuel chemistry solution to the problem of jet fuel supplies 25 p0001 A80-10199
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels 25 p0073 A80-18832
Molten salt pyrolysis of latex --- for hydrocarbon fuel production [NASA-CASE-NPO-14315-1] 25 p0092 N80-10361
Characterization and combustion of SRC 2 fuel oil [EPRI-FP-1028] 25 p0119 N80-12192
Environmental aspects of alternative fuels utilization for highway vehicles [UCRL-81841] 25 p0120 N80-12201
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion --- models for environmentally clean power plant design [COO-4272-3] 25 p0165 N80-14587
Ethanol/gasoline blends as automotive fuels [CONF-790520-5] 25 p0168 N80-15280

HYDROCARBONS
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California 25 p0004 A80-11019
Remote sensing of LNG spill vapor dispersion using Raman LIDAR [UCRL-13984] 25 p0103 N80-10689
The analysis of sediment samples for hydrocarbons [AD-A073822] 25 p0149 N80-13754
Petrochemicals: Their economic significance in the domestic economy [PB-299733/6] 25 p0181 N80-15992

HYDROCRACKING
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis 25 p0019 A80-12244
An update of German non-isothermal coal pyrolysis work 25 p0019 A80-12245
Status of the PEATGAS process [CONF-781045-3] 25 p0120 N80-12199

HYDROELECTRIC POWER STATIONS
Energy-storage systems --- pumped-storage hydroelectric plants, compressed-air energy-storage plants, electric batteries and hot water storage 25 p0034 A80-13513
Global options for short-range alternative energy strategies 25 p0048 A80-17129
The application potential of hydro power 25 p0049 A80-17136
Utilization of ocean heat for hydrogen production 25 p0086 A80-20686
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model [PB-297274/3] 25 p0108 N80-11551
Solar thermal electric plants in hydroelectric grid --- Lower Colorado region [DOE/SF/10505-1] 25 p0143 N80-13663
Fundamental economic issues in the development of small-scale hydro [DOE/RA-23-216.00.0-02] 25 p0143 N80-13667
Turbomachinery options for an underground pumped hydroelectric storage plant [CONF-790803-50] 25 p0177 N80-15629
Energy program at the Johns Hopkins University Applied Physics Laboratory [PB-310245/7] 25 p0179 N80-15648

HYDROGEN
Ablation of solid hydrogen in a plasma 25 p0050 A80-17218
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment [NASA-TM-79308] 25 p0132 N80-12881
Hydrogen-halogen energy storage system [BNL-50924] 25 p0139 N80-13632
Analysis of hydrogen in solids --- technology assessment of ways to analyze hydrogen for hydrogen based energy and hydrogen production [DOE/ER-0026] 25 p0167 N80-15220

HYDROGEN ATOMS
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K 25 p0072 A80-18726

HYDROGEN CHLORIDES
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States 25 p0019 A80-12128

HYDROGEN ENGINES
Hydrogen-powered vs. battery-powered automobiles 25 p0033 A80-13195
New heat transfer geometry for hydride heat engines and heat pumps [LA-7822] 25 p0169 N80-15289

HYDROGEN FUELS
Hydrogen - The fuel of the future --- Russian book 25 p0002 A80-10349
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures 25 p0008 A80-11816
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides 25 p0033 A80-13200

Gasoline's alternatives are feasible
25 p0034 A80-13225

Hydrogen fuel applications for urban transit
25 p0037 A80-14703

Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993

Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[AIAA PAPER 80-0023] 25 p0063 A80-18243

Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

Survey of liquid hydrogen container techniques for highway vehicle fuel system applications
[HCP/M2752-01] 25 p0092 N80-10383

Applications analysis of fixed site hydrogen storage
[SAND-78-8272] 25 p0092 N80-10384

Hydrogen as a fuel. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0771/0] 25 p0094 N80-10397

Hydrogen-electric power drives
[SLAC-PUB-2203] 25 p0113 N80-11604

The future role of hydrogen fuel in an electrical society
[UTIAS-241] 25 p0119 N80-12189

Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0126 N80-13297

Critical review and assessment of environmental and safety problems in hydrogen energy systems
[LA-7820-PR] 25 p0145 N80-13690

HYDROGEN IONS

Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

HYDROGEN ISOTOPES

A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour
25 p0022 A80-12453

Investigations of isotope separation effects of a Ti-fluidized bed
25 p0082 A80-19669

HYDROGEN OXYGEN FUEL CELLS

Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride
[AD-A071157] 25 p0139 N80-13625

HYDROGEN PLASMA

Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines
25 p0082 A80-19672

HYDROGEN PRODUCTION

A mathematical model for a future hydrogen power system
25 p0001 A80-10223

The turnover times and pool sizes of photosynthetic hydrogen production by green algae
25 p0029 A80-12819

Hydrogen evolution from water using solid carbon and light energy
25 p0032 A80-13109

The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195

Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So2-I2 system for H2O decomposition
25 p0032 A80-13196

Microbial hydrogen production from replenishable resources
25 p0032 A80-13197

Photophysical and chemical processes affecting the stability of the thiazine dye-iron system --- in hydrogen production
25 p0033 A80-13198

Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen --- electron transfer reactions in solar energy conversion processes
25 p0040 A80-15358

Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings
25 p0041 A80-15976

Solar-hydrogen energy systems --- Book
25 p0051 A80-17573

Introduction - A review of the scope --- solar-hydrogen energy conversion
25 p0052 A80-17574

Thermodynamics of water-splitting --- for hydrogen production
25 p0052 A80-17575

Water electrolysis --- for hydrogen production
25 p0052 A80-17576

Direct thermal decomposition of water
25 p0052 A80-17577

Thermochemical hydrogen production
25 p0052 A80-17578

Photochemical hydrogen production
25 p0052 A80-17579

Photoelectrochemical hydrogen production
25 p0052 A80-17580

Biological and biochemical hydrogen production
25 p0053 A80-17581

Solar energy storage by metal hydride
25 p0053 A80-17582

Direct solar energy conversion at sea
25 p0053 A80-17583

Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice
25 p0078 A80-19473

Utilization of ocean heat for hydrogen production
25 p0086 A80-20686

Start up system for hydrogen generator used with an internal combustion engine
[NASA-CASE-NPO-13849-1] 25 p0092 N80-10374

Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401

One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922

Economics of hydrogen production and liquefaction updated to 1980
[NASA-CR-159163] 25 p0106 N80-11238

LASL thermochemical hydrogen program status on October 31, 1978 --- fusion-synfuel
[LA-UR-78-2895] 25 p0120 N80-12197

Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605

Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296

Development of the steam-iron process for hydrogen production, 9010
[FE-2435-32] 25 p0150 N80-14258

Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CCNF-780807-11] 25 p0150 N80-14265

Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571

Analysis of hydrogen in solids --- technology assessment of ways to analyze hydrogen for hydrogen based energy and hydrogen production
[DOE/ER-0026] 25 p0167 N80-15220

Fusion energy for hydrogen production --- systems engineering of a process for hydrogen production from nuclear fusion
[BNL-24906] 25 p0180 N80-15897

HYDROGEN RECOMBINATIONS

Elucidation of coal structural components by short residence-time extractive liquefaction
25 p0119 N80-12188

HYDROGEN SULFIDE

Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454

Dynamic modeling of H2S clean-up processes --- in coal gasification
25 p0088 A80-20885

Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626

HYDROGEN-BASED ENERGY

A mathematical model for a future hydrogen power system
25 p0001 A80-10223

Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848

Hydrogen - A means of integrating competing technology into a unified energy system 25 p0014 A80-11955

The R&D programme of the European communities in the field of hydrogen - Progress and results 25 p0032 A80-13195

Hydrogen-powered vs. battery-powered automobiles 25 p0033 A80-13199

Hydrogen - The Denver story 25 p0038 A80-14709

Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings 25 p0041 A80-15976

Hydrogen storage by means of reversible magnesium alloy 25 p0041 A80-15990

Use of reversible hydrides for hydrogen storage 25 p0042 A80-15991

Hydrogen storage by use of cryoadsorbents in comparison to alternatives 25 p0042 A80-15992

Solar-hydrogen energy systems --- Book 25 p0051 A80-17573

Introduction - A review of the scope --- solar-hydrogen energy conversion 25 p0052 A80-17574

Performance testing of a hydrogen heat pipe [AIAA PAPER 80-0212] 25 p0064 A80-18379

Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K 25 p0072 A80-18728

Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base [NTIS/PS-79/0772/8] 25 p0094 N80-10402

Proceedings of the DOE chemical/hydrogen energy contractor review systems [CONF-771131] 25 p0164 N80-14572

Analysis of hydrogen in solids --- technology assessment of ways to analyze hydrogen for hydrogen based energy and hydrogen production [DOE/ER-0026] 25 p0167 N80-15220

HYDROGENATION

Current German developments in coal liquefaction technology 25 p0015 A80-11965

Catalysis of hydrogen transfer in a tetralin-coal system 25 p0019 A80-12246

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [FE-2307-46] 25 p0134 N80-13280

Catalyst development for coal liquefaction [EPRI-AF-1084] 25 p0136 N80-13292

HYDROLYSIS

Coal conversion in flash hydropyrolysis reactors [BNL-26209] 25 p0136 N80-13294

Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle [UCRL-52546] 25 p0164 N80-14571

HYDROSTATIC PRESSURE

Geopressure energy resource evaluation --- Texas and Louisiana [ORNL/PPA-79/2] 25 p0138 N80-13605

HYGROSCOPICITY

Physical properties of gasoline/alcohol automotive fuels [CONF-790520-4] 25 p0134 N80-13273

I

ICE FORMATION

Intermediate report on the performance of plate-type ice-maker heat pumps [ORNL/CON-23] 25 p0176 N80-15619

IDAHO

INEL geothermal environmental program [TREE-1340] 25 p0112 N80-11595

IGNITION TEMPERATURE

Minimum ignition energies and quenching distances of methanol blends 25 p0004 A80-11331

IGNITRONS

Ignitron switching problems associated with a large reversed field pinch experiment 25 p0081 A80-19629

ILLUMINANCE

Photoelectric parameters of photoelectric converters in relation to illumination 25 p0044 A80-16627

IMAGE PROCESSING

X-ray measurement of laser fusion targets using least squares fitting 25 p0060 A80-18110

IMPACTORS

First experiences with the use of impactors in large power plants 25 p0074 A80-18859

Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites 25 p0074 A80-18861

IMPEDANCE MATCHING

Theoretical consideration of curve fill factor in solar cells 25 p0026 A80-12768

Power loss in photovoltaic arrays due to mismatch in cell characteristics 25 p0028 A80-12815

IMPERIAL VALLEY (CA)

Seismic refraction investigation of the Salton Sea geothermal area, Imperial Valley, California [PB-296547/3] 25 p0118 N80-11711

Identification of environmental control technologies for geothermal development in the Imperial Valley of California [UCRL-52548] 25 p0179 N80-15668

IMPLOSIONS

The KMSF laser fusion programme 25 p0056 A80-17860

Work on laser interaction and implosion at Centre d'Etudes de Limeil 25 p0057 A80-17863

Inertial confinement fusion research at Osaka 25 p0057 A80-17868

Nuclear fusion by cylindrical ion implosion 25 p0058 A80-17874

Optimization of stabilized imploding liner fusion reactors 25 p0079 A80-19593

IMPURITIES

Accumulation of impurities and stability behaviour in the high-density regime of Pulsator 25 p0054 A80-17759

INCENTIVE TECHNIQUES

Implementation of state solar incentives: Land-use planning to ensure solar access [SERI/TR-51-163] 25 p0158 N80-14519

Implementation of state solar incentives: A preliminary assessment [SERI/TR-51-159] 25 p0158 N80-14520

INCENTIVES

Photovoltaic incentives options [HCP/CS-0023] 25 p0162 N80-14561

INDEXES (DOCUMENTATION)

Energy information data base. Corporate author entries [DOE/TIC-4585-R1-SUPPL-1] 25 p0097 N80-10617

NASA authorization for fiscal year 1980. Part 4: Index [GPO-51-336] 25 p0104 N80-10964

National environmental/energy workshop assessment, phase 3. Energy programs --- directory of courses available [PB-298587/7] 25 p0117 N80-11634

A manual for cataloging and indexing documents --- geothermal energy data base [LBL-4432-REV-1] 25 p0118 N80-11946

World energy data system (WENDS). Volume 8: Nuclear facility profiles, CO-HU [ANL-PMS-79-2-VOL-8] 25 p0139 N80-13630

INDIA

Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978 25 p0023 A80-12739

Solar energy availability over India for maximum utilisation 25 p0023 A80-12740

Programme and progress of DST sponsored solar photovoltaic work in India 25 p0025 A80-12760

Industrial applications of solar energy in India 25 p0027 A80-12780

INDIUM COMPOUNDS
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747

INDIUM SULFIDES
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786

INDUCTION MOTORS
Induction and synchronous machines for vertical axis wind turbines
[SAND-79-7017] 25 p0144 N80-13675

INDUSTRIAL ENERGY
Techniques for evaluation of advanced cogeneration technologies
25 p0014 A80-11957
Low/medium BTU coal gasification - Perspective of the gas industry
25 p0015 A80-11969
Commercial building and industrial applications for solar energy
25 p0017 A80-11985
Industrial solar total energy systems
25 p0017 A80-11987
Near-term prospects for solar industrial process heat
25 p0018 A80-11988
Industrial applications of solar energy in India
25 p0027 A80-12780
Progress in R and D on coal liquefaction - Progress in research-development on coal liquefaction
25 p0030 A80-12940
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706
Application of solar and fuel cell technology to industrial users
25 p0037 A80-14707
Economic comparisons of solar and fossil total energy systems for industrial applications
[ASME PAPER 79-WA/TS-6] 25 p0065 A80-18552
An applications analysis for the solar industrial process heat market
25 p0088 A80-20888
Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner
[FE-2489-33] 25 p0093 N80-10390
Department of Energy workshops on industrial energy conservation reporting
[DOE/CS-1830-T3] 25 p0099 N80-10635
Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656
Microwave heating: Industrial applications. Citations from the engineering data base
[NTIS/PS-79/0632/4] 25 p0102 N80-10674
Geothermal energy for industrial application
[LBL-8919] 25 p0111 N80-11579
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 3: Policy barriers and investment decisions in industry
[LBL-7896-PT-3] 25 p0114 N80-11614
Effects of energy policy on industry
[USPFE-1978-8] 25 p0129 N80-12604
Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650
Technology development needs for high temperature process heat
[SERI/TR-35-047] 25 p0143 N80-13669
Industrial applications of advanced energy systems
[CONF-790602-54] 25 p0147 N80-13708
Energy conservation in the US economy from increased recycle of obsolete steel scrap
[COO-2893-10] 25 p0159 N80-14524
Candidate thermal energy storage technologies for solar industrial process heat applications
[NASA-TM-81380] 25 p0171 N80-15560
SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
The 1985, 1990 and 1995 midterm energy market model results under three scenarios of Fuel Use Act regulations
[DOE/EIA-0182/2] 25 p0173 N80-15592

INDUSTRIAL MANAGEMENT
Materials resource requirements and potential limitations in solar energy products
25 p0018 A80-11990
The financing problems of Europe's gas industry
25 p0032 A80-13174
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 3: Policy barriers and investment decisions in industry
[LBL-7896-PT-3] 25 p0114 N80-11614

INDUSTRIAL PLANTS
Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959
Influence of the working fluid on heat transfer and layout of solar tower receivers
25 p0036 A80-14671
Novel power generation cycles using coal gas
[ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites
25 p0074 A80-18861
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

INDUSTRIAL WASTES
Source, supply and nature of municipal and industrial waste as a fuel
25 p0017 A80-11983
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641
Energy conservation through point source recycle with high temperature hyperfiltration --- textile industry
[PB-299183/4] 25 p0180 N80-15688

INDUSTRIES
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532
Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747

INERT ATMOSPHERE
Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454

INERTIAL FUSION (REACTOR)
Status of inertial confinement fusion
25 p0016 A80-11976
Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers
25 p0046 A80-16745
Inertial confinement fusion at NRL
25 p0056 A80-17861
Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory
25 p0056 A80-17862
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864
Developments in Sandia Laboratories particle beam fusion programme
25 p0057 A80-17867
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
The United States programme in heavy ion beam fusion
25 p0058 A80-17873
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
Summary on inertial-confinement fusion
25 p0059 A80-17893

INFORMATION DISSEMINATION
Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576
INFORMATION SYSTEMS
World Energy Data System (WENDS)
[CONF-790461-2] 25 p0112 N80-11587
INFRARED ABSORPTION
The KMSF laser fusion programme
25 p0056 A80-17860
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863
INFRARED LASERS
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863
INGOTS
Assessment of present state-of-the-art sawing technology of large diameter ingots for solar sheet material
[NASA-CR-162535] 25 p0151 N80-14273
INHIBITORS
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567
INJECTORS
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618
INORGANIC COMPOUNDS
Environmental protection in the processing of coal - The utilization or disposal of coal processing residues
25 p0030 A80-12942
INORGANIC NITRATES
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685
INPUT
Supply and demand in input-output analysis for energy modeling
25 p0088 A80-20890
SAMICS: Input data preparation --- Solar Array Manufacturing Industry Costing Standards
[NASA-CR-162421] 25 p0110 N80-11570
INSOLATION
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
Insolation modeling overview
25 p0020 A80-12428
Solar energy availability over India for maximum utilisation
25 p0023 A80-12740
Calculation of monthly mean solar radiation for horizontal and inclined surfaces
25 p0028 A80-12817
Calculation of climatic solar heating performance
25 p0029 A80-12820
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821
Measurement of insolation using CdS photoresistor
25 p0047 A80-16998
A method of estimating monthly average solar radiation on shaded receivers
25 p0060 A80-18123
Use of adjustable flat mirrors with flat-plate collectors
[AIAA PAPER 80-0294] 25 p0063 A80-18299
Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301
An average slope factor for solar insolation
[ASME PAPER 79-WA/SOL-41] 25 p0067 A80-18572
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418] 25 p0100 N80-10640
Solar-climactic statistical study --- windpower utilization and solar energy conversion
[HCP/T4016-01/2] 25 p0149 N80-13747
Insolation models, data and algorithms
[SERI/TR-36-110] 25 p0165 N80-14617
INSTRUMENT ERRORS
Solar cell spectral response characterization
25 p0037 A80-14685
INSTRUMENT PACKAGES
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431
INSTRUMENTS
Instrumentation principles for performance measurement of solar heating systems
25 p0020 A80-12432
INTEGRATED CIRCUITS
Development of integrated thermionic circuits for geothermal high-temperature applications
[LA-UR-79-723] 25 p0112 N80-11592
INTEGRATED ENERGY SYSTEMS
Steam turbines --- thermoelectric power generation
[ANL/CES/TE-78-7] 25 p0095 N80-10502
The first small power system experiment, Phase 1: Engineering experiment no. 1 --- solar thermal electric power plants
[NASA-CR-162417] 25 p0095 N80-10596
Heat pump centered integrated community energy systems: System development
[ANL/ICES-TM-27] 25 p0110 N80-11571
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
Regional reference energy systems: Electric utility applications
[BNL-50962] 25 p0111 N80-11585
DOE heat pump centered integrated community energy systems project
[CONF-790362-1] 25 p0112 N80-11586
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-[illegible]36
Community heating and cooling systems
[CONF-790446-6] 25 p0147 N80-[illegible]06
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263
Heat pump centered integrated community energy systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588
Heat pump centered integrated community energy systems; System development
[ANL/ICES-TM-26] 25 p0173 N80-15589
INTERMETALLICS
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200
INTERNAL COMBUSTION ENGINES
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816
Start up system for hydrogen generator used with an internal combustion engine
[NASA-CASE-NPO-13849-1] 25 p0092 N80-10374
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation
[DOE/[illegible]-90476-13] 25 p0169 N80-15293
INTERNATIONAL COOPERATION
Legal and political problems of solar power stations in space
[IAF PAPER 79-IISL-03] 25 p0047 A80-17064
INVERTED CONVERTERS (DC TO AC)
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377
INVESTMENTS
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
IODINE
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265

ION ACCELERATORS
The United States programme in heavy ion beam fusion
25 p0058 A80-17873
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

ION BEAMS
Developments in Sandia Laboratories particle beam fusion programme
25 p0057 A80-17867
The United States programme in heavy ion beam fusion
25 p0058 A80-17873
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874
MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy
25 p0080 A80-19612

ION CHARGE
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

ION CURRENTS
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829
MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy
25 p0080 A80-19612

ION CYCLOTRON RADIATION
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608

ION DISTRIBUTION
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

ION PROBES
Particle beam systems in plasma diagnostics
25 p0045 A80-16718

ION PROPULSION
Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362

IRELAND
The assessment of actual wind power availability in Ireland
25 p0003 A80-10844

IRON
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system --- in hydrogen production
25 p0033 A80-13198
Development of the steam-iron process for hydrogen production, 9010
[PE-2435-32] 25 p0150 N80-14258

IRON COMPOUNDS
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862
Review of industrial participation on the ANL lithium/iron sulfide battery development program --- for energy storage and electric vehicles
[CONF-780852-1] 25 p0164 N80-14573
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614

IRRADIATION
A study of the thermal effect that radiant energy produces on a mass of water --- Spanish thesis
25 p0040 A80-15653

IRRIGATION
Solar-thermal jet pumping for irrigation
[AIAA PAPER 80-0402] 25 p0077 A80-19328
Technical and economic assessment of solar powered water pumping for remote areas
[SAND-79-8187] 25 p0129 N80-12608

ISOMERIZATION
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502

ISOMERS
Energy storage in organic photoisomers
25 p0072 A80-18747

ISOTOPE EFFECT
Investigations of isotope separation effects of a Ti-fluidized bed
25 p0082 A80-19669

ISOTOPE SEPARATION
Investigations of isotope separation effects of a Ti-fluidized bed
25 p0082 A80-19669
The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329

ITALY
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203

IVORY COAST
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591

J

JET ENGINE FUELS
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199
Alternative jet aircraft fuels
25 p0091 N80-10209

JET MIXING FLOW
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551

JET PUMPS
Solar-thermal jet pumping for irrigation
[AIAA PAPER 80-0402] 25 p0077 A80-19328

JET STREAMS (METEOROLOGY)
Electricity generation from jet-stream winds
25 p0007 A80-11644

JOSEPHSON JUNCTIONS
A 30-ps Josephson current injection logic /CIL/
25 p0030 A80-12853
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430

JUNCTION DIODES
AlGaAs tunnel diode
25 p0046 A80-16799

JUNCTION TRANSISTORS
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368

K

KENYA
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591

KEROGEN
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels
25 p0073 A80-18832
Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens
25 p0085 A80-20378

KEROSENE
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

KINETIC THEORY
Photogalvanic cells
25 p0073 A80-18749

KRYPTON FLUORIDE LASERS
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964

L

LABORATORY EQUIPMENT
Laboratory coal gasifier facility
[UCRL-82602] 25 p0106 N80-11245

LAKES
Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens
25 p0085 A80-20378

LAMINAR FLOW
A theoretical study of laminar free convection in 1-D solar induced flows
25 p0005 A80-11337
LAMINAR HEAT TRANSFER
A theoretical study of laminar free convection in 1-D solar induced flows
25 p0005 A80-11337
LAND MANAGEMENT
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T1] 25 p0168 N80-15276
Federal leasing and outer continental shelf energy production goals
[DOE/RA-0037] 25 p0178 N80-15640
LAND USE
Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400
Implementation of state solar incentives: Land-use planning to ensure solar access
[SERI/TR-51-163] 25 p0158 N80-14519
Analysis of potential implementation levels for waste heat utilization in the nuclear power industry
[ORNL/TM-63-2] 25 p0177 N80-15625
LARGE SPACE STRUCTURES
Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641
LASER APPLICATIONS
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964
CO2 electric discharge lasers - Present status and future applications
25 p0039 A80-14960
LASER FUSION
Status of inertial confinement fusion
25 p0016 A80-11976
The physics of laser fusion --- Book
25 p0019 A80-12049
Laser fusion - Energy application perspectives
25 p0030 A80-12883
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194
The KMSF laser fusion programme
25 p0056 A80-17860
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110
LASER HEATING
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick
[AIAA PAPER 80-0148] 25 p0064 A80-18366
LASER OUTPUTS
A cesium TELEC experiment at Lewis Research Center
[NASA-CR-159729] 25 p0151 N80-14386
LASER PLASMA INTERACTIONS
The physics of laser fusion --- Book
25 p0019 A80-12049
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
Summary on inertial-confinement fusion
25 p0059 A80-17893
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers
25 p0060 A80-18111
A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering
25 p0084 A80-20165
LASER PLASMAS
The physics of laser fusion --- Book
25 p0019 A80-12049
Inertial confinement fusion at NRL
25 p0056 A80-17861
LASER TARGETS
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776
LASERS
Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick
[AIAA PAPER 80-0148] 25 p0064 A80-18366
LATEX
Molten salt pyrolysis of latex --- for hydrocarbon fuel production
[NASA-CASE-NPO-14315-1] 25 p0092 N80-10361
LAW (JURISPRUDENCE)
Dimensions/NBS, volume 63, no. 6, June 1979
[PB-297836/9] 25 p0105 N80-10975
Energy Policy and Conservation Act (Public Law 94-163) as amended by the National Energy Conservation Policy Act (Public Law 95-619). Title 10: Energy. Chapter 2: Department of Energy. Subchapter D: Energy Conservation. Part 430: Energy conservation program for consumer products
[DOE/CS-0056] 25 p0163 N80-14567
LEAD (METAL)
Lead batteries, volume 2. Citations from the engineering index data base
[NTIS/PS-77/0634] 25 p0103 N80-10681
LEAD OXIDES
Lead oxides-lithium cells
25 p0012 A80-11859
LEAD SELENIDES
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
LEAD SULFIDES
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
LEAST SQUARES METHOD
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110
RAPAD - Real-time Accurate Performance Analysis of Data --- for performance estimation of wind energy conversion system
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565
LEGAL LIABILITY
Legal and political problems of solar power stations in space
[IAF PAPER 79-IISL-03] 25 p0047 A80-17064
LIBRARIES
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655
LIFE (DURABILITY)
Gas generator research and development: BI-GAS process
[FE-1207-62] 25 p0135 N80-13288

Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483

LIFE CYCLE COSTS
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
OTEC - A comprehensive energy analysis
25 p0085 A80-20456
An applications analysis for the solar industrial process heat market
25 p0088 A80-20888

LIGHT BEAMS
Structure of an averaged statistical pencil of rays reflected from a heliostat
25 p0051 A80-17247

LIGHT SCATTERING
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers
25 p0060 A80-18111
Cavity enhancement by controlled directional scattering --- in solar collectors
25 p0083 A80-19955

LIGHT SOURCES
Space light - Space industrial enhancement of the solar option
25 p0073 A80-18797

LIGHT WATER
Outlook for nuclear fission energy
[CONF-7811126-1] 25 p0157 N80-14509

LIGNITE
Lignite fuel and power-plant availability
25 p0004 A80-10944
Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal
25 p0007 A80-11448

LIMESTONE
Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623

LINEAR CIRCUITS
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core
25 p0083 A80-20066
Change in rate of conducting-piston motion and the characteristics of field-diffusion processes in a linear electromechanical energy converter
25 p0083 A80-20069

LINEAR PROGRAMMING
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576
MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version)
[BNL-26390] 25 p0178 N80-15634

LIQUEFACTION
Economics of hydrogen production and liquefaction updated to 1980
[NASA-CR-159163] 25 p0106 N80-11238

LIQUEFIED NATURAL GAS
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
Numerical modeling of LNG spill phenomena
[UCRL-82031] 25 p0130 N80-12625
Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266
LNG industry: An overview of projects and costs
[CONF-7811112-2] 25 p0168 N80-15278
Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282

LIQUID AMMONIA
Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266

LIQUID CHROMATOGRAPHY
A chromatographic peak profiling technique for interpretation and analysis of combustion processes
[AIAA PAPER 80-0284] 25 p0063 A80-18291

LIQUID FLOW
Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

LIQUID HELIUM
Preparation of superconducting coil through composite
25 p0040 A80-15512

LIQUID HYDROGEN
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199
Hydrogen storage by use of cryoadsorbents in comparison to alternatives
25 p0042 A80-15992
Survey of liquid hydrogen container techniques for highway vehicle fuel system applications
[HCP/M2752-01] 25 p0092 N80-10383
Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401
Economics of hydrogen production and liquefaction updated to 1980
[NASA-CR-159163] 25 p0106 N80-11238
Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0136 N80-13297
Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266

LIQUID INJECTION
Energy saving in injection molding
[NEL-662] 25 p0136 N80-13318

LIQUID METALS
Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554
Performance limits for liquid-metal heat pipes containing long adiabatic sections
[LA-UR-79-1241] 25 p0095 N80-10472
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882

LIQUID PHASES
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase
25 p0076 A80-19209

LIQUID-GAS MIXTURES
Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process
[AED-CONF-78-155-010] 25 p0121 N80-12291

LIQUID-SOLID INTERFACES
Heat transfer to a melting solid with application to thermal energy storage systems
25 p0036 A80-14667

LIQUIDS
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497

LITHIUM
Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854
Heat generation in Li/SOCl2 cells
25 p0012 A80-11855
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857
Recent advances in high temperature primary lithium batteries
25 p0013 A80-11863
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
Lithium inorganic electrolyte battery development
[AD-A073858] 25 p0157 N80-14505

LITHIUM CHLORIDES
Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1] 25 p0101 N80-10652

Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614

LITHIUM COMPOUNDS
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4
25 p0081 A80-19660

LITHIUM HYDRIDES
New heat transfer geometry for hydride heat engines and heat pumps
[LA-7822] 25 p0169 N80-15289

LITHIUM SULFUR BATTERIES
Lithium/metal sulfide battery development
[CONF-790538-10] 25 p0159 N80-14530
Review of industrial participation on the ANL lithium/iron sulfide battery development program --- for energy storage and electric vehicles
[CONF-780852-1] 25 p0164 N80-14573
Lithium/iron sulfide batteries for electric vehicles
[CONF-781006-2] 25 p0175 N80-15611

LOGIC CIRCUITS
A 30-ps Josephson current injection logic /CIL/
25 p0030 A80-12853

LONG TERM EFFECTS
Derivation of method for predicting long term average energy delivery of solar collectors
25 p0005 A80-11339
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

LORENTZ FORCE
Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922

LOUISIANA
Geopressure energy resource evaluation --- Texas and Louisiana
[ORNL/PPA-79/2] 25 p0138 N80-13605

LOW ASPECT RATIO
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876

LOW CONCENTRATIONS
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544

LOW COST
Low-cost central receiver solar power plant using molten salt as a heat transfer and storage medium
25 p0017 A80-11986
Some experimental studies on the technical developments of low cost silicon solar cells
25 p0028 A80-12789
Low cost solar cells based on amorphous silicon electrodeposited from organic solvents
[SAN-0113-T3] 25 p0145 N80-13678

LOW TEMPERATURE
Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288
Low temperature thermal energy storage: A state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583

LUBRICATING OILS
Measurements and standards for recycled oil - 2
[PB-299951/4] 25 p0167 N80-15275

M

MAGNESIUM ALLOYS
Hydrogen storage by means of reversible magnesium alloy
25 p0041 A80-15990
Use of reversible hydrides for hydrogen storage
25 p0042 A80-15991

MAGNETIC COILS
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620

MAGNETIC CONTROL
Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004

MAGNETIC CORES
Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362

MAGNETIC EFFECTS
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997

MAGNETIC FIELD CONFIGURATIONS
Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349
Magnetic field design for a large tokamak
25 p0046 A80-16760
High-beta tokamaks
25 p0054 A80-17789
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2
25 p0078 A80-19581
A new high beta reversed field pinch machine
25 p0078 A80-19587
Numerical computations in the design of compact ignition experiments --- of D-T toroidal plasma heating
25 p0078 A80-19589
Poloidal magnetic field design of a pulsed tokamak reactor
25 p0078 A80-19592
The effect of classical and anomalous transport on the performance of Tandem Mirror reactors
25 p0079 A80-19596
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629

MAGNETIC FIELDS
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields
25 p0019 A80-12310

MAGNETIC FLUX
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627

MAGNETIC INDUCTION
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138

MAGNETIC MIRRORS
Diagnostics for mirror machines
25 p0045 A80-16720
Survey of mirror machine reactors
25 p0046 A80-16752
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857
Tandem mirror reactors --- for controlled fusion
25 p0059 A80-17887
The effect of classical and anomalous transport on the performance of Tandem Mirror reactors
25 p0079 A80-19596

MAGNETIC PISTONS
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core
25 p0083 A80-20066

MAGNETIC SUSPENSION
Linear synchronous motor development for urban and rapid transit systems
25 p0062 A80-18167

MAGNETIC SWITCHING
Developments for the high voltage test of pulsed superconducting coils --- used in tokamak switches
25 p0081 A80-19655

MAGNETICALLY TRAPPED PARTICLES
A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour
25 p0022 A80-12453
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

MAGNETOACOUSTIC WAVES

Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855

MAGNETOHYDRODYNAMIC FLOW

Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353

Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355

Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304

MAGNETOHYDRODYNAMIC GENERATORS

Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642

Survey of MHD plant applications
25 p0015 A80-11972

Economics/reliability trade-offs in materials for various coal conversion and utilization processes
25 p0016 A80-11975

Calculation of the low-frequency electromagnetic field of MHD machines encapsulated in a common screening shell
25 p0030 A80-12896

Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898

Determination of the geometry of the transition region of a series MHD generator
25 p0030 A80-12900

Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516

Some problems with variable operation of an MHD generator
25 p0035 A80-14530

The physics of closed cycle MHD power generation
25 p0043 A80-16264

Dynamic suppression of ionization instability --- in MHD devices of Faraday and Hall types
25 p0043 A80-16484

Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996

Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997

MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004

Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

Influence of the loading factor on the performance characteristics of series MHD generators
25 p0061 A80-18137

Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138

Characteristics of series channels with a diminishing electrode-commutation angle in the transition section --- MHD generators
25 p0061 A80-18139

High interaction subsonic MHD channel operation
[AIAA PAPER 80-0022] 25 p0062 A80-18242

Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[AIAA PAPER 80-0023] 25 p0063 A80-18243

Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results
[AIAA PAPER 80-0091] 25 p0063 A80-18265

Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353

Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354

Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355

Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554

Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304

Power take-off analysis for diagonally connected MHD channels
[AIAA PAPER 80-0253] 25 p0077 A80-19309

Effect of off-design operation of MHD generators on NO/X/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310

Relativistic high-current microwave plasma electronics
25 p0083 A80-19847

Digital computer modeling of steady-state conditions of the magnetoplasmadynamic generator current layer
25 p0083 A80-20058

Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[NASA-TM-79308] 25 p0132 N80-12881

Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882

User's manual for the magnetohydrodynamic generator channel code, MHDCHN
[SAND-78-1260] 25 p0132 N80-12894

Effects of metallurgical microstructure of armatures on compressed magnetic field generators
[SAND-79-0890C] 25 p0137 N80-13375

Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922

MAGNETOHYDRODYNAMIC STABILITY

Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349

The physics of laser fusion --- Book
25 p0019 A80-12049

Dynamic suppression of ionization instability --- in MHD devices of Faraday and Hall types
25 p0043 A80-16484

Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754

Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

High-beta tokamaks
25 p0054 A80-17789

Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

MHD stability limits on high-beta tokamaks
25 p0054 A80-17797

What is the mechanism responsible for the precursors of internal disruptions --- as observed in Tokamak plasma
25 p0054 A80-17807

LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811

End plugging of a hot linear theta pinch
25 p0055 A80-17824

Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825

Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826

Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

Inertial confinement fusion at NRL
25 p0056 A80-17861

Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876

The effect of current shear on the tearing instability
25 p0059 A80-18086
Optimization of stabilized imploding liner fusion reactors
25 p0079 A80-19593
Effect of finite beta on drift-wave turbulence and particle confinement --- of toroidal plasma
25 p0084 A80-20158
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159

MAGNETOHYDRODYNAMIC WAVES
Effect of finite beta on drift-wave turbulence and particle confinement --- of toroidal plasma
25 p0084 A80-20158

MAGNETOHYDRODYNAMICS
NASA-Lewis closed-cycle magnetohydrodynamics plant analysis
[NASA-TM-79249] 25 p0095 N80-10595
Technical support for open-cycle MHD program --- project planning and systems analysis of a magnetohydrodynamic/steam power system
[ANL/MHD-78-11] 25 p0181 N80-15942

MAGNETORESISTIVITY
A review of in situ composites for nonstructural applications
25 p0002 A80-10285

MAGNETOSTATIC FIELDS
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194

MAGNETS
The basics of magnetic separation as applied to municipal solid waste reclamation plants
25 p0074 A80-18871

MAINTAINABILITY
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

MAINTENANCE
Effects of inspection and maintenance programs on fuel economy
[PB-297583/7] 25 p0170 N80-15420

MAN ENVIRONMENT INTERACTIONS
Prospects - A social context for natural science --- global energy resource review
25 p0044 A80-16651
The scope of environmental risk management
25 p0053 A80-17743
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125
Automobile transportation and the environment
25 p0072 A80-18734
Global ecology and man
25 p0131 N80-12668
Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677

MAN MACHINE SYSTEMS
Interactive analysis methods for resource mapping
25 p0008 A80-11709

MANAGEMENT ANALYSIS
Energy policy and decision analysis; new concepts and mechanisms
[LA-7909-MS] 25 p0140 N80-13634

MANAGEMENT METHODS
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520

MANAGEMENT PLANNING
Materials resource requirements and potential limitations in solar energy products
25 p0018 A80-11990
Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382
Managerial plan: Executive order 12003 and the National Energy Act
[DOE/TIC-10067] 25 p0104 N80-10965
The future role of hydrogen fuel in an electrical society
[UTIAS-241] 25 p0119 N80-12189
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6934] 25 p0139 N80-13631
Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281

MANUFACTURING
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697
A survey of photovoltaic systems
[NASA-CR-150696] 25 p0171 N80-15563

MARINE RESOURCES
Fuels from marine biomass
25 p0045 A80-16656
Direct solar energy conversion at sea
25 p0053 A80-17583
Climatic variability, marine resources and offshore development
25 p0131 N80-12689

MARINE TECHNOLOGY
Direct solar energy conversion at sea
25 p0053 A80-17583
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747

MARKET RESEARCH
The prospect for anthracite as a national energy resource
25 p0014 A80-11960
SRC solids - A preferred compliance boiler fuel --- Solvent Refined Coal
25 p0015 A80-11968
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978
Energy supply and demand in the midterm: 1985, 1990, and 1995
[DOE/EIA-0102/52] 25 p0097 N80-10620
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747
Application of diffusion research to solar energy policy issues
[SERI/TR-51-194] 25 p0158 N80-14518
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544
Photovoltaic power systems market identification and analysis
[HCP/T4022-01] 25 p0162 N80-14559
Application analysis of solar total energy systems to the residential sector. Volume 4: Market penetration
[ALO-3787-4] 25 p0174 N80-15597

MARKETING
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for solar water heating
[TID-28856-DRAFT] 25 p0161 N80-14545
Commercializing solar heating: A national strategy needed
[PB-297882/3] 25 p0164 N80-14575
Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972

MARYLAND
Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957

MASS SPECTROSCOPY

MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy 25 p0080 A80-19612

Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry. Mass spectrometry and fossil-energy conversion technology: A review [FE-2537-7] 25 p0120 N80-12198

MATERIAL ABSORPTION

Ion-stimulated sorption of nitrogen on a continuously deposited titanium film 25 p0051 A80-17252

MATERIALS HANDLING

Assessment of synfuel transportation to year 2000 [PNL-2768] 25 p0092 N80-10382

Survey of liquid hydrogen container techniques for highway vehicle fuel system applications [HCP/M2752-01] 25 p0092 N80-10383

Preparation of a coal conversion systems technical data book, project 61003 [FE-2286-32] 25 p0134 N80-13281

MATERIALS RECOVERY

Resource recovery systems costs 25 p0001 A80-10029

Energy conservation through recycling 25 p0003 A80-10842

Gas recovery from unconventional sources 25 p0014 A80-11958

A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour 25 p0022 A80-12453

The uncertain costs of waste disposal and resource recovery 25 p0043 A80-16150

The basics of magnetic separation as applied to municipal solid waste reclamation plants 25 p0074 A80-18871

Methane recovery from coalbeds [DOE/MC-08089-T1] 25 p0093 N80-10387

Methane recovery from coalbeds project. Technology test projects: Evaluation of candidate projects [METC-8089-T4] 25 p0135 N80-13290

Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste [CONF-790373-1] 25 p0163 N80-14562

Meteorological effects of oil refinery operations in Los Angeles [PB-300720/0] 25 p0180 N80-15758

MATERIALS SCIENCE

Materials research - Probable impacts on solar energy 25 p0018 A80-11991

New development and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978 25 p0040 A80-15501

Report on Finnish technological activities 25 p0119 N80-11991

MATHEMATICAL MODELS

A mathematical model for a future hydrogen power system 25 p0001 A80-10223

Second-law analysis of solar-thermal processes 25 p0003 A80-10843

Frontiers in energy demand modeling 25 p0009 A80-11830

Assessing energy policy models - Current state and future directions 25 p0009 A80-11831

Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials 25 p0020 A80-12311

Computers in the design of solar energy systems 25 p0020 A80-12426

Integral modeling of MHD channel boundary layers [AIAA PAPER 80-0175] 25 p0064 A80-18353

A vortex model of the Darrieus turbine - An analytical and experimental study [ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620

Thermodynamic behaviour of the Bagnore geothermal field 25 p0075 A80-19205

Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control 25 p0087 A80-20862

A single coal particle gasification model 25 p0088 A80-20884

Dynamic modeling of H2S clean-up processes --- in coal gasification 25 p0088 A80-20885

Optimization of a solar heating system with integral compensation 25 p0089 A80-20894

Mathematical modeling of coal gasification processes 25 p0089 A80-20913

Dynamics and control: Energy conversion, delivery, and demand analysis [BNL-26045] 25 p0099 N80-10633

Analysis of financial programs for energy conservation: Market simulation (penetration) model [HCP/M8662-1] 25 p0114 N80-11606

A probabilistic study of wind-electric conversion systems from the point of view of reliability and capacity credit 25 p0153 N80-14475

Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain [PB-298785/7] 25 p0165 N80-14578

Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-5] 25 p0172 N80-15576

The 1985, 1990 and 1995 midterm energy market model results under three scenarios of Fuel Use Act regulations [DOE/EIA-0182/2] 25 p0173 N80-15592

Fuel utilization in residences [EPRI-EA-894] 25 p0175 N80-15604

MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version) [BNL-26390] 25 p0178 N80-15634

MATHEMATICAL PROGRAMMING

An optimization model for overall urban energy planning 25 p0038 A80-14844

Newton's method for generalized equations and the PIES energy model 25 p0149 N80-13872

MAXWELL EQUATION

New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium 25 p0085 A80-20538

MEASURING INSTRUMENTS

A low level wind measurement technique for wind turbine generator siting 25 p0042 A80-16084

Borehole geological assessment [NASA-CASE-NPO-14231-1] 25 p0104 N80-10709

MECHANICAL DRIVES

Prime mover for solar power plant 25 p0024 A80-12752

Semiconductor alternating-current motor drives and energy conservation 25 p0034 A80-13861

MECHANICAL ENGINEERING

Coal liquefaction short residence time process research [SAND-79-1400] 25 p0133 N80-13272

MECHANICAL PROPERTIES

Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels [FE-1784-42] 25 p0106 N80-11248

MELTING

Heat transfer to a melting solid with application to thermal energy storage systems 25 p0036 A80-14667

MEMBRANES

Anton permselective membrane [NASA-CR-159599] 25 p0122 N80-12551

MERCURY (METAL)
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265
METAL AIR BATTERIES
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849
METAL COATINGS
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845
Selective black nickel coatings on zinc surfaces by chemical conversion --- for high solar energy absorption
25 p0060 A80-18126
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527
METAL FILMS
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776
Ion-stimulated sorption of nitrogen on a continuously deposited titanium film
25 p0051 A80-17252
METAL HYDRIDES
Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200
Hydrogen storage by means of reversible magnesium alloy
25 p0041 A80-15990
Use of reversible hydrides for hydrogen storage
25 p0042 A80-15991
Solar energy storage by metal hydride
25 p0053 A80-17582
Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0772/8] 25 p0094 N80-10402
Closed-cycle hydride engines
[SAND-78-2228] 25 p0125 N80-12572
METAL IONS
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system --- in hydrogen production
25 p0033 A80-13198
METAL MATRIX COMPOSITES
A review of in situ composites for nonstructural applications
25 p0002 A80-10285
METAL OXIDE SEMICONDUCTORS
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785
METAL OXIDES
An update of German non-isothermal coal pyrolysis work
25 p0019 A80-12245
METAL PARTICLES
The scope of effective medium theory for fine metal particle solar absorbers
25 p0029 A80-12835
Spectrally selective surfaces with coatings comprised of ultrafine metal particles --- solar collectors
[AID-CONF-78-212-004] 25 p0115 N80-11620
METAL SURFACES
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques --- components of coal gasification and liquefaction pilot plants
[CONF-790480-1] 25 p0167 N80-15259
METAL-GAS SYSTEMS
Use of reversible hydrides for hydrogen storage
25 p0042 A80-15991
Solar energy storage by metal hydride
25 p0053 A80-17582
METALLIC PLASMAS
Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898
METALLIZING
Some experimental studies on the technical developments of low cost silicon solar cells
25 p0028 A80-12789
METALS
Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180
METEOROLOGICAL PARAMETERS
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125
The Building Loads Analysis System Thermodynamics (BLAST) program, version 2.0 Input booklet --- for predicting energy consumption based on structural size and meteorological data
[AD-A072435] 25 p0107 N80-11259
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723
METHANE
Gas recovery from unconventional sources
25 p0014 A80-11958
Methane fermentation of aquatic biomass
25 p0043 A80-16148
The microbial production of methane from household wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870
The controlling production mechanism of methane gas from coalbeds
25 p0085 A80-20499
Methane recovery from coalbeds
[DOE/MC-08089-T1] 25 p0093 N80-10387
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398
Methane recovery from sanitary landfills; gas recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254
HYGAS process update
[CONF-781045-4] 25 p0120 N80-12200
Biological transformation of light energy into methane using an anaerobic filter
25 p0133 N80-13267
Methane recovery from coalbeds project. Technology test projects: Evaluation of candidate projects
[METC-8089-T4] 25 p0135 N80-13290
Economic analysis of small scale bioconversion units in New Mexico
[PB-301390/1] 25 p0169 N80-15298
METHYL ALCOHOLS
Minimum ignition energies and quenching distances of methanol blends
25 p0004 A80-11331
Methanol from coal - An adaption from the past
25 p0033 A80-13224
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146

  Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
    [FE-2447-13] 25 p0093 N80-10388
  Biomass-based alcohol fuels: The near-term potential for use with gasoline
    [HCP/T4101-03] 25 p0093 N80-10393
  Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
    [CONF-790520-7] 25 p0134 N80-13274
  The 50,000 mile methanol/gasoline blend fleet study --- fuel efficiency and exhaust emissions
    [CONF-790520-6] 25 p0134 N80-13275

METHYL COMPOUNDS
  Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen --- electron transfer reactions in solar energy conversion processes
    25 p0040 A80-15358

MICROCLIMATOLOGY
  Colloquium on the Microclimatic Environment and Habitat, Reims, France, May 21-23, 1979, Proceedings
    25 p0041 A80-15968

MICROELECTRONICS
  Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
    25 p0035 A80-14430

MICROORGANISMS
  Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
    [AD-A073761] 25 p0150 N80-14259

MICROPROCESSORS
  Development and testing of the Junkeeper Control Corporation integrated programmable electronic controller and hydronics package
    [NASA-TM-78244] 25 p0155 N80-14495
  Development and testing of the Rho Sigma Incorporated microprocessor control subsystem
    [NASA-TM-78246] 25 p0156 N80-14496

MICROSTRUCTURE
  Microstructural objectives for high-temperature alloys in advanced energy systems
    25 p0002 A80-10306
  Effects of metallurgical microstructure of armatures on compressed magnetic field generators
    [SAND-79-0890C] 25 p0137 N80-13375

MICROWAVE EQUIPMENT
  Microwave heating: Industrial applications. Citations from the engineering data base
    [NTIS/PS-79/0632/4] 25 p0102 N80-10674

MICROWAVE SCATTERING
  Measurements of the density fluctuations using the microwave scattering method --- for toroidal plasmas
    25 p0046 A80-16731

MICROWAVE SENSORS
  Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
    25 p0035 A80-14430

MICROWAVE TRANSMISSION
  Impacts of satellite power system technology
    25 p0048 A80-17132
  The satellite power system concept and program
    [SAWE PAPER 1305] 25 p0086 A80-20643
  Analysis of S-band solid-state transmitters for the solar power satellite
    [NASA-CR-160320] 25 p0096 N80-10600

MINERAL EXPLORATION
  SEASAT demonstration experiments with the offshore oil, gas and mining industries
    [NASA-CR-162423] 25 p0108 N80-11532

MINERALOGY
  Mineral changes during oil shale retorting
    25 p0085 A80-20455

MINES (EXCAVATIONS)
  Underground coal conversion. Program description
    [DOE/ET-0100] 25 p0136 N80-13293
  Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
    [CONF-790630-9] 25 p0136 N80-13295
  Three potential longwall mining methods for thick coal seams in the western United States
    [PB-299568/6] 25 p0170 N80-15544

MINICOMPUTERS
  Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment --- design of a gas pipeline station control system and a railway switch car
    [AD-A074885] 25 p0182 N80-16022

MINING
  Computer software to calculate and map geologic parameters required in estimating coal production costs
    [EPRI-EA-674] 25 p0095 N80-10584
  Automated longwall guidance and control systems, phase 1
    [NASA-CR-161329] 25 p0122 N80-12538
  Automated longwall guidance and control systems, phase 2, part 2: Vertical control system (VCS)
    [NASA-CR-161330] 25 p0122 N80-12539
  Automated longwall guidance and control systems, phase 2, part 2: RCS, PAS, and MCS
    [NASA-CR-161331] 25 p0122 N80-12540
  Development of mining guidance and control systems
    [NASA-TM-78226] 25 p0137 N80-13601
  Coal-shale interface detection system
    [NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
  Three potential longwall mining methods for thick coal seams in the western United States
    [PB-299568/6] 25 p0170 N80-15544
  Evaluation of the environmental effects of western surface coal mining, volume 1
    [PB-300375/3] 25 p0179 N80-15681

MINORITY CARRIERS
  Measurements of minority-carrier diffusion length in heterojunction solar cells
    25 p0086 A80-20717

MIRRORS
  Use of adjustable flat mirrors with flat-plate collectors
    [AIAA PAPER 80-0294] 25 p0063 A80-18299
  Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick
    [AIAA PAPER 80-0148] 25 p0064 A80-18366

MIS (SEMICONDUCTORS)
  Relating computer simulation studies with interface state measurements on MIS solar cells
    25 p0062 A80-18231

MISSOURI RIVER (US)
  Energy development vs water quality in the upper Colorado and upper Missouri River Basins
    [LA-7497-MS] 25 p0117 N80-11641

MIXTURES
  Biomass-based alcohol fuels: The near-term potential for use with gasoline
    [HCP/T4101-03] 25 p0093 N80-10393

MODELS
  Dynamic energy system optimization model --- study of computerized simulation domestic energy models
    [EPRI-EA-1079] 25 p0157 N80-14514

MOLDING MATERIALS
  Cooling aluminum molds using heat pipes
    [BDX-613-2039-REV] 25 p0108 N80-11384

MOLDS
  Energy saving in injection molding
    [NEL-662] 25 p0136 N80-13318

MOLECULAR BEAMS
  Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
    25 p0035 A80-13986

MOLECULAR EXCITATION
  Synthetic molecular organizates
    25 p0073 A80-18752

MOLECULAR PUMPS
  Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines
    25 p0082 A80-19672

MOLTEN SALT ELECTROLYTES
  The performance of molten-carbonate fuel cells
    25 p0011 A80-11851
  Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
    25 p0012 A80-11854
  Recent advances in high temperature primary lithium batteries
    25 p0013 A80-11863
  A performance and current distribution model for scaled-up molten carbonate fuel cells
    25 p0062 A80-18213

MOLTEN SALTS
Low-cost central receiver solar power plant using molten salt as a heat transfer and storage medium 25 p0017 A80-11986
Modeling of a thermal wall panel using phase change materials 25 p0021 A80-12439
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting 25 p0029 A80-12823
Molten salt pyrolysis of latex --- for hydrocarbon fuel production [NASA-CASE-NPO-14315-1] 25 p0092 N80-10361

MOLYBDENUM
Current collectors for sodium-sulphur batteries 25 p0013 A80-11867

MONITORS
Color graphic controls for the solar central receiver test facility 25 p0022 A80-12626

MONTANA
Bell Creek residual oil saturation technology test [BETC-2180-4] 25 p0108 N80-11546

MOON
Space light - Space industrial enhancement of the solar option 25 p0073 A80-18797

MOTOR VEHICLES
Ethyl alcohol production and use as a motor fuel --- Book 25 p0050 A80-17241
Environmental aspects of alternative fuels utilization for highway vehicles [UCRL-81841] 25 p0120 N80-12201
Applications of fuel cells in transportation [LA-UR-79-628] 25 p0159 N80-14526
Environmental planning and assessment for highway vehicle use to alcohol fuels [CONF-790520-2] 25 p0168 N80-15281
Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle [PB-299928/2] 25 p0180 N80-15699

MUD
Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens 25 p0085 A80-20378

N

N-N JUNCTIONS
Analysis and evaluation of isotype heterojunction solar cells 25 p0087 A80-20734

NAPHTHALENE
Heat transfer to a melting solid with application to thermal energy storage systems 25 p0036 A80-14667
Elucidation of coal structural components by short residence-time extractive liquefaction 25 p0119 N80-12188

NASA PROGRAMS
NASA authorization for fiscal year 1980. Part 4: Index [GPO-51-336] 25 p0104 N80-10964
An evaluation of the NASA Tech House, including live-in test results, volume 1 [NASA-TP-1564] 25 p0109 N80-11559
Status of the DOE/NASA critical gas turbine research and technology project [NASA-TM-79307] 25 p0155 N80-14493

NATIONS
World energy data system (WENDS). Volume 8: Nuclear facility profiles, CO-HU [ANL-PMS-79-2-VOL-8] 25 p0139 N80-13630

NATURAL GAS
Gas recovery from unconventional sources 25 p0014 A80-11958
The European economic community's policy concerning natural gas, coal and new sources of energy 25 p0032 A80-13175
The helium question --- future domestic consumption vs storage of current natural gas derived supplies 25 p0034 A80-13589
Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels [AIAA PAPER 80-0075] 25 p0076 A80-19275
The controlling production mechanism of methane gas from coalbeds 25 p0085 A80-20499
Natural gas reserves estimates: A good federal program emerging, but problems and duplications persist [PB-296628/2] 25 p0103 N80-10679
Remote sensing of LNG spill vapor dispersion using Raman LIDAR [UCRL-13984] 25 p0103 N80-10689
National Gas Survey report to the Federal Energy Regulatory Commission by the Supply-Technical Advisory Task Force on nonconventional natural gas resources [DOE/FERC-0010] 25 p0107 N80-11251
Fuel choice and aggregate energy demand in the commercial sector --- electricity, natural gas, and fuel oil [ORNL/CON-27] 25 p0126 N80-12580
Devonian paleocurrents of the Applachian basin --- gas production [METC/CR-79/22] 25 p0149 N80-13735
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas [PB-299181/8] 25 p0152 N80-14467
Commercialization strategy report for recovery of natural gas from unconventional sources [TID-28848-DRAFT] 25 p0168 N80-15287
Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment --- design of a gas pipeline station control system and a railway switch car [AD-A074885] 25 p0182 N80-16022

NEBRASKA
Test plan for the Mead 25-kW Photovoltaic Flexible Test Facility, 1979 [COO-4094-53] 25 p0146 N80-13692

NETWORK ANALYSIS
Power loss in photovoltaic arrays due to mismatch in cell characteristics 25 p0028 A80-12815
A 30-ps Josephson current injection logic /CIL/ 25 p0030 A80-12853

NEUTRAL BEAMS
Selected topics on surface effects in fusion devices - Neutral-beam injectors and beam-direct converters 25 p0043 A80-16262
Diagnostics for mirror machines 25 p0045 A80-16720
Doublet III neutral beam injection system overview and status report 25 p0079 A80-19599
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks 25 p0079 A80-19600
150-kV, 80-A solid state power supply for neutral beam injection 25 p0080 A80-19617

NEUTRON DISTRIBUTION
One- and two-dimensional heating analyses of fusion synfuel blankets [BNL-NUREG-25635] 25 p0104 N80-10922

NEUTRON FLUX DENSITY
Some implications of a cellular structure in minimum thickness fusion reactor blankets 25 p0081 A80-19663

NEUTRON IRRADIATION
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4 25 p0081 A80-19660

NEUTRON PHYSICS
Optimization of neutron yield in conical system at explosion-induced compression 25 p0007 A80-11545
Neutronics in the toroidal belt-geometry of a screw pinch reactor 25 p0081 A80-19657

NEUTRON SOURCES
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets 25 p0081 A80-19662

NEVADA
Evaluation of Baltazor known geothermal resources area, Nevada
25 p0076 A80-19206
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
NEW ENGLAND (US)
National Energy Act of 1978: A regional assessment
[PB-296479/9] 25 p0130 N80-12615
NEW MEXICO
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0097 N80-10609
Midtemperature Solar Systems Test Facility (MSSTF) project test results: Phase 4A MSSTF system operation
[SAND-78-1088] 25 p0114 N80-11613
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471
Economic analysis of small scale bioconversion units in New Mexico
[PB-301390/1] 25 p0169 N80-15298
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645
NEW YORK
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494
NEW ZEALAND
An estimate of the resource potential of New Zealand geothermal fields for power generation
25 p0076 A80-19208
NEWTON-RAPHSON METHOD
Newton's method for generalized equations and the PIES energy model
25 p0149 N80-13872
NICKEL
Selective black nickel coatings on zinc surfaces by chemical conversion --- for high solar energy absorption
25 p0060 A80-18126
NICKEL ALLOYS
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841
NICKEL CADMIUM BATTERIES
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147
NICKEL OXIDES
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847
NIGER
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591
NIGERIA
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591
NIOBIUM ALLOYS
Preparation of superconducting coil through composite
25 p0040 A80-15512
NITROGEN LASERS
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964
NITROGEN OXIDES
Effect of off-design operation of MHD generators on NO/x/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310
Technical assessment of thermal DeNOx process --- for coal fired boilers
[PB-297947/4] 25 p0117 N80-11656
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687
NONAQUEOUS ELECTROLYTES
Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride
[AD-A071157] 25 p0139 N80-13625
Solid electrolyte fuel cell for electric power generation --- nonaqueous electrolyte fuel cells development for electric power plants
[BNL-26238] 25 p0158 N80-14522
NONEQUILIBRIUM FLOW
Effect of off-design operation of MHD generators on NC/x/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310
NONEQUILIBRIUM PLASMAS
Dynamic suppression of ionization instability --- in MHD devices of Faraday and Hall types
25 p0043 A80-16484
NONEQUILIBRIUM THERMODYNAMICS
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage
25 p0084 A80-20274
NONLINEARITY
Newton's method for generalized equations and the PIES energy model
25 p0149 N80-13672
NONUNIFORM PLASMAS
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
NUCLEAR ELECTRIC POWER GENERATION
A mathematical model for a future hydrogen power system
25 p0001 A80-10223
United States energy alternatives to 2010 and beyond - The CONAES study
25 p0008 A80-11827
Nuclear power program information and data: Update, March - April 1979
[DOE/TIC-10119] 25 p0166 N80-14894
Novel scheme for making cheap electricity with nuclear energy
[UCID-18153-REV-1] 25 p0171 N80-15564
Nuclear strategy of the Department of Energy
[DOE/ER-0025/D] 25 p0175 N80-15605
NUCLEAR ENERGY
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728
World Energy Data System (WENDS). Volume 7: Nuclear facility profiles, AG-CH
[ANL-PMS-79-2-VOL-7] 25 p0139 N80-13629
World energy data system (WENDS). Volume 8: Nuclear facility profiles, CO-HU
[ANL-PMS-79-2-VOL-8] 25 p0139 N80-13630
NUCLEAR FISSION
World Energy Data System (WENDS). Volume 11: Nuclear fission program summaries
[ANL-PMS-79-2-VOL-11] 25 p0124 N80-12562
Outlook for nuclear fission energy
[CONF-7811126-1] 25 p0157 N80-14509
Fission energy program of the U.S. Department of Energy, FY 1980
[DOE/ET-0089] 25 p0180 N80-15893
NUCLEAR FUEL REPROCESSING
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888
NUCLEAR FUELS
Tandem mirror reactors --- for controlled fusion
25 p0059 A80-17887
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665
World Energy Data System (WENDS). Volume 7: Nuclear facility profiles, AG-CH
[ANL-PMS-79-2-VOL-7] 25 p0139 N80-13629
World energy data system (WENDS). Volume 8: Nuclear facility profiles, CO-HU
[ANL-PMS-79-2-VOL-8] 25 p0139 N80-13630

Evaluation of fuel resources and requirements for the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570
Nuclear power program information and data: Update, March - April 1979
[DOE/TIC-10119] 25 p0166 N80-14894

NUCLEAR FUSION
United States magnetic fusion energy program
[DOE/ET-0072] 25 p0126 N80-12583
Search for fusion power
[UCRL-81890] 25 p0132 N80-12900
Fusion power program
[ANL/FPP-78-4] 25 p0149 N80-13941
Evaluation of fuel resources and requirements for the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570
Fusion energy for hydrogen production --- systems engineering of a process for hydrogen production from nuclear fusion
[BNL-24906] 25 p0180 N80-15897
Pulsed power for fusion
[SAND-79-0933C] 25 p0181 N80-15908
Superconductivity for mirror fusion
[UCRL-81693] 25 p0181 N80-15933
Fusion: A possible option for solving long-term energy problems
[PB-300692/1] 25 p0181 N80-15946

NUCLEAR HEAT
Possible improvements to a basic cellular thin blanket fusion reactor configuration
25 p0081 A80-19664
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program --- plutonium oxide
[LA-7519-PR] 25 p0118 N80-11889

NUCLEAR POWER PLANTS
Laser fusion - Energy application perspectives
25 p0030 A80-12883
Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891
Land-based application of an OTEC open-cycle power system
[CONF-790631-3] 25 p0144 N80-13676
Nuclear power program information and data: Update, March - April 1979
[DOE/TIC-10119] 25 p0166 N80-14894
Analysis of potential implementation levels for waste heat utilization in the nuclear power industry
[ORNL/TM-63-2] 25 p0177 N80-15625

NUCLEAR REACTIONS
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141

NUCLEAR REACTORS
World Energy Data System (WENDS). Volume 7: Nuclear facility profiles, AG-CH
[ANL-PMS-79-2-VOL-7] 25 p0139 N80-13629
Baseline design of the thermoelectric reactor space power system
[LA-UR-79-1242] 25 p0149 N80-13906

NUCLEAR RESEARCH
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
World energy data system (WENDS). Volume 8: Nuclear facility profiles, CO-HU
[ANL-PMS-79-2-VOL-8] 25 p0139 N80-13630

NUMERICAL ANALYSIS
Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307
Numerical modeling of LNG spill phenomena
[UCRL-82031] 25 p0130 N80-12625

NUMERICAL CONTROL
An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628

O

OCEAN BOTTOM
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431

OCEAN CURRENTS
Waves, currents, tides - Problems and prospects
25 p0049 A80-17134

OCEAN DATA ACQUISITIONS SYSTEMS
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431

OCEAN THERMAL ENERGY CONVERSION
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524
Is there a chance for OTEC
25 p0007 A80-11394
Energy from ocean thermal gradients
25 p0044 A80-16652
Ocean thermal energy conversion /OTEC/ - Social and environmental issues
25 p0049 A80-17135
Ocean energy - Forms and prospects
25 p0061 A80-18162
OTEC - Solar energy from the sea
25 p0085 A80-20424
OTEC - A comprehensive energy analysis
25 p0085 A80-20456
Utilization of ocean heat for hydrogen production
25 p0086 A80-20686
A thermodynamic assessment of OTEC open-cycle power systems
25 p0088 A80-20886
OTEC thermal resource report for Caribbean Sea Plant Ship 13-15 degrees N 75-80 degrees W
[HCP/T2898] 25 p0113 N80-11599
Foam solar sea power: A physical investigation
25 p0122 N80-12548
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564
Ocean Thermal Energy Conversion (OTEC) platform configuration and integration, executive summary
[DOE/ET-4064-1] 25 p0128 N80-12600
Condensation and evaporation heat transfer with low-boiling temperature fluids --- for ocean thermal and geothermal energy conversion
[CONF-790539-1] 25 p0137 N80-13412
OTEC platform configuration and integration. Volume 1: Systems engineering and integration
[TID-29418] 25 p0142 N80-13655
OTEC thermal response report for Pacific plant ship, 5 to 10 deg N 90 to 95 deg W
[HCP/T2898-01/3] 25 p0142 N80-13656
Experimental and analytical OTEC studies at ORNL
[CONF-790631-1] 25 p0143 N80-13666
Land-based application of an OTEC open-cycle power system
[CONF-790631-3] 25 p0144 N80-13676
OTEC power systems
[CONF-790444-2] 25 p0146 N80-13696
OTEC platform configuration and integration, executive summary
[DOE/ET-4065/1] 25 p0147 N80-13711
OTEC platform configuration and integration, appendixes to volume 2
[DOE/ET-4065/1-VOL-2-APP] 25 p0147 N80-13713
OTEC platform configuration and integation. Volume 3: Project plan
[DOE/ET-4065/1-VOL-3] 25 p0148 N80-13714
Fifth Ocean Thermal Energy Conversion Conference, volume 2, sections 4-5
[CONF-780236-P2] 25 p0162 N80-14553
OTEC-1 test conductor program --- project management quality control
[CONF-780550-9] 25 p0163 N80-14563
Alternate cycles applied to ocean thermal energy conversion
[SERI/TP-34-180] 25 p0172 N80-15571
Environmental development plan ocean thermal energy conversion
[DOE/EDP-0034] 25 p0176 N80-15621

OCEANOGRAPHY
Transmission of tidal energy over a plateau
25 p0072 A80-18721

OCEANS
Wave power systems
[PB-299851/6] 25 p0164 N80-14576

OCTANE NUMBER
Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273
OFF-ON CONTROL
Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307
OFFSHORE ENERGY SOURCES
Energy from ocean thermal gradients
25 p0044 A80-16652
The Coriolis program --- electric power from moored counterrotating turbine arrays in warm water current
25 p0044 A80-16653
Salt power - Is Neptune's ole salt a tiger in the tank --- fresh/salt water osmotic pressure difference for electrical generation
25 p0045 A80-16654
Power from ocean waves
25 p0045 A80-16655
Fuels from marine biomass
25 p0045 A80-16656
Chemosynthetic production of biomass - An idea from a recent oceanographic discovery
25 p0045 A80-16657
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532
Climatic variability, marine resources and offshore development
25 p0131 N80-12689
Federal leasing and outer continental shelf energy production goals
[DOE/RA-0037] 25 p0178 N80-15640
OFFSHORE PLATFORMS
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747
Ocean Thermal Energy Conversion (OTEC) platform configuration and integration, executive summary
[DOE/ET-4064-1] 25 p0128 N80-12600
OTEC platform configuration and integration. Volume 1: Systems engineering and integration
[TID-29418] 25 p0142 N80-13655
OTEC platform configuration and integration, appendixes to volume 2
[DOE/ET-4065/1-VOL-2-APP] 25 p0147 N80-13713
OTEC platform configuration and integation. Volume 3: Project plan
[DOE/ET-4065/1-VOL-3] 25 p0148 N80-13714
OHIO
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541
OIL EXPLORATION
Borehole geological assessment
[NASA-CASE-NPO-14231-1] 25 p0104 N80-10709
Overview of in situ oil shale technology and recent advances in true in situ retort modeling
[SAND-78-2367C] 25 p0122 N80-12543
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723
OIL FIELDS
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels
25 p0073 A80-18832
OIL RECOVERY
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795
Solar enhanced oil recovery - An assessment of economic feasibility
25 p0078 A80-19472
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544
Oil recovery by carbon dioxide injection --- West Virginia
[ORO-5301-34] 25 p0108 N80-11545
Bell Creek residual oil saturation technology test
[BETC-2180-4] 25 p0108 N80-11546
Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery
[FE-2025-38] 25 p0130 N80-12624
Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470
Solar enhanced oil recovery: An assessment of economic feasibility
[SAND-79-0787] 25 p0178 N80-15641
OILS
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields
25 p0019 A80-12310
Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials
25 p0020 A80-12311
OPERATING TEMPERATURE
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554
OPERATIONS RESEARCH
A mathematical model for a future hydrogen power system
25 p0001 A80-10223
OPTICAL MEASURING INSTRUMENTS
An in-situ optical particle sizing technique --- for fuel droplets
[AIAA PAPER 80-0020] 25 p0062 A80-18240
OPTICAL PROPERTIES
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747
Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564
OPTICAL RADAR
Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10689
OPTICAL WAVEGUIDES
Development of optical waveguides for a power-related application --- of solar radiation transmission
25 p0036 A80-14596
OPTIMAL CONTROL
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795
Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307
Optimization of a solar heating system with integral compensation
25 p0089 A80-20894
Minimum cost transmitter-receiver antenna pairs --- antenna design for the satellite solar power station using optimal control theory
[RM-690] 25 p0094 N80-10414
Optimal control of distributed parameter systems for solar thermal applications
25 p0095 N80-10593
Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616
OPTIMIZATION
The optimal design of solar cell grid lines
25 p0005 A80-11335
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847
Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434

Optimization of multi-layer front-contact grid
patterns for solar cells
25 p0028 A80-12816
An optimization model for overall urban energy
planning
25 p0038 A80-14844
A design method for optimizing collector systems
for small solar center receivers
[ASME PAPER 79-WA/SOL-14] 25 p0068 A80-18580
The influence of thermophysical properties on the
design and sizing of geothermal power plant
components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593
Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641
Fuel minimal take-off path of jet lift VTOL
aircraft, log no. C3558
25 p0105 N80-11066
Design optimization of aquifer reservoir-based
compressed air storage systems
[CONF-781046-5] 25 p0116 N80-11628
Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650

ORBITAL SPACE STATIONS
Cost effectiveness requirements for space power
stations
25 p0073 A80-18800

ORGANIC COMPOUNDS
Energy storage in organic photoisomers
25 p0072 A80-18747
Energy storing organic photoreactions
[AD-A074915] 25 p0156 N80-14503

ORGANIC LITHIUM COMPOUNDS
Lead oxides-lithium cells
25 p0012 A80-11859

ORGANIC MATERIALS
Status of the PEATGAS process
[CONF-781045-3] 25 p0120 N80-12199

ORGANIC SULFUR COMPOUNDS
Study of photochemical processes in the
ferrous-thionine system --- photogalvanic effect
in dye redox systems for chemical energy
conversion
25 p0027 A80-12783

ORGANIC WASTES (FUEL CONVERSION)
Fluid bed combustion in processing, environmental
protection and energy supply
25 p0072 A80-18735
Gasification of solid waste in a fluidized bed
reactor with circulating sand
25 p0074 A80-18868
The microbial production of methane from household
wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870
Waste utilization as an energy source. Citations
from the International Aerospace Abstracts Data
Base
[NTIS/PS-79/0765/2] 25 p0102 N80-10667
Pilot plant gasification test on biomass fuels
[PB-299077/8] 25 p0151 N80-14272

OSMOSIS
Salt power - Is Neptune's ole salt a tiger in the
tank --- fresh/salt water osmotic pressure
difference for electrical generation
25 p0045 A80-16654
Osmotically pumped energy transport system
[AIAA PAPER 80-0210] 25 p0064 A80-18378

OUTER SPACE TREATY
Legal and political problems of solar power
stations in space
[IAF PAPER 79-IISL-03] 25 p0047 A80-17064

OUTPUT
Supply and demand in input-output analysis for
energy modeling
25 p0088 A80-20890

OXALIC ACID
High-efficiency alkaline accumulator with cadmium
mass treated with oxalic acid
25 p0010 A80-11842

OXIDATION
Analysis of tarry fractions in emissions resulting
from low temperature oxidation of brown coal
25 p0007 A80-11448
Chemosynthetic production of biomass - An idea
from a recent oceanographic discovery
25 p0045 A80-16657
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294

OXIDE FILMS
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
Effect of thin oxide layer on the current voltage
relations of Schottky barrier solar cells
25 p0026 A80-12772

OXIDES
Optical and electrical investigations on annealed
indium oxide selective coatings produced by
spray pyrolysis
25 p0023 A80-12747

OXYGEN
The calculation of carbon load and axial profiles
of oxygen concentration in the bed of a
fluidized combustor
25 p0077 A80-19421
Hydrogen and oxygen from water. II - Some
considerations in the reduction of the idea to
practice
25 p0078 A80-19473
Spatial and depth distribution of deuterium,
oxygen, and limiter materials on the liner of
TFR 400
25 p0082 A80-19682
Results of duct area ratio changes in the NASA
Lewis H2-O2 combustion MHD experiment
[NASA-TM-79306] 25 p0132 N80-12881

OXYHALIDES
Projected mechanism for thionyl chloride and
sulphuryl chloride cathode reactions
25 p0012 A80-11856

OZONOMETRY
Unleaded gasoline shortages and fuel switching -
The potential impact in Southern California
25 p0004 A80-11019

P

P-N JUNCTIONS
The semiconductor-insulator-semiconductor /indium
tin oxide on silicon/ solar cell -
Characteristics and loss mechanisms
25 p0006 A80-11368
Effect of concentrated sunlight on the various
parameters of the p-n junction solar cell
25 p0025 A80-12764
Efficient shallow-homojunction GaAs solar cells by
molecular beam epitaxy
25 p0035 A80-13986
High-voltage multijunction solar cell
25 p0035 A80-14593
Photoelectric parameters of photoelectric
converters in relation to illumination
25 p0044 A80-16627
Analysis of the optical characteristics of silicon
photoelectric converters with bilateral
sensitivity
25 p0044 A80-16628
Temperature dependence of open-circuit
photovoltage of a back-surface field
semiconductor junction
25 p0087 A80-20727

P-N-P JUNCTIONS
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric
converters with an illuminated n-region
25 p0044 A80-16626

PACIFIC OCEAN
OTEC thermal response report for Pacific plant
ship, 5 to 10 deg N 90 to 95 deg W
[HCP/T2898-01/3] 25 p0142 N80-13656

PACKING DENSITY
Cost analysis of packed beds for thermal energy
storage
[CAES-11] 25 p0145 N80-13687

PALEONTOLOGY
Devonian paleocurrents of the Applachian basin ---
gas production
[METC/CR-79/22] 25 p0149 N80-13735

PARABOLIC BODIES
Comparative study of solar optics for paraboloidal
concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564

PARABOLIC REFLECTORS
Using a fin with a parabolic concentrator
25 p0004 A80-10847
An investigation of experimental performance of a
compound parabolic concentrator
25 p0023 A80-12748

Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749
Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement
25 p0027 A80-12784
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706
SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators
[ASME PAPER 79-WA/SOL-13] 25 p0068 A80-18581
Solar concentrators using vacuum-contoured surfaces for tracking
[AIAA PAPER 80-0399] 25 p0077 A80-19326
Cavity enhancement by controlled directional scattering --- in solar collectors
25 p0083 A80-19955
Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473

PARABOLOID MIRRORS
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629

PARTICLE ACCELERATION
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194

PARTICLE ACCELERATORS
Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers
25 p0046 A80-16745
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617
Pulsed power for fusion
[SAND-79-0933C] 25 p0181 N80-15908

PARTICLE BEAMS
Particle beam systems in plasma diagnostics
25 p0045 A80-16718
Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers
25 p0046 A80-16745
Pulsed power for fusion
[SAND-79-0933C] 25 p0181 N80-15908

PARTICLE DIFFUSION
Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386

PARTICLE PRODUCTION
Optimization of neutron yield in conical system at explosion-induced compression
25 p0007 A80-11545

PARTICLE SIZE DISTRIBUTION
An in-situ optical particle sizing technique --- for fuel droplets
[AIAA PAPER 80-0020] 25 p0062 A80-18240

PARTICLES
A single coal particle gasification model
25 p0088 A80-20884

PARTICULATE SAMPLING
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

PATTERN METHOD (FORECASTING)
Energy demand in the developing countries
[DOE/EIA-0183/10] 25 p0177 N80-15631

PEAT
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833

PEDALS
The pedal wind turbine
25 p0008 A80-11645

PELLETS
Pelletized wood /Woodex/ - Applications and potential --- from biomass waste products
25 p0017 A80-11981
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
Refueling by means of pellets - Ablation rate and injection velocity considerations --- effects on plasma confinement in tokamak
25 p0080 A80-19611

PENDULUMS
Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement
25 p0027 A80-12784

PENETROMETERS
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431

PENNSYLVANIA
Development of mining guidance and control systems
[NASA-TM-78226] 25 p0137 N80-13601

PERFORMANCE PREDICTION
Derivation of method for predicting long term average energy delivery of solar collectors
25 p0005 A80-11339
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
Computer modelling of electrically parallel arrays of sodium-sulphur cells
25 p0013 A80-11865
Validation methodology for solar heating and cooling systems
25 p0020 A80-12431
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821
The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825
A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures
25 p0046 A80-16794
Sensitivity of direct gain space heating performance to fundamental parameter variations
25 p0060 A80-18128
A performance and current distribution model for scaled-up molten carbonate fuel cells
25 p0062 A80-18213
Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558
RAPAD - Real-time Accurate Performance Analysis of Data --- for performance estimation of wind energy conversion system
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565
Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector
[ASME PAPER 79-WA/SOL-3] 25 p0067 A80-18570
Evaluation of a solar heating system installed in the LSU Field House
[ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600
Modeling and simulation of WECS assisted utility systems --- Wind-Electric Conversion System
25 p0088 A80-20887

PERFORMANCE TESTS
Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype --- French thesis
25 p0001 A80-10109
Experimental demonstration of the diffuser-augmented wind turbine concept
25 p0007 A80-11643
The pedal wind turbine
25 p0008 A80-11645
Development of silver-hydrogen cells
25 p0010 A80-11844
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847
Some aspects of sodium-sulphur batteries
25 p0013 A80-11866

Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125
On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427
Instrumentation principles for performance measurement of solar heating systems
25 p002C A80-12432
Monitoring of the solar-heated modular homes at Los Alamos
25 p0022 A80-12607
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748
A seasonally adjusted concentrating collector made of mirror strips
25 p0024 A80-12750
Prime mover for solar power plant
25 p0024 A80-12752
Electrochemical storage of photovoltaic solar energy
25 p0025 A80-12757
Testing of three installed solar domestic water heaters
25 p0025 A80-12758
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0C27 A80-12776
Experimental investigations of an intermittent ammonia-water solar refrigerator
25 p0028 A80-12786
Performance characteristics of solar regenerators
25 p0028 A80-12787
Solar cell spectral response characterization
25 p0037 A80-14685
Performance testing of a hydrogen heat pipe
[AIAA PAPER 80-0212] 25 p0064 A80-18379
Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation
[ASME PAPER 79-WA/SOL-2] 25 p0067 A80-18571
A comparison of test results for flat-plate water-heating solar collectors using the BSE and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585
Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589
Testing and performance of the 30 kA ohmic heating system for ASDEX --- tokamak experiment with axisymmetric diverter
25 p0078 A80-19585
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618
Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines
25 p0082 A80-19672
New concept for a system suitable for solar simulation
25 p0C83 A80-19976
Gas generator research and development: BI-GAS process
[FE-1207-62] 25 p0135 N80-13288
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497
Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577
Intermediate report on the performance of plate-type ice-maker heat pumps
[ORNL/CON-23] 25 p0176 N80-15619
PERIODICALS
Dimensions/NBS, volume 63, no. 6, June 1979
[PB-297836/9] 25 p0105 N80-10975
PERMEABILITY
Anton permselective membrane
[NASA-CR-159599] 25 p0122 N80-12551
PERSONNEL DEVELOPMENT
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158] 25 p0179 N80-15670
PETROLEUM PRODUCTS
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels
25 p0073 A80-18832
Petrochemicals: Their economic significance in the domestic economy
[PB-299733/6] 25 p0181 N80-15992
PHASE TRANSFORMATIONS
On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427
Modeling of a thermal wall panel using phase change materials
25 p0021 A80-12439
Design criteria in PCM wall thermal storage --- Phase Change Materials
25 p0021 A80-12440
Storage of solar heat by solid-liquid phase change
25 p0024 A80-12755
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting
25 p0029 A80-12823
Effectiveness - NTU charts for latent heat storage units --- heat exchangers
[ASME PAPER 79-WA/SOL-16] 25 p0066 A80-18561
Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584
PHILOSOPHY
Soft and hard energy paths - The roads not taken --- political, technical and philosophical aspects of energy problem
25 p0007 A80-11400
PHOSPHORIC ACID
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861
Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159705] 25 p0096 N80-10603
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646
PHOSPHORUS
Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858
PHOTOABSORPTION
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869
PHOTOCHEMICAL REACTIONS
Hydrogen evolution from water using solid carbon and light energy
25 p0032 A80-13109
Photochemical hydrogen production
25 p0052 A80-17579
International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge University, Cambridge, England, August 10-12, 1978, Lectures
25 p0072 A80-18746
Energy storage in organic photoisomers
25 p0072 A80-18747
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502
Energy storing organic photoreactions
[AD-A074915] 25 p0156 N80-14503
PHOTOCONDUCTORS
An electronic device for intermittent tracking --- of sun in solar collectors
25 p0027 A80-12782
Measurement of insolation using CdS photoresistor
25 p0047 A80-16998
PHOTODIODES
AlGaAs tunnel diode
25 p0046 A80-16799
PHOTOELECTRIC CELLS
Studies of photogalvanic cells
25 p0023 A80-12743
Photogalvanic cells
25 p0073 A80-18749
PHOTOELECTRIC EFFECT
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627

PHOTOELECTRIC EMISSION
Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells
25 p0087 A80-20723

PHOTOELECTRIC MATERIALS
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343

PHOTOELECTROCHEMICAL DEVICES
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
Study of photochemical processes in the ferrous-thionine system --- photogalvanic effect in dye redox systems for chemical energy conversion
25 p0027 A80-12783
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system --- in hydrogen production
25 p0033 A80-13198
Photochemical hydrogen production
25 p0052 A80-17579
Photoelectrochemical hydrogen production
25 p0052 A80-17580
Power conversion efficiency monitoring in photoelectrochemical and other solar cells
25 p0062 A80-18214
Photoelectrochemistry and heterogeneous photocatalysis at semiconductors
25 p0073 A80-18750
Principles of photoelectrochemical solar energy conversion
25 p0074 A80-18990
Photoelectrochemical conversion of optical energy to electricity and fuels
[AD-A072861] 25 p0123 N80-12556

PHOTOGEOLOGY
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E80-10033] 25 p0170 N80-15528

PHOTOGRAPHIC PROCESSING EQUIPMENT
A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750

PHOTOLYSIS
Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401
The water splitting light reaction of chlorophyll a dihydrate. Visible light solar energy conversion after the primary reaction in plant photosynthesis
25 p0133 N80-13188

PHOTOMETERS
Measurement of insolation using CdS photoresistor
25 p0047 A80-16998

PHOTONS
Energy storing organic photoreactions
[AD-A074915] 25 p0156 N80-14503

PHOTOPHILIC PLANTS
Microbial hydrogen production from replenishable resources
25 p0032 A80-13197

PHOTOSENSITIVITY
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627
Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628

PHOTOSYNTHESIS
The photo-electrochemical production of C-C bonds from carbon dioxide
25 p0004 A80-10848
Photochemical conversion and storage of solar energy
25 p0009 A80-11829
The turnover times and pool sizes of photosynthetic hydrogen production by green algae
25 p0029 A80-12819
Petroleum plantations and synthetic chloroplasts
25 p0049 A80-17137
Biological and biochemical hydrogen production
25 p0053 A80-17581
The water splitting light reaction of chlorophyll a dihydrate. Visible light solar energy conversion after the primary reaction in plant photosynthesis
25 p0133 N80-13188

PHOTOVOLTAGES
Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells
25 p0087 A80-20723
Temperature dependence of open-circuit photovoltage of a back-surface field semiconductor junction
25 p0087 A80-20727
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377

PHOTOVOLTAIC CELLS
Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype --- French thesis
25 p0001 A80-10109
Theory of the direct coupling between D.C. motors and photovoltaic solar arrays
25 p0005 A80-11334
The optimal design of solar cell grid lines
25 p0005 A80-11335
Concentration ratio and efficiency in thermophotovoltaics
25 p0005 A80-11336
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853
Electrochemical storage of photovoltaic solar energy
25 p0025 A80-12757
Programme and progress of DST sponsored solar photovoltaic work in India
25 p0025 A80-12760
Cadmium telluride solar cells
25 p0026 A80-12765
GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774
Design and development of a 100 peak watt photovoltaic concentrator system
25 p0027 A80-12778
Power loss in photovoltaic arrays due to mismatch in cell characteristics
25 p0028 A80-12815
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627
Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628
The ampere-hour efficiency of photovoltaic solar generators
25 p0047 A80-16999
Global aspects of sunlight as a major energy source
25 p0048 A80-17131
Photovoltaic solar cell array used for supplemental power generation
25 p0061 A80-18129
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575
The satellite power system concept and program
[SAWE PAPER 1305] 25 p0086 A80-20643
Computer analysis of grids currently used for CdS/Cu2S solar cells
25 p0089 A80-20893
Analytical evaluation of a solar thermophotovoltaic (TPV) converter
[SAND-79-0504C] 25 p0099 N80-10638
Flywheel energy storage and conversion system for solar photovoltaic applications
[COO-4094-31] 25 p0100 N80-10639
Night storage and backup generation with electrochemical engines --- study of electric generators for electrochemical engines using photovoltaic energy conversion
[LA-UR-78-1149] 25 p0113 N80-11596

Maximum power trackers for photovoltaic arrays [COO-4094-17] 25 p0116 N80-11627
A photovoltaic power system in the remote African village of Tangaye, Upper Volta [NASA-TM-79318] 25 p0123 N80-12552
Batteries for specific solar applications [SAND-79-1428C] 25 p0124 N80-12559
Mead, Nebraska, 25-kW photovoltaic power system [COO-4094-10] 25 p0127 N80-12592
Evaluation of combined photovoltaic/thermal collectors [COO-4577-8] 25 p0143 N80-13665
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid [DOE/CS-34267/1] 25 p0145 N80-13688
Photovoltaic systems. Program summary [DOE/ET-0019/2] 25 p0146 N80-13691
Test plan for the Mead 25-kW Photovoltaic Flexible Test Facility, 1979 [COO-4094-53] 25 p0146 N80-13692
Residential photovoltaic module and array requirements study, appendices [NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study [NASA-CR-162528] 25 p0154 N80-14482
Photovoltaic power systems market identification and analysis [HCP/T4022-01] 25 p0162 N80-14559
Photovoltaic incentives options [HCP/CS-0023] 25 p0162 N80-14561
A survey of photovoltaic systems [NASA-CR-150696] 25 p0171 N80-15563
Status of the US Department of Energy photovoltaic concentrator development project [SAND-78-2187C] 25 p0172 N80-15578
Flywheel energy storage and conversion system for photovoltaic applications [COO-4094-48] 25 p0178 N80-15635

PHOTOVOLTAIC CONVERSION
Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype --- French thesis 25 p0001 A80-10109
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes 25 p0004 A80-10879
Solar electric generating system resource requirements 25 p0005 A80-11341
Programme and progress of DST sponsored solar photovoltaic work in India 25 p0025 A80-12760
Role of oxide layer in Schottky barrier solar cells 25 p0025 A80-12761
Effect of concentrated sunlight on the various parameters of the p-n junction solar cell 25 p0025 A80-12764
Experimental study of MOS solar cells under concentration 25 p0026 A80-12769
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact 25 p0033 A80-13204
Photoconverter with bilateral sensitivity 25 p0044 A80-16625
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion 25 p0046 A80-16786
Conversion of radiant energy into chemical energy [UCRL-TRANS-11427] 25 p0114 N80-11609
Photovoltaic energy conversion in polymer films 25 p0154 N80-14477
System tests and applications photovoltaic program [HCP/T4024-01/15] 25 p0163 N80-14566
Photovoltaic power system reliability considerations [NASA-TM-79291] 25 p0170 N80-15422

PHOTOVOLTAIC EFFECT
The physics and chemistry of solar cells 25 p0073 A80-18751
Photoelectrochemical conversion of optical energy to electricity and fuels [AD-A072861] 25 p0123 N80-12556
Decentralized solar photovoltaic energy systems [LA-7866-TASE] 25 p0171 N80-15565
Design of photovoltaic systems for residential applications in the United States [SAND-78-2186C] 25 p0171 N80-15566
Description of the MIT/Lincoln Laboratory photovoltaic systems test facility [COO-4094-41] 25 p0178 N80-15638

PHYSICAL PROPERTIES
On the performance of air-based solar heating systems utilizing phase-change energy storage 25 p0020 A80-12427

PILOT PLANTS
Is there a chance for OTEC 25 p0007 A80-11394
Kentucky's coal-based chemical/energy park 25 p0013 A80-11954
Current German developments in coal liquefaction technology 25 p0015 A80-11965
SRC solids - Boiler fuel and building block --- Solvent Refined Coal 25 p0015 A80-11967
The near term potential for gasification-combined cycle electric power generation 25 p0015 A80-11970
Progress and development trends in coal gasification and liquefaction technologies - New gasification methods developed on a laboratory or large scale 25 p0031 A80-12946
Harnessing power from tides - State of the art 25 p0045 A80-16658
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation [SAND-78-8180] 25 p0097 N80-10612
HYGAS process update [CCNF-781045-4] 25 p0120 N80-12200
Pilot plant gasification test on biomass fuels [PB-299077/8] 25 p0151 N80-14272
The 10 MW solar thermal pilot plant dynamic simulation. Volume 1: Computer program description [ATR-78(7747)-1-VOL-1] 25 p0162 N80-14550
The 10 MW solar thermal pilot plant dynamic simulation. Volume 2: Computer program source listing [ATR-78(7747)-2-VOL-2] 25 p0162 N80-14551
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques --- components of coal gasification and liquefaction pilot plants [CONF-790480-1] 25 p0167 N80-15259

PIPE FLOW
Feasible thermophysical conditions for gas receiver tubes in solar power stations [ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627

PIPELINES
Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment --- design of a gas pipeline station control system and a railway switch car [AD-A074885] 25 p0182 N80-16022

PIPES (TUBES)
Optimal insulation of pipes and tanks for solar heating systems [ALC-5319-2] 25 p0102 N80-10660
Materials testing for central receiver solar-thermal power systems [TID-29443] 25 p0146 N80-13695
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques --- components of coal gasification and liquefaction pilot plants [CONF-790480-1] 25 p0167 N80-15259

PISTON THEORY
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core 25 p0083 A80-20066
Change in rate of conducting-piston motion and the characteristics of field-diffusion processes in a linear electromechanical energy converter 25 p0083 A80-20069

PLASMA CONTROL
Tearing modes in a plasma with magnetic braiding 25 p0006 A80-11349
The physics of laser fusion --- Book 25 p0019 A80-12049

Diagnostics for mirror machines 25 p0045 A80-16720

Hard X-ray measurements --- performed on plasma confinement devices 25 p0045 A80-16722

Survey of mirror machine reactors 25 p0046 A80-16752

Magnetic field design for a large tokamak 25 p0046 A80-16760

Accumulation of impurities and stability behaviour in the high-density regime of Pulsator 25 p0054 A80-17759

High-beta tokamaks 25 p0054 A80-17789

Dependence of ideal MHD beta limits on current density and pressure profiles 25 p0054 A80-17790

MHD stability limits on high-beta tokamaks 25 p0054 A80-17797

LASL toroidal reversed-field pinch programme 25 p0054 A80-17809

Principles of plasma heating and confinement in a compact toroidal configuration 25 p0055 A80-17822

End plugging of a hot linear theta pinch 25 p0055 A80-17824

Heating, confinement and fluctuations in the CLEO stellarator 25 p0055 A80-17826

Transverse particle losses in axially asymmetrical open traps 25 p0055 A80-17840

Drift wave stability and transport theory in fusion systems 25 p0056 A80-17846

Inertial confinement fusion at NRL 25 p0056 A80-17861

Work on laser interaction and implosion at Centre d'Etudes de Limeil 25 p0057 A80-17863

Inertial confinement fusion research at Osaka 25 p0057 A80-17868

The United States programme in heavy ion beam fusion 25 p0058 A80-17873

Nuclear fusion by cylindrical ion implosion 25 p0058 A80-17874

Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions 25 p0058 A80-17875

Low-aspect-ratio limit of the toroidal reactor - The spheromak 25 p0058 A80-17876

Boundary layer analysis of cold-blanket systems 25 p0058 A80-17877

Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2 25 p0078 A80-19581

A new high beta reversed field pinch machine 25 p0078 A80-19587

Numerical computations in the design of compact ignition experiments --- of D-T toroidal plasma heating 25 p0078 A80-19589

Poloidal magnetic field design of a pulsed tokamak reactor 25 p0078 A80-19592

Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors 25 p0079 A80-19594

The effect of classical and anomalous transport on the performance of Tandem Mirror reactors 25 p0079 A80-19596

Refueling by means of pellets - Ablation rate and injection velocity considerations --- effects on plasma confinement in tokamak 25 p0080 A80-19611

The application of computers to fusion experimental facilities 25 p0080 A80-19619

Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines 25 p0082 A80-19672

Effect of finite beta on drift-wave turbulence and particle confinement --- of toroidal plasma 25 p0084 A80-20158

PLASMA CYLINDERS

Nonlinear modification of resonance-cone trajectories --- due to ponderomotive force in cylindrical plasma 25 p0006 A80-11347

Current equilibrium and effective ion charge in L-2 stellarator plasma 25 p0055 A80-17829

Nuclear fusion by cylindrical ion implosion 25 p0058 A80-17874

PLASMA DENSITY

Measurements of the density fluctuations using the microwave scattering method --- for toroidal plasmas 25 p0046 A80-16731

Theory of cavitons in laser-irradiated plasmas 25 p0057 A80-17872

Boundary layer analysis of cold-blanket systems 25 p0058 A80-17877

A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering 25 p0084 A80-20165

PLASMA DIAGNOSTICS

Particle beam systems in plasma diagnostics 25 p0045 A80-16718

Diagnostics for mirror machines 25 p0045 A80-16720

Hard X-ray measurements --- performed on plasma confinement devices 25 p0045 A80-16722

Measurements of the density fluctuations using the microwave scattering method --- for toroidal plasmas 25 p0046 A80-16731

Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers 25 p0046 A80-16745

Survey of mirror machine reactors 25 p0046 A80-16752

Experimental studies of interaction and transport processes in laser fusion 25 p0057 A80-17864

MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy 25 p0080 A80-19612

A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering 25 p0084 A80-20165

PLASMA ELECTRODES

Determination of the geometry of the transition region of a series MHD generator 25 p0030 A80-12900

Characteristics of series channels with a diminishing electrode-commutation angle in the transition section --- MHD generators 25 p0061 A80-18139

Power take-off analysis for diagonally connected MHD channels [AIAA PAPER 80-0253] 25 p0077 A80-19309

PLASMA EQUILIBRIUM

Magnetic field design for a large tokamak 25 p0046 A80-16760

High-beta tokamaks 25 p0054 A80-17789

Dependence of ideal MHD beta limits on current density and pressure profiles 25 p0054 A80-17790

LASL toroidal reversed-field pinch programme 25 p0054 A80-17809

Current equilibrium and effective ion charge in L-2 stellarator plasma 25 p0055 A80-17829

Poloidal magnetic field design of a pulsed tokamak reactor 25 p0078 A80-19592

New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium 25 p0085 A80-20538

PLASMA GENERATORS

Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas 25 p0007 A80-11612

PLASMA HEATING

Nonlinear modification of resonance-cone trajectories --- due to ponderomotive force in cylindrical plasma 25 p0006 A80-11347

Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194
Selected topics on surface effects in fusion devices - Neutral-beam injectors and beam-direct converters
25 p0043 A80-16262
Dynamic suppression of ionization instability --- in MHD devices of Faraday and Hall types
25 p0043 A80-16484
Diagnostics for mirror machines
25 p0045 A80-16720
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
End plugging of a hot linear theta pinch
25 p0055 A80-17824
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857
Testing and performance of the 30 kA ohmic heating system for ASDEX --- tokamak experiment with axisymmetric diverter
25 p0078 A80-19585
Numerical computations in the design of compact ignition experiments --- of D-T toroidal plasma heating
25 p0078 A80-19589
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
Possible improvements to a basic cellular thin blanket fusion reactor configuration
25 p0081 A80-19664
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665
Main power supplies for large toroidal fusion experiments
25 p0082 A80-19670
Status of the JET project --- Joint European Torus
25 p0082 A80-19708
Steady-state currents driven by collisionally damped lower-hybrid waves --- in plasma
25 p0084 A80-20157
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159

PLASMA INTERACTIONS
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218
High interaction subsonic MHD channel operation
[AIAA PAPER 80-0022] 25 p0062 A80-18242

PLASMA JETS
A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour
25 p0022 A80-12453

PLASMA LAYERS
What is the mechanism responsible for the precursors of internal disruptions --- as observed in Tokamak plasma
25 p0054 A80-17807

PLASMA LOSS
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

PLASMA PHYSICS
The physics of laser fusion --- Book
25 p0019 A80-12049
Review of tokamak experiments
25 p0034 A80-13342
The physics of closed cycle MHD power generation
25 p0043 A80-16264
Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volumes 1, 2 & 3
25 p0053 A80-17751
Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results
[AIAA PAPER 80-0091] 25 p0063 A80-18265
Relativistic high-current microwave plasma electronics
25 p0083 A80-19847

PLASMA PINCH
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811
The effect of current shear on the tearing instability
25 p0059 A80-18086
A new high beta reversed field pinch machine
25 p0078 A80-19587
Neutronics in the toroidal belt-geometry of a screw pinch reactor
25 p0081 A80-19657
The design of a thin walled toroidal vacuum chamber for a large RFP experiment --- Reversed Field Pinch
25 p0082 A80-19676

PLASMA POTENTIALS
Particle beam systems in plasma diagnostics
25 p0045 A80-16718

PLASMA RESONANCE
Nonlinear modification of resonance-cone trajectories --- due to ponderomotive force in cylindrical plasma
25 p0006 A80-11347
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871

PLASMA TEMPERATURE
A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering
25 p0084 A80-20165

PLASMA TURBULENCE
Effect of finite beta on drift-wave turbulence and particle confinement --- of toroidal plasma
25 p0084 A80-20158

PLASMA WAVES
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846
Steady-state currents driven by collisionally damped lower-hybrid waves --- in plasma
25 p0084 A80-20157

PLASMA-ELECTROMAGNETIC INTERACTION
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871

PLASMA-PARTICLE INTERACTIONS
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium
25 p0085 A80-20538

PLASMAS (PHYSICS)
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627

PLASTIC TAPES
Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346

PLASTICS
Petrochemicals: Their economic significance in the domestic economy
[PB-299733/6] 25 p0181 N80-15992

PLATINUM
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146

PLUMES
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992
Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants
25 p0089 A80-21010

PLUTONIUM OXIDES
General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program --- plutonium oxide
[LA-7519-PR] 25 p0118 N80-11889

PNEUMATIC EQUIPMENT
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705

POINTING CONTROL SYSTEMS
Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector
25 p0022 A80-12627
An electronic device for intermittent tracking --- of sun in solar collectors
25 p0027 A80-12782

POLARIZATION (CHARGE SEPARATION)
Synthetic molecular organizates
25 p0073 A80-18752

POLICIES
A policy-sensitive model of technology assessment
25 p0004 A80-11140

POLITICS
Soft and hard energy paths - The roads not taken --- political, technical and philosophical aspects of energy problem
25 p0007 A80-11400

POLLUTION CONTROL
Economics of Pullman Kellogg's magnesium promoted FGD system --- Flue Gas Desulfurization
25 p0014 A80-11961
Vehicle emissions control and its effect on engine development
25 p0037 A80-14708
Hydrogen - The Denver story
25 p0038 A80-14709
An optimization model for overall urban energy planning
25 p0038 A80-14844
The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505
Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623
First experiences with the use of impactors in large power plants
25 p0074 A80-18859
Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites
25 p0074 A80-18861
Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700
Technical assessment of thermal DeNOx process --- for coal fired boilers
[PB-297947/4] 25 p0117 N80-11656
Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion --- models for environmentally clean power plant design
[COO-4272-3] 25 p0165 N80-14587
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294
Sulfur fixation during coal gasification --- desulfurizing to reduce air pollution
[PB-301104/6] 25 p0169 N80-15296
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979 --- electric power plants
[PB-299399/6] 25 p0179 N80-15682
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687
Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle
[PB-299928/2] 25 p0180 N80-15699

POLLUTION MONITORING
Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal
25 p0007 A80-11448
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964
Energetics aspects of environmental protection
25 p0072 A80-18733
Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants
25 p0089 A80-21010

POLYCRYSTALS
Efficient indium tin oxide/polycrystalline silicon solar cells
25 p0039 A80-15136
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492

POLYESTERS
Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement
25 p0027 A80-12784

POLYMER CHEMISTRY
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861

POLYMER MATRIX COMPOSITE MATERIALS
Materials program for fiber composite flywheels
[UCRL-81724] 25 p0115 N80-11618

POLYMERIC FILMS
Photovoltaic energy conversion in polymer films
25 p0154 N80-14477
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

POLYMERS
Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride
[AD-A071157] 25 p0139 N80-13625

POLYSTYRENE
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028

PONDEROMOTIVE FORCES
Nonlinear modification of resonance-cone trajectories --- due to ponderomotive force in cylindrical plasma
25 p0006 A80-11347

PONDS
Solar pond concepts: Old and new
[SERI/TP-35-208] 25 p0102 N80-10663

POROUS MATERIALS
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841

POROUS PLATES
A high performance porous flat-plate solar collector
25 p0021 A80-12438

POWER CONDITIONING
Flywheels for energy storage
25 p0019 A80-12166
Enhanced power generation of GSS/4/PS by optical solar reflectors --- Gravitationally Stabilized Solid-State-Satellite Solar-Power Station
25 p0038 A80-14948
Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688
Self-reconfiguring solar cell system
[NASA-CASE-LEW-12586-1] 25 p0153 N80-14472
POWER EFFICIENCY
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
Power loss in photovoltaic arrays due to mismatch in cell characteristics
25 p0028 A80-12815
Optimization of multi-layer front-contact grid patterns for solar cells
25 p0028 A80-12816
The possibilities of increasing gas turbine efficiency
25 p0032 A80-13024
Evaluation of conductor mass and necessary voltage level for large satellite solar arrays
25 p0036 A80-14595
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system --- for Stirling engine and solar thermal rocket
25 p0036 A80-14597
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997
The ampere-hour efficiency of photovoltaic solar generators
25 p0047 A80-16999
Influence of the loading factor on the performance characteristics of series MHD generators
25 p0061 A80-18137
Power conversion efficiency monitoring in photoelectrochemical and other solar cells
25 p0062 A80-18214
POWER LINES
The 50kA flux pump for the superconducting transmission line test bed
[LA-6953-MS] 25 p0094 N80-10443
Energy analysis of the basic materials utilized in electric power transmission systems
[HCP/T5043-01] 25 p0157 N80-14510
POWER PLANTS
The influence of thermophysical properties on the design and sizing of geothermal power plant components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593
Heber geothermal demonstration power plant
[EPRI-ER-863] 25 p0114 N80-11607
Waste heat rejection from geothermal power stations
[ORNL/TM-6533] 25 p0125 N80-12575
POWER SERIES
Modified power law equations for vertical wind profiles
[NASA-TM-79275] 25 p0138 N80-13623
POWER SUPPLY CIRCUITS
Solar cells in practice
25 p0083 A80-19844
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368
PRECIPITATION (CHEMISTRY)
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567
PREDICTION ANALYSIS TECHNIQUES
Validation of computer models for predicting radiation levels on tilted surfaces
25 p0020 A80-12429

Dynamic modeling of H2S clean-up processes --- in coal gasification
25 p0088 A80-20885
PRESSURE DISTRIBUTION
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790
PRESSURE EFFECTS
High-beta tokamaks
25 p0054 A80-17789
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935
PRESSURE MEASUREMENTS
Dissociation pressure measurements on salts proposed for thermochemical energy storage
[SAND-79-8033] 25 p0160 N80-14532
PRESSURE REDUCTION
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204
PRESSURE VESSELS
Interim structural design standard for solar energy applications, phases 1 and 2 --- boiler and pressure vessel code
[SAND-79-8183] 25 p0146 N80-13698
PRESTRESSING
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553
PRIMARY BATTERIES
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862
Recent advances in high temperature primary lithium batteries
25 p0013 A80-11863
Lithium inorganic electrolyte battery development
[AD-A073858] 25 p0157 N80-14505
PROBABILITY DENSITY FUNCTIONS
Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891
PROBABILITY THEORY
Solar cooling performance predictions via stochastic weather algorithms
25 p0020 A80-12430
Modeling and simulation of WECS assisted utility systems --- Wind-Electric Conversion System
25 p0088 A80-20887
PROCESS CONTROL (INDUSTRY)
Near-term prospects for solar industrial process heat
25 p0018 A80-11986
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795
Mathematical modeling of coal gasification processes
25 p0089 A80-20913
Automated longwall guidance and control systems, phase 1
[NASA-CR-161329] 25 p0122 N80-12538
Automated longwall guidance and control systems, phase 2, part 2: Vertical control system (VCS)
[NASA-CR-161330] 25 p0122 N80-12539
Automated longwall guidance and control systems, phase 2, part 2: RCS, FAS, and MCS
[NASA-CR-161331] 25 p0122 N80-12540
PRODUCT DEVELOPMENT
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762
PRODUCTION ENGINEERING
The challenge of efficiently retorting very nonuniform beds of oil shale rubble
25 p0085 A80-20453
Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565
Status of the PEATGAS process
[CONF-781045-3] 25 p0120 N80-12199

- PRODUCTION PLANNING
  - Economic structure, aggregate production functions and the demand for energy as an intermediate product: A preliminary analysis [DOE/EIA-0103/8] 25 p0096 N80-10607
- PROFILE METHOD (FORECASTING)
  - MEDEE 2: A model for long term energy demand evaluation [IIASA-RR-78-17] 25 p0109 N80-11554
- PROGRAM VERIFICATION (COMPUTERS)
  - Validation methodology for solar heating and cooling systems 25 p0020 A80-12431
- PROJECT MANAGEMENT
  - Managerial plan: Executive order 12003 and the National Energy Act [DOE/TIC-10067] 25 p0104 N80-10965
  - Analysis of financial programs for energy conservation: Market simulation (penetration) model [HCP/M8662-1] 25 p0114 N80-11606
  - Low-temperature thermal energy storage program annual operating plan [ORNL/TM-6605] 25 p0125 N80-12568
  - Photovoltaic systems. Program summary [DOE/ET-0019/2] 25 p0146 N80-13691
  - US program for the immobilization of high-level nuclear wastes [DP-MS-79-2] 25 p0149 N80-13917
  - Report to the Congress on the coordination of Federal energy conservation programs involving state and local governments [DOE/TIC-10127] 25 p0157 N80-14515
  - Geothermal energy: Program summary [DOE/ET-0101] 25 p0161 N80-14542
  - OTEC-1 test conductor program --- project management quality control [CONF-780550-9] 25 p0163 N80-14563
  - LNG industry: An overview of projects and costs [CONF-7811112-2] 25 p0168 N80-15278
  - Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis [ORAU-158] 25 p0179 N80-15670
- PROJECT PLANNING
  - JT-60 project --- tokamak fusion reactor design analysis 25 p0082 A80-19709
  - Solar power satellite system definition study, phase 2. [NASA-CR-160377] 25 p0105 N80-11121
  - Solar power satellite system definition study, phase 2. Part 1: Midterm briefing [NASA-CR-160378] 25 p0105 N80-11122
  - Low NO(x) heavy fuel combustor program [NASA-TM-79313] 25 p0138 N80-13624
  - Systems engineering for power, program report [DOE/ET-0012/2-REV] 25 p0140 N80-13637
  - Fundamental economic issues in the development of small-scale hydro [DOE/RA-23-216.00.0-02] 25 p0143 N80-13667
  - Commercialization strategy report for hydrothermal electric and direct heat application --- project planning of geothermal resources for geothermal energy conversion for heating electricity generation [TID-28840-DRAFT] 25 p0157 N80-14508
  - SERAPH implementation plans [SERI/RR-34-152] 25 p0172 N80-15570
  - Laminated disk flywheel program [UCRL-81772] 25 p0175 N80-15612
  - Environmental development plan ocean thermal energy conversion [DOE/EDP-0034] 25 p0176 N80-15621
  - Fission energy program of the U.S. Department of Energy, FY 1980 [DOE/ET-0089] 25 p0180 N80-15893
  - Technical support for open-cycle MHD program --- project planning and systems analysis of a magnetohydrodynamic/steam power system [ANL/MHD-78-11] 25 p0181 N80-15942
- PROPANE
  - Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures 25 p0008 A80-11816
- PROPULSION SYSTEM PERFORMANCE
  - Preparing aircraft propulsion for a new era in energy and the environment 25 p0053 A80-17737
  - Impact of flywheel-transmissions on automobile performance: A logical basis for evaluation [UCRL-52758] 25 p0137 N80-13480
  - Energy storage system for automobile propulsion, 1978 study. 2: Detailed report [UCRL-52553-VOL-2] 25 p0181 N80-15995
- PROPYLENE
  - Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes 25 p0012 A80-11857
- PUBLIC HEALTH
  - Coal conversion technologies - Some health and environmental effects 25 p0006 A80-11369
- PUBLIC LAW
  - Solar access law. Protecting access to sunlight for solar energy systems [PB-296532/5] 25 p0117 N80-11633
  - Report to Congress on the economic impact of energy actions as required by public law 93-275, section 18-d [DOE/PE-0007] 25 p0181 N80-15993
- PULSE GENERATORS
  - Developments for the high voltage test of pulsed superconducting coils --- used in tokamak switches 25 p0081 A80-19655
  - PULSAR: An inductive pulse power source [SAND-79-1246C] 25 p0177 N80-15627
- PULSED RADIATION
  - Pulsed power for fusion [SAND-79-0933C] 25 p0181 N80-15908
- PUMPS
  - Continuous coal processing method and means [NASA-CASE-NPO-13758-2] 25 p0092 N80-10377
  - Technical and economic assessment of solar powered water pumping for remote areas [SAND-79-8187] 25 p0129 N80-12608
- PYROLYSIS
  - Experimental techniques and mathematical models in the study of waste pyrolysis and gasification 25 p0001 A80-10028
  - Molten salt pyrolysis of latex --- for hydrocarbon fuel production [NASA-CASE-NPO-14315-1] 25 p0092 N80-10361
  - Coal conversion in flash hydropyrolysis reactors [BNL-26209] 25 p0136 N80-13294
  - Review of supporting research at Oak Ridge National Laboratory for underground coal conversion [CONF-790630-9] 25 p0136 N80-13295
- PYROTECHNICS
  - Recent advances in high temperature primary lithium batteries 25 p0013 A80-11863

Q

- Q SWITCHED LASERS
  - A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering 25 p0084 A80-20165
- QUALITY CONTROL
  - Alternative jet aircraft fuels 25 p0091 N80-10209
  - Quality assurance in alternative energy sources [RHO-SA-107] 25 p0095 N80-10504
  - Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska [NASA-CR-162534] 25 p0154 N80-14483
  - OTEC-1 test conductor program --- project management quality control [CONF-780550-9] 25 p0163 N80-14563
- QUANTITATIVE ANALYSIS
  - Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash 25 p0053 A80-17710
- QUENCHING (ATOMIC PHYSICS)
  - Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen --- electron transfer reactions in solar energy conversion processes 25 p0040 A80-15358
- QUENCHING (COOLING)
  - Minimum ignition energies and quenching distances of methanol blends 25 p0004 A80-11331

R

RADIANT HEATING
Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials
25 p0020 A80-12311
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600

RADIATION
Conversion of radiant energy into chemical energy
[UCRL-TRANS-11427] 25 p0114 N80-11609

RADIATION CHEMISTRY
Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen --- electron transfer reactions in solar energy conversion processes
25 p0040 A80-15358

RADIATION DAMAGE
Solar panels exposed to cosmic rays
25 p0008 A80-11825
Some implications of a cellular structure in minimum thickness fusion reactor blankets
25 p0081 A80-19663
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564
Space solar cells: High efficiency and radiation damage
[NASA-TM-81387] 25 p0170 N80-15554

RADIATION DISTRIBUTION
Validation of computer models for predicting radiation levels on tilted surfaces
25 p0020 A80-12429

RADIATION EFFECTS
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647

RADIATION MEASUREMENT
Measurement of insolation using CdS photoresistor
25 p0047 A80-16998
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982

RADIATION TOLERANCE
A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures
25 p0046 A80-16794

RADIATIVE HEAT TRANSFER
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516
A study of the thermal effect that radiant energy produces on a mass of water --- Spanish thesis
25 p0040 A80-15653
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558
Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304

RADIATIVE TRANSFER
Development of optical waveguides for a power-related application --- of solar radiation transmission
25 p0036 A80-14596

RADIO FREQUENCY HEATING
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17655
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608

RADIOACTIVE ISOTOPES
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program --- plutonium oxide
[LA-7519-PR] 25 p0118 N80-11889

RADIOACTIVE WASTES
Quality assurance in alternative energy sources
[RHC-SA-107] 25 p0095 N80-10504
World Energy Data System (WENDS). Volume 11: Nuclear fission program summaries
[ANL-PMS-79-2-VOL-11] 25 p0124 N80-12562
US program for the immobilization of high-level nuclear wastes
[DP-MS-79-2] 25 p0149 N80-13917

RADIOGRAPHY
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110

RADIOISOTOPE BATTERIES
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267

RADIOLYSIS
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system --- in hydrogen production
25 p0033 A80-13198

RADIOMETERS
Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector
25 p0022 A80-12627

RAIL TRANSPORTATION
Development of a sodium/sulphur battery for rail applications
25 p0031 A80-13003
The status of advanced propulsion systems for urban rail vehicles
[PB-297980/5] 25 p0133 N80-12962
Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment --- design of a gas pipeline station control system and a railway switch car
[AD-A074885] 25 p0182 N80-16022

RAMAN SPECTRA
Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10669

RANKINE CYCLE
Selection of working fluids for low temperature solar thermal power cycles
25 p0024 A80-12751
A parametric study of solar thermal power plant
25 p0024 A80-12753
OTEC - Solar energy from the sea
25 p0085 A80-20424
Evaluation of solar Rankine-cycle engine systems
[SAND-78-0986] 25 p0125 N80-12571
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
[SAND-78-2163C] 25 p0146 N80-13693

RAPID TRANSIT SYSTEMS
The electric trolley bus - Revisited
25 p0002 A80-10321
Hydrogen fuel applications for urban transit
25 p0037 A80-14703
Linear synchronous motor development for urban and rapid transit systems
25 p0062 A80-18167
The status of advanced propulsion systems for urban rail vehicles
[PB-297980/5] 25 p0133 N80-12962

RARE GASES
Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas
25 p0007 A80-11612

REACTION CONTROL
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19666

REACTION KINETICS
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544
Cadmium electrodes with improved surface characteristics for alkaline storage batteries
25 p0009 A80-11838
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856
Effect of off-design operation of MHD generators on NO/X/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
[CONF-781063-2] 25 p0115 N80-11615

Materials compatibility in liquid sodium
[HEDL-SA-1559] 25 p0119 N80-12147
Elucidation of coal structural components by short residence-time extractive liquefaction
25 p0119 N80-12188
Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion --- models for environmentally clean power plant design
[COO-4272-3] 25 p0165 N80-14587
Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288

REACTOR DESIGN
The physics of laser fusion --- Book
25 p0019 A80-12049
Developments in Sandia Laboratories particle beam fusion programme
25 p0057 A80-17867
The United States programme in heavy ion beam fusion
25 p0058 A80-17873
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885
Testing and performance of the 30 kA ohmic heating system for ASDEX --- tokamak experiment with axisymmetric diverter
25 p0078 A80-19585
A new high beta reversed field pinch machine
25 p0078 A80-19587
Poloidal magnetic field design of a pulsed tokamak reactor
25 p0078 A80-19592
Optimization of stabilized imploding liner fusion reactors
25 p0079 A80-19593
Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors
25 p0079 A80-19594
The effect of classical and anomalous transport on the performance of Tandem Mirror reactors
25 p0079 A80-19596
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
The combined d.c. power supply for JET --- Joint European Torus
25 p0080 A80-19621
Blanket and power conversion system of NUWMAK --- tokamak reactor
25 p0081 A80-19658
Some implications of a cellular structure in minimum thickness fusion reactor blankets
25 p0081 A80-19663
JT-60 project --- tokamak fusion reactor design analysis
25 p0082 A80-19709
Coal conversion processes and analysis methodologies for synthetic fuels production --- technology assessment and economic analysis of reactor design for coal gasification
[NASA-CR-161322] 25 p0092 N80-10379
Conceptual design of a Demonstration Tokamak Hybrid Reactor (DTHR)
[WFPS-TME-107] 25 p0132 N80-12898
Pulsed power for fusion
[SAND-79-0933C] 25 p0181 N80-15908

REACTOR MATERIALS
Microstructural objectives for high-temperature alloys in advanced energy systems
25 p0002 A80-10306

REACTOR SAFETY
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program --- plutonium oxide
[LA-7519-PR] 25 p0118 N80-11889

REACTOR STARTUP TESTS
Volt-second consumption during the start-up phase of FLT
25 p0040 A80-15532

REACTOR TECHNOLOGY
Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volumes 1, 2 & 3
25 p0053 A80-17751
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888
Summary on inertial-confinement fusion
25 p0059 A80-17893
Summary on reactor systems --- tokamak devices
25 p0059 A80-17894
Developments for the high voltage test of pulsed superconducting coils --- used in tokamak switches
25 p0081 A80-19655
World Energy Data System (WENDS). Volume 11: Nuclear fission program summaries
[ANL-PMS-79-2-VOL-11] 25 p0124 N80-12562
Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272

REAL TIME OPERATION
RAPAD - Real-time Accurate Performance Analysis of Data --- for performance estimation of wind energy conversion system
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565

RECEIVERS
Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694
Evaluation of the evacuated solar annular receivers used at the Midtemperature Solar Systems Test Facility (MSSTF)
[SAND-78-0983] 25 p0173 N80-15585

RECOMBINATION REACTIONS
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840

RECURSIVE FUNCTIONS
RAPAD - Real-time Accurate Performance Analysis of Data --- for performance estimation of wind energy conversion system
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565

RECYCLING
Energy conservation through recycling
25 p0003 A80-10842
Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0765/2] 25 p0102 N80-10667
Energy conservation in the US economy from increased recycle of obsolete steel scrap
[COO-2893-10] 25 p0159 N80-14524
Measurements and standards for recycled oil - 2
[PB-299951/4] 25 p0167 N80-15275
Energy optimal use of waste paper
[COO-2893-9] 25 p0174 N80-15595
Energy conservation through point source recycle with high temperature hyperfiltration --- textile industry
[PB-299183/4] 25 p0180 N80-15688

REFINING
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992

REFLECTANCE
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980

REFLECTORS
Effect of boosters on the performance of flat plate collector
25 p0023 A80-12744
Computer simulation results for planar reflectors and flat plate solar collectors
[ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559

REFRACTION
Seismic refraction investigation of the Salton Sea geothermal area, Imperial Valley, California
[PB-296547/3] 25 p0118 N80-11711

REFRACTIVITY
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749

REFRACTORY MATERIALS
Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588
Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels
[FE-1784-42] 25 p0106 N80-11248
REFRIGERATING
Heat exchange fluids and techniques --- Book
25 p0041 A80-15659
REFRIGERATING MACHINERY
Experimental investigations of an intermittent ammonia-water solar refrigerator
25 p0028 A80-12786
The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825
Development of a high temperature solar powered water chiller. Volume 3: Phase 1
[SAN-1590-1/3-VOL-3] 25 p0101 N80-10654
Intermediate report on the performance of plate-type ice-maker heat pumps
[ORNL/CON-23] 25 p0176 N80-15619
REFRIGERATORS
Maximum cold-generation capacity of thermoelectric refrigerators
25 p0035 A80-14594
REFUELING
Refueling by means of pellets - Ablation rate and injection velocity considerations --- effects on plasma confinement in tokamak
25 p0080 A80-19611
REGENERATION (ENGINEERING)
Performance characteristics of solar regenerators
25 p0028 A80-12787
Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646
Open cycle air turbine solar thermal power system
25 p0083 A80-19989
Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277
REGENERATIVE FUEL CELLS
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632
REGENERATORS
Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263
REGIONAL PLANNING
Global perspectives and options for long-range energy strategies
25 p0048 A80-17130
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
A regional approach to forecasting electric energy requirements for environmental assessments
25 p0130 N80-12619
REGULATIONS
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494
REINFORCING FIBERS
Materials program for fiber composite flywheels
[UCRL-81724] 25 p0115 N80-11618
RELATIVISTIC ELECTRON BEAMS
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
Relativistic high-current microwave plasma electronics
25 p0083 A80-19847
New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium
25 p0085 A80-20538
RELATIVISTIC PLASMAS
Relativistic high-current microwave plasma electronics
25 p0083 A80-19847
RELAXATION TIME
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811
RELIABILITY ANALYSIS
Economics/reliability trade-offs in materials for various coal conversion and utilization processes
25 p0016 A80-11975
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775
Modified aerospace reliability and quality assurance method for wind turbines
[NASA-TM-79284] 25 p0137 N80-13490
A probabilistic study of wind-electric conversion systems from the point of view of reliability and capacity credit
25 p0153 N80-14475
RELIABILITY ENGINEERING
Improving the reliability of capacitance batteries in power grids with higher-harmonic sources
25 p0008 A80-11671
Photovoltaic power system reliability considerations
[NASA-TM-79291] 25 p0170 N80-15422
REMOTE SENSORS
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964
REQUIREMENTS
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482
RESEARCH
Assessment of long term research needs for coal-gasification technologies
[PB-297853/4] 25 p0107 N80-11255
RESEARCH AND DEVELOPMENT
Is there a chance for OTEC
25 p0007 A80-11394
Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978
25 p0009 A80-11637
Materials research - Probable impacts on solar energy
25 p0018 A80-11991
Programme and progress of DST sponsored solar photovoltaic work in India
25 p0025 A80-12760
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195
The promise and puzzle of electric vehicles
25 p0039 A80-15175
Electric and hybrid vehicles --- Book
25 p0041 A80-15658
Report on Finnish technological activities
25 p0119 N80-11991
Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1
[GPC-41-481] 25 p0122 N80-12550
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287
Status of the DOE/NASA critical gas turbine research and technology project
[NASA-TM-79307] 25 p0155 N80-14493
RESEARCH MANAGEMENT
A policy-sensitive model of technology assessment
25 p0004 A80-11140
Development of renewable energy sources in the United Kingdom
25 p0017 A80-11980

An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195
Quality assurance in alternative energy sources
[RHO-SA-107] 25 p0095 N80-10504
Natural gas reserves estimates: A good federal program emerging, but problems and duplications persist
[PB-296628/2] 25 p0103 N80-10679
Proposed research planning format for the Environmental Assessment Department --- needs and concerns of groups concerned with environment and energy issues
[EPRI-EA-1018] 25 p0103 N80-10692
Solar power satellite system definition study, phase 2.
[NASA-CR-160377] 25 p0105 N80-11121
Solar power satellite system definition study, phase 2. Part 1: Midterm briefing
[NASA-CR-160378] 25 p0105 N80-11122
Biofuels: A survey
[EPRI-ER-746-SR] 25 p0107 N80-11250
Proceedings: Solar Thermal Power User Review Panel Meeting
[SERI/TP-69-221] 25 p0113 N80-11598
Status of information for consumers of small wind energy systems
[SERI/TP-51-158] 25 p0113 N80-11602
Southeastern forum on appropriate technology
[PB-298796/4] 25 p0118 N80-11965
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6605] 25 p0125 N80-12568
Underground coal conversion. Program description
[DOE/ET-0100] 25 p0136 N80-13293
Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
[CONF-790630-9] 25 p0136 N80-13295
Solar heating and cooling research projects: A summary
[EPRI-ER-1095-SR] 25 p0147 N80-13703
West Coast Forum on Appropriate Technology --- research in energy and environmental areas
[PB-298986/1] 25 p0166 N80-14962

RESERVOIRS
Energy-storage systems --- pumped-storage hydroelectric plants, compressed-air energy-storage plants, electric batteries and hot water storage
25 p0034 A80-13513
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647

RESIDENTIAL AREAS
Residential sector energy forecasts, national level for 1978-electricity, natural gas, number two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482
Measurement of energy to heat houses: Initial study
[PB-299448/2] 25 p0170 N80-15304
Application analysis of solar total energy systems to the residential sector. Volume 4: Market penetration
[ALO-3787-4] 25 p0174 N80-15597

RESIDUES
Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes
[FE-2247-2] 25 p0119 N80-12191
Gasification of residual materials from coal liquefaction
[FE-2247-22] 25 p0135 N80-13289

RESIN BONDING
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147

RESISTANCE HEATING
Heating, confinement and fluctuations in the CLEC stellarator
25 p0055 A80-17826
Electric heat - The right price at the right time
25 p0062 A80-18184
Testing and performance of the 30 kA ohmic heating system for ASDEX --- tokamak experiment with axisymmetric diverter
25 p0078 A80-19585
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
Steady-state currents driven by collisionally damped lower-hybrid waves --- in plasma
25 p0084 A80-20157
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159

RESONANT FREQUENCIES
Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622

RESOURCE ALLOCATION
Global options for short-range alternative energy strategies
25 p0048 A80-17129
Energy policy and decision analysis; new concepts and mechanisms
[LA-7909-MS] 25 p0140 N80-13634

RESOURCES MANAGEMENT
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199
Interactive analysis methods for resource mapping
25 p0008 A80-11709
The role of coal in the world energy picture up to the year 2000 - Reserves, resources, and availability from the Western European viewpoint
25 p0040 A80-15625
National environmental/energy workshop assessment, phase 3. Energy programs --- directory of courses available
[PB-298587/7] 25 p0117 N80-11634
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
Water use alternatives for Navajo energy production
[LA-UR-79-1598] 25 p0178 N80-15643

RETORT PROCESSING
The challenge of efficiently retorting very nonuniform beds of oil shale rubble
25 p0085 A80-20453
Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454
Mineral changes during oil shale retorting
25 p0085 A80-20455

RETROFITTING
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566

REVERSE FIELD PINCH
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629

RIBBONS
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474

RING STRUCTURES
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729

RISK
The scope of environmental risk management
25 p0053 A80-17743

RIVER BASINS
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641

ROCKET ENGINES
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system --- for Stirling engine and solar thermal rocket
25 p0036 A80-14597

ROTARY STABILITY
Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729
On the weathervaning of wind turbines
25 p0047 A80-16952
Recent spin test of two composite wagon wheel flywheels
[SAND-79-1669C] 25 p0140 N80-13640

ROTATING DISKS
Laminated disk flywheel program
[UCRL-81772] 25 p0175 N80-15612

ROTATING PLASMAS
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218

ROTOR AERODYNAMICS
The Kirsten rotor as a wind turbine
25 p0039 A80-15330
Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation
[ASME PAPER 79-WA/SOL-2] 25 p0067 A80-18571
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620

ROTOR BLADES (TURBOMACHINERY)
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043
The Kirsten rotor as a wind turbine
25 p0039 A80-15330

ROTORS
Comparative performance measurements on a Savonius rotor with ancillary surfaces
25 p0042 A80-16085
The Coriolis program --- electric power from moored counterrotating turbine arrays in warm water current
25 p0044 A80-16653
Wind energy innovative systems
[SERI/PR-13-054] 25 p0144 N80-13674

RUBY LASERS
A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering
25 p0064 A80-20165

RURAL AREAS
Economics of small solar power plants --- in rural areas
25 p0024 A80-12754
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773

RUTHENIUM COMPOUNDS
Hydrogen evolution from water using solid carbon and light energy
25 p0032 A80-13109

S

SAFETY
Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266

SAFETY FACTORS
Critical review and assessment of environmental and safety problems in hydrogen energy systems
[LA-7820-PR] 25 p0145 N80-13690

SALINITY
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524
Salt power - Is Neptune's ole salt a tiger in the tank --- fresh/salt water osmotic pressure difference for electrical generation
25 p0045 A80-16654

SALTON SEA (CA)
Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647
Geothermal energy development from the Salton Trough to the High Cascades --- Cerro Preto, Lower California and Mt. Hood, Oregon
[LBL-8703] 25 p0171 N80-15568

SANDS
Geology of the Athabasca oil sands
25 p0050 A80-17236

SANDWICH STRUCTURES
Weight minimization of sandwich type solar collector panels
[SAND-78-2305C] 25 p0147 N80-13710

SATELLITE ANTENNAS
Enhanced power generation of GSS/4/PS by optical solar reflectors --- Gravitationally Stabilized Solid-State-Satellite Solar-Power Station
25 p0038 A80-14948

SATELLITE DESIGN
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

SATELLITE ORIENTATION
Enhanced power generation of GSS/4/PS by optical solar reflectors --- Gravitationally Stabilized Solid-State-Satellite Solar-Power Station
25 p0038 A80-14948

SATELLITE POWER TRANSMISSION (TO EARTH)
Earth benefits of solar power satellites
25 p0038 A80-14791
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657
Satellite Power Systems (SPS) concept definition study. Volume 4: SPS point design definition
[NASA-CR-150683] 25 p0119 N80-12106
Satellite Power System (SPS): An overview of prospective organizational structures in the solar satellite field
[TID-29094] 25 p0154 N80-14478

SATELLITE SOLAR ENERGY CONVERSION
Solar electric generating system resource requirements
25 p0005 A80-11341
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775
Evaluation of conductor mass and necessary voltage level for large satellite solar arrays
25 p0036 A80-14595
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

SATELLITE SOLAR POWER STATIONS
Enhanced power generation of GSS/4/PS by optical solar reflectors --- Gravitationally Stabilized Solid-State-Satellite Solar-Power Station
25 p0038 A80-14948
Legal and political problems of solar power stations in space
[IAF PAPER 79-IISL-03] 25 p0047 A80-17064
Impacts of satellite power system technology
25 p0048 A80-17132
Cost effectiveness requirements for space power stations
25 p0073 A80-18800
Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641
The satellite power system concept and program
[SAWE PAPER 1305] 25 p0086 A80-20643
Minimum cost transmitter-receiver antenna pairs --- antenna design for the satellite solar power station using optimal control theory
[RM-690] 25 p0094 N80-10414

Satellite Power System (SPS): An overview of prospective organizational structures in the solar satellite field
[TID-29094] 25 p0154 N80-14478

SATELLITE TEMPERATURE
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267

SCALE (RATIO)
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551

SCALING LAWS
Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors
25 p0079 A80-19594

SCHOTTKY DIODES
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204
Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells
25 p0086 A80-20716
Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells
25 p0087 A80-20723

SCIENCE
A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volumes 1, 2, 3 & 4
25 p0038 A80-14794

SCREEN EFFECT
Calculation of the low-frequency electromagnetic field of MHD machines encapsulated in a common screening shell
25 p0030 A80-12896

SCRUBBERS
Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623
Hot gas cleanup
[ICTIS/TR-03] 25 p0117 N80-11647

SEA WATER
On the basic dynamics of extracting power from waves
25 p0038 A80-14837
OTEC - Solar energy from the sea
25 p0085 A80-20424

SEALS (STOPPERS)
Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694

SEASAT OCEAN DYNAMICS SATELLITE
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532

SEDIMENTS
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048
The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754

SEISMIC WAVES
Seismic refraction investigation of the Salton Sea geothermal area, Imperial Valley, California
[PB-296547/3] 25 p0118 N80-11711

SEISMOLOGY
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431

SEMICONDUCTING FILMS
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141

SEMICONDUCTOR DEVICES
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853
Semiconductor alternating-current motor drives and energy conservation
25 p0034 A80-13861
Photoelectrochemistry and heterogeneous photocatalysis at semiconductors
25 p0073 A80-18750
The physics and chemistry of solar cells
25 p0073 A80-18751
Measurement techniques for high-power semiconductor materials and devices: --- application to energy technologies
[PB-298574/5] 25 p0121 N80-12300
Photoelectrochemical conversion of optical energy to electricity and fuels
[AD-A072861] 25 p0123 N80-12556

SEMICONDUCTOR JUNCTIONS
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786
Temperature dependence of open-circuit photovoltage of a back-surface field semiconductor junction
25 p0087 A80-20727

SEMICONDUCTORS (MATERIALS)
Theoretical consideration of curve fill factor in solar cells
25 p0026 A80-12768
Measurement techniques for high-power semiconductor materials and devices: --- application to energy technologies
[PB-298574/5] 25 p0121 N80-12300
Materials for solar thermal conversion
[COO-4557-1] 25 p0143 N80-13670

SENEGAL
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591

SERVICES
Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957

SEWAGE TREATMENT
Simulation of solar-assisted urban sewage digestion
[ASME PAPER 79-WA/SOL-36] 25 p0065 A80-18556
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648

SHADOWS
Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant
25 p0051 A80-17246
A method of estimating monthly average solar radiation on shaded receivers
25 p0060 A80-18123

SHALE OIL
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795
Geology of the Athabasca oil sands
25 p0050 A80-17236
The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels
25 p0073 A80-18832
Prospects for the near-term commercialization of shale oil in the United States
25 p0078 A80-19474

The challenge of efficiently retorting very nonuniform beds of oil shale rubble
25 p0085 A80-20453

Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454

Mineral changes during oil shale retorting
25 p0085 A80-20455

Alternative jet aircraft fuels
25 p0091 N80-10209

Overview of in situ oil shale technology and recent advances in true in situ retort modeling
[SAND-78-2367C] 25 p0122 N80-12543

Shale oil: US and world resources and prospects for near-term commercialization in the United States
[ORAU/IEA-79-8(R)] 25 p0122 N80-12544

Environmental analysis of synthetic liquid fuels --- shale oil, coal liquefaction, and biomass production of ethanol
[DOE/EV-0044] 25 p0134 N80-13279

Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723

Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259

Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465

Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470

SHALES

Devonian paleocurrents of the Applachian basin --- gas production
[METC/CR-79/22] 25 p0149 N80-13735

Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423

SHELL STABILITY

Stability of a system of coaxial superconducting shells
25 p0018 A80-12027

SHOCK HEATING

Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

SHOCK WAVE INTERACTION

Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

SHORT TAKEOFF AIRCRAFT

Fuel minimal take-off path of jet lift VTOL aircraft, log no. C3558
25 p0105 N80-11066

SHROUDED PROPELLERS

Experimental demonstration of the diffuser-augmented wind turbine concept
25 p0007 A80-11643

Electricity generation from jet-stream winds
25 p0007 A80-11644

SIGNAL DETECTORS

Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423

SILICON

Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980

Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561

Low cost solar cells based on amorphous silicon electrodeposited from organic solvents
[SAN-0113-T3] 25 p0145 N80-13678

Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492

Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204

Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577

SILICON CARBIDES

Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588

SILICON DIOXIDE

On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567

SILICON FILMS

Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion
25 p0087 A80-20722

SILICON JUNCTIONS

The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368

Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125

Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762

Some experimental studies on the technical developments of low cost silicon solar cells
25 p0028 A80-12789

Efficient indium tin oxide/polycrystalline silicon solar cells
25 p0039 A80-15136

Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626

Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627

Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628

SILICON NITRIDES

Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263

SILVER HYDROGEN BATTERIES

Development of silver-hydrogen cells
25 p0010 A80-11843

Development of silver-hydrogen cells
25 p0010 A80-11844

SIMULATION

Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control
25 p0087 A80-20862

SINGLE CRYSTALS

Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

SINTERING

Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841

SITES

Applications analysis of fixed site hydrogen storage
[SAND-78-8272] 25 p0092 N80-10384

Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891

Simulation approach for base-line energy-siting analysis
[CONF-790459-22] 25 p0157 N80-14511

SIZE (DIMENSIONS)

Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022

SIZE DETERMINATION

The influence of thermophysical properties on the design and sizing of geothermal power plant components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593

Realistic sizing of residential solar heating and cooling systems
[COO-2858-14] 25 p0163 N80-14569

SKIN (STRUCTURAL MEMBER)
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566
SLICING
Assessment of present state-of-the-art sawing technology of large diameter ingots for solar sheet material
[NASA-CR-162535] 25 p0151 N80-14273
SLOPES
An average slope factor for solar insolation
[ASME PAPER 79-WA/SOL-41] 25 p0067 A80-18572
SOCIAL FACTORS
Back to the central city - Myths and realities
25 p0002 A80-10323
A policy-sensitive model of technology assessment
25 p0004 A80-11140
Ocean thermal energy conversion /OTEC/ - Social and environmental issues
25 p0049 A80-17135
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657
Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects
[CONF-780843-5] 25 p0103 N80-10693
Distribution and classification of local socio-economic impacts from energy development
[CONF-790481-1] 25 p0166 N80-14954
SODIUM REACTOR EXPERIMENT
Materials compatibility in liquid sodium
[HEDL-SA-1559] 25 p0119 N80-12147
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
SODIUM SULFUR BATTERIES
Computer modelling of electrically parallel arrays of sodium-sulphur cells
25 p0013 A80-11865
Some aspects of sodium-sulphur batteries
25 p0013 A80-11866
Current collectors for sodium-sulphur batteries
25 p0013 A80-11867
Development of a sodium/sulphur battery for rail applications
25 p0031 A80-13003
Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588
SODIUM VAPOR
The thermal design and analysis of an integrated sodium boiler/receiver for solar energy conversion
[ASME PAPER 79-WA/SOL-10] 25 p0067 A80-18569
SOLAR ARRAYS
Theory of the direct coupling between D.C. motors and photovoltaic solar arrays
25 p0005 A80-11334
Color graphic controls for the solar central receiver test facility
25 p0022 A80-12626
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749
Power loss in photovoltaic arrays due to mismatch in cell characteristics
25 p0028 A80-12815
Optimization of multi-layer front-contact grid patterns for solar cells
25 p0028 A80-12816
Evaluation of conductor mass and necessary voltage level for large satellite solar arrays
25 p0036 A80-14595
Enhanced power generation of GSS/4/PS by optical solar reflectors --- Gravitationally Stabilized Solid-State-Satellite Solar-Power Station
25 p0038 A80-14948
SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators
[ASME PAPER 79-WA/SOL-13] 25 p0068 A80-18581
The satellite power system concept and program
[SAWE PAPER 1305] 25 p0086 A80-20643
Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565
SAMICS: Input data preparation --- Solar Array Manufacturing Industry Costing Standards
[NASA-CR-162421] 25 p0110 N80-11570
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377
PEP solar array definition study
[NASA-CR-160398] 25 p0138 N80-13622
Photovoltaic systems. Program summary
[DOE/ET-0019/2] 25 p0146 N80-13691
Assessment of present state-of-the-art sawing technology of large diameter ingots for solar sheet material
[NASA-CR-162535] 25 p0151 N80-14273
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204
SOLAR CELLS
Theory of the direct coupling between D.C. motors and photovoltaic solar arrays
25 p0005 A80-11334
The optimal design of solar cell grid lines
25 p0005 A80-11335
Concentration ratio and efficiency in thermophotovoltaics
25 p0005 A80-11336
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
Solar panels exposed to cosmic rays
25 p0008 A80-11825
Improvements in the performance of a low cost thin film solar cell
25 p0018 A80-11989
Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125
Studies of photogalvanic cells
25 p0023 A80-12743
Programme and progress of DST sponsored solar photovoltaic work in India
25 p0025 A80-12760
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
Effect of concentrated sunlight on the various parameters of the p-n junction solar cell
25 p0025 A80-12764
Cadmium telluride solar cells
25 p0026 A80-12765
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766
Theoretical consideration of curve fill factor in solar cells
25 p0026 A80-12768
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771

Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells 25 p0026 A80-12772

Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting 25 p0026 A80-12773

GaAs-electrolyte photovoltaic cells 25 p0026 A80-12774

Reliability studies on thin film solar cells for satellite application 25 p0027 A80-12775

Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells 25 p0027 A80-12776

Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light 25 p0027 A80-12777

Design and development of a 100 peak watt photovoltaic concentrator system 25 p0027 A80-12778

Effect of image force on the characteristics of MOS solar cell 25 p0028 A80-12785

Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution 25 p0028 A80-12788

Some experimental studies on the technical developments of low cost silicon solar cells 25 p0028 A80-12789

Optimization of multi-layer front-contact grid patterns for solar cells 25 p0028 A80-12816

Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy 25 p0035 A80-13986

Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells 25 p0035 A80-14592

High-voltage multijunction solar cell 25 p0035 A80-14593

Solar cell spectral response characterization 25 p0037 A80-14685

Application of solar and fuel cell technology to industrial users 25 p0037 A80-14707

Efficient indium tin oxide/polycrystalline silicon solar cells 25 p0039 A80-15136

Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates 25 p0039 A80-15141

Photoconverter with bilateral sensitivity 25 p0044 A80-16625

Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region 25 p0044 A80-16626

Photoelectric parameters of photoelectric converters in relation to illumination 25 p0044 A80-16627

Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity 25 p0044 A80-16628

A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures 25 p0046 A80-16794

AlGaAs tunnel diode 25 p0046 A80-16799

The ampere-hour efficiency of photovoltaic solar generators 25 p0047 A80-16999

Photovoltaic solar cell array used for supplemental power generation 25 p0061 A80-18129

Power conversion efficiency monitoring in photoelectrochemical and other solar cells 25 p0062 A80-18214

Relating computer simulation studies with interface state measurements on MIS solar cells 25 p0062 A80-18231

Thermal energy utilization in the Mississippi County Community College Photovoltaic Project [ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575

The physics and chemistry of solar cells 25 p0073 A80-18751

Synthetic molecular organizates 25 p0073 A80-18752

Solar cells in practice 25 p0083 A80-19844

The effect of fluorescent wavelength shifting on solar cell spectral response 25 p0086 A80-20715

Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells 25 p0086 A80-20716

Measurements of minority-carrier diffusion length in heterojunction solar cells 25 p0086 A80-20717

Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells 25 p0087 A80-20723

Temperature dependence of open-circuit photovoltage of a back-surface field semiconductor junction 25 p0087 A80-20727

Analysis and evaluation of isotype heterojunction solar cells 25 p0087 A80-20734

Computer analysis of grids currently used for CdS/Cu2S solar cells 25 p0089 A80-20893

Analytical evaluation of a solar thermophotovoltaic (TPV) converter [SAND-79-0504C] 25 p0099 N80-10638

Silicon solar cell process development, fabrication and analysis, phase 1 [NASA-CR-162427] 25 p0109 N80-11561

Electron radiation damage of (AlGa) As-GaAs solar cells [NASA-CR-162425] 25 p0110 N80-11564

Satellite Power Systems (SPS) concept definition study. Volume 4: SPS point design definition [NASA-CR-150683] 25 p0119 N80-12106

Theoretical analysis of multi-cell, high efficiency broad spectral sensitivity solar cells 25 p0138 N80-13617

Novel concentrator photovoltaic converter system development [SAND-79-7040] 25 p0143 N80-13661

Low cost solar cells based on amorphous silicon electrodeposited from organic solvents [SAN-0113-T3] 25 p0145 N80-13678

Silicon concentrator solar cell manufacturing development [SAND-79-7021] 25 p0146 N80-13697

Self-reconfiguring solar cell system [NASA-CASE-LEW-12586-1] 25 p0153 N80-14472

Photovoltaic incentives options [HCP/CS-0023] 25 p0162 N80-14561

Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions [NASA-TM-81383] 25 p0167 N80-15204

Space solar cells: High efficiency and radiation damage [NASA-TM-81387] 25 p0170 N80-15554

Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSP/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity [NASA-TM-78253] 25 p0171 N80-15562

A survey of photovoltaic systems [NASA-CR-150696] 25 p0171 N80-15563

Design and performance of silicon solar cells under concentrated sunlight [SAND-79-1165C] 25 p0172 N80-15577

SOLAR COLLECTORS

A new approach to low cost large area selective surfaces for photothermal conversion 25 p0003 A80-10845

Performance of an inexpensive constant flow solar collector/storage system in ground 25 p0003 A80-10846

Using a fin with a parabolic concentrator 25 p0004 A80-10847

The effects of axial conduction on collector heat removal factor 25 p0004 A80-11333

A theoretical study of laminar free convection in 1-D solar induced flows 25 p0005 A80-11337

Derivation of method for predicting long term average energy delivery of solar collectors
25 p0005 A80-11339
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
Economy of a retrofit solar system --- water heating
25 p0017 A80-11984
Commercial building and industrial applications for solar energy
25 p0017 A80-11985
Near-term prospects for solar industrial process heat
25 p0018 A80-11988
Materials resource requirements and potential limitations in solar energy products
25 p0018 A80-11990
Computers in the design of solar energy systems
25 p0020 A80-12426
A high performance porous flat-plate solar collector
25 p0021 A80-12438
Modeling of a thermal wall panel using phase change materials
25 p0021 A80-12439
Heliostat Beam Characterization System --- computerized video radiometer technique for solar collector
25 p0022 A80-12627
Effect of boosters on the performance of flat plate collector
25 p0023 A80-12744
Solar energy flat plate collectors - Optimization of air gap
25 p0023 A80-12745
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749
A seasonally adjusted concentrating collector made of mirror strips
25 p0024 A80-12750
A parametric study of solar thermal power plant
25 p0024 A80-12753
Economics of small solar power plants --- in rural areas
25 p0024 A80-12754
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
An electronic device for intermittent tracking --- of sun in solar collectors
25 p0027 A80-12782
Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement
25 p0027 A80-12784
Calculation of monthly mean solar radiation for horizontal and inclined surfaces
25 p0028 A80-12817
Calculation of climatic solar heating performance
25 p0029 A80-12820
An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822
Truncation of nonimaging cusp concentrators --- solar collector geometry
25 p0029 A80-12824
Flat-plate solar collector materials
25 p0035 A80-14409
Solar collectors as energy converters
25 p0036 A80-14670
Influence of the working fluid on heat transfer and layout of solar tower receivers
25 p0036 A80-14671
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706
Calculation of steam generation with parabolic solar collectors
25 p0039 A80-15328
A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629
On a calculation procedure for a heat accumulator in a solar heating system
25 p0044 A80-16630
Brightness distribution over the solar disk --- in solar reflectors
25 p0050 A80-17243
A method of estimating monthly average solar radiation on shaded receivers
25 p0060 A80-18123
High temperature solar collector with optimal concentration - Non-focusing Fresnel lens with secondary concentrator
25 p0060 A80-18127
A simplified technique for comparing the effectiveness of collector absorber coatings
25 p0061 A80-18133
Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297
Performance characteristics of point-focusing distributed-receiver solar Brayton systems
[AIAA PAPER 80-0293] 25 p0063 A80-18298
Use of adjustable flat mirrors with flat-plate collectors
[AIAA PAPER 80-0294] 25 p0063 A80-18299
Optimization of a point-focusing, distributed receiver solar thermal electric system
[ASME PAPER 79-WA/SOL-11] 25 p0065 A80-18553
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554
Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction
[ASME PAPER 79-WA/SOL-18] 25 p0065 A80-18557
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558
Computer simulation results for planar reflectors and flat plate solar collectors
[ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559
A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560
Helium penetration in evacuated solar collectors - Theory and effect on their performance
[ASME PAPER 79-WA/SOL-17] 25 p0066 A80-18563
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566
Superheated steam generation in a Fresnel lens concentrating collector
[ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567
Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector
[ASME PAPER 79-WA/SOL-3] 25 p0067 A80-18570
An average slope factor for solar insolation
[ASME PAPER 79-WA/SOL-41] 25 p0067 A80-18572
Noniterative solution of heat transfer equation of fluid flow in solar collector
[ASME PAPER 79-WA/SOL-24] 25 p0068 A80-18577
An optimization formulation for solar hot water systems
[ASME PAPER 79-WA/SOL-42] 25 p0068 A80-18578
A design method for optimizing collector systems for small solar center receivers
[ASME PAPER 79-WA/SOL-14] 25 p0068 A80-18580
SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators
[ASME PAPER 79-WA/SOL-13] 25 p0068 A80-18581
Analysis of convective heat loss from the receiver of solar power plants
[ASME PAPER 79-WA/HT-36] 25 p0068 A80-18582

A comparison of test results for flat-plate water-heating solar collectors using the BSI and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585
Residential solar heat pump systems - Thermal and economic performance
[ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591
Design of the International Energy Agency 500 kWe distributed-collector solar thermal-electric powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592
Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596
Solar concentrators using vacuum-contoured surfaces for tracking
[AIAA PAPER 80-0399] 25 p0077 A80-19326
Solar enhanced oil recovery - An assessment of economic feasibility
25 p0078 A80-19472
Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740
Cavity enhancement by controlled directional scattering --- in solar collectors
25 p0083 A80-19955
New concept for a system suitable for solar simulation
25 p0083 A80-19976
Coatings for enhanced photothermal energy collection. II - Non-selective and energy control films
25 p0086 A80-20714
Cobalt oxide as a spectrally selective material for use in solar collectors
25 p0086 A80-20719
An applications analysis for the solar industrial process heat market
25 p0088 A80-20888
Optimal control of distributed parameter systems for solar thermal applications
25 p0095 N80-10593
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation
[SAND-78-8180] 25 p0097 N80-10612
MDAC/Rocketdyne solar receiver: Design review
[SAND-78-8188] 25 p0097 N80-10616
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418] 25 p0100 N80-10640
Concentrating solar collector test results Collector Module Test Facility (CMTF)
[SAND-78-0977] 25 p0111 N80-11580
Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11581
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
Spectrally selective surfaces with coatings comprised of ultrafine metal particles --- solar collectors
[AED-CONF-78-212-004] 25 p0115 N80-11620
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626
Fluid Dynamics of Porous Media in Energy Applications, volume 1 --- heat storage and transfer in solar energy conversion systems
[VKI-LEC-SER-1979-4-VOL-1] 25 p0121 N80-12338
Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353
Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566
Double-exposure collector system
[TID-28964] 25 p0127 N80-12593
Study of corrosion and its control in aluminum solar collectors
[COO-2934-7] 25 p0129 N80-12609
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644
Performance testing of the General Electric Engineering Prototype Collector
[SAND-79-0514] 25 p0141 N80-13645
Evaluation of combined photovoltaic/thermal collectors
[COO-4577-8] 25 p0143 N80-13665
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671
Solar central receiver prototype heliostat CDRL item B.D., volume 1
[SAN-1605/7-VOL-1] 25 p0146 N80-13700
Weight minimization of sandwich type solar collector panels
[SAND-78-2305C] 25 p0147 N80-13710
Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473
Visualization of natural convection in flat plate solar collectors
25 p0153 N80-14476
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497
Results of thermal performance evaluation of the Owens-Illinois sunpack liquid solar collector at indoor conditions
[NASA-CR-161189] 25 p0156 N80-14500
Non-tracking inflated cylindrical solar concentrator
[UCRL-82721] 25 p0159 N80-14528
Thermal degradation of a black chrome solar selective absorber coating: Short term
[LBL-8857] 25 p0161 N80-14549
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Realistic sizing of residential solar heating and cooling systems
[COO-2858-14] 25 p0163 N80-14569
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569
Evaluation of the evacuated solar annular receivers used at the Midtemperature Solar Systems Test Facility (MSSTF)
[SAND-78-0983] 25 p0173 N80-15585
Analysis of field test results for single-axis-tracking solar collector foundations
[SAND-79-7023] 25 p0173 N80-15586
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616

SOLAR COOLING
Commercial building and industrial applications for solar energy
25 p0017 A80-11985
Solar cooling performance predictions via stochastic weather algorithms
25 p0020 A80-12430
Validation methodology for solar heating and cooling systems
25 p0020 A80-12431
Design of 1-ton solar operated LiBr-water air-conditioning system with special reference to solar part
25 p0025 A80-12759
Experimental investigations of an intermittent ammonia-water solar refrigerator
25 p0028 A80-12786
The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825
Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244
Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307

A new solar thermal electricity/cooling generation system
[AIAA PAPER 80-0296] 25 p0063 A80-18300
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555
A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
Passive solar energy programs and plans
[GPO-36-211] 25 p0095 N80-10599
Ocmulgee national monument visitor center solar heating and cooling system design review data
[NASA-CR-150706] 25 p0096 N80-10601
Solar heating and cooling systems design and development
[NASA-CR-150618] 25 p0096 N80-10602
Solar heating and cooling systems design and development
[NASA-CR-150873] 25 p0109 N80-11560
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616
October 1978 environmental data for sites in the National Solar Data Network
[SOLAR/0010-78-10] 25 p0126 N80-12585
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586
Solar Heating And Cooling Of Buildings (SHACOB) Commercialization report. Part B: Analysis of market development, volume 2
[DOE/TIC-10071] 25 p0128 N80-12603
Development and testing of the Junkeeper Control Corporation integrated programmable electronic controller and hydronics package
[NASA-TM-78244] 25 p0155 N80-14495
Development and testing of the Rho Sigma Incorporated microprocessor control subsystem
[NASA-TM-78246] 25 p0156 N80-14496
Development and testing of the Solar Control Corporation modular controller and Solarstat subsystem
[NASA-TM-78243] 25 p0156 N80-14498
Engineering concerns in solar system design and operation
[SOLAR/0811-79/01] 25 p0160 N80-14539
Evlaution of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
[BNL-26218] 25 p0162 N80-14552
Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook
[DOE/EV-0028] 25 p0163 N80-14565
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Realistic sizing of residential solar heating and cooling systems
[COO-2858-14] 25 p0163 N80-14569
National program plan for passive and hybrid solar heating and cooling
[DOE/CS-0089] 25 p0174 N80-15598
Conference on performance monitoring techniques for evaluation of solar heating and cooling systems
[CONF-780432] 25 p0174 N80-15599
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616

SOLAR CORPUSCULAR RADIATION

Possibility of conversion of solar corpuscular radiation energy into electrical energy
25 p0085 A80-20495

SOLAR ELECTRIC PROPULSION

Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253] 25 p0171 N80-15562

SOLAR ENERGY

Some solar energy programmes in the United Nations system
25 p0006 A80-11342
A cheap method of improving the performance of roof type solar stills
25 p0006 A80-11343
Economic performance - Evaluations for solar energy
25 p0014 A80-11956
Calculation of monthly mean solar radiation for horizontal and inclined surfaces
25 p0028 A80-12817
The Coriolis program --- electric power from moored counterrotating turbine arrays in warm water current
25 p0044 A80-16653
Biomass energy enhancement: A report to the President's Council on Environmental Quality --- solar heat gasification
[PB-296624/0] 25 p0094 N80-10396
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625
State of the art of sensible heat storage for solar heat pump systems
[BNL-25909] 25 p0101 N80-10651
Development of a high temperature solar powered water chiller. Volume 3: Phase 1
[SAN-1590-1/3-VOL-3] 25 p0101 N80-10654
Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656
Performance monitoring of an off-peak heating and cooling system utilizing thermal storage and solar augmented heat pump
[EPRI-ER-845] 25 p0102 N80-10662
Solar pond concepts: Old and new
[SERI/TP-35-208] 25 p0102 N80-10663
Solar commercialization
[GPO-43-586] 25 p0109 N80-11556
Solar heating and cooling systems design and development
[NASA-CR-150873] 25 p0109 N80-11560
Solar access law. Protecting access to sunlight for solar energy systems
[PB-296532/5] 25 p0117 N80-11633
Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353
Evaluation of solar Rankine-cycle engine systems
[SAND-78-0986] 25 p0125 N80-12571
Solar mechanical energy storage project
[SAND-78-1982C] 25 p0127 N80-12590
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591
Project CESA-1, a 1 MW solar power plant in Almeria
[AED-CONF-78-212-011] 25 p0130 N80-12614
Solar energy perspectives for public power
[SERI/TP-35-300] 25 p0140 N80-13635
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653
Trans-seasonal storage of solar energy: Innovative research program subtask --- underground storage
[COO-4546-3] 25 p0144 N80-13672
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502
Implementation of state solar incentives: Land-use planning to ensure solar access
[SERI/TR-51-163] 25 p0158 N80-14519
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for solar water heating
[TID-28856-DRAFT] 25 p0161 N80-14545

A review of the economics of selected passive and hybrid systems --- design concepts for solar energy utilization
[SERI/TP-61-144] 25 p0161 N80-14547
Commercializing solar architecture
[SERI/TP-62-113] 25 p0161 N80-14548
The 10 MW solar thermal pilot plant dynamic simulation. Volume 1: Computer program description
[ATR-78(7747)-1-VOL-1] 25 p0162 N80-14550
The 10 MW solar thermal pilot plant dynamic simulation. Volume 2: Computer program source listing
[ATR-78(7747)-2-VOL-2] 25 p0162 N80-14551
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574
Photovoltaic power system reliability considerations
[NASA-TM-79291] 25 p0170 N80-15422
Evaluation of the evacuated solar annular receivers used at the Midtemperature Solar Systems Test Facility (MSSTF)
[SAND-78-0983] 25 p0173 N80-15585
Dynamic storage in solar total energy programs
[SAND-78-0958C] 25 p0174 N80-15600
Solar mechanical energy storage program overview and systems analysis results
[SAND-79-1642C] 25 p0178 N80-15637
Solar enhanced oil recovery: An assessment of economic feasibility
[SAND-79-0787] 25 p0178 N80-15641

SOLAR ENERGY ABSORBERS
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845
A theoretical study of laminar free convection in 1-D solar induced flows
25 p0005 A80-11337
Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125
On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427
Modeling of a thermal wall panel using phase change materials
25 p0021 A80-12439
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
Performance characteristics of solar regenerators
25 p0028 A80-12787
The scope of effective medium theory for fine metal particle solar absorbers
25 p0029 A80-12835
Efficiency of quantum-utilizing solar energy converters in the absence of intraband thermalization
25 p0030 A80-12838
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980
Flat-plate solar collector materials
25 p0035 A80-14409
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system --- for Stirling engine and solar thermal rocket
25 p0036 A80-14597
Investigation of absorptive and radiative characteristics of an ideal selective surface --- for solar energy absorbers
25 p0044 A80-16632
Selective black nickel coatings on zinc surfaces by chemical conversion --- for high solar energy absorption
25 p0060 A80-18126
A simplified technique for comparing the effectiveness of collector absorber coatings
25 p0061 A80-18133
Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages
[ASME PAPER 79-WA/SOL-27] 25 p0067 A80-18568
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141
Coatings for enhanced photothermal energy collection. II - Non-selective and energy control films
25 p0086 A80-20714
Cobalt oxide as a spectrally selective material for use in solar collectors
25 p0086 A80-20719
The spectral selectivity of conducting micromeshes --- as solar energy absorbers
25 p0087 A80-20720
Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion
25 p0087 A80-20722
Materials for solar thermal conversion
[COO-4557-1] 25 p0143 N80-13670
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540

SOLAR ENERGY CONVERSION
Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype --- French thesis
25 p0001 A80-10109
A review of in situ composites for nonstructural applications
25 p0002 A80-10285
Second-law analysis of solar-thermal processes
25 p0003 A80-10843
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845
The photo-electrochemical production of C-C bonds from carbon dioxide
25 p0004 A80-10848
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338
Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370
Solar panels exposed to cosmic rays
25 p0008 A80-11825
The compatibility of wind and solar technology with conventional energy systems
25 p0008 A80-11828
Photochemical conversion and storage of solar energy
25 p0009 A80-11829
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853
Improvements in the performance of a low cost thin film solar cell
25 p0018 A80-11989
Materials resource requirements and potential limitations in solar energy products
25 p0018 A80-11990
Materials research - Probable impacts on solar energy
25 p0018 A80-11991
Insolation modeling overview
25 p0020 A80-12428
The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
Solar energy for rural development; Proceedings of the National Solar Energy Convention, Bhavnagar, India, December 20-22, 1978
25 p0023 A80-12739
Solar energy availability over India for maximum utilisation
25 p0023 A80-12740
Studies of photogalvanic cells
25 p0023 A80-12743
Selection of working fluids for low temperature solar thermal power cycles
25 p0024 A80-12751
Prime mover for solar power plant
25 p0024 A80-12752
A parametric study of solar thermal power plant
25 p0024 A80-12753
Storage of solar heat by solid-liquid phase change
25 p0024 A80-12755

Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756

Electrochemical storage of photovoltaic solar energy
25 p0025 A80-12757

Design of 1-ton solar operated LiBr-water air-conditioning system with special reference to solar part
25 p0025 A80-12759

Programme and progress of DST sponsored solar photovoltaic work in India
25 p0025 A80-12760

Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761

Cadmium telluride solar cells
25 p0026 A80-12765

Experimental study of MOS solar cells under concentration
25 p0026 A80-12769

Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773

Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776

Design and development of a 100 peak watt photovoltaic concentrator system
25 p0027 A80-12778

Industrial applications of solar energy in India
25 p0027 A80-12780

Experimental investigations of an intermittent ammonia-water solar refrigerator
25 p0028 A80-12786

Performance characteristics of solar regenerators
25 p0028 A80-12787

The turnover times and pool sizes of photosynthetic hydrogen production by green algae
25 p0029 A80-12819

Efficiency of quantum-utilizing solar energy converters in the absence of intraband thermalization
25 p0030 A80-12838

Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells
25 p0035 A80-14592

High-voltage multijunction solar cell
25 p0035 A80-14593

Studies in heat transfer: A Festschrift for E. R. G. Eckert --- Book
25 p0036 A80-14655

Solar collectors as energy converters
25 p0036 A80-14670

Influence of the working fluid on heat transfer and layout of solar tower receivers
25 p0036 A80-14671

Calculation of steam generation with parabolic solar collectors
25 p0039 A80-15328

Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen --- electron transfer reactions in solar energy conversion processes
25 p0040 A80-15358

A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750

Global aspects of sunlight as a major energy source
25 p0048 A80-17131

Petroleum plantations and synthetic chloroplasts
25 p0049 A80-17137

Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244

Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant
25 p0051 A80-17246

Structure of an averaged statistical pencil of rays reflected from a heliostat
25 p0051 A80-17247

Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343

Solar-hydrogen energy systems --- Book
25 p0051 A80-17573

Introduction - A review of the scope --- solar-hydrogen energy conversion
25 p0052 A80-17574

Direct thermal decomposition of water
25 p0052 A80-17577

Photoelectrochemical hydrogen production
25 p0052 A80-17580

Solar energy storage by metal hydride
25 p0053 A80-17582

Direct solar energy conversion at sea
25 p0053 A80-17583

Analysis of systems for the generation of electricity from solar radiation
25 p0060 A80-18124

The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125

An electrochemical heat engine for direct solar energy conversion
25 p0061 A80-18131

Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297

Performance characteristics of point-focusing distributed-receiver solar Brayton systems
[AIAA PAPER 80-0293] 25 p0063 A80-18298

A new solar thermal electricity/cooling generation system
[AIAA PAPER 80-0296] 25 p0063 A80-18300

Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301

Optimization of a point-focusing, distributed receiver solar thermal electric system
[ASME PAPER 79-WA/SOL-11] 25 p0065 A80-18553

Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554

Simulation of solar-assisted urban sewage digestion
[ASME PAPER 79-WA/SOL-36] 25 p0065 A80-18556

The thermal design and analysis of an integrated sodium boiler/receiver for solar energy conversion
[ASME PAPER 79-WA/SOL-10] 25 p0067 A80-18569

Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575

SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants
[ASME PAPER 79-WA/SOL-12] 25 p0068 A80-18579

A design method for optimizing collector systems for small solar center receivers
[ASME PAPER 79-WA/SOL-14] 25 p0068 A80-18580

A solar thermal electric power plant for small communities
[ASME PAPER 79-WA/SOL-7] 25 p0069 A80-18584

Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586

Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589

International Conference on the Photochemical Conversion and Storage of Solar Energy, 2nd, Cambridge University, Cambridge, England, August 10-12, 1978, Lectures
25 p0072 A80-18746

Principles of photoelectrochemical solar energy conversion
25 p0074 A80-18990

Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice
25 p0078 A80-19473

Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740

Open cycle air turbine solar thermal power system
25 p0083 A80-19989

OTEC - Solar energy from the sea
25 p0085 A80-20424

Possibility of conversion of solar corpuscular radiation energy into electrical energy
25 p0085 A80-20495

Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606

Dispersed power systems and total energy
[SAND-78-2006C] 25 p0096 N80-10608
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0097 N80-10609
Solar assisted heat pump overview and summary of in-house research
[BNL-24911] 25 p0058 N80-10624
Survey of solar thermal energy storage subsystems for thermal/electric applications
[ORNL/TM-5758] 25 p0098 N80-10627
Selected results from the technology assessment of solar energy program
[LA-UR-79-950] 25 p0099 N80-10637
Analytical evaluation of a solar thermophotovoltaic (TPV) converter
[SAND-79-0504C] 25 p0099 N80-10638
Flywheel energy storage and conversion system for solar photovoltaic applications
[COO-4094-31] 25 p0100 N80-10639
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418] 25 p0100 N80-10640
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650
Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653
Solar commercialization
[GPC-43-586] 25 p0109 N80-11556
Concentrating solar collector test results Collector Module Test Facility (CMTF)
[SAND-78-0977] 25 p0111 N80-11560
Proceedings: Solar Thermal Power User Review Panel Meeting
[SERI/TP-69-221] 25 p0113 N80-11598
Status of information for consumers of small wind energy systems
[SERI/TP-51-158] 25 p0113 N80-11602
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603
Midtemperature Solar Systems Test Facility (MSSTF) project test results: Phase 4A MSSTF system operation
[SAND-78-1088] 25 p0114 N80-11613
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
Preliminary materials assessment in solar demonstration systems
[ANL/EES-CP-30] 25 p0115 N80-11619
Maximum power trackers for photovoltaic arrays
[COO-4094-17] 25 p0116 N80-11627
Solar energy with latent heat storage: Fundamentals and applications
[ASSA-10/1978] 25 p0116 N80-11632
Fluid Dynamics of Porous Media in Energy Applications, volume 1 --- heat storage and transfer in solar energy conversion systems
[VKI-LEC-SER-1979-4-VOL-1] 25 p0121 N80-12338
A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552
Effect of operating temperatures on the cost of energy from solar thermal electric power plants
[SAND-79-0801] 25 p0124 N80-12563
Systems Analysis and testing (SAT) program
[SERI/PR-35-313] 25 p0124 N80-12565
The great adventure: A report on the 10 regional public hearings on solar energy for the domestic policy review
[HCP/U6354-01] 25 p0124 N80-12567
Operational experience with drain-down solar systems
[IS-M-166] 25 p0125 N80-12576
Direct labor requirements for select solar energy technologies: A review and synthesis
[SERI/RR-53-045] 25 p0126 N80-12578
October 1978 environmental data for sites in the National Solar Data Network
[SOLAR/0010-78-10] 25 p0126 N80-12585
Residential on site solar heating systems. A project evaluation using the capital asset pricing model
[LBL-8298] 25 p0126 N80-12588
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12569
Mead, Nebraska, 25-kW photovoltaic power system
[COO-4094-10] 25 p0127 N80-12592
Architectural concerns in solar system design and installation
[SOLAR/0801-79-01] 25 p0129 N80-12607
Solar-powered steam generator heliostat
[BNL-50974] 25 p0129 N80-12610
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
[IS-M-202] 25 p0129 N80-12611
Photothermal conversion of solar energy into electricity
[DOE-TR-159] 25 p0130 N80-12612
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647
Solar-climatic statistical study. Summary report, volume 1
[HCP/T4016-1] 25 p0132 N80-12707
The water splitting light reaction of chlorophyll a dihydrate. Visible light solar energy conversion after the primary reaction in plant photosynthesis
25 p0133 N80-13188
Biological transformation of light energy into methane using an anaerobic filter
25 p0133 N80-13267
Solar thermal test facility heliostat development
[SAND-78-1177] 25 p0140 N80-13642
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644
Performance testing of the General Electric Engineering Prototype Collector
[SAND-79-0514] 25 p0141 N80-13645
Review of the environment effects and benefits of selected solar energy technologies
[SERI/TP-53-114R] 25 p0141 N80-13649
Design, construction, and operation of the solar assisted heat pump ground coupled storage experiments at Brookhaven National Laboratory
[BNL-25908] 25 p0142 N80-13654
Solar thermal power systems
[DOE/ET-0078/11] 25 p0143 N80-13662
Technology development needs for high temperature process heat
[SERI/TR-35-047] 25 p0143 N80-13669
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697
Interim structural design standard for solar energy applications, phases 1 and 2 --- boiler and pressure vessel code
[SAND-79-8183] 25 p0146 N80-13698
Review of solar energy
[SERI/TR-54-066] 25 p0146 N80-13699
Solar heating and cooling research projects: A summary
[EPRI-ER-1095-SR] 25 p0147 N80-13703
Thin film problems and research in energy systems
[CONF-761168-SUMM] 25 p0147 N80-13705
Industrial applications of advanced energy systems
[CONF-790602-54] 25 p0147 N80-13706
Solar-climactic statistical study --- windpower utilization and solar energy conversion
[HCP/T4016-01/2] 25 p0149 N80-13747
Rough cost estimates of solar thermal/coal or biomass-derived fuels
[SERI/TP-35-279] 25 p0151 N80-14269
Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473
A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484
Application of field-modulated generator systems to dispersed solar thermal electric generation
[NASA-CR-162536] 25 p0155 N80-14486
Results of thermal performance evaluation of the Owens-Illinois sunpack liquid solar collector at indoor conditions
[NASA-CR-161169] 25 p0156 N80-14500

Analysis of remote site energy storage and
generation systems --- systems analysis of solar
energy conversion and windpower utilization
energy storage systems
[AD-A074869] 25 p0156 N80-14504
Application of diffusion research to solar energy
policy issues
[SERI/TR-51-194] 25 p0158 N80-14518
Implementation of state solar incentives: A
preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520
Non-tracking inflated cylindrical solar concentrator
[UCRL-82721] 25 p0159 N80-14528
Commercial solar augmented heat pump system
[EPRI-ER-1004] 25 p0160 N80-14537
Systems Studies for Central Solar Thermal Electric
[CONF-780383] 25 p0162 N80-14558
Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560
System tests and applications photovoltaic program
[HCP/T4024-01/15] 25 p0163 N80-14566
Insolation models, data and algorithms
[SERI/TR-36-110] 25 p0165 N80-14617
Decentralized solar photovoltaic energy systems
[LA-7866-TASE] 25 p0171 N80-15565
SERAPS implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
Department of Energy large solar central power
systems semiannual review
[SAND-78-8511] 25 p0175 N80-15601
Department of Energy large solar central power
systems semiannual review
[SAND-79-8508] 25 p0175 N80-15602
Solar/wind handbook for Hawaii: Technical
applications for Hawaii, the Pacific Basin and
sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628
Role of the government in the development of solar
energy
[SERI/TP-52-138] 25 p0178 N80-15639

SOLAR FLUX
Solar access law. Protecting access to sunlight
for solar energy systems
[PB-296532/5] 25 p0117 N80-11633
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982

SOLAR FURNACES
Development of optical waveguides for a
power-related application --- of solar radiation
transmission
25 p0036 A80-14596
Calculation of the optical characteristics of
high-power two-mirror solar furnaces
25 p0044 A80-16629

SOLAR GENERATORS
Concentration ratio and efficiency in
thermophotovoltaics
25 p0005 A80-11336
A theoretical study of laminar free convection in
1-D solar induced flows
25 p0005 A80-11337
Design of a small thermochemical receiver for
solar thermal power
25 p0005 A80-11338
Solar electric generating system resource
requirements
25 p0005 A80-11341
Low-cost central receiver solar power plant using
molten salt as a heat transfer and storage medium
25 p0017 A80-11986
Color graphic controls for the solar central
receiver test facility
25 p0022 A80-12626
Selection of working fluids for low temperature
solar thermal power cycles
25 p0024 A80-12751
Prime mover for solar power plant
25 p0024 A80-12752
Economics of small solar power plants --- in rural
areas
25 p0024 A80-12754
SSPS project - two solar power plants in Spain
25 p0032 A80-13180
Autonomous power supplies for telecommunications
25 p0033 A80-13211
Calculation of steam generation with parabolic
solar collectors
25 p0039 A80-15328
The ampere-hour efficiency of photovoltaic solar
generators
25 p0047 A80-16999
Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297
A new solar thermal electricity/cooling generation
system
[AIAA PAPER 80-0296] 25 p0063 A80-18300
A home-size solar-powered engine for cooling
systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562
Small solar thermal electric power plants with
early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586
The effects of regional insolation differences
upon advanced solar thermal electric power plant
performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
Design of the International Energy Agency 500 kWe
distributed-collector solar thermal-electric
powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592
Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596
Feasible thermophysical conditions for gas
receiver tubes in solar power stations
[ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627
A small hybrid solar closed-cycle gas turbine
cogeneration plant concept based on today's
technology
[ASME PAPER 79-WA/GT-3] 25 p0071 A80-18637
Solar-thermal jet pumping for irrigation
[AIAA PAPER 80-0402] 25 p0077 A80-19328
Open cycle air turbine solar thermal power system
25 p0083 A80-19989
The first small power system experiment, Phase 1:
Engineering experiment no. 1 --- solar thermal
electric power plants
[NASA-CR-162417] 25 p0095 N80-10596
The 10MW(e) solar thermal central receiver pilot
plant: Heliostat foundation and interface
structure investigation
[SAND-78-8180] 25 p0097 N80-10612
MDAC/Rocketdyne solar receiver: Design review
[SAND-78-8188] 25 p0097 N80-10616
Technical and economic assessment of solar powered
water pumping for remote areas
[SAND-79-8187] 25 p0129 N80-12608
Project CESA-1, a 1 MW solar power plant in Almeria
[AED-CGNF-78-212-011] 25 p0130 N80-12614
Test plan for the Mead 25-kW Photovoltaic Flexible
Test Facility, 1979
[COO-4094-53] 25 p0146 N80-13692
Sandia Laboratories operational experience with
small heat engines in solar thermal power systems
[SAND-78-2163C] 25 p0146 N80-13693
Materials testing for central receiver
solar-thermal power systems
[TID-29443] 25 p0146 N80-13695
Solar central receiver prototype heliostat CDRL
item B.D., volume 1
[SAN-1605/7-VOL-1] 25 p0146 N80-13700
Application of field-modulated generator systems
to dispersed solar thermal electric generation
[NASA-CR-162536] 25 p0155 N80-14488
solar thermal power systems advanced solar thermal
technology project, advanced subsystems
development
[NASA-CR-162546] 25 p0155 N80-14491
Department of Energy large solar central power
systems semiannual review
[SAND-78-8511] 25 p0175 N80-15601

SOLAR HEATING
Second-law analysis of solar-thermal processes
25 p0003 A80-10843
Performance of an inexpensive constant flow solar
collector/storage system in ground
25 p0003 A80-10846
Solar availability for winter space heating - An
analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370
Development of renewable energy sources in the
United Kingdom
25 p0017 A80-11980
Economy of a retrofit solar system --- water heating
25 p0017 A80-11984
Commercial building and industrial applications
for solar energy
25 p0017 A80-11985

Near-term prospects for solar industrial process heat
25 p0018 A80-11988

Computers in the design of solar energy systems
25 p0020 A80-12426

On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427

Validation methodology for solar heating and cooling systems
25 p0020 A80-12431

Instrumentation principles for performance measurement of solar heating systems
25 p0020 A80-12432

A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis
25 p0021 A80-12433

Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434

Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435

The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436

Determination of the optimal solar investment decision criterion
25 p0021 A80-12437

A high performance porous flat-plate solar collector
25 p0021 A80-12438

Design criteria in PCM wall thermal storage --- Phase Change Materials
25 p0021 A80-12440

Monitoring of the solar-heated modular homes at Los Alamos
25 p0022 A80-12607

Heat flow meters for solar system performance monitoring
25 p0022 A80-12608

Energy meter for solar air systems
25 p0022 A80-12609

A parametric study of solar thermal power plant
25 p0024 A80-12753

Testing of three installed solar domestic water heaters
25 p0025 A80-12758

Calculation of climatic solar heating performance
25 p0029 A80-12820

Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821

An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822

Flat-plate solar collector materials
25 p0035 A80-14409

Studies in heat transfer: A Festschrift for E. R. G. Eckert --- Book
25 p0036 A80-14655

Solar collectors as energy converters
25 p0036 A80-14670

Absorption heat pumps for solar space heating systems
25 p0036 A80-14672

A study of the thermal effect that radiant energy produces on a mass of water --- Spanish thesis
25 p0040 A80-15653

A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750

On a calculation procedure for a heat accumulator in a solar heating system
25 p0044 A80-16630

Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631

Investigation of absorptive and radiative characteristics of an ideal selective surface --- for solar energy absorbers
25 p0044 A80-16632

Global aspects of sunlight as a major energy source
25 p0048 A80-17131

Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244

Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307

Sensitivity of direct gain space heating performance to fundamental parameter variations
25 p0060 A80-18128

Solar heating system performance estimation using sinusoidal inputs
25 p0061 A80-18130

Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301

Computer simulation results for planar reflectors and flat plate solar collectors
[ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559

A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560

Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566

Superheated steam generation in a Fresnel lens concentrating collector
[ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567

Optimization and comparison strategies for solar energy systems
[ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573

The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574

Evaluation of a solar heating system installed in the LSU Field House
[ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576

An optimization formulation for solar hot water systems
[ASME PAPER 79-WA/SOL-42] 25 p0068 A80-18578

Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

A comparison of test results for flat-plate water-heating solar collectors using the BSE and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585

Performance of heat pumps at elevated evaporating temperatures - With application to solar input
[ASME PAPER 79-WA/SOL-19] 25 p0069 A80-18587

Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590

Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600

An applications analysis for the solar industrial process heat market
25 p0088 A80-20888

Optimization of a solar heating system with integral compensation
25 p0089 A80-20894

Passive solar energy programs and plans
[GPO-36-211] 25 p0095 N80-10599

Ocmulgee national monument visitor center solar heating and cooling system design review data
[NASA-CR-150706] 25 p0096 N80-10601

Solar heating and cooling systems design and development
[NASA-CR-150618] 25 p0096 N80-10602

MSFC solar heating and cooling high speed performance (Hisper) code validation
[NASA-CR-161323] 25 p0096 N80-10604

Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645

Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646

Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1] 25 p0101 N80-10652

Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653

Experimental and numerical studies of liquid storage tank thermal stratification for a solar energy system
[COO-4479-2] 25 p0101 N80-10655

Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658
Solar energy system performance evaluation: A-Frame Industries, single family dwelling, Kaneohe, Hawaii
[SOLAR/1010-78/14] 25 p0101 N80-10659
Optimal insulation of pipes and tanks for solar heating systems
[ALO-5319-2] 25 p0102 N80-10660
Solar heating and cooling systems design and development
[NASA-CR-150873] 25 p0109 N80-11560
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616
Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings
[BMFT-FB-T-78-48] 25 p0116 N80-11630
Solar energy with latent heat storage: Fundamentals and applications
[ASSA-10/1978] 25 p0116 N80-11632
October 1978 environmental data for sites in the National Solar Data Network
[SOLAR/0010-78-10] 25 p0126 N80-12585
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586
Residential on site solar heating systems. A project evaluation using the capital asset pricing model
[LBL-8298] 25 p0126 N80-12588
Solar Heating And Cooling Of Buildings (SHACOB) Commercialization report. Part B: Analysis of market development, volume 2
[DOE/TIC-10071] 25 p0128 N80-12603
Solar energy perspectives for public power
[SERI/TP-35-300] 25 p0140 N80-13635
Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694
The solar in Federal buildings demonstration program
[PB-298535/6] 25 p0151 N80-14279
Development and testing of the Junkeeper Control Corporation integrated programmable electronic controller and hydronics package
[NASA-TM-78244] 25 p0155 N80-14495
Development and testing of the Rho Sigma Incorporated microprocessor control subsystem
[NASA-TM-78246] 25 p0156 N80-14496
Development and testing of the Solar Control Corporation modular controller and Solarstat subsystem
[NASA-TM-78243] 25 p0156 N80-14498
Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499
Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications
[NASA-TM-78251] 25 p0156 N80-14501
Engineering concerns in solar system design and operation
[SOLAR/0811-79/01] 25 p0160 N80-14539
Thermal energy storage for solar applications: An overview
[SERI/TP-34-089] 25 p0161 N80-14546
Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook
[DOE/EV-0028] 25 p0163 N80-14565
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Realistic sizing of residential solar heating and cooling systems
[COO-2858-14] 25 p0163 N80-14569
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574
Commercializing solar heating: A national strategy needed
[PB-297882/3] 25 p0164 N80-14575
Candidate thermal energy storage technologies for solar industrial process heat applications
[NASA-TM-81380] 25 p0171 N80-15560
National program plan for passive and hybrid solar heating and cooling
[DOE/CS-0089] 25 p0174 N80-15598
Conference on performance monitoring techniques for evaluation of solar heating and cooling systems
[CONF-780432] 25 p0174 N80-15599
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616

SOLAR HOUSES
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
Design criteria in PCM wall thermal storage --- Phase Change Materials
25 p0021 A80-12440
Monitoring of the solar-heated modular homes at Los Alamos
25 p0022 A80-12607
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821
Performance and analysis of a 'series' heat pump-assisted solar heated residence in Madison, Wisconsin
25 p0061 A80-18132
Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555
A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566
The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574
Evaluation of a solar heating system installed in the LSU Field House
[ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576
Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590
A solar assisted and wind powered heat pump for residential dwellings
[ASME PAPER 79-WA/HT-33] 25 p0070 A80-18595
Optimization of a solar heating system with integral compensation
25 p0089 A80-20894
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559
Performance of Los Alamos solar Mobile/Modular Home Unit no. 1
[LA-UR-78-2587] 25 p0126 N80-12577
Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668
Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications
[NASA-TM-78251] 25 p0156 N80-14501
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616

SOLAR PONDS (HEAT STORAGE)
Under ground thermal storage in the operation of solar ponds
25 p0077 A80-19471
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541

SOLAR POSITION
An electronic device for intermittent tracking --- of sun in solar collectors
25 p0027 A80-12782

SOLAR POWER SATELLITES
Earth benefits of solar power satellites
25 p0038 A80-14791
Impacts of satellite power system technology
25 p0048 A80-17132
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600
Solar power satellite system definition study, phase 2.
[NASA-CR-160377] 25 p0105 N80-11121
Solar power satellite system definition study, phase 2. Part 1: Midterm briefing
[NASA-CR-160378] 25 p0105 N80-11122
Satellite Power System (SPS): An overview of prospective organizational structures in the solar satellite field
[TID-29094] 25 p0154 N80-14478
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

SOLAR PROPULSION
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system --- for Stirling engine and solar thermal rocket
25 p0036 A80-14597

SOLAR RADIATION
Insolation modeling overview
25 p0020 A80-12428
Validation of computer models for predicting radiation levels on tilted surfaces
25 p0020 A80-12429
Solar energy availability over India for maximum utilisation
25 p0023 A80-12740
Effect of concentrated sunlight on the various parameters of the p-n junction solar cell
25 p0025 A80-12764
Calculation of monthly mean solar radiation for horizontal and inclined surfaces
25 p0028 A80-12817
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418] 25 p0100 N80-10640
Solar-climatic statistical study. Summary report, volume 1
[HCP/T4016-1] 25 p0132 N80-12707

SOLAR REFLECTORS
Structure of an averaged statistical pencil of rays reflected from a heliostat
25 p0051 A80-17247
Use of adjustable flat mirrors with flat-plate collectors
[AIAA PAPER 80-0294] 25 p0063 A80-18299
Space light - Space industrial enhancement of the solar option
25 p0073 A80-18797
Summary report of the Solar Reflective Materials Technology Workshop
[PNL-2763] 25 p0057 N80-10613

SOLAR SENSORS
An electronic device for intermittent tracking --- of sun in solar collectors
25 p0027 A80-12782

SOLAR SIMULATION
New concept for a system suitable for solar simulation
25 p0083 A80-19976

SOLAR SPECTRA
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
Brightness distribution over the solar disk --- in solar reflectors
25 p0050 A80-17243

SOLAR TERRESTRIAL INTERACTIONS
Solar collectors as energy converters
25 p0036 A80-14670

SOLAR TOTAL ENERGY SYSTEMS
Industrial solar total energy systems
25 p0017 A80-11987
A new solar thermal electricity/cooling generation system
[AIAA PAPER 80-0296] 25 p0063 A80-18300
Economic comparisons of solar and fossil total energy systems for industrial applications
[ASME PAPER 79-WA/TS-6] 25 p0065 A80-18552
The thermal design and analysis of an integrated sodium boiler/receiver for solar energy conversion
[ASME PAPER 79-WA/SOL-10] 25 p0067 A80-18569
Optimization and comparison strategies for solar energy systems
[ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575
Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583
A solar thermal electric power plant for small communities
[ASME PAPER 79-WA/SOL-7] 25 p0069 A80-18584
Dispersed power systems and total energy
[SAND-78-2006C] 25 p0096 N80-10608
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0097 N80-10609
Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
[SAND-78-2163C] 25 p0146 N80-13693
SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
Methodology for determining the configuration of the optimum solar total energy system
[SAND-79-0422] 25 p0172 N80-15574
Application analysis of solar total energy systems to the residential sector. Volume 4: Market penetration
[ALO-3787-4] 25 p0174 N80-15597

SOLENOIDS
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825

SOLID ELECTRODES
Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588
MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004

SOLID STATE DEVICES
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617

SOLID WASTES
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028
Resource recovery systems costs
25 p0001 A80-10029
Energy conservation through recycling
25 p0003 A80-10842
Hydrogen - The Denver story
25 p0038 A80-14709
The uncertain costs of waste disposal and resource recovery
25 p0043 A80-16150
Gasification of solid waste in a fluidized bed reactor with circulating sand
25 p0074 A80-18868
The basics of magnetic separation as applied to municipal solid waste reclamation plants
25 p0074 A80-18871
Methane recovery from sanitary landfills; gas recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521
Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste
[CONF-790373-1] 25 p0163 N80-14562
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691

SOLIDIFIED GASES
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728

SOLITARY WAVES
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
SOUTHERN CALIFORNIA
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019
SPACE
District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States --- using computerized simulation
[NMEI-10-1] 25 p0172 N80-15582
SPACE ERECTABLE STRUCTURES
Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641
SPACE HEATING (BUILDINGS)
Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370
Commercial building and industrial applications for solar energy
25 p0017 A80-11985
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
A high performance porous flat-plate solar collector
25 p0021 A80-12438
Design criteria in PCM wall thermal storage --- Phase Change Materials
25 p0021 A80-12440
Absorption heat pumps for solar space heating systems
25 p0036 A80-14672
On a calculation procedure for a heat accumulator in a solar heating system
25 p0044 A80-16630
Sensitivity of direct gain space heating performance to fundamental parameter variations
25 p0060 A80-18128
Solar heating system performance estimation using sinusoidal inputs
25 p0061 A80-18130
Electric heat - The right price at the right time
25 p0062 A80-18184
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566
Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages
[ASME PAPER 79-WA/SOL-27] 25 p0067 A80-18568
The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575
Evaluation of a solar heating system installed in the LSU Field House
[ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576
An evaluation of thermal energy storage for residential air conditioning applications
[ASME PAPER 79-WA/HT-31] 25 p0071 A80-18631
Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning
25 p0084 A80-20242
Passive solar energy programs and plans
[GPO-36-211] 25 p0095 N80-10599
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645
Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646
The Building Loads Analysis System Thermodynamics (BLAST) program, version 2.0 Input booklet --- for predicting energy consumption based on structural size and meteorological data
[AD-A072435] 25 p0107 N80-11259
Solar heating and cooling systems design and development
[NASA-CR-150873] 25 p0109 N80-11560
Standby conservation plan no. 2: Emergency building temperature restrictions. Economic analysis
[DOE/ERA-0047] 25 p0112 N80-11593
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616
Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings
[BMFT-FB-T-78-48] 25 p0116 N80-11630
Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566
Standby conservation plan no. 2: Emergency building temperature restrictions. Authorities: Need, rationale, operation
[DOE/ERA-0048] 25 p0126 N80-12582
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637
Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660
Community heating and cooling systems
[CONF-790446-6] 25 p0147 N80-13706
The solar in Federal buildings demonstration program
[PB-298535/6] 25 p0151 N80-14279
Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499
Commercializing solar heating: A national strategy needed
[PB-297882/3] 25 p0164 N80-14575
Measurement of energy to heat houses: Initial study
[PB-299448/2] 25 p0170 N80-15304
Low temperature thermal energy storage: A state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583
Fuel utilization in residences
[EPRI-EA-894] 25 p0175 N80-15604
SPACE PROGRAMS
Toward the endless frontier: History of the Committee on Science and Technology 1959 - 1979
[GPO-35-120] 25 p0181 N80-15994
SPACE SHUTTLE ORBITERS
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267
PEP solar array definition study
[NASA-CR-160398] 25 p0138 N80-13622
SPACE TRANSPORTATION SYSTEM
PEP solar array definition study
[NASA-CR-160398] 25 p0138 N80-13622
SPACECRAFT POWER SUPPLIES
Development of silver-hydrogen cells
25 p0010 A80-11843
Development of silver-hydrogen cells
25 p0010 A80-11844
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775
Possibility of conversion of solar corpuscular radiation energy into electrical energy
25 p0085 A80-20495
General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608
PEP solar array definition study
[NASA-CR-160398] 25 p0138 N80-13622
Baseline design of the thermoelectric reactor space power system
[LA-UR-79-1242] 25 p0149 N80-13906

SPACECRAFT RADIATORS
Cooling a radioisotope power source in the Space Shuttle Orbiter [ASME PAPER 79-ENAS-44] 25 p0039 A80-15267

SPACECRAFT SHIELDING
Solar panels exposed to cosmic rays 25 p0008 A80-11825

SPAIN
SSPS project - Two solar power plants in Spain 25 p0032 A80-13180

SPATIAL DISTRIBUTION
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400 25 p0082 A80-19682
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage 25 p0084 A80-20274

SPECIMEN GEOMETRY
A seasonally adjusted concentrating collector made of mirror strips 25 p0024 A80-12750

SPECTRAL ENERGY DISTRIBUTION
Solar cell spectral response characterization 25 p0037 A80-14685
Brightness distribution over the solar disk --- in solar reflectors 25 p0050 A80-17243

SPECTRAL REFLECTANCE
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances 25 p0057 A80-17871

SPECTRAL SENSITIVITY
A new approach to low cost large area selective surfaces for photothermal conversion 25 p0003 A80-10845
Textured silicon - A selective absorber for solar thermal conversion 25 p0034 A80-13980
Investigation of absorptive and radiative characteristics of an ideal selective surface --- for solar energy absorbers 25 p0044 A80-16632
Selective black nickel coatings on zinc surfaces by chemical conversion --- for high solar energy absorption 25 p0060 A80-18126
A simplified technique for comparing the effectiveness of collector absorber coatings 25 p0061 A80-18133
Cobalt oxide as a spectrally selective material for use in solar collectors 25 p0086 A80-20719
The spectral selectivity of conducting micromeshes --- as solar energy absorbers 25 p0087 A80-20720
Spectrally selective surfaces with coatings comprised of ultrafine metal particles --- solar collectors [AED-CONF-78-212-004] 25 p0115 N80-11620

SPECTROSCOPY
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies [IS-M-202] 25 p0129 N80-12611

SPECTRUM ANALYSIS
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers 25 p0060 A80-18111

SPEED CONTROL
Wind energy conversion system with electromagnetic stabiliser 25 p0031 A80-13004
Controllable d.c. power supply from wind-driven self-excited induction machines 25 p0075 A80-19031

SPHERICAL TANKS
Application of packed beds to energy storage use of latent heat of fusion 25 p0121 N80-12353

SPIN TESTS
Whirling response and stability of flexibly mounted, ring-type flywheel systems [ASME PAPER 79-DET-71] 25 p0041 A80-15729
Lateral and tilt whirl modes of flexibly mounted flywheel systems --- for energy storage [SAND-78-7070] 25 p0115 N80-11622
Whirling response and stability of flexibly mounted, ring-type flywheel systems [SAND-78-7073] 25 p0116 N80-11623
Recent spin test of two composite wagon wheel flywheels [SAND-79-1669C] 25 p0140 N80-13640
Sandia composite-rim flywheel development [SAND-78-1865C] 25 p0177 N80-15624

SPRAYED COATINGS
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis 25 p0023 A80-12747

STABILITY TESTS
Whirling response and stability of flexibly mounted, ring-type flywheel systems [SAND-78-7073] 25 p0116 N80-11623

STABILIZED PLATFORMS
Electricity generation from jet-stream winds 25 p0007 A80-11644

STAINLESS STEELS
Materials testing for central receiver solar-thermal power systems [TID-29443] 25 p0146 N80-13695

STANDARDS
SAMICS: Input data preparation --- Solar Array Manufacturing Industry Costing Standards [NASA-CR-162421] 25 p0110 N80-11570
Interim structural design standard for solar energy applications, phases 1 and 2 --- boiler and pressure vessel code [SAND-79-8183] 25 p0146 N80-13698
Measurements and standards for recycled oil - 2 [PB-299951/4] 25 p0167 N80-15275

STATIC STABILITY
On the weathervaning of wind turbines 25 p0047 A80-16952

STATISTICAL ANALYSIS
Solar-climatic statistical study. Summary report, volume 1 [HCP/T4016-1] 25 p0132 N80-12707
Solar-climactic statistical study --- windpower utilization and solar energy conversion [HCP/T4016-01/2] 25 p0149 N80-13747

STATISTICAL DISTRIBUTIONS
Federal Energy Data System (FEDS) statistical summary update [DOE/EIA-0192] 25 p0177 N80-15630

STATISTICAL WEATHER FORECASTING
Solar cooling performance predictions via stochastic weather algorithms 25 p0020 A80-12430
The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes 25 p0042 A80-16086

STEADY STATE
Steady-state currents driven by collisionally damped lower-hybrid waves --- in plasma 25 p0084 A80-20157

STEAM
Calculation of steam generation with parabolic solar collectors 25 p0039 A80-15328
Superheated steam generation in a Fresnel lens concentrating collector [ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase 25 p0076 A80-19209
Development of the steam-iron process for hydrogen production, 9010 [FE-2435-32] 25 p0150 N80-14258
Characterization of operating conditions for gas/water heat recovery steam generators [ORNL/TM-6622] 25 p0176 N80-15620
Technical support for open-cycle MHD program --- project planning and systems analysis of a magnetohydrodynamic/steam power system [ANL/MHD-78-11] 25 p0181 N80-15942

STEAM TURBINES
Novel power generation cycles using coal gas [ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
Steam turbines --- thermoelectric power generation [ANL/CES/TE-78-7] 25 p0095 N80-10502
Screening evaluation of novel power cycles integrated with gasification plants [EPRI-AP-1002] 25 p0096 N80-10605

STEEL STRUCTURES
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques --- components of coal gasification and liquefaction pilot plants [CONF-790480-1] 25 p0167 N80-15259

STEELS
Microstructural objectives for high-temperature alloys in advanced energy systems 25 p0002 A80-10306
Materials compatibility in liquid sodium [HEDL-SA-1559] 25 p0119 N80-12147
Energy conservation in the US economy from increased recycle of obsolete steel scrap [COO-2893-10] 25 p0159 N80-14524

STELLARATORS
Heating, confinement and fluctuations in the CLEO stellarator 25 p0055 A80-17826
Current equilibrium and effective ion charge in L-2 stellarator plasma 25 p0055 A80-17829
Constant current and constant voltage excitation of large coils by flywheel-generator-converter --- for fusion reactors 25 p0080 A80-19624
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device 25 p0084 A80-20159

STILLS
A cheap method of improving the performance of roof type solar stills 25 p0006 A80-11343

STIRLING CYCLE
A pistonless Stirling engine - The traveling wave heat engine 25 p0031 A80-13011
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system --- for Stirling engine and solar thermal rocket 25 p0036 A80-14597
Assessment of Stirling engine potential in total and integrated energy systems [ANL/ES-76] 25 p0140 N80-13636
Assessment of the state of technology of automotive Stirling engines [NASA-CR-159631] 25 p0150 N80-13989
Sintered silicon nitrode recuperator fabrication [NASA-CR-159706] 25 p0167 N80-15263

STORAGE BATTERIES
Zinc-bromine battery studies 25 p0010 A80-11845
Recent advances in zinc-bromine batteries 25 p0010 A80-11846
Hydrogen /Hydride/-air secondary battery 25 p0011 A80-11848
Hydrogen-powered vs. battery-powered automobiles 25 p0033 A80-13199
Electric and hybrid vehicles --- Book 25 p0041 A80-15658
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings [UCRL-52553-VOL-1] 25 p0105 N80-10970
Lithium/metal sulfide battery development [CONF-790538-10] 25 p0159 N80-14530
Advanced batteries for electric vehicles: A look at the future [CONF-790484-1] 25 p0159 N80-14531

STORAGE TANKS
Optimal insulation of solar heating system pipes and tanks 25 p0021 A80-12434
Experimental and numerical studies of liquid storage tank thermal stratification for a solar energy system [COO-4479-2] 25 p0101 N80-10655

STRUCTURAL ANALYSIS
Analysis of field test results for single-axis-tracking solar collector foundations [SAND-79-7023] 25 p0173 N80-15586

STRUCTURAL DESIGN
The design of a thin walled toroidal vacuum chamber for a large RFP experiment --- Reversed Field Pinch 25 p0082 A80-19676
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation [SAND-78-8180] 25 p0097 N80-10612
The Building Loads Analysis System Thermodynamics (BLAST) program, version 2.0 Input booklet --- for predicting energy consumption based on structural size and meteorological data [AD-A072435] 25 p0107 N80-11259
Interim structural design standard for solar energy applications, phases 1 and 2 --- boiler and pressure vessel code [SAND-79-8183] 25 p0146 N80-13698
Weight minimization of sandwich type solar collector panels [SAND-78-2305C] 25 p0147 N80-13710
OTEC platform configuration and integration, appendixes to volume 2 [DOE/ET-4065/1-VOL-2-APP] 25 p0147 N80-13713
OTEC platform configuration and integation. Volume 3: Project plan [DOE/ET-4065/1-VOL-3] 25 p0148 N80-13714
Non-tracking inflated cylindrical solar concentrator [UCRL-82721] 25 p0159 N80-14528
A review of the economics of selected passive and hybrid systems --- design concepts for solar energy utilization [SERI/TP-61-144] 25 p0161 N80-14547
Commercializing solar architecture [SERI/TP-62-113] 25 p0161 N80-14548

STRUCTURAL DESIGN CRITERIA
MDAC/Rocketdyne solar receiver: Design review [SAND-78-8188] 25 p0097 N80-10616
Methane recovery from sanitary landfills; gas recovery system installation and testing [PB-296622/4] 25 p0107 N80-11254
Executive summary: Mod-1 wind turbine generator analysis and design report [NASA-CR-159497] 25 p0109 N80-11558
Methodology for determining the configuration of the optimum solar total energy system [SAND-79-0422] 25 p0172 N80-15574

STRUCTURAL ENGINEERING
Battery Energy Storage Test (BEST) facility [EPRI-EM-1005] 25 p0098 N80-10628
Report on Finnish technological activities 25 p0119 N80-11991

STRUCTURAL MEMBERS
Preliminary materials assessment in solar demonstration systems [ANL/EES-CP-30] 25 p0115 N80-11619

STRUCTURAL PROPERTIES (GEOLOGY)
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction 25 p0075 A80-19049
Computer software to calculate and map geologic parameters required in estimating coal production costs [EPRI-EA-674] 25 p0095 N80-10584

STRUCTURAL STABILITY
Aeroelastic stability and response of horizontal axis wind turbine blades 25 p0032 A80-13116

SUBSONIC FLOW
High interaction subsonic MHD channel operation [AIAA PAPER 80-0022] 25 p0062 A80-18242

SUGAR CANE
Net energy analysis of alcohol production from sugarcane 25 p0062 A80-18165
Sugar crops as a source of fuels. Volume 1: Agricultural research [TID-29400/1] 25 p0093 N80-10395
Production of sugarcane and tropical grasses as a renewable energy source [DOE/CS/5912-T1] 25 p0168 N80-15277

SULFATES
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle [LA-UR-79-1256] 25 p0129 N80-12605
Western energy sulfate/nitrate monitoring network [PB-299238/6] 25 p0180 N80-15685

SULFIDES
Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications 25 p0012 A80-11854
Utilization of transition metal phosphorus trisulphides as battery cathodes 25 p0012 A80-11858

The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862

Review of industrial participation on the ANL lithium/iron sulfide battery development program --- for energy storage and electric vehicles
[CONF-780852-1] 25 p0164 N80-14573

SULFONATES

Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544

SULFUR

The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833

Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386

SULFUR CHLORIDES

Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856

SULFUR COMPOUNDS

Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294

SULFUR DIOXIDES

Heat generation in Li/SOCl2 cells
25 p0012 A80-11855

The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505

SUNLIGHT

Effect of concentrated sunlight on the various parameters of the p-n junction solar cell
25 p0025 A80-12764

Space light - Space industrial enhancement of the solar option
25 p0073 A80-18797

Solar access law. Protecting access to sunlight for solar energy systems
[PB-296532/5] 25 p0117 N80-11633

Combined effects of polycyclic aromatic hydrocarbons and sunlight --- on Chinese hamster V79 cells
[CONF-790447-4] 25 p0131 N80-12631

Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577

SUPERCONDUCTING MAGNETS

Developments for the high voltage test of pulsed superconducting coils --- used in tokamak switches
25 p0081 A80-19655

Space applications of superconductivity - High field magnets
25 p0084 A80-20128

Superconducting magnetic energy storage for electric power system dynamic stabilization
[LA-UR-79-1220] 25 p0160 N80-14535

Superconductivity for mirror fusion
[UCRL-81693] 25 p0181 N80-15933

SUPERCONDUCTING POWER TRANSMISSION

Stability of a system of coaxial superconducting shells
25 p0018 A80-12027

Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430

Superconducting composites fabrication and properties
25 p0040 A80-15511

Preparation of superconducting coil through composite
25 p0040 A80-15512

The 50kA flux pump for the superconducting transmission line test bed
[LA-6953-MS] 25 p0094 N80-10443

Some dc superconducting cables --- for underground power transmission
[LA-UR-79-1057] 25 p0107 N80-11348

Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346

Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346

SUPERCONDUCTIVITY

Superconductivity for mirror fusion
[UCRL-81693] 25 p0181 N80-15933

SUPERCONDUCTORS

Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898

Superconducting composites fabrication and properties
25 p0040 A80-15511

Preparation of superconducting coil through composite
25 p0040 A80-15512

International activities: The fiscal year 1978 survey of international programs at NEL
[PB-300491/8] 25 p0181 N80-16004

SUPERHIGH FREQUENCIES

Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600

SUPERSONIC FLOW

Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

SUPPLYING

Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607

The 1985, 1990 and 1995 midterm energy market model results under three scenarios of Fuel Use Act regulations
[DOE/EIA-0182/2] 25 p0173 N80-15592

Energy supply and demand in the short term: 1979 and 1980
[DOE/EIA-0184/4] 25 p0174 N80-15593

SURFACE DIFFUSION

Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204

SURFACE GEOMETRY

Validation of computer models for predicting radiation levels on tilted surfaces
25 p0020 A80-12429

Truncation of nonimaging cusp concentrators --- solar collector geometry
25 p0029 A80-12824

Solar concentrators using vacuum-contoured surfaces for tracking
[AIAA PAPER 80-0399] 25 p0077 A80-19326

SURFACE PROPERTIES

Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980

Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system --- for Stirling engine and solar thermal rocket
25 p0036 A80-14597

Investigation of absorptive and radiative characteristics of an ideal selective surface --- for solar energy absorbers
25 p0044 A80-16632

Spectrally selective surfaces with coatings comprised of ultrafine metal particles --- solar collectors
[AED-CONF-78-212-004] 25 p0115 N80-11620

SURFACE REACTIONS

Cadmium electrodes with improved surface characteristics for alkaline storage batteries
25 p0009 A80-11838

Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600

SURFACE VEHICLES

New technology and vehicle operation on roadways
25 p0037 A80-14702

SURFACE WATER

Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561

SURVEYS

A survey of electric and hybrid vehicle simulation programs
[NASA-CR-162457] 25 p0118 N80-11954

SWEDEN

The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049

Effects of energy policy on industry [USFPE-1978-8] 25 p0129 N80-12604

SWITCHING CIRCUITS

Dynamic suppression of ionization instability --- in MHD devices of Faraday and Hall types 25 p0043 A80-16484

Ignitron switching problems associated with a large reversed field pinch experiment 25 p0081 A80-19629

Self-reconfiguring solar cell system [NASA-CASE-LEW-12586-1] 25 p0153 N80-14472

SYNCHRONOUS MOTORS

Linear synchronous motor development for urban and rapid transit systems 25 p0062 A80-18167

Induction and synchronous machines for vertical axis wind turbines [SAND-79-7017] 25 p0144 N80-13675

SYNTHANE

Low/medium BTU coal gasification - Perspective of the gas industry 25 p0015 A80-11969

Gasoline's alternatives are feasible 25 p0034 A80-13225

Environmental assessment report: Lurgi coal gasification systems for SNG [PB-298109/0] 25 p0120 N80-12204

SYNTHETIC FUELS

Hydrogen - The fuel of the future --- Russian book 25 p0002 A80-10349

Kentucky's coal-based chemical/energy park 25 p0013 A80-11954

Coal liquefaction - An international perspective 25 p0015 A80-11964

Recent developments in coal liquefaction in the United States 25 p0015 A80-11966

SRC solids - Boiler fuel and building block --- Solvent Refined Coal 25 p0015 A80-11967

SRC solids - A preferred compliance boiler fuel --- Solvent Refined Coal 25 p0015 A80-11968

Fuels from marine biomass 25 p0045 A80-16656

Can alternative energy resources be brought into large-scale use in the United States by the year 2000 25 p0048 A80-17128

Two-dimensional heating analysis of fusion blankets for synfuel production 25 p0082 A80-19665

Molten salt pyrolysis of latex --- for hydrocarbon fuel production [NASA-CASE-NPO-14315-1] 25 p0092 N80-10361

Coal conversion processes and analysis methodologies for synthetic fuels production --- technology assessment and economic analysis of reactor design for coal gasification [NASA-CR-161322] 25 p0092 N80-10379

Assessment of synfuel transportation to year 2000 [PNL-2768] 25 p0092 N80-10382

Sugar crops as a source of fuels. Volume 1: Agricultural research [TID-29400/1] 25 p0093 N80-10395

Biomass energy enhancement: A report to the President's Council on Environmental Quality --- solar heat gasification [PB-296624/0] 25 p0094 N80-10396

Energy and economic assessment of anaerobic digesters and biofuels for rural waste management [PB-296523/4] 25 p0094 N80-10398

Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base [NTIS/PS-79/0765/2] 25 p0102 N80-10667

One- and two-dimensional heating analyses of fusion synfuel blankets [BNL-NUREG-25635] 25 p0104 N80-10922

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [FE-2307-38] 25 p0106 N80-11249

Methane recovery from sanitary landfills; gas recovery system installation and testing [PB-296622/4] 25 p0107 N80-11254

Department of Energy fossil energy equipment development programs [CONF-790405-14] 25 p0112 N80-11590

LASL thermochemical hydrogen program status on October 31, 1978 --- fusion-synfuel [LA-UR-78-2895] 25 p0120 N80-12197

Status of the PEATGAS process [CONF-781045-3] 25 p0120 N80-12199

Environmental aspects of alternative fuels utilization for highway vehicles [UCRL-81841] 25 p0120 N80-12201

Environmental analysis of synthetic liquid fuels --- shale oil, coal liquefaction, and biomass production of ethanol [DOE/EV-0044] 25 p0134 N80-13279

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal) [FE-2307-46] 25 p0134 N80-13280

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels [FE-1800-33] 25 p0135 N80-13287

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels [FE-1800-30] 25 p0135 N80-13291

Synfuel (hydrogen) production from fusion power [LA-UR-79-1115] 25 p0136 N80-13296

Pilot plant gasification test on biomass fuels [PB-299077/8] 25 p0151 N80-14272

High temperature electrolysis --- synthetic fuel production [BNL-26331] 25 p0167 N80-15227

Report of the Alcohol Fuel Policy Review [DOE/PE-0012] 25 p0169 N80-15290

Conversion of coal-based methanol to ethylene and a gaseous fuel [PB-301256/4] 25 p0169 N80-15297

SYSTEM EFFECTIVENESS

Effectiveness - NTU charts for latent heat storage units --- heat exchangers [ASME PAPER 79-WA/SOL-16] 25 p0066 A80-18561

RAPAD - Real-time Accurate Performance Analysis of Data --- for performance estimation of wind energy conversion system [ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565

Residential solar heat pump systems - Thermal and economic performance [ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591

SYSTEMS ANALYSIS

Preliminary analysis of a total solar heating system [ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control 25 p0087 A80-20862

Computer analysis of grids currently used for CdS/Cu2S solar cells 25 p0089 A80-20893

Satellite Power Systems (SPS) concept definition study. Volume 4: SPS point design definition [NASA-CR-150683] 25 p0119 N80-12106

Systems Analysis and testing (SAT) program [SERI/PR-35-313] 25 p0124 N80-12565

Solar cooling performance in CSU Solar House 3 [COO-2858-23] 25 p0143 N80-13668

OTEC platform configuration and integration, executive summary [DOE/ET-4065/1] 25 p0147 N80-13711

Satellite Power System (SPS): An overview of prospective organizational structures in the solar satellite field [TID-29094] 25 p0154 N80-14478

Analysis of remote site energy storage and generation systems --- systems analysis of solar energy conversion and windpower utilization energy storage systems [AD-A074869] 25 p0156 N80-14504

Energy analysis of the basic materials utilized in electric power transmission systems [HCP/T5043-01] 25 p0157 N80-14510

Decentralized solar photovoltaic energy systems [LA-7866-TASE] 25 p0171 N80-15565

Design of photovoltaic systems for residential applications in the United States [SAND-78-2186C] 25 p0171 N80-15566

MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version) [BNL-26390] 25 p0178 N80-15634

Solar mechanical energy storage program overview
and systems analysis results
[SAND-79-1642C] 25 p0178 N80-15637
Technical support for open-cycle MHD program ---
project planning and systems analysis of a
magnetohydrodynamic/steam power system
[ANL/MHD-78-11] 25 p0181 N80-15942

SYSTEMS COMPATIBILITY
The compatibility of wind and solar technology
with conventional energy systems
25 p0008 A80-11828

SYSTEMS ENGINEERING
Area load-frequency control --- software package
for electric power system operation
25 p0022 A80-12735
Design of the International Energy Agency 500 kWe
distributed-collector solar thermal-electric
powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592
OTEC - Solar energy from the sea
25 p0085 A80-20424
A thermodynamic assessment of OTEC open-cycle
power systems
25 p0088 A80-20886
Analysis of a LiCl open-cycle absorption air
conditioner which utilizes a packed bed for
regeneration of the absorbent solution driven by
solar heated air
[COO-4546-1] 25 p0101 N80-10652
Methane recovery from sanitary landfills; gas
recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254
Executive summary: Mod-1 wind turbine generator
analysis and design report
[NASA-CR-159497] 25 p0109 N80-11558
Architectural concerns in solar system design and
installation
[SOLAR/0801-79-01] 25 p0129 N80-12607
Design and development of a 30 watt solid polymer
electrolyte fuel cell power source fueled with
calcium hydride
[AD-A071157] 25 p0139 N80-13625
Systems engineering for power, program report
[DOE/ET-0012/2-REV] 25 p0140 N80-13637
OTEC platform configuration and integration.
Volume 1: Systems engineering and integration
[TID-29418] 25 p0142 N80-13655
Photovoltaic systems. Program summary
[DOE/ET-0019/2] 25 p0146 N80-13691
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263
solar thermal power systems advanced solar thermal
technology project, advanced subsystems
development
[NASA-CR-162546] 25 p0155 N80-14491
Engineering concerns in solar system design and
operation
[SOLAR/0811-79/01] 25 p0160 N80-14539
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
Solar power satellite system definition study.
Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294
Design of photovoltaic systems for residential
applications in the United States
[SAND-78-2186C] 25 p0171 N80-15566
Methodology for determining the configuration of
the optimum solar total energy system
[SAND-79-0422] 25 p0172 N80-15574
Flywheel energy storage and conversion system for
photovoltaic applications
[COO-4094-48] 25 p0178 N80-15635
Fusion energy for hydrogen production --- systems
engineering of a process for hydrogen production
from nuclear fusion
[BNL-24906] 25 p0180 N80-15897

SYSTEMS STABILITY
Superconducting magnetic energy storage for
electric power system dynamic stabilization
[LA-UR-79-1220] 25 p0160 N80-14535

T

TANKS (CONTAINERS)
Optimal insulation of pipes and tanks for solar
heating systems
[ALO-5319-2] 25 p0102 N80-10660

TARS
Analysis of tarry fractions in emissions resulting
from low temperature oxidation of brown coal
25 p0007 A80-11448

TASKS
Development of the Rocky Mountain Energy and
Environmental Technology Center: A preliminary
analysis
[ORAU-158] 25 p0179 N80-15670

TAYLOR INSTABILITY
Inertial confinement fusion at NRL
25 p0056 A80-17861
Optimization of stabilized imploding liner fusion
reactors
25 p0079 A80-19593

TECHNOLOGICAL FORECASTING
Models of worldwide energy demand and consumption
25 p0002 A80-10228
United States energy alternatives to 2010 and
beyond - The CONAES study
25 p0008 A80-11827
Review of scenarios of future U.S. energy use
25 p0009 A80-11832
Overview of division of energy storage program
Department of energy
25 p0016 A80-11979
Near-term prospects for solar industrial process
heat
25 p0018 A80-11988
Fuel cell sesquicentennial
25 p0033 A80-13223
The helium question --- future domestic
consumption vs storage of current natural gas
derived supplies
25 p0034 A80-13589
The role of coal in the world energy picture up to
the year 2000 - Reserves, resources, and
availability from the Western European viewpoint
25 p0040 A80-15625
Global perspectives and options for long-range
energy strategies
25 p0048 A80-17130
Impacts of satellite power system technology
25 p0048 A80-17132
Waves, currents, tides - Problems and prospects
25 p0049 A80-17134
Multirole cargo aircraft options and configurations
--- economic analysis
[NASA-TM-80177] 25 p0105 N80-11053
Silicon materials outlook study for 1980-1985
calendar years
[NASA-CR-162541] 25 p0155 N80-14492
Advanced batteries for electric vehicles: A look
at the future
[CONF-790484-1] 25 p0159 N80-14531

TECHNOLOGY ASSESSMENT
A policy-sensitive model of technology assessment
25 p0004 A80-11140
Energy technology VI: Achievements in perspective;
Proceedings of the Sixth Conference, Washington,
D.C., February 26-28, 1979
25 p0013 A80-11953
Hydrogen - A means of integrating competing
technology into a unified energy system
25 p0014 A80-11955
Overview of division of energy storage program
Department of energy
25 p0016 A80-11979
Flywheels for energy storage
25 p0019 A80-12166
Monitoring of the solar-heated modular homes at
Los Alamos
25 p0022 A80-12607
An investigation of experimental performance of a
compound parabolic concentrator
25 p0023 A80-12748
Some experimental studies on the technical
developments of low cost silicon solar cells
25 p0028 A80-12789
New technology and vehicle operation on roadways
25 p0037 A80-14702
CO2 electric discharge lasers - Present status and
future applications
25 p0039 A80-14960
The promise and puzzle of electric vehicles
25 p0039 A80-15175
Electric and hybrid vehicles --- Book
25 p0041 A80-15658

Technical possibilities and economic prospects for coal refining
25 p0043 A80-16175

Harnessing power from tides - State of the art
25 p0045 A80-16658

Exploring alternative energy strategies
25 p0047 A80-17127

Global aspects of sunlight as a major energy source
25 p0048 A80-17131

An analysis of the potential of wind energy conversion systems
25 p0048 A80-17133

Comparative risk assessment of energy systems
25 p0049 A80-17139

Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737

Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory
25 p0056 A80-17862

The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

Summary on inertial-confinement fusion
25 p0059 A80-17893

Summary on reactor systems --- tokamak devices
25 p0059 A80-17894

Methods for regional assessment of geothermal resources
25 p0075 A80-19202

OTEC - A comprehensive energy analysis
25 p0085 A80-20456

The satellite power system concept and program
[SAWE PAPER 1305] 25 p0086 A80-20643

A thermodynamic assessment of OTEC open-cycle power systems
25 p0088 A80-20886

Coal conversion processes and analysis methodologies for synthetic fuels production --- technology assessment and economic analysis of reactor design for coal gasification
[NASA-CR-161322] 25 p0092 N80-10379

Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382

Survey of liquid hydrogen container techniques for highway vehicle fuel system applications
[HCP/M2752-01] 25 p0092 N80-10383

Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
[FE-2447-13] 25 p0093 N80-10388

Coal conversion systems: Technical data book
[HCP/T2286-01] 25 p0093 N80-10392

Summary report of the Solar Reflective Materials Technology Workshop
[PNL-2763] 25 p0097 N80-10613

Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

Environmental readiness of emerging energy technologies
[DOE/ERD-0022] 25 p0099 N80-10631

Selected results from the technology assessment of solar energy program
[LA-UR-79-950] 25 p0099 N80-10637

State of the art of sensible heat storage for solar heat pump systems
[BNL-25909] 25 p0101 N80-10651

Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970

Assessment of long term research needs for coal-gasification technologies
[PB-297853/4] 25 p0107 N80-11255

Bell Creek residual oil saturation technology test
[BETC-2180-4] 25 p0108 N80-11546

An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559

Southeastern forum on appropriate technology
[PB-298796/4] 25 p0118 N80-11965

The future role of hydrogen fuel in an electrical society
[UTIAS-241] 25 p0119 N80-12189

HYGAS process update
[CONF-781045-4] 25 p0120 N80-12200

Search for fusion power
[UCRL-81890] 25 p0132 N80-12900

The status of advanced propulsion systems for urban rail vehicles
[PB-297980/5] 25 p0133 N80-12962

Status of alcohol fuels utilization technology for stationary gas turbines
[HCP/M2098-03] 25 p0135 N80-13283

Solar energy perspectives for public power
[SERI/TP-35-300] 25 p0140 N80-13635

Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650

Multi-year plan for thermal and mechanical energy storage program
[DOE/ET-0109] 25 p0142 N80-13658

Status of development, energy and economics aspects of alternative technologies --- energy policy and technology with respect to coal utilization
[CONF-790371-1] 25 p0145 N80-13689

Geothermal energy. Part 3: Technology and general studies, volume 4. Citations from the NTIS data base
[NTIS/PS-79/0817/1] 25 p0148 N80-13719

Assessment of the state of technology of automotive Stirling engines
[NASA-CR-159631] 25 p0150 N80-13989

Assessment of present state-of-the-art sawing technology of large diameter ingots for solar sheet material
[NASA-CR-162535] 25 p0151 N80-14273

Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste
[CONF-790373-1] 25 p0163 N80-14562

Assessment of the applicability of mechanical energy storage devices to electric and hybrid vehicles. Volume 1: Executive summary
[UCRL-52773-VOL-1] 25 p0166 N80-14973

Analysis of hydrogen in solids --- technology assessment of ways to analyze hydrogen for hydrogen based energy and hydrogen production
[DOE/ER-0026] 25 p0167 N80-15220

Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287

A survey of photovoltaic systems
[NASA-CR-150696] 25 p0171 N80-15563

Low temperature thermal energy storage: A state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583

Lithium/iron sulfide batteries for electric vehicles
[CONF-781006-2] 25 p0175 N80-15611

Toward the endless frontier: History of the Committee on Science and Technology 1959 - 1979
[GPO-35-120] 25 p0181 N80-15994

TECHNOLOGY TRANSFER

Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings
25 p0037 A80-14701

SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532

Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576

Proceedings: Solar Thermal Power User Review Panel Meeting
[SERI/TP-69-221] 25 p0113 N80-11598

Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957

Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
[CONF-790630-9] 25 p0136 N80-13295

TECHNOLOGY UTILIZATION

Soft and hard energy paths - The roads not taken --- political, technical and philosophical aspects of energy problem
25 p0007 A80-11400

Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858

Low/medium BTU coal gasification - Perspective of the gas industry
25 p0015 A80-11969

The reality of on-site fuel cells
25 p0016 A80-11973

Source, supply and nature of municipal and
industrial waste as a fuel
25 p0017 A80-11983
Fuel cell sesquicentennial
25 p0033 A80-13223
The role of technology as air transportation faces
the fuel situation
25 p0037 A80-14700
Application of solar and fuel cell technology to
industrial users
25 p0037 A80-14707
A link between science and applications of
automatic control; Proceedings of the Seventh
Triennial World Congress, Helsinki, Finland,
June 12-16, 1978. Volumes 1, 2, 3 & 4
25 p0038 A80-14794
Solar cells in practice
25 p0083 A80-19844
Space applications of superconductivity - High
field magnets
25 p0084 A80-20128
Passive solar energy programs and plans
[GPO-36-211] 25 p0095 N80-10599
Technology development needs for high temperature
process heat
[SERI/TR-35-047] 25 p0143 N80-13669
Industrial applications of advanced energy systems
[CONF-790602-54] 25 p0147 N80-13708
Fuel cell option
[CONF-7809137-1] 25 p0158 N80-14523
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
A review of the economics of selected passive and
hybrid systems --- design concepts for solar
energy utilization
[SERI/TP-61-144] 25 p0161 N80-14547
Commercializing solar architecture
[SERI/TP-62-113] 25 p0161 N80-14548
Solar/wind handbook for Hawaii: Technical
applications for Hawaii, the Pacific Basin and
sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628

TECTONICS
Summaries of physical research in the geosciences
[DOE/ER-0030] 25 p0137 N80-13582

TELECOMMUNICATION
Autonomous power supplies for telecommunications
25 p0033 A80-13211

TELESCOPES
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982

TEMPERATURE COMPENSATION
Optimization of a solar heating system with
integral compensation
25 p0089 A80-20894

TEMPERATURE CONTROL
The thermal triode --- construction by adding
controlling zone to heat pipe
25 p0037 A80-14675
The simulation of building heat transfer for
passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574
Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646
Development and testing of the Solar Control
Corporation modular controller and Solarstat
subsystem
[NASA-TM-78243] 25 p0156 N80-14498

TEMPERATURE DEPENDENCE
Temperature dependence of open-circuit
photovoltage of a back-surface field
semiconductor junction
25 p0087 A80-20727

TEMPERATURE DISTRIBUTION
Transient rise of plate temperature in solar
collectors
25 p0023 A80-12746
Calculation of climatic solar heating performance
25 p0029 A80-12820
Experimental and numerical studies of liquid
storage tank thermal stratification for a solar
energy system
[COO-4479-2] 25 p0101 N80-10655
Effect of vertical scale distortion on the
temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551
Dynamic response of a packed-bed energy storage
system to a time varying inlet temperature
25 p0121 N80-12341

TEMPERATURE EFFECTS
Experimental enthalpies for a mixture of 80 mole
percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935

TEMPERATURE GRADIENTS
Energy from ocean thermal gradients
25 p0044 A80-16652
Heat flow and heat transfer conditions in the
bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048

TEMPERATURE MEASUREMENT
Energy meter for solar air systems
25 p0022 A80-12609

TEMPERATURE MEASURING INSTRUMENTS
Development and testing of the Solar Control
Corporation modular controller and Solarstat
subsystem
[NASA-TM-78243] 25 p0156 N80-14498

TEMPERATURE SENSORS
Heat flow meters for solar system performance
monitoring
25 p0022 A80-12608

TEST EQUIPMENT
The 50kA flux pump for the superconducting
transmission line test bed
[LA-6953-MS] 25 p0094 N80-10443
Impact of new instrumentation on advanced turbine
research
[NASA-TM-79301] 25 p0166 N80-15133

TEST FACILITIES
An overview of Controlled Thermonuclear Research
Division control and data acquisition computer
usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628
The application of computers to fusion
experimental facilities
25 p0080 A80-19619
Midtemperature Solar Systems Test Facility (MSSTF)
project test results: Phase 4A MSSTF system
operation
[SAND-78-1088] 25 p0114 N80-11613
Experimental test facility for evaluation of solar
control strategies
[LBL-8308] 25 p0126 N80-12586
Mead, Nebraska, 25-kW photovoltaic power system
[COO-4094-10] 25 p0127 N80-12592
Test plan for the Mead 25-kW Photovoltaic Flexible
Test Facility, 1979
[COO-4094-53] 25 p0146 N80-13692
Description of the MIT/Lincoln Laboratory
photovoltaic systems test facility
[COO-4094-41] 25 p0178 N80-15638

TETHERING
Electricity generation from jet-stream winds
25 p0007 A80-11644

TETRACHLORIDES
Tetrachlorodibenzo-p-dioxin quantitation in
stack-collected coal fly ash
25 p0053 A80-17710

TEXAS
Geopressure energy resource evaluation --- Texas
and Louisiana
[CRNL/PPA-79/2] 25 p0138 N80-13605

TEXTILES
Energy conservation through point source recycle
with high temperature hyperfiltration ---
textile industry
[PB-299183/4] 25 p0180 N80-15688

THEMATIC MAPPING
Interactive analysis methods for resource mapping
25 p0008 A80-11709

THERMAL BATTERIES
Studies on the $Ca-CaCrO_4$ and $Li-Al-FeS_2$ systems
for thermal battery applications
25 p0012 A80-11854
Heat generation in $Li/SOCl_2$ cells
25 p0012 A80-11855
Batteries for specific solar applications
[SAND-79-1428C] 25 p0124 N80-12559

THERMAL CONTROL COATINGS
Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303

THERMAL DEGRADATION
Thermal degradation of a black chrome solar
selective absorber coating: Short term
[LBL-8857] 25 p0161 N80-14549

THERMAL DIFFUSION
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4
25 p0081 A80-19660
THERMAL DISSOCIATION
Direct thermal decomposition of water
25 p0052 A80-17577
THERMAL EMISSION
Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626
THERMAL ENERGY
Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756
Industrial applications of solar energy in India
25 p0027 A80-12780
Heat transfer to a melting solid with application to thermal energy storage systems
25 p0036 A80-14667
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125
An electrochemical heat engine for direct solar energy conversion
25 p0061 A80-18131
Osmotically pumped energy transport system
[AIAA PAPER 80-0210] 25 p0064 A80-18378
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575
Fluid Dynamics of Porous Media in Energy Applications, volume 1 --- heat storage and transfer in solar energy conversion systems
[VKI-LEC-SER-1979-4-VOL-1] 25 p0121 N80-12338
Dynamic response of a packed-bed energy storage system to a time varying inlet temperature
25 p0121 N80-12341
Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6934] 25 p0139 N80-13631
Large-scale annual-cycle thermal energy storage in aquifers
[CONF-790515-3] 25 p0145 N80-13686
Department of Energy large solar central power systems semiannual review
[SAND-78-8511] 25 p0175 N80-15601
Aquifer thermal energy storage
[LBL-7070] 25 p0176 N80-15618
THERMAL INSULATION
Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645
Experimental and numerical studies of liquid storage tank thermal stratification for a solar energy system
[COC-4479-2] 25 p0101 N80-10655
Optimal insulation of pipes and tanks for solar heating systems
[ALO-5319-2] 25 p0102 N80-10660
THERMAL MAPPING
Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning
25 p0084 A80-20242
THERMAL RESOURCES
OTEC thermal response report for Pacific plant ship, 5 to 10 deg N 90 to 95 deg W
[HCP/T2898-01/3] 25 p0142 N80-13656
THERMALIZATION (ENERGY ABSORPTION)
Efficiency of quantum-utilizing solar energy converters in the absence of intraband thermalization
25 p0030 A80-12838
THERMOCHEMICAL PROPERTIES
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system --- during melting
25 p0029 A80-12823
Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935
THERMOCHEMISTRY
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195
Thermodynamics of water-splitting --- for hydrogen production
25 p0052 A80-17575
Thermochemical hydrogen production
25 p0052 A80-17578
Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401
Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656
LASL thermochemical hydrogen program status on October 31, 1978 --- fusion-synfuel
[LA-UR-78-2895] 25 p0120 N80-12197
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605
Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571
THERMODYNAMIC CYCLES
Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642
The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825
The possibilities of increasing gas turbine efficiency
25 p0032 A80-13024
Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells
25 p0035 A80-14592
Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297
Screening evaluation of electric power cycles integrated with coal gasification plants
[ASME PAPER 79-WA/ENER-4] 25 p0071 A80-18644
Novel power generation cycles using coal gas
[ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716
Open cycle air turbine solar thermal power system
25 p0083 A80-19989
A thermodynamic assessment of OTEC open-cycle power systems
25 p0088 A80-20886
Analysis of binary thermodynamic cycles for a moderately low-temperature geothermal resource
[TREE-1365] 25 p0139 N80-13627
THERMODYNAMIC EFFICIENCY
Second-law analysis of solar-thermal processes
25 p0003 A80-10843
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846
Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642
Heat flow meters for solar system performance monitoring
25 p0022 A80-12608
Solar energy flat plate collectors - Optimization of air gap
25 p0023 A80-12745
Selection of working fluids for low temperature solar thermal power cycles
25 p0024 A80-12751
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821

The possibilities of increasing gas turbine efficiency
25 p0032 A80-13024
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200
Maximum cold-generation capacity of thermoelectric refrigerators
25 p0035 A80-14594
Thermodynamics of water-splitting --- for hydrogen production
25 p0052 A80-17575
Performance characteristics of point-focusing distributed-receiver solar Brayton systems
[AIAA PAPER 80-0293] 25 p0063 A80-18298
SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants
[ASME PAPER 79-WA/SOL-12] 25 p0068 A80-18579
Residential solar heat pump systems - Thermal and economic performance
[ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591
Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716
Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner
[FE-2489-33] 25 p0093 N80-10390
Screening evaluation of novel power cycles integrated with gasification plants
[EPRI-AP-1002] 25 p0096 N80-10605
Sensitivity study of Brayton cycle power plant performance
[SAND-78-8020] 25 p0098 N80-10626
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645
Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11581
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
[IS-M-202] 25 p0125 N80-12611
Evaluation of combined photovoltaic/thermal collectors
[COO-4577-8] 25 p0143 N80-13665
Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680
Assessment of the state of technology of automotive Stirling engines
[NASA-CR-159631] 25 p0150 N80-13989
Results of thermal performance evaluation of the Owens-Illinois sunpack liquid solar collector at indoor conditions
[NASA-CR-161189] 25 p0156 N80-14500

THERMODYNAMIC PROPERTIES
A study of the thermal effect that radiant energy produces on a mass of water --- Spanish thesis
25 p0040 A80-15653
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497

THERMODYNAMICS
Noniterative solution of heat transfer equation of fluid flow in solar collector
[ASME PAPER 79-WA/SOL-24] 25 p0068 A80-18577
Multi-year plan for thermal and mechanical energy storage program
[DOE/ET-0109] 25 p0142 N80-13658
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265

THERMOELECTRIC COOLING
Maximum cold-generation capacity of thermoelectric refrigerators
25 p0035 A80-14594

THERMOELECTRIC GENERATORS
Concentration ratio and efficiency in thermophotovoltaics
25 p0005 A80-11336
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program --- plutonium oxide
[LA-7519-PR] 25 p0118 N80-11889
Solar central receiver prototype heliostat CDRL item B.D., volume 1
[SAN-1605/7-VOL-1] 25 p0146 N80-13780
Solar thermal power systems advanced solar thermal technology project, advanced subsystems development
[NASA-CR-162546] 25 p0155 N80-14491

THERMOELECTRIC POWER GENERATION
Solar electric generating system resource requirements
25 p0005 A80-11341
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564
Photothermal conversion of solar energy into electricity
[DOE-TR-159] 25 p0130 N80-12612
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-13636
Baseline design of the thermoelectric reactor space power system
[LA-UR-79-1242] 25 p0149 N80-13906
A cesium TELEC experiment at Lewis Research Center
[NASA-CR-159729] 25 p0151 N80-14386

THERMOELECTRICITY
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage
25 p0084 A80-20274

THERMONUCLEAR POWER GENERATION
Status of inertial confinement fusion
25 p0016 A80-11976

THERMONUCLEAR REACTIONS
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544
Optimization of neutron yield in conical system at explosion-induced compression
25 p0007 A80-11545
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662

THERMOPHYSICAL PROPERTIES
The influence of thermophysical properties on the design and sizing of geothermal power plant components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593

THERMOSIPHONS
Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499

THERMOSTATS
Development and testing of the Solar Control Corporation modular controller and Solarstat subsystem
[NASA-TM-78243] 25 p0156 N80-14498

THETA PINCH
End plugging of a hot linear theta pinch
25 p0055 A80-17824
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825

THIAZINE (TRADEMARK)
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system --- in hydrogen production
25 p0033 A80-13198

THIN FILMS
Improvements in the performance of a low cost thin film solar cell
25 p0018 A80-11989

Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141
Thin film problems and research in energy systems
[CONF-761168-SUMM] 25 p0147 N80-13705
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4257-1] 25 p0171 N80-15569

THIN WALLED SHELLS
The design of a thin walled toroidal vacuum chamber for a large RFP experiment --- Reversed Field Pinch
25 p0082 A80-19676

THOMSON SCATTERING
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers
25 p0060 A80-18111
A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering
25 p0084 A80-20165

THYRISTORS
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368

TIDAL WAVES
Transmission of tidal energy over a plateau
25 p0072 A80-18721

TIDEPOWER
Harnessing power from tides - State of the art
25 p0045 A80-16658
Waves, currents, tides - Problems and prospects
25 p0049 A80-17134
Ocean energy - Forms and prospects
25 p0061 A80-18162
Transmission of tidal energy over a plateau
25 p0072 A80-18721

TIDES
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647

TIME SERIES ANALYSIS
Wind time series analyses for WECS applications
[SAND-77-1701] 25 p0132 N80-12709

TIN OXIDES
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
Efficient indium tin oxide/polycrystalline silicon solar cells
25 p0039 A80-15136

TIRES
Ranking tires using a transient speed-time cycle
[PB-297756/9] 25 p0108 N80-11487

TITANIUM
Ion-stimulated sorption of nitrogen on a continuously deposited titanium film
25 p0051 A80-17252

TITANIUM NITRIDES
Ion-stimulated sorption of nitrogen on a continuously deposited titanium film
25 p0051 A80-17252

TITANIUM OXIDES
Hydrogen evolution from water using solid carbon and light energy
25 p0032 A80-13109

TOKAMAK DEVICES
Power supply requirements for a tokamak fusion reactor
25 p0003 A80-10474
Nonlinear modification of resonance-cone trajectories --- due to ponderomotive force in cylindrical plasma
25 p0006 A80-11347
Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349
A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour
25 p0022 A80-12453
Review of tokamak experiments
25 p0034 A80-13342
Volt-second consumption during the start-up phase of PLT
25 p0040 A80-15532
Selected topics on surface effects in fusion devices - Neutral-beam injectors and beam-direct converters
25 p0043 A80-16262
Particle beam systems in plasma diagnostics
25 p0045 A80-16718
Magnetic field design for a large tokamak
25 p0046 A80-16760
Plasma physics and controlled nuclear fusion research 1978; Proceedings of the Seventh International Conference, Innsbruck, Austria, August 23-30, 1978. Volumes 1, 2 & 3
25 p0053 A80-17751
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759
High-beta tokamaks
25 p0054 A80-17789
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
What is the mechanism responsible for the precursors of internal disruptions --- as observed in Tokamak plasma
25 p0054 A80-17807
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885
Summary on reactor systems --- tokamak devices
25 p0059 A80-17894
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers
25 p0060 A80-18111
Testing and performance of the 30 kA ohmic heating system for ASDEX --- tokamak experiment with axisymmetric diverter
25 p0078 A80-19585
Poloidal magnetic field design of a pulsed tokamak reactor
25 p0078 A80-19592
SISYFUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608
Refueling by means of pellets - Ablation rate and injection velocity considerations --- effects on plasma confinement in tokamak
25 p0080 A80-19611
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620

Constant current and constant voltage excitation of large coils by flywheel-generator-converter --- for fusion reactors
25 p0080 A80-19624
Neutronics in the toroidal belt-geometry of a screw pinch reactor
25 p0081 A80-19657
Blanket and power conversion system of NUWMAK --- tokamak reactor
25 p0081 A80-19658
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668
Main power supplies for large toroidal fusion experiments
25 p0082 A80-19670
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682
Status of the JET project --- Joint European Torus
25 p0082 A80-19708
JT-60 project --- tokamak fusion reactor design analysis
25 p0082 A80-19709
Power supply requirements for a tokamak fusion reactor
[ANL/FPP/TM-119] 25 p0104 N80-10918
United States magnetic fusion energy program
[DOE/ET-0072] 25 p0126 N80-12583
Conceptual design of a Demonstration Tokamak Hybrid Reactor (DTHR)
[WFPS-TME-107] 25 p0132 N80-12898

TOROIDAL PLASMAS
Measurements of the density fluctuations using the microwave scattering method --- for toroidal plasmas
25 p0046 A80-16731
Magnetic field design for a large tokamak
25 p0046 A80-16760
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
What is the mechanism responsible for the precursors of internal disruptions --- as observed in Tokamak plasma
25 p0054 A80-17807
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885
Fusion technology 1978; Proceedings of the Tenth Symposium, Padua, Italy, September 4-9, 1978. Volumes 1 & 2
25 p0078 A80-19581
Testing and performance of the 30 kA ohmic heating system for ASDEX --- tokamak experiment with axisymmetric diverter
25 p0078 A80-19585
A new high beta reversed field pinch machine
25 p0078 A80-19587
Numerical computations in the design of compact ignition experiments --- of D-T toroidal plasma heating
25 p0078 A80-19589
Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors
25 p0079 A80-19594
SISYFUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608
The combined d.c. power supply for JET --- Joint European Torus
25 p0080 A80-19621
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629
Neutronics in the toroidal belt-geometry of a screw pinch reactor
25 p0081 A80-19657
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682
Status of the JET project --- Joint European Torus
25 p0082 A80-19708
Effect of finite beta on drift-wave turbulence and particle confinement --- of toroidal plasma
25 p0084 A80-20158

TOROIDAL SHELLS
The design of a thin walled toroidal vacuum chamber for a large RFP experiment --- Reversed Field Pinch
25 p0082 A80-19676

TOXICITY
Dimensions/NBS, volume 63, no. 6, June 1979
[PB-297836/9] 25 p0105 N80-10975

TRACE ELEMENTS
Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180

TRACKING (POSITION)
An electronic device for intermittent tracking --- of sun in solar collectors
25 p0027 A80-12782

TRAFFIC CONTROL
New technology and vehicle operation on roadways
25 p0037 A80-14702

TRAILERS
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948

TRAJECTORY ANALYSIS
Nonlinear modification of resonance-cone trajectories --- due to ponderomotive force in cylindrical plasma
25 p0006 A80-11347

TRANSFER ORBITS
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204

TRANSFORMERS
Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362

TRANSISTOR AMPLIFIERS
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600

TRANSITION METALS
Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858

TRANSLATIONAL MOTION
Lateral and tilt whirl modes of flexibly mounted flywheel systems --- for energy storage
[SAND-78-7070] 25 p0115 N80-11622

TRANSMISSION EFFICIENCY
A 30-ps Josephson current injection logic /CIL/
25 p0030 A80-12853

TRANSMISSION LINES
Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346

TRANSMISSIONS (MACHINE ELEMENTS)
Impact of flywheel-transmissions on automobile performance: A logical basis for evaluation
[UCRL-52758] 25 p0137 N80-13480
TRANSMITTER RECEIVERS
Minimum cost transmitter-receiver antenna pairs --- antenna design for the satellite solar power station using optimal control theory
[RM-690] 25 p0094 N80-10414
TRANSPORT PROPERTIES
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922
Survey and description of transport phenomena in packed-beds --- for thermal energy storage
25 p0121 N80-12340
TRANSPORT THEORY
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846
TRANSPORTATION
Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382
Survey of liquid hydrogen container techniques for highway vehicle fuel system applications
[HCP/M2752-01] 25 p0092 N80-10383
Disaggregating PIES fuel forecasts, validating PIES transportation model data base, and other technical services
[TID-29000] 25 p0114 N80-11612
TRANSPORTATION ENERGY
The electric trolley bus - Revisited
25 p0002 A80-10321
Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324
Development of a sodium/sulphur battery for rail applications
25 p0031 A80-13003
The role of technology as air transportation faces the fuel situation
25 p0037 A80-14700
Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings
25 p0037 A80-14701
New technology and vehicle operation on roadways
25 p0037 A80-14702
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
Ethyl alcohol production and use as a motor fuel --- Book
25 p0050 A80-17241
Osmotically pumped energy transport system
[AIAA PAPER 80-0210] 25 p0064 A80-18378
Electric and hybrid vehicles: Commercialization phase 3 planning
[DOE/ERD-0004] 25 p0151 N80-14349
TRAPPED PARTICLES
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194
TRAVELING WAVES
A pistonless Stirling engine - The traveling wave heat engine
25 p0031 A80-13011
TREES (PLANTS)
Energy plantation for coromandel littoral --- growing plant materials for fuel value in India
25 p0023 A80-12742
TRIGGER CIRCUITS
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629
TRIODES
The thermal triode --- construction by adding controlling zone to heat pipe
25 p0037 A80-14675
TRITIUM
Tandem mirror reactors --- for controlled fusion
25 p0059 A80-17887
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4
25 p0081 A80-19660
Possible improvements to a basic cellular thin blanket fusion reactor configuration
25 p0081 A80-19664
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668
Evaluation of fuel resources and requirements for the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570
TRUCKS
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948
Demand for special performance vehicles, 1975 - 2025
[UCRL-13911] 25 p0133 N80-12960
Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0136 N80-13297
TUBE HEAT EXCHANGERS
Experimental and analytical CTEC studies at ORNL
[CONF-790631-1] 25 p0143 N80-13666
Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499
TUNNEL DIODES
AlGaAs tunnel diode
25 p0046 A80-16799
TURBINE BLADES
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116
On the weathervaning of wind turbines
25 p0047 A80-16952
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553
TURBINE PUMPS
New concepts for converting the energy in low-to medium-temperature liquids, with emphasis on geothermal applications
[UCRL-52583] 25 p0125 N80-12570
TURBINE WHEELS
The pedal wind turbine
25 p0008 A80-11645
On the weathervaning of wind turbines
25 p0047 A80-16952
TURBINES
Executive summary: Mod-1 wind turbine generator analysis and design report
[NASA-CR-159497] 25 p0109 N80-11558
Hybrid staging of geothermal energy conversion processes
[UCID-17949] 25 p0125 N80-12569
Efforts on the economic analysis of Darrieus vertical axis wind turbines
[SAND-78-1851C] 25 p0126 N80-12579
Induction and synchronous machines for vertical axis wind turbines
[SAND-79-7017] 25 p0144 N80-13675
Lawrence Livermore Laboratory geothermal energy program: A status report on the development of the Total-Flow concept
[UCRL-50046-77] 25 p0159 N80-14529
Darrieus wind turbine program at Sandia Laboratories
[SAND-79-0997C] 25 p0160 N80-14538
Alternate cycles applied to ocean thermal energy conversion
[SERI/TP-34-180] 25 p0172 N80-15571
TURBOGENERATORS
Experimental demonstration of the diffuser-augmented wind turbine concept
25 p0007 A80-11643
Electricity generation from jet-stream winds
25 p0007 A80-11644
Prime mover for solar power plant
25 p0024 A80-12752
Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells
25 p0035 A80-14592
A low level wind measurement technique for wind turbine generator siting
25 p0042 A80-16084
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586

Novel power generation cycles using coal gas
[ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716
Open cycle air turbine solar thermal power system
25 p0083 A80-19989
Utilization of ocean heat for hydrogen production
25 p0086 A80-20686
The first small power system experiment, Phase 1: Engineering experiment no. 1 --- solar thermal electric power plants
[NASA-CR-162417] 25 p0095 N80-10596
Land-based application of an OTEC open-cycle power system
[CONF-790631-3] 25 p0144 N80-13676

TURBOMACHINE BLADES
Impact of new instrumentation on advanced turbine research
[NASA-TM-79301] 25 p0166 N80-15133

TURBOMACHINERY
Turbomachinery options for an underground pumped hydroelectric storage plant
[CONF-790803-50] 25 p0177 N80-15629

TURBOSHAFTS
Development of an aircraft-derivative gas turbine with high performance and large output
25 p0003 A80-10823

TURBULENT FLOW
Feasible thermophysical conditions for gas receiver tubes in solar power stations
[ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627
Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels
[AIAA PAPER 80-0075] 25 p0076 A80-19275
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

TURBULENT HEAT TRANSFER
Studies in heat transfer: A Festschrift for E. R. G. Eckert --- Book
25 p0036 A80-14655

TWO PHASE FLOW
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882

U

U.S.S.R.
Soviet energy balances
[RAND/R-2257-DOE] 25 p0099 N80-10634

ULTRAHIGH FREQUENCIES
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600

ULTRASONIC TESTS
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques --- components of coal gasification and liquefaction pilot plants
[CONF-790480-1] 25 p0167 N80-15259

UNDERGROUND STORAGE
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846
Under ground thermal storage in the operation of solar ponds
25 p0077 A80-19471
Underground pumped hydro storage: An overview
[CONF-781046-1] 25 p0116 N80-11624
Trans-seasonal storage of solar energy: Innovative research program subtask --- underground storage
[COO-4546-3] 25 p0144 N80-13672
Compressed air energy storage technology program --- concept for supplying electric power to meet peak load demands
[PNL-2935] 25 p0160 N80-14534
Turbomachinery options for an underground pumped hydroelectric storage plant
[CONF-790803-50] 25 p0177 N80-15629

UNDERGROUND TRANSMISSION LINES
Some dc superconducting cables --- for underground power transmission
[LA-UR-79-1057] 25 p0107 N80-11348

UNDERWATER RESOURCES
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747

UNITED KINGDOM
Development of renewable energy sources in the United Kingdom
25 p0017 A80-11980

UNITED NATIONS
Some solar energy programmes in the United Nations system
25 p0006 A80-11342
The United Nations' approach to geothermal resource assessment
25 p0076 A80-19207

UNITED STATES OF AMERICA
United States energy alternatives to 2010 and beyond - The CONAES study
25 p0008 A80-11827
Review of scenarios of future U.S. energy use
25 p0009 A80-11832
A review of the U.S. wind energy programme
25 p0042 A80-16083
Can alternative energy resources be brought into large-scale use in the United States by the year 2000
25 p0048 A80-17128
Another look at energy conservation
[LBL-7893] 25 p0097 N80-10611
National energy plan 2
[DOE/TIC-10109] 25 p0097 N80-10618
Overview of geothermal energy in the United States
[CONF-790530-1] 25 p0102 N80-10661
Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543
Southeastern forum on appropriate technology
[PB-298796/4] 25 p0118 N80-11965
Identification of a methodology for projecting short-term crude petroleum production in the United States
[DOE/EIA-0103/14] 25 p0122 N80-12542
United States magnetic fusion energy program
[DOE/ET-0072] 25 p0126 N80-12583
Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery
[FE-2025-38] 25 p0130 N80-12624
National energy act of 1978: Far western perspective. A study for the US Department of Energy, Federal Region 9
[UCID-17944-REV-1] 25 p0132 N80-12955
Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607
US energy flow in 1978
25 p0158 N80-14517
Federal Energy Data System (FEDS) statistical summary update
[DOE/EIA-0192] 25 p0177 N80-15630
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

UNIVERSITIES
National environmental/energy workforce assessment, phase 3. Air programs --- bibliography
[PB-298580/2] 25 p0117 N80-11670

UPPER VOLTA
A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552

URANIUM
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466

URANIUM ISOTOPES
The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329

URANIUM OXIDES
Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740

URANIUM 233
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602
URBAN DEVELOPMENT
Back to the central city - Myths and realities
25 p0002 A80-10323
Colloquium on the Microclimatic Environment and Habitat, Reims, France, May 21-23, 1979, Proceedings
25 p0041 A80-15968
Dimensions/NBS, volume 63, no. 6, June 1979
[PB-297836/9] 25 p0105 N80-10975
Report on Finnish technological activities
25 p0119 N80-11591
URBAN PLANNING
Hydrogen fuel applications for urban transit
25 p0037 A80-14703
An optimization model for overall urban energy planning
25 p0038 A80-14844
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653
URBAN RESEARCH
Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494
Definition and analysis of the barriers to the implementation of urban energy recovery systems
[ANL/CNSV/TM-2] 25 p0159 N80-14525
URBAN TRANSPORTATION
The electric trolley bus - Revisited
25 p0002 A80-10321
Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324
Linear synchronous motor development for urban and rapid transit systems
25 p0062 A80-18167
The status of advanced propulsion systems for urban rail vehicles
[PB-297980/5] 25 p0133 N80-12962
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
USER MANUALS (COMPUTER PROGRAMS)
User's manual for the magnetohydrodynamic generator channel code, MHDCHN
[SAND-78-1260] 25 p0132 N80-12894
USER REQUIREMENTS
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978
Proposed research planning format for the Environmental Assessment Department --- needs and concerns of groups concerned with environment and energy issues
[EPRI-EA-1018] 25 p0103 N80-10692
Proceedings: Solar Thermal Power User Review Panel Meeting
[SERI/TP-69-221] 25 p0113 N80-11598
UTILITIES
The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436
The financing problems of Europe's gas industry
25 p0032 A80-13174
A solar thermal electric power plant for small communities
[ASME PAPER 79-WA/SOL-7] 25 p0069 A80-18584
Modeling and simulation of WECS assisted utility systems --- Wind-Electric Conversion System
25 p0088 A80-20887
Regional reference energy systems: Electric utility applications
[BNL-50962] 25 p0111 N80-11585
Demand management demonstration project. Stage 1: Development of residential load characteristics. Stage 4: Demonstration of residential incremental cost pricing implemented by time-of-day metering
[HCP/B8072-01] 25 p0118 N80-11941
Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes
[EPRI-ER-978-VOL-3] 25 p0139 N80-13628
Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560

V

VACUUM CHAMBERS
The design of a thin walled toroidal vacuum chamber for a large RFP experiment --- Reversed Field Pinch
25 p0082 A80-19676
VACUUM DEPOSITION
Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788
VACUUM EFFECTS
Solar concentrators using vacuum-contoured surfaces for tracking
[AIAA PAPER 80-0399] 25 p0077 A80-19326
VAPOR DEPOSITION
Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion
25 p0087 A80-20722
VAPOR PHASES
Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282
VAPOR PRESSURE
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204
Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273
VAPORS
Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10689
VELOCITY DISTRIBUTION
Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922
VERTICAL TAKEOFF AIRCRAFT
Fuel minimal take-off path of jet lift VTOL aircraft, log no. C3558
25 p0105 N80-11066
VISCOUS FLOW
Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349
VLASOV EQUATIONS
New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium
25 p0085 A80-20538
VOLCANOES
Geothermal energy development from the Salton Trough to the High Cascades --- Cerro Preto, Lower California and Mt. Hood, Oregon
[LBL-8703] 25 p0171 N80-15568
VOLT-AMPERE CHARACTERISTICS
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430
Some problems with variable operation of an MHD generator
25 p0035 A80-14530
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
AlGaAs tunnel diode
25 p0046 A80-16799

Relating computer simulation studies with interface state measurements on MIS solar cells
25 p0062 A80-18231

VOLTAGE CONVERTERS (DC TO DC)
Unconventional circuits for static voltage transformers
[BMFT-FE-T-78-26] 25 p0107 N80-11368

VOLTAGE REGULATORS
Controllable d.c. power supply from wind-driven self-excited induction machines
25 p0075 A80-19031

VORTICES
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620

W

WAFERS
Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines
25 p0082 A80-19672
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561

WALL JETS
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996

WALL TEMPERATURE
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600

WALLS
Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680

WASTE DISPOSAL
The uncertain costs of waste disposal and resource recovery
25 p0043 A80-16150
Simulation of solar-assisted urban sewage digestion
[ASME PAPER 79-WA/SOL-36] 25 p0065 A80-18556
Quality assurance in alternative energy sources
[RHO-SA-107] 25 p0095 N80-10504
World Energy Data System (WENDS). Volume 11: Nuclear fission program summaries
[ANL-PMS-79-2-VOL-11] 25 p0124 N80-12562
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691

WASTE ENERGY UTILIZATION
Techniques for evaluation of advanced cogeneration technologies
25 p0014 A80-11957
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128
Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646
Deep space network feasibility study of terminating Southern California Edison electrical service to Goldstone --- cost analysis of electric power supplies and waste energy utilization
25 p0091 N80-10263
Waste Heat Utilization: Proceedings of 1978 Engineering Foundation Conference
[CONF-7808102] 25 p0102 N80-10665
High COP heat pump system, phase 1, results
[HCP/M5056-01] 25 p0110 N80-11573
Heat pump centered integrated community energy systems: System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
Waste heat rejection from geothermal power stations
[ORNL/TM-6533] 25 p0125 N80-12575
Land-based application of an OTEC open-cycle power system
[CONF-790631-3] 25 p0144 N80-13676
Conceptual designs for two reject heat systems for a Brayton closed-cycle converter
[LA-7821-MS] 25 p0144 N80-13677
Cogeneration opportunities --- conferences
[CONF-7806118] 25 p0145 N80-13681
Definition and analysis of the barriers to the implementation of urban energy recovery systems
[ANL/CNSV/TM-2] 25 p0159 N80-14525
Utilization of waste heat from Federal facilities
[ORO-5523-T1] 25 p0173 N80-15590
Aquifer thermal energy storage
[LBL-7070] 25 p0176 N80-15618
Characterization of operating conditions for gas/water heat recovery steam generators
[ORNL/TM-6622] 25 p0176 N80-15620
Analysis of potential implementation levels for waste heat utilization in the nuclear power industry
[ORNL/TM-63-2] 25 p0177 N80-15625

WASTE TREATMENT
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700
US program for the immobilization of high-level nuclear wastes
[DP-MS-79-2] 25 p0149 N80-13917

WASTE UTILIZATION
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028
Resource recovery systems costs
25 p0001 A80-10029
Energy conservation through recycling
25 p0003 A80-10842
Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959
Pelletized wood /Woodex/ - Applications and potential --- from biomass waste products
25 p0017 A80-11981
Source, supply and nature of municipal and industrial waste as a fuel
25 p0017 A80-11983
Environmental protection in the processing of coal - The utilization or disposal of coal processing residues
25 p0030 A80-12942
Hydrogen - The Denver story
25 p0038 A80-14709
The relative value of energy derived from municipal refuse
25 p0051 A80-17352
Energetics aspects of environmental protection
25 p0072 A80-18733
Gasification of solid waste in a fluidized bed reactor with circulating sand
25 p0074 A80-18868
The microbial production of methane from household wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870
The basics of magnetic separation as applied to municipal solid waste reclamation plants
25 p0074 A80-18871
Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0765/2] 25 p0102 N80-10667
Gasification of residual materials from coal liquefaction
[FE-2247-22] 25 p0135 N80-13289
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648
Pilot plant gasification test on biomass fuels
[PB-299077/8] 25 p0151 N80-14272
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521
Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste
[CONF-790373-1] 25 p0163 N80-14562
Conversion of cellulosic and waste polymer material to gasoline
[COO-2982-38] 25 p0169 N80-15291
Energy optimal use of waste paper
[COO-2893-9] 25 p0174 N80-15595

WASTE WATER
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559
Energy conservation through point source recycle with high temperature hyperfiltration --- textile industry
[PB-299183/4] 25 p0180 N80-15688

WATER

Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So2-I2 system for H2O decomposition
25 p0032 A80-13196

Seminar on Hydrogen as an Energy Vector: Its Production, Use and Transportation, 1st, Brussels, Belgium, October 3, 4, 1978, Proceedings
25 p0041 A80-15976

Thermodynamics of water-splitting --- for hydrogen production
25 p0052 A80-17575

Water electrolysis --- for hydrogen production
25 p0052 A80-17576

Direct thermal decomposition of water
25 p0052 A80-17577

Thermochemical hydrogen production
25 p0052 A80-17578

Photochemical hydrogen production
25 p0052 A80-17579

Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice
25 p0078 A80-19473

Underground pumped hydro storage: An overview
[CONF-781046-1] 25 p0116 N80-11624

WATER HEATING

Economy of a retrofit solar system --- water heating
25 p0017 A80-11984

The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436

Testing of three installed solar domestic water heaters
25 p0025 A80-12758

An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822

Flat-plate solar collector materials
25 p0035 A80-14409

A study of the thermal effect that radiant energy produces on a mass of water --- Spanish thesis
25 p0040 A80-15653

A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750

Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

Solar heating system performance estimation using sinusoidal inputs
25 p0061 A80-18130

Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301

Evaluation of a solar heating system installed in the LSU Field House
[ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576

An optimization formulation for solar hot water systems
[ASME PAPER 79-WA/SOL-42] 25 p0068 A80-18578

A comparison of test results for flat-plate water-heating solar collectors using the ESE and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585

Solar energy system performance evaluation: A-Frame Industries, single family dwelling,' Kaneohe, Hawaii
[SOLAR/1010-78/14] 25 p0101 N80-10659

Solar heating and cooling systems design and development
[NASA-CR-150873] 25 p0109 N80-11560

Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings
[BMFT-FB-T-78-48] 25 p0116 N80-11630

Double-exposure collector system
[TID-28964] 25 p0127 N80-12593

Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1] 25 p0130 N80-12613

Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660

Commercialization strategy report for solar water heating
[TID-28856-DRAFT] 25 p0161 N80-14545

Commercializing solar heating: A national strategy needed
[PB-297882/3] 25 p0164 N80-14575

WATER POLLUTION

Mineral changes during oil shale retorting
25 p0085 A80-20455

Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204

Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676

WATER QUALITY

Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641

Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470

WATER RESOURCES

Water use alternatives for Navajo energy production
[LA-UR-79-1598] 25 p0178 N80-15643

WATER TEMPERATURE

Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541

WATER TREATMENT

A cheap method of improving the performance of roof type solar stills
25 p0006 A80-11343

WATER WAVES

Wave power systems
[PB-299851/6] 25 p0164 N80-14576

WATERWAVE ENERGY

Development of renewable energy sources in the United Kingdom
25 p0017 A80-11980

Ocean energy - Forms and prospects
25 p0061 A80-18162

WATERWAVE ENERGY CONVERSION

On the basic dynamics of extracting power from waves
25 p0038 A80-14837

Power from ocean waves
25 p0045 A80-16655

Waves, currents, tides - Problems and prospects
25 p0049 A80-17134

Wave power systems
[PB-299851/6] 25 p0164 N80-14576

WATERWAVE POWERED MACHINES

On the basic dynamics of extracting power from waves
25 p0038 A80-14837

WAVE EXCITATION

Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855

WAVE GENERATION

Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870

WAVE PROPAGATION

Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346

WEAR

Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques --- components of coal gasification and liquefaction pilot plants
[CONF-790480-1] 25 p0167 N80-15259

WEATHER MODIFICATION

Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

WEATHER STATIONS

Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655

WEIBULL DENSITY FUNCTIONS

The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes
25 p0042 A80-16086

WEIGHT REDUCTION

Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641

WELDED STRUCTURES

Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-3] 25 p0119 N80-12163

WELLS

Bell Creek residual oil saturation technology test [BETC-2180-4] 25 p0108 N80-11546

Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base [NTIS/PS-79/0814/8] 25 p0148 N80-13715

WEST VIRGINIA

Oil recovery by carbon dioxide injection --- West Virginia [ORO-5301-34] 25 p0108 N80-11545

WIND (METEOROLOGY)

Wind resource analysis [SERI/TR-36-088] 25 p0132 N80-12710

Solar-climactic statistical study --- windpower utilization and solar energy conversion [HCP/T4016-01/2] 25 p0149 N80-13747

WIND EFFECTS

On the weathervaning of wind turbines 25 p0047 A80-16952

WIND MEASUREMENT

The assessment of actual wind power availability in Ireland 25 p0003 A80-10844

Measurements on a 15 kW wind energy conversion system 25 p0039 A80-15329

WIND PROFILES

Modified power law equations for vertical wind profiles [NASA-TM-79275] 25 p0138 N80-13623

WIND TUNNEL TESTS

Experimental demonstration of the diffuser-augmented wind turbine concept 25 p0007 A80-11643

Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles 25 p0046 A80-16948

WIND VARIATIONS

Solar-climatic statistical study. Summary report, volume 1 [HCP/T4016-1] 25 p0132 N80-12707

WIND VELOCITY MEASUREMENT

A low level wind measurement technique for wind turbine generator siting 25 p0042 A80-16084

The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes 25 p0042 A80-16086

Modeling and simulation of WECS assisted utility systems --- Wind-Electric Conversion System 25 p0088 A80-20887

WINDMILLS (WINDPOWERED MACHINES)

Aeroelastic stability and response of horizontal axis wind turbine blades 25 p0032 A80-13116

Controllable d.c. power supply from wind-driven self-excited induction machines 25 p0075 A80-19031

Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model [DM-26] 25 p0116 N80-11631

Evaluation of feasibility of prestressed concrete for use in wind turbine blades [NASA-CR-159725] 25 p0170 N80-15553

WINDPOWER UTILIZATION

The assessment of actual wind power availability in Ireland 25 p0003 A80-10844

Some solar energy programmes in the United Nations system 25 p0006 A80-11342

The pedal wind turbine 25 p0008 A80-11645

The compatibility of wind and solar technology with conventional energy systems 25 p0008 A80-11828

A review of the U.S. wind energy programme 25 p0042 A80-16083

Comparative performance measurements on a Savonius rotor with ancillary surfaces 25 p0042 A80-16085

The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes 25 p0042 A80-16086

An analysis of the potential of wind energy conversion systems 25 p0048 A80-17133

Methods of estimating the reliability of wind energy systems with storage [UCRL-15005] 25 p0098 N80-10623

Fluid dynamic aspects of wind energy conversion [AGARD-AG-243] 25 p0103 N80-10683

Wind energy systems: Program summary [DOE/ET-0093] 25 p0111 N80-11578

Status of information for consumers of small wind energy systems [SERI/TP-51-158] 25 p0113 N80-11602

Efforts on the economic analysis of Darrieus vertical axis wind turbines [SAND-78-1851C] 25 p0126 N80-12579

Solar mechanical energy storage project [SAND-78-1982C] 25 p0127 N80-12590

Solar-climatic statistical study. Summary report, volume 1 [HCP/T4016-1] 25 p0132 N80-12707

Wind time series analyses for WECS applications [SAND-77-1701] 25 p0132 N80-12709

Wind resource analysis [SERI/TR-36-088] 25 p0132 N80-12710

Modified power law equations for vertical wind profiles [NASA-TM-79275] 25 p0138 N80-13623

Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes [EPRI-ER-978-VOL-3] 25 p0139 N80-13628

Wind energy innovative systems [SERI/PR-13-054] 25 p0144 N80-13674

Induction and synchronous machines for vertical axis wind turbines [SAND-79-7017] 25 p0144 N80-13675

Environmental development plan: Wind energy conversion [DOE/EDP-0030] 25 p0147 N80-13701

Solar-climactic statistical study --- windpower utilization and solar energy conversion [HCP/T4016-01/2] 25 p0149 N80-13747

A probabilistic study of wind-electric conversion systems from the point of view of reliability and capacity credit 25 p0153 N80-14475

Barriers to the application of wind energy conversion systems in urban settings 25 p0155 N80-14494

Analysis of remote site energy storage and generation systems --- systems analysis of solar energy conversion and windpower utilization energy storage systems [AD-A074869] 25 p0156 N80-14504

Darrieus wind turbine program at Sandia Laboratories [SAND-79-0997C] 25 p0160 N80-14538

Commercialization strategy report for small wind systems [TID-28844-DRAFT] 25 p0161 N80-14543

Commercialization strategy report for large wind systems [TID-28843-DRAFT] 25 p0161 N80-14544

Assessment of the applicability of the national fire weather data library to wind energy analyses [PNL-2538] 25 p0165 N80-14655

Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions [UCRL-15053] 25 p0177 N80-15628

WINDPOWERED GENERATORS

Experimental demonstration of the diffuser-augmented wind turbine concept 25 p0007 A80-11643

Electricity generation from jet-stream winds 25 p0007 A80-11644

Wind energy conversion system with electromagnetic stabiliser 25 p0031 A80-13004

Autonomous power supplies for telecommunications 25 p0033 A80-13211

Measurements on a 15 kW wind energy conversion system 25 p0039 A80-15329

The Kirsten rotor as a wind turbine 25 p0039 A80-15330

A low level wind measurement technique for wind turbine generator siting
25 p0042 A80-16084
Comparative performance measurements on a Savonius rotor with ancillary surfaces
25 p0042 A80-16085
On the weathervaning of wind turbines
25 p0047 A80-16952
An analysis of the potential of wind energy conversion systems
25 p0048 A80-17133
RAPAD - Real-time Accurate Performance Analysis of Data --- for performance estimation of wind energy conversion system
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565
Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation
[ASME PAPER 79-WA/SOL-2] 25 p0067 A80-18571
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620
Modeling and simulation of WECS assisted utility systems --- Wind-Electric Conversion System
25 p0088 A80-20687
Methods of estimating the reliability of wind energy systems with storage
[UCRL-15005] 25 p0098 N80-10623
Fluid dynamic aspects of wind energy conversion
[AGARD-AG-243] 25 p0103 N80-10683
Executive summary: Mod-1 wind turbine generator analysis and design report
[NASA-CR-159497] 25 p0109 N80-11558
Modified aerospace reliability and quality assurance method for wind turbines
[NASA-TM-79284] 25 p0137 N80-13490
Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes
[EPRI-ER-978-VOL-3] 25 p0139 N80-13628
Wind energy innovative systems
[SERI/PR-13-054] 25 p0144 N80-13674
Induction and synchronous machines for vertical axis wind turbines
[SAND-79-7017] 25 p0144 N80-13675
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544

WINDPOWERED PUMPS
A solar assisted and wind powered heat pump for residential dwellings
[ASME PAPER 79-WA/HT-33] 25 p0070 A80-18595

WINTER
Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370

WIRE CLOTH
The spectral selectivity of conducting micromeshes --- as solar energy absorbers
25 p0087 A80-20720

WOOD
Near term potential of wood as a fuel
[HCP/C4101] 25 p0093 N80-10389

WORKING FLUIDS
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
Selection of working fluids for low temperature solar thermal power cycles
25 p0024 A80-12751
Performance characteristics of solar regenerators
25 p0028 A80-12787
Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898
Influence of the working fluid on heat transfer and layout of solar tower receivers
25 p0036 A80-14671
Heat exchange fluids and techniques --- Book
25 p0041 A80-15659
Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction
[ASME PAPER 79-WA/SOL-18] 25 p0065 A80-18557
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716

X

X RAY ANALYSIS
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110

X RAY SPECTRA
Hard X-ray measurements --- performed on plasma confinement devices
25 p0045 A80-16722
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776

Z

ZINC
Zinc-bromine battery studies
25 p0010 A80-11845
Recent advances in zinc-bromine batteries
25 p0010 A80-11846

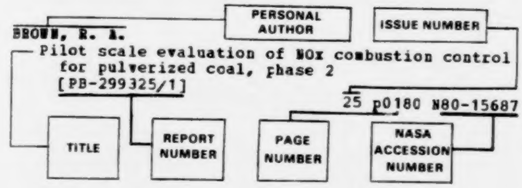
ZINC SELENIDES
Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571

PERSONAL AUTHOR INDEX

ENERGY/*A Continuing Bibliography (Issue 25)*

APRIL 1980

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The issue, page and accession numbers are located beneath and to the right of the title, e.g., 25 p0180 N80-15687. Under any one author's name the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

AAMODT, R. E.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

AASE, D. T.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

ABBEY, D.
Water use alternatives for Navajo energy production
[LA-UR-79-1598] 25 p0178 N80-15643

ABBIN, J. P., JR.
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
[SAND-78-2163C] 25 p0146 N80-13693

ABBOTT, I. H. A.
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559

ABDEL-KHALIK, S. I.
On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427

ABDOU, M. A.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

ABDURAKHMANOV, A.
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system
25 p0036 A80-14597
Investigation of absorptive and radiative characteristics of an ideal selective surface
25 p0044 A80-16632

ABELES, T. P.
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398

ABILOCK, H.
Dynamic energy system optimization model
[EPRI-EA-1079] 25 p0157 N80-14514
MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version)
[BNL-26390] 25 p0178 N80-15634

ABRAHAM, B. M.
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265

ABRAMS, M.
Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596

ACHARD, J. C.
Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200

ACHARYA, H. N.
GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774

ADAM, J.
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608

ADLER, D.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

ADLHART, O.
Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride
[AD-A071157] 25 p0139 N80-13625

AGGEEVA, I. A.
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system
25 p0036 A80-14597

AGNIHOTRI, O. P.
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747

AHRENS, F. W.
Design optimization of aquifer reservoir-based compressed air storage systems
[CONF-781046-5] 25 p0116 N80-11628

AHGREN, B.
Utility fuel cells for Sweden
25 p0011 A80-11852

AHLBOM, K.
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049

AHLUWALIA, R. K.
Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355
Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304

AHMAD, A.
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795

AHMAD, B. S.
A policy-sensitive model of technology assessment
25 p0004 A80-11140

AHMADI, G.
Under ground thermal storage in the operation of solar ponds
25 p0077 A80-19471

AHMED, S. B.
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748

AHN, Y. K.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576

AHNER, D. J.
Fixed-bed gasifier dynamic model for IGCCP control study
25 p0088 A80-20883

AIMAN, W. R.
Laboratory coal gasifier facility
[UCRL-82602] 25 p0106 N80-11245

AKAGAWA, K.
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-197[illegible]6

AKBARZADEH, A.
Under ground thermal storage in the operation of solar ponds
25 p0077 A80-19471

AKINSETE, V. A.
A cheap method of improving the performance of roof type solar stills
25 p0006 A80-11343

AKULINA, D. K.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

ALARIO, J.
Performance testing of a hydrogen heat pipe
[AIAA PAPER 80-0212] 25 p0064 A80-18379

ALBANESE, A. S.
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639

ALBERY, W. J.
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343
Photogalvanic cells
25 p0073 A80-18749

ALEXANDER, A. G.
Production of sugarcane and tropical grasses as a renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277

ALEXANDER, G.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688

ALEXANDER, J. H.
Dynamic modeling of H2S clean-up processes
25 p0088 A80-20885

ALEXANDER, S. S.
Anton permselective membrane
[NASA-CR-159599] 25 p0122 N80-12551

ALEXANDER, W.
Solar concentrators using vacuum-contoured surfaces for tracking
[AIAA PAPER 80-0399] 25 p0077 A80-19326

ALLRED, D. D.
Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion
25 p0087 A80-20722

ALLSUP, J. R.
Ethanol/gasoline blends as automotive fuels
[CONF-790520-5] 25 p0168 N80-15280

ALMUALA, B. C.
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285

ALPERT, S. B.
The near term potential for gasification-combined cycle electric power generation
25 p0015 A80-11970

ALTSEIMER, J. H.
Selected results from the technology assessment of solar energy program
[LA-UR-79-950] 25 p0099 N80-10637

AMHERD, N. A.
Feasibility study for enhancing the development of fusion energy
[EPRI-ER-778-SR] 25 p0178 N80-15642

AMIRANOFF, A.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

ANTHOR, F. R.
Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1] 25 p0130 N80-12613

ANAND, D. K.
Solar cooling performance predictions via stochastic weather algorithms
25 p0020 A80-12430
Validation methodology for solar heating and cooling systems
25 p0020 A80-12431

ANDERSON, C. J.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Environmental aspects of alternative fuels utilization for highway vehicles
[UCRL-81841] 25 p0120 N80-12201
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

ANDERSON, J.
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565

ANDERSON, L. A.
Analysis of remote site energy storage and generation systems
[AD-A074869] 25 p0156 N80-14504

ANDERSON, P. J.
LNG industry: An overview of projects and costs
[CONF-7811112-2] 25 p0168 N80-15278

ANDERSON, T. D.
Outlook for nuclear fission energy
[CONF-7811126-1] 25 p0157 N80-14509

ANDERSON, W. A.
Relating computer simulation studies with interface state measurements on MIS solar cells
25 p0062 A80-18231

ANDERSSON, B.
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847

ANDREEV, N. E.
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871

ANDREEV, V. I.
Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898

ANDREWS, J. W.
Solar assisted heat pump overview and summary of in-house research
[BNL-24911] 25 p0098 N80-10624

ANDRIA, G. D.
Mathematical modeling of coal gasification processes
25 p0089 A80-20913

ANDRIUKHINA, E. D.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

ANG, P.
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
[CONF-781063-2] 25 p0115 N80-11615

ANISIMOV, A. M.
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138

ANNAKLYCHEVA, O.
Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

ANNAMALAI, N. K.
Computer analysis of grids currently used for CdS/Cu2S solar cells
25 p0089 A80-20893

ANNANIIAZOV, K. O.
Brightness distribution over the solar disk
25 p0050 A80-17243

ANOSHIN, IU. A.
Photoconverter with bilateral sensitivity
25 p0044 A80-16625

ANTAL, M. J., JR.
Biomass energy enhancement: A report to the President's Council on Environmental Quality
[PB-296624/0] 25 p0094 N80-10396

ANTHONY, R. G.
Conversion of coal-based methanol to ethylene and a gaseous fuel
[PB-301256/4] 25 p0169 N80-15297

ANTOINE, P.
Development of silver-hydrogen cells
25 p0010 A80-11844

ANTONOPOULOS, A. A.
Fusarium species: Their potential for transforming biomass to ethanol
[ANL/EES/TM-38] 25 p0151 N80-14271

AOTA, H.
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716

APLEY, W. J.
SHADE - A computer model for evaluating the optical performance of two-axis tracking parabolic concentrators
[ASME PAPER 79-WA/SOL-13] 25 p0068 A80-18581

APOLLONSKII, S. M.
Calculation of the low-frequency electromagnetic field of MHD machines encapsulated in a common screening shell
25 p0030 A80-12896

APPELMAN, E. H.
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265

APPELT, J.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

ARCHBOLD, P.
OTEC-1 test conductor program
[CONF-780550-9] 25 p0163 N80-14563

ARRINGTON, K.
Direct labor requirements for select solar energy technologies: A review and synthesis
[SERI/RR-53-045] 25 p0126 N80-12578

ARMSTRONG, J. R. C.
A review of the U.S. wind energy programme
25 p0042 A80-16083

ARORA, J. D.
Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125

ARRILLAGA, J.
Controllable d.c. power supply from wind-driven self-excited induction machines
25 p0075 A80-19031

ARVIZU, D. E.
Solar thermal test facility heliostat development
[SAND-78-1177] 25 p0140 N80-13642

ARZHANNIKOV, A. V.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

ASBURY, J. G.
Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370
Electric heat - The right price at the right time
25 p0062 A80-18184

ASHWORTH, J.
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520

ASTER, R. W.
SAMICS: Input data preparation
[NASA-CR-162421] 25 p0110 N80-11570

ATANACKOVIC, M.
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849

ATHAY, T. M.
Area load-frequency control
25 p0022 A80-12735

ATKINSON, D. W.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826

ATKINSON, P.
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205

ATKINSON, P. G.
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase
25 p0076 A80-19209

ATKINSON, S. E.
Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287

AUGENSTEIN, D. C.
Methane fermentation of aquatic biomass
25 p0043 A80-16148

AUH, P. C.
Evlaution of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
[BNL-26218] 25 p0162 N80-14552

AULD, H. E.
Analysis of field test results for single-axis-tracking solar collector foundations
[SAND-79-7023] 25 p0173 N80-15586

AULT, L. E.
Summary report of the Solar Reflective Materials Technology Workshop
[PNL-2763] 25 p0097 N80-10613

AUSTIN, A. L.
New concepts for converting the energy in low-to medium-temperature liquids, with emphasis on geothermal applications
[UCRL-52583] 25 p0125 N80-12570
Lawrence Livermore Laboratory geothermal energy program: A status report on the development of the Total-Flow concept
[UCRL-50046-77] 25 p0159 N80-14529

AUZILLEAU, J.
Autonomous power supplies for telecommunications
25 p0033 A80-13211

AVEZOV, R. R.
On a calculation procedure for a heat accumulator in a solar heating system
25 p0044 A80-16630
Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631

AXON, K. B.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754

AZECHI, H.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868

AZIMOV, O.
On a calculation procedure for a heat accumulator in a solar heating system
25 p0044 A80-16630

AZIMOV, S. A.
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629

AZODI, H.
End plugging of a hot linear theta pinch
25 p0055 A80-17824

B

BACH, W.
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979
25 p0047 A80-17126
Exploring alternative energy strategies
25 p0047 A80-17127

BAER, C. A.
RAPAD - Real-time Accurate Performance Analysis of Data
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565

BAER, M.
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655

BAGATIN, M.
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811

BAILEY, E. E.
Methanol from coal - An adaption from the past
25 p0033 A80-13224

BAILEY, E. W.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

BAILIE, R. C.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576

BAIR, W. G.
HYGAS process update
[CONF-781045-4] 25 p0120 N80-12200

BAIRAMOV, R.
Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

BAIRD, M. D.
Recent advances in high temperature primary lithium batteries
25 p0013 A80-11863

BAJURA, R. A.
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551

BAKER, A.
Coal liquefaction - An international perspective
25 p0015 A80-11964

BAKER, B. S.
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861

BAKER, C. C.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

BAKER, C. R.
Economics of hydrogen production and liquefaction updated to 1980
[NASA-CR-159163] 25 p0106 N80-11238

BAKER, D. A.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

BAKER, L. J.
Some implications of a cellular structure in minimum thickness fusion reactor blankets
25 p0081 A80-19663

BAKER, N. R.
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263

BAKER, R. D.
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program
[LA-7519-PR] 25 p0118 N80-11889

BAKER, R. W.
A low level wind measurement technique for wind turbine generator siting
25 p0042 A80-16084

BAKER, W.
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617

BALCOMB, J. D.
Sensitivity of direct gain space heating performance to fundamental parameter variations
25 p0060 A80-18128
Performance of Los Alamos solar Mobile/Modular Home Unit no. 1
[LA-UR-78-2587] 25 p0126 N80-12577

BALL, G. L.
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603

BALLARD, S. C.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

BALMER, J. E.
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869

BALON, J. E.
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747

BAMMERT, K.
Influence of the working fluid on heat transfer and layout of solar tower receivers
25 p0036 A80-14671

BANNEROT, R. B.
Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector
[ASME PAPER 79-WA/SOL-3] 25 p0067 A80-18570
A design method for optimizing collector systems for small solar center receivers
[ASME PAPER 79-WA/SOL-14] 25 p0068 A80-18580

BARANOV, G. L.
Digital computer modeling of steady-state conditions of the magnetoplasmadynamic generator current layer
25 p0083 A80-20058

BARANOWSKI, J.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

BARBIER, E.
Workshop on Geothermal Resource Assessment and Reservoir Engineering, Larderello, Italy, September 12-16, 1977, Proceedings
25 p0075 A80-19201

BARD, A. J.
Photoelectrochemistry and heterogeneous photocatalysis at semiconductors
25 p0073 A80-18750

BARDHAN, A. R.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

BARKER, A. S., JR.
Photovoltaic solar cell array used for supplemental power generation
25 p0061 A80-18129

BARKER, R. J.
The effect of current shear on the tearing instability
25 p0059 A80-18086

BARLOW, T. M.
Mechanical energy storage technology development for electric and hybrid vehicle applications
[UCRL-81786] 25 p0128 N80-12596

BARNES, F. E.
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629

BARR, W. L.
Tandem mirror reactors
25 p0059 A80-17887

BARRA, G. A.
A theoretical study of laminar free convection in 1-D solar induced flows
25 p0005 A80-11337

BARRETT, E. W.
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

BARRON, W.
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578

BARRON, W. F.
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648

BARTH, E. A.
Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle
[PB-299928/2] 25 p0180 N80-15699
BARTHOLME, L. G.
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614
BARTLIT, J. R.
Environmental options for coal use
[LA-UR-79-1393] 25 p0165 N80-14584
BARTSCH, R. R.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
BASIULIS, A.
Osmotically pumped energy transport system
[AIAA PAPER 80-0210] 25 p0064 A80-18378
BASSETT, W. W.
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658
BASU, P.
Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771
BASU, T. K.
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662
BATCHELOR, D. B.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883
BATES, J. O.
OTEC-1 test conductor program
[CONF-780550-9] 25 p0163 N80-14563
BAUM, I. V.
Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant
25 p0051 A80-17246
Structure of an averaged statistical pencil of rays reflected from a heliostat
25 p0051 A80-17247
BAUM, V. A.
Brightness distribution over the solar disk
25 p0050 A80-17243
BAUMAN, A. J.
Molten salt pyrolysis of latex
[NASA-CASE-NPO-14315-1] 25 p0092 N80-10361
BAUMGAERTEL, K.
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871
BAXTER, G. A.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
BAXTER, V. D.
Intermediate report on the performance of plate-type ice-maker heat pumps
[ORNL/CON-23] 25 p0176 N80-15619
BAYLIN, F.
Low temperature thermal energy storage: A state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583
BAZAROV, B. A.
Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells
25 p0035 A80-14592
BAZAROV, G. P.
Determination of the geometry of the transition region of a series MHD generator
25 p0030 A80-12900
Influence of the loading factor on the performance characteristics of series MHD generators
25 p0061 A80-18137
Characteristics of series channels with a diminishing electrode-commutation angle in the transition section
25 p0061 A80-18139
BEARD, J. T.
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671
BEAUFRERE, A. H.
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632
BEAULIEU, R.
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786
BECHTOLD, R. L.
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274
BECKER, D. A.
Measurements and standards for recycled oil - 2
[PB-299951/4] 25 p0167 N80-15275
BECKER, E. W.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618
BECKER, M.
Feasible thermophysical conditions for gas receiver tubes in solar power stations
[ASME PAPER 79-WA/HT-37] 25 p0071 A80-18627
BECKMAN, W. A.
Computers in the design of solar energy systems
25 p0020 A80-12426
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590
BEDAIR, S. M.
AlGaAs tunnel diode
25 p0046 A80-16799
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661
BEECY, D.
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286
BEESON, J. L.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-38] 25 p0106 N80-11249
BEHN, R.
A multi-pulse ruby laser recording of the temporal evolution of plasma parameters by light scattering
25 p0084 A80-20165
BEHRIN, E.
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995
BEHRISCH, R.
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682
BEKIARIAN, A.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863
BELL, C. A.
Solar-thermal jet pumping for irrigation
[AIAA PAPER 80-0402] 25 p0077 A80-19328
BELL, R. L.
Concentration ratio and efficiency in thermophotovoltaics
25 p0005 A80-11336
BELLOMO, P.
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
BELLOWS, R. J.
Zinc-bromine battery studies
25 p0010 A80-11845
BELOHOUBEK, E. F.
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600
BEN-DAVID, S.
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645

BENATTAR, R.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

BENDANIEL, D. J.
Semiconductor alternating-current motor drives and energy conservation
25 p0034 A80-13861

BENDER, D. J.
Tandem mirror reactors
25 p0059 A80-17887

BENEMANN, J. R.
Biofuels: A survey
[EPRI-ER-746-SR] 25 p0107 N80-11250

BENENATI, R.
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897

BENFORD, S. M.
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

BENJAMIN, B. M.
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168

BENNER-DRURY, D. L.
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660

BENNETT, G. A.
Conceptual designs for two reject heat systems for a Brayton closed-cycle converter
[LA-7821-MS] 25 p0144 N80-13677

BENSON, D. K.
Materials research - Probable impacts on solar energy
25 p0018 A80-11991
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564

BERDAHL, P.
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12589

BERENY, J. A.
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574

BEREZHETSKII, M. S.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

BERGER, D. P.
High-beta tokamaks
25 p0054 A80-17789

BERGER, R. L.
The KMSF laser fusion programme
25 p0056 A80-17860

BERGERON, K. D.
Solar enhanced oil recovery - An assessment of economic feasibility
25 p0078 A80-19472
Solar enhanced oil recovery: An assessment of economic feasibility
[SAND-79-0787] 25 p0178 N80-15641

BERGLES, A. E.
Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707

BERGSTROM, C.
MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version)
[BNL-26390] 25 p0178 N80-15634

BERHRIN, C. J.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970

BERKELIEV, A.
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626

BERMAN, I.
Interim structural design standard for solar energy applications, phases 1 and 2
[SAND-79-8183] 25 p0146 N80-13698

BERNA, M.
Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004

BERNARD, M. J., III
Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281

BERNATOWICZ, D. T.
Space solar cells: High efficiency and radiation damage
[NASA-TM-81387] 25 p0170 N80-15554

BERT, C. W.
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729
Lateral and tilt whirl modes of flexibly mounted flywheel systems
[SAND-78-7070] 25 p0115 N80-11622
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[SAND-78-7073] 25 p0116 N80-11623
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622

BERTOLACINI, R. J.
Catalyst development for coal liquefaction
[EPRI-AF-1084] 25 p0136 N80-13292

BERTOLINI, E.
Main power supplies for large toroidal fusion experiments
25 p0082 A80-19670

BERTRAM, K. M.
Implementing energy conservation strategies in energy materials transport: U. S. Department of Energy and other government agency policy-making decisions
[ANL/EES-TM-32] 25 p0111 N80-11577

BESSOLOV, V. N.
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626

BETTIS, E. S.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

BEVAN, J.
A survey of electric and hybrid vehicle simulation programs
[NASA-CR-162457] 25 p0118 N80-11954

BEVILAQUA, O. M.
Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281

BEVZIUK, M. I.
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048

BHARDWAJ, R. K.
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749

BHASKARAN, K. A.
A parametric study of solar thermal power plant
25 p0024 A80-12753

BHATNAGAR, P. K.
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785

BHATTACHARYA, S.
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776

BHUMRALKAR, C. M.
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125

BIBERMAN, L. M.
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516

BICKEL, T. C.
Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272
BICKERTON, R. J.
Review of tokamak experiments
25 p0034 A80-13342
BIELIK, M.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874
BIFANO, W. J.
A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552
BIGELOW, H. R.
Analysis of potential implementation levels for waste heat utilization in the nuclear power industry
[ORNL/TM-63-2] 25 p0177 N80-15625
BINDER, A. E.
Effects of metallurgical microstructure of armatures on compressed magnetic field generators
[SAND-79-0890C] 25 p0137 N80-13375
BIRD, S. P.
SOLSTEP - A computer model for predicting the thermodynamic and economic performance of solar thermal power plants
[ASME PAPER 79-WA/SOL-12] 25 p0068 A80-18579
BIRT, D.
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862
BISANTZ, D. J.
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586
BISHOP, A. B.
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641
BISHOP, C. J.
Systems Analysis and testing (SAT) program
[SERI/PR-35-313] 25 p0124 N80-12565
BISHOP, W. S.
Analysis of remote site energy storage and generation systems
[AD-A074869] 25 p0156 N80-14504
BJORNSTAD, D. J.
Regional economic/demographic projections for energy policy analysis
[ORNL/TM-6668] 25 p0128 N80-12599
BLACK, R. A.
Commercialization strategy report for hydrothermal electric and direct heat application
[TID-28840-DRAFT] 25 p0157 N80-14508
BLADEN, P. G.
A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562
BLAIR, P.
Analysis of resource pricing for geothermal electric power production
25 p0088 A80-20889
BLAKE, T. R.
Computer modeling of coal gasification reactors
25 p0087 A80-20882
Dynamic modeling of H2S clean-up processes
25 p0088 A80-20885
BLANCHETT, R. S.
Fuel utilization in residences
[EPRI-EA-894] 25 p0175 N80-15604
BLAUNSTEIN, R.
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544
BLAZEK, C. F.
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263
BLEWER, R. S.
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682
BLOMGREN, G. E.
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856
BLOMQUIST, C. A.
Underground pumped hydro storage: An overview
[CONF-781046-1] 25 p0116 N80-11624
Turbomachinery options for an underground pumped *hydroelectric storage plant*
[CONF-790803-50] 25 p0177 N80-15629
BLOOMQUIST, C.
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657
BLOOMSTER, C. H.
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625
BLURTON, K. F.
The performance of molten-carbonate fuel cells
25 p0011 A80-11851
Commercial applications of molten carbonate fuel cell systems
25 p0016 A80-11974
Commercial application of molten carbonate fuel cell system
[CONF-790213-4] 25 p0123 N80-12557
Fuel cell option
[CONF-7809137-1] 25 p0158 N80-14523
BOBBETT, R.
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
BOCKRIS, J. O'M.
The photo-electrochemical production of C-C bonds from carbon dioxide
25 p0004 A80-10848
BODNER, S. E.
Inertial confinement fusion at NRL
25 p0056 A80-17861
BOEER, K. W.
The physics and chemistry of solar cells
25 p0073 A80-18751
BOEHM, R.
Simulation of solar-assisted urban sewage digestion
[ASME PAPER 79-WA/SOL-36] 25 p0065 A80-18556
BOEHM, R. F.
Computer simulation results for planar reflectors and flat plate solar collectors
[ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559
BOES, E. C.
Insolation modeling overview
25 p0020 A80-12428
Status of the US Department of Energy photovoltaic concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578
BOGDANKEVICH, L. S.
Relativistic high-current microwave plasma electronics
25 p0083 A80-19847
BOHN, M. S.
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564
BOKHAN, A. N.
Improving the reliability of capacitance batteries in power grids with higher-harmonic sources
25 p0008 A80-11671
BOL, K.
Volt-second consumption during the start-up phase of PLT
25 p0040 A80-15532
BOLIN, B.
Global ecology and man
25 p0131 N80-12668
BOLING, N. L.
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650
BOLTON, J. R.
Photochemical conversion and storage of solar energy
25 p0009 A80-11829
BOMELBURG, H.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

BOMKAMP, D. H.
Technical support for open-cycle MHD program
[ANL/MHD-78-11] 25 p0181 N80-15942
BOND, G. W.
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
BONES, R. J.
Current collectors for sodium-sulphur *batteries*
25 p0013 A80-11867
BONNEVIER, B.
Boundary layer analysis of cold-blanket systems
25 p0056 A80-17877
BOOK, D. L.
Optimization of stabilized imploding liner fusion reactors
25 p0079 A80-19593
BOOTH, D. C.
Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion
25 p0087 A80-20722
BORDINA, N. M.
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
BORGESON, N. S.
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T1] 25 p0168 N80-15276
BORIS, J. P.
Inertial confinement fusion at NRL
25 p0056 A80-17861
BORRASS, K.
SISYPUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597
BORTON, D. N.
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558
BOSE, D. N.
GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774
BOSNJAKOVIC, F.
Solar collectors as energy converters
25 p0036 A80-14670
BOUTRIT, C.
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204
BOWMAN, B. R.
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
Numerical modeling of LNG spill phenomena
[UCRL-82031] 25 p0130 N80-12625
BOWMAN, M. G.
LASL thermochemical hydrogen program status on October 31, 1978
[LA-UR-78-2895] 25 p0120 N80-12197
BOWSER, R. P.
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541
BOWYER, J. M.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
BOZLER, C. O.
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141
BRACKBILL, J. U.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
BRADLEY, J. E.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
BRADSHAW, T.
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
BRADY, J.
MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version)
[BNL-26390] 25 p0178 N80-15634
BRANDHORST, H. W., JR.
Space solar cells: High efficiency and radiation damage
[NASA-TM-81387] 25 p0170 N80-15554
BRANDON, C. A.
Energy conservation through point source recycle with high temperature hyperfiltration
[PB-299183/4] 25 p0180 N80-15688
BRANOVER, H.
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554
BRATIS, J. C.
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-13636
BRAUNSTEIN, B.
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
BRAY, R. E.
Solar-climatic statistical study. Summary report, volume 1
[HCP/T4016-1] 25 p0132 N80-12707
Solar-climactic statistical study
[HCP/T4016-01/2] 25 p0149 N80-13747
BRECHBEISEN, A. M.
Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470
BREELLE, Y.
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
BREEV, V. V.
Some problems with variable operation of an MHD generator
25 p0035 A80-14530
BREHM, W. F.
Materials compatibility in liquid sodium
[HEDL-SA-1559] 25 p0119 N80-12147
BREIZMAN, B. N.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857
BRETT, C. E.
A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560
Heat pump centered integrated community energy systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588
BRIGGS, R. W.
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691
BRIGHT, R.
The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436
BRIMER, W. F.
Pelletized wood /Woodex/ - Applications and potential
25 p0017 A80-11981
BRITT, E. J.
A cesium TELEC experiment at Lewis Research Center
[NASA-CR-159729] 25 p0151 N80-14386
BRO, P.
Heat generation in Li/SOCl2 cells
25 p0012 A80-11855
BRODD, R. J.
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856
BRODRICK, J. R.
Energy conservation in the US economy from increased recycle of obsolete steel scrap
[COO-2893-10] 25 p0159 N80-14524
BROEHL, J. H.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688

BROHL, E. C.
Operational experience with drain-down solar systems
[IS-M-166] 25 p0125 N80-12576

BRONOEL, G.
Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848

BROOK, J. W.
The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329

BROOKS, H.
United States energy alternatives to 2010 and beyond - The CONAES study
25 p0008 A80-11827

BROOKS, J.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

BROOKS, J. N.
Power supply requirements for a tokamak fusion reactor
25 p0003 A80-10474
Power supply requirements for a tokamak fusion reactor
[ANL/FPP/TM-119] 25 p0104 N80-10918

BROOKS, W. P.
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627

BROSSEAU, J. D.
Microbial hydrogen production from replenishable resources
25 p0032 A80-13197

BROUSSELY, M.
Lead oxides-lithium cells
25 p0012 A80-11859

BROWN, D. H.
Techniques for evaluation of advanced cogeneration technologies
25 p0014 A80-11957

BROWN, H.
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979
25 p0047 A80-17126
Can alternative energy resources be brought into large-scale use in the United States by the year 2000
25 p0048 A80-17128

BROWN, K. C.
Near-term prospects for solar industrial process heat
25 p0018 A80-11988

BROWN, L. R.
The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754

BROWN, M. C.
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673

BROWN, P.
Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972

BROWN, P. W.
Fundamental economic issues in the development of small-scale hydro
[DOE/RA-23-216.00.0-02] 25 p0143 N80-13667

BROWN, R.
Health and enviromental effects of coal gasification and liquefaction technologies: A workshop summary and panel reports
[PB-297618/1] 25 p0104 N80-10701

BROWN, R. A.
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687

BRUCE, R. F.
Seismic refraction investigation of the Salton Sea geothermal area, Imperial Valley, California
[PB-296547/3] 25 p0118 N80-11711

BRUMBERG, R. J.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576

BRUMMER, S. B.
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

BRYANT, H. S.
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541

BUBENKO, J. A.
An optimization model for overall urban energy planning
25 p0038 A80-14844

BUCCIARELLI, L. L., JR.
Power loss in photovoltaic arrays due to mismatch in cell characteristics
25 p0028 A80-12815

BUCHANAN, D. L.
A review of the economics of selected passive and hybrid systems
[SERI/TP-61-144] 25 p0161 N80-14547

BUCHENAUER, C. J.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

BUCHLIN, J. M.
Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353

BUCK, W. L.
Status of development, energy and economics aspects of alternative technologies
[CONF-790371-1] 25 p0145 N80-13689

BUCKNER, J. H.
Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623

BUDGE, T. K.
Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning
25 p0084 A80-20242

BUEKENS, A. G.
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028

BUENDE, R.
SISYFUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597

BUFFA, A.
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811

BUNEMAN, O.
The effect of current shear on the tearing instability
25 p0059 A80-18086

BURDAKOV, A. V.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

BURDEN, R. A.
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629

BURESI, E.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

BURGESON, R. N.
Ranking tires using a transient speed-time cycle
[PB-297756/9] 25 p0108 N80-11487

BURK, D.
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368

BURKE, A. R.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540

BURKHARDT, L. C.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

BURMASOV, A. S.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

BURNS, P.
Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653
BURSELL, M.
Utility fuel cells for Sweden
25 p0011 A80-11852
BURT, J.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
BURTON, R. L.
Optimization of stabilized imploding liner fusion reactors
25 p0079 A80-19593
BUSBY, J. P.
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
BUSHNELL, R. H.
Calculation of climatic solar heating performance
25 p0029 A80-12820
BUSSAC, M. N.
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876
BUTLER, G. D.
Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607
BUTLER, M. A.
Principles of photoelectrochemical solar energy conversion
25 p0074 A80-18990

C

CALABEK, M.
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842
CALAWA, A. R.
Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
25 p0035 A80-13986
CALDWELL, R. L.
West Coast Forum on Appropriate Technology
[PB-298986/1] 25 p0166 N80-14962
CALIA, V.
The jet membrane process for uranium separation and enrichment
[RE-586] 25 p0091 N80-10329
CALM, J. M.
DOE heat pump centered integrated community energy systems project
[CONF-790362-1] 25 p0112 N80-11586
Community heating and cooling systems
[CONF-790446-6] 25 p0147 N80-13706
CALVERT, S.
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591
CALVIN, M.
Petroleum plantations and synthetic chloroplasts
25 p0049 A80-17137
CALZAFERRI, G.
Conversion of radiant energy into chemical energy
[UCRL-TRANS-11427] 25 p0114 N80-11609
CAMARA, E. H.
The performance of molten-carbonate fuel cells
25 p0011 A80-11851
CAMPBELL, P. M.
The KMSF laser fusion programme
25 p0056 A80-17860
CAMPBELL, R.
Soviet energy balances
[RAND/R-2257-DOE] 25 p0099 N80-10634
CAMPBELL, R. A.
Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
CANNON, D. G.
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment
[NASA-TM-80194] 25 p0150 N80-14114
CAPELLE, G. A.
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964
CAPUTO, R.
Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10689
CARLEY, W.
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564
CARLING, A.
Effects of energy policy on industry
[USPFE-1978-8] 25 p0129 N80-12604
CARLING, R. W.
Dissociation pressure measurements on salts proposed for thermochemical energy storage
[SAND-79-8033] 25 p0160 N80-14532
CARLSON, G. A.
Tandem mirror reactors
25 p0059 A80-17887
CARLSON, R. C.
Economic impacts of energy conservation and renewable energy sources
[UCRL-15087] 25 p0177 N80-15633
CARLSON, T. C. G.
OTEC - A comprehensive energy analysis
25 p0085 A80-20456
CARLSSON, B.
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system
25 p0029 A80-12823
CARMICHAEL, D. C.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483
CARPETIS, C.
Hydrogen storage by use of cryoadsorbents in comparison to alternatives
25 p0042 A80-15992
CARRATELLI, R. P.
A theoretical study of laminar free convection in 1-D solar induced flows
25 p0005 A80-11337
CARRIE, J.
The policy of the European Economic Community in the field of energy savings
25 p0050 A80-17223
CARROLL, W. L.
Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680
CASAGRANDE, D. J.
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833
CASKEY, B. C.
Solar mechanical energy storage project
[SAND-78-1982C] 25 p0127 N80-12590
Solar mechanical energy storage program overview and systems analysis results
[SAND-79-1642C] 25 p0178 N80-15637
CASSANOVA, R. A.
Southeastern forum on appropriate technology
[PB-298796/4] 25 p0118 N80-11965
CASSEL, R.
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
CASSEL, T.
Analysis of resource pricing for geothermal electric power production
25 p0088 A80-20889
CASSOU, A. M.
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels
25 p0073 A80-18832
CASTALDINI, C.
Technical assessment of thermal DeNOx process
[PB-297947/4] 25 p0117 N80-11656

CASTILLO, R.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions 25 p0058 A80-17875

CASTLE, J.
SERAPH implementation plans [SERI/RR-34-152] 25 p0172 N80-15570

CATALDI, R.
Methods for regional assessment of geothermal resources 25 p0075 A80-19202
Assessment of geothermal potential of central and southern Tuscany 25 p0075 A80-19203

CAVAGNARO, D. M.
Lead batteries, volume 2. Citations from the engineering index data base [NTIS/PS-77/0634] 25 p0103 N80-10681

CELATI, R.
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field 25 p0075 A80-19204
Thermodynamic behaviour of the Bagnore geothermal field 25 p0075 A80-19205

CENA, R. J.
Laboratory coal gasifier facility [UCRL-82602] 25 p0106 N80-11245

CENACCHI, G.
Numerical computations in the design of compact ignition experiments 25 p0078 A80-19589

CENEK, M.
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid 25 p0010 A80-11842

CEPERLEY, P. H.
A pistonless Stirling engine - The traveling wave heat engine 25 p0031 A80-13011

CERINI, D. J.
Start up system for hydrogen generator used with an internal combustion engine [NASA-CASE-NPO-13849-1] 25 p0092 N80-10374

CERNANSKY, N. P.
A chromatographic peak profiling technique for interpretation and analysis of combustion processes [AIAA PAPER 80-0284] 25 p0063 A80-18291

CERVENAN, M. R.
Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials 25 p0020 A80-12311

CHA, C.-S.
An indirect ammonia-air fuel system 25 p0013 A80-11868

CHAMBERLAIN, R. G.
SAMICS: Input data preparation [NASA-CR-162421] 25 p0110 N80-11570

CHAMBERS, R. S.
Gasohol - Does it or doesn't it produce positive net energy 25 p0034 A80-13863

CHAN, S. T.
Simulation of LNG vapor spread and dispersion by finite element methods [UCRL-82441] 25 p0168 N80-15282

CHANCE, M. S.
MHD stability limits on high-beta tokamaks 25 p0054 A80-17797

CHANDLER, G. I.
An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory 25 p0022 A80-12628

CHANDRA, A.
Solar absorption spectra of PbS-Al and PbSe-Al systems 25 p0027 A80-12781

CHANDRA, S.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light 25 p0027 A80-12777

CHANDRAN, G.
Development of space quality silicon solar cells at B.A.R.C. 25 p0025 A80-12762

CHANG, K. K.
An optimization formulation for solar hot water systems [ASME PAPER 79-WA/SOL-42] 25 p0068 A80-18578

CHAPMAN, G. H.
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion 25 p0046 A80-16786

CHAPMAN, R. L.
Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy 25 p0035 A80-13986

CHARATIS, G.
The KMSF laser fusion programme 25 p0056 A80-17860

CHARLTON, L. A.
High-beta tokamaks 25 p0054 A80-17789

CHARTOCK, M. A.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls [PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal [PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale [PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium [PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas [PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal [PB-299182/6] 25 p0152 N80-14468

CHATEL, B.
Some solar energy programmes in the United Nations system 25 p0006 A80-11342

CHATILLON, C.
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides 25 p0033 A80-13200

CHATTOPADHYAYA, S. K.
Temperature dependence of open-circuit photovoltage of a back-surface field semiconductor junction 25 p0087 A80-20727

CHATURVEDI, L.
Use of geothermal energy for desalination in New Mexico: A feasibility study [PB-299271/7] 25 p0179 N80-15645

CHAUVEL, A.
Technico economic study of the use of hydrogen and methanol for road transport 25 p0042 A80-15993

CHEMERIS, V. T.
Change in rate of conducting-piston motion and the characteristics of field-diffusion processes in a linear electromechanical energy converter 25 p0083 A80-20069

CHEN, F. C.
A thermodynamic assessment of OTEC open-cycle power systems 25 p0088 A80-20886
Land-based application of an OTEC open-cycle power system [CONF-790631-3] 25 p0144 N80-13676

CHEN, F. M.
Analysis of convective heat loss from the receiver of solar power plants [ASME PAPER 79-WA/HT-36] 25 p0068 A80-18582

CHEN, H. C.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-5] 25 p0172 N80-15576

CHEN, H. H.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
CHEN, J. M.
Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277
CHEN, J.-B.
Magnetic field design for a large tokamak
25 p0046 A80-16760
CHEN, T. L.
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
CHEN, T. L. C.
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[ASME PAPER 79-DET-71] 25 p0041 A80-15729
Lateral and tilt whirl modes of flexibly mounted flywheel systems
[SAND-78-7070] 25 p0115 N80-11622
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[SAND-78-7073] 25 p0116 N80-11623
Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622
CHENG, C. F.
Preliminary materials assessment in solar demonstration systems
[ANL/EES-CP-30] 25 p0115 N80-11619
CHERKASSKII, A. KH.
Evaluation of conductor mass and necessary voltage level for large satellite solar arrays
25 p0036 A80-14595
CHERNG, J.
A new solar thermal electricity/cooling generation system
[AIAA PAPER 80-0296] 25 p0063 A80-18300
CHERNIAVSKY, E. A.
Dynamic energy system optimization model
[EPRI-EA-1079] 25 p0157 N80-14514
CHERNOVA, K. S.
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199
CHESTER, M. S.
Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362
CHETTY, P. R. K.
Enhanced power generation of GSS/4/PS by optical solar reflectors
25 p0038 A80-14948
CHIANG, S. H.
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502
CHIANG, S.-H.
Energy storage in organic photoisomers
25 p0072 A80-18747
CHILD, J.
Energy demand in the developing countries
[DOE/EIA-0183/10] 25 p0177 N80-15631
CHILDS, J.
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655
CHILENSKAS, A. A.
Lithium/iron sulfide batteries for electric vehicles
[CONF-781006-2] 25 p0175 N80-15611
CHIOU, J. P.
Noniterative solution of heat transfer equation of fluid flow in solar collector
[ASME PAPER 79-WA/SOL-24] 25 p0068 A80-18577
CHIRIKOV, B. V.
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840
CHIU, W. S.
Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263
CHOPRA, K. L.
Selective black nickel coatings on zinc surfaces by chemical conversion
25 p0060 A80-18126
CHOWDHURI, P.
Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346
CHRISTAKIS, A. N.
A policy-sensitive model of technology assessment
25 p0004 A80-11140
CHRISTENSEN, M. N.
Energy transition in California
[UCRL-15003] 25 p0097 N80-10619
CHRISTNER, L.
Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159705] 25 p0096 N80-10603
CHRYSOCHOOS, J.
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650
CHU, C. K.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809
CHU, Y.-C.
An indirect ammonia-air fuel system
25 p0013 A80-11868
CHUAH, D. G. S.
The ampere-hour efficiency of photovoltaic solar generators
25 p0047 A80-16999
CHUBB, T. A.
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338
CHURCH, R. L.
Simulation approach for base-line energy-siting analysis
[CONF-790459-22] 25 p0157 N80-14511
CHUTE, F. S.
Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials
25 p0020 A80-12311
CISCATO, D.
The combined d.c. power supply for JET
25 p0080 A80-19621
CLARK, A. J.
Recent advances in high temperature primary lithium batteries
25 p0013 A80-11863
CLARK, G. J.
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141
CLARK, J. A.
Survey and description of transport phenomena in packed-beds
25 p0121 N80-12340
Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342
CLARK, J. S.
Status of the DOE/NASA critical gas turbine research and technology project
[NASA-TM-79307] 25 p0155 N80-14493
CLARK, R. G.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
CLARK, R. P.
Batteries for specific solar applications
[SAND-79-1428C] 25 p0124 N80-12559
CLARK, W.
Testing of three installed solar domestic water heaters
25 p0025 A80-12758
CLARK, W. H. M.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
CLARKE, V.
A high performance porous flat-plate solar collector
25 p0021 A80-12438
CLAYTON, R. N.
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586

CLEARY, F. L.
Mathematical modeling of coal gasification processes
25 p0089 A80-20913
CLEMENTS, L. D.
Solar-thermal jet pumping for irrigation
[AIAA PAPER 80-0402] 25 p0077 A80-19328
CLEMMER, R.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884
CLIFTON, D. S., JR.
Southeastern forum on appropriate technology
[PB-298796/4] 25 p0118 N80-11965
CLOTH, P.
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662
CLUSEN, R. C.
Electric and hybrid vehicles: Commercialization phase 3 planning
[DOE/ERD-0004] 25 p0151 N80-14349
CNARE, E. C.
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627
CNOBLOCH, H.
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850
COATES, R.
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633
COCCORESE, R.
The combined d.c. power supply for JET
25 p0080 A80-19621
COCHE, A.
Efficient indium tin oxide/polycrystalline silicon solar cells
25 p0039 A80-15136
COCHRAN, H. D., JR.
Recent developments in coal liquefaction in the United States
25 p0015 A80-11966
COCKS, F. H.
Study of corrosion and its control in aluminum solar collectors
[COO-2934-7] 25 p0129 N80-12609
CODERRE, W. J.
Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results
[AIAA PAPER 80-0091] 25 p0063 A80-18265
COHAN, D.
Proposed research planning format for the Environmental Assessment Department
[EPRI-EA-1018] 25 p0103 N80-10692
COHEN, A. S.
Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste
[CONF-790373-1] 25 p0163 N80-14562
COHEN, R.
Energy from ocean thermal gradients
25 p0044 A80-16652
COHEN, R. S.
A chromatographic peak profiling technique for interpretation and analysis of combustion processes
[AIAA PAPER 80-0284] 25 p0063 A80-18291
COHN, E. M.
Fuel cell sesquicentennial
25 p0033 A80-13223
COHN, S.
Fuel choice and aggregate energy demand in the commercial sector
[ORNL/CON-27] 25 p0126 N80-12580
COLE, R. L.
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996
COLEMAN, M. G.
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
COLLARES-PEREIRA, M.
Derivation of method for predicting long term average energy delivery of solar collectors
25 p0005 A80-11339
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
High temperature solar collector with optimal concentration - Non-focusing Fresnel lens with secondary concentrator
25 p0060 A80-18127
COLLERAINE, A. P.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600
COLLIE, M. J.
Electric and hybrid vehicles
25 p0041 A80-15658
COLLIER, R. K.
The analysis and simulation of an open cycle absorption refrigeration system
25 p0029 A80-12825
A simplified technique for comparing the effectiveness of collector absorber coatings
25 p0061 A80-18133
COLLINS, C. J.
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168
COLSHER, C. S.
Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576
COMFORT, W. J.
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
COMMISSO, R. J.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
CONDIT, W. C.
Survey of mirror machine reactors
25 p0046 A80-16752
CONN, R. W.
Summary on reactor systems
25 p0059 A80-17894
CONNAN, J.
Properties of gases and petroleum liquids derived from terrestrial kerogen at various maturation levels
25 p0073 A80-18832
CONNER, D. W.
Multirole cargo aircraft options and configurations
[NASA-TM-80177] 25 p0105 N80-11053
CONNOLLY, J. S.
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
CONSTANS, R.
The European economic community's policy concerning natural gas, coal and new sources of energy
25 p0032 A80-13175
CONSTANTINE, G.
Possible improvements to a basic cellular thin blanket fusion reactor configuration
25 p0081 A80-19664
CONWAY, T. M.
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616
COOK, E.
The helium question
25 p0034 A80-13589
COOK, F.
Evaluation of the environmental effects of western surface coal mining, volume 1
[PB-300375/3] 25 p0179 N80-15681

COOPERSTEIN, G.
Inertial confinement fusion at NRL
25 p0056 A80-17861

COPELAND, R. J.
Technology development needs for high temperature process heat
[SERI/TR-35-047] 25 p0143 N80-13669
Rough cost estimates of solar thermal/coal or biomass-derived fuels
[SERI/TP-35-279] 25 p0151 N80-14269

COPPI, B.
Numerical computations in the design of compact ignition experiments
25 p0078 A80-19589

CORMAN, J. C.
Coal to electricity - Integrated gasification combined cycle
25 p0015 A80-11971

CORSI, R.
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205

COSTAIN, J. K.
Geothermal resources of the Atlantic Coastal Plain
25 p0016 A80-11977

COSTOGUE, E.
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492

COTTINGHAM, J. G.
Solar-powered steam generator heliostat
[BNL-50974] 25 p0129 N80-12610

COUDEVILLE, A.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

COURINGTON, H. C.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

COWAN, M.
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627

COX, F. W.
Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273

COX, K. E.
LASL thermochemical hydrogen program status on October 31, 1978
[LA-UR-78-2895] 25 p0120 N80-12197
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296

COYLE, A. G.
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747

CRAFOORD, C.
Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model
[DM-26] 25 p0116 N80-11631

CRAIG, R. B.
Environmental implications for geothermal energy development
[CONF-790445-3] 25 p0103 N80-10694

CRANDALL, J. L.
US program for the immobilization of high-level nuclear wastes
[DP-MS-79-2] 25 p0149 N80-13917

CRANE, R. E.
Heat pump centered integrated community energy systems; System development
[ANL/ICES-TM-26] 25 p0173 N80-15589

CRAWFORD, K.
Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204

CRAWLEY, H. J.
The design of a thin walled toroidal vacuum chamber for a large RFP experiment
25 p0082 A80-19676

CRESPI, G.
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841

CRISP, J. N.
Analysis of remote site energy storage and generation systems
[AD-A074869] 25 p0156 N80-14504

CROWLEY-MILLING, M. C.
The application of computers to fusion experimental facilities
25 p0080 A80-19619

CUNNINGTON, G. R.
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-28447/1] 25 p0142 N80-13660

CUTTING, J. C.
Survey of MHD plant applications
25 p0015 A80-11972

CWIKLINSKI, R. R.
A single coal particle gasification model
25 p0088 A80-20884

D

DAENNER, W.
SISYFUS - A simulation model for systematic analyses of fusion power plants
25 p0079 A80-19597

DAIGA, V. R.
Commercial building and industrial applications for solar energy
25 p0017 A80-11985

DAMERON, T. B., III
A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562

DAND, P. V.
Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854

DANDL, R. A.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

DANG, V.
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897

DANG, V. D.
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639
Coal conversion in flash hydropyrolysis reactors
[BNL-26209] 25 p0136 N80-13294

DANIELS, R. J.
LNG industry: An overview of projects and costs
[CONF-7811112-2] 25 p0168 N80-15278

DANIELS, E. L.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395

DANILKIN, I. S.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

DARBANDI, A.
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608

DARGAY, J.
Effects of energy policy on industry
[USFFE-1978-8] 25 p0129 N80-12604

DARRIET, B.
Use of reversible hydrides for hydrogen storage
25 p0042 A80-15991

DARSEY, D. M.
Color graphic controls for the solar central receiver test facility
25 p0022 A80-12626

DATTA, R. L.
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773

DAURIO, A.
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657

DAUTRAY, R.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

DAVID, E. E., JR.
Semiconductor alternating-current motor drives and energy conservation
25 p0034 A80-13861

DAVIDSON, R. C.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

DAVIS, A.
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-13636

DAVIS, J. M.
Commercialization strategy report for solar water heating
[TID-28856-DRAFT] 25 p0161 N80-14545

DAVIS, P.
Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972

DAVIS, R. J.
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

DAVITIAN, H.
The marginal cost of electricity used as backup for solar hot water systems - A case study
25 p0021 A80-12436

DAY, J. W., JR.
Net energy analysis of alcohol production from sugarcane
25 p0062 A80-18165

DAY, M. L.
Flat-plate solar collector materials
25 p0035 A80-14409

DE ANGELIS, R.
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811

DEAN, S. O.
United States magnetic fusion energy program
[DOE/ET-0072] 25 p0126 N80-12583

DEAVER, F. K.
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575

DEB, S.
Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788

DEBAERE, L. A.
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398

DEBICCARI, D. J.
Development of silver-hydrogen cells
25 p0010 A80-11843

DEBNEY, B. T.
A theoretical evaluation and optimization of the radiation resistance of gallium arsenide solar-cell structures
25 p0046 A80-16794

DECOSTE, R.
Inertial confinement fusion at NRL
25 p0056 A80-17861

DEIF, I. N.
Solar cooling performance predictions via stochastic weather algorithms
25 p0020 A80-12430

DELLENBACK, P. A.
Solar-thermal jet pumping for irrigation
[AIAA PAPER 80-0402] 25 p0077 A80-19328

DELLIS, A. N.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826

DELOBEAU, F.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

DEMOS, E. K.
Hydrogen - The Denver story
25 p0038 A80-14709

DEMUTH, O. J.
Analysis of binary thermodynamic cycles for a moderately low-temperature geothermal resource
[TREE-1365] 25 p0139 N80-13627

DENNEHY, G.
Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651

DENNIS, C.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

DENSEN, T.
Controllable d.c. power supply from wind-driven self-excited induction machines
25 p0075 A80-19031

DESHMUKH, R. G.
Modeling and simulation of WECS assisted utility systems
25 p0088 A80-20887
A probabilistic study of wind-electric conversion systems from the point of view of reliability and capacity credit
25 p0153 N80-14475

DESHPANDE, C. M.
Pollution aspects of oilfired and coalfired boilers
25 p0074 A80-18849

DESPIC, A. R.
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849

DEVORE, R. V.
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577

DEVOTO, R. S.
Tandem mirror reactors
25 p0059 A80-17887

DEVRIES, O.
Fluid dynamic aspects of wind energy conversion
[AGARD-AG-243] 25 p0103 N80-10683

DEWAR, R. L.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797

DEWEY, L.
Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287

DEXTER, W. L.
Tandem mirror reactors
25 p0059 A80-17887

DHARIWAL, S. R.
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785

DI CAPUA, M. S.
Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers
25 p0046 A80-16745

DIAZ, H.
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200

DIBELLO, E. G.
Overview of geothermal energy in the United States
[CONF-790530-1] 25 p0102 N80-10661

DICK, K. L.
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840

DICKENSON, R. L.
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T1] 25 p0168 N80-15276

DICKERSON, L. S.
Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
[CONF-790630-9] 25 p0136 N80-13295

DICKINSON, T.
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840

DILLARD, C. A.
Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584
DIMARCO, J. N.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809
DIONNE, J. V.
Commercialization strategy report for hydrothermal electric and direct heat application
[TID-28840-DRAFT] 25 p0157 N80-14508
DIVAKARUNI, S. M.
A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484
DIVECHA, A. P.
Preparation of superconducting coil through composite
25 p0040 A80-15512
DIVER, R. B.
Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice
25 p0078 A80-19473
DIVONE, L. V.
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544
DIXIT, B. S.
Heat pump centered integrated community energy systems: System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
DODD, H. M.
Solar mechanical energy storage project
[SAND-78-1982C] 25 p0127 N80-12590
DOELLING, N.
Wave power systems
[PB-299851/6] 25 p0164 N80-14576
DOERFLER, W.
The thermal triode
25 p0037 A80-14675
DOGGETT, J.
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158] 25 p0179 N80-15670
DOGGETT, J. N.
Tandem mirror reactors
25 p0059 A80-17887
DOLINSKI, U.
On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example
25 p0074 A80-19000
DOLL, D. W.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599
DONALDSON, I. G.
An estimate of the resource potential of New Zealand geothermal fields for power generation
25 p0076 A80-19208
DONALDSON, T. P.
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869
DONNELLY, J. J., JR.
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199
DONSI, G.
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421
DONVITO, P.
Residential sector energy forecasts, national level for 1978-electricity, natural gas, number two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601
DORAN, R. J.
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840
DORN, D.
National energy act of 1978: Far western perspective. A study for the US Department of Energy, Federal Region 9
[UCID-17944-REV-1] 25 p0132 N80-12955
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
DOROSHENKO, V. G.
High-voltage multijunction solar cell
25 p0035 A80-14593
DORY, R. A.
High-beta tokamaks
25 p0054 A80-17789
DOSCHER, T. M.
The controlling production mechanism of methane gas from coalbeds
25 p0085 A80-20499
DOSS, E. D.
Convective heat transfer in MHD channels and its influence on channel performance
[AIAA PAPER 80-0178] 25 p0064 A80-18355
Power take-off analysis for diagonally connected MHD channels
[AIAA PAPER 80-0253] 25 p0077 A80-19309
DOUGHERTY, D. A.
SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
DOUGLASS, R. H., JR.
OTEC - Solar energy from the sea
25 p0085 A80-20424
DOWNING, J. N.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809
DOWNS, W.
Characterization and combustion of SRC 2 fuel oil
[EPRI-FP-1028] 25 p0119 N80-12192
DOWNWARD, J. G.
The KMSF laser fusion programme
25 p0056 A80-17860
DOYLE, E. J.
Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1] 25 p0130 N80-12613
DRAKE, D. D.
Kentucky's coal-based chemical/energy park
25 p0013 A80-11954
DRAKE, J. R.
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877
DRAZIC, D. M.
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849
DREIER, M. E.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553
DREW, M. S.
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821
Solar heating system performance estimation using sinusoidal inputs
25 p0061 A80-18130
DRIVER, C.
The role of technology as air transportation faces the fuel situation
25 p0037 A80-14700
DRONNIK, L. A.
Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897
DRYER, F. L.
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion
[COO-4272-3] 25 p0165 N80-14587
DUBEY, R. C.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777
DUBIN, R. R.
Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588

DUBOW, J.
  The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
  25 p0006 A80-11368
DUDLEY, V. E.
  Concentrating solar collector test results Collector Module Test Facility (CMTF)
  [SAND-78-0977] 25 p0111 N80-11580
  Performance testing of the General Electric Engineering Prototype Collector
  [SAND-79-0514] 25 p0141 N80-13645
DUECHS, D. F.
  Refueling by means of pellets - Ablation rate and injection velocity considerations
  25 p0080 A80-19611
DUFF, W. S.
  Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
  [COO-2577-16] 25 p0163 N80-14568
  Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
  [COO-2577-17] 25 p0176 N80-15616
DUFFIE, J. A.
  Computers in the design of solar energy systems
  25 p0020 A80-12426
DUFFIELD, R. B.
  Hot dry rock geothermal energy development program
  [LA-7807-HDR] 25 p0144 N80-13673
DUFFY, R. E.
  Barriers to the application of wind energy conversion systems in urban settings
  25 p0155 N80-14494
DUGAN, J. F., JR.
  Aircraft Energy Efficiency (ACEE) status report
  25 p0091 N80-10206
DUGAN, V. L.
  Dispersed power systems and total energy
  [SAND-78-2006C] 25 p0096 N80-10608
DUGGER, G. L.
  Is there a chance for OTEC
  25 p0007 A80-11394
DUNCAN, D. A.
  Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
  [FE-2307-38] 25 p0106 N80-11249
  Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
  [FE-2307-46] 25 p0134 N80-13280
DUNN, P. D.
  A review of the U.S. wind energy programme
  25 p0042 A80-16083
DUNNING, R. L.
  Research and development of a heat and pump water heater, volume 1
  [ORNL/SUB-7321-1] 25 p0130 N80-12613
DURFEE, R. C.
  Computer software to calculate and map geologic parameters required in estimating coal production costs
  [EPRI-EA-674] 25 p0095 N80-10584
DURU, C. U.
  A cheap method of improving the performance of roof type solar stills
  25 p0006 A80-11343
DUVALL, J. J.
  Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
  25 p0085 A80-20454
DVERNIAKOV, V. S.
  Development of optical waveguides for a power-related application
  25 p0036 A80-14596
DWYER, C.
  Current U. S. petroleum situation and short-term supply/demand outlook
  [DOE/EIA-0184/5] 25 p0138 N80-13607
DYBBS, A.
  A solar assisted and wind powered heat pump for residential dwellings
  [ASME PAPER 79-WA/HT-33] 25 p0070 A80-18595

E

EAPEN, J. T.
  An electronic device for intermittent tracking
  25 p0027 A80-12782
EASTERLY, J. L.
  Engineering concerns in solar system design and operation
  [SOLAR/0811-79/01] 25 p0160 N80-14539
EASTON, C. R.
  Solar central receiver prototype heliostat CDRL item B.D., volume 1
  [SAN-1605/7-VOL-1] 25 p0146 N80-13700
ECCLESTON, B. H.
  Ambient temperature, fuel economy, emissions, and trip length
  [PB-298847/5] 25 p0166 N80-14976
ECCLESTON, D. B.
  Ethanol/gasoline blends as automotive fuels
  [CONF-790520-5] 25 p0168 N80-15280
ECKLUND, E. E.
  Hydrogen-powered vs. battery-powered automobiles
  25 p0033 A80-13199
EDELFELT, I. H.
  Regenerative flywheel energy storage system
  [UCRL-13982] 25 p0112 N80-11594
EDENBURN, M. W.
  Analytical evaluation of a solar thermophotovoltaic (TPV) converter
  [SAND-79-0504C] 25 p0099 N80-10638
  Status of the US Department of Energy photovoltaic concentrator development project
  [SAND-78-2187C] 25 p0172 N80-15578
EDESESS, M.
  Solar pond concepts: Old and new
  [SERI/TP-35-208] 25 p0102 N80-10663
EDESKUTY, F. J.
  Critical review and assessment of environmental and safety problems in hydrogen energy systems
  [LA-7820-PR] 25 p0145 N80-13690
EDLER, H. G.
  Satellite Power System (SPS): An overview of prospective organizational structures in the solar satellite field
  [TID-29094] 25 p0154 N80-14478
EDWARDS, M. S.
  Economics of gasoline production from underground coal gasification via mobil-M process
  [CONF-790405-12] 25 p0106 N80-11246
EGDELL, R. G.
  Thionine coated electrode for photogalvanic cells
  25 p0051 A80-17343
EHDE, C. L.
  A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
  [NASA-CR-162544] 25 p0154 N80-14484
EHRICKE, K. A.
  Space light - Space industrial enhancement of the solar option
  25 p0073 A80-18797
EHST, D.
  Impact of technology and maintainability on economic aspects of tokamak power plants
  25 p0059 A80-17884
EISSENBERG, D. M.
  Low-temperature thermal energy storage program annual operating plan
  [ORNL/TM-6605] 25 p0125 N80-12568
  Low-temperature thermal energy storage program annual operating plan
  [ORNL/TM-6934] 25 p0139 N80-13631
EKDAHL, C. A.
  Recent developments in linear theta-pinch and laser-heated solenoid research
  25 p0055 A80-17825
EL GABALAWI, N.
  Performance characteristics of point-focusing distributed-receiver solar Brayton systems
  [AIAA PAPER 80-0293] 25 p0063 A80-18298
EL-REFAIE, M. F.
  Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
  [ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600
ELETSKII, A. V.
  Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas
  25 p0007 A80-11612

ELKIN, A. I.
Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

ELKIND, M. M.
Combined effects of polycyclic aromatic hydrocarbons and sunlight
[CONF-790447-4] 25 p0131 N80-12631

ELKOTB, M. M.
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600

ELLGERING, H.
SSPS project - Two solar power plants in Spain
25 p0032 A80-13180

ELLICKSON, P. L.
Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices
[RAND/R-2335-DOE] 25 p0099 N80-10636

ELLINGSON, W. A.
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques
[CONF-790480-1] 25 p0167 N80-15259

ELLIOTT, G. R. B.
Night storage and backup generation with electrochemical engines
[LA-UR-78-1149] 25 p0113 N80-11596

ELLSWORTH, D. A.
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398

ELWOOD, J. P.
Supply, harvesting and nature of forest biomass as a fuel
25 p0017 A80-11982

EMERY, A. F.
The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574

ENGELHARDT, W.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

ENGELMANN, F.
Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors
25 p0079 A80-19594

ENGER, R. C.
Solar electric generating system resource requirements
25 p0005 A80-11341

ENGLISH, R. A.
Development of a high temperature solar powered water chiller. Volume 3: Phase 1
[SAN-1590-1/3-VOL-3] 25 p0101 N80-10654

EREMINA, T. V.
Development of optical waveguides for a power-related application
25 p0036 A80-14596

ERMAK, D. L.
Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626

ERNEST, R. K.
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T1] 25 p0168 N80-15276

ERVOLINI, M.
Analysis of resource pricing for geothermal electric power production
25 p0088 A80-20889

ESCHER, W. J. D.
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199
Direct solar energy conversion at sea
25 p0053 A80-17583
Survey of liquid hydrogen container techniques for highway vehicle fuel system applications
[HCP/M2752-01] 25 p0052 N80-10383

ESKOV, A. G.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

ESTES, R. C.
Optimization and comparison strategies for solar energy systems
[ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573

ETTENBERG, M.
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600

ETTER, D. E.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540

EUBANK, H. P.
Particle beam systems in plasma diagnostics
25 p0045 A80-16718

EUSTACE, D. J.
Zinc-bromine battery studies
25 p0010 A80-11845

EVANS, A. R.
Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576

EVANS, D.
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982

EVANS, K.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

F

FABBRO, R.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

FABER, J. A.
Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584

FABRE, E.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

FABRIS, G.
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073120] 25 p0132 N80-12882

FABUSS, B. M.
Resource recovery systems costs
25 p0001 A80-10029

FALICK, L.
Commercialization strategy report for hydrothermal electric and direct heat application
[TID-28840-DRAFT] 25 p0157 N80-14508

FALICOFF, W.
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628

FALKENBERRY, H. L.
Kentucky's coal-based chemical/energy park
25 p0013 A80-11954

FALTER, H. D.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19610

FAN, J. C. C.
Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
25 p0035 A80-13986
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141

FANG, L. M.
A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560

FARAHAT, M.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970

Energy storage system for automobile propulsion, 1978 study. 2: Detailed report [UCRL-52553-VOL-2] 25 p0181 N80-15995

FARBER, E. S.
Status of development, energy and economics aspects of alternative technologies [CONF-790371-1] 25 p0145 N80-13689

FARRIS, D. R.
Optimal control studies of a solar heating system [LA-UR-78-2556] 25 p0100 N80-10646
Energy savings for a solar heated and cooled building through adaptive optimal control [LA-UR-78-2986] 25 p0115 N80-11616

FAUNCE, S. F.
Modeling of a thermal wall panel using phase change materials 25 p0021 A80-12439

FECHTER, R. B.
Determination of the technical and economic feasibility of luminescent solar concentrators [SAND-79-7005] 25 p0100 N80-10650

FEDIANIN, O. I.
Current equilibrium and effective ion charge in L-2 stellarator plasma 25 p0055 A80-17829

FEILER, C. E.
Preparing aircraft propulsion for a new era in energy and the environment 25 p0053 A80-17737

FEJER, A. A.
Development of gas turbine fuels and combustion; An overview [CONF-790337-6] 25 p0093 N80-10391

FELDMAN, K. T., JR.
Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick [AIAA PAPER 80-0148] 25 p0064 A80-18366

FELTHAM, C.
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes 25 p0013 A80-11862

FELTHAM, C. E.
Recent advances in high temperature primary lithium batteries 25 p0013 A80-11863

FERBER, R.
Silicon materials outlook study for 1980-1985 calendar years [NASA-CR-162541] 25 p0155 N80-14492

FERRARIO, B.
Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines 25 p0082 A80-19672

FICKETT, F. R.
Space applications of superconductivity - High field magnets 25 p0084 A80-20128

FIELD, R. L.
An average slope factor for solar insolation [ASME PAPER 79-WA/SOL-41] 25 p0067 A80-18572

FIELDING, S. J.
Results from the Divertor Injection Tokamak Experiment /DITE/ 25 p0054 A80-17754

FILGES, D.
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets 25 p0C81 A80-19662

FILINOV, V. S.
Dynamic suppression of ionization instability 25 p0043 A80-16484

FILLO, J. A.
Fusion energy for hydrogen production [BNL-24906] 25 p0180 N80-15897

FINAN, W.
Wharton annual energy model: Development and simulation results [EPRI-EA-1115] 25 p0175 N80-15606

FINK, J. H.
Tandem mirror reactors 25 p0059 A80-17887

FIORE, V. B.
The reality of on-site fuel cells 25 p0016 A80-11973

FISCHER, A. K.
Experimental two-phase liquid-metal magnetohydrodynamic generator program [AD-A073128] 25 p0132 N80-12882

FISCHER, W. H.
Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results [AIAA PAPER 80-0091] 25 p0063 A80-18265

FISHER, S. T.
Processing of coal, oil sand and heavy oil in situ by electric and magnetic fields 25 p0019 A80-12310

FLASK, A. P.
SRC solids - Boiler fuel and building block 25 p0015 A80-11967

FLAT, A.
Optimization of multi-layer front-contact grid patterns for solar cells 25 p0028 A80-12816

FLEMING, E. S.
Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner [FE-2489-33] 25 p0093 N80-10390

FLETCHER, C. A. J.
Electricity generation from jet-stream winds 25 p0007 A80-11644

FLETCHER, E. A.
Hydrogen and oxygen from water. II - Some considerations in the reduction of the idea to practice 25 p0078 A80-19473

FOGELSON, S.
Fusion energy for hydrogen production [BNL-24906] 25 p0180 N80-15897

FOLEY, R. T.
On the properties of a fuel cell electrolyte [AD-A072864] 25 p0123 N80-12554

FOLLEA, D.
Conceptual design, realization and experimentation of a concentration photovoltaic generator - SOPHOCLE 1000 prototype 25 p0001 A80-10109

FOMEL, B. M.
Transverse particle losses in axially asymmetrical open traps 25 p0055 A80-17840

FORBES, R. E.
Addition of solar air heaters to a pre-engineered metal building [ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566

FOREMAN, K. M.
Experimental demonstration of the diffuser-augmented wind turbine concept 25 p0007 A80-11643

FORMILLER, D. J.
Osmotically pumped energy transport system [AIAA PAPER 80-0210] 25 p0064 A80-18378

FORNEY, J. A.
Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications [NASA-TM-78251] 25 p0156 N80-14501

FORSBERG, B. C.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings [UCRL-52553-VOL-1] 25 p0105 N80-10970
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report [UCRL-52553-VOL-2] 25 p0181 N80-15995

FOSTER-PEGG, R. W.
Screening evaluation of novel power cycles integrated with gasification plants [EPRI-AP-1002] 25 p0096 N80-10605

FOSTER, K. E.
West Coast Forum on Appropriate Technology [PB-298986/1] 25 p0166 N80-14962

FOUGERE, P.
Development of silver-hydrogen cells 25 p0010 A80-11844

FOULDS, A. W.
Thionine coated electrode for photogalvanic cells 25 p0051 A80-17343
Photogalvanic cells 25 p0073 A80-18749

FOWLER, T. K.
Tandem mirror reactors 25 p0059 A80-17887

FRANKS, L. A.
Laboratory evaluation of two laser fluorosensor systems
25 p0031 A80-12964

FRANTA, G.
Commercializing solar architecture
[SERI/TP-62-113] 25 p0161 N80-14548

FREED, R. K.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

FREEDMAN, D.
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398

FREESE, K. B.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825

FREY, W. P.
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567

FRIEDMAN, P. S.
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650

FRIEDMANN, P. P.
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

FRIEMAN, E. A.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797

FRIGO, A. A.
Turbomachinery options for an underground pumped hydroelectric storage plant
[CONF-790803-50] 25 p0177 N80-15629

FUJII, T.
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716

FUJISHIMA, A.
Photoelectrochemical hydrogen production
25 p0052 A80-17580

FUJITA, H.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868

FUJITA, T.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588

FUKUDA, J.
Gasification of solid waste in a fluidized bed reactor with circulating sand
25 p0074 A80-18868

FULTON, R. L.
Geothermal energy for industrial application
[LBL-8919] 25 p0111 N80-11579

FUNICH, G.
Progress and development trends in coal gasification and liquefaction technologies - New gasification methods developed on a laboratory or large scale
25 p0031 A80-12946

FURLONG, D. B.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553

FURMAN, E. R.
Candidate thermal energy storage technologies for solar industrial process heat applications
[NASA-TM-81380] 25 p0171 N80-15560

FURTH, H. P.
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876

FUSSMANN, G.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

G

GABANO, J. P.
Lead oxides-lithium cells
25 p0012 A80-11859

GAC, K.
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

GACEK, A.
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544

GADDIS, J. L.
Energy conservation through point source recycle with high temperature hyperfiltration
[PB-299183/4] 25 p0180 N80-15688

GAINES, G. B.
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483

GAINES, G. L., JR.
Coulombic effects in the quenching of photoexcited Tris/2,2'-bipyridine/ruthenium/II/ and related complexes by methyl viologen
25 p0040 A80-15358

GALANT, I. R.
Development of optical waveguides for a power-related application
25 p0036 A80-14596

GALBRAITH, D. L.
The effect of classical and anomalous transport on the performance of Tandem Mirror reactors
25 p0079 A80-19596

GALLAGHER, R. J.
Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596

GALLAGHER, S. P.
Screening evaluation of electric power cycles integrated with coal gasification plants
[ASME PAPER 79-WA/ENER-4] 25 p0071 A80-18644

GALLIKER, J. P.
Federal Energy Data System (FEDS) statistical summary update
[DOE/EIA-0192] 25 p0177 N80-15630

GALLO, P.
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286

GALLOWAY, L.
The water splitting light reaction of chlorophyll a dihydrate. Visible light solar energy conversion after the primary reaction in plant photosynthesis
25 p0133 N80-13188

GALLOWAY, T. R.
The challenge of efficiently retorting very nonuniform beds of oil shale rubble
25 p0085 A80-20453

GANDHIDASAN, P.
Performance characteristics of solar regenerators
25 p0028 A80-12787

GANESAN, H. R.
Solar energy availability over India for maximum utilisation
25 p0023 A80-12740

GANGADHARAN, A. C.
Interim structural design standard for solar energy applications, phases 1 and 2
[SAND-79-8183] 25 p0146 N80-13698

GARBAN, C.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864
GARCIA, M.
Production of sugarcane and tropical grasses as a renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277
GARDINER, G.
Energy saving in injection molding
[NEL-662] 25 p0136 N80-13318
GARDNER, J. H.
Inertial confinement fusion at NRL
25 p0056 A80-17861
GARG, H. P.
Effect of boosters on the performance of flat plate collector
25 p0023 A80-12744
Solar energy flat plate collectors - Optimization of air gap
25 p0023 A80-12745
Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756
GARG, S. B. L.
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749
GARLAND, R. V.
Novel power generation cycles using coal gas
[ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
Screening evaluation of novel power cycles integrated with gasification plants
[EPRI-AF-1002] 25 p0096 N80-10605
GARSIDE, B. K.
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786
GASKELL, T. F.
Climatic variability, marine resources and offshore development
25 p0131 N80-12689
GATTI, A.
Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263
GAUSSENS, P.
The present status of coal gasification following the 14th World Gas Congress Toronto 1979
25 p0050 A80-17222
GAVRILKO, S. A.
Change in rate of conducting-piston motion and the characteristics of field-diffusion processes in a linear electromechanical energy converter
25 p0083 A80-20069
GAY, E. C.
Review of industrial participation on the ANL lithium/iron sulfide battery development program
[CONF-780852-1] 25 p0164 N80-14573
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614
GEISE, R. F.
Electric heat - The right price at the right time
25 p0062 A80-18184
GEIST, J.
Solar cell spectral response characterization
25 p0037 A80-14685
GELB, G. H.
Application of solar and fuel cell technology to industrial users
25 p0037 A80-14707
GELIN, P.
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
GEORGAKIS, C.
A single coal particle gasification model
25 p0088 A80-20884
GEORGE, J. H.
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795
GEORGE, M. A.
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861
GERICH, J. W.
Non-tracking inflated cylindrical solar concentrator
[UCRL-82721] 25 p0159 N80-14528
GERISCHER, H.
Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells
25 p0087 A80-20723
GERNHARDT, J.
Testing and performance of the 30 kA ohmic heating system for ASDEX
25 p0078 A80-19585
GERTZ, J.
Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353
GETOFF, N.
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system
25 p0033 A80-13198
GHASSEMI, M.
Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204
GHEEWALA, T. R.
A 30-ps Josephson current injection logic /CIL/
25 p0030 A80-12853
GHULE, M. M.
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
Effect of concentrated sunlight on the various parameters of the p-n junction solar cell
25 p0025 A80-12764
GILBERT, B. L.
Experimental demonstration of the diffuser-augmented wind turbine concept
25 p0007 A80-11643
GILL, R. D.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
GILLILAND, M.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
GINER, J.
Study of corrosion and its control in aluminum solar collectors
[COO-2934-7] 25 p0129 N80-12609
GINLEY, D. S.
Principles of photoelectrochemical solar energy conversion
25 p0074 A80-18990
GIRARD, P.
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816
GITTLEMAN, J. I.
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980
Materials for solar thermal conversion
[COO-4557-1] 25 p0143 N80-13670
GLADD, N. T.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846
GLAESER, F.
The financing problems of Europe's gas industry
25 p0032 A80-13174
GLASER, P. E.
Earth benefits of solar power satellites
25 p0038 A80-14791
GLASS, R. E.
Superheated steam generation in a Fresnel lens concentrating collector
[ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567

GLASSER, A. H.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
GLASSEY, C. R.
Methods of estimating the reliability of wind energy systems with storage
[UCRL-15005] 25 p0098 N80-10623
GLASSMAN, I.
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion
[COO-4272-3] 25 p0165 N80-14587
GLOCK, E.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759
GLUCHOWSKI, W.
Optimization of neutron yield in conical system at explosion-induced compression
25 p0007 A80-11545
GLUCKMAN, M. J.
The near term potential for gasification-combined cycle electric power generation
25 p0015 A80-11970
Novel power generation cycles using coal gas
[ASME PAPER 79-WA/ENER-5] 25 p0071 A80-18645
GOBRECHT, J.
Schottky barrier height, photovoltage and photocurrent in liquid-junction solar cells
25 p0087 A80-20723
GODLOVE, T. F.
The United States programme in heavy ion beam fusion
25 p0058 A80-17873
GOEBEL, F.
Lithium inorganic electrolyte battery development
[AD-A073858] 25 p0157 N80-14505
GOGNA, P. K.
Selective black nickel coatings on zinc surfaces by chemical conversion
25 p0060 A80-18126
GOLDEMBERG, J.
Global options for short-range alternative energy strategies
25 p0048 A80-17129
GOLDEN, T. S.
Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957
GOLDSTEIN, D. J.
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700
GOLDSTEIN, N. E.
Geothermal energy development from the Salton Trough to the High Cascades
[LBL-8703] 25 p0171 N80-15568
GOLDSTEIN, R. J.
Heat transfer to a melting solid with application to thermal energy storage systems
25 p0036 A80-14667
GOLDSTEIN, S. A.
Inertial confinement fusion at NRL
25 p0056 A80-17861
GOLOVNER, T. M.
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627
GOMBIA, E.
Measurements of minority-carrier diffusion length in heterojunction solar cells
25 p0086 A80-20717
GONKALE, S. D.
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773
GONZALEZ-MOLINA, C.
Production of sugarcane and tropical grasses as a renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277
GOODALL, D. H. J.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
GOODMAN, A. C.
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0175 N80-15648
GORODETSKII, S. M.
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627
GORSKI, E.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874
GOSS, J. R.
Pilot plant gasification test on biomass fuels
[PB-299077/8] 25 p0151 N80-14272
GOTO, S.
New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium
25 p0085 A80-20538
GOTTARDI, N.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759
GRAHAM, R. W.
Impact of new instrumentation on advanced turbine research
[NASA-TM-79301] 25 p0166 N80-15133
GRANGER, L.
Economics of Pullman Kellogg's magnesium promoted FGD system
25 p0014 A80-11961
GRANQVIST, C. G.
Spectrally selective surfaces with coatings comprised of ultrafine metal particles
[AED-CONF-78-212-004] 25 p0115 N80-11620
GRANT, E. A.
An estimate of the resource potential of New Zealand geothermal fields for power generation
25 p0076 A80-19208
GRASSMANN, P.
The thermal triode
25 p0037 A80-14675
GRAVES, R. L.
Characterization of operating conditions for gas/water heat recovery steam generators
[ORNL/TM-6622] 25 p0176 N80-15620
GRAY, J. W.
Ignitron switching problems associated with a large reversed field pinch experiment
25 p0081 A80-19629
GREAIER, R. C.
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199
GREBENSHCHIKOV, S. E.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829
GREBOGI, C.
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870
GREEN, R.
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520
GREENBAUM, E.
The turnover times and pool sizes of photosynthetic hydrogen production by green algae
25 p0029 A80-12819
GREENBERGER, M.
Assessing energy policy models - Current state and future directions
25 p0009 A80-11831
GREENE, J. M.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
GREENSTEIN, M.
Foam solar sea power: A physical investigation
25 p0122 N80-12548
GREGORY, E.
Superconducting composites fabrication and properties
25 p0040 A80-15511
GREK, B.
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776
GRENON, L. P.
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
GRESHO, P. M.
Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282

GRETHER, D.
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647

GRETHER, D. F.
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12589
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982

GREYWALL, M. S.
Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922

GRIBBLE, R. F.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825

GRIGOREVA, G. N.
Solar panels exposed to cosmic rays
25 p0008 A80-11825

GRIGOROV, G. I.
Ion-stimulated sorption of nitrogen on a continuously deposited titanium film
25 p0051 A80-17252

GRIMES, P.
Zinc-bromine battery studies
25 p0010 A80-11845

GRIMM, R. C.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797

GRIMM, U.
Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386

GROBMAN, J.
Alternative jet aircraft fuels
25 p0091 N80-10209

GROBMAN, J. S.
Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737

GROEPPEL, D.
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850

GRONLI, K.
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833

GROS, J.
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544

GROSS, M. L.
Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash
25 p0053 A80-17710

GRUBBS, D. M.
A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560

GRUBER, R.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

GRUBER, R. P.
Self-reconfiguring solar cell system
[NASA-CASE-LEW-12586-1] 25 p0153 N80-14472

GRYZINSKI, M.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

GUBANKOV, V. N.
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430

GUBAREV, A. V.
Some problems with variable operation of an MHD generator
25 p0035 A80-14530

GUCERI, S. I.
Modeling of a thermal wall panel using phase change materials
25 p0021 A80-12439

GUCKERT, L. G.
Oil recovery by carbon dioxide injection
[ORC-5301-34] 25 p0108 N80-11545

GUENTHER, R.
Calculation of steam generation with parabolic solar collectors
25 p0039 A80-15328

GUGGI, D.
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4
25 p0081 A80-19660

GUHA, M. K.
Economics/reliability trade-offs in materials for various coal conversion and utilization processes
25 p0016 A80-11975

GUHA, S. N.
Study of photochemical processes in the ferrous-thionine system
25 p0027 A80-12783

GUILLANEUX, F.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

GUINET, P.
Hydrogen storage by means of reversible magnesium alloy
25 p0041 A80-15990

GUNN, T. L.
Energy optimal use of waste paper
[COO-2893-9] 25 p0174 N80-15595

GUPTA, A.
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766

GUPTA, B. K.
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747

GUPTA, G. D.
Interim structural design standard for solar energy applications, phases 1 and 2
[SAND-79-8183] 25 p0146 N80-13698

GUPTA, M. C.
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748
A parametric study of solar thermal power plant
25 p0024 A80-12753
Experimental investigations of an intermittent ammonia-water solar refrigerator
25 p0028 A80-12786
Performance characteristics of solar regenerators
25 p0028 A80-12787

GUPTA, M. K.
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762

GUPTA, S. K.
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762

GUPTA, Y. P.
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

GURUSWAMY, V.
The photo-electrochemical production of C-C bonds from carbon dioxide
25 p0004 A80-10848

GURWELL, W. E.
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625

GUTBERLET, L. C.
Catalyst development for coal liquefaction
[EPRI-AF-1084] 25 p0136 N80-13292

GUTJAHR, M. A.
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841

H

HABERSTICH, A.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

HAEFELE, W.
Models of worldwide energy demand and consumption
25 p0002 A80-10228
Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677

HAEFFELE, W.
Global perspectives and options for long-range energy strategies
25 p0048 A80-17130

HAGENA, O. F.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

HAGENMULLER, P.
Use of reversible hydrides for hydrogen storage
25 p0042 A80-15991

HAGEY, G.
Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972

HAHN, D. W.
Cooling aluminum molds using heat pipes
[BDX-613-2039-REV] 25 p0108 N80-11384

HALL, D. O.
Photochemical conversion and storage of solar energy
25 p0009 A80-11829

HALL, F. F.
Hydrogen-electric power drives
[SLAC-PUB-2203] 25 p0113 N80-11604

HALL, K. J.
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343

HALL, R. E.
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637

HALL, T. A.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

HALOTIER, D.
Hydrogen storage by means of reversible magnesium alloy
25 p0041 A80-15990

HALOW, J. S.
Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386

HAN, J.
Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287

HAMASAKI, S.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

HAMERSMA, J. W.
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294

HAMES, M. D.
Some aspects of sodium-sulphur batteries
25 p0013 A80-11866
Development of a sodium/sulphur battery for rail applications
25 p0031 A80-13003

HAMILTON, G. W.
Tandem mirror reactors
25 p0059 A80-17887

HAMILTON, L. D.
Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369

HAMILTON, R. I.
Cost analysis of packed beds for thermal energy storage
[CAES-11] 25 p0145 N80-13687

HAMILTON, R. N.
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T11] 25 p0168 N80-15276

HAMILTON, S.
Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646

HAMMERSHAIB, E.
The controlling production mechanism of methane gas from coalbeds
25 p0085 A80-20499

HAMMOND, R.
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638

HAMMOND, R. D.
Quality assurance in alternative energy sources
[RHO-SA-107] 25 p0095 N80-10504

HAMMOND, R. H.
An electrochemical heat engine for direct solar energy conversion
25 p0061 A80-18131

HAMPSON, N. A.
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146

HANDLEY, L. M.
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646

HANKINS, J. D.
Development and testing of the Junkeeper Control Corporation integrated programmable electronic controller and hydronics package
[NASA-TM-78244] 25 p0155 N80-14495
Development and testing of the Rho Sigma Incorporated microprocessor control subsystem
[NASA-TM-78246] 25 p0156 N80-14496
Development and testing of the Solar Control Corporation modular controller and Solarstat subsystem
[NASA-TM-78243] 25 p0156 N80-14498
Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499

HANLEY, G.
Satellite Power Systems (SPS) concept definition study. Volume 4: SPS point design definition
[NASA-CR-150683] 25 p0119 N80-12106

HANLEY, G. M.
The satellite power system concept and program
[SAWE PAPER 1305] 25 p0086 A80-20643

HANSON, R. J.
The electric trolley bus - Revisited
25 p0002 A80-10321

HANSON, D.
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633

HANSON, J.
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049

HANSON, J. M.
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647

HARDER, C. R.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

HARDY, D. M.
Wind resource analysis
[SERI/TR-36-088] 25 p0132 N80-12710

HARKNESS, S.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

HARRAR, J. E.
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567
Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561

HARRIGAN, W. C., JR.
New development and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978
25 p0040 A80-15501

HARRIS, A. W.
Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages
[ASME PAPER 79-WA/SOL-27] 25 p0067 A80-18568

HARRIS, H. G.
Optimal oil yield from in situ oil shale retorting
25 p0038 A80-14795

HARRISON, J. S.
Environmental protection in the processing of coal - The utilization or disposal of coal processing residues
25 p0030 A80-12942

HARRISON, T. D.
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
Midtemperature Solar Systems Test Facility (MSSTF) project test results: Phase 4A MSSTF system operation
[SAND-78-1088] 25 p0114 N80-11613

HART, S. R., JR.
SRC solids - A preferred compliance boiler fuel
25 p0015 A80-11968

HARTLEY, D. G.
Some aspects of sodium-sulphur batteries
25 p0013 A80-11866

HARTLEY, J. N.
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625

HARTMAN, C. D.
Design of the International Energy Agency 500 kWe distributed-collector solar thermal-electric powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592

HARTMAN, R. S.
Frontiers in energy demand modeling
25 p0009 A80-11830

HARTNETT, J. P.
Studies in heat transfer: A Festschrift for E. R. G. Eckert
25 p0036 A80-14655

HARVEY, E. B.
Commercialization strategy report for hydrothermal electric and direct heat application
[TID-28840-DRAFT] 25 p0157 N80-14508

HASANAIN, M. A.
Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454

HASBACH, W.
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492

HASEGAWA, A.
Effect of finite beta on drift-wave turbulence and particle confinement
25 p0084 A80-20158

HASEGAWA, M.
Gasification of solid waste in a fluidized bed reactor with circulating sand
25 p0074 A80-18868

HASELMAN, L. C.
Numerical modeling of LNG spill phenomena
[UCRL-82031] 25 p0130 N80-12625

HASLETT, J.
The assessment of actual wind power availability in Ireland
25 p0003 A80-10844

HASSELBERG, G.
What is the mechanism responsible for the precursors of internal disruptions
25 p0054 A80-17807

HATTORI, H.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

HAUK, R.
Rapid devolatilization and partial gasification of coal in an entrained dust reactor
25 p0002 A80-10226

HAUSER, J. R.
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661

HAVEN, K. F.
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648

HAWRYLUK, R. J.
Volt-second consumption during the start-up phase of PLT
25 p0040 A80-15532

HAY, J. E.
Calculation of monthly mean solar radiation for horizontal and inclined surfaces
25 p0028 A80-12817

HAY, R. D.
Flywheel energy storage interface unit for photovoltaic applications
[COO-4094-44] 25 p0175 N80-15609

HAYES, G. B.
Solar access law. Protecting access to sunlight for solar energy systems
[PB-296532/5] 25 p0117 N80-11633

HAZZARD, G.
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862

HEALEY, H. M.
MSFC solar heating and cooling high speed performance (Hisper) code validation
[NASA-CR-161323] 25 p0096 N80-10604

HEATH, R. A.
Transmission of tidal energy over a plateau
25 p0072 A80-18721

HECHLER, K.
Toward the endless frontier: History of the Committee on Science and Technology 1959 - 1979
[GPO-35-120] 25 p0181 N80-15994

HECKES, A. A.
Closed-cycle hydride engines
[SAND-78-2228] 25 p0125 N80-12572

HECKLINGER, R. S.
The relative value of energy derived from municipal refuse
25 p0051 A80-17352

HEDDEN, K.
Rapid devolatilization and partial gasification of coal in an entrained dust reactor
25 p0002 A80-10226

HEDRICK, C. L.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

HEDSTROM, J. C.
Monitoring of the solar-heated modular homes at Los Alamos
25 p0022 A80-12607
Performance of Los Alamos solar Mobile/Modular Home Unit no. 1
[LA-UR-78-2587] 25 p0126 N80-12577

HEERWAGEN, D. R.
The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574

HEGG, D. A.
Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants
25 p0089 A80-21010

HEGGIE, J. C. P.
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141

HEIGES, H. H.
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586

HEIMBURGER, D. A.
A survey of electric and hybrid vehicle simulation programs
[NASA-CR-162457] 25 p0118 N80-11954

HEINSHEIMER, T. F.
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019

HEMENWAY, A.
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286

HENDERSON, J.
Solar pond concepts: Old and new
[SERI/TP-35-208] 25 p0102 N80-10663

HENDERSON, R. W.
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648

HENDERSON, T. M.
The KMSF laser fusion programme
25 p0056 A80-17860

HENDRICKS, C. D.
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110

HENDRIE, S. D.
Evaluation of combined photovoltaic/thermal collectors
[COO-4577-8] 25 p0143 N80-13665

HENKENER, J. A.
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747

HENKES, P. R. W.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

HENLINE, W. D.
Dynamic modeling of H2S clean-up processes
25 p0088 A80-20885

HENNESSEY, J. P., JR.
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723

HENNING, C. D.
Superconductivity for mirror fusion
[UCRL-81693] 25 p0181 N80-15933

HENRIQUEZ, M.
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648

HENSCHEL, D. B.
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

HERENDEEN, R. A.
Gasohol - Does it or doesn't it produce positive net energy
25 p0034 A80-13863
New hybrid 1971 energy intensities, part 1
[COO-4628-4-PT-1] 25 p0158 N80-14516

HERMELEE, A.
Regional reference energy systems: Electric utility applications
[BNL-50962] 25 p0111 N80-11585

HEWSON, E. W.
A low level wind measurement technique for wind turbine generator siting
25 p0042 A80-16084

HICKS, R. E.
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700

HIGHTOWER, M. M.
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

HIJIKATA, K.
MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004

HILL, G. R.
A regional approach to forecasting electric energy requirements for environmental assessments
25 p0130 N80-12619

HILL, J. E.
A comparison of test results for flat-plate water-heating solar collectors using the BSI and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585

HILL, J. H.
Identification of environmental control technologies for geothermal development in the Imperial Valley of California
[UCRL-52548] 25 p0179 N80-15668

HILL, R. F.
Energy technology VI: Achievements in perspective; Proceedings of the Sixth Conference, Washington, D.C., February 26-28, 1979
25 p0013 A80-11953

HILLER, C. C.
Sensitivity study of Brayton cycle power plant performance
[SAND-78-8020] 25 p0098 N80-10626

HILLMAN, A. R.
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343

HILLSMAN, E. L.
Simulation approach for base-line energy-siting analysis
[CONF-790459-22] 25 p0157 N80-14511

HINERMAN, J. M.
Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation
[ASME PAPER 79-WA/SOL-2] 25 p0067 A80-18571

HINES, A. L.
Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454

HINKEBEIN, T. E.
Closed-cycle hydride engines
[SAND-78-2228] 25 p0125 N80-12572

HINMAN, G. W.
Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558

HINRICHSEN, E. N.
Induction and synchronous machines for vertical axis wind turbines
[SAND-79-7017] 25 p0144 N80-13675

HINZ, H.
Minimum cost transmitter-receiver antenna pairs
[RM-690] 25 p0094 N80-10414

HIRATA, Y.
Constant current and constant voltage excitation of large coils by flywheel-generator-converter
25 p0080 A80-19624

HIRAYAMA, K.
Constant current and constant voltage excitation of large coils by flywheel-generator-converter
25 p0080 A80-19624

HO, Y.-P.
Magnetic field design for a large tokamak
25 p0046 A80-16760

HOBBS, P. V.
Measurements of gas-to-particle conversion in the plumes from five coal-fired electric power plants
25 p0089 A80-21010

HOBBY, M.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754

HODGDON, R. B.
Anion permselective membrane
[NASA-CR-159599] 25 p0122 N80-12551

HODGSON, R. T.
The effect of fluorescent wavelength shifting on solar cell spectral response
25 p0086 A80-20715

HOFFMAN, D. C.
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691

HOFFMAN, H. W.
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6605] 25 p0125 N80-12568
Condensation and evaporation heat transfer with low-boiling temperature fluids
[CONF-790539-1] 25 p0137 N80-13412

Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6934] 25 p0139 N80-13631

HOFFMAN, K. C.
Dynamics and control: Energy conversion, delivery, and demand analysis
[BNL-26045] 25 p0099 N80-10633

HOFFMAN, T. J.
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602

HOGAN, J. T.
High-beta tokamaks
25 p0054 A80-17789

HOGAN, W. J.
Numerical modeling of LNG spill phenomena
[UCRL-82031] 25 p0130 N80-12625

HOLBL, J. F.
Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings
[BMFT-FB-T-78-48] 25 p0116 N80-11630

HOLDREN, J. P.
Environmental aspects of alternative energy technologies for California
[UCRL-15002] 25 p0131 N80-12628

HOLIGHAUS, R.
Technical possibilities and economic prospects for coal refining
25 p0043 A80-16175

HOLL, R. J.
A solar thermal electric power plant for small communities
[ASME PAPER 79-WA/SOL-7] 25 p0065 A80-18584

HOLLA, V.
Review of the work done at C.E.E.B.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

HOLLAND, M. M.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

HOLLANDER, J. M.
Annual review of energy. Volume 4
25 p0008 A80-11826
United States energy alternatives to 2010 and beyond - The CONAES study
25 p0008 A80-11827

HOLLECK, G. L.
Development of silver-hydrogen cells
25 p0010 A80-11843

HOLT, E. A.
The near term potential for gasification-combined cycle electric power generation
25 p0015 A80-11970

HOLVE, D. J.
An in-situ optical particle sizing technique
[AIAA PAPER 80-0020] 25 p0062 A80-18240

HOMBACH, H. P.
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168

HOMOLYA, J. B.
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128

HOMSY, R. V.
Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386

HONDA, K.
Photoelectrochemical hydrogen production
25 p0052 A80-17580

HONEA, R. B.
Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584

HOOKE, W. M.
Steady-state currents driven by collisionally damped lower-hybrid waves
25 p0084 A80-20157

HOPKINS, D.
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617

HOPKINS, H. T.
Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676

HOPKINSON, C. S., JR.
Net energy analysis of alcohol production from sugarcane
25 p0062 A80-18165

HOPKINSON, R. F.
Test plan for the Mead 25-kW Photovoltaic Flexible Test Facility, 1979
[COO-4094-53] 25 p0146 N80-13692

HOPPING, K. A.
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559

HORA, H.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875

HORNELL, C.
Utility fuel cells for Sweden
25 p0011 A80-11852

HORNER, H. L.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

HORODENSKI, A.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

HOUGHBY, W. E.
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646

HOUSE, P. A.
New concepts for converting the energy in low-to medium-temperature liquids, with emphasis on geothermal applications
[UCRL-52583] 25 p0125 N80-12570

HOUSEMAN, J.
Start up system for hydrogen generator used with an internal combustion engine
[NASA-CASE-NPO-13849-1] 25 p0092 N80-10374

HOVEL, H. J.
The effect of fluorescent wavelength shifting on solar cell spectral response
25 p0086 A80-20715

HOWELL, J. R.
Solar concentrators using vacuum-contoured surfaces for tracking
[AIAA PAPER 80-0399] 25 p0077 A80-19326

HOWELL, R. B.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

HOWELL, Y.
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574

HRUBY, V.
Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal
25 p0007 A80-11448

HSIEH, B. C. B.
Fixed-bed gasifier dynamic model for IGCCP control study
25 p0088 A80-20883

HUANG, H.
Status of development, energy and economics aspects of alternative technologies
[CONF-790371-1] 25 p0145 N80-13689

HUANG, M. C.
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600

HUANG, L.
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564

HUBA, J. D.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

HUBBARTT, J. E.
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

HUBER, H. D.
User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605

HUBER, L.
Rapid devolatilization and partial gasification of coal in an entrained dust reactor
25 p0002 A80-10226
HUDGINS, J. L.
Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
HUDSON, C. L.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995
HUDSON, N. M.
Some aspects of sodium-sulphur batteries
25 p0013 A80-11866
HUGHES, J. W.
Back to the central city - Myths and realities
25 p0002 A80-10323
HUGHES, P. J.
Residential solar heat pump systems - Thermal and economic performance
[ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591
HUGILL, J.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
HULISZ, S.
Progress in R and D on coal liquefaction - Progress in research-development on coal liquefaction
25 p0030 A80-12940
HULL, W.
Economic analysis of small scale bioconversion units in New Mexico
[PB-301390/1] 25 p0169 N80-15298
HULSTROM, R. L.
Insolation models, data and algorithms
[SERI/TR-36-110] 25 p0165 N80-14617
HUMPHREYS, D. W.
New technology and vehicle operation on roadways
25 p0037 A80-14702
HUNDEMANN, A. S.
Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0814/8] 25 p0148 N80-13715
Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716
Geothermal energy. Part 3: Technology and general studies, volume 4. Citations from the NTIS data base
[NTIS/PS-79/0817/1] 25 p0148 N80-13719
Geothermal energy, volume 4. Citations from the Engineering Index data base
[NTIS/PS-79/0819/7] 25 p0148 N80-13720
HUNEAU, M.
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816
HUNT, A.
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982
HURD, H. A.
Measurements and standards for recycled oil - 2
[PB-299951/4] 25 p0167 N80-15275
HYATT, D.
Flat-plate solar collector materials
25 p0035 A80-14409
HYLAND, S.
Relating computer simulation studies with interface state measurements on MIS solar cells
25 p0062 A80-18231
HYMAN, E. A.
Battery Energy Storage Test (BEST) facility
[EPRI-EM-1005] 25 p0098 N80-10628
HYPES, W. D.
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559

I

IAKOVLEV, IU. P.
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626
IANNUCCI, J. J.
Applications analysis of fixed site hydrogen storage
[SAND-78-8272] 25 p0092 N80-10384
IBADOV, S.
Possibility of conversion of solar corpuscular radiation energy into electrical energy
25 p0085 A80-20495
IHARA, S.
Direct thermal decomposition of water
25 p0052 A80-17577
IHLE, H. R.
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4
25 p0081 A80-19660
IIYOSHI, A.
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159
ILES, P. A.
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561
ILIEV, I.
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849
IM, K. H.
Heat transfer including radiation and slag particles evolution in MHD channel. I
[AIAA PAPER 80-0250] 25 p0076 A80-19304
IMARISIO, G.
The R&D programme of the European communities in the field of hydrogen - Progress and results
25 p0032 A80-13195
IMASAKI, K.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
IMENKOV, A. N.
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626
INGBERMAN, A.
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286
INGBERMAN, A. K.
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544
INGLIS, M. R.
Residential heat loss mapping of Farmington, New Mexico using airborne thermal scanning
25 p0084 A80-20242
INMAN, R. E.
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
IRETON, V.
Measurement of energy to heat houses: Initial study
[PB-299448/2] 25 p0170 N80-15304
IRVINE, T. F., JR.
Studies in heat transfer: A Festschrift for E. R. G. Eckert
25 p0036 A80-14655
ISAACS, H.
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897
ISAACS, H. S.
Solid electrolyte fuel cell for electric power generation
[BNL-26238] 25 p0158 N80-14522
ISAACS, J. D.
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524

Ocean energy - Forms and prospects
25 p0061 A80-18162

ISHERWOOD, W. F.
Evaluation of Baltazor known geothermal resources area, Nevada
25 p0076 A80-19206

ITO, K.
Minimum ignition energies and quenching distances of methanol blends
25 p0004 A80-11331

ITOH, H.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

IURUKOVSKII, N. P.
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199

IWASAWA, Y.
Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So2-I2 system for H2O decomposition
25 p0032 A80-13196

IZAWA, Y.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868

J

JACH, K.
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

JACKSON, D. R.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395

JACOBSON, A. R.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809

JACQUINOT, J.
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608

JAEGER, E. F.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

JAGADISH, B. S.
Prime mover for solar power plant
25 p0024 A80-12752
Economics of small solar power plants
25 p0024 A80-12754

JAGANMOHAN, A.
Selection of working fluids for low temperature solar thermal power cycles
25 p0024 A80-12751
Prime mover for solar power plant
25 p0024 A80-12752

JAHODA, F. C.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825

JAIN, B. C.
Industrial applications of solar energy in India
25 p0027 A80-12780

JAIN, S. C.
Prime mover for solar power plant
25 p0024 A80-12752

JAIN, V. K.
Cadmium telluride solar cells
25 p0026 A80-12765

JAKUBOWSKI, L.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

JANNASCH, H. W.
Chemosynthetic production of biomass - An idea from a recent oceanographic discovery
25 p0045 A80-16657

JARDIN, S. C.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797

JARVINEN, P. O.
Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694

JASKE, R. T.
Hydrogen - A means of integrating competing technology into a unified energy system
25 p0014 A80-11955

JAVADEV, T. S.
Solar pond concepts: Old and new
[SERI/TP-35-208] 25 p0102 N80-10663

JAYADEV, T. S.
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564

JEFFRIES, K. D.
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204

JEFFS, E. J.
The application potential of hydro power
25 p0049 A80-17136

JENKINS, G. H.
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603

JENKINS, J. P.
A comparison of test results for flat-plate water-heating solar collectors using the BSE and ASHRAE procedures
[ASME PAPER 79-WA/SOL-4] 25 p0069 A80-18585

JENKINS, M. K.
Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642

JENSEN, D.
Computer analysis of grids currently used for CdS/Cu2S solar cells
25 p0089 A80-20893

JERZYKIEWICZ, A.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

JINDRA, J.
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147

JOCKEL, W.
First experiences with the use of impactors in large power plants
25 p0074 A80-18859

JOHNSON, C. E.
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882

JOHNSON, D.
Volt-second consumption during the start-up phase of PLT
25 p0040 A80-15532

JOHNSON, I.
The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505

JOHNSON, J. L.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797

JOHNSON, P. C.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826

JOHNSON, R. R.
The KMSF laser fusion programme
25 p0056 A80-17860

JOHNSON, W. H.
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646

JOHNSTON, T. W.
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776

JONES, C. D.
Fuel utilization in residences
[EPRI-EA-894] 25 p0175 N80-15604

JONES, D. W.
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594

JONES, G. F.
Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434

Optimal insulation of pipes and tanks for solar heating systems
[ALC-5319-2] 25 p0102 N80-10660

JONES, G. J.
Design of photovoltaic systems for residential applications in the United States
[SAND-78-2186C] 25 p0171 N80-15566

JONES, G., II
Energy storage in organic photoisomers
25 p0072 A80-18747
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502
Energy storing organic photoreactions
[AD-A074915] 25 p0156 N80-14503

JONES, H. E.
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586
The first small power system experiment, Phase 1: Engineering experiment no. 1
[NASA-CR-162417] 25 p0095 N80-10596

JONES, H. T.
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590

JONES, J. E., JR.
Industrial applications of advanced energy systems
[CONF-790602-54] 25 p0147 N80-13708

JONES, J. W.
An evaluation of thermal energy storage for residential air conditioning applications
[ASME PAPER 79-WA/HT-31] 25 p0071 A80-18631

JONES, R. P.
Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651

JONES, W. M.
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605

JONGUITUDFALCON, V.
Biological transformation of light energy into methane using an anaerobic filter
25 p0133 N80-13267

JORGENSEN, L. W.
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218

JOSEPH, L. M.
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285

JOSEPHY, N. H.
Newton's method for generalized equations and the PIES energy model
25 p0149 N80-13872

JOYCE, J. J.
Gasohol - Does it or doesn't it produce positive net energy
25 p0034 A80-13863

JUANG, L. L.
Dynamic energy system optimization model
[EPRI-EA-1079] 25 p0157 N80-14514

JUENGER, S.
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633

JUENTGEN, H.
An update of German non-isothermal coal pyrolysis work
25 p0019 A80-12245

JUMEL, Y.
Lead oxides-lithium cells
25 p0012 A80-11859

JUNGE, D. C.
Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation
[DOE/EL-90476-13] 25 p0169 N80-15293

JUNGE, G.
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368

JUNKHAN, G. H.
Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707

JUNKISON, A. R.
Current collectors for sodium-sulphur batteries
25 p0013 A80-11867

JURINAK, J. J.
On the performance of air-based solar heating systems utilizing phase-change energy storage
25 p0020 A80-12427

JUST, J.
Review of scenarios of future U.S. energy use
25 p0009 A80-11832

K

KAHAN, W.
Optimization and comparison strategies for solar energy systems
[ASME PAPER 79-WA/SOL-26] 25 p0067 A80-18573

KAHN, E.
The compatibility of wind and solar technology with conventional energy systems
25 p0008 A80-11828

KAKABAEV, A.
Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244

KALASHIAN, V. A.
High-voltage multijunction solar cell
25 p0035 A80-14593

KALE, S. C.
Pollution aspects of oilfired and coalfired boilers
25 p0074 A80-18849

KALHAMMER, F. R.
Energy-storage systems
25 p0034 A80-13513

KALININ, A. V.
Laser fusion - Energy application perspectives
25 p0030 A80-12883

KALISKI, S.
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544
Optimization of neutron yield in conical system at explosion-induced compression
25 p0007 A80-11545
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

KALISKY, Y.
Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740

KALNOKI-KIS, T.
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856

KAMAT, P. V.
Study of photochemical processes in the ferrous-thionine system
25 p0027 A80-12783

KAMATH, G. S.
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564

KAMINSKY, M.
Selected topics on surface effects in fusion devices - Neutral-beam injectors and beam-direct converters
25 p0043 A80-16262

KAMIYA, M.
Photochemical hydrogen production
25 p0052 A80-17579

KAMMASH, T.
The effect of classical and anomalous transport on the performance of Tandem Mirror reactors
25 p0079 A80-19596

KAMPERSCHROER, J. H.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600

KANDLIKAR, S. G.
Selection of working fluids for low temperature solar thermal power cycles
25 p0024 A80-12751

KANDPAL, T. C.
Using a fin with a parabolic concentrator
25 p0004 A80-10847
KANE, E. L.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
KANG, D.
Elucidation of coal structural components by short residence-time extractive liquefaction
25 p0119 N80-12188
KANOUSE, R.
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643
KANT, M.
Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004
KAR, S.
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776
KARADY, G.
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620
KARGER, F.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759
KARLSSON, G.
Utility fuel cells for Sweden
25 p0011 A80-11852
KARR, H. J.
LASL toroidal reversed-field pinch programme
25 p0054 A80-17809
KARTSOUNES, G. T.
Underground pumped hydro storage: An overview
[CONF-781046-1] 25 p0116 N80-11624
KASICH-PILIPENKO, I. E.
Development of optical waveguides for a power-related application
25 p0036 A80-14596
KATO, Y.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
KATZ, M.
Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972
KAUFMAN, E. L.
Energy policy and decision analysis; new concepts and mechanisms
[LA-7909-MS] 25 p0140 N80-13634
KAUSHIK, S. C.
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
KAW, P. K.
Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349
KAWAI, T.
Hydrogen evolution from water using solid carbon and light energy
25 p0032 A80-13109
KAWAMURA, Y.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
KAY, J.
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648
KAYE, W. G.
Development of fluidised bed combustion in the United Kingdom
25 p0015 A80-11963
KAYLONCU, A. A.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395
KAYNE, N.
Vehicle emissions control and its effect on engine development
25 p0037 A80-14708
KAYUKAWA, N.
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997
KELLEDY, E.
The assessment of actual wind power availability in Ireland
25 p0003 A80-10844
KELLER, W. E.
Some dc superconducting cables
[LA-UR-79-1057] 25 p0107 N80-11348
KELLEY, J. L.
Conceptual design of a Demonstration Tokamak Hybrid Reactor (DTHR)
[WFPS-TME-107] 25 p0132 N80-12898
KELLY, J. T.
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687
KEMME, J. E.
Performance limits for liquid-metal heat pipes containing long adiabatic sections
[LA-UR-79-1241] 25 p0095 N80-10472
KEMPER, W. D.
Trans-seasonal storage of solar energy: Innovative research program subtask
[COO-4546-3] 25 p0144 N80-13672
KENNINGTON, J.
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633
KENNISH, W. J.
Validation methodology for solar heating and cooling systems
25 p0020 A80-12431
KERN, E. C., JR.
Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566
KERNER, W.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790
KESSLER, R.
High interaction subsonic MHD channel operation
[AIAA PAPER 80-0022] 25 p0062 A80-18242
KESTIN, J.
The influence of thermophysical properties on the design and sizing of geothermal power plant components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593
KEYES, C. G., JR.
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645
KHALIFA, H. E.
The influence of thermophysical properties on the design and sizing of geothermal power plant components
[ASME PAPER 79-WA/HT-18] 25 p0070 A80-18593
KHAMIDULLIN, F. A.
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074
KHANDURDYEV, A.
Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244
KHATAMOV, S. O.
Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631
KHODZHAEV, A.
Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

KHOLEVA, N. N.
Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628

KHOLNOV, IU. V.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

KIEFFER, J. C.
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776

KILGORE, W. C.
International energy assessment
[DOE/EIA-0184/1] 25 p0174 N80-15594

KIM, D. K.
Catalyst development for coal liquefaction
[EPRI-AF-1084] 25 p0136 N80-13292

KIM, J. K.
Relating computer simulation studies with interface state measurements on MIS solar cells
25 p0062 A80-18231

KIMBLE, B. J.
Tetrachlorodibenzo-p-dioxin quantitation in stack-collected coal fly ash
25 p0053 A80-17710

KINNEY, W. L.
Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470

KIPPENHAN, C. J.
The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574

KISHINEVSKII, M. E.
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

KLAPSTE, B.
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839

KLARE, K. A.
An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628

KLEIN, S. A.
Computers in the design of solar energy systems
25 p0020 A80-12426
A method of estimating monthly average solar radiation on shaded receivers
25 p0060 A80-18123

KLEIN, W. E.
Modified aerospace reliability and quality assurance method for wind turbines
[NASA-TM-79284] 25 p0137 N80-13490

KLEMENT, G.
Testing and performance of the 30 kA ohmic heating system for ASDEX
25 p0078 A80-19585

KLEMETSON, S. L.
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641

KLEPEIS, J. E.
Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results
[AIAA PAPER 80-0091] 25 p0063 A80-18265

KLIMAS, P. C.
Darrieus wind turbine program at Sandia Laboratories
[SAND-79-0997C] 25 p0160 N80-14538

KLINE, R.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

KLINGELHOEFER, R.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

KLUEBER, O.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

KLUGMANN, E.
Measurement of insolation using CdS photoresistor
25 p0047 A80-16998

KNASEL, T. M.
Validation methodology for solar heating and cooling systems
25 p0020 A80-12431

KNECHTLI, R.
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564

KNISELEY, R. N.
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
[IS-M-202] 25 p0129 N80-12611

KNOCHE, K. F.
Absorption heat pumps for solar space heating systems
25 p0036 A80-14672

KNOEPFEL, H.
Hard X-ray measurements
25 p0045 A80-16722

KNOX, C. E.
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment
[NASA-TM-80194] 25 p0150 N80-14114

KOCAY, C. A.
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622

KOCH, R. A.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

KOCH, V. R.
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

KODAIRA, J.
Constant current and constant voltage excitation of large coils by flywheel-generator-converter
25 p0080 A80-19624

KOELLING, G.
Current German developments in coal liquefaction technology
25 p0015 A80-11965

KOENIG, D. R.
Baseline design of the thermoelectric reactor space power system
[LA-UR-79-1242] 25 p0149 N80-13906

KOEPPENDOERFER, W.
A simple model describing hydrogen re-cycling in fusion experiments and its influence on discharge behaviour
25 p0022 A80-12453

KOGER, T.
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979
[PB-299399/6] 25 p0179 N80-15682

KOH, J. L.
Deep space network feasibility study of terminating Southern California Edison electrical service to Goldstone
25 p0091 N80-10263

KOHLI, J. C.
Doublet III neutral beam injection system overview and status report
25 p0079 A80-19599

KOHLMUELLER, H.
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850

KOIDAN, V. S.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

KOIDE, G.
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628

KOLBASOV, B. N.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

KOLBENSON, C. R.
Computer analysis of grids currently used for CdS/Cu2S solar cells
25 p0089 A80-20893

KONIUKHOV, V. V.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

KONKEL, R. S.
Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects
[CONF-780843-5] 25 p0103 N80-10693

KOPPANY, C. R.
Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935

KORNEV, B. I.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

KORNILOV, V. A.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

KOSAKI, M.
Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346

KOSHELETS, V. P.
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430

KOSSON, R.
Performance testing of a hydrogen heat pipe
[AIAA PAPER 80-0212] 25 p0064 A80-18379

KOTHARI, H. S.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

KOTTAPALLI, S. B. R.
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

KOUDELKA, V.
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147

KOUTS, H.
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897

KOVALSKII, B. V.
Maximum cold-generation capacity of thermoelectric refrigerators
25 p0035 A80-14594

KRACK, H.
Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings
[BMFT-FB-T-78-48] 25 p0116 N80-11630

KRAFT, M. L.
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294

KRAJEWSKI, R. F.
Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651

KRAKOWSKI, R. A.
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296

KRALL, N. A.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

KRAMER, S.
International activities: The fiscal year 1978 survey of international programs at NEL
[PB-300491/8] 25 p0181 N80-16004

KREIDER, J. F.
Second-law analysis of solar-thermal processes
25 p0003 A80-10843

KREININ, L. B.
Solar panels exposed to cosmic rays
25 p0008 A80-11825
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627

KREJCI, I.
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839

KRESHCHUK, A. P.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

KRESOVICH, S.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395

KRICHKO, A. A.
Progress and development trends in coal gasification and liquefaction technologies
25 p0031 A80-12945

KRIKORIAN, O. H.
Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571

KROEGER, F. A.
Low cost solar cells based on amorphous silicon electrodeposited from organic solvents
[SAN-0113-T3] 25 p0145 N80-13678

KROLL, P.
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578

KRONENBERG, M. L.
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856

KRONER, W. M.
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494

KRUGLIAKOV, E. P.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

KRUIDHOF, W.
Cobalt oxide as a spectrally selective material for use in solar collectors
25 p0086 A80-20719

KRUPKA, M. C.
Selected results from the technology assessment of solar energy program
[LA-UR-79-950] 25 p0099 N80-10637

KRUPTA, M. C.
Decentralized solar photovoltaic energy systems
[LA-7866-TASE] 25, p0171 N80-15565

KU, A. C.
Small solar thermal electric power plants with early commercial potential
[ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586

KUBASCO, A. J.
Characterization and combustion of SRC 2 fuel oil
[EPRI-FP-1028] 25 p0119 N80-12192

KUCUK, F.
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205

KUCZERA, H.
Calculation of steam generation with parabolic solar collectors
25 p0039 A80-15328

KUDIRKA, A. A.
Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297

KUDKIN, O. I.
Investigation of absorptive and radiative characteristics of an ideal selective surface
25 p0044 A80-16632

KUDRIN, O. I.
Selective ray-absorption as means of increasing the efficiency of a high-temperature solar energy system
25 p0036 A80-14597

KUEHL, D.
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850

KUESTER, J. L.
Conversion of cellulosic and waste polymer material to gasoline
[COO-2982-38] 25 p0169 N80-15291

KUFA, E. M.
Determination of the geometry of the transition region of a series MHD generator
25 p0030 A80-12900

Influence of the loading factor on the performance characteristics of series MHD generators
25 p0061 A80-18137

Characteristics of series channels with a diminishing electrode-commutation angle in the transition section
25 p0061 A80-18139

KUHLMANN-WILSDORF, D.
New development and applications in composites; Proceedings of the Symposium, St. Louis, Mo., October 16, 17, 1978
25 p0040 A80-15501

KUHN, H.
Synthetic molecular organizates
25 p0073 A80-18752

KULADOVA, N. A.
Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

KULAGIN, V. D.
Kinetics of the processes in a plasma produced by an electron beam in a dense inert gas
25 p0007 A80-11612

KULLMAN, B. C.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

KULSHRESHTHA, A. P.
Cadmium telluride solar cells
25 p0026 A80-12765

Theoretical consideration of curve fill factor in solar cells
25 p0026 A80-12768

KUMAR, R.
Performance of solid compound parabolic concentrators in series
25 p0024 A80-12749

KUMAR, S.
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766

KUNDU, M. M.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

KUNII, D.
Gasification of solid waste in a fluidized bed reactor with circulating sand
25 p0074 A80-18868

KURBANKULIEV, CH.
Solar system with a hermetically and nonhermetically vitrified regenerative heater and its energetic indices
25 p0051 A80-17244

KURBATOV, D. K.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

KURSTED, H. A.
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705

KURTMULLAEV, R. KH.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

KURZ, U.
Diffusion of tritium in neutron-irradiated microcrystalline Beta-Li5AlO4
25 p0081 A80-19660

KURZYNA, J.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874

KUSCHNER, M.
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897

KUSH, E. A.
Performance of heat pumps at elevated evaporating temperatures - With application to solar input
[ASME PAPER 79-WA/SOL-19] 25 p0069 A80-18587

KUSTOM, R.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

KUSTOM, R. L.
Power supply requirements for a tokamak fusion reactor
25 p0003 A80-10474

Power supply requirements for a tokamak fusion reactor
[ANL/FPP/TM-119] 25 p0104 N80-10918

KUSY, V.
Analysis of tarry fractions in emissions resulting from low temperature oxidation of brown coal
25 p0007 A80-11448

KUTAS, R. I.
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048

KUTATELADZE, S. S.
Energetics aspects of environmental protection
25 p0072 A80-18733

KUTHY, A.
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877

KUUS, H.
Design of antennae for R.F. power coupling to tokamak plasma in the ion cyclotron range of frequency
25 p0079 A80-19608

KUUSKRAA, V. A.
The controlling production mechanism of methane gas from coalbeds
25 p0085 A80-20499

KUZIN, A. F.
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

KUZNETSOV, S. E.
Conduction-type MHD generator with back-and-forth motion of the hybrid working material
25 p0030 A80-12898

KWARTLER, M.
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494

KWATNY, H. G.
Area load-frequency control
25 p0022 A80-12735

L

LA-THANH, H.
Distribution and movement of electrolyte in fuel cells and batteries
25 p0138 N80-13619

LAASKO, J. H.
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644

LABAHN, K.-D.
On the substitution of petroleum by other energy sources - Using the energy economics of West Germany as an example
25 p0074 A80-19000

LACKNER, K.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

LADY, G. M.
Economic structure, aggregate production functions and the demand for energy as an intermediate product: A preliminary analysis
[DOE/EIA-0103/8] 25 p0096 N80-10607

LAEDRACH, P.
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869

LAKAS, G. R.
Combined effects of polycyclic aromatic hydrocarbons and sunlight
[CONF-790447-4] 25 p0131 N80-12631

LALLI, V. R.
Photovoltaic power system reliability considerations
[NASA-TM-79291] 25 p0170 N80-15422
LAMBOU, V. W.
Surface water quality parameters for monitoring oil shale development
[PB-297984/7] 25 p0153 N80-14470
LAMORTE, M. F.
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661
LAMPERT, C. M.
Coatings for enhanced photothermal energy collection. II - Non-selective and energy control films
25 p0086 A80-20714
Thermal degradation of a black chrome solar selective absorber coating: Short term
[LBL-8857] 25 p0161 N80-14549
LANDSMAN, E. E.
Maximum power trackers for photovoltaic arrays
[COO-4094-17] 25 p0116 N80-11627
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377
LANGNER, J.
Nuclear fusion by cylindrical ion implosion
25 p0058 A80-17874
LANIER, M.
Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications
[NASA-TM-78251] 25 p0156 N80-14501
LANSING, F. L.
A high performance porous flat-plate solar collector
25 p0021 A80-12438
LANSING, N.
Solar heating and cooling research projects: A summary
[EPRI-ER-1095-SR] 25 p0147 N80-13703
LANTZ, L. J.
Validation of computer models for predicting radiation levels on tilted surfaces
25 p0020 A80-12429
LANZA, F.
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19666
LAPILLONNE, B.
MEDEE 2: A model for long term energy demand evaluation
[IIASA-RR-78-17] 25 p0109 N80-11554
LAREAU, W. E.
World Energy Data System (WENDS)
[CONF-790461-2] 25 p0112 N80-11587
LARSON, D. C.
Use of adjustable flat mirrors with flat-plate collectors
[AIAA PAPER 80-0294] 25 p0063 A80-18299
Double-exposure collector system
[TID-28964] 25 p0127 N80-12593
LARSON, S. A.
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049
LASALLE, J.
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers
25 p0060 A80-18111
LATTA, A. F.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
LAU, T. K.
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590
LAUKHIN, IA. N.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
LAURENCE, C. L.
A design method for optimizing collector systems for small solar center receivers
[ASME PAPER 79-WA/SOL-14] 25 p0068 A80-18580
LAVE, L.
Review of scenarios of future U.S. energy use
25 p0009 A80-11832
LAVENDER, K. E.
The design of a thin walled toroidal vacuum chamber for a large RFP experiment
25 p0082 A80-19676
LAVI, A.
Ocean thermal energy conversion /OTEC/ - Social and environmental issues
25 p0049 A80-17135
Fifth Ocean Thermal Energy Conversion Conference, volume 2, sections 4-5
[CONF-780236-P2] 25 p0162 N80-14553
LAVI, G. H.
Ocean thermal energy conversion /OTEC/ - Social and environmental issues
25 p0049 A80-17135
LAVRENTEV, I. V.
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138
LAWHON, W. T.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395
LAWRENCE, K. A.
Review of the environment effects and benefits of selected solar energy technologies
[SERI/TP-53-114R] 25 p0141 N80-13649
LAWRENCE, V. F.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
LAZARETH, O.
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897
LAZARETH, O. W.
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665
One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922
LAZZAROTTO, A.
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203
LE GRIVES, E.
Open cycle air turbine solar thermal power system
25 p0083 A80-19989
LE MEHAUTE, A.
Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858
LE ROUX, N. W.
The microbial production of methane from household wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870
LEBOEUF, C. M.
Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1] 25 p0101 N80-10652
LEDENT, P.
Progress and development trends in coal gasification and liquefaction technologies - Underground coal gasification
25 p003[illegible] A80-12948
LEE, C.
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-13636
LEE, H.
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586
LEE, R.
Inertial confinement fusion at NRL
25 p0056 A80-17861
LEE, R. L.
Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282

LEE, Y.-C.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

LEES, D. J.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826

LEFFEL, C. S., JR.
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648

LEFLAR, J.
Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

LEFLAR, J. A.
Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653

LEGER, V. Z.
Projected mechanism for thionyl chloride and sulphuryl chloride cathode reactions
25 p0012 A80-11856

LEGGETT, N. E.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

LEHMAN, S. J.
Novel gas turbine cycles with coal gasification
[ASME PAPER 79-WA/ENER-6] 25 p0071 A80-18646

LEHMANN, H. W.
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980

LEHMBERG, R. H.
Inertial confinement fusion at NRL
25 p0056 A80-17861

LEHNERT, B.
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877

LEIBLEIN, S.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553

LEIBOWITZ, L. P.
Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297

LENGYEL, L. L.
Refueling by means of pellets - Ablation rate and injection velocity considerations
25 p0080 A80-19611

LENOIR, J. M.
Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935

LENZ, T.
Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656

LEON, A. M.
Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959

LEONARD, B. R., JR.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

LEONARD, D. A.
Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10689

LEONARD, J. A.
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0057 N80-10609

LEONARD, R. L.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

LEONARD, T. A.
The KMSF laser fusion programme
25 p0056 A80-17860

LEPLEY, B.
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204

LEPRINCE, P.
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993

LETIN, V. A.
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628

LEVINE, D. I.
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267

LEVINE, S. R.
Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303

LEVY, S.
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521

LEWANDOWSKI, A.
Alternate cycles applied to ocean thermal energy conversion
[SERI/TP-34-180] 25 p0172 N80-15571

LEWIN, L.
RAPAD - Real-time Accurate Performance Analysis of Data
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565

LEWIS, C. W.
Efficiency improvements in bioenergy conversion systems
25 p0047 A80-16995

LEYER, J. C.
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816

LEYERLE, R. W.
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861

LILBERG, J. W.
An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628

LIN, B. Y.
Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180

LIND, G.
The Bullaren lineament, southwestern Sweden - A possible site for geothermal heat extraction
25 p0075 A80-19049

LIND, M. A.
Summary report of the Solar Reflective Materials Technology Workshop
[PNL-2763] 25 p0097 N80-10613

LINDEMANIS, A. E.
Mineral changes during oil shale retorting
25 p0085 A80-20455

LINDSTROM, O.
Utility fuel cells for Sweden
25 p0011 A80-11852

LIOR, N.
Instrumentation principles for performance measurement of solar heating systems
25 p0020 A80-12432
Optimal insulation of solar heating system pipes and tanks
25 p0021 A80-12434
Optimal insulation of pipes and tanks for solar heating systems
[ALO-5319-2] 25 p0102 N80-10660

LIPINSKY, E. S.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1]
25 p0093 N80-10395

LIPMAN, N. H.
A review of the U.S. wind energy programme
25 p0042 A80-16083

LISITANO, G.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

LISSAMAN, P. B. S.
The Coriolis program
25 p0044 A80-16653

LISTER, E.
Low NO(x) heavy fuel combustor program
[NASA-TM-79313]
25 p0138 N80-13624

LITCHFIELD, J. W.
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711]
25 p0098 N80-10625

LITTLE, J.
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158]
25 p0179 N80-15670

LITTLE, S. A.
Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253]
25 p0171 N80-15562

LIU, C. S.
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870

LIUBIMOV, G. A.
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516

LIVENGOOD, C. D.
Status of development, energy and economics aspects of alternative technologies
[CONF-790371-1]
25 p0145 N80-13689

LO, C.-T.
An indirect ammonia-air fuel system
25 p0013 A80-11868

LOBE, W.
Commercialization strategy report for coal liquefaction
[TID-28846]
25 p0135 N80-13285

LOCKE, F. E.
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195]
25 p0110 N80-11567

LOEF, G. O. G.
Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1]
25 p0101 N80-10652
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16]
25 p0163 N80-14568
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17]
25 p0176 N80-15616

LOFERSKI, J. J.
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786

LOGAN, B. G.
Tandem mirror reactors
25 p0059 A80-17887

LOKAI, N. V.
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0003 A80-10613
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0091 N80-10068

LOMAS, P. J.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826

LONDAHL, D. S.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725]
25 p0170 N80-15553

LONG, G.
Development of renewable energy sources in the United Kingdom
25 p0017 A80-11980

LONG, J.
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5]
25 p0165 N80-14591

LONGINOV, A. V.
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855

LOO, R.
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425]
25 p0110 N80-11564

LOPEZ, M. I. S.
A study of the thermal effect that radiant energy produces on a mass of water
25 p0040 A80-15653

LORENSEN, L. E.
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195]
25 p0110 N80-11567

LORSCH, H. G.
Heat pump centered integrated community energy systems: System development
[ANL/ICES-TM-26]
25 p0173 N80-15589

LOSCUTOFF, W. V.
Compressed air energy storage technology program
[PNL-2935]
25 p0160 N80-14534

LOTKER, M.
EPRI new energy resources department strategy paper
[EPRI-ER-979]
25 p0097 N80-10610

LOWELL, C. E.
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

LOYD, E. A.
Commercialization strategy report for coal liquefaction
[TID-28846]
25 p0135 N80-13285

LOZOVSKII, V. N.
High-voltage multijunction solar cell
25 p0035 A80-14593

LUETZKE, K.
Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites
25 p0074 A80-18861

LUKASH, V. E.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

LUKENS, L. I.
Effect of operating temperatures on the cost of energy from solar thermal electric power plants
[SAND-79-0801]
25 p0124 N80-12563

LUKENS, L. L.
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418]
25 p0100 N80-10640

LUKHIANOV, V. N.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857

LUNDBERG, A. W.
Lawrence Livermore Laboratory geothermal energy program: A status report on the development of the Total-Flow concept
[UCRL-50046-77]
25 p0159 N80-14529

LUNDEGARD, P.
Devonian paleocurrents of the Applachian basin
[METC/CR-79/22] 25 p0149 N80-13735
LUSTENADER, E. L.
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594
LYNCH, J. J.
Survey of MHD plant applications
25 p0015 A80-11972
LYNN, D.
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
LYON, R. J. P.
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E80-10033] 25 p0170 N80-15528
LYSIANSKII, P. B.
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

M

MABEY, D. R.
Evaluation of Baltazor known geothermal resources area, Nevada
25 p0076 A80-19206
MACCARLEY, C. A.
Hydrogen fuel applications for urban transit
25 p0037 A80-14703
MACHENS, U.
Measurements on a 15 kW wind energy conversion system
25 p0039 A80-15329
MADDALA, G. S.
Analysis of financial programs for energy conservation: Market simulation (penetration) model
[HCP/M8662-1] 25 p0114 N80-11606
MAHABALA, MR.
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773
MAHAFFY, M. A.
Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346
MAHENDRA, K. K.
Theoretical consideration of curve fill factor in solar cells
25 p0026 A80-12768
MAHER, K. M.
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747
MAISH, A. B.
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671
MAITRA, K.
Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788
MAJAHAD, P. S.
Study of corrosion and its control in aluminum solar collectors
[COO-2934-7] 25 p0129 N80-12609
MAJTELES, M.
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586
MAJUMDAR, S.
Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606
Materials testing for central receiver solar-thermal power systems
[TID-29443] 25 p0146 N80-13695
MAKINO, K.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244
MALATHI, G.
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
MALECHA, R. P.
Review of industrial participation on the ANL lithium/iron sulfide battery development program
[CONF-780852-1] 25 p0164 N80-14573
MALECKI, E. J.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
MALESANI, G.
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811
MALIK, J.
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147
MALIK, M. A. S.
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
MALIUTIN, A. I.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
MALLAEVA, KH. M.
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629
MAMEDNIIAZOV, S. O.
Brightness distribution over the solar disk
25 p0050 A80-17243
Algorithm for calculating the shading and blocking of the heliostats of a solar electric power plant
25 p0051 A80-17246
Structure of an averaged statistical pencil of rays reflected from a heliostat
25 p0051 A80-17247
MANICKAM, J.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
MANNERING, F. L.
Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324
MANSHARD, W.
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979
25 p0047 A80-17126
MAPLES, D.
Experimental results of the solar heating system on the LSU field house
[AIAA PAPER 80-0297] 25 p0063 A80-18301
Evaluation of a solar heating system installed in the LSU Field House
[ASME PAPER 79-WA/SOL-31] 25 p0068 A80-18576
MARATHE, B. R.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777
MARATHE, C. B.
Solar concentrator with polyester film for reflecting surface and pendulum arrangement for tracking movement
25 p0027 A80-12784

MARCINIAK, T. J.
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-13636

MARCONCINI, R.
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204

MARGARITIS, A.
Microbial hydrogen production from replenishable resources
25 p0032 A80-13197

MARIANOWSKI, L. G.
The performance of molten-carbonate fuel cells
25 p0011 A80-11851

MARK, E. V.
Testing and performance of the 30 kA ohmic heating system for ASDEX
25 p0078 A80-19585

MARKIN, A. I.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

MARKIN, T. L.
Current collectors for sodium-sulphur batteries
25 p0013 A80-11867

MARKOVSKII, N. V.
Digital computer modeling of steady-state conditions of the magnetoplasmadynamic generator current layer
25 p0083 A80-20058

MARKOWSKY, J. J.
170 MW pressurized fluidized bed combustion electric plant
25 p0014 A80-11962

MARLAND, G.
Prospects for the near-term commercialization of shale oil in the United States
25 p0078 A80-19474
Shale oil: US and world resources and prospects for near-term commercialization in the United States
[ORAU/IEA-79-8(R)] 25 p0122 N80-12544

MARLATT, W. E.
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655

MARONI, V.
Impact of technology and maintainability on economic aspects of tokamak power plants
25 p0059 A80-17884

MARSH, W. D.
Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes
[EPRI-ER-978-VOL-3] 25 p0139 N80-13628

MARTEV, I. N.
Ion-stimulated sorption of nitrogen on a continuously deposited titanium film
25 p0051 A80-17252

MARTIN, F.
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776

MARTIN, J.
MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy
25 p0080 A80-19612

MARTIN, J. G.
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602

MARTIN, M.
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12589

MARTIN, T. H.
Pulsed power for fusion
[SAND-79-0933C] 25 p0181 N80-15908

MARTINO, F. J.
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614

MARTIUSHOV, IU. S.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

MARTZ, J. E.
A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552

MASHAYEKHI, G. H.
Supply and demand in input-output analysis for energy modeling
25 p0088 A80-20890

MASLOWSKI, C.
Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370

MASON, B.
Direct labor requirements for select solar energy technologies: A review and synthesis
[SERI/RR-53-045] 25 p0126 N80-12578

MASON, H. B.
Technical assessment of thermal DeNOx process
[PB-297947/4] 25 p0117 N80-11656

MASSIMILLA, L.
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421

MATHIEU, J. C.
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200

MATHUR, P. C.
Performance of silicon solar cells in front of a water absorber
25 p0019 A80-12125

MATHUR, R. S.
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763

MATHUR, S. S.
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845
Using a fin with a parabolic concentrator
25 p0004 A80-10847
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747

MATOBA, M.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868

MATSUURA, K.
Constant current and constant voltage excitation of large coils by flywheel-generator-converter
25 p0080 A80-19624

MATTHEWS, W. H.
Renewable energy prospects; Proceedings of the Conference on Non-Fossil Fuel and Non-Nuclear Fuel Energy Strategies, Honolulu, Hawaii, January 9-12, 1979
25 p0047 A80-17126
Exploring alternative energy strategies
25 p0047 A80-17127

MATTSSON, C.
An optimization model for overall urban energy planning
25 p0038 A80-14844

MATVEEV, Y. V.
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022

MAXWELL, B.
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168

MAXWELL, J. C.
Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543

MAY, M. E.
Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259

MAYER, F. J.
The KMSF laser fusion programme
25 p0056 A80-17860

MAYNARD, J. B.
Devonian paleocurrents of the Applachian basin
[METC/CR-79/22] 25 p0149 N80-13735

MCALEES, D. G.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

MCALVERY, R. F., III
Impact of flywheel-transmissions on automobile performance: A logical basis for evaluation
[UCRL-52758] 25 p0137 N80-13480
MCBREEN, J.
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
MCBRIDE, J. B.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846
MCBRIDE, M. F.
Fuel utilization in residences
[EPRI-EA-894] 25 p0175 N80-15604
MCCLAINE, A. W.
High interaction subsonic MHD channel operation
[AIAA PAPER 80-0022] 25 p0062 A80-18242
MCCLELLAND, J. F.
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
[IS-M-202] 25 p0125 N80-12611
MCCLELLAND, R. H.
Low/medium BTU coal gasification - Perspective of the gas industry
25 p0015 A80-11969
MCCLENDON, R. W.
Addition of solar air heaters to a pre-engineered metal building
[ASME PAPER 79-WA/SOL-33] 25 p0066 A80-18566
MCCLURE, T. A.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395
MCCORMICK, B.
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
MCCORMICK, J. B.
Development of integrated thermionic circuits for geothermal high-temperature applications
[LA-UR-79-723] 25 p0112 N80-11592
MCCORMICK, N. J.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888
MCCRACKEN, G. M.
Results from the Divertor Injection Tokamak Experiment /DITE/
25 p0054 A80-17754
MCCREIGHT, L. R.
Sintered silicon nitrode recuperator fabrication
[NASA-CR-159706] 25 p0167 N80-15263
MCCULLOCH, W. H.
Midtemperature Solar Systems Test Facility (MSSTF) project test results: Phase 4A MSSTF system operation
[SAND-78-1088] 25 p0114 N80-11613
MCCURRY, D. C.
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
MCDEVITT, P. K.
District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States
[NMEI-10-1] 25 p0172 N80-15582
MCDONALD, C. F.
A small hybrid solar closed-cycle gas turbine cogeneration plant concept based on today's technology
[ASME PAPER 79-WA/GT-3] 25 p0071 A80-18637
MCDONALD, C. L.
User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605
MCGREGOR, K. T.
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637
MCINTIRE, W. R.
Truncation of nonimaging cusp concentrators
25 p0029 A80-12824
MCKEE, M.
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641
MCKENNA, K. F.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
MCKIBBEN, R.
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979
[PB-299399/6] 25 p0179 N80-15682
MCKINLEY, T.
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158] 25 p0179 N80-15670
MCNEESE, L. E.
Recent developments in coal liquefaction in the United States
25 p0015 A80-11966
MCNICOL, B. D.
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146
MCNITT, J. R.
The United Nations' approach to geothermal resource assessment
25 p0076 A80-19207
MCPARTLAND, B. J.
Theoretical analysis of multi-cell, high efficiency broad spectral sensitivity solar cells
25 p0138 N80-13617
MCWANE, P. D.
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
MCWILLIAMS, R.
Steady-state currents driven by collisionally damped lower-hybrid waves
25 p0084 A80-20157
MEADOR, J. T.
Steam turbines
[ANL/CES/TE-78-7] 25 p0095 N80-10502
MEAKIN, J. D.
Improvements in the performance of a low cost thin film solar cell
25 p0018 A80-11989
MEARS, J. C., JR.
Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589
MEDIN, S. A.
Determination of the geometry of the transition region of a series MHD generator
25 p0030 A80-12900
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516
Influence of the loading factor on the performance characteristics of series MHD generators
25 p0061 A80-18137
MEGAHED, M.
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
MEHTA, A. J.
Sulfur fixation during coal gasification
[PB-301104/6] 25 p0169 N80-15296
MEI, J. S.
Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386
MEILKE, P.
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655
MEISEL, D.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759
MELIA, M.
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979
[PB-299399/6] 25 p0179 N80-15682
MELSA, J. L.
Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616

MEREDITH, D. B.
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616
MERROW, E. W.
Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices
[RAND/R-2335-DOE] 25 p0099 N80-10636
MERTENS, J. J. R.
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028
METCALFE, M. A.
A survey of electric and hybrid vehicle simulation programs
[NASA-CR-162457] 25 p0118 N80-11954
METZ, P. D.
State of the art of sensible heat storage for solar heat pump systems
[BNL-25909] 25 p0101 N80-10651
Design, construction, and operation of the solar assisted heat pump ground coupled storage experiments at Brookhaven National Laboratory
[BNL-25908] 25 p0142 N80-13654
MEYER, C.
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993
MEYER, C. F.
Large-scale annual-cycle thermal energy storage in aquifers
[CONF-790515-3] 25 p0145 N80-13686
MEYERS, R. E.
Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883
MICCIO, M.
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421
MICHAELIS, B. P.
A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750
MICHALSKI, S. R.
Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691
MICHEL, J. W.
Experimental and analytical OTEC studies at ORNL
[CONF-790631-1] 25 p0143 N80-13666
MICHELOTTI, D. P.
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551
MICKA, K.
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147
MICKLE, M. H.
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control
25 p0087 A80-20862
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment
25 p0087 A80-20881
MIDZUNO, Y.
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194
MIKHEICHEV, P. A.
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199
MILKE, T.
New hybrid 1971 energy intensities, part 1
[COO-4628-4-PT-1] 25 p0158 N80-14516
MILLAR, W.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
MILLER, A. K.
Recent spin test of two composite wagon wheel flywheels
[SAND-79-1669C] 25 p0140 N80-13640
MILLER, B.
Power conversion efficiency monitoring in photoelectrochemical and other solar cells
25 p0062 A80-18214
MILLER, F. G.
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204
MILLER, G.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
MILLER, R. A.
Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303
MILLER, R. D. C.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
MILLER, R. H.
On the weathervaning of wind turbines
25 p0047 A80-16952
MILLER, W. E.
Review of industrial participation on the ANL lithium/iron sulfide battery development program
[CONF-780852-1] 25 p0164 N80-14573
MILLIMAN, J. W.
Analysis of financial programs for energy conservation: Market simulation (penetration) model
[HCP/M8662-1] 25 p0114 N80-11606
MILLNER, A. R.
Flywheels for energy storage
25 p0019 A80-12166
Flywheel energy storage and conversion system for solar photovoltaic applications
[COO-4094-31] 25 p0100 N80-10639
Flywheel energy storage interface unit for photovoltaic applications
[COO-4094-44] 25 p0175 N80-15609
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-48] 25 p0178 N80-15635
MILNE, T. A.
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
MILNES, A. G.
Optimization of multi-layer front-contact grid patterns for solar cells
25 p0028 A80-12816
MILNES, K.
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617
MILOVANOVA, N. A.
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
MIMA, K.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
MINARDI, A.
An optimization formulation for solar hot water systems
[ASME PAPER 79-WA/SOL-42] 25 p0068 A80-18578
MINCHEW, C. D.
The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754
MINGLE, J. G.
Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation
[DOE/RL-90476-13] 25 p0169 N80-15293

MIRONOV, B. N.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
MISKELL, J. T.
Gasoline's alternatives are feasible
25 p0034 A80-13225
MITCHEL, G.
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776
MITCHELL, J. W.
Computers in the design of solar energy systems
25 p0020 A80-12426
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590
MITCHELL, L. D.
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705
MITOFF, S. P.
Computer modelling of electrically parallel arrays of sodium-sulphur cells
25 p0013 A80-11865
MITROVICH, D.
The KMSF laser fusion programme
25 p0056 A80-17860
MITSUI, A.
Biological and biochemical hydrogen production
25 p0053 A80-17581
MIYAHARA, A.
Constant current and constant voltage excitation of large coils by flywheel-generator-converter
25 p0080 A80-19624
MIYAMOTO, S.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
MIZUMOTO, Y.
Inertial confinement fusion research at Osaka
25 p0057 A80-17868
MNATSAKANIAN, A. KH.
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516
MODEST, M. F.
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558
MOENCH, A. F.
Transient-pressure analysis in geothermal steam reservoirs with an immobile vaporizing liquid phase
25 p0076 A80-19209
MONCUR, N. K.
The KMSF laser fusion programme
25 p0056 A80-17860
MONTGOMERY, W. D., III
The 1985, 1990 and 1995 midterm energy market model results under three scenarios of Fuel Use Act regulations
[DOE/EIA-0182/2] 25 p0173 N80-15592
MOORE, S. W.
Performance of Los Alamos solar Mobile/Modular Home Unit no. 1
[LA-UR-78-2587] 25 p0126 N80-12577
MOORTHY, P. N.
Study of photochemical processes in the ferrous-thionine system
25 p0027 A80-12783
MORAGUES, J. A.
Photothermal conversion of solar energy into electricity
[DOE-TR-159] 25 p0130 N80-12612
MORARU, D.
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853
MOREHOUSE, J. H.
Residential solar heat pump systems - Thermal and economic performance
[ASME PAPER 79-WA/SOL-25] 25 p0070 A80-18591
MORELAND, W. C.
Performance monitoring of an off-peak heating and cooling system utilizing thermal storage and solar augmented heat pump
[EPRI-ER-845] 25 p0102 N80-10662
MORI, Y.
MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004
MORRIS, G.
Environmental aspects of alternative energy technologies for California
[UCRL-15002] 25 p0131 N80-12628
MORRIS, P. W.
Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
MORRIS, S. C.
Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369
MORRISON, G. F.
Combustion of low grade coal
[ICTIS/TR-02] 25 p0106 N80-11179
Hot gas cleanup
[ICTIS/TR-03] 25 p0117 N80-11647
MORSE, F. H.
Commercialization strategy report for solar water heating
[TID-28856-DRAFT] 25 p0161 N80-14545
MOSER, H. O.
MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy
25 p0080 A80-19612
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618
MOSES, H.
Impacts of satellite power system technology
25 p0048 A80-17132
MOSHER, D.
Inertial confinement fusion at NRL
25 p0056 A80-17861
MOSIN, I. I.
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0003 A80-10613
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0091 N80-10068
MOSKOWITZ, P. D.
Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369
MOSKOWITZ, S.
Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959
MOSKVICHEVA, V. N.
Energetics aspects of environmental protection
25 p0072 A80-18733
MOSSOP, G. D.
Geology of the Athabasca oil sands
25 p0050 A80-17236
MOTLEY, R. W.
Steady-state currents driven by collisionally damped lower-hybrid waves
25 p0084 A80-20157
MOTOJIMA, O.
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159
MOTZ, H.
The physics of laser fusion
25 p0019 A80-12049
MOULTHROUP, P.
National energy act of 1978: Far western perspective. A study for the US Department of Energy, Federal Region 9
[UCID-17944-REV-1] 25 p0132 N80-12955
MOURAD, A. G.
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747
MOYER, G.
Minimum cost transmitter-receiver antenna pairs
[RM-690] 25 p0094 N80-10414

MOYER, G. F.
Methods of estimating the reliability of wind energy systems with storage
[UCRL-15005] 25 p0098 N80-10623

MRHA, J.
Non-sintered plastic-bonded nickel oxide electrodes with open structure and their electrochemical performance
25 p0009 A80-11839
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147

MUELLER, R. I.
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474

MUELLER, R. O.
Solar availability for winter space heating - An analysis of SOLMET data, 1953 to 1975
25 p0006 A80-11370
Electric heat - The right price at the right time
25 p0062 A80-18184

MUFFLER, P.
Methods for regional assessment of geothermal resources
25 p0075 A80-19202
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203

MUHR, W.
Experiences with the practical use of an Andersen cascade impactor in the exhaust gas of various industrial sites
25 p0074 A80-18861

MUIRHEAD, V. U.
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948

MUKHERJEE, D.
Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788

MUKHERJEE, M. K.
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775
Bogus-type treatment of Cu2S-CdS solar cells using deposition from solution
25 p0028 A80-12788

MUKHOPADHYAY, K.
Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771

MULLICK, S. C.
A seasonally adjusted concentrating collector made of mirror strips
25 p0024 A80-12750

MUNRO, J. K.
High-beta tokamaks
25 p0054 A80-17789

MURAVEVA, M. I.
Development of optical waveguides for a power-related application
25 p0036 A80-14596

MURLIDHAR, MR.
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766

MURMANN, H.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759

MURPHY, A.
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555

MURPHY, R. W.
Condensation and evaporation heat transfer with low-boiling temperature fluids
[CONF-790539-1] 25 p0137 N80-13412

MURTHY, K. S.
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

MYAL, D.
Bell Creek residual oil saturation technology test
[BETC-2180-4] 25 p0108 N80-11546

N

NABOZNY, R. L.
Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342

NACK, H.
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

NAHAR, N. M.
Solar energy flat plate collectors - Optimization of air gap
25 p0023 A80-12745

NAIR, M. J.
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775

NAJIM, S. E.
Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels
[AIAA PAPER 80-0075] 25 p0076 A80-19275

NAKAMURA, T.
Performance of disk generators for open-cycle MHD power generation
25 p0007 A80-11642

NANDA, S. K.
A seasonally adjusted concentrating collector made of mirror strips
25 p0024 A80-12750

NARAGHI, M.
End plugging of a hot linear theta pinch
25 p0055 A80-17824

NARAYAN, R.
Studies of photogalvanic cells
25 p0023 A80-12743

NARAYANAN, T. V.
Interim structural design standard for solar energy applications, phases 1 and 2
[SAND-79-8183] 25 p0146 N80-13698

NARGUNDKAR, V. R.
Experimental studies of neutron multiplication from beryllium /n, 2n/ reaction in CTR blankets
25 p0081 A80-19662

NARKUS-KRAMER, M.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

NASBY, R. D.
Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577

NASH, J. M.
Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589

NASSER, A.
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327

NATARAJAN, R.
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748

NAZAROV, N.
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626

NAZEMI, M. A.
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019

NEALE, D. H., SR.
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

NEARHOOF, S. L.
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482

NEDOSPASOV, A. V.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

NEFEDKINA, L. B.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

NEIHOF, R. A.
Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259

NELSON, D. B.
High-beta tokamaks
25 p0054 A80-17789
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

NELSON, E. L.
Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607

NELSON, E. T.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576

NELSON, P. A.
Lithium/iron sulfide batteries for electric vehicles
[CONF-781006-2] 25 p0175 N80-15611

NELSON, S.
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526

NEMEC, J.
Environmental protection in the processing of coal
25 p0030 A80-12943

NEMECEK, J. J.
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338

NEMETZ, D. L.
Solar energy system performance evaluation: A-Frame Industries, single family dwelling, Kaneohe, Hawaii
[SOLAR/1010-78/14] 25 p0101 N80-10659

NENE, V. D.
The status of advanced propulsion systems for urban rail vehicles
[PB-297980/5] 25 p0133 N80-12962

NERI, G.
Analysis of reservoir pressure and decline curves in Serrazzano zone, Larderello geothermal field
25 p0075 A80-19204

NESTLER, J.
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368

NEUBAUER, P.
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687

NEUMANN, R.
The role of coal in the world energy picture up to the year 2000 - Reserves, resources, and availability from the Western European viewpoint
25 p0040 A80-15625

NEUMANN, T. W.
Design of the International Energy Agency 500 kWe distributed-collector solar thermal-electric powerplant
[ASME PAPER 79-WA/SOL-6] 25 p0070 A80-18592

NEVITT, J. S.
Unleaded gasoline shortages and fuel switching - The potential impact in Southern California
25 p0004 A80-11019

NEWELL, T.
Simulation of solar-assisted urban sewage digestion
[ASME PAPER 79-WA/SOL-36] 25 p0065 A80-18556

NEWMAN, J. N.
Power from ocean waves
25 p0045 A80-16655

NG, P. H.
Drift wave stability and transport theory in fusion systems
25 p0056 A80-17846

NGUYEN, D. V.
Comparative performance measurements on a Savonius rotor with ancillary surfaces
25 p0042 A80-16085

NGUYEN, K. H.
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658

NGUYEN, P. H.
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204

NGUYEN, T.
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620

NICHOLS, L.
Low NO(x) heavy fuel combustor program
[NASA-TM-79313] 25 p0138 N80-13624

NICHOLS, R. J.
Hydrogen-powered vs. battery-powered automobiles
25 p0033 A80-13199

NICHOLSON-FLORENCE, M. F.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875

NIEDZWIECKI, R. W.
Low NO(x) heavy fuel combustor program
[NASA-TM-79313] 25 p0138 N80-13624

NIEMI, A.
A link between science and applications of automatic control; Proceedings of the Seventh Triennial World Congress, Helsinki, Finland, June 12-16, 1978. Volumes 1, 2, 3 & 4
25 p0038 A80-14794

NIESSEN, W. R.
Source, supply and nature of municipal and industrial waste as a fuel
25 p0017 A80-11983

NIHAN, N. L.
Energy conservation - Aerodynamic drag reduction of intercity buses
25 p0050 A80-17227

NILSSON, T.
Utility fuel cells for Sweden
25 p0011 A80-11852

NIMMO, B.
Testing of three installed solar domestic water heaters
25 p0025 A80-12758

NISHIKAWA, K.
Summary on inertial-confinement fusion
25 p0059 A80-17893

NISHIMURA, H.
Fuel minimal take-off path of jet lift VTOL aircraft, log no. C3558
25 p0105 N80-11066

NITTA, H.
A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750

NOEL, G. T.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483

NOETHER, G.
Developments for the high voltage test of pulsed superconducting coils
25 p0081 A80-19655

NOHARA, S.
Constant current and constant voltage excitation of large coils by flywheel-generator-converter
25 p0080 A80-19624

NOLL, S.
Economic performance - Evaluations for solar energy
25 p0014 A80-11956
A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis
25 p0021 A80-12433

Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645

NOLL, S. A.
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653

NORDSTROM, T. V.
Effects of metallurgical microstructure of armatures on compressed magnetic field generators
[SAND-79-0890C] 25 p0137 N80-13375

NORED, D. L.
Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737
Aircraft Energy Efficiency (ACEE) status report
25 p0091 N80-10206

NOREEN, D. L.
Design of heat pipe cooled laser mirrors with an inverted meniscus evaporator wick
[AIAA PAPER 80-0148] 25 p0064 A80-18366

NORTH, D. W.
Proposed research planning format for the Environmental Assessment Department
[EPRI-EA-1018] 25 p0103 N80-10692

NORTHRUP, C. J.
Closed-cycle hydride engines
[SAND-78-2228] 25 p0125 N80-12572

NOVAK, M. M.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875

NOWOGRODZKI, M.
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600

O

OBERLE, H. J.
Numerical computation of singular control problems with application to optimal heating and cooling by solar energy
25 p0051 A80-17307

OBERLE, R. D.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-38] 25 p0106 N80-11249

OBEROI, H. S.
Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668

OBERT, W.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618

OBRIEN, W. F.
Horizontal-axis wind generator performance with varying tip speed ratio and rotor orientation
[ASME PAPER 79-WA/SOL-2] 25 p0067 A80-18571

OCONNELL, L. G.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

ODLAND, R.
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520

OETTINGER, F. F.
Measurement techniques for high-power semiconductor materials and devices:
[PB-298574/5] 25 p0121 N80-12300

OFFENHARTZ, P. O'D.
Development of silver-hydrogen cells
25 p0010 A80-11843

OGASAWARA, S.
Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So2-I2 system for H2O decomposition
25 p0032 A80-13196

OGURECHNIKOV, L. A.
Energetics aspects of environmental protection
25 p0072 A80-18733

OHLSSON, D.
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877

OHTA, T.
Solar-hydrogen energy systems
25 p0051 A80-17573
Introduction - A review of the scope
25 p0052 A80-17574
Thermodynamics of water-splitting
25 p0052 A80-17575
Photochemical hydrogen production
25 p0052 A80-17579
Solar energy storage by metal hydride
25 p0053 A80-17582
Direct solar energy conversion at sea
25 p0053 A80-17583

OHTAKE, K.
MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004

OITTO, R. H.
Three potential longwall mining methods for thick coal seams in the western United States
[PB-299568/6] 25 p0170 N80-15544

OJEFORS, L.
Optimization of iron-air and nickel oxide-iron traction batteries
25 p0011 A80-11847

OKABAYASHI, M.
MHD stability limits on high-beta tokamaks
25 p0054 A80-17797
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876

OKAZAKI, K.
MHD boundary layer of the seeded combustion gas near cold electrodes
25 p0047 A80-17004

OKE, Y. V.
Development of space quality silicon solar cells at B.A.R.C.
25 p0025 A80-12762

OKEKE, B. O.
Visualization of natural convection in flat plate solar collectors
25 p0153 N80-14476

OKUDA, H.
Effect of finite beta on drift-wave turbulence and particle confinement
25 p0084 A80-20158

OLBERT, H.
International activities: The fiscal year 1978 survey of international programs at NEL
[PB-300491/8] 25 p0181 N80-16004

OLSEN, T. J.
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658

OLSON, L.
Steady-state currents driven by collisionally damped lower-hybrid waves
25 p0084 A80-20157

OLSONN, G. K.
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660

OLSSON, M.
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524

OLSZEWSKI, M.
Analysis of potential implementation levels for waste heat utilization in the nuclear power industry
[CRNL/TM-63-2] 25 p0177 N80-15625

OLVERA, A.
Design, evaluation, and testing of a moderately concentrating, non-tracking solar energy collector
[ASME PAPER 79-WA/SOL-3] 25 p0067 A80-18570

ONO, S.
Solar energy storage by metal hydride
25 p0053 A80-17582

ONYEOGU, O. E.
Measurement of insolation using CdS photoresistor
25 p0047 A80-16998

OPAR, T.
Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353

OPDYCKE, G. L.
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650

ORBACH, A.
Optimal control of distributed parameter systems for solar thermal applications
25 p0095 N80-10593

ORCHARD, A. F.
Thionine coated electrode for photogalvanic cells
25 p0051 A80-17343

ORIORDAN, T.
The scope of environmental risk management
25 p0053 A80-17743

ORLOV, M. M.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822

ORLOV, V. V.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

ORTIZ-VELEZ, J.
Production of sugarcane and tropical grasses as a renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277

ORTOLANI, S.
Studies on plasma formation, relaxation and heating in a reversed-field pinch
25 p0054 A80-17811

OSBORN, D. B.
The thermal design and analysis of an integrated sodium boiler/receiver for solar energy conversion
[ASME PAPER 79-WA/SOL-10] 25 p0067 A80-18569

OSHER, J. E.
Diagnostics for mirror machines
25 p0045 A80-16720

OSTER, J. R.
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482

OSTERLE, F.
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555

OTSUKI, H. H.
Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571

OTTO, C. H., JR.
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567

OUCHI, K.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

OVAKIMIAN, R. M.
Stability of a system of coaxial superconducting shells
25 p0018 A80-12027

OVCHINNIKOV, V. L.
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138

OVERBEY, W. K.
Gas recovery from unconventional sources
25 p0014 A80-11958

OVSIANNIKOV, G. A.
Effect of microwave radiation on the voltage-current characteristics of a variable-thickness Josephson microbridge
25 p0035 A80-14430

OWEN, L. B.
Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561

OWEN, L. W.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

OWREN, H.
150-kV, 80-A solid state power supply for neutral beam injection
25 p0080 A80-19617

OZAWA, Y.
Simplified theory of nonuniform electrical conduction for an open cycle MHD generator with shaped magnetic induction
25 p0047 A80-16997

P

PADDISON, F. C.
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978

PALM, E. J.
Calculated and measured efficiencies of thin-film shallow-homojunction GaAs solar cells on Ge substrates
25 p0039 A80-15141

PALMITER, L.
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653

PAN, Y.-C.
Power take-off analysis for diagonally connected MHD channels
[AIAA PAPER 80-0253] 25 p0077 A80-19309

PANDE, P. C.
Effect of boosters on the performance of flat plate collector
25 p0023 A80-12744
Review of thermal storage materials from the view point of solar energy application
25 p0025 A80-12756

PARDOE, G. K. C.
Cost effectiveness requirements for space power stations
25 p0073 A80-18800

PARK, W.
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393

PARK, W. C.
Mineral changes during oil shale retorting
25 p0085 A80-20455

PARKER, R.
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591

PARKER, W. L.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

PARKHURST, M. A.
Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382

PARKINSON, R. W.
RAPAD - Real-time Accurate Performance Analysis of Data
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565

PARKS, P. C.
On the basic dynamics of extracting power from waves
25 p0038 A80-14837

PARTRIDGE, J. E.
The design of a thin walled toroidal vacuum chamber for a large RFP experiment
25 p0082 A80-19676

PARUNGO, F. P.
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

PASICHNYI, V. V.
Development of optical waveguides for a power-related application
25 p0036 A80-14596

PASSMAN, H.
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286

PASTIRIK, E. M.
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562

PATOU, C.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

PATTERSON, G. N.
The future role of hydrogen fuel in an electrical society
[UTIAS-241] 25 p0119 N80-12189

PATTERSON, R. G.
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591

PAUL, J. K.
Ethyl alcohol production and use as a motor fuel
25 p0050 A80-17241

PAUWELS, H. J.
Analysis and evaluation of isotype heterojunction solar cells
25 p0087 A80-20734

PAVELESCU, M.
A mathematical model for a future hydrogen power system
25 p0001 A80-10223

PAWELSKI, M. J.
Comparisons of measured and simulated performance for CSU Solar House I
[ASME PAPER 79-WA/SOL-35] 25 p0070 A80-18590

PAYNE, H. R.
MDAC/Rocketdyne solar receiver: Design review
[SAND-78-8188] 25 p0097 N80-10616

PEARCE, J.
Testing of three installed solar domestic water heaters
25 p0025 A80-12758

PEARCE, L.
The electrochemical characteristics of iron sulphide in immobilized salt electrolytes
25 p0013 A80-11862

PEARCE, L. J.
Recent advances in high temperature primary lithium batteries
25 p0013 A80-11863

PEARMAIN, A. J.
Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346

PEARSON, G. L.
Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells
25 p0086 A80-20716

PEARSON, R. J.
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

PEARTREE, R. J.
Demonstration of a nitrogen based carburizing atmosphere: Energy consumption of the endothermic generator
[CONS/5058-T1] 25 p0173 N80-15591

PEDRAM, E.
Adsorption of hydrogen sulfide in shale retorted in an inert atmosphere
25 p0085 A80-20454

PEJSA, J. H.
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658

PELL, J.
The prospect for anthracite as a national energy resource
25 p0014 A80-11960

PELLIN, R.
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492

PELLINEN, D. G.
Megavolt and megampere diagnostic techniques for pulsed power particle beam fusion drivers
25 p0046 A80-16745

PENDERGRASS, J. H.
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296

PENG, Y.-K. M.
High-beta tokamaks
25 p0054 A80-17789

PENKO, P. F.
NASA-Lewis closed-cycle magnetohydrodynamics plant analysis
[NASA-TM-79249] 25 p0095 N80-10595

PENNER, P. S.
Gasohol - Does it or doesn't it produce positive net energy
25 p0034 A80-13863
New hybrid 1971 energy intensities, part 1
[COO-4628-4-PT-1] 25 p0158 N80-14516

PEPIN, H.
Evidence of nonlinear processes from X-ray spectra of CO2 laser-irradiated targets
25 p0046 A80-16776

PERCHE, P.
Utilization of transition metal phosphorus trisulphides as battery cathodes
25 p0012 A80-11858

PERCHERMEIER, J.
Investigations of isotope separation effects of a Ti-fluidized bed
25 p0082 A80-19669

PERCHERON-GUEGAN, A.
Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848
Thermodynamic and structural properties of LaNi/5-y/Aly compounds and their related hydrides
25 p0033 A80-13200

PERELMAN, L. J.
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520

PERKINS, R. B.
Recent progress in inertial confinement fusion research at the Los Alamos Scientific Laboratory
25 p0056 A80-17862

PERRA, J. J.
A manual for cataloging and indexing documents
[LBL-4432-REV-1] 25 p0118 N80-11946

PERROUD, P.
Hydrogen storage by means of reversible magnesium alloy
25 p0041 A80-15990

PERRY, C. W.
Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery
[FE-2025-38] 25 p0130 N80-12624

PERRY, R. T.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

PESCHKA, W.
Hydrogen storage by use of cryoadsorbents in comparison to alternatives
25 p0042 A80-15992

PETERS, H. H.
Proceedings of the 1978 Coal Chemistry Workshop
[CONF-780372] 25 p0150 N80-14264

PETERS, R. R.
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418] 25 p0100 N80-10640
Methodology for determining the configuration of the optimum solar total energy system
[SAND-79-0422] 25 p0172 N80-15574

PETERSON, J. R.
Commercial applications of molten carbonate fuel cell systems
25 p0016 A80-11974
Commercial application of molten carbonate fuel cell system
[CONF-790213-4] 25 p0123 N80-12557

PETIT, G.
Technico economic study of the use of hydrogen and methanol for road transport
25 p0042 A80-15993

PETRASH, D. A.
Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737

PETREE, F.
Electrical power system to TFTR poloidal coils
25 p0080 A80-19620

PETRICH, C. H.
Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584

PETRICK, M.
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882

PETROV, V. G.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

PETTIBONE, J. A.
Novel scheme for making cheap electricity with nuclear energy
[UCID-18153-REV-1] 25 p0171 N80-15564

PETTIT, R. B.
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527

PETTY, R. J.
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141

PEZAT, M.
Use of reversible hydrides for hydrogen storage
25 p0042 A80-15991

PEZDIRTZ, G. F.
Overview of division of energy storage program Department of energy
25 p0016 A80-11979

PFANN, H.
Petrochemicals: Their economic significance in the domestic economy
[PB-299733/6] 25 p0181 N80-15992

PFENDER, E.
Studies in heat transfer: A Festschrift for E. R. G. Eckert
25 p0036 A80-14655

PHELPS, P. L.
Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626

PHILLIPS, J. T.
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation
[SAND-78-8180] 25 p0097 N80-10612

PHILLIPS, S. L.
A manual for cataloging and indexing documents
[LBL-4432-REV-1] 25 p0118 N80-11946

PHILLIPS, W. F.
The effects of axial conduction on collector heat removal factor
25 p0004 A80-11333

PHIPPS, G. S.
Heliostat Beam Characterization System
25 p0022 A80-12627

PIEPER, W. M.
The Kirsten rotor as a wind turbine
25 p0039 A80-15330

PIERSON, E. S.
Influence of wall-jet gas injection on liquid-metal MHD generator performance
25 p0047 A80-16996
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882

PIGNASTII, S. S.
Investigation of the effect of piston inductance on energetic characteristics of a piston linear generator with a ferromagnetic core
25 p0083 A80-20066

PILATI, D. A.
Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650

PILLAI, N. R.
Reliability studies on thin film solar cells for satellite application
25 p0027 A80-12775

PINE, G. D.
Economic comparisons of solar and fossil total energy systems for industrial applications
[ASME PAPER 79-WA/TS-6] 25 p0065 A80-18552

PINSON, J. D.
Analysis of remote site energy storage and generation systems
[AD-A074869] 25 p0156 N80-14504

PIRNATOV, I. I.
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629

PISKUNOV, V. A.
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199

PISTUNOVICH, V. I.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

PITCHFORD, M.
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

PITROLO, A. A.
Gas recovery from unconventional sources
25 p0014 A80-11958

PLATZ, P.
Multichannel Thomson scattering system for the tokamak TFR based on two-detector spectrum analyzers
25 p0060 A80-18111

PLUNKETT, A. B.
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594

PODGORNYI, A. N.
Hydrogen - The fuel of the future
25 p0002 A80-10349

POLLARD, W. G.
Analysis of systems for the generation of electricity from solar radiation
25 p0060 A80-18124

POLLOCK, P.
Implementation of state solar incentives: Land-use planning to ensure solar access
[SERI/TR-51-163] 25 p0158 N80-14519
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520

POMROY, S. R. A.
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840

PONS, R. L.
Optimization of a point-focusing, distributed receiver solar thermal electric system
[ASME PAPER 79-WA/SOL-11] 25 p0065 A80-18553

POON, P.
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564

POOTH, L. A.
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296

POPESCU, C. I.
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853

POPOVICS, C.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

POQUERUSSE, A.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

PORTER, J. J.
Energy conservation through point source recycle with high temperature hyperfiltration
[PB-299183/4] 25 p0180 N80-15688

POST, R. F.
Search for fusion power
[UCRL-81890] 25 p0132 N80-12900

POTH, I.
Construction and test of a high power injector of hydrogen cluster ions
25 p0080 A80-19618
POTTER, P. E.
Devonian paleocurrents of the Applachian basin
[METC/CR-79/22] 25 p0149 N80-13735
POWELL, I.
New concept for a system suitable for solar simulation
25 p0083 A80-19976
POWELL, J. L.
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590
POWELL, J. R.
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665
One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922
High temperature electrolysis
[BNL-26331] 25 p0167 N80-15227
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897
POWER, H. J.
Photovoltaic solar cell array used for supplemental power generation
25 p0061 A80-18129
PRAMANIK, D.
The spectral selectivity of conducting micromeshes
25 p0087 A80-20720
PRATT, R. B.
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568
Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616
PRELAT, A. E.
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E80-10033] 25 p0170 N80-15528
PRENGER, F. C., JR.
Performance limits for liquid-metal heat pipes containing long adiabatic sections
[LA-UR-79-1241] 25 p0095 N80-10472
PRESS, K. K.
Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854
PRICE, G.
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393
PRITCHARD, J. T.
Optimization of a solar heating system with integral compensation
25 p0089 A80-20894
PROCHAZKA, S.
Evaluation of sintered SiC as an electrode and container material in sodium/sulfur cells
25 p0035 A80-14588
PROSHLETSOV, A. P.
Principles of plasma heating and confinement in a compact toroidal configuration
25 p0055 A80-17822
PROULX, H.
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758
PRYOR, D. V.
RAPAD - Real-time Accurate Performance Analysis of Data
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565
PRYOR, J. A.
SRC solids - Boiler fuel and building block
25 p0015 A80-11967
PRYOR, R. A.
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
PRYOR, W. A.
Devonian paleocurrents of the Applachian basin
[METC/CR-79/22] 25 p0149 N80-13735
PSAKHIS, B. I.
Energetics aspects of environmental protection
25 p0072 A80-18733
PUESCHEL, R. F.
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758
PULICE, J.
Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286
PULLMAN, B.
Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274
PUNWANI, D. V.
Status of the PEATGAS process
[CONF-781045-3] 25 p0120 N80-12199
PYTLINSKI, J. T.
A new solar thermal electricity/cooling generation system
[AIAA PAPER 80-0296] 25 p0063 A80-18300

Q

QUENTIN, G. H.
Fixed-bed gasifier dynamic model for IGCCP control study
25 p0088 A80-20883
QUICKENDEN, T. I.
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
QUINLIVAN, S.
Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204

R

RAAB, G. A.
Mineral changes during oil shale retorting
25 p0085 A80-20455
RAAEN, V. F.
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168
RABASSE, C.
Flame propagation through unconfined and confined hemispherical stratified gaseous mixtures
25 p0008 A80-11816
RABER, E.
Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561
RABINOVICH, M. S.
Relativistic high-current microwave plasma electronics
25 p0083 A80-19847
RABL, A.
Derivation of method for predicting long term average energy delivery of solar collectors
25 p0005 A80-11339
Simple procedure for predicting long term average performance of nonconcentrating and of concentrating solar collectors
25 p0005 A80-11340
RADDING, S. B.
Proceedings of the 1978 Coal Chemistry Workshop
[CONF-780372] 25 p0150 N80-14264
RAFAT, N. M.
Multi-pass solar heater with heat-exchanging passes and exposed to non-uniform radiation
[ASME PAPER 79-WA/HT-67] 25 p0070 A80-18600
RAMAKUMAR, R.
Modeling and simulation of WECS assisted utility systems
25 p0088 A80-20887
Application of field-modulated generator systems to dispersed solar thermal electric generation
[NASA-CR-162536] 25 p0155 N80-14488
RAMBACK, G.
Evaluation of solar Rankine-cycle engine systems
[SAND-78-0986] 25 p0125 N80-12571

RAMEY, H. J., JR.
Thermodynamic behaviour of the Bagnore geothermal field
25 p0075 A80-19205

RAMSEY, J. W.
Heat transfer to a melting solid with application to thermal energy storage systems
25 p0036 A80-14667
Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584

RAMSEY, W. J.
US energy flow in 1978
25 p0158 N80-14517

RANKEN, W. A.
Baseline design of the thermoelectric reactor space power system
[LA-UR-79-1242] 25 p0149 N80-13906

RANNEY, M. W.
Heat exchange fluids and techniques
25 p0041 A80-15659

RAO, C. R.
District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States
[NMEI-10-1] 25 p0172 N80-15582

RAO, D. S.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777

RAO, K. K.
An investigation of experimental performance of a compound parabolic concentrator
25 p0023 A80-12748

RAO, K. S.
Techno-economic feasibility analysis of solar cells with and without concentrators for rural lighting
25 p0026 A80-12773

RAPP, C. F.
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650

RAPPAPORT, E. B.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

RATAJCZAK, A. F.
A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552

RATCLIFF, D. D.
The USAF Academy flywheel-electric car preliminary design report
[AD-A071242] 25 p0123 N80-12553

RATZEL, A. C.
Utilization of heavy fill gases in annular solar receiver geometries for heat loss reduction
[ASME PAPER 79-WA/SOL-18] 25 p0065 A80-18557
Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11581
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
Evaluation of the evacuated solar annular receivers used at the Midtemperature Solar Systems Test Facility (MSSTF)
[SAND-78-0983] 25 p0173 N80-15585

RAVELET, S.
Copper diffusion and photovoltaic mechanisms at Cu-CdS contact
25 p0033 A80-13204

RAY, P. S.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875

REALINI, G.
Influence of the scaling of plasma confinement on the economy and unit size of ignited toroidal reactors
25 p0079 A80-19594

REBUT, P. H.
Status of the JET project
25 p0082 A80-19708

RECHBERGER, H.
Solar cells in practice
25 p0083 A80-19844

REECE, E. W.
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431

REED, C. B.
Solar-powered liquid-metal MHD power systems
[ASME PAPER 79-WA/SOL-22] 25 p0065 A80-18554

REED, J. W.
An analysis of the potential of wind energy conversion systems
25 p0048 A80-17133
Wind time series analyses for WECS applications
[SAND-77-1701] 25 p0132 N80-12709

REED, T. B.
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617

REED, W. E.
Microwave heating: Industrial applications. Citations from the engineering data base
[NTIS/PS-79/0632/4] 25 p0102 N80-10674

REEDY, E. D., JR.
Sandia composite-rim flywheel development
[SAND-78-1865C] 25 p0177 N80-15624

REH, L.
Fluid bed combustion in processing, environmental protection and energy supply
25 p0072 A80-18735

REID, H., JR.
Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423

REILLY, J. P.
CO2 electric discharge lasers - Present status and future applications
25 p0039 A80-14960

REINERT, R. P.
Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641

REISFELD, R.
Improved planar solar convertor based on uranyl neodymium and holmium glasses
25 p0083 A80-19740

REISSE, J. M.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

REITER, M.
Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471

RENNER, D. S.
Flat-plate solar collector materials
25 p0035 A80-14409

RENIER, J. P.
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602

RENTZ, R. L.
Status of alcohol fuels utilization technology for stationary gas turbines
[HCP/M2098-03] 25 p0135 N80-13283

REUTER, R. C., JR.
Weight minimization of sandwich type solar collector panels
[SAND-78-2305C] 25 p0147 N80-13710

REUTSKII, S. IU.
Simultaneous investigation of transverse and longitudinal edge effects in the channel of a plane MHD induction pump
25 p0030 A80-12897

REYNOLDS, R.
A high performance porous flat-plate solar collector
25 p0021 A80-12438

RHINEHAMMER, T. B.
Evaluation of fuel resources and requirements for the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570

RIBE, F. L.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

RICE, M. P.
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558

RICE, R. L.
Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386

RICE, W. L. R.
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544

RICHARD, E. H.
The basics of magnetic separation as applied to municipal solid waste reclamation plants
25 p0074 A80-18871

RICHARDS, T. R.
Modified power law equations for vertical wind profiles
[NASA-TM-79275] 25 p0138 N80-13623

RICHELS, R.
Assessing energy policy models - Current state and future directions
25 p0009 A80-11831

RICHTER, R.
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594

RIERSGARD, P.
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590

RIETJENS, L. H. T.
The physics of closed cycle MHD power generation
25 p0043 A80-16264

RINDE, J. A.
Materials program for fiber composite flywheels
[UCRL-81724] 25 p0115 N80-11618

RINDT, B. A.
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574

RINES, C.
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521

RINGO, M.
Fundamental economic issues in the development of small-scale hydro
[DOE/RA-23-216.00.0-02] 25 p0143 N80-13667

RIPIN, B. H.
Inertial confinement fusion at NRL
25 p0056 A80-17861

RISEN, W. M., JR.
An electrochemical heat engine for direct solar energy conversion
25 p0061 A80-18131

RISKIEV, T. T.
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629

RITSCHARD, R. L.
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648

RIUTOV, D. D.
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

ROACH, F.
Economic performance - Evaluations for solar energy
25 p0014 A80-11956
Passive and active residential solar heating: A comparative economic analysis of select designs
25 p0021 A80-12435
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653

ROARK, W. H.
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168

ROBERTS, B. W.
Electricity generation from jet-stream winds
25 p0007 A80-11644

ROBERTS, R. B.
Analysis of financial programs for energy conservation: Market simulation (penetration) model
[HCP/M8662-1] 25 p0114 N80-11606

ROBERTSON, C. S.
A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484

ROBERTSON, J.
Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558

ROBERTSON, R. C.
Waste heat rejection from geothermal power stations
[ORNL/TM-6533] 25 p0125 N80-12575

ROBIN, A. M.
Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes
[FE-2247-2] 25 p0119 N80-12191
Gasification of residual materials from coal liquefaction
[FE-2247-22] 25 p0135 N80-13289

ROBINSON, A. C.
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532

ROBINSON, K. K.
Catalyst development for coal liquefaction
[EPRI-AF-1084] 25 p0136 N80-13292

ROBINSON, L. K.
West Coast Forum on Appropriate Technology
[PB-298986/1] 25 p0166 N80-14962

ROBINSON, S. L.
Applications analysis of fixed site hydrogen storage
[SAND-78-8272] 25 p0092 N80-10384

ROCCO, P.
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668

RODEKOHR, M.
Energy demand in the developing countries
[DOE/EIA-0183/10] 25 p0177 N80-15631

ROESSNER, J. D.
Application of diffusion research to solar energy policy issues
[SERI/TR-51-194] 25 p0158 N80-14518

ROGAN, J. E.
Industrial solar total energy systems
25 p0017 A80-11987

ROGER, J. A.
Theory of the direct coupling between D.C. motors and photovoltaic solar arrays
25 p0005 A80-11334

ROGERS, W. E.
Heat transfer analysis of receivers for a solar concentrating collector
[ASME PAPER 79-WA/SOL-20] 25 p0065 A80-18558

ROGISTER, A.
What is the mechanism responsible for the precursors of internal disruptions
25 p0054 A80-17807

ROLLINS, R.
Measurement of gaseous hydrogen chloride emissions from municipal refuse energy recovery systems in the United States
25 p0019 A80-12128

ROMAINE, W. R.
Mead, Nebraska, 25-kW photovoltaic power system
[COO-4094-10] 25 p0127 N80-12592

ROMEY, I.
Current German developments in coal liquefaction technology
25 p0015 A80-11965

ROMMERS, P. J.
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857

RONALLO, D. F.
Mathematical modeling of coal gasification processes
25 p0089 A80-20913

ROSAI, L.
Behavior of SORB-AC wafer pumps in contaminated H2 plasmas and during maintenance of plasma machines
25 p0082 A80-19672

ROSE, R. P.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

ROSEN, A.
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

ROSEN, G.
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728

ROSENBLUTH, M. N.
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876

ROSINI, D. A.
Combustion of anthracite culm in a fluidized bed boiler
25 p0014 A80-11959

ROSS, R. T.
Efficiency of quantum-utilizing solar energy converters in the absence of intraband thermalization
25 p0030 A80-12838

ROWE, A. P.
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043

RUDLOFF, F. A.
Computer simulation results for planar reflectors and flat plate solar collectors
[ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559

RUKHADZE, A. A.
Relativistic high-current microwave plasma electronics
25 p0083 A80-19647

RUSSELL, G.
Heat flow meters for solar system performance monitoring
25 p0022 A80-12608

RUSSELL, M. C.
Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566

RUSSO, A. J.
User's manual for the magnetohydrodynamic generator channel code, MHDCHN
[SAND-78-1260] 25 p0132 N80-12894

RUSSO, G.
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421

RUTHERFORD, P. H.
Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349

RYAN, P. B.
Harnessing power from tides - State of the art
25 p0045 A80-16658

RYASON, P. R.
Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377

RYBAK, S. C.
Automated longwall guidance and control systems, phase 1
[NASA-CR-161329] 25 p0122 N80-12538

RYCROFT, R. W.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463

Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464

Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/[illegible]] 25 p0152 N80-14465

Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466

Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467

Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

RYTHER, J. H.
Methane fermentation of aquatic biomass
25 p0043 A80-16148

Fuels from marine biomass
25 p0045 A80-16656

S

SACCO, S. B.
Description of the MIT/Lincoln Laboratory photovoltaic systems test facility
[COO-4094-41] 25 p0178 N80-15638

SADOWSKI, E. P.
Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-3] 25 p0119 N80-12163

SAEUFFERER, H.
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841

SAHA, H.
Electrochemical storage of photovoltaic solar energy
25 p0025 A80-12757

Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771

SAITO, T.
New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium
25 p0085 A80-20538

SAKAGUCHI, T.
Studies on carbon dioxide cycles for power generation. I - Fundamental condensation cycles
25 p0083 A80-19716

SAKATA, T.
Hydrogen evolution from water using solid carbon and light energy
25 p0032 A80-13109

SALEHPOUR, A.
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555

SALIN, R.
MeV cluster ion beam diagnostics by means of calorimetry and time-of-flight spectroscopy
25 p0080 A80-19612

SALMON, R.
Recent developments in coal liquefaction in the United States
25 p0015 A80-11966

Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246

SALO, D. J.
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393

SALTONSTALL, R.
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520

SALTZMAN, E. J.
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948

SALVESEN, K. G.
Technical assessment of thermal DeNOx process
[PB-297947/4] 25 p0117 N80-11656

SALYER, I. O.
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603

SALZANO, F. J.
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632

SAMMELLS, A. F.
A performance and current distribution model for scaled-up molten carbonate fuel cells
25 p0062 A80-18213
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
[CONF-781063-2] 25 p0115 N80-11615
Prediction of current distribution in a molten carbonate fuel cell
[CONF-781063-1] 25 p0175 N80-15613

SAMPATH, V.
A performance and current distribution model for scaled-up molten carbonate fuel cells
25 p0062 A80-18213
Prediction of current distribution in a molten carbonate fuel cell
[CONF-781063-1] 25 p0175 N80-15613

SAMUEL, A. A.
A parametric study of solar thermal power plant
25 p0024 A80-12753

SAMUELS, G.
Geopressure energy resource evaluation
[ORNL/PPA-79/2] 25 p0138 N80-13605

SAMUELS, N.
Devonian paleocurrents of the Applachian basin
[METC/CR-79/22] 25 p0149 N80-13735

SAMURIN, N. A.
Preliminary design of axial flow hydrocarbon turbine/generator set for geothermal applications
[EPRI-ER-513] 25 p0160 N80-14536

SANDERA, J.
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842

SANFILIPPO, G. P.
Oil recovery by carbon dioxide injection
[ORO-5301-34] 25 p0108 N80-11545

SANTINI, D. J.
Distribution and classification of local socio-economic impacts from energy development
[CONF-790481-1] 25 p0166 N80-14954

SANTORO, R. T.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

SARRADIN, J.
Hydrogen /Hydride/-air secondary battery
25 p0011 A80-11848

SASAKI, H.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

SASSIN, W.
Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677

SATHYANARAYANA, S.
Cadmium electrodes with improved surface characteristics for alkaline storage batteries
25 p0009 A80-11838

SATO, S.
Thermochemical hydrogen production
25 p0052 A80-17578

SATTAROV, D. K.
Development of optical waveguides for a power-related application
25 p0036 A80-14596

SAUER, K.
Wave absorption and superreflectivity of laser plasmas due to electromagnetic structure resonances
25 p0057 A80-17871

SAUNDERS, N. T.
Aircraft Energy Efficiency (ACEE) status report
25 p0091 N80-10206

SAVERY, C. W.
Double-exposure collector system
[TID-28964] 25 p0127 N80-12593

SBITNIKOVA, I. S.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829

SCHAEFER, A. O.
Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels
[FE-1784-42] 25 p0106 N80-11248

SCHAETZLE, W. J.
A solar energy system with annual aquifer storage
[ASME PAPER 79-WA/SOL-30] 25 p0066 A80-18560
Heat pump centered integrated community energy systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588

SCHARLACK, R. S.
The optimal design of solar cell grid lines
25 p0005 A80-11335

SCHECHTER, R. S.
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544

SCHEININE, A.
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565

SCHEPPELE, S. E.
Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry. Mass spectrometry and fossil-energy conversion technology: A review
[FE-2537-7] 25 p0120 N80-12198

SCHERZER, B. M. U.
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682

SCHILLER, T. G.
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646

SCHILLING, H.-D.
The role of coal gasification and liquefaction in improving the efficiency of energy use - Comparative end use efficiency of the use of coal: Substitute natural gas and other gases versus electric power production
25 p0030 A80-12941

SCHINK, G. R.
Wharton annual energy model: Development and simulation results
[EPRI-EA-1115] 25 p0175 N80-15606

SCHIPPER, L.
Another look at energy conservation
[LBL-7893] 25 p0097 N80-10611
Energy conservation and the environment: conflict or complement
[LBL-7882] 25 p0098 N80-10621

SCHMIDL, H.
Spatial and depth distribution of deuterium, oxygen, and limiter materials on the liner of TFR 400
25 p0082 A80-19682

SCHMITT, R.
Improvement of the high-rate discharge behaviour of the nickel electrode
25 p0010 A80-11841

SCHMITT, W. R.
Ocean energy - Forms and prospects
25 p0061 A80-18162

SCHNAPER, G. H.
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

SCHNEIDER, S. H.
Comparative risk assessment of energy systems
25 p0049 A80-17139

SCHOETERS, J. G. E.
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028

SCHOOLEY, F. A.
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T1] 25 p0168 N80-15276

SCHOWEBEL, R. L.
Analysis of hydrogen in solids
[DOE/ER-0026] 25 p0167 N80-15220

SCHRATTENHOLZER, L.
Models of worldwide energy demand and consumption
25 p0002 A80-10228

SCHREIBER, R.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790
SCHREINER, F.
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265
SCHREINER, M.
Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
[FE-2447-13] 25 p0093 N80-10388
SCHREYER, J. M.
Economy of a retrofit solar system
25 p0017 A80-11984
SCHRIDER, L. A.
Gas recovery from unconventional sources
25 p0014 A80-11958
SCHROEDER, R. L.
Resource recovery systems costs
25 p0001 A80-10029
SCHUELER, D. G.
Status of the US Department of Energy photovoltaic concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578
SCHUHMANN, R., JR.
Sulfur fixation during coal gasification
[PB-301104/6] 25 p0169 N80-15296
SCHULTE, S. C.
User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605
SCHULTZ, R. J.
Overview of geothermal energy in the United States
[CONF-790530-1] 25 p0102 N80-10661
SCHUMANN, J. W.
The electric trolley bus - Revisited
25 p0002 A80-10321
SCHUNCK, J. P.
Efficient indium tin oxide/polycrystalline silicon solar cells
25 p0039 A80-15136
SCHUTZ, S. R.
Residential on site solar heating systems. A project evaluation using the capital asset pricing model
[LBL-8298] 25 p0126 N80-12588
SCHWARTZ, R. W.
Effect of mechanical energy storage systems on the characteristics of electric vehicles
[UCRL-82710] 25 p0102 N80-10664
Assessment of the applicability of mechanical energy storage devices to electric and hybrid vehicles. Volume 1: Executive summary
[UCRL-52773-VOL-1] 25 p0166 N80-14973
SCHWARTZ, S. M.
A manual for cataloging and indexing documents
[LBL-4432-REV-1] 25 p0118 N80-11946
SCHWARZ, F. C.
Bi-directional four quadrant (BDQ4) power converter development
[NASA-CR-159660] 25 p0154 N80-14480
SCOTT, R. J.
Ocean Thermal Energy Conversion (OTEC) platform configuration and integration, executive summary
[DOE/ET-4064-1] 25 p0128 N80-12600
SCOTTI, L. J.
Economics of Pullman Kellogg's magnesium promoted FGD system
25 p0014 A80-11961
SEARCY, J. Q.
Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook
[DOE/EV-0028] 25 p0163 N80-14565
SEAY, J. G.
LNG industry: An overview of projects and costs
[CONF-7811112-2] 25 p0168 N80-15278
SEBELIEN, K. B.
Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382
SECHI, F. N.
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600
SEDMAK, M. R.
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
SEENIRAJ, V.
Storage of solar heat by solid-liquid phase change
25 p0024 A80-12755
SEGASER, C. L.
Survey of solar thermal energy storage subsystems for thermal/electric applications
[ORNL/TM-5758] 25 p0098 N80-10627
SEIBERT, M.
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
SEIKEL, G. R.
Survey of MHD plant applications
25 p0015 A80-11972
SELDEN, A. C.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
SELMAN, J. R.
A performance and current distribution model for scaled-up molten carbonate fuel cells
25 p0062 A80-18213
Prediction of current distribution in a molten carbonate fuel cell
[CONF-781063-1] 25 p0175 N80-15613
SELVAGE, R. B. G.
Correspondence between solar load ratio method for passive water wall systems and f-Chart performance estimates
25 p0029 A80-12821
Solar heating system performance estimation using sinusoidal inputs
25 p0061 A80-18130
SENGUPTA, S.
Annealing and degradation studies of ceramic CdS solar cells
25 p0026 A80-12771
SENGUPTA, U.
GaAs-electrolyte photovoltaic cells
25 p0026 A80-12774
SEPSY, C.
Fuel utilization in residences
[EPRI-EA-894] 25 p0175 N80-15604
SERAPHIN, B. O.
Stabilized CVD amorphous silicon for high temperature photothermal solar energy conversion
25 p0087 A80-20722
SESHADRI, C. V.
Energy plantation for coromandel littoral
25 p0023 A80-12742
SESNIC, S.
Accumulation of impurities and stability behaviour in the high-density regime of Pulsator
25 p0054 A80-17759
SETH, A. K.
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
SEUFERT, F. B.
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700
SEVIAN, W. A.
Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369
SEXTON, K.
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992
SHAFER, B. D.
Status of the US Department of Energy photovoltaic concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578
SHALA, F. J.
A chromatographic peak profiling technique for interpretation and analysis of combustion processes
[AIAA PAPER 80-0284] 25 p0063 A80-18291
SHAMSUNDAR, N.
Effectiveness - NTU charts for latent heat storage units
[ASME PAPER 79-WA/SOL-16] 25 p0066 A80-18561

SHANKER, D.
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776
SHARMA, A. K.
Optical and electrical investigations on annealed indium oxide selective coatings produced by spray pyrolysis
25 p0023 A80-12747
SHARMA, S. B.
Effect of thin oxide layer on the current voltage relations of Schottky barrier solar cells
25 p0026 A80-12772
Effect of image force on the characteristics of MOS solar cell
25 p0028 A80-12785
SHARP, L. E.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
SHATFORD, P. A.
Heating, confinement and fluctuations in the CLEO stellarator
25 p0055 A80-17826
SHCHUKIN, V. K.
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022
SHEHEEN, M. N.
Critical review and assessment of environmental and safety problems in hydrogen energy systems
[LA-7820-PR] 25 p0145 N80-13690
SHELPUK, B.
Alternate cycles applied to ocean thermal energy conversion
[SERI/TP-34-180] 25 p0172 N80-15571
SHEN, C. N.
Operational and parameter studies of a solar-powered absorption cycle system with internal latent energy storages
[ASME PAPER 79-WA/SOL-27] 25 p0067 A80-18568
SHEN, M. S.
Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277
SHEN, Y. D.
Preparation and properties of Au-/n/AlxGa1-xAs-/n/GaAs Schottky barrier solar cells
25 p0086 A80-20716
SHEPANSKI, J. R.
Calculations of inertial confinement fusion gains using a collective model for reheat, bremsstrahlung and fuel depletion for highly efficient electrodynamic laser compressions
25 p0058 A80-17875
SHET, U. S. P.
A parametric study of solar thermal power plant
25 p0024 A80-12753
SHEWCHUN, J.
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
The A-I/1-y/B-I/y/C-IIID-VI/2x/E-VI2/1-x/ pentenary alloy system and its application to photovoltaic solar energy conversion
25 p0046 A80-16786
SHIAU, J. F.
Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623
SHIBL, A.
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
SHIELDS, J. R.
Preliminary design of axial flow hydrocarbon turbine/generator set for geothermal applications
[EPRI-ER-513] 25 p0160 N80-14536
SHIELDS, K. J.
Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676
SHILLIDAY, T. S.
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483
SHIMOJO, T.
New approach for Vlasov equilibrium of a relativistic electron beam in a plasma medium
25 p0085 A80-20538
SHIMOTAKE, H.
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614
SHIMURA, Y.
Development of an aircraft-derivative gas turbine with high performance and large output
25 p0003 A80-10823
SHITOV, V. K.
Energetics aspects of environmental protection
25 p0072 A80-18733
SHOGREN, R. K.
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation
[SAND-78-8180] 25 p0097 N80-10612
SHOTLAND, S.
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657
SHROPSHIRE, J. A.
Zinc-bromine battery studies
25 p0010 A80-11845
SHUKER, F. S.
Development of silver-hydrogen cells
25 p0010 A80-11843
SHUKLA, P. K.
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
SHULZHENKO, G. I.
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840
SICHEL, E. K.
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980
Materials for solar thermal conversion
[COO-4557-1] 25 p0143 N80-13670
SICILIANO, C. L. B.
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
SIDLES, P. H.
Operational experience with drain-down solar systems
[IS-M-166] 25 p0125 N80-12576
SIDOR, L. B.
Society and Aerospace Technology Workshop, Los Angeles, Calif., November 15, 1979, Proceedings
25 p0037 A80-14701
SIEBERS, D. L.
Solar thermal central receiver systems
[ASME PAPER 79-WA/HT-38] 25 p0070 A80-18596
SIEGEL, J. S.
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285
SIEMON, R. E.
Recent developments in linear theta-pinch and laser-heated solenoid research
25 p0055 A80-17825
SIEMSEN, G.
The conversion of ethylene glycol with air in alkaline fuel cells
25 p0011 A80-11850
SIEVERS, A. J.
The spectral selectivity of conducting micromeshes
25 p0087 A80-20720
SIEWERDT, L.
Developments for the high voltage test of pulsed superconducting coils
25 p0081 A80-19655
SIGEL, R.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864
SIGMAR, D. J.
High-beta tokamaks
25 p0054 A80-17789
SILBERSTEIN, S.
Coal conversion technologies - Some health and environmental effects
25 p0006 A80-11369
SILLESEN, A. H.
Ablation of solid hydrogen in a plasma
25 p0050 A80-17218

SILSBEE, R. H.
The spectral selectivity of conducting micromeshes
25 p0087 A80-20720

SIMMONS, D. R.
Design of a small thermochemical receiver for solar thermal power
25 p0005 A80-11338

SIMMONS, G. A.
Effect of off-design operation of MHD generators on NO/X/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310

SIMMONS, M. K.
Annual review of energy. Volume 4
25 p0008 A80-11826

SIMPSON, C. E.
Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11581

SIMPSON, J. G.
Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473

SIMPSON, M. N.
The microbial production of methane from household wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870

SIMS, C. T.
Microstructural objectives for high-temperature alloys in advanced energy systems
25 p0002 A80-10306

SINGER, M. I.
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285

SINGH, R.
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368

SINGH, R. N.
Using a fin with a parabolic concentrator
25 p0004 A80-10847

SINGLETON, R. M.
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110

SINHA, A.
Temperature dependence of open-circuit photovoltage of a back-surface field semiconductor junction
25 p0087 A80-20727

SINHA, K. C.
Forecasting automobile fleet fuel efficiency
25 p0002 A80-10324

SITT, B.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863

SKAGGS, R. L.
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626

SKELLETT, S.
The design of a thin walled toroidal vacuum chamber for a large RFP experiment
25 p0082 A80-19676

SKLAREW, D. S.
Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens
25 p0085 A80-20378

SKOKOV, IU. V.
High-voltage multijunction solar cell
25 p0035 A80-14593

SLEMMONS, A.
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125

SLINN, W. G. N.
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723

SMAIL, H. E.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688

SMALL, T. J., III
An evaluation of thermal energy storage for residential air conditioning applications
[ASME PAPER 79-WA/HT-31] 25 p0071 A80-18631

SMETANA, F. O.
A home-size solar-powered engine for cooling systems of generation of electricity
[ASME PAPER 79-WA/SOL-34] 25 p0066 A80-18562

SMITH, C. F., JR.
Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253] 25 p0171 N80-15562

SMITH, G. B.
The scope of effective medium theory for fine metal particle solar absorbers
25 p0029 A80-12835

SMITH, J. M.
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[AIAA PAPER 80-0023] 25 p0063 A80-18243
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[NASA-TM-79308] 25 p0132 N80-12881
Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922

SMITH, M.
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979
[PB-299399/6] 25 p0179 N80-15682

SMITH, M. C.
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673

SMITH, M. P.
Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0816/3] 25 p0148 N80-13717
Geothermal energy, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0818/9] 25 p0148 N80-13718

SMITH, P. R.
Superheated steam generation in a Fresnel lens concentrating collector
[ASME PAPER 79-WA/SOL-21] 25 p0067 A80-18567
National Energy Act of 1978: A regional assessment
[PB-296479/9] 25 p0130 N80-12615

SMITH, R. G.
Area load-frequency control
25 p0022 A80-12735

SMITHSON, J. H.
Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285

SMOK, J. T.
Comparison of predicted and measured solar energy system performance
[ASME PAPER 79-WA/SOL-39] 25 p0069 A80-18589

SMULDERS, P. T.
The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes
25 p0042 A80-16086

SNELLING, R.
Western energy sulfate/nitrate monitoring network
[PB-299238/6] 25 p0180 N80-15685

SNOEBERGER, D. F.
Identification of environmental control technologies for geothermal development in the Imperial Valley of California
[UCRL-52548] 25 p0179 N80-15668

SNOW, E. C.
General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608

SNYDER, R. B.
The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505

SODHA, M. S.
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746
SOFRATA, H.
A study of the solar LiBr dual cycle characteristics
[AIAA PAPER 80-0400] 25 p0077 A80-19327
SOLAR, S.
Photophysical and chemical processes affecting the stability of the thiazine dye-iron system
25 p0033 A80-13198
SOLBES, A.
High interaction subsonic MHD channel operation
[AIAA PAPER 80-0022] 25 p0062 A80-18242
Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353
SOLODUKHA, O. I.
High-voltage multijunction solar cell
25 p0035 A80-14593
SOLOMON, A. D.
Design criteria in PCM wall thermal storage
25 p0021 A80-12440
SOMASUNDARAN, M.
Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646
SORENSEN, J.
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643
SOUTH, D. W.
Distribution and classification of local socio-economic impacts from energy development
[CONF-790481-1] 25 p0166 N80-14954
SOWELL, E.
The Building Loads Analysis System Thermodynamics (BLAST) program, version 2.0 Input booklet
[AD-A072435] 25 p0107 N80-11259
SOWELL, R. R.
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527
SPARKS, T. G.
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562
SPARROW, E. M.
Studies in heat transfer: A Festschrift for E. R. G. Eckert
25 p0036 A80-14655
Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584
SPARROW, F. T.
Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650
SPATSCHEK, K. H.
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
SPEARS, W. R.
Poloidal magnetic field design of a pulsed tokamak reactor
25 p0078 A80-19592
SPENCER, D. B.
Resource recovery systems costs
25 p0001 A80-10029
SPENCER, D. F.
The near term potential for gasification-combined cycle electric power generation
25 p0015 A80-11970
SPENCER, S. G.
INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595
SPERA, D. A.
Modified power law equations for vertical wind profiles
[NASA-TM-79275] 25 p0138 N80-13623
SPERBERG, R. T.
The reality of on-site fuel cells
25 p0016 A80-11973
SPERO, E.
A solar assisted and wind powered heat pump for residential dwellings
[ASME PAPER 79-WA/HT-33] 25 p0070 A80-18595
SPITZER, M.
The semiconductor-insulator-semiconductor /indium tin oxide on silicon/ solar cell - Characteristics and loss mechanisms
25 p0006 A80-11368
SPITZER, R. H.
Sulfur fixation during coal gasification
[PB-301104/6] 25 p0169 N80-15296
SPUCK, W. H., III
Borehole geological assessment
[NASA-CASE-NPO-14231-1] 25 p0104 N80-10709
SQUARCI, P.
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203
SRINIVASAMURTHY, N.
A theoretical method for estimation of power loss due to mismatch in solar cell I-V characteristics
25 p0025 A80-12763
SRINIVASAN, R.
Effectiveness - NTU charts for latent heat storage units
[ASME PAPER 79-WA/SOL-16] 25 p0066 A80-18561
SRINIVASAN, S.
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632
Solid electrolyte fuel cell for electric power generation
[BNL-26238] 25 p0158 N80-14522
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
SRIRAMULU, V.
Performance characteristics of solar regenerators
25 p0028 A80-12787
SRIVASTAVA, A.
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846
SRIVASTAVA, S.
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
STACY, L. E.
A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484
STADJUHAR, S. A.
An applications analysis for the solar industrial process heat market
25 p0088 A80-20888
STAFFELDT, E. E.
Economic analysis of small scale bioconversion units in New Mexico
[PB-301390/1] 25 p0169 N80-15298
STAMPER, K. R.
The 50,000 mile methanol/gasoline blend fleet study
[CONF-790520-6] 25 p0134 N80-13275
STANLEY, N. E.
INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595
STECCONI, P.
The calculation of carbon load and axial profiles of oxygen concentration in the bed of a fluidized combustor
25 p0077 A80-19421
STECURA, S.
Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303
STEEN, P. C.
Experimental techniques and mathematical models in the study of waste pyrolysis and gasification
25 p0001 A80-10028
STEFANI, G.
Assessment of geothermal potential of central and southern Tuscany
25 p0075 A80-19203
STEHMEIER, D.
Absorption heat pumps for solar space heating systems
25 p0036 A80-14672
STEIDEL, R. F.
Hybrid staging of geothermal energy conversion processes
[UCID-17949] 25 p0125 N80-12569
STEINBERG, M.
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639
Coal conversion in flash hydropyrolysis reactors
[BNL-26209] 25 p0136 N80-13294

Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897

STEMBER, L. H.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688

STENZ, C.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864

STEPANOV, K. N.
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855

STEPNIEWSKI, W.
Optimization of argon admixture in deuterium fusion with non-stationary action of plane shock waves
25 p0007 A80-11546

STERNLIEB, G.
Back to the central city - Myths and realities
25 p0002 A80-10323

STEUNENBERG, R. K.
Lithium/metal sulfide battery development
[CONF-790538-10] 25 p0159 N80-14530
Lithium/iron sulfide batteries for electric vehicles
[CONF-781006-2] 25 p0175 N80-15611

STEVENS, M. J. M.
The estimation of the parameters of the Weibull wind speed distribution for wind energy utilization purposes
25 p0042 A80-16086

STEWART, L. D.
Measured and predicted beam attenuation in neutral beam drift ducts for tokamaks
25 p0079 A80-19600

STEWART, W. F.
Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0136 N80-13297

STEWART, W. L.
Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737

STEYERT, W. A.
New heat transfer geometry for hydride heat engines and heat pumps
[LA-7822] 25 p0169 N80-15289

STICKFORD, G. H.
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688

STICKLEY, C. M.
Status of inertial confinement fusion
25 p0016 A80-11976

STIEFEL, M.
Soft and hard energy paths - The roads not taken
25 p0007 A80-11400

STIMPSON, L. D.
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267

STOLARZ, A. C.
Validation methodology for solar heating and cooling systems
25 p0020 A80-12431

STONE, R. G.
Laminated disk flywheel program
[UCRL-81772] 25 p0175 N80-15612

STORTI, G.
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697

STRAHLE, W. C.
Mach 3 hydrogen external/base burning
[AIAA PAPER 80-0280] 25 p0077 A80-19311

STRICKLAND, G.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

STRICKLAND, J. H.
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620

STRICKLER, D. J.
High-beta tokamaks
25 p0054 A80-17789

STRINGER, R. P.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-5] 25 p0172 N80-15576

STROGONOV, O. V.
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

STROMBERG, R. P.
Dynamic storage in solar total energy programs
[SAND-78-0958C] 25 p0174 N80-15600

STROUD, H. J. F.
Progress and development trends in coal gasification and liquefaction technologies - Recent achievements in conventional coal gasification processes
25 p0031 A80-12947

STRUSS, R. G.
Operational experience with drain-down solar systems
[IS-M-166] 25 p0125 N80-12576

STRYKER, H. I.
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646

STUPAKOV, G. V.
Transverse particle losses in axially asymmetrical open traps
25 p0055 A80-17840

STYLES, A. C.
Combustion and turbulence characteristics of cyclone combustors for burning low calorific value fuels
[AIAA PAPER 80-0075] 25 p0076 A80-19275

STYMNE, H.
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system
25 p0029 A80-12823

SU, W.
SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570

SUBRAHMANYAM, A.
Theoretical consideration of curve fill factor in solar cells
25 p0026 A80-12768

SUBRAHMANYAM, N.
Studies of photogalvanic cells
25 p0023 A80-12743

SUCCOP, D. C.
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-30] 25 p0135 N80-13291

SUCHER, G.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

SUDWORTH, J. L.
Development of a sodium/sulphur battery for rail applications
25 p0031 A80-13003

SUFFET, I. H.
A chromatographic peak profiling technique for interpretation and analysis of combustion processes
[AIAA PAPER 80-0284] 25 p0063 A80-18291

SUGIHARA, R.
Non-stochastic heating of magnetized plasma by electrostatic wave
25 p0043 A80-16194

SULEIMANOV, S. KH.
Calculation of the optical characteristics of high-power two-mirror solar furnaces
25 p0044 A80-16629

SULLIVAN, J. F.
INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595

SULLIVAN, L. D.
Coal-fired open cycle MHD combustion plasmas - Chemical equilibrium and transport properties workshop results
[AIAA PAPER 80-0091] 25 p0063 A80-18265

SULLIVAN, R. C.
Energy conservation - Aerodynamic drag reduction of intercity buses
25 p0050 A80-17227

SULLIVAN, W. N.
Efforts on the economic analysis of Darrieus vertical axis wind turbines
[SAND-78-1851C] 25 p0126 N80-12579

SURPRENANT, N. F.
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637

SUTER, G. W., II
Environmental implications for geothermal energy development
[CONF-790445-3] 25 p0103 N80-10694

SUTTER, D. F.
The United States programme in heavy ion beam fusion
25 p0058 A80-17873

SUTTON, M.
The distribution of sulfur and organic matter in various fractions of peat - Origins of sulfur in coal
25 p0074 A80-18833

SUTTON, S. B.
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688

SUYAMA, J.
Prospects of future geothermal energy development
25 p0049 A80-17138

SWAMI, N. K.
Role of oxide layer in Schottky barrier solar cells
25 p0025 A80-12761
Effect of concentrated sunlight on the various parameters of the p-n junction solar cell
25 p0025 A80-12764

SWANBERG, C. A.
Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

SWANSON, S. R.
Computer simulation results for planar reflectors and flat plate solar collectors
[ASME PAPER 79-WA/SOL-37] 25 p0066 A80-18559

SWARTZ, S. H.
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551

SWIERCZYNSKI, R.
Optimization of neutron yield in conical system at explosion-induced compression
25 p0007 A80-11545

SWITKOWSKI, Z. E.
Use of nuclear techniques in the characterization of chrome black solar absorber surfaces
25 p0084 A80-20141

SYKES, A.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

SYLWAN, C.
Utility fuel cells for Sweden
25 p0011 A80-11852

SYRED, N.
Combustion and turbulence characteristics of cyclone combustors for burning low calcrific value fuels
[AIAA PAPER 80-0075] 25 p0076 A80-19275

SZE, D.-K.
Blanket and power conversion system of NUWMAK
25 p0081 A80-19658

T

TACEY, C. F.
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705

TAHSIRI, H.
End plugging of a hot linear theta pinch
25 p0055 A80-17824

TAIROV, B. D.
Thermodynamic analysis of thermomechanical solar energy converters operating in conjunction with solar cells
25 p0035 A80-14592

TAKAHASHI, P.
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628

TAKAHASHI, T.
Water electrolysis
25 p0052 A80-17576

TAKEO, K.
Development of an aircraft-derivative gas turbine with high performance and large output
25 p0003 A80-10823

TAKEO, T.
Water splitting reaction on a polynaphthoquinone catalyst - A polynaphthoquinone-So2-I2 system for H2O decomposition
25 p0032 A80-13196

TAKEYA, G.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

TALANTOV, A. V.
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

TAM, S. W.
Underground pumped hydro storage: An overview
[CONF-781046-1] 25 p0116 N80-11624
Turbomachinery options for an underground pumped hydroelectric storage plant
[CONF-790803-50] 25 p0177 N80-15629

TANABE, K.
Activity tests of various catalysts for hydrocracking of coal by means of high pressure differential thermal analysis
25 p0019 A80-12244

TANASESCU, F. T.
Some promising aspects regarding solar energy conversion with metal oxide photovoltaic cells
25 p0011 A80-11853

TANENBAUM, G.
Environmental aspects of alternative energy technolcgies for California
[UCRL-15002] 25 p0131 N80-12628

TANNER, D. P.
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561

TARONI, A.
Numerical computations in the design of compact ignition experiments
25 p0078 A80-19589

TARRICONE, L.
Measurements of minority-carrier diffusion length in heterojunction solar cells
25 p0086 A80-20717

TAYLOR, S. J.
Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543
Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544

TEAGLE, D. A.
Current collectors for sodium-sulphur batteries
25 p0013 A80-11867

TEGGERS, H.
Coal as a source of chemical raw materials - Prospects for chemical synthesis based on gas from coal
25 p0031 A80-12944

TEMBOURY, J.
Project CESA-1, a 1 MW solar power plant in Almeria
[AED-CONF-78-212-011] 25 p0130 N80-12614

TENNFORS, E.
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877

TEOFILO, V. L.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

TEPER, M. D.
Coal liquefaction - An international perspective
25 p0015 A80-11964

TERRELL, R. E.
Performance and analysis of a 'series' heat pump-assisted solar heated residence in Madison, Wisconsin
25 p0061 A80-18132

TERRY, R. B.
Photovoltaic incentives options
[HCP/CS-0023] 25 p0162 N80-14561

TEWARI, G. N.
Transient rise of plate temperature in solar collectors
25 p0023 A80-12746

TEWARY, V. K.
Performance studies on uniform illumination type nontracking concentrators
25 p0026 A80-12766

THALHAMMER, E. D.
Heliostat Beam Characterization System
25 p0022 A80-12627

THANVI, K. P.
Effect of boosters on the performance of flat plate collector
25 p0023 A80-12744

THEUNISSEN, P. H.
Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353

THOMAS, I. M.
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650

THOMAS, J. R., JR.
Helium penetration in evacuated solar collectors - Theory and effect on their performance
[ASME PAPER 79-WA/SOL-17] 25 p0066 A80-18563

THOMAS, M. G.
Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288

THOMAS, R. A.
Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346

THOMAS, R. E.
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483

THOMPSON, C.
Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676

THOMPSON, J.
Power sources 7: Research and development in non-mechanical electrical power sources; Proceedings of the Eleventh International Symposium, Brighton, Sussex, England, September 25-28, 1978
25 p0009 A80-11837
Failure mechanisms of vented nickel-cadmium cells in overcharge
25 p0010 A80-11840

THORSNESS, C. B.
Laboratory coal gasifier facility
[UCRL-82602] 25 p0106 N80-11245

TIERNEY, P.
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655

TILLER, J. S.
Southeastern forum on appropriate technology
[PB-298796/4] 25 p0118 N80-11965

TIMBARIO, T. J.
Status of alcohol fuels utilization technology for stationary gas turbines
[HCP/M2098-03] 25 p0135 N80-13283

TISON, R. R.
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263

TIWARI, F. K.
A new approach to low cost large area selective surfaces for photothermal conversion
25 p0003 A80-10845

TIWARI, G. N.
Performance of an inexpensive constant flow solar collector/storage system in ground
25 p0003 A80-10846

TODD, A. M. M.
Low-aspect-ratio limit of the toroidal reactor - The spheromak
25 p0058 A80-17876

TOKOR, M. Z.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885

TORABI-FARD, A.
End plugging of a hot linear theta pinch
25 p0055 A80-17824

TORPY, M. F.
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641

TORRO, J.
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565

TOTH, P.
The possibilities of increasing gas turbine efficiency
25 p0032 A80-13024

TOTH, W. J.
Geothermal energy markets on the Atlantic coastal plain
25 p0016 A80-11978
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648

TOUSKOVA, A.
High-efficiency alkaline accumulator with cadmium mass treated with oxalic acid
25 p0010 A80-11842

TRACEY, T. R.
Low-cost central receiver solar power plant using molten salt as a heat transfer and storage medium
25 p0017 A80-11986

TRAEGER, R. K.
Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272
Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288

TRAMMEL, B. C.
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574

TRIFFET, T.
West Coast Forum on Appropriate Technology
[PB-298986/1] 25 p0166 N80-14962

TRIGG, E.
Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583

TRIPATHI, V. K.
Non-linear theory of collective processes in laser-pellet interaction and soliton generation
25 p0057 A80-17870

TROITSKII, I. V.
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074

TROSHENKIN, B. O.
Utilization of ocean heat for hydrogen production
25 p0086 A80-20686

TROYON, F.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

TRUSCELLO, V. C.
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706

TSAI, M.-C.
Catalysis of hydrogen transfer in a tetralin-coal system
25 p0019 A80-12246

TSANG, C. F.
Aquifer thermal energy storage
[LBL-7070] 25 p0176 N80-15618

TSANG, J. S. K.
Two-dimensional heating analysis of fusion blankets for synfuel production
25 p0082 A80-19665

One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922

TSARENKOV, B. V.
Broadband varizone Ga/1-x/Al/x/As-Si-photoelectric converters with an illuminated n-region
25 p0044 A80-16626

TSATSOV, K. K.
Ion-stimulated sorption of nitrogen on a continuously deposited titanium film
25 p0051 A80-17252

TSIEN, H. C.
Zinc-bromine battery studies
25 p0010 A80-11845

TSUKISHIMA, T.
Measurements of the density fluctuations using the microwave scattering method
25 p0046 A80-16731

TSURIKOV, V. A.
Fast-magnetosonic-wave excitation in large-tokamak plasmas
25 p0056 A80-17855

TURCHAN, M. J.
Development of silver-hydrogen cells
25 p0010 A80-11843

TURCHI, P. J.
Optimization of stabilized imploding liner fusion reactors
25 p0079 A80-19593

TURNBULL, F. G.
Regenerative flywheel energy storage system
[UCRL-13982] 25 p0112 N80-11594

TURNER, A. K.
Interactive analysis methods for resource mapping
25 p0008 A80-11709

TURNER, G. W.
Efficient shallow-homojunction GaAs solar cells by molecular beam epitaxy
25 p0035 A80-13986

TURNER, R.
Superconducting magnetic energy storage for electric power system dynamic stabilization
[LA-UR-79-1220] 25 p0160 N80-14535

TURNER, W. D.
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575

TYL, J.
Effect of kinetics of thermonuclear reaction products upon D-T plasma parameters
25 p0007 A80-11544

TYNER, C. E.
Overview of in situ oil shale technology and recent advances in true in situ retort modeling
[SAND-78-2367C] 25 p0122 N80-12543

TZIVELEKAS, I.
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368

U

UCKAN, N. A.
The Elmo Bumpy Torus /EBT/ reactor
25 p0058 A80-17883

UIHLEIN, J.
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979
[PB-299399/6] 25 p0179 N80-15682

ULBRICHT, A.
Developments for the high voltage test of pulsed superconducting coils
25 p0081 A80-19655

ULLAL, H. S.
Photovoltaic energy conversion in polymer films
25 p0154 N80-14477

ULRICH, W. C.
Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246

ULSETH, G. W.
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494

UMAROV, G. G.
Investigation of aerodynamic drag of solar air heaters
25 p0044 A80-16631

UO, K.
Study of current-driven magnetohydrodynamic instability in the Heliotron-D device
25 p0084 A80-20159

URI, N. D.
Identification of a methodology for projecting short-term crude petroleum production in the United States
[DOE/EIA-0103/14] 25 p0122 N80-12542

URSU, I.
A mathematical model for a future hydrogen power system
25 p0001 A80-10223

USHAKOVA, A. D.
Results of interdepartmental tests of solar water heaters over an annual cycle. I
25 p0051 A80-17245

UTSUMI, H.
Combined effects of polycyclic aromatic hydrocarbons and sunlight
[CONF-790447-4] 25 p0131 N80-12631

UTZINGER, D. M.
A method of estimating monthly average solar radiation on shaded receivers
25 p0060 A80-18123

V

VALEO, E. J.
Tearing modes in a plasma with magnetic braiding
25 p0006 A80-11349
Steady-state currents driven by collisionally damped lower-hybrid waves
25 p0084 A80-20157

VAN BEEK, J. R.
Behaviour of the secondary lithium electrode on alloying substrates in propylene carbonate based electrolytes
25 p0012 A80-11857

VAN DER LEIJ, M.
Cobalt oxide as a spectrally selective material for use in solar collectors
25 p0086 A80-20719

VAN HEEK, K. H.
An update of German non-isothermal coal pyrolysis work
25 p0019 A80-12245

VAN RUTTEN, P.
A system for the control of tritium losses in primary and steam circuits of a fusion power plant
25 p0082 A80-19668

VANDERBORGH, N. E.
Night storage and backup generation with electrochemical engines
[LA-UR-78-1149] 25 p0113 N80-11596

VANGOOL, W.
Constraints on energy conservation
[ORAU/IEA-78-17(M)] 25 p0127 N80-12594
Fundamental aspects of energy conservation policy
[ORAU/IEA-78-20(M)] 25 p0127 N80-12595

VANSTON, J. H.
Feasibility study for enhancing the development of fusion energy
[EPRI-ER-778-SR] 25 p0178 N80-15642

VAREY, G. B.
The simulation of building heat transfer for passive solar systems
[ASME PAPER 79-WA/SOL-38] 25 p0067 A80-18574

VARLJEN, T. C.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888

VARMA, H. K.
Design of 1-ton solar operated LiBr-water air-conditioning system with special reference to solar part
25 p0025 A80-12759

VARMA, S.
Experimental study of MOS solar cells under concentration
25 p0026 A80-12769
Experimental investigation of various barrier metals for Schottky barrier and MOS solar cells
25 p0027 A80-12776

VARSHAVSKII, I. L.
Hydrogen - The fuel of the future
25 p0002 A80-10349

VARUGHESE, A.
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
VAS, I. E.
Wind energy innovative systems
[SERI/PR-13-054] 25 p0144 N80-13674
VASAGAM, R. M.
Enhanced power generation of GSS/4/PS by optical solar reflectors
25 p0038 A80-14948
VASILEV, N. N.
Concept of tokamak-type reactor with high-temperature blanket
25 p0059 A80-17885
VASILEV, V. P.
Induced fields in the motion of a conducting medium in the field of an air-core magnetic system
25 p0061 A80-18138
VAUGHAN, J. C., III
Multirole cargo aircraft options and configurations
[NASA-TM-80177] 25 p0105 N80-11053
VAYENAS, C. G.
A single coal particle gasification model
25 p0088 A80-20884
VEDEL, J. M.
Work on laser interaction and implosion at Centre d'Etudes de Limeil
25 p0057 A80-17863
VELIKANOV, D. P.
Automobile transportation and the environment
25 p0072 A80-18734
VELIKOV, V. V.
Some problems with variable operation of an MHD generator
25 p0035 A80-14530
VENERO, A. F.
Zinc-bromine battery studies
25 p0010 A80-11845
VENKATARAMANI, G.
Energy plantation for coromandel littoral
25 p0023 A80-12742
VENKATESH, A.
Experimental investigations of an intermittent ammonia-water solar refrigerator
25 p0028 A80-12786
VENKATESWARLU, U.
Programme and progress of DST sponsored solar photovoltaic work in India
25 p0025 A80-12760
VERCAEMERT, P.
A simplified procedure for performance of solar systems with heat pumps
[ASME PAPER 79-WA/SOL-23] 25 p0065 A80-18555
VERHOEFF, J.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629
VERMEULEN, F. E.
Physical modelling of the electromagnetic heating of oil sand and other earth-type and biological materials
25 p0020 A80-12311
VERRIER, F. E.
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705
VERSCHUUR, K. A.
Neutronics in the toroidal belt-geometry of a screw pinch reactor
25 p0081 A80-19657
VEZIROGLU, T. N.
Fifth Ocean Thermal Energy Conversion Conference, volume 2, sections 4-5
[CONF-780236-P2] 25 p0162 N80-14553
VIACHESLAVOV, L. N.
Investigation of plasma heating by powerful relativistic electron beams
25 p0056 A80-17857
VIDONI, E.
Wind energy conversion system with electromagnetic stabiliser
25 p0031 A80-13004
VINAYAGALINGAM, T.
The pedal wind turbine
25 p0008 A80-11645
VINOGRADOV, A. P.
Dynamic suppression of ionization instability
25 p0043 A80-16484
VINOGRADOVA, E. E.
Photoelectric parameters of photoelectric converters in relation to illumination
25 p0044 A80-16627
VIRMONT, J.
Experimental studies of interaction and transport processes in laser fusion
25 p0057 A80-17864
VLASES, G. C.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888
VOGEL, R. W.
Energy policy and decision analysis; new concepts and mechanisms
[LA-7909-MS] 25 p0140 N80-13634
VOGT, W. G.
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 2 - Systems and control
25 p0087 A80-20862
Modeling and simulation. Volume 10 - Proceedings of the Tenth Annual Pittsburgh Conference, University of Pittsburgh, Pittsburgh, Pa., April 25-27, 1979. Part 3 - Energy and environment
25 p0087 A80-20881
VON ARX, W. S.
Prospects - A social context for natural science
25 p0044 A80-16651
VORONOV, G. S.
Current equilibrium and effective ion charge in L-2 stellarator plasma
25 p0055 A80-17829
VOSS, A.
Waves, currents, tides - Problems and prospects
25 p0049 A80-17134
VUORI, S.
Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891
VYGOVSKII, V. P.
Heat flow and heat transfer conditions in the bottom sediments of the equatorial Indian Ocean
25 p0075 A80-19048

W

WADE, D. W.
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
WADE, W. H.
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544
WAEGLI, P.
Laser fusion implications of resonance absorption and associated electrostatic field pressure
25 p0057 A80-17869
WAGH, A. S.
Solar absorption spectra of PbS-Al and PbSe-Al systems
25 p0027 A80-12781
WAGNER, S.
Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607
WAHIG, M.
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982
WAHLIG, M.
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586
WAIBEL, R. T.
Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner
[FE-2489-33] 25 p0093 N80-10390
WAITE, W. A.
Anton permselective membrane
[NASA-CR-159599] 25 p0122 N80-12551

WAKAMIYA, W.
Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382

WAKATANI, M.
Effect of finite beta on drift-wave turbulence and particle confinement
25 p0084 A80-20158

WAKERLEY, D. S.
The microbial production of methane from household wastes - Fixed-bed anaerobic digestion
25 p0074 A80-18870

WALKER, D.
Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications
[NASA-TM-78251] 25 p0156 N80-14501

WALKER, D. C.
Pelletized wood /Woodex/ - Applications and potential
25 p0017 A80-11981

WALKER, W. R.
Trans-seasonal storage of solar energy: Innovative research program subtask
[COO-4546-3] 25 p0144 N80-13672

WALSH, W. J.
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Advanced batteries for electric vehicles: A look at the future
[CONF-790484-1] 25 p0159 N80-14531
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

WALTER, D.
Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521

WALTON, H.
Residential sector energy forecasts, national level for 1978-electricity, natural gas, number two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601

WALZER, W.
Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648

WANG, F. E.
Preparation of superconducting coil through composite
25 p0040 A80-15512

WANG, S.-A.
An experimental study of corrugated steel sheet solar water heater
25 p0029 A80-12822

WANG, Z.-D.
An indirect ammonia-air fuel system
25 p0013 A80-11868

WANIG, M.
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12589

WARD, D. S.
Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668
Realistic sizing of residential solar heating and cooling systems
[COO-2858-14] 25 p0163 N80-14569

WARD, J. C.
Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668

WARREN, J. L.
Analysis of hydrogen in solids
[DOE/ER-0026] 25 p0167 N80-15220

WARREN, M.
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586

WATANABE, T.
Photoelectrochemical hydrogen production
25 p0052 A80-17580

WATSON, D. B.
Controllable d.c. power supply from wind-driven self-excited induction machines
25 p0075 A80-19031

WATTS, R. L.
Materials resource requirements and potential limitations in solar energy products
25 p0018 A80-11990
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625

WAYNE, M.
The promise and puzzle of electric vehicles
25 p0039 A80-15175

WEAVER, H. T.
Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577

WEBB, R. L.
Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707

WEBELER, R. W. H.
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728

WEBER, D.
Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process
[AED-CONF-78-155-010] 25 p0121 N80-12291

WEBSTER, B. T.
A vortex model of the Darrieus turbine - An analytical and experimental study
[ASME PAPER 79-WA/FE-6] 25 p0070 A80-18620

WEDLER, H.
Testing and performance of the 30 kA ohmic heating system for ASDEX
25 p0078 A80-19585

WEH, H.
Linear synchronous motor development for urban and rapid transit systems
25 p0062 A80-18167

WEI, I. W.
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700

WEI, J.
A single coal particle gasification model
25 p0088 A80-20884

WEICHEL, H.
Solar electric generating system resource requirements
25 p0005 A80-11341

WEICHSELGARTNER, H.
Investigations of isotope separation effects of a Ti-fluidized bed
25 p0082 A80-19669

WEINGART, J. M.
Global aspects of sunlight as a major energy source
25 p0048 A80-17131

WEINSTEIN, B. W.
X-ray measurement of laser fusion targets using least squares fitting
25 p0060 A80-18110

WEINSTEIN, S.
Architectural concerns in solar system design and installation
[SCLAB/0801-79-01] 25 p0129 N80-12607

WEIR, E. E.
Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676

WEIS, P.
Status of information for consumers of small wind energy systems
[SERI/TP-51-158] 25 p0113 N80-11602

WEISS, I.
The European economic community's policy concerning natural gas, coal and new sources of energy
25 p0032 A80-13175

WEISSBROD, R.
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578

WELLER, S. W.
Catalysis of hydrogen transfer in a tetralin-coal system
25 p0019 A80-12246

WELLMAN, D. L.
Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

WELLS, W. L.
Fiscal year 1978 experiences at TVA's Widows Creek unit 8 limestone scrubber
[ASME PAPER 79-WA/APC-10] 25 p0071 A80-18623

WELSH, L. B.
Phosphoric acid fuel-cell electrocatalysts from pyropolymer ceramic composites
25 p0012 A80-11861

WEN, L.
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-16564

WENZLER, S. A.
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658

WERDEN, R. G.
Heat pump centered integrated community energy systems; System development
[ANL/ICES-TM-26] 25 p0173 N80-15589

WERNER, A. S.
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637

WESSON, J. A.
Dependence of ideal MHD beta limits on current density and pressure profiles
25 p0054 A80-17790

WESTBERG, H.
Ambient air measurements of petroleum refinery emissions
25 p0018 A80-11992

WESTMORELAND, P. R.
Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
[CONF-790630-9] 25 p0136 N80-13295

WETTERMARK, G.
An incongruent heat-of-fusion system - CaCl2-6H2O - made congruent through modification of the chemical composition of the system
25 p0029 A80-12823

WEYL, G.
Integral modeling of MHD channel boundary layers
[AIAA PAPER 80-0175] 25 p0064 A80-18353

WHITAKER, A. F.
Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253] 25 p0171 N80-15562

WHITAKER, R. B.
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603

WHITE, I. L.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468

WHITNEY, R. L.
A low level wind measurement technique for wind turbine generator siting
25 p0042 A80-16084

WICK, G. L.
Salinity gradient power - Utilizing vapor pressure differences
25 p0003 A80-10524

WICK, G. S.
Salt power - Is Neptune's ole salt a tiger in the tank
25 p0045 A80-16654

WICKSTROM, B.
170 MW pressurized fluidized bed combustion electric plant
25 p0014 A80-11962

WIDMER, R.
Textured silicon - A selective absorber for solar thermal conversion
25 p0034 A80-13980

WIEDENHEFT, C. J.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540

WIEWIOROWSKA, K.
Legal and political problems of solar power stations in space
[IAF PAPER 79-IISL-03] 25 p0047 A80-17064

WIHL, M.
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565

WILBORN, J.
Commercial solar augmented heat pump system
[EPRI-ER-1004] 25 p0160 N80-14537

WILCOCK, P. D.
A new high beta reversed field pinch machine
25 p0078 A80-19587

WILDE, D.
Development of integrated thermionic circuits for geothermal high-temperature applications
[LA-UR-79-723] 25 p0112 N80-11592

WILEMSKI, G.
Nonequilibrium thermodynamics of fuel cells - Heat release mechanisms and voltage
25 p0084 A80-20274

WILKINS, D. E.
Dynamic modeling of H2S clean-up processes
25 p0088 A80-20885

WILKINS, R. W.
An overview of Controlled Thermonuclear Research Division control and data acquisition computer usage at the Los Alamos Scientific Laboratory
25 p0022 A80-12628

WILKINSON, M. K.
Crystallographic contributions to the energy problem
[CONF-780867-1] 25 p0128 N80-12598

WILL, F. G.
Recent advances in zinc-bromine batteries
25 p0010 A80-11846

WILLARS, H. J.
The methanol-air fuel cell - A selective review of methanol oxidation mechanisms at platinum electrodes in acid electrolytes
25 p0042 A80-16146

WILLIAMS, A. N.
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706

WILLIAMS, J.
Climatic impact of alternative energy sources
25 p0050 A80-17140
The impact of a conceptual solar thermal electric conversion plant on regional meteorological conditions - A numerical study
25 p0060 A80-18125
Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677

WILLIAMS, O. G.
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626

WILLIAMS, T.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629

WILLIAMS, T. S.
Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354

WILLIAMS, W. R.
Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590

WILNER, B.
Boundary layer analysis of cold-blanket systems
25 p0058 A80-17877

WILSON, D. C.
Energy conservation through recycling
25 p0003 A80-10842
The uncertain costs of waste disposal and resource recovery
25 p0043 A80-16150
WILSON, D. L.
Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584
WILSON, D. R.
Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354
Effect of off-design operation of MHD generators on NO/x/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310
WILSON, J. R.
Nonlinear modification of resonance-cone trajectories
25 p0006 A80-11347
WILSON, W. I.
The use of oil shale for SO2 emission control in atmospheric-pressure fluidized-bed coal combustors
25 p0064 A80-18505
WILZBACH, K. E.
Status of development, energy and economics aspects of alternative technologies
[CONF-790371-1] 25 p0145 N80-13689
WINELAND, D. L.
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
WINN, C. B.
Validation cf computer models for predicting radiation levels on tilted surfaces
25 p0020 A80-12429
Energy meter for solar air systems
25 p0022 A80-12609
RAPAD - Real-time Accurate Performance Analysis of Data
[ASME PAPER 79-WA/SOL-1] 25 p0066 A80-18565
Preliminary analysis of a total solar heating system
[ASME PAPER 79-WA/SOL-40] 25 p0069 A80-18583
Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653
WINSTON, R.
Cavity enhancement by controlled directional scattering
25 p0083 A80-19955
WIPF, S. L.
The 50kA flux pump for the superconducting transmission line test bed
[LA-6953-MS] 25 p0094 N80-10443
WISE, D. L.
Methane fermentation of aquatic biomass
25 p0043 A80-16148
WISE, R. L.
Gas recovery from unconventional sources
25 p0014 A80-11958
WISNIEWSKI, G. R.
Studies on the Ca-CaCrO4 and Li-Al-FeS2 systems for thermal battery applications
25 p0012 A80-11854
WITTENBERG, L. J.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541
Evaluation of fuel resources and requirements for the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570
WITTER, A.
Health and enviromental effects of coal gasification and liquefaction technologies: A workshop summary and panel reports
[PB-297618/1] 25 p0104 N80-10701
WOHLGEMUTH, J.
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697
WOLF, M. A.
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723
WOLFF, W. A.
OTEC thermal resource report for Caribbean Sea Plant Ship 13-15 degrees N 75-80 degrees N
[HCP/T2898] 25 p0113 N80-11599
OTEC thermal response report for Pacific plant ship, 5 to 10 deg N 90 to 95 deg W
[HCP/T2898-01/3] 25 p0142 N80-13656
WOLFINGER, T. F.
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629
WOLOWSKI, R.
Current German developments in coal liquefaction technology
25 p0015 A80-11965
WONG, D.
Study of corrosion and its control in aluminum solar collectors
[COO-2934-7] 25 p0129 N80-12609
WONG, K. L.
Nonlinear modification of resonance-cone trajectories
25 p0006 A80-11347
WOO, T. G.
Lignite fuel and power-plant availability
25 p0004 A80-10944
WOOD, D. O.
Annual review of energy. Volume 4
25 p0008 A80-11826
WOOD, L. R.
Modeling and experimental analysis of a fluidic generator
[ASME PAPER 79-DET-9] 25 p0041 A80-15705
WOOD, V. E.
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483
WOODALL, J. M.
The effect of fluorescent wavelength shifting on solar cell spectral response
25 p0086 A80-20715
WOODEN, V. A.
Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253] 25 p0171 N80-15562
WOODLEY, N. H.
Solar energy perspectives for public power
[SERI/TP-35-300] 25 p0140 N80-13635
WOODRUFF, G. L.
Fuel production characteristics of fusion hybrid reactors
25 p0059 A80-17888
WOODS, R. O.
Overview of flywheel energy storage component development
[SAND-78-1999C] 25 p0176 N80-15623
WOODSMALL, W. H., JR.
Thermal energy utilization in the Mississippi County Community College Photovoltaic Project
[ASME PAPER 79-WA/SOL-29] 25 p0068 A80-18575
WORKHOVEN, R. M.
Concentrating solar collector test results Collector Module Test Facility (CMTF)
[SAND-78-0977] 25 p0111 N80-11580
WORKHOVEN, V. R.
Performance testing of the General Electric Engineering Prototype Collector
[SAND-79-0514] 25 p0141 N80-13645
WRAY, W. O.
A microeconomic approach to passive solar design - Performance, cost, optimal sizing and comfort analysis
25 p0021 A80-12433
Sensitivity of direct gain space heating performance to fundamental parameter variations
25 p0060 A80-18128

WREDE, H.
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368
WRIGHT, J. D.
SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
WRIGHTON, M. S.
Photoelectrochemical conversion of optical energy to electricity and fuels
[AD-A072861] 25 p0123 N80-12556
WRIGLEY, C.
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697
WU, S. T.
Experimental and numerical studies of liquid storage tank thermal stratification for a solar energy system
[COO-4479-2] 25 p0101 N80-10655
WYMAN, C.
Thermal energy storage for solar applications: An overview
[SERI/TP-34-089] 25 p0161 N80-14546
WYNNE, F. E.
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-33] 25 p0135 N80-13287
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-30] 25 p0135 N80-13291

X

XUAN, P. T.
Energy storage in organic photoisomers
25 p0072 A80-18747
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502

Y

YADAV, K. S.
Review of the work done at C.E.E.R.I. on the development of single crystal silicon solar cells for use with concentrated light
25 p0027 A80-12777
YAFFEE, P.
Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957
YAMAGUCHI, M.
Solar energy storage by metal hydride
25 p0053 A80-17582
YANO, T.
Minimum ignition energies and quenching distances of methanol blends
25 p0004 A80-11331
YAO, L. S.
Analysis of convective heat loss from the receiver of solar power plants
[ASME PAPER 79-WA/HT-36] 25 p0068 A80-18582
YARZE, J. C.
Economics of Pullman Kellogg's magnesium promoted FGD system
25 p0014 A80-11961
YASUI, R. K.
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474
YAWS, C.
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492
YIM, G. K.
A comprehensive model for photovoltage generation at metal electrodes in contact with solutions of fluorescent dyes
25 p0004 A80-10879
YOKELL, M. D.
Role of the government in the development of solar energy
[SERI/TP-52-138] 25 p0178 N80-15639
YONAS, G.
Developments in Sandia Laboratories particle beam fusion programme
25 p0057 A80-17867
YOO, H. I.
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561
Assessment of present state-of-the-art sawing technology of large diameter ingots for solar sheet material
[NASA-CR-162535] 25 p0151 N80-14273
YORK, W. L.
Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560
YOSHIKAWA, M.
JT-60 project
25 p0082 A80-19709
YOUNGSDAHL, C. A.
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques
[CONF-790480-1] 25 p0167 N80-15259
YU, G.-Y.
Magnetic field design for a large tokamak
25 p0046 A80-16760
YU, M. Y.
Theory of cavitons in laser-irradiated plasmas
25 p0057 A80-17872
YUE, A. S.
A review of in situ composites for nonstructural applications
25 p0002 A80-10285

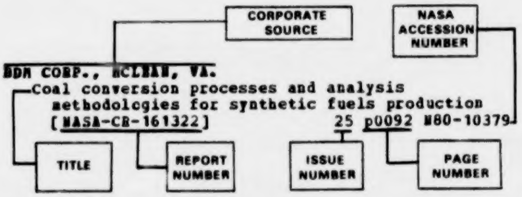
Z

ZABRANSKY, Z.
Plastic bonded electrodes for nickel-cadmium accumulators. I - Cadmium electrode
25 p0043 A80-16147
ZAIAVLIN, V. R.
Analysis of the optical characteristics of silicon photoelectric converters with bilateral sensitivity
25 p0044 A80-16628
ZAITSEVA, A. K.
Photoconverter with bilateral sensitivity
25 p0044 A80-16625
ZAJIC, J. E.
Microbial hydrogen production from replenishable resources
25 p0032 A80-13197
ZAKS, M. B.
High-voltage multijunction solar cell
25 p0035 A80-14593
ZALEWSKI, E. F.
Solar cell spectral response characterization
25 p0037 A80-14685
ZAMPELLI, E. M.
Determination of the optimal solar investment decision criterion
25 p0021 A80-12437
ZATELEPIN, V. N.
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516
ZECEVIC, S.
Neutral electrolyte aluminium-air battery
25 p0011 A80-11849
ZEIMETZ, K. A.
Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400
ZELLARS, G. R.
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043
ZHELEZNIAK, M. B.
Heat transfer in the channel of a high-power MHD generator
25 p0035 A80-14516
ZIEGLER, A.
Technical possibilities and economic prospects for coal refining
25 p0043 A80-16175
ZIEGLER, E. N.
Control technology for coal-fired combustion in Northeastern U.S. A - Overview and sulfur emissions control. B - Particulates, NOx and combined systems
25 p0074 A80-18883
ZIEMIANSKI, J. A.
Aircraft Energy Efficiency (ACEE) status report
25 p0091 N80-10206

ZIMMERMAN, D. K.
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644
ZIMMERMAN, F. W.
Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery
[FE-2025-38] 25 p0130 N80-12624
ZIMMERMAN, J. B.
Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423
ZIMMERMAN, W. F.
A conceptual design study on the application of liquid metal heat transfer technology tc the solar thermal power plant
[NASA-CR-162544] 25 p0154 N80-14484
ZOCHER, R. W.
General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608
ZOLLARS, G. F.
Hydrogen as a fuel. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0771/0] 25 p0094 N80-10397
Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401
Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0772/8] 25 p0094 N80-10402
Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0765/2] 25 p0102 N80-10667
Aircraft fuel. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0764/5] 25 p0102 N80-10668
ZOTOV, A. V.
Some problems with variable operation of an MHD generator
25 p0035 A80-14530
ZRELOV, V. N.
An engine fuel chemistry solution to the problem of jet fuel supplies
25 p0001 A80-10199

CORPORATE SOURCE INDEX

Typical Corporate Source Index Listing


CORPORATE SOURCE
NASA ACCESSION NUMBER
BDM CORP., MCLEAN, VA.
Coal conversion processes and analysis methodologies for synthetic fuels production
[NASA-CR-161322] 25 p0092 N80-10379
TITLE
REPORT NUMBER
ISSUE NUMBER
PAGE NUMBER

The title of the document is used to provide a brief description of the subject matter. The issue, page number and NASA or AIAA accession number are included in each entry to assist the user in locating the abstract in the abstract section of an individual supplement of *Energy*. If applicable, a report number is also included as an aid in identifying the document.

A

ACRES AMERICAN, INC., BUFFALO, N. Y.
Feasibility of compressed air energy storage as a peak shaving technique in California, Volume 2
[SAN-1331-T1] 25 p0174 N80-15596
ACUREX CORP., MOUNTAIN VIEW, CALIF.
Technical assessment of thermal DeNOx process
[PB-297947/4] 25 p0117 N80-11656
Pilot scale evaluation of NOx combustion control for pulverized coal, phase 2
[PB-299325/1] 25 p0180 N80-15687
ADDIS TRANSLATIONS INTERNATIONAL, PORTOLA VALLEY, CALIF.
Conversion of radiant energy into chemical energy
[UCRL-TRANS-11427] 25 p0114 N80-11609
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT, NEUILLY-SUR-SEINE (FRANCE).
Fluid dynamic aspects of wind energy conversion
[AGARD-AG-243] 25 p0103 N80-10683
AEG-TELEFUNKEN, BERLIN (WEST GERMANY).
Unconventional circuits for static voltage transformers
[BMFT-FB-T-78-26] 25 p0107 N80-11368
AEROJET ENERGY CONSERVATION CO., SACRAMENTO, CALIF.
Multi-use geothermal energy system with augmentation for enhanced utilization. Non-electric application of geothermal energy in Susanville, California
[DOE/ET-248447/1] 25 p0142 N80-13660
AEROSPACE CORP., EL SEGUNDO, CALIF.
The 10 MW solar thermal pilot plant dynamic simulation. Volume 1: Computer program description
[ATR-78(7747)-1-VOL-1] 25 p0162 N80-14550
The 10 MW solar thermal pilot plant dynamic simulation. Volume 2: Computer program source listing
[ATR-78(7747)-2-VOL-2] 25 p0162 N80-14551
AIR FORCE ACADEMY, COLO.
The USAF Academy flywheel-electric car preliminary design report
[AD-A071242] 25 p0123 N80-12553
AIR POLLUTION TECHNOLOGY, INC., SAN DIEGO, CALIF.
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 1
[PB-299191/7] 25 p0165 N80-14590
Effects of conditioning agents on emissions from coal-fired boilers: Test report no. 2
[PB-299192/5] 25 p0165 N80-14591
AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA.
Demonstration of a nitrogen based carburizing atmosphere: Energy consumption of the endothermic generator
[CONS/5058-T1] 25 p0173 N80-15591
ALABAMA UNIV., HUNTSVILLE.
Experimental and numerical studies of liquid storage tank thermal stratification for a solar energy system
[COO-4479-2] 25 p0101 N80-10655
A survey of photovoltaic systems
[NASA-CR-150696] 25 p0171 N80-15563
ALABAMA UNIV., UNIVERSITY.
Heat pump centered integrated community energy systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588
ALLERTON PRESS, INC., NEW YORK, N. Y.
Study of heat-pipe heat exchanger in the small gas turbine engine system
25 p0091 N80-10022
Selection of optimal parameters of heat-pipe heat exchanger for a gas turbine engine
25 p0091 N80-10068
Dynamics of diesel fuel combustion in turbulent flow
25 p0091 N80-10074
AMERICAN UNIV., WASHINGTON, D. C.
On the properties of a fuel cell electrolyte
[AD-A072864] 25 p0123 N80-12554
AMES LAB., IOWA.
Operational experience with drain-down solar systems
[IS-M-166] 25 p0125 N80-12576
Photothermal conversion surface measurements using photoacoustic and photothermal spectroscopies
[IS-M-202] 25 p0129 N80-12611
Fossil energy program. 1. Mining research and development: Coal preparation and analysis
[IS-4655] 25 p0145 N80-13679
Fossil energy program, 1. Mining research and development: Coal preparation and analysis
[IS-4703] 25 p0147 N80-13702
AMOCO OIL CO., NAPERVILLE, ILL.
Catalyst development for coal liquefaction
[EPRI-AF-1084] 25 p0136 N80-13292
APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL, MD.
Geothermal energy market study on the Atlantic coastal plain. Economic evaluation model for direct use of moderate temperature, up to 250 F, geothermal resources in the northern Atlantic coastal plain
[PB-298785/7] 25 p0165 N80-14578
Energy program at the Johns Hopkins University Applied Physics Laboratory
[PB-310245/7] 25 p0179 N80-15648
ARGONNE NATIONAL LAB., ILL.
Materials testing for central receiver solar-thermal power systems
[DOE/TIC-10103] 25 p0096 N80-10606
Power supply requirements for a tokamak fusion reactor
[ANL/FPP/TM-119] 25 p0104 N80-10918
Heat pump centered integrated community energy systems; System development
[ANL-ICES-TM-28] 25 p0111 N80-11574
Transfer of energy conservation technology to industry. A preliminary survey of existing mechanisms
[ANL/EES-TM-28] 25 p0111 N80-11576

Implementing energy conservation strategies in energy materials transport: U. S. Department of Energy and other government agency policy-making decisions
[ANL/EES-TM-32] 25 p0111 N80-11577
DOE heat pump centered integrated community energy systems project
[CONF-790362-1] 25 p0112 N80-11586
World Energy Data System (WENDS)
[CONF-790461-2] 25 p0112 N80-11587
Preliminary materials assessment in solar demonstration systems
[ANL/EES-CP-30] 25 p0115 N80-11619
Underground pumped hydro storage: An overview
[CONF-781046-1] 25 p0116 N80-11624
Design optimization of aquifer reservoir-based compressed air storage systems
[CONF-781046-5] 25 p0116 N80-11628
World Energy Data System (WENDS). Volume 11: Nuclear fission program summaries
[ANL-PMS-79-2-VOL-11] 25 p0124 N80-12562
Combined effects of polycyclic aromatic hydrocarbons and sunlight
[CONF-790447-4] 25 p0131 N80-12631
Experimental two-phase liquid-metal magnetohydrodynamic generator program
[AD-A073128] 25 p0132 N80-12882
World Energy Data System (WENDS). Volume 7: Nuclear facility profiles, AG-CH
[ANL-PMS-79-2-VOL-7] 25 p0139 N80-13629
World energy data system (WENDS). Volume 8: Nuclear facility profiles, CO-HU
[ANL-PMS-79-2-VOL-8] 25 p0139 N80-13630
Assessment of Stirling engine potential in total and integrated energy systems
[ANL/ES-76] 25 p0140 N80-13636
Status of development, energy and economics aspects of alternative technologies
[CONF-790371-1] 25 p0145 N80-13689
Materials testing for central receiver solar-thermal power systems
[TID-29443] 25 p0146 N80-13695
OTEC power systems
[CONF-790444-2] 25 p0146 N80-13696
Community heating and cooling systems
[CONF-790446-6] 25 p0147 N80-13706
Fusion power program
[ANL/FPP-78-4] 25 p0149 N80-13941
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water, ANL-4
[CONF-780807-11] 25 p0150 N80-14265
Fusarium species: Their potential for transforming biomass to ethanol
[ANL/EES/TM-38] 25 p0151 N80-14271
Definition and analysis of the barriers to the implementation of urban energy recovery systems
[ANL/CNSV/TM-2] 25 p0159 N80-14525
Lithium/metal sulfide battery development
[CONF-790538-10] 25 p0159 N80-14530
Advanced batteries for electric vehicles: A look at the future
[CONF-790484-1] 25 p0159 N80-14531
Overview of the Department of Energy's research, development and demonstration program for the recovery of energy and materials from urban waste
[CONF-790373-1] 25 p0163 N80-14562
Review of industrial participation on the ANL lithium/iron sulfide battery development program
[CONF-780852-1] 25 p0164 N80-14573
Distribution and classification of local socio-economic impacts from energy development
[CONF-790481-1] 25 p0166 N80-14954
Long-term erosion monitoring of metallic conduits by ultrasonic pulse-echo techniques
[CONF-790480-1] 25 p0167 N80-15259
Environmental planning and assessment for highway vehicle use to alcohol fuels
[CONF-790520-2] 25 p0168 N80-15281
Heat pump centered integrated community energy systems: Systems development
[ANL/ICES-TM-30] 25 p0173 N80-15588
Heat pump centered integrated community energy systems; System development
[ANL/ICES-TM-26] 25 p0173 N80-15589
Lithium/iron sulfide batteries for electric vehicles
[CONF-781006-2] 25 p0175 N80-15611
Development of Li-Al/FeS cells with LiCl-rich electrolyte
[CONF-7810135-2] 25 p0176 N80-15614
Turbomachinery options for an underground pumped hydroelectric storage plant
[CONF-790803-50] 25 p0177 N80-15629
Technical support for open-cycle MHD program
[ANL/MHD-78-11] 25 p0181 N80-15942

ARIZONA STATE UNIV., TEMPE.
Conversion of cellulosic and waste polymer material to gasoline
[COO-2982-38] 25 p0169 N80-15291

ARIZONA UNIV., TUCSON.
Analysis and simulated diagenesis of kerogen in a recent bottom mud from Mono Lake, California - A comparison with selected ancient kerogens
25 p0085 A80-20378
West Coast Forum on Appropriate Technology
[PB-298986/1] 25 p0166 N80-14962

ARMY CONSTRUCTION ENGINEERING RESEARCH LAB., CHAMPAIGN, ILL.
The Building Loads Analysis System Thermodynamics (BLAST) program, version 2.0 Input booklet
[AD-A072435] 25 p0107 N80-11259

ARMY RESEARCH OFFICE, WASHINGTON, D. C.
Fuel cell sesquicentennial
25 p0033 A80-13223

ATOMICS INTERNATIONAL, GOLDEN, COLO.
Quality assurance in alternative energy sources
[RHO-SA-107] 25 p0095 N80-10504

AUSTRIAN SOLAR AND SPACE AGENCY, VIENNA.
Solar energy with latent heat storage: Fundamentals and applications
[ASSA-10/1978] 25 p0116 N80-11632

B

BABCOCK AND WILCOX CO., ALLIANCE, OHIO.
Characterization and combustion of SRC 2 fuel oil
[EPRI-FP-1028] 25 p0119 N80-12192

BATTELLE COLUMBUS LABS., OHIO.
Sugar crops as a source of fuels. Volume 1: Agricultural research
[TID-29400/1] 25 p0093 N80-10395
SEASAT demonstration experiments with the offshore oil, gas and mining industries
[NASA-CR-162423] 25 p0108 N80-11532
Preliminary assessment of industrial needs for an advanced ocean technology
[NASA-CR-162435] 25 p0118 N80-11747
Photovoltaic concentrator application experiment. Phase 1: A 150 kW photovoltaic concentrator power system for load-center applications with feedback into the utility grid
[DOE/CS-34267/1] 25 p0145 N80-13688
Development of an accelerated test design for predicting the service life of the solar array at Mead, Nebraska
[NASA-CR-162534] 25 p0154 N80-14483
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595

BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
Assessment of synfuel transportation to year 2000
[PNL-2768] 25 p0092 N80-10382
Summary report of the Solar Reflective Materials Technology Workshop
[PNL-2763] 25 p0097 N80-10613
Methodology for identifying materials constraints to implementation of solar energy technologies
[PNL-2711] 25 p0098 N80-10625
User manual for GEOCITY: A computer model for geothermal district heating cost analysis
[PNL-2742] 25 p0113 N80-11605
Compressed air energy storage technology program
[PNL-2935] 25 p0160 N80-14534

BDM CORP., MCLEAN, VA.
Coal conversion processes and analysis methodolcgies for synthetic fuels production
[NASA-CR-161322] 25 p0092 N80-10379

BECHTEL NATIONAL, INC., SAN FRANCISCO, CALIF.
Technical and economic assessment of solar powered water pumping for remote areas
[SAND-79-8187] 25 p0129 N80-12608

BENDIX CORP., ENGLEWOOD, COLO.
Automated longwall guidance and control systems, phase 1
[NASA-CR-161329] 25 p0122 N80-12538
Automated longwall guidance and control systems, phase 2, part 2: Vertical control system (VCS)
[NASA-CR-161330] 25 p0122 N80-12539
Automated longwall guidance and control systems, phase 2, part 2: RCS, PAS, and MCS
[NASA-CR-161331] 25 p0122 N80-12540

BENDIX CORP., KANSAS CITY, MO.
Cooling aluminum molds using heat pipes
[BDX-613-2039-REV] 25 p0108 N80-11384

BITUMINOUS COAL RESEARCH, INC., MONROEVILLE, PA.
Gas generator research and development: BI-GAS process
[FE-1207-62] 25 p0135 N80-13288

BOEING AEROSPACE CO., SEATTLE, WASH.
Weight optimization of ultra large space structures
[SAWE PAPER 1301] 25 p0086 A80-20641
Solar power satellite system definition study, phase 2.
[NASA-CR-160377] 25 p0105 N80-11121
Solar power satellite system definition study, phase 2. Part 1: Midterm briefing
[NASA-CR-160378] 25 p0105 N80-11122
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

BOEING ENGINEERING AND CONSTRUCTION, SEATTLE, WASH.
Linear concentration solar collector in an air supported enclosure. Preliminary design study
[SAND-78-7022] 25 p0141 N80-13644

BOOZ-ALLEN AND HAMILTON, INC., BETHESDA, MD.
EPRI new energy resources department strategy paper
[EPRI-ER-979] 25 p0097 N80-10610

BOSTON UNIV., MASS.
Photosensitization mechanisms for energy storing isomerizations
[AD-A074968] 25 p0156 N80-14502
Energy storing organic photoreactions
[AD-A074915] 25 p0156 N80-14503

BRAUN (C. F.) AND CO., ALHAMBRA, CALIF.
Experimental enthalpies for a mixture of 80 mole percent isobutane in isopentane
[EPRI-ER-1034] 25 p0118 N80-11935

BROOKHAVEN NATIONAL LAB., UPTON, N. Y.
Solar assisted heat pump overview and summary of in-house research
[BNL-24911] 25 p0098 N80-10624
Dynamics and control: Energy conversion, delivery, and demand analysis
[BNL-26045] 25 p0099 N80-10633
State of the art of sensible heat storage for solar heat pump systems
[BNL-25909] 25 p0101 N80-10651
One- and two-dimensional heating analyses of fusion synfuel blankets
[BNL-NUREG-25635] 25 p0104 N80-10922
Regional reference energy systems: Electric utility applications
[BNL-50962] 25 p0111 N80-11585
Environmental control technology for carbon dioxide
[BNL-24999] 25 p0117 N80-11639
Solar-powered steam generator heliostat
[BNL-50974] 25 p0129 N80-12610
Regenerative process for desulfurization of high temperature combustion and fuel gases
[BNL-50944] 25 p0134 N80-13277
Coal conversion in flash hydropyrolysis reactors
[BNL-26209] 25 p0136 N80-13294
Hydrogen-halogen energy storage system
[BNL-50924] 25 p0139 N80-13632
Process optimization of industrial energy use
[BNL-26482] 25 p0141 N80-13650
Case study of the Brownell low energy requirement house
[BNL-50968] 25 p0142 N80-13651
Design, construction, and operation of the solar assisted heat pump ground coupled storage experiments at Brookhaven National Laboratory
[BNL-25908] 25 p0142 N80-13654
Highlights of the energy technology programs
[BNL-50959] 25 p0157 N80-14512
Dynamic energy system optimization model
[EPRI-EA-1079] 25 p0157 N80-14514
Solid electrolyte fuel cell for electric power generation
[BNL-26238] 25 p0158 N80-14522
Evlaution of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
[BNL-26218] 25 p0162 N80-14552
High temperature electrolysis
[BNL-26331] 25 p0167 N80-15227
Partial discharge performance of lapped plastic insulation for superconducting power transmission cables and the dielectric strength of supercritical helium gas
[BNL-24779] 25 p0170 N80-15346
MARKAL: A multiperiod linear-programming model for energy systems analysis (BNL version)
[BNL-26390] 25 p0178 N80-15634
Fusion energy for hydrogen production
[BNL-24906] 25 p0180 N80-15897

BROOKLYN UNION GAS CO., N. Y.
Methane recovery from sanitary landfills; gas recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254

BROWN AND ROOT, INC., HOUSTON, TEX.
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

BUREAU OF MINES, DENVER, COLO.
Three potential longwall mining methods for thick coal seams in the western United States
[PB-299568/6] 25 p0170 N80-15544

BUREAU OF RECLAMATION, BOULDER CITY, NEV.
Solar thermal electric plants in hydroelectric grid
[DOE/SF/10505-1] 25 p0143 N80-13663

BURT, HILL, KOSAR, RITTLEMAN, AND ASSOCIATES, BUTLER, PA.
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Residential photovoltaic module and array requirements study
[NASA-CR-162528] 25 p0154 N80-14482

C

CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.
Another look at energy conservation
[LBL-7893] 25 p0097 N80-10611
Energy conservation and the environment: conflict or complement
[LBL-7882] 25 p0098 N80-10621
On-line tests of organic additives for the inhibition of the precipitation of silica from hypersaline geothermal brine. 2: Tests of nitrogen-containing compounds, silanes, and additional ethoxylated compounds
[UCID-18195] 25 p0110 N80-11567
Geothermal energy for industrial application
[LBL-8919] 25 p0111 N80-11579
Energy conservation: Policy issues and end-use scenarios of savings potential. Part 3: Policy barriers and investment decisions in industry
[LBL-7896-PT-3] 25 p0114 N80-11614
A manual for cataloging and indexing documents
[LBL-4432-REV-1] 25 p0118 N80-11946
Experimental test facility for evaluation of solar control strategies
[LBL-8308] 25 p0126 N80-12586
Residential on site solar heating systems. A project evaluation using the capital asset pricing model
[LBL-8298] 25 p0126 N80-12588
Analysis of the California solar resource, volume 2
[LBL-7860-VOL-2] 25 p0127 N80-12589
Circumsolar radiation data for central receiver simulation
[LBL-8371] 25 p0131 N80-12647
Measurement of circumsolar radiation: Status report
[LBL-8391] 25 p0133 N80-12982

Characterization of solid-waste conversion and cogeneration systems
[LBL-7883] 25 p0141 N80-13648
Thermal performance of buildings and building envelope systems: An annotated bibliography
[LBL-8925] 25 p0145 N80-13680
Proceedings of the Thermal Energy Storage in Aquifers Workshop
[LBL-8431] 25 p0160 N80-14533
Thermal degradation of a black chrome solar selective absorber coating: Short term
[LBL-8857] 25 p0161 N80-14549
Geothermal energy development from the Salton Trough to the High Cascades
[LBL-8703] 25 p0171 N80-15568
Aquifer thermal energy storage
[LBL-7070] 25 p0176 N80-15618

CALIFORNIA UNIV., DAVIS.
Pilot plant gasification test on biomass fuels
[PB-299077/8] 25 p0151 N80-14272

CALIFORNIA UNIV., LIVERMORE.
Using surface waters for supplementing injection at the Salton Sea Geothermal Field (SSGF), Southern California
[UCRL-83011] 25 p0124 N80-12561

CALIFORNIA UNIV., LIVERMORE. LAWRENCE LIVERMORE LAB.
Energy transition in California
[UCRL-15003] 25 p0097 N80-10619
Methods of estimating the reliability of wind energy systems with storage
[UCRL-15005] 25 p0098 N80-10623
Effect of mechanical energy storage systems on the characteristics of electric vehicles
[UCRL-82710] 25 p0102 N80-10664
The impact of LNG spills on the environment: A comparison of dispersion models and experimental data
[UCRL-81812] 25 p0103 N80-10688
Energy storage systems for automobile propulsion, 1978 study. 1: Overview and findings
[UCRL-52553-VOL-1] 25 p0105 N80-10970
Laboratory coal gasifier facility
[UCRL-82602] 25 p0106 N80-11245
Two-dimensional transient dispersion and adsorption in porous media
[UCRL-81970] 25 p0108 N80-11386
Materials program for fiber composite flywheels
[UCRL-81724] 25 p0115 N80-11618
Environmental aspects of alternative fuels utilization for highway vehicles
[UCRL-81841] 25 p0120 N80-12201
Hybrid staging of geothermal energy conversion processes
[UCID-17949] 25 p0125 N80-12569
New concepts for converting the energy in low-to medium-temperature liquids, with emphasis on geothermal applications
[UCRL-52583] 25 p0125 N80-12570
Mechanical energy storage technology development for electric and hybrid vehicle applications
[UCRL-81786] 25 p0128 N80-12596
Numerical modeling of LNG spill phenomena
[UCRL-82031] 25 p0130 N80-12625
Environmental aspects of alternative energy technologies for California
[UCRL-15002] 25 p0131 N80-12628
Search for fusion power
[UCRL-81890] 25 p0132 N80-12900
National energy act of 1978: Far western perspective. A study for the US Department of Energy, Federal Region 9
[UCID-17944-REV-1] 25 p0132 N80-12955
Energy system in the Far West: Impacts of the National Energy Act of 1978
[UCRL-52754] 25 p0140 N80-13638
Tidal pressure response as a reservoir engineering tool
[UCRL-83012] 25 p0141 N80-13647
US energy flow in 1978
25 p0158 N80-14517
Non-tracking inflated cylindrical solar concentrator
[UCRL-82721] 25 p0159 N80-14528
Lawrence Livermore Laboratory geothermal energy program: A status report on the development of the Total-Flow concept
[UCRL-50046-77] 25 p0159 N80-14529
Process design and economic analysis of the zinc selenide thermochemical hydrogen cycle
[UCRL-52546] 25 p0164 N80-14571
Assessment of the applicability of mechanical energy storage devices to electric and hybrid vehicles. Volume 1: Executive summary
[UCRL-52773-VOL-1] 25 p0166 N80-14973
Simulation of LNG vapor spread and dispersion by finite element methods
[UCRL-82441] 25 p0168 N80-15282
Novel scheme for making cheap electricity with nuclear energy
[UCID-18153-REV-1] 25 p0171 N80-15564
Laminated disk flywheel program
[UCRL-81772] 25 p0175 N80-15612
Environmental overview of geothermal development: The Geysers-Calistoga KGRA. Volume 1: Issues and recommendations
[UCRL-52496-VOL-1] 25 p0177 N80-15626
Identification of environmental control technologies for geothermal development in the Imperial Valley of California
[UCRL-52548] 25 p0179 N80-15668
Superconductivity for mirror fusion
[UCRL-81693] 25 p0181 N80-15933
Energy storage system for automobile propulsion, 1978 study. 2: Detailed report
[UCRL-52553-VOL-2] 25 p0181 N80-15995

CALIFORNIA UNIV., LOS ANGELES.
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

CALIFORNIA UNIV., RIVERSIDE.
Seismic refraction investigation of the Salton Sea geothermal area, Imperial Valley, California
[PB-296547/3] 25 p0118 N80-11711

CALIFORNIA UNIV., SAN DIEGO.
National energy policy and state coastal programs: A critique of current efforts to balance environmental protection and energy production along the coast
[SAN-0034/263-1] 25 p0141 N80-13643

CAMBRIDGE SYSTEMATICS, INC., MASS.
Demand for special performance vehicles, 1975 - 2025
[UCRL-13911] 25 p0133 N80-12960

CARNEGIE-MELLON UNIV., PITTSBURGH, PA.
Optimization of multi-layer front-contact grid patterns for solar cells
25 p0028 A80-12816
Foam solar sea power: A physical investigation
25 p0122 N80-12548

CARRIER CORP., SYRACUSE, N. Y.
Development of a high temperature solar powered water chiller. Volume 3: Phase 1
[SAN-1590-1/3-VOL-3] 25 p0101 N80-10654

CENTRO DE ESTUDIOS DE LA ENERGIA, MADRID (SPAIN).
Project CESA-1, a 1 MW solar power plant in Almeria
[AED-CONF-78-212-011] 25 p0130 N80-12614

CHALMERS UNIV. OF TECHNOLOGY, GOTEBORG (SWEDEN).
Spectrally selective surfaces with coatings comprised of ultrafine metal particles
[AED-CONF-78-212-004] 25 p0115 N80-11620

CINCINNATI UNIV., OHIO.
Devonian paleocurrents of the Applachian basin
[METC/CR-79/22] 25 p0149 N80-13735

CLEMSON UNIV., S.C.
Energy conservation through point source recycle with high temperature hyperfiltration
[PB-299183/4] 25 p0180 N80-15688

COLORADO STATE UNIV., FORT COLLINS.
Analysis of a LiCl open-cycle absorption air conditioner which utilizes a packed bed for regeneration of the absorbent solution driven by solar heated air
[COO-4546-1] 25 p0101 N80-10652
Preliminary analysis of a total solar heating system
[COO-4546-4] 25 p0101 N80-10653
Solar generation of industrial steam. Innovative research program subtask
[COO-4546-9] 25 p0101 N80-10656
Solar cooling performance in CSU Solar House 3
[COO-2858-23] 25 p0143 N80-13668
Trans-seasonal storage of solar energy: Innovative research program subtask
[COO-4546-3] 25 p0144 N80-13672

Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU solar house 1
[COO-2577-16] 25 p0163 N80-14568

Realistic sizing of residential solar heating and cooling systems
[COO-2858-14] 25 p0163 N80-14569

Performance of residential solar heating and cooling system with flat-plate and evacuated tubular collectors: CSU Solar House 1
[COO-2577-17] 25 p0176 N80-15616

COMBUSTION ENGINEERING, INC., WINDSOR, CONN.

MDAC/Rocketdyne solar receiver: Design review
[SAND-78-8188] 25 p0097 N80-10616

COMISION NACIONAL DE ENERGIA ATOMICA, BUENOS AIRES (ARGENTINA).

Photothermal conversion of solar energy into electricity
[DOE-TR-159] 25 p0130 N80-12612

COMMERCE DEPT., WASHINGTON, D.C.

Petrochemicals: Their economic significance in the domestic economy
[PB-299733/6] 25 p0181 N80-15992

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION (U. S. SENATE).

NASA authorization for fiscal year 1980. Part 4: Index
[GPO-51-336] 25 p0104 N80-10964

COMMITTEE ON ENERGY AND NATURAL RESOURCES (U.S. SENATE).

Energy initiatives of the 95th Congress
[GPO-42-797] 25 p0109 N80-11557

COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE (U. S. HOUSE).

Solar commercialization
[GPO-43-586] 25 p0109 N80-11556

COMMITTEE ON SCIENCE AND TECHNOLOGY (U. S. HOUSE).

Passive solar energy programs and plans
[GPO-36-211] 25 p0095 N80-10599

Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1
[GPO-41-481] 25 p0122 N80-12550

Toward the endless frontier: History of the Committee on Science and Technology 1959 - 1979
[GPO-35-120] 25 p0181 N80-15994

COMPUTER GENETICS CORP., WAKEFIELD, MASS.

Remote sensing of LNG spill vapor dispersion using Raman LIDAR
[UCRL-13984] 25 p0103 N80-10689

D

DAYTON UNIV., OHIO.

Analysis of remote site energy storage and generation systems
[AD-A074869] 25 p0156 N80-14504

DECISION FOCUS, INC., PALO ALTO, CALIF.

Proposed research planning format for the Environmental Assessment Department
[EPRI-EA-1018] 25 p0103 N80-10692

DEPARTMENT OF ENERGY, BARTLESVILLE, OKLA.

Physical properties of gasoline/alcohol automotive fuels
[CONF-790520-4] 25 p0134 N80-13273

Driving cycle comparisons of energy economies and emissions from an alcohol and gasoline fueled vehicle
[CONF-790520-7] 25 p0134 N80-13274

The 50,000 mile methanol/gasoline blend fleet study
[CONF-790520-6] 25 p0134 N80-13275

Ambient temperature, fuel economy, emissions, and trip length
[PB-298847/5] 25 p0166 N80-14976

DEPARTMENT OF ENERGY, MORGANTOWN, W. VA.

Fluidized-bed combustion of high sulfur coals
[METC/RI-79/4] 25 p0093 N80-10386

DEPARTMENT OF ENERGY, OAK RIDGE, TENN.

Energy information data base. Corporate author entries
[DOE/TIC-4585-R1-SUPPL-1] 25 p0097 N80-10617

Energy information data base. Serial titles, February 1976 - March 1979
[DOE/TIC-4579-R10-SUPPL-4] 25 p0128 N80-12601

Cogeneration opportunities
[CONF-7806118] 25 p0145 N80-13681

DEPARTMENT OF ENERGY, SEATTLE, WASH.

Increased energy from biomass: 1985 possibilities and problem. Working papers for planners
[RLO-788-5] 25 p0112 N80-11589

DEPARTMENT OF ENERGY, WASHINGTON, D. C.

Survey of MHD plant applications
25 p0015 A80-11972

Economic structure, aggregate production functions and the demand for energy as an intermediate product: A preliminary analysis
[DOE/EIA-0103/8] 25 p0096 N80-10607

National energy plan 2
[DOE/TIC-10109] 25 p0097 N80-10618

Energy supply and demand in the midterm: 1985, 1990, and 1995
[DOE/EIA-0102/52] 25 p0097 N80-10620

Comprehensive environment, health, and safety program report, FY 1978
[DOE/EV-0035] 25 p0098 N80-10630

Environmental readiness of emerging energy technologies
[DOE/ERD-0022] 25 p0099 N80-10631

Summary of major energy legislation of the 95th Congress
[DOE/TIC-10118] 25 p0100 N80-10644

Waste Heat Utilization: Proceedings of 1978 Engineering Foundation Conference
[CONF-7808102] 25 p0102 N80-10665

National Gas Survey report to the Federal Energy Regulatory Commission by the Supply-Technical Advisory Task Force on nonconventional natural gas resources
[DOE/FERC-0010] 25 p0107 N80-11251

Wind energy systems: Program summary
[DOE/ET-0093] 25 p0111 N80-11578

Department of Energy fossil energy equipment development programs
[CONF-790405-14] 25 p0112 N80-11590

Standby conservation plan no. 2: Emergency building temperature restrictions. Economic analysis
[DOE/ERA-0047] 25 p0112 N80-11593

Residential sector energy forecasts, national level for 1978-electricity, natural gas, number two fuel oil and propane
[DOE/EIA-0102/50] 25 p0113 N80-11601

International coal technology summary document
[DOE/PE-0010] 25 p0115 N80-11621

Identification of a methodology for projecting short-term crude petroleum production in the United States
[DOE/EIA-0103/14] 25 p0122 N80-12542

Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1
[GPO-41-481] 25 p0122 N80-12550

Standby conservation plan no. 2: Emergency building temperature restrictions. Authorities: Need, rationale, operation
[DOE/ERA-0048] 25 p0126 N80-12582

United States magnetic fusion energy program
[DOE/ET-0072] 25 p0126 N80-12583

Environmental analysis of synthetic liquid fuels
[DOE/EV-0044] 25 p0134 N80-13279

Commercialization strategy report for coal liquefaction
[TID-28846] 25 p0135 N80-13285

Commercialization task force for high Btu gasification
[TID-28849] 25 p0135 N80-13286

Underground coal conversion. Program description
[DOE/ET-0100] 25 p0136 N80-13293

Summaries of physical research in the geosciences
[DOE/ER-0030] 25 p0137 N80-13582

Current U. S. petroleum situation and short-term supply/demand outlook
[DOE/EIA-0184/5] 25 p0138 N80-13607

Systems engineering for power, program report
[DOE/ET-0012/2-REV] 25 p0140 N80-13637

Multi-year plan for thermal and mechanical energy storage program
[DOE/ET-0109] 25 p0142 N80-13658

Solar thermal power systems
[DOE/ET-0078/T1] 25 p0143 N80-13662

Photovoltaic systems. Program summary
[DOE/ET-0019/2] 25 p0146 N80-13691

Environmental development plan: Wind energy conversion
[DOE/EDP-0030] 25 p0147 N80-13701

Thin film problems and research in energy systems
[CONF-761168-SUMM] 25 p0147 N80-13705

Liquefied gaseous fuels safety and environmental control assessment program
[DOE/EV-0036] 25 p0151 N80-14266

Electric and hybrid vehicles: Commercialization phase 3 planning
[DOE/END-0004] 25 p0151 N80-14349

Commercialization strategy report for hydrothermal electric and direct heat application
[TID-28840-DRAFT] 25 p0157 N80-14508

Report to the Congress on the coordination of Federal energy conservation programs involving state and local governments
[DOE/TIC-10127] 25 p0157 N80-14515

Commercialization strategy report for energy from urban wastes
[TID-28852-DRAFT] 25 p0158 N80-14521

Geothermal energy: Program summary
[DOE/ET-0101] 25 p0161 N80-14542

Commercialization strategy report for small wind systems
[TID-28844-DRAFT] 25 p0161 N80-14543

Commercialization strategy report for large wind systems
[TID-28843-DRAFT] 25 p0161 N80-14544

Commercialization strategy report for solar water heating
[TID-28856-DRAFT] 25 p0161 N80-14545

Photovoltaic incentives options
[HCP/CS-0023] 25 p0162 N80-14561

Energy Policy and Conservation Act (Public Law 94-163) as amended by the National Energy Conservation Policy Act (Public Law 95-619). Title 10: Energy. Chapter 2: Department of Energy. Subchapter D: Energy Conservation. Part 430: Energy conservation program for consumer products
[DOE/CS-0056] 25 p0163 N80-14567

Nuclear power program information and data: Update, March - April 1979
[DOE/TIC-10119] 25 p0166 N80-14894

Commercialization strategy report for electric and hybrid vehicles
[TID-28858-DRAFT] 25 p0166 N80-14972

Analysis of hydrogen in solids
[DOE/ER-0026] 25 p0167 N80-15220

Project planning document: Highway vehicle Alternative Fuels Utilization Program (AFUP)
[DOE/CS-0093] 25 p0168 N80-15279

Ethanol/gasoline blends as automotive fuels
[CONF-790520-5] 25 p0168 N80-15280

Commercialization strategy report for recovery of natural gas from unconventional sources
[TID-28848-DRAFT] 25 p0168 N80-15287

Report of the Alcohol Fuel Policy Review
[DOE/PE-0012] 25 p0169 N80-15290

The 1985, 1990 and 1995 midterm energy market model results under three scenarios of Fuel Use Act regulations
[DOE/EIA-0182/2] 25 p0173 N80-15592

Energy supply and demand in the short term: 1979 and 1980
[DOE/EIA-0184/4] 25 p0174 N80-15593

International energy assessment
[DOE/EIA-0184/1] 25 p0174 N80-15594

National program plan for passive and hybrid solar heating and cooling
[DOE/CS-0089] 25 p0174 N80-15598

Nuclear strategy of the Department of Energy
[DOE/ER-0025/D] 25 p0175 N80-15605

All-union scientific and technical conference on use of the earth's heat for the production of electric power - summary of reports
[CONF-751270-SUMM] 25 p0176 N80-15615

Environmental development plan ocean thermal energy conversion
[DOE/EDP-0034] 25 p0176 N80-15621

Federal Energy Data System (FEDS) statistical summary update
[DOE/EIA-0192] 25 p0177 N80-15630

Energy demand in the developing countries
[DOE/EIA-0183/10] 25 p0177 N80-15631

Federal leasing and outer continental shelf energy production goals
[DOE/RA-0037] 25 p0178 N80-15640

Environmental development plan: Electric Energy Systems
[DOE/EDP-0038] 25 p0179 N80-15669

Fission energy program of the U.S. Department of Energy, FY 1980
[DOE/ET-0089] 25 p0180 N80-15893

Report to Congress on the economic impact of energy actions as required by public law 93-275, section 18-d
[DOE/PE-0007] 25 p0181 N80-15993

DRAVO CORP., PITTSBURGH, PA.

Management of coal preparation fine wastes without disposal ponds
[PB-299100/8] 25 p0180 N80-15691

DREXEL UNIV., PHILADELPHIA, PA.

Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728

Optimal control of distributed parameter systems for solar thermal applications
25 p0095 N80-10593

Double-exposure collector system
[TID-28964] 25 p0127 N80-12593

DU PONT DE NEMOURS (E. I.) AND CO., AIKEN, S. C.

US program for the immobilization of high-level nuclear wastes
[DP-MS-79-2] 25 p0149 N80-13917

DYNATECH CORP., CAMBRIDGE, MASS.

Cost analysis of aquatic biomass systems
[HCP/ET/4000-78/1] 25 p0120 N80-12202

E

ECONOMICS, STATISTICS AND COOPERATIVES SERVICE, WASHINGTON, D. C.

Growing energy: Land for biomass farms
[PB-296650/5] 25 p0094 N80-10400

EDGERTON, GERMESHAUSEN AND GRIER, INC., IDAHO FALLS, IDAHO.

INEL geothermal environmental program
[TREE-1340] 25 p0112 N80-11595

EHRENKRANTZ GROUP, NEW YORK, N. Y.

Architectural concerns in solar system design and installation
[SOLAR/0801-79-01] 25 p0129 N80-12607

EIC, INC., NEWTON, MASS.

Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-1] 25 p0171 N80-15569

ELECTRIC POWER RESEARCH INST., PALO ALTO, CALIF.

Biofuels: A survey
[EPRI-ER-746-SR] 25 p0107 N80-11250

Solar heating and cooling research projects: A summary
[EPRI-ER-1095-SR] 25 p0147 N80-13703

Electric utility solar energy activities, 1978
[EPRI-ER-966-SR] 25 p0162 N80-14560

Feasibility study for enhancing the development of fusion energy
[EPRI-ER-778-SR] 25 p0178 N80-15642

ELLIOTT CO., JEANNETTE, PA.

Preliminary design of axial flow hydrocarbon turbine/generator set for geothermal applications
[EPRI-ER-513] 25 p0160 N80-14536

ENERGY RESEARCH CORP., DANBURY, CONN.

Technology development for phosphoric acid fuel cell powerplant, phase 2
[NASA-CR-159705] 25 p0096 N80-10603

ENERGY TECHNOLOGY ENGINEERING CENTER, CANOGA PARK, CALIF.

OTEC-1 test conductor program
[CONF-780550-9] 25 p0163 N80-14563

ENERGY UTILIZATION SYSTEMS, INC., PITTSBURGH, PA.

Research and development of a heat and pump water heater, volume 1
[ORNL/SUB-7321-1] 25 p0130 N80-12613

ENGELHARD MINERALS AND CHEMICALS CORP., EDISON, N. J.

Design and development of a 30 watt solid polymer electrolyte fuel cell power source fueled with calcium hydride
[AD-A071157] 25 p0139 N80-13625

ENVIRONMENTAL LAW INST., WASHINGTON, D. C.
- Solar access law. Protecting access to sunlight for solar energy systems [PB-296532/5] 25 p0117 N80-11633

ENVIRONMENTAL MONITORING AND SUPPORT LAB., LAS VEGAS, NEV.
- Surface water quality parameters for monitoring oil shale development [PB-297984/7] 25 p0153 N80-14470
- Western energy sulfate/nitrate monitoring network [PB-299238/6] 25 p0180 N80-15685

ENVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MICH.
- Ranking tires using a transient speed-time cycle [PB-297756/9] 25 p0108 N80-11487
- Effects of inspection and maintenance programs on fuel economy [PB-297583/7] 25 p0170 N80-15420
- Investigation of the effects of the installation of an oxidation catalyst on a diesel powered vehicle [PB-299928/2] 25 p0180 N80-15699

ESCHER TECHNOLOGY ASSOCIATES, ST. JOHNS, MICH.
- Survey of liquid hydrogen container techniques for highway vehicle fuel system applications [HCP/M2752-01] 25 p0092 N80-10383

F

FLETCHER (A. L.) AND ASSOCIATES, GAINESVILLE, FLA.
- Analysis of financial programs for energy conservation: Market simulation (penetration) model [HCP/M8662-1] 25 p0114 N80-11606

FLORIDA UNIV., GAINESVILLE.
- Distribution and movement of electrolyte in fuel cells and batteries 25 p0138 N80-13619

FLUOR ENGINEERS AND CONSTRUCTORS, INC., IRVINE, CALIF.
- Heber geothermal demonstration power plant [EPRI-ER-863] 25 p0114 N80-11607

FORD AEROSPACE AND COMMUNICATIONS CORP., NEWPORT BEACH, CALIF.
- Optimization of a point-focusing, distributed receiver solar thermal electric system [ASME PAPER 79-WA/SOL-11] 25 p0065 A80-18553

FOSTER WHEELER CORP., LIVINGSTON, N.J.
- Interim structural design standard for solar energy applications, phases 1 and 2 [SAND-79-8183] 25 p0146 N80-13698

FRANKLIN INST. RESEARCH LABS., PHILADELPHIA, PA.
- The great adventure: A report on the 10 regional public hearings on solar energy for the domestic policy review [HCP/U6354-01] 25 p0124 N80-12567

FRANKLIN PIERCE LAW CENTER, CONCORD, N. H.
- Fundamental economic issues in the development of small-scale hydro [DOE/RA-23-216.00.0-02] 25 p0143 N80-13667

G

GARY OPERATING CO., ENGLEWOOD, COLO.
- Bell Creek residual oil saturation technology test [BETC-2180-4] 25 p0108 N80-11546

GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C.
- Energy saving strategies for federal procurement [PB-296969/9] 25 p0103 N80-10678
- Natural gas reserves estimates: A good federal program emerging, but problems and duplications persist [PB-296628/2] 25 p0103 N80-10679
- The solar in Federal buildings demonstration program [PB-298535/6] 25 p0151 N80-14279
- Commercializing solar heating: A national strategy needed [PB-297882/3] 25 p0164 N80-14575
- Fusion: A possible option for solving long-term energy problems [PB-300692/1] 25 p0181 N80-15946

GENERAL ELECTRIC CO., CINCINNATI, OHIO.
- A conceptual design study on the application of liquid metal heat transfer technology to the solar thermal power plant [NASA-CR-162544] 25 p0154 N80-14484

GENERAL ELECTRIC CO., FAIRFIELD, CONN.
- Solar power satellite system definition study. Volume 1: Executive summary [NASA-CR-160442] 25 p0167 N80-15195

GENERAL ELECTRIC CO., PHILADELPHIA, PA.
- Executive summary: Mod-1 wind turbine generator analysis and design report [NASA-CR-159497] 25 p0109 N80-11558
- Sintered silicon nitrode recuperator fabrication [NASA-CR-159706] 25 p0167 N80-15263

GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
- Large-scale annual-cycle thermal energy storage in aquifers [CONF-790515-3] 25 p0145 N80-13686

GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
- Small solar thermal electric power plants with early commercial potential [ASME PAPER 79-WA/SOL-9] 25 p0069 A80-18586
- The first small power system experiment, Phase 1: Engineering experiment no. 1 [NASA-CR-162417] 25 p0095 N80-10596
- Regenerative flywheel energy storage system [UCRL-13982] 25 p0112 N80-11594
- Commercial application of molten carbonate fuel cell system [CONF-790213-4] 25 p0123 N80-12557
- Requirements assessment of wind power plants in electric utility systems. Volume 3: Appendixes [EPRI-ER-978-VOL-3] 25 p0139 N80-13628

GEORGIA INST. OF TECH., ATLANTA.
- Heat pump centered integrated community energy systems; System development [ANL-ICES-TM-28] 25 p0111 N80-11574
- Southeastern forum on appropriate technology [PB-298796/4] 25 p0118 N80-11965

GESELLSCHAFT FUER WIRTSCHAFTLICHE BAUTECHNIK M.B.H., MUNICH (WEST GERMANY).
- Investigation of the applicability of technical systems utilizing solar energy for the heat supply of buildings [BMFT-FB-T-78-48] 25 p0116 N80-11630

GIBBS AND COX, INC., WASHINGTON, D. C.
- Ocean Thermal Energy Conversion (OTEC) platform configuration and integration, executive summary [DOE/ET-4064-1] 25 p0128 N80-12600

GILBERT/COMMONWEALTH, READING, PA.
- Survey of MHD plant applications 25 p0015 A80-11972

GILBERT ASSOCIATES, INC., READING, PA.
- Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-5] 25 p0172 N80-15576

GINER, INC., WALTHAM, MASS.
- Study of corrosion and its control in aluminum solar collectors [COO-2934-7] 25 p0129 N80-12609

GRUMMAN AEROSPACE CORP., BETHPAGE, N.Y.
- The jet membrane process for uranium separation and enrichment [RE-586] 25 p0091 N80-10329
- Minimum cost transmitter-receiver antenna pairs [RE-690] 25 p0094 N80-10414
- Solar power satellite system definition study. Volume 1: Executive summary [NASA-CR-160442] 25 p0167 N80-15195

GTE SYLVANIA, INC., NEEDHAM HEIGHTS, MASS.
- Lithium inorganic electrolyte battery development [AD-A073858] 25 p0157 N80-14505

GULF RESEARCH AND DEVELOPMENT CO., PITTSBURGH, PA.
- Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels [FE-1800-33] 25 p0135 N80-13287
- Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels [FE-1800-30] 25 p0135 N80-13291

GULF UNIVERSITIES RESEARCH CONSORTIUM, BELLAIRE, TEX.
- Naturally occuring carbon dioxide sources in the United States. A geologic appraisal and economic sensitivity study of drilling and producing carbon dioxide for use in enhanced oil recovery [FE-2025-38] 25 p0130 N80-12624

GUTEHOFFNUNGSHUETTE STERKRADE A.G. OBERHAUSEN (WEST GERMANY).
Electric power generation and LNG evaporation with the aid of gas turbines within a closed-cycle process
[AED-CONF-78-155-010] 25 p0121 N80-12291

H

HANFORD ENGINEERING DEVELOPMENT LAB., RICHLAND, WASH.
Materials compatibility in liquid sodium
[HEDL-SA-1559] 25 p0119 N80-12147
HAWAII STATE DEPT. OF PLANNING AND ECONOMIC DEVELOPMENT, HONOLULU.
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628
HAWAII UNIV. AT HILO.
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628
HAWAII UNIV. AT MANOA, HONOLULU.
Solar/wind handbook for Hawaii: Technical applications for Hawaii, the Pacific Basin and sites worldwide with similar climatic conditions
[UCRL-15053] 25 p0177 N80-15628
HIGGINS, AULD AND ASSOCIATES, ALBUQUERQUE, N. MEX.
Analysis of field test results for single-axis-tracking solar collector foundations
[SAND-79-7023] 25 p0173 N80-15586
HITTMAN ASSOCIATES, INC., COLUMBIA, MD.
Environmental assessment report: Solvent Refined Coal (SRC) systems
[PB-300383/7] 25 p0179 N80-15676
HONEYWELL, INC., MINNEAPOLIS, MINN.
Ocmulgee national monument visitor center solar heating and cooling system design review data
[NASA-CR-150706] 25 p0096 N80-10601
Solar heating and cooling systems design and development
[NASA-CR-150618] 25 p0096 N80-10602
Cost-effective control systems for solar heating and cooling applications
[SAN-1592-1] 25 p0101 N80-10658
Solar heating and cooling systems design and development
[NASA-CR-150873] 25 p0105 N80-11560
HUGHES RESEARCH LABS., MALIBU, CALIF.
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564

I

IBM FEDERAL SYSTEMS DIV., HUNTSVILLE, ALA.
October 1978 environmental data for sites in the National Solar Data Network
[SOLAR/0010-78-10] 25 p0126 N80-12585
IDAHO NATIONAL ENGINEERING LAB., IDAHO FALLS.
Overview of geothermal energy in the United States
[CONF-790530-1] 25 p0102 N80-10661
Analysis of binary thermodynamic cycles for a moderately low-temperature geothermal resource
[TREE-1365] 25 p0139 N80-13627
IEA COAL RESEARCH, LONDON (ENGLAND).
Combustion of low grade coal
[ICTIS/TR-02] 25 p0106 N80-11179
Trace elements from coal combustion: Atmospheric emissions
[ICTIS/TR-05] 25 p0106 N80-11180
Hot gas cleanup
[ICTIS/TR-03] 25 p0117 N80-11647
ILLINOIS UNIV., URBANA.
New hybrid 1971 energy intensities, part 1
[COO-4628-4-PT-1] 25 p0158 N80-14516
Energy conservation in the US economy from increased recycle of obsolete steel scrap
[COO-2893-10] 25 p0159 N80-14524
Energy optimal use of waste paper
[COO-2893-9] 25 p0174 N80-15595
INDUSTRIAL ENVIRONMENTAL RESEARCH LAB., RESEARCH TRIANGLE PARK, N. C.
Environmental assessment of the fluidized-bed combustion of coal: Methodology and initial results
[PB-298473/0] 25 p0165 N80-14595
INSTITUTE FOR ENERGY ANALYSIS, OAK RIDGE, TENN.
Constraints on energy conservation
[ORAU/IEA-78-17(M)] 25 p0127 N80-12594
Fundamental aspects of energy conservation policy
[ORAU/IEA-78-20(M)] 25 p0127 N80-12595
INSTITUTE FOR LOCAL SELF RELIANCE, WASHINGTON, D. C.
The great adventure: A report on the 10 regional public hearings on solar energy for the domestic policy review
[HCP/U6354-01] 25 p0124 N80-12567
INSTITUTE OF GAS TECHNOLOGY, CHICAGO, ILL.
Development of combustion data to utilize low Btu gases as industrial process fuels. Project 61004 special report no. 4: High-forward-momentum burner
[FE-2489-33] 25 p0093 N80-10390
Development of gas turbine fuels and combustion; An overview
[CONF-790337-4] 25 p0093 N80-10391
Coal conversion systems: Technical data book
[HCP/T2286-01] 25 p0093 N80-10392
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-38] 25 p0106 N80-11249
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
[CONF-781063-2] 25 p0115 N80-11615
Status of the PEATGAS process
[CONF-781045-3] 25 p0120 N80-12199
HYGAS process update
[CONF-781045-4] 25 p0120 N80-12200
Commercial application of molten carbonate fuel cell system
[CONF-790213-4] 25 p0123 N80-12557
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels (riser cracking of coal)
[FE-2307-46] 25 p0134 N80-13280
Preparation of a coal conversion systems technical data book, project 61003
[FE-2286-32] 25 p0134 N80-13281
Development of the steam-iron process for hydrogen production, 9010
[FE-2435-32] 25 p0150 N80-14258
High-BTU coal gasification processes
[ANL/CES/TE-79-2] 25 p0150 N80-14263
Fuel cell option
[CONF-7809137-1] 25 p0158 N80-14523
LNG industry: An overview of projects and costs
[CONF-7811112-2] 25 p0168 N80-15278
Application analysis of solar total energy systems to the residential sector. Volume 4: Market penetration
[ALO-3787-4] 25 p0174 N80-15597
Prediction of current distribution in a molten carbonate fuel cell
[CONF-781063-1] 25 p0175 N80-15613
INTERNATIONAL BUSINESS MACHINES CORP., HUNTSVILLE, ALA.
Solar energy system performance evaluation: A-Frame Industries, single family dwelling, Kaneohe, Hawaii
[SOLAR/1010-78/14] 25 p0101 N80-10659
INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS, LAXENBURG (AUSTRIA).
MEDEE 2: A model for long term energy demand evaluation
[IIASA-RR-78-17] 25 p0109 N80-11554
Energy and climate: A review with emphasis on global interactions
25 p0131 N80-12677
INTERNATIONAL METEOROLOGICAL INST., STOCKHOLM (SWEDEN).
Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model
[DM-26] 25 p0116 N80-11631
INTERNATIONAL NICKEL CO., INC., SUFFERN, N. Y.
Evaluation of high chromium overplays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-3] 25 p0119 N80-12163
INTERTECHNOLOGY CORP., WARRENTON, VA.
Photovoltaic power systems market identification and analysis
[HCP/T4022-01] 25 p0162 N80-14559

IONICS, INC., WATERTOWN, MASS.
Anton permselective membrane
[NASA-CR-159599] 25 p0122 N80-12551
IOWA STATE UNIV. OF SCIENCE AND TECHNOLOGY, AMES.
A regional approach to forecasting electric energy requirements for environmental assessments
25 p0130 N80-12619
Energy conservation via heat transfer enhancement
[COO-4649-4] 25 p0147 N80-13707
IOWA UNIV., IOWA CITY.
Are large concentration of atomic H storable in tritium-impregnated solid in H2 below 0.10 K
25 p0072 A80-18728

J

JET PROPULSION LAB., CALIFORNIA INST. OF TECH., PASADENA.
A high performance porous flat-plate solar collector
25 p0021 A80-12438
New technology and vehicle operation on roadways
25 p0037 A80-14702
Heat and electricity from the sun using parabolic dish collector systems
25 p0037 A80-14706
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267
Advanced solar thermal receiver technology
[AIAA PAPER 80-0292] 25 p0063 A80-18297
Performance characteristics of point-focusing distributed-receiver solar Brayton systems
[AIAA PAPER 80-0293] 25 p0063 A80-18298
Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[ASME PAPER 79-WA/SOL-15] 25 p0069 A80-18588
Deep space network feasibility study of terminating Southern California Edison electrical service to Goldstone
25 p0091 N80-10263
Molten salt pyrolysis of latex
[NASA-CASE-NPO-14315-1] 25 p0092 N80-10361
Start up system for hydrogen generator used with an internal combustion engine
[NASA-CASE-NPO-13849-1] 25 p0092 N80-10374
Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377
Borehole geological assessment
[NASA-CASE-NPO-14231-1] 25 p0104 N80-10709
Electron radiation damage of (AlGa) As-GaAs solar cells
[NASA-CR-162425] 25 p0110 N80-11564
SAMICS: Input data preparation
[NASA-CR-162421] 25 p0110 N80-11570
A survey of electric and hybrid vehicle simulation programs
[NASA-CR-162457] 25 p0118 N80-11954
Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474
Residential photovoltaic module and array requirements study, appendices
[NASA-CR-162529] 25 p0154 N80-14481
Application of field-modulated generator systems to dispersed solar thermal electric generation
[NASA-CR-162536] 25 p0155 N80-14488
solar thermal power systems advanced solar thermal technology project, advanced subsystems development
[NASA-CR-162546] 25 p0155 N80-14491
Silicon materials outlook study for 1980-1985 calendar years
[NASA-CR-162541] 25 p0155 N80-14492
Proceedings of the DOE chemical/hydrogen energy contractor review systems
[CONF-771131] 25 p0164 N80-14572

K

KANSAS UNIV., LAWRENCE.
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948
Biological transformation of light energy into methane using an anaerobic filter
25 p0133 N80-13267
KENTROL INTERNATIONAL, INC. PASADENA, CALIF.
A high performance porous flat-plate solar collector
25 p0021 A80-12438
KENTUCKY UNIV., LEXINGTON.
Photovoltaic energy conversion in polymer films
25 p0154 N80-14477

L

LEAGUE OF WOMEN VOTERS, WASHINGTON, D. C.
Energy conservation technology education program
[HCP/M2165] 25 p0129 N80-12606
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
Flywheel energy storage and conversion system for solar photovoltaic applications
[COO-4094-31] 25 p0100 N80-10639
Maximum power trackers for photovoltaic arrays
[COO-4094-17] 25 p0116 N80-11627
Optimization of photovoltaic/thermal collector heat pump systems
[COO-4577-7] 25 p0124 N80-12566
Mead, Nebraska, 25-kW photovoltaic power system
[COO-4094-10] 25 p0127 N80-12592
Classification and technical review of dc-ac inverters for use in photovoltaic power systems
[COO-4094-25] 25 p0137 N80-13377
Evaluation of combined photovoltaic/thermal collectors
[COO-4577-8] 25 p0143 N80-13665
Cost analysis of packed beds for thermal energy storage
[CAES-11] 25 p0145 N80-13687
Test plan for the Mead 25-kW Photovoltaic Flexible Test Facility, 1979
[COO-4094-53] 25 p0146 N80-13692
Novel ceramic receiver for solar Brayton systems
[COO-4878-3] 25 p0146 N80-13694
Flywheel energy storage interface unit for photovoltaic applications
[COO-4094-44] 25 p0175 N80-15609
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-48] 25 p0178 N80-15635
Description of the MIT/Lincoln Laboratory photovoltaic systems test facility
[COO-4094-41] 25 p0178 N80-15638
LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS.
Solar Heating And Cooling Of Buildings (SHACOB) Commercialization report. Part B: Analysis of market development, volume 2
[DOE/IIC-1007:] 25 p0128 N80-12603
Energy analysis of the basic materials utilized in electric power transmission systems
[HCP/T5043-01] 25 p0157 N80-14510
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195
Utilization of waste heat from Federal facilities
[ORO-5523-T1] 25 p0173 N80-15590
LOS ALAMOS SCIENTIFIC LAB., N. MEX.
The 50kA flux pump for the superconducting transmission line test bed
[LA-6953-MS] 25 p0094 N80-10443
Performance limits for liquid-metal heat pipes containing long adiabatic sections
[LA-UR-79-1241] 25 p0095 N80-10472
Selected results from the technology assessment of solar energy program
[LA-UR-79-950] 25 p0099 N80-10637
Economic performance of passive solar heating: A preliminary analysis
[LA-UR-78-2861] 25 p0100 N80-10645
Some dc superconducting cables
[LA-UR-79-1057] 25 p0107 N80-11348
Geothermal exploration methods and results: Inland states
[LA-UR-79-665] 25 p0108 N80-11543
Development of integrated thermionic circuits for geothermal high-temperature applications
[LA-UR-79-723] 25 p0112 N80-11592
Night storage and backup generation with electrochemical engines
[LA-UR-78-1149] 25 p0113 N80-11596

General-purpose heat source development. Phase 1: Design requirements
[LA-7385-SR] 25 p0114 N80-11608
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616
Energy development vs water quality in the upper Colorado and upper Missouri River Basins
[LA-7497-MS] 25 p0117 N80-11641
General-purpose heat source project space nuclear safety program and radioisotopic terrestrial safety program
[LA-7519-PR] 25 p0118 N80-11889
LASL thermochemical hydrogen program status on October 31, 1978
[LA-UR-78-2895] 25 p0120 N80-12197
Performance of Los Alamos solar Mobile/Modular Home Unit no. 1
[LA-UR-78-2587] 25 p0126 N80-12577
Process design of the LASL bismuth sulfate thermochemical hydrogen cycle
[LA-UR-79-1256] 25 p0129 N80-12605
Synfuel (hydrogen) production from fusion power
[LA-UR-79-1115] 25 p0136 N80-13296
Liquid hydrogen as an automotive fuel
[LA-UR-79-621] 25 p0136 N80-13297
Energy policy and decision analysis; new concepts and mechanisms
[LA-7909-MS] 25 p0140 N80-13634
Energy planning with solar and conservations: Individual values and community choice
[LA-UR-79-1599] 25 p0142 N80-13653
Hot dry rock geothermal energy development program
[LA-7807-HDR] 25 p0144 N80-13673
Conceptual designs for two reject heat systems for a Brayton closed-cycle converter
[LA-7821-MS] 25 p0144 N80-13677
Critical review and assessment of environmental and safety problems in hydrogen energy systems
[LA-7820-PR] 25 p0145 N80-13690
Baseline design of the thermoelectric reactor space power system
[LA-UR-79-1242] 25 p0149 N80-13906
Wave propagation in a dc superconducting cable. Part 1: Analysis
[LA-UR-79-226] 25 p0151 N80-14346
Applications of fuel cells in transportation
[LA-UR-79-628] 25 p0159 N80-14526
Superconducting magnetic energy storage for electric power system dynamic stabilization
[LA-UR-79-1220] 25 p0160 N80-14535
Environmental options for coal use
[LA-UR-79-1393] 25 p0165 N80-14584
New heat transfer geometry for hydride heat engines and heat pumps
[LA-7822] 25 p0169 N80-15289
Decentralized solar photovoltaic energy systems
[LA-7866-TASE] 25 p0171 N80-15565
Water use alternatives for Navajo energy production
[LA-UR-79-1598] 25 p0178 N80-15643

LOWELL UNIV., MASS.
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602

M

MARLATT AND ASSOCIATES, FORT COLLINS, COLO.
Assessment of the applicability of the national fire weather data library to wind energy analyses
[PNL-2538] 25 p0165 N80-14655

MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
Photoelectrochemical conversion of optical energy to electricity and fuels
[AD-A072861] 25 p0123 N80-12556
Wave power systems
[PB-299851/6] 25 p0164 N80-14576

MATHTECH, INC., PRINCETON, N. J.
Evaluation of the environmental effects of western surface coal mining, volume 1
[PB-300375/3] 25 p0179 N80-15681

MCALVERY AND ASSOCIATES, HOBOKEN, N. J.
Impact of flywheel-transmissions on automobile performance: A logical basis for evaluation
[UCRL-52758] 25 p0137 N80-13480

MCDONNELL-DOUGLAS ASTRONAUTICS CO., HUNTINGTON BEACH, CALIF.
Solar central receiver prototype heliostat CDRL item B.D., volume 1
[SAN-1605/7-VOL-1] 25 p0146 N80-13700

MCDONNELL-DOUGLAS ASTRONAUTICS CO., NEWPORT BEACH, CALIF.
A solar thermal electric power plant for small communities
[ASME PAPER 79-WA/SOL-7] 25 p0069 A80-18584

MECHANICAL TECHNOLOGY, INC., LATHAM, N. Y.
High COP heat pump system, phase 1, results
[HCP/M5056-01] 25 p0110 N80-11573
Assessment of the state of technology of automotive Stirling engines
[NASA-CR-159631] 25 p0150 N80-13989

METAL PROPERTIES COUNCIL, INC., NEW YORK.
Program to discover materials suitable for service under hostile conditions obtaining in equipment for the gasification of coal and other solid fuels
[FE-1784-42] 25 p0106 N80-11248

MIAMI UNIV., CORAL GABLES, FLA.
Fifth Ocean Thermal Energy Conversion Conference, volume 2, sections 4-5
[CONF-780236-P2] 25 p0162 N80-14553

MICHIGAN UNIV., ANN ARBOR.
Survey and description of transport phenomena in packed-beds
25 p0121 N80-12340
Dynamic response of a packed-bed energy storage system to a time varying inlet temperature
25 p0121 N80-12341
Heat storage and thermal transfer aspects of the dynamic behaviour of a packed bed
25 p0121 N80-12342

MIDWEST RESEARCH INST., GOLDEN, COLO.
Solar pond concepts: Old and new
[SERI/TP-35-208] 25 p0102 N80-10663
Proceedings: Solar Thermal Power User Review Panel Meeting
[SERI/TP-69-221] 25 p0113 N80-11598
Research overview of biological and chemical conversion methods and identification of key research areas for SERI
[SERI/TR-33-067] 25 p0115 N80-11617
Thermoelectric ocean thermal energy conversion
[SERI/TP-35-254] 25 p0124 N80-12564
Systems Analysis and testing (SAT) program
[SERI/PR-35-313] 25 p0124 N80-12565
Direct labor requirements for select solar energy technologies: A review and synthesis
[SERI/RR-53-045] 25 p0126 N80-12578
Wind resource analysis
[SERI/TR-36-088] 25 p0132 N80-12710
Solar energy perspectives for public power
[SERI/TP-35-300] 25 p0140 N80-13635
Review of the environment effects and benefits of selected solar energy technologies
[SERI/TP-53-114R] 25 p0141 N80-13649
Technology development needs for high temperature process heat
[SERI/TR-35-047] 25 p0143 N80-13669
Wind energy innovative systems
[SERI/PR-13-054] 25 p0144 N80-13674
Review of solar energy
[SERI/TR-54-066] 25 p0146 N80-13699
Rough cost estimates of solar thermal/coal or biomass-derived fuels
[SERI/TR-35-279] 25 p0151 N80-14269
Application of diffusion research to solar energy policy issues
[SERI/TR-51-194] 25 p0158 N80-14518
Implementation of state solar incentives: Land-use planning to ensure solar access
[SERI/TR-51-163] 25 p0158 N80-14519
Implementation of state solar incentives: A preliminary assessment
[SERI/TR-51-159] 25 p0158 N80-14520
Thermal energy storage for solar applications: An overview
[SERI/TR-34-089] 25 p0161 N80-14546
A review of the economics of selected passive and hybrid systems
[SERI/TP-61-144] 25 p0161 N80-14547
Commercializing solar architecture
[SERI/TP-62-113] 25 p0161 N80-14548
Insolation models, data and algorithms
[SERI/TR-36-110] 25 p0165 N80-14617

SERAPH implementation plans
[SERI/RR-34-152] 25 p0172 N80-15570
Alternate cycles applied to ocean thermal energy conversion
[SERI/TP-34-180] 25 p0172 N80-15571
Low temperature thermal energy storage: A state-of-the-art survey
[SERI/RR-54-164] 25 p0172 N80-15583
Role of the government in the development of solar energy
[SERI/TP-52-138] 25 p0178 N80-15639

MIDWEST RESEARCH INST., KANSAS CITY, MO.
Status of information for consumers of small wind energy systems
[SERI/TP-51-158] 25 p0113 N80-11602

MINNESOTA UNIV., MINNEAPOLIS.
Melting in phase-change thermal storage media
[COO-2993-1] 25 p0173 N80-15584

MISSISSIPPI STATE UNIV., STATE COLLEGE.
The analysis of sediment samples for hydrocarbons
[AD-A073822] 25 p0149 N80-13754
Visualization of natural convection in flat plate solar collectors
25 p0153 N80-14476

MITRE CORP., MCLEAN, VA.
Near term potential of wood as a fuel
[HCP/C4101] 25 p0093 N80-10389
Biomass-based alcohol fuels: The near-term potential for use with gasoline
[HCP/T4101-03] 25 p0093 N80-10393
Environmental data for energy technology policy analysis. Volume 1: Summary
[HCP/EV6119-1] 25 p0098 N80-10629
Health and enviromental effects of coal gasification and liquefaction technologies: A workshop summary and panel reports
[PB-297618/1] 25 p0104 N80-10701
Assessment of long term research needs for coal-gasification technologies
[PB-297853/4] 25 p0107 N80-11255
The status of advanced propulsion systems for urban rail vehicles
[PB-297980/5] 25 p0133 N80-12962

MOBIL RESEARCH AND DEVELOPMENT CORP., PRINCETON, N. J.
Research guidance studies to assess gasoline from coal by methanol-to-gasoline and sasol-type Fischer-Tropsch technologies
[FE-2447-13] 25 p0093 N80-10388

MONSANTO RESEARCH CORP., DAYTON, OHIO.
Energy storage for solar air conditioning applications utilizing a form-stable, high density polyethylene pellet bed
[MLM-2598(OP)] 25 p0113 N80-11603

MOTOROLA, INC., SCOTTSDALE, ARIZ.
The automated array assembly task of the low-cost silicon solar array project, phase 2
[NASA-CR-162429] 25 p0109 N80-11562

MOUND LAB., MIAMISBURG, OHIO.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
[MLM-2625-OP] 25 p0160 N80-14540
Construction and initial operation of the Miamisburg salt-gradient solar pond
[MLM-2626-OP] 25 p0161 N80-14541
Evaluation of fuel resources and requirements for the magnetic fusion energy program
[MLM-2419] 25 p0164 N80-14570

MUELLER ASSOCIATES, INC., BALTIMORE, MD.
Status of alcohol fuels utilization technology for stationary gas turbines
[HCP/M2098-03] 25 p0135 N80-13283

N

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
Geothermal resources and technology in the United States
[PB-296623/2] 25 p0102 N80-10677

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
Fuel cell sesquicentennial
25 p0033 A80-13223

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. AMES RESEARCH CENTER, MOFFETT FIELD, CALIF.
A solar-heated water system for a photographic processing laboratory
25 p0041 A80-15750

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. FLIGHT RESEARCH CENTER, EDWARDS, CALIF.
Reduction of aerodynamic drag and fuel consumption for tractor-trailer vehicles
25 p0046 A80-16948

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.
Baltimore applications project
[NASA-TM-80577] 25 p0133 N80-12957

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.
The role of technology as air transportation faces the fuel situation
25 p0037 A80-14700
Multirole cargo aircraft options and configurations
[NASA-TM-80177] 25 p0105 N80-11053
An evaluation of the NASA Tech House, including live-in test results, volume 1
[NASA-TP-1564] 25 p0109 N80-11559
Preliminary test results of a flight management algorithm for fuel conservative descents in a time based metered traffic environment
[NASA-TM-80194] 25 p0150 N80-14114

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LEWIS RESEARCH CENTER, CLEVELAND, OHIO.
The erosion/corrosion of small superalloy turbine rotors operating in the effluent of a PFB coal combustor
25 p0001 A80-10043
Survey of MHD plant applications
25 p0015 A80-11972
Preparing aircraft propulsion for a new era in energy and the environment
25 p0053 A80-17737
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[AIAA PAPER 80-0023] 25 p0063 A80-18243
Thermal barrier coatings for aircraft gas turbines
[AIAA PAPER 80-0302] 25 p0064 A80-18303
Aircraft Energy Efficiency (ACEE) status report
25 p0091 N80-10206
Alternative jet aircraft fuels
25 p0091 N80-10209
NASA-Lewis closed-cycle magnetohydrodynamics plant analysis
[NASA-TM-79249] 25 p0095 N80-10595
A photovoltaic power system in the remote African village of Tangaye, Upper Volta
[NASA-TM-79318] 25 p0123 N80-12552
Results of duct area ratio changes in the NASA Lewis H2-O2 combustion MHD experiment
[NASA-TM-79308] 25 p0132 N80-12881
Modified aerospace reliability and quality assurance method for wind turbines
[NASA-TM-79284] 25 p0137 N80-13490
Modified power law equations for vertical wind profiles
[NASA-TM-79275] 25 p0138 N80-13623
Low NO(x) heavy fuel combustor program
[NASA-TM-79313] 25 p0138 N80-13624
Self-reconfiguring solar cell system
[NASA-CASE-LEW-12586-1] 25 p0153 N80-14472
Status of the DOE/NASA critical gas turbine research and technology project
[NASA-TM-79307] 25 p0155 N80-14493
Effect of velocity overshoot on the performance of magnetohydrodynamic subsonic diffusers
[NASA-TM-79305] 25 p0166 N80-14922
Impact of new instrumentation on advanced turbine research
[NASA-TM-79301] 25 p0166 N80-15133
Analysis of GaAs and Si solar cell arrays for earth orbital and orbit transfer missions
[NASA-TM-81383] 25 p0167 N80-15204
Photovoltaic power system reliability considerations
[NASA-TM-79291] 25 p0170 N80-15422
Space solar cells: High efficiency and radiation damage
[NASA-TM-81387] 25 p0170 N80-15554
Candidate thermal energy storage technologies for solar industrial process heat applications
[NASA-TM-81380] 25 p0171 N80-15560

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.
Development of mining guidance and control systems
[NASA-TM-78226] 25 p0137 N80-13601

Coal-shale interface detection system
[NASA-CASE-MFS-23720-2] 25 p0152 N80-14423

Solar concentrator
[NASA-CASE-MFS-23727-1] 25 p0153 N80-14473

Development and testing of the Junkeeper Control Corporation integrated programmable electronic controller and hydronics package
[NASA-TM-78244] 25 p0155 N80-14495

Development and testing of the Rho Sigma Incorporated microprocessor control subsystem
[NASA-TM-78246] 25 p0156 N80-14496

Development and testing of the Solar Control Corporation modular controller and Solarstat subsystem
[NASA-TM-78243] 25 p0156 N80-14498

Development, testing and certification of the sigma research, maxi-therm-S-101 thermosyphon heat exchanger
[NASA-TM-78245] 25 p0156 N80-14499

Computer program for assessing the economic feasibility of solar energy for single family residences and light commercial applications
[NASA-TM-78251] 25 p0156 N80-14501

Characterization of three types of silicon solar cells for SEPS deep space missions. Volume 1: Current-voltage characteristics of OCLI BSF/BSR 10 ohm-cm, and BSR 2 ohm-cm cells as a function of temperature and intensity
[NASA-TM-78253] 25 p0171 N80-15562

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. PASADENA OFFICE, CALIF.

Molten salt pyrolysis of latex
[NASA-CASE-NPO-14315-1] 25 p0092 N80-10361

Start up system for hydrogen generator used with an internal combustion engine
[NASA-CASE-NPO-13849-1] 25 p0092 N80-10374

Continuous coal processing method and means
[NASA-CASE-NPO-13758-2] 25 p0092 N80-10377

Borehole geological assessment
[NASA-CASE-NPO-14231-1] 25 p0104 N80-10709

Method for forming a solar array strip
[NASA-CASE-NPO-13652-3] 25 p0153 N80-14474

NATIONAL AEROSPACE LAB., TOKYO (JAPAN).

Fuel minimal take-off path of jet lift VTOL aircraft, log no. C3558
25 p0105 N80-11066

NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.

Space applications of superconductivity - High field magnets
25 p0084 A80-20128

NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.

Solar cell spectral response characterization
25 p0037 A80-14685

Dimensions/NBS, volume 63, no. 6, June 1979
[PB-297836/9] 25 p0105 N80-10975

Measurement techniques for high-power semiconductor materials and devices:
[PB-298574/5] 25 p0121 N80-12300

Measurements and standards for recycled oil - 2
[PB-299951/4] 25 p0167 N80-15275

International activities: The fiscal year 1978 survey of international programs at NEL
[PB-300491/8] 25 p0181 N80-16004

NATIONAL ENGINEERING LAB., EAST KILBRIDE (SCOTLAND).

Energy saving in injection molding
[NEL-662] 25 p0136 N80-13318

NATIONAL FIELD RESEARCH CENTER, INC., IOWA CITY, IOWA.

National environmental/energy workshop assessment, phase 3. Energy programs
[PB-298587/7] 25 p0117 N80-11634

National environmental/energy workforce assessment, phase 3. Air programs
[PB-298580/2] 25 p0117 N80-11670

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, BOULDER, COLO.

Meteorological effects of oil refinery operations in Los Angeles
[PB-300720/0] 25 p0180 N80-15758

NATIONAL RESEARCH COUNCIL OF CANADA, OTTAWA (ONTARIO).

Bulletin of the Division of Mechanical Engineering and the National Aeronautical Establishment
[AD-A074885] 25 p0182 N80-16022

NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA.

Microwave heating: Industrial applications. Citations from the engineering data base
[NTIS/PS-79/0632/4] 25 p0102 N80-10674

Lead batteries, volume 2. Citations from the engineering index data base
[NTIS/PS-77/0634] 25 p0103 N80-10681

Geothermal energy. Part 1: Exploration, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0814/8] 25 p0148 N80-13715

Geothermal energy. Part 2: Corrosion and equipment, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0815/5] 25 p0148 N80-13716

Geothermal energy. Part 3: Technology and general studies, volume 3. Citations from the NTIS data base
[NTIS/PS-79/0816/3] 25 p0148 N80-13717

Geothermal energy, volume 3. Citations from the Engineering Index data base
[NTIS/PS-79/0818/9] 25 p0148 N80-13718

Geothermal energy. Part 3: Technology and general studies, volume 4. Citations from the NTIS data base
[NTIS/PS-79/0817/1] 25 p0148 N80-13719

Geothermal energy, volume 4. Citations from the Engineering Index data base
[NTIS/PS-79/0819/7] 25 p0148 N80-13720

NAVAL CIVIL ENGINEERING LAB., PORT HUENEME, CALIF.

Comparative study of solar optics for paraboloidal concentrators
[ASME PAPER 79-WA/SOL-8] 25 p0066 A80-18564

NAVAL RESEARCH LAB., WASHINGTON, D. C.

Microbial deterioration of hydrocarbon fuels from oil shale, coal, and petroleum. 1: Exploratory experiments
[AD-A073761] 25 p0150 N80-14259

NEW BRUNSWICK ELECTRIC POWER COMMISSION, FREDERICTON.

Measurement of energy to heat houses: Initial study
[PB-299448/2] 25 p0170 N80-15304

NEW MEXICO ENERGY AND MINERALS DEPT., SANTA FE.

Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471

NEW MEXICO ENERGY INST., LAS CRUCES.

Economic analysis of small scale bioconversion units in New Mexico
[PB-301390/1] 25 p0169 N80-15298

Use of geothermal energy for desalination in New Mexico: A feasibility study
[PB-299271/7] 25 p0179 N80-15645

NEW MEXICO INST. OF MINING AND TECHNOLOGY, SOCORRO.

Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471

NEW MEXICO STATE UNIV., LAS CRUCES.

Deep terrestrial heat flow measurements in New Mexico and neighboring geologic areas
[PB-299489/5] 25 p0153 N80-14471

NEW MEXICO STATE UNIV., UNIVERSITY PARK.

District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States
[NMEI-10-1] 25 p0172 N80-15582

NEW MEXICO UNIV., ALBUQUERQUE.

Hydrogen as a fuel. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0771/0] 25 p0094 N80-10397

Hydrogen production. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0773/6] 25 p0094 N80-10401

Hydrogen storage as a hydride. Citations from the international aerospace abstracts data base
[NTIS/PS-79/0772/8] 25 p0094 N80-10402

Waste utilization as an energy source. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0765/2] 25 p0102 N80-10667

Aircraft fuel. Citations from the International Aerospace Abstracts Data Base
[NTIS/PS-79/0764/5] 25 p0102 N80-10668

District space heating potential of low temperature hydrothermal geothermal resources in the southwestern United States
[NMEI-10-1] 25 p0172 N80-15582

NEW YORK CITY RESOURCE RECOVERY TASK FORCE, N. Y.
Methane recovery from sanitary landfills; gas recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254

NORTHEASTERN LEGISLATIVE LEADERS ENERGY RESEARCH PROJECT, ALBANY, N.Y. ALBANY, N.Y.
National Energy Act of 1978: A regional assessment
[PB-296479/9] 25 p0130 N80-12615

NORTHROP SERVICES, INC., HUNTSVILLE, ALA.
Solar-climatic statistical study. Summary report, volume 1
[HCP/T4016-1] 25 p0132 N80-12707
Solar-climactic statistical study
[HCP/T4016-01/2] 25 p0149 N80-13747

NOTRE DAME UNIV., IND.
Optimal control studies of a solar heating system
[LA-UR-78-2556] 25 p0100 N80-10646
Energy savings for a solar heated and cooled building through adaptive optimal control
[LA-UR-78-2986] 25 p0115 N80-11616

O

OAK RIDGE ASSOCIATED UNIVERSITIES, TENN.
Shale oil: US and world resources and prospects for near-term commercialization in the United States
[ORAU/IEA-79-8(R)] 25 p0122 N80-12544
Development of the Rocky Mountain Energy and Environmental Technology Center: A preliminary analysis
[ORAU-158] 25 p0179 N80-15670

OAK RIDGE NATIONAL LAB., TENN.
Steam turbines
[ANL/CES/TE-78-7] 25 p0095 N80-10502
Computer software to calculate and map geologic parameters required in estimating coal production costs
[EPRI-EA-674] 25 p0095 N80-10584
Survey of solar thermal energy storage subsystems for thermal/electric applications
[ORNL/TM-5758] 25 p0098 N80-10627
Socioeconomic data requirements for environmental assessment: Coal gasification and liquefaction projects
[CONF-780843-5] 25 p0103 N80-10693
Environmental implications for geothermal energy development
[CONF-790445-3] 25 p0103 N80-10694
Chemical structures and reactivities of coal as an organic natural product
[CONF-790415-25] 25 p0105 N80-11168
Economics of gasoline production from underground coal gasification via mobil-M process
[CONF-790405-12] 25 p0106 N80-11246
Inventory of advanced energy technologies and energy conservation research and development, 1976-1978, volume 1
[GPO-41-481] 25 p0122 N80-12550
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6605] 25 p0125 N80-12568
Waste heat rejection from geothermal power stations
[ORNL/TM-6533] 25 p0125 N80-12575
Fuel choice and aggregate energy demand in the commercial sector
[ORNL/CON-27] 25 p0126 N80-12580
Crystallographic contributions to the energy problem
[CONF-780867-1] 25 p0128 N80-12598
Regional economic/demographic projections for energy policy analysis
[ORNL/TM-6668] 25 p0128 N80-12599
Economics of fusion driven symbiotic energy systems
[CONF-790602-50] 25 p0128 N80-12602
Review of supporting research at Oak Ridge National Laboratory for underground coal conversion
[CONF-790630-9] 25 p0136 N80-13295
Condensation and evaporation heat transfer with low-boiling temperature fluids
[CONF-790539-1] 25 p0137 N80-13412
Geopressure energy resource evaluation
[ORNL/PPA-79/2] 25 p0138 N80-13605
Low-temperature thermal energy storage program annual operating plan
[ORNL/TM-6934] 25 p0139 N80-13631
Experimental and analytical OTEC studies at ORNL
[CONF-790631-1] 25 p0143 N80-13666
Land-based application of an OTEC open-cycle power system
[CONF-790631-3] 25 p0144 N80-13676
Industrial applications of advanced energy systems
[CONF-790602-54] 25 p0147 N80-13708
Outlook for nuclear fission energy
[CONF-7811126-1] 25 p0157 N80-14509
Intermediate report on the performance of plate-type ice-maker heat pumps
[ORNL/CON-23] 25 p0176 N80-15619
Characterization of operating conditions for gas/water heat recovery steam generators
[ORNL/TM-6622] 25 p0176 N80-15620
Analysis of potential implementation levels for waste heat utilization in the nuclear power industry
[ORNL/TM-63-2] 25 p0177 N80-15625

OCEAN DATA SYSTEMS, INC., MONTEREY, CALIF.
OTEC thermal resource report for Caribbean Sea Plant Ship 13-15 degrees N 75-80 degrees N
[HCP/T2898] 25 p0113 N80-11599
OTEC thermal response report for Pacific plant ship, 5 to 10 deg N 90 to 95 deg W
[HCP/T2898-01/3] 25 p0142 N80-13656

OHIO PUBLIC UTILITIES COMMISSION, COLUMBUS.
Demand management demonstration project. Stage 1: Development of residential load characteristics. Stage 4: Demonstration of residential incremental cost pricing implemented by time-of-day metering
[HCP/B8072-01] 25 p0118 N80-11941

OHIO STATE UNIV., COLUMBUS.
Ohio exposition center solar home project
[PB-298541/4] 25 p0164 N80-14577
Fuel utilization in residences
[EPRI-EA-894] 25 p0175 N80-15604

OKLAHOMA STATE UNIV., STILLWATER.
Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry. Mass spectrometry and fossil-energy conversion technology: A review
[FE-2537-7] 25 p0120 N80-12198
A probabilistic study of wind-electric conversion systems from the point of view of reliability and capacity credit
25 p0153 N80-14475

OKLAHOMA UNIV., NORMAN.
Lateral and tilt whirl modes of flexibly mounted flywheel systems
[SAND-78-7070] 25 p0115 N80-11622
Whirling response and stability of flexibly mounted, ring-type flywheel systems
[SAND-78-7073] 25 p0116 N80-11623
Research on the dynamics of band-supported flywheel systems
[SAND-78-7074] 25 p0128 N80-12597
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
Critical speeds and natural frequencies of rim-type composite-material flywheels
[SAND-78-7049] 25 p0176 N80-15622

OPTICAL COATING LAB., INC., CITY OF INDUSTRY, CALIF.
Silicon solar cell process development, fabrication and analysis, phase 1
[NASA-CR-162427] 25 p0109 N80-11561
Assessment of present state-of-the-art sawing technology of large diameter ingots for solar sheet material
[NASA-CR-162535] 25 p0151 N80-14273
OREGON STATE UNIV., CORVALLIS.
Critique of the meteorological and air quality baseline monitoring program for the prototype oil shale leaseholds. Part A: Comments on the approach taken and recommendations for continuing program. Part B: Comments on the data acquisition and management
[DOE/EV-70031/4-PT-A/B] 25 p0148 N80-13723
Investigation of the viability and cost effectiveness of solid fuel gasifiers close coupled to internal combustion engines for 200 kWe power generation
[DOE/RL-90476-13] 25 p0169 N80-15293

P

PARAGON PACIFIC, INC., EL SEGUNDO, CALIF.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553
PEDCO-ENVIRONMENTAL, INC., CINCINNATI, OHIO.
EPA utility FGD (Flue Gas Desulfurization) survey: December 1978 - January 1979
[PB-299399/6] 25 p0179 N80-15682
PENNSYLVANIA UNIV., PHILADELPHIA.
Optimal insulation of pipes and tanks for solar heating systems
[ALO-5319-2] 25 p0102 N80-10660
PENNZOIL CO., VIENNA, W. VA.
Oil recovery by carbon dioxide injection
[ORO-5301-34] 25 p0108 N80-11545
PHILLIPS PETROLEUM CO., HOMER CITY, PA.
Gas generator research and development: BI-GAS process
[FE-1207-62] 25 p0135 N80-13288
PITTSBURGH UNIV., PA.
Theoretical analysis of multi-cell, high efficiency broad spectral sensitivity solar cells
25 p0138 N80-13617
PLANCO, INC., DALLAS, TEX.
Survey of the research into energy-economy interactions. Volume 1: Survey
[HCP/I6346-01/1-VOL-1] 25 p0139 N80-13633
POWER ELECTRONICS ASSOCIATES, INC., LINCOLN, MASS.
Bi-directional four quadrant (BDQ4) power converter development
[NASA-CR-159660] 25 p0154 N80-14480
POWER TECHNOLOGIES, INC., SCHENECTADY, N. Y.
Induction and synchronous machines for vertical axis wind turbines
[SAND-79-7017] 25 p0144 N80-13675
PRC ENERGY ANALYSIS CO., LOS ANGELES, CALIF.
Satellite Power System (SPS) preliminary societal assessment
[HCP/R4024-01/14] 25 p0101 N80-10657
PRC ENERGY ANALYSIS CO., MCLEAN, VA.
Solar energy commercialization for African countries
[HCP/CS-2522] 25 p0127 N80-12591
Satellite Power System (SPS): An overview of prospective organizational structures in the solar satellite field
[TID-29094] 25 p0154 N80-14478
Engineering concerns in solar system design and operation
[SOLAR/0811-79/01] 25 p0160 N80-14539
System tests and applications photovoltaic program
[HCP/T4024-01/15] 25 p0163 N80-14566
PRINCETON UNIV., N. J.
Biomass energy enhancement: A report to the President's Council on Environmental Quality
[PB-296624/0] 25 p0094 N80-10396
Fundamental and semi-global kinetic mechanisms of hydrocarbon combustion
[COO-4272-3] 25 p0165 N80-14587
PUBLIC SERVICE ELECTRIC AND GAS CO., NEWARK, N. J.
Battery Energy Storage Test (BEST) facility
[EPRI-EM-1005] 25 p0098 N80-10628
PUERTO RICO SCIENTIFIC RESEARCH LAB., INC., RIO PIEDRAS.
Production of sugarcane and tropical grasses as a renewable energy source
[DOE/CS/5912-T1] 25 p0168 N80-15277
PURDUE UNIV., LAFAYETTE, IND.
The water splitting light reaction of chlorophyll a dihydrate. Visible light solar energy conversion after the primary reaction in plant photosynthesis
25 p0133 N80-13188
Sulfur fixation during coal gasification
[PB-301104/6] 25 p0169 N80-15296

R

RADIAN CORP., AUSTIN, TEX.
Energy from the West: Energy resource development systems report. Volume 1: Introduction and general social controls
[PB-299177/6] 25 p0152 N80-14463
Energy from the West: Energy resource development systems report. Volume 2: Coal
[PB-299178/4] 25 p0152 N80-14464
Energy from the West: Energy resource development systems report. Volume 3: Oil shale
[PB-299179/2] 25 p0152 N80-14465
Energy from the West: Energy resource development systems report. Volume 4: Uranium
[PB-299180/0] 25 p0152 N80-14466
Energy from the West: Energy resource development systems report. Volume 5: Oil and natural gas
[PB-299181/8] 25 p0152 N80-14467
Energy from the West: Energy resource development systems report. Volume 6: Geothermal
[PB-299182/6] 25 p0152 N80-14468
RAND CORP., SANTA MONICA, CALIF.
Soviet energy balances
[RAND/R-2257-DOE] 25 p0099 N80-10634
Resolving environmental issues in energy development: Roles for the Department of Energy and its field offices
[RAND/R-2335-DOE] 25 p0099 N80-10636
RASOR ASSOCIATES, INC., SUNNYVALE, CALIF.
A cesium TELEC experiment at Lewis Research Center
[NASA-CR-159729] 25 p0151 N80-14386
RCA LABS., PRINCETON, N. J.
Analysis of S-band solid-state transmitters for the solar power satellite
[NASA-CR-160320] 25 p0096 N80-10600
Materials for solar thermal conversion
[COO-4557-1] 25 p0143 N80-13670
RENSSELAER POLYTECHNIC INST., TROY, N. Y.
Barriers to the application of wind energy conversion systems in urban settings
25 p0155 N80-14494
RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.
Novel concentrator photovoltaic converter system development
[SAND-79-7040] 25 p0143 N80-13661
ROCKET RESEARCH CORP., REDMOND, WASH.
Heat pump centered integrated community energy systems: System development
[ANL/ICES-TM-27] 25 p0110 N80-11571
ROCKWELL INTERNATIONAL CORP., DOWNEY, CALIF.
Cooling a radioisotope power source in the Space Shuttle Orbiter
[ASME PAPER 79-ENAS-44] 25 p0039 A80-15267
Satellite Power Systems (SPS) concept definition study. Volume 4: SPS point design definition
[NASA-CR-150683] 25 p0119 N80-12106
ROSENBLATT (M.) AND SON, INC., NEW YORK.
OTEC platform configuration and integration. Volume 1: Systems engineering and integration
[TID-29418] 25 p0142 N80-13655
OTEC platform configuration and integration, executive summary
[DOE/ET-4065/1] 25 p0147 N80-13711
OTEC platform configuration and integration, appendixes to volume 2
[DOE/ET-4065/1-VOL-2-APP] 25 p0147 N80-13713
OTEC platform configuration and integation. Volume 3: Project plan
[DOE/ET-4065/1-VOL-3] 25 p0148 N80-13714

S

SANDIA LABS., ALBUQUERQUE, N. MEX.
Dispersed power systems and total energy
[SAND-78-2006C] 25 p0096 N80-10608
Safety and environmental implications DOE/Sandia Midtemperature Solar Systems Test Facility
[SAND-78-2292C] 25 p0097 N80-10609
Sensitivity study of Brayton cycle power plant performance
[SAND-78-8020] 25 p0098 N80-10626
Analytical evaluation of a solar thermophotovoltaic (TPV) converter
[SAND-79-0504C] 25 p0099 N80-10638
Graphical representation of TMY solar radiation availability for one- and two-axis solar collectors
[SAND-79-0418] 25 p0100 N80-10640
Determination of the technical and economic feasibility of luminescent solar concentrators
[SAND-79-7005] 25 p0100 N80-10650
Concentrating solar collector test results Collector Module Test Facility (CMTF)
[SAND-78-0977] 25 p0111 N80-11580
Heat loss reduction techniques for annular solar receiver designs
[SAND-78-1769] 25 p0111 N80-11581
Design considerations for a proposed passive vacuum solar annular receiver
[SAND-78-0982] 25 p0111 N80-11582
Midtemperature Solar Systems Test Facility (MSSTF) project test results: Phase 4A MSSTF system operation
[SAND-78-1088] 25 p0114 N80-11613
Lateral and tilt whirl modes of flexibly mounted flywheel systems
[SAND-78-7070] 25 p0115 N80-11622
Overview of in situ oil shale technology and recent advances in true in situ retort modeling
[SAND-78-2367C] 25 p0122 N80-12543
Batteries for specific solar applications
[SAND-79-1428C] 25 p0124 N80-12559
Effect of operating temperatures on the cost of energy from solar thermal electric power plants
[SAND-79-0801] 25 p0124 N80-12563
Evaluation of solar Rankine-cycle engine systems
[SAND-78-0986] 25 p0125 N80-12571
Closed-cycle hydride engines
[SAND-78-2228] 25 p0125 N80-12572
Efforts on the economic analysis of Darrieus vertical axis wind turbines
[SAND-78-1851C] 25 p0126 N80-12579
Solar mechanical energy storage project
[SAND-78-1982C] 25 p0127 N80-12590
Wind time series analyses for WECS applications
[SAND-77-1701] 25 p0132 N80-12709
User's manual for the magnetohydrodynamic generator channel code, MHDCHN
[SAND-78-1260] 25 p0132 N80-12894
Coal liquefaction short residence time process research
[SAND-79-1400] 25 p0133 N80-13272
Effects of metallurgical microstructure of armatures on compressed magnetic field generators
[SAND-79-0890C] 25 p0137 N80-13375
Development of in situ marine seismic and geotechnical instrumentation systems
[SAND-79-0868C] 25 p0137 N80-13431
Recent spin test of two composite wagon wheel flywheels
[SAND-79-1669C] 25 p0140 N80-13640
Solar thermal test facility heliostat development
[SAND-78-1177] 25 p0140 N80-13642
Performance testing of the General Electric Engineering Prototype Collector
[SAND-79-0514] 25 p0141 N80-13645
Sandia Laboratories operational experience with small heat engines in solar thermal power systems
[SAND-78-2163C] 25 p0146 N80-13693
Weight minimization of sandwich type solar collector panels
[SAND-78-2305C] 25 p0147 N80-13710
Thermal aging characteristics of electrodeposited black chrome solar coatings
[SAND-78-2094C] 25 p0159 N80-14527
Darrieus wind turbine program at Sandia Laboratories
[SAND-79-0997C] 25 p0160 N80-14538
Hazardous properties and environmental effects of materials used in Solar Heating and Cooling (SHAC) technologies: Interim handbook
[DOE/EV-0028] 25 p0163 N80-14565
Low temperature reaction path for coal liquefaction
[SAND-79-0738C] 25 p0169 N80-15288
Design of photovoltaic systems for residential applications in the United States
[SAND-78-2186C] 25 p0171 N80-15566
Methodology for determining the configuration of the optimum solar total energy system
[SAND-79-0422] 25 p0172 N80-15574
Design and performance of silicon solar cells under concentrated sunlight
[SAND-79-1165C] 25 p0172 N80-15577
Status of the US Department of Energy photovoltaic concentrator development project
[SAND-78-2187C] 25 p0172 N80-15578
Evaluation of the evacuated solar annular receivers used at the Midtemperature Solar Systems Test Facility (MSSTF)
[SAND-78-0983] 25 p0173 N80-15585
Dynamic storage in solar total energy programs
[SAND-78-0958C] 25 p0174 N80-15600
Department of Energy large solar central power systems semiannual review
[SAND-78-8511] 25 p0175 N80-15601
Department of Energy large solar central power systems semiannual review
[SAND-79-8508] 25 p0175 N80-15602
Overview of flywheel energy storage component development
[SAND-78-1999C] 25 p0176 N80-15623
Sandia composite-rim flywheel development
[SAND-78-1865C] 25 p0177 N80-15624
PULSAR: An inductive pulse power source
[SAND-79-1246C] 25 p0177 N80-15627
Solar mechanical energy storage program overview and systems analysis results
[SAND-79-1642C] 25 p0178 N80-15637
Solar enhanced oil recovery: An assessment of economic feasibility
[SAND-79-0787] 25 p0178 N80-15641
Pulsed power for fusion
[SAND-79-0933C] 25 p0181 N80-15908

SANDIA LABS., LIVERMORE, CALIF.
Applications analysis of fixed site hydrogen storage
[SAND-78-8272] 25 p0092 N80-10384
Dissociation pressure measurements on salts proposed for thermochemical energy storage
[SAND-79-8033] 25 p0160 N80-14532
Systems Studies for Central Solar Thermal Electric
[CONF-780383] 25 p0162 N80-14558

SOLAR CONTROL CORP., BOULDER, COLO.
Development and testing of the Solar Control Corporation modular controller and Solarstat subsystem
[NASA-TM-78243] 25 p0156 N80-14498

SOLAR ENERGY INFORMATION SERVICES, SAN MATEO, CALIF.
Engineers guide to solar energy
[PB-297043/2] 25 p0164 N80-14574

SOLAREX CORP., ROCKVILLE, MD.
Phase 2 of the array automated assembly task for the low cost silicon solar array project
[NASA-CR-162426] 25 p0110 N80-11565
Silicon concentrator solar cell manufacturing development
[SAND-79-7021] 25 p0146 N80-13697

SOUTHERN CALIFORNIA EDISON CO., ROSEMEAD.
Commercial solar augmented heat pump system
[EPRI-ER-1004] 25 p0160 N80-14537

SRI INTERNATIONAL CORP., MENLO PARK, CALIF.
Proceedings of the 1978 Coal Chemistry Workshop
[CONF-780372] 25 p0150 N80-14264
Mission analysis for the Federal fuels from biomass program. Volume 3: Feedstock availability
[SAN-0115-T1] 25 p0168 N80-15276
Economic impacts of energy conservation and renewable energy sources
[UCRL-15087] 25 p0177 N80-15633

STANFORD LINEAR ACCELERATOR CENTER, CALIF.
Hydrogen-electric power drives
[SLAC-PUB-2203] 25 p0113 N80-11604

STANFORD UNIV., CALIF.
Geological and geothermal data use investigations for application explorer mission-A, heat capacity mapping mission
[E80-10033] 25 p0170 N80-15528

STOCKHOLM UNIV. (SWEDEN).
Interaction in limited arrays of windmills: Review of earlier results from a simple model and a presentation of the capabilities of a dynamic PBL model
[DM-26] 25 p0116 N80-11631
Effects of energy policy on industry
[USFFE-1978-8] 25 p0129 N80-12604
Global ecology and man
25 p0131 N80-12668

SYSTEM DEVELOPMENT CORP., SANTA MONICA, CALIF.
The 10MW(e) solar thermal central receiver pilot plant: Heliostat foundation and interface structure investigation
[SAND-78-8180] 25 p0097 N80-10612

T

TECHNICAL REPORT SERVICES, ROCKY RIVER, OHIO.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553

TECHNICAL RESEARCH CENTRE OF FINLAND, ESPOO.
Evaluation of nuclear power plant siting by probabilistic assessment of environmental impact
[VTT-EN-24] 25 p0118 N80-11891
Report on Finnish technological activities
25 p0119 N80-11991

TECHNION - ISRAEL INST. OF TECH., HAIFA.
Aeroelastic stability and response of horizontal axis wind turbine blades
25 p0032 A80-13116

TENNESSEE UNIV., KNOXVILLE.
Simulation approach for base-line energy-siting analysis
[CONF-790459-22] 25 p0157 N80-14511

TEXACO, INC., EL MONTE, CALIF.
Gasification of residual materials from coal liquefaction. Evaluation of SRC 2 vacuum flash drum bottoms from Powhatan coal as a feedstock for the Texaco gasification processes
[FE-2247-2] 25 p0119 N80-12191

TEXACO, INC., MONTEBELLO, CALIF.
Gasification of residual materials from coal liquefaction
[FE-2247-22] 25 p0135 N80-13289

TEXAS A&M RESEARCH FOUNDATION, COLLEGE STATION.
Conversion of coal-based methanol to ethylene and a gaseous fuel
[PB-301256/4] 25 p0169 N80-15297

TEXAS UNIV., ARLINGTON.
Off-design performance analysis of MHD generator channels
[AIAA PAPER 80-0176] 25 p0064 A80-18354
Effect of off-design operation of MHD generators on NO/x/ chemical kinetics
[AIAA PAPER 80-0254] 25 p0077 A80-19310

TEXAS UNIV., AUSTIN.
Tertiary oil recovery processes research at the University of Texas
[BETC-0001-1] 25 p0108 N80-11544

TORONTO UNIV. (ONTARIO).
The future role of hydrogen fuel in an electrical society
[UTIAS-241] 25 p0119 N80-12189

TRANSPORTATION AND ECONOMIC RESEARCH ASSOCIATES, INC., ARLINGTON, VA.
Disaggregating PIES fuel forecasts, validating PIES transportation model data base, and other technical services
[TID-29000] 25 p0114 N80-11612

TRW DEFENSE AND SPACE SYSTEMS GROUP, REDONDO BEACH, CALIF.
Heat pipe cooled power magnetics
[NASA-CR-159659] 25 p0136 N80-13362
PEP solar array definition study
[NASA-CR-160398] 25 p0138 N80-13622
Coal sulfur measurements
[PB-299575/1] 25 p0169 N80-15294

TRW, INC., CLEVELAND, OHIO.
Solar power satellite system definition study. Volume 1: Executive summary
[NASA-CR-160442] 25 p0167 N80-15195

TRW, INC., MCLEAN, VA.
International coal technology summary document
[DOE/PE-0010] 25 p0115 N80-11621

TRW, INC., REDONDO BEACH, CALIF.
Environmental assessment report: Lurgi coal gasification systems for SNG
[PB-298109/0] 25 p0120 N80-12204
Emissions assessment of conventional stationary combustion systems. Volume 1: Gas- and oil-fired residential heating sources
[PB-298494/6] 25 p0131 N80-12637

TRW ENERGY SYSTEMS PLANNING DIV., MCLEAN, VA.
Methane recovery from coalbeds
[DOE/MC-08089-T1] 25 p0093 N80-10387

TRW SYSTEMS GROUP, MCLEAN, VA.
Methane recovery from coalbeds project. Technology test projects: Evaluation of candidate projects
[METC-8089-T4] 25 p0135 N80-13290

TUTHILL PUMP CO., SAN RAFAEL, CALIF.
Evaluation of feasibility of prestressed concrete for use in wind turbine blades
[NASA-CR-159725] 25 p0170 N80-15553

U

UNIFIED INDUSTRIES, INC., ALEXANDRIA, VA.
Managerial plan: Executive order 12003 and the National Energy Act
[DOE/TIC-10067] 25 p0104 N80-10965

UNION CARBIDE CORP., TONAWANDA, N.Y.
Economics of hydrogen production and liquefaction updated to 1980
[NASA-CR-159163] 25 p0106 N80-11238

UNITED TECHNOLOGIES CORP., SOUTH WINDSOR, CONN.
Integral cell scale-up and performance verification
[EPRI-EM-1134] 25 p0141 N80-13646

UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.
Low cost solar cells based on amorphous silicon electrodeposited from organic solvents
[SAN-0113-T3] 25 p0145 N80-13678

UNIVERSITY OF WESTERN KENTUCKY, BOWLING GREEN.
MSFC solar heating and cooling high speed performance (Hisper) code validation
[NASA-CR-161323] 25 p0096 N80-10604

UTAH UNIV., SALT LAKE CITY.
Elucidation of coal structural components by short residence-time extractive liquefaction
25 p0119 N80-12188
Conference on performance monitoring techniques for evaluation of solar heating and cooling systems
[CONF-780432] 25 p0174 N80-15599

V

VIRGINIA UNIV., CHARLOTTESVILLE.
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
[SAND-79-1053C] 25 p0144 N80-13671

VON KARMAN INST. FOR FLUID DYNAMICS, RHODE-SAINT-GENESE (BELGIUM).
Fluid Dynamics of Porous Media in Energy Applications, volume 1
[VKI-LEC-SER-1979-4-VOL-1] 25 p0121 N80-12338
Fluid Dynamics of Porous Media in Energy Applications, volume 2
[VKI-LEC-SER-1979-4-VOL-2] 25 p0121 N80-12346
Application of packed beds to energy storage use of latent heat of fusion
25 p0121 N80-12353

W

WASHINGTON SCIENTIFIC MARKETING, INC., WASHINGTON, D. C.
Department of Energy workshops on industrial energy conservation reporting
[DOE/CS-1830-T3] 25 p0099 N80-10635

WASHINGTON STATE UNIV., PULLMAN.
Comparison of geothermal energy with coal, oil, and natural gas for selected uses
[DOE/ET-27139-1] 25 p0123 N80-12558

WATER PURIFICATION ASSOCIATES, CAMBRIDGE, MASS.
Wastewater treatment in coal conversion
[PB-297587/8] 25 p0104 N80-10700

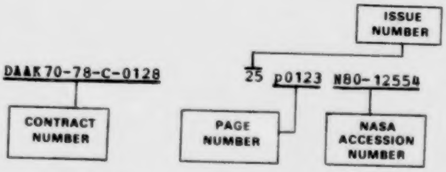
WEHRAN CO., INC., BUFFALO, N. Y.
Methane recovery from sanitary landfills: gas recovery system installation and testing
[PB-296622/4] 25 p0107 N80-11254
WEST VIRGINIA UNIV., MORGANTOWN.
Effect of vertical scale distortion on the temperature field of a thermal-hydraulic model
[PB-297274/3] 25 p0108 N80-11551
WESTINGHOUSE ELECTRIC CORP., EDDYSTONE, PA.
Screening evaluation of novel power cycles integrated with gasification plants
[EPRI-AF-1002] 25 p0096 N80-10605
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
Conceptual design of a Demonstration Tokamak Hybrid Reactor (DTHR)
[WFPS-TME-107] 25 p0132 N80-12898
WESTINGHOUSE RESEARCH AND DEVELOPMENT CENTER, PITTSBURGH, PA.
Performance monitoring of an off-peak heating and cooling system utilizing thermal storage and solar augmented heat pump
[EPRI-ER-845] 25 p0102 N80-10662
WHARTON (E. F. A.), INC., PHILADELPHIA, PA.
Wharton annual energy model: Development and simulation results
[EPRI-EA-1115] 25 p0175 N80-15606
WILLIAMS (O. G.) AND SKAGGS (R. L.), LAS VEGAS, NEV.
Solar parabolic trough forming process
[ALO-4158-1] 25 p0116 N80-11626
WISCONSIN UNIV. - MADISON.
Newton's method for generalized equations and the PIES energy model
25 p0149 N80-13872
WISCONSIN UNIV. CENTER SYSTEM, RICE LAKE.
Energy and economic assessment of anaerobic digesters and biofuels for rural waste management
[PB-296523/4] 25 p0094 N80-10398
WORLD METEOROLCGICAL ORGANIZATION, GENEVA (SWITZERLAND).
Climatic variability, marine resources and offshore development
25 p0131 N80-12689
WYLE LABS., INC., HUNTSVILLE, ALA.
Thermal performance evaluation of the Suncatcher SH-11 (liquid) solar collector
[NASA-CR-161253] 25 p0156 N80-14497
Results of thermal performance evaluation of the Owens-Illinois sunpack liquid solar collector at indoor conditions
[NASA-CR-161189] 25 p0156 N80-14500

CONTRACT NUMBER INDEX

ENERGY */A Continuing Bibliography (Issue 25)*

APRIL 1980

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the *IAA* accession numbers appearing first. The accession number denotes the number by which the citation is identified in either the *IAA* or *STAR* section. Preceding the accession number are the issue and page number in the particular supplement in which the citation may be found.

AF PROJ. 2303
25 p0123 N80-12553
AF PROJ. 3145
25 p0157 N80-14505
AT(29-1)-789
25 p0097 N80-10616
25 p0162 N80-14558
BMFT-ET-4056-A
25 p0116 N80-11630
CY-76-C-03-0167
25 p0079 A80-19599
DAAG53-76-C-0014
25 p0012 A80-11861
DAAK70-77-C-0222
25 p0139 N80-13625
DAAK70-78-C-0128
25 p0123 N80-12554
DE-AB29-76EI-20370
25 p0170 N80-15422
DE-AC01-79EV-10018
25 p0104 N80-10701
DE-AC04-76DP-00789
25 p0146 N80-13693
25 p0146 N80-13698
25 p0167 N80-15220
25 p0171 N80-15566
25 p0172 N80-15578
DE-AC04-76DP00789
25 p0020 A80-12428
25 p0065 A80-18557
25 p0074 A80-18990
DE-AC20-79LC10020
25 p0085 A80-20454
DE-AC21-76MC-05201
25 p0149 N80-13735
DE-AC21-78MC-08089
25 p0093 N80-10387
DE-AI01-79ET-20307
25 p0069 A80-18588
DE-AI01-79ET-20307
25 p0155 N80-14491
DE-AI03-79SF-10505
25 p0143 N80-13663
DE-AM03-76SF00472
25 p0053 A80-17710
DE-8C04-78CS-34261
25 p0070 A80-18591
DEN3-1
25 p0122 N80-12551
DEN3-32
25 p0150 N80-13989
DEN3-54
25 p0167 N80-15263
DEN3-67
25 p0096 N80-10603
DI-BM-H0155092
25 p0137 N80-13601
DI-G-ET-79-11270
25 p0180 N80-15691
DI-14-34-0001-6214
25 p0108 N80-11551
DOE TASK 3403,01
25 p0005 A80-11339
DOE-07-7149
25 p0046 A80-16799
DOT-CG-81-76-1476
25 p0149 N80-13754
DOT-TSC-RA-76-48
25 p0166 N80-14976
DOT-UT-9002
25 p0133 N80-12962
DSHS-8072-FGF-10432
25 p0067 A80-18574
E(04-3)-1203
25 p0006 A80-11368
E(11-1)-2588
25 p0020 A80-12426
25 p0020 A80-12427
25 p0070 A80-18590
E(11-1)-3237
25 p0058 A80-17876
E(49-18)-1800
25 p0135 N80-13287
25 p0135 N80-13291
E(49-18)-2234
25 p0038 A80-14795
E(49-26)-1059
25 p0138 N80-13623
EA-77-A-01-6010
25 p0121 N80-12300
EC-75-F-01-8072
25 p0118 N80-11941
EC-76-C-01-8662
25 p0114 N80-11606
EC-77-A-29-1010
25 p0109 N80-11558
EC-77-A-31-1011
25 p0118 N80-11954
EC-77-A-31-1034
25 p0171 N80-15560
EC-77-A-31-1035
25 p0164 N80-14572
EC-77-A-31-1062
25 p0138 N80-13624
EC-77-A-31-10040
25 p0150 N80-13989
EC-77-C-01-2165
25 p0129 N80-12606
EC-77-C-01-5043
25 p0157 N80-14510
EC-77-C-01-5056
25 p0110 N80-11573
EC-77-C-01-8578
25 p0114 N80-11612
EC-77-C-05-5523
25 p0173 N80-15590
EC-77-S-02-4372
25 p0165 N80-14587
EC-77-S-04-3992
25 p0172 N80-15582
EC-77-X-01-2752
25 p0092 N80-10383
EE-76-C-02-4234
25 p0168 N80-15278
EE-77-C-01-6119
25 p0098 N80-10629
EE-77-S-02-4204
25 p0151 N80-14266
EE-77-S-02-4447
25 p0151 N80-14266
EE-77-S-02-4548
25 p0151 N80-14266
EEC-07076-EHF
25 p0042 A80-15993
EEF-77-C-03-1481
25 p0062 A80-18240
EF-76-C-05-5301
25 p0108 N80-11545
EF-77-A-01-2593
25 p0155 N80-14493
EF-77-A-01-2674
25 p0095 N80-10595
25 p0166 N80-14922
EF-77-C-01-1207
25 p0089 A80-20913
EF-77-C-01-2621
25 p0119 N80-12163
EF-77-01-2519
25 p0062 A80-18242
25 p0064 A80-18353
EG-76-C-01-4065
25 p0147 N80-13711
25 p0147 N80-13713
EG-77-C-01-2522
25 p0127 N80-12591
25 p0129 N80-12607
25 p0160 N80-14539
EG-77-C-01-4000
25 p0120 N80-12202
EG-77-C-01-4016
25 p0132 N80-12707
25 p0149 N80-13747
EG-77-C-01-4022
25 p0162 N80-14559
EG-77-C-01-4024
25 p0101 N80-10657
25 p0154 N80-14478
25 p0163 N80-14566
EG-77-C-01-4042
25 p0018 A80-11991
25 p0088 A80-20888
25 p0102 N80-10663
25 p0113 N80-11598
25 p0113 N80-11602
25 p0115 N80-11617
25 p0124 N80-12564
25 p0124 N80-12565
25 p0126 N80-12578
25 p0132 N80-12710
25 p0140 N80-13635
25 p0141 N80-13649
25 p0143 N80-13669
25 p0144 N80-13674
25 p0146 N80-13699
25 p0151 N80-14269
25 p0158 N80-14518
25 p0158 N80-14519
25 p0158 N80-14520
25 p0161 N80-14546
25 p0161 N80-14547
25 p0161 N80-14548
25 p0165 N80-14617
25 p0172 N80-15570
25 p0172 N80-15571
25 p0172 N80-15583
25 p0178 N80-15639
EG-77-C-01-4049
25 p0069 A80-18589
25 p0101 N80-10659
25 p0126 N80-12585
EG-77-C-01-4064
25 p0128 N80-12600
EG-77-C-01-4065
25 p0142 N80-13655
EG-77-C-01-4101
25 p0093 N80-10389
25 p0093 N80-10393
EG-77-C-02-4395
25 p0040 A80-15358
EG-77-C-02-4544
25 p0059 A80-17888
25 p0132 N80-12898
EG-77-C-02-4557
25 p0143 N80-13670
EG-77-C-03-1467
25 p0067 A80-18573
EG-77-C-03-1576
25 p0018 A80-11989
EG-77-C-03-1590
25 p0101 N80-10654
EG-77-C-03-1605
25 p0146 N80-13700
EG-77-C-04-3787
25 p0174 N80-15597
EG-77-C-04-3974/EPT-5
25 p0066 A80-18561
EG-77-C-1979
25 p0046 A80-16786
EG-77-G-04-4089
25 p0127 N80-12593
EG-77-G-04-4158
25 p0116 N80-11626
EG-77-G-05-5550
25 p0162 N80-14553
EG-77-S-02-4479
25 p0101 N80-10655
EG-77-S-02-4546
25 p0101 N80-10652
25 p0101 N80-10653
25 p0101 N80-10656
25 p0144 N80-13672
EG-77-S-02-4577
25 p0124 N80-12566
25 p0143 N80-13665
EG-77-S-03-1456
25 p0087 A80-20720
EG-77-S-04-4094
25 p0174 N80-15599
EG-77-01-2118
25 p0022 A80-12735
EI-78-C-01-6346
25 p0139 N80-13633
EM-77-C-01-8962
25 p0104 N80-10965
EM-78-C-01-5058
25 p0173 N80-15591
EM-78-C-03-1735
25 p0115 N80-11615
25 p0123 N80-12557
25 p0158 N80-14523
25 p0175 N80-15613
EM-78-C-04-4261
25 p0020 A80-12431
EM-78-C-04-4297
25 p0171 N80-15569
EM-78-C-04-5319
25 p0102 N80-10660
EM-78-S-02-4628
25 p0158 N80-14516
EMD-77-2202
25 p0169 N80-15298
EN-77-3-01-6173
25 p0059 A80-17888

CONTRACT NUMBER INDEX

EP-78-C-02-4734
25 p0151 N80-14266
EP-78-C-03-2057
25 p0151 N80-14266
EP-78-C-05-6020
25 p0151 N80-14266
EPA PROJ. EHE624A
25 p0165 N80-14590
25 p0165 N80-14591
EPA-R-803875
25 p0180 N80-15688
EPA-R-804457
25 p0094 N80-10398
EPA-R-804836
25 p0094 N80-10396
EPA-T-900591-03
25 p0117 N80-11634
25 p0117 N80-11670
EPA-68-01-1916
25 p0152 N80-14463
25 p0152 N80-14464
25 p0152 N80-14465
25 p0152 N80-14466
25 p0152 N80-14467
25 p0152 N80-14468
EPA-68-01-4380
25 p0001 A80-10029
EPA-68-02-1885
25 p0180 N80-15687
EPA-68-02-2138
25 p0165 N80-14595
EPA-68-02-2162
25 p0179 N80-15676
EPA-68-02-2165
25 p0169 N80-15294
EPA-68-02-2197
25 p0131 N80-12637
EPA-68-02-2603
25 p0179 N80-15682
EPA-68-02-2611
25 p0117 N80-11656
EPA-68-02-2622
25 p0004 A80-11140
EPA-68-02-2628
25 p0165 N80-14590
25 p0165 N80-14591
EPA-68-02-2635
25 p0120 N80-12204
EPA-68-03-2207
25 p0104 N80-10700
EPA-68-03-2226
25 p0179 N80-15681
EPRI PROJ. 137-1
25 p0175 N80-15604
EPRI PROJ. 440-1
25 p0175 N80-15606
EPRI PROJ. 580-2
25 p0114 N80-11607
EPRI PROJ. 804
25 p0095 N80-10584
EPRI PROJ. 928-4
25 p0118 N80-11935
EPRI PROJ. 990-3
25 p0096 N80-10605
EQ9AD499
25 p0094 N80-10396
ER-78-C-01063
25 p0107 N80-11255
ER-78-S-02-4737
25 p0078 A80-19473
ER-78-S-02-4899
25 p0087 A80-20722
ERDA 31-109-38-3552
25 p0011 A80-11851
ES-77-C-02-4149
25 p0056 A80-17860
ET-78-C-01-2898
25 p0113 N80-11599
25 p0142 N80-13656
ET-78-C-02-5022
25 p0172 N80-15576
ET-78-C-03-1740
25 p0142 N80-13660
ET-78-C-03-2028
25 p0162 N80-14550
25 p0162 N80-14551
ET-78-C-03-2180
25 p0108 N80-11546
ET-78-C-04-4267
25 p0145 N80-13688
ET-78-S-02-4649
25 p0147 N80-13707
ET-78-S-02-4713
25 p0088 A80-20889
ET-78-S-02-4878
25 p0146 N80-13694
ET-78-S-05-5912
25 p0168 N80-15277
ET-78-I-01-2402
25 p0150 N80-14264
EU-78-C-01-6354
25 p0124 N80-12567
EW-78-C-21-8089
25 p0135 N80-13290
EW-78-S-19-0001
25 p0108 N80-11544
EX-76-A-01-2295
25 p0145 N80-13687
EX-76-A-36-1008
25 p0165 N80-14578
EX-76-C-01-1207
25 p0135 N80-13288
EX-76-C-01-1770
25 p0087 A80-20882
EX-76-C-01-1784
25 p0106 N80-11248
EX-76-C-01-1800
25 p0135 N80-13287
25 p0135 N80-13291
EX-76-C-01-2025
25 p0130 N80-12624
EX-76-C-01-2098
25 p0135 N80-13283
EX-76-C-01-2247
25 p0119 N80-12191
25 p0135 N80-13289
EX-76-C-01-2286
25 p0093 N80-10392
25 p0134 N80-13281
EX-76-C-01-2307
25 p0106 N80-11249
25 p0134 N80-13280
EX-76-C-01-2337
25 p0099 N80-10634
25 p0099 N80-10636
EX-76-C-01-2433
25 p0093 N80-10391
EX-76-C-01-2434
25 p0120 N80-12200
EX-76-C-01-2435
25 p0150 N80-14258
EX-76-C-01-2469
25 p0120 N80-12199
EX-76-C-01-2489
25 p0093 N80-10390
EX-76-C-10-3885
25 p0115 N80-11621
EX-76-C-2341
25 p0007 A80-11642
EX-76-I-01-1028
25 p0170 N80-15553
EY-C-76-03-1132
25 p0017 A80-11987
EY-76-C-2-2616-A001
25 p0007 A80-11643
EY-76-C-02-0016
25 p0006 A80-11369
25 p0021 A80-12436
25 p0098 N80-10624
25 p0099 N80-10633
25 p0101 N80-10651
25 p0104 N80-10922
25 p0111 N80-11585
25 p0117 N80-11639
25 p0129 N80-12610
25 p0134 N80-13277
25 p0136 N80-13294
25 p0139 N80-13632
25 p0141 N80-13650
25 p0142 N80-13651
25 p0142 N80-13654
25 p0157 N80-14512
25 p0157 N80-14514
25 p0158 N80-14522
25 p0162 N80-14552
25 p0167 N80-15227
25 p0170 N80-15346
25 p0178 N80-15634
25 p0180 N80-15897
EY-76-C-02-2857
25 p0098 N80-10628
EY-76-C-02-2934
25 p0129 N80-12609
EY-76-C-02-2950
25 p0010 A80-11846
EY-76-C-02-3073
25 p0006 A80-11347
25 p0006 A80-11349
25 p0040 A80-15532
25 p0054 A80-17797
25 p0058 A80-17876
25 p0079 A80-19600
25 p0084 A80-20157
25 p0084 A80-20158
EY-76-C-02-3093
25 p0080 A80-19620
EY-76-C-02-4094
25 p0100 N80-10639
25 p0116 N80-11627
25 p0127 N80-12592
25 p0137 N80-13377
25 p0146 N80-13692
25 p0175 N80-15609
25 p0178 N80-15635
25 p0178 N80-15638
EY-76-C-03-0115
25 p0168 N80-15276
EY-76-C-03-0167
25 p0059 A80-17888
25 p0079 A80-19600
EY-76-C-03-0515
25 p0113 N80-11604
EY-76-C-03-0700
25 p0163 N80-14563
EY-76-C-03-1331
25 p0174 N80-15596
EY-76-C-04-0053
25 p0113 N80-11603
25 p0160 N80-14540
25 p0161 N80-14541
25 p0164 N80-14570
EY-76-C-04-0613
25 p0108 N80-11384
EY-76-C-04-0789
25 p0092 N80-10384
25 p0096 N80-10608
25 p0097 N80-10609
25 p0097 N80-10612
25 p0097 N80-10616
25 p0098 N80-10626
25 p0099 N80-10638
25 p0100 N80-10640
25 p0100 N80-10650
25 p0111 N80-11580
25 p0111 N80-11581
25 p0111 N80-11582
25 p0114 N80-11613
25 p0115 N80-11622
25 p0116 N80-11623
25 p0122 N80-12543
25 p0124 N80-12559
25 p0124 N80-12563
25 p0125 N80-12571
25 p0125 N80-12572
25 p0126 N80-12579
25 p0127 N80-12590
25 p0128 N80-12597
25 p0129 N80-12608
25 p0132 N80-12709
25 p0132 N80-12894
25 p0133 N80-13272
25 p0137 N80-13375
25 p0137 N80-13431
25 p0140 N80-13640
25 p0140 N80-13642
25 p0141 N80-13644
25 p0141 N80-13645
25 p0143 N80-13661
25 p0144 N80-13671
25 p0144 N80-13675
25 p0146 N80-13693
25 p0146 N80-13697
25 p0147 N80-13710
25 p0159 N80-14527
25 p0160 N80-14532
25 p0160 N80-14538
25 p0162 N80-14558
25 p0169 N80-15288
25 p0172 N80-15574
25 p0172 N80-15577
25 p0173 N80-15585
25 p0173 N80-15586
25 p0174 N80-15600
25 p0175 N80-15601
25 p0175 N80-15602
25 p0176 N80-15622
25 p0176 N80-15623
25 p0177 N80-15624
25 p0177 N80-15627
25 p0178 N80-15637
25 p0178 N80-15641
25 p0181 N80-15908
EY-76-C-05-0033
25 p0078 A80-19474
25 p0122 N80-12544
25 p0127 N80-12594
25 p0127 N80-12595
25 p0179 N80-15670
EY-76-C-06-1830
25 p0092 N80-10382
25 p0097 N80-10613
25 p0098 N80-10625
25 p0113 N80-11605
25 p0151 N80-14266
25 p0160 N80-14534
25 p0165 N80-14655
EY-76-C-07-1570
25 p0102 N80-10661
25 p0112 N80-11595
25 p0139 N80-13627
EY-76-C-09-0001
25 p0149 N80-13917
EY-76-C-14-2170
25 p0119 N80-12147
EY-76-S-02-2577
25 p0163 N80-14568
25 p0176 N80-15616
EY-76-S-02-2858
25 p0143 N80-13668
25 p0163 N80-14569
EY-76-S-02-2893
25 p0159 N80-14524
25 p0174 N80-15595
EY-76-S-02-2948
25 p0043 A80-16148
EY-76-S-02-2993
25 p0173 N80-15584
EY-76-S-02-4051-A002
25 p0070 A80-18593
EY-76-S-03-0034
25 p0141 N80-13643
EY-76-S-03-0113
25 p0145 N80-13678
EY-76-S-05-4976-A003
25 p0020 A80-12430
EY-76-S-06-2221
25 p0123 N80-12558
EY-76-S-06-2227
25 p0148 N80-13723
25 p0169 N80-15293
EY-77-C-06-1036
25 p0095 N80-10504
EY-77-C-1030
25 p0095 N80-10504
EY-77-S-2446
25 p0005 A80-11339
F29601-76-C-0132
25 p0064 A80-18366
F33615-76-C-2093
25 p0010 A80-11843
F33615-77-C-2004
25 p0156 N80-14504
F33615-77-C-2021
25 p0157 N80-14505
F33616-78-C-2077
25 p0046 A80-16799
F44620-75-C-0037
25 p0006 A80-11349
HUD-H-8213G
25 p0117 N80-11633
JPL PROJ. 5102-117
25 p0155 N80-14491
JPL PROJ. 5102-136
25 p0155 N80-14488
JPL PROJ. 5230-1-REV-A
25 p0155 N80-14492
JPL-954328
25 p0154 N80-14483
JPL-954830
25 p0151 N80-14273
JPL-954847
25 p0109 N80-11562

CONTRACT NUMBER INDEX

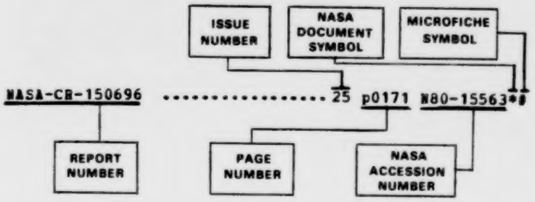
JPL-954854
25 p0110 N80-11565
JPL-955018
25 p0154 N80-14484
JPL-955089
25 p0109 N80-11561
JPL-955115
25 p0065 A80-18553
JPL-955116
25 p0069 A80-18586
25 p0095 N80-10596
JPL-955149
25 p0154 N80-14481
25 p0154 N80-14482
NASA ORDER A-417018
25 p0084 A80-20128
NASA ORDER C-25906
25 p0170 N80-15553
NASW-2800
25 p0108 N80-11532
25 p0118 N80-11747
NAS1-14698
25 p0106 N80-11238
NAS2-9925
25 p0041 A80-15750
NAS3-20058
25 p0109 N80-11558
NAS3-20596
25 p0170 N80-15553
NAS3-21149
25 p0151 N80-14386
NAS3-30363
25 p0154 N80-14480
NAS3-30813
25 p0170 N80-15553
NAS5-24232
25 p0170 N80-15528
NAS7-100
25 p0021 A80-12438
25 p0110 N80-11564
25 p0155 N80-14488
25 p0155 N80-14491
25 p0155 N80-14492
NAS8-31293
25 p0171 N80-15563
NAS8-32036
25 p0156 N80-14497
25 p0156 N80-14500
NAS8-32093
25 p0096 N80-10601
25 p0096 N80-10602
25 p0109 N80-11560
NAS8-32256
25 p0156 N80-14496
NAS8-32258
25 p0156 N80-14498
NAS8-32475
25 p0119 N80-12106
NAS8-32921
25 p0122 N80-12538
25 p0122 N80-12539
25 p0122 N80-12540
NAS8-33387
25 p0096 N80-10604
NAS8-33608
25 p0092 N80-10379
NAS9-15196
25 p0086 A80-20641
NAS9-15636
25 p0086 A80-20641
25 p0105 N80-11121
25 p0105 N80-11122
25 p0167 N80-15195
NAS9-15755
25 p0096 N80-10600
NAS9-15870
25 p0138 N80-13622
NGR-03-002-171
25 p0085 A80-20378
NGR-39-087-021
25 p0028 A80-12816
NOAA-04-6-158-4410
25 p0003 A80-10524
NR PROJ. 051-696
25 p0123 N80-12556
NSF AER-72-03551
25 p0118 N80-11711
NSF AER-73-03197
25 p0062 A80-18231
NSF AER-74-20135
25 p0169 N80-15297
NSF A&R-75-02665
25 p0169 N80-15296
NSF AER-76-19752
25 p0063 A80-18291
NSF CHE-78-18572
25 p0053 A80-17710
NSF CISP-78-22989
25 p0166 N80-14962
NSF DMR-84373
25 p0086 A80-20716
NSF ENG-76-02402
25 p0059 A80-18086
NSF ENG-77-21626
25 p0036 A80-14667
NSF ENG-78-06263
25 p0089 A80-20893
NSF GI-32482
25 p0153 N80-14471
NSF ISP-75-15817
25 p0130 N80-12615
NSF ISP-78-22994
25 p0118 N80-11965
NSF PCM-76-11655
25 p0030 A80-12838
NSG-3082
25 p0032 A80-13116
NSG-3255
25 p0064 A80-18354
25 p0077 A80-19310
NSG-7491
25 p0072 A80-18728
N00014-76-C-0442
25 p0156 N80-14502
25 p0156 N80-14503
N00014-78-C-0630
25 p0123 N80-12556
N00014-78-F-0004
25 p0132 N80-12882
N00014-79-C-0318
25 p0062 A80-18240
OWRT PROJ. C-7171(6214) (4)
25 p0108 N80-11551
PROJ. 2345
25 p0109 N80-11562
PROJ. 8987
25 p0174 N80-15597
RA-23-216.00.0
25 p0143 N80-13667
RESEARCH PROJ. 408-1
25 p0136 N80-13292
W-31-109-ENG-38
25 p0043 A80-16262
25 p0065 A80-18554
25 p0076 A80-19304
25 p0077 A80-19309
25 p0095 N80-10502
25 p0096 N80-10606
25 p0104 N80-10918
25 p0110 N80-11571
25 p0111 N80-11574
25 p0111 N80-11576
25 p0111 N80-11577
25 p0112 N80-11586
25 p0112 N80-11587
25 p0115 N80-11619
25 p0116 N80-11624
25 p0116 N80-11628
25 p0124 N80-12562
25 p0131 N80-12631
25 p0139 N80-13629
25 p0139 N80-13630
25 p0140 N80-13636
25 p0145 N80-13689
25 p0146 N80-13695
25 p0146 N80-13696
25 p0147 N80-13706
25 p0149 N80-13941
25 p0150 N80-14263
25 p0150 N80-14265
25 p0151 N80-14271
25 p0159 N80-14525
25 p0159 N80-14530
25 p0159 N80-14531
25 p0163 N80-14562
25 p0164 N80-14573
25 p0166 N80-14954
25 p0167 N80-15259
25 p0168 N80-15281
25 p0173 N80-15588
25 p0173 N80-15589
25 p0175 N80-15611
25 p0176 N80-15614
25 p0177 N80-15629
25 p0181 N80-15942
W-7405-ENG-26
25 p0015 A80-11966
25 p0017 A80-11984
25 p0021 A80-12440
25 p0054 A80-17789
25 p0058 A80-17883
25 p0065 A80-18552
25 p0088 A80-20886
25 p0095 N80-10584
25 p0098 N80-10627
25 p0103 N80-10693
25 p0103 N80-10694
25 p0105 N80-11168
25 p0106 N80-11246
25 p0107 N80-11348
25 p0112 N80-11590
25 p0125 N80-12568
25 p0125 N80-12575
25 p0126 N80-12580
25 p0128 N80-12598
25 p0128 N80-12599
25 p0128 N80-12602
25 p0130 N80-12613
25 p0136 N80-13295
25 p0137 N80-13412
25 p0138 N80-13605
25 p0139 N80-13631
25 p0143 N80-13666
25 p0144 N80-13676
25 p0145 N80-13686
25 p0147 N80-13708
25 p0157 N80-14509
25 p0157 N80-14511
25 p0176 N80-15619
25 p0176 N80-15620
25 p0177 N80-15625
W-7405-ENG-36
25 p0094 N80-10443
25 p0095 N80-10472
25 p0099 N80-10637
25 p0100 N80-10646
25 p0108 N80-11543
25 p0112 N80-11592
25 p0113 N80-11596
25 p0114 N80-11608
25 p0115 N80-11616
25 p0117 N80-11641
25 p0118 N80-11889
25 p0120 N80-12197
25 p0126 N80-12577
25 p0129 N80-12605
25 p0136 N80-13296
25 p0136 N80-13297
25 p0140 N80-13634
25 p0142 N80-13653
25 p0144 N80-13673
25 p0144 N80-13677
25 p0145 N80-13690
25 p0149 N80-13906
25 p0151 N80-14346
25 p0159 N80-14526
25 p0160 N80-14535
25 p0165 N80-14584
25 p0169 N80-15289
25 p0171 N80-15565
25 p0178 N80-15643
W-7405-ENG-48
25 p0046 A80-16752
25 p0059 A80-17887
25 p0060 A80-18110
25 p0075 A80-19049
25 p0085 A80-20453
25 p0097 N80-10611
25 p0097 N80-10619
25 p0098 N80-10623
25 p0102 N80-10664
25 p0103 N80-10688
25 p0103 N80-10689
25 p0105 N80-10970
25 p0106 N80-11245
25 p0108 N80-11386
25 p0110 N80-11567
25 p0111 N80-11579
25 p0112 N80-11594
25 p0114 N80-11614
25 p0115 N80-11618
25 p0118 N80-11946
25 p0120 N80-12201
25 p0124 N80-12561
25 p0125 N80-12569
25 p0125 N80-12570
25 p0126 N80-12586
25 p0126 N80-12588
25 p0127 N80-12589
25 p0128 N80-12596
25 p0130 N80-12625
25 p0131 N80-12628
25 p0131 N80-12647
25 p0132 N80-12900
25 p0132 N80-12955
25 p0133 N80-12960
25 p0133 N80-12982
25 p0137 N80-13480
25 p0140 N80-13638
25 p0141 N80-13647
25 p0141 N80-13648
25 p0145 N80-13680
25 p0158 N80-14517
25 p0159 N80-14528
25 p0159 N80-14529
25 p0160 N80-14533
25 p0161 N80-14549
25 p0164 N80-14571
25 p0166 N80-14973
25 p0168 N80-15282
25 p0171 N80-15564
25 p0171 N80-15568
25 p0175 N80-15612
25 p0176 N80-15618
25 p0177 N80-15626
25 p0177 N80-15628
25 p0177 N80-15633
25 p0179 N80-15668
25 p0181 N80-15933
25 p0181 N80-15995
W-7405-ENG-82
25 p0125 N80-12576
25 p0129 N80-12611
25 p0145 N80-13679
25 p0147 N80-13702
W-7405-ENG-92
25 p0093 N80-10395
W-7406-ENG-48
25 p0098 N80-10621
W-7409-ENG-38
25 p0029 A80-12824
W-7495-ENG-48
25 p0045 A80-16720
2F57571004
25 p0150 N80-14259
141-95-01-15
25 p0109 N80-11559
513-52-01-16
25 p0150 N80-14114
530-04-13-01
25 p0105 N80-11053
778-17-01
25 p0096 N80-10603
778-35-03
25 p0167 N80-15263

REPORT/ACCESSION INDEX

ENERGY */A Continuing Bibliography (Issue 25)*

APRIL 1980

Typical Report/Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The issue and page number indicate the actual Supplement and page where the citation may be located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

AD-A071157 .... 25 p0139 N80-13625 #
AD-A071242 .... 25 p0123 N80-12553 #
AD-A072435 .... 25 p0107 N80-11259 #
AD-A072861 .... 25 p0123 N80-12556 #
AD-A072864 .... 25 p0123 N80-12554 #
AD-A073128 .... 25 p0132 N80-12882 #
AD-A073761 .... 25 p0150 N80-14259 #
AD-A073822 .... 25 p0149 N80-13754 #
AD-A073858 .... 25 p0157 N80-14505 #
AD-A074869 .... 25 p0156 N80-14504 #
AD-A074885 .... 25 p0182 N80-16022 #
AD-A074915 .... 25 p0156 N80-14503 #
AD-A074968 .... 25 p0156 N80-14502 #

AD-E000316 .... 25 p0150 N80-14259 #

AED-CONF-78-155-010 .... 25 p0121 N80-12291 #
AED-CONF-78-212-004 .... 25 p0115 N80-11620 #
AED-CONF-78-212-011 .... 25 p0130 N80-12614 #

AER-425 .... 25 p0094 N80-10400 #

AFAPL-TR-79-2026 .... 25 p0157 N80-14505 #

AFESC/ESL-TR-79-20 .... 25 p0156 N80-14504 #

AGARD-AG-243 .... 25 p0103 N80-10683 #

AIAA PAPER 80-0020 .... 25 p0062 A80-18240 #
AIAA PAPER 80-0022 .... 25 p0062 A80-18242 #
AIAA PAPER 80-0023 .... 25 p0063 A80-18243*#
AIAA PAPER 80-0075 .... 25 p0076 A80-19275 #
AIAA PAPER 80-0091 .... 25 p0063 A80-18265 #
AIAA PAPER 80-0148 .... 25 p0064 A80-18366 #
AIAA PAPER 80-0175 .... 25 p0064 A80-18353 #
AIAA PAPER 80-0176 .... 25 p0064 A80-18354*#
AIAA PAPER 80-0178 .... 25 p0064 A80-18355 #
AIAA PAPER 80-0210 .... 25 p0064 A80-18378 #
AIAA PAPER 80-0212 .... 25 p0064 A80-18379 #
AIAA PAPER 80-0250 .... 25 p0076 A80-19304 #
AIAA PAPER 80-0253 .... 25 p0077 A80-19309 #
AIAA PAPER 80-0254 .... 25 p0077 A80-19310*#
AIAA PAPER 80-0280 .... 25 p0077 A80-19311 #
AIAA PAPER 80-0284 .... 25 p0063 A80-18291 #
AIAA PAPER 80-0292 .... 25 p0063 A80-18297*#
AIAA PAPER 80-0293 .... 25 p0063 A80-18298*#
AIAA PAPER 80-0294 .... 25 p0063 A80-18299 #
AIAA PAPER 80-0296 .... 25 p0063 A80-18300 #
AIAA PAPER 80-0297 .... 25 p0063 A80-18301 #
AIAA PAPER 80-0302 .... 25 p0064 A80-18303*#
AIAA PAPER 80-0399 .... 25 p0077 A80-19326 #
AIAA PAPER 80-0400 .... 25 p0077 A80-19327 #
AIAA PAPER 80-0402 .... 25 p0077 A80-19328 #

ALC-3787-4 .... 25 p0174 N80-15597 #
ALC-4158-1 .... 25 p0116 N80-11626 #
ALO-5319-2 .... 25 p0102 N80-10660 #

ALW-11 .... 25 p0137 N80-13601*#

ANI-ICES-TM-28 .... 25 p0111 N80-11574 #

ANL-PMS-79-2-VOL-7 .... 25 p0139 N80-13629 #
ANL-PMS-79-2-VOL-8 .... 25 p0139 N80-13630 #
ANL-PMS-79-2-VOL-11 .... 25 p0124 N80-12562 #

ANL/CES/TE-78-7 .... 25 p0095 N80-10502 #
ANL/CES/TE-79-2 .... 25 p0150 N80-14263 #
ANL/CNSV/TM-2 .... 25 p0159 N80-14525 #
ANL/EES-CP-30 .... 25 p0115 N80-11619 #
ANI/EES-TM-28 .... 25 p0111 N80-11576 #
ANL/EES-TM-32 .... 25 p0111 N80-11577 #
ANL/EES/TM-38 .... 25 p0151 N80-14271 #
ANL/ES-76 .... 25 p0140 N80-13636 #
ANL/FPP-78-4 .... 25 p0149 N80-13941 #
ANL/FPP/TM-119 .... 25 p0104 N80-10918 #
ANL/ICES-TM-26 .... 25 p0173 N80-15589 #
ANL/ICES-TM-27 .... 25 p0110 N80-11571 #
ANL/ICES-TM-30 .... 25 p0173 N80-15588 #
ANL/MHD-78-11 .... 25 p0181 N80-15942 #
ANL/MHD-79-1 .... 25 p0132 N80-12882 #

APL/JHU/EQR-79-2 .... 25 p0179 N80-15648 #
APL/JHU/GEMS-003 .... 25 p0165 N80-14578 #
APL/JHU/QM-79-002 .... 25 p0165 N80-14578 #

APR-5 .... 25 p0133 N80-12957*#

AR-3 .... 25 p0136 N80-13292 #

AR/IA/79-27 .... 25 p0174 N80-15594 #

ASA-78-06 .... 25 p0097 N80-10616 #

ASME PAPER 79-DET-9 .... 25 p0041 A80-15705 #
ASME PAPER 79-DET-71 .... 25 p0041 A80-15729 #
ASME PAPER 79-ENAS-44 .... 25 p0039 A80-15267*#
ASME PAPER 79-WA/APC-10 .... 25 p0071 A80-18623 #
ASME PAPER 79-WA/ENER-4 .... 25 p0071 A80-18644 #
ASME PAPER 79-WA/ENER-5 .... 25 p0071 A80-18645 #
ASME PAPER 79-WA/ENER-6 .... 25 p0071 A80-18646 #
ASME PAPER 79-WA/FE-6 .... 25 p0070 A80-18620 #
ASME PAPER 79-WA/GT-3 .... 25 p0071 A80-18637 #
ASME PAPER 79-WA/HT-18 .... 25 p0070 A80-18593 #
ASME PAPER 79-WA/HT-31 .... 25 p0071 A80-18631 #
ASME PAPER 79-WA/HT-33 .... 25 p0070 A80-18595 #
ASME PAPER 79-WA/HT-36 .... 25 p0068 A80-18582 #
ASME PAPER 79-WA/HT-37 .... 25 p0071 A80-18627 #
ASME PAPER 79-WA/HT-38 .... 25 p0070 A80-18596 #
ASME PAPER 79-WA/HT-67 .... 25 p0070 A80-18600 #
ASME PAPER 79-WA/SOL-1 .... 25 p0066 A80-18565 #
ASME PAPER 79-WA/SOL-2 .... 25 p0067 A80-18571 #
ASME PAPER 79-WA/SOL-3 .... 25 p0067 A80-18570 #
ASME PAPER 79-WA/SOL-4 .... 25 p0069 A80-18585 #
ASME PAPER 79-WA/SOL-6 .... 25 p0070 A80-18592 #
ASME PAPER 79-WA/SOL-7 .... 25 p0069 A80-18584*#
ASME PAPER 79-WA/SOL-8 .... 25 p0066 A80-18564*#
ASME PAPER 79-WA/SOL-9 .... 25 p0069 A80-18586*#
ASME PAPER 79-WA/SOL-10 .... 25 p0067 A80-18569 #
ASME PAPER 79-WA/SOL-11 .... 25 p0065 A80-18553*#
ASME PAPER 79-WA/SOL-12 .... 25 p0068 A80-18579 #
ASME PAPER 79-WA/SOL-13 .... 25 p0068 A80-18581 #
ASME PAPER 79-WA/SOL-14 .... 25 p0068 A80-18580 #
ASME PAPER 79-WA/SOL-15 .... 25 p0069 A80-18588*#
ASME PAPER 79-WA/SOL-16 .... 25 p0066 A80-18561 #
ASME PAPER 79-WA/SOL-17 .... 25 p0066 A80-18563 #
ASME PAPER 79-WA/SOL-18 .... 25 p0065 A80-18557 #

ASME PAPER 79-WA/SOL-19 .... 25 p0069 A80-18587 #
ASME PAPER 79-WA/SOL-20 .... 25 p0065 A80-18558 #
ASME PAPER 79-WA/SOL-21 .... 25 p0067 A80-18567 #
ASME PAPER 79-WA/SOL-22 .... 25 p0065 A80-18554 #
ASME PAPER 79-WA/SOL-23 .... 25 p0065 A80-18555 #
ASME PAPER 79-WA/SOL-24 .... 25 p0068 A80-18577 #
ASME PAPER 79-WA/SOL-25 .... 25 p0070 A80-18591 #
ASME PAPER 79-WA/SOL-26 .... 25 p0067 A80-18573 #
ASME PAPER 79-WA/SOL-27 .... 25 p0067 A80-18568 #
ASME PAPER 79-WA/SOL-29 .... 25 p0068 A80-18575 #
ASME PAPER 79-WA/SOL-30 .... 25 p0066 A80-18560 #
ASME PAPER 79-WA/SOL-31 .... 25 p0068 A80-18576 #
ASME PAPER 79-WA/SOL-33 .... 25 p0066 A80-18566 #
ASME PAPER 79-WA/SOL-34 .... 25 p0066 A80-18562 #
ASME PAPER 79-WA/SOL-35 .... 25 p0070 A80-18590 #
ASME PAPER 79-WA/SOL-36 .... 25 p0065 A80-18556 #
ASME PAPER 79-WA/SOL-37 .... 25 p0066 A80-18559 #
ASME PAPER 79-WA/SOL-38 .... 25 p0067 A80-18574 #
ASME PAPER 79-WA/SOL-39 .... 25 p0069 A80-18589 #
ASME PAPER 79-WA/SOL-40 .... 25 p0069 A80-18583 #
ASME PAPER 79-WA/SOL-41 .... 25 p0067 A80-18572 #
ASME PAPER 79-WA/SOL-42 .... 25 p0068 A80-18578 #
ASME PAPER 79-WA/TS-6 .... 25 p0065 A80-18552 #

ASSA-10/1978 .... 25 p0116 N80-11632 #

ATR-78(7747)-1-VOL-1 .... 25 p0162 N80-14550 #
ATR-78(7747)-2-VOL-2 .... 25 p0162 N80-14551 #

BCL-OA-TFR-79-4 .... 25 p0118 N80-11747*#
BCL-OA-TFR-79-6 .... 25 p0108 N80-11532*#

BDM/W-79-548-TR .... 25 p0092 N80-10379*#

BDX-613-2039-REV .... 25 p0108 N80-11384 #

BETC-0001-1 .... 25 p0108 N80-11544 #
BETC-2180-4 .... 25 p0108 N80-11546 #

BM-IC-8792 .... 25 p0170 N80-15544 #

BMPT-PB-T-78-26 .... 25 p0107 N80-11368 #
BMPT-PB-T-78-48 .... 25 p0116 N80-11630 #

BNL-NUREG-25635 .... 25 p0104 N80-10922 #

BNL-24779 .... 25 p0170 N80-15346 #
BNL-24906 .... 25 p0180 N80-15897 #
BNL-24911 .... 25 p0098 N80-10624 #
BNL-24999 .... 25 p0117 N80-11639 #
BNL-25908 .... 25 p0142 N80-13654 #
BNL-25909 .... 25 p0101 N80-10651 #
BNL-26045 .... 25 p0099 N80-10633 #
BNL-26209 .... 25 p0136 N80-13294 #
BNL-26218 .... 25 p0162 N80-14552 #
BNL-26238 .... 25 p0158 N80-14522 #
BNL-26331 .... 25 p0167 N80-15227 #
BNL-26390 .... 25 p0178 N80-15634 #
BNL-26482 .... 25 p0141 N80-13650 #
BNL-50924 .... 25 p0139 N80-13632 #
BNL-50944 .... 25 p0134 N80-13277 #
BNL-50959 .... 25 p0157 N80-14512 #
BNL-50962 .... 25 p0111 N80-11585 #
BNL-50968 .... 25 p0142 N80-13651 #
BNL-50974 .... 25 p0129 N80-12610 #

CAEC-36 .... 25 p0151 N80-14272 #
CAEC-500-79-007 .... 25 p0151 N80-14272 #

CAES-11 .... 25 p0145 N80-13687 #

CERL-TR-E-154 .... 25 p0107 N80-11259 #

CGR/DC-12/79 .... 25 p0149 N80-13754 #

CN-ISSN-0082-5255 .... 25 p0119 N80-12189 #

CONF-751270-SUMM .... 25 p0176 N80-15615 #
CONF-761168-SUMM .... 25 p0147 N80-13705 #
CONF-771131 .... 25 p0164 N80-14572 #
CONF-780236-P2 .... 25 p0162 N80-14553 #
CONF-780372 .... 25 p0150 N80-14264 #
CONF-780380 .... 25 p0097 N80-10613 #
CONF-780383 .... 25 p0162 N80-14558 #
CONF-780387-1 .... 25 p0130 N80-12625 #
CONF-780425-7 .... 25 p0115 N80-11620 #
CONF-780432 .... 25 p0174 N80-15599 #
CONF-780447-1 .... 25 p0113 N80-11596 #
CONF-780550-9 .... 25 p0163 N80-14563 #
CONF-780550-10 .... 25 p0129 N80-12611 #
CONF-780714-2 .... 25 p0176 N80-15618 #
CONF-780792 .... 25 p0161 N80-14548 #
CONF-780807-11 .... 25 p0150 N80-14265 #
CONF-780808-23 .... 25 p0163 N80-14569 #
CONF-780808-24 .... 25 p0163 N80-14568 #
CONF-780843-5 .... 25 p0103 N80-10693 #
CONF-780852-1 .... 25 p0164 N80-14573 #
CONF-780867-1 .... 25 p0128 N80-12598 #
CONF-780885-1 .... 25 p0131 N80-12647 #
CONF-780944-1 .... 25 p0174 N80-15600 #
CONF-780952-39 .... 25 p0181 N80-15933 #
CONF-780953-6 .... 25 p0180 N80-15897 #
CONF-780972-1 .... 25 p0126 N80-12579 #
CONF-780983-2 .... 25 p0098 N80-10624 #
CONF-780983-7 .... 25 p0133 N80-12982 #
CONF-781006-2 .... 25 p0175 N80-15611 #
CONF-781027-2 .... 25 p0170 N80-15346 #
CONF-781045-3 .... 25 p0120 N80-12199 #
CONF-781045-4 .... 25 p0120 N80-12200 #
CONF-781046-1 .... 25 p0116 N80-11624 #
CONF-781046-3 .... 25 p0177 N80-15624 #
CONF-781046-4 .... 25 p0175 N80-15612 #
CONF-781046-5 .... 25 p0116 N80-11628 #
CONF-781046-8 .... 25 p0176 N80-15623 #
CONF-781046-9 .... 25 p0115 N80-11618 #
CONF-781046-10 .... 25 p0127 N80-12590 #
CONF-781046-11 .... 25 p0128 N80-12596 #
CONF-781063-1 .... 25 p0175 N80-15613 #
CONF-781063-2 .... 25 p0115 N80-11615 #
CONF-781071-2 .... 25 p0119 N80-12147 #
CONF-781102-1 .... 25 p0126 N80-12577 #
CONF-781102-3 .... 25 p0125 N80-12576 #
CONF-781109-8 .... 25 p0097 N80-10609 #
CONF-781109-22 .... 25 p0120 N80-12201 #
CONF-781110-10 .... 25 p0117 N80-11639 #
CONF-781112-8 .... 25 p0115 N80-11619 #
CONF-781133 .... 25 p0100 N80-10645 #
CONF-781133-3 .... 25 p0096 N80-10608 #
CONF-781142-4 .... 25 p0120 N80-12197 #
CONF-781208 .... 25 p0100 N80-10646 #
CONF-781214-2 .... 25 p0113 N80-11604 #
CONF-781235-3 .... 25 p0113 N80-11602 #
CONF-790105-1 .... 25 p0115 N80-11616 #
CONF-790107-10 .... 25 p0171 N80-15568 #
CONF-790122-3 .... 25 p0178 N80-15639 #
CONF-790127 .... 25 p0167 N80-15220 #
CONF-790213-4 .... 25 p0123 N80-12557 #
CONF-790305-6 .... 25 p0100 N80-10639 #
CONF-790305-7 .... 25 p0146 N80-13694 #
CONF-790328-1 .... 25 p0113 N80-11603 #
CONF-790328-4 .... 25 p0101 N80-10651 #
CONF-790337-4 .... 25 p0093 N80-10391 #
CONF-790358-1 .... 25 p0111 N80-11579 #
CONF-790362-1 .... 25 p0112 N80-11586 #
CONF-790371-1 .... 25 p0145 N80-13689 #
CONF-790373-1 .... 25 p0163 N80-14562 #
CONF-790405-12 .... 25 p0106 N80-11246 #
CONF-790405-14 .... 25 p0112 N80-11590 #
CONF-790415-25 .... 25 p0105 N80-11168 #
CONF-790433-2 .... 25 p0108 N80-11543 #
CONF-790434-3 .... 25 p0106 N80-11245 #
CONF-790444-2 .... 25 p0146 N80-13696 #
CONF-790444-3 .... 25 p0172 N80-15571 #
CONF-790445-1 .... 25 p0103 N80-10688 #
CONF-790445-3 .... 25 p0103 N80-10694 #
CONF-790446-3 .... 25 p0142 N80-13654 #
CONF-790446-6 .... 25 p0147 N80-13706 #
CONF-790447-4 .... 25 p0131 N80-12631 #
CONF-790457-2 .... 25 p0172 N80-15578 #
CONF-790457-3 .... 25 p0171 N80-15566 #
CONF-790459-22 .... 25 p0157 N80-14511 #
CONF-790461-2 .... 25 p0112 N80-11587 #
CONF-790480-1 .... 25 p0167 N80-15259 #
CONF-790481-1 .... 25 p0166 N80-14954 #
CONF-790484-1 .... 25 p0159 N80-14531 #
CONF-790501-2 .... 25 p0160 N80-14538 #
CONF-790515-3 .... 25 p0145 N80-13686 #
CONF-790515-4 .... 25 p0178 N80-15635 #
CONF-790520-2 .... 25 p0168 N80-15281 #
CONF-790520-4 .... 25 p0134 N80-13273 #
CONF-790520-5 .... 25 p0168 N80-15280 #
CONF-790520-6 .... 25 p0134 N80-13275 #
CONF-790520-7 .... 25 p0134 N80-13274 #
CONF-790527-1 .... 25 p0107 N80-11348 #
CONF-790530-1 .... 25 p0102 N80-10661 #
CONF-790538-10 .... 25 p0159 N80-14530 #
CONF-790539-1 .... 25 p0137 N80-13412 #
CONF-790540-3 .... 25 p0137 N80-13375 #

CONF-790541-2 .... 25 p0099 N80-10638 #
CONF-790541-3 .... 25 p0144 N80-13671 #
CONF-790541-12 .... 25 p0159 N80-14528 #
CONF-790541-16 .... 25 p0161 N80-14541 #
CONF-790541-17 .... 25 p0160 N80-14540 #
CONF-790541-20 .... 25 p0124 N80-12566 #
CONF-790541-21 .... 25 p0162 N80-14552 #
CONF-790541-24 .... 25 p0142 N80-13653 #
CONF-790541-32 .... 25 p0159 N80-14527 #
CONF-790541-37 .... 25 p0161 N80-14549 #
CONF-790541-39 .... 25 p0172 N80-15577 #
CONF-790541-54 .... 25 p0143 N80-13665 #
CONF-790550-1 .... 25 p0165 N80-14584 #
CONF-790550-3 .... 25 p0178 N80-15643 #
CONF-790602-14 .... 25 p0104 N80-10922 #
CONF-790602-50 .... 25 p0128 N80-12602 #
CONF-790602-54 .... 25 p0147 N80-13708 #
CONF-790602-69 .... 25 p0149 N80-13917 #
CONF-790605-1 .... 25 p0112 N80-11592 #
CONF-790611-3 .... 25 p0099 N80-10637 #
CONF-790611-5 .... 25 p0151 N80-14269 #
CONF-790622-7 .... 25 p0181 N80-15908 #
CONF-790622-19 .... 25 p0177 N80-15627 #
CONF-790630 .... 25 p0108 N80-11386 #
CONF-790630-9 .... 25 p0136 N80-13295 #
CONF-790631-1 .... 25 p0143 N80-13666 #
CONF-790631-3 .... 25 p0144 N80-13676 #
CONF-790631-6 .... 25 p0124 N80-12564 #
CONF-790636-1 .... 25 p0099 N80-10633 #
CONF-790685-1 .... 25 p0140 N80-13635 #
CONF-790713-1 .... 25 p0151 N80-14346 #
CONF-790803-3 .... 25 p0102 N80-10663 #
CONF-790803-9 .... 25 p0136 N80-13296 #
CONF-790803-07 .... 25 p0160 N80-14535 #
CONF-790803-08 .... 25 p0122 N80-12543 #
CONF-790803-16 .... 25 p0159 N80-14526 #
CONF-790803-17 .... 25 p0102 N80-10664 #
CONF-790803-21 .... 25 p0149 N80-13906 #
CONF-790803-23 .... 25 p0146 N80-13693 #
CONF-790803-25 .... 25 p0129 N80-12605 #
CONF-790803-27 .... 25 p0147 N80-13710 #
CONF-790803-29 .... 25 p0158 N80-14522 #
CONF-790803-42 .... 25 p0175 N80-15609 #
CONF-790803-50 .... 25 p0177 N80-15629 #
CONF-790805-3 .... 25 p0137 N80-13431 #
CONF-790815-2 .... 25 p0136 N80-13297 #
CONF-790822-5 .... 25 p0136 N80-13294 #
CONF-790854-1 .... 25 p0178 N80-15637 #
CONF-790906-10 .... 25 p0141 N80-13647 #
CONF-790906-15 .... 25 p0124 N80-12561 #
CONF-790915-1 .... 25 p0168 N80-15282 #
CONF-790917-7 .... 25 p0169 N80-15288 #
CONF-791007-3 .... 25 p0178 N80-15634 #
CONF-791009-3 .... 25 p0141 N80-13650 #
CONF-791103-16 .... 25 p0167 N80-15227 #
CONF-7804101-1 .... 25 p0176 N80-15616 #
CONF-7804102-6 .... 25 p0121 N80-12291 #
CONF-7804108-3 .... 25 p0130 N80-12614 #
CONF-7805126-5 .... 25 p0126 N80-12586 #
CONF-7805140 .... 25 p0160 N80-14533 #
CONF-7806118 .... 25 p0145 N80-13681 #
CONF-7806153-1 .... 25 p0140 N80-13642 #
CONF-7808102 .... 25 p0102 N80-10665 #
CONF-7808104-1 .... 25 p0097 N80-10611 #
CONF-7809137-1 .... 25 p0158 N80-14523 #
CONF-7809141-1 .... 25 p0098 N80-10621 #
CONF-7810132 .... 25 p0112 N80-11589 #
CONF-7810135-2 .... 25 p0176 N80-15614 #
CONF-7810154-1 .... 25 p0115 N80-11622 #
CONF-7810167-1 .... 25 p0098 N80-10621 #
CONF-7811112-2 .... 25 p0168 N80-15278 #
CONF-7811126-1 .... 25 p0157 N80-14509 #

CONS/5058-T1 .... 25 p0173 N80-15591 #

COO-2577-16 .... 25 p0163 N80-14568 #
COO-2577-17 .... 25 p0176 N80-15616 #
COO-2858-14 .... 25 p0163 N80-14569 #
COO-2858-23 .... 25 p0143 N80-13668 #
COO-2893-9 .... 25 p0174 N80-15595 #
COO-2893-10 .... 25 p0159 N80-14524 #
COO-2934-7 .... 25 p0129 N80-12609 #
COO-2982-38 .... 25 p0169 N80-15291 #
COO-2993-1 .... 25 p0173 N80-15584 #
COO-4094-10 .... 25 p0127 N80-12592 #
COO-4094-17 .... 25 p0116 N80-11627 #
COO-4094-25 .... 25 p0137 N80-13377 #
COO-4094-31 .... 25 p0100 N80-10639 #
COO-4094-41 .... 25 p0178 N80-15638 #
COO-4094-44 .... 25 p0175 N80-15609 #
COO-4094-48 .... 25 p0178 N80-15635 #
COO-4094-53 .... 25 p0146 N80-13692 #
COO-4272-3 .... 25 p0165 N80-14587 #
COO-4297-1 .... 25 p0171 N80-15569 #
COO-4479-2 .... 25 p0101 N80-10655 #
COO-4546-1 .... 25 p0101 N80-10652 #
COO-4546-3 .... 25 p0144 N80-13672 #
COO-4546-4 .... 25 p0101 N80-10653 #
COO-4546-9 .... 25 p0101 N80-10656 #
COO-4557-1 .... 25 p0143 N80-13670 #
COO-4577-7 .... 25 p0124 N80-12566 #
COO-4577-8 .... 25 p0143 N80-13665 #
COO-4628-4-PT-1 .... 25 p0158 N80-14516 #
COO-4649-4 .... 25 p0147 N80-13707 #
COO-4878-3 .... 25 p0146 N80-13694 #
COO-5022-5 .... 25 p0172 N80-15576 #

DM-26 .... 25 p0116 N80-11631 #

DME/NAE-1979-2 .... 25 p0182 N80-16022 #

DOE-TR-159 .... 25 p0130 N80-12612 #

DOE/CS-0056 .... 25 p0163 N80-14567 #
DOE/CS-0089 .... 25 p0174 N80-15598 #
DOE/CS-0093 .... 25 p0168 N80-15279 #
DOE/CS-1830-T3 .... 25 p0099 N80-10635 #
DOE/CS-34267/1 .... 25 p0145 N80-13688 #
DOE/CS/5912-T1 .... 25 p0168 N80-15277 #
DOE/EDP-0030 .... 25 p0147 N80-13701 #
DOE/EDP-0034 .... 25 p0176 N80-15621 #
DOE/EDP-0038 .... 25 p0179 N80-15669 #
DOE/EIA-0102/50 .... 25 p0113 N80-11601 #
DOE/EIA-0102/52 .... 25 p0097 N80-10620 #
DOE/EIA-0103/8 .... 25 p0096 N80-10607 #
DOE/EIA-0103/14 .... 25 p0122 N80-12542 #
DOE/EIA-0182/2 .... 25 p0173 N80-15592 #
DOE/EIA-0183/10 .... 25 p0177 N80-15631 #
DOE/EIA-0184/1 .... 25 p0174 N80-15594 #
DOE/EIA-0184/4 .... 25 p0174 N80-15593 #
DOE/EIA-0184/5 .... 25 p0138 N80-13607 #
DOE/EIA-0192 .... 25 p0177 N80-15630 #
DOE/ER-0025/D .... 25 p0175 N80-15605 #
DOE/ER-0026 .... 25 p0167 N80-15220 #
DOE/ER-0030 .... 25 p0137 N80-13582 #
DOE/ERA-0047 .... 25 p0112 N80-11593 #
DOE/ERA-0048 .... 25 p0126 N80-12582 #
DOE/ERD-0004 .... 25 p0151 N80-14349 #
DOE/ERD-0022 .... 25 p0099 N80-10631 #
DOE/ET-0012/2-REV .... 25 p0140 N80-13637 #
DOE/ET-0019/2 .... 25 p0146 N80-13691 #
DOE/ET-0072 .... 25 p0126 N80-12583 #
DOE/ET-0078/T1 .... 25 p0143 N80-13662 #
DOE/ET-0089 .... 25 p0180 N80-15893 #
DOE/ET-0093 .... 25 p0111 N80-11578 #
DOE/ET-0100 .... 25 p0136 N80-13293 #
DOE/ET-0101 .... 25 p0161 N80-14542 #
DOE/ET-0109 .... 25 p0142 N80-13658 #
DOE/ET-4064-1 .... 25 p0128 N80-12600 #
DOE/ET-4065/1 .... 25 p0147 N80-13711 #
DOE/ET-4065/1-VOL-2-APP .... 25 p0147 N80-13713 #
DOE/ET-4065/1-VOL-3 .... 25 p0148 N80-13714 #
DOE/ET-27139-1 .... 25 p0123 N80-12558 #
DOE/ET-248447/1 .... 25 p0142 N80-13660 #
DOE/EV-0028 .... 25 p0163 N80-14565 #
DOE/EV-0035 .... 25 p0098 N80-10630 #
DOE/EV-0036 .... 25 p0151 N80-14266 #
DOE/EV-0044 .... 25 p0134 N80-13279 #
DOE/EV-70031/4-PT-A/B .... 25 p0148 N80-13723 #
DOE/FERC-0010 .... 25 p0107 N80-11251 #
DOE/HEW/EPA-03 .... 25 p0104 N80-10701 #
DOE/JPL-1012-22-REV-A .... 25 p0110 N80-11570*#
DOE/JPL-1012-33 .... 25 p0155 N80-14492*#
DOE/JPL-1060-20 .... 25 p0155 N80-14491*#
DOE/JPL-1060-25 .... 25 p0155 N80-14488*#
DOE/JPL-1060-28 .... 25 p0154 N80-14484*#
DOE/JPL-954328-79/13 .... 25 p0154 N80-14483*#
DOE/JPL-954830-78/2 .... 25 p0151 N80-14273*#
DOE/JPL-954847-78/4 .... 25 p0109 N80-11562*#
DOE/JPL-954854-77/4 .... 25 p0110 N80-11565*#
DOE/JPL-955089-79/4 .... 25 p0109 N80-11561*#
DOE/JPL-955149-79/1 .... 25 p0154 N80-14482*#
DOE/JPL-955149-79/1-APP .... 25 p0154 N80-14481*#
DOE/MC-08089-T1 .... 25 p0093 N80-10387 #
DOE/NASA-2674-79/7 .... 25 p0095 N80-10595*#
DOE/NASA/0001-79/1 .... 25 p0122 N80-12551*#
DOE/NASA/0032-79/4 .... 25 p0150 N80-13989*#
DOE/NASA/0054-79/1 .... 25 p0167 N80-15263*#

DOE/NASA/0058-79/3 .... 25 p0109 N80-11558*#
DOE/NASA/0067-79-2 .... 25 p0096 N80-10603*#
DOE/NASA/1034-79/6 .... 25 p0171 N80-15560*#
DOE/NASA/1059-79/4 .... 25 p0138 N80-13623*#
DOE/NASA/1062-79/3 .... 25 p0138 N80-13624*#
DOE/NASA/2593-79/11 .... 25 p0155 N80-14493*#
DOE/NASA/2674-79/8 .... 25 p0166 N80-14922*#
DOE/NASA/5906-79/1 .... 25 p0170 N80-15553*#
DOE/NASA/20370-79/18 .... 25 p0137 N80-13490*#
DOE/NASA/20370-79/19 .... 25 p0170 N80-15422*#
DOE/PE-0007 .... 25 p0181 N80-15993 #
DOE/PE-0010 .... 25 p0115 N80-11621 #
DOE/PE-0012 .... 25 p0169 N80-15290 #
DOE/RA-23-216.00.0-02 .... 25 p0143 N80-13667 #
DOE/RA-0037 .... 25 p0178 N80-15640 #
DOE/RL-90476-13 .... 25 p0169 N80-15293 #
DOE/SF/10505-1 .... 25 p0143 N80-13663 #
DOE/TIC-4579-R10-SUPPL-4 .... 25 p0128 N80-12601 #
DOE/TIC-4585-R1-SUPPL-1 .... 25 p0097 N80-10617 #
DOE/TIC-10067 .... 25 p0104 N80-10965 #
DOE/TIC-10071 .... 25 p0128 N80-12603 #
DOE/TIC-10103 .... 25 p0096 N80-10606 #
DOE/TIC-10109 .... 25 p0097 N80-10618 #
DOE/TIC-10118 .... 25 p0100 N80-10644 #
DOE/TIC-10119 .... 25 p0166 N80-14894 #
DOE/TIC-10127 .... 25 p0157 N80-14515 #

DOT-HS-803-668 .... 25 p0166 N80-14976 #

DOT-TSC-NHTSA-79-43 .... 25 p0166 N80-14976 #

DP-MS-79-2 .... 25 p0149 N80-13917 #

DPM-RAB/SHS-78-1 .... 25 p0108 N80-11551 #

DRL-74/DRD-SE .... 25 p0109 N80-11561*#

D180-25381-1 .... 25 p0105 N80-11121*#
D180-25402-1 .... 25 p0105 N80-11122*#
D180-25461-1 .... 25 p0167 N80-15195*#

E-159 .... 25 p0095 N80-10595*#
E-211 .... 25 p0137 N80-13490*#
E-235 .... 25 p0170 N80-15422*#
E-251 .... 25 p0166 N80-15133*#
E-257 .... 25 p0166 N80-14922*#
E-263 .... 25 p0155 N80-14493*#
E-264 .... 25 p0132 N80-12881*#
E-269 .... 25 p0138 N80-13624*#
E-274 .... 25 p0123 N80-12552*#
E-285 .... 25 p0171 N80-15560*#
E-291 .... 25 p0167 N80-15204*#
E-297 .... 25 p0170 N80-15554*#

EMD-78-68 .... 25 p0103 N80-10679 #
EMD-79-19 .... 25 p0164 N80-14575 #
EMD-79-27 .... 25 p0181 N80-15946 #
EMD-79-68 .... 25 p0103 N80-10678 #
EMD-79-84 .... 25 p0151 N80-14279 #

EPA-600/J-78-111 .... 25 p0165 N80-14595 #
EPA-600/4-79-018 .... 25 p0153 N80-14470 #
EPA-600/7-78-174 .... 25 p0094 N80-10398 #
EPA-600/7-79-007 .... 25 p0180 N80-15691 #
EPA-600/7-79-022C .... 25 p0179 N80-15682 #
EPA-600/7-79-029B .... 25 p0131 N80-12637 #
EPA-600/7-79-060A-VOL-1 .... 25 p0152 N80-14463 #
EPA-600/7-79-060B-VOL-2 .... 25 p0152 N80-14464 #
EPA-600/7-79-060C-VOL-3 .... 25 p0152 N80-14465 #
EPA-600/7-79-060D-VOL-4 .... 25 p0152 N80-14466 #
EPA-600/7-79-060E-VOL-5 .... 25 p0152 N80-14467 #
EPA-600/7-79-060F-VOL-6 .... 25 p0152 N80-14468 #
EPA-600/7-79-074 .... 25 p0180 N80-15685 #
EPA-600/7-79-104A .... 25 p0165 N80-14590 #
EPA-600/7-79-104B .... 25 p0165 N80-14591 #
EPA-600/7-79-110-VOL-1 .... 25 p0179 N80-15681 #
EPA-600/7-79-117 .... 25 p0117 N80-11656 #
EPA-600/7-79-120 .... 25 p0120 N80-12204 #
EPA-600/7-79-131 .... 25 p0180 N80-15688 #
EPA-600/7-79-132 .... 25 p0180 N80-15687 #
EPA-600/7-79-146 .... 25 p0179 N80-15676 #
EPA-600/7-79-150 .... 25 p0169 N80-15294 #
EPA-600/7-89-133 .... 25 p0104 N80-10700 #
EPA-600/8-79-023A .... 25 p0117 N80-11670 #
EPA-600/8-79-023H .... 25 p0117 N80-11634 #

EPRI-AF-1002 .... 25 p0096 N80-10605 #
EPRI-AF-1084 .... 25 p0136 N80-13292 #

EPRI-EA-674 .... 25 p0095 N80-10584 #
EPRI-EA-894 .... 25 p0175 N80-15604 #
EPRI-EA-1018 .... 25 p0103 N80-10692 #
EPRI-EA-1079 .... 25 p0157 N80-14514 #
EPRI-EA-1115 .... 25 p0175 N80-15606 #

EPRI-EM-1005 .... 25 p0098 N80-10628 #
EPRI-EM-1134 .... 25 p0141 N80-13646 #

EPRI-ER-513 .... 25 p0160 N80-14536 #
EPRI-ER-746-SR .... 25 p0107 N80-11250 #
EPRI-ER-778-SR .... 25 p0178 N80-15642 #
EPRI-ER-845 .... 25 p0102 N80-10662 #
EPRI-ER-863 .... 25 p0114 N80-11607 #
EPRI-ER-966-SR .... 25 p0162 N80-14560 #
EPRI-ER-978-VOL-3 .... 25 p0139 N80-13628 #
EPRI-ER-979 .... 25 p0097 N80-10610 #
EPRI-ER-1004 .... 25 p0160 N80-14537 #
EPRI-ER-1034 .... 25 p0118 N80-11935 #
EPRI-ER-1095-SR .... 25 p0147 N80-13703 #

EPRI-FP-1028 .... 25 p0119 N80-12192 #

E80-10033 .... 25 p0170 N80-15528*#

FE-1207-62 .... 25 p0135 N80-13288 #
FE-1784-42 .... 25 p0106 N80-11248 #
FE-1800-30 .... 25 p0135 N80-13291 #
FE-1800-33 .... 25 p0135 N80-13287 #
FE-2025-38 .... 25 p0130 N80-12624 #
FE-2247-2 .... 25 p0119 N80-12191 #
FE-2247-22 .... 25 p0135 N80-13289 #
FE-2286-32 .... 25 p0134 N80-13281 #
FE-2307-38 .... 25 p0106 N80-11249 #
FE-2307-46 .... 25 p0134 N80-13280 #
FE-2435-32 .... 25 p0150 N80-14258 #
FE-2447-13 .... 25 p0093 N80-10388 #
FE-2489-33 .... 25 p0093 N80-10390 #
FE-2537-7 .... 25 p0120 N80-12198 #
FE-2621-3 .... 25 p0119 N80-12163 #
FE-11270-1 .... 25 p0180 N80-15691 #

FJSRL-TR-79-0006 .... 25 p0123 N80-12553 #

F3737-QR-102 .... 25 p0109 N80-11560*#

GEAEP-54 .... 25 p0154 N80-14484*#

GIT-B-519-F .... 25 p0118 N80-11965 #

GPO-35-120 .... 25 p0181 N80-15994 #
GPO-36-211 .... 25 p0095 N80-10599 #
GPO-41-481 .... 25 p0122 N80-12550 #
GPO-42-797 .... 25 p0109 N80-11557 #
GPO-43-586 .... 25 p0109 N80-11556 #
GPO-51-336 .... 25 p0104 N80-10964 #

GURC-REPT-165 .... 25 p0130 N80-12624 #

HCP/B8072-01 .... 25 p0118 N80-11941 #
HCP/CS-0023 .... 25 p0162 N80-14561 #
HCP/CS-2522 .... 25 p0127 N80-12591 #
HCP/C4101 .... 25 p0093 N80-10389 #
HCP/ET/4000-78/1 .... 25 p0120 N80-12202 #
HCP/EV6119-1 .... 25 p0098 N80-10629 #
HCP/I6346-01/1-VOL-1 .... 25 p0139 N80-13633 #
HCP/M1011-04 .... 25 p0118 N80-11954*#
HCP/M2098-03 .... 25 p0135 N80-13283 #
HCP/M2165 .... 25 p0129 N80-12606 #
HCP/M2752-01 .... 25 p0092 N80-10383 #
HCP/M5056-01 .... 25 p0110 N80-11573 #
HCP/M8662-1 .... 25 p0114 N80-11606 #
HCP/P3885 .... 25 p0115 N80-11621 #
HCP/R4024-01/14 .... 25 p0101 N80-10657 #
HCP/T2286-01 .... 25 p0093 N80-10392 #
HCP/T2898 .... 25 p0113 N80-11599 #
HCP/T2898-01/3 .... 25 p0142 N80-13656 #
HCP/T4016-1 .... 25 p0132 N80-12707 #
HCP/T4016-01/2 .... 25 p0149 N80-13747 #
HCP/T4022-01 .... 25 p0162 N80-14559 #
HCP/T4024-01/15 .... 25 p0163 N80-14566 #
HCP/T4101-03 .... 25 p0093 N80-10393 #
HCP/T5043-01 .... 25 p0157 N80-14510 #
HCP/U6354-01 .... 25 p0124 N80-12567 #

HEDL-SA-1559 .... 25 p0119 N80-12147 #

HONEYWELL-F3437-QR-101 .... 25 p0096 N80-10602*#

REPORT/ACCESSION NUMBER INDEX

IAF PAPER 79-IISL-03 .... 25 p0047 A80-17064 #

ICTIS/TR-02 .... 25 p0106 N80-11179 #
ICTIS/TR-03 .... 25 p0117 N80-11647 #
ICTIS/TR-05 .... 25 p0106 N80-11180 #

ID-12027-1 .... 25 p0173 N80-15591 #

IIASA-RR-78-17 .... 25 p0109 N80-11554

IMS-001/PE/1 .... 25 p0170 N80-15420 #

IR-1 .... 25 p0114 N80-11607 #

IS-M-166 .... 25 p0125 N80-12576 #
IS-M-202 .... 25 p0129 N80-12611 #

IS-4655 .... 25 p0145 N80-13679 #
IS-4703 .... 25 p0147 N80-13702 #

ISBN-0-309-02874-4 .... 25 p0102 N80-10677 #
ISBN-0-930978-04-8 .... 25 p0164 N80-14574 #
ISBN-92-835-1326-6 .... 25 p0103 N80-10683 #
ISBN-92-9029-016-1 .... 25 p0106 N80-11179 #
ISBN-92-9029-017-X .... 25 p0117 N80-11647 #
ISBN-92-9029-024-2 .... 25 p0106 N80-11180 #
ISBN-951-38-0704-5 .... 25 p0118 N80-11891 #

JPL-PUB-79-83 .... 25 p0155 N80-14488*#
JPL-PUB-79-107 .... 25 p0155 N80-14491*#
JPL-PUB-79-110 .... 25 p0155 N80-14492*#

L-13440 .... 25 p0109 N80-11559*#

LA-UR-78-1149 .... 25 p0113 N80-11596 #
LA-UR-78-2556 .... 25 p0100 N80-10646 #
LA-UR-78-2587 .... 25 p0126 N80-12577 #
LA-UR-78-2861 .... 25 p0100 N80-10645 #
LA-UR-78-2895 .... 25 p0120 N80-12197 #
LA-UR-78-2986 .... 25 p0115 N80-11616 #
LA-UR-79-226 .... 25 p0151 N80-14346 #
LA-UR-79-621 .... 25 p0136 N80-13297 #
LA-UR-79-628 .... 25 p0159 N80-14526 #
LA-UR-79-665 .... 25 p0108 N80-11543 #
LA-UR-79-723 .... 25 p0112 N80-11592 #
LA-UR-79-950 .... 25 p0099 N80-10637 #
LA-UR-79-1057 .... 25 p0107 N80-11348 #
LA-UR-79-1115 .... 25 p0136 N80-13296 #
LA-UR-79-1220 .... 25 p0160 N80-14535 #
LA-UR-79-1241 .... 25 p0095 N80-10472 #
LA-UR-79-1242 .... 25 p0149 N80-13906 #
LA-UR-79-1256 .... 25 p0129 N80-12605 #
LA-UR-79-1393 .... 25 p0165 N80-14584 #
LA-UR-79-1598 .... 25 p0178 N80-15643 #
LA-UR-79-1599 .... 25 p0142 N80-13653 #

LA-6953-MS .... 25 p0094 N80-10443 #
LA-7385-SR .... 25 p0114 N80-11608 #
LA-7497-MS .... 25 p0117 N80-11641 #
LA-7519-PR .... 25 p0118 N80-11889 #
LA-7807-HDR .... 25 p0144 N80-13673 #
LA-7820-PR .... 25 p0145 N80-13690 #
LA-7821-MS .... 25 p0144 N80-13677 #
LA-7822 .... 25 p0169 N80-15289 #
LA-7866-TASE .... 25 p0171 N80-15565 #
LA-7909-MS .... 25 p0140 N80-13634 #

LBL-4432-REV-1 .... 25 p0118 N80-11946 #
LBL-7070 .... 25 p0176 N80-15618 #
LBL-7860-VOL-2 .... 25 p0127 N80-12589 #
LBL-7882 .... 25 p0098 N80-10621 #
LBL-7883 .... 25 p0141 N80-13648 #
LBL-7893 .... 25 p0097 N80-10611 #
LBL-7896-PT-3 .... 25 p0114 N80-11614 #
LBL-8298 .... 25 p0126 N80-12588 #
LBL-8308 .... 25 p0126 N80-12586 #
LBL-8371 .... 25 p0131 N80-12647 #
LBL-8391 .... 25 p0133 N80-12982 #
LBL-8431 .... 25 p0160 N80-14533 #
LBL-8703 .... 25 p0171 N80-15568 #
LBL-8857 .... 25 p0161 N80-14549 #
LBL-8919 .... 25 p0111 N80-11579 #
LBL-8925 .... 25 p0145 N80-13680 #

LC-78-62956 .... 25 p0164 N80-14574 #
LC-78-606163 .... 25 p0093 N80-10392 #
LC-79-600126 .... 25 p0167 N80-15275 #

MDC-G7399-VOL-1 .... 25 p0146 N80-13700 #

METC-8089-T4 .... 25 p0135 N80-13290 #

METC/CR-79/22 .... 25 p0149 N80-13735 #
METC/RI-79/4 .... 25 p0093 N80-10386 #

MITSG-79/16 .... 25 p0164 N80-14576 #

MLM-2419 .... 25 p0164 N80-14570 #
MLM-2598(CP) .... 25 p0113 N80-11603 #
MLM-2625-OP .... 25 p0160 N80-14540 #
MLM-2626-OP .... 25 p0161 N80-14541 #

MPR-92 .... 25 p0135 N80-13288 #

MTI-79ASE77RE2 .... 25 p0150 N80-13989*#

MTR-79W0022 .... 25 p0133 N80-12962 #
MTR-79W00137 .... 25 p0104 N80-10701 #
MTR-79W00160 .... 25 p0107 N80-11255 #

NASA-CASE-LEW-12586-1 .... 25 p0153 N80-14472*

NASA-CASE-MFS-23720-2 .... 25 p0152 N80-14423*
NASA-CASE-MFS-23727-1 .... 25 p0153 N80-14473*

NASA-CASE-NPO-13652-3 .... 25 p0153 N80-14474*
NASA-CASE-NPO-13758-2 .... 25 p0092 N80-10377*#
NASA-CASE-NPO-13849-1 .... 25 p0092 N80-10374*
NASA-CASE-NPO-13907-1 .... 25 p0092 N80-10374*
NASA-CASE-NPO-14231-1 .... 25 p0104 N80-10709*
NASA-CASE-NPO-14315-1 .... 25 p0092 N80-10361*#

NASA-CR-150618 .... 25 p0096 N80-10602*#
NASA-CR-150683 .... 25 p0119 N80-12106*#
NASA-CR-150696 .... 25 p0171 N80-15563*#
NASA-CR-150706 .... 25 p0096 N80-10601*#
NASA-CR-150873 .... 25 p0109 N80-11560*#
NASA-CR-159163 .... 25 p0106 N80-11238*#
NASA-CR-159497 .... 25 p0109 N80-11558*#
NASA-CR-159599 .... 25 p0122 N80-12551*#
NASA-CR-159631 .... 25 p0150 N80-13989*#
NASA-CR-159659 .... 25 p0136 N80-13362*#
NASA-CR-159660 .... 25 p0154 N80-14480*#
NASA-CR-159705 .... 25 p0096 N80-10603*#
NASA-CR-159706 .... 25 p0167 N80-15263*#
NASA-CR-159725 .... 25 p0170 N80-15553*#
NASA-CR-159729 .... 25 p0151 N80-14386*#
NASA-CR-160320 .... 25 p0096 N80-10600*#
NASA-CR-160377 .... 25 p0105 N80-11121*#
NASA-CR-160378 .... 25 p0105 N80-11122*#
NASA-CR-160398 .... 25 p0138 N80-13622*#
NASA-CR-160442 .... 25 p0167 N80-15195*#
NASA-CR-161189 .... 25 p0156 N80-14500*#
NASA-CR-161253 .... 25 p0156 N80-14497*#
NASA-CR-161322 .... 25 p0092 N80-10379*#
NASA-CR-161323 .... 25 p0096 N80-10604*#
NASA-CR-161329 .... 25 p0122 N80-12538*#
NASA-CR-161330 .... 25 p0122 N80-12539*#
NASA-CR-161331 .... 25 p0122 N80-12540*#
NASA-CR-162417 .... 25 p0095 N80-10596 #
NASA-CR-162421 .... 25 p0110 N80-11570*#
NASA-CR-162423 .... 25 p0108 N80-11532*#
NASA-CR-162425 .... 25 p0110 N80-11564*#
NASA-CR-162426 .... 25 p0110 N80-11565*#
NASA-CR-162427 .... 25 p0109 N80-11561*#
NASA-CR-162429 .... 25 p0109 N80-11562*#
NASA-CR-162435 .... 25 p0118 N80-11747*#
NASA-CR-162444 .... 25 p0170 N80-15528*#
NASA-CR-162457 .... 25 p0118 N80-11954*#
NASA-CR-162528 .... 25 p0154 N80-14482*#
NASA-CR-162529 .... 25 p0154 N80-14481*#
NASA-CR-162534 .... 25 p0154 N80-14483*#
NASA-CR-162535 .... 25 p0151 N80-14273*#
NASA-CR-162536 .... 25 p0155 N80-14488*#
NASA-CR-162541 .... 25 p0155 N80-14492*#
NASA-CR-162544 .... 25 p0154 N80-14484*#
NASA-CR-162546 .... 25 p0155 N80-14491*#

NASA-TM-78226 .... 25 p0137 N80-13601*#
NASA-TM-78243 .... 25 p0156 N80-14498*#
NASA-TM-78244 .... 25 p0155 N80-14495*#
NASA-TM-78245 .... 25 p0156 N80-14499*#
NASA-TM-78246 .... 25 p0156 N80-14496*#
NASA-TM-78251 .... 25 p0156 N80-14501*#
NASA-TM-78253 .... 25 p0171 N80-15562*#
NASA-TM-79249 .... 25 p0095 N80-10595*#

NASA-TM-79275 .... 25 p0138 N80-13623*#
NASA-TM-79284 .... 25 p0137 N80-13490*#
NASA-TM-79291 .... 25 p0170 N80-15422*#
NASA-TM-79301 .... 25 p0166 N80-15133*#
NASA-TM-79305 .... 25 p0166 N80-14922*#
NASA-TM-79307 .... 25 p0155 N80-14493*#
NASA-TM-79308 .... 25 p0132 N80-12881*#
NASA-TM-79313 .... 25 p0138 N80-13624*#
NASA-TM-79318 .... 25 p0123 N80-12552*#
NASA-TM-80177 .... 25 p0105 N80-11053*#
NASA-TM-80194 .... 25 p0150 N80-14114*#
NASA-TM-80577 .... 25 p0133 N80-12957*#
NASA-TM-81380 .... 25 p0171 N80-15560*#
NASA-TM-81383 .... 25 p0167 N80-15204*#
NASA-TM-81387 .... 25 p0170 N80-15554*#

NASA-TP-1564 .... 25 p0109 N80-11559*#

NBS-SP-556 .... 25 p0167 N80-15275 #

NBS/DIM-63/6 .... 25 p0105 N80-10975 #

NBSIR-79-1756 .... 25 p0121 N80-12300 #
NBSIR-79-1792 .... 25 p0181 N80-16004 #

NEL-662 .... 25 p0136 N80-13318 #

NMEI-10-1 .... 25 p0172 N80-15582 #
NMEI-37 .... 25 p0169 N80-15298 #
NMEI-38 .... 25 p0153 N80-14471 #
NMEI-42 .... 25 p0179 N80-15645 #

NOAA-TM-ERL-APCL-22 .... 25 p0180 N80-15758 #

NOAA-79080910 .... 25 p0164 N80-14576 #
NOAA-79081403 .... 25 p0180 N80-15758 #

NRL-MR-4060 .... 25 p0150 N80-14259 #

NSF/RA-780511 .... 25 p0118 N80-11711 #
NSF/RA-780608 .... 25 p0130 N80-12615 #
NSF/RA-780616 .... 25 p0169 N80-15297 #
NSF/RA-790003 .... 25 p0166 N80-14962 #
NSF/RA-790007 .... 25 p0118 N80-11965 #

NSR-8-1 .... 25 p0151 N80-14386*#

NTIS/PS-76/0447 .... 25 p0102 N80-10674 #
NTIS/PS-76/0463 .... 25 p0148 N80-13719 #
NTIS/PS-76/0465 .... 25 p0148 N80-13720 #
NTIS/PS-76/0550 .... 25 p0103 N80-10681 #
NTIS/PS-77/0515 .... 25 p0102 N80-10674 #
NTIS/PS-77/0561 .... 25 p0148 N80-13715 #
NTIS/PS-77/0562 .... 25 p0148 N80-13716 #
NTIS/PS-77/0563 .... 25 p0148 N80-13719 #
NTIS/PS-77/0565 .... 25 p0148 N80-13720 #
NTIS/PS-77/0634 .... 25 p0103 N80-10681 #
NTIS/PS-78/0572 .... 25 p0102 N80-10674 #
NTIS/PS-78/0664 .... 25 p0148 N80-13715 #
NTIS/PS-78/0665 .... 25 p0148 N80-13716 #
NTIS/PS-78/0666 .... 25 p0148 N80-13719 #
NTIS/PS-78/0667 .... 25 p0148 N80-13720 #
NTIS/PS-78/0690 .... 25 p0103 N80-10681 #
NTIS/PS-79/0632/4 .... 25 p0102 N80-10674 #
NTIS/PS-79/0764/5 .... 25 p0102 N80-10668 #
NTIS/PS-79/0765/2 .... 25 p0102 N80-10667 #
NTIS/PS-79/0771/0 .... 25 p0094 N80-10397 #
NTIS/PS-79/0772/8 .... 25 p0094 N80-10402 #
NTIS/PS-79/0773/6 .... 25 p0094 N80-10401 #
NTIS/PS-79/0782/7 .... 25 p0103 N80-10681 #
NTIS/PS-79/0814/8 .... 25 p0148 N80-13715 #
NTIS/PS-79/0815/5 .... 25 p0148 N80-13716 #
NTIS/PS-79/0816/3 .... 25 p0148 N80-13717 #
NTIS/PS-79/0817/1 .... 25 p0148 N80-13719 #
NTIS/PS-79/0818/9 .... 25 p0148 N80-13718 #
NTIS/PS-79/0819/7 .... 25 p0148 N80-13720 #

NYSERDA-78/18 .... 25 p0107 N80-11254 #

OPPORTUNITY-BRIEF-15 .... 25 p0164 N80-14576 #

ORAU-158 .... 25 p0179 N80-15670 #

ORAU/IEA-78-17(M) .... 25 p0127 N80-12594 #
ORAU/IEA-78-20(M) .... 25 p0127 N80-12595 #
ORAU/IEA-79-8(R) .... 25 p0122 N80-12544 #

ORNL/CON-23 .... 25 p0176 N80-15619 #
ORNL/CON-27 .... 25 p0126 N80-12580 #

ORNL/PPA-79/2 .... 25 p0138 N80-13605 #
ORNL/SUB-7321-1 .... 25 p0130 N80-12613 #
ORNL/TM-63-2 .... 25 p0177 N80-15625 #
ORNL/TM-5758 .... 25 p0098 N80-10627 #
ORNL/TM-6533 .... 25 p0125 N80-12575 #
ORNL/TM-6605 .... 25 p0125 N80-12568 #
ORNL/TM-6622 .... 25 p0176 N80-15620 #
ORNL/TM-6668 .... 25 p0128 N80-12599 #
ORNL/TM-6934 .... 25 p0139 N80-13631 #

ORO-5301-34 .... 25 p0108 N80-11545 #
ORO-5523-T1 .... 25 p0173 N80-15590 #

OSU-SEL-5-510X .... 25 p0164 N80-14577 #

OU-AMNE-78-5 .... 25 p0115 N80-11622 #
OU-AMNE-78-6 .... 25 p0116 N80-11623 #

PAPER-77-26.6-REV .... 25 p0165 N80-14595 #

PB-296479/9 .... 25 p0130 N80-12615 #
PB-296523/4 .... 25 p0094 N80-10398 #
PB-296532/5 .... 25 p0117 N80-11633 #
PB-296547/3 .... 25 p0118 N80-11711 #
PB-296622/4 .... 25 p0107 N80-11254 #
PB-296623/2 .... 25 p0102 N80-10677 #
PB-296624/0 .... 25 p0094 N80-10396 #
PB-296628/2 .... 25 p0103 N80-10679 #
PB-296650/5 .... 25 p0094 N80-10400 #
PB-296969/9 .... 25 p0103 N80-10678 #
PB-297043/2 .... 25 p0164 N80-14574 #
PB-297274/3 .... 25 p0108 N80-11551 #
PB-297583/7 .... 25 p0170 N80-15420 #
PB-297587/8 .... 25 p0104 N80-10700 #
PB-297618/1 .... 25 p0104 N80-10701 #
PB-297756/9 .... 25 p0108 N80-11487 #
PB-297836/9 .... 25 p0105 N80-10975 #
PB-297853/4 .... 25 p0107 N80-11255 #
PB-297882/3 .... 25 p0164 N80-14575 #
PB-297947/4 .... 25 p0117 N80-11656 #
PB-297980/5 .... 25 p0133 N80-12962 #
PB-297984/7 .... 25 p0153 N80-14470 #
PB-298109/0 .... 25 p0120 N80-12204 #
PB-298473/0 .... 25 p0165 N80-14595 #
PB-298494/6 .... 25 p0131 N80-12637 #
PB-298535/6 .... 25 p0151 N80-14279 #
PB-298541/4 .... 25 p0164 N80-14577 #
PB-298574/5 .... 25 p0121 N80-12300 #
PB-298580/2 .... 25 p0117 N80-11670 #
PB-298587/7 .... 25 p0117 N80-11634 #
PB-298785/7 .... 25 p0165 N80-14578 #
PB-298796/4 .... 25 p0118 N80-11965 #
PB-298847/5 .... 25 p0166 N80-14976 #
PB-298986/1 .... 25 p0166 N80-14962 #
PB-299077/8 .... 25 p0151 N80-14272 #
PB-299100/8 .... 25 p0180 N80-15691 #
PB-299177/6 .... 25 p0152 N80-14463 #
PB-299178/4 .... 25 p0152 N80-14464 #
PB-299179/2 .... 25 p0152 N80-14465 #
PB-299180/0 .... 25 p0152 N80-14466 #
PB-299181/8 .... 25 p0152 N80-14467 #
PB-299182/6 .... 25 p0152 N80-14468 #
PB-299183/4 .... 25 p0180 N80-15688 #
PB-299191/7 .... 25 p0165 N80-14590 #
PB-299192/5 .... 25 p0165 N80-14591 #
PB-299238/6 .... 25 p0180 N80-15685 #
PB-299271/7 .... 25 p0179 N80-15645 #
PB-299325/1 .... 25 p0180 N80-15687 #
PB-299399/6 .... 25 p0179 N80-15682 #
PB-299448/2 .... 25 p0170 N80-15304 #
PB-299489/5 .... 25 p0153 N80-14471 #
PB-299568/6 .... 25 p0170 N80-15544 #
PB-299575/1 .... 25 p0169 N80-15294 #
PB-299733/6 .... 25 p0181 N80-15992 #
PB-299851/6 .... 25 p0164 N80-14576 #
PB-299928/2 .... 25 p0180 N80-15699 #
PB-299951/4 .... 25 p0167 N80-15275 #
PB-300375/3 .... 25 p0179 N80-15681 #
PB-300383/7 .... 25 p0179 N80-15676 #
PB-300491/8 .... 25 p0181 N80-16004 #
PB-300692/1 .... 25 p0181 N80-15946 #
PB-300720/0 .... 25 p0180 N80-15758 #
PB-301104/6 .... 25 p0169 N80-15296 #
PB-301256/4 .... 25 p0169 N80-15297 #
PB-301390/1 .... 25 p0169 N80-15298 #
PB-310245/7 .... 25 p0179 N80-15648 #

PNL-2538 .... 25 p0165 N80-14655 #
PNL-2711 .... 25 p0098 N80-10625 #

PNL-2742 25 p0113 N80-11605 #
PNL-2763 25 p0097 N80-10613 #
PNL-2768 25 p0092 N80-10382 #
PNL-2935 25 p0160 N80-14534 #

PR-1 25 p0098 N80-10628 #
PR-9 25 p0169 N80-15293 #

PRF-8601 25 p0169 N80-15296 #

PRRL-78-CR-42 25 p0143 N80-13670 #

PUBL-96-10 25 p0109 N80-11557 #

QPR-10 25 p0134 N80-13277 #

QR-1 25 p0106 N80-11249 #
QR-1 25 p0133 N80-13272 #
QR-1 25 p0173 N80-15591 #
QR-2 25 p0168 N80-15277 #
QR-3 25 p0096 N80-10603*#
QR-3 25 p0134 N80-13280 #
QR-8 25 p0150 N80-14258 #

RAND/R-2257-DOE 25 p0099 N80-10634 #
RAND/R-2335-DOE 25 p0099 N80-10636 #

RE-586 25 p0091 N80-10329 #

REPT-78/293 25 p0180 N80-15687 #

RHO-SA-107 25 p0095 N80-10504 #

RLO-788-5 25 p0112 N80-11589 #
RLO-2227-T22-13 25 p0169 N80-15293 #
RLO-2227-T31-4-PT-A/B 25 p0148 N80-13723 #

RLO/2221-T14/1 25 p0123 N80-12558 #

RM-690 25 p0094 N80-10414 #

RR-9 25 p0108 N80-11551 #

SAN-0034/263-1 25 p0141 N80-13643 #
SAN-0113-T3 25 p0145 N80-13678 #
SAN-0115-T1 25 p0168 N80-15276 #
SAN-1331-T1 25 p0174 N80-15596 #
SAN-1590-1/3-VOL-3 25 p0101 N80-10654 #
SAN-1592-1 25 p0101 N80-10658 #
SAN-1605/7-VOL-1 25 p0146 N80-13700 #

SAND-77-1701 25 p0132 N80-12709 #
SAND-78-0958C 25 p0174 N80-15600 #
SAND-78-0977 25 p0111 N80-11580 #
SAND-78-0982 25 p0111 N80-11582 #
SAND-78-0983 25 p0173 N80-15585 #
SAND-78-0986 25 p0125 N80-12571 #
SAND-78-1088 25 p0114 N80-11613 #
SAND-78-1177 25 p0140 N80-13642 #
SAND-78-1260 25 p0132 N80-12894 #
SAND-78-1769 25 p0111 N80-11581 #
SAND-78-1851C 25 p0126 N80-12579 #
SAND-78-1865C 25 p0177 N80-15624 #
SAND-78-1982C 25 p0127 N80-12590 #
SAND-78-1999C 25 p0176 N80-15623 #
SAND-78-2006C 25 p0096 N80-10608 #
SAND-78-2094C 25 p0159 N80-14527 #
SAND-78-2163C 25 p0146 N80-13693 #
SAND-78-2186C 25 p0171 N80-15566 #
SAND-78-2187C 25 p0172 N80-15578 #
SAND-78-2228 25 p0125 N80-12572 #
SAND-78-2292C 25 p0097 N80-10609 #
SAND-78-2305C 25 p0147 N80-13710 #
SAND-78-2367C 25 p0122 N80-12543 #
SAND-78-7022 25 p0141 N80-13644 #
SAND-78-7049 25 p0176 N80-15622 #
SAND-78-7070 25 p0115 N80-11622 #
SAND-78-7073 25 p0116 N80-11623 #
SAND-78-7074 25 p0128 N80-12597 #
SAND-78-8020 25 p0098 N80-10626 #
SAND-78-8180 25 p0097 N80-10612 #
SAND-78-8188 25 p0097 N80-10616 #
SAND-78-8272 25 p0092 N80-10384 #
SAND-78-8511 25 p0175 N80-15601 #
SAND-79-0418 25 p0100 N80-10640 #
SAND-79-0422 25 p0172 N80-15574 #
SAND-79-0504C 25 p0099 N80-10638 #
SAND-79-0514 25 p0141 N80-13645 #
SAND-79-0738C 25 p0169 N80-15288 #
SAND-79-0787 25 p0178 N80-15641 #
SAND-79-0801 25 p0124 N80-12563 #
SAND-79-0868C 25 p0137 N80-13431 #
SAND-79-0890C 25 p0137 N80-13375 #
SAND-79-0933C 25 p0181 N80-15908 #
SAND-79-0997C 25 p0160 N80-14538 #
SAND-79-1053C 25 p0144 N80-13671 #
SAND-79-1165C 25 p0172 N80-15577 #
SAND-79-1246C 25 p0177 N80-15627 #
SAND-79-1400 25 p0133 N80-13272 #
SAND-79-1428C 25 p0124 N80-12559 #
SAND-79-1642C 25 p0178 N80-15637 #
SAND-79-1669C 25 p0140 N80-13640 #
SAND-79-7005 25 p0100 N80-10650 #
SAND-79-7017 25 p0144 N80-13675 #
SAND-79-7021 25 p0146 N80-13697 #
SAND-79-7023 25 p0173 N80-15586 #
SAND-79-7040 25 p0143 N80-13661 #
SAND-79-8033 25 p0160 N80-14532 #
SAND-79-8183 25 p0146 N80-13698 #
SAND-79-8187 25 p0129 N80-12608 #
SAND-79-8508 25 p0175 N80-15602 #

SAPR-3 25 p0155 N80-14491*#

SAR-1 25 p0171 N80-15569 #

SAWE PAPER 1301 25 p0086 A80-20641*
SAWE PAPER 1305 25 p0086 A80-20643

SD-78-AP-0023-4-VOL-4 25 p0119 N80-12106*#

SDSB-79/14 25 p0108 N80-11487 #

SEIS-79/1 25 p0164 N80-14574 #

SERI/PR-13-054 25 p0144 N80-13674 #
SERI/PR-35-313 25 p0124 N80-12565 #
SERI/RR-34-152 25 p0172 N80-15570 #
SERI/RR-53-045 25 p0126 N80-12578 #
SERI/RR-54-164 25 p0172 N80-15583 #
SERI/TP-34-089 25 p0161 N80-14546 #
SERI/TP-34-180 25 p0172 N80-15571 #
SERI/TP-35-208 25 p0102 N80-10663 #
SERI/TP-35-254 25 p0124 N80-12564 #
SERI/TP-35-279 25 p0151 N80-14269 #
SERI/TP-35-300 25 p0140 N80-13635 #
SERI/TP-51-158 25 p0113 N80-11602 #
SERI/TP-52-138 25 p0178 N80-15639 #
SERI/TP-53-114R 25 p0141 N80-13649 #
SERI/TP-61-144 25 p0161 N80-14547 #
SERI/TP-62-113 25 p0161 N80-14548 #
SERI/TP-69-221 25 p0113 N80-11598 #
SERI/TR-33-067 25 p0115 N80-11617 #
SERI/TR-35-047 25 p0143 N80-13669 #
SERI/TR-36-088 25 p0132 N80-12710 #
SERI/TR-36-110 25 p0165 N80-14617 #
SERI/TR-51-159 25 p0158 N80-14520 #
SERI/TR-51-163 25 p0158 N80-14519 #
SERI/TR-51-194 25 p0158 N80-14518 #
SERI/TR-54-066 25 p0146 N80-13699 #

SLAC-PUB-2203 25 p0113 N80-11604 #

SOLAR/0010-78-10 25 p0126 N80-12585 #
SOLAR/0801-79-01 25 p0129 N80-12607 #
SOLAR/0811-79/01 25 p0160 N80-14539 #
SOLAR/1010-78/14 25 p0101 N80-10659 #

TAEB-79-7 25 p0180 N80-15699 #

TID-28840-DRAFT 25 p0157 N80-14508 #
TID-28843-DRAFT 25 p0161 N80-14544 #
TID-28844-DRAFT 25 p0161 N80-14543 #
TID-28846 25 p0135 N80-13285 #
TID-28848-DRAFT 25 p0168 N80-15287 #
TID-28849 25 p0135 N80-13286 #
TID-28852-DRAFT 25 p0158 N80-14521 #
TID-28856-DRAFT 25 p0161 N80-14545 #
TID-28858-DRAFT 25 p0166 N80-14972 #
TID-28964 25 p0127 N80-12593 #
TID-29000 25 p0114 N80-11612 #
TID-29094 25 p0154 N80-14478 #
TID-29400/1 25 p0093 N80-10395 #
TID-29418 25 p0142 N80-13655 #
TID-29443 25 p0146 N80-13695 #

TPS-78-798 25 p0103 N80-10692 #

TP759.C52	25	p0093	N80-10392 #
TQPR-2	25	p0145	N80-13678 #
TR-1	25	p0110	N80-11573 #
TR-2-ONR	25	p0123	N80-12556 #
TR-9	25	p0156	N80-14502 #
TREE-1340	25	p0112	N80-11595 #
TREE-1365	25	p0139	N80-13627 #
TRW-33572-6001-RU-00	25	p0136	N80-13362*#
TRW-35515-6002-RU-00	25	p0138	N80-13622*#
UCID-17944-REV-1	25	p0132	N80-12955 #
UCID-17949	25	p0125	N80-12569 #
UCID-18153-REV-1	25	p0171	N80-15564 #
UCID-18195	25	p0110	N80-11567 #
UCR/IGPP-78/19	25	p0118	N80-11711 #
UCRL-TRANS-11427	25	p0114	N80-11609 #
UCRL-13911	25	p0133	N80-12960 #
UCRL-13982	25	p0112	N80-11594 #
UCRL-13984	25	p0103	N80-10689 #
UCRL-15002	25	p0131	N80-12628 #
UCRL-15003	25	p0097	N80-10619 #
UCRL-15005	25	p0098	N80-10623 #
UCRL-15053	25	p0177	N80-15628 #
UCRL-15087	25	p0177	N80-15633 #
UCRL-50046-77	25	p0159	N80-14529 #
UCRL-52496-VOL-1	25	p0177	N80-15626 #
UCRL-52546	25	p0164	N80-14571 #
UCRL-52548	25	p0179	N80-15668 #
UCRL-52553-VOL-1	25	p0105	N80-10970 #
UCRL-52553-VOL-2	25	p0181	N80-15995 #
UCRL-52583	25	p0125	N80-12570 #
UCRL-52754	25	p0140	N80-13638 #
UCRL-52758	25	p0137	N80-13480 #
UCRL-52773-VOL-1	25	p0166	N80-14973 #
UCRL-81693	25	p0181	N80-15933 #
UCRL-81724	25	p0115	N80-11618 #
UCRL-81772	25	p0175	N80-15612 #
UCRL-81786	25	p0128	N80-12596 #
UCRL-81812	25	p0103	N80-10688 #
UCRL-81841	25	p0120	N80-12201 #
UCRL-81890	25	p0132	N80-12900 #
UCRL-81970	25	p0108	N80-11386 #
UCRL-82031	25	p0130	N80-12625 #
UCRL-82441	25	p0168	N80-15282 #
UCRL-82602	25	p0106	N80-11245 #
UCRL-82710	25	p0102	N80-10664 #
UCRL-82721	25	p0159	N80-14528 #
UCRL-83011	25	p0124	N80-12561 #
UCRL-83012	25	p0141	N80-13647 #
UDR-TR-79-35	25	p0156	N80-14504 #
UDSE-TR-79-02	25	p0156	N80-14504 #
UMTA-VA-06-0053-79-1	25	p0133	N80-12962 #
US-PATENT-APPL-SN-668783	25	p0092	N80-10374*
US-PATENT-APPL-SN-727444	25	p0092	N80-10377*#
US-PATENT-APPL-SN-809890	25	p0153	N80-14474*
US-PATENT-APPL-SN-848421	25	p0152	N80-14423*
US-PATENT-APPL-SN-856465	25	p0153	N80-14473*
US-PATENT-APPL-SN-891358	25	p0153	N80-14474*
US-PATENT-APPL-SN-900659	25	p0092	N80-10361*#
US-PATENT-APPL-SN-903019	25	p0104	N80-10709*
US-PATENT-APPL-SN-916655	25	p0153	N80-14472*
US-PATENT-CLASS-23-288R	25	p0092	N80-10374*
US-PATENT-CLASS-29-572	25	p0153	N80-14474*
US-PATENT-CLASS-29-588	25	p0153	N80-14474*
US-PATENT-CLASS-29-627	25	p0153	N80-14474*
US-PATENT-CLASS-48-DIG.8	25	p0092	N80-10374*
US-PATENT-CLASS-48-10-3	25	p0092	N80-10374*
US-PATENT-CLASS-48-61	25	p0092	N80-10374*
US-PATENT-CLASS-48-102A	25	p0092	N80-10374*
US-PATENT-CLASS-48-107	25	p0092	N80-10374*
US-PATENT-CLASS-48-117	25	p0092	N80-10374*
US-PATENT-CLASS-60-300	25	p0092	N80-10374*
US-PATENT-CLASS-60-606	25	p0092	N80-10374*
US-PATENT-CLASS-73-12	25	p0152	N80-14423*
US-PATENT-CLASS-73-82	25	p0152	N80-14423*
US-PATENT-CLASS-73-155	25	p0104	N80-10709*
US-PATENT-CLASS-123-DIG.12	25	p0092	N80-10374*
US-PATENT-CLASS-123-3	25	p0092	N80-10374*
US-PATENT-CLASS-123-179R	25	p0092	N80-10374*
US-PATENT-CLASS-126-438	25	p0153	N80-14473*
US-PATENT-CLASS-126-442	25	p0153	N80-14473*
US-PATENT-CLASS-136-89P	25	p0153	N80-14474*
US-PATENT-CLASS-175-78	25	p0104	N80-10709*
US-PATENT-CLASS-307-63	25	p0153	N80-14472*
US-PATENT-CLASS-307-66	25	p0153	N80-14472*
US-PATENT-CLASS-323-15	25	p0153	N80-14472*
US-PATENT-CLASS-323-19	25	p0153	N80-14472*
US-PATENT-CLASS-350-295	25	p0153	N80-14473*
US-PATENT-CLASS-350-296	25	p0153	N80-14473*
US-PATENT-CLASS-423-650	25	p0092	N80-10374*
US-PATENT-4,033,133	25	p0092	N80-10374*
US-PATENT-4,132,697	25	p0153	N80-14474*
US-PATENT-4,157,655	25	p0152	N80-14423*
US-PATENT-4,167,111	25	p0104	N80-10709*
US-PATENT-4,173,397	25	p0153	N80-14473*
US-PATENT-4,173,820	25	p0153	N80-14474*
US-PATENT-4,175,249	25	p0153	N80-14472*
USCG-D-40-79	25	p0149	N80-13754 #
USFFE-1978-8	25	p0129	N80-12604 #
UTIAS-241	25	p0119	N80-12189 #
VKI-LEC-SER-1979-4-VOL-1	25	p0121	N80-12338 #
VKI-LEC-SER-1979-4-VOL-2	25	p0121	N80-12346 #
VTT-EN-24	25	p0118	N80-11891 #
WFPS-TME-107	25	p0132	N80-12898 #

Item 830-J-5
E

NAS 1.21:7043(26)

Energy
A Continuing
Bibliography
with Indexes

NASA SP-7043(26)
July 1980

635-055
C-648

contin

9099

National Aeronautics and
Space Administration

y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E

ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges:

IAA (A-10000 Series)	A80-21041 – A80-32626
STAR (N-10000 Series)	N80-16023 – N80-22254

Previous publications announced in this series/subject category include:

DOCUMENT	*DATE*	*COVERAGE*
NASA SP-7042	April 1974	January 1968 – December 1973
NASA SP-7043(01)	May 1974	January 1, 1974 – March 31, 1974
NASA SP-7043(02)	November 1974	April 1, 1974 – June 30, 1974
NASA SP-7043(03)	February 1975	July 1, 1974 – September 30, 1974
NASA SP-7043(04)	May 1975	October 1, 1974 – December 31, 1974
NASA SP-7043(05)	August 1975	January 1, 1975 – March 31, 1975
NASA SP-7043(06)	October 1975	April 1, 1975 – June 30, 1975
NASA SP-7043(07)	December 1975	July 1, 1975 – September 30, 1975
NASA SP-7043(08)	February 1976	October 1, 1975 – December 31, 1975
NASA SP-7043(09)	April 1976	January 1, 1976 – March 31, 1976
NASA SP-7043(10)	July 1976	April 1, 1976 – June 30, 1976
NASA SP-7043(11)	October 1976	July 1, 1976 – September 30, 1976
NASA SP-7043(12)	January 1977	October 1, 1976 – December 31, 1976
NASA SP-7043(13)	April 1977	January 1, 1977 – March 31, 1977
NASA SP-7043(14)	July 1977	April 1, 1977 – June 30, 1977
NASA SP-7043(15)	October 1977	July 1, 1977 – September 30, 1977
NASA SP-7043(16)	January 1978	October 1, 1977 – December 31, 1977
NASA SP-7043(17)	April 1978	January 1, 1978 – March 31, 1978
NASA SP-7043(18)	August 1978	April 1, 1978 – June 30, 1978
NASA SP-7043(19)	October 1978	July 1, 1978 – September 30, 1978
NASA SP-7043(20)	January 1979	October 1, 1978 – December 31, 1978
NASA SP-7043(21)	April 1979	January 1, 1979 – March 31, 1979
NASA SP-7043(22)	July 1979	April 1, 1979 – June 30,1979
NASA SP-7043(23)	October 1979	July 1, 1979 – September 30, 1979
NASA SP-7043(24)	January 1980	October 1, 1979 – December 31, 1979
NASA SP-7043(25)	April 1980	January 1, 1980 - March 31, 1980

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by PRC Data Services Company.

NASA SP-7043 (26)

ENERGY

A Continuing Bibliography

With Indexes

Issue 26

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced from April 1 through June 30, 1980 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

NASA Scientific and Technical Information Branch 1980
National Aeronautics and Space Administration
Washington, DC

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, at the price $15.00 domestic; $30.00 foreign.

INTRODUCTION

This issue of *Energy: A Continuing Bibliography with Indexes* (NASA SP-7043(26)) lists 1134 reports, journal articles, and other documents announced between April 1, 1980 and June 30, 1980 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA).* The first issue of this continuing bibliography was published in May 1974 and succeeding issues are published quarterly.

The coverage includes regional, national and international energy systems; research and development on fuels and other sources of energy; energy conversion, transport, transmission, distribution and storage, with special emphasis on use of hydrogen and of solar energy. Also included are methods of locating or using new energy resources. Of special interest is energy for heating, lighting, for powering aircraft, surface vehicles, or other machinery.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries* in that order. The citation, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR* including the original accession numbers from the respective announcement journals. This procedure, which saves time and money accounts for the slight variation in citation appearances.

Five indexes -- subject, personal author, corporate source, contract number, and report number -- are included.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A80-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at $7.00 per document up to a maximum of 40 pages. The charge for each additional page is $0.25. Microfiche[1] of documents announced in *IAA* are available at the rate of $3.00 per microfiche on demand, and at the rate of $1.25 per microfiche for standing orders for all *IAA* microfiche. The price for the *IAA* microfiche by category is available at the rate of $1.50 per microfiche plus a $1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of $1.50 per microfiche.

Minimum air-mail postage to foreign countries is $1.00 and all foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

STAR ENTRIES (N80-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page viii.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard $3.50 price, for those documents identified by a # symbol.)

---

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.

Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.

Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)

Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.

Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the quarterly supplements is $50.00 domestic; $100.00 foreign. All questions relating to the subscriptions should be referred to NTIS, Attn: Subscriptions, 5285 Port Royal Road, Springfield, Virginia 22161.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and
Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

Department of Energy
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information
Facility
P.O. Box 8757
B. W. I. Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Branch (NST-41)
Washington, D.C. 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey
1033 General Services Administration
Building
Washington, D.C. 20242

U.S. Geological Survey
601 E. Cedar Avenue
Flagstaff, Arizona 86002

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U.S. Geological Survey
Bldg. 25, Denver Federal Center
Denver, Colorado 80225

Fachinformationszentrum Energie, Physik,
Mathematik GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1980)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 3.50	$ 5.25
A02	001-025	5.00	10.00
A03	026-050	6.00	12.00
A04	051-075	7.00	14.00
A05	076-100	8.00	16.00
A06	101-125	9.00	18.00
A07	126-150	10.00	20.00
A08	151-175	11.00	22.00
A09	176-200	12.00	24.00
A10	201-225	13.00	26.00
A11	226-250	14.00	28.00
A12	251-275	15.00	30.00
A13	276-300	16.00	32.00
A14	301-325	17.00	34.00
A15	326-350	18.00	36.00
A16	351-375	19.00	38.00
A17	376-400	20.00	40.00
A18	401-425	21.00	42.00
A19	426-450	22.00	44.00
A20	451-475	23.00	46.00
A21	476-500	24.00	48.00
A22	501-525	25.00	50.00
A23	526-550	26.00	52.00
A24	551-575	27.00	54.00
A25	576-600	28.00	56.00
A99	601-up	-- 1/	-- 2/

1/ Add $1.00 for each additional 25 page increment or portion thereof for 601 pages up.

2/ Add $2.00 for each additional 25 page increment or portion thereof for 601 pages and more.

Schedule E

EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

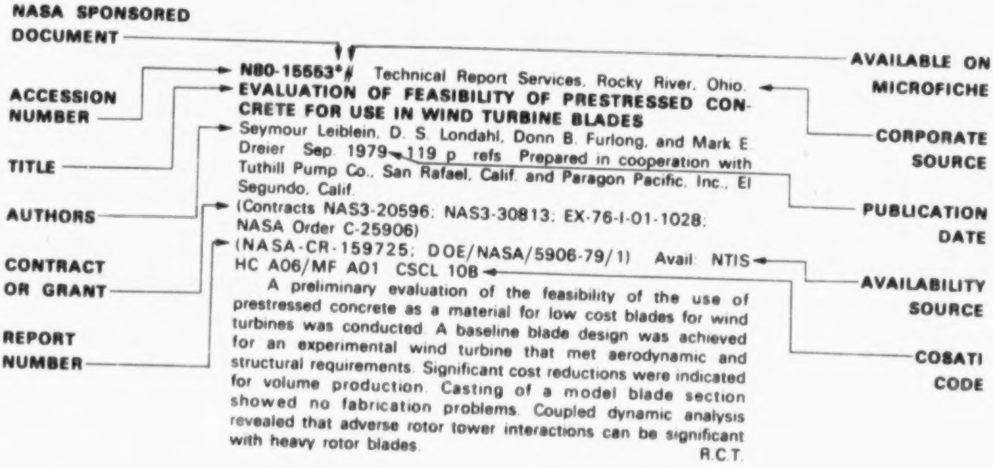
Price Code	North American Price	Foreign Price
E01	$ 5.50	$ 11.50
E02	6.50	13.50
E03	8.50	17.50
E04	10.50	21.50
E05	12.50	25.50
E06	14.50	29.50
E07	16.50	33.50
E08	18.50	37.50
E09	20.50	41.50
E10	22.50	45.50
E11	24.50	49.50
E12	27.50	55.50
E13	30.50	61.50
E14	33.50	67.50
E15	36.50	73.50
E16	39.50	79.50
E17	42.50	85.50
E18	45.50	91.50
E19	50.50	100.50
E20	60.50	121.50
E99 - Write for quote		
N01	28.00	40.00

TABLE OF CONTENTS

IAA Entries 183
STAR Entries 257

Subject Index A-1
Personal Author Index B-1
Corporate Source Index C-1
Contract Number Index D-1
Report/Accession Number Index E-1

TYPICAL CITATION AND ABSTRACT FROM *STAR*

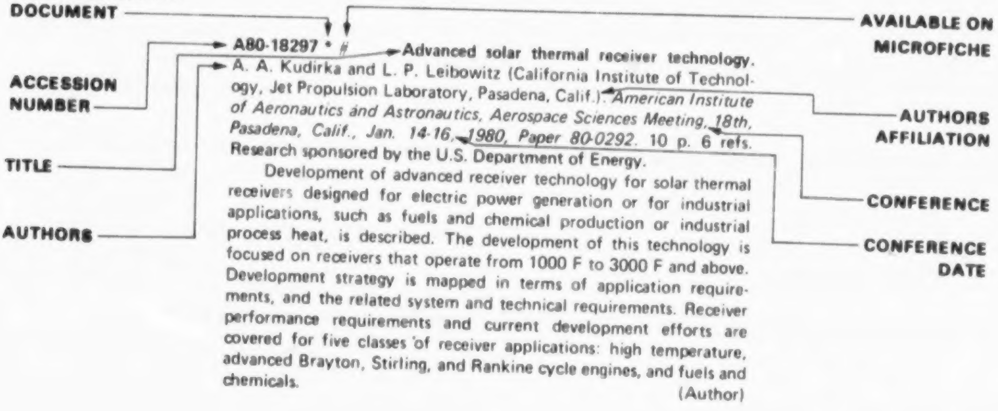


NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
CONTRACT OR GRANT
REPORT NUMBER
AVAILABLE ON MICROFICHE
CORPORATE SOURCE
PUBLICATION DATE
AVAILABILITY SOURCE
COSATI CODE

N80-15553*# Technical Report Services, Rocky River, Ohio.
EVALUATION OF FEASIBILITY OF PRESTRESSED CONCRETE FOR USE IN WIND TURBINE BLADES
Seymour Leiblein, D. S. Londahl, Donn B. Furlong, and Mark E. Dreier Sep. 1979 119 p refs Prepared in cooperation with Tuthill Pump Co., San Rafael, Calif. and Paragon Pacific, Inc., El Segundo, Calif.
(Contracts NAS3-20596; NAS3-30813; EX-76-I-01-1028; NASA Order C-25906)
(NASA-CR-159725; DOE/NASA/5906-79/1) Avail: NTIS HC A06/MF A01 CSCL 10B

A preliminary evaluation of the feasibility of the use of prestressed concrete as a material for low cost blades for wind turbines was conducted. A baseline blade design was achieved for an experimental wind turbine that met aerodynamic and structural requirements. Significant cost reductions were indicated for volume production. Casting of a model blade section showed no fabrication problems. Coupled dynamic analysis revealed that adverse rotor tower interactions can be significant with heavy rotor blades. R.C.T.

TYPICAL CITATION AND ABSTRACT FROM *IAA*



NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
AVAILABLE ON MICROFICHE
AUTHORS AFFILIATION
CONFERENCE
CONFERENCE DATE

A80-18297 * # **Advanced solar thermal receiver technology.**
A. A. Kudirka and L. P. Leibowitz (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0292.* 10 p. 6 refs. Research sponsored by the U.S. Department of Energy.

Development of advanced receiver technology for solar thermal receivers designed for electric power generation or for industrial applications, such as fuels and chemical production or industrial process heat, is described. The development of this technology is focused on receivers that operate from 1000 F to 3000 F and above. Development strategy is mapped in terms of application requirements, and the related system and technical requirements. Receiver performance requirements and current development efforts are covered for five classes of receiver applications: high temperature, advanced Brayton, Stirling, and Rankine cycle engines, and fuels and chemicals. (Author)

A Listing of Energy Bibliographies Contained In This Publication:

1. Alcohol fuels. Citations from the American petroleum institute data base --- a bibliography with abstracts p0259 N80-16195
2. Solar energy concentrator design and operations. Citations from the NTIS data base p0270 N80-16557
3. Solar energy concentrator design and operations. Citations from the Engineering Index data base p0270 N80-16558
4. Energy Research Information System (ERIS) projects report, volume 4, number 1 --- bibliographies p0270 N80-16561
5. Energy policy and research planning, volume 3. A bibliography with abstracts p0271 N80-16563
6. Flat plate solar collector design and performance. Citations from the NTIS data base p0271 N80-16566
7. Flat plate solar collector design and performance. Citations from the Engineering Index data base p0271 N80-16567
8. Heliostat system design and operation. Citations from the Engineering Index data base p0271 N80-16571
9. Bibliography of geology and hydrology, eastern New Mexico p0273 N80-16663
10. Fiscal year 1979 scientific and technical reports, articles, papers and presentations p0274 N80-17014
11. Thermal energy storage, volume 2. Citations from the NTIS data base p0279 N80-17584
12. Thermal energy storage, volume 1. Citations from the NTIS data base p0279 N80-17585
13. Thermal energy storage, volume 1. Citations from the Engineering Index data base p0279 N80-17586
14. Thermal energy storage, volume 2. Citations from the Engineering Index data base p0279 N80-17587
15. Silicon solar cells, volume 3. Citations from the Engineering Index data base --- bibliographies p0280 N80-17588
16. Silicon solar cells, volume 3. Citations from the NTIS data base --- bibliographies p0280 N80-17589

17. Silicon solar cells, volume 2. Citations from the Engineering Index data base --- bibliographies p0280 N80-17590

18. Design and applications of flywheels, volume 1. Citations from the NTIS data base --- bibliographies p0280 N80-17591

19. Design and applications of flywheels, volume 2. Citations from the NTIS data base --- bibliographies p0280 N80-17592

20. Design and applications of flywheels. Citations from the Engineering Index data base --- bibliographies p0280 N80-17593

21. Combined cycle power generation. Citations from the NTIS data base --- bibliographies p0280 N80-17594

22. Combined cycle power generation. Citations from the Engineering Index data base --- bibliographies p0280 N80-17595

23. Survey of the research into energy - economic interactions. Volume 2: Annotated bibliography p0281 N80-17909

24. Solar electric power generation, volume 3: Citations from the Engineering Index data base p0296 N80-19657

25. Solar electric power generation, volume 2. Citations from the NTIS data base p0296 N80-19658

26. Solar electric power generation, volume 3. Citations from the NTIS data base p0296 N80-19659

27. Solar electric power generation, volume 2. Citations from the Engineering Index data base p0296 N80-19660

28. Solar sea power plants. Citations from the NTIS data base p0297 N80-19661

29. Solar seapower plants. Citations from the Engineering Index data base p0297 N80-19662

30. Energy information data base p0305 N80-20881

31. Wind energy information directory p0305 N80-20883

32. Solar water pumps. Citations from the Engineering Index data base p0308 N80-20910

ENERGY

A Continuing Bibliography (Issue 26)

JULY 1980

IAA ENTRIES

A80-21089 **Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation.** J. C. C. Fan, R. L. Chapman, C. O. Bozler (MIT, Lexington, Mass.), and P. J. Drevinsky (USAF, Rome Air Development Center, Bedford, Mass.). *Applied Physics Letters,* vol. 36, Jan. 1, 1980, p. 53-56. 14 refs. USAF-supported research.

The fabrication of single-crystal GaAs shallow-homojunction solar cells that have conversion efficiencies of about 20% at AMI has been reported. These cells employ an n(+)/p/p(+) structure, prepared by chemical vapor deposition on either GaAs or Ge substrates. The superior resistance of such cells to 1-MeV electron radiation, which produces effects approximating those due to space radiation was demonstrated. The experiments were done on four cells at fluences up to 10 to the 16th power e/sq cm of which one had both higher initial and final maximum power per unit area than any space cells previously reported. (Author)

A80-21091 **Polyacetylene, /CH/x - Photoelectrochemical solar cell.** S. N. Chen, A. J. Heeger, Z. Kiss, A. G. MacDiarmid (Chronar Corp., Princeton, N.J.), S. C. Gau, and D. L. Peebles (Pennsylvania, University, Philadelphia, Pa.). *Applied Physics Letters,* vol. 36, Jan. 1, 1980, p. 96-98. 19 refs.

Photoelectrochemical photovoltaic cells have been fabricated using polyacetylene as the active photoelectrode. Using a sodium polysulfide solution as electrolyte, the open-circuit voltage and the short-circuit current were determined under illumination of approximately 1 sun. Under present conditions, the cell efficiency is limited by the series resistance, the small effective area of the electrode configuration, and the absorbance of the solution. (Author)

A80-21104 **Canadian renewable energy prospects.** H. Swain, R. Overend, and T. A. Ledwell (Department of Energy, Mines and Resources, Renewable Energy Resources Branch, Ottawa, Canada). *Solar Energy,* vol. 23, no. 6, 1979, p. 459-470. 35 refs.

Prospects for the use of Canada's renewable energy resources are assessed. Future energy supplies and demands in Canada are examined, and the systems aspects of energy costs are discussed. Consideration is then given to the technologies of solar space and water heating, solar electricity generation, the use of forest and agricultural biomass, wind power, tidal power in the Bay of Fundy, ocean wave power, ocean thermal gradient utilization, geothermal energy conversion and hydroelectric power. It is seen that of the renewable resources, not all may be considered 'soft' in the sense of posing few dangers to the environment and deemphasizing centralized technologies, and no new ones are either technically or economically ready to replace fossil and nuclear fuels. Recommendations as to the future role of government in encouraging the transition to renewable resources are proposed. A.L.W.

A80-21105 **Performance effects of Trombe wall control strategies.** A. V. Sebald, J. R. Clinton, and F. Langenbacher (California, University, La Jolla, Calif.). *Solar Energy,* vol. 23, no. 6, 1979, p. 479-487. 12 refs. Contract No. EM-76-S-04-4221.

Trombe wall performance is analyzed for a variety of a control strategies in Albuquerque, New Mexico, Santa Maria, California and Madison, Wisconsin. Controls were considered in both the presence and absence of backup energy. The analysis was performed using hourly simulations on Solmet weather data in a thermal network model. Sensitivity of the results of wall thickness and size, building azimuth and house insulation levels is computed. Proper controls were found to reduce backup requirements as much as 50 per cent. Alternatively, they appear to provide equivalent solar fractions with thinner and smaller walls. Finally, in the absence of backup energy, proper controls on thin walls provide better performance than standard walls of double thickness. The results given in this paper are based entirely on computer simulations and are therefore intended to enhance the reader's insight into the Trombe Wall control problem. Efforts are underway to verify the major conclusions in test structures and real houses. (Author)

A80-21106 **Solar energy storage using chemical potential changes associated with drying of zeolites.** R. A. Shigeishi, C. H. Langford, and B. R. Hollebone (Carleton University, Ottawa, Canada). *Solar Energy,* vol. 23, no. 6, 1979, p. 489-495. 20 refs.

A80-21107 **Shadow effect of adjacent solar collectors in large scale systems.** J. Appelbaum and J. Bany (Tel Aviv University, Tel Aviv, Israel). *Solar Energy,* vol. 23, no. 6, 1979, p. 497-507. 6 refs. Ministry of Energy and Infrastructure Contract No. 78-1-41.

In large scale solar systems and in other cases with limited field area (such as on tops of buildings), shadowing of collectors, (thermal or photovoltaic) by their neighbours might occur during the day. This situation calls for an optimal solution of collector deployment in a given field area for maximum or desired energy. The paper deals firstly with the shadowing analysis of vertical and inclined poles and collectors (the shadow components, height and area). This useful information is used in an example of optimal deployment of collectors in a given area (which includes the tilt angle, collector size, spacing between collectors and the number of collector rows). (Author)

A80-21108 **Accuracies achievable with indirect measurements of the direct solar irradiance component.** J. A. Secrest and I. Dirmhirn (Utah State University of Agriculture and Applied Science, Logan, Utah). *Solar Energy,* vol. 23, no. 6, 1979, p. 509-512. Contract No. EG-77-S-07-1656.

The accuracy of indirect measurements of direct solar irradiance using global and diffuse irradiance measurements is investigated as a possible means of avoiding the use of a tracking pyrheliometer, which requires frequent maintenance, to evaluate possible sites in harsh environments for focusing solar energy conversion systems. Irradiance values calculated from the subtraction of the diffuse component from the global irradiance measured by pyranometers were compared with those obtained from a tracking pyrheliometer. It is found that the use of corrections for the cosine error depending on solar zenith angle of the global pyranometer and of the error induced by the shadowband in the diffuse pyranometer enable the desired accuracy of + or - 2% with respect to direct measurements to be achieved up to zenith angles of 80 deg and time intervals of 15 min. A.L.W.

A80-21109 **Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant.** B. D. Pomeroy (General Electric Co., Schenectady, N.Y.). *Solar Energy,* vol. 23, no. 6, 1979, p. 513-515. 7 refs. Contract No. EM-78-C-03-1725.

The broadening of the thermocline found during the discharge phase of packed bed iron sphere heat storage media which use liquid sodium as the coolant is discussed. The design parameters contributing to thermocline broadening due to conduction resistance in the iron, convective resistance between the sodium and the iron and axial conduction in the sodium and iron are identified, and a simple design procedure based on mathematical models of transient heat transfer effects is developed. It is shown that storage parameters such as

sodium flow speed, iron sphere size and bed dimensions can be selected so as to limit thermocline broadening to less than 20% of the total discharge time.
A.L.W.

A80-21110 **Mirror enclosures for double-exposure solar collectors.** D. C. Larson (Drexel University, Philadelphia, Pa.). *Solar Energy*, vol. 23, no. 6, 1979, p. 517-524. 19 refs. Research supported by the U.S. Department of Energy.

Configurations of flat-mirror enclosures to reflect solar radiation onto both sides of a double-exposure flat plate solar collector are evaluated for various solar energy applications at latitudes of 35, 40 and 45 deg. Enhancements in solar energy absorbed relative to that absorbed by a single-exposure panel tilted at the latitude angle from the horizontal were calculated for direct-beam and diffuse radiation for fixed and adjustable mirror configurations surrounding a vertical collector panel. Optimal fixed mirror configurations are obtained for both winter space-heating and year-round applications, however, an adjustable mirror configuration in which the tilt of the front and rear mirrors is changed twice a year is found to be optimal for year-round applications at all three latitudes. Enhancements over single-exposure plates as great as a factor of four in the winter and two in the summer indicate the cost effectiveness of the 70% more expensive double-exposure unit.
A.L.W.

A80-21112 **Optimal controllers of the second kind.** C. B. Winn and D. E. Hull, III (Colorado State University, Fort Collins, Colo.). *Solar Energy*, vol. 23, no. 6, 1979, p. 529-534. 5 refs. Contract No. EG-77-S-02-4519-A000.

An approximate analytical solution to the problem of determining the optimal flow rate through solar collectors so as to maximize the integral of the difference between the useful energy and the pumping costs incurred in collecting the solar energy has been obtained. The solution presented is an optimal feedback controller based upon measurable states of the system. The solution technique employed was that of the Pontryagin maximum principle, and an approximate analytical solution to the resulting two-point boundary value problem was obtained by means of a transformation that involved using the heat removal factor as the control. The optimal control (the mass flow rate) is then recoverable from the heat removal factor. The derivation of the optimal control law, and a discussion of implementation of the optimal control law, are presented. Finally, comparisons between these results and those presented in an earlier paper in which a numerical solution was obtained are made.
(Author)

A80-21113 **Calculation of performance of N collectors in series from test data on a single collector.** R. L. Oonk (Solaron Corp., Denver, Colo.), D. E. Jones (National Bureau of Standards, Gaithersburg, Md.), and B. E. Cole-Appel (Energy Management Consultants, Lakewood, Colo.). *Solar Energy*, vol. 23, no. 6, 1979, p. 535, 536.

A80-21115 **The effect of a self consistent effective ambient temperature on collector efficiency parameters.** G. B. Smith (New South Wales Institute of Technology, Broadway, Australia). *Solar Energy*, vol. 23, no. 6, 1979, p. 541, 542.

A80-21116 **Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions.** O. Samuel, A. Moradpour, and H. B. Kagan (Paris XI, Université, Orsay, Essonne, France). *Solar Energy*, vol. 23, no. 6, 1979, p. 543-545. 25 refs. Research supported by the Centre National de la Recherche Scientifique.

The long-term efficiency of iterative photochemical syntheses of strained molecules for solar energy storage is evaluated. The efficiency of the interconversion of norbornadiene and quadricyclane is measured in terms of reaction yields, and it is found that both the storage capacity and stability of the media degrade substantially (to about 50 percent and 78 percent of the original, respectively) after only four cycles. Calculations of the economic efficiency and costs of available energies are then presented which indicate that in order to be useful, an iterative photochemical storage system must be capable of operating for more than 400,000 cycles with a cost of $1/g or must cost less than $0.003/g with a lifetime of 1440 cycles and an average reaction yield of 99.99 percent to be competitive.
A.L.W.

A80-21117 **Calculation of the monthly-average transmittance-absorptance product.** S. A. Klein (Wisconsin, University, Madison, Wis.). *Solar Energy*, vol. 23, no. 6, 1979, p. 547-551. 16 refs.

The paper considers the calculation of the ratio of the monthly average to the normal incidence products of the transmittance and the absorptance of solar collector covers and plates in the evaluation of the thermal performance of solar energy systems. An expression for the collector transmittance-absorptance product is presented in terms of the relative contributions of the beam, diffuse and ground-reflected radiation components, and means for estimating these components as functions of incidence angle are indicated. It is noted that experimental determinations of the incidence angle modifier can also be used to obtain the transmittance-absorptance product ratio. The monthly average of the product ratio is then calculated by the integration of the product expression and results of the integration are presented in terms of the mean incidence angle for beam radiation for various collector types at latitudes between 20 and 50 deg N, slopes between 0 and 90 deg and azimuths between 0 and 90 deg for all months of the year. The use of these expressions to compare the monthly average daily solar radiation absorbed on vertical mass walls facing south and 30 deg west of south per unit area at 43 deg N is then illustrated.
A.L.W.

A80-21123 **Energy storage.** J. Jensen. London, Newnes-Butterworths, 1980. 107 p. 27 refs. $15.75.

The book is concerned with large-scale energy storage systems. Thermal, chemical, mechanical, electrical and magnetic energy storage methods are discussed and their applications, capabilities, and limitations are analyzed. Expected technical and cost characteristics are given for selected energy storage systems. Examples of existing storage systems include solar houses in Britain and the United States, batteries for various electric vehicles, fuel cells used in the Apollo 8 flight and the Baseball II superconductive magnet for controlled thermonuclear research. Appendices contain energy tables, lists of energy storage equipment manufacturers, and research programs and organizations.
V.L.

A80-21449 # **Magnetohydrodynamic power generation - Program planning and status.** W. D. Jackson (U.S. Department of Energy, Washington, D.C.) and E. Levi (New York, Polytechnic Institute, Brooklyn, N.Y.). *(Institute of Electrical and Electronics Engineers, Summer Meeting, Los Angeles, Calif., July 16-21, 1978.) IEEE Transactions on Power Apparatus and Systems*, vol. PAS-98, Nov.-Dec. 1979, p. 2022-2027. 6 refs.

This paper is concerned with the phased development of the MHD power system program and the development issues which are being addressed. System engineering considerations for the development logic and design criteria are established in terms of systems - emphasizing open cycle MHD - and components - combustor, generator, materials, seed recovery, emission control, magnets and power conversion systems.
(Author)

A80-21745 **Net energy production history of the Geysers Geothermal Project.** L. Iceman (Washington University, St. Louis, Mo.). *Energy* (UK), vol. 5, Jan. 1980, p. 29-33. 16 refs.

Geothermal projects at the Geysers, California, have relatively high net energy ratios for electricity-production facilities. Comparison of the net cumulative electrical energy generated at the Geysers with the cumulative thermal energy invested for construction and operation of the facility indicates a favorable energy return, even during periods of rapid systems expansion.
(Author)

A80-21746 **Energy resource requirements of a solar heating system.** D. W. O. Rogers (National Research Council, Ottawa, Canada). *Energy* (UK), vol. 5, Jan. 1980, p. 75-86. 17 refs.

The paper addresses the question of the total energy resource use of a solar hot water and space heating system compared to the traditional oil, gas and electric heating options. The methods of energy analysis have been applied to a liquid-based, short-term storage solar space and water heating system for a dwelling in Toronto, and the results indicate that the indirect use of energy resources does not have a major impact on the overall energy conservation characteristics of the system which, being in many respects a worst case, takes 1.0-3.5 years of operation to conserve the energy resources, required to build, operate and maintain the system. Over the assumed 20-year lifetime the solar heating system, sized to provide 50% of the heating requirement to a house, uses between 53 and 62% as many energy resources as a conventional system, heating the same house. The energy-conservation characteristics of the system can be completely negated by the use of thermally generated electricity as backup in a 50% solar heating system which replaces oil or gas heating. The collectors and annual operating energy for the pumps were found to be the two most significant factors in the analysis. L.M.

A80-21766 **United States energy policy - The continuing failure (La politique énergétique des Etats-Unis - Toujours l'échec).** W. Goldstein. *Revue de l'Energie,* vol. 30, Dec. 1979, p. 951-968. In French.

Consideration is given to United States energy policy in the face of continuing OPEC price increases and supply curtailments. It is argued that the American political system is currently incapable of putting into effect those measures which would reduce significantly American dependence on foreign oil and thus remove the current imbalance between petroleum supply and demand and stabilize the world economy. A.L.W.

A80-21825 **Warm water storage in district heating systems incorporating combined heat and power plant (Warmwasserspeicher in Fernwärmesystemen mit Kraft-Wärme-Kopplung).** F. Scholz (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). *Brennstoff-Wärme-Kraft,* vol. 31, Oct. 1979, p. 397-402. 11 refs. In German.

It is noted that district heating based on combined heat and power systems is the most favorable form of energy supply in the low-temperature household heating range, from the point of view of the energy supply and the national economy. Short term storage in large steel vessels at atmospheric pressure is shown to be available at low development cost expenditure, and can be expected to contribute greatly to reducing obstacles to the realisation of combined heat and power systems. Discussion of applications and operational methods includes the possibility for such a storage system to obtain additional electrical output from an extraction turbine for covering the peaks in the electricity demand by supplying the required heat from the accumulator. M.E.P.

A80-21846 **Power consumption in the high-tension field between the government's responsibility to provide energy and politics (Die Stromversorgung im Spannungsfeld zwischen Versorgungspflicht und Politik).** W. Rinke (Rheinisch-Westfälische Elektrizitätswerk AG, Essen, West Germany). *Energiewirtschaftliche Tagesfragen,* vol. 30, Jan. 1980, p. 3-15. In German.

The importance of a close tie between the lawful duties of an energy provision department and politics is discussed. The economic question of energy in terms of a global viewpoint, and the stimulation of energy development within West Germany are examined together with the projected net power consumption rate and the future development capabilities of the gross national product. Attention is given to the bureaucratic processes undertaken to permit and install nuclear reactors, employing fusion and fission reactions. C.F.W.

A80-21877 # **Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production (Kompleksnoe energoradiatsionnoe ispol'zovanie iadernykh reaktorov - ekonomichnyi put' proizvodstva vodoroda).** Ia. M. Kolotyrkin, A. Kh. Breger, and E. A. Borisov. *Atomno-Vodorodnaia Energetika i Tekhnologiia,* no. 2, 1979, p. 32-40. 39 refs. In Russian.

A80-21878 # **Solar hydrogen energy (Solnechno-vodorodnaia energetika).** I. V. Berezin, S. D. Varfolomeev, and P. P. Titov. *Atomno-Vodorodnaia Energetika i Tekhnologiia,* no. 2, 1979, p. 48-56. 42 refs. In Russian.

The feasibility, in principle, of power plants based on conversion of solar energy to fuel by photochemical decomposition of water is examined. The current status of solar power engineering is reviewed, and the effectiveness of energy conversion in systems utilizing biological photosynthesis is analyzed. Systems based on biophotolysis of water are discussed, and the cost effectiveness of the systems studied is assessed. V.P.

A80-21879 # **Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy (Perspektivy sozdaniia atomnykh energoustanovok s khemotermicheskim akkumulirovaniem teplovoi energii).** N. N. Ponomarev-Stepnoi, A. N. Protsenko, and A. Ia. Stoliarevskii. *Atomno-Vodorodnaia Energetika i Tekhnologiia,* no. 2, 1979, p. 184-196. 12 refs. In Russian.

It is shown that nuclear power plants employing high-temperature gas-cooled reactors can operate efficiently under variable loads on the basis of modern chemothermal principles. The technological and economic aspects of such power plants are discussed. V.P.

A80-21880 # **Use of hydrogen as a fuel for automobile heat engines (Primenenie vodoroda v kachestve topliva dlia teplovykh dvigatelei automobilei).** A. N. Podgornyi, I. L. Varshavskii, A. I. Mishchenko, and G. B. Talda. *Atomno-Vodorodnaia Energetika i Tekhnologiia,* no. 2, 1979, p. 197-205. In Russian.

The present analysis shows that automobiles running on hydrogen are not only economical but have the advantage of low exhaust toxicity, excellent ignition characteristics, and high burning rates. On the other hand, such automobiles have the drawback of a low ignition energy, which may cause backflash at the inlet pipe. Present lack of hydrogen storage facilities at gas stations limits hydrogen utilization to additions to air-fuel mixtures. V.P.

A80-21881 # **Decomposition of water in a nonequilibrium plasma (O razlozhenii vody v neravnovesnoi plazme).** V. P. Bochin, V. A. Legasov, V. D. Rusanov, A. A. Fridman, and G. V. Sholin. *Atomno-Vodorodnaia Energetika i Tekhnologiia,* no. 2, 1979, p. 206-211. 9 refs. In Russian.

The present paper deals with a nonequilibrium plasmachemical process of hydrogen production by water vapor decomposition. The optimal discharge parameters with respect to process efficiency are identified. It is shown that depending on the degree of plasma ionization, the hydrogen production efficiency can be as high as 50 to 70 percent. V.P.

A80-21901 **The evolution of a large laser control system - From Shiva to Nova.** G. J. Suski and F. W. Holloway (California, University, Livermore, Calif.). *IEEE Circuits and Systems Magazine,* vol. 1, Sept. 1979, p. 3-10. Contract No. W-7405-eng-48.

The Nova laser system is a 200 terawatt laser facility under construction at Lawrence Livermore Laboratory. Its current operational predecessor, the 30 terawatt Shiva laser, is controlled and diagnosed via a network of 50 computers. Although the highly distributed Shiva control system has proven effective and reliable, the need for more integrated process control on Nova is leading to a more centralized architecture. An overview of these control systems is presented and their differences are discussed. (Author)

A80-21902 **High temperature electronics for geothermal energy.** A. F. Veneruso (Sandia Laboratories, Albuquerque, N.

Mex.). *IEEE Circuits and Systems Magazine,* vol. 1, Sept. 1979, p. 11-17. 10 refs. Contract No. DE-AC04-76PD00789.

Recent estimates indicate that geothermal energy sources could produce over 10 GW of electric power in the USA by 1990. Once a system is in operation, engineers periodically need accurate and timely downhole information from each well in order to obtain optimum production. Instrumentation for geothermal borehole measurements is being expanded beyond today's limited capabilities. Prototypical logging tools have been successfully field-tested to 275 C; a high-resolution quartz pressure transducer and a gallium phosphide diode have been successfully tested. Near-term goals of current programs are to develop instrumentation for use at 275 in pressures up to 48.3 MPa (7,000 psi). (Author)

A80-21903 **Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant.** M. A. Soderstrand, D. M. Darsey (Sandia Laboratories, Albuquerque, N. Mex.), R. C. Rountree (Aerospace Corp., El Segundo, Calif.), R. R. Sheahan (California, University, Livermore, Calif.), and C. P. Winarski (Southern California Edison Co., Los Angeles, Calif.). *IEEE Circuits and Systems Magazine,* vol. 1, Sept. 1979, p. 18-27. Research sponsored by the U.S. Department of Energy.

A design of the 10-megawatt electric Solar Central Receiver Power Plant currently under construction in Barstow, California is described. Consideration is given to the collector, receiver, and thermal storage subsystems. The circuits and systems concepts related to the Master Control and Data Acquisition Systems are emphasized. Implementation of the Master Control Subsystem, operational requirements, and software are discussed along with its status and expectations. V.T.

A80-21908 **Space manufacturing, satellite power and human exploration.** B. T. O'Leary and G. K. O'Neill (Princeton University, Princeton, N.J.). *Interdisciplinary Science Reviews,* vol. 4, Sept. 1979, p. 193-207. 82 refs.

It is suggested that satellite power stations manufactured from nonterrestrial materials may alleviate the global energy crisis as early as the 1990's. The paper shows that costs may be competitive with coal and nuclear power and could provide an environmentally acceptable, inexhaustible and continuous supply of electricity anywhere on earth. Attention is given to habitats for the work force employed in space manufacturing which would offer a choice of gravities for living and recreation. Finally, recent progress in this field and the interdisciplinary aspects of planning such a program are reviewed. M.E.P.

A80-21913 # **Photovoltaic cost blitz spawns new silicon processes.** M. Sherman-Willis. *High Technology,* Feb. 1980, p. 78-85.

The article surveys the objectives of a $1.5 billion, 10 year solar project by the DOE to develop low cost solar energy systems. Attention is given to the DOE cost targets for photovoltaic cells which are $2.80 per peak watt by 1982, 70 cents by 1986, and 15 cents by 1990. Discussion covers the type of production methods necessary to achieve such cost effectiveness, such as automated lines, batch factories, casting of silicon cells and eventually production of silicon sheets in ribbon form. M.E.P.

A80-21914 **Antireflection coatings on solar cells.** B. Gandham, R. Hill, H. A. Macleod, and M. Bowden (Newcastle-upon-Tyne Polytechnic, Newcastle-upon-Tyne, England). *Solar Cells,* vol. 1, Nov. 1979, p. 3-22. 11 refs.

The effective refractive index of an assembly of films is derived from first principles via the characteristic matrix and is used to find the conditions under which a solar cell can have minimum reflectance to normally incident radiation. The characteristics of ideal antireflection coatings are calculated for Ag/Si Schottky barrier cells and it is found that the refractive index of an ideal single-layer coating increases as the thickness of the metal film increases. The optimum parameters for Ag/p-Si cells antireflected by a single ZnS layer or by ZnS and cryolite layers are calculated for air mass 1 radiation and it is shown that multilayer coatings do not significantly improve the short-circuit current. (Author)

A80-21915 **Laser treatment of phosphorus-diffused silicon solar cells.** E. Fogarassy, R. Stuck, J. C. Muller, A. Grob, J. J. Grob, P. Siffert (CNRS, Centre de Recherches Nucléaires de Strasbourg, Strasbourg, France), Y. Salles, and D. Diguet (La Radiotechnique Compelec, Caen, France). *Solar Cells,* vol. 1, Nov. 1979, p. 23-28.

High energy ruby laser pulses were used to dissolve the precipitates formed during the thermal diffusion of phosphorus into silicon in order to improve the characteristics of diffused solar cells. A maximum open circuit voltage of 600 mV and a fill factor of 0.75 were obtained for a laser energy density of 1.1 J per sq cm. (Author)

A80-21916 **Unique high concentration solar test facility.** J. A. Cape and I. Deyhimy (Rockwell International Electronics Research Center, Thousand Oaks, Calif.). *Solar Cells,* vol. 1, Nov. 1979, p. 29-36.

A high concentration solar test facility is described in which a 60.96 cm x 66.04 cm plane mirror heliostat made from a commercial (Celestron-14) telescope mount reflects the insolation to a fixed f/4 focusing mirror 53.34 cm in diameter in an enclosed laboratory. Tracking is provided by a feedback system in which the unconcentrated sunlight is pinhole imaged onto a 1 cm quadrant detector. Photocurrent differences from opposite segments of the quadrant drive the right ascension and declination controls of the Celestron-14 mount. The tracking accuracy is better than 0.01 deg and the total system cost is less than $11,000. (Author)

A80-21917 **An overview of photovoltaic market research.** D. Costello and D. Posner (Solar Energy Research Institute, Golden, Colo.). *Solar Cells,* vol. 1, Nov. 1979, p. 37-53. 21 refs. Research supported by the U.S. Department of Energy.

Available information on current and potential markets for photovoltaics is compared and contrasted. The major markets considered are communications, cathodic protection, international agricultural pumping and remote general power, and U.S. residential applications. Each of these markets is described by market size, competing power sources and system prices required for photovoltaics to compete. It is concluded that some growth in sales to communications and cathodic protection markets can be expected in the near term. International markets for agricultural pumping and general power systems show the greatest potential for sales in the early to mid 1980s. Major energy-displacing markets in the U.S., particularly in the residential sector, can be a large and profitable long-term market for photovoltaics. (Author)

A80-21918 **Energy analysis of CdS:Cu2S sputtered solar cells.** R. Harrison, G. Jenkins (Sunderland Polytechnic, Sunderland, England), and R. Hill (Newcastle-upon-Tyne Polytechnic, Newcastle-upon-Tyne, England). *Solar Cells,* vol. 1, Nov. 1979, p. 55-63. 10 refs.

The paper presents energy analysis of CdS:Cu2S sputtered solar cells. The analysis shows that sputtered thin film CdS:Cu2S cells should give good energy paybacks by computing the energy for converting raw material into cells and the energy content of the sputtering apparatus; the process energy requirements including the RF power for sputtering, ac mains power for the vacuum pumps, dc power for heating, and the energy content of the argon gas are estimated. Finally, the energy ratio as a function of machine lifetime is calculated with cell lifetime as a parameter, showing that if the predicted cell lifetime of 20 years is achievable, the ratio will exceed 10 even for the worst case if the machine lifetime exceeds 8 years. A.T.

A80-21919 **Grain size and its influence on efficiency in polycrystalline GaAs solar cells.** A. E. Blakeslee and S. M. Vernon (IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y.). *Solar Cells,* vol. 1, Nov. 1979, p. 81-90. 15 refs.

Several variations of the metal-organic chemical vapor deposition process for growth of polycrystalline GaAs films have been developed. The grain size of the films ranged from less than one to several hundred microns, yet the air mass zero efficiencies of the best Schottky barrier solar cells made from films grown by each procedure were all only about 1 - 2%. The short-circuit current was quite high, as predicted, for large grain films but in nearly all cases where extra processing and higher temperatures were introduced in order to obtain larger grains the open-circuit voltage and fill factor were reduced. Clearly, enhancement of grain size alone is insufficient to yield high quality devices, and the roles of contamination and/or process-induced defects must be thoroughly investigated in order to understand and improve the low efficiencies. (Author)

A80-21920 **The temperature dependence of the characteristics of sputtered a-Si-H solar cells.** M. M. Alkaisi and M. J. Thompson (Sheffield, University, Sheffield, England). *Solar Cells,* vol. 1, Nov. 1979, p. 91-98. 9 refs.

It is now well established that the properties of hydrogenated amorphous silicon are highly dependent on the preparation conditions. In this paper we describe the Schottky barrier characteristics of cells incorporating a-Si-H grown at different substrate temperatures and in various hydrogen partial pressures. The characteristics of the cells in the dark and under illumination are highly dependent on the type of the dominant conduction process. The illuminated cell characteristics are described for cells with efficiencies of 2%. The open-circuit voltage Voc and the short-circuit current Isc are shown to be temperature dependent and the dependence is more pronounced for non-optimum cells than for optimum devices. The spectral response for the cells is also described. (Author)

A80-21921 **The doping of amorphous silicon for solar cells.** F. Riddoch, A. Wallace, and J. I. B. Wilson (Heriot-Watt University, Edinburgh, Scotland). *Solar Cells,* vol. 1, Nov. 1979, p. 99-106. 14 refs. Research supported by the Science Research Council of England; European Economic Communities Contract No. 435-78-ESUK.

Schottky barrier diodes of gold on n-type amorphous silicon give photovoltages dependent on the silicon doping. The best voltages require an undoped layer of silicon for the junction region and approximately 100 nm of heavily doped silicon adjacent to the ohmic substrate contact. There is virtually no carrier collection outside the space charge region, as is shown by the long-wave photocurrent spectral response, and a drift field is desirable. High substrate temperatures during silicon deposition increase the long-wave response of these cells but give poorer diodes. (Author)

A80-21922 **Temperature dependence of the maximum theoretical efficiency in solar cells.** N. M. Ravindra and V. K. Srivastava (Roorkee, University, Roorkee, India). *Solar Cells,* vol. 1, Nov. 1979, p. 107-109.

An expression for the variation of the maximum theoretical efficiency of a solar cell with temperature is presented. The expression relates the difference in the maximum theoretical efficiencies of the cell at 0 C and a given temperature to the difference of the fourth roots of the corresponding temperatures. Values of the maximum theoretical efficiency at various temperatures obtained from the present expression are shown to agree very well with values theoretically evaluated by Rappaport (1959) and Wysocki and Rappaport (1960), as are values of the corresponding energy gaps. Plots of the maximum theoretical efficiency and optimum energy gaps of solar cells as functions of temperature derived from the expression are also presented. A.L.W.

A80-21924 **Overview of coal energy utilization technology in Japan.** S. Tamanuki (Electric Power Development Co., Ltd., Japan). *Energy Developments in Japan,* vol. 1, Jan. 1979, p. 213-231. 5 refs.

The paper examines short-, intermediate-, and long-range planning concerning the utilization of coal technology in Japan; the discussion is based on report no. 75 issued in June 1977 by the Japanese Natural Resources Survey Committee. The problem of setting up a schedule for each phase of research and for making a long-range strategy with a view to reviving the large-scale consumption of coal is discussed. B.J.

A80-21925 **Study of flywheel energy storage system for electric utilities.** S. Shimamura, K. Matsuno, Y. Noguchi, and Y. Tsutsui (Ministry of International Trade and Industry, Mechanical Engineering Laboratory, Tokyo, Japan). *(Seimitsu Kikai,* vol. 44, no. 1, 1978, p. 91-96.) *Energy Developments in Japan,* vol. 1, Jan. 1979, p. 233-244. Translation.

Studies on stationary flywheel energy storage system for use by electric utilities are now being carried on at the Mechanical Engineering Laboratory (MEL) as part of the national R&D projects for new energy technology called the 'Sunshine Project'. Discussions based on theoretical analyses and some experimental results are presented relative to the material, the shape, and the fabrication method of the flywheel. Experimental devices such as the flywheel performance testing machine, the fiber composite (FRP) flywheel winding machines, etc., set up at MEL are also described. (Author)

A80-21926 **Solvolysis liquefaction of coal.** H. Honda (Tokyo, Science University, Tokyo, Japan) and H. Kakiyama (Kyushu, National Industrial Research Institute, Tosu, Japan). *Energy Developments in Japan,* vol. 1, Jan. 1979, p. 255-266.

The KKS solvolysis process, which uses both coal and petroleum residues as solvent, is described. Attention is given to the compatibility of coal-tar pitch and petroleum pitch, the effect of heat treatment conditions, the effect of rank of coal on product yields, and the solvent fractionation of solvolysis pitch. A pilot plant having a processing capacity of one ton of coal a day by the solvolysis process has been constructed. B.J.

A80-21927 **Fundamental characteristics of the reverse flat plate collector.** K. Sakuta, T. Tani, S. Sawata, T. Tanaka, and T. Horigome (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan). *(Japan Solar Energy Society, Proceedings,* vol. 3, Dec. 1977.) *Energy Developments in Japan,* vol. 1, Jan. 1979, p. 267-275. Translation.

A low-cost solar collector of the nonconcentrating type, called the reverse flat plate (RFP) collector, has been developed and found to collect solar heat at high temperatures (up to 200 C), something which cannot be achieved by conventional nonconcentrating systems. The basic characteristics of the RFP collector are summarized, and a comparison of the RFP collector to the normal flat plate collector is described. B.J.

A80-21928 **Geological and geochemical characteristics of geothermal resources in Japan.** H. Nakamura (Japan Metals and Chemicals Co., Ltd., Japan), K. Sumi (Geological Survey of Japan, Kawasaki, Kanagawa, Japan), and T. Ozawa (Tokyo Institute of Technology, Tokyo, Japan). *(Japan Geothermal Energy Association, Journal,* vol. 14, no. 2, 1977.) *Energy Developments in Japan,* vol. 1, Jan. 1979, p. 277-301. 17 refs.

The Geological Survey of Japan is carrying on geothermal studies in 30 promising areas. Exploratory wells are being drilled in order to find new geothermal areas consisting of hot water and/or dry steam systems. This paper describes the geochemical and geological characteristics of the areas under study. B.J.

A80-21929 **Development of vertical axis wind turbines.** P. N. Shankar (National Aeronautical Laboratory, Bangalore, India). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences,* vol. C 2, Mar. 1979, p. 49-61, 63-66. 11 refs.

This paper summarizes the development of vertical axis wind turbines based on the Darrieus rotor. A performance analysis was developed which permits the estimation of the characteristics of such machines; 5 m high wind turbine using curved wooden blades was fabricated and tested. The tests confirmed the low starting torque of the turbine and wind tunnel tests were performed on model Savonius rotors to determine optimum starter bucket configurations. Finally, a straight-bladed turbine was constructed, concluding that Darrieus turbines should be useful in large systems used to generate electrical power for the grid; for direct water pumping purposes, however, these turbines are unlikely to be suitable. (Author)

A80-21937 **Storage of solar energy.** T. B. Taylor (Princeton University, Princeton, N.J.). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences,* vol. C 2, Sept. 1979, p. 319-330. 8 refs. Research supported by the Rockefeller Foundation.

A framework is presented for identifying appropriate systems for storage of electrical, mechanical, chemical, and thermal energy in solar energy supply systems. Classification categories include the nature of the supply system's setting; the type of energy supplied; the type of solar energy collection system used (including 'indirect' solar energy, such as wind and hydropower); the type of energy stored; and some other characteristics of the storage system. A global insolation summary is used to exhibit the diversity of requirements for solar energy storage in different settings. Comments are then made on the need and opportunities for 24 hr storage of electrical energy in batteries; backup systems that use stored chemical fuel derived from solar energy; storage of intermediate temperature heat as heat of hydration of compounds such as sulfuric acid; annual storage of low temperature heat in fresh water ponds or aquifers; and annual storage of ice produced in places with cold winters. Arguments are presented for using a systems approach to the selection of solar energy storage methods appropriate for use in specific types of settings. (Author)

A80-21938 **Studies in biogas technology. I - Performance of a convectional biogas plant.** P. Rajabapaiah, K. V. Ramanayya, S. R. Mohan, and A. K. N. Reddy (Indian Institute of Science, Bangalore, India). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences,* vol. C 2, Sept. 1979, p. 357-363. 9 refs. Research supported by the Tata Energy Research Institute.

This paper gives an account of a conventional 5.66-cu m/day (200 cu ft/day) biogas plant which has been instrumented, operated and monitored for 2.5 years. Observations regarding input to the plant, sludge and biogas outputs, and conditions inside the digester, have been described. Three salient features stand out. First, the observed average daily gas yield is much less than the rated capacity of the plant. Secondly, the plants show ease of operation and a very slow response to reductions and cessations of dung supply. Thirdly, the unexpectedly marked uniformity of density and temperature inside the digester indicates the almost complete absence of the stratification which is widely believed to take place; hence, biogas plants may be treated as isothermal, 'uniform' density, most probably imperfectly mixed, fed-batch reactors operating at mean ambient temperature and the density of water. (Author)

A80-21939 **Studies in biogas technology. II - Optimization of plant dimensions.** D. K. Subramanian, P. Rajabapaiah, and A. K. N. Reddy (Indian Institute of Science, Bangalore, India). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences,* vol. C 2, Sept. 1979, p. 365-375. Research supported by the Tata Energy Research Institute.

In this paper, the design basis of the conventional Khadi and Village Industries Commission biogas plants has been elucidated. It has been shown that minimization of the cost of the gas holder alone leads to the narrow and deep digesters of conventional plants. If instead, the total capital cost of the gas holder plus digester is minimized, the optimization leads to wide and shallow digesters, which are less expensive. To test this alternative, two prototype plants have been designed, constructed and operated. These plants are not only 25-40% cheaper, but their performance is actually slightly better than the conventional plants. (Author)

A80-21940 **Studies in biogas technology. III - Thermal analysis of biogas plants.** C. R. Prasad and S. R. C. Sathyanarayan (Indian Institute of Science, Bangalore, India). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences,* vol. C 2, Sept. 1979, p. 377-386. 8 refs.

A thermal model for a conventional biogas plant has been developed in order to understand the heat transfer from the slurry and the gas holder to the surrounding earth and air respectively. The computations have been performed for two conditions: (1) when the slurry is at an ambient temperature of 20 C, and (2) when it is at 35 C, the optimum temperature for anaerobic fermentation. Under both these conditions, the gas holder is the major 'culprit' with regard to heat losses from the biogas plant. The calculations provide an estimate for the heat which has to be supplied by external means to compensate for the net heat losses which occur if the slurry is to be maintained at 35 C. Even if this external supply of heat is realized through (the calorific value of) biogas, there is a net increase in the biogas output, and therefore a net benefit, by operating the plant at 35 C. At this elevated temperature, the cooling effect of adding the influent at ambient temperature is not insignificant. (Author)

A80-21941 **Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still.** A. K. N. Reddy, C. R. Prasad, P. Rajabapaiah, and S. R. C. Sathyanarayan (Indian Institute of Science, Bangalore, India). *Indian Academy of Sciences, Proceedings, Section C: Engineering Sciences,* vol. C 2, Sept. 1979, p. 387-393. Research supported by the Tata Energy Research Institute.

A reduction in the heat losses from the top of the gas holder of a biogas plant has been achieved by the simple device of a transparent cover. The heat losses thus prevented have been deployed to heat a water pond formed on the roof of the gas holder. This solar-heated water is mixed with the organic input for the 'hot-charging' of the biogas plant. A thermal analysis of such a solar water-heater 'piggy-backing' on the gas holder of a biogas plant has been carried out. To test whether the advantages indicated by the thermal analysis can be realized in practice, a biogas plant of the ASTRA design was modified to incorporate a roof-top solar water-heater. The operation of such a modified plant, even under worst case conditions, shows a significant improvement in the gas yield compared to the unmodified plant. Hence, the innovation reported here may lead to drastic reductions in the sizes and therefore costs of biogas plants. By making the transparent cover assume a tent-shape, the roof-top solar heater can serve the additional function of a solar still to yield distilled water. (Author)

A80-21949 **Introduction to the study of solar technology (Introduction à l'étude de l'héliotechnique).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 1, 1979, p. 3-19. In French.

The conversion of solar energy to meet the world's energy requirements by means of solar technology is discussed as preface to an introductory course in solar technology. The significance of the energy crisis of 1973 to the development of alternative sources of energy, primarily solar, is considered, and the amount of recoverable solar energy incident on the earth is estimated to be able to supply the world's energy demand. The various means of solar energy conversion, including thermal, chemical in the form of hydrogen or methane, and direct or thermal electrical, are examined, and areas of these technologies requiring further experimental investigation are indicated. Solar technology is presented as the science of the artificial applications of solar energy, with mention of its associated disciplines, and the deficiencies of the solar technology developed prior to the energy crisis are exposed. Goals for contemporary instruction in solar technology are then derived, the introductory course is outlined, and bibliographic references are presented. Differences between the sources of solar and traditional energies are also discussed. A.L.W.

A80-21950 **Solar heat production - Generalizations (La production solaire de chaleur - Généralités).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 1, 1979, p. 21-41. 7 refs. In French.

The utilization of solar radiation for the production of heat is considered. The modern science of solar technology, developed in response to the recent energy crisis, is introduced, and the collection of solar radiation by means of solar concentrators and direct collectors is examined. The general aspects of direct and indirect solar heating are considered, and the fundamental parameters in the replacement of a substantial portion of world energy consumption by solar energy are presented, including incident energy, energy regularization, distribution and necessity. The concept of insolation is introduced, and the present lack of a solar architecture is discussed. The true solar house, which captures almost all of the solar radiation it receives for various uses, is described, and it is emphasized that the science of solar technology is far from complete. The thermodynamics of solar energy conversion are also considered. A.L.W.

A80-21951 **Industrial solar thermal collectors (Les insolateurs industriels à fonction thermique).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 2, 1979, p. 3-23. In French.

Solar collectors for the provision of medium-temperature (100-150 C) industrial heat are examined. The primary energy fluxes and secondary heat fluxes produced in all types of solar energy collectors are considered, and the dimensions, heat transfer fluids and installations of solar thermal energy collectors are discussed. The component elements of the solar collector are presented, including the transparent cover, the solar absorber, the interior cavity with its magnification, concentration and loss prevention and air circulation devices and accessory equipment, and the installation of this equipment at industrial sites is considered. Further studies required to be performed on the siting development and optimization of industrial solar energy installations are indicated, and the various types of thermal microcollectors and fixed collectors, and biological and electrical collectors are described. A.L.W.

A80-21952 **The utilization of industrially produced moderate-temperature solar heat (L'utilisation de la chaleur solaire à moyenne température produite industriellement).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 2, 1979, p. 25-45. In French.

Consideration is given to the utilization of centrally produced moderate-temperature (above 100 C) solar-derived heat. Moderate-temperature heat requirements are discussed, and the operation of solar thermal collectors is examined, with attention given to output temperature and its regulation, radiation thresholds and heat loss prevention. Possible applications for industrially produced moderate-temperature heat, including space heating, water heating, cooling, industrial drying, and distilling are considered, and the process of heat storage is examined. The relative merits of centralized and distributed solar collectors are discussed, with consideration given to the siting of heat distribution networks along existing arteries in the case of centralized installations, and the auxiliary services necessary to the centralized stations are considered. Orders of magnitude of the thermal, and water requirements for space heating and desalinization are evaluated, heat transfer fluids, including water, metals, salts and organic liquids are reviewed, and numerical examples of the substitution of solar heat for pumps, swimming pool heating, water and space heating, distillation and greenhouse heating are presented. A.L.W.

A80-21953 **Industrial solar thermal concentrators (Les concentrateurs industriels à fonction thermique).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 3, 1979, p. 3-34. 7 refs. In French.

The conversion and concentration of solar thermal radiation are treated, and various industrial solar heaters and concentrators are presented. The principles of solar absorbers are discussed, and the concentration of solar radiation by means of lenses, mirrors and mixed systems is examined. High-temperature industrial solar thermal heaters and concentrators developed prior to the present energy crisis are described, including systems of conical and cylindrical mirrors, paraboloid mirrors, cylindrical-parabolic mirrors and mirror fields. Current realizations, plans and possibilities for solar thermal electricity conversion are presented, including heliostat, concentrator and high-temperature insolator systems, and the experimental investigation of solar heater technology is discussed. Attention is also given to the optical properties of parabolic mirrors, the fabrication of Fresnel lenses, and the utilization of optical waveguides and light ducts in solar systems. A.L.W.

A80-21954 **The industrial applications of high-temperature heat - Solar thermal and electric plants (Les utilisations industrielles de la chaleur à haute température - Les stations thermo et électro-solaires).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 3, 1979, p. 37-47. In French.

Consideration is given to the industrial utilization of high-temperature heat and the application of solar thermal and electrical technology to supply it. The concentration of solar energy attainable in solar furnaces and reactors is discussed, noting the generation of energy without accompanying by-products and applications of solar concentrators in metallurgical and thermochemical furnaces and photochemical reactors. The problem of heat transfer in solar heat and power plants is discussed, and the utilization of high-temperature solar heat in electrosolar plants is considered, with examinations of the thermodynamic cycles possible, the utilization of waste heat and cooling processes presented. The siting of solar installations on a scale which would displace a significant amount of petroleum-derived energy is also discussed and practical considerations in the operation of thermo- and electrosolar power stations are indicated. A.L.W.

A80-21955 **The real problems of solar energy (Les vrais problèmes de l'énergie solaire).** M. Touchais. *L'Energie Solaire et sa Maîtrise Industrielle, First Series,* no. 4, 1979, p. 3-49. 16 refs. In French.

The technical, organizational and nonindustrial problems of solar technology are examined. Technical problems considered include those posed by the production of high- and moderate-temperature industrial solar heat, the construction of solar-heat utilizing installations, the utilization of photovoltaic or thermoelectric cells, the direct production of energetic compounds, solar/wind stations and the utilization of solar energy in arid regions, as well as the instruction of solar technology and the ecological and climatological effect of the capture of large amounts of solar energy. Attention is also given to movable solar collectors and fixed concentrators, which are considered unworkable, improper terminology used in solar technology, and terms proposed to replace them, and a detailed selective bibliography of works dealing with modern solar technology is presented. A.L.W.

A80-21956 **Electric transport - The future prospects.** B. M. Bird (Bristol, University, Bristol, England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews,* vol. 127, pt. A, no. 1, Jan. 1980, p. 21-26.

A review of prospects for increasing the use of electricity for transport is presented. Both private and nationalized organizations in UK invested heavily in research and development producing key technologies for expanding the use of electricity in transport. A comparison of power flows in refuelling with petroleum with refuelling with electricity led to consideration of the limited-range battery-electric vehicle, the hybrid vehicle, and main-line traction developments; the advanced passenger train and its braking system are also discussed. It is concluded that the government should formulate an energy strategy for using electricity for transport in the future. A.T.

A80-22042 **Toroidal Trivelpiece-Gould modes.** F. P. Stössel (Innsbruck, Universität, Innsbruck, Austria). ***Plasma Physics,*** **vol. 21, Dec. 1979, p. 1031-1042. 13 refs. Österreichischer Fonds zur Förderung der Wisseschaftlichen Forschung Contract No. 2781/S.**

Electron plasma waves are treated in quasi-electrostatic approximation in a toroidal cavity of rectangular cross-section in an infinitely strong azimuthal magnetic field. The differential equation for the electrostatic potential, derived from fluid equations, can be separated using cylindrical coordinates. The eigenvalue problem for

the radial dependence is solved numerically by a shooting method. Eigenvalues are given for different aspect ratios. Comparison with appropriate modes of the straight geometry shows that the toroidal frequencies generally lie some percent above those for the straight case. Plots of the eigenfunctions demonstrate clearly the influence of toroidicity. The deviation from symmetry (which should appear for straight geometry) depends not only on the aspect ratio but also strongly on the mode numbers. (Author)

A80-22046 **Short haul transport for the 1990s.** P. Robinson (British Aerospace, Aircraft Group, Kingston-upon-Thames, Surrey, England) and D. G. Brown (British Aerospace, Aircraft Group, Hatfield, Herts., England). *Aeronautical Journal,* vol. 83, Nov. 1979, p. 413-436. 23 refs.

The paper presents an analysis of market trends and technical developments in short haul air transport over the next 20 years. Regional estimates of the market are given in accordance with the ICAO breakdown for 1990 and 2000 in revenue passenger kilometers, average annual growth rates, and aircraft units. Restraints and stimuli controlling the short haul market are analyzed, e.g. economic factors, safety, communications, and ecological considerations. Technological advances will be of evolutionary, rather than revolutionary, nature. In propulsion, emphasis will be on improving specific weight, reducing complexity and cost, and increasing reliability and safety. Advances in aerodynamics will include reduction of subcritical drag and application of wing tip devices to improve lift drag ratio under low speed and cruise conditions. While aircraft configurations will remain essentially the same, substantial benefits in fuel economics and overall performance will be derived from improved materials, systems and equipment. V.L.

A80-22167 **Development of sulfur-tolerant components for the molten carbonate fuel cell.** A. F. Sammells, S. B. Nicholson, and P. G. P. Ang (Institute of Gas Technology, Chicago, Ill.). *Electrochemical Society, Journal,* vol. 127, Feb. 1980, p. 350-357. 10 refs. Research supported by the Electric Power Research Institute.

The sulfur tolerance of candidate anode and anode current collector materials for the molten carbonate fuel cell were evaluated in an electrochemical half-cell using both steady-state and transient potentiostatic techniques. Hydrogen sulfide was introduced into the fuel at concentrations of 50 and 1000 ppm; at the higher sulfur concentration nickel and cobalt underwent a negative shift in their open-circuit potentials, and high anodic and cathodic currents were observed compared with clean fuels. Exchange currents were not greatly affected by 50 ppm H2S; but, at higher sulfur concentrations, higher apparent exchange currents were observed, indicating a probable sulfidation reaction. New anode materials including TiC showed good stability in the anodic region. Of the anode current collector materials evaluated, high stabilities were found for 410 and 310 stainless steels. (Author)

A80-22169 **Possible use of honeycomb-type structures for high power batteries and fuel cells.** J. T. Kummer (Ford Motor Co., Dearborn, Mich.). *Electrochemical Society, Journal,* vol. 127, Feb. 1980, p. 364,365.

The paper describes a possible method for constructing a Kapitza-type battery that differs from the usual thin plate approach, and may be simpler to construct, as well as a possible method for constructing a fuel cell that may offer an economic advantage over present methods. Both experiments employ a honeycomb structure of the type used as a substrate for auto exhaust catalysts. It is shown that in the case of a battery, if the alternate passageways in the honeycomb contain a positive and a negative electrode, respectively, the structure allows for a high interface area between electrodes with considerable strength. Finally, the results of the experimental battery and fuel cell are presented and discussed with consideration given to how various materials might improve the performance of such units. M.E.P.

A80-22280 **Electricity generation choices for the near term.** D. Bodansky (Washington, University, Seattle, Wash.). *Science,* vol. 207, Feb. 15, 1980, p. 721-728.

The alternatives available for the generation of electricity in the United States in the next few decades are evaluated. The present sources of electricity and recent trends in the amount of electricity generated by the various sources are reviewed, and widely varying projections of future energy demand are discussed, noting that electricity demand is expected to increase considerably if a significant reduction in oil consumption is achieved. The renewable energy resources hydroelectric power, biomass energy, geothermal power, direct solar power and wind energy are found to be incapable of making a major contribution to electricity expansion by the year 2000. Coal and nuclear power are then discussed as the most practical alternatives, and the advantages of nuclear power in the areas of cost and safety, despite the Three Mile Island accident, are pointed out. It is concluded that for the near future, all of the possible options deserve investigation. A.L.W.

A80-22281 **Wind power excites utility interest.** R. J. Smith. *Science,* vol. 207, Feb. 15, 1980, p. 739-742.

The impact of federally supported and independently developed wind power technology on electrical utilities in the United States is reported. The construction of a 200-ft, 3-MW wind turbine by the Southern California Edison Company wholly without federal assistance represents the first of its size to be erected by any utility; however, the Department of Energy is still greatly involved in the support of windmill prototype development and various companies have already sold small-scale designs to utilities. A proposal is currently the subject of prolonged debate in Congress which would significantly expand the program of government subsidies for windmill research and utilization. Private concerns have also entered the wind energy supply market, notably Windfarms, Ltd. with its projected 80-MW wind energy installation for the island of Oahu. The reaction of the DOE to such independent ventures has so far been ambivalent; on the one hand there is concern that the privately supplied facilities will not perform adequately, while on the other hand the end of federal support programs is anticipated. A.L.W.

A80-22348 **Turbulation of plasma in combustion chamber of an MHD generator.** A. I. Bystryi and R. V. Ganefel'd (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, May-June 1979, p. 611-617.) *High Temperature,* vol. 17, no. 3, Nov. 1979, p. 508-513. 13 refs. Translation.

The turbulent characteristics of diffusion and homogeneous burning in the combustion chamber of the K-1 MHD apparatus were investigated. The experimentally determined turbulence characteristics are compared with the calculated values obtained from a thermal model of flame autoturbulation, and the evolution of the turbulent disturbances in the plasma channel of the apparatus was followed. (Author)

A80-22349 **Equivalent circuits for the channel of the magnetohydrodynamic generator.** A. A. Blitshtein, Iu. P. Gusev, S. I. Pishchikov, and V. I. Pishchikov (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, May-June 1979, p. 626-631.) *High Temperature,* vol. 17, no. 3, Nov. 1979, p. 521-525. 6 refs. Translation.

We present a method for the calculation of electrical characteristics of MHD generators based on the equivalent circuit method, which provides a unified approach to the solution of electrophysical and electrotechnical problems of MHD energy transformation. We show the relationship between the equivalent circuit parameters, the physical characteristics of the plasma flow, and the channel geometry. The main algorithmic problems of the equivalent circuit calculations are briefly analyzed, and the possibility of their application to a wide class of problems is discussed. Examples are given which illustrate the validity of the present method. (Author)

A80-22433 # **Some application of Landsat imagery interpretation for petroleum targetting in India.** D. Venkataramanan (Oil and Natural Gas Commission, Madras, India). In: International Symposium on Remote Sensing of Environment, 13th, Ann Arbor, Mich., April 23-27, 1979, Proceedings. Volume 2. Ann Arbor, Mich., Environmental Research Institute of Michigan, 1979, p. 911-923. 13 refs.

An assessment of the utility of space imageries in targeting for petroleum traps is presented. Interpretations of plotted lineaments in conjunction with geological, geomorphological, and geophysical data show that petroleum entrapment is more likely near the main boundary fault in the sub-Himalayan foothills which separate the fresh-water Siwalik sedimentary belt from the Pre-Tertiaries. It is concluded that in the southwestern West Bengal basin, a new geological model is proposed on imagery interpretation, and evidence is observed of the build-up in the basin of east-flowing rivers. A.T.

A80-22441 # **Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults.** R. Peterson (Nebraska, University, Lincoln, Neb.). In: International Symposium on Remote Sensing of Environment, 13th, Ann Arbor, Mich., April 23-27, 1979, Proceedings. Volume 2. Ann Arbor, Mich., Environmental Research Institute of Michigan, 1979, p. 993-1014. 33 refs.

The system for exploration of oil and gas, described in the present paper, is based on the delineation of lineaments on remotely sensed images. By recognition of certain lineament patterns associated with bends in wrench faults, potential petroleum-bearing structures can be located. V.P.

A80-22456 # **Estimation of primary production of vegetation in agricultural and forested areas using Landsat data.** Y. Mukai and S. Takeuchi (Remote Sensing Technology Center of Japan, Tokyo, Japan). In: International Symposium on Remote Sensing of Environment, 13th, Ann Arbor, Mich., April 23-27, 1979, Proceedings. Volume 2. Ann Arbor, Mich., Environmental Research Institute of Michigan, 1979, p. 1177-1188. 5 refs.

A method to estimate the vegetal primary production from Landsat data is shown. Since vegetal resources are grouped into two categories, agricultural and forested one, a test area for each category was selected. Multitemporal Landsat scenes covering test areas with some ground truth data were obtained. For the agricultural test area, paddyfield area data and the dry biomass data related to each growth stage were collected; for the forest test area, area data of each forest type and timber volume data were collected. Crop classification or forest type classification was performed for the respective test area using multi-temporal Landsat images, and the results of the classification were compared with corresponding ground truth data. (Author)

A80-22475 # **Heat loss detection from flat roof buildings by means of aerial thermography.** R. J. Brown, J. Cihlar (Department of Energy, Mines and Resources, Canada Centre for Remote Sensing, Ottawa, Canada), J. N. Barry (Philip A. Lapp, Ltd., Toronto, Canada), and D. J. Gillis (Prince Edward Island, University, Charlottetown, Canada). In: International Symposium on Remote Sensing of Environment, 13th, Ann Arbor, Mich., April 23-27, 1979, Proceedings. Volume 3. Ann Arbor, Mich., Environmental Research Institute of Michigan, 1979, p. 1429-1438. 5 refs.

Reduction of energy consumption for heating buildings has become a major goal of government and private agencies in many countries. Localized 'hotspots' on thermograms of flat roof buildings indicate structural breakdowns and other problems of concern to the building owner. Detailed interpretation of the thermograms is often complex because the signals recorded on the thermograms represent the combined effects of several variables. Thermograms were collected and interpreted for heat loss over the same flat roof buildings (industrial and institutional) in two different years. An assessment was made of the interpretation reliability from a single data set and to what extent thermal anomalies associated with ice, snow, and water can be differentiated from excessive heat loss areas. (Author)

A80-22526 * **Structure of deformed silicon and implications for low-cost solar cells.** N. Mardesich (Spectrolab, Inc., Sylmar, Calif.), M. H. Leipold (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.), G. B. Turner (Arco Solar, Inc., Chatsworth, Calif.), and T. G. Digges, Jr. (Virginia Semiconductor, Fredericksburg, Va.). *Metallurgical Transactions A - Physical Metallurgy and Materials Science*, vol. 10A, Dec. 1979, p. 1831-1835. 17 refs. Research supported by the U.S. Department of Energy; Contracts No. JPL-954506; No. NAS7-100.

The paper reports on an investigation of the microstructure and minority carrier lifetime of silicon in uniaxially compressed silicon samples, the objective of which was to determine if it is feasible to produce silicon solar cells from sheet formed by high temperature deformation. It is reported that recrystallization was found to be incomplete in both fine and large grained materials, and that the major mode of recrystallization appears to be migration of existing boundaries into the deformed regions. Also, minority carrier diffusion length was found to be drastically reduced after deformation, perhaps due to contamination or cooling rate, and recovered only slightly with annealing. It is concluded that these results suggest that high temperature deformation of silicon for direct production of sheet for high efficiency solar cells is not practical. It is noted that potential may exist for its use as a coarse grained substrate. M.E.P.

A80-22687 * **Durability of foam insulation for LH2 fuel tanks of future subsonic transports.** E. L. Sharpe (NASA, Langley Research Center, Hampton, Va.) and R. G. Helenbrook (Bell Aerospace Textron, Buffalo, N.Y.). In: Nonmetallic materials and composites at low temperatures; Proceedings of the Conference, Munich, West Germany, July 10, 11, 1978. New York, Plenum Press, 1979, p. 207-230. 6 refs.

Organic foams were tested to determine their suitability for insulating liquid hydrogen tanks of subsonic aircraft. The specimens, including nonreinforced foams and foams with chopped glass reinforcements, flame retardants, and vapor barriers, were scaled to simulate stress conditions in large tanks. The tests were conducted within aluminum tank compartments filled with liquid hydrogen and the boil-off rate was used as the criterion of thermal performance. It was found that while all insulations deteriorated with increased cycles, two nonreinforced polyurethane foams showed no structural deterioration after 4200 thermal cycles (equivalent to 15 years of airline service). It was also found that fiberglass reinforcement and flame retardants impaired thermal performance and reduced useful life of the foams. Vapor barriers enhanced structural integrity without any deterioration in thermal properties. V.L.

A80-22690 **Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures.** E. L. Stone, L. O. El-Marazki, and W. C. Young (Wisconsin, University, Madison, Wis.). In: Nonmetallic materials and composites at low temperatures; Proceedings of the Conference, Munich, West Germany, July 10, 11, 1978. New York, Plenum Press, 1979, p. 283-290. 7 refs. Research supported by the U.S. Department of Energy.

The fatigue testing of a unidirectional glass-reinforced polyester composite at cryogenic temperatures to simulate the cyclic compressive loads of the magnet support struts in a superconductive magnetic energy storage unit is reported. Right circular cylindrical specimens were tested at 77, 4.2 K and room temperature at different stress levels using a 1-Hz haversine waveform imposed upon a constant baseload in a load-controlled closed-loop electrohydraulic test machine. Two failure modes, uniform mushrooming near one end and a 45 deg fracture line through the middle of the specimen, are observed, with no systematic difference in fatigue life between the modes. Fatigue lives obtained at 77 and 4.2 K are found to be similar, with fatigue failure at 100,000 cycles occurring at stress

levels of 70 and 75% of the ultimate compressive strengths of specimens at room temperature and 77 K, respectively. The room temperature fatigue lives of the glass/polyester specimens are found to be intermediate between those reported for glass/epoxy composites with different glass contents costing over twice as much.
A.L.W.

A80-22739 # **Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies.** R. A. Harvey, S. T. Demetriades, C. D. Maxwell, and J. L. Miller (STD Research Corp., Arcadia, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0180.* 11 p. 13 refs. Research supported by the Electric Power Research Institute.

The paper summarizes studies of the performance, cost, and operational characteristics of the principal coal burning Open-Cycle MHD (OCMHD) power plant options, including systems with directly-fired air preheaters, systems with separately-fired air preheaters and systems using oxygen enrichment. The study concludes that directly-fired plants of 1000 MWe capacity offer heat rates of 7500 Btu/kWh and will cost approximately 1100 $/kW in 1976 dollars and that the separately-fired and oxygen-enriched plant options are suitable vehicles for MHD technology demonstration and early commercial installations. The concept of installing an OCMHD system as a retrofit to an existing, fossil-fueled steam generating plant is determined to be technically feasible and appears to be economically suited to a research and development project of an electric utility.
(Author)

A80-22745 # **Current transport mechanisms in the boundary regions of MHD generators.** S. T. Demetriades, D. A. Oliver, and C. D. Maxwell (STD Research Corp., Arcadia, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0249.* 17 p. 21 refs.

Elementary models are presented of the behavior of electrode voltage drops, interelectrode insulators, anodes and cathodes, and transboundarylayer and interelectrode arcing in slagging or cleanwall, hot or cold, MHD channels. Simple calculations are presented of MHD channel interelectrode insulator failure distribution probabilities, interelectrode current leakage, and transboundary and interelectrode arcing (including computations of the number of arcs on electrodes). These models and calculations are designed to enhance the understanding of the underlying principles of the STD/MHD codes rather than provide detailed or complete engineering design calculations. As a consequence, they require only a small number of critical results from these codes. It is hoped that these models clarify the influence of some of the more interesting physical mechanisms on current transport in the boundary regions of MHD generators especially as applicable to MHD channel design.
(Author)

A80-22764 **In-situ combustion retorting of oil shale.** M. C. Branch (Colorado, University, Boulder, Colo.). *Progress in Energy and Combustion Science,* vol. 5, no. 3, 1979, p. 193-206. 67 refs.

The in situ (underground) combustion retorting of underground western United States oil shales are reviewed. The chemical compositions, thermal properties and ignition temperatures of the oil shales found in various locations are surveyed, and the kinetics of the pyrolytic conversion of kerogen, the dominant form of organic matter in western oil shales, to bitumen and oil and gas and the endothermic decomposition of carbonate minerals are examined. Investigations of the oxidation of the char remaining on oil shale after kerogen pyrolysis and organic liquid and gas removal, which provides the energy for in situ combustion oil shale retorting, are discussed, and consideration is given to models and experimental investigations of the structure of an in situ combustion retorting zone. It is concluded that, although a complete understanding of the physical and chemical processes involved in the retorting of oil shale by in situ combustion has not yet been achieved, predictions are sufficiently detailed to provide qualitative estimates of the effects of process variables on retorting rates, oil yield and effluent gas properties.
A.L.W.

A80-22766 **Incineration of industrial waste.** R. K. Tanner (European Environmental Enterprise, Zurich, Switzerland). *Progress in Energy and Combustion Science,* vol. 5, no. 3, 1979, p. 245-251.

Consideration is given to the problem of the disposal of industrial wastes, and solutions offered by the design of an industrial waste incineration plant are presented. The characteristics of the industrial wastes produced in West Germany and the facilities provided for their disposal are surveyed, with particular emphasis on those in the area of Hessen. The special waste incineration plant under construction for the Hessische Industriemüll GmbH is then described, taking into account the rotary kiln for the combustion of solid wastes, the combustion chamber for liquid wastes and polluted water, the heat recovery boiler, electrostatic precipitator, flue gas scrubber, flue gas reheater, and turbogenerator system contained in each of the two 25,000-ton/year capacity units of the plant. The commissioning of the plant is scheduled for autumn, 1980. A.L.W.

A80-22768 **Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal.** R. Yoshida, K. Ishida (Government Industrial Development Laboratory, Sapporo; Nagoya Institute of Technology, Tajimi, Japan), T. Yoshida, S. Ueda, I. Sekiguchi, Y. Nakata, S. Yokoyama, T. Okutani, Y. Yoshida (Government Industrial Development Laboratory, Sapporo, Japan), and Y. Jomoto (Government Industrial Development Laboratory, Sapporo; Muroran Institute of Technology, Muroran, Japan). *Fuel Processing Technology,* vol. 3, Jan. 1980, p. 1-5. 10 refs.

The effect of coal particle size on the catalytic hydrogenation of dry coal was investigated for three Hokkaido coals (Japan) of different ranks. It was found that the effect of coal particle size on conversion is dependent on coal rank. A greater difference in conversion with respect to coal particle size is noticed for coals of lower carbon content. The physical appearance of the products in the autoclave after the reaction suggests that the effect of particle size on conversion is dependent on the plastic properties of the heated coal sample. When the reaction proceeds with coal in the plastic state, the effect of particle size is small. As indicated by the product distribution, the plastic properties of a coal sample are related to the yield of asphaltene (hexane insoluble/benzene solubles) and/or the structural parts of original coal which yield asphaltene.
(Author)

A80-22770 **Surface-active materials from Athabasca oil sands.** S. E. Moschopedis, K. F. Schulz, J. G. Speight, and D. N. Morrison (Alberta Research Council, Edmonton, Canada). *Fuel Processing Technology,* vol. 3, Jan. 1980, p. 55-61. 13 refs.

Surface-active derivatives can be separated, or chemically-derived, from Athabasca bitumen. These materials have the ability to lower the surface tensions of aqueous solutions as well as substantially reduce the interfacial tensions of aqueous-organic systems. As such, they do appear to have a beneficial effect on bitumen recovery processes.
(Author)

A80-22788 **Urban activity allocation under criteria of transportation energy efficiency.** M. C. Romanos (Illinois, University, Urbana, Ill.) and M. L. Hatmaker (Arizona Dept. of Transportation, Phoenix, Ariz.). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 1-10. 24 refs.

A linear programming optimization technique is applied to the problem of allocating new land using activities in an existing urban area. While it is recognized that energy is not yet as decisive a factor in the determination of household and firm locational patterns as other factors such as accessibility and time costs, the model attempts to resolve land allocation problems by means of minimizing total transportation energy costs alone. Such an analysis may serve as a benchmark against which other policies and their energy repercussions could and should be measured.
(Author)

A80-22789 **Synergetics of the fission electric cells.** I. Ursu and I. I. Purica (Institutul Central de Fizica, Bucharest, Rumania). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 19-30. 20 refs.

The processes that take place in cells for the direct conversion of nuclear fission energy into electrical energy are investigated. It is shown that the use of the catastrophe theory is needed to describe an adequate model for the behavior of the cells. Three models of cells with electrostatic suppression of the secondary electrons are described. It is shown that, in these cases, the fold and cusp catastrophe model are sufficient. The description in terms of the catastrophe theory allows the choice of some parameters in order to overcome the experimental difficulties with the purpose of obtaining higher voltages and acceptable efficiencies. (Author)

A80-22790 **Domestic space-heating and solar energy in Ireland.** A. Raftery, P. Shier, and T. Obilade (Trinity College, Dublin, Ireland). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 31-39. 12 refs.

Five systems which use solar energy to heat houses are discussed and evaluated for thermal performance and cost-effectiveness by the use of a computer simulation model based on a typical Irish house. It is shown that such systems are currently unviable when compared with systems using oil, gas and off-peak electricity. The most economic solar system is that which uses rock as storage medium. Further, it is demonstrated that thermal performance is relatively insensitive to changes in storage volume. (Author)

A80-22791 **Some geometrical design aspects of a linear Fresnel reflector concentrator.** R. N. Singh, S. S. Mathur, and T. C. Kandpal (Indian Institute of Technology, New Delhi, India). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 59-67. 9 refs.

A somewhat new approach to the design of solar concentrators of Fresnel reflector geometry is outlined. The constituent mirror elements of the concentrator surface are characterized by three parameters: shift, tilt and width. The evaluation of these parameters and the concentration characteristics are investigated on the basis of a simple ray optical model. (Author)

A80-22792 **Analyses of single and double exposure solar air heaters.** P. K. Bansal and S. C. Kaushik (Indian Institute of Technology, New Delhi, India). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 69-79.

This paper presents an investigation of the performance of single and double exposure solar air heaters. A conventional solar air heater consists of a flat passage between two metallic plates through which heating fluid (air) is made to pass. The conduction loss along the lengths of the plates in the direction of the air flow and the radiation loss of heat from the absorbing plate to the bottom plate have been incorporated in the analyses. The analyses consist of the exact solutions of the heat balance equations for the absorbing plate, bottom plate and the air stream. Analytical expressions for the plate and the air stream temperatures as a function of distance along the direction of air flow and some other parameters have been derived. It is found that the heat conduction effects are negligible in both the air heaters and the reradiation of heat from the absorbing plate to the bottom plate is also insignificant. (Author)

A80-22793 **End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes.** P. R. L. Sarma, M. L. Mittal (Indian Institute of Technology, Bombay, India), and V. K. Rohatgi (Bhabha Atomic Research Centre, Bombay, India). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 81-90. 13 refs. Research sponsored by the Department of Atomic Energy of India.

The end effects phenomenon is investigated in a MHD channel with finitely segmented electrode walls when the applied magnetic field decays as a sinusoidal function at the entrance and is constant inside the channel. The governing equations to determine the electric potential are solved numerically by the successive overrelaxation method. The normal current distribution and the electrical efficiency are calculated for various types of electrode spacing. It is found that the leakage currents are more for the case when the electrode length is greater than the insulator length, and the end losses are less. (Author)

A80-22794 **A speculation on a general photoelectrochemical reactor.** V. Guruswamy and J. O. Bockris (Texas A & M University, College Station, Tex.). *International Journal of Energy Research,* vol. 4, Jan.-Mar. 1980, p. 91, 92. 6 refs.

The applicability of photoelectrochemical reactors employing inorganic semiconductor couples to chemical syntheses is considered. The TiO2-LaCrO3/GaP couple is presented as a promising electrode system, and possible structures of such a system are outlined. The dependences of reactions obtained on the potential difference of the given couple is pointed out, and an analogy with biological enzyme systems is noted. The possibility of using multi-coupled photoelectrochemical reactors in domestic waste disposal systems in place of biological systems is also discussed. A.L.W.

A80-22833 * # **Microwave power beaming for long range energy transfer.** E. J. Nalos, W. W. Lund, Jr., O. Denman, and S. M. Rathjen (Boeing Aerospace Co., Seattle, Wash.). In: European Microwave Conference, 8th, Paris, France, September 4-8, 1978, Proceedings. Sevenoaks, Kent, England, Microwave Exhibitions and Publishers, Ltd., 1979, p. 573-578. Contract No. NAS9-15196.

Current studies by NASA have identified space solar power as a potential long term viable candidate for efficient energy transfer at orbital ranges using a microwave beam. This paper will describe some of the power-aperture relationships leading to a potential feasible design of a power beaming system. The topics include a discussion of the system constraints, the transmitter and spaceborne array configuration, and the error budget levied by microwave system requirements. (Author)

A80-22867 **Hydrogen storage in metal hydrides.** J. J. Reilly (Brookhaven National Laboratory, Upton, N.Y.) and G. D. Sandrock (International Nickel Co., Inc., New York, N.Y.). *Scientific American,* vol. 242, Feb. 1980, p. 118, 119, 121 (4 ff.).

The use of metal hydrides as a hydrogen-storage medium for hydrogen-powered vehicles is discussed. Various metal hydrides are compared by their hydrogen content and energy density, and their suitability as a storage medium is evaluated against a set of criteria, such as ease of formation and decomposition, availability, cost, and safety. Compounds based on iron-titanium hydride are shown to be practical for use in motor vehicles as well as in other applications, including energy storage for peak leveling in electric power systems, compressors, pumps, and air-conditioners. V.L.

A80-22868 **Energy accounting of alternative energy sources.** F. Roberts. *Applied Energy,* vol. 6, Jan.-Feb. 1980, p. 1-20.

An energy accounting study was performed in the United Kingdom of five alternative energy resource systems - solar, geothermal, wind, wave and tidal power. The paper gives the data sources, the assumptions, an outline of the procedure, results and some general comments for each case. A detailed comparison with regard to likely energy ratios is not possible; however, a value of about 10:1 is seen as reasonable for the future. Based on such an energy ratio the likely factor saving for wind, wave and tidal energy systems is around 33:1. In the case of solar and geothermal energy it could vary from 6:1 through 23:1, depending upon system design, local conditions, etc. Energy pay-back times are short for all the systems, the longest being about four-and-a-half years. Finally, it is noted that our primary non-renewable fuels could be considerably conserved by using them to operate renewable energy resources even if economic analysis shows that at the present time such a policy is hardly justified. L.M.

A80-22869 **Application of centrifugal separation to the production of hydrogen from coal.** L. O. Williams (Martin Marietta Aerospace, Denver, Colo.). *Applied Energy,* vol. 6, Jan.-Feb. 1980, p. 63-70.

A 50-cm model centrifuge made of lightweight composite materials such as Kevlar, boron or carbon filaments, and capable of separating pure hydrogen from a coal-water-reaction gas mixture on a continuous basis is proposed. For the release of hydrogen, water vapor at 1000-1800 C is injected into a coal-containing retort where primarily hydrogen and carbon monoxide are produced. The emerging hot gas is utilized to heat incoming water and coal in a counter-current flow with the hydrogen separated from all the heavier gases by centrifugation and supplied to the user. The heavy gases are subjected to centrifugation to remove most of the sulphur dioxide and similar noxious materials for recovery, and the relatively pure carbon monoxide is burned with air to provide the final superheat to obtain the necessary hot water vapor. Coupled with a hydrogen-air fuel cell of 80% efficiency, the process would provide a coal-to-electricity system of 58% thermodynamic efficiency. For use in combustion processes such as home heating, process energy, transportation fuel, etc, the hydrogen contains 61.5% of the potential energy in the starting coal. L.M.

A80-22940 **Energy by reverse electrodialysis.** R. E. Lacey (Southern Research Institute, Birmingham, Ala.). *Ocean Engineering,* vol. 7, no. 1, 1980, p. 1-47. 32 refs. Contract No. EG-77-C-05-5544.

The use of reverse electrodialysis, a reverse desalinization process, to derive energy from the difference between the chemical potentials of concentrated and dilute salt solutions is evaluated. The process employs the flows of brine and dilute solutions through alternating cells bounded by cation- and anion-exchange membranes in a stack placed between two electrodes to generate a voltage by the passage of salt through the membranes. Potential sources of brine include the salt domes of oil and gas wells, salt water lakes, and geothermal brines. Experiments have shown the technical feasibility of reverse electrodialysis, and have confirmed equations derived to predict their performance. Calculations show that in order for reverse electrolysis to be economically attractive, the internal resistance of the cells should be minimized and net output power maximized by using large concentration ratios between the brine and the dilute solution, the minimum dilute compartment and diffusive boundary layer thicknesses, low-resistance, highly selective membranes and appropriate manufacturing methods. A.L.W.

A80-22976 **A control strategy for a variable-speed wind energy conversion system (Stratégie de commande pour un système de conversion de l'énergie éolienne à vitesse variable).** A. Jacob, V. Rajagopalan (Québec, Université, Trois-Rivières, Canada), and D. Veillette. *Canadian Electrical Engineering Journal,* vol. 5, Jan. 1980, p. 16-20. 10 refs. In French. Research supported by the Department of Energy, Mines and Resources, Natural Sciences and Engineering Research Council, and Université de Québec.

In this article, a method of calculating an optimal control strategy for a variable-speed wind power generation scheme incorporating a squirrel cage induction machine and operating in a self-excited induction generator mode is discussed. This scheme also uses a conventional three-phase thyristor rectifier, a line-commutated inverter and an economical auxiliary commutated-voltage-source inverter. The three regulated variables are: (1) drive speed as a function of available mechanical energy by manipulating the resistive torque developed by induction generator; (2) induction motor power consumption during start-up of the wind machine of vertical axis type; (3) operating slip of the induction machine, thereby limiting start-up and braking currents. The developed strategy is also suitable for any other variable-speed drive system incorporating an induction machine. (Author)

A80-23014 # **Thin solid solution films Zn/x/Cd/1-x/S.** M. S. Lakova and D. I. Dimova (B'lgarska Akademiia na Naukite, Tsentralna Laboratoriia po Sl'ncheva Energiia i Novi Energiini Iztochnitsi, Sofia, Bulgaria). *Bolgarskaia Akademiia Nauk, Doklady,* vol. 32, no. 9, 1979, p. 1195-1198. 7 refs.

A vapor deposition technique for the preparation of thin films of Zn(x)Cd(1-x)S is described, and the electrical properties of films made with this technique are examined. The technique makes it possible to vary the composition and resistivity of films by varying the composition of the initial material at a constant evaporation temperature. The use of such films in solar cells is mentioned. B.J.

A80-23101 **Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5.** Conference sponsored by the U.S. Department of Energy, et al. Edited by T. N. Veziroglu and W. Seifritz (Zürich, Eidgenössische Technische Hochschule, Zurich, Switzerland). Oxford and New York, Pergamon Press (Advances in Hydrogen Energy I), 1979. Vol. 1, 509 p.; vol. 2, 580 p.; vol. 3, 718 p.; vol. 4, 595 p.; vol. 5, 661 p. Price of five volumes, $250.

Papers are presented on recent developments in hydrogen energy systems, including primary energy sources; electrolytic, thermochemical, and hybrid hydrogen production; hydrogen production from fossil fuels; transmission and distribution, and storage. Other topics include nuclear energy as a primary energy source for hydrogen production, the conversion of solar energy into hydrogen, improvements in alkaline electrolysis technology, the development of solid polymer electrolyte electrolysis systems, the atomic sulfur-iodine water splitting cycle, the electrolysis of hydrobromic acid, the ZnSe thermochemical hydrogen production cycle, and the industrial-scale production of hydrogen from natural gas, naphtha, and coal. Attention is also given to solar-thermochemical hydrogen production from water, plasma-chemical hydrogen production, photoelectrochemical hydrogen production, gas distribution equipment for hydrogen, cryogenic hydrogen storage, and the development of low-cost nickel-rare earth hydrides for hydrogen storage. A.L.W.

A80-23102 **Nuclear energy as a primary energy source for hydrogen production.** R. Schulten (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 3-24.

Work currently under way in West Germany on the development of nuclear reactors to supply high-temperature (300-1000 C) process heat for coal liquefaction and gasification and the production of hydrogen to meet future energy demands is reviewed. The AVR reactor in Jülich, which has been supplying heat at a maximum temperature of 950 C since 1975, is described, with consideration given to its helium heat transfer system, charging and discharge system and the types of fuel elements to be investigated. The 300-MW Thorium High-Temperature Reactor (THTR) currently under construction and expected to be operational by 1980, which is based on the AVR design, is then presented, and work on the realization of a high-power process heat reactor, based on the design of the THTR, is discussed, with particular attention given to the once-through-then-out charging of the pebble bed reactor. The development of coal modification processes using nuclear heat is reported, and it is pointed out that the ideal application of the high-temperature reactor could be the production of hydrogen from water using thermochemical and hybrid processes. A.L.W.

A80-23103 * **Storage, transmission and distribution of hydrogen.** J. H. Kelley and R. Hagler, Jr. (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 25-53. 8 refs. Contract No. NAS7-100.

Current practices and future requirements for the storage, transmission and distribution of hydrogen are reviewed in order to identify inadequacies to be corrected before hydrogen can achieve its full potential as a substitute for fossil fuels. Consideration is given to the storage of hydrogen in underground solution-mined salt caverns, portable high-pressure containers and dewars, pressure vessels and aquifers and as metal hydrides, hydrogen transmission in evacuated double-walled insulated containers and by pipeline, and distribution by truck and internal distribution networks. Areas for the improvement of these techniques are indicated, and these technological deficiencies, including materials development, low-cost storage and transmission methods, low-cost, long-life metal hydrides and novel methods for hydrogen storage, are presented as challenges for research and development. A.L.W.

A80-23104 **Present state and outlook of the electrolytic H2-production route.** A. Menth and S. Stucki (Brown, Boveri et Cie. AG, Research Centre, Baden, Switzerland). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 55-63. 17 refs.

The present state of water electrolysis systems is reviewed, and potential future electrolytic processes for the production of hydrogen are presented. The history and current realizations of the KOH electrolysis unit are discussed, and the performance of these units under different pressure conditions is indicated. Attention is then given to the development of advanced alkaline electrolyzers, solid polymer electrolyte electrolyzers, high-temperature ceramic electrolyzers, photoelectrochemical water splitting processes and hybrid electrolytic-thermochemical water splitting processes. It is concluded that, with improvements in the areas of cell voltage, current density and produced gas pressure by research and development in electrode materials and interface electrochemical reactions, water electrolysis has the potential to play an important role in a future hydrogen market. A.L.W.

A80-23105 **Nuclear methane reforming for coal gasification.** J. Rastoin, J. Malherbe (Commissariat à l'Energie Atomique, Gif-sur-Yvette, Essonne, France), J. Pottier, and A. Lecoanet (Gaz de France, Paris, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 67-76.

Prospects for the large-scale production of hydrogen and coal gasification using nuclear heat are discussed, and a detailed study of the nuclear steam reforming of methane for hydrogen production is presented. Conditions favoring the expansion of the chemical hydrogen market in France and thus the applicability of nuclear methane reforming are indicated, and reasons for the selection of a process utilizing liquid-phase high-pressure hydrogen derived from nuclear methane reforming for simultaneous coal liquefaction and gasification by the Groupe d'Etude de Gazéification par Voie Nucléaire are outlined. The adaptation of the steam reforming of natural gas to a nuclear source of heat is then considered, with attention given to the process gas pressure reactor size and layout, and steam reforming parameters. Reactor options are then examined, and choices of a core outlet temperature of 850 C and an intermediate circuit are discussed. A.L.W.

A80-23106 **Hydrogen production from nuclear fission product waste heat and use in gas turbines.** M. E. Nelson, E. L. Keating, D. R. Govan, R. J. Banchak, and J. R. Corpus (U.S. Naval Academy, Annapolis, Md.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 77-108. 9 refs.

An analysis has been made on the feasibility of producing hydrogen using fission product waste heat and its subsequent combustion in gas turbines. The work has been performed in three distinct phases. In the first phase, a system using radioactive waste heat has been designed, which produces electricity. The electrical power output of this system has been calculated as a function of fission product decay time, solidified form of fission products, as well as numerous other parameters. In the second phase, the electrical energy produced is used to electrolyze water, which in turn produces hydrogen. The amount of hydrogen produced (lb/hr) has been calculated for varying electrical inputs, electrolyzer efficiencies, and feedwater temperatures. This hydrogen is then assumed to be liquified and stored. Finally, the third phase considers the burning of this hydrogen in a standard marine gas turbine. (Author)

A80-23107 **On the potential of solar energy conversion into hydrogen and/or other fuels.** J. Gretz (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 109-129. 21 refs.

The thermodynamics and energetics of the splitting of water to obtain hydrogen for use as a chemical raw material are examined. The major characteristics of the CEC 1-MW helioelectric demonstration plant are presented as a reference energy source. The water decomposition techniques of electrolysis, thermal conversion, photolysis and bioconversion are then considered, and the economics of the different techniques are estimated. Qualitative considerations on the influence of large-scale solar power plants on climate are also presented to demonstrate the lack of atmospheric temperature change and the minimal temperature reduction under the solar collectors. A.L.W.

A80-23108 **The theoretical design of a solar engine for the production of hydrogen.** L. D. Ryan (Western Michigan University, Kalamazoo, Mich.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 131-145. 7 refs.

A simple engine based on the Stirling cycle has been developed for the conversion of solar energy into hydrogen by the electrolysis of water. In place of the costly and complicated displacement piston of the Stirling engine, the present design employs the rotation of the entire engine through 180 deg within the heat source and another 180 deg for cooling. Solar energy from a concentrating collector is focused on energy-conducting rings, which transfer energy to the gas above one of two pistons. A patent search has confirmed the uniqueness of the design. The efficiency of the engine has been calculated to be the same as that of the Stirling engine and the Carnot efficiency, and expressions for the heat transfer to the conducting rings have been derived. Optimization of the present design is expected to lead to a version which is cost effective as well as efficient. A.L.W.

A80-23109 **OTEC for hydrogen production.** A. Lavi and L. C. Trimble (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 147-167.

OTEC is discussed as the most promising technology for the conversion of solar energy to hydrogen by the electrolytic decomposition of water. The operating characteristics of OTEC units are outlined, with its continuous operation, cost dependence on temperature difference, and economy of scale noted, and OTEC electricity costs are estimated. The transmission of OTEC electricity to its users is considered, and water electrolysis is proposed as a simple means for the chemical conversion of OTEC power. The economics of an OTEC electrolysis plant are then considered, and it is estimated that hydrogen can be produced at a cost from $1.41 to $1.91/kg, being cheaper than hydrogen produced from other energy sources if the cost of OTEC electricity is $0.30/kWh or less. Electricity generated from OTEC hydrogen is also shown to be potentially competitive with that derived from liquefied natural gas or nuclear fission. A.L.W.

A80-23110 **The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology.** J. R. Puryear. In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 169-172.

A80-23111 **The kinetics of oxygen evolution on non-traditional electrodic materials.** G. Fiori, C. Mandelli, C. M. Mari, and P. V. Scolari (Milano, Università, Milan, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 193-213. 24 refs. Research supported by the Commission of the European Communities.

The kinetics of oxygen evolution on electrodes based on mixed oxides with perovskite structures are investigated in relation to the efficiency of the electrodes for electrolytic hydrogen production. Samples of NiLa2O4, NiPr2O4 and NiNd2O4 were deposited on platinum sheets and the current potential curves and quasi-steady polarization curves of cells in which the electrodes were placed were measured. Results obtained at different KOH concentrations indicate that the oxidation consists of two initial electrochemical steps, the second of which is rate determining. A change in the slope of the Tafel line at high current densities is attributed to the occupation of active sites on the electrode surface. A comparison indicates the performances of electrodes containing noble metals and those containing the more common transition metals to be similar, thus favoring the development and investigation of the reaction mechanism of materials such as spinels, perovskites and perovskite-like mixed oxides. A.L.W.

A80-23112 **Improvements in electrolysis technology in alkaline solution.** A. J. Appleby and G. Crépy (Compagnie Générale d'Electricité, Marcoussis, Essonne, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 227-240. 9 refs. Research supported by the Commission of the European Communities.

Potential technologies for the improvement of alkaline electrolyzer performance in the next five to ten years are discussed. Studies of electrode catalysts, separator materials and bipolar electrolyzer designs capable of allowing electrolysis to proceed at higher current densities, lower working potentials, and temperatures no higher than 120 C to reduce electrical requirements and overall development and capital costs are reviewed. It is concluded that the simplest technology for an advanced alkaline electrolyzer is that based on a thin nickel bipolar plate, with a separator retained between two undulating pierced screens and gas bubble removal on the face of the electrode. Teflon-bonded potassium hexatitanate shows promise as a separator material, and nickel molybdate and nickel oxide/iron molybdate catalysts have been found to exhibit a low cost and a high performance, respectively. A.L.W.

A80-23113 **The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis.** P. Perroud and G. Terrier (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Grenoble, Grenoble, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 241-253. 5 refs. Research supported by the Délégation Générale à la Recherche Scientifique.

A80-23114 **The significance of studies with palladium to basic problems of electrolytic hydrogen evolution.** F. A. Lewis (Belfast, Queen's University, Belfast, Northern Ireland). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 279-290. 51 refs.

Palladium and palladium alloys possess an ability to equilibrate readily with molecular hydrogen and to permit its rapid internal permeation. Changes of electrode potential and physical properties can be accurately correlated with hydrogen chemical potentials. These features have proved valuable in establishing the contribution to hydrogen overpotential of the chemical potential corresponding to the concentration of molecular hydrogen dissolved adjacent to the electrode surface and governed by diffusive transport through the Brunner-Nernst layer. Recently studies with these electrodes have been concerned with the possible influence of local variations of hydrogen chemical potential on other components of hydrogen overpotential, modes of hydrogen bubble evolution, electrolytic hydrogen isotope separation factors and hydrogen isotope exchange with aqueous solutions. (Author)

A80-23115 **Electrodes for generation of hydrogen and oxygen for seawater.** J. E. Bennett (Diamond Shamrock Corp., Painesville, Ohio). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 291-309. 10 refs.

Factors influencing the relative rates of the evolution of chlorine and oxygen in seawater electrolysis systems are examined in order to investigate means for ensuring the selective evolution of oxygen. The relative efficiencies under different conditions of chlorine and oxygen evolution in conventional seawater electrolysis for the production of hypochlorite are compared to demonstrate that under usual salinities and temperatures and using conventional anodes, chlorine evolution is predominant despite the thermodynamically preferred oxygen reaction. The theory of seawater electrolysis is then developed to show how mass transfer limitations and reaction kinetics suppress oxygen evolution at the anode. Conditions of seawater electrolysis favoring oxygen evolution are proposed, and an anode coating which selectively evolves oxygen from chloride solutions at 95% efficiency in concentrated brine by a proposed mechanism in which the deposited manganese dioxide coating limits chlorine mass transfer is then presented. A.L.W.

A80-23116 **Unipolar water electrolysers - A competitive technology.** R. L. LeRoy (Noranda Research Centre, Pointe Claire, Quebec, Canada) and A. K. Stuart (Electrolyser Corp., Ltd., Etobicoke, Ontario, Canada). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 359-375. 22 refs.

An analysis of the costs of electrolytic hydrogen produced by improved unipolar electrolyzers currently under development is presented. Consideration is given to the voltage-current performance of unipolar and bipolar electrolyzer designs, and performance improvements to be expected from the reduction of contributions to cell voltage, the application of electrode catalysis in unipolar designs, and the use of solid polymer electrolytes in bipolar designs. The capital costs of electrolyzer operation, including cells and accessories, installation and start-up, rectification, and electric power, are analyzed to obtain an expression for total hydrogen cost, which is applied to different electrolyzer technologies. Costs of the present unipolar and bipolar technologies are found to be comparable, as are those of future unipolar technology and solid polymer electrolyte technology. A.L.W.

A80-23117 **Development of Billings SPE electrolyzer.** B. C. Campbell (Billings Energy Corp., Provo, Utah). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 377-390. 10 refs.

A small-scale solid polymer electrolyte electrolyzer for hydrogen production has been developed to comply with requirements for low capital cost and high reliability. The original cell employed Nafion as the electrolyte, nickel as the cathode catalyst, and lead dioxide as the anode catalyst in a filter-press cell design, and was found to operate at an efficiency of 30% at current densities of 400 milliamp/sq cm. Estimates of a service life of 1500 hours for this device led to the replacement of the lead dioxide and nickel electrodes by platinum-plated titanium to prevent galvanic corrosion and catalyst decomposition. The modified cell has been found to operate at an efficiency of 45% at 600 milliamp/sq cm and pressures from 3 to 10 MPa, with an indicated reliability of one year maintenance-free operation and seven years total service life and a competitive hydrogen cost, despite the use of a precious metal. A.L.W.

A80-23118 **Hydrogen production by high temperature electrolysis of water vapour.** W. Doenitz, R. Schmidberger, E. Steinheil (Dornier System GmbH, Friedrichshafen, West Germany), and R. Streicher (Lurgi Kohle und Mineralotechnik GmbH, Frankfurt am Main, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 403-421. Research sponsored by the Bundesministerium für Forschung und Technologie.

The high-temperature electrolysis of steam is presented as a potentially efficient means of hydrogen production. The thermodynamic advantages of high-temperature electrolysis are indicated, and technologies to be developed for steam electrolysis are examined, including electrolysis cells composed of an oxygen electrode, a water vapor-hydrogen electrode, a solid electrolyte and material to interconnect cells in series, and overall process engineering. These considerations are illustrated for the design and development of the German High Operating Temperature Electrolysis reactor. Ultimate efficiencies of greater than 50% are predicted. A.L.W.

A80-23119 **Development and operation of a high current density high pressure advanced electrolysis cell.** M. G. Nayar, P. Ragunathan, and S. K. Mitra (Bhabha Atomic Research Centre, Bombay, India). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 1. Oxford and New York, Pergamon Press, 1979, p. 451-467.

This paper deals with the development work in Bhabha Atomic Research Centre, India, on alkaline water electrolysis cells. Indigenous development of an advanced type high amperage high pressure electrolyser using porous nickel electrodes for tonnage production of hydrogen is described. Methods of producing porous nickel plaques and other cell components are also presented. Operation and performance characteristics of the cells are reported. (Author)

A80-23120 **Irreversibility analysis of hydrogen separation schemes in thermochemical cycles.** K. E. Cox (California, University, Los Alamos, N. Mex.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 471-498. 8 refs. Research sponsored by the U.S. Department of Energy.

Six processes have been evaluated as regards irreversibility generation for hydrogen separation from binary gas mixtures. The results are presented as a series of plots of separation efficiency against the mol fraction hydrogen in the feed gas. Three processes, condensation, physical absorption and electrochemical separation indicate increasing efficiency with hydrogen content. The other processes, physical and thermal adsorption, and diffusion show maxima in efficiency at a hydrogen content of 50 mol percent. Choice of separation process will also depend on such parameters as condition of feed, impurity content and capital investment. For thermochemical cycles, schemes based on low temperature heat availability are preferable to those requiring a work input. (Author)

A80-23121 **A feasibility study on thermochemical water-splitting cycles using sulfur compounds.** M. Dokiya, K. Fukuda, T. Kameyama, and H. Yokokawa (National Chemical Laboratory for Industry, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 499-512. 14 refs. Research supported by the Agency of Industrial Science and Technology.

Several thermochemical cycles were studied: (1) Cu-Cl hybrid cycle, (2) SO2 hybrid cycle, (3) SO2-I2 cycle, (4) SO2-I2-Benzene cycle, (5) SO2-Methanol-Iodine cycle and (6) SO2-H2S cycle. Except for the Cu-Cl hybrid cycle, these cycles utilize sulfur compounds and involve the thermal decomposition reaction of sulfuric acid as the oxygen evolving reaction. A test performance of an iron catalyst was carried out for 120 hrs. on 60 wt% sulfuric acid at 800-850 C under 1 atm. It is concluded that a cycle which involves methanol and iodine is the most promising. (Author)

A80-23122 **Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle.** J. H. Norman, K. J. Mysels, D. R. O'Keefe, S. A. Stowell, and D. G. Williamson (General Atomic Co., San Diego, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 513-543. 15 refs. Research sponsored by the American Gas Association and General Atomic Co.

Developments in the sulfur-iodine thermochemical cycle are discussed which include (1) experiments showing that the SO2-H2O-I2 reaction can be carried out at temperatures above the melting point of I2; (2) a description of the catalytic thermal decomposition of H2SO4 vapors for the first transition metal period; (3) a study of the separation of HI from HI-H2O-I2 mixtures which details the breaking of the H2O-HI azeotrope using H3PO4 as an extractive distillation agent; and (4) a study of the catalytic decomposition of HI for which activated carbon is used as a catalyst which is contacted with gaseous components only. The conversion advantages of obtaining condensed state iodine are elucidated. (Author)

A80-23125 **The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine.** G. De Beni, G. Pierini, B. Spelta, D. van Velzen, and H. Langenkamp (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 617-648. 15 refs.

The paper describes experimental work on the reaction of SO2, H2O and X2 (where X = Br or I). The reaction with iodine results in separation problems which may be surmounted by the use of a large excess of SO2 and/or by the addition of suitable organic solvents. The results obtained with SO2 only and with addition of diethylether and TBP are discussed, with the consideration of application of this reaction in possible thermochemical cycles. The reaction with bromine is much more advantageous than with iodine. Equilibrium measurements show that high sulfuric acid concentrations are attainable. A simple mathematical model for the reaction rate in packed columns has been developed which satisfactorily fits the experimental data. (Author)

A80-23126 **Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle.** D. van Velzen, H. Langenkamp, G. Schütz, D. Lalonde, J. Flamm, and P. Fiebelmann (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 649-665. 11 refs.

The paper describes the state of the art of the experimental work carried out at the JRC-Ispra, noting that the aim of the project is to construct a reliable small scale model of the process which should yield valuable information for further scaling-up. Apposite design and/or simulation rules have been applied in the design calculations for the process. Features of the plant, which uses the Mark-13 process are surveyed; the anticipated net hydrogen production rate is 4.0 gmoles/h - i.e., 100 l/h S.T.P. M.E.P.

A80-23127 **Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles.** J. D. Schreiber, J. R. Dafler, and S. E. Foh (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 669-685. 25 refs.

The paper examines equilibrium effects in high-pressure hydrogen production for thermochemical water-splitting cycles. The hydrogen production steps of these cycles were classified according to the ratio of the mole numbers of gaseous products to the mole number of gaseous reactants indicating the temperature of the hydrogen production step. Generalized relationships are presented for hydrogen production steps so that the Gibbs free energy change is zero, and relationships between the hydrogen mole fraction and product pressure are defined. Finally, the trade-offs between product streams composition and input heat temperatures are assessed, showing that the degree of feed stream impurities which can be tolerated can be determined. A.T.

A80-23128 **Electrochemical aspects of the H_2SO_4-SO_2 thermoelectrochemical cycle for hydrogen production.** A. J. Appleby and B. Pichon (Compagnie Générale d'Electricité, Marcoussis, Essonne, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 687-707. 16 refs. Délégation Générale à la Recherche Scientifique et Technique Contract No. 76-7-1514; European Economic Communities Contract No. 183-77-EHF.

Oxidation of SO_2 has been studied on electrode surfaces in sulfuric acid solutions as a function of acid concentration and temperature. Most work was conducted on platinum electrodes of high surface area with sulfuric acid as the final product. The reaction rate at constant potential vs hydrogen is strongly dependent on sulfuric acid concentration and temperature has little effect. In some potential and SO_2 partial pressure ranges, the process has a very low SO_2 reaction order which can ensure uniform hydrogen current density in a practical system at high SO_2 conversion rates. The limiting steps in engineered SO_2-depolarized hydrogen production cells are reviewed. (Author)

A80-23129 **Electrolysis of hydrobromic acid.** G. H. Schuetz, P. J. Fiebelmann, and D. R. Lalonde (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 709-730. 14 refs.

The electrolysis of hydrobromic acid is of interest for hybrid cycles. It is shown that the electrolysis is feasible on a laboratory scale with bipolar graphite electrodes. Graphite is actually the only practical material. The high hydrogen overvoltage of graphite can be reduced to a large extent by adding small amounts of Pd or Pt salts directly to the electrolyte. The bromine overvoltage is much lower than that for chlorine and can be neglected. The working temperature may be higher than for present day H_2O or HCl electrolysis. Under conventional conditions several kA/m^2 can be obtained below 1 V. (Author)

A80-23130 **The decomposition of hydrogen bromide using iron bromide and magnetite.** C. F. V. Mason (California, University, Los Alamos, N. Mex.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 731-745. 12 refs. Research sponsored by the U.S. Department of Energy.

A means of thermochemically decomposing hydrogen bromide has been investigated experimentally using the reaction between magnetite and HBr as the bromine producing step. A high yield of Br_2 was formed in a short time. For the hydrogen producing step, the direct hydrolysis of ferrous bromide was confirmed as having an unfavorable equilibrium. However, introduction of magnesium oxide into an aqueous solution of $FeBr_2$ and subsequent heating of the insoluble product gave H_2 and Fe_3O_4 in good yields. The main drawback in these reactions is the heat required to dry and dehydrate magnesium bromide to reform MgO by hydrolysis. (Author)

A80-23131 **Energy balance calculations and assessment of two thermochemical sulfur cycles.** D. Léger, P. Lessart, J. P. Manaud, R. Benizri, and P. Courvoisier (Commissariat à l'Energie Atomique, Centre d'Etudes Nucleaires de Saclay, Gif-sur-Yvette, Essonne, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 747-760. 7 refs.

A study of the formation and decomposition of sulfuric acid for hydrogen production by water-splitting is presented. Thermochemical analyses of cycles involving reactions using iron sulphide and copper and magnesium oxides and bromides are discussed; the quantities of reactants and products are calculated and flow diagrams prepared. The enthalpy diagrams are plotted and energy balances evaluated using the helium from a 3000 MWth high temperature nuclear reactor as a heat source and devising internal heat exchange. A.T.

A80-23132 **Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory.** C. E. Bamberger (Oak Ridge National Laboratory, Oak Ridge, Tenn.) and D. M. Richardson. In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 763-769. 15 refs. Contract No. W-7405-eng-26.

The paper deals with two new cycles derived from a study of the chemical feasibility of thermochemical cycles for the production of hydrogen from water. The new thermochemical cycles consist essentially of three and five chemical reactions, respectively. The reactions involved have been demonstrated experimentally and are well described in the literature. V.P.

A80-23133 **The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies.** O. H. Krikorian (California, University, Livermore, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 791-807. 16 refs. Contract No. W-7405-eng-48.

Problems during initial stages of the development of the ZnSe thermochemical cycle are described. The recent chemical studies include work on the steam hydrolysis of $ZnCl_2(l)$ at 780 to 980 K to produce ZnO(s) and HCl(g), and on the mechanism of decomposition of $H_2Se(g)$ at 673 to 748 K. Process design and cost analyses for the cycle give a conservative cost estimate of about $13/GJ for hydrogen production. It is anticipated that as work on this cycle progresses, chemical and process-design innovations will lower production costs. (Author)

A80-23134 **A study of the cerium-chlorine system for thermochemical production of hydrogen.** C. M. Hollabaugh, E. I. Onstott, T. C. Wallace, Sr., and M. G. Bowman (California, University, Los Alamos, N. Mex.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2.

Oxford and New York, Pergamon Press, 1979, p. 809-828. 12 refs. Research sponsored by the U.S. Department of Energy.

Experimental studies of the reaction rates for the cerium chloride cycle for producing H2 thermochemically have shown that all the reactions occur at useful rates without interfering side reactions. Reaction models were developed to describe the course of the 3 reactions: the hydrochlorination of CeO2, the hydrolysis of CeCl3 and the H2 producing reaction. These models indicate that the rate controlling steps include chemical reaction, product layer diffusion and gas transport into the powdered reactant. The reaction of oxidation of water with Cl2 to produce O2 was not included in these studies. (Author)

A80-23135 **Br-Ca-Fe water-decomposition cycles for hydrogen production.** H. Kameyama and K. Yoshida (Tokyo, University, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 829-850. 7 refs.

Experimental results of two kinds of Br-Ca-Fe cycles named 'UT-2' and 'UT-3' processes are described. First, data on reaction kinetics are given. Then, several problems to be solved for its industrialization are discussed: method for the reaction performance, method for separation of gaseous products, method for supporting of solid reactants and method for heating as well as cooling of reactors. The efficiencies of both processes based on the flow sheets are finally estimated. (Author)

A80-23136 **Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4.** E. H. Appelman, F. Schreiner, and B. M. Abraham (Argonne National Laboratory, Argonne, Ill.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 851-907. 13 refs. Research sponsored by the U.S. Department of Energy.

A80-23137 **The magnesium-iodine cycle for the thermochemical decomposition of water.** W. Kondo, S. Mizuta, T. Kumagai, Y. Oosawa, Y. Takemori, and K. Fujii (National Chemical Laboratory for Industry, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 909-921. 10 refs.

A thermochemical water-splitting cycle comprising four chemical reactions carried out at 600 C or below was developed by utilizing magnesium oxide in the alkaline earth metal-iodine cycles. Difficulty in the redox reaction of iodine with magnesium oxide could be surmounted by an excess of iodine and high temperature compared with the case of calcium oxide. Advantages of the present cycle over the calcium-iodine cycle are 1) magnesium iodide can be hydrolysed completely at 400 C or below and the reaction rate is considerably high, while the hydrolytic conversion of calcium iodide is only 70 - 80% at 700 C, and 2) magnesium iodate can be decomposed at 600 C, while calcium iodate is decomposed at 800 C. (Author)

A80-23138 **Thermochemical water splitting cycles - Impact of thermal burdens and kinetics.** B. M. Abraham (Chicago, University, Chicago, Ill.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 923-234. 5 refs.

Equations are rigorously derived for evaluating the thermal efficiency of a thermochemical water splitting cycle, from which it is possible to assess the impact of each heat burden or loss separately. It is shown that the equations of continuity are coupled and, as a consequence, heat flow is found to be the rate determining process for the operation of a thermochemical water splitting plant. It is noted that since the heat flow is rate determining, the chemical rate of reaction must be fast relative to heat flow even in the asymptotic approach to completion. It is concluded that recycling of reactants, which is required if the change in G is greater than or equal to 0, will probably result in an uneconomical cycle. M.E.P.

A80-23139 **A kinetic investigation of the reforming of natural gas for the production of hydrogen.** G. A. Karim and M. M. Metwally (Calgary, University, Calgary, Alberta, Canada). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 937-956. 24 refs. Research supported by the National Research Council of Canada and University of Calgary.

An analysis of the thermal uncatalyzed reaction of a homogeneous mixture of steam and methane for the production of hydrogen on the basis of detailed chemical kinetics is presented. The kinetic behaviour of a homogeneous mixture of steam/methane is investigated over a temperature range of 1400 - 3000 K, pressure range of 0.5 - 10 atm, and steam/methane ratio range of 1.0 - 5.0. The reaction is attractive for temperatures over 1800 K, and it has been shown that near equilibrium conditions can be achieved within a residence time of about 10.0 seconds. The addition of O2 to the reacting mixture of methane and steam is also investigated, and it has been found that the addition of a small amount of O2 has only a small effect on the composition of the products. (Author)

A80-23140 **The economics of producing hydrogen from a small air-blown coal gasifier.** L. D. Hadden (Billings Energy Corp., Provo, Utah). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 983-1005. 5 refs.

In the quest to implement hydrogen energy concepts, the lack of modest quantities of low cost hydrogen is often encountered. Production of hydrogen from coal is commercial in many of the world's ammonia plants. In this study a hydrogen production facility is described which would be appropriate for a single large user or small municipality. The cost of hydrogen from this plant is competitive with existing fuels and represents a new alternative for the utilizing coal including those with high sulfur content. (Author)

A80-23141 **Industrial scale production of hydrogen from natural gas, naphtha and coal.** W. Balthasar and D. J. Hambleton (Kinetics Technology International, Zoetermeer, Netherlands). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 2. Oxford and New York, Pergamon Press, 1979, p. 1007-1028.

This paper reviews the three major routes for the production of hydrogen from fossil fuels. Today, there is considerable interest in the production of hydrogen via the gasification of coal. Existing processes and developments are listed. The partial oxidation processes which utilize feedstocks ranging from light hydrocarbons to heavy fuel oil are attractive due to feedstock flexibility. Hydrogen production based on the steam reforming of light hydrocarbons has become the most widely used process as a result of, in general, better economics. (Author)

A80-23142 **Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace.** B. Cheynet, C. Bernard (Grenoble, Ecole Nationale Supérieure d'Electrochimie et d'Electrométallurgie, Saint-Martin-d'Hères, Isère, France), and M. Ducarroir (CNRS, Laboratoires des Ultra-Réfractairs, Font-Romeu, Pyrénées-Orientales, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1031-1049. 8 refs.

A computation method, based on the minimization of the total Gibbs energy, is presented for the study and selection of thermochemical cycles for hydrogen production. In the case of the 'Fe-O-H-Br' system a three-step cycle is generated. The calculations show the characteristic behavior of the hydrolysis reaction in relation with different parameters. The experimental results are in good agreement with the theoretical equilibrium and illustrate the reliability of the thermodynamic approach. This reaction is also experimentally studied in a fluidized-bed reactor heated by the concentrated radiation beam of an arc image furnace. (Author)

A80-23143 **Solar-thermochemical production of hydrogen from water.** J. R. Schuster and J. L. Russell, Jr. (General Atomic Co., San Diego, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1051-1066. 9 refs.

Several methods for the thermochemical production of hydrogen from water are described. It is noted that thermochemical water splitting using the sulfur-iodine cycle has the potential to be an efficient approach. This cycle uses high-temperature heat that could be supplied by a solar concentrator. It is suggested that the fixed mirror solar concentrator incorporates features that make it well suited to the solar-thermochemical production of hydrogen. B.J.

A80-23144 **Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6.** T. Ohta, N. Kamiya, T. Otagawa, M. Suzuki (Yokohama National University, Yokohama, Japan), S. Kurita, and A. Suzuki (IHI Technical Laboratories, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1067-1084. 7 refs. Research supported by the Ministry of International Trade and Industry.

The paper examines optimum operating conditions for the Yokohama Mark 5 and 6 hybrid hydrogen-producing systems. An electrochemical approach is used to calculate energy storage using photochemical reactions, and conditions of maximum storage are examined. The potential difference of the two systems, i.e., Fe(3+)/Fe(2+) and I3(-)/I(-), was considered as the stored energy. It is found that in order to achieve optimum conditions the photochemical cell should be thin and the concentration of I3(-) should be high with an appropriate Fe(2+)/I3(-) ratio. B.J.

A80-23145 **Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column.** S. Tanisho, N. Wakao, and T. Ohta (Yokohama National University, Yokohama, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1085-1106. 10 refs.

Theoretical calculations and experimental results show that the thermogravitational column can be used to separate hydrogen from a hydrogen iodide/hydrogen-iodine gas mixture. The advantage of this method is that the decomposition of hydrogen iodide into hydrogen and iodine occurs in the bulk space and the iodine deposited on the cold wall can be recovered easily. It is found that the recovery efficiency largely depends on the feed location, the width of the annular spacing between hot and cold walls, the temperature difference between the walls, and the axial temperature distribution. B.J.

A80-23147 **On the study of hydrogen production from water using solar thermal energy.** S. Ihara (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1121-1133. 10 refs.

Theoretical thermal efficiency of hydrogen production by one-step water splitting utilizing solar heat at high temperatures is calculated. Carnot efficiency is assumed for the conversion of effective work input, and the solar collection efficiency is considered for the total energy input. The overall efficiency shows its maximum in the range of temperature between 1500 and 2700 K depending upon the solar concentration ratio and the method of product separation. The technical feasibility of direct splitting method is discussed on the basis of those calculated results. (Author)

A80-23148 **Hydrogen production from fusion reactors coupled with high temperature electrolysis.** J. A. Fillo, J. R. Powell, M. Steinberg, F. Salzano (Brookhaven National Laboratory, Upton, N.Y.), R. Benenati, V. Dang, S. Fogelson, H. Issacs, H. Kouts, and M. Kushner. In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1135-1168. 6 refs. Research sponsored by the U.S. Department of Energy.

Preliminary studies at Brookhaven show that high temperature electrolysis (HTE) has the highest potential for the production of hydrogen from fusion reactions. A fusion-to-hydrogen efficiency of 70% appears possible with 1800 C HTE units and 60% power cycle efficiency; an efficiency of 50% appears possible with 1400 C HTE units and 40% power cycle efficiency. Based on efficiency results HTE methods appear to have potentially lower unit process or capital costs compared to thermochemical or direct decomposition methods. B.J.

A80-23149 **Plasmochemical cycle of hydrogen production from the water.** I. G. Belousov, V. A. Legasov, V. D. Rusanov, and I. V. Kurchatov (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1169-1181. 7 refs.

The paper is devoted to the two-stage plasmochemical cycle of hydrogen generation from the water, based on decomposition of the carbon dioxide in a nonequilibrium gas-discharge plasma with the subsequent hydrogen production from the carbon oxide by steam conversion. Comparison is given of the plasmochemical cycle with the electrolysis and thermochemical ones. Some general questions of choice of the cycle for the industrial technology are briefly considered. (Author)

A80-23151 **Spin-aligned hydrogen.** W. C. Stwalley (Iowa, University, Iowa City, Iowa). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1209-1213. 30 refs. Research supported by the Petroleum Research Fund.

Spin-aligned hydrogen is a hypothetical form of hydrogen, which consists of hydrogen atoms maintained exclusively in their lowest electronic energy magnetic sublevels under low-temperature, high-magnetic-field conditions. This paper briefly reviews the properties of spin-aligned hydrogen and the current prognosis for its experimental preparation. B.J.

A80-23152 **Hydrogen generation via photoelectrolysis of water - Recent advances.** A. J. Nozik (Allied Chemical Materials Research Center, Morristown, N.J.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1217-1246. 93 refs.

The current status of hydrogen production by the photoelectrolysis of water using sunlight is reviewed. Advances in the theoretical understanding of the energetics and mechanisms of photoelectrolysis are examined, and the development of new semiconductor electrode materials is discussed. The problems associated with the achievement of a cost-effective photoelectrolysis system are considered. B.J.

A80-23153 **Photoelectrochemical generation of hydrogen**

with hybrid electrodes. K. Yazawa and H. Morisaki (University of Electro-Communications, Chofu, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1247-1251. 5 refs.

A novel semiconductor electrode structure is described which enables the stable photoelectrolysis of water in a single cell without any auxiliary power source. A TiO_2 thin film is fabricated on a Si solar cell either by chemical vapor deposition or by thermal oxidation of a sputtered Ti film in vacuum. This structure of electrodes has several advantages: (1) TiO_2 film is anodically biased by the solar cell, and the efficiency of its catalytic action to decompose water is greatly improved; (2) photons with energy higher than 3.0 eV of the solar radiation are absorbed in the TiO_2 film and those with energies between 1.2 and 3.0 eV are used in the solar cell; and (3) the electrode is free from the corrosion problem. (Author)

A80-23154 **Photochemical production of hydrogen from water.** E. Broda (Wien, Universität, Vienna, Austria). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1253-1265. 35 refs.

Various techniques of photochemical production of hydrogen are reviewed. These include plant photosynthesis, energy farming, and water photolysis with membranes. The latter technique is emphasized with attention given to single- and double-phase systems, the use of two photosystems in succession, photolysis with visible light, and artificial photolytic membranes. The technical feasibility of the water photolysis technique is assessed. B.J.

A80-23155 **Bio-solar hydrogen production.** A. Mitsui (Miami, University, Miami, Fla.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1267-1291. 166 refs. NSF Grants No. AER-75-11171-A01; No. AER-77-11545.

Biological hydrogen photoproduction is reviewed, with emphasis on research on hydrogen photoproduction in salt water systems under way at the University of Miami Marine School. Consideration is given to: (1) the advantages of biological hydrogen production as a source of fuel and biomass, (2) the key areas of research in this field, and (3) the economic potential and feasibility of such systems. B.J.

A80-23156 **Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems.** T. Yagi (Shizuoka University, Shizuoka, Japan) and H. Ochiai (Shimane University, Matsue, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1293-1307. 58 refs. Ministry of Education, Science, and Culture Grant No. 211112.

An attempt has been made to develop a hydrogen-producing system consisting of chloroplasts and bacterial hydrogenase, separated by an electron carrier. The main difficulties with the development of such a system are the photoinactivation of chloroplast photosystems, the oxygen-sensitivity of bacterial hydrogenase, and the autooxidation of the reduced form of electron carriers. Ways to overcome these difficulties are described. B.J.

A80-23157 **Thermoelectrochemical cycles for power and hydrogen production.** M. Steinberg (Brookhaven National Laboratory, Upton, N.Y.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1309-1325. Contract No. EY-76-C-02-0016.

The thermoelectrochemical (TEC) power cycle combines the electrochemical decomposition of a compound at a state where the free energy change is low and the recombination of the same or a different compound at a state where the free energy change is high. The difference in free energies gives a net difference in emf which results in a net power output for the system. The power cycle combines the operation of an electrolyzer at a high-temperature, low-emf condition and a fuel cell at a low-temperature, high-emf condition. The principles of operation are illustrated by an H_2-O_2-H_2O system and an H_2-O_2-Cl_2-HCl system. B.J.

A80-23158 **Analysis of the potential transmission of hydrogen by pipeline in Switzerland.** E. Anderson, J. Davies, M. Kornmann, and G. Capitaine (Battelle, Geneva Research Centre, Geneva, Switzerland). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1347-1372. 25 refs. Research supported by the Fonds National Suisse de la Recherche Scientifique.

It is shown that the pipeline transmission of hydrogen under optimum conditions in new, full-capacity pipelines will be 25-50% more expensive than natural-gas transmission. However, for a given pipeline diameter and for pipeline operation at throughputs significantly below maximum capacity, which is the current situation for national gas pipelines in Switzerland, there would be no capacity problems, and transport costs would be virtually the same if hydrogen were transported. The major technical problem concerning the transmission of hydrogen gas at high pressure is the possibility of slow fatigue-crack growth from existing cracks or crack-like defects in the pipe body or weld. B.J.

A80-23159 **Mixture properties for hydrogen supplementation of natural gas.** N. R. Baker and W. D. Van Vorst (California, University, Los Angeles, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1373-1400. 25 refs.

It has been suggested that manufactured gases, such as SNG or hydrogen, will be required to supplement and eventually replace the natural gas reserve. Such a proposal requires that both methane and hydrogen, in varying amounts, be transmitted, distributed, and used in the existing natural gas supply network. This paper examines the prediction of the properties of hydrogen-methane mixtures and presents the results of computation of Joule-Thomson coefficients, inflammability limits, quenching distances and diameters, minimum ignition energies, and the flame stability of mixtures of several compositions. B.J.

A80-23160 **Small scale ammonia production as a means for hydrogen storage.** J. Jourdan and R. Roguenant (Rhône-Poulenc Industries, Courbevoie, Hauts-de-Seine, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1401-1429. 5 refs.

The paper considers ammonia production as a means of hydrogen storage in production of solar electricity. A 75 t/d ammonia plant based on this concept is described, showing that it would serve energy needs of isolated regions including electricity, gas, ammonia fertilizer, and easy to store back-up hydrogen source. The electricity and fertilizer needs of a population in the 10 to 50 thousand range could be met by a 100 MWe peak solar power station coupled to a 75 t/d ammonia plant; specific examples are given within these ranges. A.T.

A80-23161 **A study on hydrogen storage by use of cryoadsorbents.** C. Carpetis and W. Peschka (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1433-1456. 14 refs.

The paper reports investigations on the techniques and economics of hydrogen storage by means of cryoadsorption. Also a comparison with alternative storage methods is included. The hydrogen storage capacity of several adsorbents in the temperature range from 65 K to 150 K has been investigated experimentally. Basing on these data economics and operating conditions for minimum total costs of the system are calculated. Utilization-factor and capacity-factor parameters are shown to be decisive for outlining the favorable ranges of application for competitive hydrogen storage methods. (Author)

A80-23162 **The cryogenic storage of hydrogen.** J. J. Thibault (L'Air Liquide, Sassenage, Isère, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1457-1473.

Liquefaction processes are reviewed, noting the problems with large size liquefiers, and examples of industrial liquefiers are given. Attention is also given to the storage and distribution equipment, such as storage tanks (fixed and mobile), transfer lines and cryogenic pumps. Finally, the different factors entering in the choice of a given distribution process are discussed. M.E.P.

A80-23163 **The role of metal hydrides in hydrogen storage and utilization.** F. E. Lynch (Denver, University, Denver, Colo.) and E. Snape (MPD Technology Corp., Waldwick, N.J.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1475-1524. 28 refs.

The paper reviews some of the more immediate, practical applications of hydrides and discusses some of the technical and economic limitations of hydride systems. Examples are given of specific hardware which utilize hydrides and their cost/performance characteristics are compared with more conventional systems. In addition, the economic and technical advantages of using metal hydride storage tanks in conjunction with electrolyzers are illustrated, and compressors and pumps based on metal hydrides are described. Finally, some of the methods of characterizing hydrides for specific applications are also reviewed. M.E.P.

A80-23164 **Use of binary titanium alloys for hydrogen storage.** O. de Pous and H. M. Lutz (Battelle, Geneva, Switzerland). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1525-1541. 12 refs.

A study of intermetallic binary compounds such as Ti3M, Ti2M, and TiM for hydrogen storage is presented. The reversibility of hydrogen exchange depends on the relative thermal stabilities of intermetallic compounds, defined as the enthalpy of formation. This parameter also represents the heat required for hydrogen release from its storage system; the permanence of the intermetallic composition during hydrogen absorption and desorption is related to the range of variation of the operating temperature and pressure. A.T.

A80-23165 **Cubic metal-alloys for hydrogen storage.** H. Buchner, M. Stohrer, and O. Bernaur (Daimler-Benz AG, Stuttgart, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1543-1560. 16 refs.

Various hydrige forming elements are investigated with reference to the use of metal hydrides for hydrogen storage. Hydrides of Mg- and Ti-based binary intermetallic compounds are suggested as mobile hydrogen storage systems for automotive propulsion. The pressure and temperature dependence of the hydrogen-to-metal ratio of the alloys and the hydride capacity are determined. The magnetic susceptibility of the phase is measured and the band structure at the Fermi level is analyzed along with hydrogenation effects. Guidelines for further research are proposed. V.L.

A80-23166 **Mixing effects of different types of hydrides.** S. Suda and M. Uchida (Kogakuin University, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1561-1573. 10 refs.

A method for synthesizing a mixture which has new hydriding and dehydriding properties is presented and a series of hydriding alloy mixtures composed of LaNi5 and Ti0.8Zr0.2Cr0.8Mn1.2 were selected to demonstrate the validity of the proposed method. Experimental results were reported for the equilibrium behaviors of the (xLaNi5 + (1-x)Ti0.8Zr0.2Cr0.8Mn1.2)H(y) system, where x is the weight fraction of LaNi5 and y is the numbers of hydrogen atoms absorbed in a mole of alloy mixture and ranges from 3.0 to 6.7. The rate studies were also undertaken under various temperature and composition conditions. From the results, the mixed hydrides were expected to find various uses in thermodynamic cycles and many types of energy systems, and on the more practical scene, in the safety device developments and use of hydriding alloy mixtures from economical standpoints. (Author)

A80-23168 **Effect of the interstitial hole size and electron concentration on complex metal hydride formation.** O. de Pous and H. M. Lutz (Battelle, Geneva, Switzerland). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1597-1611. 16 refs.

The influence of the interstitial hole size and the electron density of intermetallic compounds is discussed from the view point of utilizing these materials for hydrogen storage. Intermetallic compounds with electron to metal atom ratios ranging from four to seven have been found to form complex metal hydrides with temperatures of decomposition above ambient for a hydrogen pressure of one atmosphere. Higher electron concentrations lead to a lowering of the hydrogen content and a consequent decrease in the storage capacity. In a series of isoelectronic materials, the thermal stability of complex metal hydrides has been found to increase with the metal-metal distance characteristic of the parent metal lattice. Experimental results shows the extent to which the selection of a suitable material for hydrogen storage is limited. (Author)

A80-23169 **Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys.** Y. C. Huang, M. Tada, T. Watanabe, and K. Fujita (Tokai University, Kanagawa, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1613-1623. 19 refs.

An assessment on the influence of Ni, Ce, and Co to the solubility and equilibrium pressure of hydrogen, in the systems for La-Ni, and Misch metal-Ni alloys have been made by means of measuring pressure-temperature-composition relationships. The hydrogen pressure at plateau, which indicates two-phase coexistence, was shown almost at the same value, above Ni/REM ratio is more than 2 to 5, and the plateau region of isotherms was increased with increasing of Ni content. Ce would increase the plateau pressure of hydrogen in La-Ni alloys, and the experiment was carried out up to the La-0.4-Ce-0.6-Ni-5 alloy. However, an addition of Co would decrease the plateau of hydrogen pressure remarkably for La-Ce-Ni-5 alloy. (Author)

A80-23170 **Development of low cost nickel-rare earth hydrides for hydrogen storage.** G. D. Sandrock (International Nickel

Research and Development Center, Suffern, N.Y.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1625-1656. 24 refs.

Development of low-cost nickel-rare earth hydrides for hydrogen storage is presented. A survey was made to develop ternary substituted MNi alloys with reasonable plateau pressures, with substitutions of Ca for M and Cu, Fe, Mn, or Al for Ni. All elements were suitable for lowering the room-temperature plateau pressure of MNi; properties surveyed included plateau pressure, hysteresis, H-storage capacity, density, raw material cost per unit of hydrogen storage capacity, and crystallographic parameters. (Author)

A80-23171 **Technological aspects and characteristics of industrial hydrides reservoirs.** P. Guinet, P. Perroud, and J. Rebière (Commissariat à l'Energie Atomique, Centre d'Etudes Nucléaires de Grenoble, Grenoble, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1657-1675. 14 refs. Research supported by the Institut de Recherches sur les Transports, Commission des Communautés Européennes, and Délégation Générale à la Recherche Scientifique et Technique.

An investigation of the hydrogen sorption capacity, reaction rate, and loss of capacity vs time and hydrogen purity of industrial FeTi and Mg alloys is presented. The amount of hydrogen stored in the FeTi reservoir, the maximum outflow rate, and the maximum working pressure were determined; the improved heat transfer capability of the heat exchange systems increases the discharge rate and the maximum hydrogen content. The capacity of the Mg2Cu reservoir was measured, and its inflow and outflow rates were determined using a scale model. A.T.

A80-23172 **Development of high-temperature hydrides for vehicular applications.** H. Buchner, O. Bernauer, and W. Strauss (Daimler-Benz AG, Stuttgart, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1677-1688. 7 refs.

It is noted that dilute solutions of magnesium compounds in magnesium improve the hydrogen exchange kinetics without too great a loss of the high magnesium storage capacity. The paper reports on an investigation of the magnesium/magnesium-nickel system and the magnesium/magnesium-yttrium system. Attention is given to the optimization of storage capacity, absorption and desorption kinetics and dissociation enthalpy with respect to vehicular applications. M.E.P.

A80-23173 **The influence of Al on the hydrogen sorption properties of intermetallic compounds.** I. Jacob and D. Shaltiel (Jerusalem, Hebrew University, Jerusalem, Israel). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 3. Oxford and New York, Pergamon Press, 1979, p. 1689-1706. 16 refs.

The hydrogen sorption properties of Al containing Laves phase intermetallics are studied and the absorption capacity of various intermetallic compounds were measured at hydrogen pressure of 20 atm and at room temperature. Desorption characteristics of the obtained hydrides were also studied at several different temperatures. Attention is given to the behavior of those systems whose hydrogen capacity was measured at approximately 70 atm and room temperature, and at about 40 atm and liquid nitrogen temperature. The relative stability of the hydrides of these pseudobinary compounds was determined by measuring the desorption isotherms at room temperature. C.F.W.

A80-23174 **Iron oxide reduction kinetics by hydrogen.** J. Bessières, A. Bessières, and J. J. Heizmann (Metz, Université, Metz, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1731-1746. 9 refs. Research supported by the Délégation Générale à la Recherche Scientifique et Technique.

The iron oxide kinetics by hydrogen is examined. The reduction reaction is complex because several elementary or multiple reactions occur together; different routes for the reduction with a gas and the chemical kinetics of the single, double, and triple reactions were determined. The true kinetics of each single reaction which proceeds within multiple reductions is determined using a reaction triangle which determines the relative rate of three reactions. A.T.

A80-23175 **Hydrogen-fueled railroad motive power systems - A North American view.** R. T. Alpaugh (U.S. Department of Energy, Washington, D.C.), W. J. D. Escher (Escher Technology Associates, St. Johns, Mich.), and M. Novil (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1793-1827. 19 refs. Contract No. WA-76-4707; No. EC-77-X-01-1883.

Results of initial feasibility studies carried out in 1976-77 in the U.S. on hydrogen as an alternative to petroleum-based diesel fuel upon which North American railroads are totally dependent, are presented. Positive technical and economic feasibility are indicated. Feedback on this concept from industry and government railroad organizations, though generally favorable, strongly indicate the need for a hardware in-service demonstration of a hydrogen-fueled locomotive. A program plan for accomplishing this is discussed, and the status of the project is reviewed. (Author)

A80-23176 **Design considerations for the Riverside hydrogen bus.** R. L. Woolley (Billings Energy Corp., Provo, Utah). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1829-1849. 10 refs.

Design considerations for the prototype hydrogen-fueled bus are examined. It is required that the hydrogen system could be switched to an alternate conventional fuel, and that safety, range, power, refuel time, flashback elimination and NOx reduction, and hydride tank weight and loading density be considered. Safety requirements included factors of safety of two for hydrogen tanks and lines, and overdesign of the support structure; finally, the six flow circuits in the system including hydrogen delivery, heat exchange fluid, induction water, and pneumatic and intake air are described. A.T.

A80-23177 **Hydrogen injection two-stroke spark ignition engine.** S. Furuhama and H. Azuma (Musashi Institute of Technology, Tokyo, Japan). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1851-1878. Research supported by the Ministry of Education.

The paper discusses hydrogen injection into a two-stroke engine to improve the thermal efficiency and to suppress NOx formation. A three-cylinder microcar engine modified into a hydrogen injection type was tested showing good performance and low NOx and HC emissions. It was also shown that it was not more advantageous to inject hydrogen fuel near the top dead center than to inject at the initial stage of the compression stroke. A.T.

A80-23178 **Hydrogen energy in United States Post Office delivery systems.** V. R. Anderson (Billings Energy Corp., Provo, Utah). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1879-1901.

A United States Postal Service delivery vehicle (1/4 ton DJ-5F) has been converted to operate on hydrogen fuel, under Contract No. 1-4231-B77-0073 with the United States Postal Service. This paper presents details and general specifications of the vehicle and engine conversion, including design of the iron-titanium storage system and of the related controls and safety equipment. Engine modifications include: a gaseous fuel IMPCO carburetor, a water induction system and changes in the ignition system. Power control is obtained by throttling the air-hydrogen mixture. Waste heat in the engine water cooling system is circulated through the hydride tank to drive off hydrogen. The method for recharging the system is also described. (Author)

A80-23179 **Hydrogen fuel in air transportation and its effects around airports.** K. S. Varde (Michigan, University, Dearborn, Mich.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1903-1916. 13 refs.

Based on the characteristics of hydrogen fuel a model analysis is conducted to predict the pollution that might be generated from a hydrogen fueled aircraft. Specific consideration is given when the aircraft is idling at the terminal and during full power conditions. The kinetic model predicts the dominant pollutant to be the oxides of nitrogen with other related species being in very small quantities. (Author)

A80-23180 **Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system.** D. M. Gruen, M. Mendelsohn, I. Sheft, and G. Lamich (Argonne National Laboratory, Argonne, Ill.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1931-1946. 15 refs. Research sponsored by the U.S. Department of Energy.

The paper examines a HYCSOS chemical heat pump which uses two metal hydrides with different free energies of formation enabling hydrogen to flow from one to another of the hydrides under the influence of thermal gradients. The hydrogen flows between two pairs of four vessels which function as the generator/condenser and evaporator/absorber elements of conventional absorption refrigerators; the pump materials are based on the AB5 alloys which absorb hydrogen and have a large hydrogen storage capacity. A.T.

A80-23181 **A metal hydrogen heat pump as topping process for power generation.** G. Alefeld (München, Technische Universität, Garching, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1947-1957. 8 refs.

The paper discusses a metal hydrogen heat pump as a topping device for power generation. It is shown that the reaction rate of the topping process is high; that alloys with long-time stability such as Nb or Va materials will be available since heat transfer occurs at changing temperatures so that it is not necessary to use hydrides which have a flat plateau for the pressure vs concentration; and that the metal vapor pressure can be ignored compared to that of H2. It is concluded that hydrogen-resistant materials are available for 500 C and 200 bar service. A.T.

A80-23182 **Prospects for an alkaline hydrogen air fuel cell system.** H. Van den Broeck (ELENCO, Mol, Belgium), M. Alfenaar, G. Hovestreydt (Dutch State Mines, Geleen, Netherlands), A. Blanchart, G. Van Bogaert (Studiecentrum voor Kernenergie, Mol, Belgium), M. Bombeke, and L. Van Poucke (BEKAERT, Zwevegem, Belgium). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1959-1969.

The paper examines the potential of the alkaline hydrogen air fuel cells. Alkaline vs acid fuel cells are compared; alkaline cells are preferred when cheap hydrogen is available and maximum heat recovery is not required. Features of fuel cells are considered, including energy conservation, absence of air and noise pollution, and production of direct current electricity. Finally, applications are described in the chlorine electrolysis industry, city buses, and forklift trucks. A.T.

A80-23183 **Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials.** L. J. Swartzendruber, G. C. Carter, D. J. Kahan, M. E. Read, and J. R. Manning (National Bureau of Standards, Metallurgy Div., Washington, D.C.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 1973-2011. 43 refs. Research supported by the U.S. Department of Energy.

Physical property data are presented for three intermetallic compounds which are considered primary candidate materials for safe hydrogen storage in stationary and mobile applications. The materials are FeTi, LaNi5, and Mg2Ni. The properties cover equilibrium dissociation pressures, van't Hoff equation parameters, heats of reaction, reaction rates, diffusion, thermal conductivities, heat transfer coefficients, hydride densities, lattice parameters and expansion upon hydriding, and phase diagrams. (Author)

A80-23184 **Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics.** E. Lebsanft, D. Richter, J. Töpler, H. Wenzl (Kernforschungsanlage Jülich GmbH, Institut für Festkörperforschung, Jülich, West Germany), W. Schäfer, and G. Will (Bonn, Universität, Jülich, West Germany). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2013-2032. 19 refs.

The structure of the beta-phase of the FeTi-D system was determined to be orthorhombic. The hydrogen diffusion coefficient in FeTiH was measured by quasielastic neutron scattering and thermodynamic parameters of the FeTi-H system were discussed. In very dilute solutions the heat of solution is 1 eV per H-atom due to the occupation of Fe vacancies or other traps by the hydrogen atoms. Nucleation phenomena of the beta-phase in the alpha-phase play an important role in the hydriding kinetics and in the thermodynamics of the system. (Author)

A80-23186 **Hydrogen embrittlement, stress state and design considerations.** M. R. Louthan, Jr., R. P. McNitt, J. Murali, N. Sridhar, and T. S. Sudarshan (Virginia Polytechnic Institute and State University, Blacksburg, Va.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2053-2073. 7 refs. Contract No. E(40-1)-5255.

Delayed failure studies and dynamic tests in gaseous hydrogen were used to investigate the effects of stress state on the hydrogen compatibility of AISI 4340 and A-106 steel. Test results demonstrate the difficulty of using short time dynamic tests to predict the effects of hydrogen on the long time behavior of engineering structures under static loads. Analysis of the variables which control the hydrogen localization mechanism supports the test results and emphasize that extrapolation of data obtained under one set conditions to any other set of service conditions should be made very carefully. (Author)

A80-23189 **Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle.** P. W. Trester and S. S. Liang (General Atomic Co., San Diego, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24,

1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2113-2159. 9 refs. Research sponsored by the American Gas Association, General Atomic Co., University of California, and Northeast Utilities Service Co.

Material corrosion resistance to H_2SO_4 vapor and HI and I_2 solutions in the sulfur-iodine thermochemical water-splitting cycle was investigated. Alloys Incoloy 800H, stainless steel 304, and Inconel 600 were corroded along the grain boundaries in the decomposing H_2SO_4 vapor. A high-silicon iron alloy and a Ni-30 Mo alloy were resistant to HI(x), along with Ti, Zr, Ta, and Mo; a perfluorocarbon elastomer, borosilicate glass, and carbon materials were also resistant. The aluminized Incoloy 800H showed good resistance to oxidizing environment and was selected as the candidate material for high-temperature heat exchangers. A.T.

A80-23190 **Optimal development strategies for a whole energy system based on hydrogen.** M. Pavelescu, H. Dumitrescu (Institute for Nuclear Power Reactors, Bucharest, Rumania), and M. Stoica (Chemical School Group, Bucharest, Rumania). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2163-2178. 15 refs.

The paper is dealing with the problem of implementation in a whole power system of two nuclear subsystems from which the second with a time delay will produce, by means of the HTGR's and then the CGFBR's, Hydrogen. The mathematical model for such a system is introduced as well as a try of optimization concerning its evolution in time in order to have both the minimum of conventional fuel and nuclear fuel consumption. The problem of optimization was solved by use of a mathematical bimatrix game model without side payments. (Author)

A80-23191 **Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis.** F. Deneuve and J. P. Roncato (Gaz de France, Direction des Etudes et Techniques Nouvelles, Paris, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2179-2203. 7 refs.

A comparison of thermochemical or hybrid cycles of hydrogen production with water electrolysis is presented. The thermochemical cycles are not competitive with electrolysis because of lower thermal efficiency; the introduction of an electrolytic step in a hybrid cycle slightly improves the efficiency and provides a potential for lower investment costs than for thermochemistry. This change is insufficient, however, and direct electrolysis of water remains the best method of producing hydrogen by water decomposition. A.T.

A80-23192 **A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code.** A. Broggi, R. Joels, G. Mertel, and M. Morbello (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2205-2230.

The paper describes the improved chemical engineering code developed for the evaluation and analysis of multistep processes. The original code was retained with respect to retention of the mass and energy balances as the basis of a heat exchange network synthesis; however, the program has now been extended to accommodate a more detailed nuclear reactor-chemical plant coupling and new routines were prepared so that the hydrogen production cost can be estimated. A.T.

A80-23193 **Health benefits derived from a planned hydrogen community.** R. M. Zweig (Pollution Control Research Institute, Riverside, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 4. Oxford and New York, Pergamon Press, 1979, p. 2231-2245. 37 refs.

The paper examines health benefits derived from a planned hydrogen community. The health effects of pollutants are discussed, including those of carbon monoxide, sulfur compounds, hydrocarbon combustion particulates, lead, and photochemical oxidants; costs of pollution control are given, exemplified by over $1 million spent in the Los Angeles area. Riverside, Calif. uses hydrogen for its nonpolluting qualities, including development of a Dial-A-Ride bus which uses hydrogen fuel eliminating CO, HC, PbO_2, and SO_x from its emissions. A.T.

A80-23194 **Present state and future prospects of thermochemical hydrogen production.** G. E. Beghi (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2299-2322. 21 refs.

A80-23195 **Main requirements on the nuclear installations used for hydrogen production and in technological processes.** V. A. Legasov, N. N. Ponomarev-Stepnoi, A. N. Protsenko, A. Ia. Stoliarevskii, and Iu. F. Chernilin (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2365-2376. 5 refs.

A80-23196 **Testing aqueous caustic electrolyzers at high temperatures.** J. N. Murray and M. R. Yaffe (Teledyne Energy Systems, Timonium, Md.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2397-2412. 7 refs. Research supported by the U.S. Department of Energy.

Increasing the electrochemical cell operating temperature allows an improvement of the operating energetics of hydrogen production by alkaline solution water electrolysis. Alternative materials for the cell separator were tested; the usability of structural polymers as a cell frame, the stability of the selected anode electrocatalyst, and the possibility of the plumbing and piping selected introducing corrosion products which could affect the cathode electrocatalyst were determined. This paper describes the studies of alkaline electrolyzers and materials for operation at temperatures up to 150 C. (Author)

A80-23197 **Theoretical efficiency limit of water electrolysis and practical means to approach it.** S. Kunstreich and J. Sterlini (Compagnie Electro-Mécanique, Paris, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2413-2431. Commission of the European Communities Contract No. 063-76-EHF.

The paper shows that the inherent losses of water electrolysis increase with the temperature to obtain better cell efficiency. The theoretical efficiency limit of a complete system is described with and without energy recovery process; a gas conditioning and energy recovery process which can be adapted to various H_2 and O_2 utilization conditions and perform ideal thermodynamical operations to approach an ideal overall efficiency of the system was investigated. It was shown that at 200 C and 30 bar the overall efficiency can be improved by 10 percent, and at the overall efficiency of 90 percent the pressure can be reduced to 30 bar. A.T.

A80-23198 **Engineering impact on the validity of the Mark-16 thermochemical cycle.** W. R. A. Goossens, M. Klein, L. H. Baetslé (Centre d'Etude de l'Energie Nucléaire, Mol, Belgium). In: Hydrogen energy system; Proceedings of the Second World Hydrogen

Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2445-2463. 6 refs. Research supported by the Commission of the European Communities.

The paper presents mass and energy balances for the Mark-16 thermochemical cycle using thermodynamical information. It was shown that the product separation units related to the hydrogen iodide decomposition step influence the potential validity of the thermodynamical cycle; the thermal efficiency of the Mark-16 cycle dropped by adding the energy consumption of the product separation units related to the acids decomposition step to the energy consumption under ideal thermodynamical conditions for the chemical reaction steps. A.T.

A80-23199 **A high energy hybrid system: Hydrogen - chlorine - solar - water.** B. B. Stewart (Solar Reactor Corp., Miami, Fla.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2505-2520. 5 refs.

A new solar and hydrogen fuel system (Solar Reactor process) is described which produces extremely high energy, uses common reclaimable materials, is adaptable to most power generation units, and is environmentally acceptable. The system is based on hydrogen combusted in solar or light-activated chlorine followed by product dilution and electrolysis to produce the starting materials, hydrogen and chlorine. The high energy of the Solar Reactor process is achieved by using a hybrid system involving light absorption and conversion (57.9 Kcal), hydrogen-chlorine combustion (44.1 Kcal), and hydrogen chloride dilution (36.0 Kcal). The energies are based on one mole of hydrogen or chlorine. A total input of 94.4 Kcal (HCl electrolysis cell) is required to generate the hydrogen and chlorine for each cycle. An 80% recovery of the total output of 138 gives 110 Kcal for a net energy production of 16 Kcal. Comparisons with several commercial systems show that this hybrid system is the most energetic. (Author)

A80-23200 **Hydrogen production from water using fission-pumped laser.** K. C. Bordoloi and F. A. Bynum (Louisville, University, Louisville, Ky.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2523-2544. 35 refs.

A method is described for producing hydrogen as an alternative energy carrier and fuel. It is proposed that a fission-pumped gas laser designed to produce short wavelength ultraviolet rays be used to produce hydrogen in bulk; by selecting a proper mixture of gases and operating conditions a light rich in ultraviolet wavelengths can be produced. The ultraviolet rays will allow the photolysis of water into hydrogen and oxygen; the quantum efficiency and reaction mechanisms of several possible wavelength-dependent photolysis schemes are considered, and a description of experiments to simulate the practical hydrogen production is given. A.T.

A80-23201 **Laser-fusion production of hydrogen by radiolytic-thermochemical cycles.** H. J. Gomberg and W. W. Meinke (KMS Fusion, Inc., Ann Arbor, Mich.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2545-2569. 17 refs. Contract No. ES-77-C-02-4149.

The paper examines laser-fusion production of hydrogen by radiolytic-thermochemical cycles. In laser fusion the simple geometric arrangement which produces fusion in a small pellet generates very large fluxes of 14-MeV neutrons emanating in all directions. These energetic neutrons interact with chemical systems in a radiolysis chamber; hydrogen is split from water in a cyclic process combining radiolysis and thermally driven reactions. It was concluded that radiolytic-thermochemical processes can be competitive with other methods for utilizing laser-fusion energy to produce hydrogen. (Author)

A80-23202 **Model for hydrogen production on illuminated transition metal surfaces.** J. Keller, C. Keller, and W. Baltensperger (Zürich, Eidgenössische Technische Hochschule, Zurich, Switzerland). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2573-2585. 19 refs.

The paper considers a model for hydrogen production on illuminated transition metal surfaces. The storage properties of the transition metal alloys for which the model is described may be used to separate the atomic hydrogen from the reaction area; a hydrogen storage material is characterized by the energy of absorption of atomic hydrogen nearly equaling the energy of the H2 bond per atom, so that the hydrogen stored near saturation corresponds to an atomic hydrogen cellular liquid. It was shown that light would provide energy in a hydrogen production unit to split the input molecule R-H at the transition metal containing surface, and hydrogen can be then stored in a slab of the intermetallic material. A.T.

A80-23203 **Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds.** L. Belkbir, N. Gérard (Dijon, Université, Dijon, France), A. Percheron-Guégan, and J. C. Achard (CNRS, Laboratoire de Chimie Métallurgique et Spectroscopie des Terres Rares, Meudon, Hauts-de-Seine, France). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2589-2612. 17 refs.

The paper presents the kinetic rules of formation and decomposition of the hydrides derived from LaNi5 type compounds. A comparison is made between LaNi5H6 and more stable hydrides LaNi(5-x)Mx in terms of the pressure and the number and time of cycles. Measurements are performed by a differential volumetric device acting at constant pressure during hydrogen absorption and desorption. In addition, the influence of the gaseous impurities in industrial hydrogen (H2O, CO2, CH4) on the kinetics and hydrogen capacity is studied showing a good poisoning resistance of these compounds. A.T.

A80-23204 **A plan for active development of LH2 for use in aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2685-2697. 7 refs.

A plan for an experimental airline equipped with liquid hydrogen (LH2)-fueled aircraft flying commercial cargo between the U.S., Western Europe, and the Middle East is presented. Liquid hydrogen provides lower life cycle cost and consumption and minimum environmental pollution compared with synthetic Jet A fuel made from coal. The plan includes development of facilities for production and liquefaction of hydrogen at four air terminals; the operating experience with the aircraft and ground facilities will be shared to disseminate the information about this system. A.T.

A80-23205 **Electronic fuel injection techniques for hydrogen powered I.C. engines.** C. A. MacCarley and W. D. Van Vorst (California, University, Los Angeles, Calif.). In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2747-2792. 32 refs. Research supported by the U.S. Postal Service.

Numerous studies have demonstrated the advantages of hydrogen as a fuel for Otto Cycle engines due to high thermal efficiency and low exhaust pollutant levels. Characteristic of hydrogen engine operation using pre-mixed intake charge formation is a problem of pre-ignition resulting in an intake manifold 'backfire'. Additional problems include high NOx production when using certain equivalence ratios and power output degradation due to low fuel energy/volume density. Techniques for direct and manifold fuel injection are discussed as means for overcoming these problems. Emphasis is placed on the need for total engine control, integrating control of fuel injection, ignition timing, intake air throttling, and vehicle subsystems within a central electronic unit. An electronically actuated fuel injection valve and a prototype electronic control system are developed. These are applied in manifold and direct injection system geometries, and evaluated in engine testing. System effectiveness and feasibility are discussed. (Author)

A80-23206 **Technico-economic study of distributing hydrogen for automotive vehicles.** Y. Bréelle, C. Meyer (Institut Français du Pétrole, Rueil-Malmaison, Hauts-de-Seine, France), P. Gelin, and G. Petit (Commissariat à l'Energie Atomique, Gif-sur-Yvette, Essonne, France). *(Revue de l'Energie,* vol. 30, Apr. 1979, p. 342-357.) In: Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volume 5. Oxford and New York, Pergamon Press, 1979, p. 2793-2827. 21 refs. Translation.

The technical and economic feasibility of storing and distributing hydrogen in liquid or gas form as a fuel for motor vehicles is analyzed, and two possible energy converters - the hydrogen motor and the hydrogen battery - are compared. It is concluded that at present the distribution of gaseous hydrogen presents fewer technological difficulties than that of liquid hydrogen. The energy yield of hydrogen compares favorably with that of fuels synthesized from coal and with gasoline when used in a hydrogen battery. The cost of hydrogen used in a hydrogen motor ranges from two to four times that of present fuels (natural gas, gas oil, high-octane gasoline). The cost of hydrogen used with a hydrogen battery is about twice that of gas oil and natural gas. C.K.D.

A80-23218 **Advances in energy systems and technology. Volume 2.** Edited by P. Auer (Cornell University, Ithaca, N.Y.). New York, Academic Press, Inc., 1979. 277 p. $26.

The topics covered are: the development of solar power satellites, sea thermal power, the economics and system design for on-site solar energy systems, and models for energy technology assessment. The articles address technological issues or issues in a broader systems context, which are closely related to technological issues. B.J.

A80-23219 **The development of solar power satellites.** P. E. Glaser (Arthur D. Little, Inc., Cambridge, Mass.; Sunsat Energy Council, Washington, D.C.). In: Advances in energy systems and technology. Volume 2. New York, Academic Press, Inc., 1979, p. 1-48. 49 refs.

The SPS concept is reviewed with particular attention given to technology options for conversion in space (photovoltaic and thermal-electric) and for power transmission to earth (microwave and laser transmission). Also discussed are SPS in the space transportation system, orbital assembly and maintenance, SPS/utility power pool interface, and SPS economic considerations and environmental impacts. B.J.

A80-23220 **Sea thermal power - Competitive electricity and chemicals from the sea.** J. H. Anderson (Sea Solar Power, Inc., York, Pa.) and D. F. Mayer. In: Advances in energy systems and technology. Volume 2. New York, Academic Press, Inc., 1979, p. 49-100. 17 refs.

Sea thermal power (STP) is reviewed with attention given to operating cycles, environmental impact, energy transmission, the development of a 100-MW sea solar power plant, and the economic perspective. A detailed development program is proposed and consideration is given to program cost and the outlook for the future. B.J.

A80-23221 **Onsite solar energy systems - Economics and system design.** H. C. Kelly (Office of Technology Assessment, Washington, D.C.). In: Advances in energy systems and technology. Volume 2. New York, Academic Press, Inc., 1979, p. 101-178. 91 refs.

On-site solar energy systems are discussed with reference to scale considerations, costs and ownership, costs of competing energy, risk, and net costs to society. A method for evaluating the quantitative worth of solar energy is presented, and attention is given to the design of solar equipment and to basic issues in solar design. B.J.

A80-23222 **Models for energy technology assessment.** R. G. Richels (Electric Power Research Institute, Palo Alto, Calif.) and J. P. Weyant (Stanford University, Stanford, Calif.). In: Advances in energy systems and technology. Volume 2. New York, Academic Press, Inc., 1979, p. 179-260. 68 refs.

The need for energy technology assessment models is discussed along with problems of model implementation. The evolution of fixed-demand/single-fuel models, interfuel substitution models, and models with price-sensitive demands is examined; consideration is given to the incorporation of uncertainty and the link to the macroeconomy. A taxonomy for energy technology assessment models is presented, and models for assessing breeder-based energy are examined as an example. Finally, the state of the art of energy technology assessment is surveyed. B.J.

A80-23224 **Heat pumps.** R. D. Heap. London, E. & F. N. Spon, Ltd.; New York Halsted Press, 1979. 164 p. 305 refs. $19.95.

With increasing energy costs and changing cost relativities, potential heat pump applications deserve a thorough reassessment. Such a reassessment is the objective of this book. The topics covered include the general, historical, and theoretical background material; vapor compression equipment; general aspects of system design, with particular reference to the design of space heating systems employing heat pumps; domestic, commercial, and industrial applications; and the relevance of some methods of economic analysis to the selection of heat pump systems. V.P.

A80-23272 **Recombination in the space-charge region of Schottky barrier solar cells.** P. Panayotatos and H. C. Card (Columbia University, New York, N.Y.). *Solid-State Electronics,* vol. 23, Jan. 1980, p. 41-47. 21 refs. NSF Grant No. ENG-76-15063.

The expression for the recombination rate as a function of voltage, of illumination level, and of position in the space-charge region of the semiconductor is derived analytically. The recombination current density is derived by numerical integration of the above expression. The results show good agreement with experiment for the typical Au-n type Si near-ideal Schottky barrier solar cells, and the comparison provides information on the uncovering of deep recombination centers by the hole quasi-Fermi level under increasing illumination. It is found that the principal effect of recombination under illumination is the reduction of the photocurrent. A rather surprising but gratifying result is that, once the above effect is taken into account by using short-circuit currents rather than photocurrents, the remaining (voltage dependent) effect of recombination is extremely close to the one in the dark, provided the increase in 'uncovered' recombination centers with illumination is taken into account. (Author)

A80-23293 **Monitoring urban population and energy utilization patterns from satellite data.** R. Welch (Georgia, University, Athens, Ga.). *(International Society for Photogrammetry and International Union of Forest Organization, International Symposium on Remote Sensing for Observation and Inventory of Earth Sciences and the Endangered Environment, Freiburg im Breisgau, West Germany, July 2-8, 1978.) Remote Sensing of Environment,* vol. 9, Feb. 1980, p. 1-9. 12 refs.

Urban population trends in China and energy utilization patterns in the United States have been assessed from LANDSAT and Defense Meteorological Satellite Program (DMSP) images. Regression models developed from population data and urban area measurements on LANDSAT images provide insights into the success of Chinese urban planning policies for cities with populations of

500,000 to 2,000,000 people. Studies of the relationships between population, urban area, and electric-energy utilization patterns have been conducted from DMSP images of the United States. Microdensitometer profiles of illuminated cities recorded on nighttime (visual band) images are used in combination with the map boundaries of the built-up areas to create unique three-dimensional representations of the urban centers. The volumes of these three-dimensional figures may be computed and plotted with respect to population and/or energy utilization data to model regional patterns of use. (Author)

A80-23307 # **The potential for development of high performance light aircraft.** D. J. Marsden (Alberta, University, Edmonton, Canada). *(Canadian Aeronautics and Space Institute, Annual General Meeting, 25th, Ottawa, Canada, May 3, 1979.) Canadian Aeronautics and Space Journal,* vol. 25, 4th Quarter, 1979, p. 359-369.

The present study assesses the potential for improved performance of state-of-the-art light aircraft on the basis of available information on overall dimensions, installed power, cruising speed and all-up weight. The contribution to overall drag of undercarriage, engine cooling, and wing profile drag is estimated, and the impact of drag reduction on overall performance is discussed. It is shown that the cruise speed of a typical two-place single-engine aircraft with installed power of 100 hp, all-up weight of 1600 lb, and a cruise speed at 7000 ft altitude of 117 mph can be increased to 137 mph by making the under-carriage retractable and doing some further moderate clean-up of aerodynamic surfaces. Further modifications including a 50% reduction in wing area and addition of a full-span slotted flap to retain low landing speed will increase the cruise speed to 160 mph. More radical configuration changes to increase wing loading and place the propeller at the rear of the fuselage can increase cruising speed to 200 mph with no increase in the installed engine power. Fuel economy will be improved to 45 miles per gallon. L.M.

A80-23317 **New standards in research and development (Neue Massstäbe für Forschung und Entwicklung).** M. Grüner (Bundesministerium für Wirtschaft, Bonn, West Germany). *DFVLR-Nachrichten,* Feb. 1980, p. 3, 4. In German.

It is pointed out that in the present situation of energy and raw materials shortage, research and development problems can no longer be solved by customary or traditional means, and certainly not by seeking short-term solutions. It is imperative that the present scientific, economic, and administrative effort be planned and implemented with a view to the distant future. V.P.

A80-23326 **Economically working big scale solar power stations pneumatic light-weight construction.** H. Kleinwachter and J. Kleinwachter. *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 9-14. 7 refs.

The concepts of large 'power bowls' and the smaller 'pneumatic solar farms', protected against wind and weather under transparent domes, are discussed from the economic and technical points of view. It is argued that extremely lightweight pneumatically deformed mirror-membrane concentrators can be built cheaply with sufficient optical precision. B.J.

A80-23327 **Theoretical concentrations of solar radiation by central receiver systems.** T. Sakurai and Y. Shibata (Tohoku University, Sendai, Japan). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 15-18.

Solar concentrations by central receiver systems have been calculated theoretically assuming that plane heliostat-mirrors, sufficiently small in dimension, cover a circular field without clearance. The volume and area concentration were found to be maximum when the radius of heliostat-field was nearly the same as the height of receiver. The optimum radius showed a slight increase with increasing obliquity of incident radiation and the effect of the geometry of curved mirror on the concentration was discussed. (Author)

A80-23328 **Solar and geothermal energy (Energie solaire et geothermie).** M. Touchais. *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 19-22. 6 refs. In French.

The use of solar energy as a complementary source to raise the energy yield of low-temperature geothermal fluids is discussed. Applications of solar energy to low-temperature and high-temperature geothermal sources are considered; in particular, the use of solar energy to increase the energy yield of low pressure and temperature steam in the Tuscany geothermal fields is examined. B.J.

A80-23329 **Multifunctional collectors for dwellings - Examples of application (Systeme de toiture insolateur à fonctions multiples - Exemples d'application).** J. Allier. *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 34-37. In French.

The paper describes the design, construction, and testing of medium-temperature solar collectors intended for solar house heating systems. Particular attention is given to the design of the glass cover. The basic design philosophy of such collectors is considered, with attention given to the realization of polyvalent collectors, the regulation of solar heat in the heat cycle, and the recovery of waste heat. B.J.

A80-23330 **Status and development of production of cheap hydrogen.** P. Brennecke, H. Ewe, and E. Justi (Braunschweig, Technische Universität, Braunschweig, West Germany). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 38-43. 22 refs.

The production of hydrogen by electrolysis is reviewed with attention given to the thermodynamics of the process, the design and characteristics of water electrolyzers, and new techniques of electrolysis. It is suggested that the most promising new approaches are the ELOFLUX cell (an alkaline electrolyzer that uses only high-porosity electrodes) and the solid polymer electrolyte water electrolyzer with cationic membranes. Other possibilities for hydrogen production using high temperature heat include thermochemical cycles, the electrochemical reduction of water vapor, and chemical cycles that use sulfuric acid solutions. B.J.

A80-23331 **Solar energy electrochemical storage.** P. Cristea and R. Tuduce (Bucuresti, Institutul Politehnic, Bucharest, Rumania). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 44-47. 12 refs.

Solar electric power generation requires heat or electricity storage to ensure a continuous supply for users. Electrochemical storage by high-performance molten-electrolyte batteries of Li/S type is well suited to this purpose. In particular, the specific energy and specific power of the LiAl/LiCl-KCl/FeS battery are high enough to meet the requirements of both off-peak electric energy storage and electric-vehicle propulsion. B.J.

A80-23332 **Autonomous solar electricity production with hydraulic active storage systems on the territory.** R. Visentin (Calabria, Università, Cosenza, Italy). *Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1979, p. 48-51.

A general approach to the autonomous operation of solar power plants is developed with particular reference to the importance of the geographical location. Attention is given to a solar power generation system that operates in conjunction with hydraulic storage; this system also permits regulation of water for use in agricultural areas. The development of such systems in the Mediterranean area is considered. B.J.

A80-23333 **Theoretical study of the heating of air in a plane honeycomb solar collector (Etude théorique du chauffage de l'air dans un insolateur plan alvéolaire).** C. Pince and M. Daguenet (Perpignan, Université, Perpignan, France). *Coopération Méditer-*

ranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique, 2nd Semester, 1979, p. 55-58. In French.

The paper describes the procedure of air heating in a honeycomb collector with reference to the characteristics of this type of collector and its practical advantages. A theoretical method for obtaining a parametric equation for the efficiency of the collector is presented. The effects of collector characteristics and of climatic variables on efficiency parameters are investigated. B.J.

A80-23366 # **MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation.** T.-C. Ma. *Acta Physica Sinica,* vol. 28, Nov. 1979, p. 833-840. 5 refs. In Chinese, with abstract in English.

Expanding the magnetic flux in terms of the deviation from the magnetic axis, the MHD equilibrium and localized mode instability of an axial symmetric plasma torus with a small triangular and elliptical deformation on its cross-section was investigated. The optimization of the configuration has been analyzed and an optimal factor of the triangular deformation given. The analysis shows that it is possible to strengthen ohmic heating substantially by selecting suitable factors of the triangular deformation. (Author)

A80-23404 **Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid.** K. L. Vodop'ianov, N. N. Il'ichev, A. A. Maliutin, G. A. Matiushin, and V. M. Podgaetskii (Akademiia Nauk SSSR, Fizicheskii Institut, Gorki, USSR). *(Kvantovaia Elektronika /Moscow/,* vol. 6, Aug. 1979, p. 1795-1798.) *Soviet Journal of Quantum Electronics,* vol. 9, Aug. 1979, p. 1059-1061. 11 refs. Translation.

A80-23496 **The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight.** W.-Z. Shen and C.-Y. Wu (National Chiao Tung University, Hsinchu, Nationalist China). *Journal of Applied Physics,* vol. 51, Jan. 1980, p. 466-473. 12 refs. National Science Council of Nationalist China Contract No. 68E-0404(02).

Simple analytical expression for the open-circuit voltage of a n(+)-n-p(p(+)-p-n) high-low-emitter (HLE) junction solar cell, which is valid for both the low and high levels of optical illuminations, is presented. Based on the principle of superposition, the open-circuit voltage of a n(+)-n-p high-low-emitter junction solar cell is expressed in terms of the short-circuit current density and the known saturated dark current. Effects of the high-low junction, the energy-gap shrinkage, and the dimensions of the HLE junction solar cell on the open-circuit voltage are included. The numerical results of the derived expression are found to be in good agreements with the exact numerical analysis of Sah et al. The optimal design considerations based on the known characteristics of the open-circuit voltage are also discussed. (Author)

A80-23499 **Nickel pigmented anodic aluminum oxide for selective absorption of solar energy.** A. Anderson (Granges Aluminium, Finspang, Sweden), O. Hunderi (Norges Tekniske Hogskole, Trondheim, Norway), and C. G. Granqvist (Chalmers Tekniska Hogskola, Goteborg, Sweden). *Journal of Applied Physics,* vol. 51, Jan. 1980, p. 754-764. 78 refs.

The paper gives an experimental and theoretical treatment of the spectral reflectance of electrolytically colored anodized aluminum surfaces developed for efficient photothermal conversion of solar energy. The optical performance was studied by the recording of hemispherical reflectance or specular reflectance in conjunction with diffuse light scattering. In addition, the structure of the coatings was investigated by scanning electron microscopy on fractured specimens, Auger electron spectroscopy combined with depth profiling by sputtering, and atomic absorption analysis. A multilayer model is formulated, which features a sheath near to the Al interface comprised of metallic Ni particles in an Al2O3 matrix. M.E.P.

A80-23511 **Royal Society, Discussion on Solar Energy, London, England, November 15, 16, 1978, Proceedings.** *Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980. 168 p.

Works covered include solar space heating with air and liquid systems, results of solar heating experiments, systematic design assessment techniques for solar buildings, and research at the building research establishment into the application of solar collectors for space and water heating in buildings. Other topics are examined such as heterojunction solar cells, photoelectrochemical cells and the microbial productions of energy sources from biomass. C.F.W.

A80-23512 **Solar space heating with air and liquid systems.** G. O. G. Lof (Colorado State University, Fort Collins, Colo.). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980, p. 349-359. Research sponsored by the U.S. Department of Energy.

Detailed performance data on several types of solar heating and cooling systems in buildings of identical designs are presented, compared and the results interpreted. Maintenance and repair requirements are noted and contrasted, and forecasts of their use in various applications are presented. It is concluded that an air-heating solar system can effectively provide space and domestic water heating in residential buildings. C.F.W.

A80-23513 **Results of solar heating experiments.** B. J. Brinkworth (University College, Cardiff, Wales). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980, p. 361-373. 27 refs.

Results of solar heating experiments are presented employing full scale systems. The purpose of the study is to develop solar components, verify predicted characteristics, establish principles of good design and demonstrate the performance of systems in routine use. Trials show that solar energy can make a significant contribution to the requirements for heating domestic hot water and living spaces. The experiments on solar heating ranged from laboratory tests on individual components to long term trials with full scale systems in everyday use. C.F.W.

A80-23514 **Systematic design assessment techniques for solar buildings.** J. K. Page, G. G. Rodgers, and C. G. Souster (Sheffield, University, Sheffield, England). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980, p. 379-401. 24 refs. Research supported by the Science Research Council, Building Research Establishment, and European Economic Community.

The paper describes the various approaches developed for the detailed modelling of the relevant climatic input variables for systematic design assessments for solar housing techniques. A report is made of the techniques developed to generate systematic short wave radiation data for vertical and inclined surfaces for different types of weather. The analysis is based on different types of days, such as sunny, average and overcast. Work on the accurate estimation of the magnitude of the associated weather variables affecting heat transfer in the external environment is also reported, covering air temperature, wind speed and long wave radiation exchanges. C.F.W.

A80-23515 **Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings.** S. J. Leach (Building Research Establishment, Watford, Herts., England). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980, p. 403-412; Discussion, p. 412-414. 11 refs.

A80-23516 **Solar heating and air conditioning.** J. B. Comly (General Electric Co., Schenectady, N.Y.). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.)*

Royal Society (London), Philosophical Transactions, Series A, vol. 295, no. 1414, Feb. 7, 1980, p. 415-422. 12 refs.

The paper discusses the relative merits and the state of development of several solar boosted heat pump systems with regard to their ability to provide air conditioning using conventional vapor compression refrigeration cycles. A brief description is given of the status of solar fired air conditioning. Clues to an approach to cool storage in solar air conditioning systems are given by an assessment of cool storage in peak electrical loads from conventional air conditioning equipment. A system using hydrated salts in a rolling cylinder thermal energy storage device for compact and effective cool storage is also described. C.F.W.

A80-23517 **Non-convecting solar ponds.** H. Tabor (Scientific Research Foundation, Jerusalem, Israel). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 423-433. 18 refs.

A salt gradient is imposed on a black-bottomed pond about 1 m deep; this creates a density gradient (positive measured downwards) which suppresses convection when the pond is heated from the bottom by absorbed solar radiation. Between 15 and 25% of the incident radiation, depending upon pond cleanliness, reaches the bottom and can be decanted by stratified hydrodynamic flow of the bottom layer. Temperatures approaching the boiling point have been recorded. At 32 deg latitude and under Israel sunshine conditions, estimated annual thermal output from a pond of 1 square kilometer is equivalent to 43,000 t of fuel oil. A method of avoiding salt diffusion, which would slowly destroy the gradient, is described. Practical problems include suppression of surface mixing by wind and the possible effects of heating large areas of ground. (Author)

A80-23518 **Present status and future prospects of silicon solar cell arrays and systems.** H. Durand (Commissariat à l'Energie Solaire, Paris, France). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 435-443. 7 refs.

The first part of this paper deals with the present state of the art of the single crystal silicon cell industry: production volume, cost breakdown and main technologies. In the second section, improvements of the single crystal technologies, caused by mass production and automated physical processes, are described. These developments are compared, with regard to both cost and performance, with the future polycrystalline (or 'semicrystalline') materials, including amorphous silicon films. The various approaches, i.e. vapour or liquid film deposition, or oriented bulk ingot crystalization, are discussed. The third part assumes that very low cost goals can be achieved, either through the development of sophisticated single crystal technology, or through a polysilicon breakthrough. Future markets for photovoltaic conversion, including medium-size power generating plants, are then considered. (Author)

A80-23519 **Heterojunction solar cells.** S. Wagner (Solar Energy Research Institute, Golden, Colo.). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 445-450; Discussion, p. 450, 451. 10 refs.

This paper gives a qualitative description of semiconductor-semiconductor heterojunction solar cells. The two groups of heterojunctions of greatest economic potential, very highly efficient cells for concentrator applications and moderately efficient thin film cells for flat plates, are described with examples. These examples illustrate the role of heterojunctions in surface passivation, monolithic multijunction devices, devices with semiconductors of only one conductivity type and low-temperature fabrication techniques. (Author)

A80-23520 **Photoelectrochemical cells.** A. J. Nozik (Solar Energy Research Institute, Golden, Colo.). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 453-470. 38 refs.

The application of photoelectrochemical systems based on photoactive semiconducting electrodes to the problem of solar energy conversion and chemical synthesis is discussed. Three types of cells are described: electrochemical photovoltaic cells (wherein optical energy is converted into electrical energy); photoelectrolysis cells (wherein optical energy is converted into chemical free energy); and photocatalytic cells (wherein optical energy provides the activation energy for exoergic chemical reactions). The critical semiconductor electrode properties for these cells are the band gap, the flat-band potential, and the photoelectrochemical stability. No semiconductor electrode material is yet known for which all three parameters are simultaneously optimized. An interesting configurational variation of photoelectrolysis cells, labelled 'photochemical diodes', is described. These diodes comprise cells that have been collapsed into monolithic particles containing no external wires. Recent advances in several areas of photoelectrochemical systems are also described. (Author)

A80-23521 **Photolysis of water for H2 production with the use of biological and artificial catalysts.** D. O. Hall, M. W. W. Adams, P. Morris, and K. K. Rao (King's College, London, England). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 473-476. 12 refs. Research supported by the Commission of the European Communities, Imperial Chemical Industries, and Science Research Council.

An aqueous mixture of chloroplasts, hydrogenase and electron transfer catalyst on illumination liberates H2, the source of the H atoms being water. The rate and duration of H2 production from such a system depends on the stability of chloroplast and hydrogenase activities in light and oxygen. Both chloroplasts and hydrogenases can be stabilized to a certain degree by immobilization in gels or by incubation in bovine serum albumin. Natural electron carriers of hydrogenases are ferredoxin, cytochrome c3 and NAD. Viologen dyes and synthetic iron-sulphur particles (Jeevanu) can substitute for the biological carriers. Methyl viologen, photoreduced in the presence of chloroplasts, can liberate H2 in combination with Pt (Adam's catalyst). An aqueous solution of proflavine can be photoreduced in the presence of organic electron donors such as EDTA, cysteine, dithiothreitol, etc.; the reduced proflavine can subsequently liberate H2 with MV-Pt, MV-hydrogenase, ferredoxin-hydrogenase or cytochrome-hydrogenase systems. (Author)

A80-23522 **Energy from the biological conversion of solar energy.** N. K. Boardman (Commonwealth Scientific and Industrial Research Organization, Div. of Plant Industry, Canberra, Australia). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 477-487; Discussion, p. 487-489. 30 refs.

The paper examines the possible energy contributions by employing trees and other biological solar collectors. Attention is given to the potential availability of biomass for fuel production, emphasizing the average annual production of various types of biomass. It is concluded that biomass will not be able to contribute a substantial fraction of the world's energy demands but it was also noted that photosynthesis can make a useful contribution, particularly in countries with a relatively low per capita consumption of energy or with large areas of rain-fed productive land. C.F.W.

A80-23523 **Microbial production of energy sources from biomass.** R. C. Righelato (Tate and Lyle, Ltd., Reading, Berks., England). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A*, vol. 295, no. 1414, Feb. 7, 1980, p. 491-500; Discussion, p. 500. 32 refs.

The biochemical options available for the microbial production of energy sources from biomass is reviewed and some of the technology available for microbial conversion is discussed with particular reference to present limitations and how they may be overcome. Attention is given to the chemical process of anaerobic fermentation emphasizing the chemical reaction of glucose into pyruvic acid. The capital costs and energy consumption of ethanol and methane and their production are discussed. It is concluded that anaerobic fermentation of carbohydrates and digestion of biomass-containing effluents can be used as methods for achieving greater energy availability. C.F.W.

A80-23524 **Indirect utilization of solar energy.** H. Bondi (Department of Energy, London, England). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980, p. 501-506.

Wind and wave energy are examined as means for indirect solar energy utilization. The advantages and disadvantages of making use of wind energy by the waves that are created on the ocean surface are discussed. Various devices for converting wave power into electrical energy are studied, including a device that is designed to turn the motion of the water into air motion which in turn drives an air turbine. It is noted that predicting the future for wave power is difficult but that the total power of waves that break on the English shore is probably more than the total electricity generating capacity of England. C.F.W.

A80-23525 **Effect of solar power satellite transmissions on radio-astronomical research.** B. Anderson and B. Lovell (Manchester, Victoria University, Jodrell Bank, England). *(Royal Society, Discussion on Solar Energy, London, England, Nov. 15, 16, 1978.) Royal Society (London), Philosophical Transactions, Series A,* vol. 295, no. 1414, Feb. 7, 1980, p. 507-511. 5 refs.

The paper examines the use of solar powered satellites as an additional energy source. Calculations indicate that severe restrictions will be placed on the use of radio telescopes on earth for the study of radio emission from celestial objects. It is determined that for a single solar powered satellite it would be possible to operate with the receiver protected by suitable filters at radio frequencies well separated from 2.45 GHz and at angles of look well displaced from the satellite. C.F.W.

A80-23533 **Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept.** K. M. Foreman and B. L. Gilbert (Grumman Aerospace Corp., Bethpage, N.Y.). *Wind Engineering,* vol. 3, no. 3, 1979, p. 153-166. 8 refs. Contract No. EY-76-C-2-2616.

An attractive advanced wind energy concept is the Diffuser Augmented Wind Turbine (DAWT), which involves the addition of a turbine wake diffuser making possible a greatly increased mass flow rate through the wind turbine. The technical challenge has been to develop a compact diffuser to minimize the equipment cost and complexity associated with a given power augmentation capability. A phased three-year investigation, involving three test facilities and based upon the use of both multibladed turbines and of screens to simulate turbine pressure drop, has led to the development of several compact diffuser designs that appear technically and economically attractive. Model tests with a nonoptimized DAWT configuration have demonstrated power augmentation for a given turbine diameter and wind speed by a factor of about 3.5 compared with an ideal conventional system. Further DAWT system refinements are expected to raise this factor to the range between 6 and 8. Corresponding improvements in plant capacity factor through other operational advantages may potentially bring the busbar cost of generated electricity to economically competitive levels. (Author)

A80-23534 **Describing wind data.** D. T. Swift-Hook (Central Electricity Generating Board, Applied Physics Div., Leatherhead, Surrey, England). *Wind Engineering,* vol. 3, no. 3, 1979, p. 167-186.

When assessing a potential wind-power site for which wind data are available, it is important to know for what fraction of the time wind of any given speed is available. It is noted that wind data are usually presented as the amount of time various wind speeds are exceeded, i.e. as cumulative probabilities. The distributions are usually (half-) bell-shaped indicating that, for most of the time, the wind is in some preferred range that can be specified in terms of its 'upper' and 'lower' velocities. It follows that many sets of data fit Weibull distribution curves; the parameter alpha adjusts the shape of the bell and can be found by various methods, including the slope of a Weibull plot, from 'upper' and 'lower' or 90% and 10% velocities, from the slope along the straightest part of the curve, or by calculation using individual points. It is concluded that a wide range of wind speeds can be summarized by specifying two parameters: the standard wind speed and the shape factor. L.M.

A80-23535 **Wind energy research and development at Lincoln.** R. E. Chilcott (Lincoln College, Canterbury, New Zealand). *Wind Engineering,* vol. 3, no. 3, 1979, p. 187-196. 14 refs.

Wind and energy research and development work undertaken at Lincoln College, New Zealand, and covering such activities as wind-energy surveying and resource assessment, wind-environment amelioration and wind-power utilization, is discussed. Results show that in order to provide reliable air generator systems techniques developed for aircraft, helicopters and wind-sensitive structures have to be used, for example, helicopter blades, coupled to a hydraulic variable-pitch agricultural-aircraft-type propeller hub. Provided that these methods are applied to produce economic systems, (estimated at 10 cents/KWh) wind power can make a small but significant contribution to electricity supplies. The impact of wind turbines on the environment remains to be seen. With rising oil prices the increased use of agricultural and horticultural shelter and the fairing of road transport vehicles to reduce fuel consumption are expected as immediate impacts, associated with wind-environment amelioration. L.M.

A80-23536 **A statistical methodology for study of wind characteristics from a close array of stations.** T. N. Goh and G. K. Nathan (University of Singapore, Singapore). *Wind Engineering,* vol. 3, no. 3, 1979, p. 197-206. 8 refs.

A method for improving the effectiveness of meteorological data interpretation is described, the goal being to develop analytical tools for use in the selection of wind power station sites. Wind measurements were collected from six stations within a 700 sq km area on and off Singapore. Autoregressive and stochastic-dynamic modelling techniques were applied to analyze simultaneous data from all stations, and the analysis was done in two stages: a single station analysis, involving time series modelling in addition to the usual graphical presentation of data summary, and further investigations in which the interstation relationship was expressed through impulse response functions. The approach has the advantage of yielding mathematical models that carry essential characteristics of data interdependence in both time and space in only a small collection of parameter values, and comparisons of wind characteristics can be made through numerical values of model parameters as well as model forms. L.M.

A80-23537 **An oscillatory wind energy convertor.** G. Ahmadi (Shiraz University, Shiraz, Iran). *Wind Engineering,* vol. 3, no. 3, 1979, p. 207-215. 18 refs. Research supported by Shiraz University.

The paper reviews the concept of wind energy conversion through the oscillation of an aerodynamically unstable system and a small wind energy convertor model of H section is presented. The unit is mounted on a shaft connected to a mechanical rectifier and the restoring couple is supplied by a steel rod pendulum. The model was tested at the exit of a wind tunnel, and a nonlinear theory predicting the power coefficient for such a model was developed. The test results are compared to the theoretical predictions showing a good correlation between theoretical and experimental values. It is also shown that the efficiency of energy conversion decreases with increasing wind speed. It is concluded that although the oscillating convertor has the advantage of simple design and low construction cost, which may make it attractive for use in remote areas of developing countries, the low value of its power coefficient is considered a deficiency. L.M.

A80-23833 **Material requirements for coal gasification (Anforderungen an Werkstoffe für den Einsatz bei der Kohlevergasung).** G. Kalwa (Mannesmann-Forschungsinstitut GmbH, Duisburg, West Germany). *(Deutscher Verband für Materialprüfung, Jahrestagung, Stuttgart, West Germany, Oct. 8-11, 1979.) Materialprüfung,* vol. 22, Jan. 1980, p. 27-32. In German.

It is noted that coal gasification processes, especially those with nuclear process heat, require the use of high temperature resistant metals. Attention is given to the various forms of high temperature corrosion which influence the service life of these construction materials. It is concluded that a sensible alloy development should lead to a material with a high corrosion resistance and high temperature stability which can be formed into small diameter pipes with present technology and can be welded reliably. M.E.P.

A80-23938 # **Scale-up of advanced MHD generators.** C. D. Maxwell, S. T. Demetriades, D. A. Oliver, A. A. Vetter, and T. F. Swean (STD Research Corp., Arcadia, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0179.* 18 p. 33 refs.

The steady state performance and fluid mechanical behavior of linear, combustion-driven MHD power generators from laboratory-scale to commercial-scale are characterized through numerical analysis of seven real generator designs. Despite the diverse philosophies embodied in these designs, the power extraction parameters and quasi-three-dimensional fluid behavior correlate well with appropriate interaction parameters. The scale dependence of transverse conductivity nonuniformity and its influence on generator performance are examined, and the impact of the unconventional flow field in the MHD generator upon the design and performance of other MHD System components is discussed. (Author)

A80-23953 # **The STD/MHD codes - Comparison of analyses with experiments.** A. A. Vetter, C. D. Maxwell, and S. T. Demetriades (STD Research Corp., Arcadia, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0024.* 17 p. 39 refs. Contract No. EX-76-C-01-2243.

In the present paper, the STD Research MHDQ3D code is used to simulate experimental tests of the Avco Mark VI-C Faraday-connected and the UTSI diagonal-conducting-wall MHD power-generating channels. The simulations are analyzed and the results are compared with experimental data. Additional analyses provide insight into phenomena that occur in MHD generators, but cannot be measured adequately. V.P.

A80-23954 # **Transient response of large experimental MHD power generator flowtrain systems.** D. A. Oliver, R. D. Crouse, C. D. Maxwell, and S. T. Demetriades (STD Research Corp., Arcadia, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0025.* 14 p.

STD Research Corporation's TRANSIENT code family can model, simulate, and reveal with great precision a very large number of transient phenomena in MHD power generator flow trains. Typical cases for several of these transient episodes for MHD flow trains are discussed. These include the start-up and shutdown transient, the flowtrain response to downstream fluctuations imposed by a periodically stalled diffuser, and self-excited large amplitude magnetoacoustic instabilities in multiple load diagonal operation of the MHD generator. Detailed discussion of important processes occurring in such transient situations such as Hall voltage overshoots is presented. (Author)

A80-23956 # **The state-of-the-art of cryogenic heat pipes.** R. C. Prager and A. Basiulis (Hughes Aircraft Co., Torrance, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0211.* 5 p. 16 refs.

The paper reviews the design and fabrication of cryogenic heat pipes. Working fluids and materials are considered. Attention is given to the published experimental results obtained with cryogenic working fluids at temperatures below 125 K, with comment on the utility and properties of each fluid. V.T.

A80-23998 # **Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors.** A. L. Dilpare (Florida Institute of Technology, Melbourne, Fla.) and A. J. Morales. In: World Congress on the Theory of Machines and Mechanisms, 5th, Montreal, Canada, July 8-13, 1979, Proceedings. Volume 2. New York, American Society of Mechanical Engineers, 1979, p. 1460-1463. 8 refs.

A novel solar concentrating collector has been developed wherein the flat plate collector remains stationary throughout the day, while the solar tracking function is obtained with a pair of contiguous nonparallel flat mirrors. Geometric optics are used to derive the required angular relationship between the auxilary mirrors and the incident solar angle as a function of the mirror/collector width ratio. Synthesis to obtain a drive mechanism used an analytic method to drive a simple four-bar mechanism having structural errors on the order of a few degrees. This mechanism may be driven with either an optical servo solar tracker, or with a simple 24 hour clock. Another four-bar mechanism was synthesized to generate the collector diurnal elevation angular change, and may also be driven with a 24-hour clock. The results of a computer analysis of collector gain and efficiency using the simplified mechanisms are presented in terms of daily averages, and the overall annual average; the annual average functional efficiency of the drive mechanism is found to be 93.39 per cent. (Author)

A80-24070 **Aerial thermography - A tool for making people aware of energy conservation (La thermographie aérienne - Outil de sensibilisation aux économies d'énergie).** J. Ruelland, G. Forgues (Bureau des Economies d'Energie, Montreal, Canada), and H. Audet (Ministère des Terres et Forêts, Centre Québécois de Coordination de la Télédétection, Sainte-Foy, Quebec, Canada). In: Remote sensing and resources management; Congress, 1st, Montreal, Canada, November 1977 and Congress, 2nd, Sherbrooke, Quebec, Canada, May 3, 4, 1979, Proceedings. Sainte-Foy, Quebec, Canada, Association Québécoise de Télédétection, 1979, p. 205-209. 6 refs. In French.

In 1978 the Energy Conservation Office of Quebec sponsored a program whose objective was to use the aerial thermography of buildings in order to make people aware of the need for energy conservation. The aerial data were collected on April 6 and 7, 1978, and a clinic was held in Joliette, the site of the experiment, at the end of May. All home owners and tenants were invited to see the thermal condition of their homes and to talk with experts. B.J.

A80-24071 **Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings (Problèmes d'interprétation des thermographies pour la détection des pertes d'énergie des bâtiments).** C. Prévost (Université Laval, Quebec, Canada) and F. Bonn (Sherbrooke, Université, Sherbrooke, Quebec, Canada). In: Remote sensing and resources management; Congress, 1st, Montreal, Canada, November 1977 and Congress, 2nd, Sherbrooke, Quebec, Canada, May 3, 4, 1979, Proceedings. Sainte-Foy, Quebec, Canada, Association Québécoise de Télédétection, 1979, p. 211-222. 7 refs. In French.

The potential of aerial thermography for detecting heat losses from buildings was assessed in a pilot program conducted in Joliette, Quebec. This paper describes the experiment and the procedure of data interpretation. The Joliette images showed that it is possible to detect 98 per cent of houses with an insulation level of R 15 or less.

It was not possible, however, to distinguish a moderately insulated house from a well insulated one. B.J.

A80-24072 **Thermography at the earth's surface and the energy efficiency of buildings (Thermographie au sol et économie d'énergie dans les bâtiments).** J. Laforest and M. Thériault (Ministère des Travaux Publics et de l'Approvisionnement, Direction de la Construction, Quebec, Canada). In: Remote sensing and resources management; Congress, 1st, Montreal, Canada, November 1977 and Congress, 2nd, Sherbrooke, Quebec, Canada, May 3, 4, 1979, Proceedings. Sainte-Foy, Quebec, Canada, Association Québécoise de Télédétection, 1979, p. 223-230. 6 refs. In French.

A portable thermography system was used to determine heat losses from four buildings in different regions of Quebec during the winter of 1978-1979. The system consisted of an IR camera (type AGA 750) operating in the 2-5.6 micron range along with an imager yielding a dynamic representation of the temperature gradients of the objects studied. The experiment is described in detail, and some causes of heat loss are identified. B.J.

A80-24124 **Exotic energy R&D has potential.** J. T. Miskell. *Energy,* vol. 5, Winter 1980, p. 6, 7.

The paper examines the use of wave power or ocean gradient differential as one aspect of energy production along with the farming of biomass as a feedstock for methane production. Attention is given to various cost estimates for projects such as the conversion of kelp to methane that will hopefully result in a reasonable yield. The design features of a turbine wind tower or tornado machine are discussed and some of the advantages of the design are presented. C.F.W.

A80-24125 **Water turbine technology for small power stations.** T. Salovaara (Oy Tampella Ab, Tempeke, Finland). *Energy,* vol. 5, Winter 1980, p. 23, 24.

The paper examines hydro-power stations and the efficiency and costs of using water turbines to run them. Attention is given to different turbine types emphasizing the use of Kaplan-turbines and runners. Hydraulic characteristics and mechanical properties of low head turbines and small turbines, constructed of fully fabricated steel plate structures, are presented. C.F.W.

A80-24223 **Gradient bounds for plasma confinement.** I. Stakgold (Delaware, University, Newark, Del.). *Mathematical Methods in the Applied Sciences,* vol. 2, no. 1, 1980, p. 68-72. 11 refs. Army-supported research.

The problem of plasma confinement in a tokamak machine has recently attracted considerable mathematical attention. In the present article, gradient bounds for the solution are obtained through the use of differential inequalities and the Hopf maximum principle. These estimates, which take slightly different forms in the plasma and vacuum regions, become exact in the one-dimensional case. An estimate is also given for the distance from the boundary of the interior point where the maximum of the solution is attained. (Author)

A80-24256 **Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application.** D. J. Ahner, A. S. Brower, A. S. Patel (General Electric Co., Schenectady, N.Y.), and G. Quentin (Electric Power Research Institute, Palo Alto, Calif.). In: Joint Automatic Control Conference, Denver, Colo., June 17-21, 1979, Proceedings. New York, American Institute of Chemical Engineers, 1979, p. 601-608.

This paper presents the effects of integrated air-blown fixed bed coal gasification/combined cycle (GCC) power generation on the control performance of a utility power system. The logic of the GCC station control, major plant subloops and the power system control are illustrated and discussed, stressing the impact and/or modification of these controls for this new type of energy supply. Results of digital computer simulations, showing the transient response of the plant and electrical system power flows in response to system disturbances, are presented. (Author)

A80-24319 **Numerical modeling of heat flow in underground coal liquefaction.** F. K. Fong and D. R. Skidmore (Ohio State University, Columbus, Ohio). In: Numerical methods in thermal problems; Proceedings of the First International Conference, Swansea, Wales, July 2-6, 1979. Swansea, Wales, Pineridge Press, Ltd., 1979, p. 805-814. 5 refs.

A stable numerical method, called the method of alternating variables, has been developed to solve the conjugated nonlinear heat transfer problems encountered in the in-situ coal liquefaction process. The method simplifies the calculation of implicit approximations. One or two iterations are sufficient for accurate solution (plus or minus 1 C). When applied to hyperbolic equations with inherent discontinuity, the alternating variable method solves the implicit approximations explicitly with high accuracy. V.L.

A80-24482 **Low-density ignition scenarios in injection-heated tokamaks.** J. A. Holmes, J. A. Rome, W. A. Houlberg, Y.-K. M. Peng, and S. J. Lynch (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *Nuclear Fusion,* vol. 20, Jan. 1980, p. 59-67. 20 refs.

Plasma heating and ignition by neutral injection have been studied using a Monte-Carlo neutral-injection computer code coupled to a single-fluid, one-dimensional (1-D) transport code and a two-dimensional (2-D) flux-conserving equilibrium code. It is shown that, by taking advantage of central alpha-heating, profile effects, and flux surface shifts in elongated plasmas, it is possible to ignite a modelled, prototypical reactor plasma using 45-30 MW of 100-150 keV (D-super-plus) neutral beams. To do this, the plasma is started at full bore but with a density below that needed for ignition. Because of the decreasing beam line efficiency with increasing energy, it is found that a nearly constant extracted power of about 85-95 MW is needed for ignition in the range studied. There is thus little economic difference in this energy range. However, higher-energy beams around 150 keV imply fewer injectors and perhaps lower impurity production rates during heating to ignition. (Author)

A80-24487 **Two-stroke tokamak reactor.** L. M. Degtiarev (Akademiia Nauk SSSR, Institut Prikladnoi Matematiki, Moscow, USSR), V. I. Pistunovich, and V. D. Shafranov (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). *Nuclear Fusion,* vol. 20, Jan. 1980, p. 102, 103. 8 refs.

The scheme of a two-stroke tokamak reactor without a divertor is considered. The reactor operates with short pulses, at the end of which the whole of the plasma column is expelled automatically from the working chamber into an auxiliary vacuum chamber where quenching of the discharge takes place. Then fresh deuterium-tritium mixture is admitted into the working chamber, the discharge is initiated, and the cycle repeats itself. (Author)

A80-24498 **Model for description of transient behavior of a tokamak discharge.** A. Airoldi Crescentini, G. Grosso, G. Lampis, and E. Lazzaro (EURATOM and CNR, Laboratorio di Fisica del Plasma, Milan, Italy). *Nuovo Cimento B, Serie 11,* vol. 54B, Dec. 11, 1979, p. 426-434. 7 refs.

The transient behaviour of a tokamak discharge is analysed through a simple electrodynamical model. From this model indications are obtained on the macroscopic parameters, controlled by the experimentalists, defining the range of existence and gross stability of the discharge. The findings of the analysis are compared with the experimental results of the tokamak Thor. (Author)

A80-24512 **The thermodynamics of heating. I - The second law and conventional heating systems (Zur Thermodynamik des Heizens. I - Der zweite Hauptsatz und die konventionellen Heizsysteme).** H. D. Baehr (Hamburg, Hochschule der Bundeswehr, Hamburg, West Germany). *Brennstoff-Wärme-Kraft,* vol. 32, Jan. 1980, p. 9-15. 14 refs. In German.

The paper introduces a 'heating number' to enable better determination of the primary energy use of a heating system. This number is defined as the relationship between the yearly heat requirement and the primary energy consumption. Its maximum which is fixed by the laws of nature, is calculated with the help of the second law of thermodynamics. It is shown that the maximum of the 'heating number' depends on the heating comfort required and on the frequency curve of the ambient temperature. Finally, it is noted that this maximum lies between 16 and 20 for the Federal Republic of Germany and could be obtained from an ideal reversible heating system. M.E.P.

A80-24531 **Photovoltaics. I - Solar-cell arrays.** J. J. Loferski (Brown University, Providence, R.I.). *IEEE Spectrum,* vol. 17, Feb. 1980, p. 26-31.

Semiconductor photovoltaic devices such as silicon photovoltaic cells and thin-film copper-sulfide/cadmium-sulfide cells are discussed, as well as gallium arsenide single-crystal, polycrystalline GaAs, compound, amorphous silicon, and electrochemical solar cells. Attention is given to the economics of solar-cell power systems, a combination of efficiency and cost that must be met before electricity can be generated at a price comparable to that for conventional systems. Analyses of flat-plate and concentrator systems are presented together with a look at methods of improving overall efficiency. C.F.W.

A80-24532 **Photovoltaics. II - Flat panels.** M. Wolf (Pennsylvania, University, Philadelphia, Pa.). *IEEE Spectrum,* vol. 17, Feb. 1980, p. 32, 33.

The paper discusses the future of solar cell technology with emphasis on high performance and a reduction of present fabrication costs. Methods of producing pure silicon are discussed, including the edge-defined film growth method and the capillary action shaping technique. Attention is given to the major steps in the solar-cell fabrication sequence of junction formation, contact metallization, and application of an antireflection coating. C.F.W.

A80-24533 **Photovoltaics. III - Concentrators.** C. E. Backus (Arizona State University, Tempe, Ariz.). *IEEE Spectrum,* vol. 17, Feb. 1980, p. 34-36.

Photovoltaic concentration systems that redirect sunlight falling on a surface to a smaller solar-cell surface concentrating the intensity of sunlight many times are examined. It is noted that solar cells for concentrating systems must be designed for low internal resistance as well as for high sunlight intensities. Two designs of silicon cells are presented that perform well at high concentrations; these are interdigitated back-contact cells and vertical multijunction cells. Attention is given to heat tapping of reemitted light. C.F.W.

A80-24534 **Photovoltaics. IV - Advanced materials.** J. J. Loferski (Brown University, Providence, R.I.). *IEEE Spectrum,* vol. 17, Feb. 1980, p. 37, 38.

The paper examines compound semiconductor solar cell development, which includes the development of thin-film polycrystalline cells and tandem concentrating collector cells. Attention is given to the low-cost processes of copper sulfide/cadmium sulfide and gallium arsenide cells. Various binary-compound semiconductors such as indium phosphide and cadmium telluride are also examined. C.F.W.

A80-24535 **Photovoltaics. V - Amorphous silicon cells.** D. E. Carlson (RCA Laboratories, Princeton, N.J.). *IEEE Spectrum,* vol. 17, Feb. 1980, p. 39-41. Research supported by the U.S. Department of Energy.

Hydrogen amorphous silicon alloys that enable fairly efficient output currents of solar cells are investigated. It is noted that amorphous silicon produced from a glow discharge in silane gas has very few defect states. Attention is given to the fabrication techniques such as the deposition process and the parameters involved; the process of forming typical Schottky barrier cells is also discussed. C.F.W.

A80-24537 **Cheap electricity from French tides.** H. Andre (Electricité de France, Annecy, Haute-Savoie, France). *IEEE Spectrum,* vol. 17, Feb. 1980, p. 54-57.

A tidal power plant built in Saint-Malo, France is examined, and some of the problems that have resulted in recent years are analyzed. These include mechanical problems due to turbine runner-blade seal failure and electrical problems involving electroerosion and structural station difficulties. the effects of tidal power plants on the environment are discussed, and it is noted that all possible side effects of the operations are very limited. Attention is given to the basic requirements for constructing power sites. C.F.W.

A80-24660 # **Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation.** M. A. M. Abdelrahman. Research supported by the Ecole Polytechnique Fédérale de Lausanne. Zurich, Juris-Verlag (Ecole Polytechnique Fédérale de Lausanne, Institut de Thermique Appliquée, Communication, No. 6), 1979. 174 p. 81 refs.

The applicability of gaseous suspensions of graphite particles as absorbers of concentrated solar radiation is investigated. Conventional solar energy absorbers are considered, and it is shown that the direct absorption of solar energy by absorbing fluids presents important advantages in efficiency and corrosion resistance compared to absorption by surfaces. In the absence of existing black fluids, suspensions of graphite particles one micron in diameter are presented as satisfying the optical requirements for an absorbing fluid. The agglomeration and deposition of particles suspended in a gas are then considered, and a mathematical model of particle suspension behavior is derived. The model is found to agree with results of an experimental study during the first 20 minutes of the experiment, diverging later due to the fact that later suspension evolution becomes independent of time. It is also found, both theoretically and experimentally, that coating the graphite particles with a silicone base layer will prevent agglomeration and deposition and allow solar absorption efficiency to be maintained at a high level. A.L.W.

A80-24661 **Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978.** Course sponsored by the European Atomic Energy Community, European Physical Society, Ministero della Pubblica Istruzione, et al. Edited by B. Brunelli. Oxford, Pergamon Press, Ltd., 1979. 482 p. $72.64.

Specific topics discussed are mirror reactors, two-component tokamaks, and low-Q fusion devices. Particular attention is given to such topics as the physics of field-reversed mirrors, superconducting magnets for mirror machines, neutral beam injectors, and nonelectric fusion energy applications. B.J.

A80-24664 **The physics of field reversed mirrors.** R. F. Post (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 53-85. 16 refs. Contract No. W-7405-eng-48.

The use of field-reversed mirrors in controlled fusion studies is described. Analytical treatments and computer simulation studies have demonstrated equilibrium solutions both in the fluid limit and in the large-orbit limit. Several experimental methods for achieving field-reversed states are described including: (1) the use of relativistic electron beams to create a field-reversing current ring, (2) the use of the reversed theta pinch or REB pulses to create field-reversing diamagnetic currents in a long cylinder cylindrical plasma, and (3) the field-reversed mirror created by the tangential injection of high-current neutral beams. B.J.

A80-24665 **The mirror fusion test facility.** R. F. Post (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 87-104. Contract No. W-7405-eng-48.

The MFTF is a large new mirror facility under construction at Livermore for completion in 1981-82. Its magnet, employing superconducting NbTi windings, is of Yin-Yang form and will weigh 200 tons. MFTF will be driven by neutral beams of two levels of current and energy: 1000 amp of 20-keV (accelerating potential) pulsed beams for plasma startup; 750 amp of 80-keV beams of 0.5-second duration for temperature buildup and plasma sustainment. Two operating modes for MFTF are envisaged: The first is operation as a conventional mirror cell with a confinement parameter equal to approximately 10 to the 12th sec/cu cm and an ion energy of 50 keV, where the emphasis will be on studying the physics of mirror cells. The second possible mode is the further study of the field reversed mirror idea, using high-current neutral beams to sustain the field-reversed state. MFTF has been oriented so that it could compreise one end cell of a scaled-up tandem mirror experiment. Also, if MFTF were to succeed in achieving a field-reversed state it could serve as an essentially full-sized physics prototype of one cell of a field-reversed mirror fusion power plant. (Author)

A80-24666 **The economic significance of Q for mirror reactors - Combinations of Q and M which look promising.** R. W. Werner (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 105-120.

The mirror reactor is suspect as an economic power producer because of its Q parameter, the fusion power output divided by the power input. This paper demonstrates that unless promising combinations of Q and M (the blanket energy multiplication) are found the mirror reactor will never be economically feasible. B.J.

A80-24667 **Tandem mirror reactors.** G. A. Carlson (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 121-138.

Preliminary fusion reactor designs based on the tandem mirror confinement concept have been developed. These include a 100 MWe fusion power reactor and a nearer-term fusion-fission hybrid reactor with reduced plasma confinement and technology requirements. The design and basic characteristics of these reactors are reviewed. B.J.

A80-24668 **Field-reversed mirror reactor.** G. A. Carlson (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 139-154. 6 refs.

The conceptual design of a fusion power reactor based on the field-reversed mirror confinement concept has been completed. The reactor design is a multicell arrangement where a series of field-reversed plasma layers are arranged along the axis of a long superconducting solenoid which provides the background magnetic field. This paper discusses the analytical model for this reactor, parametric studies, and some of the particulars of the reference case reactor design. B.J.

A80-24670 **Mirror hybrid reactors.** R. W. Moir and J. D. Lee (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 191-216. 11 refs.

The driven two-component tandem mirror seems well-suited to application as a fuel-producing hybrid reactor because of its cylindrical geometry, steady state operation, and relatively low technology. Development sequences are underway that could lead to a two-component tandem hybrid fuel-producing reactor. They include a tandem mirror experiment, a modified mirror fusion test facility, and then a pilot plant. B.J.

A80-24671 **Beam and plasma direct converters.** R. W. Moir (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 217-235. 7 refs.

Two types of direct converters, one for beams and one for plasma, are under development, with voltages and power densities approaching reactor-like conditions. Direct conversion allows positive ion beams to be made into neutrals efficiently up to 150 keV for D(0), 225 keV for T(0), and 300 keV for He-3(0). Direct conversion raises the efficiency of producing neutral beams, can save millions of dollars when applied to next-generation experiments, and can improve the power balance of driven reactors. B.J.

A80-24672 **Superconducting magnets for mirror machines.** G. A. Carlson (California, University, Livermore, Calif.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 237-250. 5 refs.

The evolution of superconducting magnet systems, particularly Baseball and Yin-Yang coil systems, for standard mirror and tandem mirror machines is described. Attention is given to magnet shape, magnet size, magnetic field strength, magnetic design considerations, and the current status of magnet development for mirror machines. B.J.

A80-24674 **Plasma parametric studies and potential applications of driven fusion reactors.** R. W. Conn (Wisconsin, University, Madison, Wis.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 297-345. 20 refs. Research supported by the Wisconsin Electric Utilities Research Foundation.

Analytical and computational models for investigating the dynamic performance of plasmas in TCA (two-component amplifier), MFA (Maxwellian fusion amplifier), or ignition modes of operation are presented. In particular, examples of thermal burn instability in each of these operating modes are given. The potential application of TCA or MFA in reactors aimed at engineering testing, materials irradiation, and hybrid applications is examined. The potential of the driven tokamak as a hybrid is analyzed based on plasmas operating in the TCA and MFA modes. B.J.

A80-24675 **Neutral beam injectors.** F. P. G. Valckx (EURATOM and Commissariat à l'Energie Atomique sur la Fusion, Département de Physique du Plasma et de la Fusion Contrôlée, Fontenay-aux-Roses, Hauts-de-Seine, France). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 347-367. 34 refs.

Four types of ion sources are described and compared: the duopigatron, the field free LBL source, the periplasmatron, and the Bucket-source. Both multiaperture and multislit type extraction systems are treated. In addition, the paper considers different sources of negative ions, and reviews basic designs of negative-ion neutral injectors. B.J.

A80-24676 **Non-electric fusion energy applications.** S. L. Bogart (U.S. Department of Energy, Div. of Magnetic Fusion Energy, Washington, D.C.). In: Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978. Oxford, Pergamon Press, Ltd., 1979, p. 371-402.

Studies aimed at assessing the feasibility of nonelectric fusion energy applications are reviewed, with particular reference to the Inexhaustible Energy Resources Planning Study. Particular attention is given to fusion-fission energy systems and synthetic chemical fuel production by fusion reactors. B.J.

A80-24717 **The price of oil in the year 2000.** G. A. Hazelrigg, Jr. (ECON, Inc., Princeton, N.J.). In: Astrodynamics 1979; Proceedings of the Conference, Provincetown, Mass., June 25-27, 1979. Part 1. San Diego, Calif., American Astronautical Society; Univelt, Inc., 1980, p. 843-861. 9 refs. (AAS 79-172)

A mathematical model that projects the price of oil in the year 2000 is presented, by characterizing the long-run economic forces to which the decision makers are subject. The model is based upon well-established characteristics of human behavior and modern control theory. Attention is given to the stochastic demand function. Results show that it is not in the best interest of OPEC to raise the price of oil beyond that indicated by the optimal trajectories. C.F.W.

A80-24735 **Power plant impacts on visibility in the west - Siting and emissions control implications.** D. A. Latimer (Systems Applications, Inc., San Rafael, Calif.). *Air Pollution Control Association, Journal,* vol. 30, Feb. 1980, p. 142-146. Research supported by the U.S. Environmental Protection Agency.

A80-25021 # **The theory of a free-field inductive MHD-propulsor (K teorii induktsionnogo MGD-dvizhitelia so svobodnym polem).** V. I. Iakovlev (Akademiia Nauk SSSR, Institut Teoreticheskoi i Prikladnoi Mekhaniki, Novosibirsk, USSR). *Akademiia Nauk SSSR, Doklady,* vol. 249, no. 6, 1979, p. 1342-1345. 7 refs. In Russian.

The paper investigates the energy characteristics of a free-field inductive MHD-system. The model body set into motion is taken to be a flat plate of finite width and infinite length in a boundless conducting fluid. The problem is one of determining the electromagnetic field parameters necessary to set the plate into motion. The use of current-amplitude modulation to control the energy parameters of the MHD system is discussed. B.J.

A80-25026 # **Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference (Obshchnost' svoistv bakterial'nogo i zritel'nogo rodopsinov - Prevrashchenie energii sveta v raznost' elektricheskikh potentsialov).** V. I. Bol'shakov, A. L. Drachev, L. A. Drachev, G. R. Kalamkarov, A. D. Kaulen, M. A. Ostrovskii, and V. P. Skulachev (Akademiia Nauk SSSR, Institut Khimicheskoi Fiziki; Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). *Akademiia Nauk SSSR, Doklady,* vol. 249, no. 6, 1979, p. 1462-1466. 15 refs. In Russian.

A80-25061 **Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints.** Symposium sponsored by the Montana Energy and MHD Research and Development Institute, Montana College of Mineral Science and Technology, and Montana State University. Edited by R. J. Rosa (Montana State University, Bozeman, Mont.). Bozeman, Mont., Montana State University, 1979. **480 p. $20.**

The Symposium focused on open cycle systems, slag seed and air heaters, magnet and materials, liquid metal and closed cycle, discharge and plasma effects, control-inverters, and inhomogeneities and combustion. Papers were presented on design and performance predictions for the first CDIF power train, approximate three-dimensional solution for finitely segmented frame-type MHD channels, radiative and convective heat transfer in the MHD generator duct, an evaluation of candidate seed processing systems, wettability and corrosion of MHD ceramics by rosebud coal slag, and fluctuations in combustion MHD generator systems. A.T.

A80-25062 # **Design description and performance predictions for the first CDIF power train.** G. Enos, J. Morenskii, S. Petty, and A. Solbes (Avco Everett Research Laboratory, Inc., Everett, Mass.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. A.1.1-A.1.9. Research supported by the U.S. Department of Energy.

The paper considers the range of inlet plasma conditions to the supersonic MHD power channel for the CDIF power train and describes the features of a slagging combustor that produces these conditions. Channel performance characteristics are predicted including the diagonal and Faraday regimes; the major engineering features of the flow train components are described with emphasis on the MHD channel; the channel gas dynamic conditions are presented, including the distributions of static pressure, Mach number, conductivity, current density, and electric field. A.T.

A80-25063 # **Long duration channel development and testing.** A. Demirjian, V. Hruby, S. Petty, and A. Solbes (Avco Everett Research Laboratory, Inc., Everett, Mass.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. A.3.1-A.3.11. Research supported by the U.S. Department of Energy.

The paper presents long duration CDIF reference channel development and testing. Anode designs of copper protected by noble metal caps and copper cathodes were evaluated for long term resistance to electrochemical erosion; the channel was resistively loaded as an ideal Faraday and operating parameters were selected to duplicate those expected in power station service. Fly ash from a power plant was injected into an oil fired combustor to simulate the carryover rate from a coal fired combustor. The test was conducted with inspection points for photographic records, and material analyses were made on several electrode/insulator/slag samples. A.T.

A80-25064 # **Electrical characteristics of an arc-mode slagging electrode generator.** J. K. Koester and R. M. Nelson (Stanford University, Stanford, Calif.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. A.4.1-A.4.9. Research supported by the Electric Power Research Institute.

The paper considers the electrical characteristics of an arc-mode slagging segmented Faraday generator studied with voltage probes, an ac resistance instrument, and a wide-view optical port. Cathode gap deterioration was observed during operation with the ac resistance instrument and correlated with the decrease in Hall voltage performance. Experiments on nonuniform loading were performed in clean fuel and slagging channels; the experimental Faraday and Hall voltage distributions compared well with a superposition of currents rule utilizing empirically determined influence coefficients. A.T.

A80-25065 # **Study of the U-25B MHD generator system in strong electric and magnetic fields.** A. D. Iserov, V. I. Maksimenko, G. I. Maslennikov, A. P. Nefedov, M. Ia. Panovko, D. S. Pinkhasik, V. D. Semenov, Iu. N. Sokolov, I. A. Vasil'eva (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR), and K. Tempelmeyer (Argonne National Laboratory, Argonne, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. A.5.1-A.5.14. 7 refs.

A study of the U-25B MHD generator system in strong electric and magnetic fields is presented. It demonstrated that the MHD flow train has operated for over 50 hr with little difficulty, and that no significant problems occurred due to vibration, stress, or fluctuation of the electrical and gasdynamic parameters of the system components. The MHD generator produced a maximum power of 575 kW, a maximum Hall voltage of 4240 V, and a maximum Hall field of 2100 V/m; data obtained from two tests show that the effective plasma conductivity and channel mass flow must be increased to increase the U-25B channel power. A.T.

A80-25066 # **Local analysis of electrical performance of the U-25B generator.** J. D. Teare, W. C. Unkel, J. F. Louis (MIT, Cambridge, Mass.), and J. K. Koester (Stanford University, Stanford, Calif.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. A.6.1-A.6.9. 10 refs. Research supported by the U.S. Department of Energy.

The electrical performance of the No. 1 channel in the U-25B facility is examined, based on data from Tests 2, 3 and 4 (March, June and December 1978). Since the channel behavior has not been well modeled by the overall performance codes, the present analysis concentrates on local electrical behavior, using the measured static pressures in a mixed mean analysis of the combustor and channel to determine local fluid and plasma parameters. Measured axial electric field versus load current density characteristics are extrapolated to given values of open circuit electric field and short circuit current density at various axial locations as functions of mass flow rate, magnetic field and oxygen enrichment. Comparisons with theoretical performance based on 'layer models' show that the effective non-uniformity factor is much larger than would be expected for the upstream section of the generator, and the paper discusses several phenomena which could be contributing to the discrepancies between theory and experiment. The discussion emphasizes the need for improved basic instrumentation as well as advanced diagnostics to aid in the interpretation of data from future U-25B tests. (Author)

A80-25068 # **Radiative and convective heat transfer in the MHD generator duct.** L. M. Biberman, S. A. Medin, A. Kh. Mnatsakanian, V. N. Zatelepin, M. B. Zhelezniak (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR), and G. A. Liubimov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. B.5.1-B.5.6. 13 refs.

The paper presents calculations of MHD flow and radiative-conductive heat transfer in the high power MHD generator duct. The calculations are based on the hydraulic approximation of the magnetohydrodynamic equations including radiative heat losses. The results show that the radiative heat flux to the duct walls of a future large MHD power station is comparable with the convective flux and should be taken into account in the MHD flow calculations. A.T.

A80-25069 # **Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel.** B. Zaporowski and J. Roszkiewicz (Poznan, Politechnika, Poznan, Poland). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. B.6.1-B.6.6.

A80-25070 # **Application of black-liquor boiler technology to MHD heat and seed recovery equipment design.** P. R. Sheth, R. L. Lawit, and M. G. Klett (Gilbert Associates, Inc., Reading, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.1.1-C.1.6. 15 refs. Contract No. 01-78-ET-11058.000.

A80-25071 # **Condensation and deposition of seed in the MHD bottoming plant.** K. H. Im, J. Patten, T. R. Johnson, and K. Tempelmeyer (Argonne National Laboratory, Argonne, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.2.1-C.2.7. 23 refs. Research supported by the U.S. Department of Energy.

The paper considers the computer model for the prediction of the growth of deposition of seed particles in the steam and air heater sections of the MHD bottoming plant. The model represents a hot combustion gas stream with vaporized seed and entrained slag particles of a selected size distribution flowing through a bank of cooled tubes. It was shown that in the absence of slag particles, the bulk of the seed vapor condenses in the gas stream to form particles in the 0.02-0.2 micron diameter range; in the presence of the submicron slag particles formed upstream in the MHD diffuser, the largest fraction of the seed vapor condenses on the existing entrained particles causing them to grow to approximately one micron. A.T.

A80-25072 # **An evaluation of candidate seed processing systems for open cycle MHD.** E. J. Lahoda and T. E. Lippert (Westinghouse Electric Corp., Pittsburgh, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.3.1-C.3.6. 6 refs. Research supported by the Electric Power Research Institute and Westinghouse Electric Corp.

In coal burning systems, if potassium carbonate is added to the plasma, potassium sulfate results at the low temperature end of the plant. Recovery and conversion of this potassium sulfate back to carbonate in the seed regeneration process provides one method for sulfur removal and control. This paper summarizes an economic and technical evaluation of eight options for sulfur control. They include the double alkali, Engel-Precht, formate, ACP/Tempella, PERC, Markant and a Westinghouse process, as well as conventional limestone SO2 scrubbers. (Author)

A80-25073 # **A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2.** I. Eliezer, N. Eliezer, R. Howald, and P. Viswanadham (Montana State University, Bozeman, Mont.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.4.1-C.4.7. 22 refs. Research supported by the Montana Energy and MHD Research and Development Institute; Contract No. ET-78-C-01-3087.

The paper considers a model for the vaporization of seeded slags with emphasis on the KO(0.5)CaO-AlO(1.5)SiO2 system. The equilibrium pressures were measured over a number of compositions in this system, presenting typical data on the effect of varying the CaO mole fraction. The thermodynamic analysis of a four-component system from which compositions and vaporization-condensation equilibria in the MHD system can be obtained is prepared from the properties of the pure components with successive additions of data on binary and ternary subsystems. Sample calculations using this model to predict the slag-seed behavior under MHD operational conditions are presented which include the mean values of the temperatures, amounts, and compositions of slag and seed species expected at selected points of the MHD system. A.T.

A80-25074 # **Wettability and corrosion of MHD ceramics by Rosebud coal slag.** R. Guidotti, L. Bentsen, and J. Rasmussen (Montana Energy and MHD Research and Development Institute, Inc., Butte, Mont.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.5.1-C.5.6. 5 refs.

The interaction of natural Rosebud coal slag with a variety of commercial oxide refractories has been investigated by measurement of the wettability using the sessile-drop method. Contact angles were measured as a function of temperature up to 1500 C. The effect of refractory composition and porosity upon wetting behavior of natural Rosebud in air was studied and the interfacial region was examined to observe the extent of chemical reaction. The effect of K2SO4-seed upon wettability behavior was also explored. (Author)

A80-25075 # **Operability and materials testing for MHD air heaters.** D. P. Saari, R. R. Smyth, C. J. Kniebel, and L. R. White (FluiDyne Engineering Corp., Minneapolis, Minn.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.6.1-C.6.8. 14 refs. Contract No. EX-78-C-01-3005.

The experimental program and test facilities for MHD heater development are described. Significant results with respect to heater operability and materials performance are shown. Stable air heater operation and removal of seed/slag deposits have been demonstrated in a test facility. Fusion cast magnesia-spinel has been identified as a candidate material for full-scale air heaters and is now being subjected to long term evaluation. (Author)

A80-25076 # **Particulate size and rates of pressure drop increase in an MHD air preheater.** H. W. Townes, T. C. Reihman, C.

J. Mozer, and T. A. Ameel (Montana State University, Bozeman, Mont.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. C.8.1-C.8.5. Research supported by the Montana Energy and MHD Research and Development Institute; Contract No. ET-78-C-01-3087.

Rates of pressure drop increase are given for three particulate sizes for flows with fly ash in a regenerative heat exchanger. The pressure drop measurements were made across a ceramic regenerative heat exchanger typical of that which would be used in an indirectly-fired open-cycle MHD system. The pressure drop increase across the ceramic bed was measured for 100 hours of operation for each particle size. The top ceramic temperature was above the melting temperature of the slag. (Author)

A80-25077 # **Superconducting MHD magnets - Technology development, procurement and the path to commercial scale.** P. G. Marston, D. B. Montgomery, J. E. C. Williams, and A. M. Dawson (MIT, Cambridge, Mass.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-1.1.1 to D-1.1.8. Research supported by the U.S. Department of Energy.

The paper considers the characteristics of the superconducting MHD magnets. It is shown that the synergism of the parallel procurement and technology development permits a dynamic interaction of the CDIF, CFFF and Stanford concepts; the CDIF superconducting magnet which reduces cumulative loads and frictional heating to a minimum and the Stanford magnet which will modify quench behavior so that the design will be fail-safe without a dynamic energy-dumping system are discussed. Finally, studies of shipping of magnets, the properties of materials of construction, and of systems engineering of cryogenic systems are presented. A.T.

A80-25078 # **A modular design for a superconducting magnet for the ETF and larger MHD generators.** J. L. Zar (Avco Everett Research Laboratory, Inc., Everett, Mass.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-1.2.1 to D-1.2.7. Research supported by the Massachusetts Institute of Technology; Contract No. EF-77-C-01-2614.

The paper describes a new design for superconducting magnets for MHD generators whose magnet parts, the windings, and structure can be shop built and shipped to the site for assembly. The design reduces labor costs and uses a pair of saddle and race track coils for the winding and a cryogenically stable conductor. The vacuum tank, a splice box in the windings, and the force containment structures of high strength aluminum are discussed; the welding of the winding assemblies which compensates for the differential thermal expansion between the windings and the structure by the use of corrugated shim plates is described. A.T.

A80-25079 # **A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute.** S.-T. Wang, L. R. Turner, R. C. Niemann, L. Genens, W. Pelczarski, J. Gonczy, J. Hoffman, K. Mataya, H. Ludwig, and S.-H. Kim (Argonne National Laboratory, Argonne, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-1.3.1 to D-1.3.6. Research supported by the U.S. Department of Energy.

The paper describes a superconducting dipole magnet for the CFFF MHD. The design of the MHD system consisting of the superconducting magnet, magnet cryostat, a helium refrigerator, and instrumentation are discussed, noting that the magnet will have an on-axis peak field of 6 T and an MHD channel warm aperture of 80 cm diameter at the MHD channel inlet. The conductor design, coil configurations, and coil structure are examined, and cryostability, magnetic forces, and design of bore tube, end flanges, and ring girder are described. Finally, the cryostat and cold mass support, and instrumentation for magnet protection and operation are analyzed. A.T.

A80-25080 # **The effect of electrochemical and arcing phenomena on electrode performance.** L. H. Cadoff, S. K. Lau, and B. R. Rossing (Westinghouse Research and Development Center, Pittsburgh, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-1.4.1 to D-1.4.11. 26 refs. Contracts No. EX-76-C-01-2248; No. DE-AC-01-79-ET-15529.

Laboratory studies aimed at understanding the mechanisms of electrochemical corrosion between liquid coal slag and ionically conducting ZrO2 based electrodes will be presented. Based on these results, a comprehensive analytical model is derived which permits detailed analysis of the role of slag properties as well as electrode polarization on the nature of electrochemical reactions under hot slagging conditions. Criteria for electrode material selection will be discussed. An experimental arrangement to measure anode arc erosion rates is also described. Arc erosion rates for both copper and platinum anodes as a function of substrate temperature and slag-seed chemistry are presented. These results are compared to erosion rates obtained from other test rigs and MHD channels. (Author)

A80-25083 # **Control of liquid metal-gas two phase flow by application of axial magnetic field.** Y. Fujii-e, M. Saito, H. Nagae, and S. Inoue (Osaka University, Suita, Japan). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-2.1.1 to D-2.1.10. 7 refs.

Due to electromagnetic interaction, a pressure gradient occurs in the liquid metal-gas two-phase flow producing the pinch effect in the cross section perpendicular to the flow. An experiment conducted with NaK-N2 two-phase flow in a rectangular channel located in a magnet 50 cm long (B is equal to 1.5 T) is examined, in which the external axial field is superposed on the induced one. Consideration is given to the impact of the pinch effect on void distribution and to the influence of void redistribution on the slip ratio and the axial pressure drop. It is concluded that the control of the void distribution by superposing the axial magnetic field is possible without disturbing the main interaction which causes the pressure drop in the axial direction and without changing the liquid-gas slip ratio. L.M.

A80-25084 # **High-power-density liquid-metal MHD generator results.** G. Fabris, E. S. Pierson, I. Pollack, P. Dauzvardis, and W. Ellis (Argonne National Laboratory, Argonne, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-2.2.1 to D-2.2.6. 9 refs. Navy-supported research.

The experimental results presented herein satisfy one major goal in demonstrating the technical feasibility of two-phase LMMHD (liquid-metal MHD), i.e., operating an MHD generator at power densities equal to or above that anticipated for practical power systems. Power densities of up to 32 MWe/cu m and efficiencies higher than 0.6 at high void fractions were attained for a small 20-kWe generator. Slip ratio, pressure distribution, and voltage profile data are also given. Supporting analytical and experimental studies are summarized. All results are encouraging for the development of large high-efficiency LMMHD generators. (Author)

A80-25085 # **High-temperature liquid-metal MHD generator experiments.** P. F. Dunn, E. S. Pierson, J. D. Staffon, I. Pollack, and P. V. Dauzvardis (Argonne National Laboratory, Argonne, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints.
Bozeman, Mont., Montana State University, 1979, p. D-2.2.7 to D-2.2.12. 9 refs. Navy-NSF-supported research; Contract No. W-31-109-eng-38.

Detailed data were obtained for the world's first high-temperature two-phase liquid-metal MHD generator under open-circuit conditions. Both single-phase (sodium) and two-phase (sodium and nitrogen) flows were used in the temperature range of approximately 490 to 740 K. The data presented includes pressures, voltages, and slip ratios (ratio of gas velocity to liquid velocity). The two-phase pressure-gradient data were well predicted by a simplified two-phase MHD correlation that includes the effect of a pure-liquid shunt layer between the electrodes. The slip ratio is shown to decrease with increasing temperature, implying higher generator and system efficiencies. (Author)

A80-25086 # **Experiments on the nonuniform discharge structure in noble gas MHD generators.** W. M. Hellebrekers, A. Veefkind, and C. A. Borghi (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-2.4.1 to D-2.4.7. 11 refs.

The nonuniform discharge structures in a noble gas MHD generator are investigated in two MHD shock channels. The anode and cathode of one electrode pair are divided into nine fragments which are mounted flush on the wall and connected by resistors so that the current through each fragment can be measured. Consideration is given to fluctuation levels, the characteristic length between streamers, and their sizes. Characteristic times for the transport of particles are evaluated for plasma parameters. High-speed camera pictures taken under various conditions show an extension of the streamer along magnetic field lines, caused by the large heat flux in this direction. Voltage distribution measurements in the relaxation region of the generator indicate large anode drops. L.M.

A80-25088 # **Experimental studies of an inert gas disk MHD generator with a small seed fraction.** S. Shioda, H. Yamasaki, K. Matsutani, and H. Sato (Tokyo Institute of Technology, Tokyo, Japan). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. D-2.6.1 to D-2.6.7. 8 refs.

Experiments (DISK-II) for inert gas disk generators with a stagnant gas pressure of 3 atm. and a seed fraction of .00005 have been conducted. When the seed was fully ionized and the ionization instability was suppressed, the effective Hall parameter and the effective conductivity recovered to 6.5 and 50 mho/m, respectively. The electrical efficiency of 73% and the power density of 13.3 MW/cu m have been achieved even though the magnetic field was low (0.98 Tesla). These results indicate the possible operation of nonequilibrium disk MHD generator with small seed fractions. The recovery factor increased to 85% and it was shown to depend on the amount of fluctuations which still remained in the stabilized region. (Author)

A80-25089 # **Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger.** K. Yoshikawa, K. Okada, and M. Ishikawa (Kyoto University, Uji, Japan). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. E.1.1-E.1.6. 11 refs.

A80-25090 # **Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator.** R. K. James and C. H. Kruger (Stanford University, Stanford, Calif.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. E.4.1-E.4.6. Contract No. EX-76-C-01-2341.

A80-25091 # **Electrical nonuniformities in U-25 MHD channels.** A. E. Buznikov, V. I. Kovbasiuk, S. I. Pishikov, and B. Ia. Shumiatskii (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. E.5.1-E.5.6. 8 refs.

Electric current and voltage nonuniformities in channels of the U-25 MHD generator are investigated. Measurements of current nonuniformities were performed in diagonal channels with frames having floating and gradually varying potential distributions obtained using an active potential divider. High-intensity arcs with currents exceeding 100 A are observed on the electrodes of the floating-potential channels, demonstrating the requirement for voltage stabilization by a potential divider. The nonsymmetric high-intensity arcs on the frame are discussed as the cause of voltage distribution nonuniformities, and electrical nonuniformities caused by arcing in the end zones are considered. A.L.W.

A80-25092 # **Design, construction and initial operation of an MHD inverter system for the Mark VI generator.** A. Chaffee, I. Quijano, A. Solbes (Avco Everett Research Laboratory, Inc., Everett, Mass.), A. Humphrey, and J. Mandalakas. In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. F.1.1-F.1.11. Research sponsored by the Electric Power Research Institute.

The design, integration, and initial operating characteristics of the 250-KVA power converter for the Mark VI MHD generator are presented. The forced commutated voltage source system consists of two series-connected bridge inverter units comprised of three pole modules based on the McMurray pulse commutated unit and connected into a 480-V ac line with an isolating transformer. CMOS all-digital PWM logic design is used for run, stop and trip functions, and phase angle, notch angle and voltage control, with a stepless power factor control. During subsystem fabrication and interconnection, problems were encountered with the magnetics, dV/dt circuits, dc circuit breaker, series operation of the inverter bridges, control, and control logic of the system. The ac current/inverter phase angle curves indicating the phase shift to be due mainly to inductance and the broadening to be due to losses (on the order of 10 kW) in the magnetics, and means to reduce harmonic losses between the inverter and the ac line, have been obtained. The system has been used to invert 200 kW into a 480 V line for 12.7 hours, and the integration of a multiphase lock loop and a closed loop control system into the inverter is planned. A.L.W.

A80-25093 # **A rotary inverter system for a multiple-electrode MHD generator.** C. S. J. Lamb, S. Ramakrishnan, and H. K. Messerle (Sydney, University, Sydney, Australia). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. F.2.1-F.2.3.

Coupling of magnetohydrodynamic generators to existing power grids requires dc to ac conversion. Most of the present day research teams are considering the use of solid-state inverters for this task. In this paper, a rotary inverter system is proposed which makes use of a parallel-connected rotary motor driving a conventional alternator. The advantages are direct connection to a multiple-electrode MHD generator, simple construction, and easy operation. (Author)

A80-25094 # **Characterization of dynamic influences in a coal-fired MHD system.** M. H. Scott, W. E. Baucum, and G. A. Suneson (Tennessee, University, Tullahoma, Tenn.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. F.3.1-F.3.6. 8 refs. Contract No. EX-76-C-01-1760.

Experimental measurements of parameters influencing the performance of an open-cycle coal-fired MHD generator system are presented. Narrow- and wide-band variations in oxidizer and fuel flow rates, the combustion process, and generator activity were determined in terms of coal flow rate, dynamic pressure in the combustor and electrical parameters. Experimental results are used

to calculate inverse conductivity variations, which are then compared with values obtained theoretically from considerations of an axially nonuniform conductivity and a varying electrode voltage drop.
A.L.W.

A80-25095 # **First-principle component models for control system simulation of MHD-steam plants.** D. A. Pierre and D. A. Rudberg (Montana State University, Bozeman, Mont.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints.
Bozeman, Mont., Montana State University, 1979, p. F.4.1-F.4.6. 13 refs. Research supported by the Montana Energy and MHD Research and Development Institute; Contract No. ET-78-C-01-3087.

The first-principle, lumped-parameter subsystem models for the CNCD unit, typical steam-water path units, the boiler feed pump, the steam drum, steam turbines, the air compressor, and the spray attemperator are discussed. The models can predict time-varying changes in combustion gas temperature and enthalpy, and temperature within each major component of the combined-cycle system. Methods of connecting the component models for the computer simulation of a typical MHD-steam cycle are considered along with relationships between control variables and system state variables. It is concluded that alternative coordinated control strategies can be imbedded in the simulation to assist in the specification of overall control topology and controller parameters. L.M.

A80-25096 * # **Oxygen-enriched air for MHD power plants.** R. W. Ebeling, Jr., J. C. Cutting (Gilbert Associates, Inc., Reading, Pa.), and J. A. Burkhart (NASA, Lewis Research Center, Cleveland, Ohio). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints.
Bozeman, Mont., Montana State University, 1979, p. G.1.1-G.1.9. 16 refs. Research supported by the U.S. Department of Energy.

Cryogenic air-separation process cycle variations and compression schemes are examined. They are designed to minimize net system power required to supply pressurized, oxygen-enriched air to the combustor of an MHD power plant with a coal input of 2000 MWt. Power requirements and capital costs for oxygen production and enriched air compression for enrichment levels from 13 to 50% are determined. The results are presented as curves from which total compression power requirements can be estimated for any desired enrichment level at any delivery pressure. It is found that oxygen enrichment and recuperative heating of MHD combustor air to 1400 F yields near-term power plant efficiencies in excess of 45%. A minimum power compression system requires 167 MW to supply 330 lb of oxygen per second and costs roughly 100 million dollars. Preliminary studies show MHD/steam power plants to be competitive with plants using high-temperature air preheaters burning gas. L.M.

A80-25097 # **Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants.** F. Becker, F. Hals, R. Kessler, L. Westra (Avco Everett Research Laboratory, Inc., Everett, Mass.), W. Morgan (Chas T. Main, Inc., Boston, Mass.), and C. Bozzuto (Combustion Engineering, Inc., Windsor, Conn.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. G.3.1-G.3.20. 6 refs. Research supported by the U.S. Department of Energy.

A80-25098 # **A 250 MWt MHD Engineering Test Facility /ETF/ system design.** C. H. Marston, C. S. Cook, L. Terrey, and B. Zauderer (General Electric Co., Philadelphia, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. G.4.1-G.4.8. 8 refs. Research supported by the U.S. Department of Energy.

A conceptual design study was performed to establish a Reference Design for the MHD Engineering Test Facility. The design is for a complete 250 MW (thermal) MHD/Steam plant for component and system development and long term operation as a demonstration plant. Selection of individual components must be made considering the impact on other components and overall system operation and with full attention to flexibility for development purposes. A two-stage combustor with a fluidized bed first stage and a double vortex second stage was chosen for considerations of potential slag-free operation, and electrical isolation between combustor stages. High performance ceramic regenerative air preheaters, utilizing pressurized combustion in the individual heat exchanger domes, and capable of delivering air at 3000 F, are recommended. Limited oxygen enrichment was considered for test flexibility. Both diagonal wall and Faraday, subsonic, linear MHD generators are compatible with the system. (Author)

A80-25099 * # **Coupled generator and combustor performance calculations for potential early commercial MHD power plants.** T. C. Dellinger, J. G. Hnat, and C. H. Marston (GE Space Sciences Laboratory, King of Prussia, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. G.5.1-G.5.11. 8 refs. Contract No. DEN3-52.

A parametric study of the performance of the MHD generator and combustor components of potential early commercial open-cycle MHD/steam power plants is presented. Consideration is given to the effects of air heater system concept, MHD combustor type, coal type, thermal input power, oxygen enrichment of the combustion, subsonic and supersonic generator flow and magnetic field strength on coupled generator and combustor performance. The best performance is found to be attained with a 3000 F, indirectly fired air heater, no oxygen enrichment, Illinois no. 6 coal, a two-stage cyclone combustor with 85% slag rejection, a subsonic generator, and a magnetic field configuration yielding a constant transverse electric field of 4 kV/m. Results indicate that optimum net MHD generator power is generally compressor-power-limited rather than electric-stress-limited, with optimum net power a relatively weak function of operating pressure. A.L.W.

A80-25100 # **National R&D program on MHD in Japan.** S. Korenaga, T. Homma, and I. Todoriki (Agency of Industrial Science and Technology, Tokyo, Japan). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. H.1.1-H.1.6.

The paper considers research in magnetohydrodynamic (MHD) electric power generation in Japan. Various components of the MHD power generation were developed and tested including superconducting magnets, helium refrigerators and liquefiers, air preheaters, seed recovery devices, and materials for the fabrication of generating channels. In the current phase of this program, generators known as Mark VII and VIII are to be developed and tested, and basic research is scheduled on MHD generation. A.T.

A80-25101 # **Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant.** F. D. Retallick, D. A. McCutchan, T. E. Lippert, and K. D. Le (Westinghouse Electric Corp., Pittsburgh, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. H.2.1-H.2.5.

Commercialization of MHD will be contingent on three major factors; performance, plant availability and economics. These three factors are interrelated in a complex manner in the electric utility environment. Simulation of this environment has been performed as a guide to MHD power plant development. The worth of availability is found to be between 10-20 $/kWe depending on the specific utility characteristic. MHD duct lifetime requirements for attaining competitive power plant availability are a strong function of the cycle arrangement (method of preheat and/or oxygen enrichment) and the duct replacement time, varying between 2500 to 9700 hours as extremes. Significant reductions in these requirements may be

possible with simultaneous operation of dual channels, each having a capability in excess of 50% of the power plant rating. Market penetration analysis of MHD by geographic region of the U.S. between 1995-2000 shows a major potential for MHD. The geographic regions and coal type have been classified as favorable, marginal or low in potential.
(Author)

A80-25102 # **The retrofit approach to MHD demonstration and commercialization.** J. W. Griswold, J. W. Moyer, and M. C. Wehrey (Southern California Edison Co., Los Angeles, Calif.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints.
Bozeman, Mont., Montana State University, 1979, p. H.3.1-H.3.8. 7 refs.

The paper presents the retrofit approach as a means to demonstrate MHD technology. The anticipated benefits of retrofitting are discussed along with some ground rules from a utility point of view, the key decisions to be made, the retrofit path to demonstration, and an opinion on the potential market for MHD retrofit installations.
V.T.

A80-25103 # **A modular approach to an engineering test facility and beyond.** R. Johnson and D. Rudberg (Montana State University, Bozeman, Mont.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. H.4.1-H.4.7. Research supported by Montana State University and Montana Energy and MHD Research and Development Institute; Contract No. ET-78-C-01-3087.

The concept of using a new baseload coal-fired power plant as a bottoming plant for a MHD/steam generator engineering test facility is examined. Consideration is given to three possible system configurations with increasing levels of combustion gas coupling. The first configuration allows the interaction of only the steam and water flows, duplicating many components and resulting in an expensive system lacking versatility and of low efficiency. The second configuration integrates the combustion gas from the topping cycle after clean-up with that from the bottoming cycle and requires the use of a low-pressure Kraft boiler in both portions. The third configuration integrates the seed/slag-laden combustion into one half of the bottoming plant and represents the most flexible configuration, with the highest combined-cycle efficiency. Either of the last two configurations is considered superior to the first as a test facility.
A.L.W.

A80-25104 # **The transition MHD power plant concept.** S. Way. In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints.
Bozeman, Mont., Montana State University, 1979, p. H.6.1-H.6.6. 8 refs.

In order to hasten the realization of commercial MHD power generation, with its attendant benefits, a transition type power plant may be designed and constructed. The plant could meet the needs for preliminary pilot plant experience, and could then evolve into a functioning commercial power installation. Its projected size would be 172 MW net electrical output, and station efficiency would be 43-44%. The MHD-dc power generated would be 80 MW. Initial operation at 50 MW-MHD power, instead of the normal 80 MW, would furnish preliminary experience. Under those conditions the top temperature would be reduced, and air preheat would be 1320 K instead of 1348 K. The MHD system is combined with a simple non-reheat steam bottom plant, which can be operated alone when the MHD generator is out of service.
(Author)

A80-25105 # **Fluctuations in combustion MHD generator systems.** J. P. Barton, J. K. Koester, and M. Mitchner (Stanford University, Stanford, Calif.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. J.1.1-J.1.8. 6 refs. Contract No. EX-76-C-01-2341.

Inherent fluctuations in electrode current, electric field, and pressure within a subsonic, combustion-driven, MHD generator system have been measured and analyzed. An analysis of the fluctuation measurements as a function of the MHD generator operating parameters has provided information concerning the nature of the inherent disturbances. The results indicate that the inherent disturbances consist of a combination of axial acoustical standing waves and local, convected conductivity nonuniformities. The effects of these inherent property fluctuations upon actual MHD generator operation are presented and discussed. A theoretical model, utilizing a linearized analysis of the MHD generator, gives qualitative agreement with the experimental observations. The use of this model to predict the importance of these effects for generators operating at high magnetic interaction is considered.
(Author)

A80-25106 # **Fluctuations in MHD generators.** J. S. Walker (Illinois, University, Urbana, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. J.2.1-J.2.3. NSF Grant No. ENG-74-23778.

It is shown that the experimental results, presented by Barton, Koester and Mitchner (1977) in reference to pressure and voltage fluctuations in a subsonic, combustion, segmented Faraday generator, are consistent with the analytical results of the fluid transients study in MHD duct flows. A family of wave modes is found in MHD duct flows which occur only in the magnetic field and involve hydrodynamic and electromagnetic variables. Consideration is given to natural frequencies for these modes, and it is shown that there is a continuous distribution of natural frequencies throughout the low frequency range 0-200 Hz. The analytical model does not include such effects as nonuniformities in seed concentration, incomplete combustion fluctuations and arcs.
L.M.

A80-25107 # **Experiments concerning inhomogeneities in combustion MHD generators.** R. M. Kowalik and C. H. Kruger (Stanford University, Stanford, Calif.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. J.3.1.-J.3.6. 7 refs. Contract No. EX-76-C-01-2341.

Two sets of inhomogeneity experiments have been run in the Stanford facility. The first set investigated the effects of currents and applied magnetic fields on plasma luminosity fluctuations. The second set of experiments demonstrated the feasibility of local conductivity fluctuation measurements with a laser-induced fluorescence diagnostic. The laser-induced fluorescence diagnostic should be applicable in many MHD channels; a discussion of its capabilities and limitations is presented in the paper.
(Author)

A80-25108 # **Kinetics of char burnout and ash vaporization in coal-fired MHD combustors.** R. Shuck, T. Hastings, Ĉ. Mims, and A. Sarofim (MIT, Cambridge, Mass.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.1.1-K.1.9. 9 refs. Research supported by the U.S. Department of Energy and Electric Power Research Institute.

A computer model which simulates coal combustion in a simple MHD combustor has been assembled. Data from parallel experimental work on devolatilization, char oxidation, and ash vaporization at MHD conditions provide input parameters to the model and prove checks on some of the assumptions therein. Trade-offs between ash vaporization and char utilization predicted by the model are shown. Finally, the importance of CO2, H2O, O2, O, and OH to char oxidation is indicated from both theoretical and experimental considerations.
(Author)

A80-25109 # **Progress in coal combustion research at Avco Everett Research Laboratory, Inc.** F. E. Becker, D. B. Stickler, M. M. Delichatsois, and A. Ballantyne (Avco Everett Research Laboratory, Inc., Everett, Mass.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.2.1-K.2.7. Research supported by the U.S. Department of Energy.

The experimental operation of a pulverized coal combustor coupled to either a regenerative air heater system or a hot vitiated air source is discussed. Combustor performance at conditions appropriate for MHD power system requirements indicate 25-35 ms combustor residence times for optimum thermal performance for single stage combustors. In addition, the analytical model of Stickler, et al. (1979) appears capable of describing the coal combustion process in simple flow fields. Parametric studies to give direction for combustor optimization indicate definite gains in performance for more finely pulverized coal, higher oxidizer preheat temperature and faster input mixing of the pulverized coal and oxidizer streams. J.P.B.

A80-25110 # **Wall combustion in high-swirl combustors.** P. M. Chung (Argonne National Laboratory, Argonne; Illinois, University, Chicago, Ill.) and R. S. Smith (Argonne National Laboratory, Argonne, Ill.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.3.1-K.3.8. 13 refs. Research supported by the U.S. Department of Energy.

The burning rate of char along the wall of an idealized swirl combustor is analyzed. Combustion by O2, H2O, and CO2 is considered. The combustion rate largely depends on the swirl and roughness of the char layer-gasphase interface, which set the turbulence level, and on the gaseous reactant Damkohler number. In general, the higher the pressure and the smaller the char particle size, the more efficient the gas core combustion is, when compared to wall combustion. On the other hand the reverse is true at lower pressures and for the larger particles. (Author)

A80-25111 # **One-stage cyclone combustor for coal fired test stand of 4MW thermal power.** T. Kozlowski, Z. Rybacki, and W. S. Brzozowski (Instytut Badan Jadrowych, Swierk, Poland). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.4.1-K.4.6.

Experimental results are presented on the 4 MW coal-fired MHD test rig at Swierk. Stable operation of a single-stafe coal combustor was achieved during several runs of 4-6 hours duration. The protection of the inner walls by a slag layer is highly effective. Heat losses due to cooling of the combustor walls have not exceeded the predicted values and may be reduced to several percents in full scale combustor operation. The achieved intensity of heat release is very near that required for commercial operation. The percentage of seed absorbed by the slag is high, 15-20%. B.J.

A80-25112 # **High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers.** S. Omori, C. S. Cook, E. Tate, D. Rogers, and K. Dickinson (GE Space Sciences Laboratory, King of Prussia, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.5.1-K.5.10. 13 refs. Contracts No. EX-76-C-01-2238; No. ET-78-C-01-3106.

A80-25113 # **Development of a slagging cyclone gasifier for MHD applications.** R. J. Demski, J. T. Yeh, J. I. Joubert, and D. Bienstock (U.S. Department of Energy, Pittsburgh Energy Technology Center, Pittsburgh, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.6.1-K.6.7. 6 refs.

The paper discusses experimental results obtained at atmospheric pressure with a vertical cyclone gasifier designed for MHD applications. The gasifier represents the first stage of a two-stage combustion system which will provide an MHD plasma relatively free of coal ash. Development of a successful vertical cyclone gasifier design was completed in April of 1978. Slag rejection rates in excess of 95 percent were achieved at coal-feed rates of 100 to 125 lb/hr, stoichiometric air levels of temperatures ranging from 2820 to 2900 F. Larger versions of the successful gasifier design are now undergoing further tests in the PETC Atmospheric-Pressurized MHD Combustor Test Facilities. (Author)

A80-25114 # **Scaling MHD cyclone coal combustors.** R. J. Wright (U.S. Department of Energy, Pittsburgh Energy Technology Center, Pittsburgh, Pa.). In: Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints. Bozeman, Mont., Montana State University, 1979, p. K.6.8-K.6.14. 18 refs.

The paper presents a scaling relationship for MHD cyclone coal combustors. Similarity is achieved using a constant ratio of particle reaction time to gas residence time and an expression is derived for equal heat release per unit wall area in terms of the mass flow rate, the cyclone diameter, and the diameter of a representative particle. Coal particle scaling is required to achieve similarity in ash carryover and in the ratio of particle reaction time to gas residence time. The scaling relationship permits prediction of the heat loss as a percent of thermal input at various scale factors; scale-up of a two-stage MHD coal combustor demonstrates the use of the scaling relationship. A.T.

A80-25115 **The OTEC connection - Power from the sea.** D. Petty (Solar Energy Research Institute, Golden, Colo.). *Solar Engineering Magazine,* vol. 5, Feb. 1980, p. 10-12.

OTEC is discussed as a means of contributing to United States energy self-sufficiency. The technology involved in the conversion of ocean thermal gradients found in tropical regions to electricity transmittable by submarine cable is examined, with attention given to the operating principles of open- and closed-cycle Rankine engines and design considerations for the evaporators, condensers and heat exchangers. The environmental impact and economics of OTEC are considered, and Department of Energy research projects in areas of OTEC technology including heat transfer, biofouling, environmental assessment, underwater electrical transmission and mooring and test plants are indicated. It is pointed out that US islands presently offer excellent markets for early commercial OTEC plants, with Gulf Coast markets requiring further technology developments to be economically attractive. A.L.W.

A80-25116 **Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption.** J. Feuell. *Turbomachinery International,* vol. 21, Jan.-Feb. 1980, p. 18-22.

A80-25152 # **The role of navigation satellites in oil exploration.** J. G. Morgan (Chevron Geophysical Co., Houston, Tex.). In: Navigation satellite users; Proceedings of the National Aerospace Symposium, Springfield, Va., March 6-8, 1979. Washington, D.C., Institute of Navigation, 1979, p. 119-126. 9 refs.

The paper examines the requirements of the oil and gas exploration communities for navigation and positioning (with particular reference to seismic surveys, well site surveys, and drilling vessel positioning) and describes the role played by the Transit satellite system in oil and gas exploration. Emphasis is placed on some problems facing the civil user of Transit, particularly the problem of the time gap between some satellite fixes. B.J.

A80-25159 # **GPS application to seismic oil exploration.** C. Johnson and P. Ward (Texas Instruments, Inc., Dallas, Tex.). In: Navigation satellite users; Proceedings of the National Aerospace Symposium, Springfield, Va., March 6-8, 1979. Washington, D.C., Institute of Navigation, 1979, p. 163-169.

The NAVSTAR Global Positioning System (GPS) is considered in terms of the requirements of the geophysical oil exploration industry. The suitability of the GPS for both marine and land surveys is discussed, as are receiver requirements in terms of C/A-code and P-code. It is noted that the space vehicles of the GPS provide a three-dimensional estimate of the user's position to 10 m and velocity to 0.01 m/s, as well as absolute GPS time to a few nanoseconds. J.P.B.

A80-25170 **Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms.** S. E. Lindberg (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *Atmospheric Environment*, vol. 14, no. 2, 1980, p. 227-231. 33 refs. Contract No. W-7405-eng-26.

Air samples were collected isokinetically in the plume of a major coal-fired power plant during helicopter flights. The dominant form of mercury in the plume was elemental Hg vapor, ranging from 92 to 99% of the total Hg concentration in air. There was no evidence of significant gas to particle conversion during plume aging. The predominance of the vapor form is conducive to long-range transport and removal by precipitation scavenging. (Author)

A80-25253 # **Solar power satellites and the ITU - Some U.S. policy options.** S. Gorove (Mississippi, University, University, Miss.). In: Annals of air and space law. Volume 4.
Montreal, McGill University; Toronto, Carswell Co., Ltd.; Paris, Editions A. Pedone, 1979, p. 505-517. 31 refs.

The purpose of the paper is to focus on some of the legal problems that may arise in connection with proposed use of solar power satellites, with special regard to the role of the International Telecommunications Union and some related U.S. policy options. Attention is given to geostationary orbit availability and the radio spectrum and to microwave frequency allocation. C.F.W.

A80-25259 **Geothermal energy and the environment - The global experience.** M. J. Pasqualetti (Arizona State University, Tempe, Ariz.). *Energy* (UK), vol. 5, Feb. 1980, p. 111-165. 277 refs.

The paper discusses the impact of environmental problems on the world's geothermal generating stations. The significant impacts include conflicts in land use, air pollution, subsidence, water pollution, induced seismicity, blowouts, and noise. Development of geothermal resources has been slowed down in some countries: in U.S., the emission of hydrogen sulfide produced a problem; in Japan, land use in national parks and waste-water disposal resulted in difficulties; and in El Salvador, waste-water disposal presented a difficulty. Geothermal development faces many regulations and difficulties, particularly in U.S., a country which could stimulate a global acceleration in this field with appropriately relaxed controls. A.T.

A80-25260 **A performance and economic evaluation of annual cycle energy storage /ACES/.** R. S. Miller (General Electric Co., Schenectady, N.Y.). *Energy* (UK), vol. 5, Feb. 1980, p. 183-190. 5 refs.

The performance of a residential annual energy storage scheme utilizing ice storage and a three-coil heat pump is evaluated for a range of climates and storage sizes. Comparisons are made with conventional electric resistance heat with central air conditioning or an electric air-to-air heat pump. Economic evaluations are made with payback and with present value life-cycle costing. Annual energy storage is found to be uneconomical. (Author)

A80-25261 **A central solar domestic hot water system - Performance and economic analysis.** D. Wolf, A. Tamir, and A. I. Kudish (Negev, University, Beersheba, Israel). *Energy* (UK), vol. 5, Feb. 1980, p. 191-205. 5 refs. Research supported by the Ministry of Commerce, Industry and Tourism and Ministry of Energy.

A solar-assisted central hot water system was retrofitted onto one of the student dormitory complexes. The system consisted of twenty commercial solar collectors, of the pipe and plate type, and central hot water tank connected to two dormitory buildings. The system has two loops: (1) a solar loop, in which the heated water circulates between the collector panels and the central hot water tank, and (2) a consumer loop, where the solar-heated water circulates between the central hot water tank and the dormitory. The solar-heated water circulates through the individual electric hot water tanks which serve as individual hot water storage and booster units, and the mains water is introduced at the bottom of the central tank to replace consumed water. The description of the system, the design and its performance, together with an economic analysis, are presented. (Author)

A80-25322 **Quiescent and turbulent plasmas under mirror-configurations of magnetic field.** R. Hatakeyama, N. Sato, H. Sugai, and Y. Hatta (Tohoku University, Sendai, Japan). *Plasma Physics*, vol. 22, Jan. 1980, p. 25-40. 32 refs.

Particle reflection and trapping are investigated on plasma flows injected into mirror configurations of magnetic field. Detailed measurements are made on a collisionless plasma whose ion energy distribution is controlled before entering into the mirror configuration, and the results are well explained by the orbit theory. When the plasma density is so high that the ion-ion collision mean free path is comparable to the mirror length, we can observe a clear plasma trapping due to the collisions. An instability around the ion-cyclotron frequency is excited in order to trap a collisionless plasma, and enhanced tail heating of ion energy distribution is observed in addition to the trapping. (Author)

A80-25444 **Native oxide and external dielectric polycrystalline GaAs MIS solar cells.** R. Singh (Waterloo, University, Waterloo, Ontario, Canada) and T. N. Bhar (District of Columbia, University, Washington, D.C.). *International Journal of Electronics*, vol. 47, Nov. 1979, p. 509-513. 10 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

The polycrystalline MIS solar cell is a potential candidate for converting solar energy to electrical energy for large scale terrestrial applications. In this paper, native oxide and external added dielectric polycrystalline GaAs MIS solar cells have been modelled. Two assumptions were made: (1) the potential barrier near the grain boundary has no effect on the barrier height of the device; (2) the main effect of the grain boundary is to reduce the minority carrier lifetime of the polycrystalline semiconductor. The performance of Au-polycrystalline GaAs MIS solar cells have been calculated as a function of the grain size of the crystallites. The native oxide device was modelled as a parallel combination of Schottky barrier and MIS solar cell. These calculations show that in case of native oxide devices, if the fractional areas of Schottky parts is greater than about 10 to the -4th to 10 to the -3rd, the beneficial effect of the interfacial layer will not be observed. (Author)

A80-25472 **Discharge start-up in a tokamak with a poloidal divertor.** Iu. K. Kuznetsov, S. A. Lebed', and O. S. Pavlichenko (Akademiia Nauk Ukrainskoi SSR, Fiziko-Tekhnicheskii Institut, Kharkov, Ukrainian SSR). *Nuclear Fusion*, vol. 20, Feb. 1980, p. 123-131. 14 refs. Translation.

The paper considers the problem of organizing a regime with an expanding magnetic limiter in a tokamak with a poloidal divertor in order to suppress skin effects in the current rise stage. Various laws of limiter expansion may be applied by regulating the current in the divertor conductor. The paper also considers some questions relating to the ionization of the working gas (hydrogen) in a tokamak: the role of processes involving molecules, and controlled influx of the gas. The analysis is performed by means of numerical calculations of a zero-dimensional and one-dimensional model of the initial stage of the discharge. (Author)

A80-25473 **Shape control of doublets.** R. L. Miller (General Atomic Co., San Diego, Calif.). *Nuclear Fusion*, vol. 20, Feb. 1980, p. 133-147. 27 refs. Contract No. EY-76-C-03-0167.

A 1-1/2-D tokamak transport code is used to model the evolution of doublet geometry on the transport time scale. The doublet shape is determined by the plasma current profile and the current flowing in the field-shaping coils. The current profile is determined in turn by the assumed transport mechanisms for the densities and temperatures and by an auxiliary heating which may be present. In a large hot machine, such as Doublet III, the time-dependent current profile will also depend upon the assumed initial profile because the skin time is long. As the plasma current evolves, the field-shaping coils must be actively programmed to preserve a desired shape. Using an idealized transport model and a DIII-size plasma, the effects of these key elements upon shape evolution are illustrated, and control of doublet equilibria on a transport time scale is demonstrated for this model. The components of the current profile (p' and ff') obtained should serve as a guide to selecting realistic profiles for MHD stability studies. (Author)

A80-25474 **Transverse confinement of a high-pressure plasma in a corrugated magnetic field.** S. L. Musher and M. D. Spektor (Akademiia Nauk SSSR, Institut Avtomatiki i Elektrometrii, Novosibirsk, USSR). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 149-157. 10 refs. Translation.

The confinement of a high-pressure plasma in a multi-mirror magnetic configuration with a corrugated metal casing is studied analytically and numerically. Equations are derived describing the dynamics of a dense plasma in a corrugated magnetic field and it is shown that the structure of the magnetic lines of force is maintained during the transverse expansion of a hot plasma. The energy confinement time is found to be of the order of the ratio of the square of the characteristic radius of the device to the thermal diffusivity under the assumption that the thermal diffusivity is Bohm-like. (Author)

A80-25475 **Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors.** S. Y. Yuen, D. Kaplan, and D. R. Cohn (MIT, Cambridge, Mass.). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 159-169. 21 refs. Contract No. ET-78-S-02-4646.

The use of lower hybrid waves for current drive in steady-state tokamak power reactors is studied. Constraints imposed by RF wave propagation are considered. The effect of the decoupling of electron and ion temperatures is studied and is found to enhance the ratio of fusion power to dissipated power. Trade-offs for parameters of RF-driven steady-state reactors are determined. It is found that RF-driven steady-state current operation is especially suitable for high-field high-density reactor designs. For example, this study indicates that a tokamak power reactor characterized by a major radius of 6 m, a magnetic field on axis of 7.5 T, and a fusion power output of 2500 MW could be driven in steady-state operation with an RF power level equal to 2.5% of the fusion power output. (Author)

A80-25476 * **The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma.** Y. C. Kim, E. J. Powers, J. Y. Hong (Texas, University, Austin, Tex.), J. R. Roth, and W. M. Krawczonek (NASA, Lewis Research Center, Cleveland, Ohio). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 171-176. 11 refs. Research supported by the Texas Atomic Energy Research Foundation; Grant No. NsG-3089.

A80-25478 **Spatial profiles of light impurity ions in the Alcator A tokamak plasma.** K. I. Chen, J. L. Terry, H. W. Moos (Johns Hopkins University, Baltimore, Md.), and E. S. Marmar (MIT, Cambridge, Mass.). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 189-195. 22 refs. Contract No. EY-76-S-02-2711; No. ET-78-C-02-3019.

Spatial profiles of the concentrations of the highly ionized light impurities (O V, O VI, N V) have been obtained in the Alcator A tokamak by using an absolutely calibrated 0.4-m normal-incidence ultraviolet monochromator. In the inversion process, account has been taken of the observed up-down asymmetries in the UV emissions from these impurity ions. The concentrations of oxygen and nitrogen at the periphery relative to the local electron density are found to be 0.05-0.1% and 0.08-0.15%, respectively, at the time of the peak electron density. The positions and breadths of these shells have been studied as functions of electron density and plasma current. The shells show sharply defined outer edges near the local virtual limiter radius while the inner edges appear to be determined by the temperature profile. (Author)

A80-25479 **Neutral-beam injection calculations for torsatrons.** D. T. Anderson, J. L. Shohet (Wisconsin, University, Madison, Wis.), S. Rehker (Max-Planck-Institut für Plasmaphysik, Garching, West Germany), and J. A. Tataronis (New York University, New York, N.Y.). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 197-202. 8 refs. Contract No. ET-78-S-02-5069.

A numerical investigation of the effectiveness of neutral-beam heating in two torsatron-type devices has been undertaken. A modified version of a well-known deposition and orbit code was used for this purpose. It was found that, for beam currents within the applicable range of the model, neutral beams can efficiently heat either a 'classical or an 'ultimate' torsatron plasma provided the injection is tangential to the magnetic axis. These results were obtained by following ionized test particles down to thermalization. Efficiency of the injection drops as the angle approaches perpendicular, because of relatively poor containment of helically trapped orbits within the assumed plasma volume. (Author)

A80-25480 **Active burn control of nearly ignited plasmas.** L. Bromberg, D. R. Cohn (MIT, Cambridge, Mass.), and J. L. Fisher (MIT; Charles Stark Draper Laboratory, Inc., Cambridge, Mass.). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 203-207. 10 refs. Contract No. EG-77-S-02-4183-A002.

The stabilization of thermal runaway in nearly ignited plasmas by actively controlled auxiliary heating is considered. The use of a variable amount of auxiliary heating for burn control can greatly increase the values of the power multiplication factor Q (fusion power/auxiliary heating power) relative to those values permitted with constant auxiliary heating. A one-dimensional calculation is used to determine the maximum allowable deviation from thermal equilibrium as a function of the equilibrium temperature and Q. The results are applied to tokamak plasmas. The effect of the auxiliary heating deposition profile upon Q is determined. For fixed deviation from thermal equilibrium, significantly higher values of Q can be obtained with central ion heating relative to those obtained with edge ion heating. Central electron heating has about the same order of effectiveness as edge ion heating. For central temperatures of about 25 keV, Q approximately 25 can be obtained if the deviation in the ion temperature is held below 15%. (Author)

A80-25481 **Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma.** K. Kadota, M. Otsuka, and J. Fujita (Nagoya University, Nagoya, Japan). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 209-212. 8 refs.

A80-25482 **Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode.** V. A. Mazur (Akademiia Nauk SSSR, Institut Zemnogo Magnetizma, Ionosfery i Rasprostraneniia Radiovoln, Irkutsk, USSR). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 213-218. 7 refs. Translation.

The anomalous diffusion of alpha particles (product of DT fusion) in a field of trapped-ion turbulence is considered. It is shown that allowance for the slight nonpotential character of this mode considerably increases the diffusion coefficient. For the parameters of tokamak reactors currently being planned the diffusion coefficient is found to be two orders of magnitude greater than the electron diffusion coefficient. (Author)

A80-25483 **Observation of radio-frequency-driven plasma current in the octopole tokamak.** R. J. La Haye, C. J. Armentrout, R. W. Harvey, C. P. Moeller, and R. D. Stambaugh (General Atomic Co., San Diego, Calif.). *Nuclear Fusion,* vol. 20, Feb. 1980, p. 218-222. 10 refs.

A toroidally unidirectional slow wave is launched at a frequency well above the lower hybrid resonance. The effects of the wave on the toroidal plasma current are presented and compared with predictions of quasi-linear electron Landau damping theory. (Author)

A80-25494 **Fluidized bed combustion of high sulphur coals.** R. Haque, M. L. Dutta (Regional Research Laboratory, Jorhat, India), and R. K. Chakrabarti (Central Mine Planning and Design Institute, Ltd., Ranchi, India). *Institute of Energy, Journal,* vol. 52, Dec. 1979, p. 173-177. 12 refs.

This paper presents the work carried out on fluidized bed combustion of high sulphur coals in a 20 kg/h capacity coal burning test rig using limestone as the bed material. Effects of various combustion variables have been studied with reference to determining the combustion efficiency and efficiency of sulphur retention. Fluidized bed combustion has been found to be a good solution for minimizing atmospheric pollution and achieving efficient combustion of low grade high sulphur coals. (Author)

A80-25495 **Pumped water storage.** V. G. Newman (Central Electricity Generating Board, Planning Dept., London, England). *(Symposium on Energy Storage, Fawley, England, May 11, 1978.) Institute of Energy, Journal,* vol. 52, Dec. 1979, p. 178-184.

The history, current state of development and future developments of electrical energy storage through the pumping of water to a higher elevation are reviewed. Developments in the turbine and pump units of pumped water energy storage plants since their introduction in the 1890s are surveyed, and it is pointed out that the advantages of reversible pump-generator machines have led to their widespread adoption over the past 20 years in place of separate pumps and turbines. Progress made since 1950 in increasing unit capacities to almost 400 MW, operating heads to over 1400 m and efficiencies to better than 78% for supplying peak energy demands and providing reserve capacities to cover sudden generating losses by pumping water during weekday nights and weekends is indicated. Possible sites for additional pumped water storage facilities are considered, and the impact of alternative energy supplies on pumped water storage system operation is discussed. A.L.W.

A80-25496 **Thermal storage in density-stratified fluids and phase-change materials.** B. J. Brinkworth (University College, Cardiff, Wales). *(Symposium on Energy Storage, Fawley, England, May 11, 1978.) Institute of Energy, Journal,* vol. 52, Dec. 1979, p. 193-196. 13 refs.

Consideration is given to the thermodynamics and fluid mechanics of solar heat storage in density-stratified fluids and phase-change materials. Various solid and liquid sensible heat storage materials are examined, and the process of density stratification in liquid stores is considered, noting methods designed for delivering heat to maintain the stratification. The design of latent heat storage systems to meet the requirements of high energy density and rapid charging is discussed, and experimental investigations of convective heat transfer during melting are presented. It is concluded that the present state of thermohydrodynamics is insufficient to meet the needs of thermal storage design, which requires the minimization of convection in sensible heat storage systems and its maximization in latent heat systems. A.L.W.

A80-25657 **Spectral selectivity of high-temperature solar absorbers.** D. M. Trotter, Jr. and A. J. Sievers (Cornell University, Ithaca, N.Y.). *Applied Optics,* vol. 19, Mar. 1, 1980, p. 711-728. 42 refs. Research supported by the Solar Energy Research Institute; NSF Grant No. DMR-76-81083.

Numerical calculations of the thermal emissivity epsilon (TH) and normal incidence solar absorptivity alpha (s) of model spectrally selective solar absorbers at high temperatures are reported. The model absorbers consist of Drude metal substrates coated with layers that are successively made better and better approximations to a selective solar absorber. The emissivity of the bare metal substrates epsilon (TH)M is calculated as a function of temperature. Then the metal substrate is coated with a homogeneous dielectric layer of index n(L) and it is found that epsilon (TH) of the coated metal increases monotonically with n(L) from epsilon (TH)M at that temperature. The dielectric layer is then replaced by a selectively absorbing layer with the optimum physically realizable spectral absorptivity, and maximum values of alpha(s) and minimum values of epsilon (TH) are calculated as functions of operating temperature and layer thickness. Finally, the homogeneous selective layer is replaced with one having a complex refractive index graded linearly through the thickness of the film. It is found that, compared with homogeneous films of the same thickness, the graded films typically have a higher alpha(s) and a lower epsilon (TH). For films thick enough to be useful absorber surfaces, however, the improvements in alpha(s) and epsilon (TH) are small. (Author)

A80-25679 # **Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes (Energieumwandlung und Korrosionsprozesse in elektrochemischen Solarzellen mit Halbleiterelektroden).** J. Gobrecht. Berlin, Technische Universität, Fachbereich Physik, Dr.-Ing. Dissertation, 1979. 132 p. 124 refs. In German.

The irradiated phase-interface between semiconductors and redox electrolytes is studied together with possible corrective measures for stabilizing photocorrosion. Analyses of the properties of individual electrochemical components of solar cells are presented. Results show the instability of various semiconductor combinations, especially those of Group II-VI and Group III-V. C.F.W.

A80-25689 **The development of fluidized bed combustion.** J. Highley (Coal Research Establishment, Cheltenham, Glos., England). *Environmental Science and Technology,* vol. 14, Mar. 1980, p. 270-275.

The development of fluidized bed coal combustion for electricity generation at a lower capital cost and reduced sulfur dioxide emission levels is outlined. Attention is given to the elimination of coal crushing from the standard fluidized bed combustion procedure to attain a higher combustion efficiency with washed coal and modifications to conventional boiler design. The conversion of fire-tube boilers for use with oil burners to fluidized bed coal combustion is discussed, and new boilers developed for use with fluidized combustion are presented. Applications of fluidized bed combustion in drying processes and waste incineration are also pointed out, and research in combined thermodynamic cycle power generation using fluidized bed combustion is discussed. A.L.W.

A80-25690 **Combined flue gas desulfurization and water treatment in coal-fired power plants.** R. H. Borgwardt (U.S. Environmental Protection Agency, Industrial Environmental Research Laboratory, Research Triangle Park, N.C.). *Environmental Science and Technology,* vol. 14, Mar. 1980, p. 294-298. 14 refs.

Pilot plant experiments were carried out to investigate the feasibility of replacing makeup water in limestone flue gas desulfurization (FGD) scrubbers with a simulated cooling tower blowdown. Tests were conducted while forcing the oxidation of the scrubber slurry to gypsum and maintaining Cl(-) concentrations at levels expected with the use of high-sulfur coals of moderate chloride content. Results show that all of the makeup water could be replaced with blowdown containing up to 690 ppm Na(+) when operating at SO2 make-per-pass below 8 mmol/l and a tightly uncontrolled discharge of soluble salts and trace elements from a power plant can be markedly reduced by the application of water treatment units such as vapor-compression evaporation as an integral part of the FGD scrubber. Such systems should be more effective in maximizing water reuse and should have lower energy requirements than the direct application of water treatment to blowdown streams. A.L.W.

A80-25771 **European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers.** Conference sponsored by the European Physical Society. Abingdon, Oxon, England, Atomic Energy Research Establishment, 1980. 387 p. $28.

The contributed papers report developments both in magnetic field systems and in inertial confinement methods employing lasers and relativistic beams. Specific studies include theoretical research in fusion reactors, disruption investigations, stellarator research, tokamak, mirror machines, and hybrid fusion-fission reactor research, ICRF heating, and doublet plasmas. Other studies include DITE tokamak with injection and bundle divertor, REB accelerator for ICF, and investigation of laser fusion physical processes. V.L.

A80-25777 # **US tokamak research.** H. P. Furth (Princeton University, Princeton, N.J.). In: European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers. Abingdon, Oxon, England, Atomic Energy Research Establishment, 1980, p. 309-319. 14 refs. Contract No. EY-76-C-02-3073.

Experimental results obtained on ISX-B, Alcator C, PDX, and PLT tokamaks are discussed. The neutral-beam-heated ISX-B is the first tokamak device to have reached a beta level of approximately 3%. Alcator C, in its initial half-field operation, has obtained plasma containment time values exceeding 20 msec and has found a modified empirical scaling pattern. The Poloidal Divertor Experiment (PDX) has entered initial round-plasma operation at currents up to 500 kA. Low-power ion-cyclotron heating on PLT has given bulk-ion-temperature rises up to 600 eV and energetic efficiencies exceeding those of neutral-beam heating. V.L.

A80-25785 # **Progress in the production and energy flux concentration of the REB accelerator for ICF.** V. P. Smirnov (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). In: European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers. Abingdon, Oxon, England, Atomic Energy Research Establishment, 1980, p. 473-484. 17 refs.

It is noted that the energy flux concentration on the surface of a thermonuclear target is the main problem at the present stage of the ICF investigations with high power pulse generators as an energy source. Present efforts are aimed mainly at achieving high efficiency in the transmission and at investigating the mechanisms of an efficient energy deposition on the outer surface of the pellet. The recent results obtained on the energy flux concentration at the Rudakov division of the Kurchatov Institute are outlined. M.E.P.

A80-25786 # **Controlled fusion research in China.** Z. Li (Southwestern Institute of Physics, Loshan, Communist China). In: European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers. Abingdon, Oxon, England, Atomic Energy Research Establishment, 1980, p. 485-489.

Developments in fusion research in China are reviewed. Specific fields discussed include fusion reactors, toroidal magnetic confinement, and mirror magnetic confinement. Technical details are given for several operating tokamaks and for a mirror device with superconducting coils and vacuum ionization of a 100-keV neutral beam. Other studies include fast pulsed discharges, plasma focus experiments, and laser fusion research. V.L.

A80-25885 **Development of a spherical reflector/tracking absorber solar energy collector.** G. Grossman and E. Fruchter (Technion - Israel Institute of Technology, Haifa, Israel). *Israel Journal of Technology*, vol. 17, no. 1, 1979, p. 5-11. 6 refs. Research sponsored by the U.S.-Israel Binational Science Foundation and Israel Ministry of Commerce and Industry.

A concentrating solar collector based on the Stationary Reflector/Tracking Absorber (SRTA) concept was built and tested. The collector consists of a 2.5 m diameter fixed spherical mirror, which concentrates solar radiation on a cylinder-shaped tubular absorber tracking the sun. The system was exposed to weather conditions for more than a year and tested at different operating temperatures. The design of the mirror and absorber and their method of fabrication, the automatic tracking mechanism and the heat removal system are described. Experimental results are given and compared with a theoretical performance prediction. Total efficiency of 42% has been obtained for a wide range of outlet temperatures up to 150 C. Higher temperatures, up to 300 C, have been reached but could not be maintained at no-boiling conditions. The results of this study indicate the possiblity of obtaining higher efficiencies with a better mirror surface, and the practical independence of the efficiency on the operating temperatures for a wide range of the latter. The system is hence capable of providing heat at high temperatures sufficient for space heating and air conditioning and for compact heat storage. (Author)

A80-25886 **Technology and performance of a high concentration solar cell power supply.** J. Mandelkorn and G. Yekutieli (Weizmann Institute of Science, Rehovot, Israel). *Israel Journal of Technology*, vol. 17, no. 1, 1979, p. 12-18. 13 refs.

A prototype, 25 watt output, high concentration solar cell power supply has been constructed using immediately available components (1977). Concentration ratio of about 100 x minimized cell cost without incurring high costs for critical optics and tracking. The power supply consists of 36 1 x 1 cm cells in series, a corresponding number of 10 cm x 10 cm Fresnel lenses mounted above the cells, and a sun position detector and tracker. The overall operating efficiency of the power supply is 7.5%. The supply is described in terms of individual components and subsystem design, structure, and fabrication. (Author)

A80-25887 **Optimization of a solar water heating system for a Negev kibbutz.** D. Faiman (Negev, University, Sde Boger and Beersheba, Israel), J. M. Gordon, and D. Govaer (Negev, University, Sde Boger, Israel). *Israel Journal of Technology*, vol. 17, no. 1, 1979, p. 19-28. Research supported by the Ministry for Immigrant Absorption of Israel.

A technical and economic analysis of the costs and benefits of adding solar energy to the centralized hot water system already existing at a Negev kibbutz is presented. Detailed estimates were received from five Israeli manufacturers. Taking into account the technical capabilities of the collectors, the local climatological data and the domestic hot water requirements, it was possible to estimate for each proposed system the amount of useful energy it could provide and hence, the money to be saved in reduced fuel oil costs. The analysis was developed in such a way as to determine if a proposed system can repay its initial cost and to estimate a net savings over the anticipated life of the system. In a majority of the scenarios considered, all of which neglect the possibility of increases in the real price of fuel, of the five sytems considered only two exhibited attractive economic and technical capabilities. (Author)

A80-25888 **Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure.** S.-L. Chong, J. J. Cummins, and W. E. Robinson (U.S. Department of Energy, Laramie Energy Technology Center, Laramie, Wyo.). *Israel Journal of Technology*, vol. 17, no. 1, 1979, p. 36-50. 19 refs.

The alkanes produced from the reaction of Green River and oil-shale kerogen with CO and H2O at temperatures of 300 to 450 C were characterized by GLC and GC-MS. The amount of alkanes generally increases with a higher reaction temperature, and at 450 C it is higher than that produced by the Fischer assay method. This study shows that the isoprenoid-type structures are a significant part of the structure of Green River kerogen, and that the components produced from the kerogen in the CO-H2O reaction below 400 C are essentially the same as those in the natural bitumen. (Author)

A80-25889 **Gasification of oil shale.** Y. Schachter (Bar-Ilan University, Ramat Gan, Israel). *Israel Journal of Technology*, vol. 17, no. 1, 1979, p. 51-57. 14 refs.

Kerogen can be converted into gas by heating. Because of its very fine distribution reactions take place within a few seconds. A simple mixture of gases is obtained: hydrogen, methane, ethylene, carbon monoxide and carbon dioxide. Residual carbon reacts with steam, carbon dioxide or oxygen. Above 850 C virtually total conversion takes place. In the presence of carbonates the carbon dioxide formed on decomposition reacts with kerogen coke in situ.

The oxides react with hydrogen sulphide. With shales lacking carbonates the same effects can be obtained by admixing carbonate-containing mineral. The gases formed can be used as feedstock for the chemical industry, fuel, or for the production of hydrogen or methanol. The gasification of oil shale seems, under certain conditions, economically more attractive than production of oil. (Author)

A80-26001 **Simplified correlations for prediction of NO/x/ emissions from MHD power plants.** J. Hopenfeld (U.S. Department of Energy, MHD Div., Germantown, Md.). *Journal of Energy,* vol. 3, Nov.-Dec. 1979, p. 335-343. 16 refs.

Exact numerical solutions of NOx concentrations in coal-fired MHD boilers are employed to develop simple correlations of the boiler parameters, which would allow a sufficient residence time for NOx to decompose to EPA-allowed levels. These simple correlations take into account boiler diameter, stoichiometry, and degree of slag carryover. The correlation method provides results within + or - 10% of the more exact numerical calculations. The mathematical model underlying the present results considers ideal gas flow with chemical reactions and heat losses to the walls of a cylindrical vessel. The chemical reactions for NOx decomposition are described with the chemical reaction rate constants taken from the JANAF tables. The flue gas is cooled by radiation from both gaseous constituents and slag particles. Secondary combustion is not taken into account. In general, the results indicate that radiant boilers in commercial MHD generating plants would operate at stoichiometric ratios in the range of 0.9 to 0.95. Stoichiometric ratios near 0.85 would be required to meet more strict NOx requirements than currently proposed by the U.S. EPA. (Author)

A80-26002 **Study of a vortex augmentor for a wind-powered turbine.** J. E. Hubbartt (Georgia Institute of Technology, Atlanta, Ga.). *Journal of Energy,* vol. 3, Nov.-Dec. 1979, p. 344-348. 5 refs.

An experimental investigation of an augmentor which employs a vortex to create a low pressure sink for the discharge of a wind-powered turbine is reported. The test model has a horizontal axis with the vortex produced by an annular cascade of stator vanes surrounding the turbine duct. The maximum value of the experimental power coefficient was only about one-third of the ideal flow limit. Furthermore, the power augmentation with this vortex pump was only slightly higher than that obtained when the stator-vane annulus was completely blocked. Thus, it is concluded that this type of vortex augmentor is ineffective. (Author)

A80-26003 **Space-manufactured satellite power systems.** R. H. Miller and D. L. Akin (MIT, Cambridge, Mass.). *Journal of Energy,* vol. 3, Nov.-Dec. 1979, p. 373-375. 6 refs.

The tradeoffs between using lunar rather than terrestrial materials for solar power satellite (SPS) manufacturing are examined, particularly the effects of uncertainties in the two primary cost drivers on these tradeoffs: human productivity in space and the cost of transportation to low earth orbit (LEO). Two cases were chosen for comparison, namely, assembly in LEO from terrestrial materials and transportation of the completed SPS to geosynchronous earth orbit (GEO), and materials refined on the moon but parts manufactured and SPS assembled at GEO. It is found that the tradeoff between the use of lunar or terrestrial materials is critically dependent on productivity in space, with the crossover occurring at about 5 kg/h. J.P.B.

A80-26004 **The Lanchester-Betz limit.** K. H. Bergey (Oklahoma, University, Norman, Okla.). *Journal of Energy,* vol. 3, Nov.-Dec. 1979, p. 382-384.

Everyone involved in the development of wind machines is familar with the so-called Betz limit. It defines an upper limit to the amount of energy in the wind that can be converted to usable power. The output of a windpower generator may be measured by the change in wind velocity across the windmill rotor. In 1915 Lanchester had shown that the maximum power is obtained from a windmill when the residual velocity downwind from the rotor is 1/3 that of the free wind, and that the maximum theoretical efficiency is 16/27 or 59.3%. Betz derivation, however, was published in 1920. Arguments are presented in support of the proposition that the so-called Betz limit be referred to in the future as the Lanchester-Betz limit. There seems to be no doubt that Lanchester's derivation preceded Betz's derivation. S.D.

A80-26169 **Soft-energy provision - A new Utopia (Sanfte Energieversorgung - Eine neue Utopie).** D. Oesterwind, O. Renn, and A. Voss (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). *Energiewirtschaftliche Tagesfragen,* vol. 30, Feb. 1980, p. 111-117. 26 refs. In German.

A new 'soft-energy' alternative to the present energy problems is discussed, which emphasizes solar heating and cooling systems, as well as biomass conversion and combinations of the systems. Advantages of the proposed system include, (1) almost no transportation and distribution costs, (2) short construction times (3) and easy comprehension. The question of adapting this system in West Germany is considered together with its social and economic consequences. C.F.W.

A80-26175 **Biogas - Fuel of the future.** E. J. DaSilva (UNESCO, Div. of Scientific Research and Higher Education, Paris, France). *Ambio,* vol. 9, no. 1, 1980, p. 2-9. 43 refs.

The potential and economic feasibility of the bioconversion of organic residue into methane fuel is discussed. Since it uses renewable resources otherwise polluting the environment, biogas generation serves a triple function: waste removal, management of the environment, and energy production. It is found that 1000 cu ft of biogas has an energy equivalent of 600 cu ft of natural gas, 6.4 gallons of butane, 5.2 gallons of gasoline, or 4.6 gallons of diesel oil. Details of the biogas plant design, construction, and operation are provided along with the status of biogas in various countries and some R&D tasks. Some of the problems impeding the efficiency of biogas generation, such as the reduction of steel in current gas plant designs, efficient burners, heating of digesters with solar radiation, coupling of biogas systems with other nonconventional energy sources, and design of large-scale plants for communities, are outlined. It is concluded that biogas shows promise as a future source of energy for both developed and developing countries. L.M.

A80-26184 **Possible energy savings through tribological measures - Especially in automobiles (Mögliche Energie-Einsparung durch tribologische Massnahmen - Insbesondere beim Kraftfahrzeug).** W. J. Bartz (Esslingen, Technische Akademie, Esslingen, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 33, Feb. 1980, p. 78-87. 57 refs. In German.

The efficiency of internal combustion engines and gears is analyzed. Their influence and the state of friction is discussed to assess the order of magnitude of fuel savings that can be achieved through lubricants. These figures are compared with the results achieved elsewhere to establish a practical value for efficiency. C.F.W.

A80-26309 **Thermodynamics of heating. II (Zur Thermodynamik des Heizens. II).** H. D. Baehr (Hamburg, Hochschule der Bundeswehr, Hamburg, West Germany). *Brennstoff-Wärme-Kraft,* vol. 32, Feb. 1980, p. 47-57. 18 refs. In German.

It is shown that in contrast to the conventional heating systems discussed in the first part of the investigation, primary energy can only be saved by heating systems in which greatest portion of the heating energy is obtained from sources such as waste heat or the environment, rather than primary energy. The heating numbers of three heat pump heating systems are calculated and compared with each other. Finally, it is shown that the combined heat and power systems frequently achieve a better primary energy utilization than heat pump systems. M.E.P.

A80-26340 **Carrier generation, recombination, and transport in amorphous silicon solar cells.** R. Williams and R. S. Crandall

(RCA Laboratories, Princeton, N.J.). *RCA Review,* vol. 40, Dec. 1979, p. 371-389. 44 refs. Research sponsored by RCA; Contract No. ET-78-C-03-2219.

The discovery of the amorphous silicon solar cell has stimulated work in many laboratories to develop a cheap, efficient, and practical cell. The ability to deposit large-area thin films of this material, with its high optical absorption and relatively good electron lifetime, offers great promise for the development of solar cells. However, the charge-carrier generation and transport are quite different from that found in the more familiar single-crystal silicon. A proper design for a solar cell must take these differences into account. Attention is given to charge-carrier generation, recombination, and transport through insulator layers, and it is shown how these affect solar cell performance. (Author)

A80-26344 # **New approaches to sailing.** B. Smith. *Astronautics and Aeronautics,* vol. 18, Mar. 1980, p. 36-47.

It is noted that sailing involves no thermodynamic cycle and generates little heat, and that sailboats react mechanically to the force of the wind without any train of energy-losing conversions in the path of the action. The paper investigates some possible configurations for sail powered vessels, such as a blimp sail boat, hybrid motor-sailer, and a tanker sailed with the gases derived from the well yielding the oil. Attention is also given to some model aerohydrofoils which have been experimented with. M.E.P.

A80-26466 **Thin film CdSe photoanodes for electrochemical photovoltaic cells.** M. A. Russak, J. Reichman (Grumman Aerospace Corp., Bethpage, N.Y.), H. Witzke, S. K. Deb, and S. N. Chen (Optel Corp., Princeton, N.J.). *Electrochemical Society, Journal,* vol. 127, Mar. 1980, p. 725-733. 28 refs.

Electrochemical photovoltaic cells rely on the junction formed between a semiconductor and electrolyte to accomplish photovoltaic conversion. As a result, they offer certain technical features that make them an attractive alternative to all solid-state solar cells, especially if thin film photoelectrodes are used. This paper describes the fabrication and evaluation of thin film CdSe electrodes for use with sulfide/polysulfide electrolyte in these cells. The effects of electrode preparation and electrolyte concentration on efficiency and stability are presented. I-V curves and action spectra are also discussed. Simple depletion layer theory is applied to monochromatic photocurrent curves and a correlation between efficiency and minority carrier diffusion length is shown. Conversion efficiencies (AM1) as high as 5% are reported. (Author)

A80-26511 # **Selective optical surfaces for solar energy convertors (Selektivnye opticheskie poverkhnosti preobrazovatelei solnechnoi energii).** M. M. Koltun. Moscow, Izdatel'stvo Nauka, 1979. 215 p. 213 refs. In Russian.

Optical surfaces and coatings with selective spectral characteristics are studied with reference to solar cells and arrays for power generation in space and on the ground. Detailed optical, electrical, and thermal properties are given for solar energy concentrators, radiators, transparent thermoreflective windows, and thermal collectors. It is shown that selective surfaces make it possible to collect up to 90% of the energy contained in the incident solar radiation and to increase the efficiency of photovoltaic generators by 50%. The service life of solar arrays can be increased through the use of selective coatings by a factor of up to several hundreds. V.L.

A80-26681 **Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction.** F. K. Fong and D. R. Skidmore (Ohio State University, Columbus, Ohio). In: Advances in computer methods for partial differential equations - III; Proceedings of the Third International Symposium, Bethlehem, Pa., June 20-22, 1979. New Brunswick, N.J., International Association for Mathematics and Computers in Simulation, 1979, p. 120-126. 12 refs. Research supported by the Ohio State University, West Virginia University, U.S. Bureau of Mines, and U.S. Department of Energy.

A80-26708 **Application of computer models to the retorting of oil shale.** D. A. Crowl and R. A. Piccirelli (Wayne State University, Detroit, Mich.). In: Advances in computer methods for partial differential equations - III; Proceedings of the Third International Symposium, Bethlehem, Pa., June 20-22, 1979. New Brunswick, N.J., International Association for Mathematics and Computers in Simulation, 1979, p. 341-350. 28 refs. Contract No. EX-76-C-01-2346.

The development of various models for describing the physical processes that occur in a single particle of oil shale is discussed. The current development of these single particle models is described and some of the problems in the numerical solution of partial differential equations are outlined. Attention is given to the pseudo-steady state pressure approximation, and to the distributed parameter and quasi-shrinking core models. C.F.W.

A80-26813 **Free space microwave power transmission systems for microwave powered atmospheric platforms.** W. C. Brown (Raytheon Co., Waltham, Mass.). In: EASCON '79; Electronics and Aerospace Systems Conference, Arlington, Va., October 9-11, 1979, Conference Record. Volume 3. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 550-556. 13 refs.

The microwave power transmission system consists of the efficient conversion of ordinary electrical power into microwave power, the forming of a microwave beam, accurately aimed at the platform, and the efficient capture and conversion of the microwave power into ordinary electrical power at the platform. A special device, the rectenna, with a dc power output to mass ratio of one kilowatt per kilogram, efficiently captures and rectifies the microwave power even though there may be substantial attitude and position change of the platform. The rectenna can be designed for any voltage and is tolerant of changes in load impedance. The balance of the system is also described and an estimate of system cost is made. (Author)

A80-26820 * # **Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications.** J. W. Youngblood, W. L. Darnell, R. W. Johnson, and R. C. Harriss (NASA, Langley Research Center, Hampton, Va.). *Institute of Electrical and Electronics Engineers, Electronics and Aerospace Systems Conference, Arlington, Va., Oct. 9-11, 1979, Paper.* 7 p. 14 refs.

A high-altitude, unmanned, propeller-driven electric airplane is proposed for remote sensing of environmental phenomena. With motive power from surface-mounted solar arrays or microwave receivers, flight endurance of weeks to months could be anticipated. The proposed system offers unique capability for monitoring oceanic and atmospheric characteristics on local or regional scales. Coastal marine and tropospheric research activities, which require temporal resolutions of 2-72 hours, would be prime application areas. Potential missions might include the monitoring of ocean disposals, episodic marine biological events, and river/ocean interactions. Preliminary sizing and performance calculations are presented along with possible mission scenarios and payload complements. (Author)

A80-27057 **Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells.** H. Matsumoto, N. Nakayama, and S. Ikegami (Matsushita Electric Industrial Co., Ltd., Wireless Research Laboratory, Osaka, Japan). *Japanese Journal of Applied Physics,* vol. 19, Jan. 1980, p. 129-134. 15 refs. Research supported by the Agency of Industrial Science and Technology.

CdS/Cu(x)S solar cells were prepared by using a screen printing method. A low resistivity CdS film was obtained by screen printing CdS paste on a glass substrate and then sintering it in N2 gas including a small amount of Cd vapor. A Cu(x)S layer was formed on the surface of a CdS film and Ag paint electrode or Ni paint electrode was applied to the Cu(x)S layer, which was then heat treated in N2 gas. Fabrication of a low resistivy CdS film and heat treatment in N2 gas after applying electrodes were important factors in obtaining a high efficiency cell. The stability of the cell was influenced by the electrode material on the Cu(x)S layer. (Author)

A80-27058 **Application of plasma focus device to compression of toroidal plasma.** K. Ikuta (Nagoya University, Nagoya, Japan). *Japanese Journal of Applied Physics,* vol. 19, Jan. 1980, p. 157-160. 8 refs.

A new concept of compressing a toroidal plasma using a plasma focus device is considered. Maximum compression ratio of toroidal plasma is determined merely by the initial density ratio of the toroidal plasma to a sheet plasma in a focus device because of the Rayleigh-Taylor instability. An initiation scenario of plasma-liner is also proposed with a possible application of this concept to the creation of a burning plasma in reversed field configurations, i.e., burning plasma vortex. (Author)

A80-27099 **Organic content of particulate matter in turbine engine exhaust.** D. J. Robertson, R. H. Groth, and T. J. Blasko (United Technologies Corp., Commercial Products Div., East Hartford, Conn.). *Air Pollution Control Association, Journal,* vol. 30, Mar. 1980, p. 261-266.

Solid particulate matter, mainly carbon, emitted into the air from the combustion of fossil fuels contains a variety of organic species adsorbed on it. In an examination of these particulates from the combustion of kerosene-type fuels in a gas turbine engine, attention was focused on polynuclear aromatic compounds, phenols, nitrosamines, and total organics. The particulates were collected using a high-capacity pumping system and 293-mm diameter teflon filters through which was passed up to 43 cu m of exhaust gas. Extraction of the organic matter was done in a Soxhlet extractor using hexane usually. The engine was operated at idle, approach, climb, and take-off power settings with low-sulfur and high-sulfur (0.25%) fuels. Most of the PAH were small 3 and 4 fused ring compounds with very few, at low concentrations, 5 and 6 fused ring species. No nitrosamines were found and except in a few cases, at low levels, no phenols. PNA and total organic levels decreased with increase in a power setting and were higher in the exhaust from low sulfur fuels. Less than 1% of the organic matter emitted by the engine was absorbed on the particulate matter. (Author)

A80-27195 **Transverse self-focusing of a Gaussian beam - Moment method.** S. K. Sinha and M. S. Sodha (Indian Institute of Technology, New Delhi, India). *Physical Review A - General Physics, 3rd Series,* vol. 21, Feb. 1980, p. 633-638. 13 refs.

The present paper investigates the self-focusing and self-trapping of a Gaussian laser beam propagating transverse to the static magnetic field in a plasma. In order to accomplish this, moment theory has been adopted, as opposed to the paraxial-ray approximation, which has so far been the basis for most of the analyses of self-focusing in the recent past. An equation for the beam width has been set up and solved numerically; the condition for self-trapping of the beam has also been obtained. (Author)

A80-27204 **Use of solar energy under terrestrial conditions - Automated production of solar generator components (Nutzung der Sonnenenergie unter terrestrischen Bedingungen - Automatisierte Fertigung von Solargenerator-Komponenten).** *VDI-Z,* vol. 122, no. 4, Feb. 1980, p. 141-143. In German.

A80-27263 **Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas.** K. Kato (Nagoya University, Nagoya, Japan). *Physical Review Letters,* vol. 44, Mar. 24, 1980, p. 779-781. 16 refs.

A80-27269 **Future large cargo aircraft technology.** R. H. Lange (Lockheed-Georgia Co., Advanced Concepts Dept., Marietta, Ga.). *Lockheed Horizons,* Spring 1980, p. 16-24.

Some innovative design concepts are surveyed which show potential for significant improvements in aerodynamic efficiency, operating economics, and operational efficiency. Topics examined include military/civil commonality issues, and cargo capacity. Attention is given to the environmental impact of future cargo aircraft covering advanced composite materials, advanced aircraft propulsion, aircraft drag reduction, alternate fuels, and innovative design concepts. M.E.P.

A80-27270 **The changing horizons for technical progress. II.** R. H. Hopps (Lockheed-California Co., Burbank, Calif.). *Lockheed Horizons,* Spring 1980, p. 32-39.

Some new technologies are surveyed that offer the possibility of obsoleting the present concept of a jet transport. Attention is given to such areas as laminar flow control, all-wing concepts, superlarge aircraft, advanced turboprops, air cargo, avionics, hydrogen, VTOL and V/STOL. Also covered are a nuclear-powered airplane and a supersonic transport. It is concluded that new developments will be of an evolutionary manner rather than a sudden jump to a new generation of aircraft, as in the past. M.E.P.

A80-27276 **Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma.** J. Weiland (EURATOM and Chalmers University of Technology, Institute for Electromagnetic Field Theory, Goteborg, Sweden). *Physical Society of Japan, Journal,* vol. 48, Jan. 1980, p. 238-246. 39 refs. Research supported by the Japan Society for the Promotion of Science.

Excitation of dissipative drift wave turbulence with waves propagating perpendicular to the density gradient is studied numerically, taking an average over the gradient coordinate. Situations where the plasma current is the main source of instability and situations closer to an ordinary dissipative drift wave excitation are investigated in the presence of finite beta effects and ion viscosity. The main saturation mechanism is quasilinear modification of the background density. In addition to the usual current induced growth, the current is also found to decrease the finite beta stabilization. (Author)

A80-27278 **Toroidal effects on nonlocal collisionless drift instability.** K. Itoh, T. Tuda (Japan Atomic Energy Research Institute, Tokai, Ibaraki, Japan), and S. Inoue (Hiroshima University, Hiroshima, Japan). *Physical Society of Japan, Journal,* vol. 48, Jan. 1980, p. 258-263. 10 refs.

Toroidal curvature effects on the electrostatic collisionless drift instability in a sheared magnetic field is investigated. The magnetic curvature drift of ions reduces or even annihilates the shear convective damping and causes the mode ballooning. It is found that the universal mode is stable (or marginally stable at most) so long as the convective damping remains finite, and the critical current density for the current-driven drift instability becomes lower. (Author)

A80-27321 **High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell.** R. A. Mickelsen and W. S. Chen (Boeing Aerospace Co., Seattle, Wash.). *Applied Physics Letters,* vol. 36, Mar. 1, 1980, p. 371-373. Contract No. EG-77-C-03-1458.

A polycrystalline thin-film CdS/CuInSe2 heterojunction solar cell with an efficiency of 5.7% has been prepared using a simultaneous elemental evaporation technique to deposit the CuInSe2 film. The cell's short-circuit current of 31 mA/sq cm under 100 mW/sq cm is the highest ever reported for a 1-sq-cm cell. Heat treatments have been found to improve cell efficiency and to also change the cell I-V and C-V characteristics. (Author)

A80-27337 * **Silicon ribbon growth using scanned lasers.** A. Baghdadi (National Bureau of Standards, Washington, D.C.), R. J. Ellis, and R. W. Gurtler (Motorola, Inc., Solar Energy Research and Development Dept., Phoenix, Ariz.). *Applied Optics,* vol. 19, Mar. 15, 1980, p. 909-913. 7 refs. Contract No. JPL-954376.

The recent demand for low-cost photovoltaic arrays has renewed the interest in growing silicon in ribbon form. The approach used in the present paper for the growth of low-cost silicon ribbon is shown schematically. A pair of scanned, focused CO_2 laser beams is directed onto both sides of a preformed silicon ribbon. A narrow (about 1 mm high) molten zone is formed across the full width of the ribbon. As the silicon ribbon is passed through the laser-heated zone, large grains are produced in the recrystallized ribbon. The laser beam path is outlined schematically. As a general rule, the lenses are not positioned so as to bring the laser beams to a fine focus, since highly focused beams would vaporize the silicon surface rather than serve to melt the bulk. Silicon ribbon has been grown at rates up to 13.3 cm/min by this approach. The best solar cell fabricated so far on this material has a conversion efficiency of 12.7%. S.D.

A80-27340 **Choice of an optimum multichannel Nd:glass laser system for fusion experiments.** L. A. Bolshov, A. M. Dykhne, N. G. Kovalskii, A. N. Kolomiiskii, T. K. Kirichenko, M. I. Pergament, Iu. P. Rudnitskii, R. V. Smirnov, A. N. Starostin, and V. M. Cherniak (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). *Applied Optics*, vol. 19, Mar. 15, 1980, p. 924-929. 9 refs.

A comparison has been made between proposed configurations for Nd-glass laser systems for fusion. Detailed theoretical modeling of pulse propagation has been carried out using a linearized model with the variables taken to be time, axial coordinate, and one transverse coordinate. A non-temporally varying, three-spatial dimension model was also used to correct the linearized two-spatial dimension calculations. A 100,000 J system using 200 slab amplifiers and 20 spatial filters and having a 0.0001 rad divergence appears feasible. (Author)

A80-27417 **Methanol derivation from North Dakota lignite and use as a fuel.** E. C. Glass, A. L. Freeman, and T. O. Wentworth (Northern States Power Co., Minneapolis, Minn.). *(U.S. Department of Energy and University of North Dakota, Biennial Lignite Symposium, 10th, Grand Forks, N. Dak., May 1979.) I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 18, Dec. 1979, p. 288-291.

Methanol has the potential for a significant replacement of oil in the U.S. Its utilization by electric and gas utilities and by industry appears favorable. Methanol has an advantage over oil where a very clean flame is required. It can also be converted to gasoline at a modest cost. A process design firm has performed an engineering evaluation and a study of economic feasibility of a plant producing 2.5 billion gallons of methanol annually from North Dakota lignite. A range of costs for methanol from $18 to $28/bbl (1978 $) of oil equivalent is indicated depending mainly on type of financing. (Author)

A80-27418 **Application of liquefaction processes to low-rank coals.** W. G. Willson, C. L. Knudson, G. G. Baker (U.S. Department of Energy, Grand Forks Energy Technology Center, Grand Forks, N. Dak.), T. C. Owens, and D. E. Severson (North Dakota, University, Grand Forks, N. Dak.). *(U.S. Department of Energy and University of North Dakota, Biennial Lignite Symposium, 10th, Grand Forks, N. Dak., May 1979.) I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 18, Dec. 1979, p. 297-310. 6 refs.

The Grand Forks Energy Technology Center and the University of North Dakota researchers are conducting research on the liquefaction behavior of low-rank coals necessary to apply major developing processes to these distinctly different coals. In a 5-lb coal/h continuous process unit, synthesis gas, raw lignite, and anthracene oil solvent were reacted at elevated temperatures in single pass tests in a continuous-stirred tank reactor (CSTR). Product yield fractions were correlated with percent coal in the feed slurry, hydrogen donor (tetralin) concentration, and temperature. The molecular weight of the soluble but nondistillable yield fraction was markedly reduced by increasing temperature. In batch autoclave systems, work has been conducted to establish rates and product distributions from several liquefaction solvents. Two solvents were chosen for subsequent tests aimed at determining the catalytic effects of diverse mineral matter in eight different low-rank coals. (Author)

A80-27419 **Performance of low rank coals in the Exxon Donor Solvent Process.** W. N. Mitchell, K. L. Trachte, and S. Zaczepinski (Exxon Research and Engineering Co., Baytown, Tex.). *(U.S. Department of Energy and University of North Dakota, Biennial Lignite Symposium, 10th, Grand Forks, N. Dak., May 1979.) I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 18, Dec. 1979, p. 311-314.

The Exxon Donor Solvent Coal Liquefaction Process (EDS) handles a full range of coals ranging from bituminous through subbituminous to lignites. The overall process performance based on the 50 lb/day Recycle Coal Liquefaction Unit (RCLU) and the 1 ton/day Coal Liquefaction Pilot Plant (CLPP) is summarized as a function of process conditions and coal rank. Special emphasis is placed on the conversion and yield response of the range of coals demonstrated in the EDS process to date. In addition to the liquefaction potential, the operability issues associated with operating on low rank coals are addressed. More specifically, the relationship between the operating severity and the liquefaction bottoms viscosity is explored in detail. Also, the calcium carbonate scale deposition and agglomerates formation in the process reactors is covered. As part of this discussion, process and mechanical solutions to this problem are summarized. (Author)

A80-27420 **Lignite and coal in the U.S. energy future.** W. L. Fisher (Texas, University, Austin, Tex.). *(U.S. Department of Energy and University of North Dakota, Biennial Lignite Symposium, 10th, Grand Forks, N. Dak., May 1979.) I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 18, Dec. 1979, p. 314-317.

The future energy situation of the United States is discussed, with particular emphasis on the potential role of coal and lignite production in increasing domestic energy supplies. The greater than expected increase in energy conservation since 1973 is indicated, however it is pointed out that energy production has not increased at a rate necessary to meet projected energy demands, even assuming a demand growth rate of 2% yearly. Limitations to increased oil, natural gas and nuclear energy production, which would prevent a drastic increase in imported energy or drastic reduction in energy consumption, are outlined. Coal and lignite production is then presented as the only feasible means of meeting the nation's energy demand in the short term, if administrative, legal, environmental, physical, economic, social and political constraints can be overcome. A.L.W.

A80-27567 **Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage.** V. N. Mokhov, V. K. Chernyshev, V. B. Iakubov, M. S. Protasov, V. M. Danov, and E. I. Zharinov. *(Akademiia Nauk SSSR, Doklady*, vol. 247, no. 1, 1979, p. 83-86.) *Soviet Physics - Doklady*, vol. 24, July 1979, p. 557-559. 14 refs. Translation.

Extensive studies have been made of the compression of spherical targets by means of intense laser beams. In the present paper the effectiveness of an approach to controlled thermonuclear synthesis, based on the compression of thermonuclear targets by a magnetic field is demonstrated theoretically and experimentally. V.P.

A80-27649 **An economic analysis of air pollution from coal-fired power plants.** R. Mendelsohn (Washington, University, Seattle, Wash.). *Journal of Environmental Economics and Management*, vol. 7, Mar. 1980, p. 30-43. 24 refs.

The benefits of air pollution control techniques on a coal-fired power plant are simulated with a scientifically based environmental model. Air pollution abatement techniques are assessed in terms of their resource cost (measured in dollars) and their effectiveness in reducing environmental damage (measured in dollars and healthy days lost). Which air pollution techniques are most efficient depend upon how much a day of health should be valued. Other factors of potential interest such as uncertainty and equity are also simulated through the model. The paper demonstrates that scientific evidence can be organized around economic principles in order to develop more rational and effective environmental policies. (Author)

A80-27656 * **Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings.** Symposia sponsored by IEEE, DOE, and NASA. Edited by C. R. Kerns (Fermi National Accelerator Laboratory, Batavia, Ill.). *IEEE Transactions on Nuclear Science,* vol. NS-27, Feb. 1980. 958 p.

The paper covers the studies presented on nuclear science and nuclear power systems symposiums. The studies deal with nuclear radiation detectors, nuclear circuits and systems, space and medical instrumentation, as well as with environmental and reactor instrumentation. Data preprocessing and acquisition are discussed. Emphasis is placed on the engineered safety features of nuclear systems. V.T.

A80-27672 **Design considerations of a CAMAC system for large tokamak JT-60.** T. Kumahara, A. Ogata, T. Matoba, I. Kondo, and Y. Suzuki (Japan Atomic Energy Research Institute, Tokai, Ibaraki, Japan). *(IEEE, DOE, and NASA, Nuclear Science Symposium, 26th, San Francisco, Calif., Oct. 17-19, 1979.) IEEE Transactions on Nuclear Science,* vol. NS-27, Feb. 1980, p. 637-640.

Microprocessor based distributed intelligence CAMAC system is adopted in control and monitoring of a large tokamak device JT-60. Such novel techniques as hierarchical serial highways, auxiliary controllers with standard highway ports, a variable word-length data transfer, byte serial data transfer with single cable of optical fiber pair, hand-shaking timing system with error recovery capability, flying capacitor multiplexers for temperature monitor and digital integrators for electromagnetic probe are introduced in the CAMAC system. Outlines of the new techniques as well as system configuration of JT-60 CAMAC system are described. (Author)

A80-27677 **Combined magnetic levitation and propulsion - The Mag-Transit concept.** R. G. Rule and R. G. Gilliland (Boeing Aerospace Co., Automated Transportation Systems Organization, Seattle, Wash.). *IEEE Transactions on Vehicular Technology,* vol. VT-29, Feb. 1980, p. 41-49. 12 refs.

Mag-Transit is a unique combination of magnetic levitation and propulsion for people mover applications. Linear induction motors are used for levitation, propulsion, braking, and guidance. Since there are a minimum of moving parts there is a potential for a substantial increase in system reliability and availability as compared to conventional systems. Modern solid-state technology provides the capability to condition sufficient quantities of electrical energy to control motor excitation, and thereby levitation, within a closed-loop servo system. Real time measurements of air gaps and vehicle accelerations are used to compute the desired levitation force. In addition, the solid-state electronics provides the ability to control independently the speed of the vehicle by a continuously variable excitation frequency to the motors. An overview is provided of the Mag-Transit concept from a control system standpoint. Results from a dynamic simulation of a test vehicle configuration are presented. (Author)

A80-27729 **A storage tank for vehicular storage of liquid hydrogen.** L. O. Williams and D. E. Spond (Martin Marietta Aerospace, Denver, Colo.). *Applied Energy,* vol. 6, Mar.-Apr. 1980, p. 99-112.

This article outlines a concept for a new method of fabricating cryogenic liquid hydrogen storage tanks with emphasis on the application of liquid hydrogen as an automotive fuel. It includes a recapitulation of the properties of hydrogen and gasoline for reference, a discussion of automotive fuel utilisation rates, a thermal analysis of the liquid hydrogen boil-off rate for a reference storage container and the new concept tank. In addition, an analysis of the tank concept and its method of assembly line fabrication are provided. The conclusions reached are that this fabrication concept would provide a liquid hydrogen storage tank of improved thermal performance, that the tank could be potentially less expensive to build than current technology tanks, and that the tank would be suitable for automotive containment of liquid hydrogen. (Author)

A80-27730 **Tubular solar collector.** P. K. C. Pillai and R. C. Agarwal (Indian Institute of Technology, Delhi, India). *Applied Energy,* vol. 6, Mar.-Apr. 1980, p. 125-132. 13 refs.

Details of the design and development of an inexpensive solar collector system which does not make use of a blackened metal plate as an absorber are given in this paper. A spiral-shaped plastic tube coated with a black paint constitutes the solar absorber. Unlike other flat plate collectors, the working fluid moves through a spiral path in this collector. As the liquid moves progressively towards the centre, its temperature gradually rises and in the process it absorbs a part of the heat transferred radially from the centre of the collector, thus reducing heat losses. (Author)

A80-27731 **Large energy storage systems for utilities.** S. L. Ridgway, J. L. Dooley, and R. P. Hammond (R & D Associates, Marina del Rey, Calif.). *Applied Energy,* vol. 6, Mar.-Apr. 1980, p. 133-142.

The paper shows that steel lined cavities deep underground, using the rock to provide containment, are economical and practical in large capacities for energy storage. It is shown that by reducing the cavity pressure, steam is flashed from the hot water and used to drive peaking turbines when needed; at low load periods surplus steam is condensed in the water to recharge the vault. The saturation pressure of the hot water is borne by the overburden pressure of the rock formation in which the storage vault is constructed. Finally, it is estimated that the cost of a facility to deliver 1000 MW of peaking power for 10 h would fall in the range of $250-350 million. M.E.P.

A80-27752 # **The energy problem: Its effect on aircraft design. I - Supply and demand.** W. Tye. *Aircraft Engineering,* vol. 52, Mar. 1980, p. 9-11.

Energy demands for aircraft by the year 2000 are discussed, considering fuel supply shortages that are expected to result in a 7% cut in the availability of aviation fuel. Attention is given to the use of kerosine with higher aromatic content and an expected trend toward fuels more like diesel oil, as well as consequent engine and aircraft modifications. J.P.B.

A80-27924 **A model for the Sulphur Springs geothermal field St. Lucia.** K. H. Williamson (Institute of Geological Sciences, London, England). *Geothermics,* vol. 8, no. 2, 1979, p. 75-83. 23 refs. Research supported by the Ministry of Overseas Development of England.

A model to explain the behavior of the Sulphur Springs geothermal field has been derived from downhole temperature records in the exploration boreholes. The model incorporates a main reservoir at 1-1.5 km depth, intersected by steeply inclined fissures which carry steam and gas to the well bores, and to the natural fumaroles. A substantial decline in the gas content of the steam could have serious consequences where the fissures are utilized as conduits between the boreholes and the deep reservoir. Further development of the field should concentrate on the fissures around 300 m or on the reservoir itself around 1000-1500 m. (Author)

A80-28012 **Metal/air batteries: Their status and potential - A review.** K. F. Blurton and A. F. Sammells (Institute of Gas Technology, Chicago, Ill.). *Journal of Power Sources,* vol. 4, Dec. 1979, p. 263-279. 49 refs.

Lithium, aluminum, magnesium, zinc and iron/air batteries are compared with particular emphasis on the suitability of each system for electric vehicle propulsion. The relative merits of mechanically and electrically rechargeable batteries are given, together with systems employing static and circulating electrolytes. It is concluded that, due to the institutional difficulties associated with the deployment of recharge systems for mechanically rechargeable batteries in electric vehicles, electrically rechargeable systems are more viable for commercialization in the near term. C.F.W.

A80-28013 **Current trends in the development of sodium-sulphur batteries.** G. R. Lomax (Chloride Silent Power, Ltd., Runcorn, Ches., England). *(Institute of Electrical and Electronics Engineers, International Telephone Energy Conference, Washington, D.C., Oct. 25-27, 1978.) Journal of Power Sources,* vol. 4, Dec. 19, p. 301-308.

The current status of sodium-sulphur technology in CSPL is outlined. 350 W h cells have now been developed with energy densities of 0.36 W h/cc and 0.16 W h/g, and much of the R & D effort is now being directed towards battery design. Because it must be thermally insulated, the shape of the battery and the thickness of the insulation are significant, and it is possible to realize gross battery energy densities of between 0.1 W h/cc and 0.25 W h/cc, volumetric energy density normally being the more critical. These are some three times greater than for conventional lead-acid batteries, and combined with operating characteristics which differ markedly from conventional batteries, they could offer a number of interesting applications in addition to road transport and load levelling. (Author)

A80-28014 **Lead-acid batteries for remote photovoltaic applications.** H. J. Schaetzle and D. P. Boden (C & D Batteries, Plymouth Meeting, Pa.). *(Institute of Electrical and Electronics Engineers, International Telephone Energy Conference, Washington, D.C., Oct. 25-27, 1978.) Journal of Power Sources,* vol. 4, Dec. 19, p. 327-336.

The various load profile characteristics most commonly encountered in photovoltaic installations are analyzed in conjunction with solar array and battery performance data and used to generate battery specifications with particular respect to operating characteristics and cycle life requirements. The design of lead-acid batteries for photovoltaic applications is discussed and illustrated with both operating, maintenance, and cycle life data. Other performance characteristics of lead-acid photovoltaic batteries are described including the effects of operating temperature and the correct choice of charging method for various operational requirements. (Author)

A80-28015 # **Photovoltaic power for telecommunications.** H. Kelly (Office of Technology Assessment, Washington, D.C.). *(Institute of Electrical and Electronics Engineers, International Telephone Energy Conference, Washington, D.C., Oct. 25-27, 1978.) Journal of Power Sources,* vol. 4, Dec. 19, p. 337-347. 11 refs.

Photovoltaic equipment may be an attractive power source for many kinds of communication equipment in the next five years. The first applications will be found in remote parts of the U.S. and in new systems installed overseas in areas remote from electric distribution grids. By the end of the 1980's, the equipment may compare favorably with grid electricity in some regions. This paper will discuss the kinds of improvements in equipment performance and manufacturing techniques which may lead to photovoltaic systems capable of competing in the communications industry, and estimate the cost of power which could be obtained if such improvements are achieved. It will review some of the problems of system design which must be confronted in constructing systems capable of meeting realistic demand patterns, and outline a technique for optimizing the size of components. (Author)

A80-28016 **Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves.** B. Klapste, J. Mrha, K. Micka, J. Jindra, and V. Marecek (Ceskoslovenska Akademie Ved, Ustav Fyzikalni Chemie a Elektrochemie, Prague, Czechoslovakia). *Journal of Power Sources,* vol. 4, Dec. 19, p. 349-360. 16 refs.

A80-28200 # **Investigation of heat and mass transfer for a regenerator model of a solar cooling system (Issledovanie teplo- i massoobmena na modeli regeneratora solnechnoi kholodil'noi ustanovki).** A. Khandurdyev, A. Kakabaev, and A. Nurgel'dyev (Turkmenskii Gosudarstvennyi Universitet, Ashkhabad, Turkmen SSR). *Akademiia Nauk Turkmenskoi SSR, Izvestiia, Seriia Fiziko-Tekhnicheskikh, Khimicheskikh i Geologicheskikh Nauk,* no. 6, 1979, p. 14-18. 9 refs. In Russian.

A80-28251 **OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979.** Conference sponsored by the Institute of Electrical and Electronics Engineers and Marine Technology Society. New York, Institute of Electrical and Electronics Engineers, Inc., 1979. 815 p. $33.75.

Topics included in this work are on advanced surface craft, electromagnetic systems for ocean surface monitoring and communications, ocean energy, Space Shuttle support. Individual subjects such as the use of semi-submerged ships to support new technology at sea, buoyant module VHF antenna design for submerged systems/aircraft communications, a system for undersea storage of thermal energy, ocean wave concepts as well as the solid rocket booster dewatering set, and the SRB retrieval support craft are presented. C.F.W.

A80-28257 **SEAS - A system for undersea storage of thermal energy.** J. D. Powell (California, University, La Jolla, Calif.) and J. R. Powell (Brookhaven National Laboratory, Upton, N.Y.). In: OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 527-532.

Methods of storing medium grade (200 to 275 C) thermal energy are of great economic interest for electric generation and process heat. Storage of water heated by land based energy sources and pumped to ocean or lake depths great enough that the ambient hydrostatic pressure equals the saturation pressure appears to be a low cost, safe, and technically feasible method for storing large volumes of hot water. (Author)

A80-28258 **Flap type weather proof ocean wave energy converter.** F. H. Hsu (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 541-545.

A wave energy extraction system is presented that consists of one centrally located main body and two cylindrical flaps situated on each side of the main body and joined to it by two linkage arms. It is noted that this system can be operated not only on the ocean surface but also at submerged level. Attention is given to the system function which is divided into three stages: pre roll resonance, the roll resonant period and post roll resonance. Conclusions show that the device is not intended to replace the major power plants now in operation, but can be used to supplement the power needs for coastal regions, islands or offshore platforms, etc. C.F.W.

A80-28259 **The MINI-OTEC test.** R. L. Waid (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 548-552. Research supported by the Lockheed Missiles and Space Co.

MINI-OTEC is the first at-sea, closed-loop OTEC system using warm surface water and cold deep water to generate electrical power. The thermal resource and current environment at the test site, Keahole Point, Hawaii, are discussed. The OTEC power system and components are described as are the components of the ocean system. At-sea operating experience of an OTEC plant, including biofouling effects and countermeasure effectiveness, are the primary objectives of the project. The characteristics and loads of vortex-induced flow around the cold water pipe are described. (Author)

A80-28260 # **Ocean wave energy conversion concepts.** M. E. McCormick (U.S. Naval Academy, Annapolis, Md.). In: OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San

Diego, Calif., September 17-19, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 553-558. 10 refs.

Nine ocean wave energy conversion techniques are described and discussed. These techniques include the use of heaving and pitching bodies, cavity resonators, wave focusing, pressure devices, surging devices, paddles, outriggers and combination devices. Examples of each technique are presented, and required subsystems are described. Finally a comparison study is performed based on efficiency, operational practicality and cost. (Author)

A80-28261 **Coriolis Program - A review of the status of the ocean turbine energy system.** P. B. S. Lissaman and R. L. Radkey (AeroVironment, Inc., Pasadena, Calif.). In: OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 559-565. 12 refs.

The goal of the Coriolis Program is to develop an energy system to generate electrical power via an array of large ducted turbines moored about 30 km east of Miami in the Florida Current of the Gulf Stream. Numerous studies have been made of the technical, economic, and environmental issues involved. Here, the program background is given, and the system as currently envisaged is described. The Florida Current resource is discussed, using estimates of the power available from the momentum flux. Important environmental issues are reviewed and estimates of effects are given which show that the program will have no adverse local or global effects. A recent U.S. Department of Energy sponsored study of the hydrodynamic and hydroelastic behavior of key system components is described. In this work, theoretical and experimental studies show that the catenary turbine rotors will be free of adverse vibrations, and that the proposed mooring system will be stable and well damped. Finally, the overall Coriolis Program plan is reviewed and the next phases for the design and construction of a small scale (11 m diameter) prototype are discussed. (Author)

A80-28262 **Salinity gradient energy conversion.** G. D. Mehta, S. C. Jain, M. D. Fraser (InterTechnology/Solar Corp., Warrenton, Va.), S. J. Senatore, and H. L. Rothstein (Ebasco Services, Inc., New York, N.Y.). In: OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979. New York, Institute of Electrical and Electronics Engineers, Inc., 1979, p. 566-571. 7 refs. Contracts No. EG-77-G-01-4066; No. EG-77-C-05-5560; No. DE-AC05-79ET21001.

The feasibility of Osmo-Hydro Power /TM/ (OHP) systems, as conceived by ITC/Solar, to generate electricity in a practical and economic manner from aqueous saline solutions is discussed. Initial design of a 50-kWe system using brackish water and saturated brine is presented. Preliminary estimates show that for larger units the capital cost of such a system will be around $4,000 to $5,000 per net kWe. (Author)

A80-28271 **Hydrogen energy research programs in Japan.** T. Ohta (Yokohama National University, Yokohama, Japan) and M. V. C. Sastri (Indian Institute of Technology, Madras, India). *International Journal of Hydrogen Energy,* vol. 4, no. 6, 1979, p. 489-498.

The paper reviews the hydrogen energy research programs carried out under the Sunshine Project in Japan. Work on both electrolytic and thermochemical processes for large-scale hydrogen production is discussed. New methods for hydrogen production, such as direct thermal decomposition of water and photo-electrolysis of water with semiconductor electrodes are outlined. Storage and transportation of hydrogen and hydrogen burners are emphasized. V.T.

A80-28272 **Present state and future prospects of thermochemical hydrogen production.** G. E. Beghi (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). *(World Hydrogen Energy Conference, 2nd, Zurich, Switzerland, Aug. 1978.) International Journal of Hydrogen Energy,* vol. 4, no. 6, 1979, p. 499-512. 20 refs.

Thermochemical decomposition of water as a method of producing hydrogen is a relatively recent subject of research. First studies are mentioned, giving definitions and indicating methodology for analysis. Chemical reactions of 'pure' and 'hybrid' thermochemical cycles for the main processes under study are mentioned. For the experimental activities in progress, the recent demonstration of the technical feasibility on the laboratory scale is reported, based on some complete circuits in operation or under construction. For the technico-economic evaluations the different calculations are given and the uncertainty existing is emphasized; a figure of about 8 $/9J for hydrogen production cost seems to meet good consensus. Further experimental data, particularly in some research areas, are necessary to give evidence of the competitiveness of thermochemical processes: the next few years will be critical in contributing to give an answer as to the prospects of this new method for hydrogen production. (Author)

A80-28273 **Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water.** C. E. Bamberger and D. H. Nichols (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *International Journal of Hydrogen Energy,* vol. 4, no. 6, 1979, p. 513-516. 10 refs. Contract No. W-7405-eng-26.

The chemistry of a new thermochemical cycle for splitting water is described. It consists essentially of three reactions: (1) Ce(IV), as CeO_2, is reduced to Ce(III) by reaction with TiO_2, evolving oxygen and forming one or more Ce(III) titanates; (2) the Ce(III) titanates react with molten NaOH to evolve hydrogen, and form CeO_2 and Na-titanate; and (3) the sodium titanate is hydrolyzed by boiling water into a hydrous titanium dioxide and a sodium hydroxide solution. The cycle has been demonstrated with regenerated materials. (Author)

A80-28274 **Open-loop thermochemical cycles for the production of hydrogen.** W. L. Conger (Kentucky, University, Lexington, Ky.). *International Journal of Hydrogen Energy,* vol. 4, no. 6, 1979, p. 517-522.

The concept of open-loop thermochemical cycles (cycles which have additional or other feedstocks than water and produce materials in addition to hydrogen and oxygen) is introduced. Preliminary analysis of possible feedstocks available indicates substantial quantities of hydrogen could possibly be produced through open-cycles. The advantages of open-cycles include the conversion of unwanted waste products to useful products while producing hydrogen. A compilation of open processes which would have SO_2 in addition to water as feedstock and which would produce sulfuric acid in addition to hydrogen and oxygen is given. (Author)

A80-28275 **Engineering impact on the validity of the Mark-16 thermochemical cycle.** W. R. A. Goossens, M. Klein, and L. H. Baetslé (Centre d'Etude de l'Energie Nucléaire, Mol, Belgium). *International Journal of Hydrogen Energy,* vol. 4, no. 6, 1979, p. 523-534. 8 refs. Research supported by the Commission of the European Communities.

Mass and energy balances are presented for the entire Mark-16 thermochemical cycle in order to evaluate the impact of practical constraints on the validity of the cycle. In particular, a detailed analysis of the hydrogen iodide decomposition step of this cycle is considered. It is found that adding the energy consumption of the product separation units related to the HI decomposition step to the energy consumption under equilibrium conditions for the chemical reaction steps shows a thermal efficiency of 0.31 for the Mark-16 cycle. J.P.B.

A80-28276 **Nuclear methane reforming for coal gasification.** J. Rastoin, J. Malherbe (Commissariat à l'Energie Atomique, Gif-sur-Yvette, Essonne, France), J. Pottier, and A. Lecoanet (Gaz de France, Saint Denis, Seine-St.-Denis, France). *International Journal of Hydrogen Energy,* vol. 4, no. 6, 1979, p. 535-540.

The paper studies hydrogen for chemical industries and coal gasification prospects along with nuclear methane reforming. Consideration is given to coal gasification using nuclear energy hydrogen and methane steam reforming. It is noted that nuclear reforming can be competitive with autothermic reforming for hydrogen production.
V.T.

A80-28277 **Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds.** L. Belkbir, N. Gérard (Dijon, Université, Dijon, France), A. Percheron-Guégan, and J. C. Achard (CNRS, Laboratoire de Chimie Métallurgique et Spectroscopie des Terres Rares, Meudon, Hauts-de-Seine, France). *International Journal of Hydrogen Energy*, vol. 4, no. 6, 1979, p. 541-557. 27 refs.

Kinetic rules of formation and decomposition of the hydrides derived from LaNi5-type compounds are determined. Comparison between LaNi5H6 and more stable hydrides is made in terms of pressure, number and time of cycles. Measurements are performed by a differential volumetric device functioning under constant pressure, during hydrogen absorption and desorption. The influence on the kinetics and hydrogen capacities of the gaseous impurities contained in industrial hydrogen is studied as a function of the number of cycles, showing a good resistance to poisoning of the above mentioned compounds.
(Author)

A80-28278 **Physical, chemical and energy aspects of underground hydrogen storage.** P. O. Carden and L. Paterson (Australian National University, Canberra, Australia). *International Journal of Hydrogen Energy*, vol. 4, no. 6, 1979, p. 559-569. 24 refs.

Large scale energy storage is becoming an important consideration as we turn more towards nuclear power and the utilization of renewable sources such as solar energy. Underground storage of hydrogen in aquifers has been suggested as an inexpensive method of providing the required energy storage. With this theme in mind, the losses associated with gas storage in aquifers are discussed. These losses include physical leakage of gas, loss of gas through underground chemical reactions and the energy requirements associated with storing and recovering the gas. Although underground storage of hydrogen appears a most promising solution to the problem of large scale energy storage it it shown that much remains to be done to confirm this. For example, better estimates of hydrogen diffusion through water saturated porous media are required.
(Author)

A80-28305 **Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions.** J. E. Bowers, J. L. Schmit, C. J. Speerschneider (Honeywell Corporate Technology Center, Bloomington, Minn.), and R. B. Maciolek (Minnesota Mining and Manufacturing, St. Paul, Minn.). *IEEE Transactions on Electron Devices*, vol. ED-27, Jan. 1980, p. 24-28. 21 refs. Contract No. F33615-77-C-5142.

A80-28307 **Properties of ion-implanted junctions in mercury-cadmium-telluride.** A. Kolodny and I. Kidron (Technion - Israel Institute of Technology, Haifa, Israel). *IEFE Transactions on Electron Devices*, vol. ED-27, Jan. 1980, p. 37-43. 26 refs.

A80-28330 **Computer modeling of a two-junction, monolithic cascade solar cell.** M. F. Lamorte and D. H. Abbott (Research Triangle Institute, Research Triangle Park, N.C.). *IEEE Transactions on Electron Devices*, vol. ED-27, Jan. 1980, p. 231-249. 51 refs. USAF-supported research.

The paper presents an analytic method predicting the performance characteristics of a two-junction monolithic cascade solar cell as a function of temperature. Material selection criteria for cascade structures are provided. The characteristics include the family of solar cell V-I curves, conversion efficiency, voltage at the maximum power point, dark current of top and bottom cells, fill factor, and special response.
V.T.

A80-28331 **Open-circuit voltage and interface study of silicon MOS solar cells.** K. Rajkanan (General Instrument Corp., Hicksville, N.Y.), R. Singh (Colorado State University, Fort Collins, Colo.), and J. Shewchun (Brown University, Providence, R.I.). *IEEE Transactions on Electron Devices*, vol. ED-27, Jan. 1980, p. 250-254. 42 refs. Research supported by the U.S. Department of Energy and National Research Council of Canada.

The paper presents theoretical and experimental studies carried out on the open-circuit voltage of Al-SiO(x)-(p-type)Si solar cells. Emphasis is placed on a phenomenological model taking into consideration the effects of pinholes which are expected to be present in the ultrathin oxides involved in MOS solar cells.
V.T.

A80-28337 **MOS and oxide-charge-induced /OCI/ BSF solar cells.** A. Neugroschel (Florida, University, Gainesville, Fla.). *IEEE Transactions on Electron Devices*, vol. ED-27, Jan. 1980, p. 287-290. 20 refs.

New structures in which the heavily doped region in the base of a back-surface-field (BSF) solar cell is eliminated are proposed. Instead, the desired high concentration of majority carriers at the back surface is obtained by the Coulomb attraction utilizing the oxide formed on this surface. The origin of the Coulomb attraction is either charge in the oxide (OCI-BSF cell) or a small gate voltage which draws no power (MOS-BSF cell) applied to a metal-oxide-semiconductor structure.
V.T.

A80-28425 **Stirling engine design and feasibility for automotive use.** Edited by M. J. Collie. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 47), 1979. 480 p. $36.

The book is based on two reports dealing with theoretical considerations in the design of Stirling engines for automotive use, and with a feasibility study for an 80-100-hp automotive Stirling engine. The basic principles of heat engines are explained, and the Stirling engine is introduced, with attention given to the variety of Stirling engine types and their utility in comparison to other machines. Engine analysis is treated starting from elementary principles through cycle analysis, and analysis methodologies are classified as first, second or third order depending upon their degree of complexity and probable application. Current high-power engines are briefly described, and an extensive bibliography on Stirling engines and a directory of companies and individuals active in Stirling engine development are presented. A 170-hp-engine-powered vehicle of the 4500-lb inertia weight class is then presented, and results of vehicle and dynamometer engine tests are indicated. The vehicle, engine controls, and engine systems considerations of a 80-100-hp downsized Stirling engine design study are described, together with the results of the study.
A.L.W.

A80-28426 # **Future trends in the automobile.** D. Downs (Ricardo Consulting Engineers, Shoreham-by-Sea, Sussex, England). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume 0 - Opening ceremony. Symposium sponsored by the Studiengesellschaft Nahverkehr and Bundesministerium für Forschung und Technologie. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 132-144.

Automotive trends are discussed with regard to fuel, engines, air pollution and noise. Turbocharging, high compression (15:1) operation, and diesel engines are considered, as well as the use of a wide cut petroleum fuel from the mid-distillation range of crude petroleum, and liquefied petroleum gas. Attention is given to controlling air pollution from HC, CO, and NOx emissions by exhaust catalysts, stratified charge combustion, or indirect injection diesel engines. In addition, noise reduction by improvements in combustion, engine design, and engine shielding is considered, as well as vehicle modifications regarding aerodynamics, weight, and transmission.
J.P.B.

A80-28427 # **Air transport and travel in 2000 - Future requirements.** R. Abraham (Deutsche Lufthansa AG, Cologne, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume 0 - Opening ceremony. Symposium sponsored by the Studiengesellschaft Nahverkehr and Bundesministerium für Forschung und Technologie. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 199-221.

Air transportation over the next 20 years is discussed, considering increased business and tourist air travel, and the competitiveness of air travel with other forms of transportation as well as with advanced forms of communication. Attention is given to the improved use of available capacity, advances in aviation technology such as active flight control systems, and to improvements in fuel consumption, maintenance costs, and maximized payloads. J.P.B.

A80-28431 # **The dual-mode bus and further bus developments in France.** B. Dupont (Institut de Recherche des Transports, Arcueil, Val-de-Marne, France). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume A1.
Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 145-160.

The paper describes two electric vehicles for mass transport which are both equipped with Ni/Cd batteries and are currently undergoing testing in France. Attention is given to the dual mode trolley bus, a large-capacity trolley bus which can be powered either from overhead contact lines or by batteries. The batteries are recharged during passage along route sections with overhead contact lines. Also discussed is the electric mini-bus for inner-city areas, noting that it has a capacity of approximately 25 passengers and is designed for battery recharging at special points along the short inner-city routes. M.E.P.

A80-28458 # **The development of the magnetically suspended transportation system in the Federal Republic of Germany.** D. Rogg (Dornier System GmbH, Friedrichshafen, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume B2. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 89-124. 26 refs.

The German maglev development program is reviewed with reference to the objectives of government support, the details of the development-program phases, and vehicle design and operation. Two applications are considered: maglev as a long-distance transportation system coordinated with other systems, and maglev as a solution to specific transportation tasks in the medium-distance range. B.J.

A80-28470 **International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies.** Symposium sponsored by the Studiengesellschaft Nahverkehr and Bundesministerium für Forschung und Technologie. Bonn, Bundesministerium für Forschung und Technologie, 1979. Vol. C1, 463 p.; vol. C2, 129 p.

Modern vehicle propulsion systems are presented along with alternative forms of energy for use in a road traffic technology and requirements to be met by the automobile of the future. Trends in the construction of Otto engines in the USA and the future of the Diesel engine are discussed. Hybrid, electric, and alcohol driven vehicles are described. Requirements for vehicle design from the viewpoint of accident research are outlined. V.T.

A80-28471 # **A technical conception for highly developed spark-ignition engines.** H.-J. Förster and D. Gwinner (Daimler-Benz AG, Stuttgart, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1.
Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 15-38.

The paper examines future developments in spark-ignition engines including control of exhaust gas emissions. The optimization of combustion, shorter warm-up time, turbocharging, increasing the engine compression, and consumption at idling speed were examined; the future choice of the engine operating curve will be more strongly affected by fuel consumption, leading to more direct rear axle ratios or additional overdrives. It is shown that future engines will use more electronics for mixture proportioning and ignition timing, more fuel injection, utilize light alloys and ceramics, have higher compression ratios and lower idling speeds, and specify engine operating curves to provide good fuel consumption. A.T.

A80-28472 # **Trends in the construction of Otto engines in the U.S.** F. W. Bowditch and S. W. Martens (GM Technical Center, Warren, Mich.). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 39-54. 13 refs.

The paper presents the developments in the construction of Otto cycle gasoline engines in the U.S. It has been found that almost 25% of the hydrocarbons emitted came from crankcase emissions, so that the first hydrocarbon controls consisted of a positive crankcase ventilating system followed by an exhaust treatment, including injection of secondary air. CO formation was dependent on carburation and manifolding, and control of nitrogen oxides was accomplished with introduction of inert gases to the intake charge. It is concluded that effective exhaust system should be aided by the use of an oxidizing exhaust catalytic converter and setting the engine operating parameters for maximum fuel. A.T.

A80-28473 # **The future of the Diesel engine - A critical analysis.** P. Hofbauer and H.-A. Kuck (Volkswagenwerk AG, Wolfsburg, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 55-73.

An analysis of the future of the Diesel engine in passenger automobiles is presented. The disadvantages of a 1.5 liter swirl chamber Diesel engine were compared with the Otto engine with respect to low power to weight ratio and high noise level; modification of the swirl chamber configuration increased the power to weight ratio of the natural aspirated engine to 3 kg/kW. Turbocharging of the Diesel engine increased the power to weight ratio up to the range of Otto engines, and the results of the project were utilized in a demonstration vehicle with a capsulated turbocharged Diesel engine. A.T.

A80-28474 # **Advanced engine concepts - The Ford Proco engine.** E. J. Horton (Ford of Europe, Inc., Basildon, Essex, England). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 74-97.

The paper presents the Ford Proco engine designed as a fuel efficient engine for passenger automobile and light truck applications. The Proco combustion process using swirl movement induced through the intake port and squish action to provide fuel efficiency and air utilization are discussed along with the thermodynamics of economy improvement due to higher efficiency and compression ratio. A 6.6 liter single cylinder system and the combustion system configuration incorporated in an experimental 6.6 liter V8 multicylinder research engine are discussed; dynamometer mapping procedures applied to the V8 Proco engine are examined. Finally, emission and fuel economy projections, power characteristics, and peak combustion gas pressure are considered, and it is concluded that the 6.6L V8 Proco research engine can provide a 20% improvement in fuel economy over a carbureted engine of the same size. A.T.

A80-28475 # **Hybrid drive-systems for municipal buses.** J. Helling (Aachen, Technische Hochschule, Aachen, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 98-125.

The paper examines hybrid drive-systems for municipal buses. The three types of buses which use these systems and their longitudinal dynamics are described, noting high efficiency, reduction of energy consumption, and improvement of passenger comfort requirements. The energy consumption analyzed relative to the vehicle mass is plotted, and an expression is determined for energy consumption per passenger kilometer; the energy content of the storage component and its weights and costs are examined. Finally, the structure of transmission and operation of hybrid drive-system designs with diesel, flywheel, and infinitely variable transmissions are considered, concluding that the optimal component of the storage unit would be the flywheel and the differential gearing system in the selection of the transmission. A.T.

A80-28476 # **Experience with alcohol fuels.** W. Bernhardt (Volkswagenwerk AG, Wolfsburg, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 126-142. 7 refs. Research supported by the Bundesministerium für Forschung und Technologie.

The paper considers the use of methanol and ethanol as alternative automotive fuels. Both alcohols are the best fuel materials with respect to raw material availability, economy, handling, and exhaust emissions; prototype vehicles are being developed for the use of alcohol. The 15% methanol/gasoline blend and the 20% ethanol/gasoline blend can be used in the intermediate stage of the alcohol fuel technology; they were investigated in a fleet test, showing many advantages of the alcohol blends and alcohol fuels compared to conventional fuel. A.T.

A80-28477 # **Marginal conditions in automobile construction and their implications on the design of upper-category vehicles.** B. Strackerjan (Daimler-Benz AG, Stuttgart, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C1. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 230-252.

The paper discusses design of an upper-category research vehicle based on marginal conditions in transport, energy, and road accident volume. Energy conservation is discussed in terms of fuel consumption at various speeds, and drive units are examined including gas turbines and reciprocating piston engines. Aerodynamic drag is expected to have an important effect on the upper-category vehicle with a large amount of intercity driving; exhaust gas and emissions are considered, and finally safety statistics are examined relative to vehicle design and economy discussed through reduction of maintenance and repair. A.T.

A80-28481 # **Possibilities and limits of the conception of an up-to-date compact vehicle for the nineties.** D. Reister (Bayerische Motoren Werke AG, Munich, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C2. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 39-50.

The paper investigates the problem of how to achieve essential reductions of fuel, energy, and raw materials and improvements in exhaust and noise emissions and safety without affecting the appeal of the passenger vehicle in respect to driving and transport characteristics, economy and efficiency. The paper describes a BMW proposal for a compact vehicle. Attention is given to fuel consumption reduction, optimization of air resistance, selection of optimal drive, optimization of driving performance and consumption, and reduction of exhaust gas emission. Consideration is also given to reduction of noise emission and improvement of safety. M.E.P.

A80-28482 # **The contribution of Volkswagenwerk AG to the automobile concept of the 90's.** U. Seiffert (Volkswagenwerk AG, Wolfsburg, West Germany). In: International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volume C2. Bonn, Bundesministerium für Forschung und Technologie, 1979, p. 116-131.

A methodic approach to the development of an automobile concept for the 90's is presented. Attention is given to the need for the design of an automobile to permit fast responses to changes in market demand. It is shown that one base model should be used so that compliance with government standards in different countries can be assured with a minimum of modifications. Also discussed are the need for good fuel economy and the use of alternative fuels. Finally, consideration is given to the need for engineering measures to be aimed at reducing repair and maintenance costs so that the increasing cost of labor can be compensated for. M.E.P.

A80-28484 # **Electric vehicle in Japan.** M. Sugitani (Daihatsu Motor Co., Ltd., Osaka, Japan). *International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Paper.* 21 p.

The paper describes the development of the electric vehicle (EV) in Japan since 1965. The development of experimental vehicles, of new high energy density batteries, and of electric motors and control devices is discussed; oil consumption, noise prevention and road tests are examined. An experimental vehicle was tested in a pollution-free industrial park, and in 1975 electric sight-seeing vehicles with a DC shunt motor and a transistor hybrid control system were exhibited. Since 1976, the Japan Electric Vehicle Association and Electric Vehicle Council were established, and in 1978 the Electric Vehicle Engineering Research Association was organized for R&D work of mass-producible commercial type EV models. A.T.

A80-28485 # **Future prospects for use of the gas turbine for automobiles.** G. M. Thur (U.S. Department of Energy, Washington, D.C.). *International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Paper.* 8 p.

The development of gas turbine engines for use in automobiles is reviewed, and prospects for the replacement of automobile internal combustion engines by gas turbine engines are assessed. The replacement of aircraft internal combustion engines by exhaust-driven turbocharger engines and gas turbine engines is outlined, and problems with the previous attempts to commercialize the automotive gas turbine engine, associated with material cost and availability, engine efficiency and acceleration are identified. Subsequent requirements for emission reduction and fuel economy are then discussed as conditions favorable for the further development of gas turbine engines using ceramics in the hot sections. Work on ceramic engine parts is discussed, and the development status of U.S. and European automotive gas turbine programs is presented, noting current efforts in improving the design criteria for light-duty gas turbine engines and the commercialization and production of heavy-duty engines. A.L.W.

A80-28735 **Magnetooptical switch for synchronization of CO2 and red laser beams.** R. K. Ahrenkiel, S. J. Thomas (California University, Los Alamos, Calif.), G. A. Prinz, J. J. Krebs, and W. G. Maisch (U.S. Navy, Naval Research Laboratory, Washington, D.C.). *IEEE Journal of Quantum Electronics,* vol. QE-16, Mar. 1980, p. 253-255. 5 refs. Research sponsored by the U.S. Department of Energy.

In CO2 laser fusion systems low-jitter synchronization of a shorter wavelength probe laser with the pulsed CO2 fusion driver is desirable. In this paper a new method of beam synchronization using the thermomagnetic effect is described. The large Faraday effect, which has been reported for certain magnetic insulators, is utilized to switch a red HeNe laser beam. Synchronization of CO2 and red HeNe laser beams is obtained by using a CO2 laser to quench the ferrimagnetic Faraday effect in thin films of (Co,Cr,Fe)3O4 and (Co,Rh,Fe)3O4 which have a large Faraday effect at 6328 A. Switching occurs in subnanosecond times; it occurs when the absorption of CO2 laser radiation by lattice or restrahlen absorption is sufficient to heat the film above the Curie temperature. S.D.

A80-28801 **Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers.** Conference sponsored by the American Institute of Aeronautics and Astronautics and Solar Energy Research Institute. New York, American Institute of Aeronautics and Astronautics, Inc., 1980. 310 p. $35.

Papers are presented concerning the technology, and economics of wind energy conversion systems. Specific topics include the aerodynamic analysis of the Darrieus rotor, the numerical calculation of the flow near horizontal-axis wind turbine rotors, the calculation of dynamic wind turbine rotor loads, markets for wind energy systems, an oscillating-wing windmill, wind tunnel tests of wind rotors, wind turbine generator wakes, the application of a multispeed electrical generator to wind turbines, the feasibility of wind-powered systems for dairy farms, and wind characteristics over uniform and complex terrain. Attention is also given to performance tests of the DOE/NASA MOD-1 2000-kW wind turbine generator, the assessment of utility-related test data, offshore wind energy conversion systems, and the optimization of wind energy utilization economics through load management. A.L.W.

A80-28802 # **A comparison of aerodynamic analyses for the Darrieus Rotor.** R. E. Wilson and W. R. McKie (Oregon State University, Corvallis, Ore.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 1-7. 15 refs. (AIAA 80-0605)

A comparison is made of the single streamtube, multiple streamtube, fixed wake and free wake analyses of a straight bladed Darrieus Rotor using potential flow aerodynamics. The angle of attack, lift coefficient, circulation and loads are examined for a rotor operating at maximum performance. The unsteady aerodynamic forces are evaluated with special consideration given to wake crossing transients. (Author)

A80-28803 # **Aerodynamic interference between two Darrieus wind turbines.** P. R. Schatzle, P. C. Klimas, and H. R. Spahr (Sandia Laboratories, Albuquerque, N. Mex.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 8-13. 7 refs. Research supported by the U.S. Department of Energy. (AIAA 80-0606)

The effect of aerodynamic interference on the performance of two curved bladed Darrieus-type vertical axis wind turbines has been calculated using a vortex/lifting line aerodynamic model. The turbines have a tower-to-tower separation distance of 1.5 turbine diameters, with the line of turbine centers varying with respect to the ambient wind direction. The effects of freestream turbulence were neglected. For the cases examined, the calculations showed that the downwind turbine power decrement (1) was significant only when the line of turbine centers was coincident with the ambient wind direction, (2) increased with increasing tip-speed-ratio, and (3) is due more to induced flow angularities downstream than to speed deficits near the downstream turbine. (Author)

A80-28804 * # **Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades.** D. S. Dulikravich (NASA, Lewis Research Center, Cleveland, Ohio). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 14-19. 9 refs. Research sponsored by the National Research Council. (AIAA 80-0607)

The air flow through a propeller-type wind turbine rotor is characterized by three-dimensional rotating cascade effects about the inner portions of the rotor blades and compressibility effects about the tip regions of the blades. In the case of large rotor diameter and/or increased rotor angular speed, the existence of small supersonic zones terminated by weak shocks is possible. An exact nonlinear mathematical model (called a steady Full Potential Equation - FPE) that accounts for the above phenomena has been rederived. An artificially time dependent version of FPE was iteratively solved by a finite volume technique involving an artificial viscosity and a three-level consecutive mesh refinement. The exact boundary conditions were applied by generating a boundary conforming periodic computation mesh. (Author)

A80-28805 # **Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data.** J. A. Schetz (Virginia Polytechnic Institute and State University, Blacksburg, Va.) and R. L. Figard (Rockwell International Corp., Downey, Calif.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 20-28. 19 refs. Research supported by the U.S. Department of Agriculture. (AIAA 80-0608)

A numerical procedure based on the full Navier-Stokes equations as applied to the flow near a wind turbine rotor is developed. The flow is assumed axisymmetric, and the unsteady equations of motion are cast in terms of a stream function, one vorticity component and the peripheral velocity. The vorticity equation and the peripheral momentum equation are solved by an Alternating Differenece Implicit technique, and the Poisson equation for the stream function is solved by Direct Matrix Reduction. The rotor is modeled as an actuator disk, and the direct simulation of a given actual wind turbine rotor is considered in detail. Turbulent transport is modeled by an integrated Turbulent Kinetic Energy equation with a simple extension to represent the effects of swirl. Comparison with field measurements on a horizontal-axis, three-bladed Elektro 10 kw machine at a station right behind the rotor shows that a good prediction of the radial distribution of the axial velocity was obtained. (Author)

A80-28806 # **Wind energy conversion system simulation program.** R. J. Assarabowski and J. J. Mankauskas (United Technologies Research Center, East Hartford, Conn.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 29-36. (AIAA 80-0609)

The paper deals with a simulation program developed to evaluate the operation and performance of a Wind Energy Conversion System (WECS) and to perform a life-cycle economic analysis. To demonstrate the use of the program, a hypothetical system is described and analyzed. V.T.

A80-28807 # **Wind loading definition for the structural design of wind turbine generators.** A. Kareem, P. B. S. Lissaman, and T. G. Zambrano (AeroVironment, Inc., Pasadena, Calif.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 37-43. 21 refs. (AIAA 80-0610)

The stochastic nature of atmospheric wind plays an important role in the design of a wind turbine generator and the supporting structure. This paper is concerned with the identification of important statistical parameters of fluctuating wind such as turbulence intensity, power spectral density, and coherence functions. This information also provides an insight to the importance of turbulence characteristics for the practical design of wind turbine generators and is used as a guide for obtaining representative wind flow measurements in an area of Southern California currently being developed for large scale wind energy generation. For the practical design of wind turbine generators, short-term extreme wind loading descriptions for the stressing of structural systems and long-term loading for the fatigue analysis are discussed in time and frequency domains. (Author)

A80-28808 # **Dynamic rotor loads of a wind turbine via hand-held calculations.** W. Stoddard (U.S. Windpower, Inc., Burlington, Mass.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 44-49. 9 refs. (AIAA 80-0611)

A straightforward method has been developed for the calculation of wind turbine dynamic loads using a closed-form analytical model. This paper describes the model and provides an example calculation. Blade natural frequencies are used to identify an analytical blade model to represent the complex, flexible rotor blade. The rotor and wind parameters are identified and calculated, and the equations giving collective and cyclic blade trajectories are described. The corresponding root bending moments are calculated for the example set of conditions. The inplane coupling due to Coriolis force and flapping velocity is then assessed. Limitations of the theory and method are described, with simple procedures to assess their effects. (Author)

A80-28810 # **Markets for wind energy systems - When, where and at what price.** E. E. Johanson, M. Goldenblatt, R. Marshall, and M. Tennis (JBF Scientific Corp., Wilmington, Mass.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 55-60. 11 refs. Research supported by the U.S. Department of Energy and Electric Power Research Institute. (AIAA 80-0613)

The paper considers the resources, machines, loads, rate structures, and potential users' buy, no-buy criteria of a wind energy conversion system (WECS) economic analysis. Based upon these criteria, a market emergence picture is presented indicating where WECS penetration should begin and under what conditions. V.T.

A80-28811 # **Economic incentives to wind systems commercialization.** M. Lotker (Synetics Group, Inc., Bethesda, Md.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 61-72. Contract No. EG-77-C-01-4053. (AIAA 80-0617)

The paper reports on a study of economic incentives to commercialization of wind systems. The study analyzes the quantitative and qualitative impacts of government funded economic incentives on Wind Energy Conversion Systems (WECS). The uncertainties of WECS and WECS user economics required the development of analysis methodologies which are capable of parametrically analyzing a (1) broad range of incentives, (2) a variety of WECS cost and performance assumptions, and (3) various classes of WECS users. To develop these methods assumptions were made to produce a 'rational man' model for each market sector's decision process; WECS incentives were evaluated for WECS manufacturers, the utility market for WECS, and the residential market for WECS. A.T.

A80-28812 # **Economics of selected WECS dispersed applications.** S. Krawiec (Solar Energy Research Institute, Golden, Colo.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 73-79. (AIAA 80-0618)

The breakeven cost/market relationship and other economic indices of Wind Energy Conversion Systems (WECS) are analyzed with reference to various markets. It is shown that the economics of WECS varies widely by location depending on the availability of wind resources, the fluctuation of fuel prices and electricity rates, and the effects of seasonal changes on load profiles, even within the same application. The breakeven cost under the best market conditions should not exceed $1,200/installed kW (1979 $) in order to enable these systems to compete effectively with conventional energy systems. The capital cost of the wind systems has to be reduced to $600-$800 for broad market applications. V.L.

A80-28813 # **The wingmill - An oscillating-wing windmill.** W. McKinney and J. DeLaurier (Toronto, University, Toronto, Canada). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 80-87. 12 refs. Research supported by the National Research Council of Canada and University of Toronto. (AIAA 80-0621)

This paper describes an analytical and experimental investigation of a windmill which utilizes a harmonically-oscillating wing to extract wind energy. In particular, the wing's span is horizontally aligned and the airfoil is a chordwise-rigid symmetrical section. The whole wing oscillates in vertical translation and angle-of-attack, with prescribed phasing between the two motions. A theoretical analysis was developed utilizing unsteady-wing aerodynamics from aeroelasticity and the results guided the design of a working model for wind-tunnel experiments. For the cases tested, theory and experiment compared favorably, and showed the wingmill to be capable of efficiencies comparable to those of the best rotary designs. (Author)

A80-28814 # **Tension-field wind machine - A new concept in large-scale energy production.** D. Z. Bailey (Bailey Engineering, East Greenwich, R.I.; Aerospace Systems, Inc., Burlington, Mass.) and R. B. Noll (Aerospace Systems, Inc., Burlington, Mass.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 88-98. 9 refs. (AIAA 80-0622)

A unique wind energy conversion system (WECS) is described for large-scale (megawatt range) energy production. The uniqueness of the system is the application of the well-proven tension-field concept of suspension bridges to provide the required structural strength not only for the WECS support but also for the airfoil section. The machine typically has parallel, horizontal tensioned blades, spreaders to maintain rotational radius, and anchored end-bearings to accept the large axial tension. The basic configuration is called a horizontal cross-axis tension-field WECS or HCATF-WECS. Typical configurations, performance, cost effectiveness, and preliminary tests are discussed. (Author)

A80-28815 # **Model wind rotors in wind tunnels - Performance and the effect of Reynolds number.** L. W. Slager and D. E. Cromack (Massachusetts, University, Amherst, Mass.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 99-104. 15 refs. (AIAA 80-0623)

Small-scale wind rotors have been tested in a four-foot by four-foot open-throat wind tunnel. A variety of operation conditions are considered to evaluate design and off-design performance. It is noted that lifting line theory provides improved predictions when compared to experimental data over a broad range of operating conditions. V.T.

A80-28816 # **Experiments on an oscillating aerofoil and applications to wind energy converters.** K. H. Ly and V. A. L. Chasteau (Auckland, University, Auckland, New Zealand). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 105-111. 14 refs. (AIAA 80-0624)

Forces measured on a two-dimensional NACA 0012 aerofoil oscillating in pitch and combined pitch-heave are presented. The application of this data to the prediction of Darrieus turbine performance, by approximating blade-wind interaction to a pure pitch oscillation, showed some significant differences from steady aerofoil predictions. The use of an aerofoil oscillating in combined heave-pitch as a WEC is treated briefly. (Author)

A80-28817 # **Further studies on wind turbine generator wakes.** P. M. Sforza, P. Sheerin, and M. Smorto (New York, Polytechnic Institute, Farmingdale, N.Y.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautic and Astronautics, Inc., 1980, p. 112-122. 58 refs. (AIAA 80-0626)

An experimental and theoretical investigation of the wake behind a simulated wind turbine is presented. Modeling of wake in an environmental wind tunnel is described and experimental results for the three-dimensional model wake flow field are presented. A three-dimensional turbulent flow analysis is developed to deal with prediction of the wake characteristics. The theoretical results are shown to display the experimentally observed features of the wake, and may be used to predict the behavior of full-scale wind turbines under conditions of practical importance. (Author)

A80-28818 # **Preliminary work concerning the near wake structure of the Darrieus turbine.** J. H. Strickland and A. L. Goldman (Texas Tech University, Lubbock, Tex.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 123-129. 26 refs. Research supported by the U.S. Department of Energy. (AIAA 80-0627)

The potential of a vortex analytical model in making near wake predictions is analyzed. The near wake predictions using this model are compared with a full-scale Darrieus turbine operating in a natural wind environment. Consideration is given to predicted velocity profiles, and corrections for wind direction fluctuations. V.T.

A80-28819 # **Wind-turbine power improvement with modern airfoil sections and multiple-speed generators.** B. F. Habron (Westinghouse Research and Development Center, Pittsburgh, Pa.), F. R. Goldschmied, and H. S. Kirschbaum. In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 130-147. 11 refs. (AIAA 80-0633)

A brief study was conducted on the power improvement of horizontal-axis wind turbines with modern airfoil sections and multiple-speed PAM generators. On the basis of a reference single-speed variable-pitch wind turbine with NACA 23018 blades, the following improvements can be made with a three-speed PAM generator and NASA LS(1)-0417 blades: (1) 15% gain of plant factor, i.e., average annual energy generation, (2) 17% gain of power output at a rated wind speed of 25 mph, and (3) 70% gain of power output at a higher wind speed of 32 mph. (Author)

A80-28820 # **Low cost composite blades for large wind turbines.** D. J. Peery and O. Weingart (Structural Composites Industries, Inc., Azusa, Calif.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 148-154. 7 refs. Research sponsored by the U.S. Department of Energy. (AIAA 80-0634)

The paper discusses results of the studies of a low-cost composite blade being designed to meet NASA requirements. The proposed composite blade is a one-piece reliable design that can be fabricated in a continuous operation on automatic machinery. Consideration is given to design requirements, material, and blade structural properties. V.T.

A80-28821 # **Multi-speed electrical generator application to wind turbines.** T. S. Andersen (Westinghouse Electric Corp., Advanced Energy Systems Div., Pittsburgh, Pa.) and H. S. Kirschbaum. In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 155-162. (AIAA 80-0635)

A cost-effective method to achieve increased energy conversion from wind turbine generators is presented. Most large wind turbines designed to supply electricity to a power have been optimized at a single rotor speed to maintain synchronism with the grid. Suboptimal performance results from spatial and temporal variation in actual wind speeds. Use of mechanical or electrical devices to allow variable or multiple rotor speeds in operation to obtain more efficient aerodynamic performance offer a wider range of wind speeds can improve annual energy capture from 10-30%. The Pole Amplitude Modulated multi-speed induction generator is shown to achieve such benefits without introduction of adverse costs or inefficiencies associated with other conventional approaches. (Author)

A80-28822 # **Wind turbines for irrigation pumping.** R. N. Clark (Conservation and Production Laboratory, Bushland, Tex.), V. Nelson, and R. E. Barieau (West Texas State University, Canyon, Tex.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 163-169. (AIAA 80-0639)

A80-28823 # **Technical and economic feasibility of wind-powered systems for dairy farms.** J. G. McGowan (Massachusetts, University, Amherst, Mass.) and P. F. Wendelgass (New York State, Energy Office, Albany, N.Y.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 170-178. 18 refs. (AIAA 80-0641)

A80-28824 # **Demonstration and analysis of a combined wind-solar energy conversion system.** L. Icerman, A. Swift (Washington University, St. Louis, Mo.), and W. Cargal (Solar Building Corp., St. Louis, Mo.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 179-184. 10 refs. Contract No. EW-79-G-47-1025. (AIAA 80-0643)

The current proof-of-concept demonstration project consists of two integrated components: (i) an experimental program to construct and operate a model combined wind-solar energy conversion system and (ii) an analytical program to model the performance of full-sized combined wind-solar system designs. The experimental program is designed to: (i) investigate systems integration problems; (ii) test the concept of combined wind-solar systems; (iii) monitor the operation of a scale-model system; and (iv) provide empirical data to validate performance simulations. The analytical phase is developing a computer simulation model to: (i) compare combined wind-solar system operation with solar- and wind-only designs; (ii) analyze the impact of a combined wind-solar system on optimal storage capacities; and (iii) translate the empirical results of the system model testing program into useful general design information and performance evaluations of full-scale combined wind-solar system designs. (Author)

A80-28825 # **Wind characteristics over complex terrain relative to WECS siting.** W. Frost (FWG Associates, Inc.; Tennessee University, Tullahoma, Tenn.) and C. F. Shieh (FWG Associates, Inc., Tullahoma, Tenn.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 185-193. 23 refs. Contract No. E(45-1)-2443. (AIAA 80-0645)

The phenomenon of atmospheric flow over various surface features relative to WECS siting in complex terrain has been analyzed systematically. Although the information presented cannot be utilized to compute highly accurate values of the wind power at a site nor to identify the exact optimum location for a WECS (wind energy conversion system), the wind prospector can use it to select locations where the wind field will be potentially higher and certainly not less than the synoptic wind. Moreover, siting personnel will have the background knowledge needed to identify and to avoid regions of low wind speed and of highly turbulent and periodic flow. This knowledge is provided under the considerations of the effects of the geometries of terrain features, their surface conditions and atmosphere stratifications, as well as the history of wind approaching the WECS site. The application of this information will provide the basic guidance in practical WECS siting. (Author)

A80-28827 # **Project windsheet - An interim report.** E. X. Berry (Atmospheric Research and Technology, Inc., Sacramento, Calif.), R. K. Hauser, and W. G. Lane (California State University, Chico, Calif.). In: Wind Energy Conference, Boulder, Colo., April

9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 197-199. (AIAA 80-0647)

The paper deals with a wind-energy prospecting project Windesert being conducted over approximately a 90,000-sq-km area including the southern California desert. Twenty-five anemometer stations have been installed which give hourly resolution of wind run, north-south and east-west wind-run components, wind energy, and wind-energy weighted run. Field operations, equipment and system design are considered. V.T.

A80-28828 # **Measurements of wind shear at the Mod-1 Site, Boone, N.C.** M. Garstang, J. W. Snow, and G. D. Emmitt (Virginia, University, Charlottesville, Va.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 200-204. Contract No. EY-76-C-06-1830. (AIAA 80-0648)

Three components of the wind field, temperature and pressure were measured by means of tethered balloon-borne sondes from the surface to 175 meters over a ten day period at the Mod-1 Site in Boone, N.C. Composite wind profiles are presented for different flow and stability regimes. The most extreme shears, on the order of 0.3/sec, were found between 10 meters and hub height. Individual profiles of wind and temperature show the effect of nocturnal cooling and accompanying surface stratification on the intensity of the wind shear. The variations of gustiness with height and of the wind shear itself are discussed. (Author)

A80-28829 # **SWECS qualifications criteria for state tax incentive programs.** J. V. Guerrero and C. Alford (Rockwell International Corp., Golden, Colo.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 205-208. 9 refs. (AIAA 80-0650)

The paper considers Small Wind Energy Conversion Systems (SWECS) qualifications criteria for state tax incentive programs. The high initial cost of SWECS require state and federal financial incentives to promote its public acceptance; several prototype qualification documents are being prepared to guide the states in formulating their specific criteria. The formulation of a comprehensive range of qualification documents enables each state to select one as a model representative of its needs, modify the prototype qualification to satisfy its requirements, or change its own qualification requirements based on inputs provided by a range of documents. A.T.

A80-28830 # **An integrated approach to energy supply for small communities.** F. K. Manasse (New Hampshire, University, Durham, N.H.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 209-217. 6 refs. (AIAA 80-0651)

The use of hybrid or integrated systems in which wind power is combined with such renewable energy sources as hydro, biomass, and solar technologies is proposed for remote community applications, as for instance in New England. Attention is given to generic applications and methods to overcome their temporal, seasonal, and geographic limitations through multiple source integration, showing that the integrated schemes can replace the fossil-fueled electric generating systems and encourage the use of locally available resources. L.M.

A80-28831 # **UTRC 8 kW wind turbine tests.** M. C. Cheney (United Technologies Research Center, East Hartford, Conn.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 218-226. 5 refs. (AIAA 80-0657)

The various features of a bearingless wind turbine, which were conceived and wind tunnel tested over three years, were demonstrated in full scale during the field testing reported in this paper. The tests also demonstrated the predicted performances of 9 kW at 20 mph and the high speed stall control feature. V.T.

A80-28832 # **Aerodynamic tests of Darrieus turbine blades.** P. G. Migliore, W. P. Wolfe, and R. E. Walters (West Virginia University, Morgantown, W. Va.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 227-237. 20 refs. Contract No. DE-AC05-76ET05135. (AIAA 80-0625)

An indoor facility was developed for aerodynamic testing of Darrieus wind turbine blades. A three component strain gage balance was used to determine lift, drag, and moment coefficients of blades whose angle of attack, chord-to-radius ratio and Reynolds number could be systematically varied. Two blades were tested, each having an aspect ratio of 6, a chord of 0.3 meters and a span of 1.8 meters. The first blade was of NACA 0015 airfoil section while the second was a 15% elliptical section with a modified rounded trailing edge. This second blade was tested without and with (circulation control) high energy air tangentially injected into the boundary layer at approximately 98% chord. Maximum lift coefficients of 0.92, 0.98 and 2.30 were measured respectively. The elliptical blade tested was not of optimum shape and much greater lift augmentation is possible. Wind turbine performance calculations indicate that net power coefficient increases of 50% might be achieved with circulation control. The effects of flow curvature on blade aerodynamics were experimentally verified. Both blades demonstrated virtual camber and incidence as evidenced by non-zero moment coefficients and angles of zero lift. Boundary layer centrifugal effects were also demonstrated. (Author)

A80-28833 # **Gust models for design and performance analyses of wind turbines.** J. C. Doran and D. C. Powell (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 238-243. 6 refs. Contract No. EY-76-C-06-1830. (AIAA 80-0644)

This paper presents an analysis of discrete gusts that are characterized by the amplitude and duration of departures of the fluctuating wind speed from some mean value. The data were recorded using a circular array of anemometers, 49 m in diameter, mounted in a vertical plane. The observed gust characteristics at a fixed point are related to features of gusts that would be experienced by wind turbines. Spatial averaging of gusts is derived from low-pass filtering, and the frequency of occurrence of gust amplitudes and times as a function of filter length is shown. The relationship between gust times and amplitudes is also given in terms of curves that allow determination of the range of gust times associated with a given amplitude. Finally, comparisons are made between the gust environment at a fixed point and that felt by a rotating blade element. (Author)

A80-28834 # **An assessment of utility-related test data from large wind turbine generator tests.** W. A. Vachon (Arthur D. Little, Inc., Cambridge, Mass.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 244-248. 9 refs. Research supported by the Electric Power Research Institute. (AIAA 80-0631)

An ongoing project sponsored by the Electric Power Research Institute (EPRI) is described in which performance and test data emanating from the U.S. Department of Energy (DOE) large wind turbine generator (WT) tests is examined as an aid to electric utilities contemplating the use of WT's. It is shown that if the lost operating time of DOE large wind turbine tests is analyzed in detail, it is possible to derive a higher estimated machine availability by eliminating downtime associated with the research and engineering nature of the machine tests. Recommendations are made on the performance parameters which should be measured during WT tests to make the resulting information of greater value to utilities. Lastly, estimates of the annual average capacity factor from both federally and privately funded large WT's are derived for a wind speed distribution at a site with a 6.3 m/s (14 mph) annual average wind speed. (Author)

A80-28835 * # **Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator.** R. L. Puthoff, J. L. Collins, and R. A. Wolf (NASA, Lewis Research Center, Cleveland, Ohio). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 249-260. 5 refs. (AIAA 80-0638)

The paper describes the DOE/NASA Mod-1 wind turbine generator, its assembly and testing, and its installation at Boone, North Carolina. The paper concludes with performance data taken during the initial tests conducted on the machine. The successful installation and initial operation of the Mod-1 wind turbine generator has had the following results: (1) megawatt-size wind turbines can be operated satisfactorily on utility grids; (2) the structural loads can be predicted by existing codes; (3) assembly of the machine on top of the tower presents no major problem; (4) large blades 100 ft long can be transported long distances and over mountain roads; and (5) operating experience and performance data will contribute substantially to the design of future low-cost wind turbines. S.D.

A80-28836 * # **Teetered, tip-controlled rotor - Preliminary test results from Mod-O 100-kW experimental wind turbine.** J. C. Glasgow and D. R. Miller (NASA, Lewis Research Center, Cleveland, Ohio). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 261-268. 5 refs. (AIAA 80-0642)

A series of tests is currently being conducted using the DOE/NASA 100 kW Experimental Wind Turbine with a two-bladed, teetered rotor with 30% span tip control. Preliminary evaluation test results indicates that the teetered rotor significantly decreases loads on the yaw drive mechanism and reduces blade cyclic flapwise bending moments by 25% at the 20% span location when compared to rigid hub rotor. The teetered hub performed well but did impact the teeter stops on occasion as wind speed and/or direction varied rapidly. The tip-controlled rotor performed satisfactorily with some expected loss of control when compared to the full span pitchable blade. The performance results indicate that a review of techniques used to calculate rotor power is in order. (Author)

A80-28837 # **Economic assessment of the Darrieus wind turbine.** R. O. Nellums (Sandia Laboratories, Albuquerque, N. Mex.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 269-274. 8 refs. Contract No. DE-AC04-76DP00789. (AIAA 80-0614)

Development of a second-generation vertical axis wind turbine (VAWT) is currently in progress. This paper assesses second-generation economic progress to date in relation to first-generation experience. Cost performance of first-generation VAWTs in production is established to be 5 to 6 cents/kWh using a combination of economic projections, experimental performance data, and prototype fabrication cost experience. Economic methods and design guidelines are discussed as they are applied to second-generation analysis of foundation volume, drive train efficiency, guy cable tiedown configuration, and improved control of aerodynamic power regulation. Reference is also made to preliminary work on aerodynamic efficiency, blade structural tailoring, and installation procedures. Potential for energy cost reduction in the second-generation is concluded to be 35 to 50% under the assumptions contained in the paper. (Author)

A80-28838 # **The potential for optimizing the economics of wind energy utilization on a dairy farm through load management.** E. B. Kear (Clarkson College of Technology, Potsdam, N.Y.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 275-279. 7 refs. (AIAA 80-0640)

A80-28839 # **Offshore wind energy conversion systems.** L. A. Kilar, P. H. Stiller (Westinghouse Electric Corp., East Pittsburgh, Pa.), and D. F. Anacona (U.S. Department of Energy, Washington, D.C.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 280-285. Research supported by the U.S. Department of Energy. (AIAA 80-0619)

The paper summarizes the findings of a comprehensive assessment of off-shore wind energy conversion systems. Eight generic types of support platforms are discussed, and their conceptual designs are given. Attention is given to the economics of such systems, emphasizing the busbar energy cost measures. Onshore energy costs are developed in terms of controlling environmental parameters, distance from shore and equipment type. C.F.W.

A80-28840 # **New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems.** O. Ljungstrom (Flygtekniska Forsoksanstalten, Bromma, Sweden). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 286-298. 24 refs. Research supported by the Styrelsen for Tekniskutveckling and NE. (AIAA 80-0620)

The basic characteristics of three selected vertical axis wind turbine (VAWT) subsystems in Sweden are discussed. Results of preliminary small-scale rotor experiments are outlined. An example of application of these subsystems to a 20-MW VAWT, the L-180 Poseidon is presented. V.T.

A80-28841 # **A refined windmill rotor model.** J. A. C. Bugge (Danmarks Tekniske Hojskole, Lyngby, Denmark). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 299-303. (AIAA 80-0628)

A model for calculating performance and aerodynamic blade loads under various working conditions including fully stalled rotor and instationary inflow, is presently being developed. The theory used is a further development of the lifting line theory. In order to be able to handle the stall case, the usual condition of no flow across the meanline at the three quarter point is relaxed, and a certain amount of cross flow is allowed for. The bound circulation on the blade is calculated iteratively within each step of a simulation scheme. The induced velocities at the blades and the self-induced distortion of the rotor wake is calculated using three types of wake representation: vortex sheet, discrete vortex filaments and dipoles each enclosing a given number of vortex filaments. , (Author)

A80-28842 # **Aerodynamic performance of the DOE/Sandia 17-m vertical axis wind turbine in the two-bladed configuration.** M. H. Worstell (Sandia Laboratories, Albuquerque, N. Mex.). In: Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 304-306. Contract No. DE-AC04-76DP00789. (AIAA 80-0655)

The aerodynamic performance of the DOE/Sandia 17-m Darrieus wind turbine is presented in the two-bladed configuration for two-blade constructions: (1) strutted composite NACA 0012, 21.0 inch chord, (2) unstrutted aluminum extrusion NACA 0015, 24.0 inch chord. Significant increases in overall performance were obtained for the extruded blade which represents a currently viable low-cost blade construction technique for the Darrieus wind turbine. (Author)

A80-28858 # **Solar water heating in the Midwest - An economic assessment based on measured performance.** W. P.

Corcoran (Solar Energy Research Institute, Golden, Colo.), R. C. Foote (Citizens Gas and Coke Utility, Indianapolis, Ind.), R. E. Henderson, G. D. Huffman, and J. I. Kaplan (Indianapolis Center for Advanced Research; Purdue University, Indianapolis, Ind.). *Journal of Energy*, vol. 4, Jan.-Feb. 1980, p. 39-43. 24 refs. Research supported by the Citizens Gas and Coke Utility.

Solar hot water heaters using both natural and forced flow have been used for many years. Both experimental and theoretical investigations have been conducted recently. The bulk of the experimental studies have been carried out over short periods of time, but assessments of maintainability, upkeep, and the related cost have not been addressed. In the present study, performance data have been obtained for a 12-mo period. Maintenance problems are documented, and the long-term measured performance is used as the basis for an economic evaluation of solar hot water systems. Substantial reductions in installed systems costs are required before the solar units can compete economically with natural gas in the Midwest. (Author)

A80-28859 # **Condensation of aluminum when used as a fuel additive in MHD power generation.** A. S. Myerson (Dayton, University, Dayton, Ohio). *Journal of Energy*, vol. 4, Jan.-Feb. 1980, p. 44-46. 12 refs.

An analytic study of alumina nucleation and growth is undertaken to determine whether metal oxides will condense as predicted by equilibrium calculations in the short time they are present in an MHD channel. Attention is given to the method employed to calculate condensation times, where finite time intervals are chosen during which particles are added to the system at an instantaneous nucleation rate. It is found that alumina condensation time increased rapidly with decreasing initial supersaturation at a given initial temperature. C.F.W.

A80-28892 **PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record.** Conference sponsored by the Institute of Electrical and Electronics Engineers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979. 495 p. Members, $21.; nonmembers, $28.

The papers deal with such fields as power electronics, power converters, switching regulators, and electromagnetic devices and circuits. Among the topics covered are: the general theory of switching power converters, modeling and analysis of power processing systems; a switching amplifier for capacitive loads, using incremental resonant charging; the general topological properties of switching structures; a peak power tracking technique for photovoltaic arrays; a unified derivation of switching dc-dc converter technologies; a new current-fed converter technology; a high-reliability control circuit of PWM inverter for electric car drive; a microcomputer-based controller for a single phase 2-HP dc motor drive; and a method of designing switching power supplies for improved reliability and maintainability. V.P.

A80-28908 **Peak power tracking technique for photovoltaic arrays.** D. A. Fox, K. C. Shuey, and D. L. Stechschulte (Westinghouse Electric Corp., Lima, Ohio). In: PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 219-227.

A new method of peak power tracking for photovoltaic arrays is presented. The method utilizes ripple inherent in the system to determine the correct operating point for maximum power from the array. Peak power tracking is important for efficient operation of photovoltaic power systems. Operation of a microprocessor controlled 50KVA power conditioning unit utilizing the new peak power tracking method is described. The unit features automatic start up and parallel operation with the utility grid. (Author)

A80-28953 **Coal liquefaction processes.** P. Nowacki. Park Ridge, N.J., Noyes Data Corp. (Chemical Technology Review, No. 131; Energy Technology Review, No. 45), 1979. 349 p. 107 refs. $48.

The book describes the latest available technologies pertaining to the liquefaction of coal, thereby forming liquid fuel products that are equivalent to petroleum products. Attention is focused on recent developments in coal liquefaction processes based on pyrolysis, solvent extraction, catalytic liquefaction, and indirect liquefaction. In particular, the basic concept and chemistry of main process variants are discussed along with the special problems inherent in coal processing. Process economics, status, history, environmental impact and scheduling are also discussed. All the important domestic and foreign processes are covered; each approach is illustrated by reference to existing process development units, pilot units or large installations. S.D.

A80-28954 **Wind power: Recent developments.** Edited by D. J. De Renzo. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 46), 1979. 357 p. $36.

The work presents the most important developments which have occurred in wind power technology in the U.S. in the last five years. New useful devices and constructions are interpreted and explained by actual case histories, which provide a sound background for action toward combating the energy shortage. Special attention is given to rotor development, wind turbines, and the application of wind power to electric utilities. C.F.W.

A80-29006 **A microprocessor-based system for the monitoring and control of a solar installation.** S. A. Tyuluman, D. C. Schroder, and M. E. Austin (Texas, University, El Paso, Tex.). *IEEE Transactions on Industrial Electronics and Control Instrumentation*, vol. IECI-27, Feb. 1980, p. 1-4. 6 refs.

This paper describes the microcomputer hardware and software used to instrument and control a flat plate solar energy collection system. The procured data is transferred to a minicomputer for further signal processing and analysis. The system utilizes microelectronic circuits to digitize and store data on magnetic tape as well as use that data for control decisions. The scheme described was found to be inexpensive yet effective. (Author)

A80-29007 **Processing of solid fossil-fuel deposits by electrical induction heating.** S. T. Fisher. *IEEE Transactions on Industrial Electronics and Control Instrumentation*, vol. IECI-27, Feb. 1980, p. 19-26. 8 refs.

A study has been made to determine the feasibility of extracting the energy commodities electricity, gas, petroleum, chemical feedstocks, and coke from the solid fossil fuels coal, oil shale, oil sand, and heavy oil by the electrical induction heating of the deposits. Available electrical, physical, and chemical data indicate that this process may be technically and economically feasible. Some basic data are missing, and it has been necessary to indicate possible ranges of values for some parameters. The tentative conclusions drawn are the following. All four solid fossil fuels can be processed successfully underground. All five energy commodities can be produced economically in adequate quantities for a period of a century or more in North America, without recourse to any other major energy source. The development and construction time required is short enough to permit an uninterrupted supply of all energy commodities as present sources decline. (Author)

A80-29008 **A battery-run pulsed motor with inherent dynamic electronic switch control.** K. C. Tripathi, P. Lal, P. R. Sarma, A. K. Sharma, and V. Prakash (Bhabha Atomic Research Centre, Nuclear Research Laboratory, Srinagar, India). *IEEE Transactions on Industrial Electronics and Control Instrumentation*, vol. IECI-27, Feb. 1980, p. 29-34. 7 refs.

A new type of battery-run brushless ferrite-magnet dc motor system is described. Its rotor part consists of a few permanent ceramic (ferrite) magnets uniformly spread on the rim of a disk (wheel) and the stator part consists of electromagnets placed in such a way that when energized, they always form a repulsive couple to rotate the disk. A sensor coil is placed to give an induced pulse signal, which acts as an inherent dynamic switching time control for the automatic electronic control system. Control of speed, brake system, and safety measures are also discussed. Experimental values for the present system are given. Some possible applications are suggested. (Author)

A80-29037 **Going with the wind.** W. Nesbit, E. DeMeo, and F. Goodman, Jr. (Electric Power Research Institute, Palo Alto, Calif.). *EPRI Journal*, vol. 5, Mar. 1980, p. 6-17.

The current status of wind generation of electricity is surveyed, noting that extracting electric power from such an abundant and inconsistent source requires the correct size, a reliable machine, and power system flexibility to adapt to the air stream. Attention is given to currently operating installations in New Mexico, North Carolina, Puerto Rico, and Rhode Island. Also discussed is the breadth of the federal program including NASA work for the DOE such as the 2.5 MW MOD-2, as well as Sandia work on Darreius design of vertical axis turbines. Other topics examined include siting considerations, private efforts, the depth of analysis required, and the establishing of utility requirements. M.E.P.

A80-29038 **DOE moves ahead with geothermal.** *EPRI Journal*, vol. 5, Mar. 1980, p. 28-32.

Various forms of geothermal energy, such as: dry steam and hot water (hydrothermal resources), geopressured water with dissolved methane gas, and dry, hot rock are surveyed. A federal program under the Department of Energy for the development of hydrothermal resources in the near term (around 1985), geopressured resources in the midterm (1990-1995), and dry, hot rock in the long term (2000) is proposed, stressing the integral role in it for the private industry. Resource finding, drilling and production testing for heat and electricity of temperatures below 400 F are discussed. The flash technology and the binary cycle for lower cost power are also discussed and environmental problems (water salinity) are analyzed. O.L.

A80-29051 **Solar energy: Chemical conversion and storage.** Edited by R. R. Hautala, R. B. King, and C. Kutal (Georgia, University, Athens, Ga.). Clifton, N.J., Humana Press, Inc., 1979. 432 p. $34.

Papers are presented on solar energy conversion in photosynthesis, the chlorophyll A water-splitting light reaction, light-induced electron-transfer reactions in solution, effect of the micellar phase on photo-induced reactions, and on reversible excited-state electron-transfer reactions of transition metal complexes. Individual topics include solar cell technology, and photocyclization. C.F.W.

A80-29052 **Petroleum plantations.** M. Calvin (California, University, Berkeley, Calif.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 1-30. 54 refs. Research sponsored by the U.S. Department of Energy.

Photosynthesis is examined as an annually renewable resource for material and energy. The production of fermentation alcohol from sugar cane as a major source of materials for chemical feedstocks is examined as well as the direct photosynthetic production of hydrocarbons from known plant sources. Experiments are underway to analyze the hydrocarbons from Euphorbias and other hydrocarbon containing plants with a view toward determining their various chemical components. In addition, experimental plantings of several species of Euphorbias have begun to obtain data on which species would be most successful. Using Euphorbia lathyris, there are indications that we may expect a yield of approximately ten barrels of hydrocarbon material per acre in a seven-month growing period on semiarid land. (Author)

A80-29053 **Solar energy conversion in photosynthesis - Features relevant to artificial systems for the photochemical conversion of solar energy.** J. R. Bolton (Western Ontario, University, London, Canada). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 31-50. 46 refs.

The mechanism and efficiency of photosynthesis as a solar energy converter is examined and the features that are most relevant to the design of artificial systems are presented. A brief review of the thermodynamic and kinetic limitations on any photochemical conversion and storage process is discussed. A wavelength threshold relation is derived for a general photochemical solar energy process, and it is shown that if photosynthesis were to proceed with one photosystem, then the threshold wavelength would be about 610 nm. C.F.W.

A80-29054 **The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes.** R. E. Schwerzel, E. W. Brooman, R. A. Craig, D. D. Levy, F. R. Moore, L. E. Vaaler, and V. E. Wood (Battelle Columbus Laboratories, Columbus, Ohio). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 83-115. 28 refs. Contract No. W-7405-eng-92. DOE Task 95.

The paper presents an approach, based on the photoelectrolysis of water, by which the conversion of biomass materials to gaseous fuels can be accomplished. A review of the photoelectrolysis technique is presented, and the results on which the tandem photoelectrolysis plant concept is based, are studied. Attention is given to the concept of a photochemical diode, for the production of hydrogen and oxygen, which has evolved as an extension of the development of p-n heterotype photoelectrolysis cells. C.F.W.

A80-29055 **Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications.** D. G. Whitten, P. J. DeLaive, T. K. Foreman, J. A. Mercer-Smith, R. H. Schmehl (North Carolina, University, Chapel Hill, N.C.), and C. Giannotti (North Carolina, University, Chapel Hill, N.C.; CNRS, Institut de Chimie des Substances Naturelles, Gif-sur-Yvette, Essonne, France). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 117-140. 87 refs. Research supported by the W. R. Grace Co. and NATO; NSF Grant No. CHE-76-01074; Grants No. DAAG29-77-G-0063; No. NIH-GM-15238-11.

The paper presents a review of some investigations of light-induced electron transfer reactions and redox chemistry resulting from these processes that occur in solutions and in various molecular organizates. The first section presents solution-phase photoredox processes that will focus on ways to prevent energy wasting back reactions, such that the high energy products produced in reactions, such as 1 and 3, can be diverted to provide useable and/or energy storage. The second section deals with recent studies of electron transfer reactions in organizates and at interfaces that suggest an expanded scope and possible new applications for these products. C.F.W.

A80-29056 **Photochemical determinants of the efficiency of photogalvanic conversion of solar energy.** M. Z. Hoffman and N. N. Lichtin (Boston University, Boston, Mass.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 153-187. 76 refs. Contract No. EY-76-S-02-2889.

The photochemical determinants of the efficiency of photogalvanic cell operation are examined, which include: the absorption spectral characteristics of the cell solution, the efficiency of formation of separated charge carriers, and the lifetimes of the carriers toward back electron transfer. Modulation of bulk solution dynamics can be achieved by variation of the solution medium. The photochemical determinants are discussed with particular reference to the use of thionine or Ru(bpy)2/3(+) as the light absorbing species. (Author)

A80-29057 **Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes.** H. T. Tien, J. Higgins, and J. Mountz (Michigan State University, East Lansing, Mich.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 203-235. 30 refs. Research supported by the Michigan State University.

Numerous electrochemical photocells have been proposed for the direct conversion of solar energy to electricity or chemical fuel. These cells, on the basis of two well established photoelectric effects, can be classified as either photovoltaic (PV) or photogalvanic (PG). The operation of a PV cell depends on the generation of an EMF as a result of the absorption of light, whereas the operation of a PG cell relies on the excitation by light of photoactive species in solution which induces a Faradaic process at the electrode. This paper describes a new type of electrochemical photocell, the operation of which is based on the combined principles of the PV and PG phenomena. This system, having the advantages of both the PV and PG cell, is therefore called the photogalvanovoltaic (PGV) cell. The key element of the cell responsible for the PV effect is a porphyrin-coated glassy carbon electrode. Either Pt or glassy carbon can serve as the counter electrode. The results of an electrochemical PV cell using porphyrin-coated glassy carbon electrodes are also described. (Author)

A80-29058 **Growth and characterization of thin film III-V compound semiconductor material for solar cell applications.** W. D. Johnston, Jr. (Bell Telephone Laboratories, Inc., Holmdel, N.J.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 237-260. 10 refs.

The paper presents an overview of the growth and characterization of thin film III-V compound semiconductor materials for solar cell applications. Attention is given to the cost analysis of GaAs or InP solar cells prepared on single crystal substrates, and to the basic properties of polycrystalline thin films. Growth techniques of GaAs solar cells are discussed, including reversible reactions, the open-tube chloride VPE process, and metallorganic growth. The electrical characteristics of thin GaAs and InP films are also discussed. It is concluded that any photovoltaic array for practical terrestrial use will have to be provided with a complete hermetic seal, to ensure stability at differing temperatures. C.F.W.

A80-29059 **Nitrogen reducing solar cells.** G. N. Schrauzer, T. D. Guth, M. R. Palmer, and J. Salehi (California, University, La Jolla, Calif.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 261-269. 15 refs. Research supported by the University of California; NSF Grant No. CHE-76-10890.

An alternative approach to the use of a natural gas for existing methods of industrial ammonia synthesis is presented based on biological nitrogen fixation. The main purpose of this research is to establish the fundamental chemical aspects of the mechanism and to develop functional models of the nitrogen fixing enzyme that could become the basis of new catalytic processes. Attention is given to photooxidation of: mercury to mercuric oxide, cyanide to cyanate, and of iodide to iodine. Several experiments are conducted to determine whether minerals other than those containing titanium could possess nitrogen photoreducing activity. C.F.W.

A80-29060 **Photosensitization mechanisms for energy storing isomerizations.** G. Jones, II, P. T. Xuan, and S. H. Chiang (Boston University, Boston, Mass.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 271-298. 50 refs. Research supported by the U.S. Department of Energy and U.S. Navy.

The prospects for driving endoergic reactions of simple, relatively abundant, organic chemicals by photochemical means have been examined. Photoisomerization reactions which have some potential for storage of solar energy as latent heat in kinetically stable products are surveyed. Emphasis is placed on methods for the photosensitization of storage chemicals to visible light. Mechanisms include excited state complexation of isomerizable substrates through electron donor-acceptor attraction and conventional energy transfer photosensitization. Efficient isomerization of a norbornadiene derivative using the latter technique and photosensitizers absorbing past 500 nm is described. Factors controlling the efficiency of endothermic triplet energy transfer are outlined. The concept of 'thermal upconversion' of the excitation energies of visible absorbing sensitizers is introduced, including a demonstration of improved quantum efficiency as a function of temperature for an isomerization which utilizes a very low energy sensitizer. (Author)

A80-29061 **The norbornadiene-quadricyclene energy storage system.** R. R. Hautala, R. B. King, and C. Kutal (Georgia, University, Athens, Ga.). In: Solar energy: Chemical conversion and storage. Clifton, N.J., Humana Press, Inc., 1979, p. 333-369. 42 refs. Research supported by the U.S. Department of Energy and NSF.

It is noted that the potential applicability of endoergic photochemical transformations of organic molecules to the storage of solar energy is currently receiving considerable attention. The paper examines norbornadiene-quadricyclene interconversion, which is reported to be one of the most promising systems currently available. Attention is given to several practical problems. Discussion covers an assessment of these problems, an overview of the objectives, and a summary of the most recent efforts. M.E.P.

A80-29152 **Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons.** R. W. Coughlin and M. Farooque (Connecticut, University, Storrs, Conn.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development*, vol. 19, Apr. 1980, p. 211-219. 22 refs. Research supported by the University of Connecticut Research Foundation and U.S. Department of Energy.

Coals and other forms of solid carbonaceous fossil fuel are oxidized to oxides of carbon at the anode of an electrochemical cell and hydrogen is produced at the cathode. These gases are thereby produced in relatively pure states. The reaction proceeds at very mild temperatures and at operating electrical potentials lower than 1 V, i.e., significantly lower than the thermodynamic potential of water electrolysis. The process may be viewed as driven simultaneously by energy supplied at low temperatures in approximately equal proportions by the coal and by an external electrical source. It is expected that coal can supply a larger proportion of the energy if the process is operated at higher temperature for which the required electrical potential will be lower. (Author)

A80-29154 **Wood gasification in a fluidized bed.** S. R. Beck and M. J. Wang (Texas Tech University, Lubbock, Tex.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development*, vol. 19, Apr. 1980, p. 312-317. 21 refs. Research supported by the Texas Cattle Feeders Association, Pioneer Corp., and U.S. Environmental Protection Agency; Contract No. EY-76-S-04-3779.

Gasification of oak sawdust in the Synthesis Gas From Manure (SGFM) pilot plant at Texas Tech University has been evaluated. The SGFM reactor operates as a countercurrent, fluidized bed in which a biomass feedstock is fed to the top of the reactor and is fluidized by an air-steam mixture fed to the bottom of the reactor. Using oak sawdust from Missouri as the feedstock, the gas yields were 1.1 to 1.4 L/g daf feed when the average reactor temperature was 600 to 800 C. The gas contained about 4% C_2H_4 and 11% CH_4. The gross heating value of the gas exceeded 11.2 MJ/cu m in all cases. The gasification of wood is compared to previous results obtained for cattle manure. The differences are due to the relative amounts of cellulose, hemicellulose, and lignin in the feedstock. (Author)

A80-29280 **Arabs turn their eyes to the sun.** J. Perera. *New Scientist*, vol. 85, Feb. 14, 1980, p. 474-477.

The present status of solar energy development in the Arab world is discussed. The Arab world receives solar energy equivalent to an average of 275 W/sq m. A total of 30 million MW is potentially available, which could be converted to usable electricity at an efficiency of at least 10% to produce over 3 million MW or the equivalent of the output of 3000 large power stations generating 1 GW each. Attention is given to the solar projects undertaken by Saudi Arabia as the most deeply involved and perhaps the most important country. The joint SOLERAS program with the U.S.A. is briefly outlined. Of the other Arab states, Kuwait, Jordan, Egypt and Algeria are also backing solar research. Work done in these countries is examined. At present the various research projects are uncoordinated and there is much duplication between states. S.D.

A80-29334 **Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979.** Edited by W. Waidelich (München, Universität, Munich, West Germany). Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979. 673 p. In English and German. $78.

Papers are presented on optoelectronic components, laser systems, optoelectronic signal transmission, materials processing with laser emission, lasers in environmental measuring techniques, and optoelectronic solar technology. Individual topics presented include: blue-light emitting diodes, results and perspectives of hollow cathode gas lasers, digital fiber-optic communications link for 1 Gbit/s, programming laser marking systems, and new semiconductor laser technology for cloud altimeters. C.F.W.

A80-29370 **Helios, a 20 TW CO_2 laser fusion facility.** J. S. Ladish (California, University, Los Alamos, N. Mex.). In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 294-301. 5 refs. Research sponsored by the U.S. Department of Energy.

It is noted that since June 1978, the Los Alamos scientific laboratory's Helios CO_2 laser fusion facility has been committed to an experimental target program to investigate the feasibility of laser produced inertial confinement fusion. A brief description is given of the system, and preliminary experimental results are reported. It is shown that the development of fusion energy depends on the success of the research being carried out in inertial and magnetic confinement. It is concluded that while the recent high density results obtained must be regarded with cautious optimism, the significance of these results should not be underestimated. M.E.P.

A80-29384 **Solar generators for terrestrial use (Solargeneratoren für den terrestrischen Einsatz).** R. Buhs (Telefunken AG, Wedel, West Germany). In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 471-485. 18 refs. In German.

The paper presents an overview of the technological status of photovoltaic converters for terrestrial use. Attention is given to solar cells and solar generators, and production techniques. Further, a survey is made of the applications of terrestrial solar generators presently possible. Finally, discussion covers the research programs underway in the Western world as well as the largest German programs. M.E.P.

A80-29393 **Heterojunction for thin-film solar cells (Hetero-übergänge als Dünnschichtsolarzellen).** G. H. Hewig (Stuttgart, Universität, Stuttgart, West Germany). In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 533-538. 26 refs. In German.

The paper examines the developments in solar technology with regard to heterojunction of thin-film solar cells. Attention is given to experimental results of various layer combinations. A specific example of a Cu_2S-CdS thin-film cell is examined and analyzed, listing film densities and various possible crystal combinations. C.F.W.

A80-29394 **Silicon ribbon for photovoltaic cells.** A. Baghdadl, R. W. Gurtler, R. J. Ellis, and I. A. Lesk. In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 539-543.

The ribbon-to-ribbon method (RTR) for silicon ribbon growth is presented, in which a pair of scanned, focused CO_2 laser beams is used to establish a molten zone in a preformed polycrystalline ribbon. Large-grained silicon ribbon is then drawn from the zone at growth rates up to 13.3 cm/min and the silicon ribbon purity is maintained by purging gases used to protect the molten zone during growth. The efficiency of RTR solar cells is found to average 9% with the best cell reaching the 12% conversion efficiency needed for economic viability. It is shown that RTR has achieved the highest growth rates reported for silicon ribbon growth and has great promise as a low-cost photovoltaic substrate. L.M.

A80-29395 **Thin film solar cells based on amorphous silicon.** G. Winterling (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 544-548. 11 refs.

Thin film solar cells can be produced in a much cheaper way than conventional cells based on bulk crystalline silicon. The advantages of the amorphous silicon technology is illustrated by comparing the production process for polycrystalline and amorphous silicon cells. The state of art of the present laboratory cells with amorphous silicon is reviewed. The experimental conversion efficiency is relatively low since the mobilities of charge carriers are much smaller in amorphous silicon than in crystalline silicon. Possibilities to enhance the collection efficiency of the optically induced charge carriers are discussed. (Author)

A80-29396 **Photovoltaic hybrid collectors (Photovoltaischer Hybridkollektor).** H. Karl (Stuttgart, Universität, Stuttgart, West Germany). In: Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979. Guildford, Surrey, England, IPC Science and Technology Press, Ltd., 1979, p. 549-558. In German. Research sponsored by the Bundesministerium für Forschung und Technologie.

The performance of a combined collector has been studied. The collector produces low grade thermal energy and electrical power. It contains 4 poly-silicon solar cell arrays instead of the usual absorber surface. The efficiency of the solar cell arrays are around 6% at 60 C, where the thermal efficiency is about 40%, at normal conditions. Experiments and analysis characterizing electrical and thermal performance are discussed. A water type combined collector and a usual solar collector of the same design have been simultaneously tested. Thermal performance is measured under open voltage conditions, varying inlet temperature and meteorological conditions. (Author)

A80-29406 **A heat penalty and economic analysis of the hybrid sulfuric acid process.** R. H. Carty and W. L. Conger (Kentucky, University, Lexington, Ky.). *International Journal of Hydrogen Energy*, vol. 5, no. 1, 1980, p. 7-20. 10 refs. Contract No. EC-77-S-05-5522.

A heat penalty and economic analysis of the Westinghouse hydrogen process is made showing that the process efficiency is about 50.9% and the production cost of hydrogen based on 1976 cost figures is $8.20/GJ. A breakdown of the equipment in the process with the enthalpy change, entropy change, heat and work requirements, and heat penalty for each piece is given. (Author)

A80-29407 **The oxidation of sulphur dioxide by bromine and water.** D. van Velzen and H. Langenkamp (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune Di

Ricerche, Ispra, Italy). *International Journal of Hydrogen Energy*, vol. 5, no. 1, 1980, p. 85-96.

The reaction of SO2, Br2 and H2O, forming HBr and H2SO4, is one of the reactions of the hybrid cycle for thermochemical decomposition of water, the Mark-13 cycle. Experimental work on this reaction is described. Equilibrium measurements show that high sulfuric acid concentrations (higher than 80 wt%) are attainable. At low sulfuric acid concentrations only traces of Br2 and/or SO2 remain in the gaseous phase. Besides the equilibrium determinations, development work by dynamic experiments has also been carried out. A simple mathematical model for the reaction rate in packed columns has been developed which satisfactorily fits the available experimental data. (Author)

A80-29448 * # **Space disposal of nuclear wastes.** C. C. Priest, R. F. Nixon (NASA, Marshall Space Flight Center, Program Development Directorate, Huntsville, Ala.), and E. E. Rice (Battelle Columbus Laboratories, Columbus, Ohio). *Astronautics and Aeronautics*, vol. 18, Apr. 1980, p. 26-35. 37 refs. Contract No. NAS8-32391.

The DOE has been studying several options for nuclear waste disposal, among them space disposal, which NASA has been assessing. Attention is given to space disposal destinations noting that a circular heliocentric orbit about halfway between Earth and Venus is the reference option in space disposal studies. Discussion also covers the waste form, showing that parameters to be considered include high waste loading, high thermal conductivity, thermochemical stability, resistance to leaching, fabrication, resistance to oxidation and to thermal shock. Finally, the Space Shuttle nuclear waste disposal mission profile is presented. M.E.P.

A80-29474 **Optimizing a regional energy provision system for multi-task achievement (Optimierung eines regionalen Energieversorgungssystems bei mehrfacher Zielsetzung).** B. Fürniss, D. Hoch, V. Schulz, and H. Stehfest (Karlsruhe, Kernforschungszentrum, Karlsruhe, West Germany). *Energiewirtschaftliche Tagesfragen*, vol. 30, Mar. 1980, p. 155, 156, 158 (3 ff.). 19 refs. In German.

The purpose of the paper is to present an optimization model for energy provision systems and their possible application. A comparison is made between this model and various previous ones with regard to the existing oil/energy crisis. The main function of the proposed system is to (1) enable the optimization of many goals, including minimization of costs and primary energy consumption, and (2) be functional on a regional scale. C.F.W.

A80-29475 **Energy politics (Energiepolitik).** B. Börner (Köln, Universitat, Cologne, West Germany). *Energiewirtschaftliche Tagesfragen*, vol. 30, Mar. 1980, p. 179-183. In German.

The paper examines the basis and principles of energy politics, emphasizing the flow of goods and capital. Attention is given to the peculiarities of forecasts, including probability, freedom, and conclusions. The predicted development of energy is discussed with respect to supply and demand, and economic growth. Nuclear power and the fuel cycle are examined as viable means for dealing with the rising lack of oil. C.F.W.

A80-29662 # **Power units for mini RPV's.** D. P. Short (Weslake Aeromarine Engines, Ltd., England). In: Remotely piloted vehicles; International Conference, Bristol, England, September 3-5, 1979, Conference Papers. Bristol, England, University of Bristol, 1979, p. 16.1-16.7.

Production engines suitable for mini-remotely piloted vehicles (RPVs), having minimum bulk and weight for a given power output are discussed, including engines designed for chain saws, snowmobiles, and go-carts. Attention is given to the carburetor, exhaust and fuel systems, and the alternator. Typical specifications for such future mini-RPV engines include: rated output at 6500-8000 rpm, BMEP at rating 75-80 psi, specific fuel consumption at cruise condition better than 0.75 lb/bhp hr, and specific weight of a running engine, not including exhaust system, better than 1 lb/bhp. J.P.B.

A80-29725 **Hysteresis in metal/hydrogen systems.** T. B. Flanagan, B. S. Bowerman, and G. E. Biehl (Vermont, University, Burlington, Vt.). *Scripta Metallurgica*, vol. 14, Apr. 1980, p. 443-447. 22 refs. NSF-supported research.

The paper considers hysteresis in metal/hydrogen systems. It was shown that the hysteresis in the solvus behavior of Nb/H which consists of unequal values of relative partial enthalpy of solution for heating and cooling is due to the occurrence of plastic deformation during both processes, and that it may be applied to pressure hysteresis in the Pd/H system. Evidence based on H2 solubility suggests that dislocation densities of the same order of magnitude are generated by the beta to alpha phase transition in Pd which already contains a large dislocation density from the alpha to beta change; hysteresis scans have been measured with Pd samples which have been previously subjected to the phase changes, with the H2 removed by evacuation at low temperature. Finally, the free energy loss for a scan is computed suggesting that beta-phase can be formed or decomposed with a smaller energy loss within the hysteresis gap than along the plateau pressure branches. A.T.

A80-29742 **Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system.** G. L. Harding and B. Window (Sydney, University, Sydney, Australia). *Journal of Vacuum Science and Technology*, vol. 16, Nov.-Dec. 1979, p. 2101-2104. 10 refs. Research supported by the University of Sydney.

A solar selective absorbing surface consisting of mixed iron, chromium, and nickel carbides on copper has been deposited onto 1.5 m long, 22 mm o.d. glass tubes by reactive and nonreactive dc sputtering. Grading the properties of the metal carbide from metal rich at the copper substrate to dielectric at the surface results in solar absorptances approximately 93% and emittances approximately 4% at 300 K (both properties averaged along the length of a tube). Aging experiments show that absorptances deteriorate slowly at 300 C in vacuum due to diffusion in the graded film. Emittances at elevated temperature for copper and for the selective surfaces deposited onto tubes have been determined using a calorimetric technique. (Author)

A80-29743 **Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes.** G. L. Harding, B. Window, D. R. McKenzie, A. R. Collins, and C. M. Horwitz (Sydney, University, Sydney, Australia). *Journal of Vacuum Science and Technology*, vol. 16, Nov.-Dec. 1979, p. 2105-2108. 12 refs. Research supported by the University of Sydney.

Construction and operation of a cylindrical magnetron sputtering system for coating glass tubes with solar selective surfaces is described. A metal carbide on copper selective surface produced in the coater is discussed in terms of uniformity of coating thickness, electrical and optical properties. Short pumpdown times and high deposition rates make this a medium volume productive system. (Author)

A80-29744 **Alternative grading profile for sputtered solar selective surfaces.** G. L. Harding (Sydney, University, Sydney, Australia). *Journal of Vacuum Science and Technology*, vol. 16, Nov.-Dec. 1979, p. 2111-2113. 15 refs. Research supported by the University of Sydney.

Metal carbide selective surfaces of DMD structure produced by dc reactive sputtering in a cylindrical magnetron are discussed with reference to the deposition conditions and film properties. The experimental data indicate that absorptance and emittance of three-layer surfaces decrease as total thickness is reduced. The five-layer surfaces exhibit the same trend in absorptance, but emittance values are found to be independent of thickness in the range studied. Since the three-layer surfaces appear equivalent in selective properties to five-layer surfaces, it is suggested that little improvement will be observed for continuously graded surfaces. V.L.

A80-29795 **Possible direct conversion of chemical energy into electrical energy in a semiconductor.** A. E. Kabanskii, V. V. Styrov, and Iu. I. Tiurin (Tomsk Institute of Automated Control Systems and Electronics, Tomsk, USSR). *(Pis'ma v Zhurnal Tekhnicheskoi Fiziki,* vol. 5, July 26, 1979, p. 833-837.) *Soviet Technical Physics Letters,* vol. 5, July 1979, p. 343, 344. 8 refs. Translation.

The direct conversion of the chemical energy released by a simple heterogeneous reaction in the surface of a semiconductor into electrical energy is investigated. The requirements of high exothermicity, efficient energy conversion into an electron-hole pair and product desorption from the surface for the reaction are discussed. The peak efficiency of a H + Ge reaction system is estimated to be 0.1% in a strong magnetic field and with a high excitation level, while when a rectification chemoeffect is utilized, the maximum efficiency is calculated to be 0.04, which is of practical interest. It is pointed out that the efficiency can be increased by using a wide-gap semiconductor, a system with a more favorable energy ratio, or a system with less surface recombination. A.L.W.

A80-29800 **Oil shale processing technology.** G. L. Baughman (Colorado School of Mines, Golden, Colo.). *ISA Transactions,* vol. 19, no. 1, 1980, p. 21-28.

The paper presents the technical details of oil shale retorting technologies and describes the types of instrumentation and control problems. The underground and above ground retorting processes of direct and indirect heated types are discussed along with in-situ methods which involve the fracturing of the oil shale zone with explosives. Direct-heated above ground processes include the Gas Combustion Process, the Soviet Kiviter Process, a Paraho Process, and the Union Oil Retorting Process which have been developed to a potential commercial stage; seven methods including Lurgi-Ruhrgas and Union Oil Co. are designed for indirect-heating retorting. Finally, instrumentation for control of injected air and recycle gas, product gas monitoring and analysis of the product gas stream, and control of balance between recycle gas temperature and flow rate are examined. A.T.

A80-29812 **The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight.** C.-Y. Wu and W.-Z. Shen (National Chiao Tung University, Hsinchu, Nationalist China). *Solid-State Electronics,* vol. 23, Mar. 1980, p. 209-216. 8 refs. National Science Council of Nationalist China Contract No. 68E-0404(02).

A80-29815 **The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells.** J. T. Lue (National Tsinghua University, Hsinchu, Nationalist China). *Solid-State Electronics,* vol. 23, Mar. 1980, p. 263-268. 15 refs. Research supported by the National Science Council of Nationalist China.

A80-29817 * **The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell.** O. von Roos (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Solid-State Electronics,* vol. 23, Mar. 1980, p. 285-288. 7 refs.

For efficiency and convenience the voltage applied to a Si solar cell is often fairly rapidly driven from zero to the open circuit value typically at a common rate of 1 V per millisecond. During this time the values of current are determined as a function of the instantaneous voltage thus producing an I-V characteristic. The present paper shows that the customary expressions for the current as a function of cell parameters still remain valid provided that the diffusion length in the expression for the dark current is changed from its steady state value L to the effective diffusion length L1 given by L1 = L(1 + qV/kT.tau) to the -1/2, where V is the ramp rate considered constant and tau is the lifetime of minority carriers. This result is true to a very good approximation provided that low level injection prevails. B.J.

A80-29894 **Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions.** A. N. Dey and R. W. Holmes (P. R. Mallory Laboratory for Physical Science, Burlington, Mass.). *Electrochemical Society, Journal,* vol. 127, Apr. 1980, p. 775-778. 9 refs. Grant No. DAAB07-78-C-0563.

An isothermal DTA technique was developed for studying the kinetics of the heterogeneous exothermic reactions involving lithium metal and organic solvents used in the Li/SO2 batteries. The results showed that while film forming agents such as SO2 and PC retard the Li + AN exothermic reaction, the organic solvents such as MF, DME, DG, and THF enhance the Li + AN exothermic reaction most probably due to an enhanced solubilizing effect on the Li film. (Author)

A80-29895 **Electrochemistry of amorphous V2S5 in lithium cells.** A. J. Jacobson and S. M. Rich (Exxon Research and Engineering Co., Linden, N.J.). *Electrochemical Society, Journal,* vol. 127, Apr. 1980, p. 779-781. 28 refs.

Amorphous V2S5 prepared by thermal decomposition of (NH4)3VS4 has been found to react readily with n-butyl lithium to give amorphous compositions Li(x)V2S5. In lithium electrochemical cells, V2S5 cathodes react with 2.5 Li per vanadium above 1.40V on primary discharge. On subsequent cycling the capacity eventually falls to 30% of the initial value with an accompanying change in the voltage composition profile. (Author)

A80-29897 **Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy.** A. Fujishima, Y. Maeda, K. Honda (Tokyo, University, Tokyo, Japan), G. H. Brilmyer, and A. J. Bard (Texas, University, Austin, Tex.). *Electrochemical Society, Journal,* vol. 127, Apr. 1980, p. 840-846. 20 refs. NSF-Army-supported research.

During a photoelectrochemical reaction only a portion of the light energy absorbed by the semiconductor is utilized in the electrode reaction. By monitoring temperature changes within the photoanode as a function of electrode potential and light intensity, information concerning the efficiency of the process can be obtained. Experimental results are interpreted using a model for the energy balance within the system which permits the determination of the quantum and energy efficiencies simultaneously without the need to calibrate the light source. (Author)

A80-29898 **Mixed electrolyte solutions of propylene carbonate and dimethoxyethane for high energy density batteries.** Y. Matsuda and H. Satake (Yamaguchi University, Ube, Japan). *Electrochemical Society, Journal,* vol. 127, Apr. 1980, p. 877-879. 25 refs.

The effects of mixing propylene carbonate (PC) and dimethoxyethane (DME), containing some perchlorates, are investigated with reference to the electric conductance, dielectric constant, and viscosity. It is found that the viscosity of the mixed solvents increases when PC is added into DME, and the experimental values tend to be lower than the predictions based on the ideal solution theory. The dielectric constants of the mixed solvents increase when PC is added into DME; the measured values are almost linear. The conductance of the mixed electrolytes is found to be higher than that of each solvent with NaClO4, and the maximum value of the equivalent conductance is obtained at the mixing ratio of about one to one. V.L.

A80-29920 **Photobiological production of hydrogen.** P. F. Weaver, S. Lien, and M. Seibert (Solar Energy Research Institute, Golden, Colo.). *Solar Energy,* vol. 24, no. 1, 1980, p. 3-45. 412 refs. Contract No. EG-77-C-01-4042.

This literature survey of photobiological hydrogen production covers the period from its discovery in relatively pure cultures during the early 1930s through 1978. The focus is hydrogen production by phototrophic organisms (and their components) which occurs at the expense of light energy and electron-donating substrates. The survey covers the major contributions in the area; however, in many cases, space has limited the degree of detail provided. Among the topics included is a brief historical overview of hydrogen metabolism in photosynthetic bacteria, eucaryotic algae, and cyanobacteria (blue-green algae). The primary enzyme systems, including hydrogenase and nitrogenase, are discussed along with the manner in which they are coupled to electron transport and the primary photochemistry of photosynthesis. A number of in vivo and in vitro photobiological hydrogen evolving schemes including photosynthetic bacterial, green algal, cyanobacterial, two-stage, and cell-free systems are examined in some detail. The remainder of the review discusses specific technical problem areas that currently limit the yield and duration of many of the systems and research that might lead to progress in these specific areas. The final section outlines, in broadest terms, future research directions necessary to these specific areas. The final section outlines, in broadest terms, future research directions necessary to develop practical photobiological hydrogen-producing systems. Both whole cell (near- to mid-term) and cell-free (long-term) systems should be emphasized. Photosynthetic bacteria currently show the most promise for near-term applied systems. (Author)

A80-29921 The prospects for solar energy use in industry within the United Kingdom. C. W. Lewis (International Institute for Environment and Development, London, England). *Solar Energy,* vol. 24, no. 1, 1980, p. 47-53. 15 refs. Research supported by the Ford Foundation.

An assessment of the potential for solar energy applications within U.K. industry has been made, using a disaggregated breakdown of energy consumption in the eight industrial sectors by fuel and end-use, and taking account of solar collector performance under U.K. climatic conditions. Solar contributions of 35 per cent of process boiler heat up to a temperature of 80 C and 10 per cent in the 80-120 C range are considered feasible, along with 35 per cent of non-industrial water heating. After employing energy conservation techniques currently more cost-effective than solar systems, an additional 3.5 per cent of U.K. primary energy expended in manufacturing industry (excluding iron and steel production) could be contributed by solar. This represents 1 per cent of the U.K. national primary energy demand. (Author)

A80-29922 Transient response of thermosyphon solar collectors. G. L. Morrison (New South Wales, University, Kensington, Australia) and D. B. J. Ranatunga (National Engineering Research and Development Centre, Solar Energy Div., Colombo, Sri Lanka). *Solar Energy,* vol. 24, no. 1, 1980, p. 55-61. 8 refs.

The response of thermosyphon solar water heaters to step changes of insolation is investigated. Measurements of the transient flow development in a thermosyphon circuit were obtained using a laser doppler anemometer and a mathematical model was developed to simulate the transient performance. The results show that although there are long time delays associated with the development of the thermosyphon flow the energy collection capability is not affected by thermosyphon time delays. (Author)

A80-29923 Estimation and prediction of global solar radiation over Greece. A. A. Flocas (Salonica, University, Salonica, Greece). *Solar Energy,* vol. 24, no. 1, 1980, p. 63-70. 18 refs.

A regression analysis of the relative monthly values of global solar radiation and the corresponding values of sunshine, for the period 1961-75, was performed to determine the constants a and b of the Angstrom formula, for Athens. The geographical distribution of the annual totals of global solar radiation over Greece was mapped and some types and sub-types were identified. Further, a stepwise multiple regression analysis of the annual total amounts of global solar radiation and the three factors (latitude, longitude and altitude) was carried out; the validity of the assumption of the linear relationship between the annual totals of global solar radiation and the three factors was examined. (Author)

A80-29924 Performance calculations of tubular cover collectors. Y. Bayazitoglu and S. Asgarpour (Rice University, Houston, Tex.). *Solar Energy,* vol. 24, no. 1, 1980, p. 105-109. 11 refs.

The transmittance of the tubular cover system is calculated by treating interactive problems of the array of tubular units. The thermal analysis of the tubular cover system with a plane absorber surface underneath is studied. It is assumed that the tube wall is composed of an infinitely long nodal structure. The energy balance and radiosity equations for each element of the node is evaluated and solved. The effectiveness of convection suppression is determined by the magnitude of imposed heat transfer through the tube walls. (Author)

A80-29925 Instantaneous collector thermal efficiencies in less time. S. J. Kleis, R. T. Chen, and R. B. Bannerot (Houston, University, Houston, Tex.). *Solar Energy,* vol. 24, no. 1, 1980, p. 111, 112.

A modification of the 'standard' flow loop, based on the removal of thermal feedback due to the solar heating in the collector and on significant reduction in the transient behavior or time constant for the flow loop is discussed. The time constant is defined as the time required for the collector fluid temperature to achieve 63.2% of its final steady state value, and data on chill water flow rate are plotted. It is shown that the time constant can be changed by redesigning the chill water heat exchanger, that in the present design the response lag is essentially a function of time of residence of the collection fluid within the exchanger, and that faster time responses can be achieved by reducing the length of the coil. L.M.

A80-29938 The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants. P. D. Moskowitz, S. C. Morris, and A. S. Albanese (Brookhaven National Laboratory, Upton, N.Y.). *Air Pollution Control Association, Journal,* vol. 30, Apr. 1980, p. 353-357. 11 refs. Contract No. EY-76-C-02-0016.

The possible impacts of future U.S. solvent-refined coal (SRC-II) and coal-fired electricity generating plants on global CO2 emissions and growth rates are assessed. Analyses of carbon flows in an SRC-II electricity generation fuel cycle and a coal-fired electricity generation fuel cycle indicate that 81-88% and 98% of all carbon is ultimately vented to the atmosphere, respectively; however, the CO2 emissions from the synfuels process are 20 to 30% greater for the amount of energy produced. It is estimated that the proposed U.S. synthetic fuels programs could increase the global CO2 growth rate by less than 0.1% annually, resulting in an increase from 2.9 to 2.95% in the annual CO2 growth rate between 1976 and 1990. It is concluded that while the increased emission of CO2 from U.S. synthetic fuel combustion would exacerbate the global CO2 problem, it is less than one tenth of the projected impact of alternative fuel sources. A.L.W.

A80-29946 The energy impacts of solar heating. C. Whipple (Electric Power Research Institute, Palo Alto, Calif.). *Science,* vol. 208, Apr. 18, 1980, p. 262-266. 17 refs.

The purpose of the paper is to examine the impact of a rapid implementation of active solar space heating and water heating on the U.S. energy supply. The net energy analysis for an expanding supply system is discussed, together with several estimates of the energy requirements of solar heating equipment, and two solar heating integration paths to represent low and high growth rate scenarios. It is concluded that the cumulative energy invested to the year 2000 will be 1/2 to 1.5 times the amount saved. C.F.W.

A80-29975 Microtearing modes and anomalous transport in tokamaks. J. F. Drake, N. T. Gladd, C. S. Liu, and C. L. Chang (Maryland, University, College Park, Md.). *Physical Review Letters,* vol. 44, Apr. 14, 1980, p. 994-997. 15 refs.

The stability of microtearing modes and the associated electron thermal transport are investigated. It is shown that these modes are driven unstable by the electron temperature gradient in present tokamaks, even in the absence of toroidal effects. The unstable modes produce magnetic islands which saturate by transferring energy to stable long-wavelength modes. The associated crossfield electron thermal conductivity is found to be inversely proportional to density, consistent with Alcator scaling, and comparable in magnitude to that inferred from experiments. V.L.

A80-30241 **Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters.** I. G. Gverdtsiteli, A. G. Kalandarishvili, and P. D. Chilingarishvili. *(Zhurnal Tekhnicheskoi Fiziki,* vol. 49, Aug. 1979, p. 1764, 1765.) *Soviet Physics - Technical Physics,* vol. 24, Aug. 1979, p. 988, 989. 7 refs. Translation.

A80-30242 **Low-temperature thermionic converter with an expanded-area collector.** I. G. Gverdtsiteli, N. E. Menabde, V. K. Tskhakaia, and L. M. Tsakadze. *(Zhurnal Tekhnicheskoi Fiziki,* vol. 49, Aug. 1979, p. 1766, 1767.) *Soviet Physics - Technical Physics,* vol. 24, Aug. 1979, p. 990. Translation.

A80-30465 **Plant power fuels hydrogen production.** D. Hall, M. Adams, P. Gisby, and K. Rao (King's College, London, England). *New Scientist,* vol. 86, Apr. 10, 1980, p. 72-75.

Photolysis has unique attributes that are unmatched by any other known energy systems: the substrate (water) is abundant; the energy source (sunlight) is effectively unlimited; the product (hydrogen) can be stored and is nonpolluting; and the process is completely renewable because when hydrogen is 'consumed', the substrate (water) is regenerated. Another attraction of this system is that it operates at normal ambient temperatures and does not involve toxic intermediates. Researchers in the U.S. have shown that upon irradiation with visible light in the absence of added electron donors, spinach chloroplasts and bacterial extracts containing hydrogenase would evolve hydrogen if either ferredoxin or viologen dyes were added as electron carriers. Photobiological hydrogen production from water by intact organisms such as algae is also discussed. By mimicking natural processes one may be able to split water into hydrogen and oxygen using sunlight as the energy source. S.D.

A80-30474 **Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine.** B. C. Syrett (Electric Power Research Institute, Palo Alto, Calif.), D. D. Macdonald (Ohio State University, Columbus, Ohio), and H. Shih (National Tsinghua University, Hsinchu, Nationalist China). *Corrosion,* vol. 36, Mar. 1980, p. 130-139. 15 refs.

A80-30521 **Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy.** R. T. Yang (Brookhaven National Laboratory, Upton, N.Y.). *Fuel,* vol. 58, Apr. 1979, p. 242-246. 23 refs. Contract No. EY-76-C-02-0016.

Hydrogenation experiments with a Pennsylvania anthracite coal were carried out in H_2 under the following conditions: with simultaneous grinding; with grinding and the addition of 1% tin; without simultaneous grinding; and without grinding but with the addition of $SnCl_2$ (1% Sn). Temperature was maintained at 442 C and pressure at about 6.8 MPa gage (1000 psig). By eliminating or minimizing the effects of heating that were due to grinding, and of size and mass transfer, the net effects on hydrogenation of the above conditions were examined. $SnCl_2$, as expected, increased the light products, both gaseous and liquid. Grinding substantially increased the heavy oil products (MW about 280), but not the light fractions. The effect of grinding in combination with the addition of tin was very similar to the effect of $SnCl_2$. A simple mechanistic scheme is postulated to represent these effects. Rationale of the mechanochemical effects is presented. Some preliminary results of the ESR measurements regarding these effects are also included. (Author)

A80-30522 **Coal gasification in steam at very high temperatures.** D. B. Northam and C. W. von Rosenberg, Jr. (Avco Everett Research Laboratory, Inc., Everett, Mass.). *Fuel,* vol. 58, Apr. 1979, p. 264-268. 16 refs. Research supported by the Gas Research Institute.

Gasification of pulverized coal in steam has been investigated at heating rates of one-million K/s and peak gas temperatures of 3300 K. These severe conditions were achieved in a batch process reactor by igniting a stoichiometric hydrogen-oxygen mixture in which the coal had been blown into turbulent suspension. Subsequent gas-phase combustion was followed by heat conduction from the nascent steam to the coal. Variable solids/gas mass ratios were investigated. Stabilized carbon gasification yields as high as 80% were achieved. (Author)

A80-30523 **Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents.** W. R. Jackson, F. P. Larkins, M. Marshall, D. Rash (Monash University, Clayton, Victoria, Australia), and N. White (Broken-Hill-Proprietary Co., Ltd., Melbourne Research Laboratories, Clayton, Victoria, Australia). *Fuel,* vol. 58, Apr. 1979, p. 281-284. 21 refs. Research supported by the Victorian Brown Coal Research and Development Committee.

The effect of adding additional amounts of the inorganic constituents normally found in a Morwell coal on the hydrogenation reactions of the coal has been studied. Of the principal inorganic constituents, only iron has a major effect on conversion yields. Addition of iron as haematite led to an increase in coal conversion similar to that obtained by addition of a crushed cobalt molybdate catalyst. Generally, little inorganic matter, even in the case of iron, entered the chloroform-soluble fraction. The variation of conversion yield with the particle size of the coal was examined and found to be small. (Author)

A80-30524 **Reaction kinetics between CO_2 and oil-shale residual carbon. I - Effect of heating rate on reactivity.** A. K. Burnham (California, University, Livermore, Calif.). *Fuel,* vol. 58, Apr. 1979, p. 285-292. 33 refs. Contract No. W-7405-eng-48.

The reaction kinetics between CO_2 and residual carbon from Colorado oil shale (Mahogany Zone) have been investigated using both isothermal and nonisothermal methods. It was found that oil-shale residual carbon is approximately an order of magnitude more reactive than subbituminous-coal char, although the surface areas are similar. The reactivity of the residual carbon was found to vary by a factor of two for samples prepared by retorting the shale at heating rates between 0.033 and 12 C/min. Since the surface area of the residual carbon is approximately independent of the amount of oil coking, the heating-rate effect cannot be explained by pore filling. Surface areas of the residual organic carbon in shale were estimated by comparing the surface area of retorted shale (about 3% carbon) with that of retorted shale which had been decharred by oxidation at 400 C. Surface areas of 250-400 sq m/g and 100-200 sq m/g were obtained using CO_2 and N_2 respectively as the adsorbed gases. Mercury porosimetry results are also presented. (Author)

A80-30525 **Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids.** P. C. Painter and M. M. Coleman (Pennsylvania State University, University Park, Pa.). *Fuel,* vol. 58, Apr. 1979, p. 301-308. 22 refs. Research supported by the Electric Power Research Institute.

Fourier-transform infrared spectroscopy offers considerable advantages over conventional dispersive methods for the characterization of highly absorbing materials such as coal. This technique has been applied to the determination of the functional groups present in three solvent-refined-coal samples, all of which were obtained from the same parent coal but under different processing conditions. Both the benzene-soluble and pyridine-soluble portions are subjected to chromatographic fractionation by sequential elution from a silica-gel column using a specific sequence of solvents. The functional groups present in each fraction were identified from their infrared spectrum, using the group-frequency approach. (Author)

A80-30526 **Electrochemical gasification of coal - Investigation of operating conditions and variables.** M. Farooque and R. W.

Coughlin (Connecticut, University, Storrs, Conn.). *Fuel,* vol. 58, Oct. 1979, p. 705-712. 11 refs. Research supported by the University of Connecticut and U.S. Department of Energy.

Experimental results are reported for this new process where coal is consumed within an aqueous electrolyte to produce gaseous oxides of carbon at the anode and hydrogen at the cathode. Data are reported on the effect of coal particle size and concentration, activation energy and temperature effects, behaviour of the supporting electrolyte, and changes in morphology and reactivity of the coal during the process. The gas liberated at the anode is almost pure CO2 with a small percentage of CO. When the process is conducted galvanostatically, the potential gradually rises in parallel with accumulation of reaction intermediates on the coal and a corresponding decline in its reactivity. Moreover an abrupt and reproducible jump in potential is observed which suggests at least two different mechanisms for the overall process. (Author)

A80-30527 **Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects.** A. K. Burnham (California, University, Livermore, Calif.). *Fuel,* vol. 58, Oct. 1979, p. 713-718. 31 refs. Contract No. W-7405-eng-48.

A80-30528 **Reaction kinetics between steam and oil-shale residual carbon.** A. K. Burnham (California; University, Livermore, Calif.). *Fuel,* vol. 58, Oct. 1979, p. 719-723. 11 refs.

The reaction kinetics between steam and the residual organic carbon in retorted Colorado oil shale (Mahogany Zone) have been investigated using both isothermal and nonisothermal methods. The reaction was found to depend on the 0.5-power of the steam partial pressure. The H2O-C reaction was found to be approximately three times as fast as the CO2-C reaction at atmospheric pressure and temperatures near 700 C. The reactivity of the residual carbon depended on both the heating rate used to generate the carbon and the subsequent thermal treatment. Surface area and mercury porosimetry results are also discussed. (Author)

A80-30552 **Interchange stability of axisymmetric field reversed equilibria.** L. Sparks, J. M. Finn, and R. N. Sudan (Cornell University, Ithaca, N.Y.). *Physics of Fluids,* vol. 23, Mar. 1980, p. 611-613. 12 refs. Contract No. EY-76-S-02-3170.

Axisymmetric field reversed equilibria are obtained by solving the Grad-Shafranov equation, with pressure on the magnetic axis and pressure on the separatrix specified as independent parameters. A stability criterion assuming unfavorable curvature is evaluated for various pressure profiles. (Author)

A80-30554 **Ideal magnetohydrodynamic stability of tokamak plasmas.** C. Copenhaver (Tennessee, University, Knoxville; Oak Ridge National Laboratory, Oak Ridge, Tenn.). *Physics of Fluids,* vol. 23, Mar. 1980, p. 624-635. 18 refs. Contract No. AT-(40-1)-2598.

Variational theory is used to derive a generalized Euler equation and a new energy functional which are convenient for analytical studies of ideal magnetohydrodynamic stability in tokamaks. This generalized Euler equation, which is an explicit function of the magnetic surface coordinate psi only, represents an infinite set of equations coupled together by poloidal m mode coupling. In the infinite aspect ratio limit, the toroidal curvature and mode coupling terms disappear and an infinite set of uncoupled Euler equations for the diffuse linear pinch (Hain-Lust equation) for each m value results. The continuous spectra are discussed for the circular toroidal case. In this case, the equations are further specialized to three modes (m, m - 1, m + 1) and in the marginal stability limit reduce to known results. Analytically eliminating the m - 1 and m + 1 modes for arbitrary current profiles provides results on limiting beta poloidal for tokamaks. (Author)

A80-30597 **Balancing the process of hydrating gasification of brown coal (Bilanzierung des Verfahrens zur hydrierenden Vergasung von Braunkohle).** G. Tsatsaronis, P. Schuster (Aachen, Rheinisch-Westfalische Technische Hochschule, Aachen, West Germany), and H. Rörtgen (Rheinische Braunkohlenwerke AG, Cologne, West Germany). *Brennstoff-Wärme-Kraft,* vol. 32, Mar. 1980, p. 105-111. 23 refs. In German.

A method is presented for the hydrating gasification of brown coal to synthetic natural gas by employing heat from a nuclear reactor. Attention is given to the layout and flow scheme of the gasification plant as well as to graphs of gasification percentages versus gasification temperatures and pressure. The irreversibilities of various plant components are determined by using detailed exergy balance sheets, and the thermal and exergy efficiencies of the entire plant are noted. C.F.W.

A80-30614 # **Turbulent flows through annular spaces (Miscari turbulente prin spatii inelare).** A. D. Stan (Institutul de Petrol si Gaze, Ploiesti, Rumania). *Studii si Cercetari de Mecanica Aplicata,* vol. 38, Nov.-Dec. 1979, p. 825-837. 9 refs. In Rumanian.

Engineering conditions in the oil industry are considered, where pressure drop and shearing stress situations are involved. Numerical calculations show that in petroleum engineering, the pressure drop in an annular space of common tubular material is comparable to the pressure drop realized in a tube with a circular section. J.P.B.

A80-30656 **Coal combustion fly ash characterization - Adsorption of nitrogen and water.** S. J. Rothenberg (Lovelace Biomedical and Environmental Research Institute, Albuquerque, N. Mex.). *Atmospheric Environment,* vol. 14, no. 4, 1980, p. 445-456. 45 refs.

A80-30668 **Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer.** P. Kordos and G. L. Pearson (Stanford University, Stanford, Calif.). *Solid-State Electronics,* vol. 23, Apr. 1980, p. 399, 400. 6 refs.

A80-30772 # **Incidence-angle modifier and average optical efficiency of parabolic trough collectors.** H. Gaul and A. Rabl (Solar Energy Research Institute, Golden, Colo.). *ASME, Transactions, Journal of Solar Energy Engineering,* vol. 102, Feb. 1980, p. 16-21. 11 refs. Contract No. EG-77-C-01-4042.

The incidence-angle modifier for parabolic troughs is investigated in order to clarify the connection between collector tests and the prediction of long-term energy delivery by collector arrays. The optical efficiency of a parabolic trough collector decreases with incidence angle for several reasons: the decreased transmission of the glazing and the absorption of the absorber; the increased width of the solar image on the receiver; and the spillover of the radiation from troughs of finite length. In order to be able to apply test results from a short collector module to collector arrays of arbitrary length, it is necessary to separate analytically the end loss from the first two effects. This analysis is applied to several collectors that have been tested at low temperature with an open water test loop for improved accuracy. The results are presented in two forms: as a polynomial fit to the data; and as a single number, the all-day average optical efficiency for typical operating conditions. (Author)

A80-30773 # **Measurement of heliostat performance characteristics.** J. P. Thornton and D. Waddington (Solar Energy Research Institute, Golden, Colo.). *ASME, Transactions, Journal of Solar Energy Engineering,* vol. 102, Feb. 1980, p. 22-33. Contract No. EY-76-C-03-1110.

A key milestone in the development of any solar collector is the comparison of actual performance data with predicted data. During a series of tests at the Martin Marietta solar test facility during 1976 and 1977, the performance of four full-size, prototype heliostats with different types and sizes of glass mirrors were measured and subsequently shown to compare closely with the predicted performances. (Author)

A80-30774 # **The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions.** M. A. Lind (Battelle Pacific Northwest Laboratories, Richland, Wash.), R. B. Pettit (Sandia Laboratories, Albuquerque, N. Mex.), and K. D. Masterson (Solar Energy Research Institute, Golden, Colo.). *ASME, Transactions, Journal of Solar Energy Engineering,* vol. 102, Feb. 1980, p. 34-40. 19 refs. Contracts No. EY-76-C-06-1830; No. DE-AC04-76-DP00789; No. EG-77-C-01-4042.

The sensitivity of the solar weighted optical properties of selected materials to different terrestrial solar spectral irradiance distributions and computational techniques has been investigated. The spectral transmittance, reflectance, and absorptance of typical materials employed in solar thermal conversion systems were used for the calculations. The values obtained for several different solar irradiance distributions and calculational methods show only small differences. A single terrestrial solar irradiance distribution is recommended for use as a standard. (Author)

A80-30775 # **Operating thresholds of solar collection systems.** D. S. Ward (Colorado State University, Fort Collins, Colo.). *ASME, Transactions, Journal of Solar Energy Engineering,* vol. 102, Feb. 1980, p. 66-72. 9 refs. Research supported by the U.S. Department of Energy.

A solar collector subsystem operating threshold is defined as the minimum solar insolation rate at which useful heat can be collected when collector loop piping heat losses and parasitic power requirements are considered. This paper discusses the quantitative effect of these energy flows on the operating threshold of the solar subsystem (and thus on the overall system efficiency), and briefly considers the effects of different installation and design procedures. (Author)

A80-30801 **Submerged cylinder wave energy device - Theory and experiment.** D. V. Evans (Bristol, University, Bristol, England), D. C. Jeffrey, S. H. Salter, and J. R. M. Taylor (Edinburgh, University, Edinburgh, Scotland). *Applied Ocean Research,* vol. 1, Jan. 1979, p. 3-12. 11 refs. Research supported by the Science Research Council.

Linearized water wave theory is used to show that a submerged long circular cylinder suitably constrained by springs and dampers to make small harmonic oscillations, can be extremely efficient in absorbing the energy in an incident regular wave whose crests are parallel to the axis of the cylinder. Experimental results are described which confirm the theory for small amplitude waves and which suggest that the device can still be fairly efficient in waves of moderate amplitude. (Author)

A80-30802 **Characteristics of Salter's cam for extracting energy from ocean waves.** A. E. Mynett, D. D. Serman, and C. C. Mei (MIT, Cambridge, Mass.). *Applied Ocean Research,* vol. 1, Jan. 1979, p. 13-20. 13 refs. Research supported by the Massachusetts Institute of Technology, U.S. Navy, and NOAA.

The performance characteristics of Salter's cam with fixed or moveable support as an energy extractor from ocean waves are studied numerically. Linear theory of surface waves and floating bodies is employed in the study. Effects of varying geometrical parameters such as shape, submergence, and water depth are discussed along with the effects of nonrigid support. V.T.

A80-30804 **Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design.** P. Haren and C. C. Mei (MIT, Cambridge, Mass.). *Applied Ocean Research,* vol. 1, July 1979, p. 147-157. 19 refs. NR Project 062-228.

A theory is given for a two-dimensional wave power device which consists of a train of floating rafts whose wave-induced rotation about the hinges is used to generate energy. Ideal efficiency, wave forces and raft movements are studied by a linearized shallow water theory which is sufficiently simple to enable an investigation for optimum designs under a variety of criteria of efficiency and cost-effectiveness. For a sample raft train, a numerical theory for arbitrary wavelength is also applied, yielding results which are not essentially different from those by the long wave approximation. (Author)

A80-30805 **Absorption of wave energy by elongated bodies.** J. N. Newman (MIT, Cambridge, Mass.). *Applied Ocean Research,* vol. 1, Oct. 1979, p. 189-196. 7 refs. Navy-NSF-supported research.

Slender-body approximations are used to predict the maximum rate of energy absorption by an elongated floating vessel which performs vertical motions of varying amplitude and phase along its length. Simple estimates are derived for the amplitude and phase of particular mode shapes, and for the corresponding power absorption. Specific mode shapes considered include polynomials, trigonometric functions, and piecewise-linear functions intended to represent an articulated raft. An articulated raft with two hinges appears to be optimum from the engineering standpoint. (Author)

A80-30939 **The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells.** J. Reichman (Grumman Aerospace Corp., Research Dept., Bethpage, N.Y.). *Applied Physics Letters,* vol. 36, Apr. 1, 1980, p. 574-577. 13 refs.

Equations are derived giving the current-voltage characteristics of photovoltaic cells based on the semiconductor-electrolyte junction. Recombinations in the neutral region and space-charge region are included. It is shown that the rate-limiting effect of charge transfer across the interface enhances the recombination rate in these regions with increasing voltage, thereby reducing the fill factor. Significant differences in the behavior of these cells and other photovoltaic cells are pointed out. (Author)

A80-30940 **Amorphous Si-F-H solar cells prepared by dc glow discharge.** M. Konagai and K. Takahashi (Tokyo Institute of Technology, Tokyo, Japan). *Applied Physics Letters,* vol. 36, Apr. 1, 1980, p. 599-601. 9 refs.

Amorphous Si-F-H films were prepared by dc glow discharge in an atmosphere of SiF4 + H2. Optical and electrical measurements have been performed to evaluate the film quality. The photoconductivity of amorphous Si-F-H solar cell showed the efficiency of 1.3% under simulated AM1, 100-mW/sq cm insolation. (Author)

A80-30942 **Field-dependent quantum efficiency in hydrogenated amorphous silicon.** R. Crandall (RCA Laboratories, Princeton, N.J.). *Applied Physics Letters,* vol. 36, Apr. 1, 1980, p. 607, 608. 11 refs. Research sponsored by RCA. Contract No. AC-03-78ET21074.

A model calculation of the electric field dependence of the quantum efficiency for electron-hole pair production in hydrogenated amorphous silicon is presented and compared with recent measurements of the electric field dependence of the solar-cell collection efficiency. The theory, based on electric field reduction of geminate recombination of the excited electron-hole pair, agrees well with experiment. (Author)

A80-31042 **An underground coal gasification experiment - Hoe Creek II.** W. R. Aiman, C. B. Thorsness, R. W. Hill, and D. R. Stephens (California, University, Livermore, Calif.). *Combustion Science and Technology,* vol. 21, no. 3-4, 1980, p. 97-107. 17 refs. Contract No. W-7405-eng-48.

In this experiment the scheme of linked vertical wells for in situ coal gasification was used with an 18.3-m well spacing. The experiment took 100 days for air-flow testing, reverse-combustion linking, forward-combustion gasification, and postburn steam flow. Air was used for gasification except for a 2-day test with oxygen and steam flow. Reverse-combustion linking took 14 days at 1.6 m/day and used 0.40 Mgmol of air per meter of link. At least two linkage paths were formed. The detected links stayed below the 3 m level in the 7.6 m coal seam; however, the product flow from the forward-burn gasification probably followed the coal-overburden interface, rather than the reverse-burn links at the 3-m level.

Forward-burn gasification took 58 days and produced a total of 232 Mgmol (194 Mscf) of gas with an average heating value of 96 kJ/gmol (108 Btu/scf). During the oxygen-steam test, the heating value averaged 235 kJ/gmol (265 Btu/scf). The coal recovery was 1310 cu m (1950 ton). Gasification was terminated because of decreasing product quality, not because the burn had reached the production well. Product quality decreased as a result of increasing heat loss to inert materials underground.

(Author)

A80-31200 # **Satellite solar power plants (Satelitarne elektrownie sloneczne).** K. Wiewiorowska. *Astronautyka,* vol. 22, no. 6, 1979, p. 20, 21. In Polish.

An international survey revealed that serious effort directed to the construction of orbiting solar power plants cannot be expected earlier than in two decades. The formidable technical and economical problems involved in this venture are examined, along with some legal aspects arising from the current formulation of the international space law.

V.P.

A80-31357 # **Explosive-driven magnetic generator with a plasma load (Vzryvomagnitnyi generator s plazmennoi nagruzkoi).** I. I. Divnov, N. I. Zotov, O. P. Karpov, B. G. Klokov, and B. D. Khristoforov. *PMTF - Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki,* Nov.-Dec. 1979, p. 46-52. 9 refs. In Russian.

The paper deals with an experimental study of the energy transfer from an explosive-driven magnetic generator to an active inductive load in the form of a high-current discharge in air at normal pressure. The highest energy value (340 kJ) was obtained at a close to optimal (calculated) resistance of 0.1 ohm.

V.P.

A80-31501 # **Analysis of losses in a high-frequency converter with low-cosine capacitance load (Analiz poter' v preobrazovatele povyshennoi chastoty pri emkostnoi nizkokosinusnoi nagruzke).** I. M. Chizhenko, I. A. Kurilo, and O. S. Iakimov (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Problemy Tekhnicheskoi Elektrodinamiki,* no. 71, 1979, p. 3-6. 5 refs. In Russian.

The paper evaluates the losses and efficiency of high-frequency thyristor converters with low-cosine capacitance load both for the case of reactive-power compensation and the case without such compensation. The redistribution of losses in components of the converter circuit is analyzed, and computational results are compared with experimental data.

B.J.

A80-31507 **Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact (Ob effektivnom teplovom i elektricheskom soprotivlenii sloistykh stabilizirovannykh sverkhprovodnikov s neideal'nym kontaktom faz).** Iu. V. Boiko, Iu. G. Golubenko, F. A. Kotenev, and V. F. Reztsov (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Problemy Tekhnicheskoi Elektrodinamiki,* no. 71, 1979, p. 71-77. 8 refs. In Russian.

A80-31509 # **Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream (Elektricheskie protsessy pri vzaimodeistvii volny magnitnogo polia s potokom ionizovannogo gaza).** A. P. Rashchepkin and A. E. Vuginshtein (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *Problemy Tekhnicheskoi Elektrodinamiki,* no. 71, 1979, p. 97-102. In Russian.

The interaction of a plasma stream with a nonuniform magnetic field is studied by numerically solving the electrodynamic Maxwell equations with allowance for the anisotropy of plasma conductivity. The study is applicable to conditions in a Hall-effect MHD generator with sign-variable magnetic field.

B.J.

A80-31626 **International tokamak reactor - Executive summary of the IAEA Workshop, 1979.** G. Grieger, F. Engelmann, R. Hancox, D. Leger, P. Reynolds, S. Mori, T. Hiraoka, K. Sako, T. Tazima, and B. B. Kadomtsev (EURATOM, Brussels, Belgium). *Nuclear Fusion,* vol. 20, Mar. 1980, p. 349-388.

The paper describes the efforts of the international fusion community to define the objectives and characteristics of the next fusion device beyond the next generation of large tokamaks in the world to operate in 1990. The technical and scientific feasibility of the device is assessed together with an analysis of the advantages in international cooperation. Programmatic and technical objectives are defined, the plasma physics and technical data bases are evaluated, and major research and development needs are identified. The physical parameters of a device that would be consistent with the objectives and the data base estimates are discussed.

C.F.W.

A80-31750 **Promising fuels for MHD power stations.** N. A. Kruzhilin, A. G. Rotinov, S. A. Tager, and I. T. Iakubov (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teploenergetika,* vol. 26, July 1979, p. 28-34.) *Thermal Engineering,* vol. 26, July 1979, p. 408-413. 5 refs. Translation.

The influence of hydrocarbon fuel characteristics on the properties of the plasma generated in an open-cycle magnetohydrodynamic power station is examined in order to investigate the feasibility and efficiency of various fuels. Plasma electrical conductivity was determined from plasma pressure and temperature, fuel hydrocarbon ratio, oxidant oxygen content and potassium carbonate seed concentration in the combustion chamber, as a function of the chemical properties of various types of coals, natural gas and oil. Results indicate that coals with a high reactivity, low moisture content, low ash content, high carbon-hydrogen ratio and arbitrary sulfur content are most suitable for MHD power station use, with only the semicoke of brown coals having acceptable values of all parameters. While the clean fuels, natural gas and oil, are also found to satisfy these requirements, it is concluded that due to its relative abundance coal will most likely represent the major MHD generator fuel.

A.L.W.

A80-31770 **Light rail transit in the United States.** S. F. Taylor (Sanders and Thomas, Inc., Pottstown, Pa.). *Transportation,* vol. 9, Mar. 1980, p. 67-74.

In recent years interest in light rail transit has grown substantially in the United States. The concept of LRT is increasingly viewed as a possible answer to the search for a less costly rail transit technology that could reduce America's dependency on the private automobile and put the country on the road to a more secure, self-sufficient energy future. The paper reviews recent LRT developments in four American cities, two of which have undertaken to rehabilitate and upgrade their existing surface street railway systems, and the other two have embarked upon construction of entirely new light rail systems.

(Author)

A80-31775 # **A study on plasma plug.** T. Taniyama and T. Masutani (Nihon University, Tokyo, Japan). *Nihon University, Research Institute of Science and Technology, Report,* Sept. 1979, p. 13-33.

The paper examines fundamental experiments on high energy ignition plugs which are employed in solving problems on how to reduce the exhaust gas pollution and decrease specific fuel consumption. Wave forms of voltage, current, and light energy are observed by changing electrode materials, forms and gaps with discharge generated by impulse voltage of high pressure hydrogen. It is noted that energy transfer conditions are greatly affected by an oxide film covering the electrode surface and contents of the alloy elements that are used for electrodes.

C.F.W.

A80-31791 **The industrialisation of space.** G. K. C. Pardoe (General Technology Systems, Ltd., London, England). *British Interplanetary Society, Journal (Space and Education),* vol. 33, May 1980, p. 195-200.

It is noted that the industrialization of space has rested and will continue to rest to a major extent on the support and stimulus of defense programs. The present paper examines the more publicly visible activities in space. Discussion covers the progressive use of space to date, noting the introduction of commercially based communications satellites in the 1960s. Also examined is the growth of industrialization and the commercial implications of earth observation satellites, in-orbit material processing, orbital antenna farm, and space power system. Finally, it is concluded that the current reluctance of sectors of industry to innovate must be reversed since the solving of future problems will require a more revolutionary approach. M.E.P.

A80-31856 # **Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant.** R. J. Zoschak, S. F. Wu (Foster Wheeler Development Corp., Livingston, N.J.), and D. N. Gorman (Martin Marietta Aerospace, Denver, Colo.). *ASME, Transactions, Journal of Engineering for Power*, vol. 102, Apr. 1980, p. 486-494.

This paper focuses on the design and operating aspects of a 10-MWe cavity-type, natural-circulation, steam-generating receiver for a central-receiver thermal power plant. The development of the receiver concept and the basic design features are described. The solar energy input analysis, thermal/hydraulic performance, and structural design of the receiver are discussed along with its control concept and transient operation. The design, construction, and testing of a 5-MWt scaled-down version of the 10-MWe receiver are summarized with emphasis on test objectives, scaling criteria, and design similarities to the full-scale receiver. (Author)

A80-31857 # **The effect of material properties on the thermal efficiency of the Minto solar wheel.** S. Lin (Concordia University, Montreal, Canada) and R. Bhardwaj. *ASME, Transactions, Journal of Engineering for Power*, vol. 102, Apr. 1980, p. 504-507.

The characteristic of the thermal performance of the Minto solar wheel is that its thermal efficiency is strongly dependent on the material properties of the working fluid. For a specified working fluid, the thermal efficiency of the ideal cycle of the Minto solar wheel is dependent only on the mean diameter of the wheel. To study the effect of the material properties of the working fluid on the ideal thermal efficiency, 14 working fluids are selected, and their thermal efficiencies as functions of the mean diameter of the wheel are calculated and compared with each other. Among these fluids, R-12, R-115, R-500, R-22 and R-13B1 achieve better thermal performance than the others. (Author)

A80-31900 **Solar cells for photovoltaic generation of electricity: Materials, devices and applications.** M. Sitting. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 48), 1979. 358 p. 11 refs. $48.

The book provides detailed, descriptive information that is based on U.S. patents issued since January 1970 dealing with solar cells suitable for the photovoltaic generation of electricity. In this book, solar energy is restricted to the proposition of producing useful energy directly from sunlight only. The discussion covers the fundamentals of solar cells, future development prospects, application areas for solar cells, materials for solar cells, materials availability, toxic hazards of solar cell materials, solar cell fabrication, solar cell testing, solar cell enhancement, solar cell mountings, photovoltaic cogeneration - hybrid systems, photoemissive cell devices, solar cell energy storage, photoelectrochemical energy conversion, and economics of solar cells. S.D.

A80-31966 **The characteristics of high current amorphous silicon diodes.** R. A. Gibson, P. G. Le Comber, and W. E. Spear (Dundee, University, Dundee, Scotland). *Applied Physics*, vol. 21, Apr. 1980, p. 307-311. 7 refs. Research supported by the Science Research Council and the Lucas Group.

Amorphous silicon p-n junctions with various doping profiles have been prepared by the glow discharge technique and the effect of the barrier profile on electrical properties investigated. Current densities of up to 40 A sq cm with rectification ratios of 10 to the 4th to 10 to the 5th were obtained with n(+)-v-p(t) structures. The diode quality factor has also been investigated, both in the dark and under illumination. (Author)

A80-31999 **Gas turbines for automotive use.** Edited by J. P. O'Brien. Park Ridge, N.J., Noyes Data Corp. (Energy Technology Review, No. 54), 1980. 350 p. $42.

Gas turbine engines for automotive use are discussed with regard to technology, engine concepts, materials, and costs. The characteristics of complete engines and vehicles powered by state-of-the-art and advanced gas turbines are considered, and attention is given to the manufacture and costs of metallic materials. In addition, recent ceramic material and fabrication developments are discussed, and major ceramic technology problem areas related to the metallic and advanced Brayton engine configurations are outlined. Emphasis is placed on ceramic components capable of operating at temperatures hundreds of degrees above metallic components. The potential of advanced alternative heat engine power systems (Brayton and Stirling) is compared with that of the evolving conventional power systems, considering fuel economy, exhaust emissions, multifuel capability, use of advanced materials, and cost/manufacturability. J.P.B.

A80-32021 * **Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators.** R. Winston (Chicago, University, Chicago, Ill.) and W. T. Welford (Imperial College of Science and Technology, London, England). *Applied Optics*, vol. 19, Feb. 1, 1980, p. 347-351. Research supported by the California Institute of Technology; Contract No. JPL-955565.

The paper discusses the paraboloidal mirror as a tracking solar concentrator, fitting a nonimaging second stage to the paraboloidal mirror, other image-forming systems as first stages, and tracking systems in two-dimensional geometry. Because of inherent aberrations, the paraboloidal mirror cannot achieve the thermodynamic limit. It is shown how paraboloidal mirrors of short focal ratio and similar systems can have their flux concentration enhanced to near the thermodynamic limit by the addition of nonimaging compound elliptical concentrators. S.D.

A80-32055 **Oils and rubber from arid land plants.** J. D. Johnson (Arizona, University, Tucson, Ariz.) and C. W. Hinman (Diamond Shamrock Corp., Tucson, Ariz.). *Science*, vol. 208, May 2, 1980, p. 460-464. 17 refs. Research sponsored by the Diamond Shamrock Corp.

In this article the economic development potentials of Cucurbita species (buffalo gourd and others), Simmondsia chinensis (jojoba), Euphorbia lathyris (gopher plant), and Parthenium argentatum (guayule) are discussed. All of these plants may become important sources of oils or rubber. (Author)

A80-32056 **Radiant heat for energy conservation.** R. V. Pound (Harvard University, Cambridge, Mass.). *Science*, vol. 208, May 2, 1980, p. 494, 495.

It is proposed that human comfort could be provided in otherwise chilly surroundings by filling the occupied space with electromagnetic energy of centimeter wavelength. Very considerable reductions in the consumption of energy required for the heating of buildings should result from the lowering of interior temperatures thereby permitted. (Author)

A80-32074 # **Low cost composite blades for large wind turbines.** O. Weingart (Structural Composite Industries, Inc., Azusa, Calif.). In: Rising to the challenge of the '80s; Annual Conference and Exhibit, 35th, New Orleans, La., February 4-8, 1980, Preprints. New York, Society of the Plastics Industry, Inc., 1980, p. 17-A 1 to 17-A 4.

The TFT process developed to fabricate a filament-wound spar for a composite wind turbine blade is discussed, as well as the preliminary design review for the rotor blade and plans for a 4 kW small wind energy conversion system. The TFT process utilizes a low cost E-glass fabric called transverse-filament tape, in which the major reinforcing fibers are transverse to the length of the tape, whose circumferential winding results in axial fiber orientation. It is indicated that the TFT manufacturing process will allow the blades to be fabricated from low cost materials, in a continuous operation, on automatic machinery with low labor intensity. J.P.B.

A80-32201 # **The energy problem - Its effect on aircraft design. II - The effects of fuel cost.** W. Tye. *Aircraft Engineering*, vol. 52, Apr. 1980, p. 2-4.

The paper examines the factors of the energy problem's effect on aircraft design beginning with a discussion of what decides cost and price. Attention is given to the effect of energy costs on the pattern of living and on air transport. Consideration is then given to fuel prices and aircraft operating costs. Finally, the effect of design advances on fuel use and DOC is studied. M.E.P

A80-32220 # **End zone of a channel with segmented electrodes, carrying nonuniform flow (O kontsevoi zone ramochnogo kanala s neodnorodnym potokom).** V. L. Bobrov, V. Iu. Konoplev, and Iu. V. Makarov. *Magnitnaia Gidrodinamika*, Oct.-Dec. 1979, p. 69-72. In Russian.

In the present paper, a modification of the Lax-Wendroff method is applied to the numerical analysis of the potential and current fields in the end zone of a channel with segmented electrodes and nonuniform flow. It is shown that in order to determine the position of the first electrode, one must know both the mean values and the spatial distribution of the plasma parameters. V.P.

A80-32221 # **A magnetohydrodynamic piston engine (Porshnevoi magnitogidrodinamicheskii dvigatel').** A. I. Khozhainov. *Magnitnaia Gidrodinamika*, Oct.-Dec. 1979, p. 111-116. In Russian.

The paper deals with the theory of a conduction-type MHD piston engine with a reciprocating motion of the liquid metal. Relations for the piston rate, the apparent mass, and engine efficiency are derived under the assumption of a linear dependence of the effective resistance on the piston rate. It is assumed that the flow is laminar and that edge effects are negligible. V.P.

A80-32276 # **The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas (Primenenie raznomasshtabnykh mnogozonal'nykh kosmicheskikh snimkov zemli pri geologicheskom izuchenii neftegazonosnykh territorii).** S. V. Atanasian and V. D. Skariatin. In: Space photography and thematic mapping: A method for processing multichannel photography. Moscow, Izdatel'stvo Moskovskogo Universiteta, 1979, p. 115-122. In Russian.

The paper considers the application of photogeological interpretation methods to the exploration of areas with oil and natural gas reserves; the use of multispectral (including IR scanner) satellite photographs of different scales is examined. Geological interpretations of the Persian Gulf area and of the Caucasus Mountains area are considered as examples. B.J.

A80-32287 # **Electrical purifiers for dielectric fluids (Elektricheskie ochistiteli dielektricheskikh zhidkostei).** G. A. Nikitin (Kievskii Institut Inzhenerov Grazhdanskoi Aviatsii, Kiev, Ukrainian SSR). *Khimiia i Tekhnologiia Topliv i Masel*, no. 4, 1980, p. 21-24. In Russian.

Electrical devices for the separation of charged particle contaminants from dielectric working fluids such as fuels, motor oils and hydraulic fluids are discussed. The operating principles and design of an electrical purifier, which acts to create a nonuniform electric field within the dielectric fluid which causes the contaminant particles to settle on the electrodes, are considered. Experimental measurements of the effectiveness of various electrical purifiers in removing contaminant particles from aviation motor oil MK-8 and the hydraulic fluid AMG-10 are presented, and 92.3- and 743-fold reductions in impurity content are pointed out. It is also found that the operating conditions, fire safety and the cost effectiveness of the device are compatible for use in conjunction with filters for fuel purification. A.L.W.

A80-32318 **MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems.** R. A. Sacks (Science Applications, Inc., Oak Brook; Argonne National Laboratory, Argonne, Ill.). *Journal of Applied Physics*, vol. 51, Mar. 1980, p. 1407-1409. 5 refs.

The electrostatic potential describing the fields interior to a magnetohydrodynamic (MHD) power generating channel obeys a linear uniformly elliptic partial differential equation. The physically natural boundary conditions, however, do not fall within a class for which the solution has previously been shown to be unique. We discuss the boundary conditions appropriate to this situation and then generalize the discussion in Courant and Hilbert to demonstrate the uniqueness of the solution to an extended class of boundary value problems which includes the MHD channel as a special case. (Author)

A80-32325 **Black a-Si solar selective absorber surfaces.** R. Messier, S. V. Krishnaswamy, L. R. Gilbert, and P. Swab (Pennsylvania State University, University Park, Pa.). *Journal of Applied Physics*, vol. 51, Mar. 1980, p. 1611-1614. 23 refs. Contracts No. EM-78-C-04-5302; No. DE-AC03-79ET23038.

Amorphous Si films display a unique anisotropic etching phenomenon in which a columnar microstructure results. The alignment of the anisotropic microstructure is related to the average angle of the depositing material. Since cross-sectional spacing of the columns is less than the wavelength of light, a continuous grading of the refractive index occurs and results in a drastic reduction in the total reflectance from 40 to 50% in the as-deposited film to less than 2% in the etched film. The etchant, HF/HNO3, apparently oxidizes rapidly down aligned void networks followed by an equally rapid dissolution and removal step. Such a semiconductor film on a low IR emissivity metallic substrate is a potentially efficient photothermal selective absorber surface. (Author)

A80-32330 **Electrical conductivity of a seeded H2/O2 system.** B. K. Sawhney, S. Q. Hussain (Indian Institute of Technology, New Delhi, India), and J. Swithenbank (Sheffield, University, Sheffield, England). *Journal of Applied Physics*, vol. 51, Mar. 1980, p. 1831, 1832. 12 refs.

The feasibility of using a H2/O2 system as a working fluid in an open-cycle MHD generator is considered. The variation of the electrical conductivity of the seeded combustion products of a H2/O2 system with temperature has been determined and the results have been compared with the available data for acetylene-oxygen and water-gas-oxygen systems. Although the conductivity of a H2/O2 system is smaller than that of hydrocarbon fuels, it is sufficient at higher temperatures for MHD application. V.L.

A80-32331 * **The spectral response of a front surface field solar cell.** O. von Roos (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Journal of Applied Physics*, vol. 51, Mar. 1980, p. 1852, 1853. Contract No. NAS7-100.

A calculation of the short-circuit current as a function of wavelength of the incident light, induced in a front surface field solar cell, is presented. The cell consists of a P(+)-P-N(+) junction. The electric field present in the P(+) layer situated at the front surface (the surface exposed to the sun) boosts the minority carrier collection at the P-N(+) junction sufficiently to make this structure a viable alternative to ordinary solar cells. A distinct advantage derives from the placement of all ohmic contacts on the back-surface facilitating array assemblage. (Author)

A80-32371 **Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems.** J. W. Clarke and T. D. Rantell (Coal Research Establishment, Cheltenham, Glos., England). *Fuel*, vol. 59, Jan. 1980, p. 35-41. 10 refs.

A series of experiments has been carried out to study the effects of filtration conditions upon the rate of filtration of non-hydrogenated coal digests. The results show the dependence of cake resistivity on both the filtration temperature and pressure. Filter cakes were found to be compressible, resulting in smaller increases in rate with increasing pressure than with incompressible cakes. The filtration temperature determines the packing of residual solids in the cake which in turn affects the cake resistivity. An empirical relation has been derived between filtration temperature and resistivity. With increasing temperature there is an increase in filtration rate due to the reduced viscosity, but a reduction owing to a higher packing density of solids in the filter cake. (Author)

A80-32372 **Filtration in coal liquefaction - Influence of digestion conditions in the filtration of non-hydrogenated coal digests.** J. W. Clarke and T. D. Rantell (Coal Research Establishment, Cheltenham, Glos., England). *Fuel*, vol. 59, Mar. 1980, p. 208-212. 8 refs.

A80-32396 **Coal processing and utilization (Kohlenveredlung und Kohlenverwendung).** H.-D. Schilling (Bergbau-Forschung GmbH, Essen, West Germany). *Brennstoff-Wärme-Kraft*, vol. 32, Apr. 1980, p. 125-129. 98 refs. In German.

It is noted that the rising price of oil as well as supply concerns have lead to an increase in the use of coal. It is shown that in order for coal to take a greater role in energy supply, work must commence now in the areas of coal extraction and processing. Attention is given to new technologies such as coke production, electricity and heat generation, coal gasification, and coal liquifaction. Also covered are a separator for nitrogen oxides and active coal regeneration. Finally, the upgrading of coal is examined.

M.E.P.

A80-32397 **Regenerative energy sources (Regenerative Energiequellen).** M. Meliss (Kernforschungsanlage Julich GmbH, Julich, West Germany). *Brennstoff-Wärme-Kraft*, vol. 32, Apr. 1980, p. 140-146. 51 refs. In German.

The paper examines the impact of regenerative energy sources on the Federal Republic of Germany. Attention is given to passive systems, including a discussion of 'clearview', 'freeflow', 'sunrise' and 'sky view' systems. Also discussed are low temperature collector installations and heat pumps. Further, consideration is given to high temperature collector systems and solar cells, as well as wind energy converters. Finally, the utilization possibilities of other energy sources are surveyed. M.E.P.

A80-32398 **Energy storage (Energiespeicherung).** U. Kaier (Kraftanlagen AG, Heidelberg, West Germany). *Brennstoff-Wärme-Kraft*, vol. 32, Apr. 1980, p. 163-165. 37 refs. In German.

Attention is given to R&D in three areas: (1) storage in systems for electricity and power generation, (2) central heat storage in remote heating systems, and (3) decentralized heat and low temperature thermal energy storage. Further, discussion covers development tendencies including differences in European and U.S. approaches. It is shown that European development tends to integrate the energy storage as a supporting component in the heating system whereas in the U.S. research has primarily concentrated on short term storage. M.E.P.

A80-32399 **Gas turbines (Gasturbinen).** A. Eiermann and F. Potz (Brown, Boveri et Cie. AG, Mannheim, West Germany). *Brennstoff-Wärme-Kraft*, vol. 32, Apr. 1980, p. 170-177. 258 refs. In German.

The article examines the world market for power generating gas turbines, noting that in many cases it is economically feasible to convert steam turbine generating plants and to combine them with gas turbines. Attention is given to the use of gas turbines on oil drilling platforms to generate electricity for pumps, compressors, lighting and ventilation. Consideration is given to the technical status of gas turbines including discussion of developments regarding components such as the compressor, turbine, and combustion chamber. Also discussed are operating experiences with gas turbine installations. Finally, development trends and the future outlook are covered. M.E.P.

A80-32410 **Sweden beyond oil - Nuclear commitments and solar options.** M. Lonnroth (Swedish Secretariat for Futures Studies, Stockholm, Sweden), T. B. Johansson (Lund, Universitet, Lund, Sweden), and P. Steen (Forsvarets Forskningsanstalt, Stockholm, Sweden). *Science*, vol. 208, May 9, 1980, p. 557-563. 6 refs. Research sponsored by the Swedish Secretariat for Futures Studies.

A study of indigenous energy sources as alternatives to imported oil in Sweden is presented. Nuclear energy and renewable energy were considered, showing that large uncertainties were associated with both alternatives. The principal characteristics of an energy policy that does not rule out these two options were identified; such a policy will be based on an understanding of similarities and differences between the alternatives. A nuclear and solar energy systems were outlined as a basis for an analysis of technical, economic, and institutional issues. A.T.

A80-32412 **Cogeneration of electric energy and nitric oxide.** C. G. Vayenas and R. D. Farr (MIT, Cambridge, Mass.). *Science*, vol. 208, May 9, 1980, p. 593, 594. 8 refs. Research supported by the Massachusetts Institute of Technology; NSF Grant No. ENG-77-27500.

A solid electrolyte fuel cell operating on ammonia fuel has been constructed and tested. The yield of nitric oxide can exceed 60 percent with simultaneous electric energy production. Two dimensionless numbers have been identified which govern the product selectivity and power output of this fuel cell. The cell appears to be a promising candidate for nitric acid and electric energy cogeneration. (Author)

A80-32499 **Geothermal heating in Creil (Le chauffage géothermique de Creil).** P. Jaud (Gaz du France, Direction des Etudes et Techniques Nouvelles, Paris, France). *Revue de l'Energie*, vol. 31, Mar. 1980, p. 125-130. In French.

The geothermal heating system in operation in the city of Creil near Paris since 1976 is presented. The system makes use of three heat pumps linked to three titanium plate heat exchangers at the source in order to extract the maximum amount of heat from the saline aquifer prior to its reinjection into the ground at 21 C. Measurements have shown the system to operate at a flow rate of 270 sq m/h with an entrance water temperature of 56 C, however not to provide sufficient heat for all of the buildings to which it was connected during the heating seasons from 1976-1978. Fossil fuel energy savings during the 1977-1978 season are found to amount to 46 percent annually, with a total geothermal/backup cost of 22.25 francs/sq m space heated. It is noted that the costs of geothermal heating have declined in 1978, and, assuming that maintanence and operating costs remain low, further cost reductions are expected.

A.L.W.

A80-32500 **Study of a French national energy system based on coal and nuclear energy (Etude d'un système énergétique français utilisant le charbon et l'énergie nucléaire).** Mr. Henry, Mr. Pottier, and Mr. Le Penhuizic (Gaz du France, Direction des Etudes et Techniques Nouvelles, Paris, France). *Revue de l'Energie*, vol. 31, Mar. 1980, p. 131-143. In French.

Models of a future French national energy economy based on energy derived from coal and nuclear energy are examined. The concept of the energy vector, the form in which energy is transported and transmitted, is considered, and models of transportable energy production by electrolysis and coal gasification and of energy consumption are presented. The integration of the production, transport and storage model with the consumption model is discussed, and the utility of the models in the evaluation of connections between various factors for the planning of future energy policies is noted. A.L.W.

A80-32501 **Mixed potential analysis of sulfation of molten carbonate fuel cells.** D. Townley, J. Winnick (Georgia Institute of

Technology, Atlanta, Ga.), and H. S. Huang (Argonne National Laboratory, Argonne, Ill.). *Electrochemical Society, Journal,* vol. 127, May 1980, p. 1104-1106.

A simple thermodynamic model is used to estimate the effect of hydrogen sulfide on molten carbonate fuel cells. A linear Henry's law relation between the activity and the partial pressure is assumed, and the effect of hydrogen sulfide pressure on overvoltage is plotted. The calculations show that the effect of hydrogen sulfide is progressively greater from the inlet to the outlet of the anode. Theoretical predictions are compared with experimental data from two independent laboratories, showing good agreement. L.M.

A80-32503 * **The effects of titanium impurities in N/+//P silicon solar cells.** A. M. Salama and L. J. Cheng (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Electrochemical Society, Journal,* vol. 127, May 1980, p. 1164-1167. 8 refs. Research supported by the U.S. Department of Energy.

Microscopic and electrical measurements were performed to explain the degradation mechanisms associated with the presence of titanium impurities in silicon. The measurements included X-ray topography, transmission electron microscopy, and deep level transient spectroscopy, before and after processing. The results indicated the presence of TiO2 precipitates, the density of which increased after phosphorus diffusion. A majority carrier trapping level was observed in the wafers before processing. It was concluded that 10% of the Ti in the N(+)/P silicon solar cells formed electrically active centers which caused degradation of the cell junction. 14% of the remaining Ti precipitated out as TiO2, forming electrically active defects, which also caused junction degradation. (Author)

A80-32511 * # **Just over the horizon in space.** I. Bekey (NASA, Washington, D.C.) and J. E. Naugle. *Astronautics and Aeronautics,* vol. 18, May 1980, p. 64-76.

The article surveys some of the concepts introduced and examined by a New Concepts Symposium convened by the NASA Advisory Council recently. Results are reported from the symposium's eight working groups: astrophysics, climate, communications and navigation, energy, large structures, planetary exploration, propulsion and transportation, and telefactors. M.E.P.

STAR ENTRIES

N80-16111 California Univ., Berkeley.
HEAVY HYDROCARBONS FROM COAL GASIFICATION VAPOR PRESSURES AND DEW POINT Ph.D. Thesis
Albert Brian Macknick 1979 110 p
Avail: Univ. Microfilms Order No. 8000429

Experimental vapor pressure data at near-ambient temperatures were measured for seven heavy hydrocarbons. Semitheoretical methods are recommended for extrapolating the data to higher temperatures. Because it is not always feasible economically to determine experimentally all vapor pressure data required, a group contribution method is presented which gives parameters for a vapor pressure equation, where all parameters are obtained from molecular structure only. Techniques are presented which allow classification of heavy hydrocarbon mixtures so that vapor pressures and molecular weights needed for dew point calculations can be estimated with a minimum amount of experiment effort. A computer program is used to predict conditions for two tars obtained from coal gasification pilot plants. Dissert. Abstr.

N80-16126# Princeton Univ., N. J. Dept. of Mechanical and Aerospace Engineering.
COMBUSTION OF MULTICOMPONENT FUEL DROPLETS Final Report
H. S. Homan Jul. 1979 28 p refs
(Contract EC-77-S-02-4449)
(COO-4449-2) Avail: NTIS HC A03/MF A01

The vaporization and burning of liquid fuel droplets which contain more than one chemical component were investigated. The prediction of the transient rate of changes in chemical composition of multi-component liquid fuel droplets during vaporization and burning in convective flow was considered. A model is provided of droplet burning which is more relevant to droplet vaporization and combustion in fuel sprays than the droplet combustion models which assume spherical symmetry, single-component fuel, and constant droplet properties. The model is expected to impact the models of combustion in diesel engines, gas turbines, and furnaces especially for the heavy shale and coal-derived fuels. DOE

N80-16129# Department of Energy, Pittsburgh, Pa. Energy Technology Center.
STABILITY STUDIES OF COAL LIQUIDS
F. R. Brown and F. S. Karn Aug. 1979 23 p refs
(PETC/TR-79/5) Avail: NTIS HC A02/MF A01

The aging characteristics of liquid products derived from the hydrogenation of coal were studied. Viscometric, spectrometric, ultimate analysis, solvent separations, and oxygen consumption measurements were employed to monitor the storage properties of the coal liquids under a variety of environmental conditions. Using viscosity measurements as the primary probe of changes in the stored samples, the rate of product degradation was found to be related to the initial viscosity of the sample, the storage temperature and the concentration of oxygen in the gaseous environment over the samples. Fractions of gross coal liquid samples obtained by solvent separation methods were monitored for their rates of oxygen consumption in order to more accurately determine those materials most susceptible to oxidation, and concurrent degradation of the product. The results show that coal liquids are very susceptible to oxidative degradation. DOE

N80-16130# Department of Energy, Bartlesville, Okla.
DEVELOPMENT OF HIGH TEMPERATURE SUBTRACTIVE COLUMN AND CHROMATOGRAPHIC ANALYSIS OF HYDROCARBONS PRESENT IN DIESEL EXHAUST
Clarence J. Raible and D. E. Seizinger Dec. 1978 11 p refs
(BETC/RI-78/12) Avail: NTIS HC A02/MF A01

A high-temperature subtractive column was developed for distinguishing diesel fuel and exhaust hydrocarbons into two classifications, i.e., saturated and unsaturated hydrocarbons. Duplicate samples were collected with and without a subtractive column and subsequently analyzed by gas liquid chromatography to determine boiling range distribution of exhaust hydrocarbons. Comparison of the resulting chromatographic data permitted determination of hydrocarbon class as well as boiling range distribution. The analytical procedure was developed for classification of hydrocarbons in the range C7 to C22. The loss of saturated compounds within the subtractive column was a reproducible 6 percent over the analyzed hydrocarbon range. Compensation for losses during sample transfer was accomplished by including the transfer steps in the calibration procedure. DOE

N80-16131# Versar, Inc., Springfield, Va.
SURVEY OF POTENTIAL CHLORINE PRODUCTION PROCESSES Final Report
Apr. 1979 196 p refs Prepared for Argonne Natl. Lab., Ill.
(Contract W-31-109-eng-38)
(ANL/OEPM-79-1) Avail: NTIS HC A09/MF A01

A computerized literature search of past and current chlorine generation methods was performed to identify basic chlorine production processes. Over 200 pertinent references are cited involving 20 separate and distinct chlorine processes. Each basic process is evaluated for its engineering and economic viability and energy efficiency in terms of raw material availability, type and amount of energy required, by-product demand/disposal, and status of development. The most promising processes are the membrane process (with and without catalytic electrodes), Kel-Chlor, Mobay (direct electrolysis of hydrogen chloride), the Shell process (catalytic oxidation of hydrogen chloride), and oxidation of ammonium chloride. DOE

N80-16172# Case Western Reserve Univ., Cleveland, Ohio.
POLYMER MATERIALS BASIC RESEARCH NEEDS FOR ENERGY APPLICATIONS. PROCEEDINGS OF A WORKSHOP RECOMMENDING FUTURE DIRECTIONS IN ENERGY-RELATED POLYMER RESEARCH
W. J. Macknight, E. Baer, and R. D. Nelson Aug. 1979 205 p refs Workshop held at Cleveland, 27-29 Jun. 1978 Sponsored by DOE and Massachusetts Univ.
(CONF-780643) Avail: NTIS HC A10/MF A01

The larger field covered in the workshop consists of (1) synthesis and characterization, (2) physical chemistry, (3) physics, and (4) engineering. The basic research needs in polymer materials related to energy are reported. The development of sophisticated instrumentation makes the task of molecular characterization possible on a level hitherto unattainable. Many of these instruments because of their size and complexity must of necessity be located at the DOE National Laboratories. The importance of personnel trained in the polymer field located at these facilities is emphasized. In the past there has been relatively little concerted polymer research within the energy community. This report attempts to describe the present situation and point out some needs and future research directions. DOE

N80-16177# National Academy of Sciences - National Research Council, Washington, D. C. Energy Engineering Board.
HYDROGEN AS A FUEL
1979 86 p refs
(Contract EY-76-C-02-2708)
Avail: NTIS HC A05/MF A01

A panel of the Committee on Advanced Energy Storage Systems of the Assembly of Engineering examined the status and problems of hydrogen manufacturing methods, hydrogen transmission and distribution networks, and hydrogen storage

systems. Suitable criteria for establishing the pace, timing, and technical content of appropriate federally sponsored hydrogen R&D programs was considered. It was concluded the increasing urgency to develop new sources and forms of fuel and energy may well impact on the scale and timing of potential future hydrogen uses.
M.M.M.

N80-16178# California Univ., Berkeley. Lawrence Berkeley Lab.
AGGREGATED VECTORIAL MODEL OF PETROLEUM FLOW IN THE UNITED STATES
V. V. Krishnan and D. F. Cahn Mar. 1979 90 p refs
(Contract W-7405-eng-48)
(LBL-8874) Avail: NTIS HC A05/MF A01

An aggregated material-flow model is proposed for crude oil and its derivative products. Stages in petroleum flow where material conservation is expected are isolated from those where volumetric or identity changes can occur, and generic properties of petroleum and petroleum products that would assist in effective data validation are identified. The model provides a structural framework for organization and consolidation of the various data bases related to petroleum, and serves as a guide for analysis and enumeration of explicit semantic data interrelationships. The model is amenable to expansion into both transactional and more disaggregated representations. The material-flow model is intended as a preliminary step toward a coherent and comprehensive data structure to support monitoring, forecasting, and regulatory efforts in the energy field. The model is developed in the abstract; no attempt is made to test it using explicit data. DOE

N80-16179# Brookhaven National Lab., Upton, N. Y.
PRELIMINARY ASSESSMENT OF THE PROSPECTS FOR USE OF REFUSE-DERIVED FUEL IN MARYLAND
W. C. Metz and J. Shyer Feb. 1979 82 p refs
(Contract EY-76-C-02-0016)
(BNL-51065) Avail: NTIS HC A05/MF A01

The deployment problems of refuse derived fuel (RDF) production in Maryland are examined. Problems experienced by the pyrolysis plant in Baltimore City and the resource recovery plant in Baltimore County are cited. Maryland's municipal solid waste problems are discussed with emphasis on the major components of the municipal solid waste stream, e.g., volume, composition, and location, collection methods used, present and long-range disposal methods, and regulations and ordinances. The generic social and legal constraints to RDF production are described. The problems of RDF technology deployment in Maryland, i.e., county and state RDF energy potential, institutional barriers to RDF production and use, remitting requirements for new RDF production and use facilities, water quality issues of RDF production and use, air quality issues of RDF production and use, and recommendations for initiating RDF production and use are discussed.
DOE

N80-16180# California Univ., Livermore. Lawrence Livermore Lab.
CHEMICAL KINETICS IN LNG DETONATIONS
C. K. Westbrook and L. C. Haselman 14 Sep. 1979 27 p refs Presented at 7th Intern. Colloq. on Gas-Dynamics of Explosions and Reactive Systems, Gottingen, West Germany, 20 Aug. 1979 Revised
(Contract W-7405-eng-48)
(UCRL-82293-Rev-1; CONF-790828-1-Rev-1) Avail: NTIS HC A03/MF A01

The problem of detonability of vaporized mixtures of liquified natural gas and air is addressed, using a characteristic time analysis. Separate numerical models are used to treat the evolution of the blast wave produced by a charge of high explosive and the chemical ignition delay of the fuel-air mixture. These models are combined with experimental data to predict the amount of high explosive required to initiate a detonation of a stoichiometric mixture of methane and air, giving an estimate of 50 to 100 kg of high explosive in spherical geometry. The effects of minor constituents such as ethane and propane on methane-air detonability are examined, and the mechanism by which these minor constituents kinetically sensitize the fuel is discussed. DOE

N80-16181# Department of Energy, Morgantown, W. Va. Energy Technology Center.
UNCONVENTIONAL GAS RECOVERY PROGRAM Semiannual Report, 31 Mar. 1979
R. L. Wise, ed. Aug. 1979 375 p
(METC/SP-79/8) Avail: NTIS HC A16/MF A01

Progress of projects directed at gas recovery from unconventional sources is reported. Methane recovery from coalbeds, eastern gas shales, western gas sand, and geopressured aquifers are among the topics covered.
DOE

N80-16182# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT: EXECUTIVE SUMMARY Interim Final Report, 31 Aug. 1977 - 31 Mar. 1979
Mar. 1979 53 p
(Contract EX-76-C-02-2416)
(FE-2416-43; IFR-2) Avail: NTIS HC A04/MF A01

An engineering and economic assessment of a conceptual design for a commercial facility to convert coal-to-methanol-to-gasoline is presented. This design is conceptual and, therefore, is considered to be a prediction of the development of the technology in question and thus appropriate for comparative economic evaluation purposes.
DOE

N80-16183# Department of Energy, Washington, D. C. Div. of Coal Conversion.
COAL LIQUEFACTION Quarterly Report, Jul. - Sep. 1978
May 1979 65 p
(Contract EX-76-C-01-2297)
(DOE/ET-0068/3) Avail: NTIS HC A04/MF A01

Several conversion processes that are currently in the pilot plant stage are described briefly and information is given as to contractor, contract, funding, site, and current progress. Several support projects are also described.
DOE

N80-16184# Department of Energy, Washington, D. C. Div. of Coal Conversion.
COAL GASIFICATION Quarterly Report, Jul. - Sep. 1978
May 1979 77 p
(Contract EY-76-C-01-2297)
(DOE/ET-0067/3) Avail: NTIS HC A05/MF A01

A number of processes for making high Btu gas and for making low Btu gas are described with the contractor identification, contract, site, funding, and current progress. Projects on mathematical modeling and preparation of a coal conversion systems technical data book are also described.
DOE

N80-16185# Brookhaven National Lab., Upton, N. Y.
FLASH HYDROPYROLYSIS OF COAL Progress Report, 1 Jul. - 31 Dec. 1978
M. Steinberg and P. Fallon Feb. 1979 156 p
(Contract EY-76-C-02-0016)
(BNL-51010; PR-7) Avail: NTIS HC A08/MF A01

The data generated by the parametric study of lignite was correlated and activation energies for a first approximation of the reaction scheme are presented. These range from 88 Kcal/mol for the formation of ethane and 62 Kcal/mol for the formation of benzene to 29 Kcal/mol for the formation of methane, all from the feed coal. The mechanism appears to be largely chemical reaction rate controlled as opposed to diffusion controlled. DOE

N80-16187# Gruy Federal, Inc., Arlington, Va.
OIL AND GAS REPLACEMENT COST: DEVELOPMENT AND PRODUCTION. VOLUME 1: DISCUSSION OF METHODOLOGY, EXHIBITS, AND PROJECTIONS Final Report
5 Aug. 1977 112 p Sponsored by DOE
(DOE/TIC-10078) Avail: NTIS HC A06/MF A01

Oil and Gas Development and production costs are projected by region and depth interval for the benchmark years 1980, 1985 and 1990. Twenty-four geographical regions were specified and six depth classes defined under historical development costs. Direct operating costs are also covered.
DOE

N80-16189# Gorham International, Inc., Maine.
ASSESSMENT OF THE TECHNICAL AND ECONOMIC

FEASIBILITY OF CONVERTING WOOD RESIDUES TO LIQUID AND GASEOUS FUEL PRODUCTS USING STATE-OF-THE-ART AND ADVANCED COAL CONVERSION TECHNOLOGY Quarterly Report, 1 Dec. 1978 - 28 Feb. 1979
May 1979 15 p refs
(Contract ET-78-C-02-4862)
(COO-4862-3; QR-3) Avail: NTIS HC A02/MF A01

The approach to be used in evaluating coal gasification technologies for gasification of wood is outlined. The coal gasification technologies to be evaluated and their status are tabulated. The parameters critical to the development of wood gasification (technical risk, economics, institutional factors, and environmental impacts) are briefly discussed. DOE

N80-16190# Mobil Research and Development Corp., Paulsboro, N. J.
DEVELOPMENT STUDIES ON SELECTED CONVERSION OF SYNTHESIS GAS FROM COAL TO HIGH OCTANE GASOLINE Final Report
J. A. Brennan Oct. 1978 383 p refs
(Contract EX-76-C-01-2276)
(FE-2276-27) Avail: NTIS HC A17/MF A01

An exploratory, experimental process study was conducted on the direct conversion of coal derived synthesis gas to gasoline. Novel, proprietary catalysts were used; (these unique catalysts do not yield oxygenates and the hydrocarbons formed are limited in size to about C sub 11.) This new technology was compared with conventional Fischer-Tropsch. The experiments were conducted in micro reactor (10 cc catalyst capacity) and in bench-scale units (150 cc catalyst capacity). The bench-scale unit was used in both a fixed and fluid bed mode. The studies included effects of temperature, pressure and space velocity on catalyst performance, and catalyst activation, aging and regeneration. DOE

N80-16192# Battelle Columbus Labs., Ohio.
PROCEEDINGS: SYMPOSIUM ON COAL CLEANING TO ACHIEVE ENERGY AND ENVIRONMENTAL GOALS HELD AT HOLLYWOOD, FLORIDA ON SEPTEMBER 1978, VOLUME 1 Final Report, Apr. 1977 - Mar. 1979
S. E. Rogers, ed. and A. W. Lemmon, Jr., ed. Apr. 1979 647 p refs
(Contract EPA-68-02-2163)
(PB-299383/0; EPA-600/7-79-098A) Avail: NTIS HC A99/MF A01 CSCL 07A

The physical and chemical coal cleaning programs of EPA, DOE, the Electric Power Research Institute, and numerous industrial organizations; European and Soviet plans for the future; and problems of ongoing operations are discussed. Topics are presented: coal characteristics, coal cleaning overview, and physical coal cleaning technology. GRA

N80-16193# Battelle Columbus Labs., Ohio.
PROCEEDINGS: SYMPOSIUM ON COAL CLEANING TO ACHIEVE ENERGY AND ENVIRONMENTAL GOALS HELD AT HOLLYWOOD, FLORIDA ON SEPTEMBER 1978, VOLUME 2 Final Report, Apr. 1977 - Mar. 1979
S. E. Rogers and A. W. Lemmon, Jr. Apr. 1979 595 p refs
(Contract EPA-68-02-2163)
(PB-299384/8; EPA-600/7-79-098B) Avail: NTIS HC A25/MF A01 CSCL 07A

A review and discussion is reported on: the physical and chemical coal cleaning programs of EPA, DOE, the Electric Power Research Institute, and numerous industrial organizations; European and Soviet plans for the future; and problems of ongoing operations. The following included are: environmental assessment and pollution control technology, and chemical coal cleaning technology. GRA

N80-16194# Office of Technology Assessment, Washington, D. C.
GASOHOL: A TECHNICAL MEMORANDUM
Sep. 1979 89 p refs
(PB80-105885; OTA/TM/E-1) Avail: NTIS HC A05/MF A01 CSCL 21D

The technical and non technical issues surrounding the development of gasohol are discussed including the resource base, production technologies, and economics of gasohol, and its use as a transportation fuel. The environmental problems and benefits of producing and using gasohol, and the social and institutional issues about using agricultural products for energy are covered. Policy options about gasohol as well as other bioenergy technologies such as wood and methanol production are considered. GRA

N80-16195# National Technical Information Service, Springfield, Va.
ALCOHOL FUELS. CITATIONS FROM THE AMERICAN PETROLEUM INSTITUTE DATA BASE Progress Report, 1973 - Jul. 1979
Diane M. Cavagnaro Sep. 1979 194 p
(NTIS/PS-79/0911/2) Avail: NTIS HC $28.00/MF $28.00 CSCL 21D

Research on alcohol fuels are cited. The citations cover synthesis, chemical analysis, performance testing, processing, pollution, economics, environmental effects, and feasibility. (Contains 178 abstracts) GRA

N80-16215*# Oklahoma Univ., Norman. School of Aerospace, Mechanical and Nuclear Engineering.
LATERAL AND TILT WHIRL MODES OF FLEXIBLY MOUNTED FLYWHEEL SYSTEMS
C. W. Bert and T. L. C. Chen *In* Shock and Vibration Inform. Center The Shock and Vibration Bull., Pt. 2 Sep. 1979 p 35-46 refs Sponsored by DOE

Avail: NTIS HC A10/MF A01 CSCL 10B

An axisymmetric energy storage flywheel system with four degrees of freedom, two associated with lateral translation and two with tilting, was driven by an air turbine which added two more degrees of freedom. A six degree-of-freedom analysis was performed and applied to two versions of a specific design. K.L.

N80-16236# Los Alamos Scientific Lab., N. Mex. Cryogenics Group.
SAFETY OF LIQUID HYDROGEN IN AIR TRANSPORTATION
F. J. Edeskuty 1979 18 p refs Presented at the Hydrogen in Air Transportation Conf., Stuttgart, 10 Sep. 1979
(Contract W-7405-eng-36)
(LA-UR-79-1416; CONF-790942-1) Avail: NTIS HC A02/MF A01

The safety factors and problems associated with the use of liquid hydrogen as an aircraft fuel are discussed. The properties of liquid hydrogen are reviewed and their effect upon airline operations is reported. The effects include safety requirements for storage and refueling systems and safety devices for aircraft hangars and buildings in the close vicinity. Safety problems which need further research are addressed. These include the consequences of a hydrogen spill and dispersion, hydrogen combustion, and hydrogen disposal.

N80-16284# United Technologies Corp., South Windsor, Conn. Power Systems Div.
AN ac/dc POWER CONVERTER FOR BATTERIES AND FUEL CELLS Annual Report
Ramon W. Rosati, ed. Aug. 1978 98 p refs Sponsored by Elec. Power Res. Inst.
(EPRI-EM-662) Avail: NTIS HC A05/MF A01

The overall objective of the EPRI program is the design of an advanced power converter for use in both battery energy storage and fuel cell generation systems. This will be accomplished by expansion of the existing FCG-1 fuel cell power conditioning inverter into a high-efficiency inverter-rectifier system employing improved commutation circuits and advanced semiconductor devices capable of operating over wider dc voltage ranges. A separate but concurrent program for the U. S. Department of Energy (DOE) is examining augmentation of the present FCG-1 inverter for operation as an inverter-rectifier with battery systems. feasibility and operating characteristics were demonstra-

ted Activities ahp accomplishments in the EPRI program include revision of the preliminary specification for ac/dc conversion equipment, survey of seven semiconductor manufacturers to project characteristics of thyristors, screening of fifteen commutation concepts and selection of the two most promising options for experimental evaluation, and modifications of existing experimental power pole hardware to evaluate the selected advanced commutation circuits
DOE

N80-16293 Utah Univ, Salt Lake City
THE EFFECT OF SUPERHEATING ON THE PERFORMANCE OF FLOATING DROPLET DIRECT CONTACT HEAT EXCHANGERS Ph.D. Thesis
Calvin Albert Kodres, Jr 1979 174 p
Avail Univ Microfilms Order No. 8000972

A mathematical model of a single evaporating, superheated droplet is formulated and studied numerically to determine instantaneous and average heat transfer rates to the droplet at various stages of evaporation An explicit procedure for analyzing the entire heat exchanger is then developed based upon the application of a dimensional analysis derivation of a relationship for the heat flux from the single evaporating droplet. The results of the numerical model are used to define the parameters and determine the required constants Two operating geothermal heat exchangers are designed using this procedure The two sites both have a moderate temperature brine and both systems utilize pentane as the working fluid The heat exchanger vessel pressures are varied, providing a range of superheats from 19 to 52 C The average difference between the calculated and measured total heat flux is about 16%
Dissert Abstr

N80-16347# Sandia Labs., Livermore, Calif Combustion Applications Div
ENGINE COMBUSTION TECHNOLOGY OVERVIEW
C W Robinson and S C Keeton Oct 1978 6 p Presented at the Highway Vehicle Systems Contractors Meeting, Dearborn, Mich., 17 Oct 1978
(Contract EY-76-C-04-0789)
(SAND-78-8801; CONF-781050-1) Avail: NTIS HC A02/MF A01

A five-year program to develop technology for increasing the efficiency of automotive, truck, and stationary engines and for switching to modified or alternate fuels is discussed The plan calls for a coordinated program involving DOE/Fossil Fuel Utilization, universities, DOE laboratories, private research organizations, and the engine manufacturing industry The program plan is complementary to existing programs in the DOE/TEC, DOD, and DOT, and is coordinated with those efforts
DOE

N80-16409# Juniata Coll., Huntingdon, Pa
STUDY OF HYDROCARBON-SHALE INTERACTION Progress Report, 1 Apr. - 30 Jun. 1979
P D Schettler, Jr and D L Wampler 1979 50 p refs
(Contract EY-76-S-05-5197)
(ORO-5197-14; PR-14) Avail NTIS HC A03/MF A01

Construction of an apparatus for degasibility/isotherm measurements up to 1000 psi is complete Results of chromatographic analysis of off-gassing from wells KY No 4-, PA No 1-, PA No 2-, OH No 3-, and IL No 4-EGSP are tabulated Temperature coefficients of degasibility and isotherm parameters in Devonian shales were determined A summary of degasibility/isotherm data is presented A computer simulation of a matrix diffusion/fracture flow model in the radial case is discussed A small infrared/X-ray diffraction study is proceeding on selected samples
DOE

N80-16410# Department of Energy, Morgantown, W Va Energy Technology Center
GAS PRODUCTION OF DEVONIAN SHALE WELLS RELATIVE TO PHOTO LINEAMENT LOCATIONS: A STATISTICAL ANALYSIS
J F Howard (Howard and Associates, Owensboro, Ky), S J Lahoda (West Virginia Univ, Morgantown), W E Zirk (West Virginia Univ, Morgantown), and C A Komar Apr 1979 19 p refs
(METC/CR 79/28) Avail NTIS HC A02/MF A01

A pilot study was made to relate Devonian shale gas well production to distance from photo lineaments that were mapped at two different scales, namely low altitude (1:24,000) and intermediate altitude (1:62,500). Cumulative production after 5 years for 41 wells located in the Vicco quadrangle of Perry Co., Kentucky, was used in the study. A statistical two-way analysis of variance design was used to group the data into four classes depending on whether the producing wells were within or beyond 300 feet of a photo lineament derived from both scales. Results indicate that cumulative 5 year production is higher for wells sited within 300 feet of a low-altitude photo lineament The correlations indicate a narrow zone of influence or effect for the geologic feature represented by the photo lineament. Moreover, the most consistently effective features are derived from low-altitude (1:24,000) scale photography, well below the detail commonly utilized in studies to date
DOE

N80-16411# Department of Energy, Washington, D C
ENVIRONMENTAL DEVELOPMENT PLAN: UNDERGROUND COAL GASIFICATION
Sep 1979 76 p Sponsored by DOE, Washington, D.C
(DOE/EDP-0047) Avail NTIS HC A05/MF A01

Early tests indicate that some of the groundwater pollution due to underground coal gasification (UCG) is confined to an area adjacent to the gasified zone and the cleansing properties of the surrounding coal may serve as a natural contaminant control system. Ground subsidence is another major concern. Subsidence could cause disruption of aquifers, surface disturbance, and loss of product gas through cracks to the surface Degradation of air quality is also a significant concern particularly with respect to emissions through cracks and fissures resulting from anticipated subsidence Potential hazards to the worker exist, including the inadvertent release of gas through cracks in the ground surface and worker safety associated with the sudden collapse through subsidence. Environmental regulations which will most directly affect the UCG program include the Federal Water Pollution Control Act, the Safe Drinking Water Act, and the Clean Air Act These regulations will impact upon pollution control requirements, and potential siting of facilities
DOE

N80-16452* National Aeronautics and Space Administration Marshall Space Flight Center, Huntsville, Ala
ALUMINIUM OR COPPER SUBSTRATE PANEL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY Patent
Marion L Roberts, Max H Sharpe, and Albert C Krupnick, inventors (to NASA) Issued 4 Dec 1979 6 p Filed 30 May 1978 Supersedes N78-25557 (16 - 16, p 2137) Division of US Patent Appl SN-829390, Filed 31 Aug 1977, US Patent 4,104,134
(NASA-Case-MFS-23518-3; US-Patent-4,177,325; US-Patent-Appl-SN-910793; US-Patent-Class-428-629; US-Patent-Class-428-650; US-Patent-Class-428-658; US-Patent-Class-428-675; US-Patent-Class-428-680; US-Patent-Class-126-417; US-Patent-Class-126-901; US-Patent-Appl-SN-829390; US-Patent-4,104,134) Avail US Patent and Trademark Office CSCL 10A

A method for making panels which selectively absorb solar energy is disclosed The panels are comprised of an aluminum substrate, a layer of zinc thereon, a layer of nickel over the zinc layer and an outer layer of solar energy absorbing nickel oxide or a copper substrate with a layer of nickel thereon and a layer of solar energy absorbing nickel oxide distal from the copper substrate

Official Gazette of the U S Patent and Trademark Office

N80-16453*# National Aeronautics and Space Administration Lewis Research Center, Cleveland, Ohio
LARGE WIND TURBINE DESIGN CHARACTERISTICS AND R AND D REQUIREMENTS
Seymour Lieblein, ed (Technical Report Services, Rocky River, Ohio) Dec 1979 459 p refs Conf held at Cleveland, 24-26 Apr 1979, sponsored in part by DOE
(NASA-CP-2106; CONF-7904111) Avail NTIS HC A20/MF A01 CSCL 10B

Detailed technical presentations on large wind turbine research and development activities sponsored by public and private organizations are presented. Both horizontal and vertical axis machines are considered with emphasis on their structural design.

N80-16454*# Department of Energy, Washington, D. C.
OVERVIEW OF FEDERAL WIND ENERGY PROGRAM
Daniel F. Ancona *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 1-24 ref

Avail: NTIS HC A20/MF A01 CSCL 10B
The objectives and strategies of the Federal wind energy program are described. Changes in the program structure and some of the additions to the program are included. Upcoming organizational changes and some budget items are discussed, with particular emphasis on recent significant events regarding new approvals. R.E.S.

N80-16455*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DESIGN EVOLUTION OF LARGE WIND TURBINE GENERATORS
David A. Spera *In its* Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 25-33 ref

Avail: NTIS HC A20/MF A01 CSCL 10B
During the past five years, the goals of economy and reliability have led to a significant evolution in the basic design--both external and internal--of large wind turbine systems. To show the scope and nature of recent changes in wind turbine designs, development of three types are described: (1) system configuration developments; (2) computer code developments; and (3) blade technology developments. R.E.S.

N80-16456*# General Electric Co., Philadelphia, Pa. Space Div.
THE GENERAL ELECTRIC MOD-1 WIND TURBINE GENERATOR PROGRAM
Richard H. Poor and R. B. Hobbs *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 35-59

Avail: NTIS HC A20/MF A01 CSCL 10B
The design, fabrication, installation and checkout of MOD-1, a megawatt class wind turbine generator which generates utility grade electrical power, is described. A MOD-1/MOD-1A tradeoff study is discussed. R.E.S.

N80-16457*# Boeing Engineering and Construction, Seattle, Wash.
THE BOEING MOD-2 WIND TUNNEL SYSTEM RATED AT 2.5 MW
Richard R. Douglas *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 61-78
Avail: NTIS HC A20/MF A01 CSCL 10B
A summary description of MOD-2 development and the resulting system hardware is presented. R.E.S.

N80-16458*# WTG Energy Systems, Inc., Buffalo, N.Y.
WTG ENERGY SYSTEMS' MP1-200 200 KILOWATT WIND TURBINE GENERATOR
Allen P. Spaulding, Jr. *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 79-88

Avail: NTIS HC A20/MF A01 CSCL 10B
The preliminary design criteria of the MP1-200 wind turbine are given along with a brief description of the wind turbine generator. Performance and operational experience and cost factors are included. Recommendations for additional research are listed. J.M.S.

N80-16459*# National Swedish Board for Energy Source Development, Spanga.
SPECIFICATION, SITING AND SELECTION OF LARGE WECS PROTOTYPES
Sven Hugossor *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 89-102
Avail: NTIS HC A20/MF A01 CSCL 10B
The development of large-scale windpowered systems is outlined. Topics discussed include: prototype specifications development, site selection process, and selection of prototype contractor. J.M.S.

N80-16460*# Technical Univ. of Denmark, Lyngby.
THE DANISH LARGE WIND TURBINE PROGRAM
B. Maribo Pederson *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 103-120
Avail: NTIS HC A20/MF A01 CSCL 10B
A brief description of the Danish wind energy program and its present status is given. Results and experiences from tests on the Gedser windmill (200 kW) are presented. The key results are presented from the preliminary design study and detailed design of two new WECS (630 kW each) is described. J.M.S.

N80-16461*# Maschinenfabrik Augsburg-Nuernberg A.G., Augsburg (West Germany).
LARGE WIND ENERGY CONVERTER: GROWIAN 3 MW
F. Koerber and Hans A. Thiele *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 121-132

Avail: NTIS HC A20/MF A01 CSCL 10B
The main features of the Growian wind energy converter are presented. Energy yield, environmental impact, and construction of the energy converter are discussed. Reliability of the windpowered system is assessed. J.M.S.

N80-16462*# Sandia Labs., Albuquerque, N. Mex.
CHARACTERISTICS OF FUTURE VERTICAL AXIS WIND TURBINES (VAWTs)
Emil G. Kadlec *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 133-141 refs

(Contract DE-AC04-76DP-00789)
Avail: NTIS HC A20/MF A01 CSCL 10B
The developing Darrieus VAWT technology whose ultimate objective is economically feasible, industry-produced, commercially marketed wind energy systems is reviewed. First-level aerodynamic, structural, and system analyses capabilities which support and evaluate the system designs are discussed. The characteristics of current technology designs are presented and their cost effectiveness is assessed. Potential improvements identified are also presented along with their cost benefits. J.M.S.

N80-16463*# National Research Council of Canada, Ottawa (Ontario).
DESIGN CHARACTERISTICS OF THE 224 kW MAGDALEN ISLANDS VAWT
R. J. Templin *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 143-154 refs
Avail: NTIS HC A20/MF A01 CSCL 10A
The evolution of the main design features of the Magdalen Islands vertical axis wind turbine (VAWT) is described. The turbine has a rotor height of 120 ft (36.58 m) and diameter 80 ft (24.38 m). It was operated as a joint project between NRC and Hydro-Quebec in grid-coupled mode from July 1977 to July 1978 when the rotor was destroyed in an accident. The accident, although unfortunate, tested the basic integrity of the design in a gross overspeed condition, and the rotor is being rebuilt with minor modifications. Some directions for future VAWT research are suggested. M.M.M.

N80-16464*# Aluminum Co. of America, Alcoa Center, Pa.
ALCOA WIND TURBINES

Daniel K Ai *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 155-171 refs

Avail NTIS HC A20/MF A01 CSCL 10A

An overview of Alcoa's wind energy program is given with emphasis on the the development of a low cost, reliable Darrieus Vertical Axis Wind Turbine System. The design layouts and drawings for fabrication are now complete, while fabrication and installation to utilize the design are expected to begin shortly. M.M.M.

N80-16465*# Sandia Labs., Albuquerque, N. Mex.

TEST RESULTS OF THE DOE/SANDIA 17 METER VAWT

Robert O. Nellums and M. H. Worstell *In* NASA Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 173-184 refs

(Contract DE-AC04-76-DP00789)

Avail NTIS HC A20/MF A01 CSCL 10B

A review is given of the test program of a 17 meter Vertical Axis Wind Turbine VAWT. Performance test results are discussed including difficulties encountered during the VAWT operation along with ways of solving these problems. M.M.M.

N80-16466*# Sandia Labs., Albuquerque, N. Mex.

OVERVIEW OF VERTICAL AXIS WIND TURBINE (VAWT)

William N. Sullivan *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics R and D Requirements Dec 1979 p 185-192 refs

(Contract DE-AC04-76-DP00789)

Avail NTIS HC A20/MF A01 CSCL 10B

A survey is presented of the practices which were applied for designing VAWT blades. An attempt is made to discuss strengths and weaknesses of the existing procedures. Discussion is provided on planned or suggested future work in developing improved design tools. M.M.M.

N80-16467*# Aluminum Co. of America, Alcoa Center, Pa. Technical Marketing Div.

FABRICATION OF EXTRUDED VERTICAL AXIS TURBINE BLADES

Arthur G. Craig, Jr. *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 193-204 refs

Avail NTIS HC A20/MF A01 CSCL 10B

Important characteristics of the extruded aluminum blade for the Vertical Axis Wind Turbine are presented. Their weight, structural strength, shape, and maintainability are pointed out. M.M.M.

N80-16468*# Sandia Labs., Albuquerque, N. Mex.

OPERATIONAL EXPERIENCE WITH VAWT BLADES

William N. Sullivan *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 205-210 ref

(Contract DE-AC04-76-DP00789)

Avail NTIS HC A20/MF A01 CSCL 10B

The structural performance of 17 meter diameter wind turbine rotors is discussed. Test results for typical steady and vibratory stress measurements are summarized along with predicted values of stress based on a quasi-static finite element model. K.L.

N80-16469*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

STRUCTURAL ANALYSIS CONSIDERATIONS FOR WIND TURBINE BLADES

David A. Spera *In its* Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 211-224 refs

Avail NTIS HC A20/MF A01 CSCL 10B

Approaches to the structural analysis of wind turbine blade designs are reviewed. Specifications and materials data are discussed along with the analysis of vibrations, loads, stresses, and failure modes. K.L.

N80-16470*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

BLADE DESIGN AND OPERATING EXPERIENCE ON THE MOD-OA 200 kW WIND TURBINE AT CLAYTON, NEW MEXICO

Bradford S. Linscott and Richard K. Shaltens *In its* Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 225-238 refs

Avail NTIS HC A20/MF A01 CSCL 10B

Two 60 foot long aluminum wind turbine blades were operated for over 3000 hours on the MOD-OA wind turbine. The first signs of blade structural damage were observed after 400 hours of operation. Details of the blade design, loads, cost, structural damage, and repair are discussed. K.L.

N80-16471*# Lockheed Aircraft Service, Inc., Ontario, Calif.

EVALUATION OF AN OPERATING MOD-OA 200 kW WIND TURBINE BLADE

Robert E. Donham *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 239-265 refs

Avail NTIS HC A20/MF A01 CSCL 10B

Operating loads and structural damage were monitored during operation of the MOD-OA electric generating system. The turbine was damaged locally between stations 48 and 125 after 2.8 million rotations. Loads due to degraded yaw stiffness and fretting at rib station 48 were identified as primary to this distress. The repaired blades operated an additional 4.8 million rotations without problems. K.L.

N80-16472*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

DESIGN, FABRICATION, AND TEST OF A STEEL SPAR WIND TURBINE BLADE

Timothy L. Sullivan, Paul J. Sirocky, Jr., and Larry A. Viterna *In its* Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 267-284 refs

Avail NTIS HC A20/MF A01 CSCL 10B

The design and fabrication of wind turbine blades based on 60 foot steel spars are discussed. Performance and blade load information is given and compared to analytical prediction. In addition, performance is compared to that of the original MOD-O aluminum blades. Costs for building the two blades are given, and a projection is made for the cost in mass production. Design improvements to reduce weight and improve fatigue life are suggested. K.L.

N80-16473*# WTG Energy Systems, Inc., Buffalo, N.Y.

WTG ENERGY SYSTEMS' ROTOR: STEEL AT 80 FEET

Robert E. Barrows *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 285-292

Avail NTIS HC A20/MF A01 CSCL 10B

The design, specifications, and performance of the 80 foot diameter fixed pitch rotor operating on the MP1-200 wind turbine generator installed as part of the Island of Cuttyhunk's electric power utility grid system are described. This synchronous generating system rated 200 kilowatts at 28 mph wind velocity, and produces constant 60 Hz, 480 VAC current at +/- 1 percent accuracy throughout the machine's operating range. Future R & D requirements and suggestions are included with cost data. A.R.H.

N80-16474*# Gougeon Bros., Inc., Bay City, Mich.

THE USE OF WOOD FOR WIND TURBINE BLADE CONSTRUCTION

Meade Gougeon and Mike Zuteck *In* NASA Lewis Res Center Large Wind Turbine Design Characteristics and R and D Requirements Dec 1979 p 293-308

Avail NTIS HC A20/MF A01 CSCL 10B

The interrelationships between moisture and wood, conditions for dry rot spore activity, the protection of wood fibers from moisture, wood resin composites, wood laminating, quality control, and the mechanical properties of wood are discussed. The laminated veneer and the bonded sawn stock fabrication techniques, used in the construction of a turbine blade with a monocoque 'D' section forming the leading edge and a built up trailing edge section, are described. A 20 foot root end sample complete with 24 bonded-in studs was successfully subjected to large onetime loads in both the flatwise and edgewise directions, and to fatigue tests. Results indicate that wood is both a viable and advantageous material for use in wind turbine blades. The basic material is reasonably priced, domestically available, ecologically sound, and easily fabricated with low energy consumption. A.R.H.

N80-16475*# Kaman Aerospace Corp., Bloomfield, Conn.
LARGE, LOW COST COMPOSITE WIND TURBINE BLADES
Herbert W. Gewehr *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 309-324 refs

Avail: NTIS HC A20/MF A01 CSCL 10B

A woven roving E-glass tape, having all of its structural fibers oriented across the tape width was used in the manufacture of the spar for a wind turbine blade. Tests of a 150 ft composite blade show that the transverse filament tape is capable of meeting structural design requirements for wind turbine blades. Composite blades can be designed for interchangeability with steel blades in the MOD-1 wind generator system. The design, analysis, fabrication, and testing of the 150 ft blade are discussed. A.R.H.

N80-16476*# Boeing Engineering and Construction, Seattle, Wash.
THE MOD-1 STEEL BLADE
John VanBronkhorst *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 325-342
Avail: NTIS HC A20/MF A01 CSCL 10B

The design, development, fabrication, testing, and transport of two 100 foot metal blades for the MOD-1 WTS are summarized. Because the metal blade design was started late in the MOD-1 system development, many of the design requirements (allocations) were restrictive for the metal blade concept, particularly the maximum weight requirement. The design solutions required to achieve the weight goal resulted in a labor intensive (expensive) fabrication, particularly for a quantity of only two blades manufactured using minimal tooling. A.R.H.

N80-16477*# Boeing Engineering and Construction, Seattle, Wash.
THE BOEING MOD-2 WIND TURBINE SYSTEM ROTOR
Gordon N. Davison *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 343-354
Avail: NTIS HC A20/MF A01 CSCL 10B

External configuration, environmental, and internal design requirements for the 300 foot diameter MOD-2 rotor are discussed, with emphasis on design details, significance of fatigue strength, design development test results, and conclusions of the preliminary design efforts. A.R.H.

N80-16478*# Southern California Edison Co., Rosemead
STATUS OF THE SOUTHERN CALIFORNIA EDISON COMPANY 3 MW WIND TURBINE GENERATOR (WTG) DEMONSTRATION PROJECT
Robert L. Scheffler *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 355-362
Avail: NTIS HC A20/MF A01 CSCL 10B

To demonstrate the concept of utility scale electricity production from a high wind energy resource, a program was initiated to construct and test a 3 megawatt (3,000 kW) Schachle wind turbine generator near Palm Springs, California. The background and current status of this program are presented along with a summary of future planned program activities. A.R.H.

N80-16479*# Institut de Recherche de l'Hydro-Quebec, Varennes (Canada).
RESULTS OF A UTILITY SURVEY OF THE STATUS OF LARGE WIND TURBINE DEVELOPMENT
A. Watts, S. Quraeshi (Shawinigan Eng. Co. Ltd., Montreal), and L. P. Rowley (Canadair Ltd., Montreal) *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 363-374

Avail: NTIS HC A20/MF A01 CSCL 10B

Wind energy conversion systems were surveyed from a utility viewpoint to establish the state of the art with regard to: (1) availability of the type of machines, (2) quality of power generation, (3) suitability for electrical grid, (4) reliability, and (5) economics. Of the 23 designs discussed, 7 have vertical axis wind turbines, 9 have upwind horizontal axis turbines, and 7 have downwind horizontal axis turbines. A.R.H.

N80-16480*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SIMULATION STUDIES OF MULTIPLE LARGE WIND TURBINE GENERATORS ON A UTILITY NETWORK
Leonard J. Gilbert and David M. Triezenberg (Purdue Univ.) *In its* Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 375-384 refs

Avail: NTIS HC A20/MF A01 CSCL 10B

The potential electrical problems that may be inherent in the inertia of clusters of wind turbine generators and an electric utility network were investigated. Preliminary and limited results of an analog simulation of two MOD-2 wind generators tied to an infinite bus indicate little interaction between the generators and between the generators and the bus. The system demonstrated transient stability for the conditions considered. A.R.H.

N80-16481*# Hamilton Standard, Windsor Locks, Conn.
SYSTEM CONFIGURATION IMPROVEMENT
Glidden S. Doman *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 385-396
Avail: NTIS HC A20/MF A01 CSCL 10B

Factors involved in the choice of the system configuration for the wind turbine generator are listed. It was found that choices among the many configuration options can be based strictly upon the resulting cost of energy results. Choices made on that basis also lead to reduced analytical complexity, less hardware complexity and reduced program risk. It was also found that many seemingly minor details turn out to have important impacts that are seen only after design, performance and cost-finding were thoroughly probed. M.M.M.

N80-16482*# Hamilton Standard, Windsor Locks, Conn.
COST OF ENERGY EVALUATION
Thad M. Hasbrouck *In* NASA. Lewis Res. Center Large Wind Turbine Design Characteristics and R and D Requirements Dec. 1979 p 397-402
Avail: NTIS HC A20/MF A01 CSCL 10B

The estimated cost per kilowatt hour, the wind resources in the utilities service area, and the reliability of the units are considered in computing the cost of energy of the wind turbine generator system. M.M.M.

N80-16483*# Energy Technology, Inc., Cleveland, Ohio.
STUDY OF ADVANCED RADIAL OUTFLOW TURBINE FOR SOLAR STEAM RANKINE ENGINES
Cecil Martin and Terry Kolenc Dec. 1979 74 p refs
(Contract DEN3-86)
(NASA-CR-159695; DOE/NASA/0086-79/1; ETI-1279) Avail: NTIS HC A04/MF A01 CSCL 10B

The performance characteristics of various steam Rankine engine configurations for solar electric power generation were investigated. A radial outflow steam turbine was investigated to determine: (1) a method for predicting performance from experimental data, (2) the flexibility of a single design with regard to power output and pressure ratio, and (3) the effect of varying the number of turbine stages. All turbine designs were restricted to be compatible with commercially available gearboxes and generators. A study of several operating methods and control schemes for the steam Rankine engine shows that from an efficiency and control simplicity standpoint, the best approach is to hold turbine inlet temperature constant, vary turbine inlet pressure to match load, and allow condenser temperature to float maintaining constant heat rejection load. A.R.H.

N80-16485*# General Electric Co., Philadelphia, Pa. Space Div.

PROTOTYPE SOLAR HEATING AND COMBINED HEATING COOLING SYSTEMS

DOE 2 Oct. 1978 44 p Sponsored in part by DOE
(Contract NAS8-32092)
(NASA-CR-161340; QR-9) Avail: NTIS HC A03/MF A01 CSCL 10A

The design and development of eight prototype solar heating and combined heating and cooling systems is discussed. The program management and systems engineering are reported, and operational test sites are identified. A.W.H.

N80-16487*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

EVALUATION OF CONCENTRATED SPACE SOLAR ARRAYS USING COMPUTER MODELING

D. E. Rockey 1 Nov. 1979 54 p refs
(Contract NAS7-100)
(NASA-CR-162681; JPL-PUB-79-87) Avail: NTIS HC A04/MF A01 CSCL 10A

A general approach is developed for predicting the power output of a concentrator enhanced photovoltaic space array. A ray trace routine determines the concentrator intensity arriving at each solar cell. An iterative calculation determines the cell's operating temperature since cell temperature and cell efficiency are functions of one another. The end result of the iterative calculation is that the individual cell's power output is determined as a function of temperature and intensity. Circuit output is predicted by combining the individual cell outputs using the single diode model of a solar cell. Concentrated array characteristics such as uniformity of intensity and operating temperature at various points across the array are examined using computer modeling techniques. An illustrative example is given showing how the output of an array can be enhanced using solar concentration techniques. Author

N80-16491*# Foster-Miller Associates, Inc., Waltham, Mass.

A 15kWe (NOMINAL) SOLAR THERMAL ELECTRIC POWER CONVERSION CONCEPT DEFINITION STUDY: STEAM RANKINE REHEAT RECIPROCATOR SYSTEM Final Report

H. Fuller, R. Demler, E. Poulin, and P. Dantowitz Jun. 1979 63 p refs
(Contracts DEN3-62; EX-76-A-29-1060)
(NASA-CR-159590; DOE/NASA/0062-79/1; NAS-7845) Avail: NTIS HC A04/MF A01 CSCL 10B

An evaluation was made of the potential of a steam Rankine reheat reciprocator engine to operate at high efficiency in a point-focusing distributed receiver solar thermal-electric power system. The scope of the study included the engine system and electric generator, not included was the solar collector/mirror or the steam generator/receiver. A parametric analysis of steam conditions was completed leading to the selection of 973 K 12.1 MPa as the steam temperature/pressure for a conceptual design. A conceptual design was completed for a two cylinder/opposed engine operating at 1800 rpm directly coupled to a commercially available induction generator. A unique part of the expander design is the use of carbon/graphite piston rings to eliminate the need for using oil as an upper cylinder lubricant. The evaluation included a system weight estimate of 230 kg at the mirror focal point with the condenser mounted separately on the ground. The estimated cost of the overall system is $1932 or $90/kW for the maximum 26 kW output. R.E.S.

N80-16492*# Wyle Labs., Inc., Huntsville, Ala.

OUTDOOR TEST FOR THERMAL PERFORMANCE EVALUATION OF THE OWENS-ILLINOIS SUNPACK SEC-601 (AIR) SOLAR COLLECTOR

Dec. 1979 28 p Sponsored in part by DOE Prepared for IBM Federal Systems Div., Huntsville, Ala.
(Contract NAS8-32036)
(NASA-CR-161339; WYLE-TR-531-37R) Avail: NTIS HC A03/MF A01 CSCL 10A

The test procedures used and the test results obtained during the performance of an evaluation test program on the Owens-Illinois Sunpak, model SEC-601, air solar collector under natural outdoor weather conditions are presented. All testing activities were performed on a single module. The test was performed and the data evaluated as applicable to outdoor testing of solar collectors. J.M.S.

N80-16493*# Sundstrand Corp., Rockford, Ill.

THE 15 kW SUB e (NOMINAL) SOLAR THERMAL ELECTRIC POWER CONVERSION CONCEPT DEFINITION STUDY: STEAM RANKINE TURBINE SYSTEM Final Report

Timothy J. Bland Oct. 1979 63 p refs
(Contracts DEN3-61; EX-76-A-29-1060)
(NASA-CR-159589; AER-1713; DOE/NASA/0061-79/1) Avail: NTIS HC A04/MF A01 CSCL 10A

A study to define the performance and cost characteristics of a solar powered, steam Rankine turbine system located at the focal point of a solar concentrator is presented. A two stage re-entry turbine with reheat between stages, which has an efficiency of 27% at a turbine inlet temperature of 732 C was used. System efficiency was defined as 60 Hertz electrical output divided by absorbed thermal input in the working fluid. Mass production costs were found to be approximately 364 dollars/KW. R.E.S.

N80-16494*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PRELIMINARY ANALYSIS OF PERFORMANCE AND LOADS DATA FROM THE 2-MEGAWATT MOD-1 WIND TURBINE GENERATOR

D. A. Spera, L. A. Viterna, T. R. Richards, and H. E. Neustadter 1979 16 p refs Presented at 4th Biennial Conf. and Workshop on Wind Energy Conversion Systems, Washington, D.C., 29-31 Oct. 1979; sponsored by DOE
(Contract EX-77-A-29-1010)
(NASA-TM-81408; DOE/NASA/1010-79/5; E-322) Avail: NTIS HC A02/MF A01 CSCL 10A

Preliminary test data on output power versus wind speed, rotor blade loads, system dynamic behavior, and start-stop characteristics on the Mod-1 wind turbine generator are presented. These data were analyzed statistically and are compared with design predictions of system performance and loads. To date, the Mod-1 wind turbine generator has produced up to 1.5 MW of power, with a measured power versus wind speed curve which agrees closely with design. Blade loads were measured at wind speeds up to 14 m/s and also during rapid shutdowns. Peak transient loads during the most severe shutdowns are less than the design limit loads. On the inboard blade sections, fatigue loads are approximately equal to the design cyclic loads. On the outboard blade sections, however, measured cyclic loads are significantly larger than design values, but they do not appear to exceed fatigue allowable loads as yet. R.E.S.

N80-16495*# Jet Propulsion Lab., California Inst. of Tech., Pasadena. Semiconductor Group.

SEMICONDUCTOR GRADE, SOLAR SILICON PURIFICATION PROJECT Final Report

W. M. Ingle, R. R. Rosler, S. W. Thompson, and R. E. Chaney 10 Dec. 1979 173 p
(Contract JPL-954442)
(NASA-CR-162746; DOE/JPL-954442-78/12; Motorola-2257/12) Avail: NTIS HC A08/MF A01 CSCL 10A

Experimental apparatus and procedures used in the development of a 3-step SiF2(x) polymer transport purification process are described. Both S.S.M.S. and E.S. analysis demonstrated that major purification had occured and some samples were indistinguishable from semiconductor grade silicon (except possibly for phosphorus). Recent electrical analysis via crystal growth reveals that the product contains compensated phosphorus and boron. The low projected product cost and short energy payback time suggest that the economics of this process will result in a cost less than the goal of $10/Kg(1975 dollars). The process appears to be readily scalable to a major silicon purification facility. A.R.H.

N80-16497# University of Southeastern Massachusetts, North Dartmouth.
ECONOMICS OF GEOTHERMAL POWER
R. DiPippo Feb. 1979 13 p Transl. into ENGLISH from Nucl. Elec. Power Generation (Japan), v. 26, no. 9, Sep. 1975 p 1039-1043
(Contract EY-76-S-02-4051)
(COO-4051-43) Avail: NTIS HC A02/MF A01

Geothermal, steam, nuclear, and hydraulic construction costs, power generating costs, and utilization rate are compared. The risk factor in exploratory geothermal wells is discussed. DOE

N80-16498# Los Alamos Scientific Lab., N. Mex.
CHARACTERIZATION OF CRUSHED GLASS AS A TRANSPIRED AIR HEATING SOLAR COLLECTOR MATERIAL
R. K. Collier 1979 6 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract W-7405-eng-36)
(LA-UR-79-1336; CONF-790541-7) Avail: NTIS HC A02/MF A01

The use of crushed glass matrices as the heat absorbing media in air heating solar collectors was investigated. The most likely candidate glass types and sizes were characterized by measuring pressure drops, optical extinction coefficients, and volumetric heat transfer coefficients. Bed efficiencies were also measured and found to be similar to those expected for screen matrices unless critical amounts of clear glass were used as a top layer, which results in lower efficiency. DOE

N80-16499# Technical Translation Service, Albuquerque, N. Mex.
USE OF SOLAR ENERGY FOR THE PRODUCTION OF ELECTRICITY IN THE ALPS
Jan. 1979 48 p Transl. into ENGLISH from Serie de Publications de la Commission Federale de la Conception Globale de l'Energie (Geneva), etude no. 7 Oct. 1976 48 p Prepared in cooperation with Battelle Memorial Inst., Geneva, Switzerland
(SAND-79-6000) Avail: NTIS HC A03/MF A01

Means of converting solar energy into electricity are reviewed. Applications of solar energy technology to meet the increasing demand for electricity in Switzerland are considered. A description and discussion of central tower and heliostat field systems is presented. Details concerning steam cycles and solar boilers, turboalternator units and heat exhaust systems, daily and seasonal power variations of a solar plant, and effects on energy output due to cloudiness are considered. Meteorological data for the evaluation of possible solar generating sites is discussed and the solar potential of the Alps is analyzed. Integration of solar plants into the existing power grid is discussed. The economic and environmental impacts of solar power plants are considered in detail and a development program is suggested. DOE

N80-16500# Department of Energy, Washington, D. C. Energy Information Administration.
SOLAR COLLECTOR MANUFACTURING ACTIVITY Energy Data Report, Jul. - Dec. 1978
Sep. 1979 45 p
(DOE/EIA-0174/78) Avail: NTIS HC A03/MF A01

Results from a survey of solar collector manufacturing and importing activity are presented. Manufacturers of medium temperature liquid collectors, used primarily for hot water and space heating, low temperature nonmetallic collectors used for pool heating, and special collectors (evacuated tube collector or a concentrating collector), used for pool heating and for air conditioning and specialized industrial processes are included. J.M.S.

N80-16501# Lincoln Lab., Mass. Inst. of Tech., Lexington.
FLYWHEEL ENERGY STORAGE AND CONVERSION SYSTEM FOR PHOTOVOLTAIC APPLICATIONS
A. R. Millner 1979 7 p refs Presented at the Mech. and Magnetic Energy Storage Conductor Ann. Rev., Washington, D.C., 19-22 Aug. 1979
(Contract EY-76-C-02-4094)
(COO-4094-57; CONF-790854-3) Avail: NTIS HC A02/MF A01

A project to develop a flywheel energy storage unit for use with photovoltiacs in residential or load center applications is described. The unit employs a high efficiency permanent-magnet motor-generator and cycloconverter electronics to convert dc input to regulated ac output. The fabrication of a scale model unit, scaling laws for residential and intermediate load center sizes, and worth and cost estimation are discussed. DOE

N80-16502# Brookhaven National Lab., Upton, N. Y.
DECENTRALIZED ENERGY: TECHNOLOGY ASSESSMENT AND SYSTEMS DESCRIPTION
M. K. Reckard Jun. 1979 206 p refs
(Contract EY-76-C-02-0016)
(BNL-50987) Avail: NTIS HC A10/MF A01

Decentralized energy systems and their characteristic features are examined. These systems are divided into six groups for the purpose of analysis: solar, wind, hydro, biomass, geothermal, and coproduction (total energy). The technical and economic potential for the implementation of these systems is discussed for the years 2000 and 2025. The results of a comparison of base-case and decentralized scenarios for the year 2000, using a computer systems model, are presented. Social and institutional factors are also addressed, both as motivations for and results of energy system decentralization. Appendices are included with more detailed technical information on each of the systems groups. DOE

N80-16503# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN: SOLAR THERMAL POWER SYSTEMS
Aug. 1979 45 p refs
(DOE/EDP-0035) Avail: NTIS HC A03/MF A01

The goals of the program and potential environmental, health, safety, and socioeconomic impacts relevant to solar thermal power systems (STPS), particularly those sited in the Southwest are discussed. These impacts are screened for key issues, i.e., those issues considered to be the most serious in nature, that have near-term importance to the program, and for which current knowledge of effects and control is inadequate. A management plan is then presented for conducting and coordinating environmental research in concert with the technology development effort to ensure that identified environmental issues are resolved prior to significant public deployment of the technology. Key environmental concerns associated with the development and deployment of STPS were identified in the following subject areas: (1) site selection (including the question of water availability); (2) ecological and microclimatic effects; (3) working fluid handling and release modes; and (4) misdirected solar radiation. DOE

N80-16504# National Climatic Center, Asheville, N. C.
INPUT DATA FOR SOLAR SYSTEMS
V. Cinquemani, J. R. Owenby, Jr., and R. G. Baldwin Aug. 1979 203 p refs
(Contract EX-76-A-29-1041)
(DOE/TIC-10193-Rev-1) Avail: NTIS HC A10/MF A01

Normals (30-year mean values) of maximum, minimum, and average temperatures for a month or year, and of heating and cooling degree days are provided for 248 U.S. stations. Average daily values of total hemispheric (global) solar radiation on a horizontal surface were based on corrected hourly measurements for 25 stations, derived values from corrected measurements for 25 stations, and derived values from the corrected measurements for the remaining 222 stations. DOE

N80-16505# Sandia Labs., Albuquerque, N. Mex.
WORKSHOP ON POWER CONDITIONING FOR ALTERNATIVE ENERGY TECHNOLOGIES, EXECUTIVE SUMMARY

D R Smith 1979 139 p Workshop held at Denver, 9-11 May 1979
(Contracts EY-76-C-04-0789, EG-77-C-01-4042)
(SERI-TP-35-217-Pt-2) Avail NTIS HC A07/MF A01

The development of power conditioners for alternative energy technologies is presented. Topics discussed include: (1) assessments of current technology, (2) identification of operational requirements with a comparison of requirements for each source technology, (3) the identification of future technology trends, (4) the determination of mass production and marketing requirements, and (5) recommendations for program direction.
DOE

N80-16506# Oak Ridge National Lab., Tenn.
FOSSIL ENERGY PROGRAM Quarterly Progress Report, period ending 30 Sep. 1978
L E McNeese Jan 1979 287 p refs
(Contract W-7405-eng-26)
(ORNL-5487) Avail NTIS HC A13/MF A01

Research and development projects that are carried out in support of the increased utilization of coal and other fossil fuel alternatives to oil and gas as sources of clean energy are reviewed. These projects include: coal conversion techniques, coal gasification processess, fossil energy environmental studies, materials technology development for coal conversion, and a life sciences synthetic fuel program for biological research of health hazards in coal conversion.
DOE

N80-16507# Brookhaven National Lab., Upton, N Y
COMPUTER SIMULATION OF GROUND COUPLED STORAGE IN A SERIES SOLAR ASSISTED HEAT PUMP SYSTEM
J W Andrews and Philip D Metz 1979 5 p refs Presented at the 1979 Intern. Solar Energy Soc. Congr., Atlanta, 28 May - 1 Jun. 1979
(Contract EY-76-C-02-0016)
(BNL-26216; CONF-790541-25) Avail NTIS HC A02/MF A01

The effect of thermal coupling between the ground and the heat storage element of a series solar assisted heat pump system is studied quantitatively. The transient simulation computer program TRNSYS is used to simulate the solar portion of this system. A program to simulate the thermal interaction of the storage element with the ground is incorporated into TRNSYS as a subroutine. This program calculates heat flow through the ground in discrete steps over space and time. Boundary conditions are established. The ground coupled storage is driven by thermal inputs from the solar portion of the system and from the changing ambient and ground temperatures.
DOE

N80-16508# General Atomic Co., San Diego, Calif.
FIXED MIRROR SOLAR CONCENTRATOR FOR APPLICATION TO A 100 MW(e) ELECTRIC GENERATING PLANT
J R Schuster, J M Neill, and J Bass May 1979 6 p refs Presented at the 14th Intersoc. Energy Conf., Boston, 5-10 Aug. 1979
(Contract ET-78-C-03-2240)
(GA-A-15340; CONF-790803-10) Avail NTIS HC A02/MF A01

A design study was performed of a 100 MW(e) power plant that uses a fixed mirror solar concentrator (FMSC) to supply energy for steam generation. Various heat transport fluids were considered and draw salt was selected over Therminol 88 and sodium. The complete plant was modeled in a cost performance optimization code which automatically performed tradeoffs such as reduced blocking vs increased piping costs, field piping heat loss vs pumping power, and fluid outlet temperature vs overall system efficiency. Various collector and receiver designs were studied and evaluated for their cost effectiveness. Operational requirements impacting the component designs were identified.
DOE

N80-16509# Brookhaven National Lab., Upton, N Y
EXPERIMENTAL RESULTS FROM THE SOLAR GROUND COUPLING RESEARCH FACILITY AT BROOKHAVEN NATIONAL LABORATORY
P D Metz 1979 5 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May - 1 Jun. 1979
(Contract EY-76-C-02-0016)
(BNL-26219; CONF-790541-27) Avail NTIS HC A02/MF A01

The results of the first half year of operation of the solar ground coupling research facility are presented. The data from the eight original experiments are analyzed. A computer model of the heat transfer between first generation ground coupled heat transfer and storage devices for a solar source heat pump system and the Earth is discussed.
DOE

N80-16510# Massachusetts Inst. of Tech., Cambridge
INDEPENDENT ASSESSMENT OF ENERGY POLICY MODELS Final Report
E Kuh and D O Wood May 1979 273 p refs Sponsored by EPRI
(EPRI Proj. 1015-1)
(EPRI-EA-1071) Avail NTIS HC A12/MF A01

Energy policy models are reviewed and analyzed. Two energy system models, the Baughman-Joskow regionalized electricity model and the Wharton annual energy model are assessed and the organizational and procedural issues in the model assessment process are identified.
DOE

N80-16511# Midwest Research Inst., Golden, Colo.
SOIL FERTILITY AND SOIL LOSS CONSTRAINTS ON CROP RESIDUE REMOVAL FOR ENERGY PRODUCTION
S Flaim Jul. 1979 38 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-52-324) Avail NTIS HC A03/MF A01

A summary of the methodologies used to estimate the soil fertility and soil loss constraints on crop residue removal for energy production is presented. Estimates of excess residue are developed for wheat in north central Oklahoma and for corn and soybeans in central Iowa. The sample farming situations are analyzed.
DOE

N80-16512# Lincoln Lab., Mass. Inst. of Tech., Lexington
SOLAR PHOTOVOLTAIC FIELD TESTS AND APPLICATIONS PROJECT Quarterly Technical Report, 1 Apr. - 30 Jun. 1978
1978 58 p refs
(Contract EY-76-C-02-4094)
(COO-4094-26) Avail NTIS HC A04/MF A01

Field tests for a variety of both large and small experimental photovoltaic systems are summarized. Support activities in the areas of power conditioning, control, and storage; materials, processes, testing, and data acquisition are reviewed.
DOE

N80-16513# Midwest Research Inst., Golden, Colo.
OBJECTIVES AND STRATEGIES OF THE INTERNATIONAL PHOTOVOLTAIC PROGRAM PLAN
D Costello, D Posner, R Koontz, P Heiferling, P Carpenter (JPL), and L Perelman (JPL) Jul. 1979 45 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-52-250) Avail NTIS HC A03/MF A01

The objective of the International Photovoltaic Program Plan, the strategies that will be used in the plan, and the approach that is being taken to prepare the plan are described. Background on photovoltaic technology and markets and the DOE domestic photovoltaic effort is also presented.
DOE

N80-16514# Midwest Research Inst., Golden, Colo.
PROCEEDINGS: PHOTOVOLTAICS USER REVIEW PANEL
S Carroll Aug. 1979 26 p refs Proc. held at Golden, Colo., 6-7 Mar. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-69-276) Avail NTIS HC A03/MF A01

The discussions, recommendations, and conclusions of the photovoltaics user review panel are presented. The purpose of the panel discussion was to determine the technical information dissemination (TID) needs for target audiences, to reach agreement on what informational products could fill these needs and who should produce the materials, and to establish priorities for the need for the TID products. Technological areas discussed include photovoltaics, solar thermal power, biomass, wind energy conversion, and ocean thermal energy conversion. DOE

N80-16515# Kaiser Aluminum and Chemical Corp., Pleasanton, Calif.

ENERGY SAVINGS THROUGH USE OF AN IMPROVED REDUCTION CELL CATHODE

W. H. Goodnow 1979 19 p refs
(Contract EC-76-C-03-1257)
(SAN-1257-T2) Avail: NTIS HC A02/MF A01

Material characterization for a wettable and rained Hall cell cathode was expanded to include inspection of TiB2 components for the 15KA cell restart. The cell was restarted and went through a shakedown and performance monitoring period. An engineering and economic study of TiB2 retrofit into existing cells was carried to the point where a sensitivity type cost analysis was done. DOE

N80-16516# Sandia Labs., Albuquerque, N. Mex. Thermal and Fluid Sciences Dept.

COMPARATIVE ANALYSIS OF SOLAR ENERGY STORAGE CYCLES

C. E. Hackett 1979 25 p refs Presented at the Intern. Conf. on Solar Energy, Milan, 23 Sep. 1979
(SAND-79-1803C; CONF-790954-1) Avail: NTIS HC A02/MF A01

A thermodynamic technique is presented which will enable the assessment of the overall performance of various storage options on an absolute basis so that cost effective designs can be developed to obtain the full thermodynamic and system advantages of energy storage. First the underlying thermodynamic principles of entropy production analysis are examined. The various energy storage schemes are classified. Detailed analyses were developed to cover the various generic types of energy storage which are appropriate for solar power systems. DOE

N80-16517# Sandia Labs., Albuquerque, N. Mex.

PREPARATION OF THIN FILMS FOR SOLAR ENERGY UTILIZATION

D. M. Mattox 1979 17 p refs Presented at the National Vacuum Symp., New York, N.Y., 2 Oct. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1754C; CONF-791013-2) Avail: NTIS HC A02/MF A01

A technology assessment of thin film deposition techniques is presented. Commercial applications of thin films include photothermal selective absorbers formed by electroplating, chemical conversion and vacuum processing, solar reflectors formed by vacuum processes, heat reflectors formed by vacuum processes and spray pyrolysis, antireflection coatings formed by vacuum processes and chemical leaching and the metallization of photovoltaic cells. CdS/Cu2S photovoltaics formed by vacuum processes and spray pyrolysis are also close to commercial utilization. Principle concerns in thin films applications include economics of fabrication and environmental stability of the thin film materials. One of the major problems with thin film evaluation is the lack of acceptable testing procedures particularly as related to lifetime. The status of thin films in solar energy utilization is reviewed. DOE

N80-16520# Idaho National Engineering Lab., Idaho Falls.

COMMERCIAL PROTOTYPE DESIGN OF A SOLAR HEATING/COOLING SYSTEM FOR A MANUFACTURED HOME

M. P. Scofield (EG&G Idaho, Inc., Idaho Falls), A. S. Lau (EG&G Idaho, Inc., Idaho Falls), K. H. Liebelt (EG&G Idaho, Inc., Idaho Falls), N. R. Shinn (Boise Cascade Corp., Idaho), and T. L. Schafer (Boise Cascade Corp., Idaho) Sep. 1979 140 p refs Prepared jointly with Boise Cascade Corp., Idaho
(Contract EY-76-C-07-1570)
(TREE-1384) Avail: NTIS HC A07/MF A01

A prototype design is presented for a solar heating and cooling system for a manufactured modular home. The objective was to develop an active solar system for space heating that would be competitive with conventional energy sources: that is, the increase in the mortgage payment would be completely and simultaneously recovered from energy savings. The heating and cooling system features air collectors that are structurally part of the south facing rear wall, rock storage that is in the basement, and a heat exchanger that preheats domestic hot water. Summer cooling is achieved by cooling rock storage at night and circulating house air through the storage during the day as required. Two nearly identical homes were designed and built incorporating the prototype system. Both in Idaho, one house is located in Boise, the other in Idaho Falls, placing the homes in distinctly different climates. Both homes are being monitored for a two-year period to obtain dynamics and long-term performance data. The results of the monitoring will be the subjects of further reports. DOE

N80-16521# Solar Environmental Engineering Co., Inc., Fort Collins, Colo.

CONTINUING REGIONAL SOLAR ENERGY INFORMATION MINI-CENTER ACTIVITIES AND UPDATING THE SOLCOST PROGRAM Quarterly Report

L. J. Lantz Jul. 1979 69 p
(Contract EG-77-C-02-4643)
(COO-4643-T2) Avail: NTIS HC A04/MF A01

Progress in the various tasks in the program to develop SOLCOST is reviewed. Several SOLCOST examples are included. DOE

N80-16522# Institute of Gas Technology, Chicago, Ill.

SOLAR-MEC DEVELOPMENT PROGRAM, PROJECT 9103 Semiannual Progress Report, 1 Sep. 1977 - 28 Feb. 1978

J. Wurm, S. A. Weil, and L. R. Wright Jan. 1979 44 p
(Contract EG-77-C-02-4495)
(COO-4495-7) Avail: NTIS HC A03/MF A01

The dynamic performance of a supported molecular-sieve, regenerative, heat and mass exchanger is reported, under input conditions typical of the operation of a solar-power open desiccant cooling system. The experimental data are compared with a computer model describing the dynamic processes of air drying and desiccant regeneration of the Solar-MEC desiccant cooling system. The test setup, the experimental program, and the results of diagnostic steps to evaluate and minimize air leakage rates within the Solar-MEC system are described. The test design and experimental approach to verify the performance of the rotary regenerative (sensible) heat exchanger are reported. DOE

N80-16524# Sandia Labs., Albuquerque, N. Mex.

SOLAR CENTRAL TEST FACILITY

G. E. Brandvold and John T. Holmes 1979 18 p Presented at the Frontiers of Power Generation Conf., Stillwater, Okla., 24 Sep. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1730C; CONF-790924-1) Avail: NTIS HC A02/MF A01

The central receiver test facility capable of delivering 5 million watts of thermal power to experimental equipment is described. The primary CRTF testing programs which involve prototype components (receivers and heliostats) for central receiver solar electric power plants are discussed and the high solar flux and high temperature research and development work is reported. DOE

N80-16525# Department of Energy, Washington, D.C.

FEDERAL PHOTOVOLTAICS UTILIZATION PROGRAM

Jun. 1979 40 p refs
(DOE/EA-0087) Avail: NTIS HC A03/MF A01

The potential environmental effects of silicon cell technology are analyzed. It is noted that any potential environmental impacts of this technology occur in connection with manufacturing of silicon cells and proposed applications of photovoltaic systems. However, it was found that there are no known adverse environmental effects associated with the federal photovoltaics utilization program which cannot be mitigated or avoided. DOE

N80-16527# Boston Univ., Mass. Dept. of Chemistry.

ORGANIC PHOTOCHEMICAL STORAGE OF SOLAR ENERGY Progress Report, 1 Mar. 1978 - 31 Jan. 1979

G. Jones, II Feb. 1979 24 p refs
(Contract EG-77-S-02-4380)
(COO-4380-2) Avail: NTIS HC A02/MF A01

Photosensitization mechanisms for driving energy storing reactions of readily available organic compounds were studied. Aromatic sensitizers were used as complexing agents for a series of non-conjugated dienes which are capable of valence isomerization. Diene exciplexes, shown to be stabilized by electron donor-acceptor interaction, led to photoisomers with chemical and quantum efficiency in two of the cases studied. With triplet photosensitizers visible light (to 520 nm) was used to bring about an energy storing valence isomerization of a diester derivative of norbornadiene. High quantum yields (0.6) were measured at the longest wavelengths yet utilized for this type of isomerization. The quantum efficiency for isomerization using a very low energy triplet sensitizer was significantly enhanced at slightly elevated temperatures, suggesting that thermal energy (in amounts present in solar collector media) can be an aid in driving energy storing photo-reactions.
DOE

N80-16528# Sandia Labs., Albuquerque, N. Mex.
MIDTEMPERATURE SOLAR SYSTEMS TEST FACILITY EXPERIMENT MANUAL AND TEST PLAN
Aug. 1979 52 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0379) Avail: NTIS HC A04/MF A01

The midtemperature solar systems test facility is described and the procedures for selecting items to be evaluated there are outlined. The prerequisites for installing such items are defined, the typical tests performed are described, and the reports generated and disseminated from the facility are discussed. DOE

N80-16529# Midwest Research Inst., Golden, Colo.
PERFORMANCE CHARACTERISTICS OF A COMMERCIALLY AVAILABLE POINT-FOCUS SOLAR POWER
M. Bohn Apr. 1979 12 p refs Presented at the ASME/AICHE Natl. Heat Transfer Conf., San Diego, Calif., Aug. 1979
(Contract EG-76-C-01-4042)
(SERI/TP-34-169; CONF-790808-17) Avail: NTIS
HC A02/MF A01

The performance of a commercially available solar electric power system is described in terms of instantaneous electrical power output for a given insolation and electrical energy production per day. Receiver thermal loss coefficient and concentrator optical efficiency are measured and system performance is given using steam cycle efficiency and electrical generator efficiency as parameters.
DOE

N80-16532# Argonne National Lab., Ill. Energy and Environmental Systems Div.
SOLAR AVAILABILITY FOR WINTER SPACE HEATING: AN ANALYSIS OF THE CALENDAR PERIOD 1953-1975
J. G. Asbury, C. Maslowski, and R. O. Mueller Apr. 1979
20 p refs
(Contract W-31-109-eng-38)
(ANL/SPG-14) Avail: NTIS HC A02/MF A01

Data tapes for eight US sites containing hourly readings of insolation and ambient temperature for the period 1953-1975 were analyzed. Scatter-diagrams of insolation versus heating degree-days, compiled on a daily basis, indicate a wide variation in insolation levels, even during periods of coldest weather. For seven of the eight sites, the peak-day backup energy required by a solar space heating system exceeded 85 percent of the peak-day energy requirement of a conventional (nonsolar) heating system. The cities considered are Albuquerque (NM), Bismark (ND), Boston (MA), Caribou (ME), Columbia (MO), Madison (WI), Seattle (WA), and Sterling (VA).
DOE

N80-16535# Delaware Univ., Newark.
PHOTOVOLTAIC EFFECT, ITS PRESENT UNDERSTANDING AND REMAINING MYSTERIES
K. W. Boeer 1979 5 p refs Presented at the Intern. Solar Energy Society Meeting, Atlanta, 28 May 1979 Prepared jointly by SES, Inc., Newark, Del.
(Contract EX-76-C-23-1030)
(DOE/ET/23103-6; CONF-790541-44) Avail: NTIS
HC A02/MF A01

The present phenomenological understanding of the photovoltaic effect and solar cells is discussed. Unexplained questions and problems with the effects of various device parameters on the current-voltage characteristics are discussed, and the need for more sophisticated theoretical analyses of photovoltaic cells is stressed.
DOE

N80-16537# Motorola, Inc., Phoenix, Ariz. Semiconductor Group.
LOW-COST STRUCTURES FOR PHOTOVOLTAIC ARRAYS Final Report
P. Masser Aug. 1979 204 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7006) Avail: NTIS HC A10/MF A01

Designs of photovoltaic array support structures, which encourage life cycle cost reduction through mass production techniques, material cost reduction, and simplified installation methods, are presented. Nontracking collectors with a low concentration ratio (one to about two sums) are considered primarily for commercial and utility applications. The results are applicable to both thermal and photovoltaic flat plate collectors. A value analysis approach was used, starting with a survey of the current state-of-the-art which found an absence of pertinent references on array support structures. Also, realistic load criteria were not found, and this was determined to be a key area for future cost reduction. Heights above the ground, array geometry, and wind direction all have important effects on loads. Foundation design was also found to be a key area for future cost reduction. A generic concept study was conducted, aimed at life cycle cost reduction, and representative examples were chosen.
DOE

N80-16538# Midwest Research Inst., Golden, Colo.
PHOTOVOLTAIC MATERIALS AND DEVICE MEASUREMENTS WORKSHOP: FOCUS ON POLYCRYSTALLINE THIN FILM CELLS
1979 190 p refs Workshop held at Arlington, Va., 11 Jun. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-49-185; CONF-790601) Avail: NTIS
HC A09/MF A01

Papers on the development of thin film solar cells by improving the versatility and reliability of material and device measurement techniques are presented. Structural/chemical aspects, electro-optics, and charge transport techniques are emphasized. DOE

N80-16539# Sandia Labs., Albuquerque, N. Mex.
ECONOMIC ANALYSIS OF DARRIEUS VERTICAL AXIS WIND TURBINE SYSTEMS FOR THE GENERATION OF UTILITY GRID ELECTRICAL POWER. VOLUME 1: EXECUTIVE SUMMARY
W. N. Sullivan Aug. 1979 28 p 4 Vol.
(Contract EY-76-C-04-0789)
(SAND-78-0962-Vol-1) Avail: NTIS HC A03/MF A01

The economic analysis of the Darrieus vertical axis wind turbine is discussed. A description of the technical approach used, key results, and major conclusions is presented along with a summary of the study.
DOE

N80-16540# Sandia Labs., Albuquerque, N. Mex.
ECONOMIC ANALYSIS OF DARRIEUS VERTICAL AXIS WIND TURBINE SYSTEMS FOR THE GENERATION OF UTILITY GRID ELECTRICAL POWER. VOLUME 2: ECONOMIC OPTIMIZATION MODEL
W. N. Sullivan Aug. 1979 100 p refs 4 Vol.
(Contract EY-76-C-04-0789)
(SAND-78-0962-Vol-2) Avail: NTIS HC A05/MF A01

An economic study of the Darrieus vertical axis wind turbine (VAWT) economics is reported. A computer model of VAWT cost and performance factors useful for system design and optimization is presented. The content and limitations of the model are outlined. Output data are presented to demonstrate selection of optima and to indicate sensitivity of energy cost to design parameter variations. Optimized specifications generated by this model for six point designs are summarized. An appendix is included with a FORTRAN IV listing of the model and a description of the input/output characteristics.
DOE

N80-16541# Sandia Labs., Albuquerque, N. Mex.
ECONOMIC ANALYSIS OF DARRIEUS VERTICAL AXIS WIND TURBINE SYSTEMS FOR THE GENERATION OF UTILITY GRID ELECTRICAL POWER. VOLUME 3: POINT DESIGNS
R. D. Grover and E. G. Kadlec Aug. 1979 99 p refs 4 Vol.
(Contract EY-76-C-04-0789)
(SAND-78-0962-Vol-3) Avail: NTIS HC A05/MF A01

Features of the Darrieus vertical axis wind turbine design including the blades, the speed increaser, guy cables and cable anchors, transmission, clutch, brakes, and the electrical system are discussed. System weight characteristics are tabulated. The operation and maintenance costs, and requirements reported and detailed descriptions of point designs for 120, 200, 500, and 1600 kW Darrieus vertical axis wind energy system are examined. DOE

N80-16542# Sandia Labs., Albuquerque, N. Mex.
ECONOMIC ANALYSIS OF DARRIEUS AXIS WIND TURBINE SYSTEMS FOR THE GENERATION OF UTILITY GRID ELECTRICAL POWER. VOLUME 4: SUMMARY AND ANALYSIS OF THE A. T. KEARNEY AND ALCOA LABORATORIES POINT DESIGN ECONOMIC STUDIES
W. N. Sullivan Aug. 1979 250 p refs 4 Vol.
(Contract EY-76-C-04-0789)
(SAND-78-0962-Vol-4) Avail: NTIS HC A11/MF A01

Two independent economic studies to assess the installed costs of a series six Darrieus vertical axis wind turbine designs are summarized. The designs cover a range of sizes with peak outputs from 10 to 1600 kW. And are designed produce utility grid electrical power. A comparison and analysis of the studies is presented. DOE

N80-16543# Illinois Univ., Urbana. Fusion Studies Lab.
DIRECT ENERGY CONVERSION SYSTEMS
G. H. Miley 1978 11 p refs Presented at the Meeting on the Technology of Controlled Thermonuclear Fusion, Santa Fe, N. Mex., 9 May 1978
(Contract EY-76-S-02-2218)
(COO-2218-117; CONF-780508-73) Avail: NTIS HC A02/MF A01

The potential importance of direct energy conversion to the long-term development of fusion power is discussed with stress on the possibility of alleviating waste heat problems. Two approaches to direct conversion, i.e., direct collection and magnetic expansion are reviewed. DOE

N80-16545# Department of Energy, Washington, D. C. Div. of Technology Assessment.
HYDROTHERMAL ELECTRIC AND DIRECT HEAT. COMMERCIALIZATION PHASE 3 PLANNING
R. C. Clusen Sep. 1978 38 p
(DOE/ERD-0005) Avail: NTIS HC A03/MF A01

A technology program for the development of hydrothermal electric and direct heat energy is discussed. Environmental concerns identified over the commercialization of hydrothermal energy are examined. They include: airborne effluents, waterborne effluents, noise, subsidence, enhanced seismicity, water use conflicts, land use, socioeconomic impacts, and system safety and occupational health. A.W.H.

N80-16546# Delta Research Corp., Arlington, Va.
WORLDWIDE TRANSPORTATION/ENERGY DEMAND FORECAST, 1975 - 2000
R. U. Ayres Oct. 1978 103 p refs
(Contract W-7405-eng-26)
(ORNL/SUB-78/13536/1) Avail: NTIS HC A06/MF A01

Worldwide transportation energy demand for both commodities and passengers are forecast for 1975 - 2000. The long-range forecast methodology is described. Regional aggregation and economic/demographic projects are discussed. Transportation projections and transportation energy projections are presented. DOE

N80-16547# Department of Energy, Washington, D. C.
ADVANCED ELECTRIC GENERATION. COMMERCIALIZATION IN PHASE 3 PLANNING
Sep. 1978 46 p
(DOE/ERD-0014) Avail: NTIS HC A03/MF A01

Two basic technologies are under consideration for advanced electrical generation: fluidized-bed combustion (FBC) and phosphoric acid fuel cells. FBC consists of two major subtypes: atmospheric and pressurized fluidized-bed combustion. The fuel-cell power plant produces electricity by electrochemical conversion. The commercial readiness of these technologies with respect to environmental issues was investigated. Characteristics of the technologies and status information on the technical and environmental R and D programs are discussed. A milestone chart representing a relationship between a considered commercialization schedule and relevant environmental R and D is presented. Environmental concerns significant to the technologies were reviewed. The likelihood and consequences of adverse findings, the problems and uncertainties stemming from current or anticipated environmental regulation, and potential costs of environmental control are examined. DOE

N80-16549# Argonne National Lab., Ill.
PEAK-LOAD PROBLEM WITH STORAGE TECHNOLOGY
J. G. Asbury and R. O. Mueller Aug. 1978 23 p refs
(Contract W-31-109-eng-38)
(ANL/SPG-8) Avail: NTIS HC A02/MF A01

The pricing and welfare implications of storage in a utility supply is examined. The method of analysis, which separates the load into storage and non-storable components, is described. DOE

N80-16550# Research Triangle Inst., Research Triangle Park, N. C.
APPLICATION ANALYSIS AND PHOTOVOLTAIC SYSTEM CONCEPTUAL DESIGN FOR SERVICE/COMMERCIAL/INSTITUTIONAL AND INDUSTRIAL SECTORS, TASK 1 REPORT
R. A. Whisnant, R. D. Alberts, R. M. Burger, R. P. Gardner, C. B. Morrison, and N. G. Staffa Jul. 1978 155 p refs
(Contract EY-76-C-04-0789)
(SAND-78-7032) Avail: NTIS HC A08/MF A01

The approach used to identify applications in the defined sectors for photovoltaic conversion are: (1) The Standard Industrial Classification Codes and to describe the applications that must be considered and data on the attributes of these applications germane to solar photovoltaic systems application. (2) The expected profitability of photovoltaic applications was determined from the discounted future costs of conventional energy sources, capital costs, and projected operating and maintenance costs over the life of the system. This was combined with the energy consumption of the application to obtain an estimate of the energy market potential. (3) The application ranking and subjective evaluations of market size, diversity, and public exposure were used to select five applications and their locations for design of a suitable photovoltaic system. (4) For each of the selected applications, the various relevant characteristics were identified, potential photovoltaic system configurations were defined, and performance and economic models were used to design a representative system. The design of the selected system is described. DOE

N80-16552# Battelle Pacific Northwest Labs., Richland, Wash.
FACTORS AFFECTING POTENTIAL MARKET PENETRATION OF LASER FUSION POWER PLANTS
D. E. Deonigi and D. W. Fraley Aug. 1979 43 p refs
(Contract EY-76-C-06-1830)
(PNL-2803) Avail: NTIS HC A03/MF A01

A mini model constructed to estimate the optimal size of laser fusion power plants and to estimate the allowable cost of the first such plant in relation to the next best alternative is described. The mini model incorporates such factors as market penetration, learning, economies of scale, system size, transmission costs, reserve requirements, development and licensing costs and site costs. The results of the mini model simulations are discussed. DOE

N80-16554# Resources for the Future, Inc., Washington, D. C.
CONTRIBUTIONS TO THE FOUNDATIONS OF SUPPLY FOR ENERGY AND TRANSPORTATION: CONCEPTS, ECONOMICS, AND TECHNOLOGIES

James W Sawyer, Jr Mar 1979 224 p refs
(Grant NSF AER-75-16163)
(PB-300541/0; NSF/RA-790116) Avail: NTIS
HC A10/MF A01

The energy problem and its possible effects on transportation, interaction between energy issues and policies, and transportation issues and policies is emphasized. The development of the energy crisis is reviewed and the transition to new energy sources is discussed. Following sections include: discussions of energy resource reserves, the characterization of likely future pricing of energy resources; engineering and economic descriptions of actual and potential synfuel processes; energy as a transportation fuel and as a commodity to be transported; descriptions of the energy and transportation models used; descriptions of the model runs and projections, impacts, emerging issues, and brief discussions of some of the policy options open in both transportation and energy areas
GRA

N80-16555# General Accounting Office, Washington, D. C. Energy and Minerals Div.

FEDERAL DEMONSTRATIONS OF SOLAR HEATING AND COOLING ON PRIVATE RESIDENCES: ONLY LIMITED SUCCESS Report to the Congress

9 Oct. 1979 65 p refs
(PB-301123/6; EMD-79-55) Avail: NTIS HC A04/MF A01
CSCL 10A

The residential solar heating and cooling demonstration program implemented by the Department of Housing and Urban Development for the Department of Energy is analyzed. A perspective on the program, an evaluation of its success in demonstrating solar heating systems, and a discussion of the prospects for demonstrating solar cooling technologies are included
GRA

N80-16556# Berg (Charles A.), Buckfield, Maine

ENERGY CONSERVATION IN INDUSTRY: THE PRESENT APPROACH, THE FUTURE OPPORTUNITIES Final Report

Charles A. Berg May 1979 96 p refs
(Contract EQ7AD505)
(PB-301244/0) Avail: NTIS HC A05/MF A01 CSCL 10A

Possible opportunities for industry to conserve energy through the introduction of new technology are considered. It is indicated that these technology options offer far greater savings of energy and of all other resources required in production than modifying the operation of existing plants, toward which present energy conservation efforts are directed.
GRA

N80-16557# National Technical Information Service, Springfield, Va.

SOLAR ENERGY CONCENTRATOR DESIGN AND OPERATIONS. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1976 - Jul. 1979

Audrey S. Hundemann Sep. 1979 183 p Supersedes NTIS/PS-78/0838 Updates NTIS/PS-77/0458 2 Vol.
(NTIS/PS-79/0926/0; NTIS/PS-78/0838) Avail: NTIS
HC $28.00/MF $28.00 CSCL 10A

Government-funded research on the design and operation of various types of solar energy concentrators is discussed. Abstracts cover the efficiency and optimization of Fresnel lenses, V-trough concentrators, flat plate and parabolic reflectors, compound parabolic concentrators used in solar photovoltaic conversion, and heliostat systems. A few abstracts deal with heat loss and cost studies. (This updated bibliography contains 177 abstracts, 80 of which are new entries to the previous edition.)
GRA

N80-16558# National Technical Information Service, Springfield, Va.

SOLAR ENERGY CONCENTRATOR DESIGN AND OPERATIONS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Jul. 1979

Audrey S. Hundemann Sep. 1979 225 p Supersedes NTIS/PS-78/0839 Updates NTIS/PS-77/0459 2 Vol.
(NTIS/PS-79/0927/8; NTIS/PS-78/0839) Avail: NTIS
HC $28.00/MF $28.00 CSCL 10A

Worldwide research on the design and operation of various types of solar energy concentrators is discussed. Topic areas cover thermal and optical performance of Fresnel lenses, compound parabolic concentrators, fixed mirror concentrators, and planar reflector enhancement of flat plat collector systems. A few abstracts deal with V-trough concentrators and methods to calculate performance of concentrators. A separate Published Search on heliostat systems is available. This updated bibliography contains 220 abstracts, 53 of which are new entries to the previous edition.
GRA

N80-16559# Michigan Univ., Ann Arbor. Highway Safety Research Inst.

COPING WITH ENERGY LIMITATIONS IN TRANSPORTATION: PROPOSALS FOR MICHIGAN

Robert Kaufman and Herman Koenig Apr. 1979 49 p refs
Sponsored by Michigan Dept. of Transportation
(PB-299737/7; UM-HSRI-79-13) Avail: NTIS
HC A03/MF A01 CSCL 10B

The transportation energy dependence of Michigan's economy and major industries is discussed and quantified. Alternative energy forms and automotive propulsion systems are surveyed and assessed. Probable economic impacts on Michigan are discussed and the dual pressures of rising transport energy costs and federal regulations on the auto industry are outlined. State action for managing the economic transition which Michigan faces is recommended, and a mechanism for managing change is proposed.
GRA

N80-16560# National Bureau of Standards, Washington, D.C. National Engineering Lab.

AN INVESTIGATION OF PREFERENCES FOR VARIOUS TYPES OF ENERGY COST FEEDBACK Final Report

Ann Rammey-Smith and Jennifer L. Gagnon Aug. 1979 73 p refs Sponsored by DOE
(PB-300314/2; NBSIR-79-1771) Avail: NTIS
HC A04/MF A01 CSCL 10B

The issue of consumer preferences for various types of energy cost feedback for individual consumers is addressed. Recommendations related to the performance characteristics of energy cost feedback devices for use in testing energy cost feedback meters are examined.
GRA

N80-16561# Old West Regional Commission, Billings, Mont.

ENERGY RESEARCH INFORMATION SYSTEM (ERIS) PROJECTS REPORT, VOLUME 4, NUMBER 1 Progress Report, Dec. 1978 - Jun. 1979

Catherine A. Boyd, comp. and Janet Jelinek, comp. Jun. 1979 88 p Prepared in cooperation with Geological Survey, Reston, Va. and Argonne National Lab., Ill.
(PB-300338/1; OWRC/ERIS-7906) Avail: NTIS
HC A05/MF A01 CSCL 10B

An inventory of the energy related programs and research activities from 1974 to the present in the states of Montana, Nebraska, North Dakota, South Dakota, and Wyoming is presented. Areas of research include: coal, petroleum, oil shales, fission fuels, synthetic fuels, hydro-energy, renewable energy, resources, energy policy, reclamation, socioeconomic impacts, environmental impacts, and land use. Each project description lists title, investigator(s), research institution, sponsor, funding, time frame, location, a descriptive abstract of the research, and the titles of reports and/or publications generated by the research. GRA

N80-16562# New Mexico Energy Inst., Las Cruces.

ADDITION OF AN AIR-COOLED COLLECTOR TEST CAPABILITY TO THE SOLAR COLLECTOR TEST FACILITY Final Report, 1 Jan. 1977 - 30 Jun. 1978

H. L. Connell Jun. 1979 41 p refs Sponsored in part by the New Mexico Energy and Minerals Dept.
(Contract ERB-76-259)
(PB-300482/7; NMEI-43) Avail: NTIS HC A03/MF A01 CSCL 10A

The design and fabrication of test stands with adjustable-tilt collector mounting frames is discussed. The air flow and conditioning circuits, and the integration of the required temperature and pressure instrumentation are also discussed. GRA

N80-16563# National Technical Information Service, Springfield, Va.

ENERGY POLICY AND RESEARCH PLANNING, VOLUME 3. A BIBLIOGRAPHY WITH ABSTRACTS Progress Report, Oct. 1977 - Sep. 1979

Andrey S. Hundemann Sep. 1979 184 p Supersedes NTIS/PS-78/0962; NTIS/PS-77/0839; NTIS/PS-76/0710
(NTIS/PS-79/1069/8; NTIS/PS-78/0962; NTIS/PS-77/0839; NTIS/PS-76/0710) Avail: NTIS HC $28.00/MF $28.00 CSCL 10A

Citations relative to planning for future U.S. energy needs on both national and state government levels are presented. The history and development of national and state legislation and regulations, Project Independence studies, and assessment of the effects of deregulation are included. Technical, economic, and environmental considerations in energy planning are also covered. GRA

N80-16564# SRI International Corp., Menlo Park, Calif.

COMPARATIVE ASSESSMENT OF RESIDENTIAL ENERGY SUPPLY SYSTEMS THAT USE FUEL CELLS: EXECUTIVE SUMMARY Final Report, Sep. 1976 - Jan. 1979

R. V. Steele, D. C. Bomberger, K. M. Clark, R. F. Goldstein, R. L. Hays, M. E. Gray, and G. Ciprios Apr. 1979 15 p
(Contract EPA-68-02-2180)
(PB-299207/1; EPA-600/7-79-105A) Avail: NTIS HC A02/MF A01 CSCL 10B

A comparison of residential energy supply systems using fuel cells is presented. All systems used coal as the primary energy source, and all residences were assumed to have identical heating and cooling demands. Five systems were analyzed in detail and the entire energy cycle, from coal mine to end use, was examined for costs, efficiency, environmental impact, and applicability. The five energy systems are: (1) a coal fired power plant supplying electricity and a coal gasification plant supplying SNG; (2) a 26 MW fuel cell power plant fueled by coal derived SNG supplying electricity; (3) a 26 MW fuel cell power plant fueled by coal derived naphtha supplying electricity; (4) a combined cycle power plant fueled by coal derived fuel oil supplying electricity; and (5) a 100 kW fuel cell power plant fueled by coal derived SNG. GRA

N80-16565# SRI International Corp., Menlo Park, Calif.

COMPARATIVE ASSESSMENT OF RESIDENTIAL ENERGY SUPPLY SYSTEMS THAT USE FUEL CELLS Final Report, Sep. 1976 - Jan. 1979

R. V. Steele, D. C. Bomberger, K. M. Clark, R. F. Goldstein, R. L. Hays, M. E. Gray, and G. Ciprios Apr. 1979 505 p refs
(Contract EPA-68-02-2180)
(PB-299208/9; EPA-600/7-79-105B) Avail: NTIS HC A22/MF A01 CSCL 10B

A comparison of residential energy supply systems using fuel cells is presented. Twelve energy systems, able to provide residential heating and cooling using technologies projected to be available toward the end of this century, were designed conceptually. Five systems were analyzed in detail. The entire energy cycle, from coal mine to end use, was examined for costs, efficiency, environmental impact, and applicability. The five energy systems were: (1) a coal fired power plant supplying electricity and a coal gasification plant supplying SNG; (2) a 26 MW fuel cell power plant fueled by coal derived SNG supplying electricity; (3) a 26 MW fuel cell power plant fueled by coal derived naphtha supplying electricity; (4) a combined cycle power plant fueled by coal derived fuel oil supplying electricity; and (5) a 100 kW fuel cell power plant fueled by coal derived SNG, sited in a housing complex, supplying electricity to heat pumps, with heat recovered from the fuel cell supplying supplemental space heating and hot water. GRA

N80-16566# National Technical Information Service, Springfield, Va.

FLAT PLATE SOLAR COLLECTOR DESIGN AND PERFORMANCE. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1976 - Jul. 1979

Audrey S. Hundemann Sep. 1979 168 p Supersedes NTIS/PS-78/0840
(NTIS/PS-79/0928/6; NTIS/PS-78/0840) Avail: NTIS HC $28.00/MF $28.00 CSCL 10A

Federally-funded research on the design and thermal efficiency of air- and liquid-type flat plate collectors is discussed. Topic areas cover convection characteristics, methods to reduce heat loss, optical coatings, and corrosion control. Emphasis of the bibliography is on basic research studies. (This updated bibliography contains 160 abstracts, 63 of which are new entries to the previous edition.) GRA

N80-16567# National Technical Information Service, Springfield, Va.

FLAT PLATE SOLAR COLLECTOR DESIGN AND PERFORMANCE. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Jul. 1979

Audrey S. Hundemann Sep. 1979 180 p Supersedes NTIS/PS-78/0841
(NTIS/PS-79/0929/4; NTIS/PS-78/0841) Avail: NTIS HC$28.00/MF$28.00 CSCL 10A

Citations from worldwide literature on the design, thermal performance, and optimization of air- and liquid-type flat plate collectors are covered. Topic areas include heat loss and heat transfer, effect of orientation, corrosion protection, optical coatings, enhancement of performance through the use of planar reflectors, and the effect of honeycomb layers on collector performance. A few studies pertain to grooved, corrugated, or V-trough collectors. Abstracts dealing with methods of measuring the performance of flat plate collectors and computer optimization studies are included. This bibliography contains 174 abstracts, 30 of which are new entries to the previous edition. GRA

N80-16568# Economics, Statistics and Cooperatives Service, Washington, D. C. National Economics Div.

SOLAR ENERGY FOR AGRICULTURE: REVIEW OF RESEARCH Final Report

W. K. Trotter, W. G. Heid, Jr., and R. G. McElroy Aug. 1979 29 p refs
(PB-298688/3; ESCS-67) Avail: NTIS HC A03/MF A01 CSCL 02B

Solar energy use in various agricultural applications is summarized. Grain drying, heating and cooling of greenhouses and rural residences, heating livestock shelters, drying crops other than grain, food processing, and irrigation are discussed. An exploratory economic assessment of solar energy technologies is given. GRA

N80-16569# New Mexico Energy Inst., Las Cruces.

FEASIBILITY STUDY OF GEOTHERMAL ENERGY FOR HEATING GREENHOUSES Final Report, 1 Jan. - 31 Aug. 1977

Leo J. LaFrance Jun. 1979 24 p refs Sponsored in part by New Mexico Energy and Minerals Dept.
(PB-299517/3; NMEI-41) Avail: NTIS HC A02/MF A01 CSCL 02C

The technical feasibility of heating greenhouses with low temperature, 212 F (100 C) and below, geothermal sources is established. The economic feasibility of using geothermal energy to heat greenhouses is summarized. Candidate greenhouse facilities in New Mexico were determined for conversion to geothermal energy as well as sites favorable for new greenhouse construction. GRA

N80-16571# National Technical Information Service, Springfield, Va.

HELIOSTAT SYSTEM DESIGN AND OPERATION. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Jul. 1979

Audrey S. Hundemann Sep. 1979 61 p Supersedes NTIS/PS-78/0842
(NTIS/PS-79/0930/2; NTIS/PS-78/0842) Avail: NTIS HC $28.00/MF $28.00 CSCL 10A

The design and use of heliostats in solar central receiver thermal power systems are discussed in abstracts from worldwide literature. Topic areas include heliostat systems performance, efficiency, and optimization. Emphasis of the bibliography is on basic research. (This updated bibliography contains 55 abstracts, 17 of which are new entries to the previous edition.) GRA

N80-16572# National Bureau of Standards, Washington, D.C. National Engineering Lab.

PERFORMANCE OF A PACKAGED SOLAR SPACE-HEATING SYSTEM USED WITH A MOBILE HOME

Dennis E. Jones and James A. Hill Aug. 1979 45 p refs
Sponsored in part by HUD, Washington, D.C. Div. of Energy, Building Technol. and Standards
(PB-300890/1; NBSIR-79-1799) Avail: NTIS HC A03/MF A01 CSCL 13A

A mobile home was equipped with a packaged solar space-heating system using air heating collectors and pebble bed shortage. The system was fully instrumented and data were collected. The performance of the system was determined and various methods of correlating performance were explored. GRA

N80-16580# Brookhaven National Lab., Upton, N. Y. Atmospheric Sciences Div.

STATUS OF POLLUTANT REMOVAL TECHNOLOGY FOR COAL FIRED PLANTS IN THE NORTHEASTERN U.S.

E. N. Ziegler (Polytechnic Inst. of N.Y., Brooklyn) and Ronald E. Meyers Feb. 1979 44 p refs
(Contract EY-76-C-02-0016)
(BNL-51004) Avail: NTIS HC A03/MF A01

The status of air pollution control technology for coal fired industrial and power plant boilers is surveyed. Lime and limestone based scrubbers, the Wellman-Lord, thiosorbic, and citrate processes, electrostatic precipitators, fabric filtration, and modification of the combustion system to reduce nitrogen oxide concentrations are among the technology items covered. Various process capital and annualized costs are reported for SO2 and particulate removal systems. The status of fluidized bed combustion, fuel desulfurization, coversion of coal to gaseous and liquid fuels, and flue gas denitrification is also discussed. DOE

N80-16581# Department of Energy, Washington, D. C.

PETROLEUM PRODUCTION AT MAXIMUM EFFICIENT RATE, NAVAL PETROLEUM RESERVE NO. 1 (ELK HILLS), KERN COUNTY, CALIFORNIA Final Environmental Impact Statement

Aug. 1979 525 p refs
(DOE/EIS-0012) Avail: NTIS HC A22/MF A01

The Naval Petroleum Reserves were opened up for production at maximum efficient rates consistent with sound engineering practices, for a period of 6 years. Production for Naval Petroleum Reserve No. 1 is expected to peak at between 205,000 and 240,000 bbl/d of crude oil in 1982. Positive impacts of the project are increased employment, use of vacant housing, increased local spending on goods and services, and the potential for increased domestic petroleum production with a commensurate decrease in the US balance of payment deficit. Adverse effects of the project include increased air pollution emissions, increased noise levels, reduction in vegetation, loss of the Petroleum Reserve for use in emergency situations, increased traffic levels, and decreased visual quality. DOE

N80-16596# Resources for the Future, Inc., Washington, D. C.

ENVIRONMENTAL SYSTEM STUDY ON THE DEVELOPMENT OF FOSSIL FUEL RESOURCES IN THE SOUTHWEST

James W. Sawyer May 1979 18 p refs
(Grant NSF AER-75-16163)
(PB-300526/1; NSF/RA-790117) Avail: NTIS HC A02/MF A01 CSCL 13B

Various outcomes of a project designed to study energy and synfuels technologies appropriate to the Southwest are described. The topics investigated include air pollution control for electric power plants in the Southwest, use of coal for electricity generation in California, and energy/transportation concepts, economics, and technologies. Navajo resource problems and economic considerations for the continued care of uranium mill sites are also discussed. GRA

N80-16600# Tennessee Valley Authority, Chattanooga. Office of Natural Resources.

REMOTE SENSING OF SULFUR DIOXIDE EFFECTS ON VEGETATION - PHOTOMETRIC ANALYSIS OF AERIAL PHOTOGRAPHS

C. Daniel Sapp Jun. 1979 42 p refs
(PB-300460/3; TVA/ONR-79/01; EPA-600/7-79-138) Avail: NTIS HC A03/MF A01 CSCL 13B

Spectral reflectances were measured by tri band densitometry of aerial color infrared photographs of soybean Glycine mass fields that had been affected by sulfur dioxide (SO2) emissions from large, coal fired power plants in northwestern Alabama and western Tennessee. The photographs were photometrically calibrated. Results indicate that, at very light levels of foliar injury, the infrared to red reflectance ration decreased with increasing injury. This behavior was in accordance with theory. At moderate and severe levels of injury, the ratio increased with injury. The best indicator of crop yield was green band reflectance, but the red and infrared bands were nearly as good. The yield variable actually increased with the level of injury, apparently because of field to field variations in canopy density. GRA

N80-16601# Acurex Corp., Mountain View, Calif. Aerotherm Div.

ENVIRONMENTAL ASSESSMENT OF STATIONARY SOURCE NOx CONTROL TECHNOLOGIES Annual Report, Jun. 1977 - Jun. 1978

L. R. Waterland, K. J. Lim, K. G. Salvesen, R. M. Evans, E. G. Higginbotham, and H. B. Mason Jun. 1979 203 p refs
(Contract EPA-68-02-2160)
(PB-300469/4; EPA-600/7-79-147; AR-2) Avail: NTIS HC A10/MF A01 CSCL 13B

Program results are summarized for: (1) developing fuel consumption and NOx emission inventories; (2) field testing selected stationary combustion sources; (3) performing process engineering and environmental assessment studies of NOx controls applied to utility and industrial boilers and gas turbines; and (4) developing reactive air quality and source analysis models. Preliminary NOx control technology analysis for utility boilers indicates that off-stoichiometric combustion and low NOx burners (LNB) are the preferred techniques for both retrofit and new applications. For coal firing, overfire air operation and LNB are both cost effective; LNB is preferred for new wall-fired boilers. For oil and gas firing, staged combustion with burners out of service is recommended. GRA

N80-16602# Mitre Corp., McLean, Va.

A REVIEW OF STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES: PETROLEUM REFINERIES

Kris Barrett and Alan Goldfarb Jan. 1979 93 p refs
(Contract EPA-68-02-2526)
(PB-300480/1; EPA-450/3-79-008; MTR-7825) Avail: NTIS HC A05/MF A01 CSCL 13B

The current standards of performance for petroleum refineries are presented. The status of current applicable control technology is reviewed and the ability of refineries to meet the current standards is discussed. Compliance test results are analyzed and recommendations are made for possible modifications and additions to the standard, including future studies needed for unresolved issues. GRA

N80-16623# General Electric Co., Santa Barbara, Calif. Center for Advanced Studies.

GROUNDWATER QUALITY MONITORING OF WESTERN OIL SHALE DEVELOPMENT. IDENTIFICATION AND PRIORITY RANKING OF POTENTIAL POLLUTION SOURCES

Guenton C. Slawson, Jr. Jan. 1979 241 p refs
(Contract EPA-68-03-2449)
(PB-300536/0; GE77TMP-51; EPA-600/7-79-023) Avail: NTIS HC A11/MF A01 CSCL 08I

Oil shale operations such as those proposed for eastern Utah are assessed as potential pollution sources. A priority ranking of pollutants is presented based on the magnitude of the source and the toxicity, persistence, and mobility of the pollutants. K.L.

N80-16625# Mitre Corp., McLean, Va. METREK Div.
OUTER CONTINENTAL SHELF ENVIRONMENT MONITORING CONCERNS Final Report
J. Slaughter Jul. 1979 78 p refs
(Contract EQ8AC020)
(PB-299861/5; MTR-79W00192) Avail: NTIS HC A05/MF A01 CSCL 13B

Information is presented on existing and proposed Federal environmental monitoring programs applicable to oil and gas exploration, development, and production on the outer continental shelves (OCS). An analysis of the relevance of these programs to the needs of state and local governments affected by OCS activities is given. Discussion of significant unmet monitoring needs is included. GRA

N80-16628 West Virginia Univ., Morgantown.
SUBSURFACE STRATIGRAPHY OF THE MIDDLE AND UPPER DEVONIAN CLASTIC SEQUENCE IN SOUTHERN WEST VIRGINIA AND ITS RELATION TO GAS PRODUCTION Ph.D. Thesis
Donald Wade Neal 1979 305 p
Avail: Univ. Microfilms Order No. 8000226

A stratigraphic framework for the Middle and Upper Devonian clastic sequence in the subsurface of southern West Virginia was established using gamma-ray logs, drillers' logs, and sample descriptions. The Devonian shale within the study area is submature with respect to hydrocarbon generation yet produces a high quality gas. An interconnected fracture system is postulated to be the reservoir in which gas accumulates where there is the complimentary presence of both thick intervals of black shale and broad flexures which produce fractures. New areas of potential shale gas exploration for both the Huron Member of the Ohio Shale and the Rhinestreet Shale-Marcellus Shale interval are located east of the Warfield Anticline in Boone, Logan, Mingo, McDowell, Wyoming, and Raleigh Counties, West Virginia. Dissert. Abstr.

N80-16632 Colorado State Univ., Fort Collins.
THE YALLAHS FAN DELTA, SOUTHEASTERN JAMAICA: A DEPOSITIONAL MODEL FOR ACTIVE TECTONIC COASTLINES Ph.D. Thesis
William Albert Wescott 1979 189 p
Avail: Univ. Microfilms Order No. 7928557

The vertical and lateral succession of specific subaerial, transitional, and submarine evironments associated with the Yallahs fan delta system provides the data for the development of a stratigraphic model for truncated, coarse-grained, humid region fans that build directly onto relatively steep submarine slopes. This model should prove useful in the recognition of fan delta deposits in the rock record and for the paleogeographic reconstruction of ancient, tectonically active continental and island-arc plate margins. It may also serve as a valuable tool in the search for economic deposits and fossil fuels. Dissert. Abstr.

N80-16652# California Univ., Berkeley. Earth Sciences Div.
VERTICAL MOVEMENT ALONG THE CERRO PRIETO TRANSFORM FAULT, BAJA CALIFORNIA, MEXICO - A MECHANISM FOR GEOTHERMAL ENERGY RENEWAL
S. VonderHaar, J. E. Noble, and I. Puente Cruz Mar. 1979 8 p refs Prepared jointly by Comision Federal de Electricidad, Mexico City
(Contract W-7405-eng-48)
(LBL-8905) Avail: NTIS HC A02/MF A01

Data from 53 geothermal wells to depths of 1 to 3 km on either side of the right-lateral Cerro Prieto fault, as well as geophysical data, indicate vertical displacements of this fault of 400 to 600 m. This episoidic vertical movement has offset deltaic sandstone reservoirs that are primarily at 1200 m and 1800 m depth and contain 250 to 345 C water. A major fracture system for convective fluid movement has been thus maintained, with production at 150 MW. DOE

N80-16653# Brookhaven National Lab., Upton, N. Y.
NORMAL INCIDENT SOLAR RADIATION MEASUREMENTS AT UPTON, NEW YORK
J. G. Cottingham 24 Oct. 1978 15 p
(Contract EY-76-C-02-0016)
(BNL-50939) Avail: NTIS HC A02/MF A01

Normal incident solar energy measurements made at Upton, L.I., New York are reported and analyzed relative to the total energy received on a horizontal surface. A method for computing normal incident solar radiation is developed and used to study long term variations in this energy source at Upton and to estimate average values for other east coast locations. DOE

N80-16663# Geological Survey, Albuquerque, N. Mex. Water Resources Div.
BIBLIOGRAPHY OF GEOLOGY AND HYDROLOGY, EASTERN NEW MEXICO Final Water Resources Investigation
Ann Finley Wright Mar. 1979 175 p
(PB-300832/3; USGS/WRI-79/76; USGS/WRD/WRI-79/060) Avail: NTIS HC A08/MF A01 CSCL 08G

The high plains of the eastern New Mexico region and its natural resources are examined. The bibliography contains 1,900 references concerned with the geology, hydrology, chemistry, and geography of the region. GRA

N80-16885*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMMENTS ON TEC TRENDS
James F. Morris 1979 28 p refs Presented at Intern. Conf. on Plasma Sci., Montreal, 4-6 Jun. 1979; sponsored by IEEE
(NASA-TM-79317; E-273) Avail: NTIS HC A03/MF A01 CSCL 20I

A technology assessment of thermionic energy conversion research and technology is presented. R.E.S.

N80-16886*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTS ON H2-O2MHD POWER GENERATION
J. Marlin Smith 1980 18 p refs Proposed for presentation at the 3d World Hydrogen Energy Conf., Tokyo, 23 - 26 Jun. 1980
(NASA-TM-81424) Avail: NTIS HC A02/MF A01 CSCL 20I

Magnetohydrodynamic power generation experiments utilizing a cesium-seeded H2-O2 working fluid were carried out using a diverging area Hall duct having an entrance Mach number of 2. The experiments were conducted in a high-field strength cryomagnet facility at field strengths up to 5 tesla. The effects of power takeoff location, axial duct location within the magnetic field, generator loading, B-field strength, and electrode breakdown voltage were investigated. For the operating conditions of these experiments, it is found that the power output increases with the square of the B-field and can be limited by choking of the channel or interelectrode voltage breakdown which occurs at Hall fields greater than 50 volts/insulator. Peak power densities of greater than 100 MW/cu M were achieved. A.R.H.

N80-16926 California Univ., Berkeley.
MOLECULAR THERMODYNAMICS OF DEW-POINT CALCULATIONS IN COAL GASIFICATION PROCESSES Ph.D. Thesis
Abdalla Ibrahim El-Twaty 1979 205 p
Avail: Univ. Microfilms Order No. 8000333

A flow apparatus for dew point measurements suitable for highly asymmetric mixtures at high temperatures is described. The apparatus was used to measure the vapor pressure of anthracene in the temperature range 145-165 C and the solubility of n-hexadecane in methane at 125 C near 600 psig. A molecular thermodynamic model was developed to predict condensation conditions for coal gases. Fugacity coefficients are calculated from the viral equation for the gas-phase. The model is implemented in the form of a computer program which requires as input: the total pressure, weight fractions of all components of the feed and, for each tar cut, one vapor pressure datum, fraction aromaticity, and hydrogen-to-carbon ratio. The program calculates the initial dew point as well as the mole and weight percent of tar and/or water condensed as the temperature falls along the heat exchanger. Dissert. Abstr.

N80-16932# Bureau of Mines, Pittsburgh, Pa. Mining and Safety Research Center.
THERMAL, MECHANICAL, AND PHYSICAL PROPERTIES OF SELECTED BITUMINOUS COALS AND COKES

J M Singer and R P Tye 1979 44 p refs
(PB-300398/5. BM-RI-8364) Avail NTIS HC A03/MF A01
CSCL 08I

Thermal, mechanical, and physical properties, of virgin and heat-treated seam coal were determined. Measured properties include thermal conductivity, specific heat, thermal expansion, density, compressive and tensile strength, porosity, and permeability, interdependence among all properties is discussed. GRA

N80-16950* Denver Univ., Colo. Industrial Economics Div.
SPACE BENEFITS: THE SECONDARY APPLICATION OF AEROSPACE TECHNOLOGY IN OTHER SECTORS OF THE ECONOMY
Jan 1980 236 p
(Contract NASw-3113)
(NASA-CR-162697) Avail: NASA Scientific and Technical Information Facility, P.O. Box 8757, B.W.I. Airport, Md. 21240
CSCL 05A

Over 580 examples of the beneficial use of NASA aerospace technology by public and private organizations are described to demonstrate the effects of mission-oriented programs on technological progress in the United States. General observations regarding technology transfer activitiy are presented. Benefit cases are listed in 20 categories along with pertinent information such as communication link with NASA, the DRI transfer example file number and individual case numbers associated with the technology and examples used; and the date of the latest contract with user organizations. Subject, organization, geographic, and field center indexes are included. A.R.H.

N80-16974# DeLeuw, Cather and Co., Chicago, Ill.
AGT GUIDEWAY AND STATION TECHNOLOGY. VOLUME 8: WEATHER PROTECTION CONCEPTS Final Report
R. D. Stevens, T. J. Nicario, T. J. McGean, S. M. Easley, and T. L. Easley Aug. 1979 249 p refs Prepared jointly with ABAM Engineers Inc.
(Contract DOT-UT-70066)
(PB-299746/8; UMTA-IT-06-0152-79-7) Avail: NTIS HC A11/MF A01 CSCL 13F

Guideway, station, and weather protection concepts which will reduce the cost and implementation time associated with AGT systems as well as to improve performance are considered. Weather protection concepts are presented for guideways associated with AGT systems, with emphasis on minimizing costs and energy consumption while maximizing system operability/reliability during winter weather. The concepts include a comparison of embedded pipe and electric heating systems with varied heated widths, heating densities, and amount of utilization. GRA

N80-16976# National Technical Information Service, Springfield, Va.
ELECTRIC AUTOMOBILES. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Aug. 1979
Audrey S. Hundemann Sep. 1979 276 p Supersedes NTIS/PS-78/0880, NTIS/PS-77/0635, NTIS/PS-76/0560 and NTIS/PS-75/490
(NTIS/PS-79/0990/6; NTIS/PS-78/0880; NTIS/PS-77/0635; NTIS/PS-76/0560; NTIS/PS-75/490) Avail: NTIS HC $28.00/MF $28.00 CSCL 13F

The research pertaining to battery systems, costs, and evaluations of electric vehicles are presented. Nickel zinc and lead acid batteries are studied and various types of lithium cells and hybrid heat engine/electric systems are reported. This bibliography contains 271 abstracts, 58 of which are new entries to the previous edition. GRA

N80-17014*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FISCAL YEAR 1979 SCIENTIFIC AND TECHNICAL REPORTS, ARTICLES, PAPERS AND PRESENTATIONS
O. L. White, comp. Oct. 1979 62 p
(NASA-TM-78250) Avail: NTIS HC A04/MF A01 CSCL 05B

This bibliography lists approximately 590 formal NASA technical reports, papers published in technical journals, presentations by MSFC personnel, and reports of MSFC contractors introduced into the NASA scientific and technical information system in 1979. J.M.S.

N80-17243# Sandia Labs., Albuquerque, N. Mex. Process Research Div.
APPLICATION OF RADIOGRAPHY TO COAL LIQUEFACTION
D. G. Sample and M. G. Thomas 1979 16 p refs Presented at the ASNT Fall Conf., St. Louis
(Contract EY-76-C-04-0789)
(SAND-79-1226C; CONF-791008-2) Avail: NTIS HC A02/MF A01

The application of X-radiographic techniques to the investigation of coal and coal liquefaction systems is discussed. The analysis of catalysts used in coal liquefaction by wavelength and energy dispersive analyses, identification and isolation of tagged catalysts using film radiography, and measuring mineral matter in coal with a radiation gage are among the topics covered. DOE

N80-17244# Los Alamos Scientific Lab., N. Mex.
PRODUCTION OF SYNTHETIC GAS FROM NUCLEAR ENERGY SOURCES
C. A. Anderson, J. C. Biery, and L. A. Booth Apr. 1979 235 p refs
(Contract EW-78-Y-04-4183)
(LA-7592-MS) Avail: NTIS HC A11/MF A01

A survey of nuclear energy sources and their potential application to the production of synthetic gas is documented. The state-of-the-art in commercial nuclear fission reactors and on-going research and development in advanced reactors is described. The status of fusion energy research and estimated timing of commercial availability are reported. Surveys of high temperature electrolysis and thermochemical cycles as means for producing synthetic gas from process heat are given. Synthetic gas production from radiolysis is discussed. A description of the nuclear fuel cycle and uranium reserve and resource estimates are presented. DOE

N80-17246# Institut Francais du Petrole, Rueil-Malmaison Lab. Recherches Chemiques de Base.
STORING HYDROGEN IN THE FORM OF LIGHT ALLOY HYDRIDES Final Report [STOCKAGE DE L'HYDROGENE SOUS FORME D'HYDRURES D'ALLIAGES DE METAUZ LEGERS]
Edouard Freund and Christine Guillerm Jul. 1978 58 p refs In FRENCH
(IFP-26-209) Avail: NTIS HC A04/MF A01

Different hydrides are investigated to find a system with a sufficiently high storage density (> or = 3 percent). The formation of hydrides with light alloys is examined. Reaction kinetics for hydride formation were defined and applied to the systems Mg-Al-H, Mg-Al-Cu-H, Ti-Al-Hi, Ti-Al-Cu-H, and Ti-Al-Ni-H. Results indicate that the addition of Al destabilizes MgH_2 and TiH_2 hydrides while having only a limited effect on the storage density. Author (ESA)

N80-17467*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE SENSITIVITY ANALYSIS OF DEPARTMENT OF ENERGY-CHRYSLER UPGRADED AUTOMOTIVE GAS TURBINE ENGINE, S/N 5-4 Final Report
Roy L. Johnsen Dec. 1979 37 p refs
(Contract EC-77-A-31-1040)
(NASA-TM-79242; DOE/NASA/1040-79/9; E-147) Avail: NTIS HC A03/MF A01 CSCL 21A

The performance sensitivity of a two-shaft automotive gas turbine engine to changes in component performance and cycle operating parameters was examined. Sensitivities were determined for changes in turbomachinery efficiency, compressor inlet temperature, power turbine discharge temperature, regenerator effectiveness, regenerator pressure drop, and several gas flow and heat leaks. Compressor efficiency was found to have the greatest effect on system performance. K.L.

N80-17470*# Chrysler Corp., Detroit, Mich.

MATERIALS REVIEW FOR IMPROVED AUTOMOTIVE GAS TURBINE ENGINE **Final Report**

C. Belleau, W. L. Ehlers, and F. A. Hagen Apr. 1978 101 p refs Sponsored by NASA
(Contract EY-76-C-02-2749.A011)
(NASA-CR-159673; DOE/NASA/2749-79/4-Vol-4) Avail NTIS HC A06/MF A01 CSCL 21A

The potential role of superalloys, refractory alloys, and ceramics in the hottest sections of engines operating with turbine inlet temperatures as high as 1370 C is examined. The convential superalloys, directionally solidified eutectics, oxide dispersion strenghened alloys, and tungsten fiber reinforced superalloys are reviewed and compared on the basis of maximum turbine blade temperature capability. Improved high temperature protective coatings and special fabrication techniques for these advanced alloys are discussed. Chromium, columbium, molybdenum, tantalum, and tungsten alloys are also reviewed. Molbdenum alloys are found to be the most suitable for mass produced turbine wheels. Various forms and fabrication processes for silicon nitride, silicon carbide, and SIALON's are investigated for use in highstress and medium stress high temperature environments. K.L.

N80-17484# Transportation Systems Center, Cambridge, Mass.

COMPARISON OF FUEL ECONOMY AND EMISSIONS FOR DIESEL AND GASOLINE POWERED TAXICABS **Final Report, Jun. 1976 - Apr. 1979**

K. M. Hergenrother Washington Jul. 1979 30 p
(PB-298609/9; DOT-TSC-UMTA-79-30; UMTA-MA-06-0066-79-1) Avail: NTIS HC A03/MF A01 CSCL 21D

Potential improvements in fuel economy and exhaust emissions by dieselization of the taxi fleet in a large urban area was assessed. Sixty-six diesel powered taxicabs and an equal number of gasoline powered cabs were operated for 120,000 miles each in three taxicab fleets in New York City. Identical cabs were powered with either 198 CID diesel engines or 225 CID gasoline engines. Test results from all cabs were used to determine fuel economy and exhaust emissions. On the road, the diesel cabs had 50 percent better fuel economy than the gasoline cabs; the diesel exhaust emissions (HC, CO, NOx) were lower than the gasoline exhaust emissions over the life of the test. Emission from the diesels did not appreciably degrade with vehicle age; emission from the gasoline cabs increased appreciably. GRA

N80-17539 Miami Univ., Coral Gables, Fla.

INFORMATION THEORY APPLIED TO SOLAR RADIATION CONCENTRATORS **Ph.D. Thesis**

Russell Paul Patera 1979 179 p
Avail: Univ. Microfilms Order No. 8001674

A solar collector is treated as a communication channel with the input being the directional distribution of radiation at the aperture and the output being the spatial distribution of the radiation at the absorber. The channel structure and information measure are found. The information measure is used to obtain a general figure of merit which is useful for collector comparisons over wide ranges of operating conditions. The findings of the theory indicate that for an isotropic distribution of radiation at the input, a single absorber segment is sufficient for optimum collector performance. For a nonisotropic distribution, many thermally separated absorber segments are necessary for optimum performance. The heat transfer fluid is first passed through the warm segments, and then passed sequentially through the progressively hotter segments. Three practical examples are given. Dissert. Abstr.

N80-17541 Georgia Inst. of Tech., Atlanta.

OPTICAL AND THERMAL EFFECTS IN LINEAR SOLAR CONCENTRATING COLLECTORS **Ph.D. Thesis**

Sheldon Moseley Jeter 1979 430 p
Avail: Univ. Microfilms Order No. 8000828

Procedures for the analysis and evaluation of optical and thermal effects in concentrating solar collectors employing reflector optical systems are presented. Particular emphasis is placed on the consideration of cylindrical, single-axis suntracking concentrators and collectors. The optical analysis is based on fundamental concepts of geometrical optics augmented by limited simplifications generally applicable to solar energy utilization and leading to representations of the source as a finite disc emitter and of the concentrating surface as an array of differential reflective elements. The optical characteristics of several ideal concentrators are evaluated and detailed. Coupling the results of the optical analysis with standard heat transfer and hydraulic analysis yields a model for the thermal collector suitable for performance projections and dynamic simulations. Elementary examples of the application of the model are presented. Dissert. Abstr.

N80-17543*# Electro-Mechanical Research, Inc., Sarasota, Fla.

DOE/NASA WIND TURBINE DATA ACQUISITION. PART 1: EQUIPMENT

O. J. Strock Jan. 1980 56 p
(Contract DEN3-98)
(NASA-CR-159779; EMR-827053) Avail: NTIS HC A04/MF A01 CSCL 10B

Large quantities of data were collected, stored, and analyzed in connection with research and development programs on wind turbines. The hardware configuration of the wind energy remote data acquisition system is described along with its use on the NASA/DOE Wind Energy Program. R.C.T.

N80-17544*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SOLAR ENERGY CONTROL SYSTEM **Patent Application**

James R. Currie, inventor (to NASA) Filed 29 Nov. 1979 18 p
(NASA-Case-MFS-25287-1; US-Patent-Appl-SN-098570) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar energy control system for a hot air type solar energy heating system wherein thermocouples are arranged to sense the temperature of a solar collector, a space to be heated, and a top and bottom of a heat storage unit is described. Pertinent thermocouples are differentially connected togther, and these are employed to effect the operation of dampers, a fan, and an auxiliary heat source. In accomplishing this, the differential outputs from the thermocouples are amplified by a single amplifier by multiplexing techniques. Additionally, the amplifier is corrected as to offset by including as one multiplex channel a common reference signal. NASA

N80-17545*# National Aeronautics and Space Administration. Earth Resources Labs., Bay St. Louis, Miss.

ENERGY FROM AQUATIC PLANT WASTEWATER TREATMENT SYSTEMS

B. C. Wolverton and Rebecca C. McDonald Sep. 1979 18 p refs
(NASA-TM-X-72733) Avail: NTIS HC A02/MF A01 CSCL 10A

Water hyacinth (Eichhornia crassipes), duckweed (Spirodela sp. and Lemma sp.), water pennywort (Hydrocotyle ranunculoides), and kudzu (Pueraria lobata) were anaerobically fermented using an anaerobic filter technique that reduced the total digestion time from 90 days to an average of 23 days and produced 0.14-0.28 cu m CH_4/kg (dry weight) (2.3-4.5 cu ft/lb) from mature filters. The anaerobic filter provided a large surface area for the anaerobic bacteria to establish and maintain an optimum balance of facultative, acid-forming, and methane-producing bacteria. Consequently the efficiency of the process was greatly improved over prior batch fermentations. Author

N80-17547*# Institute of Gas Technology, Chicago, Ill.

HIGH-TEMPERATURE MOLTEN SALT THERMAL ENERGY STORAGE SYSTEMS **Final Report, 14 Sep. 1977 - 14 Dec. 1978**

Randy J. Petri, Terry D. Claar, Ray R. Tison, and Leonard G. Marianowski Feb. 1980 175 p refs
(Contract NAS3-20806)
(NASA-CR-159663; DOE/NASA/0806-79/1) Avail: NTIS HC A08/MF A01 CSCL 10A

The results of comparative screening studies of candidate molten carbonate salts as phase change materials (PCM) for advanced solar thermal energy storage applications at 540 to 870 C (1004 to 1600 F) and steam Rankine electric generation at 400 to 540 C (752 to 1004 F) are presented. Alkali carbonates

are attractive as latent heat storage materials because of their relatively high storage capacity and thermal conductivity, low corrosivity, moderate cost, and safe and simple handling requirements. Salts were tested in 0 1 kWhr lab scale modules and evaluated on the basis of discharge heat flux, solidification temperature range, thermal cycling stability, and compatibility with containment materials. The feasibility of using a distributed network of high conductivity material to increase the heat flux through the layer of solidified salt was evaluated. The thermal performance of an 8 kWhr thermal energy storage (TES) module containing LiKCO3 remained very stable throughout 5650 hours and 130 charge/discharge cycles at 480 to 535 C (896 to 995 F). A TES utilization concept of an electrical generation peaking subsystem composed of a multistage condensing steam turbine and a TES subsystem with a separate power conversion loop was defined. Conceptual designs for a 100 MW sub e TES peaking system providing steam at 316 C, 427 C, and 454 C (600 F, 800 F, and 850 F) at 3 79 million Pa (550 psia) were developed and evaluated. Areas requiring further investigation have also been identified.
Author

N80-17548*# Kaman Aerospace Corp , Bloomfield, Conn
DESIGN, FABRICATION, TEST, AND EVALUATION OF A PROTOTYPE 150-FOOT LONG COMPOSITE WIND TURBINE BLADE Final Report
Herbert W Gewehr Sep 1979 135 p refs
(Contracts NAS3-20600, EX-76-I-01-1028)
(NASA-CR-159775, DOE/NASA/0600-79/1, R-1575) Avail NTIS HC A07/MF A01 CSCL 10B

The design, fabrication, testing, and evaluation of a prototype 150 foot long composite wind turbine blade is described. The design approach and material selection, compatible with low cost fabrication methods and objectives, are highlighted. The operating characteristics of the blade during rotating and nonrotating conditions are presented. The tensile, compression, and shear properties of the blade are reported. The blade fabrication, tooling, and quality assurance are discussed. A W H

N80-17549*# Jet Propulsion Lab , California Inst of Tech , Pasadena
PROCEEDINGS OF THE 13TH PROJECT INTEGRATION MEETING Progress Report, Apr. 1979 - Aug. 1979
R R McDonald Aug 1979 465 p Presented at 13th Project Integration Meeting, 22-23 1979
(Contract NAS7-100)
(NASA-CR-162787, JPL-Pub-79-88, DOE/JPL-1012-29, PR-13) Avail NTIS HC A20/MF A01 CSCL 10A

Progress made by the Low Cost Solar Array Project during the period April through August 1979 is presented. Reports are given on project analysis and integration, technology development in silicon material, large area sheet silicon, and encapsulation, production process and equipment development, engineering and operations, and a discussion of the steps taken to integrate these efforts. A report on, and copies of viewgraphs presented at the Project Integration Meeting held August 22-23, 1979 are presented.
M M M

N80-17551*# Jet Propulsion Lab , California Inst of Tech , Pasadena
CHARACTERIZATION OF DELIBERATELY NICKEL-DOPED SILICON WAFERS AND SOLAR CELLS
A M Salama 1 Nov 1980 24 p refs
(Contract NAS7-100)
(NASA-CR-162790, JPL-Pub-79-116, DOE/JPL-1012-34) Avail NTIS HC A02/MF A01 CSCL 10A

Microstructural and electrical evaluation tests were performed on nickel-doped p-type silicon wafers before and after solar cell fabrication. The concentration levels of nickel in silicon were 5 x 10 to the 14th power, 4 x 10 to the 15th power, and 8 x 10 to the 15th power atoms/cu cm. It was found that nickel precipitated out during the growth process in all three ingots. Clumps of precipitates, some of which exhibited star shape, were present at different depths. If the clumps are distributed at depths approximately 20 micron apart and if they are larger than 10 micron in diameter, degradation occurs in solar cell electrical properties and cell conversion efficiency. The larger the size of the precipitate clump, the greater the degradation in solar cell efficiency. A large grain boundary around the cell effective area acted as a gettering center for the precipitates and impurities and caused improvement in solar cell efficiency. Details of the evaluation test results are given.
Author

N80-17553# Army Electronics Technology and Devices Lab , Fort Monmouth, N J
REGENERATIVE BURNER SYSTEM FOR THERMOELECTRIC POWER SOURCES
G Guazzoni, J Angello, and A Herchakowski Jul 1979 9 p refs
(DA Proj 1L1-62705-AH-94)
(AD-A075955, DELET-TR-79-16) Avail NTIS HC A02/MF A01 CSCL 10/2

A thermoelectric power source is being developed to provide a multifuel, silent, maintenance free tactical power generator for forward area and unattended-operation applications. An experimental study of a regenerative burner system for the 500-Watt Thermoelectric Power Source has resulted in significant reduction in fuel consumption and infrared signature of the power source.
GRA

N80-17554# KDI Score, Inc., Cockeysville, Md
IMPROVED THERMAL BATTERY Final Report, Jun. 1976 - Dec. 1978
Praful V Dand and Khushrow K Press Apr 1979 38 p
(Contract F33615-76-C-2144, AF Proj 3145)
(AD-A075835, AFAPL-TR-79-2027) Avail NTIS HC A03/MF A01 CSCL 10/3

Under U S A F Contract F33615-76-C-2144, KDI SCORE undertook a study to advance state-of-the-art technology of thermal batteries for military applications, so that they might meet the requirements of some systems now using more complicated and expensive reserve batteries. An exhaustive study of the calcium/calcium chromate system and investigation of many new electrochemical systems showed lithium/iron disulfide to be a superior system got thermal batteries, with longer life at high current densities, and greater energy density. Based on battery tests, it was concluded that calcium/calcium chrome thermal batteries could not achieve the goal of 30 minutes life at 30 volts and 30 amperes, and that the lithium-aluminum/iron disulfide system, which achieved approximately 80% of the goal, could, with further development reach and possibly surpass this goal.
Author (GRA)

N80-17555# Brookhaven National Lab., Upton, N Y
THERMAL MATS FOR SPACE HEATING AND COOLING
F P Szydlik and A L Berlad Mar 1979 19 p refs
(Contract EY-76-C-02-0016)
(BNL-51019) Avail NTIS HC A02/MF A01

A single solar-powered device to accomplish both direct-gain heating and space cooling or water heating was studied. In the former operating mode, heating load reductions of 10 to 30 percent were achieved for small structures under cold, sunny midwinter weather conditions. With water flowing, cooling load reductions of 25 percent were obtained with the mats attached to only one large surface of similar structures. The mats also posses significant water heating capability which is a function of flow rate and solar flux. When operated simultaneously as space cooling devices, they serve as efficient water preheaters. For lower flow rates, temperature rises are sufficiently high for direct coupling to domestic hot water supplies. DOE

N80-17556# Franklin Research Center, Philadelphia, Pa
FIRST PASSIVE SOLAR HOME AWARDS
Jan 1979 229 p refs
(Contract EX-76-A-29-1020)
(DSE-1020-T17) Avail NTIS HC A11/MF A01

One hundred and sixty two solar home projects are listed and described. The projects are divided into three general categories: direct solar gain, indirect solar gain, and solarium. Discussions on selecting the best type of solar project for a given area, issues involved in marketing passive solar homes, and calculating the solar gain from passive systems are included.
A.W.H.

N80-17557# Bechtel National, Inc., San Francisco, Calif
COMBINED CYCLE FOR SOLAR-FOSSIL HYBRID POWER GENERATION
E Y Lam and J H Westsik 1979 5 p refs Presented at 14th Intersoc Energy Conversion Conf , Boston Mass , 5 Aug 1979

(Contract ET-78-C-03-2051)
(CONF-790803-43) Avail: NTIS HC A02/MF A01

Parametric studies were conducted on a near term and an advanced version of a nominal 100 MWe commercial power system. The combined cycle hybrid system consists of an air operated open Brayton cycle with a steam Rankine bottoming cycle utilizing the gas turbine waste heat. Solar energy is used to preheat the air in the gas turbine cycle with the air cooled receiver located upstream from the combustor in a series arrangement. Cycle efficiencies of 43.5 and 47.7 percent and average annual solar fractions of .312 and .408 were predicted for the near term and advanced versions respectively. DOE

N80-17558# Idaho National Engineering Lab., Idaho Falls.
TODAY'S GEOTHERMAL POWER ECONOMICS AND RISKS
T. W. Lawford 1979 6 p refs Presented at 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979
(Contract EY-76-C-07-1570)
(CONF-790803-44) Avail: NTIS HC A02/MF A01

Capital and power generation costs are developed as a parameterized composite of a number of ongoing geothermal power projects. Several of the most commonly accepted risks of geothermal power are evaluated in terms of cost penalties to a basic cost of power. The status of geothermal power in the U.S. is reviewed. DOE

N80-17560# California Univ., Berkeley. Lawrence Berkeley Lab. Materials and Molecular Research Div.
METAL FOILS FOR DIRECT APPLICATION OF ABSORBER COATINGS ON SOLAR COLLECTORS
C. M. Lampert Aug. 1979 18 p refs Presented at the Am. Electroplaters Soc. Symp. on Coatings for Solar Collectors, St. Louis, 16-17 Oct. 1979
(Contract W-7405-eng-48)
(LBL-9324; CONF-791021-1) Avail: NTIS HC A02/MF A01

The basic materials and processing associated with the production of coated metal foils for solar collector absorber surfaces are discussed. Also covered are details of heavier metal strips for direct fabrication of solar collectors. Techniques including bonding methods and the use of adhesives are surveyed. Commercial solar foil manufacturers are covered, along with the new research efforts in this area. In conclusion, advantages and disadvantages are outlined, with specific recommendations. DOE

N80-17561# Arizona Univ., Tucson. Dept. of Electrical Engineering.
SEGMENTED DISH CONCENTRATOR DESIGN PROJECT
R. L. Call Jul. 1979 89 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7024) Avail: NTIS HC A05/MF A01

A description of the segmented dish concentrator is presented in two parts: (1) the design and fabrication of the optical module concentrator with heat sink and solar cell receiver; and (2) the design and procedure of mounting the solar cells. The optical module consists of tiers of conical reflecting surfaces accumulating light on a central hexagonal shaped cylindrical receiver. The solar cells are mounted on the faces of the hexagon. Complete units were assembled and tested. Various reflecting materials were tested. An overall maximum of 7.6 percent was obtained for the module using a silver reflector. R.E.S.

N80-17562# Midwest Research Inst., Golden, Colo.
STATE-OF-THE-ART OF SOLAR CONTROL SYSTEMS IN INDUSTRIAL PROCESS HEAT APPLICATIONS
W. S. Su and J. N. Castle Jul. 1979 26 p refs Presented at the ISA Natl. Conf., Chicago, 22-25 Oct. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-39-240; CONF-791005-5) Avail: NTIS HC A02/MF A01

Solar system configurations currently being used or proposed are presented. Parameters and functions deemed essential in solar system controls are identified. Operating deficiencies and possible future improvements are discussed. DOE

N80-17563# Sandia Labs., Albuquerque, N. Mex.
SUNTECH SOLAR LINEAR ARRAY THERMAL SYSTEM (SLATS) TEST RESULTS Summary Report
H. J. Gerwin Aug. 1979 58 p refs
(Contract EY-76-C-04-0789)
(SAND-79-0658) Avail: NTIS HC A04/MF A01

A fixed-receiver, movable-reflector solar collector system was tested. The collector included 260 sq m of reflector area. Thermal energy was transferred from the linear receiver to a heat exchanger by water and from the heat exchanger to the thermal storage tanks by Therminol 66. The collector system start-up and operation over a period of 16 months is described. Several data tables and many graphical displays show the performance characteristics under various operating parameters. DOE

N80-17564# Sandia Labs., Albuquerque, N. Mex.
RECEIVER ASSEMBLY DESIGN STUDIES FOR 2-m 90 DEG PARABOLIC-CYLINDRICAL SOLAR COLLECTORS
A. C. Ratzel Sep. 1979 87 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1026) Avail: NTIS HC A05/MF A01

A computer simulation was developed to provide cumulative all day performance results or instantaneous solar noon results for three annular solar receiver assemblies: 2.223, 2.54, and 3.175 cm o.d. tubes with concentric glass jackets. Representative clear spring, summer, and winter conditions for Albuquerque, N.M. were modeled. Design problems considered in the analysis included misalignment of the receiver assembly from the focal line, reflector trough tracking bias, variation in receiver tube operating temperature, and variation in the reflector trough one-dimensional slope errors and two-dimensional mirror errors. Summarized performance results for all studies are provided graphically. For operating receiver-tube temperatures 475 K, the 3.175 cm receiver tube provides the best overall collector performance results. For higher operating temperatures where detrimental receiver heat losses become more significant, the smaller 2.54 cm tube is more effective for solar energy collection. DOE

N80-17565# Sandia Labs., Albuquerque, N. Mex.
PERFORMANCE OF LINEAR SOLAR CONCENTRATING COLLECTORS
R. P. Stromberg 1979 21 p refs Presented at the First Intern. Symp. on Non-conventional Energy, Trieste, Italy, 27 Aug. - 7 Sep. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1378C; CONF-790850-1) Avail: NTIS HC A02/MF A01

Performance equations and performance as a function of intensity are discussed. Progress over the past five years and current linear concentrating collector performance are reviewed. The design and development of a low technology linear concentrator are described. DOE

N80-17566# Sandia Labs., Albuquerque, N. Mex.
PERFORMANCE OF SOLAR PASSIVE BUILDINGS
R. P. Stromberg 1979 20 p refs Presented at the First Intern. Symp. on Non-conventional Energy, Trieste, Italy, 27 Aug. - 7 Sep. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1574C; CONF-790850-2) Avail: NTIS HC A02/MF A01

Test data are presented for five different homes during the same winter days. Trombe wall, waterwall, greenhouse, and direct gain features of the buildings display their differing responses to the same climate conditions. DOE

N80-17567# Battelle Pacific Northwest Labs., Richland, Wash.
GUST-RISE EXCEEDANCE STATISTICS FOR WIND TURBINE DESIGN
C. H. Huang and G. H. Fichtl Jul. 1979 31 p refs
(Contract EY-76-C-06-1830)
(PNL-2530) Avail: NTIS HC A03/MF A01

A method of obtaining the velocity change for the design life of a wind energy conversion system is presented. The turbulence spectra, variation of the length scale, turbulence intensity, and surface roughness that are needed to compute the total number of gust rises from the formula are also described. K.L.

N80-17568# Sandia Labs., Albuquerque, N. Mex.
MAGMA ENERGY RESEARCH, 79-1 Semiannual Report, Oct. 1 - 31 Mar. 1979

R K Traeger, ed, J L Colp, ed, and R R Neel, ed Jul 1979 59 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1344) Avail NTIS HC A04/MF A01

The Kilavea Iki lava lake was evaluated Mathematical models of the cooling of the lake and the state of solidification of the liquid lens were verified by thermal profile and permeability measurements Jet-augmented drilling concepts successfully penerated the viscous, multiphase molten rock region in some locations where conventional drilling failed. Heat transfer studies in the lake suggest that injection of fluids to enhance convection may be useful to extract energy from magma chamber margins An 800 cc simulation facility for evaluating simulated magma properties at temperatures to 1500 C and pressures to 4 kbar was completed and tested Thermodynamic stability diagrams were developed for 15 pure metals in basaltic magma systems and compatibility tests were completed Results are to be used to define simple alloy systems which may be compatible with magmas and to identify other superalloy material candidates
DOE

N80-17569# Midwest Research Inst, Golden, Colo
OVERVIEW OF DEVELOPING PROGRAMS IN SOLAR DESICCANT COOLING FOR RESIDENTIAL BUILDINGS
1979 18 p Presented at the ASHRAE Soc Meeting, Detroit, 24 Jun 1979
(Contract EG-77-C-01-4042)
(SERI/TP-34-187, CONF-790678-3) Avail NTIS HC A02/MF A01

Open cycle adsorption and absorption systems are examined The different dehumidifier bed configurations are the distinguishing features of these systems The basic operating principles of each dehumidifier concept are explained along with some discussion of their comparative features Performance predictions developed by SERI for a solar desiccant solar system employing an axial flow desiccant wheel dehumidifier are presented In terms of life cycle cost and displaced fossil fuel energy, the results indicate that it should be beneficial to use solar desiccant coolers in residential applications
DOE

N80-17570# Battelle Pacific Northwest Labs, Richland, Wash
SOME POTENTIAL MATERIAL SUPPLY CONSTRAINTS IN SOLAR SYSTEMS FOR HEATING AND COOLING OF BUILDINGS AND PROCESS HEAT. A PRELIMINARY SCREENING TO IDENTIFY CRITICAL MATERIALS
R L Watts, W E Gurwell, T A Nelson, and S A Smith Jun 1979 137 p refs
(Contract EY-76-C-06-1830)
(PNL-2972) Avail NTIS HC A07/MF A01

Nine solar heating and cooling of buildings designs and three agricultural and industrial process heat designs were studied to identify potential future material constraints to their large scale installation and use The systems were screened and found to be free of serious future material constraints The screening was carried out for each individual system design assuming 500 million sq m of collector area installed by the year 2000 Also, two mixed designed scenarios, containing equal portions of each system design, were screened Three materials were identified that could possibly restrain the deployment of solar systems in the specific scenarios investigated They are iron and steel, soda lime glass and polyvinyl fluoride All three of these materials are bulk materials No raw material supply constraints were found
DOE

N80-17571# Solar Environmental Engineering Co, Inc, Fort Collins, Colo
CONTINUING REGIONAL SOLAR ENERGY INFORMATION MINI-CENTER ACTIVITIES AND UPDATING THE SOLCOST PROGRAM Quarterly Report, Nov. 1978 - Jan. 1979
L J Lantz Jan 1979 31 p
(Contract EG-77-C-02-4643)
(COO-4643-T1) Avail NTIS HC A03/MF A01

Contents interactive SOLCOST interface, energy conversion - solar system optimization, detailed duct sizing, extension of the SOLCOST data base, portable FORTRAN version, automatic collector parameter subroutine, the SOLAR INDEX; and the operation of the SOLCOST Mini-Center
DOE

N80-17572# Research Triangle Inst, Research Triangle Park, N C
DEVELOPMENT OF HIGH EFFICIENCY, LOW COST ZnSiAs2 SOLAR CELLS Quarterly Progress Report, 9 Apr. - 30 Jun. 1979
J E Andrews 1979 7 p
(Contract DE-AC04-79ET-23001)
(DOE/ET-23001-T1, QPR-1) Avail NTIS HC A02/MF A01

Three critical goals are identified that must be achieved before ZnSiAs2 can be realistically assessed (1) hole concentrations must be reduced the 1018 to 1019/cu cm range to the 1016 to 1017/cu cm range (2) n-type ZnSiAs2 must be demonstrated, and (3) ZnSiAs2 pn junctions must be demonstrated The approach taken and the progress made toward achieving these goals are described
DOE

N80-17573# Midwest Research Inst, Golden, Colo
AEROSOLS AND SOLAR ENERGY
R E Bird and R L Hulstrom 1979 11 p refs Presented at the Workshop on Artificial Aerosols, Vail, Colo, 19 Jun 1979
(Contract EG-77-C-01-4042)
(SERI/TP-36-309, CONF-7906108-1) Avail NTIS HC A02/MF A01

A brief description is presented of the involvement of the Solar Energy Research Institute (SERI) in atmospheric research, including aerosol characterization and modeling The use of both rigorous and simple models for radiation transport is described Modeled broadband solar irradiance data are shown to illustrate the important influence that aerosols have on the enrgy available to solar systems and the economics of solar systems design Standard aerosol measurement methods for solar applications are discussed along with the need for improved instrumentation and methods
DOE

N80-17574# Battelle Pacific Northwest Labs, Richland, Wash
ENERGY MATERIAL TRANSPORT, NOW THROUGH 2000, SYSTEM CHARACTERISTICS AND POTENTIAL PROBLEMS. TASK 3: PETROLEUM TRANSPORTATION Final Report
J G DeSteese Mar 1979 291 p
(Contract EY-76-C-06-1830)
(PNL-2421) Avail NTIS HC A13/MF A01

A summary characterization of the petroleum transportation system and an assessment of some potential problems that may impact petroleum transportation in the United States during the balance of the century are presented The system characterization includes a review of petroleum product movements, modal operations and comparisons, and transportation regulations and safety A median scenario based on published projections shows that the US will probably rely on foreign oil to supply between 40 and 50 percent of domestic petroleum needs throughout the balance of the century
DOE

N80-17575*# Jet Propulsion Lab, California Inst of Tech, Pasadena
ASSESSMENT OF LOW-COST MANUFACTURING PROCESS SEQUENCES
Robert G Chamberlain 1979 11 p refs Presented at the European Congr on Operations Res, Amsterdam, 9 Apr 1979
(Contract EY-76-A-29-1012)
(NASA-CR-162745, CONF-790451-1) Avail NTIS HC A02/MF A01 CSCL 10A

An extensive research and development activity to reduce the cost of manufacturing photovoltaic solar arrays by a factor of approximately one hundred is discussed Proposed and actual manufacturing process descriptions were compared to manufacturing costs An overview of this methodclogy is presented DOE

N80-17576# Dow Chemical Co, Midland, Mich Hydrocarbons and Energy Research Dept
ENERGY FROM THE SITU PROCESSING OF ANTRIM OIL SHALE Quarterly Technical Progress Report, Jan. - Mar. 1979

L J Washington, Jr 20 Mar 1979 45 p refs
(Contract EX-76-C-01-2346)
(FE-2346-44) Avail NTIS HC A03/MF A01

The 100 series wells, which had been hydraulically and then explosively fractured, are shown to have much greater permeability than had been present in the wells on the existing site during the 1978 extraction trials Well 301, which is the central well in the explosive underreaming series, was cleaned out Two wells were drilled and cored nearby Extensive fracturing due to the use of explosives in Well 301 was evident in the well located 15 feet from the site of the explosive treatment Communication between these wells is also evident A downhole methane burner of Tejas Petroleum Engineers was successfully tested under realistic operating conditions in an existing well DOE

N80-17577# Wizard Research and Development Group, Inc, Washington, D C

CRITERIA FOR AN IDEAL SOLAR PHOTOVOLTAIC POWERED INDUSTRY

Jun 1979 74 p refs
(Contract ET-78-X-01-5433)
(HCP/T5433-01) Avail NTIS HC A04/MF A01

The application of solar photovoltaic energy and the use of energy in the Primary Metals Industries were surveyed in literature and used to outline criteria for an ideal solar photovoltaic powered industry Some of the major findings include (1) the most important requirements of an ideal solar photovoltaic powered industry are the ability to use dc electrical power, ability to be located in Southern California or the Southwestern US and ability to do without power for extended periods of time, (2) the costs of varying from the ideal are most severe with respect to the loss of power element of the criteria, (3) although most of the industries in the Primary Metals group use tremendous amounts of electrical energy, the general requirements of an uninterruptible power source makes them less than ideal users of photovoltaic energy, (4) it appears to be both technologically and economically feasible to develop processes which would make at least four of the seven members of the Primary Metals Industries ideal solar photovoltaic powered industries DOE

N80-17578# Brookhaven National Lab, Upton, N Y

REGIONAL ENVIRONMENT-ENERGY DATA BOOK: NORTHEAST REGION

Dec 1978 714 p refs
(Contract EY-76-C-02-0016)
(DOE/TIC-10114/3, BNL-24867) Avail NTIS HC A99/MF A01

A compilation of regional data relating to the energy, environmental, socioeconomic, and institutional characteristics of the Northeast is presented The document discusses current and historic data on energy supply, demand, and production, sector fuel demands, fuel consumption, transmission, and transportation, location of energy production and conversion, water quality and quantity, air quality and air quality control areas, natural and induced climatic conditions, waste disposal, land and coast conditions, use, and management, managed and endangered species, demographic and socioeconomic conditions, and health and mortality data DOE

N80-17582# Badische Anilin- und Soda-Fabrik A G, Ludwigshafen am Rhein (West Germany)

DEVELOPMENT OF ELECTROCHEMICAL STORAGE BATTERIES WITH IMPROVED ENERGY DENSITY Final Report

Fritz Beck and Wolfram Treptow Bonn Bundesmin fuer Forsch u Technol Dec 1977 209 p refs In GERMAN, ENGLISH summary Sponsored by Bundesmin fuer Forsch u Technol
(BMFT-FB-T-77-88) Avail NTIS HC A10/MF A01, Fachinformationzentrum, Karlsruhe, DM 43.45

The development of secondary batteries containing metals and metal oxides as nonporous electrodes was investigated Of the systems examined Zn/MnO2 has the most favorable theoretical stored energy density (up to 360 Whr/kg) Acid corrosion of active masses and the poor load capacity of MnO2 impeded practical applications The Pb/PbO2 system did not have these problems with an energy yield of 35 to 40 Whr for a theoretical stored energy density of 107 Whr/kg The limiting value was about 50 Wh/kg These values were valid for HBF4 as an electrolyte, which was found to be optimal Power density was high as well Results indicate that polypropylene filled with natural graphite is feasible as material for base electrodes It leads to an essentially metal free bipolar battery design and an improved manufacturing technique Data on cycle life as well as suggestions for the transformation of these results into improved battery design are also presented Author (ESA)

N80-17583# Royal Aircraft Establishment, Farnborough (England) Space Dept

PHOTOVOLTAIC CONVERSION RESEARCH AND DEVELOPMENT IN THE UNITED KINGDOM

F C Treble London HMSO 9 Mar 1977 14 p refs Presented at 1st Solar Energy R and D Workshop Bldg Res Estab, 24 Mar 1977
(RAE-TM-SPACE-247, BR57075) Avail NTIS HC A02/MF A01

Research and development, aimed at reducing the cost and increasing the efficiency of photovoltaic solar cells and modules for terrestrial applications in the United Kingdom is discussed The cell types involved include crystalline and amorphous silicon, thin film and ceramic cadmium sulfide, cadmium sulfide/indium phosphide, gallium arsenide, and Schottky barrier These activities are reviewed, with some background information on the general topic of photovoltaic conversion and the merits of the various approaches Recommendations for future action are made Author (ESA)

N80-17584# National Technical Information Service, Springfield, Va

THERMAL ENERGY STORAGE, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1978 - Jul. 1979

Diane M Cavagnaro Sep 1979 117 p
(NTIS/PS-79/0952/6) Avail NTIS HC $28 00/MF $28 00 CSCL 10C

The cited reports of Federally funded research concern thermal energy storage The 112 citations cover the design of equipment, performance evaluation, theory, materials used, and experimental design GRA

N80-17585# National Technical Information Service, Springfield, Va

THERMAL ENERGY STORAGE, VOLUME 1. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - 1977

Diane M Cavagnaro Sep 1979 203 p
(NTIS/PS-79/0951/8) Avail NTIS HC $28 00/MF $28 00 CSCL 10C

Studies on thermal energy storage are cited The 197 citations discuss the materials used, design, theory, performance evaluation, experimental design and applications GRA

N80-17586# National Technical Information Service, Springfield, Va

THERMAL ENERGY STORAGE, VOLUME 1. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - 1977

Diane M Cavagnaro Sep 1977 211 p
(NTIS/PS-79/0953/4) Avail NTIS HC $28.00/MF $28 00 CSCL 10C

Research from worldwide journal literature on thermal energy storage is cited in the bibliography The 205 citations cover the materials used, equipment design, theory, industries, performance evaluation, and the problems faced GRA

N80-17587# National Technical Information Service, Springfield, Va

THERMAL ENERGY STORAGE, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1977 - Jul. 1979

Diane M Cavagnaro Sep 1979 116 p
(NTIS/PS-79/0954/2) Avail NTIS HC $28 00/MF $28 00 CSCL 10C

Reports from worldwide research are cited covering thermal energy storage. The 110 citations cover many aspects such as the materials used, theory, applications, performance evaluation, design, and problems and advantages.
GRA

N80-17588# National Technical Information Service, Springfield, Va.

SILICON SOLAR CELLS, VOLUME 3. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, Nov. 1978 - Oct. 1979

Brian Carrigan Nov. 1979 176 p Supersedes NTIS/PS-1116; NTIS/PS-77/0958; NTIS/PS-76/0801
(PB80-800717; NTIS/PS-78/1116; NTIS/PS-77/0958; NTIS/PS-76/0801) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Worldwide research on the development of solar energy conversion devices using silicon ribbons, sheets, films, crystals, and wafers is cited. The preparation, purity, crystal defects, and efficiency of these cells are covered. The economics of solar cell development is discussed. The effects of radiation and weathering on performance are included. This updated bibliography contains 171 abstracts, all of which are new entries to the previous edition.
GRA

N80-17589# National Technical Information Service, Springfield, Va.

SILICON SOLAR CELLS, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, Dec. 1977 - Oct. 1979

Brian Carrigan Nov. 1979 290 p Supersedes NTIS/PS-1115; NTIS/PS-77/0956; NTIS/PS-76/0800; NTIS/PS-75/628
(PB80-800691; NTIS/PS-78/1115; NTIS/PS-77/0956; NTIS/PS-76/0800; NTIS/PS-75/628) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Citations of Government sponsored research reports on silicon solar cell growth and fabrication are presented. Processes covered include chemical vapor deposition, the Czochralski method, dendritic growth, ribbon growth, epitaxial growth, and silicon sheet fabrication on substrates. Silicon compound synthesis, purification, and reduction are discussed. Casting, cutting, and shaping of silicon solar cells are included. Solar energy conversion efficiency and performance are described. Abstracts on costs and production of these cells are covered. This updated bibliography contains 209 abstracts, 75 of which are new entries to the previous edition.
GRA

N80-17590# National Technical Information Service, Springfield, Va.

SILICON SOLAR CELLS, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1976 - Oct. 1978

Brian Carrigan Nov. 1979 201 p
(PB80-800709) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Worldwide research pertaining to solar energy conversion devices using silicon ribbons, sheets, films, crystals, and wafers is cited. The preparation, purity, crystal defects, and efficiency of these cells are covered. Solar cell development costs are discussed. The effects of radiation and weathering on performance are described. This updated bibliography contains 196 abstracts, none of which are new entries to the previous edition. GRA

N80-17591# National Technical Information Service, Springfield, Va.

DESIGN AND APPLICATIONS OF FLYWHEELS, VOLUME 1. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Aug. 1978

Guy E. Habercom, Jr. Oct. 1979 264 p
(PB80-800303) Avail: NTIS HC $30.00/MF $30.00 CSCL 13I

The design and varied applications of flywheels and reaction wheels are investigated in these Government-sponsored research reports. Such diversified applications as satellite stabilization, surface vehicle propulsion, energy transfer devices, and inertia or friction welding are reviewed. This updated bibliography contains 258 abstracts, none of which is new to the previous edition.
GRA

N80-17592# National Technical Information Service, Springfield, Va.

DESIGN AND APPLICATIONS OF FLYWHEELS, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, Sep. 1978 - Sep. 1979

Guy E. Habercom, Jr. Oct. 1979 99 p Supersedes NTIS/PS-78/0997; NTIS/PS-77/0882; NTIS/PS-76/0767; NTIS/PS-75/743; NTIS/PS-75/070
(PB80-800311; NTIS/PS-78/0997; NTIS/PS-77/0882; NTIS/PS-76/0767; NTIS/PS-75/743; NTIS/PS-75/070) Avail: NTIS HC $30.00/MF $30.00 CSCL 13I

Federally funded resarch in the design and use of flywheels and reaction vehicles is cited in 93 abstracts, all of which are new to the previous edition. Applications considered incude energy storage for surface vehicle propulsion, inertia or friction welding, and satellite attitude control.
A.R.H.

N80-17593# National Technical Information Service, Springfield, Va.

DESIGN AND APPLICATIONS OF FLYWHEELS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Oct. 1979

Guy E. Habercom, Jr. Oct. 1979 271 p Supersedes NTIS/PS-78/0998; NTIS/PS-77/0883; NTIS/PS-76/0768
(PB0-800329; NTIS/PS-78/0998; NTIS/PS-77/0883; NTIS/PS-76/0768) Avail: NTIS HC $30.00/MF $30.00 CSCL 13I

This bibliography cites 266 reports from world literature relating to the design and use of flywheels and reaction wheels for such applications as satellite attitude control, surface vehicle propulsion, energy transfer devices, and inertia or friction welding. Of the entries, 44 are new to the previous edition.
A.R.H.

N80-17594# National Technical Information Service, Springfield, Va.

COMBINED CYCLE POWER GENERATION. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Oct. 1979

Audrey S. Hundemann Nov. 1979 158 p Supersedes NTIS/PS-78/1156; NTIS/PS-77/0991
(PB80-800915; NTIS/PS-78/1156; NTIS/PS-77/0991) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Federally-funded research pertaining to design, efficiency, cost, resource requirements, and environmental aspects of combined cycle power plants is discussed. Abstracts primarily deal with use of coal gasification in conjunction with combined gas and steam turbine generation, including subsystems development studies. This updated bibliography contain 151 abstracts, 45 of which are new entries to the previous edition.
GRA

N80-17595# National Technical Information Service, Springfield, Va.

COMBINED CYCLE POWER GENERATION. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Oct. 1979

Audrey S. Hundemann Nov. 1979 195 p Supersedes NTIS/PS-78/1157; NTIS/PS-77/0992
(P80-800923; NTIS/PS-78/1157; NTIS/PS-77/0992) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Design, performance, efficiency, economics, and environmental aspects of combined cycle power plants are discussed. Abstracts of worldwide research cover the use of waste heat from gas turbines to drive steam turbines and the thermal efficiency of integrated gasification combined cycle plants using low or intermediate Btu gas. A few abstracts pertain to control and instrumentation used in the plants. This updated bibliography contains 189 abstracts, 36 of which are new entries to the previous edition.
GRA

N80-17597# California Univ., Berkeley. Lawrence Berkeley Lab.

REGIONAL ENVIRONMENT-ENERGY DATA BOOK: WESTERN REGION
Dec. 1978 435 p refs
(Contract W-7405-eng-48)
(DOE/TIC-10114/2; LBL-7821) Avail: NTIS HC A19/MF A01

This document provides a compilation of regional data relating to the energy, environmental, socioeconomic, and institutional characteristics of the West. The document is divided into four chapters. Chapter one includes current and historic data on energy supply, demand, and production; sector fuel demands, fuel consumption, transmission, and transportation; location of energy production and conversion; and energy prices by sector and state. Chapter two shows a variety of natural and preternatural characteristics including water quality and quantity, air quality and air quality control areas; natural and induced climatic conditions; waste disposal, land and coast conditions, use, and management; managed and endangered species; demographic and socioeconomic conditions; and health and mortality data. Included in Chapter three are a variety of organizational, legislative, and regulatory data. Chapter four provides energy equivalents, metric conversions, an index, and a glossary. DOE

N80-17598# California Univ., Berkeley. Lawrence Berkeley Lab.
REGIONAL ENVIRONMENT-ENERGY DATA BOOK: SOUTHERN REGION
Dec. 1978 832 p refs
(Contract W-7405-eng-26)
(DOE/TIC-10114/4; ORNL-5443) Avail: NTIS HC A99/MF A01

Regional data relating to the energy, environmental, socioeconomic, and institutional characteristics of the South is compiled. Chapter one includes current and historic data on energy supply, demand, and production; sector fuel demands, fuel consumption, transmission, and transportation; location of energy production and conversion; and energy prices by sector and state. Chapter two shows a variety of natural and preternatural characteristics including water quality and quantity; air quality and air quality control areas; natural and induced climatic conditions; waste disposal; land and coast conditions, use, and management; managed and endangered species; demographic and socioeconomic conditions; and health and mortality data. Included in Chapter three are a variety of organizational, legislative, and regulatory data. Chapter four provides energy equivalents, metric conversions, an index, and a glossary. DOE

N80-17599# Battelle Pacific Northwest Labs., Richland, Wash.
REGIONAL ENVIRONMENT-ENERGY DATA BOOK: NORTHWEST REGION
Dec. 1978 864 p refs
(Contract W-7405-eng-36)
(DOE/TIC-10114/5; PNL-RAP-28) Avail: NTIS HC A99/MF A01

A compilation of regional data relating to the energy, environmental, socioeconomic, and institutional characteristics of the Northwest is presented. The document is divided into four chapters and includes data on the following: energy supply, demand, and production; environmental quality, natural and induced climatic conditions; waste disposal; land and cost conditions, use, and management; managed and endangered species; demographic and socioeconomic conditions, and health and mortality. DOE

N80-17635 Deutscher Wetterdienst, Offenbach am Main (West Germany).
WIND FORCE ANALYSIS FOR THE FEDERAL REPUBLIC OF GERMANY TO DETERMINE THE USEFULNESS OF WIND POWER [DIE WINDVERHAELTNISSE IN DER BUNDESREPUBLIK DEUTSCHLAND IM HINBLICK AUF DIE NUTZUNG DER WINDKRAFT]
W. Benesch, G. Duensing, G. Jurksch, and R. Zoellner 1978 145 p refs In GERMAN; ENGLISH summary Original contains color illustrations
(ISBN-3-88148-164-8) Avail: NTIS HC A07

The utilization of wind force in inland areas is investigated on the basis of data sets from 74 stations from the period 1969 to 1974. The dependence of the annual means and average annual cumulative frequencies of wind velocity on elevation is evaluated. Analyses on the duration of threshold values of wind velocity are also made. A number of sites suitable for wind power utilization are identified. Author (ESA)

N80-17863# Westinghouse Electric Corp., Pittsburgh, Pa. Fusion Power Systems Dept.
DESIGN STUDY OF A FUSION-DRIVEN TOKAMAK HYBRID REACTOR FOR FISSILE FUEL PRODUCTION, VOLUME 1 Final Report
R. P. Rose May 1979 284 p refs
(EPRI-ER-1083-Vol-1) Avail: NTIS HC A13/MF A01

Conceptual approaches for a Tokamak fusion driven fuel producing reactor were evaluated. The conceptual design of the hybrid reactor was based on using projected state of the art technology for the late 1980s. The conceptual definitions of two alternatives for the fusion driver were assessed. A two component Tokamak (TCT) concept, based on the TFTR plasma physics parameters, was compared to a beam driven thermonuclear (BDTN) concept, based on the USSR T-20 plasma physics parameters. DOE

N80-17864# Westinghouse Electric Corp., Pittsburgh, Pa. Fusion Power Systems Dept.
DESIGN STUDY OF A FUSION-DRIVEN TOKAMAK HYBRID REACTOR FOR FISSILE FUEL PRODUCTION, VOLUME 2 Final Report
R. P. Rose May 1979 268 p refs
(EPRI-NP-1083-Vol-2) Avail: NTIS HC A12/MF A01

Conceptual approaches for a Tokamak fusion driven fuel producing reactor are discussed. The conceptual design of the hybrid reactor was based on using projected state of the art technology for the late 1980s. Considerations such as reactor materials and safety are included. The conceptual definitions of two alternatives for the fusion driver were evaluated. A two component Tokamak (TCT) concept, based on the TFTR plasma physics parameters, was compared to a beam driven thermonuclear (BDTN) concept, based on the USSR T-20 plasma physics parameters. DOE

N80-17909# Planco, Inc., Dallas, Tex.
SURVEY OF THE RESEARCH INTO ENERGY-ECONOMIC INTERACTIONS. VOLUME 2: ANNOTATED BIBLIOGRAPHY
R. Coates, D. Hanson, S. Tuenger, and J. Kennington Apr. 1979 423 p
(Contract EI-78-C-01-6346)
(DOE/TIC-10134-Vol-2) Avail: NTIS HC A18/MF A01

Abstracts of about 400 articles, books, and reports cited in Planco's 'Survey of the Research into Energy-Economy Interactions. Volume I are reported'. It represents the end result of a search for recent (1960 to present) and ongoing research into energy-economy interactions. Only the research directly related to macroeconomic energy-economy interactions was selected for inclusion in the annotated bibliography. Abstracts are provided. DOE

N80-17913# Committee on Science and Technology (U. S. House).
NASA AUTHORIZATION, 1981, PROGRAM REVIEW, VOLUME 1
Washington GPO 1979 649 p refs Hearings before the Subcomm. on Space Sci. and Applications of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., 16-18 Oct. 1979
(GPO-53-814) Avail: Subcomm. on Space Sci. and Applications

The status of NASA programs is reviewed as a preliminary to fiscal 1981 authorization hearings. Problems of cost, performance, and scheduling which can affect the budget program performance are examined. Particular emphasis is given to advanced research and development, technology utilization, and aerospace technology transfer in communications, space processing, energy conversion, electric propulsion systems, life sciences, planetary exploration, astrophysics, solar terrestrial interactions, and Earth resources observation. A.R.H.

N80-17916*# Garrett Corp., Torrance, Calif.
ADVANCED ELECTRIC PROPULSION SYSTEM CONCEPT FOR ELECTRIC VEHICLES
A. E. Raynard and F. E. Forbes Aug. 1979 157 p refs
(Contracts EC-77-A-31-1044, DEN3-81)
(NASA-CR-159651, DOE/NASA/0081-79/1, AiResearch-79-16182) Avail: NTIS HC A08/MF A01 CSCL 13F

Seventeen propulsion system concepts for electric vehicles were compared to determine the differences in components and battery pack to achieve the basic performance level. Design tradeoffs were made for selected configurations to find the optimum component characteristics required to meet all performance goals. The anticipated performance when using nickel-zinc batteries rather than the standard lead-acid batteries was also evaluated. The two systems selected for the final conceptual design studies included a system with a flywheel energy storage unit and a basic system that did not have a flywheel. The flywheel system meets the range requirement with either lead-acid or nickel-zinc batteries and also the acceleration of zero to 89 km/hr in 15 s. The basic system can also meet the required performance with a fully charged battery, but, when the battery approaches 20 to 30 percent depth of discharge, maximum acceleration capability gradually degrades. The flywheel system has an estimated life-cycle cost of $0.041/km using lead-acid batteries. The basic system has a life-cycle cost of $0.06/km. The basic system, using batteries meeting ISOA goals, would have a life-cycle cost of $0.043/km.
A.R.H.

N80-17918# EIC, Inc., Newton, Mass.
SURVEY ON METALLURGICAL RECYCLING PROCESSES Final Report
J. P. Pemsler Mar. 1979 197 p refs
(Contract W-31-109-eng-38)
(ANL/OEPM-79-2) Avail: NTIS HC A09/MF A01

Major opportunities for increasing the extent of recycle of nonferrous scrap metals and thereby increasing the energy savings are discussed. Preliminary flowsheets are presented for the recovery of value metals from batteries considered for use in vehicular propulsion and load leveling applications. A flow sheet was outlined for an integrated hydrometallurgical process to treat low-grade copper scrap. A fully integrated hydrometallurgical process is outlined, and costs and energy consumption are derived for recovering zinc metal from electric furnace flue dusts. Costs and energy are high and the process does not appear to warrant development at this time. Improvement in the recycle of magnesium is associated primarily with improved recycle in the Al industry where Mg is an important alloy additive. Ni and Ti recycle are associated with improved collection and sorting of stainless steel and specialty alloys.
DOE

N80-17922# Transportation Systems Center, Cambridge, Mass.
ANALYSIS OF LIFE-CYCLE COSTS AND MARKET APPLICATIONS OF FLYWHEEL ENERGY-STORAGE TRANSIT VEHICLES Final Report, Fall 1977 - Summer 1978
D. L. Goeddel and G. Ploetz Jul. 1979 191 p
(PB-300289/6, DOT-TSC-UMTA-78-77, UMTA-MA-06-0044-78-2) Avail: NTIS HC A09/MF A01 CSCL 13F

The operational requirements and conceptual design of flywheel energy storage vehicles for transit service are analyzed along with the economic viability and potential market applications of these proposed concepts within urban transit operations. The design characteristics, system capital costs, and annual recurring operations/maintenance costs associated with the conventional diesel bus, the trolly bus, and the flywheel-powered vehicle systems are defined. The results of the life cycle analysis and the sensitivity of these results due to variations of key assumed input variables are described.
GRA

N80-17923# Transportation Systems Center, Cambridge, Mass.
SIMULATION OF AN URBAN BATTERY BUS VEHICLE Final Report, Jun. - Dec. 1978
John J. Stickler Jul. 1979 90 p
(PB-300306/8, DOT-TSC-UMTA-79-15, UMTA-MA-06-0093-79-1) Avail: NTIS HC A05/MF A01 CSCL 13F

The computer simulation of a battery-powered bus as it traverse an arbitrary mission profile of specified acceleration, roadway grade, and headwind is described. The battery-bus system components comprise a DC shunt motor, solidstate power conditioning unit with regeneration capability, and a battery source consisting of a multiunit lead acid battery. The computer model determines vehicle tractive effort and power consumption and computes actual vehicle speed for a given mission profile. The computer model uses a 'modularization' format which facilitates the simulation of alternate propulsion systems involving the interchange of one system component for another.
GRA

N80-18098*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ECONOMIC ANALYSIS OF THE DESIGN AND FABRICATION OF A SPACE QUALIFIED POWER SYSTEM
Gregory Ruselowski Jan. 1980 25 p refs
(NASA-TM-81418; E-339) Avail: NTIS HC A02/MF A01 CSCL 10B

An economic analysis was performed to determine the cost of the design and fabrication of a low Earth orbit, 2 kW photovoltaic/battery, space qualified power system. A commercially available computer program called PRICE (programmed review of information for costing and evaluation) was used to conduct the analysis. The sensitivity of the various cost factors to the assumptions used is discussed. Total cost of the power system was found to be $2.46 million with the solar array accounting for 70.5%. Using the assumption that the prototype becomes the flight system, 77.3% of the total cost is associated with manufacturing. Results will be used to establish whether the cost of space qualified hardware can be reduced by the incorporation of commercial design, fabrication, and quality assurance methods.
J.M.S.

N80-18125 Massachusetts Univ., Amherst.
THE APPLICATION OF CHROMATOGRAPHY AND ANCILLARY TECHNIQUES TO THE CHARACTERIZATION OF SHALE OIL/OIL SHALE COMPOUND CLASSES AND OF ORGANOMETALLICS Ph.D. Thesis
Frank Patrick DiSanzo 1979 203 p
Avail: Univ. Microfilms Order No. 8004916

Chromatography and Ancillary techniques (specific detectors and mass spectrometry) were applied to the characterization of shale oil and oil shale compound classes and of organometallics. An inexpensive and simple preparative low pressure high performance liquid chromatographic scheme was developed for shale oil hydrocarbon analysis. Activated silica and silver nitrate impregnated 32-63 micron silica was employed for the isolation of alkanes, alkenes, and aromatics. Evidence for the presence of prist-1-ene in the alkene fraction is presented. Application of on-line reactors to aid in the discrimination between various classes of hydrocarbons is also described.
Dissert. Abstr.

N80-18166*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PRELIMINARY STUDY OF A SOLAR SELECTIVE COATING SYSTEM USING BLACK COBALT OXIDE FOR HIGH TEMPERATURE SOLAR COLLECTORS
G. McDonald 1980 16 p refs Proposed for presentation at Intern. Conf. on Metal Coatings, San Diego, Calif., 21-25 Apr. 1980; Sponsored by Am. Vacuum Soc.
(NASA-TM-81385; E-293) Avail: NTIS HC A02/MF A01 CSCL 10A

Black cobalt oxide coatings (high solar absorptance layer) were deposited on thin layers of silver or gold (low emittance layer) which had been previously deposited on oxidized (diffusion barrier layer) stainless steel substrates. The reflectance properties of these coatings were measured at various thicknesses of cobalt for integrated values of the solar and infrared spectrum. The values of absorptance and emittance were calculated from the measured reflectance values, before and after exposure in air at 650 C for approximately 1000 hours. Absorptance and emittance were interdependent functions of the weight of cobalt oxide. Also, these cobalt oxide/noble metal/oxide diffusion barrier

coatings have absorptances greater than 0.90 and emittances of approximately 0.20 even after about 1000 hours at 650 C.
Author

N80-18157*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECTS OF IMPURITIES IN COAL-DERIVED LIQUIDS ON ACCELERATED HOT CORROSION OF SUPERALLOYS Final Report

Daniel L. Deadmore and Carl E. Lowell Mar. 1980 30 p refs
(Contract EF-77-A-01-2593)
(NASA-TM-81384; DOE/NASA/2593-79/13; E-292) Avail: NTIS HC A03/MF A01 CSCL 11F

A Mach 0.3 burner rig was used to determine the effects of potential coal derived liquid fuel impurity combustion of products on hot corrosion in IN-100, IN-792, IN-738, U-700, Mar M-509, and 304 stainless steel. The impurities, added as aqueous solutions to the combustor, were salts of sodium, potassium, vanadium, molybdenum, tungsten, phosphorus, and lead. Extent of attack was determined by metal consumption and compared to the effects of sodium alone. Vanadium, molybdenum, tungsten, phosphorous, and lead in combination with sodium all resulted in increased attack as compared with sodium alone at some temperatures, apparently due in large part to the extension of the formation of liquid deposits. Varying the sodium-potassium ratio had little effect for ratios less than 1:3 for which reduced, but measurable, attack was observed.
K.L.

N80-18202 Oklahoma State Univ., Stillwater.

PHOTOCHEMICAL CONVERSION OF COAL TO GASOLINE IN AN ENTRAINED BED REACTOR Ph.D. Thesis

Muthu Subramanian Sundaram 1979 246 p
Avail: Univ. Microfilms Order No. 8003606

The interaction of photochemically produced hydrogen atoms with a variety of coal dusts under various reaction conditions was investigated. The existence of correlations between coal types and their relative hydrogen atom reactivities as a function of temperature, extent of conversion, particle size, and hydrogen atom concentration was explored.
Dissert. Abstr.

N80-18203# Department of the Treasury, Washington, D.C. Bureau of Alcohol, Tobacco and Firearms.

EXPERIMENTAL ALCOHOL FUEL PLANTS

Dec. 1979 27 p
(ATF-P-5000-2) Avail: NTIS HC A03/MF A01

Information on experimental alcohol fuel plants for personal fuel use is presented. Pertinent laws and regulations for the prospective alcohol producers and users are described.
R.E.S.

N80-18204# Department of the Treasury, Washington, D.C. Bureau of Alcohol, Tobacco and Firearms.

ALCOHOL FUELS INFORMATION DIRECTORY

Feb. 1980 8 p
(ATF-P-5000-3) Avail: NTIS HC A02/MF A01

Information on renewable energy sources, particularly alcohol fuels, is presented. Permit information is discussed.
R.E.S.

N80-18205*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

INITIAL CHARACTERIZATION OF AN EXPERIMENTAL REFEREE BROADENED-SPECIFICATION (ERBS) AVIATION TURBINE FUEL

George M. Prok and Gary T. Seng Jan. 1980 10 p refs
(NASA-TM-81440; E-206) Avail: NTIS HC A02/MF A01 CSCL 21D

Characterization data and a hydrocarbon compositional analysis are presented for a research test fuel designated as an experimental referee broadened-specification aviation turbine fuel. This research fuel, which is a special blend of kerosene and hydrotreated catalytic gas oil, is a hypothetical representation of a future fuel should it become necessary to broaden current kerojet specifications. It is used as a reference fuel in research investigations into the effects of fuel property variations on the performance and durability of jet aircraft components, including combustors and fuel systems.
J.M.S.

N80-18212# Loughborough Univ. of Technology (England). Dept. of Transport Technology.

HYDROGEN AS A FUEL

L. W. Richards Jul. 1979 35 p refs
(TT-7903; ISSN-0140-9751) Avail: NTIS HC A03/MF A01

Research on the storage of hydrogen in automobiles is reviewed. Metal hydride storage, encapsulation of hydrogen in molecular sieve zeolites, and the reaction of saline hydrides with water are considered in detail. After a brief comparison of hydrogen energy yield with gasoline energy yield per weight, hydrogen fuel storage in motor vehicles is considered. Safety factors of different storage schemes (high pressure gas, cryogenic tanks, metal hydrides) are emphasized along with volume and weight considerations. Results show two basic systems as feasible, namely that of a saline hydride reacting with water inside the vehicle, or a system involving a combination of calcium - mischmetal and magnesium, with nickel to act as a catalyst.
Author (ESA)

N80-18261*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

A FLUORESCENT RADIATION CONVERTER Patent Application

Walter Viehmann, inventor (to NASA) Filed 11 Jan. 1980 19 p
(NASA-Case-GSC-12528-1; US-Patent-Appl-SN-111439) Avail: NTIS HC A02/MF A01 CSCL 20N

A fluorescent radiation converter having a substantially undoped optically transparent substrate and a waveshifter coating deposited on at least one portion of substrate for absorption of radiation and conversion thereof to fluorescent radiation is described. The coating is formed of substantially 1000 g/liter of a solvent, 70 to 200 q/liter of an organic polymer, and .2 to 25 g/liter of at least one organic fluorescent dye. The incoming incident radiation impinges on the coating and enters therein. Radiation is absorbed by the fluorescent dye and is reemitted as a longer wavelength radiation. Advantages of the fluorescent radiation converter in the areas of liquid crystal displays, scintillation counters, and in photovoltaic conversion techniques are discussed.
NASA

N80-18287* National Aeronautics and Space Administration. Pasadena Office, Calif.

MICROWAVE POWER TRANSMISSION BEAM SAFETY SYSTEM Patent

Richard M. Dickinson, inventor (to NASA) (JPL) Issued 5 Feb. 1980 8 p Filed 16 Oct. 1978 Supersedes N79-10271 (17 - 01, p 0036) Sponsored by NASA
(NASA-Case-NPO-14224-1; US-Patent-4,187,506;
US-Patent-Appl-SN-951829; US-Patent-Class-343-100R;
US-Patent-Class-310-306; US-Patent-Class-343-100ST) Avail: US Patent and Trademark Office CSCL 09C

A system in which the characteristics of a microwave power transmission beam are controlled in accordance ,with power distribution profiles altered due to the detected presence or entrance of an object into the beam which causes changes that are perceived in various received, reflected and scattered power distribution profiles resulting over various receiving elements of the system is presented. The system comprises a microwave power beam radiator array, a microwave power beam receiving antenna array, the radiator array in one embodiment being located on an orbiting spacecraft and the receiving array being located at a ground station. Another embodiment provides a ground based transmitting array and a receiving array aboard an aircraft or airship.
Official Gazette of the U.S. Patent and Trademark Office

N80-18307# Naval Postgraduate School, Monterey, Calif.

PERFORMANCE ANALYSIS OF A TYPE OF ELECTROHYDRODYNAMIC POWER GENERATOR

T. H. Gawain and Oscar Biblarz Apr. 1979 91 p
(AFOSR MIPR 78-0002)
(AD-A076115; NPS67-79-006) Avail: NTIS HC A05/MF A01 CSCL 10/2

This report develops a detailed analysis of a type of electrohydrodynamic power generator which employs an ejector and a so-called 'fluid flywheel' as essential components. The medium is steam containing electrically charged water droplets. The analysis takes into account the experimentally established facts that the maximum strength of the electrical field that can be sustained at incipient breakdown at the most critical location is proportional to the fluid density at that location. It is shown that as a consequence of this fact, the electrical output can be maximized by designing the primary jet for an exit Mach number of 0.71. Estimates are made of the pump work required, of mixing losses in the ejector and of friction and secondary flow losses. The mathematical analysis is reduced to a fully non-dimensional form and the key dimensionless parameters that govern performance are clearly identified. A preliminary estimate is made of the numerical values of these parameters and the overall performance of the system is estimated on this basis.

GRA

N80-18311# Air Force Aero Propulsion Lab., Wright-Patterson AFB, Ohio.

PERMANENT MAGNET AND SUPERCONDUCTING GENERATORS IN AIRBORNE, HIGH POWER SYSTEMS Interim Report, 1 Feb. 1978 - 31 Mar. 1979

Hugh L. Southall and Frederick C. Brockhurst Aug. 1979 99 p refs
(AF Proj. 3145)
(AD-A078424; AFAPL-TR-79-2073) Avail: NTIS HC A05/MF A01 CSCL 10/2

This report presents results of a study performed to compare airborne, high power supplies at power levels of 10 and 20 MW utilizing permanent magnet and superconducting generators. Algorithms for the weight and volume of these electrical generators are presented and algorithms for the other power supply components are used to predict total system weights for seven point designs at the two power levels.

GRA

N80-18345# Brussels Univ. (Belgium). Inst. de Mecanique Appliquee.

THEORETICAL STUDY OF THERMAL LOSSES: THE USE OF HYBRID AND COMBINED DRY COOLANTS [ETUDE DE BASE DES REJETS THERMIQUES: UTILISATION DE REFRIGERANTS SECS, HYBRIDES ET COMBINES]

Andre L. Jaumotte, Pierre Decock, Bernard Leduc, and Philippe Nagel 1978 67 p refs In FRENCH Sponsored by Groupement Ecologique Belge (GEBEG)
(NT-44-1978) Avail: NTIS HC A04/MF A01

After a brief review of techniques used in the disposal of waste heat from electrical power plants, dry coolant systems are cited as a promising solution. Emphasis is placed on the size reduction of cooling towers, on further limiting heat exchanger surfaces by using special cooling fin profiles, and on the introduction of an intermediary cold cycle between the condenser and the coolant (ammonia cycle). Results show that a combined wet tower/dry tower system has short term advantages, especially from a cost effectiveness point of view (reduced ecological impact). Three regions in Belgium are taken as examples of areas that might benefit from this scheme. As a long term solution the use of a condensable fluid (ammonia) with a cold cycle for recuperating thermal energy is suggested.

Author (ESA)

N80-18406*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

EFFECT OF GEOMETRY AND OPERATING CONDITIONS ON SPUR GEAR SYSTEM POWER LOSS

Neil E. Anderson and Stuart H. Loewenthal 1980 31 p refs Proposed for presentation at 3d Intern. Power Transmission and Gearing Conf., San Francisco, Calif., 18-22 Aug. 1980; sponsored by Am. Soc. of Mech. Engr.
(NASA-TM-81426; E-350; AVRADCOM-TR-80-C-2) Avail: NTIS HC A03/MF A01 CSCL 20I

The results of an analysis of the effects of spur gear size, pitch, width, and ratio on total mesh power loss for a wide range of speeds, torques, and oil viscosities are presented. The analysis uses simple algebraic expressions to determine gear sliding, rolling, and windage losses and also incorporates an approximate ball bearing power loss expression. The analysis shows good agreement with published data. Large diameter and fine pitched gears had higher peak efficiencies but low part load efficiency. Gear efficiencies were generally greater than 98 percent except at very low torque levels. Tare (no-load) losses are generally a significant percentage of the full load loss except at low speeds.

Author

N80-18411# Engineering Development Establishment, Maribyrnong (Australia).

LABORATORY INVESTIGATION OF THE PERFORMANCE OF A HOLDEN ENGINE OPERATING ON LIQUIFIED PETROLEUM GAS

N. Webb Aug. 1979 49 p
(AD-A076145; EDE-28/79) Avail: NTIS HC A03/MF A01 CSCL 14/2

A laboratory investigation into the relative performances of an engine when operated on both liquified petroleum gas (LPG) and petrol showed that the engine operated at higher terminal efficiency on LPG and also that it would operate satisfactorily at leaner air-fuel mixtures on this fuel. Engine performance was less affected by retarded ignition for LPG than for petrol. Furthermore, a large increase in dwell angle from the recommended setting had no significant effect on LPG performance. The LPG carburettor when installed in its normal configuration maintained an essentially constant mixture strength with no part throttle leaning of mixtures to give better efficiency nor corresponding full throttle enrichment to give best engine torque.

GRA

N80-18415# Technische Hogeschool, Delft (Netherlands). Dept. of Aerospace Engineering.

FLUTTER ANALYSIS OF SMALL WINDTURBINE, DESIGNED FOR MANUFACTURE AND USE IN DEVELOPING COUNTRIES

P. C. Hensing Aug. 1978 29 p refs
(UTH-LR-272) Avail: NTIS HC A03/MF A01

The flutter behavior of a wind turborotor designed for manufacture and use in developing countries was investigated. Possible improvements are discussed. The effect of scaling is considered. Results show that the addition of small tip-masses has a curative influence on flutter sensitive rotor designs.

Author (ESA)

N80-18446*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AEROELASTIC EQUATIONS OF MOTION OF A DARRIEUS VERTICAL-AXIS WIND-TURBINE BLADE

Krishna Rao V. Kaza (Toledo Univ.) and Raymond G. Kvaternik Dec. 1979 57 p refs
(Contract E(49-26)-1028)
(NASA-TM-79295; DOE/NASA/1028-79/25; E-238) Avail: NTIS HC A04/MF A01 CSCL 20K

The second-degree nonlinear aeroelastic equations of motion for a slender, flexible, nonuniform, Darrieus vertical-axis wind turbine blade which is undergoing combined flatwise bending, edgewise bending, torsion, and extension are developed using Hamilton's principle. The blade aerodynamic loading is obtained from strip theory based on a quasi-steady approximation of two-dimensional incompressible unsteady airfoil theory. The derivation of the equations has its basis in the geometric nonlinear theory of elasticity and the resulting equations are consistent with the small deformation approximation in which the elongations and shears are negligible compared to unity. These equations are suitable for studying vibrations, static and dynamic aeroelastic instabilities, and dynamic response. Several possible methods of solution of the equations, which have periodic coefficients, are discussed.

K.L.

N80-18497*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

NUMERICAL CALCULATION OF STEADY INVISCID FULL POTENTIAL COMPRESSIBLE FLOW ABOUT WIND TURBINE BLADES

Djordje S. Dulikravich 1980 11 p refs Presented at the Wind Energy Conf., Boulder, Colo., 9-11 Apr. 1980; sponsored

by AIAA and Midwest Energy Research Inst.
(NASA-TM-81438; E-361; AIAA-Paper-80-0607) Avail: NTIS HC A02/MF A01 CSCL 10B

An exact nonlinear mathematical model that accounts for three-dimensional cascade effects about the inner portions of the rotor blades and compressibility effects about the tip regions of the blades was derived. An artificially time dependent version was iteratively solved by a finite volume technique involving an artificial viscosity and a three-level consecutive mesh refinement. The exact boundary conditions were applied by generating a boundary conforming periodic computation mesh. K.L.

N80-18547# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
GEOTHERMAL ENERGY DEVELOPMENT IN THE EASTERN UNITED STATES. EVALUATION OF POTENTIAL GEOTHERMAL RESOURCE AREAS
Franklin O. Mitchell Jul. 1979 53 p refs
(Contracts EX-76-A-36-1008; DE-A101-79ET-27025)
(PB-299925/8; APL/JHU-QM-79-163-GT) Avail: NTIS HC A04/MF A01 CSCL 08I

A method for the comparative evaluation of geothermal prospects in the eastern United States in proposed and illustrated. Comparisons are based on quantified data from geologic, engineering, and socio-economic sources including temperature gradient, depth to basement, drilling costs, population, and distribution by town size, as well as energy use in residential, commercial, and industrial applications. GRA

N80-18553 Oklahoma Univ., Norman.
ANALYSIS OF THE GEOTHERMAL BINARY CYCLE USING PARAFFIN HYDROCARBONS AS WORKING FLUIDS Ph.D. Thesis
Khan Zafar Iqbal 1979 301 p
Avail: Univ. Microfilms Order No. 8004390

It is demonstrated that the analysis of the geothermal binary cycles is simplified through the use of basic thermodynamic relations. The complex interrelationships of thermodynamic, equipment, unit operational, and cost parameters are presented. It is shown that mixtures provide a significantly greater amount of work compared to pure fluids. Furthermore, mixture composition and behavior can be changed over the plant lifetime to match the changes in the geothermal resource. For fixed brine flow rate conditions, a decrease in the resource temperature results in a decrease in the net plant power. For the 300 F georesource temperature, the resource utilization and cost optima nearly coincide. Dissert. Abstr.

N80-18554*# Spectrolab, Inc., Sylmar, Calif.
DEVELOPMENT OF IMPROVED WRAPAROUND CONTACTS FOR SILICON Final Report
Jay W. Thornhill Dec. 1979 41 p
(Contract NAS3-20065)
(NASA-CR-159748) Avail: NTIS HC A03/MF A01 CSCL 10A

A developmental process for fabricating 2 X 4 cm back surface field silicon solar cells featuring wraparound contacts and screen printed dielectric isolation is described. The process was then used to fabricate a number of cells for evaluation and study, as well as to establish the validity of the process sequence. While a number of cells exhibiting relatively good conversion efficiencies were produced, nearly all had low I-V curve factors for the level of efficiencies attained. Cells with conversion efficiencies of more than 15 percent (air mass zero and 25 C) had fill factors of only 0.76. Evidence as to the cause of this has not been conclusive, but is most probably linked to isolation failure in the wraparound dielectric and associated shunting problems. Author

N80-18555*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLEXIBLE FORMULATED PLASTIC SEPARATORS FOR ALKALINE BATTERIES Patent Application
D. W. Scheibley, J. M. Bozek, and D. G. Soltis, inventors (to NASA) Filed 28 Sep. 1979 10 p
(NASA-Case-LEW-12363-4; US-Patent-Appl-SN-079914) Avail: NTIS HC A02/MF A01 CSCL 10C

A flexible separator for alkaline batteries is disclosed. The separator is comprised of a coating which is applied to a nonwoven porous substrate such as sheets or mats of asbestos or other materials which are inert with respect to the alkaline electrolyte of the battery. The coating material comprises a polyphenylene oxide polymer, an organic additive and inorganic and organic fillers which comprise 55% by volume or less of the coating material. Preferably, at least one inorganic filler material which is reactive with the electrolyte is included to produce desirable pores in the coating. The organic additive is a polymeric polyester material which is hydrolyzed by the alkaline electrolyte to improve conductivity of the coating. NASA

N80-18556*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLEXIBLE FORMULATED PLASTIC SEPARATORS FOR ALKALINE BATTERIES Patent Application
D. W. Scheibley, J. M. Bozek, and D. G. Soltis, inventors (to NASA) Filed 19 Jul. 1979 10 p
(NASA-Case-LEW-12363-3; US-Patent-Appl-SN-058658) Avail: NTIS HC A02/MF A01 CSCL 10C

A flexible separator for alkaline batteries is disclosed. The separator is comprised of a coating which is applied to a nonwoven porous substrate such as sheets or mats of asbestos or other materials which are inert with respect to the alkaline electrolyte of the battery. The coating material is comprised of a polyphenylene oxide polymer, an organic additive and inorganic, and organic fillers which comprise 55% by volume or less of the coating material. Preferably, at least one inorganic filler material which is reactive with the electrolyte is included to produce desirable pores in the coating. The organic additive is a polymeric polyester material which is hydrolyzed by the alkaline electrolyte to improve conductivity of the coating. NASA

N80-18557*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CATALYST SURFACES FOR THE CHROMOUS/CHROMIC REDOX COUPLE Patent Application
Jose D. Giner (Giner, Inc.) and Kathleen J. Cahill, inventors (to NASA) (Giner, Inc.) Filed 27 Jul. 1979 15 p Sponsored by NASA
(NASA-Case-Lew-13148-2; US-Patent-Appl-SN-061555) Avail: NTIS HC A02/MF A01 CSCL 10A

An electricity producing cell of the reduction-oxidation type is disclosed. The cell is divided into two compartments by a membrane and each compartment contains a solid inert electrode. A ferrous/ferric couple in a chloride solution serves as a cathode fluid which is circulated through one of the compartments to produce a positive electric potential disposed therein. A chromic/chromous couple in a chloride solution serves as an anode fluid which is circulated through the second compartment to produce a negative potential on an electrode disposed therein. The electrode is an electrically conductive, inert material plated with copper, silver or gold. A thin layer of lead plates onto the copper, silver or gold layer when the cell is being charged, the lead ions being available from lead chloride which has been added to the anode fluid. If the REDOX cell is then discharged, the current flows between the electrodes causing the lead to deplate from the negative electrode and the metal coating on the electrode will act as a catalyst to cause increased current density. NASA

N80-18558*# National Aeronautics and Space Administration, Washington, D. C.
CONTROL STRATEGY FOR A VARIABLE-SPEED WIND ENERGY CONVERSION SYSTEM
A. Jacob, D. Veillette, and V. Rajagopalan Nov. 1979 10 p refs Transl. into ENGLISH from Proc. of New York Inst. of Elec. Engineers Inc., 1978 p 528-531 In FRENCH Presented at Can. Commun. and Power Conf., Montreal, 18-20 Oct. 1978 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(Contract NASw-3199)
(NASA-TM-75512) Avail: NTIS HC A02/MF A01 CSCL 10A

A control concept for a variable-speed wind energy conversion system is proposed, for which a self-exited asynchronous cage generator is used along with a system of thyristor converters. The control loops are the following: (1) regulation of the entrainment speed as function of available mechanical energy by acting on the resistance couple of the asynchronous generator, (2) control of electric power delivered to the asynchronous machine, functioning as a motor, for start-up of the vertical axis wind converter, and (3) limitation of the slip value, and by consequence, of the induction currents in the presence of sudden variations of input parameters. Author

N80-18559*# Avco Corp., Wilmington, Mass.
PARAMETRIC STUDY OF POTENTIAL EARLY COMMERCIAL MHD POWER PLANTS Final Report
Finn A. Hals Dec. 1979 246 p refs
(Contracts DEN3-51, EF-77-A-01-2674)
(NASA-CR-159633; DOE/NASA/0051-79/1) Avail: NTIS HC A11/MF A01 CSCL 10B

Three different reference power plant configurations were considered with parametric variations of the various design parameters for each plant. Two of the reference plant designs were based on the use of high temperature regenerative air preheaters separately fired by a low Btu gas produced from a coal gasifier which was integrated with the power plant. The third reference plant design was based on the use of oxygen enriched combustion air preheated to a more moderate temperature in a tubular type metallic recuperative heat exchanger which is part of the bottoming plant heat recovery system. Comparative information was developed on plant performance and economics. The highest net plant efficiency of about 45 percent was attained by the reference plant design with the use of a high temperature air preheater separately fired with the advanced entrained bed gasifier. The use of oxygen enrichment of the combustion air yielded the lowest cost of generating electricity at a slightly lower plant efficiency. Both of these two reference plant designs are identified as potentially attractive for early MHD power plant applications. R.E.S.

N80-18565*# General Electric Co., Philadelphia, Pa. Space Div.
APPENDIX: MOD-1 WIND TURBINE GENERATOR ANALYSIS AND DESIGN REPORT, VOLUME 2 Final Report
May 1979 425 p
(Contracts NAS3-20058; EX-77-A-29-1010)
(NASA-CR-159496; DOE/NASA/0058-79/2-Vol-2-App) Avail: NTIS HC A18/MF A01 CSCL 10B

The MOD-1 detail design is appended. The supporting analyses presented include a parametric system trade study, a verification of the computer codes used for rotor loads analysis, a metal blade study, and a definition of the design loads at each principal wind turbine generator interface for critical loading conditions. Shipping and assembly requirements, composite blade development, and electrical stability are also discussed. K.L.

N80-18567# Naval Postgraduate School, Monterey, Calif.
SOLAR ENERGY DESIGN IMPROVEMENT: A METHODOLOGY FOR HYDRONIC FLATPLATE COLLECTOR SYSTEMS M.S. Thesis
Lawrence William Kozoyed Sep. 1979 236 p refs
(AD-A076836) Avail: NTIS HC A11/MF A01 CSCL 03/2

A methodology for solar energy system design improvement has been developed and coupled with a constrained function optimization code resulting in an automated solar energy system design procedure. The scope of the methodology is limited to systems using flat plate collectors and water as the working fluid. Eight parameters have been included as independent design variables. The design variables included collector area, collector tile angle, collector and storage fluid stream velocities, and collector to storage heat exchanger dimensions. The procedure includes an accounting for economic parameters as an intimate part of the design process. The resulting methodology has been used for the design of solar energy systems which would use shelf item collectors for the purpose of determining the optimum design variable vector for a given situation. The methodology could also be used on a limited basis for collector design optimization by exploring the effects of changing selected collector parmeters on system performance. The methodolgoy is coded in the FORTRAN computer language under the name SOLOAD-1 (Solar Energy Optimization Analysis or Design). GRA

N80-18568# SRI International Corp., Menlo Park, Calif.
A FEASIBILITY STUDY OF WINDPOWER FOR THE NEW ENGLAND AREA Final Report, 4 Jun. - 31 Oct. 1979
Patrick Martin, Michael Balma, Gwen Crooks, Roy Endlich, and Christopher Maxwell Oct. 1979 238 p refs
(Contract N00014-79-C-0539; SRI Proj. 8569)
(AD-A076614) Avail: NTIS HC A11/MF A01 CSCL 05/3

SRI International examined the applicability of large-scale windpower electricity generating systems (WEGS) as an alternative source of energy for the New England States in general and for the U.S. Navy Portsmouth Shipyard at Kittery, Maine, in particular. The Boeing Mod 2 wind machine was selected as representative of current technology in the appropriate size range of 2.5 megawatts (MW) rated capacity. Parametric economic analyses led to the conclusion that WEGS electricity can be at economic parity with the incremental electricity from conventional generators using oil or gas without any allowance for a capacity credit, provided that the annual utilization factor for the WEGS is at least 50%. Such utilization appears to be achievable at elevations between 620 and 1,240 m (2,000 and 3,000 ft). About one-eight of the 35,500 sq kilometers of air space reviewed in New Hampshire is at such elevations. Nonutility financing and capitalization can halve the costs of WEGS electricity. Nonutility ownership of WEGS is encouraged by recent state and federal legislation. The primary potential WEGS environmental impact, interference with television reception, can be mitigated by installation of cable TV service. GRA

N80-18570# American Univ., Washington, D. C.
THE PREPARATION OF SOME NOVEL ELECTROLYTES: SYNTHESIS OF PARTIALLY FLUORINATED ALKANESULFONIC ACIDS AS POTENTIAL FUEL CELL ELECTROLYTES Final Report
C. Bunyagidj, H. Pietrowska, and M. H. Aldridge Sep. 1979 77 p refs
(Contract DAAK70-77-C-0047; DA Proj. 1L1-61102-AH-51)
(AD-A078473) Avail: NTIS HC A05/MF A01 CSCL 10/2

The objective of this research was to prepare some strong acids for evaluation by Fort Belvoir as potential fuel cell electrolytes. The major acid, other than phosphoric, H3PO4, currently under investigation by Fort Belvoir as a fuel cell electrolyte is TFMSA, CF3SO3H.H2O, trifluoromethanesulfonic acid monohydrate aqueous solutions and sodium salt mixtures. TFMSA has been found to be superior to H3PO4 from the standpoint of electrode kinetics, but certain undesirable characteristics (volatility; wetting of Teflon) led to this research for a better fuel cell electrolyte. GRA

N80-18578# Bundesministerium fuer Wissenschaft und Forschung, Vienna (Austria). Sektion Forschung.
THE STORAGE OF ELECTROCHEMICAL ENERGY [ELEKTROCHEMISCHE ENERGIESPEICHERUNG: BESTANDSAUFNAHME NATIONALER UND INTERNATIONALER FORSCHUNGEN UND ENTWICKLUNGEN VON ELEKTROCHEMISCHEN ENERGIESPEICHERN]
Jan. 1976 77 p refs In GERMAN
Avail: NTIS HC A05/MF A01

A brief survey of national and international research is compiled. Progress is noted in electrochemical batteries, chemical electrolytes electric production, and fuel cells. Author (ESA)

N80-18579# Open Univ., Milton (England). Energy Research Group.
REPORT ON THE GAS SUPPLY INDUSTRY
G. Alexander, R. Armson, M. Barrett, D. Casper, P. Chapman, D. Crabbe, G. Gravelle, D. Hemming, D. Herd, S. Johnson et al Mar. 1979 212 p refs
(ERG-027) Avail: NTIS HC A10/MF A01; Secretary, Energy Res. Group, Milton Keynes, England

The evolution of the natural gas industry in the UK is reviewed, then an assessment of its operations in the foreseeable future is made. Its rapidly growing significance in the formulation of UK energy policy is emphasized, especially in regard to decisions in the development of nuclear energy. The impact on the UK coal industry is also shown and the relevance to planning for substitute natural gas production is pointed out. Pricing issues are covered as well. Supporting data presented include gas industry statistics on supply and demand, fuel price statistics, gas appliance statistics, and a load curve analysis used to foresee the possibility of a gas supply shortfall. Author (ESA)

N80-18583 North Carolina Univ. at Chapel Hill.
EVALUATION OF A PHOTOCHEMICAL SYSTEM FOR NITROGEN OXIDES CONTROL Ph.D. Thesis
John Randolph Richards 1979 199 p
Avail: Univ. Microfilms Order No. 8005069

The technical feasibility of a photochemical pretreatment system for NOx control at coal fired boilers was evaluated. This approach utilizes reaction mechanisms similar to those responsible for photochemical oxidant incidents. The reactions are initiated under controlled conditions while the pollutants are at high concentration and while the reaction products can be removed. Results indicate that under time limited and light limited conditions, it is possible to quench the photochemical reactions at the NO2 peak and prior to the formation of ozone, aerosols, and other secondary products. However, the photochemical system will not be commercially competitive unless serious operational problems limit the alternative techniques or unless the photochemical system can be refined to reduce cost. Dissert. Abstr.

N80-18593 Texas Technological Univ., Lubbock.
COMPUTATION OF SYNTHETIC SEISMOGRAMS BY THE METHOD OF CHARACTERISTICS Ph.D. Thesis
Louis Reyes Castro 1979 65 p
Avail: Univ. Microfilms Order No. 8003211

The method of characteristics is applied to one-dimensional stress wave propagation problems of exploration interest. Several seismograms computed from dry, elastic, and viscoelastic near surface models are compared to data recorded by various types of receivers. The characteristics method is also used to obtain a solution to Biot's equations for wave propagation in saturated media. Synthetic seismograms are computed from various core and reservoir models saturated with different types of fluids. The computed seismograms are used to study the effect of variable reservoir conditions on a seismic wavelet. Dissert. Abstr.

N80-18825# Wisconsin Univ. - Madison. Mathematics Research Center.
A NEWTON METHOD FOR THE PIES ENERGY MODEL
Norman H. Josephy Jun. 1979 33 p refs
(Contract DAAG29-75-C-0024; Grant NSF MCS-74-20584)
(AD-A077102; MRC-TRC-1971) Avail: NTIS HC A03/MF A01 CSCL 12/1

Newton's method is a well known and often applied technique for computing a zero of a nonlinear function. By using the theory of generalized equations, a Newton method has been developed to solve problems arising in both mathematical programming and mathematical economics. It is shown how Newton's method for generalized equations can be applied to the economic equilibrium problem of the Project Independence Evaluation System (PIES) Energy Model. Solutions to a simplified version of PIES are obtained using a Newton method, and comparisons are made to solutions which have appeared in the literature. GRA

N80-18990*# Transportation Systems Center, Cambridge, Mass.
IMPLICATIONS OF FUEL-EFFICIENT VEHICLES ON RIDE QUALITY AND PASSENGER ACCEPTANCE: WORKSHOP PROCEEDINGS Final Report, 6-8 Sep. 1979
Anna M. Wichansky, ed. and A. R. Kuhlthau, ed. (Virginia Univ.) Aug. 1979 120 p refs Conf. held at Woods Hole, Mass., 6-8 Sep. 1978
(NASA-CP-2096; DTS-532; DOT-TSC-RSPA-79-21) Avail: NTIS HC A06/MF A01 CSCL 13F

Topics discussed include ride quality and passenger acceptance problems associated with enhanced fuel efficiency of automobiles and aircraft shifts in intermediate range (100-500 miles) travel from automobiles to public transit and implications of increased size disparity for ground transport freight and passenger vehicles using shared guideways. Major problem areas were identified and strategies for conducting pertinent research were outlined. A glossary of technical terms is included. K.L.

N80-18991*# Brobeck (William M.) and Associates, Berkeley, Calif.
STUDY OF ADVANCED ELECTRIC PROPULSION SYSTEM CONCEPT USING A FLYWHEEL FOR ELECTRIC VEHICLES Final Report
Francis C. Younger and Heinz Lackner Dec. 1979 231 p refs
(Contracts DEN3-78; EC-77-A-31-1011)
(NASA-CR-159650; DOE/NASA/0078-79/1; WMB/A-4500-131-3-R1) Avail: NTIS HC A11/MF A01 CSCL 10B

Advanced electric propulsion system concepts with flywheels for electric vehicles are evaluated and it is predicted that advanced systems can provide considerable performance improvement over existing electric propulsion systems with little or no cost penalty. Using components specifically designed for an integrated electric propulsion system avoids the compromises that frequently lead to a loss of efficiency and to inefficient utilization of space and weight. A propulsion system using a flywheel power energy storage device can provide excellent acceleration under adverse conditions of battery degradation due either to very low temperatures or high degrees of discharge. Both electrical and mechanical means of transfer of energy to and from the flywheel appear attractive; however, development work is required to establish the safe limits of speed and energy storage for advanced flywheel designs and to achieve the optimum efficiency of energy transfer. Brushless traction motor designs using either electronic commutation schemes or dc-to-ac inverters appear to provide a practical approach to a mass producible motor, with excellent efficiency and light weight. No comparisons were made with advanced system concepts which do not incorporate a flywheel. M.G.

N80-19287# Southwest Research Inst., San Antonio, Tex. Army Fuels and Lubricants Research Lab.
DIESEL ENGINE ENDURANCE TEST WITH WATER-CONTAINING FIRE-RESISTANT FUEL Interim Report, Mar. - Sep. 1977
J. V. Moffitt, E. C. Owens, B. R. Wright, and W. D. Weatherford, Jr. Sep. 1979 59 p refs
(Contracts DAAG53-76-C-0003; DAAK70-78-C-0001)
(AD-A078665; AFLRL-94) Avail: NTIS HC A04/MF A01 CSCL 21/4

A production LDT-465-1C multifuel diesel engine was operated according to a double-length Army/CRC Wheeled Vehicle Test Cycle (420 total hours) using a fire-resistant diesel fuel containing 10 vol % water. The effects of this water-in-fuel macroemulsion on engine power output, deposits, wear, and oil degradation were examined. The results indicate that this fire-resistant fuel formulation, under the conditions evaluated, does not result in abnormal deposits nor are there any major effects (adverse or favorable) on engine wear or oil degradation. However, a significant loss in horsepower output as a function of test duration did result. Post-test examinations indicated the presence of fuel-origin deposits in the injection system which were attributed to the sugar-type surfactants used in this investigation. Author (GRA)

N80-19292# Delaware Univ., Newark.
KINETICS AND MECHANISM OF DESULFURIZATION AND DENITROGENATION OF COAL-DERIVED LIQUIDS Quarterly Report, 21 Jun. - 20 Sep. 1978
B. C. Gates, J. R. Katzer, J. H. Olson, H. Kwart, and A. B. Stiles 16 Mar. 1979 134 p refs
(Contract EX-76-C-01-2028)
(FE-2028-15; QR-13) Avail: NTIS HC A07/MF A01

Studies of competing hydroprocessing reactions catalyzed by Ni-Mo/gamma-Al2O3 and involving quinoline, indole, dibenzothiophene, and naphthalene in n-hexadecane show that marked interactions exist. The naphthalene hydrogenation rate is reduced by the presence of quinoline, whereas the reactivity of quinoline

is unchanged by the naphthalene The rate of hydrodenitrogenation of indole, a non-basic nitrogen-containing compound is strongly reduced by the presence of quinoline, whereas the rate of hydro-denitrogenation of quinoline, a basic nitrogen-containing compound, is unaffected by the presence of indole. The hydrogenation reactions in the dibenzothiophene reaction network are inhibited severely as indicated by the reduction in their pseudo first-order-rate constants as are the hydrogenation reactions for naphthalene Thus the hydrogenation rate is reduced 30-fold by increasing the inital quinoline concentration from 0.0 to 0.5 wt % in naphthalene hydrogenation and in dibenzothiophene hydrodesulfurization. The rate of direct sulfur removal is reduced by only 3-fold by increasing the quinoline concentration from 0.0 to 0.5 wt %
DOE

N80-19293# Lehigh Univ., Bethlehem, Pa
CENTRIFUGAL FLUIDIZED COMBUSTION OF COAL Final Report
E K Levy and J C Chen Jan 1979 130 p refs
(Contract EX-76-S-01-2516)
(FE-2516-9) Avail NTIS HC A07/MF A01

Batch experiments on bed startup, minimum fluidization, and pressure drop were performed using room temperature air at atmospheric pressure. Particular attention was given to the effects of grid pressure drop, grid taper angle, mass of bed material, speed of rotation, and particle size and density on fluidization. The experiments demonstrated that it is possible to start up a centrifugal fluidized bed (CFB) from rest, that the system fluidizes in a predictable fashion, and that the minimum fluidization velocities and bed pressure drops are in good agreement with the theoretical models developed for the CFB. The experimental data indicate that it is possible to feed and remove solids continuously and achieve a stable bed thickness in a rotating fluidized bed Experiments performed on particle elutriation show that the air flow rate at which particle loss is initiated is a strong function of the angular velocity of the bed and the bed thickness. At higher flow rates, the rate of particle loss depends on air flow rate, angular velocity, and bed thickness DOE

N80-19294# Brookhaven National Lab., Upton, N Y
POTENTIAL OF BIOMASS CONVERSION IN MEETING THE ENERGY NEEDS OF THE RURAL POPULATIONS OF DEVELOPING COUNTRIES: AN OVERVIEW
V Mubayi, J Lee, and R Chatterjee (State Univ. of New York, Stony Brook) 1979 18 p refs Presented at the Am. Chem. Soc. Natl Meeting, Washington, D.C., 11-14 Sep. 1979
(Contract EY-76-C-02-0016)
(BNL-26721, CONF-790917-11) Avail NTIS HC A02/MF A01

A preliminary assessment is presented of the contribution biomass conversion could make in the context of the rural areas of six developing countries India, Indonesia, Peru, Sudan, Tanzania, and Thailand The technologies selected for analysis are anaerobic digestion of wet biomass to produce methane and pyrolysis of dry biomass to produce charcoal, liquid fuels, and low Btu gases Preliminary estimates are made of the amounts of fuels that could be produced in each of the selected countries by a combination of these technologies. It was found that, with the exception of India, implementation of these technologies could potentially meet the future energy needs of their rural populations for both subsistence and development
DOE

N80-19295# California Univ., Livermore Lawrence Livermore Lab
METHANOL AS A TRANSPORTATION FUEL: ASSESSMENT OF ENVIRONMENTAL AND HEALTH RESEARCH
H Timourian and F Milanovich 18 Jun 1979 97 p refs
(Contract W-7405-eng-48)
(UCRL 52697) Avail NTIS HC A05/MF A01

The current status of knowledge on the health and environmental impacts resulting from the use of methanol and methanol gasoline blends as automotive fuels is evaluated. The physical and technical background on methanol as an automotive fuel is reviewed, as well as the environmental, biological, and human health effects associated with the impact of methanol use and production The main issues that must be resolved by further research programs, and recommended research to address the main issues are outlined. An extensive bibliography is included.
DOE

N80-19296# Department of Energy, Bartlesville, Okla. Energy Technology Center.
PHYSICAL PROPERTIES OF GASOLINE/ALCOHOL BLENDS
F. W. Cox Sep. 1979 36 p refs
(BERC/RI-79/4) Avail NTIS HC A01/MF A01

Exeprimental data were generated for the octane number, water tolerance, micro vapor pressure, and distillation characteristics of gasoline/alcohol blends. The alcohols studied were methanol, ethanol, n-propanol, i-butanol, and two synthetic methyl fuels, each at 5, 10, and 15 weight percent in two gasolines which had substantially different property values. Each physical property is discussed in reference to value changes brought about by gasoline differences and those brought about by alcohol differences
DOE

N80-19298# Carnegie-Mellon Univ., Pittsburgh, Pa.
THE CHEMISTRY OF SULFUR IN CHAR AND THE IMPLICATIONS FOR HYDROGASIFICATION/HYDRODESULFURIZATION Ph.D. Thesis
A. E McIver Sep. 1979 289 p refs
(Contract EX-76-C-01-2449)
(FE-2449-9) Avail NTIS HC A13/MF A01

Experimental results, which elucidate the factors which govern the equilibrium distribution of sulfur between organic sulfur in char and gaseous hydrogen sulfide, are presented. These experiments were conducted at between 1200 F and 1600 F, for values of the ratio (P/sub H2S//P/sub H2/) ranging from 1 to 100 atmospheric pressure and for several chars. The rank of the parent coals from which these chars were derived ranged from lignite to anthracite. It is shown that the partial pressure ratio (P/sub H2S//P/sub H2/) is the pressure-dependent parameter which governs the extent of char sulfidation. It is also shown that the extent of char sulfidation is not uniquely dependent upon the char surface area, but decreases with increasing rank of the char, and the rank of the coal from which the char is derived Char sulfidation is shown to be a reversible process The kinetics of char desulfurization are shown to be a function of the physiochemical history of the char - i.e., char desulfurization is a path-dependent process. The analogy between the chemistries of oxygen and sulfur in char are explored, and the implications for coal sulfur management are outlined DOE

N80-19300# Physical Sciences, Inc., Woburn, Mass.
COAL PROCESSING FUEL CELL UTILIZATION. TASK 8: H2S REMOVAL BY CALCIUM-BASED SORBENTS
Girard A Simons and W T Rawlins Mar 1979 44 p refs
(Contract EW-78-A-21-8450)
(PSI-TR-167) Avail. NTIS HC A03/MF A01

A transport model was developed to describe the diffusion limited processes in SO2 cleanup by limestone Equilibrium calculations indicate an optimum thermodynamic limit of (H2S)/(H2O) for a typical fluidized bed gasification process using limestone or dolomite at temperatures of 1000 to 1200 K, thus the minimum H2S level which can be attained in the gasifier is probably near 100 ppM. Detailed kinetic investigations show that the kinetic rate constant for CaO with H2S is of the same magnitude as that with SO2 and that the activation energy for both reactions is less than 10 K cal/mole The model takes into account the following (1) the grain theory, (2) the addition of sulfur deposits, and (3) the effects of the calcination temperature and CO2 background on the pore structure
R.E.S

N80-19302# Lehigh Univ., Bethlehem, Pa Center for Surface and Coatings Research
METHANOL AND METHYL FUEL CATALYSTS Quarterly Report, Jun. - Aug. 1979
Kamil Klier and Richard G Herman Sep 1979 10 p
(Contract ET-78-S-01-3177)
(FE-3177-4) Avail NTIS HC A02/MF A01

It is shown that CuO/ZnO/La2O3 25/65/10, CuO/ZnO/CeO2 25/65/10, and CuO/ZnO/Al2O3 60/30/10 wt percent catalysts are active in the synthesis of methanol from syngas. Analogous to the binary CuO/ZnO 30/70 catalysts, an increase in methanol yield was noted over the cerium dioxide based catalyst when the CO2 concentration in the syngas mixture was reduced from 6 percent to about 2 percent. A similar decrease in the CO2 concentration over the aluminum-based catalyst, however, resulted in a decrease in catalytic activity. Thus, the roles played by the Al2O3 and CeO2 supports are distinctly different. Over the lanthanum-based catalyst, a decrease in the CO(CO2) flow rate decreased the gas hourly space velocity and increased the H2/C ration and appeared to result in the direct reaction of CO2 with H2. DOE

N80-19303# Brigham Young Univ., Provo, Utah. Dept. of Chemical Engineering.
MIXING AND GASIFICATION OF COAL IN ENTRAINING FLOW SYSTEMS Quarterly Technical Progress Report, 1 Jan. - 31 Mar. 1979
L. Douglas Smoot and Paul O. Hedman Apr. 1979 25 p refs
(Contract EF-77-S-02-2666)
(FE-2666-T1; QTPR-8) Avail: NTIS HC A02/MF A01

Four cold-flow mixing tests were conducted to help resolve difficulties in reproducing gas mixing data. The difficulty was identified and corrected. Nine additional cold-flow mixing tests were also performed to investigate the effect of coal particles in place of silicon particles. The secondary jet swirl generator for use in the cold-flow facility was completed. The method of blanketing the coal feeder with an inert gas was modified during the period, and pressure gauges were added to the system to allow coal feeder and reactor pressures to be monitored. The feasibility of using specific ion electrodes for analysis of sulfide in the quench water was demonstrated. A two-dimensional axi-symmetric gasification model was formulated, coded, and evaluated. Comparison between prediction and measurement for both cold-flow and reacting gases were made. DOE

N80-19304# Exxon Research and Engineering Co., Bayton, Tex. Research and Development Div.
FLUID COKING OF COAL LIQUEFACTION RESIDUES: THE FOURTH RESIDUE Final Technical Progress Report
S. Zaczepinski Jan. 1979 73 p
(Contract EX-76-C-01-2422)
(FE-2422-28) Avail: NTIS HC A04/MF A01

The applicability of current fluid coking technology to processing of coal liquefaction residues was evaluated by characterizing the coal liquefaction residues and assessing the effect of major coking process variables on yields and operability. Summary statements of results obtained on residues 1, 3 and 4 are: the ash content and feed fraction boiling below 1000 F are the only major analytical differences between these three residues; the net liquid recovered expressed on an ash-free 1000 F+ feed basis shows no feed dependence and no process variable effects; and the liquids recovered in fluid coking of these residues are the 1000 F- fraction of the feed and net 1000 F+ boiling product liquid. The process will recover the feed fraction boiling below 1000 F, but the net liquid produced boils at temperatures greater than 1000 F fluid coking operability (bogging) does not appear to be a limit over the temperature range of interest. Interim results are reported on the fourth sample (H-coal vacuum still bottoms). The sample is high in ash and processing results are generally similar to the above. DOE

N80-19305# Institute of Gas Technology, Chicago, Ill.
ENVIRONMENTAL ASSESSMENT OF THE HYGAS PROCESS. VOLUME 1: HYGAS ENVIRONMENTAL CHARACTERIZATION, DATA SYNTHESIS, ANALYSIS, AND INTERPRETATION, TESTS 37 - 64 Interim Report
Robert J. Jonardi, Louis J. Anastasia, Michael J. Massey (Carnegie-Mellon Univ.), and Richard H. Karst Jun. 1979 207 p refs
(Contract EX-76-C-01-2433; Proj. 61014)
(FE-2433-25-Vol-1) Avail: NTIS HC A10/MF A01

Report data published in the form of monthly and quarterly reports covering HYGAS test 37 through 64 are analyzed. The current program state-of-the-art, is described and future tasks are outlined. The environmental data base is divided into parts one for the coal pretreatment section, and the other for the gasification section and related downstream operations. The format employed is to identify the fate of selected coal constituents (for example, coal nitrogen, sulfur, and trace elements) along with other environmentally important species liberated or produced during the gasification process (for example, phenolic compounds). DOE

N80-19306# Hydrocarbon Research, Inc., Lawrenceville, N. J.
DEVELOPMENT OF A FAST FLUID BED GASIFIER, TASK 2 AND 3 Quarterly Progress Report, Oct. - Dec. 1978
Feb. 1979 23 p refs
(Contract EX-76-C-01-2361)
(FE-2361-40) Avail: NTIS HC A02/MF A01

A coal gasifier for low Btu gas utilizing the principle of the fast fluid bed unit operation is considered. The gasifier will be operated to determine operating parameters, feasibility and viability of a fast fluid bed gasifier. Procurement and construction of the experimental gasifier system was finished in December. A cold test program was also satisfactorily completed. The test lasted for seven days and included instrument checks, equipment evaluation and pressure testing for leaks. DOE

N80-19307# Purdue Univ., Lafayette, Ind.
SYSTEMS STUDIES OF COAL CONVERSION PROCESSES USING A REFERENCE SIMULATOR Quarterly Report, 1 Jan. - 31 Mar. 1979
G. V. Reklaitis, M. K. Sood, Y. Soni, B. W. Overturf, W. Weide, Jr., C. R. Wilkinson, J. Boo, and P. Buchanan Jun. 1979 90 p refs
(Contract EX-76-C-01-2275)
(FE-2275-11) Avail: NTIS HC A05/MF A01

Manuals were completed for the physical properties (PPROPS), process costing (PCOST), and detailed simulation (DSP-I) packages. A final manual was issued for the steady state pyrolysis system (SS/PP) model. The process simulation package (S4) was revised and used to execute simulations of the bulk methanation and water quench pyrolysis vapor recovery process sections. Sample results from these simulations are given. The DSP-I system was used to execute design calculations for the process steam and power generation section. Work was completed on the lift-tube model. The mixed algebraic and ordinary differential equation model is quite stiff and requires the use of Gear's implicit method for successful integration. Parameter studies indicate that, for purposes of converging the gasifier-combustion section recycle flows, a simplified form of the lift-tube model will suffice. However, for design of the device, the detailed model is required. DOE

N80-19308# Grace (W. R.) and Co., Memphis, Tenn. Agricultural Chemicals Group.
SYNTHESIS GAS DEMONSTRATION PLANT PROGRAM, PHASE 1 Quarterly Technical Progress Report, 1 Jan. - 31 Mar. 1979
M. R. Simpson 1979 27 p
(Contract ET-77-C-01-2577)
(FE-257706; QTPR-06) Avail: NTIS HC A03/MF A01

All activities regarding the commercial plant design, including the various trade-off studies, are essentially complete. Evidence of this stage of activity includes the delivery to DOE of all schematics, plot plans and plot elevations for the commercial plant. Demonstration plant design progressed satisfactorily (27.2 percent as of December 31, 1978, versus 58.4 percent complete as of March 31, 1979). Two additional pilot plant runs were completed. Coal feedstock was selected so as to verify the operability of the coal gasification process on coals of varying characteristics within the Kentucky No. 9 seam. Activities continued regarding development of the Environmental Report and of the various plans for obtaining raw materials and utilizing or otherwise disposing of products and by-products. Work has initiated in the areas of the capital and operating cost estimates and the phase 2 construction plan. DOE

N80-19309# Research Triangle Inst., Research Triangle Park, N. C.

POLLUTANTS FROM SYNTHETIC FUELS PRODUCTION: SAMPLING AND ANALYSIS METHODS FOR COAL GASIFICATION Final Report, Aug. 1978 - Jul. 1979
S K Gangwal, P M Grohse, D E Wagoner, D J Minick, and C M Sparacino Aug 1979 102 p refs
(Grant EPA-R-804979)
(PB80-104656, EPA-600/7-79-201) Avail NTIS HC A06/MF A01 CSCL 07D

Methods described for sampling and analyzing particulates, organic condensibles, and vapors or gases in the raw product stream of the gasifier as well as for solid residues include: (1) gas chromatography procedures for measuring fixed gases, C1-C5 hydrocarbons, sulfur gases, and C6-C8 aromatics; (2) atomic adsorption procedures for measuring toxic trace elements include those for arsenic, selenium, lead, cadmium, chromium, and mercury; (3) using polymeric sorbents to collect volatile or organics from the gas stream for analysis by glass capillary mass spectrometry; and (4) the prefractionation of tar by solvent partitioning into acid, base, and neutral fractions. Each fraction is analyzed by capillary GC/MS or high-performance liquid chromatography (HPLC). Typical results are given to illustrate the nature of the compounds studied, the methodologies, and their sensitivities.
GRA

N80-19310# Catalytic, Inc., Philadelphia, Pa
APPLICATION OF COKE PLANT CONTROL TECHNOLOGIES TO COAL CONVERSION Final Report, Aug. 1977 - Mar. 1979
S. M. Hossain, A. B. Cherry Cilione, and W. J. Wasylenko, Jr Aug 1979 214 p refs Sponsored by EPA
(Contract EPA-68-02-2167)
(PB80-108954, EPA-600/7-79-184) Avail NTIS HC A10/MF A01 CSCL 13B

Process and waste stream characteristics from the by-product coke oven process are compared with selected gasification and liquefaction processes. Recommendations are given regarding control technologies for air, water, and solid wastes. State and Federal regulations for the disposal and treatment of coke oven wastes are presented, along with a brief assessment of health effects attributed to coke oven emissions. Study results indicate that a number of coke oven control technologies are applicable to coal conversion systems. By-product upgrading and fugitive emission control technologies may be readily transferable to analogous coal conversion applications. Desulfurization and wastewater treatment technologies, however, cannot be transferred readily to applications where significant differences exist in the composition, temperature, and pressure of the two categories of process/waste streams.
GRA

N80-19424*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A LINEAR MAGNETIC MOTOR/GENERATOR Patent Application
Philip A. Studer, inventor (to NASA) Filed 7 Feb. 1980 27 p
(NASA-Case-GSC-12518-1; US-Patent-Appl-SN-119336) Avail NTIS HC A03/MF A01 CSCL 09C

A linear magnetic motor/generator is described which uses magnetic flux to provide mechanical motion or electrical energy. The linear magnetic motor/generator includes an axially movable actuator mechanism. A permanent magnet mechanism defines a first magnetic flux path which passes through a first end portion of the actuator mechanism. Another permanent magnet mechanism defines a second magnetic flux path which passes through a second end portion of the actuator mechanism. A drive coil defines a third magnetic flux path passing through a third central portion of the actuator mechanism. The invention has potential applications on all types of spacecraft requiring the use of a motor or generator, or in environments requiring long life with minimum maintenance. Presently the invention is to be used in cryogenic refrigerators aboard future spacecraft.
NASA

N80-19443# Magnetic Corp. of America, Waltham, Mass.
MAGNETOHYDRODYNAMIC (MHD) MAGNET MODELING Interim Technical Report, Mar. - Sep. 1978
Z. J. J. Stekly, Robert D. Pillsbury, Jr., Alan R. Beckwith, and R. Doug Holmes Wright-Patterson AFB, Ohio Jun. 1979 225 p Prepared in cooperation with General Dynamics Corp., San Diego, Calif.
(Contract F33615-77-C-3117; AF Proj. 3145)
(AD-A078865; MCA-WP13-01; AFAPL-TR-79-2045) Avail: NTIS HC A10/MF A01 CSCL 20/3

This report presents the results of a study to establish scaling criteria for a lightweight, superconducting magnet system for use in magnetohydrodynamic power generation. The scaling criteria are used to determine the appropriate size for a model magnet to be built to demonstrate the major system parameters of a full scale, 30 MWe, magnet system.
GRA

N80-19492 Illinois Univ. at Urbana-Champaign.
ENERGY CONSERVATION IN THE U.S. ECONOMY FROM INCREASED RECYCLE OF OBSOLETE STEEL SCRAP Ph.D. Thesis
James Ray Brodrick 1979 111 p
Avail: Univ. Microfilms Order No. 8004142

An energy model of the steel industry is formed from information on both the steel production technologies and the scrap recycle industry. The model is optimizied by use of linear programming techniques to minimize the energy intensity of steel. The optimum point of obsolete scrap recycle is about six times the amount recycled in 1967 for a decrease of 8.5 percent in the existing energy intensity. With this amount of recycling, some scrap accumulated in disposal areas from previous years would have to be reclaimed. The scrap-intensive steelmaking processes, especially the all-scrap open hearth, increase their portion of the production, while the basic oxygen production decreases. The labor impact of this energy conservation measure is a tradeoff between the labor of the iron ore and coal mines to the labor of the scrap recycling insutry. As more scrap is recycled, the labor intensity of the steel producing system is increased.
Dissert. Abstr.

N80-19503# Naval Postgraduate School, Monterey, Calif.
WASTE HEAT RECOVERY UNIT DESIGN FOR GAS TURBINE PROPULSION SYSTEMS M.S. Thesis
Robert Meredith Combs Sep. 1979 301 p refs
(AD-A078154) Avail: NTIS HC A14/MF A01 CSCL 13/10

A design model for a once-through waste heat recovery unit with a segmented fin-tube arrangement was developed along with a simple model of a combined gas and steam (COGAS) turbine propulsion system. These models were integrated and applied in a computer program written in FORTRAN IV for the IBM 360-67 computer. Waste heat recovery unit designs were produced and tested at off-design conditions. Using the space constraints and power requirements of a Navy destroyer-type ship, one design was selected and employed to make estimates of possible fuel savings to be realized through the application of a COGAS system.
GRA

N80-19510# Department of Energy, Washington, D. C. Office of Technology Impacts.
ISSUES CONCERNING THE LIGHT-DUTY DIESEL
Sep. 1979 145 p refs
(DOE/EV-0050/1) Avail: NTIS HC A07/MF A01

Major issues in diesel-related policy considerations are discussed. The issues are summarized in three areas: health and environmental protection, fuel conservation, and economic and programmatic trade-offs.
K.L.

N80-19604# System Development Corp., Santa Monica, Calif.
REGIONAL SYSTEMS DEVELOPMENT FOR GEOTHERMAL ENERGY RESOURCES. PACIFIC REGION: CALIFORNIA AND HAWAII. TASK 1: IMPLEMENTATION PLAN DEVELOPMENT
D. W. Michler 26 Mar. 1979 509 p refs
(Contract ET-78-C-03-1530)
(DOE/ET-28432-1) Avail: NTIS HC A22/MF A01

The utilization of geothermal energy resources for the generation of electrical power is considered as an alternative to fossil fuels or nuclear energy. The development of implementation plans for the commercialization of geothermal resources is described. The plans represent 21 reservoir-site developments and 48 geothermal power plant developments. Each plan consists of three integrated elements: (1) a bar-chart schedule that depicts interdependencies among activities and shows significant milestones on the path from initial exploration to power on-line; (2) task descriptions; and (3) the responsible performers of each task. A set of recommendations for the accelerated development of geothermal energy resources is given and the potential implementors are identified. J.M.S.

N80-19605# System Development Corp., Santa Monica, Calif.
REGIONAL SYSTEMS DEVELOPMENT FOR GEOTHERMAL ENERGY RESOURCES. PACIFIC REGION: CALIFORNIA AND HAWAII. TASK 2: REGIONAL PROGRAM MONITORING AND PROGRESS EVALUATION
19 Mar. 1979 132 p refs
(Contract ET-78-C-03-1530)
(DOE/ET-28432-2) Avail: NTIS HC A07/MF A01

The status of power plant projects is reported and major problems for each of the power plants are identified. Recommendations to alleviate these problems are outlined. J.M.S.

N80-19606# System Development Corp., Santa Monica, Calif.
REGIONAL SYSTEMS DEVELOPMENT FOR GEOTHERMAL ENERGY RESOURCES. PACIFIC REGION: CALIFORNIA AND HAWAII. TASK 3: WATER RESOURCES EVALUATION
J. L. Sakaguchi 19 Mar. 1979 375 p refs
(Contract ET-78-C-03-1530)
(DOE/ET-28432-3/1) Avail: NTIS HC A16/MF A01

The availability of surface and ground water for potential use as power plant make-up water in the major geothermal areas of California and Hawaii was assessed. The analysis concentrated on identifying the major sources of surface and ground water, potential limitations on the usage of this water, and the resulting constraints on potentially developable electrical power in each geothermal resource area. The water requirements for representative types of energy conversion processes were developed using a case study approach. Cooling water requirements for each type of energy conversion process were estimated based upon a specific existing or proposed type of geothermal power plant. The make-up water requirements for each type of conversion process at each resource location were then estimated as a basis for analyzing any constraints on the megawatts which potentially could be developed. DOE

N80-19607# System Development Corp., Santa Monica, Calif.
REGIONAL SYSTEMS DEVELOPMENT FOR GEOTHERMAL ENERGY RESOURCES. PACIFIC REGION: (CALIFORNIA AND HAWAII). TASK 3: WATER RESOURCES EVALUATION, APPENDICES
19 Mar. 1979 343 p refs
(Contract ET-78-C-03-1530)
(DOE/ET-28432-3/2) Avail: NTIS HC A15/MF A01

The appendices for the water resources evaluation report are included for the Imperial Valley KGRA's Coso, Mono-Long Valley, Geysers Calistoga, Surprise Valley, Wendell Amedee, Glass Mountain, Lassen, Puna, and for power plant case studies. DOE

N80-19609*# Florida Univ., Gainesville. Dept. of Electrical Engineering.
STUDIES OF SILICON p-n JUNCTION SOLAR CELLS Final Technical Report, Sep. 1977 - Dec. 1979
A. Neugroschel and F. A. Lindholm Dec. 1979 177 p refs
(Grant NsG-3018)
(NASA-CR-162832) Avail: NTIS HC A09/MF A01 CSCL 10A

To provide theoretical support for investigating different ways to obtain high open-circuit voltages in p-n junction silicon solar cells, an analytical treatment of heavily doped transparent-emitter devices is presented that includes the effects of bandgap narrowing, Fermi-Dirac statistics, a doping concentration gradient, and a finite surface recombination velocity at the emitter surface. Topics covered include: (1) experimental determination of bandgap narrowing in the emitter of silicon p-n junction devices; (2) heavily doped transparent regions in junction solar cells, diodes, and transistors; (3) high-low-emitter solar cell; (4) determination of lifetimes and recombination currents in p-n junction solar cells; (5) MOS and oxide-charged-induced BSF solar cells; and (6) design of high efficiency solar cells for space and terrestrial applications. A.R.H.

N80-19610*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ORBITER FUEL CELL PERFORMANCE CONSTRAINTS. STS/OPS PRATT WHITNEY FUEL CELLS. OPERATING LIMITS FOR MISSION PLANNING
Harry E. Kolkhorst Feb. 1980 35 p
(NASA-TM-80958; Rept-79-FM-45; JSC-16255) Avail: NTIS HC A03/MF A01 CSCL 10A

The orbiter fuel cell powerplant (FCP) performance constraints listed in the Shuttle Operational Data Book (SODB) were analyzed using the shuttle environmental control requirements evaluation tool. The effects of FCP lifetime, coolant loops, and FCP voltage output were considered. Results indicate that the FCP limits defined in the SODB are not valid. K.L.

N80-19611*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
LSA FIELD TEST Annual Report, Aug. 1978 - Aug. 1979
Peter Jaffe 15 Dec. 1979 51 p
(Contract NAS7-100)
(NASA-CR-162798; JPL-Pub-80-5; DOE/JPL-1012-38) Avail: NTIS HC A04/MF A01 CSCL 10A

Degradation tests indicate that electrical degradation is not a slow monotonically increasing phenomenon as originally thought but occurs abruptly as the result of some traumatic event. This finding has led to a change in the test philosophy. A discussion of this change is presented along with a summary of degradation and failure data from all the sites and results from a variety of special tests. New instrumentation for in-field measurements are described. Field testing activity was expanded by the addition of twelve remote sites located as far away as Alaska and the Canal Zone. Descriptions of the new sites are included. R.E.S.

N80-19612*# Jay - Carter Enterprises, Inc., Burkburnett, Tex.
A 15 kWe (NOMINAL) SOLAR THERMAL-ELECTRIC POWER CONVERSION CONCEPT DEFINITION STUDY: STEAM RANKIN RECIPROCATOR SYSTEM Final Report
W. Wingenback and J. Carter, Jr. Jun. 1979 46 p refs
(Contracts DEN3-63; EX-76-A-29-1060)
(NASA-CR-159591; DOE/NASA/0063-79/1) Avail: NTIS HC A03/MF A01 CSCL 10A

A conceptual design of a 3600 rpm reciprocation expander was developed for maximum thermal input power of 80 kW. The conceptual design covered two engine configurations: a single cylinder design for simple cycle operation and a two cylinder design for reheat cycle operation. The reheat expander contains a high pressure cylinder and a low pressure cylinder with steam being reheated to the initial inlet temperature after expansion in the high pressure cylinder. Power generation is accomplished with a three-phase induction motor coupled directly to the expander and connected electrically to the public utility power grid. The expander, generator, water pump and control system weigh 297 kg and are dish mounted. The steam condenser, water tank and accessory pumps are ground based. Maximum heat engine efficiency is 33 percent; maximum power conversion efficiency is 30 percent. Total cost is $3,307 or $138 per kW of maximum output power. R.E.S.

N80-19613*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEETERED, TIP-CONTROLLED ROTOR: PRELIMINARY TEST RESULTS FROM MOD-0 100-kW EXPERIMENTAL WIND TURBINE
J. C. Glasgow and D. R. Miller 1980 16 p refs Presented at Wind Energy Conf., Boulder, Colo., 9-11 Apr. 1980, sponsored by Am. Inst. of Aeron. and Astronautics and the Midwest Res. Inst.
(Contract EX-76-I-01-1028)

(NASA-TM-81445; DOE/NASA/1028-80/26; E-365) Avail NTIS HC A02/MF A01 CSCL 10B

Results of tests conducted using the MOD-0 100 kW experimental wind turbine are evaluated. The teetered rotor significantly decreased loads on the yaw drive mechanism and reduced blade cyclic flapwise bending moments by 25 percent at the 20 percent span location when compared to the rigid hub rotor. The teetered hub performed well, but impacted the teeter stops on occasion as wind speed and/or direction varied rapidly. The tip-controlled rotor performed satisfactorily with some expected loss of control when compared to the full span pitchable blade. The performance results indicate that a review of techniques used to calculate rotor power is in order.
K.L.

N80-19614*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

INSTALLATION AND CHECKOUT OF THE DOE/NASA MOD-1 2000-kW WIND TURBINE GENERATOR

Richard L. Puthoff and John L. Collins 1980 25 p refs Presented at Wind Energy Conf., Boulder, Colo. 9-11 Apr. 1980; sponsored by Am. Inst. of Aeron. and Astronautics and the Midwest Res. Inst.

(Contract EX-77-A-29-1010)

(NASA-TM-81444; DOE/NASA/1010-80/6; E-364) Avail NTIS HC A02/MF A01 CSCL 10B

The Mod-1 machine was assembled without the blades, tested, and sent to the site at Boone, North Carolina for erection. The blades were transported directly to the site. A series of checkout tests were then conducted to evaluate performance and loads. The results of these tests compared well with the design data.
K.L.

N80-19615*# United Technologies Corp., South Windsor, Conn. Power Systems Div.

ADVANCED TECHNOLOGY LIGHT WEIGHT FUEL CELL PROGRAM Final Report, 28 Jul. 1978 - 28 Jul. 1979

R. E. Martin 1979 52 p refs

(Contract NAS3-21257)

(NASA-CR-159807; FCR-1657) Avail: NTIS HC A04/MF A01 CSCL 10B

The development of a long life, high performance, high efficiency, hydrogen oxygen alkaline fuel cell configuration for application to a NASA orbiting space vehicle is documented. Seven full-size 0.25 ft 2 active area single cells were constructed and tested at cell temperatures between 140 F and 200 F, current densities out to 500 ASF, and reactant pressures up to 30 psia. Cells incorporating platinum-supported-on-carbon catalyst anodes demonstrated 8,085 cell-hours of endurance operation with virtually no change in performance and 2,995 cell-hours of operation to a cyclical load profiles with no apparent loss in cathode performance due to high voltage operation. Cell edge frame materials and heat treated polybenzimidazole (PBI) matrix samples were corrosion tested in 42 wt % aqueous potassium hydroxide at 250 F. Based upon available test data, PBI appears unsuitable for use as a fuel cell matrix material. Five semiconducting oxides were evaluated as cathode catalysts and as cathode catalyst supports. The candidate supports LaMnO3 and LaNiO3 appear to have development potential and merit further study.
K.L.

N80-19617*# Dow Corning Corp., Midland, Mich.

DEVELOP SILICONE ENCAPSULATION SYSTEMS FOR TERRESTRIAL SILICON SOLAR ARRAYS Final Report

Dec. 1979 57 p Prepared for JPL and DOE

(Contract JPL-954995)

(NASA-CR-162840; DOE/JPL-954995-80/6) Avail NTIS HC A04/MF A01 CSCL 10A

A cost effective encapsulant system was identified and a silicone acrylic cover material containing a durable ultraviolet screening agent was prepared. The effectiveness of the cover material in protecting photo-oxidatively sensitive polymers was demonstrated.
K.L.

N80-19620*# SOL/LOS, Inc., Los Angeles, Calif.

A NEW METHOD OF METALLIZATION FOR SILICON SOLAR CELLS Final Report, Dec. 1978 - Sep. 1979

Milo Macha Dec. 1979 67 p Prepared for JPL and DOE

(Contract JPL-955318)

(NASA-CR-162823; DOE/JPL-955318-79/3; JPL-9950-288) Avail: NTIS HC A04/MF A01 CSCL 10A

The new metallization process based on Mo-Sn system was studied. The reaction mechanism of MoO3 and its mixture with Sn was examined. The basic ink composition was modified in order to obtain a low ohmic contact to the cell. The electrical characteristics of the cells were comparable with the existing metallization processes. However, in comparison with the standard processes using silver as the contacting metal, the saving obtained by the use of the new process was substantial.
K.L.

N80-19621*# Sanders Associates, Inc., Nashua, N. H. Energy Systems Center.

HIGH TEMPERATURE SOLAR THERMAL RECEIVER Final Report

Dec. 1979 109 p Prepared for JPL and DOE

(Contract JPL-955454)

(NASA-CR-162831; JPL-9950-283) Avail: NTIS HC A06/MF A01 CSCL 10A

A design concept for a high temperature solar thermal receiver to operate at 3 atmospheres pressure and 2500 F outlet was developed. The performance and complexity of windowed matrix, tube-header, and extended surface receivers were evaluated. The windowed matrix receiver proved to offer substantial cost and performance benefits. An efficient and cost effective hardware design was evaluated for a receiver which can be readily interfaced to fuel and chemical processes or to heat engines for power generation.
K.L.

N80-19622*# General Electric Co., Schenectady, N. Y.

LOW COST POINT FOCUS SOLAR CONCENTRATOR. PHASE 1: PRELIMINARY DESIGN Final Report

16 Mar. 1979 235 p Prepared for JPL

(Contract JPL-955210)

(JPL-9950-273; NASA-CR-162830) Avail: NTIS HC A11/MF A01 CSCL 10A

The preliminary design of a low cost point focus solar concentrator is presented. The analysis, design, testing, and manufacturing assessments are described.
R.E.S.

N80-19623*# Varian Associates, Lexington, Mass.

SLICING OF SILICON INTO SHEET MATERIAL. SILICON SHEET GROWTH DEVELOPMENT FOR THE LARGE AREA SILICON SHEET TASK OF THE LOW COST SOLAR ARRAY PROJECT Final Report, 9 Jan. 1976 - 30 Sep. 1979

J. R. Fleming, S. C. Holden, and R. G. Wolfson 21 Sep. 1979 460 p Prepared for JPL and DOE

(Contracts NAS7-100; JPL-954374)

(NASA-CR-162828; DOE/JPL-954374-79/10; JPL-9950-272) Avail: NTIS HC A20/MF A01 CSCL 10A

The use of multiblade slurry sawing to produce silicon wafers from ingots was investigated. The commercially available state of the art process was improved by 20% in terms of area of silicon wafers produced from an ingot. The process was improved 34% on an experimental basis. Economic analyses presented show that further improvements are necessary to approach the desired wafer costs, mostly reduction in expendable materials costs. Tests which indicate that such reduction is possible are included, although demonstration of such reduction was not completed. A new, large capacity saw was designed and tested. Performance comparable with current equipment (in terms of number of wafers/cm) was demonstrated.
R.E.S.

N80-19624*# Boeing Engineering and Construction, Seattle, Wash.

LOW COST POINT FOCUS SOLAR CONCENTRATOR, PHASE 1

Mar. 1979 181 p Prepared for JPL

(Contract JPL-995209)

(NASA-CR-162848; JPL-9950-279) Avail NTIS HC A09/MF A01 CSCL 10A

Design concepts and plans for mass-production facilities and equipment, field installation, and maintenance were developed and used for cost analysis of a pneumatically stabilized plastic film point focus solar concentrator which has potential application in conjunction with Brayton cycle engines or supply of thermal energy. A sub-scale reflector was fabricated and optically tested by laser ray tracing to determine focal deviations of the surface slope and best focal plane. These test data were then used for comparisons with theoretical concentrator performance modeling and predictions of full-scale design performance. Results of the economic study indicate the concentrator design will have low cost when mass-produced and has cost/performance parameters that fall within current Jet Propulsion Laboratory goals. A R H

N80-19625*# Acurex Corp., Mountain View, Calif. Alternate Energy Division.
LOW-COST POINT-FOCUS SOLAR CONCENTRATOR, PHASE 1 Final Report
E. V. Nelson, T. C. Derbidge, D. Erskine, R. A. Maraschin, W. A. Niemeyer, M. J. Matsushita, and P. T. Overly 16 Mar. 1979 260 p Prepared for JPL
(Contract JPL-955208)
(NASA-CR-162839; JPL-9550-28; Acurex FR-79-340) Avail: NTIS HC A12/MF A01 CSCL 10A

The results of the preliminary design study for the low cost point focus solar concentrator (LCPFSC) development program are presented. A summary description of the preliminary design is given. The design philosophy used to achieve a cost effective design for mass production is described. The concentrator meets all design requirements specified and is based on practical design solutions in every possible way. R E S

N80-19626*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COGENERATION TECHNOLOGY ALTERNATIVES STUDY (CTAS). VOLUME 1: SUMMARY
Gerald J. Barna, Raymond K. Burns, and Gary D. Sagerman Jan. 1980 89 p
(Contract EC-77-A-31-1062)
(NASA-TM-81400; DOE/NASA/1062-80/4; E-312) Avail: NTIS HC A05/MF A01 CSCL 10B

Various advanced energy conversion systems that can use coal or coal-derived fuels for industrial cogeneration applications were compared to provide information needed by DOE to establish research and development funding priorities for advanced-technology systems that could significantly advance the use of coal or coal-derived fuels in industrial cogeneration. Steam turbines, diesel engines, open-cycle gas turbines, combined cycles, closed-cycle gas turbines, Stirling engines, phosphoric acid fuel cells, molten carbonate fuel cells, and thermionics were studied with technology advancements appropriate for the 1985-2000 time period. The various advanced systems were compared and evaluated for wide diversity of representative industrial plants on the basis of fuel energy savings, annual energy cost savings, emissions savings, and rate of return on investment as compared with purchasing electricity from a utility and providing process heat with an on-site boiler. Also included in the comparisons and evaluations are results extrapolated to the national level. F.O.S.

N80-19627*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: SEASONAL REPORT FOR SEMCO, LOXAHATCHEE, FLORIDA Contractor Report, Oct. 1978 - Aug. 1979
Jan. 1980 75 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161379) Avail: NTIS HC A04/MF A01 CSCL 10A

The operational and thermal performance of a variety of solar systems installed in operational test sites are described. The analysis used is based on instrumented system data monitored and collected for at least one full season of operation. The long-term field performance of the installed system and the technical contributions to the definition of techniques and requirements solar energy system design are analyzed. The solar energy system was designed to supply domestic hot water for a family of four, single-family residences. It consists of two liquid flat plate collectors, single tank, controls, and transport lines. F.O.S.

N80-19628*# Wyle Labs., Inc., Huntsville, Ala.
THERMAL PERFORMANCE EVALUATION OF THE NORTHROP MODEL NSC-01-0732 CONCENTRATING SOLAR COLLECTOR ARRAY AT OUTDOOR CONDITIONS
Dec. 1979 18 p Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161354; WYLE-TR-531-39) Avail: NTIS HC A02/MF A01 CSCL 10A

The thermal efficiency of the concentrating, tracking solar collector was tested after ten months of operation at the Marshall Space Flight Center solar house. The test procedures and results are presented. K.L.

N80-19629*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: A SEASONAL REPORT FOR SEMCO, MACON, GEORGIA Contractor Report, May 1978 - Apr. 1979
Jan. 1980 72 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161380) Avail: NTIS HC A04/MF A01 CSCL 10A

The solar energy system for heating water in a single-family residence for a family of four is described. The system operation, the operating energy, energy savings, maintenance, and performance are analyzed. F O S

N80-19630*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
INSTALLATION GUIDELINES FOR SOLAR HEATING SYSTEM, SINGLE-FAMILY RESIDENCE AT NEW CASTLE, PENNSYLVANIA
Jan. 1980 169 p Sponsored in part by DOE
(Contract NAS8-32093)
(NASA-CR-161355) Avail: NTIS HC A08/MF A01 CSCL 10A

The solar heating system installer guidelines are presented for each subsystem. This single family residential heating system is a solar-assisted, hydronic-to-warm-air system with solar-assisted domestic water heating. It is composed of the following major components: (1) liquid cooled flat plate collectors; (2) water storage tank; (3) passive solar-fired domestic water preheater; (4) electric hot water heater; (5) heat pump with electric backup; (6) solar hot water coil unit; (7) tube-and-shell heat exchanger, three pumps, and associated pipes and valving in an energy transport module; (8) control system; and (9) air-cooled heat purge unit. Information is provided on the operating procedures, controls, caution requirements, and routine and schedule maintenance in the form of written descriptions, schematics, detail drawings, pictures, and manufacturer's component data. R.E.S.

N80-19631*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 1, PHASE 2: EXECUTIVE SUMMARY Final Report
Nov. 1979 36 p Revised
(Contract NAS9-15636)
(NASA-CR-160540; D180-25461-1-Vol-1-Rev-A) Avail: NTIS HC A03/MF A01 CSCL 10A

A review of solar energy conversion and utilization is presented. The solar power satellite system is then described. Overall system definition and integration is discussed. Principal reference system study accomplishments and conclusions are presented. R.E.S.

N80-19632*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
ANNUAL TECHNICAL REPORT, FISCAL YEAR 1979. VOLUME 1: EXECUTIVE SUMMARY Annual Report
John W. Lucas 15 Jan. 1980 46 p Sponsored in part by DOE
(Contract NAS7-100)
(NASA-CR-159715; JPL-Pub-79-112-Vol-1) Avail: NTIS HC A03/MF A01 CSCL 10A

Accomplishments of the Point-Focusing Distributed Receiver Technology project are presented. The following aspects of the project are discussed: information dissemination, concentrator development, receiver and heat transport network development, power conversion, manufacturing, systems engineering, and tests and evaluations. R.E.S.

N80-19634*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
THE EFFECTS OF REGIONAL INSOLATION DIFFERENCES UPON ADVANCED SOLAR THERMAL ELECTRIC POWER PLANT PERFORMANCE AND ENERGY COSTS
A. F. Latta, J. M. Bowyer, T. Fujita, and P. H. Richter 1 Feb. 1980 117 p refs Revised Sponsored in part by DOE
(Contract NAS7-100)
(NASA-CR-162886; JPL-Pub-79-39-Rev-1; DOE/JPL-1060-17-Rev-1) Avail: NTIS HC A06/MF A01 CSCL 10A

The performance and cost of four 10 MWe advanced solar thermal electric power plants sited in various regions of the continental United States was studied. Each region has different insolation characteristics which result in varying collector field areas, plant performance, capital costs and energy costs. The regional variation in solar plant performance was assessed in relation to the expected rise in the future cost of residential and commercial electricity supplied by conventional utility power systems in the same regions. A discussion of the regional insolation data base is presented along with a description of the solar systems performance and costs. A range for the forecast cost of conventional electricity by region and nationally over the next several decades is given. R.E.S.

N80-19637# Massachusetts Inst. of Tech., Cambridge. Water Resources and Hydrodynamics Lab.
WAVE POWER EXTRACTION BY FLOATING BODIES
C. C. Mei and J. N. Newman Nov. 1979 27 p refs
(Contract N00014-76-C-0214)
(AD-A078058) Avail: NTIS HC A03/MF A01 CSCL 10/2

The linearized theory of water waves is reviewed in the context of wave-energy absorbers. A global analysis is outlined, leading to relatively simple expressions for the maximum energy absorption. Calculations are presented for the performance of Salter cam in two dimensions, and of a Cockerell raft in both two and three dimensions. Similar rates of optimum energy absorption are anticipated for other devices including the Kaimei ship and French air bag. Author (GRA)

N80-19639# UOP, Inc., Des Plaines, Ill. Corporate Research Center.
OPTIMIZATION OF Pt-DOPED KOCITE (TRADE NAME) ELECTRODES IN H3Po4 FUEL CELLS Final Technical Report, Sep. 1978 - May 1979
L. B. Welsh and R. W. Leyerle Aug. 1979 74 p refs
(Contract DAAG53-76-C-0014; DA Proj. 1L1-62733-AH-20)
(AD-A075372; TR-6) Avail: NTIS HC A04/MF A01 CSCL 09/1

The use of UOP Inc. Kocite (R*)-derived electrocatlysts as low-cost air and/or fuel electrocatalysts in phosphoric acid electrolyte fuel cells has been optimized with respect to some of the electrocatlyst and electrode structure parameters. Kocite-derived electrocatalysts are made from Kocite R* materials, which are composite structures consisting of pyropolymers chemically bonded to refractory substrates. Fuel cell electrodes are fabricated from these electrocatalysts and normally tested as anodes and cathodes in model fuel cells. Author (GRA)

N80-19640# Naval Civil Engineering Lab., Port Hueneme, Calif.
SOLAR-POWERED SUN TRACKER Final Report, Feb. 1977 - Sep. 1979
Carter J. Ward Jun. 1979 33 p refs
(ZF57571001)
(AD-A078653; CEL-TN-1556) Avail: NTIS HC A03/MF A01 CSCL 13/1

A solar-powered sun tracker believed to be capable of repositioning equipment to within 1 degree of the angle-of-incident radiation is described in this report. The proposed tracker is designed to reposition itself automatically after cloudy periods and should prove inexpensive as well as reliable. Included in this report are (1) a description of two tracker concepts, (2) a derivation of the heat-balance equation used to predict work available for equipment rotation, (3) a discussion of the experimental model fabricated to prove concept feasibility, and (4) an economic analysis comparing the cost of generating steam with a solar-powered boiler with the cost of generating steam with a coal-fired boiler. GRA

N80-19641# New Mexico Univ., Albuquerque. Center for Environmental Research and Development.
SOLAR POWERED LIQUID PISTON STIRLING CYCLE IRRIGATION PUMP Research Report, 1 May - 31 Dec. 1978
G. C. Bell 10 Apr. 1979 29 p refs
(Contract ET-78-G-03-1894)
(SAN/1894-1) Avail: NTIS HC A03/MF A01

A laboratory prototype of the liquid piston Stirling cycle heat engine was constructed with modeling and simulation. A range of engine sizes was used to determine lift head ranges. Preliminary investigations of solar energy inputs indicate numerous feasible methods to operate heat engines. The maximum rate of pumping obtained was one liter per 26 seconds through 109 cm lift head. DOE

N80-19642# San Diego State Univ., Calif.
RESEARCH ON DYNAMICS OF TUNDRA ECOSYSTEMS AND THEIR POTENTIAL RESPONSE TO ENERGY RESOURCE DEVELOPMENT Progress Report, 1 May 1978 - 30 Apr. 1979
P. C. Miller Jan. 1979 133 p refs
(Contract EE-77-S-03-1525)
(DOE/SF-01525-1) Avail: NTIS HC A07/MF A01

The ecological effects (costs and benefits) of impacts that can be expected from the development and utilization of energy resources in the arctic were investigated. The impacts studied include: altered nutrient availability (nitrogen and phosphorus); altered patterns of soil water drainage; and vehicle tracks. The general ecosystem characteristics used as integrative measures of the possible ecological effects include annual primary production and the relative aboveground growth of the different species or growth forms comprising the vegetation. Plant growth forms were defined by height, leaf longevity, position of the perennating bud, and rooting pattern. The main conclusion of the research is that species respond individually in terms of nutrient and total nonstructural carbohydrates accumulation to fertilization, and that the growth forms studied are not distinctive from each other on the basis of plant nutrition or growth. DOE

N80-19644# Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
MODELING THE SPACE CONDITIONING ENERGY DEMAND OF A COMMUNITY AS A FUNCTION OF WEATHER
E. R. Reiter, A. M. Starr, C. C. Burns, H. H. Leong, and G. R. Johnson Sep. 1979 16 p refs
(Contract EY-76-S-02-1340)
(COO-1340-65) Avail: NTIS HC A02/MF A01

The computer model which calculated the daily energy demand during the heating season of Greeley, Colorado, Cheyenne, Wyoming, and Minneapolis, Minnesota is discussed. The model was found to be excellently suited to test certain conservation strategies. However, preliminary tests of energy demands during the air conditioning season revealed gross inefficiency of some of the cooling systems presently in operation. DOE

N80-19645# Midwest Research Inst., Golden, Colo.
GENERAL RELIABILITY AND SAFETY METHODOLOGY AND ITS APPLICATION TO WIND ENERGY CONVERSION SYSTEMS
M. Edesess and R. D. McConnell Sep. 1979 52 p refs
(Contract EG-77-C-01-4042)

(SERI/TR-35-234) Avail: NTIS HC A04/MF A01

In conventional system reliability calculations, each component may be in the operable state of the under repair state. These calculations derive system unavailability, or the probability of the system's being down for repairs. By introducing a third component state between 'operable' and 'under repair'-namely, 'defective, but defect undetected'-the methods developed in this report enable system safety projections to be made in addition to availability projections. Also provided is a mechanism for computing the effect of inspection schedules on both safety and availability. A reliability and safety program (RASP) is detailed which perform these computations and also calculates costs for system inspections and repairs. RASP is applied to a simplified wind energy conversion system example. DOE

N80-19646# General Electric Co., Schenectady, N. Y.

SCREENING EVALUATION OF ELECTRIC POWER CYCLES INTEGRATED WITH COAL GASIFICATION PLANTS

S. P. Gallagher and D. J. Ahner Sep. 1979 80 p refs
(EPRI-AF-1160) Avail: NTIS HC A05/MF A01

Potentially lower cost alternatives to present concepts for integrated gasification combined cycle power plants were investigated. A relatively simple, potentially low cost, non steambottomed cycle was evolved and the system thermal efficiency calculated. Thermal efficiencies were also determined for several steam-bottomed cycles. The non steam-bottomed cycle was found to have a thermal efficiency of 32 percent. The steam-bottomed cycles analyzed in the study showed efficiency estimates between 38.8 and 40.3 percent, substantially higher than the non steam-bottomed case. The efficiency for an integrated gasification combined cycle using gas turbines at current firing temperatures was estimated at 37.6 percent. Performance at this level suggests the possibility that integrated gasification combined cycles using current gas turbines may be attractive for near term application. DOE

N80-19647# Institute for Energy Analysis, Oak Ridge, Tenn.

ENERGY ACCOUNTING FOR SOLAR AND ALTERNATIVE ENERGY SOURCES

Warren D. Devine, Jr. Jun. 1979 76 p refs
(Contracts EY-76-C-05-0033)
(ORAU/IEA(R)-79-11) Avail: NTIS HC A05/MF A01

Several inadequacies in present energy accounting practices are considered and an energy-accounting framework based upon the actual services provided to end users is proposed. Fifteen categories of energy service are described, and some of their characteristics are identified. The proposed energy accounting framework consists of two matrices - an energy-service matrix and an energy-carrier matrix. The energy-service matrix displays quantities of energy services provided in various ways as well as quantities of energy carriers used to provide energy services. The energy-carrier matrix displays quantities of energy carriers used to produce and distribute energy carriers to ultimate consumers. This accounting framework is illustrated with 1972 energy data for the United States, and several observations are made relative to long range solar energy research and development policy. DOE

N80-19648# Los Alamos Scientific Lab., N. Mex.

CHARACTERIZATION AND ASSESSMENT OF SELECTED SOLAR THERMAL ENERGY SYSTEMS FOR RESIDENTIAL AND PROCESS HEAT APPLICATIONS

J. C. Hyde Aug. 1979 55 p refs
(Contract W-7405-eng-36)
(LA-7995-TASE) Avail: NTIS HC A04/MF A01

The environmental data presented are in partial response to the Technology Assessment of Solar Energy (TASE) program, an assessment of the potential environmental, socioeconomic, and institutional impacts of solar technologies on the national, regional, and local community levels. The results of studies of seven solar thermal energy applications are presented. Five of these are residential applications and the remaining two applications produce industrial process heat. For each application, a representative system model and preliminary designs of major system elements were established. Then the following data were generated: annual useful energy produced, type and weight of the basic component materials, environmental residuals generated during system operation, and land and water requirements, the system characteristics and the environmental impacts are discussed. DOE

N80-19649# Lincoln Lab., Mass. Inst. of Tech., Lexington.

ON INFLUENCING THE OPERATING TEMPERATURES OF MOTOROLA AND ARCO SOLAR PHOTOVOLTAIC MODULES

P. Raghuraman 11 Oct. 1979 30 p refs
(Contract EY-76-C-02-4094)
(COO-4094-59) Avail: NTIS HC A03/MF A01

The electrical power output of photovoltaic solar cell modules decreases with increasing cell temperatures. Two such efforts on Motorola and Arco Solar modules are detailed using test measurements and analysis to increase the heat transfer from the modules and thereby lower the cell operating temperatures. The radiant heat emitted by the rear stainless steel pan of Motorola modules was increased by painting the pan with black and with white paint. This produced a pan temperature cooling of 3.7 C to 5 C, resulting in an increased electrical power output of 1.7 to 1.95 percent. Arco Solar modules were oriented horizontally and vertically to compare the effect of natural with forced convection cooling in the interior air column of the module. Natural convective heat transfer by vertical orientation produced a 1 to 3.5 C cooling over forced convective cooling by horizontal orientation. This cooling resulted in an increased cell electrical power output of 1 to 2.5 percent. DOE

N80-19650# Central Maine Power Co., Augusta.

CATARACT HYDROELECTRIC DEVELOPMENT EXPANSION STUDY

Jan. 1979 68 p refs Prepared in cooperation with Tippetts-Abbett-McCarthy-Stratton, New York, N.Y.
(Contract EW-78-F-07-1796)
(DOE/ID-01796-1) Avail: NTIS HC A04/MF A01

The Cataract hydroelectric power plant and dam was constructed in 1937-1938 and has been operated continually since that date. This unit is a vertical shaft Kaplan type machine with a rated output of 6650 kW at a design head of 44 ft. Maximum output is 8000 kW. The feasibility of expanding this existing plant was studied. The results indicate the following: the available head and unused flow at the Cataract Project will support an additional 6250 kW of generating capacity, the estimated gross plant investment cost of this plant would be $5,230,000 at present day costs. If a fishway is required the investment is estimated to be $5,730,000, and based on the analysis of 60 y of historical flow records this capacity addition would generate an average of 15,910,000 kWh annually. This feasibility study indicates that redevelopment of the Cataract site is a marginally economic proposition, which might offer some savings, over the life of the unit. DOE

N80-19651# Parsons-Brinckerhoff-Tudor-Bechtel, San Francisco, Calif.

POTENTIAL HYDROELECTRIC POWER, VERTICAL TURBINE, SPILLWAY COMBINE BROADWATER DAM Final Report

David C. Willer Apr. 1979 237 p
(Contract EW-78-F-07-1822)
(DOE/ID-01822-1) Avail: NTIS HC A11/MF A01

A feasibility study was made of the hydroelectric power potential at Broadwater Dam in western Montana. Two alternative configurations for the potential project were evaluated and the economics of four possible sources of project funding were assessed. The optimal project alternative was determined to be the apron-mounted configuration. The final choice of funding would be dependent on the power purchaser. It was shown that, regardless of the configuration or funding source selected, the project would be feasible. The cost of the apron-mounted configuration, which would consist of four turbine-generator units for a total installed capacity of 9.76 MW, was estimated as $13,250,000 with financing provided by either a PL-984 loan or tax-exempt bonds. The cost per installed kilowatt was therefore $1,350, and the cost per kilowatt-hour was 19.6 mills. The

average annual energy was estimated to be 56 44 million kWh
DOE

N80-19653# Boeing Aerospace Co., Seattle, Wash.
EMERGING MATERIALS SYSTEMS FOR SOLAR CELL APPLICATIONS-Cu/SUB 2-x/Se Quarterly Technical Progress Report, 1 Aug. - 1 Nov. 1979
R A Mickelsen, J M Stewart, W S Chen, and L F Buldhaupt
Nov 1979 16 p refs
(Contract DE-AC04-79ET-23005)
(DOE/ET-23005-T2, QTPR-2) Avail: NTIS HC A02/MF A01

The feasibility of using CU/sub 2-x/Se as a semiconductor material for the low cost production of photovoltaic solar cells was investigated. The Cu/sub 2-x/Se films was produced by coevaporation from individually monitored Cu and Se vapor sources. With a substrate temperature of 170 C, single phase cubic Cu/sub 2-x/Se films were produced. These films had a direct band gap of 2 2 eV and an indirect band gap of 1.4 eV.
DOE

N80-19654# Brookhaven National Lab., Upton, N. Y.
ELECTROLYSIS-BASED HYDROGEN STORAGE SYSTEMS OVERVIEW AND RATIONALE OF THE BROOKHAVEN NATIONAL LABORATORY MANAGED PROGRAM
A. Mezzina 1979 5 p Presented at the DOE Chem. Energy Storage and Hydrogen Energy Systems Contracts Rev. Meeting, Reston, Va., 12 Nov. 1979
(Contract EY-76-C-02-0016)
(BNL-26904, CONF-791127-4) Avail: NTIS HC A02/MF A01

A technological base in chemical/hydrogen storage technology is developed and near-term opportunities for technology transfer are identified. The emphasis is on conversion of our inexhaustible resources in a cost effective manner. Budget allocations are summarized showing electrolytic hydrogen production as the highest priority area. A budget activity summary is also presented.
DOE

N80-19655# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: IMPACT ANALYSIS REPORT. VOLUME 2: SITE-SPECIFIC AND REGIONAL IMPACT ANALYSES Final Report, Jul. 1975 - Oct. 1979
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C. Ballard, and Martha W. Gilliland Mar. 1979 991 p refs
(Contract EPA-68-01-1916)
(PB80-113574, EPA-600/7-79-082B) Avail: NTIS HC A99/MF A01 CSCL 10A

The results of impact analyses conducted as a part of a technology assessment of the development of six energy resources (coal, geothermal, natural gas, oil, oil shale and uranium) in eight western states (Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah and Wyoming) during the period 1975-2000 are presented. The likely impacts of deploying typical energy resource development technologies at sites representative of the kinds of conditions likely to be encountered are described. Local and regional impacts are discussed. GRA

N80-19656# National Technical Information Service, Springfield, Va.
CADMIUM SULFIDE SOLAR CELLS, VOLUME 1. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - 1977
Brian Carrigan Dec 1979 256 p
(PB80-802218) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Citations from Federally-funded research cover cadmium sulfide solar cell theory, design, development, fabrication, and degradation. Studies include junctions with thin films of copper sulfide, selenides, and tellurides. The performance, testing, analysis, efficiency, and costs of these cells are covered. This updated bibliography contains 248 abstracts, none of which are new entries to the previous edition.
GRA

N80-19657# National Technical Information Service, Springfield, Va.
SOLAR ELECTRIC POWER GENERATION, VOLUME 3. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, Oct. 1978 - Nov. 1979
Audrey S. Hundemann Dec. 1979 115 p Supersedes NTIS/PS-78/1109; NTIS/PS-77/0900; NTIS/PS-76/0797
(PB80-803034; NTIS/PS-78/1109; NTIS/PS-77/0900; NTIS/PS-76/0797) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

A worldwide literature survey cites power generation by direct conversion with solar cells and indirect conversion using solar heat. Topic areas cover solar tower power plants, orbital solar energy technology, photovoltaic power generation, and solar augmentation of hydroelectric power systems. A few abstracts pertain to the future role that solar energy will play in production of electric power and general studies comparing the technical and economic feasibility of various methods of electric power generation. Abstracts dealing with solar sea power generation and spacecraft power supplies are excluded. This updated bibliography contains 108 abstracts, all of which are new entries to the previous edition.
GRA

N80-19658# National Technical Information Service, Springfield, Va.
SOLAR ELECTRIC POWER GENERATION, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1976 - Sep. 1978
Audrey S. Hundemann Dec 1979 235 p
(PB80-803000) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Citations of Federally-funded research are presented pertaining to electric power generation by both direct conversion with solar cells and indirect conversion using solar heat. Topic areas cover equipment design, site surveys, economics, and feasibility studies of solar power satellite systems, photovoltaic systems, solar total energy systems, and central receiver solar thermal power systems. A few abstracts deal with phase change materials and thermal energy storage systems. This updated bibliography contains 228 abstracts, none of which is new to the previous edition.
GRA

N80-19659# National Technical Information Service, Springfield, Va.
SOLAR ELECTRIC POWER GENERATION, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, Oct. 1978 - Nov. 1979
Audrey S Hundemann Dec 1979 141 p Supersedes NTIS/PS-78/1108; NTIS/PS-77/0898; NTIS/PS-76/0796; NTIS/PS-75/691; NTIS/PS-75/346
(PB80-803018; NTIS/PS-78/1108; NTIS/PS-77/0898; NTIS/PS-76/0796; NTIS/PS-75/691; NTIS/PS-75/346) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Equipment design, site surveys, economics, and feasibility studies of solar power satellite systems, photovoltaic systems, solar total energy systems, and central receiver solar thermal power systems are discussed in the 134 Federally-sponsored research reports cited in this updated bibliography. All entries are new to the previous edition.
GRA

N80-19660# National Technical Information Service, Springfield, Va.
SOLAR ELECTRIC POWER GENERATION, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1976 - Sep. 1978
Audrey S. Hundemann Dec 1979 253 p
(PB80-803026) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Solar tower power plants, orbital solar energy technology, photovoltaic power generation, and solar augmentation of hydroelectric power systems are discussed in citations of worldwide reports. The technical and economic feasibility of various methods of electric power generation is also considered. This updated bibligraphy which contains 246 abstracts. None of the entries is new to the previous edition.
GRA

N80-19661# National Technical Information Service, Springfield, Va.

SOLAR SEA POWER PLANTS. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Nov. 1979

Audrey S. Hundemann Dec. 1979 314 p Supersedes NTIS/PS-78/1223; NTIS/PS-77/1056; NTIS/PS-76/0901
(PB80-802580; NTIS/PS-78/1223; NTIS/PS-77/1056; NTIS/PS-76/0901) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Federally-funded research studies dealing with the technical and economic feasibility of solar sea power plants are discussed. Topic areas cover condenser, evaporator, and heat exchanger design, and fouling and corrosion prevention. Site selection, dynamic modeling studies, and general studies dealing with solar sea power as an energy alternative are included. This updated bibliography contains 307 abstracts, 97 of which are new entries to the previous edition. GRA

N80-19662# National Technical Information Service, Springfield, Va.

SOLAR SEAPOWER PLANTS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Nov. 1979

Audrey S. Hundemann Dec. 1979 257 p Supersedes NTIS/PS-78/1224; NTIS/PS-77/1057; NTIS/PS-76/0902
(PB80-802598; NTIS/PS-78/1224; NTIS/PS-77/1057; NTIS/PS-76/0902) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

The present status and future prospects of using the ocean thermal gradient for production of electric power are discussed in these citations from worldwide research. Engineering, economic, and feasibility studies are covered, including studies dealing with systems and component design. This updated bibliography contains 250 abstracts, 126 of which are new entries to the previous edition. GRA

N80-19666# Battelle Pacific Northwest Labs., Richland, Wash.

ALASKAN ENVIRONMENTAL RESEARCH. SECTION 12.0 OF PART 2: ECOLOGICAL SCIENCES Annual Report, 1978

W. C. Hanson and L. E. Eberhardt Jul. 1979 31 p refs
(Contract EY-76-C-06-1830)
(PNL-2850-Pt-2-Suppl) Avail: NTIS HC A03/MF A01

Ecological consequences of resource developments in northern Alaska were investigated. Qualitative and quantitative results that describe environmental costs incurred by petroleum resource extraction and transportation, including interaction of industrial activities with arctic foxes (Alopex lagopus), small mammals, and tundra-nesting birds in the Prudhoe Bay field and along the Trans-Alaska pipeline and haul road are presented. Similar information from the Colvile River delta, baseline information on moose (Alces alces) populations, caribou (Rangifer tarandus) range quality and use, and lichen communities that are or will be impacted by resource developments is included. Field experiments to determine lichen sensitivities to sulfur oxide concentrations likely to be encountered near pipeline pumping stations; food chain transfer of stable and radioactive elements that utilize a data base of some 19 years for comparative purposes; and evaluation of oil field development activities on rabies and other physiological phenomena in foxes are described. DOE

N80-19668# Argonne National Lab., Ill.

ENVIRONMENTAL AND ECONOMIC EVALUATIONS OF ENERGY RECOVERY FROM AGRICULTURAL AND FORESTRY RESIDUES

Jerome P. Harper, Antonios A. Antonopoulos, and Andrew A. Sobek Aug. 1979 113 p refs
(Contract W-31-109-eng-38)
(ANL/EES/TM-58) Avail: NTIS HC A06/MF A01

Six biomass energy production model systems involving four conversion methods and five residues are described: hydrolysis of corn residues, pyrolysis of corn residues, combustion of cotton-ginning residues, pyrolysis of wheat residues, fermentation of molasses, and combustion of pulp and papermill wastes. Estimates of material and energy flows for those systems are given per 10 to the 12th power Btu of recovered energy. Regionalization of the model systems to the primary production region for the crop from which the residue is obtained was undertaken. The associated environmental consequences of residue utilization were then assessed for the production region. The environmental impacts of operating the model systems are examined. On the basis of estimates found in the literature, capital, operating, and maintenance cost estimates are given for the model systems. The study indicates that the most serious environmental impacts arise from residue removal rather than from conversion. DOE

N80-19672# Southern Research Inst., Birmingham, Ala.

ANALYSIS OF THERMAL DECOMPOSITION PRODUCTS OF FLUE GAS CONDITIONING AGENTS Final Report, 7 Jan. 1977 - 31 Mar. 1979

R. B. Spafford, E. B. Dismukes, and H. K. Dillon Aug. 1979 117 p refs
(Contract EPA-68-02-2200; Proj. 3832-27)
(PB80-111818; SORI-EAS-79-267; EPA-600/7-79-179) Avail: NTIS HC A06/MF A01 CSCL 13B

The reactions of several flue gas conditioning agents in a laboratory-scale facility simulating conditions in the flue gas train of a coal-burning power plant were studied. The compounds investigated were sulfur trioxide, ammonia, triethylamine, sodium carbonate, ammonium sulfate, and diammonium hydrogen phosphate. The predominant types of reactions observed in these experiments were thermal decomposition at high temperatures, recombination of decomposition fragments at lower temperatures, and reactions with normal components of the flue gas. The only significant environmental threat of any product identified was the formation of N-nitrosodiethylamine as the result of injecting triethylamine into the flue gas. This potent carcinogen was found in trace amounts when triethylamine was injected at 160 C. GRA

N80-19678# Land-Air, Inc., Bethesda, Md. Applied Research Div.

ENGINEERING EVALUATION OF CONTROL TECHNOLOGY FOR H-COAL AND EXXON DONOR SOLVENT PROCESSES Final Report, Jan. 1977 - Mar. 1979

K. R. Sarna and D. T. Oleary Jul. 1979 125 p refs
(Contract EPA-68-02-2601)
(PB80-108566; EPA-600/7-79-168) Avail: NTIS HC A06/MF A01 CSCL 13B

The results of an evaluation of the control technology of two coal liquefaction processes, H-Coal and Exxon Donor Solvent, are presented. The effluent streams were characterized and quantified for both processes and plants (pilot and conceptualized commercial). The gaseous, liquid, and solid stream emissions were analyzed for their controllability, process complexity, and efficiency. Extrapolations to the larger commercial size were based partly on pilot plant data and (where such data was unavailable) engineering judgment. Several information gaps were encountered for liquid and solid effluent streams, especially as to composition. These deficiencies were pointed out and recommendations were outlined. GRA

N80-20260*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

THE ROLE OF TECHNOLOGY AS AIR TRANSPORTATION FACES THE FUEL SITUATION

Cornelius Driver Mar. 1980 15 p Presented at Upper Midwest Council, Minneapolis, 1 Nov. 1979
(NASA-TM-81793) Avail: NTIS HC A02/MF A01 CSCL 01C

Perspectives on the air transportation fuel stituation are discussed including intercity air traffic, airline fuel consumption, fuel price effects on ticket price, and projected traffic and fuel useage between now and the year 2000. Actions taken by the airlines to reduce consumption are reviewed, as well as efforts currently underway to improve fuel consumption. Longer range technology payoffs resulting from NASA research programs are reviewed and results from studies on the use of alternate fuels are discussed. A.W.H.

N80-20272*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF WATER INJECTION AND OFF SCHEDULING OF VARIABLE INLET GUIDE VANES, GAS GENERATOR SPEED AND POWER TURBINE NOZZLE ANGLE ON THE PERFORMANCE OF AN AUTOMOTIVE GAS TURBINE ENGINE
Edward L. Warren Mar. 1980 35 p
(Contract EC-77-A-31-1040)
(NASA-TM-81415; E-333; DOE/NASA/1040-80/10) Avail: NTIS HC A03/MF A01 CSCL 21E

The Chrysler/ERDA baseline automotive gas turbine engine was used to experimentally determine the power augmentation and emissions reductions achieved by the effect of variable compressor and power engine geometry, water injection downstream of the compressor, and increases in gas generator speed. Results were dependent on the mode of variable geometry utilization. Over 20 percent increase in power was accompanied by over 5 percent reduction in SFC. A fuel economy improvement of at least 6 percent was estimated for a vehicle with a 75 kW (100 hp) engine which could be augmented to 89 kW (120 hp) relative to an 89 Kw (120 hp) unaugmented engine. Author

N80-20306*# United Technologies Corp., South Windsor, Conn.
LIGHTWEIGHT FUEL CELL POWERPLANT COMPONENTS PROGRAM Final Report, 18 Mar. 1974 - 31 Dec. 1979
R. E. Martin 22 Feb. 1980 103 p refs
(Contract NAS8-30637)
(NASA-CR-161412; FCR-1656) Avail: NTIS HC A06/MF A01 CSCL 10B

A lightweight hydrogen-oxygen alkaline fuel cell incorporated into the design of a lightweight fuel cell powerplant (LFCP) was analytically and experimentally developed. The powerplant operates with passive water removal which contributes to a lower system weight and extended operating life. A preliminary LFCP specification and design table were developed along with a lightweight power section for the LFCP design, consisting of repeating two-cell modules was designed. Two, four-cell modules were designed incorporating 0.508 sq ft active area space shuttle technology fuel cells. Over 1,200 hours of single-cell and over 8,800 hours of two-cell module testing was completed. The 0.25 sq ft active area lightweight cell design was shown to be capable of operating on propellant purity reactants out to a current density of 600ASF. Endurance testing of the two-cell module configuration exceeded the 2,500-hour LFCP voltage requirements out to 3700-hours. A two-cell module capable of operating at increased reactant pressure completed 1000 hours of operation at a 30 psia reactant pressure. A lightweight power section consisting of fifteen, two-cell modules connected electrically in series was fabricated. J.M.S.

N80-20340*# Massachusetts Inst. of Tech., Cambridge. Sloan Automotive Lab.
COMBUSTION AND OPERATING CHARACTERISTICS OF SPARK-IGNITION ENGINES Final Report, Jan. 1979 - Jan. 1980
John B. Heywood, James C. Keck, Gian Paolo Beretta, and Paula A. Watts 28 Mar. 1980 13 p refs
(Grant NsG-3245)
(NASA-CR-162896) Avail: NTIS HC A02/MF A01 CSCL 21B

The spark-ignition engine turbulent flame propagation process was investigated. Then, using a spark-ignition engine cycle simulation and combustion model, the impact of turbocharging and heat transfer variations or engine power, efficiency, and NO sub x emissions was examined. R.E.S.

N80-20404*# Kentucky Univ., Lexington. Inst. for Mining and Minerals Research.
EXPERIMENTAL LABORATORY MEASUREMENT OF THERMOPHYSICAL PROPERTIES OF SELECTED COAL TYPES Final Report
William G. Lloyd 13 Sep. 1979 113 p refs Prepared for JPL
(Contracts NAS7-100; JPL-955381)
(NASA-CR-162913; JPL-9950-317) Avail: NTIS HC A06/MF A01 CSCL 21D

A number of bituminous coals of moderate to high plasticity were examined, along with portions of their extrudates from the JPL 1.5-inch 850 F screw extruder. Portions of the condensed pyrolysis liquids released during extrusion, and of the gaseous products formed during extrusion were also analyzed. In addition to the traditional determinations, the coals and extrudates were examined in terms of microstructure (especially extractable fractions), thermal analysis (especially that associated with the plastic state), and reactivity towards thermal and catalyzed hydroliquefaction. The process of extrusion increases the fixed carbon content of coals by about 5% and tends to increase the surface area. Coals containing 25% or more DMF-extractable material show an increase in extractables as a result of extrusion, those initially containing less than 20% extractables show a decrease as a result of extrusion. Both the raw and extruded samples of Kentucky no. 9 coal are highly reactive towards hydroliquefaction, undergoing conversions of 75 to 80% in 15 min and 85-94% in 60 min in a stirred clave. A.R.H.

N80-20407# Chevron Research Co., Richmond, Calif.
REFINING AND UPGRADING OF SYNFUELS FROM COAL AND OIL SHALES BY ADVANCED CATALYTIC PROCESSES Quarterly Report, Jan. - Mar. 1979
R. F. Sullivan Apr. 1979 41 p
(Contract EX-76-C-01-2315)
(FE-2315-37) Avail: NTIS HC A03/MF A01

Pilot plant tests on the hydrotreating of SRC-2 process product indicate that this coal-derived feed is suitable for refining using advanced commercial petroleum processing technology. Nitrogen in the whole SRC-2 process product can be reduced to a concentration of less than 0.5 ppM in a single catalytic stage. Sulfur and oxygen can also be reduced to low levels; and at high severity, most of the aromatic compounds are converted to naphthenes. As the processing severity is decreased, product nitrogen increases and the product becomes more aromatic. In the latter case, further hydrotreating of the naphtha is required before it can be fed to the second stage of a catalytic reformer. Depending on the severity employed, the jet boiling range product must be further hydrogenated for specification jet fuel. Experiments were made to determine appropriate conditions for these processing steps. DOE

N80-20412# Institute of Gas Technology, Chicago, Ill.
SYNTHETIC FUELS FROM PEAT GASIFICATION
D. V. Punwani, S. A. Weil, J. E. Paganessi, and M. J. Kopstein (DOE, Washington, D.C.) 1979 7 p Presented at the 14th Intersoc. Energy Conversion Eng. Conf., Boston, 5-10 Aug. 1979
(Contract EW-78-C-19-0042)
(CONF-790803-55) Avail: NTIS HC A02/MF A01

U.S. peat resources are estimated to be about 1440 quads. Tests were conducted in laboratory and process development unit-scale equipment using peats. It was found that conversion of peat to synthetic fuel is technically feasible. The important gasification characteristics of the three peats is discussed. The peatgas process is described along with highlights of its economics for converting peat to substitute natural gas (SNG), benzene, and fuel oil. On the basis of the gasification characteristics, compared to coal, peat is a better raw material from which to make SNG as well as gasoline blending feedstock, in that a greater fraction of the energy results in these products and requires milder operating conditions. Also compared to coal, peat gasification permits more flexibility in the relative yields of gas and liquid hydrocarbons. The estimates show that the economics of converting peat (containing 50% moisture) to SNG is competitive with those of converting Eastern coal to SNG. DOE

N80-20413# Chem Systems, Inc., New York.
LIQUID PHASE METHANATION/SHIFT PILOT PLANT OPERATION AND LABORATORY SUPPORT WORK Final Report, 1 Jul. 1976 - 30 Nov. 1978
Mar. 1979 330 p
(Contract EX-76-C-01-2036)
(FE-2036-37) Avail: NTIS HC A15/MF A01

The liquid phase methanation (LPM) Pilot Plant construction was completed and shipped to the HYGAS Pilot Plant in Chicago, Illinois. The unit was reassembled and installed. Operations included seven runs totaling 2347 hours of on-stream time with 122 hours of methanation of HYGAS synthesis gas and 193 hours of steam-methane reformer gas. The basic operability of the process was demonstrated in this 50 fold scale-up from a smaller process development unit. Catalyst rate constants were determined and the LPM kinetic model was checked over a wide range of process conditions for three different catalysts. Information accumulated also includes extent of the shift reaction, by-product selectivities, catalyst bed fluidization and circulating oil stability. An experimental program studying the rates of carbon formation in vapor-phase methanators was conducted. DOE

N80-20414# Rockwell International Corp., Canoga Park, Calif. Environmental and Energy Systems Div.
ADVANCED DEVELOPMENT OF A SHORT-RESIDENCE-TIME HYDROGASIFIER Quarterly Technical Progress Report, 1 Jan. - 31 Mar. 1979
Apr. 1979 86 p refs
(Contract ET-78-C-01-3125)
(FE-3125-5; QTPR-2) Avail: NTIS HC A05/MF A01

Minor modification to the 1-TPH design were made so that the injector could be accommodated within the existing pressure vessel as a nominal 3/4-TPH hydrogasifier injector. One injector made out of Type 321 stainless steel was fabricated and delivered to the test stand. Other existing reactor hardware components were reevaluated with the viewpoint of assessing the need for any modifications. The needed modifications were completed, and all of the hardware was readied for installation at the test stand. Design work on the hydrogen cooled recuperator was initiated. The purpose of the recuperator is to recover the sensible heat from the reaction products by transferring it to the reactant hydrogen. A three module, shell and tube, counterflow type of heat exchanger concept has been chosen for this recuperator, and detailed design drawings were nearly completed. DOE

N80-20415# Oklahoma State Univ., Stillwater.
PHOTOCHEMICAL CONVERSION OF COAL TO GASOLINE IN AN ENTRAINED BED REACTOR Ph.D. Thesis
S. Sundaram Jul. 1979 252 p refs
(Contract EY-76-S-05-5020)
(ORO-5020-T1) Avail: NTIS HC A12/MF A01

Reading anthracite, Pittsburg Hi-Seam, Illinois No. 6, Utah Emery, Montana Rosebud, coals and synthane char were entrained in a rapidly flowing stream of hydrogen and then interacted with photoproduced hydrogen atoms. The reactivity of Illinois No. 6 coal was studied in detail. Products were collected in traps cooled by liquid nitrogen. Gas yields qualitatively decrease in the order given, i.e., with decreasing rank. The gaseous hydrocarbon produced corresponded to gasoline in the C1-C8 range, all isomers present and identified by GC-MS. The liquid products contained benzene, toluene, xylenes, naphthalenes, phenanthrene, pyrene, fluoranthene, benzanthracene, and benzopyrenes. The results suggest that the product distribution, yield and percent conversion are probably controlled by a rate limiting step in which phenanthrene type precursors are cracked from the coal surface and followed by secondary H atom reactions to produce smaller hydrocarbons. DOE

N80-20416# Department of Energy, Pittsburgh, Pa. Energy Technology Center.
COAL LIQUEFACTION WITH SYNTHESIS GAS
H. R. Appell, R. D. Miller, E. G. Illig, E. C. Moroni, and F. W. Steffgen Sep. 1979 65 p refs
(PETC/TR-79/1) Avail: NTIS HC A04/MF A01

The effects of changing gas composition, temperature, pressure, solvents, catalysts and coal types were studied to better understand the process fundamentals and to lay the groundwork for studies in continuous reactors on a larger scale. A variety of coals were converted in batch autoclaves to a low sulfur fuel oil at temperature of 425 C and pressures of 2200 to 2400 psig, using 1:1 (H2:CO) synthesis gas at reaction times of 30 to 60 minutes at temperature. Although early work suggested that lignites could be readily liquefied without added catalytic agents, later experiments showed that a greatly improved product could be obtained by adding pyrite, which is normally present only in small amounts. Pyrite or, in particular, its reduction product pyrrhotite, appear to be important catalysts for coal liquefaction, and, in general, the reactivity of coals correlates well with the pyrite (or iron plus sulfur) content. DOE

N80-20417# Department of Energy, Pittsburgh, Pa.
TRACE AND MINOR ELEMENT ANALYSES OF COAL LIQUEFACTION PRODUCTS
R. G. Lett, J. W. Adkins, R. R. DeSantis, and F. R. Brown Aug. 1979 37 p refs
(PETC/TR-79/3) Avail: NTIS HC A03/MF A01

The feed coal and products from a single batch of a long term liquefaction run on the 400 lb coal/day process development unit were sampled. Trace and minor element determinations were made on the Virginia hvAb feed coal, gross liquid product, and centrifuged liquid product and centrifuge residue from both the first and second centrifuging of the liquid product. Spark source mass spectrometry was used to determine the distribution and general level of about sixty elements. More precise determinations of specific trace (copper, chormium, manganese, nickel, zinc, lead, and cadmium) and minor elements (iron, silicon, aluminum, magnesium, and potassium) were made for elemental balance purposes. Results are compared with those previously obtained from a Kentucky hvBb coal run. Centrifugation of the liquid product from the West Virginia coal results in a preferential removal of iron and several other elements which were not observed in the Kentucky coal run. DOE

N80-20419# Energy and Environmental Analysis, Inc., Arlington, Va.
INDUSTRIAL FUEL CHOICE ANALYSIS MODEL. VOLUME 2: APPENDICES TO MODEL DOCUMENTATION
Jan. 1979 160 p refs
(Contract EJ-78-C-01-2832)
(DOE/EIA-2832/1-Vol-2-App) Avail: NTIS HC A08/MF A01

Description, documentation, and other information are included in these appendices dealing with industrial fuel choices, energy consumption data base; major fuel burning installation survey; American Boiler Manufacturers Association data file; midrange energy forecasting system; projection method; capacity utilization rates; nonboiler characteristics; boiler capital and O & M cost data; nonboiler capital and O & M cost data; approach to estimating energy impacts of the conversion regulatory program index or acronyms. DOE

N80-20422# Mobil Research and Development Corp., Princeton, N. J.
EXPLORATORY STUDIES IN CATALYTIC COAL LIQUEFACTION Final Report, Jun. 1978 - Mar. 1979
D. D. Whitehurst, T. O. Mitchell, M. Farcsiu, and J. J. Dickert, Jr. Sep. 1979 167 p refs
(EPRI-AF-1184) Avail: NTIS HC A08/MF A01

Catalyst aging tests simulating H-coal conditions with Illinois No. 6 coal were run for approximately 10 days with Cyanamid 1442A (CoMo/Al2O3), Cyanamid NiMo/Al2O3, Armak NiMo/ Al2O3, Amocat 1A (CoMo/Al2O3), and Amocat 1B (Mo/Al2O3) catalysts. Fresh and aged catalysts were examined for hydrogenation, hydrocracking, isomerization, desulfurization, denitrogenation, and deoxygenation. Several minerals were also included in the tests. Fresh commerical catalysts, especially NiMo/Al2O3, appear to be undesirably active for the H-Coal process. All catalysts age extensively but the used catalysts are still quite active. Activities for all reactions are reduced in the presence of nitrogen compounds. It was found that 400 F product mixtures become more complex as catalysts age, and that the catalysts affect especially the highest boiling products, but lose the ability to lower molecular weight as they age. Hydrogen donor catalyst systems are described briefly. DOE

N80-20423# Sandia Labs., Albuquerque, N. Mex.
CATALYST CHARACTERIZATION IN COAL LIQUEFACTION Quarterly Report, 1 Apr. - 30 Jun. 1979

M G Thomas Oct 1979 18 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1969; QR-3) Avail NTIS HC A02/MF A01

A charge of neutron activated CoMo catalyst was prepared for use in the H-Coal Process Demonstration Unit. Catalysts tested in a fixed bed with low ash feedstock and in ebullated and fixed beds with higher-ash containing feedstocks corroborate other evidence that the regions of high reflectivity near used catalyst surfaces are due to the pressure of containment mineral matter, primarily iron and titanium. Parametric experiments with coal, preasphaltene, asphaltene, and oil in tubing reactors show that production of hydrocarbon gases increases in the series oil asphaltene - preasphaltene, that both a CoMo catalyst and pyrite addition lowers the production of C1 to C4 hydrocarbons, and that pyrite significantly increases the amount of CO and CO2 generated. DOE

N80-20424# Southwest Research Inst., San Antonio, Tex Mobile Energy Div

STABILITY SURVEY OF HYDROCARBON FUELS Final Report

J N Bowden Oct 1979 35 p refs
(Contract EW-78-C-03-1778)
(BETC-1778-4) Avail NTIS HC A03/MF A01

The storage stability characteristics of No. 2 diesel fuels, JP-4 turbine fuels, and unleaded and leaded gasolines were evaluated. The 43.3 C storage stability test, which included gum determinations after periods of 4, 8, 16, and 32 weeks, was conducted on all samples. The thermal stability of the JP-4 fuels was also measured. Results indicate that the JP-4 fuels are the most stable, followed by the unleaded gasolines, leaded gasolines, and the diesel fuels. None of the jet fuels showed any degree of deterioration during the 32 weeks of storage, while at least one of each type of gasolines and four diesel fuels appeared to have some measure of unstability. DOE

N80-20425# Fluor Engineers and Constructors, Inc., Irvine, Calif

COAL LIQUEFACTION TEST CENTER Quarterly Technical Progress Report, Oct. - Dec. 1978

Jun. 1979 69 p
(Contract EX-76-C-01-1517)
(FE-1517-78) Avail NTIS HC A04/MF A01

Repairs from the damage incurred during the August fire were completed along with major modifications to the J-A608C/D hydrogenation reactor recycle pumps. Integrated operation of the Cresap Pilot Plant was carried out for two periods of 24 and 40 hours during Runs 014 and 015. Extraction operations in the front end totaled 37 and 7 hours for these runs. On stream hydrogenation time in section 600 consisted of 154 hours processing feedstock from storage and 64 hours on fresh extract. Because of the short periods of stabilized operation, characterization data collected were minimal. However, it is estimated that depth of extraction was about 75% on coal during each run. Hydrogenation effected about 80% conversion of - 880 F material and 60% sulfur reduction in final product. DOE

N80-20426# Conoco Coal Development Co., Library, Pa Research Div

ZINC HALIDE HYDROCRACKING PROCESS FOR DISTILLATE FUELS FROM COAL Annual Technical Progress Report, 1 Feb. 1978 - 31 Jan. 1979

C W Zielke, Melvyn Pell, C R Greene, J T Maskew, and R T Struck 15 May 1979 105 p refs
(Contract EX-76-C-02-1743)
(FE-1743-68) Avail NTIS HC A06/MF A01

Final results from the continuous bench-scale work showed that single stage liquefaction of Montana subbituminous coal can be operated up to 427 C and in multiple-stage operation, the final stage at 17.5 MPa can be as high as 496 C without coke formation. This will permit increased throughput and eliminate a melt extraction step in the process. A study of crushing and drying of subbituminous coal showed that the oxygen level in the drying gases can be controlled to a level where no degradation of the coal results. An economic study comparing direct coal feeding with producing SRC 1 and feeding it to zinc chloride processing showed an incentive for direct coal feeding. DOE

N80-20427# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst

SURVEY OF BIOMASS GASIFICATION. VOLUME 1: SYNOPSIS AND EXECUTIVE SUMMARY

Jul. 1979 45 p
(Contract EG-77-C-01-4042)
(SERI/TR-33-239-Vol-1) Avail NTIS HC A03/MF A01

The conversion of biomass into a clean burning gaseous fuel that can be used to retrofit existing gas/oil boilers, to power engines, to generate electricity, and as a base for synthesis of methanol, gasoline, ammonia, or methane is considered with emphasis on biomass gasification. Aspects reviewed include the technical background necessary for understanding the science, engineering, and commercialization of biomass; the present status of gasification processes; economics/gas conditioning; fuel synthesis; and the institutional role to be played by the federal government. Recommendations for future research and development are presented. DOE

N80-20428# McElroy (Ralph) Co., Austin, Tex.

PRODUCTION OF METHANE USING AN ANAEROBIC FILTER

Knud B. Pedersen Apr 1979 20 p Transl. into ENGLISH of Produccion de Metano Usando un Filtro Anaerobico (Puerto Rico), 5 Aug. 1978 22 p Sponsored by DOE Prepared for Argonne National Lab., Ill.
(ANL-Trans-1164) Avail NTIS HC A02/MF A01

The treatment of waste products using an anaerobic process results in methane gas as a by-product and this gas can be used as a source of energy. The viability of producing methane gas - under the conditions which are valid for Puerto Rico - from domestic sewage, using an anaerobic filter, are considered. DOE

N80-20429# Missouri Univ. -Rolla. Materials Research Center

CHEMICAL AND PHYSICAL STABILITY OF REFRACTORIES FOR USE IN COAL GASIFICATION Quarterly Progress Report, 1 Aug. - 31 Oct. 1979

Abbas Fakhr and Delbert E. Day 31 Oct. 1979 25 p refs
(Contract EY-76-S-02-2904)
(COO-2904-14) Avail NTIS HC A02/MF A01

The corrosion resistance of refractories, especially the bond phases, in high pressure/high temperature gases and liquids present in coal gasification environments are described. The results of completed exposures are given. Comparison of liquid versus vapor exposure, for various castables is given. As previously observed for castables exposed to pure steam, all the dense alumina castable had a higher strength after exposure to either the saturated vapor or immersed in liquid, compared with their controls (fired at 5000 F in air for 18 h). Results are reported. DOE

N80-20430# Argonne National Lab., Ill.

SUPPORT STUDIES IN FLUIDIZED-BED COMBUSTION 1978 ANNUAL REPORT Annual Report, Jul. 1977 - Sep. 1978

I. Johnson, G. J. Vogel, S. H. D. Lee, D. S. Moulton, and F. F. Numes Aug. 1979 112 p refs
(Contract W-31-109-eng-38)
(PB80-112758; ANL/CEN/FE-78-10; EPA-600/7-79-203) Avail NTIS HC A06/MF A01 CSCL 13B

Results of laboratory and process scale EPA studies supporting the national development of atmospheric and pressurized fluidized bed combustion (PFBC) of coal are presented. Limestone sulfation enhancement experiments showed CaCl2 and MgCl2 to be more effective than NaCl in increasing the pore size and hence the sulfation capability of calcined limestones. Experiments to evaluate coal pyrolysis char as a feedstock for FBC were conducted on Wyoming subbituminous coal pyrolyzed at about 650 C. Char combustion efficiencies were 94-99 percent. The use of oil shale for SO2 emission control in FBC was evaluated. Considerably larger quantities of shale (than limestone or dolomite) would be required because of shale's lower CaO content. GRA

N80-20506# National Bureau of Standards, Washington, D.C. Electron Devices Div.
MEASUREMENT TECHNIQUES FOR HIGH POWER SEMICONDUCTOR MATERIALS AND DEVICES Annual Report, 1 Oct. 1977 - 30 Sep. 1978
Oct. 1979 144 p refs
(DOE/RA-0041; NBSIR-79-1756) Avail: NTIS HC A07/MF A01

Results of research directed toward the development of measurement methods for semiconductor materials and devices which will lead to more effective use of high-power semiconductor devices in applications for energy generation, transmission, conversion, and conservation are reported. Emphasis is on the development of measurement methods for materials for thyristors and rectifier diodes. The use of thermally stimulated current and capacitance measurements and other deep level measurement techniques developed as a means for characterizing lifetime-controlling or leakage source defects in power grade silicon material and devices are described. Procedures to enable spreading resistance measurements of thyristor starting material and layer profiles to be made on a reliable basis are included. DOE

N80-20532*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FACTORS AFFECTING CLEANUP OF EXHAUST GASES FROM A PRESSURIZED, FLUIDIZED-BED COAL COMBUSTOR
R. James Rollbuhler and John A. Kobak Mar. 1980 37 p refs
(NASA-TM-81439; E-382) Avail: NTIS HC A03/MF A01 CSCL 20D

The cleanup of effluent gases from the fluidized-bed combustion of coal is examined. Testing conditions include the type and feed rate of the coal and the sulfur sorbent, the coal-sorbent ratio, the coal-combustion air ratio, the depth of the reactor fluidizing bed, and the technique used to physically remove fly ash from the reactor effluent gases. Tests reveal that the particulate loading matter in the effluent gases is a function not only of the reactor-bed surface gas velocity, but also of the type of coal being burnt and the time the bed is operating. At least 95 percent of the fly ash particules in the effluent gas are removed by using a gas-solids separator under controlled operating conditions. Gaseous pollutants in the effluent (nitrogen and sulfur oxides) are held within the proposed Federal limits by controlling the reactor operating conditions and the type and quantity of sorbent material. M.G.

N80-20551# Engineering Societies Commission on Energy, Inc., Washington, D. C.
BASIC RESEARCH IN ENGINEERING: FLUID DYNAMICS AND THERMAL PROCESSES
Aug. 1979 98 p refs Presented at the Fluid Dyn. and Thermal Processes Workshop, Lexington, Ky., 1 Feb. 1979
(Contract EF-77-C-01-2468)
(FE-2468-54; CONF-790240-1) Avail: NTIS HC A05/MF A01

Critical areas for research in fluid mechanics, separation phenomena, energy processing, and energy reactions are identified and discussed for four workshop papers. DOE

N80-20720 Case Western Reserve Univ., Cleveland, Ohio.
RESOURCE AND ENERGY CONSTRAINTS OF REGIONAL AND GLOBAL AVAILABILITY OF ALUMINUM COPPER, AND IRON 1975 - 2000: A COMPUTER STUDY Ph.D. Thesis
Aldo Francis Barsotti 1979 482 p
Avail: Univ. Microfilms Order No. 8005352

A computer submodel of a world integrated model system indicates that globally the resources and reserves of all three metals are more than adequate to meet projected metal needs, not only for the remainder of this century, but for at least through the year 2025 (assuming some accuracy of projections over that time horizon). The share of total energy needs accounted for by the metal (aluminum, copper and iron) industry varies considerably among countries. Based on economic settings in the model, and projections in growth of downline metal production capacity, the model indicates that forecasted energy production will be inadequate and have a major constraining effect on metal supply in most regions by the year 2000. The regions most affected by that shortage are Oceania, Japan, and Latin America. Because of its total lack of energy resources, Japan will be most vulnerable. Dissert. Abstr.

N80-20792# Nevada Bureau of Mines and Geology, Reno.
ASSESSMENT OF LOW- TO MODERATE-TEMPERATURE GEOTHERMAL RESOURCES OF NEVADA Final Report, Apr. 1978 - Jun. 1979
D. T. Trexler, Thomas Flynn, and Brian A. Koenig 1979 36 p refs
(Contract ET-78-S-08-1556)
(NVO-01556-1) Avail: NTIS HC A03/MF A01

A geothermal resource map of Nevada was produced that provides detailed information on low- to moderate-temperature geothermal systems, and that also evaluates their potential for direct non-electric utilization. The information shown on the map can be divided into two categories: spot data and regional assessment (or potential evaluation). Specific geochemical information, such as temperature, pH, and chemical species, is represented by approximately 300 circle and diamond-shaped symbols. Thirty-seven larger regions were evaluated for their potential for direct-use on the basis of a numerical technique, which is fully described. An additional 15 sites were designated as areas that may provide a basis for investigations, but that lack sufficient data for a detailed potential evaluation at this time. DOE

N80-20800# General Accounting Office, Washington, D. C. Energy and Minerals Div.
ANALYSIS OF CURRENT TRENDS IN U.S. PETROLEUM AND NATURAL GAS PRODUCTION
7 Dec. 1979 11 p
(PB80-116056; EMD-80-24) Avail: NTIS HC A02/MF A01 CSCL 08I

Petroleum and natural gas production in the U.S. is forecasted through the 1990's. It is concluded that production will decline in the 1980's, but could be stabilized in the 1990's provided new enhanced oil recovery techniques are utilized. Developments in frontier areas are also addressed. GRA

N80-20801# Texas Univ. at San Antonio. Div. of Environmental Studies.
ANALYSIS OF WATER RESOURCES REQUIREMENT FOR THE ENHANCED (TERTIARY) OIL RECOVERY IN THE SOUTHERN PLAINS REGION OF THE UNITED STATES
Chia Shun Shih and Susan H. Hamilton Sep. 1979 222 p refs
(Contract DI-14-34-0001-8120)
(PB80-110869; W80-01005; OWRT-B-218-TEX(1)) Avail: NTIS HC A10/MF A01 CSCL 08I

Water resources requirements are analyzed in terms of both water quantity and quality, for the anticipated enhanced oil recovery operations to be implemented in the Southern Plains region of the United States. The enhanced oil recovery potential of each oil-producing reservoir in the four states of Texas, Oklahoma, New Mexico, and Louisiana is assessed using parameters describing the basic characteristics of crude oil and the reservoir formation. The water quality impacts of enhanced recovery method are assessed considering surface water pollution by discharged chemicals and waste waters, groundwater pollution by the fracture of well casings, and infiltration of chemical and oil/water mixtures. GRA

N80-20806 North Carolina State Univ. at Raleigh.
COMPARISON OF THEORETICAL AND EXPERIMENTAL SOLAR CELL PERFORMANCE Ph.D. Thesis
Ching Yuh Robert Fang 1979 235 p
Avail: Univ. Microfilms Order No. 8005560

A detailed comparison of the theoretically predicted performance of silicon solar cells and the experimentally observed performance is presented. The comparison includes the dark one through five characteristics, the spectra response characteristics, and one through five characteristics under air mass zero illumination. In general it is found that the agreement between

theory and experimental behavior is very good. This good agreement is obtained for a variety of cells fabricated with junction depths ranging from 0.1 micrometer to more than 1 micrometer and for base layer resistivities from 10 ohms-cm to 0.1 ohms-cm
Dissert. Abstr.

N80-20807 Rensselaer Polytechnic Inst., Troy, N. Y.
A COMPARATIVE STUDY OF THE ENERGY ALTERNATIVES FOR THE STATE OF NEW YORK Ph.D. Thesis
Lewis Chester Cohen 1979 303 p
Avail: Univ. Microfilms Order No. 7922228

The energy supply and demand picture for the State of New York is examined. The alternatives available to meet future needs are compared. The subject matter is addressed in an interdisciplinary fashion, focusing on the economic, health, environmental, and technological state of the art of the various options. Major economic factors affecting the energy supply problem are illustrated. Various energy alternatives are discussed, which include coal use for gasification versus electrification, large scale generation of electricity, cogeneration, district heating and total energy systems, low lead hydrogeneration of electricity, fuels from biomass, wood, solid waste, solar, and wind. A suggested optimal energy path is developed, along with a scenario of how energy needs should be met. Dissert. Abstr.

N80-20810* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMBINED SOLAR COLLECTOR AND ENERGY STORAGE SYSTEM Patent
Ronald N. Jensen, inventor (to NASA) Issued 11 Mar. 1980 6 p Filed 28 Apr. 1978 Supersedes N78-23567 (16 - 14, p 1868)
(NASA-Case-LAR-12205-1; US-Patent-4,192,290; US-Patent-Appl-SN-900843; US-Patent-Class-126-437; US-Patent-Class-126-434; US-Patent-Class-165-32; US-Patent-Class-126-419) Avail: US Patent and Trademark Office CSCL 10A

A combined solar energy collector, fluid chiller and energy storage system is disclosed. A movable interior insulated panel in a storage tank is positionable flush against the storage tank wall to insulate the tank for energy storage. The movable interior insulated panel is alternately positionable to form a solar collector or fluid chiller through which the fluid flows by natural circulation. Official Gazette of the U.S. Patent and Trademark Office

N80-20811 California Univ., Los Angeles.
ENERGY CONSERVATION IN THE US: SOME INTERDISCIPLINARY APPROACHES WITH AN EMPHASIS ON INDUSTRIAL COGENERATION Ph.D. Thesis
Ali Khaki-Kashani 1979 273 p
Avail: Univ. Microfilms Order No. 8007434

The potential for energy conservation in the United States through industrial cogeneration and energy recovery from municipal solid waste was evaluated. Candidate industries with the highest potential for industrial cogeneration were identified, current and advanced energy conversion systems for cogeneration were analyzed and various cogeneration strategies to maximize the potential fuel savings, were considered. Future market potential, potential energy savings, and the national benefits of industrial cogeneration were studied. Technical analyses for cogeneration systems were performed at several industrial sites and detailed institutional, environmental, and economic analyses were conducted for major categories of institutional settings. The impact of the National Energy Act on the commercialization of industrial cogeneration was discussed. The current status of the various processes available for energy recovery from municipal solid waste was assessed along with the costs associated with each process.
Dissert. Abstr.

N80-20812*# Motorola, Inc., Phoenix, Ariz.
MARKET DEFINITION STUDY OF PHOTOVOLTAIC POWER FOR REMOTE VILLAGES IN THE UNITED STATES
Clyde Ragsdale and Prosper Quashie Feb. 1980 71 p
(Contract DEN3-49; Contract DE-AI01-79ET-20485)
(NASA-CR-159800; DOE/NASA/0049-80/1) Avail: NTIS HC A04/MF A01 CSCL 10B

A grass roots evaluation of the market potential was carried out for photovoltaic applications in remote villages in the U. S. and its possessions. An estimate of almost 14 MWp available for conversion from a potential to a real market was defined. The total power potential was based on the energy needs of almost 400 sites reported by Federal agencies and inputs from over 100 Indian tribes. The methodology used, the results achieved, and some recommendations of how to convert this domestic market potential into a real market are detailed. R.E.S.

N80-20813*# Honeywell, Inc., Minneapolis, Minn.
QUALIFICATION TEST PROCEDURES AND RESULTS FOR HONEYWELL SOLAR COLLECTOR SUBSYSTEM, SINGLE-FAMILY RESIDENCE
Washington, D.C. DOE Feb. 1977 43 p Prepared for NASA and DOE
(Contract NAS8-32093)
(NASA-CR-161382) Avail: NTIS HC A03/MF A01 CSCL 10B

The test procedures and results in qualifying the Honeywell single family residence solar collector subsystem are presented. Testing was done in the following areas: pressure, service loads, hail, solar degradation, pollutants, thermal degradation, and outgassing.
R.E.S.

N80-20814*# Pennsylvania Univ., Philadelphia. Moore School of Electrical Engineering.
ANALYSIS AND EVALUATION IN THE PRODUCTION PROCESS AND EQUIPMENT AREA OF THE LOW-COST SOLAR ARRAY PROJECT Quarterly Report, May - Aug. 1979
H. Goldman and M. Wolf Aug. 1979 63 p refs Prepared for JPL and DOE
(Contract JPL-954796)
(NASA-CR-162904; DOE/JPL-954796-79/7) Avail: NTIS HC A04/MF A01 CSCL 10A

The energy consumed in manufacturing silicon solar cell modules was calculated for the current process, as well as for 1982 and 1986 projected processes. In addition, energy payback times for the above three sequences are shown. The module manufacturing energy was partitioned two ways. In one way, the silicon reduction, silicon purification, sheet formation, cell fabrication, and encapsulation energies were found. In addition, the facility, equipment, processing material and direct material lost-in-process energies were appropriated in junction formation processes and full module manufacturing sequences. A brief methodology accounting for the energy of silicon wafers lost-in-processing during cell manufacturing is described. Author

N80-20820*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE 1979 GODDARD SPACE FLIGHT CENTER BATTERY WORKSHOP
Gerald Halpert, ed. Apr. 1980 521 p refs Workshop held in Greenbelt, Md., 13-15 Nov. 1979
(NASA-CP-2117) Avail: NTIS HC A22/MF A01 CSCL 10C

Papers discussing the latest results of testing, analysis, and development of the sealed nickel cadmium cell system are presented. Metal hydrogen and lithium cell technology and applications are also discussed. The purpose of the workshop was to share flight and test experience, stimulate discussion on problem areas, and to review the latest technology improvements.

N80-20821*# National Aeronautics and Space Administration, Washington, D. C.
OVERVIEW OF NASA BATTERY TECHNOLOGY PROGRAM
Robert W. Riebling *In* NASA. Goddard Space Flight Center The 1979 Goddard Space Flight Center Battery Workshop Apr. 1980 p 5-11
Avail: NTIS HC A22/MF A01 CSCL 10C

Highlights of NASA's technology program in batteries for space applications are presented. Program elements include: (1) advanced ambient temperature alkaline secondaries, which

are primarily nickel-cadmium cells in batteries; (2) a toroidal nickel cadmium secondaries with multi-kilowatt-hour storage capacity primarily for lower orbital applications; (3) ambient temperature lithium batteries, both primary and secondaries, primarily silver hydrogen and high-capacity nickel hydrogen
R.E.S.

N80-20830*# GTE Labs., Inc., Waltham, Mass.
LITHIUM THIONYL CHLORIDE HIGH RATE DISCHARGE
Keith A. Klinedinst *In* NASA. Goddard Space Flight Center The 1979 Goddard Space Flight Center Battery Workshop Apr. 1980 p 121-133
Avail: NTIS HC A22/MF A01 CSCL 10C

Improvements in high rate lithium thionyl chloride power technology achieved by varying the electrolyte composition, operating temperature, cathode design, and cathode composition are discussed. Discharge capacities are plotted as a function of current density, cell voltage, and temperature K.L.

N80-20831*# Boeing Aerospace Co., Seattle, Wash.
LITHIUM BATTERY DISCHARGE TESTS
Chris J. Johnson *In* NASA. Goddard Space Flight Center The 1979 Goddard Space Flight Center Battery Workshop Apr. 1980 p 135-146
Avail: NTIS HC A22/MF A01 CSCL 10C

The long term discharge of a variety of lithium cells was characterized and the susceptibility of the cells to chemical variation during the slow discharge was tested. A shunt resistor was set across the terminals to monitor the voltage as a function of time. Failures were identified by premature voltage drops K.L.

N80-20832*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
CHARACTERIZATION OF PROTOTYPE SECONDARY LITHIUM BATTERY
Robert Somoano *In* NASA. Goddard Space Flight Center The 1979 Goddard Space Flight Center Battery Workshop Apr. 1980 p 147-154
Avail: NTIS HC A22/MF A01 CSCL 10C

The performance characteristics of ambient temperature secondary lithium batteries were determined through continuous cycle tests with periodic current and voltage measurements. Cycle life of the lithium anode was found to be an important problem area as was the formation of dentrite breakage and subsequent shorting. Energy density was increased by using more efficient cathode structures. K.L.

N80-20834*# Exxon Enterprises, Inc., Somerville, N.J. Battery Div.
THE EXXON RECHARGEABLE CELLS
Paul A. Malachesky *In* NASA. Goddard Space Flight Center The 1979 Goddard Space Flight Center Battery Workshop Apr. 1980 p 169-178
Avail: NTIS HC A22/MF A01 CSCL 10C

The design and performance of ambient temperature secondary cells based on the titanium disulfide cathode are discussed. These limited performance products were developed for microelectronic applications such as solar rechargeable watches and clocks which require low drain rate and do not require many deep cycles K.L.

N80-20846*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LIFE TEST RESULTS OF THE NASA STANDARD 20 AMPERE HOUR CELLS
Gerald Halpert *In its* The 1979 Goddard Space Flight Center Battery Workshop Apr. 1980 p 321-330

Avail: NTIS HC A22/MF A01 CSCL 10C

The data collected from life cycle tests results of a 20-ampere cells are discussed. A total of 50 cells were evaluated. R.C.T.

N80-20864*# General Electric Co., Philadelphia, Pa. Space Div.
MOD 1 WIND TURBINE GENERATOR FAILURE MODES AND EFFECTS ANALYSIS
Feb. 1979 95 p
(Contracts NAS3-20058; EX-77-A-29-1010)
(NASA-CR-159494; DOE/NASA/0058-79/1) Avail: NTIS HC A05/MF A01 CSCL 10B

A failure modes and effects analysis (FMEA) was directed primarily at identifying those critical failure modes that would be hazardous to life or would result in major damage to the system. Each subsystem was approached from the top down, and broken down to successive lower levels where it appeared that the criticality of the failure mode warranted more detail analysis. The results were reviewed by specialists from outside the Mod 1 program, and corrective action taken wherever recommended. A.R.H.

N80-20865*# Honeywell, Inc., Minneapolis, Minn.
SOLAR ENERGY HEATING SYSTEM DESIGN PACKAGE FOR A SINGLE-FAMILY RESIDENCE AT NEW CASTLE, PENNSYLVANIA
Aug. 1977 187 p Prepared for DOE
(Contract NAS8-32093)
(NASA-CR-161356) Avail: NTIS HC A09/MF A01 CSCL 10A

The design of a solar heating and hot water system for a single family dwelling is described. Cost trade studies on the energy conservation and architectural features of the solar house are discussed. The present status of verification for the single family heating system, i.e., proof that the components and the system meet applicable physical and functional requirements, is reported. The system integration drawings, the major subsystems drawings, and the architect's specifications and plans are included. A.W.H.

N80-20866*# Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.
SOLAR HEATING SYSTEM DESIGN PACKAGE FOR A SINGLE-FAMILY RESIDENCE AT WILLIAM O'BRIEN STATE PARK, MINNESOTA
Jul. 1977 173 p Prepared for NASA and DOE
(Contract NAS8-32093)
(NASA-CR-161357) Avail: NTIS HC A08/MF A01 CSCL 10A

The plans, specifications, cost trade studies, and verification status of a prototype solar heating and hot water system for the Minnesota Department of Natural Resources's single-family dwelling located at O'Brien State Park, 30 miles east of Minneapolis, Minnesota are presented. R.E.S.

N80-20867# Army Armament Research and Development Command, Dover, N. J. Management Information Systems Directorate.
THE APPLICATION OF DC-DC ENERGY CONVERSION IN A SOLAR ENERGY SYSTEM Final Report
John P. Tobak Sep. 1979 156 p
(AD-A077112; AD-E400363; ARMID-TR-78002) Avail: NTIS HC A08/MF A01 CSCL 10/2

Expressions of voltage gain, current, and efficiency are developed for each of five different methods of DC-DC energy conversion. One of the five methods is selected as the design model for a prototype converter to be used in solar energy applications. Both the prototype's performance and the test methods employed are described. Efficiencies as high as 86% are measured along with a constant voltage line regulation of 0.04 volts per volt and a constant voltage load regulation of 0.034 volts per ohm. The prototype acts as a constant 12-volt power supply capable of delivering up to 10-amp currents. GRA

N80-20868# Little (Arthur D.), Inc., Cambridge, Mass.
WIND ENERGY IN THE MOUNTAINS OF NEW HAMPSHIRE AS A POTENTIAL ENERGY SOURCE FOR PORTSMOUTH NAVAL SHIPYARD Final Report
William A. Vachon, William T. Downey, Frederic March, Frederick R. Madio, Gerald A. Schimke, and John E. Wade Oct. 1979 188 p
(Contract N00014-79-C-0536; NR Proj. 521-710)
(AD-A076975) Avail: NTIS HC A09/MF A01 CSCL 04/2

A feasibility study was conducted to determine whether the wind energy in the mountainous regions of New Hampshire could be used as a possible energy course for the Portsmouth Naval Shipyard in Portsmouth, New Hampshire. The results indicate that there is adequate wind energy available at mountain sites to drive even the largest wind turbine generators (WT's) now planned, and that many potential sites exist in relatively close proximity to utility lines. Eight specific sites were identified on the basis of available wind speed data, the incidence of severe icing, environmental constraints, plus on-site interpretation of vegetative deformation by the wind (tree flagging). Based on the experiences of this study there appears to be a limited number of available WT sites which have sufficient geographic extent to support large clusters (i.e., farms) of WT's of approximately 20-100 MW rating. Technically, the local utility can 'wheel' power to the Naval Shipyard from mountain sites, but doing so would not be cost-effective for the Shipyard because of an abundance of on-site, low-cost cogenerated electricity. A simple near-term approach to wind power development in New Hampshire appears to be through the private exploitation of WT clusters of less than 5 MW capacity on private land. GRA

N80-20869# Army Electronics Research and Development Command, Fort Monmouth, N. J. Electronics Technology/Devices Lab.

MILITARIZED THERMOELECTRIC POWER SOURCES

G. Guazzoni, A. Herchakowski, and J. Angello Jul. 1979 9 p refs

(DA Proj. 1L1-62705-AH-94)

(AD-A075609; DELET-TR-79-17) Avail: NTIS HC A02/MF A01 CSCL 10/2

Thermoelectric power sources are being developed to provide multifuel, silent, maintenance free tactical power generators for forward area applications. Recent technology improvements, state of development, and performance characteristics of the 100-Watt and 500-Watt Thermoelectric Power Sources are presented. Author (GRA)

N80-20870# Air Force Inst. of Tech., Wright-Patterson AFB, Ohio. School of Engineering.

COMPUTER SIMULATION OF A SOLAR ENERGY SYSTEM WHICH UTILIZES FLAT-PLATE COLLECTORS M.S. Thesis

Barry Eugene Prins Dec. 1979 102 p refs

(AD-A079906; AFIT/GAE/AA/79D-15) Avail: NTIS HC A06/MF A01 CSCL 10/2

This thesis is a computer simulation of a solar energy system that utilizes flat-plate solar collectors. By using available data from the U.S. Weather Bureau, the location and orientation of the collector, characteristics of the collector, and the type of storage and backup heat system in use, it is possible to find the amount of solar energy collected and transferred to storage. A life cycle cost analysis can be accomplished by using financial data and an inflation-discount function to reduce all costs to present year dollars. By varying any of a number of parameters the operator can determine what effect it has on the amount of energy collected and the life cycle costs. Results of running the program for a solar water heater system indicate that such a system is cost effective, when compared to a gas water heater system, only when the federal and state tax incentives were taken into account. However, electricity is approximately three times as expensive as gas per BTU of energy gained so the solar energy system is economically feasible when compared to an electric water heating system. GRA

N80-20873# Thermo Electron Corp., Waltham, Mass.

DOE/JPL ADVANCED THERMIONIC TECHNOLOGY PROGRAM Progress Report, Dec. 1978 - Jan. 1979

1979 63 p refs

(Contract EY-76-C-02-3056)

(COO-3056-37; PR-37) Avail: NTIS HC A04/MF A01

Continuing research on thermionic converters is described. Topics include thermionic converter plasma studies, low temperature converter development, component hardware development, and combustion heated thermionic device. Basic surface experiments, tripole converter experiments, design of cylindrical converter, and high efficiency conversion experiments are described. DOE

N80-20874# Sandia Corp., Albuquerque, N. Mex. Advanced Energy Projects Div.

MECHANICAL ENERGY STORAGE TECHNOLOGY DEVELOPMENT Annual Report, 1978 - 1979

Sep. 1979 31 p refs

(Contract EY-76-C-04-0789)

(SAND-79-1151) Avail: NTIS HC A03/MF A01

Program efforts to evolve components for flywheel energy storage systems are described. Components discussed include: commercial wheels, bearings, and vacuum technology. R.E.S.

N80-20876# Burns and McDonnell, Kansas City, Mo.

FEASIBILITY OF COGENERATION APPLICATION OF A 4.8 MW FUEL CELL POWER PLANT AT A SANTA CLARA, CALIFORNIA PAPER MILL Final Report

D. E. Criner Jul. 1979 300 p refs

(Contract ET-78-C-03-2189)

(SAN-2189-T1; Rept-78-805-4-005) Avail: NTIS HC A13/MF A01

The feasibility of employing a 4.8-MW fuel cell power plant in a cogeneration mode was evaluated. Ways for utilizing the waste heat from the fuel cell within the paper mill were studied. Several uses were identified which would reduce the amount of process steam now generated by conventional fossil fuel boilers in the paper mill. The electrical energy from the fuel cell could be fed to the municipal electric system or could be used directly by the paper mill, depending upon the form of ownership for the fuel cell. Economic analyses were performed for several scenarios involving different fuels and ownership arrangements. Breakeven capital costs for the fuel cell power plant were computed for the various scenarios. Sensitivity studies were performed to determine the impact of variations in assumed base values for fuel price, electric rates, and other parameters. The environmental implications of the fuel cell power plant were also assessed. DOE

N80-20877# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.

ENERGY EFFICIENT BUILDINGS PROGRAM Annual Report

Aug. 1979 68 p refs

(Contract W-7405-eng-48)

(LBL-9576; EEB-79-5) Avail: NTIS HC A04/MF A01

Experimental and theoretical research into energy use in buildings, and the analysis of energy conservation strategies and measures are outlined. Topics discussed include: (1) building envelopes program, (2) ventilation program, (3) indoor air quality - gas stove emissions, (4) DOE-1 computer program for building energy analysis, (5) schools program, (6) hospitals program; (7) energy efficient windows program; (8) energy efficient lighting program, and (9) passive systems analysis and design. DOE

N80-20878# Argonne National Lab., Ill. Energy and Environmental Systems Div.

PROJECTIONS OF DIRECT ENERGY CONSUMPTION BY MODE: THE 1975 - 2000 BASELINE

Rita E. Knorr and Marianne Miller Aug. 1979 139 p refs

(Contract W-31-109-eng-38)

(ANL/CNSV-4) Avail: NTIS HC A07/MF A01

A comprehensive set of activity and energy-demand projections are presented for each of the major transportation modes and submodes. Projections were developed for a business-as-usual case which provides a benchmark for assessing the impact of potential conservation strategies. This baseline case assumes a continuation of present trends and no new energy-conserving programs beyond currently mandated fuel economy stands. However, because of anticipated changes in personal vehicle fuel economy, fuel prices, modal shifts, and a lower than historic rate of economic growth, projected growth rates in transportation activity and energy consumption depart from historic patterns. The factors responsible for this departure are discussed. The assumption and methodologies used to develop the modal projections are described and the projections are discussed with other efforts. DOE

N80-20879# Illinois Univ., Chicago. Dept. of Energy Engineering.
THERMAL FLUID SELECTION FOR LONG-DISTANCE HEAT TRANSMISSION
S. Szepe and J. M. Calm 1979 8 p refs Presented at the 14th Intersoc. Energy Conversion Conf., Boston, 5 Aug. 1979 Prepared in cooperation with Argonne National Lab., Ill.
(Contract W-31-109-eng-38)
(CONF-790803-47) Avail: NTIS HC A02/MF A01

A model for evaluating fluids for long distance thermal energy transport is presented. The model uses power function approximations for physical and economical relations, and its simplified version provides analytical insights into the optimal allocation of major cost components as well as a solution for the total transmission cost. The model was used to develop a criterion for screening candidate liquids for long distance thermal energy transport. The criterion derived is dependent on the physical properties and unit costs of the candidate fluids, and on the transport requirements. It can be used for fast screening and ranking of a great number of fluids. This approach may save considerable effort by eliminating the need for detailed engineering, economic, environmental, and safety studies on those fluids which would ultimately prove economically undesirable. Representative fluids are discussed and compared with the reference case of transmission by hot water. DOE

N80-20880# Dubin-Bloome Associates, New York.
HEAT-PUMP-CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS: SYSTEM DEVELOPMENT Final Report
Fred S. Dubin, Paul Herzog, and Amos Halfon Aug. 1979 450 p refs
(Contract W-31-109-eng-38)
(ANL/CNSV-TM-8) Avail: NTIS HC A19/MF A01

The performance of heat-pump centered integrated community energy systems (HP-ICES) is reported for two case studies, one in Washington, D.C. and the other in Boston, Massachusetts. The ice-generating HP-ICES uses the heat of fusion of water as a heat source for the heat pump, thus converting the water into ice. The ice is sorted in a bin and used the following summer for cooling, which, therefore, could be considered a byproduct of heating. The annual source energy input and the return on investment is cited for each project. The life cycle annual average cost and annual average operating and administration cost for the HP-ICES is given in comparison to corresponding quantities and costs of a conventional central system with equal heating and cooling capacity. DOE

N80-20881# Technical Information Center, Oak Ridge, Tenn.
ENERGY INFORMATION DATA BASE Report, Feb. 1978 - Sep. 1979
Sep. 1979 124 p refs Supplement to TID-4579-R10
(DOE/TIC-4579-R10-Suppl-6) Avail: NTIS HC A06/MF A01

Changes and additions to TID-4579-R10 (the authority list for serial titles) are presented. The supplement is cumulative from February 1978. DOE

N80-20882# Midwest Research Inst., Golden, Colo.
CONVERSION SYSTEM OVERVIEW ASSESSMENT. VOLUME 1: SOLAR THERMOELECTRICS
T. S. Jayadev, J. Henderson, J. Finegold, and D. Benson Aug. 1979 214 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-35-078-Vol-1) Avail: NTIS HC A10/MF A01

An assessment of thermoelectrics for solar energy conversion is given. There is significant potential for solar thermoelectrics in solar technologies where collector costs are low, e.g., Ocean Thermal Energy Conversion and' solar ponds. Reports of two studies by manufacturers assessing the cost of thermoelectric generators in large scale production are included and several new concepts thermoelectric systems are presented. DOE

N80-20883# Midwest Research Inst., Golden, Colo.
WIND ENERGY INFORMATION DIRECTORY
Oct. 1979 30 p refs
(Contract EG-77-C-01-4042)
(SERI/SP-69-290) Avail: NTIS HC A03/MF A01

Wind Energy Information was prepared to provide researchers, designers, manufacturers, distributors, dealers, and users of wind energy conversion systems, with easy access to technical information. This directory lists organizations and publications which have the main objective of promoting the use of wind energy conversion systems, some organizations that can respond to requests for information on wind energy or make referrals to other sources of information, and some publications that occasionally include information on wind energy. DOE

N80-20884# Physical Sciences, Inc., Woburn, Mass.
PERFORMANCE MODEL FOR MOLTEN CARBONATE FUEL CELLS Final Report, 5 Jul. 1978 - 5 Jul. 1979
G. Wilemski, T. Wolf, D. Bloomfield, M. L. Finson, E. R. Pugh, and K. L. Wray Aug. 1979 171 p refs
(Contract ET-78-C-03-2083)
(TR-190) Avail: NTIS HC A06/MF A01

The development of a performance model for molten carbonate fuel cells is reported. Key physical and chemical phenomena modeled include mass transport, ohmic losses, electrode kinetics, fuel and oxidant utilization, gas phase convective heat transfer and in-plane heat conduction through cell hardware. Numerical schemes were developed and programmed to calculate overpotential versus current density curves for individual electrodes, current-voltage performance curves for entire cells, the cell current density distribution, and the cell temperature distribution. Agreement between model predictions and available experimental data for isothermal electrode and cell performance ranges from good to excellent. Predictions of nonisothermal cell performance are also presented and discussed. DOE

N80-20885# Energy and Environmental Analysis, Inc., Arlington, Va.
INDUSTRIAL SECTOR TECHNOLOGY USE MODEL (ISTUM): INDUSTRIAL ENERGY USE IN THE UNITED STATES, 1974 - 2000. VOLUME 2: RESULTS Final Report
Oct. 1979 117 p
(Contract EX-76-C-01-2344)
(DOE/FE-2344/2) Avail: NTIS HC A06/MF A01

The results of the initial base-case run of ISTUM are presented in four sections: (1) introduction, (2) projected trends in industrial fuel consumption, (3) projected contributions of technologies to the industrial sector (fossil, conservation, solar, geothermal, coal direct heat cogeneration, conventional technologies); and (4) service sector perspectives of ISTUM base-case results (steam sector, intermediate and dirty direct heat, coal-capable indirect heat, machine-drive service sector, electrolyte sector, space heat, not coal-capable indirect heat, calcining, glass melting, brick and clay firing, iron making, steel reheating). DOE

N80-20886# Brookhaven National Lab., Upton, N. Y.
HYDROGEN STORAGE FOR AUTOMOBILES
G. Strickland 1979 4 p refs Presented at the DOE Chem Energy Storage and Hydrogen Energy Systems Contracts Rev Meeting, Reston, Va., 12 Nov. 1979
(Contract EY-76-C-02-0016)
(BNL-26906; CONF-791127-5) Avail: NTIS HC A02/MF A01

An analysis of hydrogen-fueled automobiles is presented. The hydrogen is stored either as a metal hydride at moderate pressure in TiFe-Mn-H/sub x/ and at low pressure in MgH/sub x/ catalyzed with 10 wt % Ni, or it is stored in hollow glass microspheres at pressures up to about 400 atm. Each system is briefly described. The results of the vehicle analysis are compared with those for the conventional automobile and with electric vehicles powered by Pb-acid or Ni-Zn batteries. Comparisons are made on the basis of automobile weight, initial user cost, and life-cycle cost. The results are limited to those for the 5-passenger vehicle in the period 1985-1990, and are provided as probable and optimistic values. DOE

N80-20887# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
RESIDENTIAL SOLAR HEATING AND COOLING USING EVACUATED TUBE SOLAR COLLECTORS: CSN SOLAR

HOUSE 3 Final Report, 1 Feb. 1976 - 30 Sep. 1978
D S Ward J C Ward and H S Oberoi Mar 1979 119 p refs
(Contract EY-76-S-02-2858)
(COO-2858-24-Summ) Avail NTIS HC A06/MF A01

A residential solar heating and cooling system utilizing an array of evacuated tube solar collectors was evaluated The evacuated tube collectors were removed and replaced with a state of the art liquid-heating flat plate solar collector array The installation, performance, and operating experience of the evacuated tube solar collector integrated with the CSU Solar House 3 residential sized solar heating and cooling system was examined
DOE

N80-20888# General Atomic Co , San Diego, Calif
INSTALLATION AND STARTUP OF THE FIXED MIRROR SOLAR CONCENTRATOR COLLECTOR FIELD SUBSYSTEM Final Report, 31 Jan. 1977 - 31 Mar. 1979
G H Eggers Jun 1979 111 p refs
(Contract EY-76-C-04-0789)
(GA-A-15344 SAND-79-7015) Avail NTIS HC A06/MF A01

The design, fabrication, installation, and startup of the fixed mirror solar concentrator is described The total system cost was $773 per m squared The system cost projection for a commercial plant is $188.73 per m squared At design conditions, with the oil inlet temperature at 245 C and the oil outlet temperature at 316 C, the peak system efficiency at noon was 36.8%
DOE

N80-20889# Woodard-Clyde Consultants, San Francisco, Calif Fossil Fuel and Advanced Systems Div
ENVIRONMENTAL ASSESSMENT METHODOLOGY: SOLAR POWER PLANT APPLICATIONS. VOLUME 3. ENVIRONMENTAL IMPACT ASSESSMENT APPLICATION Final Report
K Nair and A Sicherman May 1979 112 p refs
(EPRI Proj 551)
(EPRI-ER-1070-Vol-3) Avail NTIS HC A06/MF A01

The environmental impact assessment methodology described in another volume is applied to a problem of site selection for solar thermal power plants Environmental impact assessment of selected solar thermal sites are compared Certain potential impacts of solar thermal and wind energy central systems are examined In appendix A a data base system that was used to organize the literature on selected data base sites is described Appendix B contains detailed calculations and preliminary data used in the environmental impact assessment Appendix C presents a discussion of generic attributes for measuring biological impacts Appendix D is a selected bibliography of general references dealing with environmental impacts of solar-thermal and wind energy central systems
DOE

N80-20890# California Univ , Berkeley Lawrence Berkeley Lab Energy and Environment Div
EVALUATION OF A SULFUR OXIDE CHEMICAL HEAT STORAGE PROCESS FOR A STEAM SOLAR ELECTRIC PLANT
Joshua Dayan, Scott Lynn, and Alan Foss Jul 1979 198 p refs Revised
(Contract W-7405-eng-48)
(LBL-7868-Rev) Avail NTIS HC A09/MF A01

A technically feasible process configuration was developed for the sulfur oxide system 2 SO3 reversible 2 SO2 + O2 in energy storage Complete material and energy balances are presented for a base case that represents a middle range of expected operating conditions Equipment sizes and costs were estimated for the base case to obtain an approximate value for the cost of the electricity that would be produced from such an installation In addition, the sensitivity of the efficiency of the system to variations in design and operating conditions was determined for the most important parameters and design details The overall efficiency of converting heat into electricity is about 26%
DOE

N80-20891# Sandia Labs., Albuquerque, N. Mex.
DARRIEUS VERTICAL AXIS WIND TURBINE PROGRAM OVERVIEW
Richard H. Braasch 1979 15 p refs Presented at the 4th Biennial Conf and Workshop on Wind Energy Conversion Systems, Washington, D.C., 28 Oct 1979
(Contracts EY-76-C-04-0789, DE-AC04-76DP00789)
(SAND-79-2146C; CONF-791097-1) Avail: NTIS HC A02/MF A01

Some of the more salient recent developments in the Darrieus vertical axis wind turbine technology are presented. First generation costs and future plans are discussed. Potential design improvements are presented along with their cost benefits. Aerodynamic structural, and system analyses capabilities were developed to support and evaluate the system design. DOE

N80-20892# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
WIND ENERGY SYSTEMS Quarterly Review, 1 Jul. - 30 Sep. 1979
Dec 1979 176 p
(Contract EG-77-C-01-4042)
(SERI/PR-351-480) Avail NTIS HC A09/MF A01

An overview of the wind energy systems (WES) program is presented. The objectives, accomplishments, activities, and outputs of each of the tasks in the WES program are described. DOE

N80-20893# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst
OPTICAL ANALYSIS AND OPTIMIZATION OF LINE FOCUS COLLECTORS
P Bendt, A Rabl, H W Gaul, and K A Reed Sep 1979 73 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-34-092) Avail NTIS HC A04/MF A01

A macroscopic approach to the optical analysis of a solar concentrator is described The method yields all the parameters needed for the optical design of line focus parabolic troughs The flux at the receiver is determined as a function of concentrator along with receiver size, width of Sun, and optical errors All causes of image spreading are quantified as angular standard deviation Ray tracing with a real reflector and a real Sun is shown to be equivalent to convoluting the angular acceptance function of a perfect concentrator with an effective radiation source This effective source, in turn, is obtained by convoluting the distribution function of optical errors with the angular profile of the Sun The problem is reduced to two dimensions by projecting the three dimensional motion of the Sun on the plane normal to the tracking axis In this frame the apparent width of the Sun increases with incidence angle A formula and a simple graphical procedure are provided for finding the optimal geometric concentration ratio, maximizing net power output The results are illustrated by specific examples
DOE

N80-20894# TRW, Inc , McLean, Va Energy Systems Group
THERMAL ENERGY STORAGE APPLICATION AREAS
Mar 1979 105 p
(Contract EC-77-C-01-5113)
(CONS/5113-T4) Avail NTIS HC A06/MF A01

The use of thermal energy storage in the areas of building heating and cooling, recovery of industrial process and waste heat, solar power generation, and off-peak storage and load management in electric utilities is reviewed DOE

N80-20895# Center for Legislative Improvement, Denver, Colo
ENERGY SOURCE BOOK
Dewitt John and Davey Klearman Aug 1979 167 p
(Contract EW-78-X-48-0409)
(DOE/TIC-10190) Avail NTIS HC A08/MF A01

Data are compiled on energy sources for the Rocky Mountain Region The National Energy Act, major Federal energy legislation, and the state energy legislation, 1974-1979, are covered Energy consumption and conservation are discussed with the aid of charts and statistics Topics discussed include potential for energy conservation in the Mountain-Plain States; potential energy savings from Weatherization, residential energy conservation programs, and thermal efficiency standards for new buildings, energy reserves and production by state: oil, gas, coal, and uranium; potential for energy production from renewable and non-conventional sources; oil refining capacity; pipelines and movement of petroleum; electrical generation; water requirements for energy production; and severance taxes in the Mountain-Plain States. Information sources and a glossary are provided. DOE

N80-20896# Brookhaven National Lab., Upton, N. Y.
PERFORMANCE OF HEAT PUMPS AT ELEVATED EVAPORATING TEMPERATURES WITH APPLICATION TO SOLAR INPUT
E. A. Kush 1979 9 p refs Presented at the ASME Ann. Meeting, New York, 3-7 Dec. 1979
(BNL-26772; CONF-791205-15) Avail: NTIS HC A02/MF A01

The performance of the heat pump component in the solar-assisted heat pump (SAHP) system was investigated under conditions attendant to series solar input. Theoretical predictions, results of systematic experiments run on a special heat pump simulator, and interpretation/analysis of how high coefficients of performance heat pumps can be used in installed SAHP systems are presented. DOE

N80-20897# Los Alamos Scientific Lab., N. Mex.
THE 1-GWh DIURNAL LOAD-LEVELING SUPERCONDUCTING MAGNETIC ENERGY STORAGE SYSTEM REFERENCE DESIGN. APPENDIX C: DEWAR AND STRUCTURAL SUPPORT
J. G. Bennett and F. D. Ju Sep. 1979 56 p refs
(Contract W-7405-eng-36)
(LA-7885-MS-Vol-6) Avail: NTIS HC A04/MF A01

The mechanical aspects of the dewar to contain a 1-GWh superconducting coil in a 1.8 K helium bath are discussed along with the means for supporting the coil and dewar against the rock of an underground excavation. DOE

N80-20898# Oak Ridge National Lab., Tenn.
PERSPECTIVE ON WORLD ENERGY
Truman D. Anderson 25 Sep. 1979 25 p
(Contract W-7405-eng-26)
(DOE/TIC-10273) Avail: NTIS HC A02/MF A01

The problems associated with a rapidly increasing world population in the midst of fixed land resources are addressed. The unconventional resources of oil, gas, and uranium are compared in terms of abundance to conventional reserves. Nuclear fission energy is evaluated for its capability of solely supporting the world energy demands. DOE

N80-20899# Spectrolab, Inc., Sylmar, Calif.
DESIGN AND FABRICATION OF PROTOTYPE COMBINED PHOTOVOLTAIC/THERMAL NON-TRACKING COLLECTOR
H. Jandorf, L. Flourswetz, and F. M. Schwartz Jun. 1979 56 p
(Contract EY-76-C-04-0789)
(SAND-79-7014) Avail: NTIS HC A04/MF A01

Work performed to design, fabricate, test and analyze future production costs of a combined photovoltaic/thermal collector is summarized. Design improvement recommendations and future applications of the combined collector are considered. DOE

N80-20900# Wisconsin Univ. - Madison.
INTERFEROMETRIC STUDY OF THE NATURAL CONVECTION CHARACTERISTICS OF FLAT PLATE, SLAT AND VEE-CORRUGATED SOLAR COLLECTORS Final Report
M. M. ElWakil and J. W. Mitchell 30 Jun. 1979 7 p
(Contract EY-76-S-02-2971)
(COO-2971-6) Avail: NTIS HC A02/MF A01

The natural convection heat transfer relations for the heat transfer between absorber and cover plates of solar collectors were studied. Interferometric techniques were employed to evaluate the local coefficients. Average values were obtained by integration of the local values. The results are presented in terms of correlations between Nusselt number and Grashof number. The investigations were carried out over tilt angles of 45 to 90 degrees. The Grashof number range tested was representative of that existing in flat plate collectors. The various geometrics included large flat enclosures, small aspect ratio enclosures representative of honeycomb or slat collectors, vee-corrugated uranium; potential for energy production from renewable and (vee-grooved) collectors, and compound parabolic concentrators. DOE

N80-20901# California Univ., Berkeley. Lawrence Berkeley Lab.
METHODOLOGY FOR EVALUATING PHYSICAL CONSTRAINTS ON RESIDENTIAL SOLAR ENERGY USE
P. L. Smith and S. T. McCreary 1979 73 p refs
(Contract W-7405-eng-48)
(UCRL-15001) Avail: NTIS HC A04/MF A01

A procedure is set forth for assessing physical constraints on solar energy use at the site scale and for computerized findings as a data base for analysis at the community, sub-community, and individual parcel scales. Background information regarding the development of the project is presented. Next, the solar technologies being considered, their requirements for optimal performance, and physical constraints on the achievement of those requirements are described. This theoretical discussion is followed by a description of its application to a case study community. A discussion of the types of analyses in which the computerized data can be used is followed by a discussion of the way in which these analyses can be used at various points in governmental and private planning and decision-making processes. DOE

N80-20902# Mitre Corp., McLean, Va.
STATUS OF THE DOE BATTERY AND ELECTROCHEMICAL TECHNOLOGY PROGRAM
R. Roberts Sep. 1979 177 p refs
(Contract ET-78-C-01-3295)
(MTR-8026) Avail: NTIS HC A09/MF A01

Research on electrochemical storage systems is reviewed with emphasis on secondary batteries. Batteries in the research, development, and demonstration phases include nickel/iron, lithium/metal sulfide, zinc/chloride, metal/air, and hydrogen/chlorine. Supporting research on the morphology of active materials and cell performance is also reviewed. Potential contributions of the battery program to electric vehicles, photovoltaic systems, distributed electrical systems, and industrial energy conservation are discussed. K.L.

N80-20903# Battelle Pacific Northwest Labs., Richland, Wash.
ECONOMICS OF THERMAL ENERGY STORAGE FOR COMPRESSED AIR ENERGY STORAGE SYSTEMS
S. C. Schulte Aug. 1979 8 p refs
(Contract EY-76-C-06-1830)
(PNL-SA-7949) Avail: NTIS HC A02/MF A01

The costs of compressed air energy storage (CAES) systems utilizing thermal energy storage are compared with the costs of conventional CAES systems and combustion gas turbine systems. Comparisons are made on the basis of system energy cost levelized over system operating lifetime (mills/kWh). Two principal conclusions resulted from the study. First, given today's fuel prices and the expected fuel prices in the 1980's, conventional CAES systems yield lower energy cost estimates than combustion gas turbine systems. Second, thermal energy system storage/adiabatic CAES systems yield equivalent and, in some instances, slightly lower energy cost estimates than conventional CAES systems while requiring considerably less turbine fuel oil. DOE

N80-20904# Battelle Pacific Northwest Labs., Richland, Wash.
ECONOMICS OF COMPRESSED AIR ENERGY STORAGE EMPLOYING THERMAL ENERGY STORAGE
S. C. Schulte and R. W. Reilly Nov. 1979 34 p refs
(Contract EY-76-C-06-1830)
(PNL-3191) Avail: NTIS HC A03/MF A01

System design and capital cost estimates are adopted from three independent studies to arrive at a series of levelized energy costs over a system's lifetime. In addition, some analyses are provided to gauge the sensitivity of these levelized energy costs to fuel and compression energy costs and to system capacity

factors The systems chosen for comparison are conventional CAES, hybrid CAES, adiabatic CAES, and an advanced-design gas turbine. In conventional CAES systems the heat of compression generated during the storage operation is rejected to the environment, and later during the energy generation phase, turbine fuel must be burned to reheat the compressed air In the hybrid systems some of the heat of compression is stored and reapplied later during the generation phase, thereby reducing turbine fuel requirements The adiabatic systems store adequate thermal energy to eliminate the need for turbine fuel entirely. The gas turbine is included within the report for comparison purposes.
DOE

N80-20905# Department of Energy, Washington, D. C.
BIOMASS ENERGY SYSTEMS: ENVIRONMENTAL READINESS DOCUMENT
Sep 1979 50 p
(DOE/ERD-0021) Avail NTIS HC A03/MF A01

A number of environmental and socio-economic impacts of biomass energy systems are identified The large land and water requirements for terrestrial biomass energy production might lead to socio-economic conflicts It might also lead to an increase in potential for air and water erosion of the soil Severe ecosystems impacts would result from disturbing 100 million acres of marginal farm land and 350 million acres of forest land Removal of residues could increase nutrient removal and reduce the amount of organic matter returning to the soil and limit future biomass production Air pollution from the direct combustion of biomass must be considered The systems of ethanol with stillage is dependent on the feedstock The energy costs to purify the ethanol and pollution control costs appear to prevent economical production of ethanol in the near term.
DOE

N80-20907# Oak Ridge Associated Universities, Tenn. Inst for Energy Analysis
LIMITS TO ENERGY MODELING
A M Weinberg Sep 1979 19 p refs
(Contract EY-76-C-05-0033)
(ORAU-IEA-79-16(O)) Avail NTIS HC A02/MF A01

The limitations of energy modeling are described Possible approaches to energy policy that avoid the necessity of depending on uncertain predictions are discussed.
RES

N80-20908# Stanford Univ., Calif. Dept. of Operations Research
DETERMINING THE FEASIBILITY OF INCORPORATING WATER RESOURCE CONSTRAINTS INTO ENERGY MODELS Final Report
N Buras Aug 1979 132 p refs Sponsored by Elec Power Res Inst
(EPRI-EA-1147) Avail NTIS HC A07/MF A01

The availability of regional water resources for energy related activities is discussed in terms of the feasibility of integrating these availabilities into energy models Following reviews of water resources data bases, of technologies involved in energy development and of energy models with regional disaggregation, two models are used for the study of this integration the Regional Energy System Optimization Model (RESOM), and the Energy Policy Model (EPM) Water resources constraints are introduced in these models, and exploratory computer runs using demonstration scenarios are made The test scenarios assumed that nonenergy users would make increasing demands upon regional water resources, leaving limited amounts of increasingly more expensive water for energy activities The results of the exploratory runs demonstrate the feasibility of integrating water resources availabilities and water consumption data into energy-economy models.
DOE

N80-20909*# Paragon Pacific, Inc., El Segundo, Calif.
WIND ENERGY SYSTEM TIME-DOMAIN (WEST) ANALYZERS USING HYBRID SIMULATION TECHNIQUES Final Report
John A Hoffman Oct 1979 30 p refs Prepared for NASA and DOE
(Contracts DEN3-26)
(NASA-CR-159737; PPI-1030-6; DOE/NASA/0026-79/1) Avail NTIS HC A03/MF A01 CSCL 10B

Two stand-alone analyzers constructed for real time simulation of the complex dynamic characteristics of horizontal-axis wind energy systems are described Mathematical models for an aeroelastic rotor, including nonlinear aerodynamic and elastic loads, are implemented with high speed digital and analog circuitry. Models for elastic supports, a power train, a control system, and a rotor gimbal system are also included Limited correlation efforts show good comparisons between results produced by the analyzers and results produced by a large digital simulation. The digital simulation results correlate well with test data.
K.L.

N80-20910# National Technical Information Service, Springfield, Va.
SOLAR WATER PUMPS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Nov. 1979
Audrey S Hundemann Dec 1979 71 p Supersedes NTIS/PS-78/1288; NTIS/PS-77/1161
(PB80-802531; NTIS/PS-78/1288; NTIS/PS-77/1161) Avail NTIS HC $30.00/MF $30.00 CSCL 02C

Design concepts and the technical and economic feasibility of using solar energy to pump water are discussed in abstracts from worldwide literature. Topic areas cover the use of solar heat actuated Rankine cycle engines and free cylinder Stirling engines for solar powered water pumps, pumps driven by photovoltaic modules, and application of solar pumps to irrigation and electric power generation. This updated bibliography contains 85 abstracts, 25 of which are new entries to the previous edition.
GRA

N80-20911# General Accounting Office, Washington, D. C. Energy and Minerals Div
HOW TO BURN COAL EFFICIENTLY AND ECONOMICALLY, AND MEET AIR POLLUTION REQUIREMENTS: THE FLUIDIZED-BED COMBUSTION PROCESS
9 Nov. 1979 56 p
(PB80-107501; EMD-80-12) Avail NTIS HC A04/MF A01 CSCL 13B

The Department of Energy's program to demonstrate fluidized bed coal combustion are presented as well as ways the program could be improved. It specifically recommends that the Secretary of Energy: (1) enter into an interagency agreement with the Department of Defense to place industrial demonstration plants in Defense industrial facilities; and (2) enter into an interagency agreement with the Tennessee Valley Authority for hosting the 200-megawatt utility demonstration plant. The questionable need and utility of a component test and integration unit are discussed and options for terminating the contractor and selling or modifying the facility for other uses are suggested.
GRA

N80-20912# Cedar Associates, Evanston, Ill.
SNOW AND ICE ACCUMULATION AT SOLAR COLLECTOR INSTALLATIONS IN THE CHICAGO METROPOLITAN AREA Final Report
Ross B Corotis, Charles H Dowding, and Edwin C Rossow Aug 1979 109 p Sponsored in part by DOE, Washington, D.C.
(PB80-113749; NBS-GCR-79-181) Avail NTIS HC A06/MF A01 CSCL 10A

Observations and data concerning snow and ice on eighteen flat plate solar collector installations in the Chicago area are presented. The data were collected in February and March of 1979, following a record snowfall in January. Nearly all of the installations were on the roofs of buildings, and about half were mounted flush with the roof. The remainder were mounted on racks at an angle to the roof. Sketches and photographs of the buildings and snow accumulation, weather data for the entire winter, and comments of the owners are included, as well as a technique for the extraction of linear measurements from the photographs.
GRA

N80-20913# New Mexico Univ., Albuquerque Dept. of Physics

SOLAR PONDS FOR RESIDENTIAL HEATING. HEAT EXTRACTION FROM A SALT GRADIENT SOLAR POND Final Report, 19 Aug. 1976 - 30 Jun. 1977

F. Zangrando and H. C. Bryant Jul. 1979 41 p refs Sponsored in part by New Mexico Energy and Minerals Dept., Santa Fe
(PB80-108624; NMEI-45) Avail: NTIS HC A03/MF A01 CSCL 10A

A salt gradient solar pond is an efficient, low cost solar energy collection and long range storage system for low temperature heat. Research efforts to establish operational parameters, selection criteria for the materials to be used, cost and performance are described. The physical behavior of doubly diffusive systems exposed to the environment was also studied. GRA

N80-20914# New Mexico Energy Inst., Las Cruces. Mechanical Engineering Dept.

AN ECONOMICAL SOLAR HEATED AND COOLED RESIDENCE FOR SOUTHERN NEW MEXICO Final Report, 1 Sep. 1976 - 31 Aug. 1979

Thomas R. Mancini and Phillip R. Smith Jul. 1979 51 p refs
(PB80-108616; NMEI-16) Avail: NTIS HC A04/MF A01 CSCL 13A

The construction and performance of 'Skytherm' solar heated and cooled passive house located on the campus of New Mexico State University in Las Cruces, New Mexico are described. GRA

N80-20915# National Zoological Park, Washington, D.C.

NATIONAL SOLAR HEATING AND COOLING PROGRAMS

Aug. 1979 64 p refs Presented at the Intern. Solar Energy Society Congress, Atlanta, 28 May - 1 Jun. 1979
(Contract DE-AC01-79CS-30108)
(PB80-104987; CCMS-109) Avail: NTIS HC A04/MF A01 CSCL 13A

Status reports on the national solar heating and cooling programs of seventeen countries participating in the Committee on the Challenges of Modern Society's Solar Energy Pilot Study are presented. R.E.S.

N80-20920*# National Aeronautics and Space Administration, Washington, D. C.

A GLOBAL BIOGEOCENOTICAL BIOSPHERE SIMULATION

N. N. Moiseyev Mar. 1980 12 p refs Transl. into ENGLISH from Biogeofiz. i Mate. Metody Issled. Geosistem (Moscow), 1978 p 37-49 Transl. by Kanner (Leo) Associates, Redwood City, Calif.
(NASA-TM-76042) Avail: NTIS HC A02/MF A01 CSCL 13B

This model of the D. Forrester type, constructed in differential equations, predicts the food and mineral supply for the factors biosphere population, depending on two socio-economic factors, until about the year 2500. If contemporary rates of natural resources utilization are maintained and there is no management of the environment, food resources will begin to limit human population growth after 2200, and mineral resources will after 2300. A decrease in the biosphere pollution, increase in effective agricultural production, and discovery of new energy sources may forestall or completely avert the onset of a crisis situation. Conservation measures, according to the model, are to a considerable extent realizable only if carried out simultaneously in both areas. Author

N80-20921# Department of Energy, Washington, D. C.

ENVIRONMENTAL DEVELOPMENT PLAN: COAL EXTRACTION AND PREPARATION

Sep. 1979 98 p refs
(DOE/EDP-0050) Avail: NTIS HC A05/MF A01

The environmental strategy to be used by DOE to resolve environmental concerns associated with coal extraction and preparation will be to: (1) schedule environmental research in coordination with the development of the technology through its research, development and demonstration phases; (2) identify what environmental research is already underway; (3) provide for an Environmental Coordination Committee to ensure that the appropriate research is conducted in a timely manner; (4) schedule compliance activities, such as National Environmental Policy Act (NEPA) documents and Environmental Readiness Documents (ERD's) at appropriate times in the RD and D cycle; and (5) develop a monitoring approach to track the compliance of each technology with applicable Federal, State and local standards and with the performance goals established for that technology. The initial evaluation of the coal extraction and preparation program indicates that the demonstrations of technologies in the program will be undertaken within existing industrial mining/preparation facilities and therefore will not present significant identifiable impacts. Project-specific Environmental Assessment or Impact Statements will be made on a project specific basis. Even so, assessments must be made prior to the employment of program elements. DOE

N80-20922# Department of Energy, Washington, D. C.

ENVIRONMENTAL DEVELOPMENT PLAN FOR SPACE APPLICATIONS

Sep. 1979 83 p refs
(DOE/EDP-0057) Avail: NTIS HC A05/MF A01

The planning and management requirements and schedules needed to evaluate and assess the environmental, health, and safety aspects of the Space Applications Program are identified. Environment is defined in its broadest sense to include environmental, health (occupational and public), safety, socioeconomic, legal, and institutional aspects. Topics considered include: (1) space nuclear power system nuclear fuel fabrication; (2) space nuclear power system heat source fabrication; (3) testing of subsystems and assembled systems; (4) research and development in support of space nuclear system development; (5) nuclear system responses to launch and reentry accidents; and (6) nuclear system environmental behavior and recovery. DOE

N80-20926# Woodard-Clyde Consultants, San Francisco, Calif.

ENVIRONMENTAL ASSESSMENT METHODOLOGY: SOLAR POWER PLANT APPLICATIONS. VOLUME 1: ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY Final Report

K. Nair and A. Sicherman May 1979 161 p refs
(EPRI Proj. 551)
(EPRI-ER-1070-Vol-1) Avail: NTIS HC A08/MF A01

A methodology for environmental impact assessment of solar power stations based on decision analysis is presented. A general overview of the methodology is given including a discussion of the issues warranting a formal analysis, the advantages of decision analysis from the decision maker's perspective, and some case study examples where the methodology was applied. The step-by-step implementation procedure for performing an environmental impact assessment using the methodology is described. The manner in which the methodology can incorporate cost into the analysis, both as a concern and as a yardstick of comparison, is discussed. Decision analysis and cost-benefit analysis are compared and contrasted. The appendix includes a bibliography concerning methods used by industry and/or government to make monetary estimates of environmental impacts. DOE

N80-20929# Energy and Environmental Analysis, Inc., Arlington, Va.

ADEQUACY ANALYSIS OF AIR QUALITY MONITORING ACTIVITIES RELEVANT TO CALIFORNIA THERMAL ENHANCED OIL RECOVERY FIELDS

Judy Matthews and J. Thomasian Nov. 1979 139 p refs
(Contract ET-78-C-01-3092)
(SAN-12093-1) Avail: NTIS HC A07/MF A01

A summary of enchanced oil recovery (EOR) activities in California is presented. Ambient air monitoring requirements are discussed in terms of state and Federal regulations. In addition, ambient air quality monitoring in California is considered with emphasis on specific monitoring requirements for new source regulation. An inventory of California EOR air quality monitoring activity is given and the adequacy of the air monitoring activity in the California EOR fields is discussed. DOE

N80-20930# Brookhaven National Lab., Upton, N. Y.

COAL-CONVERSION TECHNOLOGIES: SOME HEALTH

AND ENVIRONMENTAL EFFECTS

S. C. Morris, P. D. Moskowitz, W. A. Sevian, S. Silberstein, and L. D. Hamilton Feb. 1979 27 p refs
(Contract EY-76-C-02-0016)
(BNL-5103; TID-4500) Avail: NTIS HC A03/MF A01

Selected health and environmental concerns of four coal conversion and four existing technologies are compared. Quantitative occupational health and safety estimates are presented covering extraction, transportation, distribution, processing, and conversion activities; also included are estimates of public health damage arising from fuel transportation and air pollution impacts. Qualitative estimates of health damage due to polycyclic organic matter and reduced sulfur are discussed. In general, energy inefficiencies, residuals, and implied environmental and health damages increase as follows: (1) direct combustion of natural gas and oil; (2) direct combustion of synthetic gas and oil; (3) central station electric power from synthetic gas; (4) central station electric power from coal; and (5) central station electric power from combustion of synthetic liquid fuels. Compliance and conflict of these technologies with Clean Air Act Amendments and other legislation are discussed. DOE

N80-20945# Environmental Protection Agency, Ann Arbor, Mich. Standards Development and Support Branch.

LIGHT-DUTY DIESEL GASEOUS EMISSIONS MEASUREMENT - COMPARISON OF DILUTION TUNNEL TEST RESULTS TO CERTIFICATION CELL TEST RESULTS

Jeff Alson Jan. 1979 13 p
(PB80-115991; SDSB-79/04) Avail: NTIS HC A02/MF A01 CSCL 13B

Gaseous emissions data are summarized for eleven light-duty diesel vehicles using both the standard certification test procedure and the dilution tunnel test procedure which incorporates particulate measurement. The greatest variability was found in the HC variability inherent in measuring HC and, in the extreme cases, also to equipment inconsistencies between the test cells. CO, NOx and CO2 data from the dilution tunnel test procedure were generally in good agreement with the certification data with the only trend being slightly lower NOx and CO2 values from the dilution tunnel. This is hypothesized as a possible dynamometer effect. It is concluded that there are no significant differences in the two test procedures with regards to the measurement of gaseous emissions. GRA

N80-20949# Land-Air, Inc., Holloman, N. Mex. Applied Research Div.

CONTROL TECHNOLOGIES FOR PARTICULATE AND TAR EMISSIONS FROM COAL CONVERTERS

C. Chen, C. Koralek, and L. Breitstein Jul. 1979 115 p refs
(Contract EPA-68-02-2601)
(PB80-108392; EPA-600/7-79-170) Avail: NTIS HC A06/MF A01 CSCL 13B

Solid and tar particulate emissions in raw product gases from several types of coal gasifiers are characterized in terms of their total quantities, chemical composition, and size distribution. Control technologies for particulate emissions were assessed with respect to the limitations of the control device and to existing and proposed regulations. Fabric filters were not suitable where tar particulates were found or at higher than 300 C. Electrostatic precipitators operated as high as 1100 C. Rotary cyclones showed the widest range of applicability, but conventional cyclones were most economical for particles larger than 50 microns. Solid and tar particulate emissions collected for 250,000 scfd of a medium-Btu gas contained up to 1.6 million kg of particulate. GRA

N80-20950# Land-Air, Inc., Holloman, N. Mex. Applied Research Div.

HOT GAS CLEANUP PROCESS Final Report, Jan. 1977 - Mar. 1979

A. Bekir Onursal Jul. 1979 155 p refs
(Contract EPA-68-02-2601)
(PB80-108467; EPA-600/7-79-169) Avail: NTIS HC A08/MF A01 CSCL 13B

The results of a study to identify and classify 22 hot gas cleanup (HGC) processes for desulfurizing reducing gases at above 430 C according to absorbent type into groups employing solid, molten salt, and molten metal absorbents are presented. Each process is described in terms of its status, chemistry, operating characteristics, problems, and uncertainties. The applicability of non HGC processes to a variety of coal gasification systems for several end uses for the product gases is assessed. Advantages and disadvantages of HGC relative to conventional low temperature cleanup systems with respect to thermal efficiency, the presence and/or emissions of tars, particulates, and NOx, and corrosion are described. GRA

N80-20973# Battelle Columbus Labs., Ohio.

CHARACTERIZATION AND ANALYSIS OF DEVONIAN SHALES AS RELATED TO RELEASE OF GASEOUS HYDROCARBONS Quarterly Progress Report, Jan. - Mar. 1979

R. S. Kalyoncu, J. P. Boyer, and M. J. Snyder 15 Apr. 1979 240 p
(Contract EY-76-C-05-5205)
(ORO-5205-10) Avail: NTIS HC A11/MF A01

This program has the objective of determining the relationships between the shale characteristics, hydrocarbon gas contents, and well location, and thereby provide a sound basis for (1) assessing the productive capacity of the Eastern Devonian Gas Shale deposits and (2) guiding research, development, and demonstration projects to enhance the recovery of natural gas from the shale deposits. The Y-1 well in Allegany County, New York was sampled in September 1978. 412 samples were collected from the Allegany County, New York well. Characterization data on Y-1 (EGSP New York No. 1), Allegany County, New York well is reported and discussed. Analysis of the hydrocarbon gases in Y-1 samples indicates that the longer chain hydrocarbon gases (ethane, propane, butane) in these shales are significantly higher than in previous wells. The carbon contents of the Y-1 (Allegany County, New York) well, on the other hand, are somewhat lower than predicted from the hydrocarbon gas contents. There is still a positive relationship between the carbon and hydrocarbon gas contents, however. A similar relationship is also apparent between the sulfur and hydrocarbon gas contents. No unusual trends are observed in the porosity values, and a reasonable agreement exists between the measured Hg-intrusion values and those calculated from the density data. Higher porosity values are associated with low bulk densities. From limited lithological observations New York shales exhibit variable clay, mineral, and quartz contents. Generally, low levels of pyrite and carbonate minerals are observed. The low pyrite and carbonate contents noted in the powder examination of the samples are supported by the EDAX results showing low Ca and S contents. DOE

N80-20993# Sandia Labs., Albuquerque, N. Mex. Environmental Research Div.

WIND CHARACTERISTICS FOR FIELD TESTING OF WIND CONVERSION SYSTEMS

Robert E. Akins Nov. 1979 55 p refs
(Contract EY-76-C-04-0789)
(SAND-78-1563) Avail: NTIS HC A04/MF A01

Techniques are presented to determine placement of instrumentation to be used in measurement of wind characteristics for field testing of wind energy conversion systems (WECS). Potential errors in the measurement of a reference wind velocity as a result of physical separation between an anemometer and a WECS and interference between the WECS and the reference anemometer are outlined. Methods of correcting errors caused by both of these sources are developed. DOE

N80-21149 Illinois Univ. at Chicago Circle, Chicago.

NONIDEAL COMPENSATION IN MHD GENERATORS Ph.D. Thesis

David A. Carl 1979 274 p
Avail: Univ. Microfilms Order No. 8009457

Nonideal compensation, the distortion of the total magnetic flux density by the induced magnetic flux density despite the presence of compensating bus bars, was examined with one and two dimensional models. The conducting fluid was assumed to be an incompressible liquid at a constant velocity. The iterative solution technique used in both models consisted of iterating between an equivalent circuit model that solves for the air gap current distribution, given the total magnetic flux density distribution, and a magnetic field model that solves for the total magnetic flux density distribution, given the air gap current distribution. End loss was modeled by a shunt resistance. The one dimensional model was intended to indicate general trends. The two dimensional model was intended to provide a more detailed analysis. Dissert. Abstr.

N80-21160# Westinghouse Electric Corp., Pittsburgh, Pa. Advanced Energy Systems Div.
DEVELOPMENT, TESTING AND EVALUATION OF MHD MATERIALS AND COMPONENTS DESIGNS Quarterly Report, Jul. - Sep. 1978
John W. Sadler, J. Bein, and D. L. Black Dec. 1978 94 p refs
(Contract EX-76-C-01-2248)
(FE-2248-22) Avail: NTIS HC A05/MF A01

Laboratory screening tests, including electrochemical corrosion and anode arc erosion tests, are reported. Results of electrochemical tests are presented which imply that for MHD channels operating under liquid slagging wall conditions the deleterious reactions with slag, presently recognized as limiting channel operation, metallic Fe formation at the cathode, and O2 gas release and cavitation at the anode, can be prevented with the use of ionic oxide electrodes. Initial results of investigations of arc impingement damage to selected metallic anode materials over the temperature range of 185 C to 650 C are presented. DOE

N80-21165# Department of Energy, Washington, D. C. Office of Fusion Energy
FUSION TECHNOLOGY DEVELOPMENT
Aug. 1979 151 p refs
(DOE/ET-0116/1) Avail: NTIS HC A08/MF A01

Conceptual design studies of fusion energy and fusion reactos are presented. The magnetics of fusion reactors are discussed with an overview of a large coil program included. Plasma heating, fueling, and exhaust systems for the reactors are described and research on materials for fusion reactors is discussed. A.W.H.

N80-21166# Argonne National Lab., Ill.
ADVANCES IN MHD TECHNOLOGY
M. Petrick, R. V. Shanklin, III (DOE, Washington, D.C.), and G. Rudins (DOE, Washington, D.C.) 1979 52 p refs Presented at the Advances in Coal Util. Symp., Louisville, Ky., 14-15 May 1979
(Contract W-31-109-eng-38)
(CONF-790598-5) Avail: NTIS HC A04/MF A01

The operation of magnetohydrodynamic (MHD) generators is discussed. The thermodynamic and economic potential, the technical status and recent advances, and the environmental issues associated with MHD power plants are examined. A national program for developing MHD conversion is described and experimental MHD generator operations in the U.S. and U.S.S.R. are reported. A.W.H.

N80-21197# Real Estate Research Corp., Chicago, Ill.
MARKETING AND MARKET ACCEPTANCE DATA FROM THE RESIDENTIAL SOLAR DEMONSTRATION PROGRAM. VOLUME 1: DETAILED ANALYSIS, AUTUMN 1979
1979 218 p refs Sponsored in part by HUD
(PB80-115298; HUD-0050579) Avail: NTIS HC A10/MF A01 CSCL 05C

The marketing and market acceptance components of HUD's residential solar heating and cooling demonstration program, designed to promote the development of a self-sustaining solar energy industry, are analyzed. The actual experiences of actors and institutions involved in the market acceptance of solar houses are described. Emerging trends in the characteristics, opinions, and actions of participants in the demonstration program are identified and explored. All findings are based on marketing interviews with program participants, with a market acceptance model used to guide analysis. Practical information relevant to the construction industry and solar manufacturers is emphasized. GRA

N80-21198# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
GEOTHERMAL ENERGY MARKET PENETRATION: DEVELOPMENT OF A MODEL FOR THE RESIDENTIAL SECTION
Allen C. Goodman Sep. 1979 34 p refs
(Contracts EX-76-A-36-1008; DE-AI01-79ET-27025)
(PB80-118359; APL/JHU-QM-79-209; APL/JHU-GEMS-006; MCGER-79/003) Avail: NTIS HC A03/MF A01 CSCL 05C

A model was developed that examines the feasibility of using geothermal technology in heating residential structures. Specific account is taken of the small contribution of new housing to the total stock in any given year and of the durability of houses and their furnaces. Both aspects constrain the penetration of geothermal energy into the residential market. Other market penetration paradigms are discussed and a simple model of market penetration is presented that is based on the premise that homeowners will not abandon an existing furnace until its economic life is over. Behavioral parameters are considered and the model is extended from 20 to 40 years. Methods are discussed for collecting the needed data to determine market penetration, and ideas are proposed of ways to induce homeowners to give up economically viable furnaces to allow the firm providing the energy to reduce costs. GRA

N80-21200*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SUPPORTING RESEARCH AND TECHNOLOGY FOR AUTOMOTIVE STIRLING ENGINE DEVELOPMENT
William A. Tomazic 1980 20 p Presented at 5th Intern. Automotive Propulsion System Symp., Dearborn, Mich., 14-18 Apr. 1980
(NASA-TM-81495; E-400; DOE/NASA/1040-80/13) Avail: NTIS HC A02/MF A01 CSCL 13F

The technology advancement topics described are a part of the supporting research and technology (SRT) program conducted to support the major Stirling engine development program. This support focuses on developing alternatives or backups to the engine development in critical areas. These areas are materials, seals control, combustors and system analysis. Specific objectives and planned milestone schedules for future activities as now envisioned are described. These planned SRT activities are related to the timeline of the engine development program that they must support. A.M.S.

N80-21201*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FUEL ECONOMY SCREENING STUDY OF ADVANCED AUTOMOTIVE GAS TURBINE ENGINES
John L. Klann Mar. 1980 57 p
(Contract EC-77-A-31-1040)
(NASA-TM-81433; E-357; DOE/NASA/1040-80/11) Avail: NTIS HC A04/MF A01 CSCL 13F

Fuel economy potentials were calculated and compared among ten turbomachinery configurations. All gas turbine engines were evaluated with a continuously variable transmission in a 1978 compact car. A reference fuel economy was calculated for the car with its conventional spark ignition piston engine and three speed automatic transmission. Two promising engine/transmission combinations, using gasoline, had 55 to 60 percent gains over the reference fuel economy. Fuel economy sensitivities to engine design parameter changes were also calculated for these two combinations. Author

N80-21204# Department of Energy, Washington, D. C. Office of Conservation and Solar Applications.
ELECTRIC AND HYBRID VEHICLE PROGRAM Quarterly Report, Apr. - May 1979
Aug. 1979 31 p refs
(DOE/CS-0026-7) Avail: NTIS HC A03/MF A01

Progress in U.S. programs on the design, development, production, and performance testing of electric powered and hybrid electric powered vehicles is briefly summarized. DOE

N80-21205# Cambridge Systematics, Inc., Mass.
URBAN MASS TRANSPORTATION ENERGY CONSERVATION: SRGP OPERATING INSTRUCTIONS AND PROGRAM DOCUMENTATION, VOLUME 5 Final Report
J. F. MacMann and R. E. Nestle Oct. 1979 120 p refs
(Contract EM-76-C-01-8628)
(DOE/PE/8628-1-Vol-5) Avail: NTIS HC A06/MF A01

A computer program for Short Range Generalized transportation Policy (SRGP) analysis developed for use in analyzing the energy conservation potential of a broad spectrum of transit, carpooling, vanpooling, parking, pricing, and other transportation system management measures is described. It is intended for use in either an areawide or corridor context and in what is referred to as a sketch planning style of analysis. Output includes changes in fuel consumption, vehicle emissions, vehicle miles of travel, and modal shares for drive alone, shared ride, and transit. Changes in travel behavior are forecast relating to auto ownership, work trip mode choice, and the frequency, destination, and mode choice for both shopping and social/recreational nonwork travel. Using a random sample household forecasting procedure, SRGP is a modified version of the program UMODEL, distributed by the U.S. Urban Mass Transportation Administration as part of UTPS, the Urban Transportation Planning System. DOE

N80-21206# Cambridge Systematics, Inc., Mass.
URBAN TRANSPORTATION ENERGY CONSERVATION: CASE CITY APPLICATIONS OF ANALYSIS METHODOLOGIES, VOLUME 3 Final Report, Jul. 1976 - Sep. 1978
T. J. Atherton and J. H. Suhrbier Oct. 1979 160 p refs
(Contract EM-76-C-01-8628)
(DOE/PE/8628-1-Vol-3) Avail: NTIS HC A08/MF A01

Disaggregate travel demand methodologies were applied to the analysis of potential energy conservation strategies in three urban areas: Denver, Colorado; Fort Worth, Texas; and San Francisco, California. The methodologies are sketch planning in nature and include the forecasting of changes in automobile ownership; work trip model shares by drive alone, shared ride, and transit; nonwork trip frequency, destination, and mode choice; fuel consumption and vehicle emissions. Policies analyzed include those related as employer based ride sharing, parking management, transit, pricing, and traffic operations. Considerable variations in the potential effectiveness was found, among the three urban areas, depending in large part on the availability of alternative travel modes such as transit. Descriptions are provided of the individual policy analyses performed, the methods by which example policies were analyzed, the necessary data preparation activities, and the procedures used to adapt the set of travel demand models to the unique conditions of each of the three metropolitan areas. DOE

N80-21207# Cambridge Systematics, Inc., Mass.
URBAN TRANSPORTATION ENERGY CONSERVATION: ANALYTIC PROCEDURES FOR ESTIMATING CHANGES IN TRAVEL DEMAND AND FUEL CONSUMPTION, VOLUME 2 Final Report, Jul. 1976 - Sep. 1978
T. J. Atherton and J. H. Suhrbier Oct. 1979 153 p refs
(Contract EM-76-C-01-8628)
(DOE/PE/8628-1-Vol-2) Avail: NTIS HC A08/MF A01

Analytical tools used to evaluate the effectiveness of alternative transportation policies in achieving reductions in overall fuel consumption are presented. To ensure a high measure of accuracy, the analysis goes beyond the first order effects, i.e., the shift from single occupant autos as the mode chosen for the work trip to more fuel efficient means of travel. Questions treated include what will happen with the autos left at home as a result of increased carpooling for work trips. The methodology developed links together several disaggregate travel demand models to predict auto ownership, work trip mode choice, and nonwork travel demands. The theoretical basis for the travel demand models used is introduced. These models and their linkages both with each other and with the various submodels are described. The assumptions made in developing the model system and using it to forecast responses to alternative transportation policies are included. Emphasis is placed on the conceptual framework of the model system and specification of the individual models and submodels. DOE

N80-21208# Cambridge Systematics, Inc., Mass.
ANALYTICAL PROCEDURES FOR URBAN TRANSPORTATION ENERGY CONSERVATION: SUMMARY OF FINDINGS AND METHODOLOGIES, VOLUME 1 Final Report, Jul. 1976 - Apr. 1979
J. H. Suhrbier and W. D. Byrne Oct. 1979 54 p refs 5 Vol.
(Contract EC-76-C-01-8628)
(DOE/PE/8628-1-Vol-1) Avail: NTIS HC A04/MF A01

Analytical methodologies are described and illustrated for use in analyzing the energy conservation potential of candidate urban transportation measurements. Quantitative methodologies oriented to carpooling, vanpooling, transit, pricing, traffic regulation and control, and auto ownership are provided based on the use of disaggregate behavioral travel demand models. Changes are indicated in trip frequency and distribution as well as in travel model, operating conditions, and vehicle miles of travel. Trip-based estimates of fuel consumption and vehicle emissions are included. The methodologies employ manual sketch planning procedures, a programmable calculator, or a fully-calibrated computer program utilizing a random sample household enumeration forecasting technique. The developed methodologies were applied in cooperation with metropolitan planning organizations representing the Dallas-Fort Worth, San Francisco, and Denver urban areas. DOE

N80-21209# Booz-Allen and Hamilton, Inc., Bethesda, Md. Energy and Environment Div.
MECHANICAL ENERGY STORAGE TECHNOLOGY FOR TRANSPORTATION APPLICATIONS PROJECT PLAN
30 Nov. 1979 50 p refs Prepared for California Univ., Livermore. Lawrence Livermore Lab.
(Contract W-7405-eng-48)
(UCRL-15138; Rept-2613-005-001) Avail: NTIS HC A03/MF A01

Flywheel systems for regenerative braking and load leveling in electric and hybrid vehicles were studied with emphasis on safety and economy. It is concluded that the use of flywheel energy storage regenerative braking and load leveling systems will upgrade the performance of electric and hybrid vehicles and improve the fuel economy of heat engine/flywheel vehicles to a level required for acceptable market penetration. DOE

N80-21210# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
TEST AND EVALUATION REPORT OF THE ERDC HYBRID-ELECTRIC VAN (HEVAN)
G. J. Klose May 1979 67 p
(Contract EX-76-A-31-1011)
(DOE/TIC-10232) Avail: NTIS HC A04/MF A01

The HEVAN or Hybrid-Electric Van is a battery powered electric vehicle with an on board gasoline fueled electric power generation unit. The HEVAN was developed from a Volkswagen transporter chassis. It is propelled by a series wound dc traction motor rated at 20 HP (14.9 kW) which is powered by sixteen 6-volt SGL lead acid batteries of nominally 96 volts. The motor power is controlled by an SCR chopper with a bypass contractor and drives the vehicle through a four-speed VW transaxle. The conventional VW hydraulic brake system is used; there is no provision for regenerative braking. The on board electric power generator consists of a 16-HP (11.9kW) gasoline engine driving a 7.5 kW alternator with a dc rectifier; this provides electrical power either directly to the drive motor or to the battery pack, depending on the battery charge state and the motor power requirements. Numerous tests were conducted with pure electric operation, but only limited results were obtained in the hybrid mode due to continual problems with the motor generator set. DOE

N80-21211# California Univ., Livermore. Lawrence Livermore Lab.
ENERGY STORAGE SYSTEMS FOR AUTOMOBILE PROPULSION
L. G. OConnell 26 Nov. 1979 35 p
(Contract W-7405-eng-48)
(UCID-18320) Avail: NTIS HC A03/MF A01

Energy storage power systems that are credible alternatives to the internal combustion engine system are evaluated. It is concluded that automotive electrical power systems can be developed for various performance levels. Most electricity using vehicles will weigh more and cost more than their internal combustion engine equivalents. If performance of these vehicles is reduced, they can be more cost competitive. Mechanical energy storage propulsion systems appear useful as power boosters for certain mission applications. DOE

N80-21379*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
GENERAL SENSITIVITY ANALYSIS OF SOLAR THERMAL-ELECTRIC PLANTS
F. L. Lansing, E. W. Hayes, and C. S. Yung *In its* The Deep Space Network 15 Apr. 1980 p 130-142

Avail: NTIS HC A08/MF A01 CSCL 10A

A unified and generalized treatment for predicting the technical performance of many present or future solar thermal electric power system designs and configurations is presented. In order to screen the major design parameters whose effect on performance is high and to assess the system improvement or deficiency resulting from their change, a sensitivity analysis is performed. The sensitivity, defined as the percentage change of output divided by the percentage change in input, is evaluated analytically for seven major system design parameters. These design parameters are: the solar radiation intensity, the ambient temperature, the optical-thermal characteristics of the collector subsystem (concentrator-receiver), the relative thermal efficiency for the energy conversion subsystem, the working fluid operating temperature, and the rate of fluid heat capacity. General performance sensitivity expressions are derived and numerically evaluated for the range of possible operating conditions. The effect of these major parameters on the system performance optimization is presented to identify future improvement areas and to pave the way for the second phase study in the economic sensitivity analysis on bus bar energy costs. A.W.H.

N80-21395*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY, VOLUME 4, PHASE 2 Final Report, Jan. - Nov. 1979
Dec. 1979 308 p refs Sponsored in part by DOE
(Contract NAS9-15636)
(NASA-CR-160565; D180-25461-4) Avail: NTIS HC A14/MF A01 CSCL 22B

Results of an overall evaluation of the solar power satellite concept are reported. Specific topics covered include: solid state sandwich configuration; parametric development of reliability design; power distribution system for solid state solar power satellites; multibeam transmission; GEO base system configuration; suppression of the heavy lift launch vehicle trajectory; conceptual design of an offshore space center facility; solar power satellite development and operations scenario; and microwave power transmission technology, advancement, development, and facility requirements. J.M.S.

N80-21456# Oak Ridge National Lab., Tenn.
OUTGASSING BEHAVIOR OF CARBON-BONDED CARBON-FIBER THERMAL INSULATION
G. C. Wei, C. D. Reynolds, and G. W. Brassell 1979 7 p refs Presented at 14th Carbon Conf., University Park, Pa., 25 Jun. 1979
(Contract W-7405-eng-26)
(CONF-790625-8) Avail: NTIS HC A02/MF A01

A carbon-bonded carbon-fiber (CBCF3) thermal insulation was developed and has demonstrated acceptable strength, thermal conductivity, and outgassing properties for the selenide isotope generator. Primary outgassing at 1350 C and 0.1 mPa (10 to the minus 6th power torr) for 70 h seemed satisfactory because reabsorption during exposure to argon or air was minimal and the total weight loss during secondary outgassing was also very small. The total outgassing of CBCF3 insulation during generator startup and operation was equivalent to the weight loss during secondary outgassing, (i.e., 0.08 mg per gram of CBCF3 insulation). The dominating gaseous species of secondary outgassing are CO and CO2. Primary outgassing (1350 C at 0.1 mPa (10 to the minus 6th power torr) for 70 h) causes no increases in the thermal conductivity of CBCF3 insulation. Specimen size affected the first few hours of primary outgassing and thus the fraction of total amount of volatile species being driven off at the end of primary outgassing. DOE

N80-21520# International Nickel Co., Inc., Suffern, N. Y. Research and Development Center.
EVALUATION OF HIGH CHROMIUM OVERLAYS TO PROTECT LESS ALLOYED SUBSTRATES FROM CORROSION IN A COAL GASIFICATION ATMOSPHERE Quarterly Report, 1 Sep. - 30 Nov. 1978
Edward P. Sadowski 1978 33 p refs
(Contract EF-77-C-01-2621)
(FE-2621-5) Avail: NTIS HC A03/MF A01

Inspection by Dy-chek and bend tests were completed. All AWS-ER 309 and INCONEL Filler Metal 72 weldments and fifteen of eighteen R139 weldments were bent 180 deg around a mandrel successfully. Mixed results were obtained on three of the R139 weldments. Stress-rupture testing at 1800 F shows no significant differences in the tensile strength of weldments due to filler metal, substrate or weld process and indicate that the substrates and welding process have an effect on the stress rupture strength. The weldments with the INCOLOY alloy 800H substrate with inert gas deposited overlays have the higher stress rupture strength. The submerged-arc weldments had the lowest stress rupture strength for each filler metal and substrate. DOE

N80-21554# Westinghouse Electric Corp., Madison, Pa. Advanced Coal Conversion Dept.
ADVANCED COAL GASIFICATION SYSTEM FOR ELECTRIC POWER GENERATION, FY 1978 Quarterly Progress Report, 1 Jul. - 30 Sep. 1978
28 Dec. 1978 123 p refs
(Contract EX-76-C-01-1514)
(FE-1514-93; QPR-4) Avail: NTIS HC A07/MF A01

A gasifier was to evaluate performance with coke breeze and char derived from coal using oxygen and steam as the gasification media. Since suitable chars were not available, direct coal feed to the gasifier was used. Four tests were run, TP-018-1 through -4, and operating summaries and test results are described. The operating results for Test TP-018-1 are summarized. Test TP-018-2 was the first gasifier test to be run with oxygen. Total time for the test exceeded 180 hours, with 50 hours of operation using Pittsburgh seam coal as feedstock. Product gas higher heating values of a dry basis ranged from 120 Btu/scf for coke breeze to 260 Btu/scf for Pittsburgh coal. An experimental test grid designed to show the effect of increased oxygen flow on reactor temperatures and heating values with the high-caking Pittsburgh seam coal was established and added to with each test conducted. Successful operation of the single stage gasifier reactor with oxygen was demonstrated with this series of tests with some rather significant results. Summaries of these results are given. DOE

N80-21557# Lummus Co., Bloomfield, N. J.
SOLVENT REFINED COAL PROCESS: DATA CORRELATION AND ANALYSIS Final Report
J. F. S. Frith, S. Viswanathan, and A. Gupta Aug. 1979 308 p Sponsored by the Elec. Power Res. Inst.
(EPRI-AF-1157) Copyright. Avail: Issuing Activity

Available pilot plant and other experimental data on coal liquifaction were evaluated and useful correlations for design and scale-up to commercial size plants were developed. The available operating data were obtained from three pilot plants. The reviewed data was organized into comparative tables to facilitate its use in subsequent studies. To reduce the data into forms useful for design calculations, a number of correlations were developed. Product yields were correlated with reaction severity expressed as hydrogen consumption. The liquefaction reactions were studied by calculating reaction rate constants for the processes of hydrogen consumption, coal conversion and organic sulfur removal. To aid the design of the vapor-liquid separation equipment, a means of characterzing coal liquids was proposed. This was used successfully with methods that are currently available to predict physical properties and vapor liquid equilibria for petroleum mixtures. DOE

N80-21558# Braun (C. F.) and Co., Alhambra, Calif.

COAL-TO-METHANOL VIA NEW PROCESSES UNDER DEVELOPMENT: AN ENGINEERING AND ECONOMIC EVALUATION Final Report

W. S. Chia, G. E. Good, and Y. S. Ng Oct. 1979 112 p
Sponsored by Elec. Power Res. Inst.
(EPRI-AF-1227) Avail: NTIS HC A06/MF A01

The results of a screening study are presented evaluating two coal to methanol routes via processes under development. A total of two coals investigated in two different plant configurations: (1) Illinois No. 6 bituminous coal in an all methanol scheme; and (2) Wyodak subbituminous coal in a methanol and distillate fuel oil coproduction scheme. In both schemes the Liquid Phase Methanol process was used for the synthesis of methanol from cleaned and conditioned synthesis gas. All other processes incorporated in the plant configurations were commercially proven in the petrochemical, chemical, or petroleum refinery industry. The conceptual designs for the two grass roots coal conversion complexes each designed to produce approximately 300 billion Btu per day of storable fuels are presented; included are overall block flow diagrams, steam and utility balances, and water management schemes. Cost estimates, economic assessments, and overall thermal efficiencies are provided for each of the two processing schemes considered. DOE

N80-21612# Office of Technology Assessment, Washington, D. C.

BENEFITS OF INCREASED USE OF CONTINUOUS CASTING BY THE UNITED STATES STEEL INDUSTRY

Oct. 1979 41 p refs
(PB80-104904; OTA/TM/ISC-2; LC-79-600177) Avail: NTIS HC A03/MF A01 CSCL 11F

The continuous casting process is described and the advantages of the process are examined. The rate of adoption of this technology in the U.S. steel industry is compared with that in the foreign steel industries. The factors that have constrained the greater adoption of continuous casting in the United States are briefly discussed and the economic costs and benefits of converting existing capacity to this new process are analyzed. GRA

N80-21697# National Bureau of Standards, Boulder, Colo. Thermophysical Properties Div.

HELIUM RESEARCH IN SUPPORT OF SUPERCONDUCTING POWER TRANSMISSION

David E. Daney Oct. 1979 64 p refs Prepared in cooperation with Brookhaven National Lab., Upton, N.Y.
(PB80-116502; NBSIR-79-1618) Avail: NTIS HC A04/MF A01 CSCL 09C

The preparation of computer codes and numerical computation of SPTL cool down were completed and the results are given. These calculations confirm original intuitive judgement that cool down times for the counterflow arrangement can be long, twenty days or more. Two sections of cable underwent extensive thermal cycling, and the results of these tests are given. The complex structure of the cable leads to unusual (although reproducible) load vs time curves. GRA

N80-21707# Hughes Aircraft Co., Fullerton, Calif. Ground Systems Group.

METHODS FOR MANUFACTURING HEAT PIPES FOR CIRCUIT CARDS Final Report, 30 Sep. 1977 - 31 Mar. 1979

Kal S. Sekhon and Lloyd A. Nelson Mar. 1979 90 p
(Contract DAAK40-77-C-0242)
(AD-A080188; FR79-12-292) Avail: NTIS HC A05/MF A01 CSCL 09/5

Manufacturing processes to fabricate heat pipes for circuit cards were evaluated. These included shell and wick fabrication, shell and wick joining, and vacuum/fill and testing. Cost effective processes were selected to meet production requirements. A production facility was designed based on cost trade-offs. The results of the evaluation, selection of recommended manufacturing methods and the design of the production facility are presented. GRA

N80-21754*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PARAMETRIC TESTS OF A TRACTION DRIVE RETROFITTED TO AN AUTOMOTIVE GAS TURBINE

Douglas A. Rohn, Stuart H. Lowenthal, and Neil E. Anderson 1980 21 p refs Presented at the 5th Intern. Automotive Propulsion Systems Symp., Dearborn, Mich., 14-18 Apr. 1980 Prepared in cooperation with Army Aviation Research and Development Command, Cleveland, Ohio
(Contract EF-77-A-31-1011)
(NASA-TM-81457; AVRADCOM-TR-80-8; DOE/NASA/1011-80/4) Avail: NTIS HC A02/MF A01 CSCL 13I

The results of a test program to retrofit a high performance fixed ratio Nasvytis Multiroller Traction Drive in place of a helical gear set to a gas turbine engine are presented. Parametric tests up to a maximum engine power turbine speed of 45,500 rpm and to a power level of 11 kW were conducted. Comparisons were made to similar drives that were parametrically tested on a back-to-back test stand. The drive showed good compatibility with the gas turbine engine. Specific fuel consumption of the engine with the traction drive speed reducer installed was comparable to the original helical gearset equipped engine. Author

N80-21755*# National Aeronautics and Space Administration, Washington, D. C.

STORAGE PEAK GAS-TURBINE POWER UNIT

B. Tsinkotski Jan. 1980 25 p refs Transl. into ENGLISH from Period. Polytech. Mech. Eng. (USSR), v. 22, no. 2, 1978 p 95-113 Original language document announced as A79-24507 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-75757) Avail: NTIS HC A02/MF A01 CSCL 10B

A storage gas-turbine power plant using a two-cylinder compressor with intermediate cooling is studied. On the basis of measured characteristics of a .25 Mw compressor computer calculations of the parameters of the loading process of a constant capacity storage unit (05.3 million cu m) were carried out. The required compressor power as a function of time with and without final cooling was computed. Parameters of maximum loading and discharging of the storage unit were calculated, and it was found that for the complete loading of a fully unloaded storage unit, a capacity of 1 to 1.5 million cubic meters is required, depending on the final cooling. Author

N80-21760# Santa Clara Univ., Calif.

EXHAUST CHARACTERIZATION OF NEAT ALCOHOL FUELED IC ENGINES Final Report

B. Pullman, R. Pefley, Richard Bechtold (DOE, Bartlesville, Okla.), and Jerry Allsup (DOE, Bartlesville, Okla.) Oct. 1979 30 p refs Sponsored by DOE
(BETC/P-B-8-1943-1) Avail: NTIS HC A03/MF A01

A late-model vehicle was converted to operate using methanol, gasoline, or ethanol as fuel and experimental work was done to obtain energy economy and exhaust emissions data for each of the three fuels. Results are compared at equal equivalence ratios both with and without an oxidation catalyst in the exhaust system. Using a catalyst for emissions control, unburned (hydro) carbon emissions were lowest during lean operating conditions and were nearly the same for all three fuels under those conditions. Oxides of nitrogen emissions typically were reduced by over 50 percent in changing from gasoline to methanol or ethanol. Composition of the exhaust hydrocarbons was determined from analysis via gas chromatography. These data were used for calculating photochemical reactivities and comparisons were made among the fuels during cold start and FTP weighted tests. DOE

N80-21824# Department of Energy, Washington, D. C. Oil and Gas Analysis Div.

PROJECTIONS OF ENHANCED OIL RECOVERY, 1985 - 1995
Joan Heinkel Sep. 1979 43 p
(DOE/EIA-0183/11; TR/ES/79-30) Avail: NTIS HC A03/MF A01

The production potential from thermal recovery methods, miscible and immiscible gas flooding, and chemical flooding methods were estimated. It was assumed that existing EOR technology is conventionally applied requiring a 10 percent real after tax rate of return similar to that assumed for conventional recovery method. Five alternative price paths for world supplies of crude oil were investigated. Supply possibilities from these enhanced methods are estimated as 0.9 million bbl/d in 1985 and show no variation despite the $6 range in price among the scenarios. Although thermal recovery techniques provide the bulk of production in the 1985-1995, they should decline in importance over time, providing 52 to 57 percent of ultimate recovery. Gas flooding will increase production over time to account for 37 to 41 percent of ultimate recovery and chemical flooding accounts for 6 to 7 percent. DOE

N80-21827# General Accounting Office, Washington, D. C. Energy and Minerals Div.
GEOTHERMAL ENERGY: OBSTACLES AND UNCERTAINTIES IMPEDE ITS WIDESPREAD USE
18 Jan. 1980 51 p refs
(PB80-134430; EMD-80-36) Avail: NTIS HC A04/MF A01 CSCL 08I

This report to Congress assesses the development and potential of geothermal energy and discusses Federal actions needed to help accelerate geothermal development and/use. GRA

N80-21828* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
WIND WHEEL ELECTRIC POWER GENERATOR Patent
John W. Kaufman, inventor (to NASA) Issued 4 Mar. 1980 8 p Filed 24 Feb. 1978 Supersedes N78-22469 (16 - 13, p 2137)
(NASA-Case-MFS-23515-1; US-Patent-4,191,505; US-Patent-Appl-SN-880726; US-Patent-Class-415-2; US-Patent-Class-415-101) Avail: U.S. Patent and Trademark Office CSCL 10B

Wind wheel electric power generator apparatus includes a housing rotatably mounted upon a vertical support column. Primary and auxiliary funnel-type, venturi ducts are fixed onto the housing for capturing wind currents and conducting to a bladed wheel adapted to be operatively connected with the generator apparatus. Additional air flows are also conducted onto the bladed wheel; all of the air flows positively effecting rotation of the wheel in a cumulative manner. The auxiliary ducts are disposed at an acute angle with respect to the longitudinal axis of the housing, and this feature, together with the rotatability of the housing and the ducts, permits capture of wind currents within a variable directional range.
Official Gazette of the U.S. Patent and Trademark Office

N80-21830# Brookhaven National Lab., Upton, N. Y.
REVIEW OF RECENT RESEARCH ON ENERGY STORAGE IN RESIDENTIAL SOLAR TOTAL ENERGY SYSTEMS
Richard W. Leigh May 1979 15 p refs
(Contract EY-76-C-02-0016)
(BNL-51012) Avail: NTIS HC A02/MF A01

Current and recent research relevant to residential applications of solar total energy are reviewed. For each project or study, the types of energy storage devices chosen and the methods used to integrate them with solar collectors and backup devices are emphasized. Several general conclusions are distilled from the studies to guide subsequent research. DOE

N80-21831*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AMPLIFIED WIND TURBINE APPARATUS Patent Application
William N. Myers, inventors (to NASA) and Leopold A. Hein Filed 12 Mar. 1980 16 p
(NASA-Case-MFS-23830-1; US-Patent-Appl-SN-129780) Avail: NTIS HC A02/MF A01 CSCL 10A

An amplified wind turbine apparatus is disclosed wherein ambient inlet air is prerotated in an air rotation chamber having a high pressure profile. A second rotation chamber adjacent and downstream of the turbine has a low pressure core profile whereby flow across the turbine is accelerated and thereafter exits the turbine apparatus through a draft anti-interference device. The draft device eliminates interference with ambient winds at the outlet of the turbine apparatus. Pivotable vanes controlled in response to prevailing wind direction admit air to the chambers and aid in imparting rotation. NASA

N80-21833*# Westinghouse Research and Development Center, Pittsburgh, Pa.
PHASE 2 OF THE ARRAY AUTOMATED ASSEMBLY TASK FOR THE LOW COST SOLAR ARRAY PROJECT Final Report, 1 Oct. 1978 - 30 Oct. 1979
R. B. Campbell, J. R. Davis, J. W. Ostroski, P. Rai-Choudhury, A. Rohatgi, E. J. Seman, and R. E. Stapleton 1979 151 p refs Prepared for JPL and DOE
(Contracts NAS7-100; JPL-954873)
(NASA-CR-162628; DOE/JPL-954873-79/08) Avail: NTIS HC A08/MF A01 CSCL 10A

The process sequence for the fabrication of dendritic web silicon into solar panels was modified to include aluminum back surface field formation. Plasma etching was found to be a feasible technique for pre-diffusion cleaning of the web. Several contacting systems were studied. The total plated Pd-Ni system was not compatible with the process sequence; however, the evaporated TiPd-electroplated Cu system was shown stable under life testing. Ultrasonic bonding parameters were determined for various interconnect and contact metals but the yield of the process was not sufficiently high to use for module fabrication at this time. Over 400 solar cells were fabricated according to the modified sequence. No sub-process incompatibility was seen. These cells were used to fabricate four demonstration modules. A cost analysis of the modified process sequence resulted in a selling price of $0.75/peak watt. R.E.S.

N80-21835*# City of Huntsville, Ala.
SOLAR HEATING AND HOT WATER SYSTEM INSTALLED AT THE SENIOR CITIZEN CENTER, HUNTSVILLE, ALABAMA Final Report
Feb. 1980 140 p Sponsored by NASA
(Contract EG-77-A-01-4071)
(NASA-CR-161384) Avail: NTIS HC A07/MF A01 CSCL 10B

The solar energy system installed at the Huntsville Senior Citizen Center is described. Detailed drawings of the complete system and discussions of the planning, the hardware, recommendations, and other pertinent information are presented. R.E.S.

N80-21836*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: SEASONAL REPORT FOR IBM SYSTEM 2, TOGUS, MAINE Contractor Report, May 1978 - Apr. 1979
Jan. 1980 68 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161383) Avail: NTIS HC A04/MF A01 CSCL 10B

The solar energy system, SIMS Prototype System 2, was designed to supply domestic hot water to single family residences. The system consists of flat plate collectors, silicone working fluid, storage tanks, pumps, heat exchanger, controls, and associated plumbing. The long term field performance of the installed system was analyzed and the results are described. R.E.S.

N80-21837*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLAME TUBE PARAMETRIC STUDIES FOR CONTROL OF FUEL BOUND NITROGEN USING RICH-LEAN TWO-STAGE COMBUSTION
Donald F. Schultz and Gary Wolfbrandt 1980 25 p refs Presented at Western States Sect. of the Combust. Inst. of Spring

Meeting, Irvine, Calif., 21-22 Apr. 1980
(Contract EF-77-A-01-2593)
(NASA-TM-81472; DOE/NASA/2593-80/15; E-405) Avail: NTIS HC A02/MF A01 CSCL 21B

An experimental parametric study of rich-lean two-stage combustion in a flame tube is described and approaches for minimizing the conversion of fuel-bound nitrogen to nitrogen oxides in a premixed, homogeneous combustion system are evaluated. Air at 672 K and 0.48 MPa was premixed with fuel blends of propane, toluene, and pyridine at primary equivalence ratios ranging from 0.5 to 2.0 and secondary equivalence ratios of 0.5 to 0.7. Distillates of SRC-II, a coal syncrude, were also tested. The blended fuels were proportioned to vary fuel hydrogen composition from 9.0 to 18.3 weight percent and fuel nitrogen composition from zero to 1.5 weight percent. Rich-lean combustion proved effective in reducing fuel nitrogen to NO sub x conversion; conversion rates up to 10 times lower than those normally produced by single-stage combustion were achieved. The optimum primary equivalence ratio, where the least NO sub x was produced and combustion efficiency was acceptable, shifted between 1.4 and 1.7 with changes in fuel nitrogen content and fuel hydrogen content. Increasing levels of fuel nitrogen content lowered the conversion rate, but not enough to avoid higher NO sub x emissions as fuel nitrogen increased. M.G.

N80-21838# Hughes Aircraft Co., Los Angeles, Calif.
HIGH EFFICIENCY SOLAR PANEL, PHASE 2, GALLIUM ARSENIDE Interim Report, 15 Sep. 1977 - 15 Jan. 1979
G. Vendura, S. Kamath, and G. Wolfe Jul. 1979 65 p refs
(Contract F33615-77-C-3150; AF Proj. 682J)
(AD-A079635; HAC-SCG-90324M; HAC-REF-E0773; AFAPL-TR-79-2058) Avail: NTIS HC A04/MF A01 CSCL 10/2

This interim report presents the progress of the GaAs High Efficiency Solar Panel program (Phase II) goal of development of space qualified solar cells of 16 percent efficiency AMO during the period of September 1977 through January 1979. Results of development research involving the basic GaAs substrate, the epitaxial reactors, LPE growth processes, ohmic contacts/metallizations, welding capability, and environmental testing are included. Efforts to increase substrate size and fabrication yield to enhance the feasibility of larger scale GaAs solar cell production are also detailed. GRA

N80-21842# California Univ., Livermore. Lawrence Livermore Lab.
EFFECT OF A HEATED ATMOSPHERE ON THE TEMPERATURE DEPENDENCE OF THE TOTAL EMITTANCE OF BLACK CHROME SOLAR ABSORBER PIPES M.S. Thesis
Thomas Alexander Reitter Oct. 1979 79 p refs
(Contract W-7405-eng-48)
(UCRL-52851) Avail: NTIS HC A05/MF A01

An apparatus for measuring the total hemispherical emittance of pipes of length suitable for in a prototype solar collector is reported. The apparatus was used to measure the total hemispherical emittance as a function of temperature of black chrome, nickel, and bare steel surfaces, before and after exposure to heated humid or dry air atmospheres. Exposure to a heated atmosphere lowered the emittance of the black chrome surfaces on the order of 20%. Similar exposure increased the emittance of the bare steel surface significantly, but had no effect on the nickel surface. It was hypothesized that the lowering of the black chrome emittance is due to the oxidation and subsequent outgassing of carbon contaminants on and in the black chrome layer. The actual causes may be a combination of this and other effects. However, due to the complexity of the black chrome layer it was not possible to explain the changes in the black chrome emittance in terms of changes in the coating. DOE

N80-21846# Boeing Engineering and Construction, Seattle, Wash.
SOLAR CENTRAL RECEIVER PROTOTYPE HELIOSTAT, VOLUME 1 Final Technical Report
1 Jun. 1979 207 p refs
(Contract EG-77-C-03-1604)
(SAN-1604-1) Avail: NTIS HC A10/MF A01

A prototype heliostat design for a solar central receiver is presented in detail. The manufacturing installation, and maintenance procedures are described. DOE

N80-21847# Stearns-Roger Corp., Denver, Colo.
SOLAR THERMAL REPOWERING SYSTEMS INTEGRATION Final Report
L. J. Dubberly Aug. 1979 156 p refs Sponsored in part by SERI, Golden, Colo.
(Contract EG-77-C-01-4042)
(SERI/TR-8037-1) Avail: NTIS HC A08/MF A01

Solar repowering interface requirements for water/steam and salt or sodium-cooled central receivers are defined for unit sizes ranging from 50 MWe non-reheat to 350 MWe reheat. Balance of plant cost estimates are presented for each of six combinations of plant type, receiver and percent solar repowering. DOE

N80-21848# Midwest Research Inst., Golden, Colo.
ANALYSIS OF A HEAT EXCHANGER-THERMOELECTRIC GENERATOR SYSTEM
Jon Henderson 1979 7 p refs Presented at the 14th Intersoc. Energy Conversion Engineering Conference, Boston, 5-10 Aug. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-35-253; CONF-790803-56) Avail: NTIS HC A02/MF A01

Analysis of a thermoelectric generator (TEG) in an ocean thermal energy conversion (OTEC) application is presented. An analytic model was developed for describing the heat exchanger-TEG interactions. This model was used to illustrate limitations of applying conventional fixed junction temperature assumptions to systems experiencing significant temperature drops across the heat exchanger surfaces. Design methods were developed for determining the thermoelectric element geometry that produces maximum output power. Results show that a heat exchanger-TEG system may deliver about 100 W/sq m of heat exchanger surface. This compares favorably with conventional OTEC schemes. DOE

N80-21849# Brookhaven National Lab., Upton, N. Y.
USE OF EARTH COUPLING IN SOLAR ASSISTED HEAT PUMPS
P. D. Metz, E. A. Kush, and J. N. Andrews 1979 11 p refs Presented at a Nordic Symp. on Earth Heat Pump Systems, Goteborg, Sweden, 15-16 Oct. 1979
(Contract EY-76-C-02-0016)
(BNL-26748; CONF-791119-1) Avail: NTIS HC A02/MF A01

The use of thermal coupling between the earth and the storage element of a solar source heat pump system was investigated. Four buried tanks and five configurations of serpentine plastic pipe with various control strategies were studied. System heating and cooling performance, detailed earth temperature profiles, and soil thermal properties were measured. Experimental results were used to validate heat flow models. The integration of ground coupling with solar heat pump systems is explained, the tank and pipe field configurations are described, and the heat flow model development is outlined. The experimental results, are reported and are compared to model predictions. DOE

N80-21850# California Univ., Berkeley. Lawrence Berkeley Lab.
AEROSPACE TECHNOLOGY REVIEW FOR LBL WINDOW/PASSIVE SOLAR PROGRAM Final Report
R. Viswanathan Jun. 1979 388 p refs
(Contract W-7405-eng-48)
(LBL-9608; EEB-W-79-13) Avail: NTIS HC A17/MF A01

A review of aerospace literature to uncover material pertinent to the Window and Passive Solar Programs is reported. Areas covered are: optical shutters, soils, thermal storage and transfer, optical properties of materials and clouds, human engineering, high efficiency light sources and solid state electronics, thermal and optical properties of landscape and building materials, and measurement and diagnostic techniques. DOE

N80-21851# Lockheed Missiles and Space Co., Sunnyvale, Calif.
EVALUATION OF SELECTIVE ABSORBERS Semiannual Report
1979 12 p refs
(Contracts DE-AC04-78CS-15361)
(TP-5461) Avail: NTIS HC A02/MF A01

Six selective absorber materials were characterized with respect to initial optical properties and abbreviated environmental exposures. For the plated black chrome, uniformity was poor in terms of a/sub s/ and epsilon as measured on 1 sq ft panels. Short term environmental exposures caused no substantial changes in optical or physical properties of the materials. DOE

N80-21852# Argonne National Lab., Ill.
APPLICATION OF GLASS TECHNOLOGY TO NOVEL SOLAR ENERGY COLLECTORS
Kent A. Reed 1979 17 p refs Presented at Am. Sci. Glass Blowers Soc. Symp., Detroit, Mich., 29 Jun. 1979
(Contract W-31-109-eng-38)
(CONF-7906118-1) Avail: NTIS HC A02/MF A01

Various compound parabolic concentrator (CPC) configurations are described and the application of glass technology to CPC absorbers, evacuated receivers, and evacuated tube receivers are considered. Also a floodlamp collector concept and a fluorescent tube collector concept are discussed. DOE

N80-21853# California Univ., Livermore.
ECONOMIC ANALYSIS OF SOLAR INDUSTRIAL PROCESS HEAT SYSTEMS. A METHODOLOGY TO DETERMINE ANNUAL REQUIRED REVENUE AND INTERNAL RATE OF RETURN
W. C. Dickinson and K. C. Brown 17 Aug. 1979 46 p refs
(Contract W-7405-eng-48)
(UCRL-52814) Avail: NTIS HC A03/MF A01

To permit an economic evaluation of solar industrial process heat systems, a methodology to determine the annual required revenue and the internal rate of return was developed. First, a format is provided to estimate the solar system's installed cost, annual operating and maintenance expenses, and net annual solar energy delivered to the industrial process. Then an expression is presented that gives the annual required revenue and the price of solar energy. The economic attractiveness of the potential solar investment can be determined by comparing the price of solar energy with the price of fossil fuel, both expressed in levelized terms. DOE

N80-21854# Sandia Labs., Albuquerque, N. Mex.
REVIEW OF SELECTED ON-SITE DOE SMALL SOLAR THERMAL POWER PLANT EXPERIMENTS
Robert L. Alvis 1979 12 p ref Presented at the Fourth Annual National Conf. on Technology for Energy, Albuquerque, N. Mex., 30 Oct. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1040C; CONF-791052-1) Avail: NTIS HC A02/MF A01

Three solar power plants are reviewed that were developed in an effort to find an alternate energy source for powering irrigation pumps. Power generation by the conversion of solar energy is shown to be technically feasible in the construction and operation of these three solar thermal power systems. The thermal cycling inherent in solar energy is shown to be more stressful on the system components and requires special design attention to obtain satisfactory performance. The economic benefit of these one-of-a-kind systems are not competitive with the conventional power systems. However, predictions for similar systems in large production indicate that power could be generated for approximately 5 cents/kWh in the Southwest. Recent increases in conventional energy costs, and continuing component development, are combining to make solar power systems a potential near-term reality. DOE

N80-21855# California Univ., Livermore. Lawrence Livermore Lab.
COMPOSITE-LAMINATE FLYWHEEL-ROTOR DEVELOPMENT PROGRAM
S. V. Kulkarni 9 Nov. 1979 13 p refs
(Contract W-7405-eng-48)
(UCRL-83554) Avail: NTIS HC A02/MF A01

The tapered thickness Stodola rotor concept is considered with emphasis on improving the performance of the rotor. Topics discussed include: (1) redesigning the Stodola rotor to increase the energy density; (2) testing laminate coupons to establish the degree of strength anisotropy of various quasi-isotropic laminates; (3) spin testing of constant thickness, composite laminate rotors to establish a relationship between design data and failure speed; (4) developing a matched-metal-die compression molding process to fabricate thick, high fiber volume, low void content composite panels, and (5) exploring the feasibility of manufacturing low cost rotors from structural sheet molding compounds. DOE

N80-21856# Brookhaven National Lab., Upton, N. Y.
MULTI-OBJECTIVE ENERGY ANALYSIS
E. A. Cherniavsky Nov. 1979 29 p refs Presented at NATO Advanced Res. Inst. Conf., Upton, N.Y., 12 Nov. 1979
(Contract EY-76-C-02-0016)
(BNL-26882; CONF-791152-1) Avail: NTIS HC A03/MF A01

Analytic models, which are applied to energy planning problems in an effort to assess the probable impacts of alternative courses of action on vital social concerns such as the quality of the environment, the state of the economy, or extent of dependence on insecure foreign energy sources, were studied. The tradeoffs between different social objectives were identified and quantified. Associated problems are explored and discussed in the light of experience with applications to energy planning models. Conclusions are drawn concerning the most fruitful directions for future research in this area. DOE

N80-21857# Cambridge Systematics, Inc., Mass.
ANALYTIC PROCEDURES FOR URBAN TRANSPORTATION ENERGY CONSERVATION. VOLUME 1: SUMMARY OF FINDINGS AND METHODOLOGIES Final Report
J. H. Suhrbier and W. D. Byrne Apr. 1979 40 p refs
(Contract EM-76-C-01-8628)
(Cons-8626-T1-Vol-1) Avail: NTIS HC A03/MF A01

Analytical methodologies are described and illustrated for use by metropolitan planning organizations and other state and local transportation agencies in analyzing the energy conservation potential of candidate urban transportation measures. Quantitative methodologies oriented to carpooling, vanpooling, transit, pricing, traffic regulation and control, and auto ownership are provided based on the use of disaggregate behavioral travel demand models. Changes are indicated in trip frequency and distribution as well as in travel model, operating conditions, and vehicle miles of travel. Trip-based estimates of fuel consumption and vehicle emissions are included. Application of the developed methodologies was performed in cooperation with metropolitan planning organizations representing the Dallas-Fort Worth, San Francisco, and Denver urban areas. DOE

N80-21859# EcoSystems, Inc., McLean, Va.
POTENTIAL FOR SOLAR/CONSERVATION TECHNOLOGIES IN THE STATE OF WASHINGTON
David Baylon, J. Brautigam, H. Reichmuth, B. Boulter, S. Gross, A. Stewart, and S. Worthman 4 Apr. 1979 70 p refs
(Contract EG-77-G-01-4099)
(WAOENG-79-3) Avail: NTIS HC A04/MF A01

A data base for Washington State energy consumption by fuel type is presented and divided into energy end use temperatures and types. Solar/conservation technologies are classed according to their immediacy as options for use, cost effectiveness, current availability, and compatibility with intended uses. The effect of presently feasible solar conservation technologies on Washington State energy consumption, if fully deployed, amounts to approximately 15 percent of the total 1974 energy use. Agricultural, industrial, commercial and residential end uses are also discussed. DOE

N80-21860# Eltra Corp., Plymouth Meeting, Pa. C and D Batteries Div.

RESEARCH, DEVELOPMENT AND DEMONSTRATION OF LEAD-ACID BATTERIES FOR ELECTRIC VEHICLE PROPULSION Annual Report, 1978
Oct. 1979 69 p refs
(Contract W-31-109-eng-38)
(ANL/OEPM-78-7) Avail: NTIS HC A04/MF A01

Progress status during the period from 4/15/78 to 8/31/78 is reported for each task in the Program's Work Breakdown Statement scheduled to be activated. The general considerations required for electric vehicle battery design are presented. The procedures followed in generating its ISOA design are described. DOE

N80-21863# Institute for Energy Analysis, Oak Ridge, Tenn.
ARE THE ALTERNATIVE ENERGY STATEGIES ACHIEVABLE?
Alvin M. Weinberg Sep. 1979 29 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA-79-15(0)) Avail: NTIS HC A03/MF A01

The constraints on penetration of energy technologies (time and information, net energy, and capital cost) are discussed. Related to the energy/time exchange is the economic cost of intermittency of energy supply. Renewable energy sources, particularly solar sources, are characteristically intermittent. To eliminate intermittency imposes a cost that must be considered in planning energy futures based on renewable sources. The article concludes that alternative energy strategies are achievable if they are subsidized by the government in the form of support for research, development and demonstration projects. R.E.S.

N80-21864# Tennessee Univ., Tullahoma. Space Inst.
DEVELOPMENT PROGRAM FOR MHD DIRECT COAL-FIRED POWER GENERATION TEST FACILITY Quarterly Technical Progress Report, Apr. - Jun. 1978
J. B. Dicks, Y. C. L. Wu, and R. C. Attig 25 Jan. 1979 52 p refs
(Contract EY-76-C-01-1760)
(FE-1760-34) Avail: NTIS HC A04/MF A01

The following program activities are described: vitiation heater/combustor development, NO/sub x/ testing, relative temperature measurement in support of combustion of combustor testing, progress in the design and construction of the coal fired flow facility, and materials experimentation to determine the rate of potassium loss from seeded coal slag at various temperatures. DOE

N80-21865# Oak Ridge National Lab., Tenn. Chemistry Div.
MOLTEN CARBONATE FUEL CELL PROGRAM: EMF AND TEMPERATURE RELAXATION IN LiKCO 3 TILES, TRANSFERENCE CELL MEASUREMENTS Progress Report, 1 Jan. - 31 Mar. 1979
J. Braunstein, H. R. Bronstein, A. R. Manner, J. Nwalor, and Duane H. Smith Dec. 1979 18 p refs
(Contract W-7405-eng-26)
(ORNL/TM-7003) Avail: NTIS HC A02/MF A01

Progress was made in resolving the thermoelectric contributions to the relaxing electromotive forces (EMF) of electrolyzed LiKCO3-LiAlO2 tiles in a study of mass transport in molten carbonate fuel cell electrolytes. The thermoelectric effect was a measurable contribution, but only in the early stages of the relaxation. Preliminary measurements with the transference EMF cell are reported along with estimates of the transference number in LiKCO2. DOE

N80-21866# Burns and Roe, Inc., Woodbury, N. Y.
CONCEPTUAL DESIGN OF AN AFBC ELECTRIC POWER GENERATING PLANT. VOLUME 3: APPENDICES
E. Kimel, S. Panico, J. Bianchini, M. Novack, J. Armstrong, and J. Wysocki Feb. 1979 328 p
(Contract EF-77-C-01-2455)
(FE-2455-27-Vol-3) Avail: NTIS HC A15/MF A01

Aspects of the conceptual design of an atmospheric fluidized-bed combustion (AFBC) electric power generating plant are examined including: coal and limestone preparation, fluidized-bed combustor performance, boiler design, performance, and cost, the development of model facilities for boiler performance testing, projections on the limestone feed requirements for a 600 MWe AFBC plant using subbituminous western coal, testing with such coals; and limestone availability in the U.S. DOE

N80-21869# Washington State Univ., Pullman. Environmental Research Center.
WASHINGTON STATE ENERGY USE PROFILE, 1960-1978
G. Allen, C. Culver, E. Quarles, and J. Robertson Jun. 1979 145 p refs
(WAOENG-79-1) Avail: NTIS HC A07/MF A01

An overview of demographic and economic factors, energy use, energy resources, and prices is presented. Energy use by fuel type: petroleum, natural gas, and coal is covered along with electricity use, supply, and prices. Energy use disaggregated by end use and consuming sector is covered for the residential, commercial, industrial, agricultural, and transportation sectors. DOE

N80-21870# Prototech, Inc., Newton Highlands, Mass.
ENERGY SAVINGS BY MEANS OF FUEL CELL ELECTRODES IN ELECTRO-CHEMICAL INDUSTRIES Progress Report, 1 Nov. - 31 Jan. 1978
Robert J. Allen, Walter Juda, R. W. Lindstorm, and H. G. Petrow 19 Mar. 1979 72 p refs
(Contract ET-78-C-02-4881)
(COO-4881-6) Avail: NTIS HC A04/MF A01

Data are presented for air depolarized cathode performance in caustic half cells and hydrogen depolarization of anodes for the electrowinning of zinc. Investigation with air depolarized Pt cathodes in caustic half cells include: progress of the one year old RA19 type air diffusion cathode; data involving incorporation of a Hg/HgO reference electrode into the standard hardware; studies investigating cathode loading vs. cell performance; continued evaluation of thin, porous, conducting substrates; and cathode performance as a function of electrolyte concentration. In the area of zinc electrowinning, short term tests (4 hours) with pure hydrogen feeds were carried out under various cell operating conditions. In addition, tests with CO-containing hydrogen were initiated utilizing different levels of carbon monoxide poison. A preliminary economic evaluation for electric energy savings versus hydrogen costs is presented. DOE

N80-21871# Sandia Labs., Albuquerque, N. Mex. Component and Subsystem Development Div.
TECHNOLOGY ASSESSMENT: LINE-FOCUS CONCENTRATORS
J. F. Banas Sep. 1979 11 p refs Presented at the Solar Industrial Process Heat Conf., San Francisco, 31 Oct. 1979
(Contract EY-76-C-04-0789)
(SAND-79-2221c; CONF-791024-10) Avail: NTIS HC A02/MF A01

Eleven solar thermal collectors and two systems are evaluated in order to define engineering development problems requiring solution to commercialization initiatives. The major engineering problems and near-term development emphasis are described. DOE

N80-21872# Los Alamos Scientific Lab., N. Mex.
SOLAR ENERGY RESEARCH AT LASL Progress Report, 1 Oct. 1977 - 31 Mar. 1978
Charles A. Bankston and Donald A. Neeper Oct. 1979 81 p refs
(Contract W-31-109-eng-36)
(LA-7741-PR) Avail: NTIS HC A05/MF A01

Research on solar collectors, studies and evaluations of both passive and active solar heating systems, and information dissemination activities are described. DOE

N80-21875# Pennsylvania State Univ., University Park. Dept. of Architectural Engineering.
PERFORMANCE OF A SOLAR ENERGY-ASSISTED HEAT PUMP HEATING SYSTEM: ANALYSIS AND CORRELATION OF FIELD-COLLECTED DATA M.S. Thesis
Ronald Craig Williams Aug. 1979 219 p refs
(Contract EY-76-S-02-2704)
(COO-2704-T1) Avail: NTIS HC A10/MF A01

An analysis of building energy usage and thermal load for the Solar Building during the winter heating seasons of 1974-75 and 1975-76 is reported. The one-story office building is located in Albuquerque, New Mexico. Its mechanical heating and cooling equipment is categorized as a solar-assisted heat pump system consisting of solar collectors, water thermal storage, a water to water heat pump and five smaller water-to-air heat pump packaged units. Building energy usage examined with emphasis on the time of day energy was consumed and the source from which the energy was obtained. The rate of electrical energy consumption was found to be very dependent on building use. High rates of electrical energy usage during occupied periods required cooling during parts of even the coldest days. Mechanical equipment heating was found to vary as a function of building usage as well as a function of the indoor-outdoor temperature differential.
DOE

N80-21876# Midwest Research Inst., Golden, Colo.
SOLAR POND FOR INDUSTRIAL PROCESS HEAT
K. C. Brown, M. Edesess, and T. S. Jayadev Oct. 1979 7 p refs Presented at the Solar Ind. Process Heat Conf., Oakland, Calif., 31 Oct. - 2 Nov. 1979
(Contract EG-77-C-01-4042)
(SERI/TD-351-460; CONF-791024-11) Avail: NTIS HC A02/MF A01

Solar ponds offer perhaps the simplest technique for conversion of solar energy to thermal energy, which can be used for industrial process heat. It is unique in its capability in acting both as collector and storage. Further, the cost of solar pond per unit area is less than any active collectors available today. Combination of these economic and technical factors make solar ponds attractive as a fuel saver in industrial process heat (IPH) applications. Detailed calculations are given for solar ponds in two specific applications: providing hot water for aluminum can washing in a manufacturing plant and hot water for washing in a large commercial laundry. With the help of computer codes, it is shown that solar ponds are far more cost effective than any other solar IPH technology for these applications. DOE

N80-21877# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
LOW COST PERFORMANCE EVALUATION OF PASSIVE SOLAR BUILDINGS
Larry S. Palmiter, L. Blair Hamilton, and Michael J. Holtz Oct. 1979 60 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-63-223) Avail: NTIS HC A04/MF A01

An approach to low cost instrumentation and performance evaluation of passive solar heated buildings is presented. Beginning with a statement of the need for a low cost approach, a minimum list of measured quantities necessary to compute a set of recommended performance factors is developed. Conflicts and confusion surrounding the definition of various performance factors are discussed and suggestions are made for dealing with this situation. Available instrumentation and data processing equipment is presented. The recommended system would monitor approximately ten variables and compute numerous performance factors on site at a projected system cost of less than $3,000 per installation.
DOE

N80-21879# Berkeley Solar Group, Calif.
PERFORMANCE MONITORING OF A PASSIVE SOLAR HEATED HOUSE, STOCKTON, CALIFORNIA Interim Report
Anthony Wexler Sep. 1979 50 p refs Sponsored by EPRI
(EPRI-ER-1177) Avail: NTIS HC A03/MF A01

The data acquisition system used in monitoring the performance of the passive solar demonstration home in Stockton, California is described. Details about the data logger, the sensors, and the installation procedure are given. The house is briefly described and some of the problems encountered in the project are discussed.
DOE

N80-21880# Technische Univ., Berlin (West Germany). Institut fuer Luft- und Raumfahrt.
STUDY ON EUROPEAN ASPECTS OF SOLAR POWER SATELLITES, VOLUME 1 Final Report
J. Ruth and W. Westphal Jun. 1979 137 p refs
(Contract ESA-3705/78-F-DK(SC))
(ESA-CR(P)-1266) Avail: NTIS HC A07/MF A01

A study on implications of the potential electricity supply for Western Europe by Solar Power Satellites (SPS) and of their implementation problems around the turn of the century is presented. Three objectives in this scope have been pursued to provide a decision platform for on-going study and research activities: (1) to establish an information base including relevant data collection and basic SPS-systems understanding; (2) to identify and preliminary assess specific European problems of SPS utilization; and (3) to accomplish recommendations for early study activities of particular European concern. The last item is directly derived from the evaluations of the second study objective and must be seen in the context with SPS activities of the USA. It is concluded that the special European environment calls for special European utilization feasibility analyses, while the principal technical feasibility of a SPS-system should be taken over from U.S. studies. Moreover, if the USA stops its activities, an implementation of a SPS-system for Western Europe would be impractical in the considered time frame (2000-2030).
Author (ESA)

N80-21881# Aeronautical Research Inst. of Sweden, Stockholm. Aerodynamics Dept.
TORSIONAL OSCILLATIONS OF THE ROTOR DISC FOR HORIZONTAL AXIS WIND TURBINES WITH HINGED OR TEETERED BLADES, PART 12
Lennart S. Hultgren (MIT) 23 Aug. 1979 39 p refs
(Contract SWEDBESD-5061.012)
(FFA-TN-AU-1499-PT-12) Avail: NTIS HC A03/MF A01

The coupling of torsional oscillations of the rotor disc and the blade motions was analyzed for horizontal axis wind turbine hinged or teetered blades. The blades and the tower were assumed to be perfectly rigid. The vibrational analysis was linear and the antisymmetric blade flapping motion was found be decoupled. Expressions for the eigenfrequencies of the system were obtained. Analytical solutions were constructed for forced vibrations due to gravity, wind shear and tower shadow. Large resonant torsional responses were found to be possible. Numerical examples are presented.
Author (ESA)

N80-21883# International Science and Technology Inst., Inc., Washington, D. C.
HYDRO FOR THE EIGHTIES: BRINGING HYDROELECTRIC POWER TO LOW INCOME PEOPLE. THE WORK BOOK. A SLIDE PRESENTATION: AUDIO CASSETTE AND WORKBOOK
Sep. 1979 44 p
(Contract CSA-B9AA-007)
(PB80-103948; CSA/LN-2435) Avail: NTIS HC A03/MF A01 CSCL 10B

The rationale for developing low cost hydroelectric power is presented. Simplified descriptions of techniques for use by community groups to evaluate prospects for small hydro development are given. The pre-feasibility or reconnaissance stage is presented in a step-by-step form. Feasibility studies, licensing and financing procedures are outlined with guidelines identified.
GRA

N80-21884# Oklahoma Univ., Norman. Science and Public Policy Program.
ENERGY FROM THE WEST: IMPACT ANALYSIS REPORT. VOLUME 1: INTRODUCTION AND SUMMARY Final Report, Jul. 1975 - Oct. 1979
Irvin L. White, Michael A. Chartock, R. Leon Leonard, Steven C Ballard, Martha W. Gilliland, Edward J. Malecki, Edward B. Rappaport, Frank J. Calzonetti, Mark S. Eckert, Timothy A. Hall et al Mar. 1979 185 p refs
(Contract EPA-68-01-1916)
(PB80-113566; EPA-600/7-79-082A) Avail: NTIS HC A09/MF A01 CSCL 10A

The results of impact analyses conducted as a part of a three year technology assessment of the development of six energy resources (coal, geothermal, natural gas, oil, oil shale and uranium) in eight western states (Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah and Wyoming) during the period 1975-2000 are reported. Both site-specific and regional impact analysis results are summarized. GRA

N80-21885# National Bureau of Standards, Washington, D.C.
DATA REQUIREMENTS AND THERMAL PERFORMANCE EVALUATION PROCEDURES FOR SOLAR HEATING AND COOLING SYSTEMS
Elmer R. Streed, ed., J. Lemming, Ove Jorgensen, Per Isakson, and Guy-Roland Perrin Aug. 1979 87 p refs Sponsored in part by DOE Prepared in cooperation with Technical Univ. of Denmark, Lyngby., Royal Inst. of Tech., Stockholm, and Ecole Polytechnique Federale de Lausanne, Switzerland
(NBS Proj. 7422413)
(PB80-120173; NBSIR-80-1980) Avail: NTIS HC A05/MF A01 CSCL 13A

Standardized nomenclature and procedures are presented to serve as a guide to monitor and evaluate research or demonstration type solar hot water or heated and/or cooled systems, components, and buildings. Performance factors, data requirements, measurement parameters, and data analysis methods are described for typical solar energy systems. GRA

N80-21886# General Accounting Office, Washington, D. C. Energy and Minerals Div.
HYDROPOWER, AN ENERGY SOURCE WHOSE TIME HAS COME AGAIN
11 Jan. 1980 96 p
(PB80-127715; EMD-80-30) Avail: NTIS HC A05/MF A01 CSCL 10B

Recent price increases in imported oil demonstrate the urgency for the U.S. to rapidly develop its renewable resources. One such renewable resource for which technology is available now is hydropower. Studies indicate that hydropower potential, particularly at existing dam sites, can save the county hundreds of thousands of barrels of oil per day. But problems and constraints-economic, environmental, institutional, and operational-limit is full potential. Federal programs have had little impact on helping to bring hydro projects on line. Specifically, the Department of Energy's Small Hydro Program could do more to overcome hydro constraints and problems through an effective outreach program and more emphasis on demonstration projects. GRA

N80-21888# AiResearch Mfg. Co., Torrance, Calif.
FLYWHEEL ENERGY STORAGE SWITCHER. VOLUME 1: STUDY SUMMARY AND DETAILED DESCRIPTION OF ANALYSIS Final Report, Sep. 1977 - Jan. 1979
L. M. Cook, W. T. Curran, R. McConnell, and A. K. Smith Apr. 1979 442 p refs
(Contract DOT-FR-777-4247-1)
(PB80-121478; FRA/ORD-79/20.1-Vol-1; AiResearch-79-15651-1) Avail: NTIS HC A19/MF A01 CSCL 13F

The application of flywheel energy storage to the railroad switchyard locomotive was studied to determine the practicality and viability of such a system. The system, as originally conceived, required the use of separately excited traction motors and a major task of the study was to test separately excited version of the Electro-Motive Division's D77 traction motor. The attractiveness of the system is very dependent on the operational scenario of the switching locomotive. The operation of locomotives at three flatyards were studied, Dillard (Southern Railway System), Baldwin (Seaboard Coast Line), and Whitefish (Burlington Northern). Also, a large amount of data concerning the operation environment of switching locomotives was collected. It is concluded that a boxcar was required to carry the energy storage unit because no room existed on the locomotive. This, combined with the increased auxiliary load, results in the same energy consumption with or without the FESS system, for a typical flatyard operation in spite of the energy recuperated and reused. Brake maintenance savings, although significant, are not sufficient to give an attractive return on investment. GRA

N80-21889# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
ENERGY PROGRAMS AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY Quarterly Report, Jul. - Sep. 1979
Oct. 1979 25 p refs Sponsored in part by DOE
(PB80-125651; JHU/APL/EQR/79-3) Avail: NTIS HC A02/MF A01 CSCL 10A

Work in developing energy resources, utilization concepts, and storage methods is reported. The first section, geothermal energy development planning, reports progress of various geothermal-related tasks. The tasks include the ongoing Atlantic Coastal Plain Geothermal Energy Market Survey, Delmarva Geothermal Development Prospectus, analysis geothermal energy at Crisfield, Md., analysis of the Crisfield well data, and comments on limited tasks. The second section, operational research, hydroelectric power development, contains a report on the survey of smallscale hydroelectric in the southeastern states and an analysis of institutional, legal, environmental, and economic factors. Landfill methane recovery and liquefied natural gas safety are also discussed. GRA

N80-21896# Industrial Environmental Research Lab., Research Triangle Park, N. C.
POLLUTION CONTROL PRACTICES, FUEL CONVERSION AND ITS ENVIRONMENTAL EFFECTS
H. Gold (Water Purification Associates, Cambridge, Mass.), J. A. Nardella (DOE, Germantown, Md.), and C. A. Vogel Aug. 1979 9 p refs Repr. from Chem. Engineering Progr., v. 75, no. 8, Aug. 1979 p 58-64 Presented at AICHE, Miami Beach, Fla. Nov. 1978
(PB80-119704; EPA-600/J-79-032) Avail: NTIS HC A02/MF A01 CSCL 13B

Water-related effects that could be expected from siting specific conversion plants at given locations in the major coal and oil shale bearing regions of the U.S. were investigated. The synthetic fuel technologies examined include: coal gasification to convert coal to pipeline gas; coal liquefaction to convert coal to low-sulfur fuel oil; coal refining to produce a de-ashed, low-sulfur solvent-refined (clean) coal; and oil shale retorting to produce synthetic crude. The results presented include the range of water requirements, the conditions for narrowing the range and optimizing the use of water, the ranges of residual solid wastes, and the cost and energy requirements for wastewater treatment. GRA

N80-21912# PEDCo-Environmental, Inc., Cincinnati, Ohio.
OVERVIEW OF POLLUTION FROM COMBUSTION OF FOSSIL FUELS IN BOILERS OF THE UNITED STATES Final Report, Jan. - Jun. 1979
P. W. Spaite and T. W. Devitt Oct. 1979 69 p refs
(Contract EPA-68-02-2603)
(PB80-124969; EPA-600/7-79-233) Avail: NTIS HC A04/MF A01 CSCL 13B

The fossil-fuel-fired boiler population of the U.S. are described. Data is given on the number and capacity of boilers for categories most relevant to producing pollution. Information presented includes: type of fuel burned (coal, residual oil, distillate oil, natural gas); usage sector (utility, industrial, commercial); size category (less than 25 million Btu/hr, 25-250 million Btu/hr, greater than 250 million Btu/hr); and heat transfer configuration (water tube, fire tube, cast iron). Fuel consumption data are presented for each type of fuel burned in each usage sector. These data are used to estimate the amount of sulfur oxide, nitrogen oxide, and particular air emissions produced by boiler operation. Other air pollutants are discussed qualitatively. Solid waste and water pollution from boiler operation is discussed generally. GRA

N80-21913# Research Triangle Inst., Research Triangle Park, N. C.
SYMPOSIUM PROCEEDINGS: ENVIRONMENTAL ASPECTS OF FUEL CONVERSION TECHNOLOGY, IV Final Report, Sep. 1978 - Sep. 1979

Franklin A. Ayer, comp. and N. Stuart Jones, comp. Sep. 1979 572 p refs Conf. held at Hollywood, Fla., Apr. 1979
(Contract EPA-68-02-3132)
(PB80-134729; EPA-600/7-79-217) Avail: NTIS HC A24/MF A01 CSCL 21D

The proceedings document presentations made at the symposium on Environmental Aspects of Fuel Conversion Technology. The symposium acted as a colloquium for discussion of environmentally related information on coal gasification and liquefaction. The program included sessions on program approach, environmental assessment, and control technology development.
GRA

N80-21955# SRI International Corp., Menlo Park, Calif.

ESTIMATION OF WIND CHARACTERISTICS AT POTENTIAL WIND ENERGY CONVERSION SITES

Oct. 1979 149 p refs Prepared for Battelle Pacific Northwest Lab., Sequim, Wash.
(Contract EY-76-C-06-1830)
(PNL-3074) Avail: NTIS HC A07/MF A01

The development and application of a method for determining wind characteristics at candidate wind energy conversion sites where no available historical data exists are described. The method uses a mass consistent wind flow model (COMPLEX) to interpolate between stations where wind data are available. The COMPLEX model incorporates the effects of terrain features and airflow. The procedure requires acquisition and merger of wind data from three to five stations, application of COMPLEX to each of the seven to eleven eigenvectors, reconstruction of the hourly interpolated winds at the site from the eigenvector solutions, and estimating the wind characteristics from the simulated hourly values. Possible improvements to the procedure are discussed.
DOE

N80-22083*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

POTENTIALITIES OF TEC TOPPING: A SIMPLIFIED VIEW OF PARAMETRIC EFFECTS

James F. Morris 1980 21 p refs Presented at Intern. Conf. on Plasma Sci., Madison, Wisc., 19-21 May 1980; sponsored by IEEE
(Contract EC-77-A-31-1062)
(NASA-TM-81468; DOE/NASA/1062-80/5; E-399) Avail: NTIS HC A02/MF A01 CSCL 10A

An examination of the benefits of thermionic-energy-conversion (TEC)-topped power plants and methods of increasing conversion efficiency are discussed. Reductions in the cost of TEC modules yield direct decreases in the cost of electricity (COE) from TEC-topped central station power plants. Simplified COE, overall-efficiency charts presented illustrate this trend. Additional capital-cost diminution results from designing more compact furnaces with considerably increased heat transfer rates allowable and desirable for high temperature TEC and heat pipes. Such improvements can evolve of the protection from hot corrosion and slag as well as the thermal expansion compatibilities offered by silicon-carbide clads on TEC-heating surfaces. Greater efficiencies and far fewer modules are possible with high-temperature, high-power-density TEC: This decreases capital and fuel costs much more and substantially increases electric power outputs for fixed fuel inputs. In addition to more electricity, less pollution, and lower costs, TEC topping used directly in coal-combustion products contributes balance-of-payment gains. M.G.

N80-22128# Bradford National Corp., Washington, D.C.

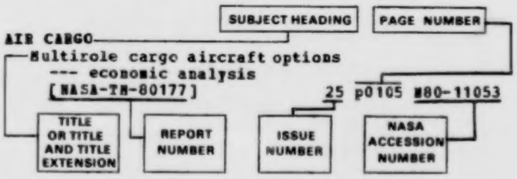
ADVANCED AUTOMOTIVE PROPULSION SYSTEMS: INCENTIVE FINANCING

Washington, D.C. DOE Feb. 1979 60 p refs
(Contract EM-78-C-01-5181)
(CONS-5181-1) Avail: NTIS HC A04/MF A01

The need for Federal guarantees of financial obligations for advanced automotive propulsion systems research, development, demonstrations, and commercial availability was surveyed in order to facilitate development and rapid implementation of AAPS energy conservation programs. Results of the survey are presented along with a background review of the complexities of AAPS and of financial incentives. Conclusions and recommendations are given.
J.M.S.

SUBJECT INDEX

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title or title and title extension provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The issue page and accession numbers are located beneath and to the right of the title e.g., 25 p0105 N80-11053. Under any subject heading the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABSORBERS (EQUIPMENT)
Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637
ABSORBERS (MATERIALS)
A study on hydrogen storage by use of cryoadsorbents
26 p0201 A80-23161
ABSORPTANCE
Calculation of the monthly-average transmittance-absorptance product --- for solar collectors
26 p0184 A80-21117
ABSORPTION
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds
26 p0234 A80-28277
ABSORPTION SPECTRA
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657
ACCEPTABILITY
Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990
ACCUMULATORS
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016
ACETYLENE
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
ACIDS
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570
ADDITIVES
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
AERIAL PHOTOGRAPHY
Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475
AERIAL RECONNAISSANCE
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings
26 p0212 A80-24071
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
AERODYNAMIC CHARACTERISTICS
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[AIAA 80-0607] 26 p0237 A80-28804
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832
AERODYNAMIC DRAG
The potential for development of high performance light aircraft
26 p0208 A80-23307
AERODYNAMIC INTERFERENCE
Aerodynamic interference between two Darrieus wind turbines
[AIAA 80-0606] 26 p0237 A80-28803
AERODYNAMIC LOADS
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807
Dynamic rotor loads of a wind turbine via hand-held calculations
[AIAA 80-0611] 26 p0237 A80-28808
A refined windmill rotor model
[AIAA 80-0628] 26 p0241 A80-28841
Torsional oscillations of the rotor disc for horizontal axis wind turbines with hinged or teetered blades, Part 12
[FFA-TN-AU-1499-PT-12] 26 p0319 N80-21881
AERODYNAMIC STALLING
A refined windmill rotor model
[AIAA 80-0628] 26 p0241 A80-28841
AERODYNAMICS
Fiscal year 1979 scientific and technical reports, articles, papers and presentations
[NASA-TM-78250] 26 p0274 N80-17014
AEROELASTICITY
An oscillatory wind energy convertor
26 p0211 A80-23537
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446
AERONAUTICAL ENGINEERING
Fiscal year 1979 scientific and technical reports, articles, papers and presentations
[NASA-TM-78250] 26 p0274 N80-17014
Overview of NASA battery technology program
26 p0302 N80-20821
AEROSOLS
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573
AEROSPACE ENGINEERING
The 1979 Goddard Space Flight Center Battery Workshop
[NASA-CP-2117] 26 p0302 N80-20820
AEROSPACE INDUSTRY
New standards in research and development
26 p0208 A80-23317
AEROSPACE TECHNOLOGY TRANSFER
Space benefits: The secondary application of aerospace technology in other sectors of the economy
[NASA-CR-162697] 26 p0274 N80-16950
NASA authorization, 1981, program review, volume 1
[GPO-53-814] 26 p0281 N80-17913

Aerospace technology review for LBL window/passive solar program
[LBL-9608] 26 p0316 N80-21850

AGING (MATERIALS)
Stability studies of coal liquids
[PEIC/TR-79/5] 26 p0257 N80-16129

AGRICULTURE
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822
Technical and economic feasibility of wind-powered systems for dairy farms
[AIAA 80-0641] 26 p0239 A80-28823
Solar energy for agriculture: Review of research
[PB-298688/3] 26 p0271 N80-16568

AIR CONDITIONING
Solar heating and air conditioning
26 p0209 A80-23516
Energy efficient buildings program
[LBL-9576] 26 p0304 N80-20877

AIR COOLING
Addition of an air-cooled collector test capability to the solar collector test facility
[PB-300482/7] 26 p0270 N80-16562

AIR LAND INTERACTIONS
Wind characteristics over complex terrain relative to WECS siting --- Wind Energy Conversion System
[AIAA 80-0645] 26 p0239 A80-28825

AIR POLLUTION
Hydrogen fuel in air transportation and its effects around airports
26 p0204 A80-23179
Health benefits derived from a planned hydrogen community
26 p0205 A80-23193
Power plant impacts on visibility in the west - Siting and emissions control implications
26 p0216 A80-24735
Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170
Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649
Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
How to burn coal efficiently and economically, and meet air pollution requirements: The fluidized-bed combustion process
[PB80-107501] 26 p0308 N80-20911
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912

AIR QUALITY
Adequacy analysis of air quality monitoring activities relevant to California thermal enhanced oil recovery fields
[SAN-12093-1] 26 p0309 N80-20929

AIR TRANSPORTATION
Hydrogen fuel in air transportation and its effects around airports
26 p0204 A80-23179
Air transport and travel in 2000 - Future requirements
26 p0234 A80-28427
The energy problem - Its effect on aircraft design. II - The effects of fuel cost
26 p0254 A80-32201
Safety of liquid hydrogen in air transportation
[LA-UR-79-1416] 26 p0259 N80-16236
The role of technology as air transportation faces the fuel situation
[NASA-TM-81793] 26 p0297 N80-20260

AIR WATER INTERACTIONS
OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979
26 p0232 A80-28251

AIRCRAFT CONFIGURATIONS
The potential for development of high performance light aircraft
26 p0208 A80-23307
Future large cargo aircraft technology
26 p0229 A80-27269

AIRCRAFT DESIGN
Short haul transport for the 1990s
26 p0190 A80-22046
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
The energy problem: Its effect on aircraft design. I - Supply and demand
26 p0231 A80-27752
The energy problem - Its effect on aircraft design. II - The effects of fuel cost
26 p0254 A80-32201

AIRCRAFT ENGINES
Power units for mini RPV's
26 p0246 A80-29662

AIRCRAFT FUEL SYSTEMS
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687

AIRCRAFT FUELS
Hydrogen fuel in air transportation and its effects around airports
26 p0204 A80-23179
A plan for active development of LH2 for use in aircraft
26 p0206 A80-23204
The energy problem: Its effect on aircraft design. I - Supply and demand
26 p0231 A80-27752
The energy problem - Its effect on aircraft design. II - The effects of fuel cost
26 p0254 A80-32201
Initial characterization of an Experimental Referee Broadened-Specification (ERBS) aviation turbine fuel
[NASA-TM-81440] 26 p0283 N80-18205
The role of technology as air transportation faces the fuel situation
[NASA-TM-81793] 26 p0297 N80-20260

AIRCRAFT SPECIFICATIONS
The potential for development of high performance light aircraft
26 p0208 A80-23307

AIRFOIL PROFILES
Model wind rotors in wind tunnels - Performance and the effect of Reynolds number
[AIAA 80-0623] 26 p0238 A80-28815
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819

AIRFOILS
New approaches to sailing
26 p0228 A80-26344
Experiments on an oscillating aerofoil and applications to wind energy converters
[AIAA 80-0624] 26 p0238 A80-28816

AIRFRAME MATERIALS
Short haul transport for the 1990s
26 p0190 A80-22046
AIRLINE OPERATIONS
Air transport and travel in 2000 - Future requirements
26 p0234 A80-28427
AIRPORTS
Hydrogen fuel in air transportation and its effects around airports
26 p0204 A80-23179
AIRSHIPS
New approaches to sailing
26 p0228 A80-26344
ALABAMA
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600
Solar heating and hot water system installed at the Senior Citizen Center, Huntsville, Alabama
[NASA-CR-161384] 26 p0315 N80-21835
ALCOHOLS
Alcohol fuels. Citations from the American petroleum institute data base --- a bibliography with abstracts
[NTIS/PS-79/0911/2] 26 p0259 N80-16195
Experimental alcohol fuel plants
[ATP-P-5000-2] 26 p0283 N80-18203
Alcohol fuels information directory
[ATP-P-5000-3] 26 p0283 N80-18204
Physical properties of gasoline/alcohol blends
[BERC/RI-79/4] 26 p0288 N80-19296
ALKALIES
Improvements in electrolysis technology in alkaline solution --- for hydrogen production
26 p0196 A80-23112
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis
26 p0196 A80-23113
Testing aqueous caustic electrolyzers at high temperatures --- for hydrogen production
26 p0205 A80-23196
ALKALINE BATTERIES
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
The dual-mode bus and further bus developments in France
26 p0235 A80-28431
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-3] 26 p0285 N80-18556
ALKANES
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H_2O at elevated pressure
26 p0226 A80-25888
ALLOCATIONS
Urban activity allocation under criteria of transportation energy efficiency
26 p0192 A80-22788
ALPHA PARTICLES
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482
ALPS MOUNTAINS (EUROPE)
Use of solar energy for the production of electricity in the Alps
[SAND-79-6000] 26 p0265 N80-16499
ALUMINUM
The influence of Al on the hydrogen sorption properties of intermetallic compounds
26 p0203 A80-23173
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study
26 p0301 N80-20720
ALUMINUM GALLIUM ARSENIDES
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668
ALUMINUM OXIDES
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859
AMMETERS
Life test results of the NASA standard 20 ampere hour cells
26 p0303 N80-20846
AMMONIA
Small scale ammonia production as a means for hydrogen storage
26 p0201 A80-23160
Nitrogen reducing solar cells
26 p0244 A80-29059
AMORPHOUS MATERIALS
Carrier generation, recombination, and transport in amorphous silicon solar cells
26 p0227 A80-26340
Thin film solar cells based on amorphous silicon
26 p0245 A80-29395
Electrochemistry of amorphous V_2S_5 in lithium cells
26 p0247 A80-29895
AMORPHOUS SEMICONDUCTORS
The temperature dependence of the characteristics of sputtered a-Si-H solar cells
26 p0187 A80-21920
The doping of amorphous silicon for solar cells
26 p0187 A80-21921
Photovoltaics. V - Amorphous silicon cells
26 p0214 A80-24535
Amorphous Si-F-H solar cells prepared by dc glow discharge
26 p0251 A80-30940
Field-dependent quantum efficiency in hydrogenated amorphous silicon --- for solar cells
26 p0251 A80-30942
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325
ANAEROBES
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428
ANALOG SIMULATION
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480
ANEMOMETERS
Project windsheet - An interim report --- on wind measurement at sites in American Southwest
[AIAA 80-0647] 26 p0239 A80-28827
ANNUAL VARIATIONS
A performance and economic evaluation of annual cycle energy storage /ACES/
26 p0223 A80-25260
ANNULAR FLOW
Turbulent flows through annular spaces
26 p0250 A80-30614
ANODES
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
ANODIZING
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499
ANTENNA DESIGN
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
ANTIREFLECTION COATINGS
Antireflection coatings on solar cells
26 p0186 A80-21914
Alternative grading profile for sputtered solar selective surfaces
26 p0246 A80-29744
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
[NASA-TM-81385] 26 p0282 N80-18156

AQUEOUS SOLUTIONS
Testing aqueous caustic electrolyzers at high temperatures --- for hydrogen production
26 p0205 A80-23196
Salinity gradient energy conversion
26 p0233 A80-28262
AQUIFERS
Physical, chemical and energy aspects of underground hydrogen storage
26 p0234 A80-28278
ARCHITECTURE
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514
Thermography at the earth's surface and the energy efficiency of buildings
26 p0213 A80-24072
ARCHITECTURE (COMPUTERS)
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672
ARCTIC REGIONS
Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SF-01525/1] 26 p0294 N80-19642
ARID LANDS
Oils and rubber from arid land plants
26 p0253 A80-32055
ARSENIDES
Development of high efficiency, low cost ZnSiAs2 solar cells.
[DOE/ET-23001/T1] 26 p0278 N80-17572
ASHES
Coal combustion fly ash characterization - Adsorption of nitrogen and water
26 p0250 A80-30656
ASSESSMENTS
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
ATMOSPHERIC CIRCULATION
Wind characteristics over complex terrain relative to WECS siting --- Wind Energy Conversion System
[AIAA 80-0645] 26 p0239 A80-28825
ATMOSPHERIC MODELS
Gust models for design and performance analyses of wind turbines
[AIAA 80-0644] 26 p0240 A80-28833
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573
ATOMIC ENERGY LEVELS
Spin-aligned hydrogen --- atoms at lowest electronic energy magnetic sublevels as substance for molecular production
26 p0200 A80-23151
ATTITUDE (INCLINATION)
Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
AUGMENTATION
Study of a vortex augmentor for a wind-powered turbine
26 p0227 A80-26002
AUTOMATED GUIDEWAY TRANSIT VEHICLES
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8] 26 p0274 N80-16974
AUTOMATIC CONTROL
Solar energy control system
[NASA-CASE-MFS-25287-1] 26 p0275 N80-17544
AUTOMOBILE ENGINES
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880
Stirling engine design and feasibility for automotive use --- Book
26 p0234 A80-28425
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471
Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472
The future of the Diesel engine - A critical analysis
26 p0235 A80-28473
Advanced engine concepts - The Ford Proco engine
26 p0235 A80-28474
Future prospects for use of the gas turbine for automobiles
26 p0236 A80-28485
A study on plasma plug --- high energy ignition plugs for exhaust pollution reduction and fuel consumption decrease in automotive gasoline engines
26 p0252 A80-31775
Gas turbines for automotive use --- Book
26 p0253 A80-31999
Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347
Performance sensitivity analysis of Department of Energy-Chrysler upgraded automotive gas turbine engine, S/N 5-4
[NASA-TM-79242] 26 p0274 N80-17467
Materials review for improved automotive gas turbine engine --- superalloys, refractory alloys, and ceramics
[NASA-CR-159673] 26 p0275 N80-17470
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas
[AD-A076145] 26 p0284 N80-18411
Issues concerning the light-duty diesel
[DOE/EV-0050/1] 26 p0290 N80-19510
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340
Supporting research and technology for automotive Stirling engine development
[NASA-TM-81495] 26 p0311 N80-21200
Fuel economy screening study of advanced automotive gas turbine engines
[NASA-TM-81433] 26 p0311 N80-21201
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760
Advanced automotive propulsion systems: Incentive financing
[CONS-5181-1] 26 p0321 N80-22128
AUTOMOBILE FUELS
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206
Experience with alcohol fuels
26 p0236 A80-28476
Future prospects for use of the gas turbine for automobiles
26 p0236 A80-28485
Hydrogen as a fuel --- automobiles
[TT-7903] 26 p0283 N80-18212
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295
Physical properties of gasoline/alcohol blends
[BERC/RI-79/4] 26 p0288 N80-19296
AUTOMOBILES
Future trends in the automobile
26 p0234 A80-28426
International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies
26 p0235 A80-28470
Marginal conditions in automobile construction and their implications on the design of upper-category vehicles
26 p0236 A80-28477
Possibilities and limits of the conception of an up-to-date compact vehicle for the nineties
26 p0236 A80-28481
The contribution of Volkswagenwerk AG to the automobile concept of the 90's
26 p0236 A80-28482

Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990
Hydrogen storage for automobiles
[BNL-26906] 26 p0305 N80-20886
Electric and hybrid vehicle program
[DOE/CS-0026/7] 26 p0311 N80-21204
Energy storage systems for automobile propulsion
[UCID-18320] 26 p0312 N80-21211

AXISYMMETRIC FLOW
Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data
[AIAA 80-0608] 26 p0237 A80-28805

B

BACTERIA
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026

BARRIER LAYERS
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815

BEAM SWITCHING
Magnetooptical switch for synchronization of CO2 and red laser beams --- in laser fusion systems
26 p0236 A80-28735

BEAM WAVEGUIDES
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287

BEARINGLESS ROTORS
UTRC 8 kW wind turbine tests
[AIAA 80-0657] 26 p0240 A80-28831

BEDS (PROCESS ENGINEERING)
Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant
26 p0183 A80-21109
Photochemical conversion of coal to gasoline in an entrained bed reactor
26 p0283 N80-18202
Photochemical conversion of coal to gasoline in an entrained bed reactor
[ORO-5020-T1] 26 p0299 N80-20415

BIBLIOGRAPHIES
Alcohol fuels. Citations from the American petroleum institute data base --- a bibliography with abstracts
[NTIS/PS-79/0911/2] 26 p0259 N80-16195
Solar energy concentrator design and operations. Citations from the NTIS data base
[NTIS/PS-79/0926/0] 26 p0270 N80-16557
Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558
Energy Research Information System (ERIS) projects report, volume 4, number 1 --- bibliographies
[PB-300338/1] 26 p0270 N80-16561
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-79/1069/8] 26 p0271 N80-16563
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-79/0928/6] 26 p0271 N80-16566
Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567
Heliostat system design and operation. Citations from the Engineering Index data base
[NTIS/PS-79/0930/2] 26 p0271 N80-16571
Bibliography of geology and hydrology, eastern New Mexico
[PB-300832/3] 26 p0273 N80-16663
Fiscal year 1979 scientific and technical reports, articles, papers and presentations
[NASA-TM-78250] 26 p0274 N80-17014
Thermal energy storage, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0952/6] 26 p0279 N80-17584
Thermal energy storage, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0951/8] 26 p0279 N80-17585
Thermal energy storage, volume 1. Citations from the Engineering Index data base
[NTIS/PS-79/0953/4] 26 p0279 N80-17586
Thermal energy storage, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0954/2] 26 p0279 N80-17587
Silicon solar cells, volume 3. Citations from the Engineering Index data base --- bibliographies
[PB80-800717] 26 p0280 N80-17588
Silicon solar cells, volume 3. Citations from the NTIS data base --- bibliographies
[PB80-800691] 26 p0280 N80-17589
Silicon solar cells, volume 2. Citations from the Engineering Index data base --- bibliographies
[PB80-800709] 26 p0280 N80-17590
Design and applications of flywheels, volume 1. Citations from the NTIS data base --- bibliographies
[PB80-800303] 26 p0280 N80-17591
Design and applications of flywheels, volume 2. Citations from the NTIS data base --- bibliographies
[PB80-800311] 26 p0280 N80-17592
Design and applications of flywheels. Citations from the Engineering Index data base --- bibliographies
[P80-800329] 26 p0280 N80-17593
Combined cycle power generation. Citations from the NTIS data base --- bibliographies
[PB80-800915] 26 p0280 N80-17594
Combined cycle power generation. Citations from the Engineering Index data base --- bibliographies
[P80-800923] 26 p0280 N80-17595
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909
Solar electric power generation, volume 3. Citations from the Engineering Index data base
[PB80-803034] 26 p0296 N80-19657
Solar electric power generation, volume 2. Citations from the NTIS data base
[PB80-803000] 26 p0296 N80-19658
Solar electric power generation, volume 3. Citations from the NTIS data base
[PB80-803018] 26 p0296 N80-19659
Solar electric power generation, volume 2. Citations from the Engineering Index data base
[PB80-803026] 26 p0296 N80-19660
Solar sea power plants. Citations from the NTIS data base
[PB80-802580] 26 p0297 N80-19661
Solar seapower plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662
Energy information data base
[DOE/TIC-4579-R10-SUPPL-6] 26 p0305 N80-20881
Wind energy information directory
[SERI/SP-69-290] 26 p0305 N80-20883
Solar water pumps. Citations from the Engineering Index data base
[PB80-802531] 26 p0308 N80-20910

BINARY ALLOYS
Use of binary titanium alloys for hydrogen storage
26 p0202 A80-23164
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165

BIOCHEMISTRY
Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

BIODEGRADATION
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428

BIOELECTRIC POTENTIAL
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026

BIOLOGICAL EFFECTS
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295

BIOMASS
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456

BIOMASS ENERGY PRODUCTION

Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938

Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939

Studies in biogas technology. III - Thermal analysis of biogas plants
26 p0188 A80-21940

Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941

Bio-solar hydrogen production
26 p0201 A80-23155

Energy from the biological conversion of solar energy
26 p0210 A80-23522

Microbial production of energy sources from biomass
26 p0210 A80-23523

Exotic energy R&D has potential --- ocean wave and windpower utilization
26 p0213 A80-24124

Soft-energy provision - A new Utopia --- present problems of solar and biomass energy conversion
26 p0227 A80-26169

Biogas - Fuel of the future
26 p0227 A80-26175

An integrated approach to energy supply for small communities
[AIAA 80-0651] 26 p0240 A80-28830

Petroleum plantations
26 p0243 A80-29052

The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054

Wood gasification in a fluidized bed
26 p0244 A80-29154

Photobiological production of hydrogen
26 p0247 A80-29920

Assessment of the technical and economic feasibility of converting wood residues to liquid and gaseous fuel products using state-of-the-art and advanced coal conversion technology
[COO-4862-3] 26 p0258 N80-16189

Decentralized energy: Technology assessment and systems description
[BNL-50987] 26 p0265 N80-16502

Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511

Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545

Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294

Environmental and economic evaluations of energy recovery from agricultural and forestry residues
[ANL/EES/TM-58] 26 p0297 N80-19668

Survey of biomass gasification. Volume 1: Synopsis and executive summary
[SERI/TR-33-239-VOL-1] 26 p0300 N80-20427

Biomass energy systems: Environmental readiness document
[DOE/ERD-0021] 26 p0308 N80-20905

BIOSPHERE

A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920

BIT SYNCHRONIZATION

Magnetooptical switch for synchronization of CO2 and red laser beams --- in laser fusion systems
26 p0236 A80-28735

BITUMENS

Surface-active materials from Athabasca oil sands
26 p0192 A80-22770

Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

BLACK BODY RADIATION

Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499

BLADE TIPS

Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836

BLANKETS (FUSION REACTORS)

Mirror hybrid reactors --- fusion-fission reactor design
26 p0215 A80-24670

BOILERS

Application of black-liquor boiler technology to MHD heat and seed recovery equipment design
26 p0217 A80-25070

First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095

Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097

Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099

The transition MHD power plant concept
26 p0221 A80-25104

Evaluation of a photochemical system for nitrogen oxides control --- coal fired boilers
26 p0287 N80-18583

BOUNDARY LAYER CONTROL

Future large cargo aircraft technology
26 p0229 A80-27269

BOUNDARY LAYER PLASMAS

Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249] 26 p0192 A80-22745

BOUNDARY VALUE PROBLEMS

Gradient bounds for plasma confinement
26 p0213 A80-24223

MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems
26 p0254 A80-32318

BRINES

Energy by reverse electrodialysis
26 p0194 A80-22940

Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474

BROMIDES

Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135

BROMINE

The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125

The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407

BUILDINGS

Overview of developing programs in solar desiccant cooling for residential buildings
[SERI/TP-34-187] 26 p0278 N80-17569

BURNERS

Regenerative burner system for thermoelectric power sources --- military equipment
[AD-A075955] 26 p0276 N80-17553

BURNING RATE

Wall combustion in high-swirl combustors --- for coal-fired MHD generators
26 p0222 A80-25110

How to burn coal efficiently and economically, and meet air pollution requirements: The fluidized-bed combustion process
[PB80-107501] 26 p0308 N80-20911

C

CADMIUM SELENIDES

Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466

CADMIUM SULFIDES

Energy analysis of CdS:Cu2S sputtered solar cells
26 p0186 A80-21918

Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014

Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells
26 p0228 A80-27057

High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell
26 p0229 A80-27321

Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base
[PB80-802218] 26 p0296 N80-19656

CADMIUM TELLURIDES

Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305

Properties of ion-implanted junctions in mercury-cadmium-telluride
26 p0234 A80-28307

CALCIUM

Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135

CALIFORNIA

Petroleum production at maximum efficient rate, Naval Petroleum Reserve no. 1 (Elk Hills), Kern County, California
[DOE/EIS-0012] 26 p0272 N80-16581

Environmental system study on the development of fossil fuel resources in the Southwest
[PB-300526/1] 26 p0272 N80-16596

Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development --- for the generation of electric power
[DOE/ET-28432/1] 26 p0290 N80-19604

Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 2: Regional program monitoring and progress evaluation --- for the generation of electric power
[DOE/ET-28432/2] 26 p0291 N80-19605

Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation --- for generation of electric power
[DOE/ET-28432/3-1] 26 p0291 N80-19606

Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices --- for generation of electric power
[DOE/ET-28432/3-2] 26 p0291 N80-19607

Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879

CANADA

Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463

CAPACITANCE

Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501

CAPACITORS

Energy storage --- Book
26 p0184 A80-21123

CARBIDES

Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742

CARBON

Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes
26 p0243 A80-29057

Reaction kinetics between CO2 and oil-shale residual carbon. I - Effect of heating rate on reactivity
26 p0249 A80-30524

Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects
26 p0250 A80-30527

Reaction kinetics between steam and oil-shale residual carbon
26 p0250 A80-30528

CARBON DIOXIDE

Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152

The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants
26 p0248 A80-29938

Reaction kinetics between CO2 and oil-shale residual carbon. I - Effect of heating rate on reactivity
26 p0249 A80-30524

Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects
26 p0250 A80-30527

CARBON DIOXIDE LASERS

Silicon ribbon growth using scanned lasers
26 p0229 A80-27337

Magnetooptical switch for synchronization of CO2 and red laser beams --- in laser fusion systems
26 p0236 A80-28735

Helios, a 20 TW CO2 laser fusion facility
26 p0245 A80-29370

CARBON FIBERS

Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456

CARBON MONOXIDE

Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888

Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416

CARBON-CARBON COMPOSITES

Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456

CARBONATES

Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167

Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501

Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884

Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865

CARGO AIRCRAFT

Future large cargo aircraft technology
26 p0229 A80-27269

The changing horizons for technical progress. II
26 p0229 A80-27270

CASTING

Benefits of increased use of continuous casting by the United States steel industry
[PB80-104904] 26 p0314 N80-21612

CATALYSIS

Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122

Photoelectrochemical cells --- with photoactive semiconducting electrodes
26 p0210 A80-23520

Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407

CATALYSTS

Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302

Exploratory studies in catalytic coal liquefaction
[EPRI-AP-1184] 26 p0299 N80-20422

Catalyst characterization in coal liquefaction
[SAND-79-1969] 26 p0299 N80-20423

CATALYTIC ACTIVITY

Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

CATASTROPHE THEORY

Synergetics of the fission electric cells
26 p0193 A80-22789

CATHODES

Long duration channel development and testing --- for MHD generator electrode corrosion measurement 26 p0216 A80-25063

CELL CATHODES

Energy savings through use of an improved reduction cell cathode [SAN-1257-T2] 26 p0267 N80-16515

CENTRIFUGAL FORCE

Centrifugal fluidized combustion of coal [FE-2516-9] 26 p0288 N80-19293

CENTRIFUGING

Application of centrifugal separation to the production of hydrogen from coal 26 p0194 A80-22869

CERAMIC COATINGS

Alternative grading profile for sputtered solar selective surfaces 26 p0246 A80-29744

CERAMICS

Wettability and corrosion of MHD ceramics by Rosebud coal slag 26 p0217 A80-25074

Future prospects for use of the gas turbine for automobiles 26 p0236 A80-28485

Energy savings through use of an improved reduction cell cathode [SAN-1257-T2] 26 p0267 N80-16515

Materials review for improved automotive gas turbine engine --- superalloys, refractory alloys, and ceramics [NASA-CR-159673] 26 p0275 N80-17470

CERIUM

A study of the cerium-chlorine system for thermochemical production of hydrogen 26 p0198 A80-23134

CERIUM COMPOUNDS

Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water 26 p0233 A80-28273

CESIUM VAPOR

Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters 26 p0249 A80-30241

CHANNEL FLOW

Equivalent circuits for the channel of the magnetohydrodynamic generator 26 p0190 A80-22349

Current transport mechanisms in the boundary regions of MHD generators [AIAA PAPER 80-0249] 26 p0192 A80-22745

End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes 26 p0193 A80-22793

The STD/MHD codes - Comparison of analyses with experiments --- MHD generator performance prediction and tests [AIAA PAPER 80-0024] 26 p0212 A80-23953

Design description and performance predictions for the first CDIF power train --- MHD generator combustor, power channel and diffusers 26 p0216 A80-25062

Long duration channel development and testing --- for MHD generator electrode corrosion measurement 26 p0216 A80-25063

Electrical characteristics of an arc-mode slagging electrode generator --- in Faraday MHD generators 26 p0216 A80-25064

Local analysis of electrical performance of the U-25B generator --- MHD generator 26 p0216 A80-25066

Control of liquid metal-gas two phase flow by application of axial magnetic field 26 p0218 A80-25083

Electrical nonuniformities in U-25 MHD channels 26 p0219 A80-25091

Fluctuations in MHD generators 26 p0221 A80-25106

End zone of a channel with segmented electrodes, carrying nonuniform flow --- current and potential fields in plasma 26 p0254 A80-32220

CHARGE CARRIERS

Carrier generation, recombination, and transport in amorphous silicon solar cells 26 p0227 A80-26340

CHARGE TRANSFER

Carrier generation, recombination, and transport in amorphous silicon solar cells 26 p0227 A80-26340

CHARGED PARTICLES

Electrical purifiers for dielectric fluids --- charged particle contaminants separation from fuels, oils and hydraulic fluids 26 p0254 A80-32287

CHECKOUT

Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator [NASA-TM-81444] 26 p0292 N80-19614

CHEMICAL ANALYSIS

Trace and minor element analyses of coal liquefaction products [PETC/TR-79/3] 26 p0299 N80-20417

Assessment of low- to moderate-temperature geothermal resources of Nevada [NVO-01556-1] 26 p0301 N80-20792

CHEMICAL ATTACK

Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine 26 p0249 A80-30474

CHEMICAL CLEANING

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2 [PB-299384/8] 26 p0259 N80-16193

CHEMICAL COMPOSITION

Initial characterization of an Experimental Referee Broadened-Specification (ERBS) aviation turbine fuel [NASA-TM-81440] 26 p0283 N80-18205

CHEMICAL EFFECTS

Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy 26 p0249 A80-30521

CHEMICAL ENERGY

Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions 26 p0184 A80-21116

Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy 26 p0185 A80-21879

Non-electric fusion energy applications 26 p0215 A80-24676

Solar energy: Chemical conversion and storage --- Book 26 p0243 A80-29051

Possible direct conversion of chemical energy into electrical energy in a semiconductor 26 p0247 A80-29795

Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program [BNL-26904] 26 p0296 N80-19654

CHEMICAL ENGINEERING

Studies in biogas technology. II - Optimization of plant dimensions 26 p0188 A80-21939

Studies in biogas technology. III - Thermal analysis of biogas plants 26 p0188 A80-21940

Mixing effects of different types of hydrides 26 p0202 A80-23166

Main requirements on the nuclear installations used for hydrogen production and in technological processes 26 p0205 A80-23195

Engineering impact on the validity of the Mark-16 thermochemical cycle --- hydrogen production restrictions and prospects 26 p0205 A80-23198

Open-loop thermochemical cycles for the production of hydrogen 26 p0233 A80-28274

Engineering impact on the validity of the Mark-16 thermochemical cycle 26 p0233 A80-28275

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1 [PB-299383/0] 26 p0259 N80-16192

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193

Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303

CHEMICAL EQUILIBRIUM

A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134

CHEMICAL REACTIONS

Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126

Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131

Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory
26 p0198 A80-23132

Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180

A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code --- improved computer program for hydrogen production and nuclear reactor-chemical plant coupling processes
26 p0205 A80-23192

Alcohol fuels. Citations from the American petroleum institute data base --- a bibliography with abstracts
[NTIS/PS-79/0911/2] 26 p0259 N80-16195

The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570

Basic research in engineering: Fluid dynamics and thermal processes --- workshop
[FE-2468-54] 26 p0301 N80-20551

CHEMICAL REACTORS

Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938

Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939

Studies in biogas technology. III - Thermal analysis of biogas plants
26 p0188 A80-21940

Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941

A speculation on a general photoelectrochemical reactor
26 p0193 A80-22794

Nuclear methane reforming for coal gasification
26 p0195 A80-23105

Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185

Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305

Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307

Synthesis gas demonstration plant program, phase 1
[FE-25770-6] 26 p0289 N80-19308

Liquid phase methanation/shift pilot plant operation and laboratory support work
[FE-2036-37] 26 p0298 N80-20413

Coal liquefaction test center
[FE-1517-78] 26 p0300 N80-20425

CHINA

Monitoring urban population and energy utilization patterns from satellite data
26 p0207 A80-23293

CHLORINE

Electrodes for generation of hydrogen and oxygen for seawater
26 p0196 A80-23115

A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134

A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199

Survey of potential chlorine production processes --- for energy efficiency
[ANL/OEPM-79-1] 26 p0257 N80-16131

CHLOROPLASTS

Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems
26 p0201 A80-23156

CHROMATOGRAPHY

The application of chromatography and ancillary techniques to the characterization of shale oil/oil shale compound classes and of organometallics
26 p0282 N80-18125

CHROMIUM

Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-5] 26 p0313 N80-21520

Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes
[UCRL-52851] 26 p0316 N80-21842

Evaluation of selective absorbers
[TP-5461] 26 p0317 N80-21851

CHROMIUM COMPOUNDS

Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557

CHROMIUM OXIDES

Evaluation of selective absorbers
[TP-5461] 26 p0317 N80-21851

CIRCUIT BOARDS

Methods for manufacturing heat pipes for circuit cards
[AD-A080188] 26 p0314 N80-21707

CIRCUIT PROTECTION

Methods for manufacturing heat pipes for circuit cards
[AD-A080188] 26 p0314 N80-21707

CIRCULAR CYLINDERS

Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

CIRCULAR TUBES

Turbulent flows through annular spaces
26 p0250 A80-30614

CLEAN ENERGY

Energy accounting of alternative energy sources
26 p0193 A80-22868

Geothermal energy and the environment - The global experience
26 p0223 A80-25259

Going with the wind
26 p0243 A80-29037

CLEAN FUELS

Fossil energy program
[ORNL-5487] 26 p0266 N80-16506

CLOCKS

The Exxon rechargeable cells --- solar rechargeable clocks
26 p0303 N80-20834

COAL

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1
[PB-299383/0] 26 p0259 N80-16192

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193

Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

Centrifugal fluidized combustion of coal
[FE-2516-9] 26 p0288 N80-19293

Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626

Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672

Experimental laboratory measurement of thermophysical properties of selected coal types
[NASA-CR-162913] 26 p0298 N80-20404
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430
Environmental development plan: Coal extraction and preparation
[DOE/EDP-0050] 26 p0309 N80-20921

COAL GASIFICATION
Application of centrifugal separation to the production of hydrogen from coal
26 p0194 A80-22869
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
The economics of producing hydrogen from a small air-blown coal gasifier
26 p0199 A80-23140
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
Material requirements for coal gasification
26 p0212 A80-23833
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113
Nuclear methane reforming for coal gasification
26 p0233 A80-28276
Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152
Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy
26 p0249 A80-30521
Coal gasification in steam at very high temperatures
26 p0249 A80-30522
Electrochemical gasification of coal - Investigation of operating conditions and variables
26 p0249 A80-30526
Balancing the process of hydrating gasification of brown coal
26 p0250 A80-30597
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042
Coal processing and utilization
26 p0255 A80-32396
Heavy hydrocarbons from coal gasification vapor pressures and dew point
26 p0257 N80-16111
Coal gasification
[DOE/ET-0067/3] 26 p0258 N80-16184
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185
Assessment of the technical and economic feasibility of converting wood residues to liquid and gaseous fuel products using state-of-the-art and advanced coal conversion technology
[COO-4862-3] 26 p0258 N80-16189
Development studies on selected conversion of synthesis gas from coal to high octane gasoline
[FE-2276-27] 26 p0259 N80-16190
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926
Combined cycle power generation. Citations from the NTIS data base --- bibliographies
[PB80-800915] 26 p0280 N80-17594
The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[FE-2449-9] 26 p0288 N80-19298
Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300
Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305
Development of a fast fluid bed gasifier, task 2 and 3
[FE-2361-40] 26 p0289 N80-19306
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
Synthesis gas demonstration plant program, phase 1
[FE-25770-6] 26 p0289 N80-19308
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310
Screening evaluation of electric power cycles integrated with coal gasification plants
[EPRI-AF-1160] 26 p0295 N80-19646
Liquid phase methanation/shift pilot plant operation and laboratory support work
[FE-2036-37] 26 p0298 N80-20413
Advanced development of a short-residence-time hydrogasifier
[FE-3125-5] 26 p0299 N80-20414
Chemical and physical stability of refractories for use in coal gasification
[COO-2904-14] 26 p0300 N80-20429
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949
Hot gas cleanup process
[PB80-108467] 26 p0310 N80-20950
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-5] 26 p0313 N80-21520
Advanced coal gasification system for electric power generation, FY 1978
[FE-1514-93] 26 p0313 N80-21554

COAL LIQUEFACTION
Solvolysis liquefaction of coal
26 p0187 A80-21926
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319
Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction
26 p0228 A80-26681
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418
Performance of low rank coals in the Exxon Donor Solvent Process
26 p0230 A80-27419
Coal liquefaction processes --- Book
26 p0242 A80-28953
Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy
26 p0249 A80-30521
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371

Filtration in coal liquefaction - Influence of digestion conditions in the filtration of non-hydrogenated coal digests
26 p0255 A80-32372
Coal processing and utilization
26 p0255 A80-32396
Stability studies of coal liquids
[PETC/TR-79/5] 26 p0257 N80-16129
Conceptual design of a coal-to-methanol-to-gasoline commercial plant: Executive summary
[FE-2416-43] 26 p0258 N80-16182
Coal liquefaction
[DOE/ET-0068/3] 26 p0258 N80-16183
Application of radiography to coal liquefaction
[SAND-79-1226C] 26 p0274 N80-17243
Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys
[NASA-TM-81384] 26 p0283 N80-18157
Fluid coking of coal liquefaction residues: The fourth residue
[FE-2422-28] 26 p0289 N80-19304
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310
Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes
[PB80-108566] 26 p0297 N80-19678
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422
Catalyst characterization in coal liquefaction
[SAND-79-1969] 26 p0299 N80-20423
Coal liquefaction test center
[FE-1517-78] 26 p0300 N80-20425
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AF-1227] 26 p0314 N80-21558

COAL UTILIZATION
Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449
Overview of coal energy utilization technology in Japan
26 p0187 A80-21924
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2 --- in MHD generator coal combustor
26 p0217 A80-25073
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute --- Coal-Fired Flow Facility
26 p0218 A80-25079
Characterization of dynamic influences in a coal-fired MHD system
26 p0219 A80-25094
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096
A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098
Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101
The retrofit approach to MHD demonstration and commercialization --- for coal-fired MHD plants
26 p0221 A80-25102
A modular approach to an engineering test facility and beyond --- for coal-fired MHD generators
26 p0221 A80-25103
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109
Wall combustion in high-swirl combustors --- for coal-fired MHD generators
26 p0222 A80-25110
One-stage cyclone combustor for coal fired test stand of 4MW thermal power --- for MHD generators
26 p0222 A80-25111
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112
Scaling MHD cyclone coal combustors
26 p0222 A80-25114
Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494
The development of fluidized bed combustion
26 p0225 A80-25689
Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690
Simplified correlations for prediction of NO/x/ emissions from MHD power plants
26 p0227 A80-26001
Lignite and coal in the U.S. energy future
26 p0230 A80-27420
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649
The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants
26 p0248 A80-29938
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523
Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids
26 p0249 A80-30525
Coal combustion fly ash characterization - Adsorption of nitrogen and water
26 p0250 A80-30656
Coal processing and utilization
26 p0255 A80-32396
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary --- domestic energy supply systems analysis of coal fired power plants using fuel cells
[PB-299207/1] 26 p0271 N80-16564
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580
Photochemical conversion of coal to gasoline in an entrained bed reactor
26 p0283 N80-18202
Evaluation of a photochemical system for nitrogen oxides control --- coal fired boilers
26 p0287 N80-18583
Photochemical conversion of coal to gasoline in an entrained bed reactor
[ORO-5020-T1] 26 p0299 N80-20415
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532
How to burn coal efficiently and economically, and meet air pollution requirements: The fluidized-bed combustion process
[PB80-107501] 26 p0308 N80-20911
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866

COASTAL PLAINS
The Yallahs fan delta, southeastern Jamaica: A depositional model for active tectonic coastlines
26 p0273 N80-16632
COATINGS
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324] 26 p0277 N80-17560
COBALT
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422
Catalyst characterization in coal liquefaction
[SAND-79-1969] 26 p0299 N80-20423
COBALT OXIDES
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
[NASA-TM-81385] 26 p0282 N80-18156
COGENERATION
Cogeneration of electric energy and nitric oxide
26 p0255 A80-32412
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626
Feasibility of cogeneration application of a 4.8 MW fuel cell power plant at a Santa Clara, California paper mill
[SAN-2189-T1] 26 p0304 N80-20876
COKE
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932
Fluid coking of coal liquefaction residues: The fourth residue
[FE-2422-28] 26 p0289 N80-19304
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310
COLLISIONLESS PLASMAS
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas
26 p0229 A80-27263
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278
COLORADO
Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
[DOE/TIC-10190] 26 p0306 N80-20895
COLUMNS (PROCESS ENGINEERING)
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145
COMBUSTION
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340
COMBUSTION CHAMBERS
Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348
Design description and performance predictions for the first CDIF power train --- MHD generator combustor, power channel and diffusers
26 p0216 A80-25062
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2 --- in MHD generator coal combustor
26 p0217 A80-25073
Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099
Fluctuations in combustion MHD generator systems
26 p0221 A80-25105
Experiments concerning inhomogeneities in combustion MHD generators
26 p0221 A80-25107
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108
Wall combustion in high-swirl combustors --- for coal-fired MHD generators
26 p0222 A80-25110
One-stage cyclone combustor for coal fired test stand of 4MW thermal power --- for MHD generators
26 p0222 A80-25111
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113
Scaling MHD cyclone coal combustors
26 p0222 A80-25114
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532
COMBUSTION CONTROL
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042
Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion
[NASA-TM-81472] 26 p0315 N80-21837
COMBUSTION EFFICIENCY
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880
Advanced engine concepts - The Ford Proco engine
26 p0235 A80-28474
Combustion of multicomponent fuel droplets
[COO-4449-2] 26 p0257 N80-16126
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430
COMBUSTION PHYSICS
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494
COMBUSTION PRODUCTS
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494
Simplified correlations for prediction of NO/x/ emissions from MHD power plants
26 p0227 A80-26001
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330
The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[FE-2449-9] 26 p0288 N80-19298
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
COMMERCIAL AIRCRAFT
A plan for active development of LH2 for use in aircraft
26 p0206 A80-23204
COMMERCIAL ENERGY
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097
Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099
The retrofit approach to MHD demonstration and commercialization --- for coal-fired MHD plants
26 p0221 A80-25102
Economic incentives to wind systems commercialization
[AIAA 80-0617] 26 p0238 A80-28811
Technical and economic feasibility of wind-powered systems for dairy farms
[AIAA 80-0641] 26 p0239 A80-28823
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869
COMPOSITE MATERIALS
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
COMPOSITE STRUCTURES
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452

Large, low cost composite wind turbine blades
26 p0263 N80-16475
Composite-laminate flywheel-rotor development program
[UCRL-83554] 26 p0317 N80-21855

COMPOSITE WRAPPING
Low cost composite blades for large wind turbines
26 p0253 A80-32074

COMPRESSED AIR
Economics of thermal energy storage for compressed air energy storage systems
[PNL-SA-7949] 26 p0307 N80-20903
Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904
Storage peak gas-turbine power unit
[NASA-TM-75757] 26 p0314 N80-21755

COMPRESSIBLE FLOW
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497

COMPRESSION TESTS
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports
26 p0191 A80-22690

COMPRESSIVE STRENGTH
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

COMPRESSOR EFFICIENCY
Storage peak gas-turbine power unit
[NASA-TM-75757] 26 p0314 N80-21755

COMPUTATIONAL FLUID DYNAMICS
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[AIAA 80-0607] 26 p0237 A80-28804

COMPUTER NETWORKS
The evolution of a large laser control system - From Shiva to Nova
26 p0185 A80-21901

COMPUTER PROGRAMS
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code --- improved computer program for hydrogen production and nuclear reactor-chemical plant coupling processes
26 p0205 A80-23192
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006
Continuing regional solar energy information mini-center activities and updating the SOLCOST program
[COO-4643-T2] 26 p0267 N80-16521
Permanent magnet and superconducting generators in airborne, high power systems --- computer program to predict weight of the generators and component systems
[AD-A078424] 26 p0284 N80-18311
Urban mass transportation energy conservation: SRGP operating instructions and program documentation, volume 5
[DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205
Estimation of wind characteristics at potential wind energy conversion sites
[PNL-3074] 26 p0321 N80-21955

COMPUTER SYSTEMS PROGRAMS
Continuing regional solar energy information Mini-Center activities and updating the SOLCOST program
[COO-4643-T1] 26 p0278 N80-17571

COMPUTER TECHNIQUES
Application of computer models to the retorting of oil shale
26 p0228 A80-26708

COMPUTERIZED DESIGN
Computer modeling of a two-junction, monolithic cascade solar cell
26 p0234 A80-28330
Dynamic rotor loads of a wind turbine via hand-held calculations
[AIAA 80-0611] 26 p0237 A80-28808
Solar energy design improvement: A methodology for hydronic flatplate collector systems
[AD-A076836] 26 p0286 N80-18567

COMPUTERIZED SIMULATION
Performance effects of Trombe wall control strategies --- passive solar building heating
26 p0183 A80-21105
The STD/MHD codes - Comparison of analyses with experiments --- MHD generator performance prediction and tests
[AIAA PAPER 80-0024] 26 p0212 A80-23953
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108
Wind energy conversion system simulation program
[AIAA 80-0609] 26 p0237 A80-28806
Advanced electric propulsion system concept for electric vehicles
[NASA-CR-159651] 26 p0282 N80-17916
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
Computer simulation of a solar energy system which utilizes flat-plate collectors
[AD-A079906] 26 p0304 N80-20870
Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques
[NASA-CR-159737] 26 p0308 N80-20909

CONCENTRATION (COMPOSITION)
Combustion of multicomponent fuel droplets
[COO-4449-2] 26 p0257 N80-16126

CONCENTRATORS
Industrial solar thermal concentrators
26 p0189 A80-21953
Theoretical concentrations of solar radiation by central receiver systems
26 p0208 A80-23327
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors
26 p0212 A80-23998
Photovoltaics. III - Concentrators
26 p0214 A80-24533
Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation --- Book
26 p0214 A80-24660
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885
Technology and performance of a high concentration solar cell power supply
26 p0226 A80-25886
Arabs turn their eyes to the sun --- solar energy development in Middle East
26 p0244 A80-29280
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021
Evaluation of concentrated space solar arrays using computer modeling --- for spacecraft propulsion and power supplies
[NASA-CR-162681] 26 p0264 N80-16487
Solar energy concentrator design and operations. Citations from the NTIS data base
[NTIS/PS-79/0926/0] 26 p0270 N80-16557
Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558
Optical and thermal effects in linear solar concentrating collectors
26 p0275 N80-17541
Performance of linear solar concentrating collectors
[SAND-79-1378C] 26 p0277 N80-17565
Low cost point focus solar concentrator. Phase 1: Preliminary design
[JPL-9950-273] 26 p0292 N80-19622
Low cost point focus solar concentrator, phase 1
[NASA-CR-162848] 26 p0292 N80-19624
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
Installation and startup of the fixed mirror solar concentrator collector field subsystem
[GA-A-15344] 26 p0306 N80-20888

Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893
Application of glass technology to novel solar energy collectors
[CONF-7906118-1] 26 p0317 N80-21852

CONDENSERS (LIQUIFIERS)
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130

CONDENSING
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859
Heavy hydrocarbons from coal gasification vapor pressures and dew point
26 p0257 N80-16111

CONDUCTING FLUIDS
End zone of a channel with segmented electrodes, carrying nonuniform flow --- current and potential fields in plasma
26 p0254 A80-32220

CONDUCTIVE HEAT TRANSFER
Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction
26 p0228 A80-26681

CONFERENCES
Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5
26 p0194 A80-23101
Royal Society, Discussion on Solar Energy, London, England, November 15, 16, 1978, Proceedings
26 p0209 A80-23511
Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978
26 p0214 A80-24661
Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints
26 p0216 A80-25061
European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers
26 p0225 A80-25771
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656
OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979
26 p0232 A80-28251
International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies
26 p0235 A80-28470
Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers
26 p0237 A80-28801
PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record
26 p0242 A80-28892
Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979
26 p0245 A80-29334
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1
[PB-299383/0] 26 p0259 N80-16192
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193
Proceedings: Photovoltaics user Review Panel
[SERI/TP-69-276] 26 p0266 N80-16514
Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990
Basic research in engineering: Fluid dynamics and thermal processes --- workshop
[PE-2468-54] 26 p0301 N80-20551
The 1979 Goddard Space Flight Center Battery Workshop
[NASA-CP-2117] 26 p0302 N80-20820
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV
[PB80-134729] 26 p0320 N80-21913

CONGRESSIONAL REPORTS
Gasohol: A technical memorandum
[PB80-105885] 26 p0259 N80-16194
Federal demonstrations of solar heating and cooling on private residences: Only limited success
[PB-301123/6] 26 p0270 N80-16555
NASA authorization, 1981, program review, volume 1
[GPO-53-814] 26 p0281 N80-17913
Geothermal energy: Obstacles and uncertainties impede its widespread use
[PB80-134430] 26 p0315 N80-21827

CONSTRUCTION MATERIALS
Gas turbines for automotive use --- Book
26 p0253 A80-31999

CONTAMINANTS
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

CONTINENTAL SHELVES
Outer continental shelf environment monitoring concerns
[PB-299861/5] 26 p0273 N80-16625

CONTROL EQUIPMENT
The evolution of a large laser control system - From Shiva to Nova
26 p0185 A80-21901
First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095

CONTROL SIMULATION
First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095

CONTROL SURFACES
Teetered, tip-controlled rotor - Preliminary test results from Mod-O 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836

CONTROL THEORY
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256

CONTROLLED FUSION
Non-electric fusion energy applications
26 p0215 A80-24676
European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers
26 p0225 A80-25771
Controlled fusion research in China
26 p0226 A80-25786
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567

CONTROLLERS
Optimal controllers of the second kind --- for flat plate solar collectors
26 p0184 A80-21112

CONVECTION
Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors
[COO-2971-6] 26 p0307 N80-20900

CONVECTIVE FLOW
Combustion of multicomponent fuel droplets
[COO-4449-2] 26 p0257 N80-16126

CONVECTIVE HEAT TRANSFER
Non-convecting solar ponds 26 p0210 A80-23517
Radiative and convective heat transfer in the MHD generator duct 26 p0217 A80-25068
Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel 26 p0217 A80-25069
Performance calculations of tubular cover collectors 26 p0248 A80-29924

CONVERTERS
A fluorescent radiation converter [NASA-CASE-GSC-12528-1] 26 p0283 N80-18261

COOLANTS
Theoretical study of thermal losses: The use of hybrid and combined dry coolants --- in electrical power plants [NT-44-1978] 26 p0284 N80-18345

COOLING
Thermal energy storage application areas --- for building heating and cooling [CONS/5113-T4] 26 p0306 N80-20894

COOLING SYSTEMS
Investigation of heat and mass transfer for a regenerator model of a solar cooling system 26 p0232 A80-28200
Prototype solar heating and combined heating cooling systems [NASA-CR-161340] 26 p0264 N80-16485
Solar-MEC development program, project 9103 [COO-4495-7] 26 p0267 N80-16522
Heat-pump-centered integrated community energy systems: System development [ANL/CNSV/TM-8] 26 p0305 N80-20880
Methods for manufacturing heat pipes for circuit cards [AD-A080188] 26 p0314 N80-21707

COPPER
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se [DOE/ET-23005/T2] 26 p0296 N80-19653
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study 26 p0301 N80-20720

COPPER SELENIDES
High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell 26 p0229 A80-27321

COPPER SULFIDES
Energy analysis of CdS:Cu2S sputtered solar cells 26 p0186 A80-21918
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells 26 p0228 A80-27057

CORIOLIS EFFECT
Coriolis Program - A review of the status of the ocean turbine energy system 26 p0233 A80-28261

CORROSION RESISTANCE
Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle 26 p0204 A80-23189
Material requirements for coal gasification 26 p0212 A80-23833
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis 26 p0225 A80-25679
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine 26 p0249 A80-30474
Chemical and physical stability of refractories for use in coal gasification [COO-2904-14] 26 p0300 N80-20429
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-5] 26 p0313 N80-21520

CORROSION TESTS
Wettability and corrosion of MHD ceramics by Rosebud coal slag 26 p0217 A80-25074

COST ANALYSIS
Energy analysis of CdS:Cu2S sputtered solar cells 26 p0186 A80-21918
OTEC for hydrogen production 26 p0195 A80-23109
Unipolar water electrolysers - A competitive technology 26 p0196 A80-23116
Development of low cost nickel-rare earth hydrides for hydrogen storage 26 p0202 A80-23170
The energy problem - Its effect on aircraft design. II - The effects of fuel cost 26 p0254 A80-32201
Continuing regional solar energy information mini-center activities and updating the SOLCOST program [COO-4643-T2] 26 p0267 N80-16521
Peak-load problem with storage technology --- cost analysis of electric energy storage based on energy requirements [ANL/SPG-8] 26 p0269 N80-16549
Factors affecting potential market penetration of laser fusion power plants [PNL-2803] 26 p0269 N80-16552
Today's geothermal power economics and risks [CONF-790803-44] 26 p0277 N80-17558
Economic analysis of the design and fabrication of a space qualified power system [NASA-TM-81418] 26 p0282 N80-18098
Low cost point focus solar concentrator, phase 1 [NASA-CR-162848] 26 p0292 N80-19624

COST EFFECTIVENESS
Space manufacturing, satellite power and human exploration 26 p0186 A80-21908
The economics of producing hydrogen from a small air-blown coal gasifier 26 p0199 A80-23140
Gas turbines for automotive use --- Book 26 p0253 A80-31999

COST ESTIMATES
The price of oil in the year 2000 [AAS 79-172] 26 p0215 A80-24717
Oil and gas replacement cost: Development and production. Volume 1: Discussion of methodology, exhibits, and projections [DOE/TIC-10078] 26 p0258 N80-16187
Cost of energy evaluation 26 p0263 N80-16482

COST INCENTIVES
SWECS qualifications criteria for state tax incentive programs --- Small Wind Energy Conversion System [AIAA 80-0650] 26 p0240 A80-28829

COST REDUCTION
Photovoltaic cost blitz spawns new silicon processes 26 p0186 A80-21913
Studies in biogas technology. II - Optimization of plant dimensions 26 p0188 A80-21939
Assessment of low-cost manufacturing process sequences --- photovoltaic solar arrays [NASA-CR-162745] 26 p0278 N80-17575

COSTS
An investigation of preferences for various types of energy cost feedback --- information feedback system to determine energy consumption costs [PB-300314/2] 26 p0270 N80-16560

COUPLED MODES
Ideal magnetohydrodynamic stability of tokamak plasmas 26 p0250 A80-30554

CREEP RUPTURE STRENGTH
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-5] 26 p0313 N80-21520

CRITICAL POINT
Heavy hydrocarbons from coal gasification vapor pressures and dew point 26 p0257 N80-16111

CROP INVENTORIES
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data 26 p0191 A80-22456

CROP VIGOR
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs [PB-300460/3] 26 p0272 N80-16600

CRUDE OIL
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276
Aggregated vectorial model of petroleum flow in the United States
[LBL-8874] 26 p0258 N80-16178
Oil and gas replacement cost: Development and production. Volume 1: Discussion of methodology, exhibits, and projections
[DOE/TIC-10078] 26 p0258 N80-16187
Petroleum production at maximum efficient rate, Naval Petroleum Reserve no. 1 (Elk Hills), Kern County, California
[DOE/EIS-0012] 26 p0272 N80-16581
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602
Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation
[PNL-2421] 26 p0278 N80-17574
Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666
Analysis of current trends in U.S. petroleum and natural gas production
[PB80-116056] 26 p0301 N80-20800
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801

CRYOGENIC EQUIPMENT
The state-of-the-art of cryogenic heat pipes
[AIAA PAPER 80-0211] 26 p0212 A80-23956

CRYOGENIC FLUID STORAGE
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687
The cryogenic storage of hydrogen
26 p0202 A80-23162
A storage tank for vehicular storage of liquid hydrogen
26 p0231 A80-27729

CRYOGENIC MAGNETS
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports
26 p0191 A80-22690
Experiments on H2-O2MHD power generation
[NASA-TM-81424] 26 p0273 N80-16886

CRYOGENIC STORAGE
A study on hydrogen storage by use of cryoadsorbents
26 p0201 A80-23161

CRYOGENICS
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

CRYSTAL GROWTH
Silicon ribbon growth using scanned lasers
26 p0229 A80-27337
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394
Silicon solar cells, volume 3. Citations from the Engineering Index data base --- bibliographies
[PB80-800717] 26 p0280 N80-17588
Silicon solar cells, volume 3. Citations from the NTIS data base --- bibliographies
[PB80-800691] 26 p0280 N80-17589
Silicon solar cells, volume 2. Citations from the Engineering Index data base --- bibliographies
[PB80-800709] 26 p0280 N80-17590

CUBIC LATTICES
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165

CURRENT CONVERTERS (AC TO DC)
An ac/dc power converter for batteries and fuel cells
[EPRI-EM-662] 26 p0259 N80-16284

CURRENT DENSITY
Development and operation of a high current density high pressure advanced electrolysis cell
26 p0197 A80-23119
Recombination in the space-charge region of Schottky barrier solar cells
26 p0207 A80-23272
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609

CURRENT DISTRIBUTION
Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815

CYLINDRICAL WAVES
Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

D

DAMS
Cataract hydroelectric development expansion study
[DOE/ID-01796-1] 26 p0295 N80-19650
Potential hydroelectric power, vertical turbine, spillway combine Broadwater Dam
[DOE/ID-01822-1] 26 p0295 N80-19651

DATA ACQUISITION
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903
Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879

DATA BASES
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

DATA CORRELATION
Solvent refined coal process: Data correlation and analysis
[EPRI-AP-1157] 26 p0313 N80-21557

DATA REDUCTION
Describing wind data --- using characteristic wind speed and shape factor parameters
26 p0211 A80-23534
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14] 26 p0268 N80-16532

DATA SYSTEMS
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672

DECOMPOSITION
The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407

DEGASSING
Study of hydrocarbon-shale interaction
[ORO-5197-14] 26 p0260 N80-16409

DEGRADATION
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
LSA field test
[NASA-CR-162798] 26 p0291 N80-19611

DEHYDROGENATION
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147

DELTAS
The Yallahs fan delta, southeastern Jamaica: A depositional model for active tectonic coastlines
26 p0273 N80-16632

DEMAND (ECONOMICS)
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study
26 p0301 N80-20720
Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2
[DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207

DEMOGRAPHY
Monitoring urban population and energy utilization patterns from satellite data
26 p0207 A80-23293

DENITROGENATION
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292

DENSE PLASMAS
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481

DENSITY DISTRIBUTION
Non-convecting solar ponds
26 p0210 A80-23517

DEOXIDIZING
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174

DEPOSITION
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071
Preparation of thin films for solar energy utilization
[SAND-79-1754C] 26 p0267 N80-16517

DESALINIZATION
Arabs turn their eyes to the sun --- solar energy development in Middle East
26 p0244 A80-29280

DESICCANTS
Overview of developing programs in solar desiccant cooling for residential buildings
[SERI/TP-34-187] 26 p0278 N80-17569

DESIGN ANALYSIS
A modular design for a superconducting magnet for the ETF and larger MHD generators
26 p0218 A80-25078
Design evolution of large wind turbine generators
26 p0261 N80-16455
Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463
Overview of Vertical Axis Wind Turbine (VAWT)
26 p0262 N80-16466
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550
Receiver assembly design studies for 2-m 90 deg parabolic-cylindrical solar collectors
[SAND-79-1026] 26 p0277 N80-17564
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1
[EPRI-ER-1083-VOL-1] 26 p0281 N80-17863
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2
[EPRI-ER-1083-VOL-2] 26 p0281 N80-17864
Parametric study of potential early commercial MHD power plants
[NASA-CR-159633] 26 p0286 N80-18559
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379

DESORPTION
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds
26 p0234 A80-28277

DESULFURIZING
Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292
The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[FE-2449-9] 26 p0288 N80-19298
Hot gas cleanup process
[PB80-108467] 26 p0310 N80-20950

DETONABLE GAS MIXTURES
Chemical kinetics in LNG detonations
[UCRL-82293-REV-1] 26 p0258 N80-16180

DETONATION
Chemical kinetics in LNG detonations
[UCRL-82293-REV-1] 26 p0258 N80-16180

DEUTERIUM PLASMA
Plasma parametric studies and potential applications of driven fusion reactors
26 p0215 A80-24674

DEVELOPING NATIONS
Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294

DEW
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926

DIAPHRAGMS (MECHANICS)
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis
26 p0196 A80-23113

DIELECTRICS
Electrical purifiers for dielectric fluids --- charged particle contaminants separation from fuels, oils and hydraulic fluids
26 p0254 A80-32287
Development of improved wraparound contacts for silicon
[NASA-CR-159748] 26 p0285 N80-18554

DIESEL ENGINES
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471
The future of the Diesel engine - A critical analysis
26 p0235 A80-28473
Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347
Comparison of fuel economy and emissions for diesel and gasoline powered taxicabs
[PB-298609/9] 26 p0275 N80-17484
Issues concerning the light-duty diesel
[DOE/EV-0050/1] 26 p0290 N80-19510

DIESEL FUELS
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287
Stability survey of hydrocarbon fuels
[BETC-1778-4] 26 p0300 N80-20424
Light-duty diesel gaseous emissions measurement - comparison of dilution tunnel test results to certification cell test results
[PB80-115991] 26 p0310 N80-20945

DIFFERENTIAL THERMAL ANALYSIS
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions
26 p0247 A80-29894

DIFFUSERS
Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept
26 p0211 A80-23533

DIODES
Measurement techniques for high power semiconductor materials and devices
[DOE/RA-0041] 26 p0301 N80-20506

DIRECT CURRENT
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008

DIRECT POWER GENERATORS
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864

DIURNAL VARIATIONS
The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support
[LA-7885-MS-VOL-6] 26 p0307 N80-20897

DOMESTIC ENERGY
Warm water storage in district heating systems incorporating combined heat and power plant
26 p0185 A80-21825

Overview of coal energy utilization technology in Japan
26 p0187 A80-21924
Geological and geochemical characteristics of geothermal resources in Japan
26 p0187 A80-21928
Results of solar heating experiments --- for full scale domestic system performance
26 p0209 A80-23513
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings
26 p0212 A80-24071
Thermography at the earth's surface and the energy efficiency of buildings
26 p0213 A80-24072
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261
Lignite and coal in the U.S. energy future
26 p0230 A80-27420
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary --- domestic energy supply systems analysis of coal fired power plants using fuel cells
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869

DOPED CRYSTALS
The doping of amorphous silicon for solar cells
26 p0187 A80-21921
Characterization of deliberately nickel-doped silicon wafers and solar cells --- microstructure, electrical properties, and energy conversion efficiency
[NASA-CR-162790] 26 p0276 N80-17551

DRAG REDUCTION
The potential for development of high performance light aircraft
26 p0208 A80-23307

DROPS (LIQUIDS)
Combustion of multicomponent fuel droplets
[COO-4449-2] 26 p0257 N80-16126
The effect of superheating on the performance of floating droplet direct contact heat exchangers
26 p0260 N80-16293

DRYING
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106

DUST
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949

DYES
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

DYNAMIC CHARACTERISTICS
Characterization of dynamic influences in a coal-fired MHD system
26 p0219 A80-25094

DYNAMIC STRUCTURAL ANALYSIS
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446

DYNAMIC TESTS
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186

E

EARTH (PLANET)
Use of earth coupling in solar assisted heat pumps
[BNL-26748] 26 p0316 N80-21849

EARTH RESOURCES
Regional environment-energy data book: Northeast region
[DOE/TIC-10114/3] 26 p0279 N80-17578
Regional environment-energy data book: Western region
[DOE/TIC-10114/2] 26 p0280 N80-17597
Regional environment-energy data book: Southern region
[DOE/TIC-10114/4] 26 p0281 N80-17598
Regional environment-energy data book: Northwest region
[DOE/TIC-10114/5] 26 p0281 N80-17599
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

EARTH SURFACE
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory --- heat transfer and storage devices for a solar source heat pump system
[BNL-26219] 26 p0266 N80-16509

ECOLOGY
Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SP-01525/1] 26 p0294 N80-19642
Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666

ECONOMETRICS
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study
26 p0301 N80-20720
Projections of enhanced oil recovery, 1985 - 1995
[DOE/EIA-0183/11] 26 p0314 N80-21824

ECONOMIC ANALYSIS
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877
An overview of photovoltaic market research
26 p0186 A80-21917
Short haul transport for the 1990s
26 p0190 A80-22046
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739
A study on hydrogen storage by use of cryoadsorbents
26 p0201 A80-23161
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code --- improved computer program for hydrogen production and nuclear reactor-chemical plant coupling processes
26 p0205 A80-23192
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206
Onsite solar energy systems - Economics and system design
26 p0207 A80-23221
The economic significance of Q for mirror reactors - Combinations of Q and M which look promising --- parameters affecting energy conversion efficiency in fusion reactor
26 p0215 A80-24666
A performance and economic evaluation of annual cycle energy storage /ACES/
26 p0223 A80-25260
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649
Ocean wave energy conversion concepts
26 p0232 A80-28260
Wind energy conversion system simulation program
[AIAA 80-0609] 26 p0237 A80-28806

Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810
Economic incentives to wind systems commercialization
[AIAA 80-0617] 26 p0238 A80-28811
Economics of selected WECS dispersed applications
[AIAA 80-0618] 26 p0238 A80-28812
Economic assessment of the Darrieus wind turbine
[AIAA 80-0614] 26 p0241 A80-28837
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858
A heat penalty and economic analysis of the hybrid sulfuric acid process
26 p0245 A80-29406
Energy politics --- economic and technological overview
26 p0246 A80-29475
Geothermal heating in Creil
26 p0255 A80-32499
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500
Economics of geothermal power
[COO-4051-43] 26 p0265 N80-16497
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 1: Executive summary
[SAND-78-0962-VOL-1] 26 p0268 N80-16539
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 2: Economic optimization model
[SAND-78-0962-VOL-2] 26 p0268 N80-16540
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541
Economic analysis of Darrieus axis wind turbine systems for the generation of utility grid electrical power. Volume 4: Summary and analysis of the A. T. Kearney and Alcoa Laboratories point design economic studies
[SAND-78-0962-VOL-4] 26 p0269 N80-16542
Today's geothermal power economics and risks
[CONF-790803-44] 26 p0277 N80-17558
Economics of thermal energy storage for compressed air energy storage systems
[PNL-SA-7949] 26 p0307 N80-20903
Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853

ECONOMIC DEVELOPMENT
Space benefits: The secondary application of aerospace technology in other sectors of the economy
[NASA-CR-162697] 26 p0274 N80-16950

ECONOMIC FACTORS
United States energy policy - The continuing failure
26 p0185 A80-21766
Advances in energy systems and technology. Volume 2 --- Book
26 p0207 A80-23218
Economically working big scale solar power stations pneumatic light-weight construction
26 p0208 A80-23326

ECONOMIC IMPACT
The energy problem: Its effect on aircraft design. I - Supply and demand
26 p0231 A80-27752
The energy impacts of solar heating
26 p0248 A80-29946

ECONOMICS
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909
A Newton method for the PIES energy model
[AD-A077102] 26 p0287 N80-18825
Are the alternative energy stategies achievable?
[ORAU/IEA-79-15(0)] 26 p0318 N80-21863

EJECTORS
Performance analysis of a type of electrohydrodynamic power generator
[AD-A076115] 26 p0283 N80-18307

ELECTRIC ARCS
Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249] 26 p0192 A80-22745
The effect of electrochemical and arcing phenomena on electrode performance --- in coal-fired MHD generators
26 p0218 A80-25080

ELECTRIC AUTOMOBILES
Electric vehicle in Japan
26 p0236 A80-28484
Electric automobiles. Citations from the NTIS data base --- and their propulsion systems
[NTIS/PS-79/0990/6] 26 p0274 N80-16976
Study of advanced electric propulsion system concept using a flywheel for electric vehicles
[NASA-CR-159650] 26 p0287 N80-18991
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-7] 26 p0317 N80-21860

ELECTRIC BATTERIES
Storage of solar energy
26 p0188 A80-21937
Electric transport - The future prospects
26 p0189 A80-21956
Solar energy electrochemical storage
26 p0208 A80-23331
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008
Mixed electrolyte solutions of propylene carbonate and dimethoxyethane for high energy density batteries
26 p0247 A80-29898
An ac/dc power converter for batteries and fuel cells
[EPRI-EM-662] 26 p0259 N80-16284
Electric automobiles. Citations from the NTIS data base --- and their propulsion systems
[NTIS/PS-79/0990/6] 26 p0274 N80-16976
Simulation of an urban battery bus vehicle
[PB-300306/8] 26 p0282 N80-17923
The 1979 Goddard Space Flight Center Battery Workshop
[NASA-CP-2117] 26 p0302 N80-20820
Overview of NASA battery technology program
26 p0302 N80-20821
Life test results of the NASA standard 20 ampere hour cells
26 p0303 N80-20846

ELECTRIC CHARGE
MOS and oxide-charge-induced /OCI/ BSF solar cells
26 p0234 A80-28337

ELECTRIC CURRENT
Fluctuations in combustion MHD generator systems
26 p0221 A80-25105
Life test results of the NASA standard 20 ampere hour cells
26 p0303 N80-20846

ELECTRIC DISCHARGES
Lithium thionyl chloride high rate discharge
26 p0303 N80-20830
Lithium battery discharge tests
26 p0303 N80-20831

ELECTRIC ENERGY STORAGE
Pumped water storage
26 p0225 A80-25495
Peak-load problem with storage technology --- cost analysis of electric energy storage based on energy requirements
[ANL/SPG-8] 26 p0269 N80-16549

ELECTRIC EQUIPMENT
Electrical purifiers for dielectric fluids --- charged particle contaminants separation from fuels, oils and hydraulic fluids
26 p0254 A80-32287

ELECTRIC FIELD STRENGTH
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

ELECTRIC FIELDS
Field-dependent quantum efficiency in hydrogenated amorphous silicon --- for solar cells
26 p0251 A80-30942

ELECTRIC GENERATORS
Tension-field wind machine - A new concept in large-scale energy production
[AIAA 80-0622] 26 p0238 A80-28814
Multi-speed electrical generator application to wind turbines
[AIAA 80-0635] 26 p0239 A80-28821
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
26 p0253 A80-31900
Large Wind Turbine Design Characteristics and R and D Requirements
[NASA-CP-2106] 26 p0260 N80-16453
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456
The Boeing MOD-2 wind tunnel system rated at 2.5 MW
26 p0261 N80-16457
WTG Energy Systems' MP1-200 200 kilowatt wind turbine generator --- a fixed pitch rotor configuration driving a synchronous generator
26 p0261 N80-16458
Specification, siting and selection of large WECS prototypes
26 p0261 N80-16459
The Danish large wind turbine program --- feasibility of wind power in a utility grid
26 p0261 N80-16460
Large wind energy converter: Growian 3 MW
26 p0261 N80-16461
Characteristics of future Vertical Axis Wind Turbines (VAWTs) --- to generate utility grid electric power
26 p0261 N80-16462
Status of the Southern California Edison Company 3 MW Wind Turbine Generator (WTG) demonstration project
26 p0263 N80-16478
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480
Fixed mirror solar concentrator for application to a 100 MW(e) electric generating plant
[GA-A-15340] 26 p0266 N80-16508
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 1: Executive summary
[SAND-78-0962-VOL-1] 26 p0268 N80-16539
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 2: Economic optimization model
[SAND-78-0962-VOL-2] 26 p0268 N80-16540
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541
Economic analysis of Darrieus axis wind turbine systems for the generation of utility grid electrical power. Volume 4: Summary and analysis of the A. T. Kearney and Alcoa Laboratories point design economic studies
[SAND-78-0962-VOL-4] 26 p0269 N80-16542
Performance analysis of a type of electrohydrodynamic power generator
[AD-A076115] 26 p0283 N80-18307
Permanent magnet and superconducting generators in airborne, high power systems --- computer program to predict weight of the generators and component systems
[AD-A078424] 26 p0284 N80-18311
A linear magnetic motor/generator --- to generate electric energy using magnetic flux for spacecraft's power supply
[NASA-CASE-GSC-12518-1] 26 p0290 N80-19424
Test and evaluation report of the ERDC Hybrid-Electric Van (HEVAN)
[DOE/TIC-10232] 26 p0312 N80-21210
Advanced coal gasification system for electric power generation, FY 1978
[FE-1514-93] 26 p0313 N80-21554
Wind wheel electric power generator
[NASA-CASE-MFS-23515-1] 26 p0315 N80-21828
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866

ELECTRIC HYBRID VEHICLES
Electric transport - The future prospects
26 p0189 A80-21956
The dual-mode bus and further bus developments in France
26 p0235 A80-28431
Hybrid drive-systems for municipal buses
26 p0235 A80-28475
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles
[PB-300289/6] 26 p0282 N80-17922
Electric and hybrid vehicle program
[DOE/CS-0026/7] 26 p0311 N80-21204
Mechanical energy storage technology for transportation applications project plan
[UCRL-15138] 26 p0312 N80-21209
Test and evaluation report of the ERDC Hybrid-Electric Van (HEVAN)
[DOE/TIC-10232] 26 p0312 N80-21210

ELECTRIC MOTOR VEHICLES
Electric transport - The future prospects
26 p0189 A80-21956
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677
Metal/air batteries: Their status and potential - A review
26 p0231 A80-28012
The dual-mode bus and further bus developments in France
26 p0235 A80-28431
Electric automobiles. Citations from the NTIS data base --- and their propulsion systems
[NTIS/PS-79/0990/6] 26 p0274 N80-16976
Advanced electric propulsion system concept for electric vehicles
[NASA-CR-159651] 26 p0282 N80-17916
Simulation of an urban battery bus vehicle
[PB-300306/8] 26 p0282 N80-17923
Electric and hybrid vehicle program
[DOE/CS-0026/7] 26 p0311 N80-21204
Mechanical energy storage technology for transportation applications project plan
[UCRL-15138] 26 p0312 N80-21209

ELECTRIC MOTORS
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008
Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558
Study of advanced electric propulsion system concept using a flywheel for electric vehicles
[NASA-CR-159650] 26 p0287 N80-18991
A linear magnetic motor/generator --- to generate electric energy using magnetic flux for spacecraft's power supply
[NASA-CASE-GSC-12518-1] 26 p0290 N80-19424

ELECTRIC NETWORKS
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480

ELECTRIC POTENTIAL
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812
MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems
26 p0254 A80-32318
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609

ELECTRIC POWER

Power consumption in the high-tension field between the government's responsibility to provide energy and politics
26 p0185 A80-21846

Wind power excites utility interest
26 p0190 A80-22281

Water turbine technology for small power stations
26 p0213 A80-24125

Possible direct conversion of chemical energy into electrical energy in a semiconductor
26 p0247 A80-29795

Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501

ELECTRIC POWER PLANTS

Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449

Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903

Study of flywheel energy storage system for electric utilities
26 p0187 A80-21925

Electricity generation choices for the near term
26 p0190 A80-22280

Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739

Small scale ammonia production as a means for hydrogen storage
26 p0201 A80-23160

Economically working big scale solar power stations pneumatic light-weight construction
26 p0208 A80-23326

Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256

Cheap electricity from French tides
26 p0214 A80-24537

Power plant impacts on visibility in the west - Siting and emissions control implications
26 p0216 A80-24735

Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097

A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098

Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099

Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101

The retrofit approach to MHD demonstration and commercialization --- for coal-fired MHD plants
26 p0221 A80-25102

A modular approach to an engineering test facility and beyond --- for coal-fired MHD generators
26 p0221 A80-25103

The transition MHD power plant concept
26 p0221 A80-25104

Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170

Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690

Simplified correlations for prediction of NO/x/ emissions from MHD power plants
26 p0227 A80-26001

Free space microwave power transmission systems for microwave powered atmospheric platforms
26 p0228 A80-26813

Economics of selected WECS dispersed applications
[AIAA 80-0618] 26 p0238 A80-28812

The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants
26 p0248 A80-29938

Satellite solar power plants
26 p0252 A80-31200

Promising fuels for MHD power stations
26 p0252 A80-31750

Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856

The Danish large wind turbine program --- feasibility of wind power in a utility grid
26 p0261 N80-16460

Characteristics of future Vertical Axis Wind Turbines (VAWTs) --- to generate utility grid electric power
26 p0261 N80-16462

Economics of geothermal power
[COO-4051-43] 26 p0265 N80-16497

Use of solar energy for the production of electricity in the Alps
[SAND-79-6000] 26 p0265 N80-16499

Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580

Criteria for an ideal solar photovoltaic powered industry
[HCP/T5433-01] 26 p0279 N80-17577

Combined cycle power generation. Citations from the NTIS data base --- bibliographies
[PB80-800915] 26 p0280 N80-17594

Combined cycle power generation. Citations from the Engineering Index data base --- bibliographies
[P80-800923] 26 p0280 N80-17595

Theoretical study of thermal losses: The use of hybrid and combined dry coolants --- in electrical power plants
[NT-44-1978] 26 p0284 N80-18345

Parametric study of potential early commercial MHD power plants
[NASA-CR-159633] 26 p0286 N80-18559

Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development --- for the generation of electric power
[DOE/ET-28432/1] 26 p0290 N80-19604

Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 2: Regional program monitoring and progress evaluation --- for the generation of electric power
[DOE/ET-28432/2] 26 p0291 N80-19605

Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation --- for generation of electric power
[DOE/ET-28432/3-1] 26 p0291 N80-19606

Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices --- for generation of electric power
[DOE/ET-28432/3-2] 26 p0291 N80-19607

Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626

The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634

Solar sea power plants. Citations from the NTIS data base
[PB80-802580] 26 p0297 N80-19661

Solar seapower plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662

Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904

Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology
[EPRI-ER-1070-VOL-1] 26 p0309 N80-20926

General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379

Storage peak gas-turbine power unit
[NASA-TM-75757] 26 p0314 N80-21755

Solar thermal repowering systems integration
[SERI/TR-8037-1] 26 p0316 N80-21847

Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866
Hydro for the eighties: Bringing hydroelectric power to low income people, the work book. A slide presentation: Audio cassette and workbook
[PB80-103948] 26 p0319 N80-21883

ELECTRIC POWER SUPPLIES
PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record
26 p0242 A80-28892

ELECTRIC POWER TRANSMISSION
Free space microwave power transmission systems for microwave powered atmospheric platforms
26 p0228 A80-26813

ELECTRIC PROPULSION
Electric automobiles. Citations from the NTIS data base --- and their propulsion systems
[NTIS/PS-79/0990/6] 26 p0274 N80-16976

ELECTRICAL MEASUREMENT
End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes
26 p0193 A80-22793
The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell
26 p0247 A80-29817
Characterization of prototype secondary lithium battery
26 p0303 N80-20832

ELECTRICAL PROPERTIES
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349
Electrical characteristics of an arc-mode slagging electrode generator --- in Faraday MHD generators
26 p0216 A80-25064
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065
Local analysis of electrical performance of the U-25B generator --- MHD generator
26 p0216 A80-25066
A study on plasma plug --- high energy ignition plugs for exhaust pollution reduction and fuel consumption decrease in automotive gasoline engines
26 p0252 A80-31775
Characterization of deliberately nickel-doped silicon wafers and solar cells --- microstructure, electrical properties, and energy conversion efficiency
[NASA-CR-162790] 26 p0276 N80-17551

ELECTRICAL RESISTANCE
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507

ELECTRO-OPTICS
Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979
26 p0245 A80-29334

ELECTROCATALYSTS
Optimization of Pt-doped Kocite (trade name) electrodes in H3Po4 fuel cells
[AD-A075372] 26 p0294 N80-19639

ELECTROCHEMICAL CELLS
Energy storage --- Book
26 p0184 A80-21123
Possible use of honeycomb-type structures for high power batteries and fuel cells
26 p0190 A80-22169
Energy by reverse electrodialysis
26 p0194 A80-22940
Solar energy electrochemical storage
26 p0208 A80-23331
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis
26 p0225 A80-25679
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897
The storage of electrochemical energy
26 p0286 N80-18578

ELECTROCHEMICAL CORROSION
Long duration channel development and testing --- for MHD generator electrode corrosion measurement
26 p0216 A80-25063
The effect of electrochemical and arcing phenomena on electrode performance --- in coal-fired MHD generators
26 p0218 A80-25080

ELECTROCHEMICAL OXIDATION
Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152

ELECTROCHEMISTRY
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles
26 p0197 A80-23120
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016
Electrochemistry of amorphous V2S5 in lithium cells
26 p0247 A80-29895
Electrochemical gasification of coal - Investigation of operating conditions and variables
26 p0249 A80-30526
Improved thermal battery --- military applications
[AD-A075835] 26 p0276 N80-17554
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557
The 1979 Goddard Space Flight Center Battery Workshop
[NASA-CP-2117] 26 p0302 N80-20820
Status of the DOE battery and electrochemical technology program
[MTR-8026] 26 p0307 N80-20902
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870

ELECTROCONDUCTIVITY
Experiments concerning inhomogeneities in combustion MHD generators
26 p0221 A80-25107
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330

ELECTRODES
Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249] 26 p0192 A80-22745
A speculation on a general photoelectrochemical reactor
26 p0193 A80-22794
The significance of studies with palladium to basic problems of electrolytic hydrogen evolution
26 p0196 A80-23114
Electrodes for generation of hydrogen and oxygen for seawater
26 p0196 A80-23115
Electrolysis of hydrobromic acid --- hybrid cycle for hydrogen production
26 p0198 A80-23129
Photoelectrochemical generation of hydrogen with hybrid electrodes
26 p0200 A80-23153
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis
26 p0225 A80-25679
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016

Low-temperature thermionic converter with an expanded-area collector 26 p0249 A80-30242
A study on plasma plug --- high energy ignition plugs for exhaust pollution reduction and fuel consumption decrease in automotive gasoline engines 26 p0252 A80-31775
Optimization of Pt-doped Kocite (trade name) electrodes in H3PO4 fuel cells [AD-A075372] 26 p0294 N80-19639
ELECTRODIALYSIS
Energy by reverse electrodialysis 26 p0194 A80-22940
ELECTRODYNAMICS
Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream 26 p0252 A80-31509
ELECTROHYDRODYNAMICS
Performance analysis of a type of electrohydrodynamic power generator [AD-A076115] 26 p0283 N80-18307
ELECTROLYSIS
Present state and outlook of the electrolytic H2-production route 26 p0195 A80-23104
On the potential of solar energy conversion into hydrogen and/or other fuels 26 p0195 A80-23107
OTEC for hydrogen production 26 p0195 A80-23109
The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology 26 p0196 A80-23110
The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions 26 p0196 A80-23111
Improvements in electrolysis technology in alkaline solution --- for hydrogen production 26 p0196 A80-23112
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis 26 p0196 A80-23113
The significance of studies with palladium to basic problems of electrolytic hydrogen evolution 26 p0196 A80-23114
Electrodes for generation of hydrogen and oxygen for seawater 26 p0196 A80-23115
Hydrogen production by high temperature electrolysis of water vapour 26 p0197 A80-23118
Development and operation of a high current density high pressure advanced electrolysis cell 26 p0197 A80-23119
Electrolysis of hydrobromic acid --- hybrid cycle for hydrogen production 26 p0198 A80-23129
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6 --- hydrogen production 26 p0200 A80-23144
Hydrogen production from fusion reactors coupled with high temperature electrolysis 26 p0200 A80-23148
Plasmochemical cycle of hydrogen production from the water 26 p0200 A80-23149
Hydrogen generation via photoelectrolysis of water - Recent advances 26 p0200 A80-23152
Photoelectrochemical generation of hydrogen with hybrid electrodes 26 p0200 A80-23153
Thermoelectrochemical cycles for power and hydrogen production 26 p0201 A80-23157
Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis 26 p0205 A80-23191
Testing aqueous caustic electrolyzers at high temperatures --- for hydrogen production 26 p0205 A80-23196
Theoretical efficiency limit of water electrolysis and practical means to approach it 26 p0205 A80-23197
Status and development of production of cheap hydrogen 26 p0208 A80-23330
Photoelectrochemical cells --- with photoactive semiconducting electrodes 26 p0210 A80-23520
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes 26 p0243 A80-29054
Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program [BNL-26904] 26 p0296 N80-19654
ELECTROLYTES
Development of sulfur-tolerant components for the molten carbonate fuel cell 26 p0190 A80-22167
Improvements in electrolysis technology in alkaline solution --- for hydrogen production 26 p0196 A80-23112
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis 26 p0196 A80-23113
Mixed electrolyte solutions of propylene carbonate and dimethoxyethane for high energy density batteries 26 p0247 A80-29898
The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells 26 p0251 A80-30939
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes [AD-A078473] 26 p0286 N80-18570
ELECTROLYTIC CELLS
Present state and outlook of the electrolytic H2-production route 26 p0195 A80-23104
Improvements in electrolysis technology in alkaline solution --- for hydrogen production 26 p0196 A80-23112
Unipolar water electrolysers - A competitive technology 26 p0196 A80-23116
Development of Billings SPE electrolyzer --- for hydrogen production 26 p0196 A80-23117
Development and operation of a high current density high pressure advanced electrolysis cell 26 p0197 A80-23119
Testing aqueous caustic electrolyzers at high temperatures --- for hydrogen production 26 p0205 A80-23196
Solar energy electrochemical storage 26 p0208 A80-23331
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes 26 p0243 A80-29054
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy 26 p0243 A80-29056
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes 26 p0243 A80-29057
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions 26 p0247 A80-29894
Electrochemistry of amorphous V2S5 in lithium cells 26 p0247 A80-29895
Cogeneration of electric energy and nitric oxide 26 p0255 A80-32412
Lightweight fuel cell powerplant components program [NASA-CR-161412] 26 p0298 N80-20306
Status of the DOE battery and electrochemical technology program [MTR-8026] 26 p0307 N80-20902
ELECTROMOTIVE FORCES
Flexible formulated plastic separators for alkaline batteries [NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries [NASA-CASE-LEW-12363-3] 26 p0285 N80-18556

ELECTRON ACCELERATORS
- Progress in the production and energy flux concentration of the REB accelerator for ICF 26 p0226 A80-25785

ELECTRON DENSITY (CONCENTRATION)
- Effect of the interstitial hole size and electron concentration on complex metal hydride formation 26 p0202 A80-23168

ELECTRON RADIATION
- Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation 26 p0183 A80-21089

ELECTRON RECOMBINATION
- Recombination in the space-charge region of Schottky barrier solar cells 26 p0207 A80-23272
- The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells 26 p0251 A80-30939
- The spectral response of a front surface field solar cell 26 p0254 A80-32331

ELECTRON STATES
- Spin-aligned hydrogen --- atoms at lowest electronic energy magnetic sublevels as substance for molecular production 26 p0200 A80-23151

ELECTRON TRANSFER
- Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications 26 p0243 A80-29055

ELECTRONIC CONTROL
- The evolution of a large laser control system - From Shiva to Nova 26 p0185 A80-21901
- Electronic fuel injection techniques for hydrogen powered I.C. engines 26 p0206 A80-23205
- Design considerations of a CAMAC system for large tokamak JT-60 26 p0231 A80-27672
- Peak power tracking technique for photovoltaic arrays 26 p0242 A80-28908

ELECTROSTATIC WAVES
- Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas 26 p0229 A80-27263
- Toroidal effects on nonlocal collisionless drift instability 26 p0229 A80-27278

ELECTROSTATICS
- Toroidal Trivelpiece-Gould modes --- quasi-electrostatic approximation for electron plasma waves in fusion reactor 26 p0189 A80-22042

ELLIPTIC DIFFERENTIAL EQUATIONS
- MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems 26 p0254 A80-32318

EMISSIVITY
- Spectral selectivity of high-temperature solar absorbers 26 p0225 A80-25657

EMITTANCE
- Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes [UCRL-52851] 26 p0316 N80-21842

ENCAPSULATING
- Develop silicone encapsulation systems for terrestrial silicon solar arrays [NASA-CR-162840] 26 p0292 N80-19617

ENERGY
- The storage of electrochemical energy 26 p0286 N80-18578

ENERGY ABSORPTION
- Submerged cylinder wave energy device - Theory and experiment 26 p0251 A80-30801
- Absorption of wave energy by elongated bodies --- in ocean water 26 p0251 A80-30805

ENERGY ABSORPTION FILMS
- High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell 26 p0229 A80-27321
- Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system 26 p0246 A80-29742
- Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes 26 p0246 A80-29743
- Alternative grading profile for sputtered solar selective surfaces 26 p0246 A80-29744
- Preparation of thin films for solar energy utilization [SAND-79-1754C] 26 p0267 N80-16517
- Photovoltaic Materials and Device Measurements Workshop: Focus on polycrystalline thin film cells [SERI/TP-49-185] 26 p0268 N80-16538

ENERGY CONSERVATION
- Energy accounting of alternative energy sources 26 p0193 A80-22868
- Aerial thermography - A tool for making people aware of energy conservation 26 p0212 A80-24070
- Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings 26 p0212 A80-24071
- Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption 26 p0222 A80-25116
- Possible energy savings through tribological measures - Especially in automobiles 26 p0227 A80-26184
- Radiant heat for energy conservation 26 p0253 A80-32056
- Energy savings through use of an improved reduction cell cathode [SAN-1257-T2] 26 p0267 N80-16515
- Energy conservation in industry: The present approach, the future opportunities [PB-301244/0] 26 p0270 N80-16556
- Survey on metallurgical recycling processes [ANL/OEPM-79-2] 26 p0282 N80-17918
- Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap 26 p0290 N80-19492
- Energy conservation in the US: Some interdisciplinary approaches with an emphasis on industrial cogeneration 26 p0302 N80-20811
- Energy efficient buildings program [LBL-9576] 26 p0304 N80-20877
- Urban mass transportation energy conservation: SRGP operating instructions and program documentation, volume 5 [DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205
- Urban transportation energy conservation: Case city applications of analysis methodologies, volume 3 [DOE/PE-8628/1-VOL-3] 26 p0312 N80-21206
- Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2 [DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207
- Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1 [DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208
- Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies [CONS-8626-T1-VOL-1] 26 p0317 N80-21857
- Potential for solar/conservation technologies in the state of Washington [WAOENG-79-3] 26 p0317 N80-21859
- Energy savings by means of fuel cell electrodes in electro-chemical industries [COO-4881-6] 26 p0318 N80-21870

ENERGY CONSUMPTION
- Monitoring urban population and energy utilization patterns from satellite data 26 p0207 A80-23293

The thermodynamics of heating. I - The second law and conventional heating systems 26 p0213 A80-24512

The potential for optimizing the economics of wind energy utilization on a dairy farm through load management [AIAA 80-0640] 26 p0241 A80-28838

The energy problem - Its effect on aircraft design. II - The effects of fuel cost 26 p0254 A80-32201

Coal processing and utilization 26 p0255 A80-32396

Study of a French national energy system based on coal and nuclear energy 26 p0255 A80-32500

Aggregated vectorial model of petroleum flow in the United States [LBL-8874] 26 p0258 N80-16178

Energy savings through use of an improved reduction cell cathode [SAN-1257-T2] 26 p0267 N80-16515

An investigation of preferences for various types of energy cost feedback --- information feedback system to determine energy consumption costs [PB-300314/2] 26 p0270 N80-16560

Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation [PNL-2421] 26 p0278 N80-17574

A Newton method for the PIES energy model [AD-A077102] 26 p0287 N80-18825

Energy accounting for solar and alternative energy sources [ORAU/IEA-79-11(R)] 26 p0295 N80-19647

Industrial fuel choice analysis model. Volume 2: Appendices to model documentation [DOE/EIA-2832/1-VOL-2-APP] 26 p0299 N80-20419

Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study 26 p0301 N80-20720

Analysis and evaluation in the production process and equipment area of the low-cost solar array project [NASA-CR-162904] 26 p0302 N80-20814

Projections of direct energy consumption by mode: The 1975 - 2000 baseline [ANL/CNSV-4] 26 p0304 N80-20878

Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results [DOE/PE-2344/2] 26 p0305 N80-20885

Perspective on world energy [DOE/TIC-10273] 26 p0307 N80-20898

Limits to energy modeling [ORAU/IEA-79-16(O)] 26 p0308 N80-20907

Storage peak gas-turbine power unit [NASA-TM-75757] 26 p0314 N80-21755

Washington state energy use profile, 1960-1978 [WAOENG-79-1] 26 p0318 N80-21869

ENERGY CONVERSION

Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system 26 p0204 A80-23180

Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis 26 p0225 A80-25679

Tension-field wind machine - A new concept in large-scale energy production [AIAA 80-0622] 26 p0238 A80-28814

Experiments on an oscillating aerofoil and applications to wind energy converters [AIAA 80-0624] 26 p0238 A80-28816

Wind characteristics over complex terrain relative to WECS siting --- Wind Energy Conversion System [AIAA 80-0645] 26 p0239 A80-28825

Coal gasification in steam at very high temperatures 26 p0249 A80-30522

Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents 26 p0249 A80-30523

Reaction kinetics between CO2 and oil-shale residual carbon. I - Effect of heating rate on reactivity 26 p0249 A80-30524

Electrochemical gasification of coal - Investigation of operating conditions and variables 26 p0249 A80-30526

Regenerative energy sources --- technology impact on the Federal Republic of Germany 26 p0255 A80-32397

Gas turbines 26 p0255 A80-32399

Development studies on selected conversion of synthesis gas from coal to high octane gasoline [FE-2276-27] 26 p0259 N80-16190

Large Wind Turbine Design Characteristics and R and D Requirements [NASA-CP-2106] 26 p0260 N80-16453

Large wind energy converter: Growian 3 MW 26 p0261 N80-16461

Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator [NASA-TM-81408] 26 p0264 N80-16494

Flywheel energy storage and conversion system for photovoltaic applications [COO-4094-57] 26 p0265 N80-16501

Workshop on Power Conditioning for Alternative Energy Technologies, executive summary [SERI-TP-35-217-PT-25] 26 p0265 N80-16505

Fossil energy program [ORNL-5487] 26 p0266 N80-16506

Direct energy conversion systems [COO-2218-117] 26 p0269 N80-16543

Advanced electric generation. Commercialization in phase 3 planning [DOE/ERD-0014] 26 p0269 N80-16547

Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report [SAND-78-7032] 26 p0269 N80-16550

Comments on TEC trends [NASA-TM-79317] 26 p0273 N80-16885

Thermal energy storage, volume 1. Citations from the NTIS data base [NTIS/PS-79/0951/8] 26 p0279 N80-17585

Control strategy for a variable-speed wind energy conversion system [NASA-TM-75512] 26 p0285 N80-18558

Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview [BNL-26721] 26 p0288 N80-19294

General reliability and safety methodology and its application to wind energy conversion systems [SERI/TR-35-234] 26 p0294 N80-19645

Screening evaluation of electric power cycles integrated with coal gasification plants [EPRI-AF-1160] 26 p0295 N80-19646

Environmental and economic evaluations of energy recovery from agricultural and forestry residues [ANL/EES/TM-58] 26 p0297 N80-19668

Synthetic fuels from peat gasification [CONF-790803-55] 26 p0298 N80-20412

Liquid phase methanation/shift pilot plant operation and laboratory support work [FE-2036-37] 26 p0298 N80-20413

Photochemical conversion of coal to gasoline in an entrained bed reactor [ORO-5020-T1] 26 p0299 N80-20415

Coal liquefaction test center [FE-1517-78] 26 p0300 N80-20425

Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard [AD-A076975] 26 p0303 N80-20868

Militarized thermoelectric power sources [AD-A075609] 26 p0304 N80-20869

Wind energy information directory [SERI/SP-69-290] 26 p0305 N80-20883

Darrieus vertical axis wind turbine program overview [SAND-79-2146C] 26 p0306 N80-20891

Wind energy systems [SERI/PR-351-480] 26 p0306 N80-20892

Environmental development plan for space applications --- development of nuclear power supplies for use in space [DOE/EDP-0057] 26 p0309 N80-20922

Wind characteristics for field testing of wind conversion systems [SAND-78-1563] 26 p0310 N80-20993

Amplified wind turbine apparatus [NASA-CASE-MFS-23830-1] 26 p0315 N80-21831
Are the alternative energy stategies achievable? [ORAU/IEA-79-15(0)] 26 p0318 N80-21863
Hydropower, an energy source whose time has come again [PB80-127715] 26 p0320 N80-21886
Pollution control practices, fuel conversion and its environmental effects [PB80-119704] 26 p0320 N80-21896
Overview of pollution from combustion of fossil fuels in boilers of the United States [PB80-124969] 26 p0320 N80-21912
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV [PB80-134729] 26 p0320 N80-21913

ENERGY CONVERSION EFFICIENCY
Calculation of performance of N collectors in series from test data on a single collector 26 p0184 A80-21113
The effect of a self consistent effective ambient temperature on collector efficiency parameters 26 p0184 A80-21115
Net energy production history of the Geysers Geothermal Project 26 p0184 A80-21745
Solar hydrogen energy 26 p0185 A80-21878
Unique high concentration solar test facility 26 p0186 A80-21916
Energy analysis of CdS:Cu2S sputtered solar cells 26 p0186 A80-21918
Grain size and its influence on efficiency in polycrystalline GaAs solar cells 26 p0186 A80-21919
Temperature dependence of the maximum theoretical efficiency in solar cells 26 p0187 A80-21922
Overview of coal energy utilization technology in Japan 26 p0187 A80-21924
Fundamental characteristics of the reverse flat plate collector 26 p0187 A80-21927
Solar heat production - Generalizations 26 p0188 A80-21950
Industrial solar thermal collectors 26 p0189 A80-21951
The utilization of industrially produced moderate-temperature solar heat 26 p0189 A80-21952
Structure of deformed silicon and implications for low-cost solar cells 26 p0191 A80-22526
Synergetics of the fission electric cells 26 p0193 A80-22789
Domestic space-heating and solar energy in Ireland 26 p0193 A80-22790
Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems 26 p0201 A80-23156
Theoretical efficiency limit of water electrolysis and practical means to approach it 26 p0205 A80-23197
Economically working big scale solar power stations pneumatic light-weight construction 26 p0208 A80-23326
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid 26 p0209 A80-23404
Results of solar heating experiments --- for full scale domestic system performance 26 p0209 A80-23513
Present status and future prospects of silicon solar cell arrays and systems 26 p0210 A80-23518
Energy from the biological conversion of solar energy 26 p0210 A80-23522
Microbial production of energy sources from biomass 26 p0210 A80-23523
An oscillatory wind energy convertor 26 p0211 A80-23537
The STD/MHD codes - Comparison of analyses with experiments --- MHD generator performance prediction and tests [AIAA PAPER 80-0024] 26 p0212 A80-23953
The economic significance of Q for mirror reactors - Combinations of Q and M which look promising --- parameters affecting energy conversion efficiency in fusion reactor 26 p0215 A80-24666
Beam and plasma direct converters 26 p0215 A80-24671
Neutral-beam injection calculations for torsatrons --- plasma heating effectiveness 26 p0224 A80-25479
Technology and performance of a high concentration solar cell power supply 26 p0226 A80-25886
The Lanchester-Betz limit --- energy conversion efficiency factor for windmills 26 p0227 A80-26004
Free space microwave power transmission systems for microwave powered atmospheric platforms 26 p0228 A80-26813
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells 26 p0228 A80-27057
High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell 26 p0229 A80-27321
Ocean wave energy conversion concepts 26 p0232 A80-28260
Properties of ion-implanted junctions in mercury-cadmium-telluride 26 p0234 A80-28307
Computer modeling of a two-junction, monolithic cascade solar cell 26 p0234 A80-28330
Wind energy conversion system simulation program [AIAA 80-0609] 26 p0237 A80-28806
Multi-speed electrical generator application to wind turbines [AIAA 80-0635] 26 p0239 A80-28821
Economic assessment of the Darrieus wind turbine [AIAA 80-0614] 26 p0241 A80-28837
New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems [AIAA 80-0620] 26 p0241 A80-28840
Peak power tracking technique for photovoltaic arrays 26 p0242 A80-28908
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy 26 p0243 A80-29056
Photovoltaic hybrid collectors 26 p0245 A80-29396
Possible direct conversion of chemical energy into electrical energy in a semiconductor 26 p0247 A80-29795
The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell 26 p0247 A80-29817
Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters 26 p0249 A80-30241
Low-temperature thermionic converter with an expanded-area collector 26 p0249 A80-30242
Incidence-angle modifier and average optical efficiency of parabolic trough collectors 26 p0250 A80-30772
Measurement of heliostat performance characteristics 26 p0250 A80-30773
Operating thresholds of solar collection systems 26 p0251 A80-30775
Amorphous Si-F-H solar cells prepared by dc glow discharge 26 p0251 A80-30940
Field-dependent quantum efficiency in hydrogenated amorphous silicon --- for solar cells 26 p0251 A80-30942
Promising fuels for MHD power stations 26 p0252 A80-31750
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant 26 p0253 A80-31856
Survey of potential chlorine production processes --- for energy efficiency [ANL/OEPM-79-1] 26 p0257 N80-16131
Cost of energy evaluation 26 p0263 N80-16482

Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483
Outdoor test for thermal performance evaluation of the Owens-Illinois Sunpack SEC-601 (air) solar collector
[NASA-CR-161339] 26 p0264 N80-16492
Performance characteristics of a commercially available point-focus solar power --- systems analysis of a solar energy conversion system in terms of power efficiency and energy conversion efficiency
[SERI/TP-34-169] 26 p0268 N80-16529
Direct energy conversion systems
[COO-2218-117] 26 p0269 N80-16543
DOE/NASA wind turbine data acquisition. Part 1: Equipment
[NASA-CR-159779] 26 p0275 N80-17543
Characterization of deliberately nickel-doped silicon wafers and solar cells --- microstructure, electrical properties, and energy conversion efficiency
[NASA-CR-162790] 26 p0276 N80-17551
Performance of linear solar concentrating collectors
[SAND-79-1378C] 26 p0277 N80-17565
Development of high efficiency, low cost ZnSiAs2 solar cells.
[DOE/ET-23001/T1] 26 p0278 N80-17572
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609
LSA field test
[NASA-CR-162798] 26 p0291 N80-19611
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634
Comparison of theoretical and experimental solar cell performance
26 p0301 N80-20806
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887
How to burn coal efficiently and economically, and meet air pollution requirements: The fluidized-bed combustion process
[PB80-107501] 26 p0308 N80-20911
Solar energy system performance evaluation: Seasonal report for IBM System 2, Togus, Maine
[NASA-CR-161383] 26 p0315 N80-21836
Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data
[COO-2704-T1] 26 p0318 N80-21875
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877
Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885
Potentialities of TEC topping: A simplified view of parametric effects
[NASA-TM-81468] 26 p0321 N80-22083

ENERGY DISSIPATION

Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501
Theoretical study of thermal losses: The use of hybrid and combined dry coolants --- in electrical power plants
[NT-44-1978] 26 p0284 N80-18345

ENERGY GAPS (SOLID STATE)

Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668

ENERGY POLICY

United States energy policy - The continuing failure
26 p0185 A80-21766
Power consumption in the high-tension field between the government's responsibility to provide energy and politics
26 p0185 A80-21846
Introduction to the study of solar technology
26 p0188 A80-21949
The real problems of solar energy
26 p0189 A80-21955
Electricity generation choices for the near term
26 p0190 A80-22280
Urban activity allocation under criteria of transportation energy efficiency
26 p0192 A80-22788
Optimal development strategies for a whole energy system based on hydrogen
26 p0205 A80-23190
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206
Onsite solar energy systems - Economics and system design
26 p0207 A80-23221
National R&D program on MHD in Japan
26 p0220 A80-25100
Solar power satellites and the ITU - Some U.S. policy options
26 p0223 A80-25253
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810
SWECS qualifications criteria for state tax incentive programs --- Small Wind Energy Conversion System
[AIAA 80-0650] 26 p0240 A80-28829
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474
Energy politics --- economic and technological overview
26 p0246 A80-29475
Sweden beyond oil - Nuclear commitments and solar options
26 p0255 A80-32410
Survey of potential chlorine production processes --- for energy efficiency
[ANL/OEPM-79-1] 26 p0257 N80-16131
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172
Coal liquefaction
[DOE/ET-0068/3] 26 p0258 N80-16183
Assessment of the technical and economic feasibility of converting wood residues to liquid and gaseous fuel products using state-of-the-art and advanced coal conversion technology
[COO-4862-3] 26 p0258 N80-16189
Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347
Overview of Federal wind energy program
26 p0261 N80-16454
Economics of geothermal power
[COO-4051-43] 26 p0265 N80-16497
Fossil energy program
[ORNL-5487] 26 p0266 N80-16506
Independent assessment of energy policy models
[EPRI-EA-1071] 26 p0266 N80-16510
Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511
Solar photovoltaic field tests and applications project
[COO-4094-26] 26 p0266 N80-16512
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
Proceedings: Photovoltaics user Review Panel
[SERI/TP-69-276] 26 p0266 N80-16514
Direct energy conversion systems
[COO-2218-117] 26 p0269 N80-16543
Hydrothermal electric and direct heat. Commercialization phase 3 planning
[DOE/ERD-0005] 26 p0269 N80-16545
Contributions to the foundations of supply for energy and transportation: Concepts, economics, and technologies
[PB-300541/0] 26 p0269 N80-16554

Federal demonstrations of solar heating and cooling on private residences: Only limited success
[PB-301123/6] 26 p0270 N80-16555
Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558
An investigation of preferences for various types of energy cost feedback --- information feedback system to determine energy consumption costs
[PB-300314/2] 26 p0270 N80-16560
Energy Research Information System (ERIS) projects report, volume 4, number 1 --- bibliographies
[PB-300338/1] 26 p0270 N80-16561
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-79/1069/8] 26 p0271 N80-16563
Storing hydrogen in the form of light alloy hydrides
[IPP-26-209] 26 p0274 N80-17246
Thermal mats for space heating and cooling
[BNL-51019] 26 p0276 N80-17555
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557
Segmented dish concentrator design project
[SAND-79-7024] 26 p0277 N80-17561
State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562
Suntech Solar Linear Array Thermal System (SLATS) test results
[SAND-79-0658] 26 p0277 N80-17563
Performance of solar passive buildings
[SAND-79-1574C] 26 p0277 N80-17566
Overview of developing programs in solar desiccant cooling for residential buildings
[SERI/TP-34-187] 26 p0278 N80-17569
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570
Continuing regional solar energy information Mini-Center activities and updating the SOLCOST program
[COO-4643-T1] 26 p0278 N80-17571
Regional environment-energy data book: Northeast region
[DOE/TIC-10114/3] 26 p0279 N80-17578
Photovoltaic conversion research and development in the United Kingdom
[RAE-TM-SPACE-247] 26 p0279 N80-17583
Combined cycle power generation. Citations from the NTIS data base --- bibliographies
[PB80-800915] 26 p0280 N80-17594
Regional environment-energy data book: Western region
[DOE/TIC-10114/2] 26 p0280 N80-17597
Regional environment-energy data book: Southern region
[DOE/TIC-10114/4] 26 p0281 N80-17598
Regional environment-energy data book: Northwest region
[DOE/TIC-10114/5] 26 p0281 N80-17599
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909
Experimental alcohol fuel plants
[ATF-P-5000-2] 26 p0283 N80-18203
Alcohol fuels information directory
[ATF-P-5000-3] 26 p0283 N80-18204
Hydrogen as a fuel --- automobiles
[TT-7903] 26 p0283 N80-18212
Appendix: MOD-1 wind turbine generator analysis and design report, volume 2
[NASA-CR-159496] 26 p0286 N80-18565
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
Centrifugal fluidized combustion of coal
[FE-2516-9] 26 p0288 N80-19293
Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294
Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap
26 p0290 N80-19492
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[NASA-TM-81444] 26 p0292 N80-19614
High temperature solar thermal receiver
[NASA-CR-162831] 26 p0292 N80-19621
Low cost point focus solar concentrator. Phase 1: Preliminary design
[JPL-9950-273] 26 p0292 N80-19622
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
Thermal performance evaluation of the Northrop model NSC-01-0732 concentrating solar collector array at outdoor conditions --- Marshall Space Flight Center solar house test facility
[NASA-CR-161354] 26 p0293 N80-19628
Installation guidelines for solar heating system, single-family residence at New Castle, Pennsylvania
[NASA-CR-161355] 26 p0293 N80-19630
Annual technical report, fiscal year 1979. Volume 1: Executive summary
[NASA-CR-159715] 26 p0293 N80-19632
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634
On influencing the operating temperatures of Motorola and Arco solar photovoltaic modules
[COO-4094-59] 26 p0295 N80-19649
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407
Industrial fuel choice analysis model. Volume 2: Appendices to model documentation
[DOE/EIA-2832/1-VOL-2-APP] 26 p0299 N80-20419
Basic research in engineering: Fluid dynamics and thermal processes --- workshop
[FE-2468-54] 26 p0301 N80-20551
Combined solar collector and energy storage system
[NASA-CASE-LAR-12205-1] 26 p0302 N80-20810
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812
Qualification test procedures and results for Honeywell solar collector subsystem, single-family residence
[NASA-CR-161382] 26 p0302 N80-20813
Solar heating system design package for a single-family residence at William O'Brien State Park, Minnesota
[NASA-CR-161357] 26 p0303 N80-20866
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868
Projections of direct energy consumption by mode: The 1975 - 2000 baseline
[ANL/CNSV-4] 26 p0304 N80-20878
Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results
[DOE/FE-2344/2] 26 p0305 N80-20885
Hydrogen storage for automobiles
[BNL-26906] 26 p0305 N80-20886
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890
Wind energy systems
[SERI/PR-351-480] 26 p0306 N80-20892
Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
[DOE/TIC-10190] 26 p0306 N80-20895
Performance of heat pumps at elevated evaporating temperatures with application to solar input
[BNL-26772] 26 p0307 N80-20896

Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors
[COO-2971-6] 26 p0307 N80-20900

Methodology for evaluating physical constraints on residential solar energy use
[UCRL-15001] 26 p0307 N80-20901

Status of the DOE battery and electrochemical technology program
[MTR-8026] 26 p0307 N80-20902

Economics of thermal energy storage for compressed air energy storage systems
[PNL-SA-7949] 26 p0307 N80-20903

Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904

Biomass energy systems: Environmental readiness document
[DOE/ERD-0021] 26 p0308 N80-20905

Limits to energy modeling
[ORAU/IEA-79-16(O)] 26 p0308 N80-20907

Solar water pumps. Citations from the Engineering Index data base
[PB80-802531] 26 p0308 N80-20910

Solar ponds for residential heating, heat extraction from a salt gradient solar pond
[PB80-108624] 26 p0308 N80-20913

An economical solar heated and cooled residence for southern New Mexico
[PB80-108616] 26 p0309 N80-20914

National solar heating and cooling programs
[PB80-104987] 26 p0309 N80-20915

Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1
[DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208

Geothermal energy: Obstacles and uncertainties impede its widespread use
[PB80-134430] 26 p0315 N80-21827

Wind wheel electric power generator
[NASA-CASE-MFS-23515-1] 26 p0315 N80-21828

Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831

Solar heating and hot water system installed at the Senior Citizen Center, Huntsville, Alabama
[NASA-CR-161384] 26 p0315 N80-21835

Solar energy system performance evaluation: Seasonal report for IBM System 2, Togus, Maine
[NASA-CR-161383] 26 p0315 N80-21836

Solar Central Receiver prototype heliostat, volume 1
[SAN-1604-1] 26 p0316 N80-21846

Solar thermal repowering systems integration
[SERI/TR-8037-1] 26 p0316 N80-21847

Analysis of a heat exchanger-thermoelectric generator system
[SERI/TP-35-253] 26 p0316 N80-21848

Aerospace technology review for LBL window/passive solar program
[LBL-9608] 26 p0316 N80-21850

Evaluation of selective absorbers
[TP-5461] 26 p0317 N80-21851

Application of glass technology to novel solar energy collectors
[CONF-7906118-1] 26 p0317 N80-21852

Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853

Multi-objective energy analysis
[BNL-26882] 26 p0317 N80-21856

Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies
[CONS-8626-T1-VOL-1] 26 p0317 N80-21857

Are the alternative energy stategies achievable?
[ORAU/IEA-79-15(O)] 26 p0318 N80-21863

Solar energy research at LASL
[LA-7741-PR] 26 p0318 N80-21872

Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data
[COO-2704-T1] 26 p0318 N80-21875

Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876

Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877

Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879

Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880

Hydro for the eighties: Bringing hydroelectric power to low income people, the work book. A slide presentation: Audio cassette and workbook
[PB80-103948] 26 p0319 N80-21883

Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

Hydropower, an energy source whose time has come again
[PB80-127715] 26 p0320 N80-21886

Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB80-125651] 26 p0320 N80-21889

ENERGY REQUIREMENTS

Net energy production history of the Geysers Geothermal Project
26 p0184 A80-21745

Energy resource requirements of a solar heating system
26 p0184 A80-21746

The thermodynamics of heating. I - The second law and conventional heating systems
26 p0213 A80-24512

The price of oil in the year 2000
[AAS 79-172] 26 p0215 A80-24717

The energy problem: Its effect on aircraft design. I - Supply and demand
26 p0231 A80-27752

Worldwide transportation/energy demand forecast, 1975 - 2000
[ORNL/SUB-78/13536/1] 26 p0269 N80-16546

Peak-load problem with storage technology --- cost analysis of electric energy storage based on energy requirements
[ANL/SPG-8] 26 p0269 N80-16549

Coping with energy limitations in transportation: Proposals for Michigan
[PB-299737/7] 26 p0270 N80-16559

Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning
[NASA-TM-80958] 26 p0291 N80-19610

Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644

A comparative study of the energy alternatives for the State of New York
26 p0302 N80-20807

ENERGY SOURCES

Canadian renewable energy prospects
26 p0183 A80-21104

Energy resource requirements of a solar heating system
26 p0184 A80-21746

Electricity generation choices for the near term
26 p0190 A80-22280

Energy by reverse electrodialysis
26 p0194 A80-22940

Microbial production of energy sources from biomass
26 p0210 A80-23523

Non-electric fusion energy applications
26 p0215 A80-24676

Lignite and coal in the U.S. energy future
26 p0230 A80-27420

Mixed electrolyte solutions of propylene carbonate and dimethoxyethane for high energy density batteries
26 p0247 A80-29898

Oils and rubber from arid land plants
26 p0253 A80-32055

Radiant heat for energy conservation
26 p0253 A80-32056

Regenerative energy sources --- technology impact on the Federal Republic of Germany
26 p0255 A80-32397

Magma energy research, 79-1
[SAND-79-1344] 26 p0277 N80-17568

Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

ENERGY STORAGE
Solar energy storage using chemical potential changes associated with drying of zeolites 26 p0183 A80-21106
Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions 26 p0184 A80-21116
Energy storage --- Book 26 p0184 A80-21123
Warm water storage in district heating systems incorporating combined heat and power plant 26 p0185 A80-21825
Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy 26 p0185 A80-21879
Study of flywheel energy storage system for electric utilities 26 p0187 A80-21925
Storage of solar energy 26 p0188 A80-21937
Hydrogen storage in metal hydrides 26 p0193 A80-22867
Storage, transmission and distribution of hydrogen 26 p0194 A80-23103
Small scale ammonia production as a means for hydrogen storage 26 p0201 A80-23160
A study on hydrogen storage by use of cryoadsorbents 26 p0201 A80-23161
The role of metal hydrides in hydrogen storage and utilization 26 p0202 A80-23163
Use of binary titanium alloys for hydrogen storage 26 p0202 A80-23164
Cubic metal-alloys for hydrogen storage 26 p0202 A80-23165
Mixing effects of different types of hydrides 26 p0202 A80-23166
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys 26 p0202 A80-23169
Development of low cost nickel-rare earth hydrides for hydrogen storage 26 p0202 A80-23170
Technological aspects and characteristics of industrial hydrides reservoirs 26 p0203 A80-23171
Development of high-temperature hydrides for vehicular applications 26 p0203 A80-23172
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials 26 p0204 A80-23183
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics 26 p0204 A80-23184
Hydrogen embrittlement, stress state and design considerations 26 p0204 A80-23186
Solar energy electrochemical storage 26 p0208 A80-23331
Autonomous solar electricity production with hydraulic active storage systems on the territory 26 p0208 A80-23332
A performance and economic evaluation of annual cycle energy storage /ACES/ 26 p0223 A80-25260
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage 26 p0230 A80-27567
Large energy storage systems for utilities 26 p0231 A80-27731
Metal/air batteries: Their status and potential - A review 26 p0231 A80-28012
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds 26 p0234 A80-28277
Physical, chemical and energy aspects of underground hydrogen storage 26 p0234 A80-28278
Solar energy: Chemical conversion and storage --- Book 26 p0243 A80-29051
Solar energy conversion in photosynthesis - Features relevant to artificial systems for the photochemical conversion of solar energy 26 p0243 A80-29053
Photosensitization mechanisms for energy storing isomerizations 26 p0244 A80-29060
The norbornadiene-quadricyclene energy storage system 26 p0244 A80-29061
Energy storage 26 p0255 A80-32398
Flywheel energy storage and conversion system for photovoltaic applications [COO-4094-57] 26 p0265 N80-16501
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory --- heat transfer and storage devices for a solar source heat pump system [BNL-26219] 26 p0266 N80-16509
Comparative analysis of solar energy storage cycles [SAND-79-1803C] 26 p0267 N80-16516
Organic photochemical storage of solar energy [COO-4380-2] 26 p0267 N80-16527
Storing hydrogen in the form of light alloy hydrides [IPP-26-209] 26 p0274 N80-17246
Development of electrochemical storage batteries with improved energy density [BMFT-FB-T-77-88] 26 p0279 N80-17582
Design and applications of flywheels, volume 1. Citations from the NTIS data base --- bibliographies [PB80-800303] 26 p0280 N80-17591
Design and applications of flywheels, volume 2. Citations from the NTIS data base --- bibliographies [PB80-800311] 26 p0280 N80-17592
Design and applications of flywheels. Citations from the Engineering Index data base --- bibliographies [P80-800329] 26 p0280 N80-17593
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles [PB-300289/6] 26 p0282 N80-17922
Catalyst surfaces for the chromous/chromic redox couple [NASA-CASE-LEW-13148-2] 26 p0285 N80-18557
The storage of electrochemical energy 26 p0286 N80-18578
Study of advanced electric propulsion system concept using a flywheel for electric vehicles [NASA-CR-159650] 26 p0287 N80-18991
Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program [BNL-26904] 26 p0296 N80-19654
Combined solar collector and energy storage system [NASA-CASE-LAR-12205-1] 26 p0302 N80-20810
Computer simulation of a solar energy system which utilizes flat-plate collectors [AD-A079906] 26 p0304 N80-20870
Mechnical energy storage technology development [SAND-79-1151] 26 p0304 N80-20874
Hydrogen storage for automobiles [BNL-26906] 26 p0305 N80-20886
Thermal energy storage application areas --- for building heating and cooling [CONS/5113-T4] 26 p0306 N80-20894
The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support [LA-7885-MS-VOL-6] 26 p0307 N80-20897
Mechanical energy storage technology for transportation applications project plan [UCRL-15138] 26 p0312 N80-21209
Energy storage systems for automobile propulsion [UCID-18320] 26 p0312 N80-21211
Storage peak gas-turbine power unit [NASA-TM-75757] 26 p0314 N80-21755
Use of earth coupling in solar assisted heat pumps [BNL-26748] 26 p0316 N80-21849
Composite-laminate flywheel-rotor development program [UCRL-83554] 26 p0317 N80-21855

Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

ENERGY TECHNOLOGY

Canadian renewable energy prospects
26 p0183 A80-21104
Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant
26 p0183 A80-21109
Net energy production history of the Geysers Geothermal Project
26 p0184 A80-21745
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877
High temperature electronics for geothermal energy
26 p0185 A80-21902
Overview of coal energy utilization technology in Japan
26 p0187 A80-21924
Wind power excites utility interest
26 p0190 A80-22281
Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5
26 p0194 A80-23101
Present state and outlook of the electrolytic H2-production route
26 p0195 A80-23104
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147
Small scale ammonia production as a means for hydrogen storage
26 p0201 A80-23160
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175
Hydrogen energy in United States Post Office delivery systems
26 p0203 A80-23178
Hydrogen fuel in air transportation and its effects around airports
26 p0204 A80-23179
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183
Theoretical efficiency limit of water electrolysis and practical means to approach it
26 p0205 A80-23197
Engineering impact on the validity of the Mark-16 thermochemical cycle --- hydrogen production restrictions and prospects
26 p0205 A80-23198
Hydrogen production from water using fission-pumped laser
26 p0206 A80-23200
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201
Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203
Advances in energy systems and technology. Volume 2 --- Book
26 p0207 A80-23218
Models for energy technology assessment
26 p0207 A80-23222
Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept
26 p0211 A80-23533
Exotic energy R&D has potential --- ocean wave and windpower utilization
26 p0213 A80-24124
Water turbine technology for small power stations
26 p0213 A80-24125
National R&D program on MHD in Japan
26 p0220 A80-25100
Geothermal energy and the environment - The global experience
26 p0223 A80-25259
A performance and economic evaluation of annual cycle energy storage /ACES/
26 p0223 A80-25260
Pumped water storage
26 p0225 A80-25495
Space-manufactured satellite power systems
26 p0227 A80-26003
Carrier generation, recombination, and transport in amorphous silicon solar cells
26 p0227 A80-26340
Methanol derivation from North Dakota lignite and use as a fuel
26 p0230 A80-27417
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418
Performance of low rank coals in the Exxon Donor Solvent Process
26 p0230 A80-27419
Present state and future prospects of thermochemical hydrogen production
26 p0233 A80-28272
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331
Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers
26 p0237 A80-28801
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Coal liquefaction processes --- Book
26 p0242 A80-28953
Wind power: Recent developments --- Book
26 p0242 A80-28954
Processing of solid fossil-fuel deposits by electrical induction heating
26 p0242 A80-29007
Going with the wind
26 p0243 A80-29037
DOE moves ahead with geothermal
26 p0243 A80-29038
Arabs turn their eyes to the sun --- solar energy development in Middle East
26 p0244 A80-29280
Thin film solar cells based on amorphous silicon
26 p0245 A80-29395
Possible direct conversion of chemical energy into electrical energy in a semiconductor
26 p0247 A80-29795
Oil shale processing technology
26 p0247 A80-29800
The prospects for solar energy use in industry within the United Kingdom
26 p0248 A80-29921
Plant power fuels hydrogen production
26 p0249 A80-30465
Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy
26 p0249 A80-30521
Coal gasification in steam at very high temperatures
26 p0249 A80-30522
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523
Electrochemical gasification of coal - Investigation of operating conditions and variables
26 p0249 A80-30526
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
26 p0253 A80-31900
Regenerative energy sources --- technology impact on the Federal Republic of Germany
26 p0255 A80-32397
Cogeneration of electric energy and nitric oxide
26 p0255 A80-32412
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172

Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51065] 26 p0258 N80-16179

Unconventional gas recovery program
[METC/SP-79/8] 26 p0258 N80-16181

Coal liquefaction
[DOE/ET-0068/3] 26 p0258 N80-16183

Assessment of the technical and economic feasibility of converting wood residues to liquid and gaseous fuel products using state-of-the-art and advanced coal conversion technology
[COO-4862-3] 26 p0258 N80-16189

Development studies on selected conversion of synthesis gas from coal to high octane gasoline
[FE-2276-27] 26 p0259 N80-16190

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1
[PB-299383/0] 26 p0259 N80-16192

Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193

Gasohol: A technical memorandum
[PB80-105885] 26 p0259 N80-16194

Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347

Study of hydrocarbon-shale interaction
[ORO-5197-14] 26 p0260 N80-16409

Large Wind Turbine Design Characteristics and R and D Requirements
[NASA-CP-2106] 26 p0260 N80-16453

Operational experience with VAWT blades --- structural performance
26 p0262 N80-16468

Structural analysis considerations for wind turbine blades
26 p0262 N80-16469

Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico
26 p0262 N80-16470

Evaluation of an operating MOD-OA 200 kW wind turbine blade
26 p0262 N80-16471

Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472

Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494

Solar collector manufacturing activity
[DOE/EIA-0174/78] 26 p0265 N80-16500

Environmental development plan: Solar thermal power systems
[DOE/EDP-0035] 26 p0265 N80-16503

Workshop on Power Conditioning for Alternative Energy Technologies, executive summary
[SERI-TP-35-217-PT-25] 26 p0265 N80-16505

Computer simulation of ground coupled storage in a series solar assisted heat pump system
[BNL-26216] 26 p0266 N80-16507

Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522

Contributions to the foundations of supply for energy and transportation: Concepts, economics, and technologies
[PB-300541/0] 26 p0269 N80-16554

Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567

Solar energy for agriculture: Review of research
[PB-298688/3] 26 p0271 N80-16568

Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905] 26 p0273 N80-16652

Experiments on H2-O2MHD power generation
[NASA-TM-81424] 26 p0273 N80-16886

Fiscal year 1979 scientific and technical reports, articles, papers and presentations
[NASA-TM-78250] 26 p0274 N80-17014

Information theory applied to solar radiation concentrators
26 p0275 N80-17539

Proceedings of the 13th Project integration meeting
[NASA-CR-162787] 26 p0276 N80-17549

Regenerative burner system for thermoelectric power sources --- military equipment
[AD-A075955] 26 p0276 N80-17553

Improved thermal battery --- military applications
[AD-A075835] 26 p0276 N80-17554

State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562

Suntech Solar Linear Array Thermal System (SLATS) test results
[SAND-79-0658] 26 p0277 N80-17563

Performance of solar passive buildings
[SAND-79-1574C] 26 p0277 N80-17566

Magma energy research, 79-1
[SAND-79-1344] 26 p0277 N80-17568

Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570

Continuing regional solar energy information Mini-Center activities and updating the SOLCOST program
[COO-4643-T1] 26 p0278 N80-17571

Combined cycle power generation. Citations from the NTIS data base --- bibliographies
[PB80-800915] 26 p0280 N80-17594

Combined cycle power generation. Citations from the Engineering Index data base --- bibliographies
[P80-800923] 26 p0280 N80-17595

Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas
[PB-299925/8] 26 p0285 N80-18547

Parametric study of potential early commercial MHD power plants
[NASA-CR-159633] 26 p0286 N80-18559

Appendix: MOD-1 wind turbine generator analysis and design report, volume 2
[NASA-CR-159496] 26 p0286 N80-18565

Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303

Advanced technology light weight fuel cell program --- orbiting space vehicle long-life hydrogen oxygen fuel cell
[NASA-CR-159807] 26 p0292 N80-19615

Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-162840] 26 p0292 N80-19617

High temperature solar thermal receiver
[NASA-CR-162831] 26 p0292 N80-19621

Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626

Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637

Solar powered liquid piston Stirling cycle irrigation pump
[SAN-1894-1] 26 p0294 N80-19641

Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SP-01525/1] 26 p0294 N80-19642

Energy accounting for solar and alternative energy sources
[ORAU/IEA-79-11(R)] 26 p0295 N80-19647

Characterization and assessment of selected solar thermal energy systems for residential and process heat applications
[LA-7995-TASE] 26 p0295 N80-19648

Cataract hydroelectric development expansion study
[DOE/ID-01796-1] 26 p0295 N80-19650

Potential hydroelectric power, vertical turbine, spillway combine Broadwater Dam
[DOE/ID-01822-1] 26 p0295 N80-19651

Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653

Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655

Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base
[PB80-802218] 26 p0296 N80-19656

Solar electric power generation, volume 3. Citations from the Engineering Index data base
[PB80-803034] 26 p0296 N80-19657

Solar electric power generation, volume 2. Citations from the NTIS data base
[PB80-803000] 26 p0296 N80-19658
Solar electric power generation, volume 3. Citations from the NTIS data base
[PB80-803018] 26 p0296 N80-19659
Solar electric power generation, volume 2. Citations from the Engineering Index data base
[PB80-803026] 26 p0296 N80-19660
Solar sea power plants. Citations from the NTIS data base
[PB80-802580] 26 p0297 N80-19661
Solar seapower plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422
Survey of biomass gasification. Volume 1: Synopsis and executive summary
[SERI/TR-33-239-VOL-1] 26 p0300 N80-20427
Measurement techniques for high power semiconductor materials and devices
[DOE/RA-0041] 26 p0301 N80-20506
Basic research in engineering: Fluid dynamics and thermal processes --- workshop
[FE-2468-54] 26 p0301 N80-20551
A comparative study of the energy alternatives for the State of New York
26 p0302 N80-20807
Lithium thionyl chloride high rate discharge
26 p0303 N80-20830
Lithium battery discharge tests
26 p0303 N80-20831
Characterization of prototype secondary lithium battery
26 p0303 N80-20832
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869
DOE/JPL advanced thermionic technology program
[COO-3056-37] 26 p0304 N80-20873
Thermal fluid selection for long-distance heat transmission
[CONF-790803-47] 26 p0305 N80-20879
Energy information data base
[DOE/TIC-4579-R10-SUPPL-6] 26 p0305 N80-20881
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887
Installation and startup of the fixed mirror solar concentrator collector field subsystem
[GA-A-15344] 26 p0306 N80-20888
The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support
[LA-7885-MS-VOL-6] 26 p0307 N80-20897
Status of the DOE battery and electrochemical technology program
[MTR-8026] 26 p0307 N80-20902
Determining the feasibility of incorporating water resource constraints into energy models
[EPRI-EA-1147] 26 p0308 N80-20908
National solar heating and cooling programs
[PB80-104987] 26 p0309 N80-20915
Environmental development plan: Coal extraction and preparation
[DOE/EDP-0050] 26 p0309 N80-20921
Fusion technology development
[DOE/ET-0116/1] 26 p0311 N80-21165
Projections of enhanced oil recovery, 1985 - 1995
[DOE/EIA-0183/11] 26 p0314 N80-21824
Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes
[UCRL-52851] 26 p0316 N80-21842
Aerospace technology review for LBL window/passive solar program
[LBL-9608] 26 p0316 N80-21850
Multi-objective energy analysis
[BNL-26882] 26 p0317 N80-21856
Are the alternative energy stategies achievable?
[ORAU/IEA-79-15(O)] 26 p0318 N80-21863
Solar energy research at LASL
[LA-7741-PR] 26 p0318 N80-21872
Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB80-125651] 26 p0320 N80-21889

ENERGY TRANSFER
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357
Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637

ENGINE DESIGN
Hydrogen energy in United States Post Office delivery systems
26 p0203 A80-23178
Stirling engine design and feasibility for automotive use --- Book
26 p0234 A80-28425
Future trends in the automobile
26 p0234 A80-28426
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471
The future of the Diesel engine - A critical analysis
26 p0235 A80-28473
Advanced engine concepts - The Ford Proco engine
26 p0235 A80-28474
Power units for mini RPV's
26 p0246 A80-29662
Gas turbines for automotive use --- Book
26 p0253 A80-31999
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612
Supporting research and technology for automotive Stirling engine development
[NASA-TM-81495] 26 p0311 N80-21200
Fuel economy screening study of advanced automotive gas turbine engines
[NASA-TM-81433] 26 p0311 N80-21201

ENGINE TESTS
Performance sensitivity analysis of Department of Energy-Chrysler upgraded automotive gas turbine engine, S/N 5-4
[NASA-TM-79242] 26 p0274 N80-17467
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas
[AD-A076145] 26 p0284 N80-18411
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287

ENGINEERING MANAGEMENT
New standards in research and development
26 p0208 A80-23317

ENGINEERING TEST REACTORS
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

ENTRAINMENT
Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303

ENVIRONMENT EFFECTS
Wind energy research and development at Lincoln
26 p0211 A80-23535
Geothermal energy and the environment - The global experience
26 p0223 A80-25259
Environmental development plan: Solar thermal power systems
[DOE/EDP-0035] 26 p0265 N80-16503
Federal photovoltaics utilization program
[DOE/EA-0087] 26 p0267 N80-16525
Petroleum production at maximum efficient rate, Naval Petroleum Reserve no. 1 (Elk Hills), Kern County, California
[DOE/EIS-0012] 26 p0272 N80-16581
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295

Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305
Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SF-01525/1] 26 p0294 N80-19642
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666
Environmental assessment methodology: Solar power plant applications. Volume 3. Environmental impact assessment application
[EPRI-ER-1070-VOL-3] 26 p0306 N80-20889
Biomass energy systems: Environmental readiness document
[DOE/ERD-0021] 26 p0308 N80-20905
Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology
[EPRI-ER-1070-VOL-1] 26 p0309 N80-20926
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV
[PB80-134729] 26 p0320 N80-21913

ENVIRONMENT MANAGEMENT
Regional environment-energy data book: Northeast region
[DOE/TIC-10114/3] 26 p0279 N80-17578
Regional environment-energy data book: Western region
[DOE/TIC-10114/2] 26 p0280 N80-17597
Regional environment-energy data book: Southern region
[DOE/TIC-10114/4] 26 p0281 N80-17598
Regional environment-energy data book: Northwest region
[DOE/TIC-10114/5] 26 p0281 N80-17599

ENVIRONMENT MODELS
A model for the Sulphur Springs geothermal field St. Lucia
26 p0231 A80-27924

ENVIRONMENT POLLUTION
Coal combustion fly ash characterization - Adsorption of nitrogen and water
26 p0250 A80-30656
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310

ENVIRONMENT PROTECTION
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
Environmental system study on the development of fossil fuel resources in the Southwest
[PB-300526/1] 26 p0272 N80-16596
Environmental development plan: Coal extraction and preparation
[DOE/EDP-0050] 26 p0309 N80-20921

ENVIRONMENT SIMULATION
Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817

ENVIRONMENTAL MONITORING
Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology
[EPRI-ER-1070-VOL-1] 26 p0309 N80-20926

ENVIRONMENTAL SURVEYS
Petroleum production at maximum efficient rate, Naval Petroleum Reserve no. 1 (Elk Hills), Kern County, California
[DOE/EIS-0012] 26 p0272 N80-16581

EPITAXY
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838

EQUATIONS OF MOTION
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446

EQUIVALENT CIRCUITS
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349

ETHANE
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185
Liquid phase methanation/shift pilot plant operation and laboratory support work
[FE-2036-37] 26 p0298 N80-20413

ETHYL ALCOHOL
Experience with alcohol fuels
26 p0236 A80-28476

EXHAUST EMISSION
Power plant impacts on visibility in the west - Siting and emissions control implications
26 p0216 A80-24735
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130
Comparison of fuel economy and emissions for diesel and gasoline powered taxicabs
[PB-298609/9] 26 p0275 N80-17484
Issues concerning the light-duty diesel
[DOE/EV-0050/1] 26 p0290 N80-19510
Light-duty diesel gaseous emissions measurement - comparison of dilution tunnel test results to certification cell test results
[PB80-115991] 26 p0310 N80-20945
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912

EXHAUST GASES
Gas turbines for automotive use --- Book
26 p0253 A80-31999
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532

EXPLORATION
Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas
[PB-299925/8] 26 p0285 N80-18547

EXTREMUM VALUES
Gradient bounds for plasma confinement
26 p0213 A80-24223

EXTRUDING
Experimental laboratory measurement of thermophysical properties of selected coal types
[NASA-CR-162913] 26 p0298 N80-20404

F

FAILURE MODES
Mod 1 wind turbine generator failure modes and effects analysis
[NASA-CR-159494] 26 p0303 N80-20864

FANS (LANDFORMS)
The Yallahs fan delta, southeastern Jamaica: A depositional model for active tectonic coastlines
26 p0273 N80-16632

FARMLANDS
Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511

FATIGUE TESTS
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports
26 p0191 A80-22690
FEASIBILITY ANALYSIS
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175
Technical and economic feasibility of wind-powered systems for dairy farms
[AIAA 80-0641] 26 p0239 A80-28823
Promising fuels for MHD power stations
26 p0252 A80-31750
Feasibility study of geothermal energy for heating greenhouses
[PB-299517/3] 26 p0271 N80-16569
Feasibility of cogeneration application of a 4.8 MW fuel cell power plant at a Santa Clara, California paper mill
[SAN-2189-T1] 26 p0304 N80-20876
FEDERAL BUDGETS
NASA authorization, 1981, program review, volume 1
[GPO-53-814] 26 p0281 N80-17913
FERRIMAGNETS
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008
FIBER COMPOSITES
Low cost composite blades for large wind turbines
26 p0253 A80-32074
Composite-laminate flywheel-rotor development program
[UCRL-83554] 26 p0317 N80-21855
FIBER ORIENTATION
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports
26 p0191 A80-22690
FILAMENT WINDING
Low cost composite blades for large wind turbines
26 p0253 A80-32074
FILTRATION
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371
Filtration in coal liquefaction - Influence of digestion conditions in the filtration of non-hydrogenated coal digests
26 p0255 A80-32372
FINITE DIFFERENCE THEORY
Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction
26 p0228 A80-26681
FISSILE FUELS
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1
[EPRI-ER-1083-VOL-1] 26 p0281 N80-17863
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2
[EPRI-NP-1083-VOL-2] 26 p0281 N80-17864
FISSION ELECTRIC CELLS
Synergetics of the fission electric cells
26 p0193 A80-22789
FISSION PRODUCTS
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106
FLAME PROPAGATION
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340
FLAME RETARDANTS
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287
FLAMMABILITY
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287
FLAT PLATES
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-79/0928/6] 26 p0271 N80-16566
Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567
Solar energy design improvement: A methodology for hydronic flatplate collector systems
[AD-A076836] 26 p0286 N80-18567
Computer simulation of a solar energy system which utilizes flat-plate collectors
[AD-A079906] 26 p0304 N80-20870
FLEXIBILITY
Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
FLORIDA
Solar energy system performance evaluation: Seasonal report for SEMCO, Loxahatchee, Florida
[NASA-CR-161379] 26 p0293 N80-19627
FLOW CHARACTERISTICS
A refined windmill rotor model
[AIAA 80-0628] 26 p0241 A80-28841
FLOW DISTRIBUTION
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938
FLUES
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
FLUID DYNAMICS
Basic research in engineering: Fluid dynamics and thermal processes --- workshop
[FE-2468-54] 26 p0301 N80-20551
FLUID FLOW
Calculation of performance of N collectors in series from test data on a single collector
26 p0184 A80-21113
FLUIDIZED BED PROCESSORS
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494
The development of fluidized bed combustion
26 p0225 A80-25689
Wood gasification in a fluidized bed
26 p0244 A80-29154
Advanced electric generation. Commercialization in phase 3 planning
[DOE/ERD-0014] 26 p0269 N80-16547
Centrifugal fluidized combustion of coal
[FE-2516-9] 26 p0288 N80-19293
Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300
Fluid coking of coal liquefaction residues: The fourth residue
[FE-2422-28] 26 p0289 N80-19304
Development of a fast fluid bed gasifier, task 2 and 3
[FE-2361-40] 26 p0289 N80-19306
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866
FLUORESCENCE
A fluorescent radiation converter
[NASA-CASE-GSC-12528-1] 26 p0283 N80-18261
FLUTTER ANALYSIS
Flutter analysis of small windturbine, designed for manufacture and use in developing countries
[UTH-LR-272] 26 p0284 N80-18415
FLUX DENSITY
Progress in the production and energy flux concentration of the REB accelerator for ICF
26 p0226 A80-25785
Nonideal compensation in MHD generators --- models of the distortion of the total magnetic flux density by the induced magnetic flux density
26 p0310 N80-21149
FLYWHEELS
Study of flywheel energy storage system for electric utilities
26 p0187 A80-21925

Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-57] 26 p0265 N80-16501
Design and applications of flywheels, volume 1. Citations from the NTIS data base --- bibliographies
[PB80-800303] 26 p0280 N80-17591
Design and applications of flywheels, volume 2. Citations from the NTIS data base --- bibliographies
[PB80-800311] 26 p0280 N80-17592
Design and applications of flywheels. Citations from the Engineering Index data base --- bibliographies
[PB0-800329] 26 p0280 N80-17593
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles
[PB-300289/6] 26 p0282 N80-17922
Study of advanced electric propulsion system concept using a flywheel for electric vehicles
[NASA-CR-159650] 26 p0287 N80-18991
Mechnical energy storage technology development
[SAND-79-1151] 26 p0304 N80-20874
Mechanical energy storage technology for transportation applications project plan
[UCRL-15138] 26 p0312 N80-21209
Composite-laminate flywheel-rotor development program
[UCRL-83554] 26 p0317 N80-21855
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

FOAMS
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687

FOCI
Low cost point focus solar concentrator, phase 1
[NASA-CR-162848] 26 p0292 N80-19624

FOLIAGE
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

FOOD
A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920

FORESTS
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456

FOSSIL FUELS
Processing of solid fossil-fuel deposits by electrical induction heating
26 p0242 A80-29007
Fossil energy program
[ORNL-5487] 26 p0266 N80-16506
Environmental system study on the development of fossil fuel resources in the Southwest
[PB-300526/1] 26 p0272 N80-16596
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557
Industrial fuel choice analysis model. Volume 2: Appendices to model documentation
[DOE/EIA-2832/1-VOL-2-APP] 26 p0299 N80-20419
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912

FOURIER TRANSFORMATION
Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids
26 p0249 A80-30525

FRACTIONATION
Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids
26 p0249 A80-30525
Experimental laboratory measurement of thermophysical properties of selected coal types
[NASA-CR-162913] 26 p0298 N80-20404

FRANCE
Cheap electricity from French tides
26 p0214 A80-24537
The dual-mode bus and further bus developments in France
26 p0235 A80-28431
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500

FREQUENCY RESPONSE
The spectral response of a front surface field solar cell
26 p0254 A80-32331

FRESNEL LENSES
Industrial solar thermal concentrators
26 p0189 A80-21953

FRESNEL REFLECTORS
Some geometrical design aspects of a linear Fresnel reflector concentrator
26 p0193 A80-22791

FUEL CELLS
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167
Possible use of honeycomb-type structures for high power batteries and fuel cells
26 p0190 A80-22169
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199
Cogeneration of electric energy and nitric oxide
26 p0255 A80-32412
Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501
An ac/dc power converter for batteries and fuel cells
[EPRI-EM-662] 26 p0259 N80-16284
Advanced electric generation. Commercialization in phase 3 planning
[DOE/ERD-0014] 26 p0269 N80-16547
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary --- domestic energy supply systems analysis of coal fired power plants using fuel cells
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570
Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300
Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning
[NASA-TM-80958] 26 p0291 N80-19610
Optimization of Pt-doped Kocite (trade name) electrodes in H3Po4 fuel cells
[AD-A075372] 26 p0294 N80-19639
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884
Hydrogen storage for automobiles
[BNL-26906] 26 p0305 N80-20886
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870

FUEL COMBUSTION
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099

Coal combustion fly ash characterization - Adsorption of nitrogen and water 26 p0250 A80-30656

Engine combustion technology overview [SAND-78-8801] 26 p0260 N80-16347

Centrifugal fluidized combustion of coal [FE-2516-9] 26 p0288 N80-19293

FUEL CONSUMPTION

Short haul transport for the 1990s 26 p0190 A80-22046

The potential for development of high performance light aircraft 26 p0208 A80-23307

Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption 26 p0222 A80-25116

The energy problem: Its effect on aircraft design. I - Supply and demand 26 p0231 A80-27752

The future of the Diesel engine - A critical analysis 26 p0235 A80-28473

Advanced engine concepts - The Ford Proco engine 26 p0235 A80-28474

Promising fuels for MHD power stations 26 p0252 A80-31750

Gas turbines for automotive use --- Book 26 p0253 A80-31999

Worldwide transportation/energy demand forecast, 1975 - 2000 [ORNL/SUB-78/13536/1] 26 p0269 N80-16546

Contributions to the foundations of supply for energy and transportation: Concepts, economics, and technologies [PB-300541/0] 26 p0269 N80-16554

Comparison of fuel economy and emissions for diesel and gasoline powered taxicabs [PB-298609/9] 26 p0275 N80-17484

Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings [NASA-CP-2096] 26 p0287 N80-18990

Issues concerning the light-duty diesel [DOE/EV-0050/1] 26 p0290 N80-19510

The role of technology as air transportation faces the fuel situation [NASA-TM-81793] 26 p0297 N80-20260

Fuel economy screening study of advanced automotive gas turbine engines [NASA-TM-81433] 26 p0311 N80-21201

FUEL CONTAMINATION

Electrical purifiers for dielectric fluids --- charged particle contaminants separation from fuels, oils and hydraulic fluids 26 p0254 A80-32287

Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys [NASA-TM-81384] 26 p0283 N80-18157

FUEL CORROSION

Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys [NASA-TM-81384] 26 p0283 N80-18157

FUEL FLOW

Analysis of the potential transmission of hydrogen by pipeline in Switzerland 26 p0201 A80-23158

FUEL INJECTION

Hydrogen injection two-stroke spark ignition engine 26 p0203 A80-23177

Electronic fuel injection techniques for hydrogen powered I.C. engines 26 p0206 A80-23205

FUEL PRODUCTION

Application of liquefaction processes to low-rank coals 26 p0230 A80-27418

Processing of solid fossil-fuel deposits by electrical induction heating 26 p0242 A80-29007

The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes 26 p0243 A80-29054

Experimental alcohol fuel plants [ATF-P-5000-2] 26 p0283 N80-18203

Alcohol fuels information directory [ATF-P-5000-3] 26 p0283 N80-18204

Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification [PB80-104656] 26 p0289 N80-19309

Liquid phase methanation/shift pilot plant operation and laboratory support work [FE-2036-37] 26 p0298 N80-20413

Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV [PB80-134729] 26 p0320 N80-21913

FUEL SPRAYS

Combustion of multicomponent fuel droplets [COO-4449-2] 26 p0257 N80-16126

FUEL TESTS

An underground coal gasification experiment - Hoe Creek II 26 p0251 A80-31042

FUEL-AIR RATIO

Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion [NASA-TM-81472] 26 p0315 N80-21837

FUELS

Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland [BNL-51065] 26 p0258 N80-16179

Alcohol fuels. Citations from the American petroleum institute data base --- a bibliography with abstracts [NTIS/PS-79/0911/2] 26 p0259 N80-16195

FULL SCALE TESTS

Results of solar heating experiments --- for full scale domestic system performance 26 p0209 A80-23513

UTRC 8 kW wind turbine tests [AIAA 80-0657] 26 p0240 A80-28831

FUSION REACTORS

Toroidal Trivelpiece-Gould modes --- quasi-electrostatic approximation for electron plasma waves in fusion reactor 26 p0189 A80-22042

Hydrogen production from fusion reactors coupled with high temperature electrolysis 26 p0200 A80-23148

Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978 26 p0214 A80-24661

The mirror fusion test facility 26 p0214 A80-24665

The economic significance of Q for mirror reactors - Combinations of Q and M which look promising --- parameters affecting energy conversion efficiency in fusion reactor 26 p0215 A80-24666

Tandem mirror reactors 26 p0215 A80-24667

Field-reversed mirror reactor 26 p0215 A80-24668

Plasma parametric studies and potential applications of driven fusion reactors 26 p0215 A80-24674

Non-electric fusion energy applications 26 p0215 A80-24676

Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors 26 p0224 A80-25475

International tokamak reactor - Executive summary of the IAEA Workshop, 1979 26 p0252 A80-31626

Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1 [EPRI-ER-1083-VOL-1] 26 p0281 N80-17863

Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2 [EPRI-NP-1083-VOL-2] 26 p0281 N80-17864

FUSION-FISSION HYBRID REACTORS

Tandem mirror reactors 26 p0215 A80-24667

Mirror hybrid reactors --- fusion-fission reactor design 26 p0215 A80-24670

Plasma parametric studies and potential applications of driven fusion reactors 26 p0215 A80-24674

Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1 [EPRI-ER-1083-VOL-1] 26 p0281 N80-17863

Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2 [EPRI-NP-1083-VOL-2] 26 p0281 N80-17864

G

GALLIUM ARSENIDES
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation 26 p0183 A80-21089
Grain size and its influence on efficiency in polycrystalline GaAs solar cells 26 p0186 A80-21919
Native oxide and external dielectric polycrystalline GaAs MIS solar cells 26 p0223 A80-25444
Growth and characterization of thin film III-V compound semiconductor material for solar cell applications 26 p0244 A80-29058
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer 26 p0250 A80-30668
High efficiency solar panel, phase 2, gallium arsenide [AD-A079635] 26 p0316 N80-21838

GALLIUM PHOSPHIDES
High temperature electronics for geothermal energy 26 p0185 A80-21902

GAMMA RAYS
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production 26 p0185 A80-21877

GAS ANALYSIS
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification [PB80-104656] 26 p0289 N80-19309

GAS CHROMATOGRAPHY
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust [BETC/RI-78/12] 26 p0257 N80-16130
Study of hydrocarbon-shale interaction [ORO-5197-14] 26 p0260 N80-16409

GAS DISCHARGES
Plasmochemical cycle of hydrogen production from the water 26 p0200 A80-23149
Model for description of transient behavior of a tokamak discharge 26 p0213 A80-24498

GAS EVOLUTION
The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions 26 p0196 A80-23111
The significance of studies with palladium to basic problems of electrolytic hydrogen evolution 26 p0196 A80-23114
Electrodes for generation of hydrogen and oxygen for seawater 26 p0196 A80-23115

GAS EXPLOSIONS
Explosive-driven magnetic generator with a plasma load 26 p0252 A80-31357

GAS HEATING
Solar space heating with air and liquid systems 26 p0209 A80-23512
Operability and materials testing for MHD air heaters 26 p0217 A80-25075

GAS IONIZATION
Experimental studies of an inert gas disk MHD generator with a small seed fraction 26 p0219 A80-25088
Discharge start-up in a tokamak with a poloidal divertor 26 p0223 A80-25472

GAS MIXTURES
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles 26 p0197 A80-23120
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column 26 p0200 A80-23145
Mixture properties for hydrogen supplementation of natural gas 26 p0201 A80-23159

GAS RECOVERY
Unconventional gas recovery program [METC/SP-79/8] 26 p0258 N80-16181

GAS TURBINE ENGINES
Organic content of particulate matter in turbine engine exhaust 26 p0229 A80-27099
Advanced engine concepts - The Ford Proco engine 26 p0235 A80-28474
Gas turbines for automotive use --- Book 26 p0253 A80-31999
Performance sensitivity analysis of Department of Energy-Chrysler upgraded automotive gas turbine engine, S/N 5-4 [NASA-TM-79242] 26 p0274 N80-17467
Materials review for improved automotive gas turbine engine --- superalloys, refractory alloys, and ceramics [NASA-CR-159673] 26 p0275 N80-17470
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine [NASA-TM-81415] 26 p0298 N80-20272
Fuel economy screening study of advanced automotive gas turbine engines [NASA-TM-81433] 26 p0311 N80-21201
Parametric tests of a traction drive retrofitted to an automotive gas turbine [NASA-TM-81457] 26 p0314 N80-21754

GAS TURBINES
Hydrogen production from nuclear fission product waste heat and use in gas turbines 26 p0195 A80-23106
Gas turbines 26 p0255 A80-32399
Waste heat recovery unit design for gas turbine propulsion systems [AD-A078154] 26 p0290 N80-19503
Storage peak gas-turbine power unit [NASA-TM-75757] 26 p0314 N80-21755

GAS-METAL INTERACTIONS
The influence of Al on the hydrogen sorption properties of intermetallic compounds 26 p0203 A80-23173
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics 26 p0204 A80-23184
Hydrogen embrittlement, stress state and design considerations 26 p0204 A80-23186
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds 26 p0206 A80-23203
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere [FE-2621-5] 26 p0313 N80-21520

GAS-SOLID INTERACTIONS
Development of a fast fluid bed gasifier, task 2 and 3 [FE-2361-40] 26 p0289 N80-19306

GASEOUS FUELS
Biogas - Fuel of the future 26 p0227 A80-26175

GASIFICATION
Gasification of oil shale 26 p0226 A80-25889
Wood gasification in a fluidized bed 26 p0244 A80-29154
Combined cycle power generation. Citations from the Engineering Index data base --- bibliographies [PB80-800923] 26 p0280 N80-17595
Synthetic fuels from peat gasification [CONF-790803-55] 26 p0298 N80-20412
Survey of biomass gasification. Volume 1: Synopsis and executive summary [SERI/TR-33-239-VOL-1] 26 p0300 N80-20427

GASOHOL (FUEL)
Gasohol: A technical memorandum [PB80-105885] 26 p0259 N80-16194

Physical properties of gasoline/alcohol blends [BERC/RI-79/4] 26 p0288 N80-19296
Exhaust characterization of neat alcohol fueled IC engines [BETC/P-B-8-1943-1] 26 p0314 N80-21760

GASOLINE
Conceptual design of a coal-to-methanol-to-gasoline commercial plant: Executive summary [FE-2416-43] 26 p0258 N80-16182
Development studies on selected conversion of synthesis gas from coal to high octane gasoline [FE-2276-27] 26 p0259 N80-16190
Comparison of fuel economy and emissions for diesel and gasoline powered taxicabs [PB-298609/9] 26 p0275 N80-17484
Photochemical conversion of coal to gasoline in an entrained bed reactor 26 p0283 N80-18202
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas [AD-A076145] 26 p0284 N80-18411
Physical properties of gasoline/alcohol blends [BERC/RI-79/4] 26 p0288 N80-19296
Photochemical conversion of coal to gasoline in an entrained bed reactor [ORO-5020-T1] 26 p0299 N80-20415
Stability survey of hydrocarbon fuels [BETC-1778-4] 26 p0300 N80-20424
Test and evaluation report of the ERDC Hybrid-Electric Van (HEVAN) [DOE/TIC-10232] 26 p0312 N80-21210
Exhaust characterization of neat alcohol fueled IC engines [BETC/P-B-8-1943-1] 26 p0314 N80-21760

GEARS
Effect of geometry and operating conditions on spur gear system power loss [NASA-TM-81426] 26 p0284 N80-18406

GENERATION
Energy conservation in the US: Some interdisciplinary approaches with an emphasis on industrial cogeneration 26 p0302 N80-20811

GEOCHEMISTRY
Geological and geochemical characteristics of geothermal resources in Japan 26 p0187 A80-21928

GEOLOGICAL FAULTS
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults 26 p0191 A80-22441
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal [LBL-8905] 26 p0273 N80-16652

GEOLOGICAL SURVEYS
Geological and geochemical characteristics of geothermal resources in Japan 26 p0187 A80-21928
Some application of Landsat imagery interpretation for petroleum targetting in India 26 p0191 A80-22433

GEOMETRICAL OPTICS
Some geometrical design aspects of a linear Fresnel reflector concentrator 26 p0193 A80-22791

GEORGIA
Solar energy system performance evaluation: A seasonal report for SEMCO, Macon, Georgia [NASA-CR-161380] 26 p0293 N80-19629

GEOTHERMAL ENERGY CONVERSION
Net energy production history of the Geysers Geothermal Project 26 p0184 A80-21745
High temperature electronics for geothermal energy 26 p0185 A80-21902
Solar and geothermal energy 26 p0208 A80-23328
Geothermal energy and the environment - The global experience 26 p0223 A80-25259
DOE moves ahead with geothermal 26 p0243 A80-29038
Geothermal heating in Creil 26 p0255 A80-32499
Economics of geothermal power [COO-4051-43] 26 p0265 N80-16497
Decentralized energy: Technology assessment and systems description [BNL-50987] 26 p0265 N80-16502
Hydrothermal electric and direct heat. Commercialization phase 3 planning [DOE/ERD-0005] 26 p0269 N80-16545
Feasibility study of geothermal energy for heating greenhouses [PB-299517/3] 26 p0271 N80-16569
Today's geothermal power economics and risks [CONF-790803-44] 26 p0277 N80-17558
Analysis of the geothermal binary cycle using paraffin hydrocarbons as working fluids 26 p0285 N80-18553
Geothermal energy market penetration: Development of a model for the residential section [PB80-118359] 26 p0311 N80-21198
Geothermal energy: Obstacles and uncertainties impede its widespread use [PB80-134430] 26 p0315 N80-21827
Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB80-125651] 26 p0320 N80-21889

GEOTHERMAL RESOURCES
Geological and geochemical characteristics of geothermal resources in Japan 26 p0187 A80-21928
Geothermal energy and the environment - The global experience 26 p0223 A80-25259
A model for the Sulphur Springs geothermal field St. Lucia 26 p0231 A80-27924
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine 26 p0249 A80-30474
Hydrothermal electric and direct heat. Commercialization phase 3 planning [DOE/ERD-0005] 26 p0269 N80-16545
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal [LBL-8905] 26 p0273 N80-16652
Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas [PB-299925/8] 26 p0285 N80-18547
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development --- for the generation of electric power [DOE/ET-28432/1] 26 p0290 N80-19604
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 2: Regional program monitoring and progress evaluation --- for the generation of electric power [DOE/ET-28432/2] 26 p0291 N80-19605
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation --- for generation of electric power [DOE/ET-28432/3-1] 26 p0291 N80-19606
Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices --- for generation of electric power [DOE/ET-28432/3-2] 26 p0291 N80-19607
Assessment of low- to moderate-temperature geothermal resources of Nevada [NVO-01556-1] 26 p0301 N80-20792

GERMANY
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power [ISBN-3-88148-164-8] 26 p0281 N80-17635

GLASS
Application of glass technology to novel solar energy collectors [CONF-7906118-1] 26 p0317 N80-21852

GLASS ELECTRODES
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes 26 p0243 A80-29057

GLASS FIBER REINFORCED PLASTICS
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports 26 p0191 A80-22690

GLOBAL AIR POLLUTION
The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants
26 p0248 A80-29938

GLOBAL POSITIONING SYSTEM
GPS application to seismic oil exploration
26 p0222 A80-25159

GLOW DISCHARGES
Amorphous Si-F-H solar cells prepared by dc glow discharge
26 p0251 A80-30940

GOLD
The doping of amorphous silicon for solar cells
26 p0187 A80-21921

GOVERNMENT/INDUSTRY RELATIONS
Canadian renewable energy prospects
26 p0183 A80-21104
Power consumption in the high-tension field between the government's responsibility to provide energy and politics
26 p0185 A80-21846
SWECS qualifications criteria for state tax incentive programs --- Small Wind Energy Conversion System
[AIAA 80-0650] 26 p0240 A80-28829
Advanced automotive propulsion systems: Incentive financing
[CONS-5181-1] 26 p0321 N80-22128

GRADIENTS
Gradient bounds for plasma confinement
26 p0213 A80-24223

GRAIN BOUNDARIES
Grain size and its influence on efficiency in polycrystalline GaAs solar cells
26 p0186 A80-21919

GRAPHITE
Electrolysis of hydrobromic acid --- hybrid cycle for hydrogen production
26 p0198 A80-23129
Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation --- Book
26 p0214 A80-24660

GRINDING (COMMINUTION)
Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy
26 p0249 A80-30521

GROUND STATIONS
Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504

GROUND WATER
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources --- in eastern Utah
[PB-300536/0] 26 p0272 N80-16623

GROUND WIND
Wind characteristics over complex terrain relative to WECS siting --- Wind Energy Conversion System
[AIAA 80-0645] 26 p0239 A80-28825

GULF STREAM
The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology
26 p0196 A80-23110
Coriolis Program - A review of the status of the ocean turbine energy system
26 p0233 A80-28261

GUSTS
Gust models for design and performance analyses of wind turbines
[AIAA 80-0644] 26 p0240 A80-28833
Gust-rise exceedance statistics for wind turbine design
[PNL-2530] 26 p0277 N80-17567

H

HABITABILITY
Space manufacturing, satellite power and human exploration
26 p0186 A80-21908

HALIDES
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

HARMONIC OSCILLATION
The wingmill - An oscillating-wing windmill
[AIAA 80-0621] 26 p0238 A80-28813

HAWAII
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development --- for the generation of electric power
[DOE/ET-28432/1] 26 p0290 N80-19604
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 2: Regional program monitoring and progress evaluation --- for the generation of electric power
[DOE/ET-28432/2] 26 p0291 N80-19605
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation --- for generation of electric power
[DOE/ET-28432/3-1] 26 p0291 N80-19606
Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices --- for generation of electric power
[DOE/ET-28432/3-2] 26 p0291 N80-19607

HAZARDS
Mod 1 wind turbine generator failure modes and effects analysis
[NASA-CR-159494] 26 p0303 N80-20864

HEALTH PHYSICS
Federal photovoltaics utilization program
[DOE/EA-0087] 26 p0267 N80-16525

HEAT EXCHANGERS
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076
Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112
The effect of superheating on the performance of floating droplet direct contact heat exchangers
26 p0260 N80-16293
Suntech Solar Linear Array Thermal System (SLATS) test results
[SAND-79-0658] 26 p0277 N80-17563
Analysis of a heat exchanger-thermoelectric generator system
[SERI/TP-35-253] 26 p0316 N80-21848

HEAT GENERATION
Oil shale processing technology
26 p0247 A80-29800
Energy storage
26 p0255 A80-32398
Gas turbines
26 p0255 A80-32399

HEAT OF COMBUSTION
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042

HEAT OF SOLUTION
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

HEAT PIPES
The state-of-the-art of cryogenic heat pipes
[AIAA PAPER 80-0211] 26 p0212 A80-23956
Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters
26 p0249 A80-30241
Methods for manufacturing heat pipes for circuit cards
[AD-A080188] 26 p0314 N80-21707

HEAT PUMPS
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180
A metal hydrogen heat pump as topping process for power generation
26 p0204 A80-23181
Heat pumps --- Book
26 p0207 A80-23224

- Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings 26 p0209 A80-23515
- Computer simulation of ground coupled storage in a series solar assisted heat pump system [BNL-26216] 26 p0266 N80-16507
- Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory --- heat transfer and storage devices for a solar source heat pump system [BNL-26219] 26 p0266 N80-16509
- Heat-pump-centered integrated community energy systems: System development [ANL/CNSV/TM-8] 26 p0305 N80-20880
- Performance of heat pumps at elevated evaporating temperatures with application to solar input [BNL-26772] 26 p0307 N80-20896
- Use of earth coupling in solar assisted heat pumps [BNL-26748] 26 p0316 N80-21849
- Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data [COO-2704-T1] 26 p0318 N80-21875

HEAT RESISTANT ALLOYS
- Material requirements for coal gasification 26 p0212 A80-23833
- Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys [NASA-TM-81384] 26 p0283 N80-18157

HEAT STORAGE
- Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant 26 p0183 A80-21109
- Systematic design assessment techniques for solar buildings 26 p0209 A80-23514
- Solar heating and air conditioning 26 p0209 A80-23516
- The state-of-the-art of cryogenic heat pipes [AIAA PAPER 80-0211] 26 p0212 A80-23956
- Thermal storage in density-stratified fluids and phase-change materials 26 p0225 A80-25496
- Large energy storage systems for utilities 26 p0231 A80-27731
- SEAS - A system for undersea storage of thermal energy 26 p0232 A80-28257
- Energy storage 26 p0255 A80-32398
- Computer simulation of ground coupled storage in a series solar assisted heat pump system [BNL-26216] 26 p0266 N80-16507
- High-temperature molten salt thermal energy storage systems [NASA-CR-159663] 26 p0275 N80-17547
- Suntech Solar Linear Array Thermal System (SLATS) test results [SAND-79-0658] 26 p0277 N80-17563
- Thermal energy storage, volume 2. Citations from the NTIS data base [NTIS/PS-79/0952/6] 26 p0279 N80-17584
- Thermal energy storage, volume 1. Citations from the NTIS data base [NTIS/PS-79/0951/8] 26 p0279 N80-17585
- Thermal energy storage, volume 1. Citations from the Engineering Index data base [NTIS/PS-79/0953/4] 26 p0279 N80-17586
- Thermal energy storage, volume 2. Citations from the Engineering Index data base [NTIS/PS-79/0954/2] 26 p0279 N80-17587
- Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant [LBL-7868-REV] 26 p0306 N80-20890
- Economics of thermal energy storage for compressed air energy storage systems [PNL-SA-7949] 26 p0307 N80-20903
- Economics of compressed air energy storage employing thermal energy storage [PNL-3191] 26 p0307 N80-20904
- Review of recent research on energy storage in residential solar total energy systems [BNL-51012] 26 p0315 N80-21830
- Review of selected on-site DOE small solar thermal power plant experiments [SAND-79-1040C] 26 p0317 N80-21854

HEAT TRANSFER
- Studies in biogas technology. III - Thermal analysis of biogas plants 26 p0188 A80-21940
- Investigation of heat and mass transfer for a regenerator model of a solar cooling system 26 p0232 A80-28200
- Characterization of crushed glass as a transpired air heating solar collector material [LA-UR-79-1336] 26 p0265 N80-16498
- Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory --- heat transfer and storage devices for a solar source heat pump system [BNL-26219] 26 p0266 N80-16509
- Thermal energy storage, volume 2. Citations from the NTIS data base [NTIS/PS-79/0952/6] 26 p0279 N80-17584
- Thermal energy storage, volume 1. Citations from the Engineering Index data base [NTIS/PS-79/0953/4] 26 p0279 N80-17586
- Thermal energy storage, volume 2. Citations from the Engineering Index data base [NTIS/PS-79/0954/2] 26 p0279 N80-17587
- Thermal fluid selection for long-distance heat transmission [CONF-790803-47] 26 p0305 N80-20879
- Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors [COO-2971-6] 26 p0307 N80-20900
- Solar pond for industrial process heat [SERI/TD-351-460] 26 p0319 N80-21876

HEAT TRANSMISSION
- Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings 26 p0212 A80-24071

HEAT TREATMENT
- Solvolysis liquefaction of coal 26 p0187 A80-21926

HEATING EQUIPMENT
- Analyses of single and double exposure solar air heaters 26 p0193 A80-22792
- Heat pumps --- Book 26 p0207 A80-23224
- Operability and materials testing for MHD air heaters 26 p0217 A80-25075
- A central solar domestic hot water system - Performance and economic analysis 26 p0223 A80-25261
- Thermodynamics of heating. II 26 p0227 A80-26309

HELIOSTATS
- Unique high concentration solar test facility 26 p0186 A80-21916
- Theoretical concentrations of solar radiation by central receiver systems 26 p0208 A80-23327
- Development of a spherical reflector/tracking absorber solar energy collector 26 p0226 A80-25885
- Technology and performance of a high concentration solar cell power supply 26 p0226 A80-25886
- Measurement of heliostat performance characteristics 26 p0250 A80-30773
- Heliostat system design and operation. Citations from the Engineering Index data base [NTIS/PS-79/0930/2] 26 p0271 N80-16571
- Solar Central Receiver prototype heliostat, volume 1 [SAN-1604-1] 26 p0316 N80-21846

HELIUM-NEON LASERS
- Magnetooptical switch for synchronization of CO2 and red laser beams --- in laser fusion systems 26 p0236 A80-28735

HETEROJUNCTION DEVICES
- The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight 26 p0209 A80-23496
- Heterojunction solar cells 26 p0210 A80-23519
- High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell 26 p0229 A80-27321

Heterojunction for thin-film solar cells
26 p0245 A80-29393
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668

HIGH CURRENT
Development and operation of a high current density high pressure advanced electrolysis cell
26 p0197 A80-23119
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966

HIGH FIELD MAGNETS
Mirror hybrid reactors --- fusion-fission reactor design
26 p0215 A80-24670

HIGH POWER LASERS
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915
Helios, a 20 TW CO2 laser fusion facility
26 p0245 A80-29370

HIGH PRESSURE
Development and operation of a high current density high pressure advanced electrolysis cell
26 p0197 A80-23119
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474
Chemical and physical stability of refractories for use in coal gasification
[COO-2904-14] 26 p0300 N80-20429

HIGH TEMPERATURE
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547
High temperature solar thermal receiver
[NASA-CR-162831] 26 p0292 N80-19621
Chemical and physical stability of refractories for use in coal gasification
[COO-2904-14] 26 p0300 N80-20429

HIGH TEMPERATURE GAS COOLED REACTORS
Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy
26 p0185 A80-21879
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
Nuclear methane reforming for coal gasification
26 p0233 A80-28276

HIGH TEMPERATURE GASES
Coal gasification in steam at very high temperatures
26 p0249 A80-30522
Hot gas cleanup process
[PB80-108467] 26 p0310 N80-20950

HIGH TEMPERATURE NUCLEAR REACTORS
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877
Nuclear energy as a primary energy source for hydrogen production
26 p0194 A80-23102

HIGH TEMPERATURE PLASMAS
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474

HIGH TEMPERATURE RESEARCH
The industrial applications of high-temperature heat - Solar thermal and electric plants
26 p0189 A80-21954

HIGH TEMPERATURE TESTS
High temperature electronics for geothermal energy
26 p0185 A80-21902
Testing aqueous caustic electrolyzers at high temperatures --- for hydrogen production
26 p0205 A80-23196

HIMALAYAS
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433

HOLE DISTRIBUTION (MECHANICS)
Effect of the interstitial hole size and electron concentration on complex metal hydride formation
26 p0202 A80-23168

HONEYCOMB STRUCTURES
Possible use of honeycomb-type structures for high power batteries and fuel cells
26 p0190 A80-22169
Theoretical study of the heating of air in a plane honeycomb solar collector
26 p0208 A80-23333

HUMAN FACTORS ENGINEERING
Space manufacturing, satellite power and human exploration
26 p0186 A80-21908

HYDRATION
Balancing the process of hydrating gasification of brown coal
26 p0250 A80-30597

HYDRIDES
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203

HYDROBROMIC ACID
Electrolysis of hydrobromic acid --- hybrid cycle for hydrogen production
26 p0198 A80-23129
The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130

HYDROCARBON COMBUSTION
Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion
[NASA-TM-81472] 26 p0315 N80-21837

HYDROCARBON FUEL PRODUCTION
Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
Energy from the biological conversion of solar energy
26 p0210 A80-23522
Microbial production of energy sources from biomass
26 p0210 A80-23523
Biogas - Fuel of the future
26 p0227 A80-26175
Methanol derivation from North Dakota lignite and use as a fuel
26 p0230 A80-27417
Coal liquefaction processes --- Book
26 p0242 A80-28953
Petroleum plantations
26 p0243 A80-29052
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305

HYDROCARBON FUELS
Experience with alcohol fuels
26 p0236 A80-28476
Study of hydrocarbon-shale interaction
[ORO-5197-14] 26 p0260 N80-16409

HYDROCARBONS
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons
[ORO-5205-10] 26 p0310 N80-20973

HYDROCRACKING
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

HYDRODYNAMICS
- Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design 26 p0251 A80-30804

HYDROELECTRIC POWER STATIONS
- The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology 26 p0196 A80-23110
- Water turbine technology for small power stations 26 p0213 A80-24125
- An integrated approach to energy supply for small communities [AIAA 80-0651] 26 p0240 A80-28830
- Decentralized energy: Technology assessment and systems description [BNL-50987] 26 p0265 N80-16502
- Cataract hydroelectric development expansion study [DOE/ID-01796-1] 26 p0295 N80-19650
- Potential hydroelectric power, vertical turbine, spillway combine Broadwater Dam [DOE/ID-01822-1] 26 p0295 N80-19651
- Hydro for the eighties: Bringing hydroelectric power to low income people, the work book. A slide presentation: Audio cassette and workbook [PB80-103948] 26 p0319 N80-21883
- Hydropower, an energy source whose time has come again [PB80-127715] 26 p0320 N80-21886
- Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB80-125651] 26 p0320 N80-21889

HYDROFOIL CRAFT
- New approaches to sailing 26 p0228 A80-26344

HYDROGEN
- Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds 26 p0234 A80-28277
- Electrical conductivity of a seeded H2/O2 system 26 p0254 A80-32330
- Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program [BNL-26904] 26 p0296 N80-19654
- Advanced development of a short-residence-time hydrogasifier [FE-3125-5] 26 p0299 N80-20414
- Coal liquefaction with synthesis gas [PETC/TR-79/1] 26 p0299 N80-20416

HYDROGEN ATOMS
- Spin-aligned hydrogen --- atoms at lowest electronic energy magnetic sublevels as substance for molecular production 26 p0200 A80-23151

HYDROGEN EMBRITTLEMENT
- Hydrogen embrittlement, stress state and design considerations 26 p0204 A80-23186

HYDROGEN ENGINES
- Design considerations for the Riverside hydrogen bus 26 p0203 A80-23176
- Hydrogen injection two-stroke spark ignition engine 26 p0203 A80-23177
- Electronic fuel injection techniques for hydrogen powered I.C. engines 26 p0206 A80-23205

HYDROGEN FUELS
- Use of hydrogen as a fuel for automobile heat engines 26 p0185 A80-21880
- Hydrogen storage in metal hydrides 26 p0193 A80-22867
- Storage, transmission and distribution of hydrogen 26 p0194 A80-23103
- Analysis of the potential transmission of hydrogen by pipeline in Switzerland 26 p0201 A80-23158
- Mixture properties for hydrogen supplementation of natural gas 26 p0201 A80-23159
- The role of metal hydrides in hydrogen storage and utilization 26 p0202 A80-23163
- Cubic metal-alloys for hydrogen storage 26 p0202 A80-23165
- Development of low cost nickel-rare earth hydrides for hydrogen storage 26 p0202 A80-23170
- Development of high-temperature hydrides for vehicular applications 26 p0203 A80-23172
- Hydrogen-fueled railroad motive power systems - A North American view 26 p0203 A80-23175
- Design considerations for the Riverside hydrogen bus 26 p0203 A80-23176
- Hydrogen injection two-stroke spark ignition engine 26 p0203 A80-23177
- Hydrogen energy in United States Post Office delivery systems 26 p0203 A80-23178
- Hydrogen fuel in air transportation and its effects around airports 26 p0204 A80-23179
- Prospects for an alkaline hydrogen air fuel cell system 26 p0204 A80-23182
- Health benefits derived from a planned hydrogen community 26 p0205 A80-23193
- A high energy hybrid system: Hydrogen - chlorine - solar - water 26 p0206 A80-23199
- Technico-economic study of distributing hydrogen for automotive vehicles 26 p0207 A80-23206
- Photolysis of water for H2 production with the use of biological and artificial catalysts 26 p0210 A80-23521
- Future large cargo aircraft technology 26 p0229 A80-27269
- The changing horizons for technical progress. II 26 p0229 A80-27270
- A storage tank for vehicular storage of liquid hydrogen 26 p0231 A80-27729
- Experiments on H2-O2MHD power generation [NASA-TM-81424] 26 p0273 N80-16886
- Hydrogen as a fuel --- automobiles [TT-7903] 26 p0283 N80-18212
- Hydrogen storage for automobiles [BNL-26906] 26 p0305 N80-20886

HYDROGEN OXYGEN FUEL CELLS
- Advanced technology light weight fuel cell program --- orbiting space vehicle long-life hydrogen oxygen fuel cell [NASA-CR-159807] 26 p0292 N80-19615
- Lightweight fuel cell powerplant components program [NASA-CR-161412] 26 p0298 N80-20306
- Feasibility of cogeneration application of a 4.8 MW fuel cell power plant at a Santa Clara, California paper mill [SAN-2189-T1] 26 p0304 N80-20876

HYDROGEN PLASMA
- Discharge start-up in a tokamak with a poloidal divertor 26 p0223 A80-25472

HYDROGEN PRODUCTION
- Energy storage --- Book 26 p0184 A80-21123
- Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production 26 p0185 A80-21877
- Solar hydrogen energy 26 p0185 A80-21878
- Decomposition of water in a nonequilibrium plasma 26 p0185 A80-21881
- A speculation on a general photoelectrochemical reactor 26 p0193 A80-22794
- Application of centrifugal separation to the production of hydrogen from coal 26 p0194 A80-22869
- Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5 26 p0194 A80-23101
- Nuclear energy as a primary energy source for hydrogen production 26 p0194 A80-23102
- Present state and outlook of the electrolytic H2-production route 26 p0195 A80-23104
- Nuclear methane reforming for coal gasification 26 p0195 A80-23105

HYDROGEN PRODUCTION CONTD

Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106
On the potential of solar energy conversion into hydrogen and/or other fuels
26 p0195 A80-23107
The theoretical design of a solar engine for the production of hydrogen
26 p0195 A80-23108
OTEC for hydrogen production
26 p0195 A80-23109
The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology
26 p0196 A80-23110
The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions
26 p0196 A80-23111
Improvements in electrolysis technology in alkaline solution --- for hydrogen production
26 p0196 A80-23112
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis
26 p0196 A80-23113
The significance of studies with palladium to basic problems of electrolytic hydrogen evolution
26 p0196 A80-23114
Electrodes for generation of hydrogen and oxygen for seawater
26 p0196 A80-23115
Unipolar water electrolysers - A competitive technology
26 p0196 A80-23116
Development of Billings SPE electrolyzer --- for hydrogen production
26 p0196 A80-23117
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118
Development and operation of a high current density high pressure advanced electrolysis cell
26 p0197 A80-23119
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles
26 p0197 A80-23120
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126
Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128
Electrolysis of hydrobromic acid --- hybrid cycle for hydrogen production
26 p0198 A80-23129
The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131
Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory
26 p0198 A80-23132
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134
Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137
Thermochemical water splitting cycles - Impact of thermal burdens and kinetics
26 p0199 A80-23138
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139
The economics of producing hydrogen from a small air-blown coal gasifier
26 p0199 A80-23140
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6 --- hydrogen production
26 p0200 A80-23144
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149
Spin-aligned hydrogen --- atoms at lowest electronic energy magnetic sublevels as substance for molecular production
26 p0200 A80-23151
Hydrogen generation via photoelectrolysis of water - Recent advances
26 p0200 A80-23152
Photoelectrochemical generation of hydrogen with hybrid electrodes
26 p0200 A80-23153
Photochemical production of hydrogen from water
26 p0201 A80-23154
Bio-solar hydrogen production
26 p0201 A80-23155
Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems
26 p0201 A80-23156
Thermoelectrochemical cycles for power and hydrogen production
26 p0201 A80-23157
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174
Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle
26 p0204 A80-23189
Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis
26 p0205 A80-23191
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code --- improved computer program for hydrogen production and nuclear reactor-chemical plant coupling processes
26 p0205 A80-23192
Present state and future prospects of thermochemical hydrogen production
26 p0205 A80-23194
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
Testing aqueous caustic electrolyzers at high temperatures --- for hydrogen production
26 p0205 A80-23196

Theoretical efficiency limit of water electrolysis and practical means to approach it
26 p0205 A80-23197

Engineering impact on the validity of the Mark-16 thermochemical cycle --- hydrogen production restrictions and prospects
26 p0205 A80-23198

Hydrogen production from water using fission-pumped laser
26 p0206 A80-23200

Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201

Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202

Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203

A plan for active development of LH2 for use in aircraft
26 p0206 A80-23204

Status and development of production of cheap hydrogen
26 p0208 A80-23330

Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

Hydrogen energy research programs in Japan
26 p0233 A80-28271

Present state and future prospects of thermochemical hydrogen production
26 p0233 A80-28272

Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273

Open-loop thermochemical cycles for the production of hydrogen
26 p0233 A80-28274

Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0233 A80-28275

Nuclear methane reforming for coal gasification
26 p0233 A80-28276

The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054

Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152

A heat penalty and economic analysis of the hybrid sulfuric acid process
26 p0245 A80-29406

The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407

Photobiological production of hydrogen
26 p0247 A80-29920

Plant power fuels hydrogen production
26 p0249 A80-30465

Hydrogen as a fuel
26 p0257 N80-16177

Coal liquefaction test center
[PE-1517-78] 26 p0300 N80-20425

HYDROGEN SULFIDE

Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501

The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[PE-2449-9] 26 p0288 N80-19298

HYDROGEN-BASED ENERGY

Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5
26 p0194 A80-23101

Storage, transmission and distribution of hydrogen
26 p0194 A80-23103

Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143

Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6 --- hydrogen production
26 p0200 A80-23144

Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145

Photochemical production of hydrogen from water
26 p0201 A80-23154

Bio-solar hydrogen production
26 p0201 A80-23155

Thermoelectrochemical cycles for power and hydrogen production
26 p0201 A80-23157

Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158

Mixture properties for hydrogen supplementation of natural gas
26 p0201 A80-23159

Small scale ammonia production as a means for hydrogen storage
26 p0201 A80-23160

A study on hydrogen storage by use of cryoadsorbents
26 p0201 A80-23161

The role of metal hydrides in hydrogen storage and utilization
26 p0202 A80-23163

Use of binary titanium alloys for hydrogen storage
26 p0202 A80-23164

Mixing effects of different types of hydrides
26 p0202 A80-23166

Effect of the interstitial hole size and electron concentration on complex metal hydride formation
26 p0202 A80-23168

Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys
26 p0202 A80-23169

Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171

The influence of Al on the hydrogen sorption properties of intermetallic compounds
26 p0203 A80-23173

Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175

Hydrogen energy in United States Post Office delivery systems
26 p0203 A80-23178

Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

Optimal development strategies for a whole energy system based on hydrogen
26 p0205 A80-23190

Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206

Hydrogen energy research programs in Japan
26 p0233 A80-28271

Physical, chemical and energy aspects of underground hydrogen storage
26 p0234 A80-28278

Hysteresis in metal/hydrogen systems
26 p0246 A80-29725

Hydrogen as a fuel
26 p0257 N80-16177

Storing hydrogen in the form of light alloy hydrides
[IPP-26-209] 26 p0274 N80-17246

HYDROGENATION

Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy
26 p0249 A80-30521

Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523

Coal liquefaction test center
[PE-1517-78] 26 p0300 N80-20425

HYDROLOGY

Bibliography of geology and hydrology, eastern New Mexico
[PB-300832/3] 26 p0273 N80-16663

HYDROLYSIS
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143
Hydrogen generation via photoelectrolysis of water - Recent advances
26 p0200 A80-23152
Photochemical production of hydrogen from water
26 p0201 A80-23154
HYPERBOLIC DIFFERENTIAL EQUATIONS
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319
HYSTERESIS
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725

I

ICE FORMATION
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912
IGNITION TEMPERATURE
In-situ combustion retorting of oil shale
26 p0192 A80-22764
Active burn control of nearly ignited plasmas
26 p0224 A80-25480
IMPLOSIONS
Application of plasma focus device to compression of toroidal plasma
26 p0229 A80-27058
IMPURITIES
Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
INCENTIVES
Advanced automotive propulsion systems: Incentive financing
[CONS-5181-1] 26 p0321 N80-22128
INCIDENT RADIATION
Calculation of the monthly-average transmittance-absorptance product --- for solar collectors
26 p0184 A80-21117
Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772
Normal incident solar radiation measurements at Upton, New York
[BNL-50939] 26 p0273 N80-16653
INCINERATORS
Incineration of industrial waste
26 p0192 A80-22766
INDIA
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433
INDIUM COMPOUNDS
High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell
26 p0229 A80-27321
INDIUM PHOSPHIDES
Growth and characterization of thin film III-V compound semiconductor material for solar cell applications
26 p0244 A80-29058

INDOLES
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292
INDUCTION HEATING
Processing of solid fossil-fuel deposits by electrical induction heating
26 p0242 A80-29007
INDUCTION MOTORS
The theory of a free-field inductive MHD-propulsor
26 p0216 A80-25021
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677
INDUSTRIAL ENERGY
Introduction to the study of solar technology
26 p0188 A80-21949
Industrial solar thermal collectors
26 p0189 A80-21951
The utilization of industrially produced moderate-temperature solar heat
26 p0189 A80-21952
Industrial solar thermal concentrators
26 p0189 A80-21953
The industrial applications of high-temperature heat - Solar thermal and electric plants
26 p0189 A80-21954
Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption
26 p0222 A80-25116
The prospects for solar energy use in industry within the United Kingdom
26 p0248 A80-29921
Energy conservation in industry: The present approach, the future opportunities
[PB-301244/0] 26 p0270 N80-16556
Criteria for an ideal solar photovoltaic powered industry
[HCP/T5433-01] 26 p0279 N80-17577
Characterization and assessment of selected solar thermal energy systems for residential and process heat applications
[LA-7995-TASE] 26 p0295 N80-19648
Industrial fuel choice analysis model. Volume 2: Appendices to model documentation
[DOE/EIA-2832/1-VOL-2-APP] 26 p0299 N80-20419
Energy conservation in the US: Some interdisciplinary approaches with an emphasis on industrial cogeneration
26 p0302 N80-20811
Feasibility of cogeneration application of a 4.8 MW fuel cell power plant at a Santa Clara, California paper mill
[SAN-2189-T1] 26 p0304 N80-20876
Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results
[DOE/FE-2344/2] 26 p0305 N80-20885
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876
INDUSTRIAL MANAGEMENT
Space disposal of nuclear wastes
26 p0246 A80-29448
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
INDUSTRIAL PLANTS
Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939
Studies in biogas technology. III - Thermal analysis of biogas plants
26 p0188 A80-21940
Incineration of industrial waste
26 p0192 A80-22766
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141

- Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption 26 p0222 A80-25116
- Status of pollutant removal technology for coal fired plants in the northeastern U.S. [BNL-51004] 26 p0272 N80-16580

INDUSTRIAL WASTES
- Incineration of industrial waste 26 p0192 A80-22766
- Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes [PB80-108566] 26 p0297 N80-19678
- Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV [PB80-134729] 26 p0320 N80-21913

INDUSTRIES
- Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979 [PB80-115298] 26 p0311 N80-21197

INERTIAL FUSION (REACTOR)
- Progress in the production and energy flux concentration of the REB accelerator for ICF 26 p0226 A80-25785
- Helios, a 20 TW CO2 laser fusion facility 26 p0245 A80-29370

INFORMATION SYSTEMS
- An investigation of preferences for various types of energy cost feedback --- information feedback system to determine energy consumption costs [PB-300314/2] 26 p0270 N80-16560
- Energy Research Information System (ERIS) projects report, volume 4, number 1 --- bibliographies [PB-300338/1] 26 p0270 N80-16561

INFORMATION THEORY
- Information theory applied to solar radiation concentrators 26 p0275 N80-17539

INFRARED DETECTORS
- Thermography at the earth's surface and the energy efficiency of buildings 26 p0213 A80-24072
- Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions 26 p0234 A80-28305

INFRARED IMAGERY
- Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs [PB-300460/3] 26 p0272 N80-16600

INFRARED SPECTROSCOPY
- Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids 26 p0249 A80-30525

INORGANIC MATERIALS
- Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents 26 p0249 A80-30523

INORGANIC SULFIDES
- Electrochemistry of amorphous V2S5 in lithium cells 26 p0247 A80-29895

INSOLATION
- Accuracies achievable with indirect measurements of the direct solar irradiance component 26 p0183 A80-21108
- Storage of solar energy 26 p0188 A80-21937
- Estimation and prediction of global solar radiation over Greece 26 p0248 A80-29923
- The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions 26 p0251 A80-30774
- Operating thresholds of solar collection systems 26 p0251 A80-30775
- Solar availability for winter space heating: An analysis of the calendar period 1953-1975 [ANL/SPG-14] 26 p0268 N80-16532

INSTALLING
- Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator [NASA-TM-81444] 26 p0292 N80-19614

INSULATION
- Performance effects of Trombe wall control strategies --- passive solar building heating 26 p0183 A80-21105

INTEGRATED CIRCUITS
- Computer modeling of a two-junction, monolithic cascade solar cell 26 p0234 A80-28330

INTEGRATED ENERGY SYSTEMS
- An integrated approach to energy supply for small communities [AIAA 80-0651] 26 p0240 A80-28830
- Prototype solar heating and combined heating cooling systems [NASA-CR-161340] 26 p0264 N80-16485
- Screening evaluation of electric power cycles integrated with coal gasification plants [EPRI-AF-1160] 26 p0295 N80-19646
- Heat-pump-centered integrated community energy systems: System development [ANL/CNSV/TM-8] 26 p0305 N80-20880
- Performance of heat pumps at elevated evaporating temperatures with application to solar input [BNL-26772] 26 p0307 N80-20896
- Solar heating and hot water system installed at the Senior Citizen Center, Huntsville, Alabama [NASA-CR-161384] 26 p0315 N80-21835
- Solar thermal repowering systems integration [SERI/TR-8037-1] 26 p0316 N80-21847
- Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data [COO-2704-T1] 26 p0318 N80-21875

INTERFACIAL TENSION
- Surface-active materials from Athabasca oil sands 26 p0192 A80-22770

INTERMETALLICS
- Use of binary titanium alloys for hydrogen storage 26 p0202 A80-23164
- Effect of the interstitial hole size and electron concentration on complex metal hydride formation 26 p0202 A80-23168
- The influence of Al on the hydrogen sorption properties of intermetallic compounds 26 p0203 A80-23173
- Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials 26 p0204 A80-23183
- Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds 26 p0206 A80-23203
- Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds 26 p0234 A80-28277

INTERNAL COMBUSTION ENGINES
- Electronic fuel injection techniques for hydrogen powered I.C. engines 26 p0206 A80-23205
- Possible energy savings through tribological measures - Especially in automobiles 26 p0227 A80-26184
- Trends in the construction of Otto engines in the U.S 26 p0235 A80-28472
- A study on plasma plug --- high energy ignition plugs for exhaust pollution reduction and fuel consumption decrease in automotive gasoline engines 26 p0252 A80-31775
- Exhaust characterization of neat alcohol fueled IC engines [BETC/P-B-8-1943-1] 26 p0314 N80-21760

INTERNATIONAL COOPERATION
- International tokamak reactor - Executive summary of the IAEA Workshop, 1979 26 p0252 A80-31626
- Objectives and strategies of the International Photovoltaic Program Plan [SERI/TR-52-250] 26 p0266 N80-16513

INTERNATIONAL LAW
- Satellite solar power plants 26 p0252 A80-31200

INTERSTITIALS
- Effect of the interstitial hole size and electron concentration on complex metal hydride formation 26 p0202 A80-23168

INVERTED CONVERTERS (DC TO AC)
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501

INVERTERS
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976
Workshop on Power Conditioning for Alternative Energy Technologies, executive summary
[SERI-TP-35-217-PT-25] 26 p0265 N80-16505

INVISCID FLOW
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497

IODIDES
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136

IODINE
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137

IODINE COMPOUNDS
Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle
26 p0204 A80-23189

ION CURRENTS
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483
Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas
26 p0229 A80-27263
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278

ION DISTRIBUTION
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478

ION IMPLANTATION
Properties of ion-implanted junctions in mercury-cadmium-telluride
26 p0234 A80-28307

ION INJECTION
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482
Neutral beam injectors
26 p0215 A80-24675
Neutral-beam injection calculations for torsatrons --- plasma heating effectiveness
26 p0224 A80-25479

ION SOURCES
Neutral beam injectors
26 p0215 A80-24675

IONIC DIFFUSION
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

IONIZED GASES
Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream
26 p0252 A80-31509

IRON
Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant
26 p0183 A80-21109
Sr-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study
26 p0301 N80-20720

IRON ALLOYS
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171

IRON COMPOUNDS
The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

IRON OXIDES
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174

IRRADIANCE
Accuracies achievable with indirect measurements of the direct solar irradiance component
26 p0183 A80-21108

IRREVERSIBLE PROCESSES
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles
26 p0197 A80-23120
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128

IRRIGATION
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822
Solar powered liquid piston Stirling cycle irrigation pump
[SAN-1894-1] 26 p0294 N80-19641

ISLANDS
Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463

ISOMERIZATION
Photosensitization mechanisms for energy storing isomerizations
26 p0244 A80-29060

J

JAPAN
Geological and geochemical characteristics of geothermal resources in Japan
26 p0187 A80-21928
National R&D program on MHD in Japan
26 p0220 A80-25100
Hydrogen energy research programs in Japan
26 p0233 A80-28271
Electric vehicle in Japan
26 p0236 A80-28484

JET ENGINE FUELS
Initial characterization of an Experimental Referee Broadened-Specification (ERBS) aviation turbine fuel
[NASA-TM-81440] 26 p0283 N80-18205
Stability survey of hydrocarbon fuels
[BETC-1778-4] 26 p0300 N80-20424

K

KANSAS
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441

KENTUCKY
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

KEROGEN
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888
Gasification of oil shale
26 p0226 A80-25889

KINEMATICS
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors
26 p0212 A80-23998

L

LAMINATES
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact 26 p0252 A80-31507
Composite-laminate flywheel-rotor development program [UCRL-83554] 26 p0317 N80-21855

LAND USE
Urban activity allocation under criteria of transportation energy efficiency 26 p0192 A80-22788
Methodology for evaluating physical constraints on residential solar energy use [UCRL-15001] 26 p0307 N80-20901

LANDSAT SATELLITES
Monitoring urban population and energy utilization patterns from satellite data 26 p0207 A80-23293

LANTHANUM ALLOYS
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys 26 p0202 A80-23169

LANTHANUM COMPOUNDS
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds 26 p0206 A80-23203
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds 26 p0234 A80-28277

LARGE SPACE STRUCTURES
Just over the horizon in space 26 p0256 A80-32511

LASER APPLICATIONS
Laser treatment of phosphorus-diffused silicon solar cells 26 p0186 A80-21915
Hydrogen production from water using fission-pumped laser 26 p0206 A80-23200
Silicon ribbon growth using scanned lasers 26 p0229 A80-27337
Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979 26 p0245 A80-29334

LASER FUSION
The evolution of a large laser control system - From Shiva to Nova 26 p0185 A80-21901
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles 26 p0206 A80-23201
Controlled fusion research in China 26 p0226 A80-25786
Choice of an optimum multichannel Nd:glass laser system for fusion experiments 26 p0230 A80-27340
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage 26 p0230 A80-27567
Magnetooptical switch for synchronization of CO2 and red laser beams --- in laser fusion systems 26 p0236 A80-28735
Helios, a 20 TW CO2 laser fusion facility 26 p0245 A80-29370
Factors affecting potential market penetration of laser fusion power plants [PNL-2803] 26 p0269 N80-16552

LASER PLASMA INTERACTIONS
Transverse self-focusing of a Gaussian beam - Moment method 26 p0229 A80-27195
Choice of an optimum multichannel Nd:glass laser system for fusion experiments 26 p0230 A80-27340

LAVA
Magma energy research, 79-1 [SAND-79-1344] 26 p0277 N80-17568

LEAD ACID BATTERIES
Lead-acid batteries for remote photovoltaic applications 26 p0232 A80-28014
Test and evaluation report of the ERDC Hybrid-Electric Van (HEVAN) [DOE/TIC-10232] 26 p0312 N80-21210

LIFE (DURABILITY)
LSA field test [NASA-CR-162798] 26 p0291 N80-19611
Advanced technology light weight fuel cell program --- orbiting space vehicle long-life hydrogen oxygen fuel cell [NASA-CR-159807] 26 p0292 N80-19615
Life test results of the NASA standard 20 ampere hour cells 26 p0303 N80-20846

LIFE CYCLE COSTS
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles [PB-300289/6] 26 p0282 N80-17922

LIGHT AIRCRAFT
The potential for development of high performance light aircraft 26 p0208 A80-23307

LIGHT TRANSMISSION
Transverse self-focusing of a Gaussian beam - Moment method 26 p0229 A80-27195

LIGNITE
Methanol derivation from North Dakota lignite and use as a fuel 26 p0230 A80-27417
Lignite and coal in the U.S. energy future 26 p0230 A80-27420
Balancing the process of hydrating gasification of brown coal 26 p0250 A80-30597

LIQUEFACTION
The cryogenic storage of hydrogen 26 p0202 A80-23162

LIQUEFIED GASES
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas [AD-A076145] 26 p0284 N80-18411

LIQUEFIED NATURAL GAS
Chemical kinetics in LNG detonations [UCRL-82293-REV-1] 26 p0258 N80-16180

LIQUID CHROMATOGRAPHY
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust [BETC/RI-78/12] 26 p0257 N80-16130

LIQUID COOLING
Helium research in support of superconducting power transmission [PB80-116502] 26 p0314 N80-21697

LIQUID HELIUM
Helium research in support of superconducting power transmission [PB80-116502] 26 p0314 N80-21697

LIQUID HYDROGEN
Durability of foam insulation for LH2 fuel tanks of future subsonic transports 26 p0191 A80-22687
The cryogenic storage of hydrogen 26 p0202 A80-23162
A plan for active development of LH2 for use in aircraft 26 p0206 A80-23204
A storage tank for vehicular storage of liquid hydrogen 26 p0231 A80-27729
Safety of liquid hydrogen in air transportation [LA-UR-79-1416] 26 p0259 N80-16236

LIQUID METALS
Control of liquid metal-gas two phase flow by application of axial magnetic field 26 p0218 A80-25083
High-power-density liquid-metal MHD generator results 26 p0218 A80-25084
High-temperature liquid-metal MHD generator experiments 26 p0218 A80-25085
A magnetohydrodynamic piston engine 26 p0254 A80-32221

LITHIUM CHLORIDES
Lithium thionyl chloride high rate discharge 26 p0303 N80-20830

LITHIUM COMPOUNDS
Lithium battery discharge tests
26 p0303 N80-20831

LITHIUM SULFUR BATTERIES
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions
26 p0247 A80-29894
Electrochemistry of amorphous V2S5 in lithium cells
26 p0247 A80-29895
Lithium thionyl chloride high rate discharge
26 p0303 N80-20830
Lithium battery discharge tests
26 p0303 N80-20831
Characterization of prototype secondary lithium battery
26 p0303 N80-20832
The Exxon rechargeable cells --- solar rechargeable clocks
26 p0303 N80-20834

LOCOMOTIVES
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

LOGISTICS MANAGEMENT
Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation
[PNL-2421] 26 p0278 N80-17574

LOW COST
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
Tubular solar collector
26 p0231 A80-27730
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
Low cost composite blades for large wind turbines
26 p0253 A80-32074
Large, low cost composite wind turbine blades
26 p0263 N80-16475
Development of high efficiency, low cost ZnSiAs2 solar cells.
[DOE/ET-23001/T1] 26 p0278 N80-17572

LOW TEMPERATURE
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242

LOWER CALIFORNIA (MEXICO)
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905] 26 p0273 N80-16652

LUBRICATING OILS
Possible energy savings through tribological measures - Especially in automobiles
26 p0227 A80-26184

M

MAGMA
Magma energy research, 79-1
[SAND-79-1344] 26 p0277 N80-17568

MAGNESIUM ALLOYS
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171

MAGNESIUM COMPOUNDS
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172

MAGNESIUM OXIDES
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137

MAGNETIC DIPOLES
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute --- Coal-Fired Flow Facility
26 p0218 A80-25079

MAGNETIC EFFECTS
End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes
26 p0193 A80-22793
Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476

MAGNETIC FIELD CONFIGURATIONS
The physics of field reversed mirrors
26 p0214 A80-24664
Field-reversed mirror reactor
26 p0215 A80-24668
Mirror hybrid reactors --- fusion-fission reactor design
26 p0215 A80-24670
Superconducting magnets for mirror machines
26 p0215 A80-24672
The theory of a free-field inductive MHD-propulsor
26 p0216 A80-25021
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472
Shape control of doublets --- for tokamak plasma stability control
26 p0223 A80-25473
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476

MAGNETIC FIELD INVERSIONS
Interchange stability of axisymmetric field reversed equilibria --- in plasma control with magnetic mirror
26 p0250 A80-30552

MAGNETIC FIELDS
Energy storage --- Book
26 p0184 A80-21123

MAGNETIC FLUX
A linear magnetic motor/generator --- to generate electric energy using magnetic flux for spacecraft's power supply
[NASA-CASE-GSC-12518-1] 26 p0290 N80-19424
Nonideal compensation in MHD generators --- models of the distortion of the total magnetic flux density by the induced magnetic flux density
26 p0310 N80-21149

MAGNETIC INDUCTION
The theory of a free-field inductive MHD-propulsor
26 p0216 A80-25021

MAGNETIC LEVITATION VEHICLES
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677
The development of the magnetically suspended transportation system in the Federal Republic of Germany
26 p0235 A80-28458

MAGNETIC MIRRORS
Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978
26 p0214 A80-24661
The physics of field reversed mirrors
26 p0214 A80-24664
The mirror fusion test facility
26 p0214 A80-24665
The economic significance of Q for mirror reactors - Combinations of Q and M which look promising --- parameters affecting energy conversion efficiency in fusion reactor
26 p0215 A80-24666
Tandem mirror reactors
26 p0215 A80-24667
Field-reversed mirror reactor
26 p0215 A80-24668
Mirror hybrid reactors --- fusion-fission reactor design
26 p0215 A80-24670
Beam and plasma direct converters
26 p0215 A80-24671
Superconducting magnets for mirror machines
26 p0215 A80-24672
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322

Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474

Interchange stability of axisymmetric field reversed equilibria --- in plasma control with magnetic mirror
26 p0250 A80-30552

MAGNETIC SUSPENSION

A storage tank for vehicular storage of liquid hydrogen
26 p0231 A80-27729

MAGNETITE

The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130

MAGNETO-OPTICS

Magnetooptical switch for synchronization of CO2 and red laser beams --- in laser fusion systems
26 p0236 A80-28735

MAGNETOHYDRODYNAMIC FLOW

Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025] 26 p0212 A80-23954

Long duration channel development and testing --- for MHD generator electrode corrosion measurement
26 p0216 A80-25063

Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322

MAGNETOHYDRODYNAMIC GENERATORS

Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449

Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348

Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349

Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739

Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249] 26 p0192 A80-22745

End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes
26 p0193 A80-22793

Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938

The STD/MHD codes - Comparison of analyses with experiments --- MHD generator performance prediction and tests
[AIAA PAPER 80-0024] 26 p0212 A80-23953

Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025] 26 p0212 A80-23954

The theory of a free-field inductive MHD-propulsor
26 p0216 A80-25021

Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints
26 p0216 A80-25061

Design description and performance predictions for the first CDIF power train --- MHD generator combustor, power channel and diffusers
26 p0216 A80-25062

Electrical characteristics of an arc-mode slagging electrode generator --- in Faraday MHD generators
26 p0216 A80-25064

Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

Local analysis of electrical performance of the U-25B generator --- MHD generator
26 p0216 A80-25066

Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068

Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel
26 p0217 A80-25069

Application of black-liquor boiler technology to MHD heat and seed recovery equipment design
26 p0217 A80-25070

Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071

An evaluation of candidate seed processing systems for open cycle MHD --- sulfur removal and control
26 p0217 A80-25072

A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2 --- in MHD generator coal combustor
26 p0217 A80-25073

Wettability and corrosion of MHD ceramics by Rosebud coal slag
26 p0217 A80-25074

Operability and materials testing for MHD air heaters
26 p0217 A80-25075

Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076

Superconducting MHD magnets - Technology development, procurement and the path to commercial scale
26 p0218 A80-25077

A modular design for a superconducting magnet for the ETF and larger MHD generators
26 p0218 A80-25078

A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute --- Coal-Fired Flow Facility
26 p0218 A80-25079

The effect of electrochemical and arcing phenomena on electrode performance --- in coal-fired MHD generators
26 p0218 A80-25080

Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083

High-power-density liquid-metal MHD generator results
26 p0218 A80-25084

High-temperature liquid-metal MHD generator experiments
26 p0218 A80-25085

Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086

Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088

Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089

Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator
26 p0219 A80-25090

Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091

Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092

A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093

Characterization of dynamic influences in a coal-fired MHD system
26 p0219 A80-25094

First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095

Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097

A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098

Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099

National R&D program on MHD in Japan
26 p0220 A80-25100

Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101

The retrofit approach to MHD demonstration and commercialization --- for coal-fired MHD plants
26 p0221 A80-25102

A modular approach to an engineering test facility and beyond --- for coal-fired MHD generators
26 p0221 A80-25103
The transition MHD power plant concept
26 p0221 A80-25104
Fluctuations in combustion MHD generator systems
26 p0221 A80-25105
Fluctuations in MHD generators
26 p0221 A80-25106
Experiments concerning inhomogeneities in combustion MHD generators
26 p0221 A80-25107
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108
Wall combustion in high-swirl combustors --- for coal-fired MHD generators
26 p0222 A80-25110
One-stage cyclone combustor for coal fired test stand of 4MW thermal power --- for MHD generators
26 p0222 A80-25111
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113
Scaling MHD cyclone coal combustors
26 p0222 A80-25114
Simplified correlations for prediction of NO/x/ emissions from MHD power plants
26 p0227 A80-26001
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357
Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream
26 p0252 A80-31509
Promising fuels for MHD power stations
26 p0252 A80-31750
End zone of a channel with segmented electrodes, carrying nonuniform flow --- current and potential fields in plasma
26 p0254 A80-32220
A magnetohydrodynamic piston engine
26 p0254 A80-32221
MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems
26 p0254 A80-32318
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330
Experiments on H2-O2MHD power generation
[NASA-TM-81424] 26 p0273 N80-16886
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443
Nonideal compensation in MHD generators --- models of the distortion of the total magnetic flux density by the induced magnetic flux density
26 p0310 N80-21149
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160
Advances in MHD technology
[CONF-790598-5] 26 p0311 N80-21166

MAGNETOHYDRODYNAMIC STABILITY
Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348
MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation
26 p0209 A80-23366
Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025] 26 p0212 A80-23954
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498
The physics of field reversed mirrors
26 p0214 A80-24664
Shape control of doublets --- for tokamak plasma stability control
26 p0223 A80-25473
Active burn control of nearly ignited plasmas
26 p0224 A80-25480
Application of plasma focus device to compression of toroidal plasma
26 p0229 A80-27058
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
Interchange stability of axisymmetric field reversed equilibria --- in plasma control with magnetic mirror
26 p0250 A80-30552
Ideal magnetohydrodynamic stability of tokamak plasmas
26 p0250 A80-30554

MAGNETOHYDRODYNAMIC WAVES
Fluctuations in MHD generators
26 p0221 A80-25106

MAGNETOHYDRODYNAMICS
Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints
26 p0216 A80-25061
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567
Parametric study of potential early commercial MHD power plants
[NASA-CR-159633] 26 p0286 N80-18559
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160
Advances in MHD technology
[CONF-790598-5] 26 p0311 N80-21166
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864

MAGNETOSTATIC FIELDS
Transverse self-focusing of a Gaussian beam - Moment method
26 p0229 A80-27195

MAGNETRONS
Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743

MAGNETS
Permanent magnet and superconducting generators in airborne, high power systems --- computer program to predict weight of the generators and component systems
[AD-A078424] 26 p0284 N80-18311

MAINE
Cataract hydroelectric development expansion study
[DOE/ID-01796-1] 26 p0295 N80-19650
Solar energy system performance evaluation: Seasonal report for IBM System 2, Togus, Maine
[NASA-CR-161383] 26 p0315 N80-21836

MAINTENANCE
Cost of energy evaluation
26 p0263 N80-16482

MAN ENVIRONMENT INTERACTIONS
Power plant impacts on visibility in the west - Siting and emissions control implications
26 p0216 A80-24735

MANAGEMENT PLANNING
Multi-objective energy analysis
[BNL-26882] 26 p0317 N80-21856

MANUALS
Midtemperature solar systems test facility experiment manual and test plan
[SAND-79-0379] 26 p0268 N80-16528

MANUFACTURING
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452

Solar collector manufacturing activity
[DOE/EIA-0174/78] 26 p0265 N80-16500

MARINE ENVIRONMENTS
The MINI-OTEC test
26 p0232 A80-28259

MARINE RESOURCES
OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979
26 p0232 A80-28251

MARKET RESEARCH
An overview of photovoltaic market research
26 p0186 A80-21917
Short haul transport for the 1990s
26 p0190 A80-22046
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810
Economic incentives to wind systems commercialization
[AIAA 80-0617] 26 p0238 A80-28811
Solar collector manufacturing activity
[DOE/EIA-0174/78] 26 p0265 N80-16500
Advanced electric generation. Commercialization in phase 3 planning
[DOE/ERD-0014] 26 p0269 N80-16547
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles
[PB-300289/6] 26 p0282 N80-17922
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812

MARKETING
Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979
[PB80-115298] 26 p0311 N80-21197
Geothermal energy market penetration: Development of a model for the residential section
[PB80-118359] 26 p0311 N80-21198

MARYLAND
Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51065] 26 p0258 N80-16179

MASS SPECTROSCOPY
The application of chromatography and ancillary techniques to the characterization of shale oil/oil shale compound classes and of organometallics
26 p0282 N80-18125

MASS TRANSFER
Investigation of heat and mass transfer for a regenerator model of a solar cooling system
26 p0232 A80-28200

MATERIALS
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570

MATERIALS HANDLING
Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation
[PNL-2421] 26 p0278 N80-17574

MATERIALS RECOVERY
Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids
26 p0249 A80-30525
Survey on metallurgical recycling processes
[ANL/OEPM-79-2] 26 p0282 N80-17918

MATERIALS TESTS
Operability and materials testing for MHD air heaters
26 p0217 A80-25075

MATHEMATICAL MODELS
Optimal development strategies for a whole energy system based on hydrogen
26 p0205 A80-23190
Application of computer models to the retorting of oil shale
26 p0228 A80-26708
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818
Aggregated vectorial model of petroleum flow in the United States
[LBL-8874] 26 p0258 N80-16178
Independent assessment of energy policy models
[EPRI-EA-1071] 26 p0266 N80-16510
Factors affecting potential market penetration of laser fusion power plants
[PNL-2803] 26 p0269 N80-16552
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884
Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results
[DOE/FE-2344/2] 26 p0305 N80-20885
Limits to energy modeling
[ORAU/IEA-79-16(0)] 26 p0308 N80-20907
Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques
[NASA-CR-159737] 26 p0308 N80-20909
A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920
Nonideal compensation in MHD generators --- models of the distortion of the total magnetic flux density by the induced magnetic flux density
26 p0310 N80-21149
Geothermal energy market penetration: Development of a model for the residential section
[PB80-118359] 26 p0311 N80-21198
Multi-objective energy analysis
[BNL-26882] 26 p0317 N80-21856
Estimation of wind characteristics at potential wind energy conversion sites
[PNL-3074] 26 p0321 N80-21955

MATHEMATICAL PROGRAMMING
A Newton method for the PIES energy model
[AD-A077102] 26 p0287 N80-18825

MECHANICAL DRIVES
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors
26 p0212 A80-23998
Effect of geometry and operating conditions on spur gear system power loss
[NASA-TM-81426] 26 p0284 N80-18406
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754

MECHANICAL ENGINEERING
Mechnical energy storage technology development
[SAND-79-1151] 26 p0304 N80-20874

MECHANICAL PROPERTIES
The use of wood for wind turbine blade construction
26 p0262 N80-16474

MERCURY (METAL)
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136

MERCURY TELLURIDES
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305
Properties of ion-implanted junctions in mercury-cadmium-telluride
26 p0234 A80-28307

MERCURY VAPOR
Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170

METAL AIR BATTERIES
Metal/air batteries: Their status and potential - A review
26 p0231 A80-28012

METAL COATINGS
Evaluation of selective absorbers
[TP-5461] 26 p0317 N80-21851

METAL COMBUSTION
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859

METAL FILMS
Antireflection coatings on solar cells
26 p0186 A80-21914

METAL FOILS
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324] 26 p0277 N80-17560
METAL HYDRIDES
Hydrogen storage in metal hydrides
26 p0193 A80-22867
Storage, transmission and distribution of hydrogen
26 p0194 A80-23103
The role of metal hydrides in hydrogen storage and utilization
26 p0202 A80-23163
Use of binary titanium alloys for hydrogen storage
26 p0202 A80-23164
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165
Mixing effects of different types of hydrides
26 p0202 A80-23166
Effect of the interstitial hole size and electron concentration on complex metal hydride formation
26 p0202 A80-23168
Development of low cost nickel-rare earth hydrides for hydrogen storage
26 p0202 A80-23170
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180
A metal hydrogen heat pump as topping process for power generation
26 p0204 A80-23181
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725
Storing hydrogen in the form of light alloy hydrides
[IFP-26-209] 26 p0274 N80-17246
METAL OXIDE SEMICONDUCTORS
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331
MOS and oxide-charge-induced /OCI/ BSF solar cells
26 p0234 A80-28337
METAL OXIDES
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2 --- in MHD generator coal combustor
26 p0217 A80-25073
Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302
METAL SURFACES
Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202
Material requirements for coal gasification
26 p0212 A80-23833
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242
METAL-GAS SYSTEMS
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys
26 p0202 A80-23169
The influence of Al on the hydrogen sorption properties of intermetallic compounds
26 p0203 A80-23173
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725
METAL-WATER REACTIONS
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474
METALLIZING
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620
METEOROLOGICAL PARAMETERS
Describing wind data --- using characteristic wind speed and shape factor parameters
26 p0211 A80-23534
METHANE
Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
Exotic energy R&D has potential --- ocean wave and windpower utilization
26 p0213 A80-24124
Biogas - Fuel of the future
26 p0227 A80-26175
Nuclear methane reforming for coal gasification
26 p0233 A80-28276
Unconventional gas recovery program
[METC/SP-79/8] 26 p0258 N80-16181
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428
METHOD OF CHARACTERISTICS
Computation of synthetic seismograms by the method of characteristics --- geophysical prospecting
26 p0287 N80-18593
METHYL ALCOHOLS
Methanol derivation from North Dakota lignite and use as a fuel
26 p0230 A80-27417
Experience with alcohol fuels
26 p0236 A80-28476
Conceptual design of a coal-to-methanol-to-gasoline commercial plant: Executive summary
[FE-2416-43] 26 p0258 N80-16182
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295
Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AF-1227] 26 p0314 N80-21558
MICHIGAN
Coping with energy limitations in transportation: Proposals for Michigan
[PB-299737/7] 26 p0270 N80-16559
MICROBIOLOGY
Microbial production of energy sources from biomass
26 p0210 A80-23523
MICROPROCESSORS
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006
MICROSTRUCTURE
Characterization of deliberately nickel-doped silicon wafers and solar cells --- microstructure, electrical properties, and energy conversion efficiency
[NASA-CR-162790] 26 p0276 N80-17551
MICROWAVE TRANSMISSION
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525
Free space microwave power transmission systems for microwave powered atmospheric platforms
26 p0228 A80-26813
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
Solar power satellite system definition study, volume 4, phase 2
[NASA-CR-160565] 26 p0313 N80-21395
MICROWAVES
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287
MILITARY OPERATIONS
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869

MILITARY TECHNOLOGY
Improved thermal battery --- military applications
[AD-A075835] 26 p0276 N80-17554
MINERAL EXPLORATION
Computation of synthetic seismograms by the method of characteristics --- geophysical prospecting
26 p0287 N80-18593
MINERALS
A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920
MINES (EXCAVATIONS)
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
MINICOMPUTERS
Continuing regional solar energy information mini-center activities and updating the SOLCOST program
[COO-4643-T2] 26 p0267 N80-16521
MINING
Environmental development plan: Coal extraction and preparation
[DOE/EDP-0050] 26 p0309 N80-20921
MINNESOTA
Solar heating system design package for a single-family residence at William O'Brien State Park, Minnesota
[NASA-CR-161357] 26 p0303 N80-20866
MIRRORS
Mirror enclosures for double-exposure solar collectors
26 p0184 A80-21110
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors
26 p0212 A80-23998
Installation and startup of the fixed mirror solar concentrator collector field subsystem
[GA-A-15344] 26 p0306 N80-20888
MIS (SEMICONDUCTORS)
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815
MISSION PLANNING
Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning
[NASA-TM-80958] 26 p0291 N80-19610
MODELS
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443
MOJAVE DESERT (CA)
Project windsheet - An interim report --- on wind measurement at sites in American Southwest
[AIAA 80-0647] 26 p0239 A80-28827
MOLECULAR STRUCTURE
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926
MOLTEN SALT ELECTROLYTES
Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501
MOLTEN SALTS
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865
MOLYBDENUM
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620
Exploratory studies in catalytic coal liquefaction
[EPRI-AP-1184] 26 p0299 N80-20422
Catalyst characterization in coal liquefaction
[SAND-79-1969] 26 p0299 N80-20423
MONTANA
Potential hydroelectric power, vertical turbine, spillway combine Broadwater Dam
[DOE/ID-01822-1] 26 p0295 N80-19651
Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
[DOE/TIC-10190] 26 p0306 N80-20895
MOTOR VEHICLES
International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies
26 p0235 A80-28470
Hybrid drive-systems for municipal buses
26 p0235 A80-28475
MULTILAYER INSULATION
A storage tank for vehicular storage of liquid hydrogen
26 p0231 A80-27729

N

N-TYPE SEMICONDUCTORS
The doping of amorphous silicon for solar cells
26 p0187 A80-21521
NAPHTHALENE
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292
NASA PROGRAMS
Overview of NASA battery technology program
26 p0302 N80-20821
NATURAL GAS
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141
Mixture properties for hydrogen supplementation of natural gas
26 p0201 A80-23159
The role of navigation satellites in oil exploration
26 p0222 A80-25152
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276
Oil and gas replacement cost: Development and production. Volume 1: Discussion of methodology, exhibits, and projections
[DOE/TIC-10078] 26 p0258 N80-16187
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410
Subsurface stratigraphy of the Middle and Upper Devonian clastic sequence in southern West Virginia and its relation to gas production
26 p0273 N80-16628
Report on the gas supply industry
[EHG-027] 26 p0286 N80-18579
Analysis of current trends in U.S. petroleum and natural gas production
[PB80-116056] 26 p0301 N80-20800
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons
[ORO-5205-10] 26 p0310 N80-20973
NAVIGATION SATELLITES
The role of navigation satellites in oil exploration
26 p0222 A80-25152
NAVSTAR SATELLITES
GPS application to seismic oil exploration
26 p0222 A80-25159
NEAR WAKES
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818
NEODYMIUM LASERS
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

NEUTRAL BEAMS
- Low-density ignition scenarios in injection-heated tokamaks 26 p0213 A80-24482
- Beam and plasma direct converters 26 p0215 A80-24671
- Neutral beam injectors 26 p0215 A80-24675
- Neutral-beam injection calculations for torsatrons --- plasma heating effectiveness 26 p0224 A80-25479

NEVADA
- Assessment of low- to moderate-temperature geothermal resources of Nevada [NVO-01556-1] 26 p0301 N80-20792

NEW ENGLAND (US)
- Regional environment-energy data book: Northeast region [DOE/TIC-10114/3] 26 p0279 N80-17578
- A feasibility study of windpower for the New England area [AD-A076614] 26 p0286 N80-18568

NEW HAMPSHIRE
- Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard [AD-A076975] 26 p0303 N80-20868

NEW MEXICO
- Test results of the DOE/Sandia 17 meter VAWT 26 p0262 N80-16465
- Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico 26 p0262 N80-16470
- Evaluation of an operating MOD-OA 200 kW wind turbine blade 26 p0262 N80-16471
- Environmental system study on the development of fossil fuel resources in the Southwest [PB-300526/1] 26 p0272 N80-16596
- Bibliography of geology and hydrology, eastern New Mexico [PB-300832/3] 26 p0273 N80-16663
- An economical solar heated and cooled residence for southern New Mexico [PB80-108616] 26 p0309 N80-20914

NEW YORK
- A comparative study of the energy alternatives for the State of New York 26 p0302 N80-20807

NEW ZEALAND
- Wind energy research and development at Lincoln 26 p0211 A80-23535

NICKEL
- Nickel pigmented anodic aluminum oxide for selective absorption of solar energy 26 p0209 A80-23499
- Exploratory studies in catalytic coal liquefaction [EPRI-AF-1184] 26 p0299 N80-20422

NICKEL ALLOYS
- Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys 26 p0202 A80-23169

NICKEL CADMIUM BATTERIES
- Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves 26 p0232 A80-28016

NICKEL COMPOUNDS
- The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions 26 p0196 A80-23111
- Development of low cost nickel-rare earth hydrides for hydrogen storage 26 p0202 A80-23170
- Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds 26 p0206 A80-23203

NICKEL OXIDES
- Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves 26 p0232 A80-28016

NIOBIUM
- Hysteresis in metal/hydrogen systems 26 p0246 A80-29725

NITRIC OXIDE
- Cogeneration of electric energy and nitric oxide 26 p0255 A80-32412
- Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion [NASA-TM-81472] 26 p0315 N80-21837

NITROGEN
- Nitrogen reducing solar cells 26 p0244 A80-29059

NITROGEN OXIDES
- Simplified correlations for prediction of NO/x/ emissions from MHD power plants 26 p0227 A80-26001
- Environmental assessment of stationary source NOx control technologies [PB-300469/4] 26 p0272 N80-16601
- Evaluation of a photochemical system for nitrogen oxides control --- coal fired boilers 26 p0287 N80-18583

NONAQUEOUS ELECTROLYTES
- Present state and outlook of the electrolytic H2-production route 26 p0195 A80-23104
- Development of Billings SPE electrolyzer --- for hydrogen production 26 p0196 A80-23117

NONEQUILIBRIUM PLASMAS
- Decomposition of water in a nonequilibrium plasma 26 p0185 A80-21881
- Plasmochemical cycle of hydrogen production from the water 26 p0200 A80-23149
- Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger 26 p0219 A80-25089

NONFERROUS METALS
- Survey on metallurgical recycling processes [ANL/CEPM-79-2] 26 p0282 N80-17918

NONUNIFORM FLOW
- End zone of a channel with segmented electrodes, carrying nonuniform flow --- current and potential fields in plasma 26 p0254 A80-32220

NONUNIFORM MAGNETIC FIELDS
- Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream 26 p0252 A80-31509

NORTH CAROLINA
- Measurements of wind shear at the Mod-1 Site, Boone, N.C --- for wind turbine [AIAA 80-0648] 26 p0240 A80-28828

NORTH DAKOTA
- Methanol derivation from North Dakota lignite and use as a fuel 26 p0230 A80-27417
- Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming [DOE/TIC-10190] 26 p0306 N80-20895

NUCLEAR ELECTRIC POWER GENERATION
- Sweden beyond oil - Nuclear commitments and solar options 26 p0255 A80-32410
- Study of a French national energy system based on coal and nuclear energy 26 p0255 A80-32500
- Environmental development plan for space applications --- development of nuclear power supplies for use in space [DOE/EDP-0057] 26 p0309 N80-20922

NUCLEAR ENERGY
- Production of synthetic gas from nuclear energy sources [LA-7592-MS] 26 p0274 N80-17244

NUCLEAR FISSION
- Hydrogen production from nuclear fission product waste heat and use in gas turbines 26 p0195 A80-23106

NUCLEAR FUSION
- Direct energy conversion systems [COO-2218-117] 26 p0269 N80-16543
- Fusion technology development [DOE/ET-0116/1] 26 p0311 N80-21165

NUCLEAR HEAT
- Nuclear energy as a primary energy source for hydrogen production 26 p0194 A80-23102
- Nuclear methane reforming for coal gasification 26 p0195 A80-23105

NUCLEAR POWER PLANTS
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877
Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy
26 p0185 A80-21879
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656
Factors affecting potential market penetration of laser fusion power plants
[PNL-2803] 26 p0269 N80-16552

NUCLEAR POWER REACTORS
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656

NUCLEAR PROPELLED AIRCRAFT
The changing horizons for technical progress. II
26 p0229 A80-27270

NUCLEAR PUMPED LASERS
Hydrogen production from water using fission-pumped laser
26 p0206 A80-23200

NUCLEAR RADIATION
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656

NUCLEAR REACTORS
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code --- improved computer program for hydrogen production and nuclear reactor-chemical plant coupling processes
26 p0205 A80-23192

NUCLEAR RESEARCH
US tokamak research
26 p0226 A80-25777

NUMERICAL CONTROL
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903
Photovoltaic cost blitz spawns new silicon processes
26 p0186 A80-21913

O

OCEAN THERMAL ENERGY CONVERSION
OTEC for hydrogen production
26 p0195 A80-23109
Advances in energy systems and technology. Volume 2 --- Book
26 p0207 A80-23218
Sea thermal power - Competitive electricity and chemicals from the sea
26 p0207 A80-23220
The OTEC connection - Power from the sea
26 p0222 A80-25115
The MINI-OTEC test
26 p0232 A80-28259
Coriolis Program - A review of the status of the ocean turbine energy system
26 p0233 A80-28261
Solar sea power plants. Citations from the NTIS data base
[PB80-802590] 26 p0297 N80-19661
Solar seapower plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662
Analysis of a heat exchanger-thermoelectric generator system
[SERI/TP-35-253] 26 p0316 N80-21848

OCEANOGRAPHY
OCEANS '79; Proceedings of the Fifth Annual Combined Conference, San Diego, Calif., September 17-19, 1979
26 p0232 A80-28251

OFFSHORE ENERGY SOURCES
The role of navigation satellites in oil exploration
26 p0222 A80-25152
GPS application to seismic oil exploration
26 p0222 A80-25159
Offshore wind energy conversion systems
[AIAA 80-0619] 26 p0241 A80-28839
New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems
[AIAA 80-0620] 26 p0241 A80-28840
Outer continental shelf environment monitoring concerns
[PB-299861/5] 26 p0273 N80-16625

OHMIC DISSIPATION
Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator
26 p0219 A80-25090

OIL EXPLORATION
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
The price of oil in the year 2000
[AAS 79-172] 26 p0215 A80-24717
The role of navigation satellites in oil exploration
26 p0222 A80-25152
GPS application to seismic oil exploration
26 p0222 A80-25159
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276
Oil and gas replacement cost: Development and production. Volume 1: Discussion of methodology, exhibits, and projections
[DOE/TIC-10078] 26 p0258 N80-16187
Energy from the situ processing of antrim oil shale
[FE-2346-44] 26 p0278 N80-17576
Computation of synthetic seismograms by the method of characteristics --- geophysical prospecting
26 p0287 N80-18593
Analysis of current trends in U.S. petroleum and natural gas production
[PB80-116056] 26 p0301 N80-20800

OIL FIELDS
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801
Adequacy analysis of air quality monitoring activities relevant to California thermal enhanced oil recovery fields
[SAN-12093-1] 26 p0309 N80-20929

OIL RECOVERY
Turbulent flows through annular spaces
26 p0250 A80-30614
Petroleum production at maximum efficient rate, Naval Petroleum Reserve no. 1 (Elk Hills), Kern County, California
[DOE/EIS-0012] 26 p0272 N80-16581
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801
Adequacy analysis of air quality monitoring activities relevant to California thermal, enhanced oil recovery fields
[SAN-12093-1] 26 p0309 N80-20929
Projections of enhanced oil recovery, 1985 - 1995
[DOE/EIA-0183/11] 26 p0314 N80-21824

OILS
Oils and rubber from arid land plants
26 p0253 A80-32055

OPERATIONS RESEARCH
Methodology for evaluating physical constraints on residential solar energy use
[UCRL-15001] 26 p0307 N80-20901

OPTICAL EMISSION SPECTROSCOPY
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481

OPTICAL PROPERTIES
Technology and performance of a high concentration solar cell power supply
26 p0226 A80-25886
Selective optical surfaces for solar energy convertors --- Russian book
26 p0228 A80-26511

Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893

OPTICAL PUMPING
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

OPTIMAL CONTROL
Optimal controllers of the second kind --- for flat plate solar collectors
26 p0184 A80-21112
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976

OPTIMIZATION
Antireflection coatings on solar cells
26 p0186 A80-21914
The temperature dependence of the characteristics of sputtered a-Si-H solar cells
26 p0187 A80-21920
Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887
The potential for optimizing the economics of wind energy utilization on a dairy farm through load management
[AIAA 80-0640] 26 p0241 A80-28838
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474

ORBITAL ASSEMBLY
The development of solar power satellites
26 p0207 A80-23219

ORGANIC COMPOUNDS
Organic photochemical storage of solar energy
[COO-4380-2] 26 p0267 N80-16527

ORGANIC LITHIUM COMPOUNDS
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions
26 p0247 A80-29894

ORGANIC MATERIALS
Application of black-liquor boiler technology to MHD heat and seed recovery equipment design
26 p0217 A80-25070

ORGANIC WASTES (FUEL CONVERSION)
Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938
Biogas - Fuel of the future
26 p0227 A80-26175
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099
Environmental and economic evaluations of energy recovery from agricultural and forestry residues
[ANL/EES/TM-58] 26 p0297 N80-19668
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428

ORGANOMETALLIC COMPOUNDS
The application of chromatography and ancillary techniques to the characterization of shale oil/oil shale compound classes and of organometallics
26 p0282 N80-18125

OTTO CYCLE
Electronic fuel injection techniques for hydrogen powered I.C. engines
26 p0206 A80-23205
Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472

OUTGASSING
Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456

OXIDATION
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139

OXIDATION-REDUCTION REACTIONS
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557

OXIDE FILMS
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444

OXYGEN
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330
Experiments on H2-O2MHD power generation
[NASA-TM-81424] 26 p0273 N80-16886

OXYGEN PRODUCTION
The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions
26 p0196 A80-23111
Electrodes for generation of hydrogen and oxygen for seawater
26 p0196 A80-23115

P

P-N JUNCTIONS
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
Photovoltaics. II - Flat panels
26 p0214 A80-24532
MOS and oxide-charge-induced /OCI/ BSF solar cells
26 p0234 A80-28337
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966
The spectral response of a front surface field solar cell
26 p0254 A80-32331
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609

P-N-P JUNCTIONS
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089

PACIFIC NORTHWEST (US)
Regional environment-energy data book: Northwest region
[DOE/TIC-10114/5] 26 p0281 N80-17599

PALLADIUM
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725

PALLADIUM ALLOYS
The significance of studies with palladium to basic problems of electrolytic hydrogen evolution
26 p0196 A80-23114

PANELS
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

PARABOLIC REFLECTORS
Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772

PARABOLOID MIRRORS
Industrial solar thermal concentrators
26 p0189 A80-21953
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021
PARAFFINS
Analysis of the geothermal binary cycle using paraffin hydrocarbons as working fluids
26 p0285 N80-18553
PARTIAL DIFFERENTIAL EQUATIONS
Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction
26 p0228 A80-26681
Application of computer models to the retorting of oil shale
26 p0228 A80-26708
PARTICLE DIFFUSION
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482
PARTICLE SIZE DISTRIBUTION
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071
PASSENGER AIRCRAFT
Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990
PATTERN RECOGNITION
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
PEAT
Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412
PENNSYLVANIA
Installation guidelines for solar heating system, single-family residence at New Castle, Pennsylvania
[NASA-CR-161355] 26 p0293 N80-19630
PERFORMANCE
Solar energy system performance evaluation: A seasonal report for SEMCO, Macon, Georgia
[NASA-CR-161380] 26 p0293 N80-19629
PERFORMANCE PREDICTION
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
The STD/MHD codes - Comparison of analyses with experiments --- MHD generator performance prediction and tests
[AIAA PAPER 80-0024] 26 p0212 A80-23953
Design description and performance predictions for the first CDIF power train --- MHD generator combustor, power channel and diffusers
26 p0216 A80-25062
Simplified correlations for prediction of NO/x/ emissions from MHD power plants
26 p0227 A80-26001
Flap type weather proof ocean wave energy converter
26 p0232 A80-28258
Model wind rotors in wind tunnels - Performance and the effect of Reynolds number
[AIAA 80-0623] 26 p0238 A80-28815
Gust models for design and performance analyses of wind turbines
[AIAA 80-0644] 26 p0240 A80-28833
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379
PERFORMANCE TESTS
The STD/MHD codes - Comparison of analyses with experiments --- MHD generator performance prediction and tests
[AIAA PAPER 80-0024] 26 p0212 A80-23953
Long duration channel development and testing --- for MHD generator electrode corrosion measurement
26 p0216 A80-25063
Local analysis of electrical performance of the U-25B generator --- MHD generator
26 p0216 A80-25066
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885
Technology and performance of a high concentration solar cell power supply
26 p0226 A80-25886
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887
Tubular solar collector
26 p0231 A80-27730
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824
UTRC 8 kW wind turbine tests
[AIAA 80-0657] 26 p0240 A80-28831
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836
Aerodynamic performance of the DOE/Sandia 17-m vertical axis wind turbine in the two-bladed configuration
[AIAA 80-0655] 26 p0241 A80-28842
Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772
Measurement of heliostat performance characteristics
26 p0250 A80-30773
Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465
Performance sensitivity analysis of Department of Energy-Chrysler upgraded automotive gas turbine engine, S/N 5-4
[NASA-TM-79242] 26 p0274 N80-17467
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas
[AD-A076145] 26 p0284 N80-18411
Solar energy system performance evaluation: Seasonal report for SEMCO, Loxahatchee, Florida
[NASA-CR-161379] 26 p0293 N80-19627
PERIODICALS
Energy information data base
[DOE/TIC-4579-R10-SUPPL-6] 26 p0305 N80-20881
PERSIAN GULF
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276
PETROLEUM PRODUCTS
Aggregated vectorial model of petroleum flow in the United States
[LBL-8874] 26 p0258 N80-16178
PHASE TRANSFORMATIONS
Solvolysis liquefaction of coal
26 p0187 A80-21926
Thermal storage in density-stratified fluids and phase-change materials
26 p0225 A80-25496
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725
PHOSPHORUS
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

PHOTOCHEMICAL REACTIONS
Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions
26 p0184 A80-21116
On the potential of solar energy conversion into hydrogen and/or other fuels
26 p0195 A80-23107
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6 --- hydrogen production
26 p0200 A80-23144
Photochemical production of hydrogen from water
26 p0201 A80-23154
A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055
Nitrogen reducing solar cells
26 p0244 A80-29059
Photosensitization mechanisms for energy storing isomerizations
26 p0244 A80-29060
The norbornadiene-quadricyclene energy storage system
26 p0244 A80-29061
Organic photochemical storage of solar energy
[COO-4380-2] 26 p0267 N80-16527
Photochemical conversion of coal to gasoline in an entrained bed reactor
26 p0283 N80-18202
Evaluation of a photochemical system for nitrogen oxides control --- coal fired boilers
26 p0287 N80-18583
Photochemical conversion of coal to gasoline in an entrained bed reactor
[ORO-5020-T1] 26 p0299 N80-20415

PHOTOCONDUCTIVITY
Organic photochemical storage of solar energy
[COO-4380-2] 26 p0267 N80-16527

PHOTODECOMPOSITION
Solar hydrogen energy
26 p0185 A80-21878
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis
26 p0225 A80-25679

PHOTOELECTRIC GENERATORS
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026

PHOTOELECTRICITY
Photovoltaic effect, its present understanding and remaining mysteries
[DOE/ET-23103/6] 26 p0268 N80-16535

PHOTOELECTROCHEMICAL DEVICES
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
A speculation on a general photoelectrochemical reactor
26 p0193 A80-22794
Hydrogen generation via photoelectrolysis of water - Recent advances
26 p0200 A80-23152
Photoelectrochemical generation of hydrogen with hybrid electrodes
26 p0200 A80-23153
Photoelectrochemical cells --- with photoactive semiconducting electrodes
26 p0210 A80-23520
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
Hydrogen energy research programs in Japan
26 p0233 A80-28271
Solar energy: Chemical conversion and storage --- Book
26 p0243 A80-29051
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
26 p0243 A80-29056
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes
26 p0243 A80-29057
The norbornadiene-quadricyclene energy storage system
26 p0244 A80-29061
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897

PHOTOELECTRON SPECTROSCOPY
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897

PHOTOGEOLOGY
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

PHOTOINTERPRETATION
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

PHOTOLUMINESCENCE
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

PHOTOLYSIS
Photochemical production of hydrogen from water
26 p0201 A80-23154
Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

PHOTOMAPPING
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

PHOTOSENSITIVITY
Photosensitization mechanisms for energy storing isomerizations
26 p0244 A80-29060
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668

PHOTOSYNTHESIS
Bio-solar hydrogen production
26 p0201 A80-23155
Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems
26 p0201 A80-23156
Energy from the biological conversion of solar energy
26 p0210 A80-23522
Petroleum plantations
26 p0243 A80-29052
Solar energy conversion in photosynthesis - Features relevant to artificial systems for the photochemical conversion of solar energy
26 p0243 A80-29053
Photobiological production of hydrogen
26 p0247 A80-29920
Plant power fuels hydrogen production
26 p0249 A80-30465

PHOTOTHERMAL CONVERSION
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325
Technology assessment: Line-focus concentrators
[SAND-79-2221C] 26 p0318 N80-21871
PHOTOVOLTAGES
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
PHOTOVOLTAIC CELLS
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
Photovoltaic cost blitz spawns new silicon processes
26 p0186 A80-21913
Unique high concentration solar test facility
26 p0186 A80-21916
An overview of photovoltaic market research
26 p0186 A80-21917
Heterojunction solar cells
26 p0210 A80-23519
Photoelectrochemical cells --- with photoactive semiconducting electrodes
26 p0210 A80-23520
Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Photovoltaics. II - Flat panels
26 p0214 A80-24532
Photovoltaics. III - Concentrators
26 p0214 A80-24533
Photovoltaics. IV - Advanced materials
26 p0214 A80-24534
Photovoltaics. V - Amorphous silicon cells
26 p0214 A80-24535
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
Lead-acid batteries for remote photovoltaic applications
26 p0232 A80-28014
Photovoltaic power for telecommunications
26 p0232 A80-28015
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes
26 p0243 A80-29057
Growth and characterization of thin film III-V compound semiconductor material for solar cell applications
26 p0244 A80-29058
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394
Photovoltaic hybrid collectors
26 p0245 A80-29396
The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells
26 p0251 A80-30939
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
26 p0253 A80-31900
Evaluation of concentrated space solar arrays using computer modeling --- for spacecraft propulsion and power supplies
[NASA-CR-162681] 26 p0264 N80-16487
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
Federal photovoltaics utilization program
[DOE/EA-0087] 26 p0267 N80-16525
Low-cost structures for photovoltaic arrays
[SAND-79-7006] 26 p0268 N80-16537
Assessment of low-cost manufacturing process sequences --- photovoltaic solar arrays
[NASA-CR-162745] 26 p0278 N80-17575
Economic analysis of the design and fabrication of a space qualified power system
[NASA-TM-81418] 26 p0282 N80-18098
LSA field test
[NASA-CR-162798] 26 p0291 N80-19611
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-162840] 26 p0292 N80-19617
On influencing the operating temperatures of Motorola and Arco solar photovoltaic modules
[COO-4094-59] 26 p0295 N80-19649
Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base
[PB80-802218] 26 p0296 N80-19656
Comparison of theoretical and experimental solar cell performance
26 p0301 N80-20806
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812
The Exxon rechargeable cells --- solar rechargeable clocks
26 p0303 N80-20834
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899
PHOTOVOLTAIC CONVERSION
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells
26 p0228 A80-27057
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908
Solar generators for terrestrial use
26 p0245 A80-29384
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-57] 26 p0265 N80-16501
Solar photovoltaic field tests and applications project
[COO-4094-26] 26 p0266 N80-16512
Proceedings: Photovoltaics user Review Panel
[SERI/TP-69-276] 26 p0266 N80-16514
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550
Photovoltaic conversion research and development in the United Kingdom
[RAE-TM-SPACE-247] 26 p0279 N80-17583
PHOTOVOLTAIC EFFECT
The temperature dependence of the characteristics of sputtered a-Si-H solar cells
26 p0187 A80-21920
Photovoltaic effect, its present understanding and remaining mysteries
[DOE/ET-23103/6] 26 p0268 N80-16535
Criteria for an ideal solar photovoltaic powered industry
[HCP/T5433-01] 26 p0279 N80-17577
PHYSICAL CHEMISTRY
The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[FE-2449-9] 26 p0288 N80-19298
PHYSICAL PROPERTIES
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183
PIGMENTS
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026
PILOT PLANTS
Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938

Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097
The transition MHD power plant concept
26 p0221 A80-25104
The MINI-OTEC test
26 p0232 A80-28259
Conceptual design of a coal-to-methanol-to-gasoline commercial plant: Executive summary
[FE-2416-43] 26 p0258 N80-16182
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305
Synthesis gas demonstration plant program, phase 1
[FE-25770-6] 26 p0289 N80-19308

PIPE FLOW
Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158

PIPELINES
Storage, transmission and distribution of hydrogen
26 p0194 A80-23103
Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158
The cryogenic storage of hydrogen
26 p0202 A80-23162

PIPES (TUBES)
Tubular solar collector
26 p0231 A80-27730
Performance calculations of tubular cover collectors
26 p0248 A80-29924

PISTON ENGINES
A magnetohydrodynamic piston engine
26 p0254 A80-32221
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612

PITCH (INCLINATION)
System configuration improvement
26 p0263 N80-16481

PITTING
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474

PLANTS (BOTANY)
Oils and rubber from arid land plants
26 p0253 A80-32055
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545

PLASMA CHEMISTRY
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149

PLASMA COMPOSITION
Neutral beam injectors
26 p0215 A80-24675
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481

PLASMA CONTROL
Gradient bounds for plasma confinement
26 p0213 A80-24223
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498
The physics of field reversed mirrors
26 p0214 A80-24664
Tandem mirror reactors
26 p0215 A80-24667
Field-reversed mirror reactor
26 p0215 A80-24668
Beam and plasma direct converters
26 p0215 A80-24671
Superconducting magnets for mirror machines
26 p0215 A80-24672
Plasma parametric studies and potential applications of driven fusion reactors
26 p0215 A80-24674
Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472
Shape control of doublets --- for tokamak plasma stability control
26 p0223 A80-25473
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
Active burn control of nearly ignited plasmas
26 p0224 A80-25480
Controlled fusion research in China
26 p0226 A80-25786
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
Interchange stability of axisymmetric field reversed equilibria --- in plasma control with magnetic mirror
26 p0250 A80-30552

PLASMA CYLINDERS
Toroidal Trivelpiece-Gould modes --- quasi-electrostatic approximation for electron plasma waves in fusion reactor
26 p0189 A80-22042

PLASMA DENSITY
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478

PLASMA DIAGNOSTICS
Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086
Experiments concerning inhomogeneities in combustion MHD generators
26 p0221 A80-25107
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478

PLASMA DIFFUSION
Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482

PLASMA ELECTRODES
End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes
26 p0193 A80-22793
Long duration channel development and testing --- for MHD generator electrode corrosion measurement
26 p0216 A80-25063
Electrical characteristics of an arc-mode slagging electrode generator --- in Faraday MHD generators
26 p0216 A80-25064
The effect of electrochemical and arcing phenomena on electrode performance --- in coal-fired MHD generators
26 p0218 A80-25080

Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093
End zone of a channel with segmented electrodes, carrying nonuniform flow --- current and potential fields in plasma
26 p0254 A80-32220

PLASMA EQUILIBRIUM
MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation
26 p0209 A80-23366
Interchange stability of axisymmetric field reversed equilibria --- in plasma control with magnetic mirror
26 p0250 A80-30552

PLASMA FLUX MEASUREMENTS
Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel
26 p0217 A80-25069

PLASMA FOCUS
Application of plasma focus device to compression of toroidal plasma
26 p0229 A80-27058

PLASMA FREQUENCIES
Toroidal Trivelpiece-Gould modes --- quasi-electrostatic approximation for electron plasma waves in fusion reactor
26 p0189 A80-22042

PLASMA HEATING
MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation
26 p0209 A80-23366
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482
Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089
Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator
26 p0219 A80-25090
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472
Shape control of doublets --- for tokamak plasma stability control
26 p0223 A80-25473
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474
Neutral-beam injection calculations for torsatrons --- plasma heating effectiveness
26 p0224 A80-25479
Active burn control of nearly ignited plasmas
26 p0224 A80-25480

PLASMA JETS
Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357

PLASMA PHYSICS
European Conference on Controlled Fusion and Plasma Physics, 9th, Oxford, England, September 17-21, 1979, Invited Papers
26 p0225 A80-25771
US tokamak research
26 p0226 A80-25777

PLASMA RESONANCE
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483

PLASMA SPECTRA
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481

PLASMA TURBULENCE
Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276

PLASMA WAVES
Toroidal Trivelpiece-Gould modes --- quasi-electrostatic approximation for electron plasma waves in fusion reactor
26 p0189 A80-22042
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276

PLASMA-ELECTROMAGNETIC INTERACTION
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475
Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream
26 p0252 A80-31509

PLASMA-PARTICLE INTERACTIONS
Neutral-beam injection calculations for torsatrons --- plasma heating effectiveness
26 p0224 A80-25479
Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas
26 p0229 A80-27263

PLASTIC COATINGS
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-3] 26 p0285 N80-18556

PLASTIC PROPERTIES
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

PLATFORMS
Free space microwave power transmission systems for microwave powered atmospheric platforms
26 p0228 A80-26813

PLATINUM
Electrolysis of hydrobromic acid --- hybrid cycle for hydrogen production
26 p0198 A80-23129
Optimization of Pt-doped Kocite (trade name) electrodes in H3Po4 fuel cells
[AD-A075372] 26 p0294 N80-19639

PLUMES
Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170

PLUTONIUM OXIDES
Environmental development plan for space applications --- development of nuclear power supplies for use in space
[DOE/EDP-0057] 26 p0309 N80-20922

PNEUMATIC EQUIPMENT
Economically working big scale solar power stations pneumatic light-weight construction
26 p0208 A80-23326

POLES (SUPPORTS)
Shadow effect of adjacent solar collectors in large scale systems
26 p0183 A80-21107

POLITICS
United States energy policy - The continuing failure
26 p0185 A80-21766
Power consumption in the high-tension field between the government's responsibility to provide energy and politics
26 p0185 A80-21846

POLLUTION CONTROL
Health benefits derived from a planned hydrogen community
26 p0205 A80-23193

Power plant impacts on visibility in the west - Siting and emissions control implications
26 p0216 A80-24735
An evaluation of candidate seed processing systems for open cycle MHD --- sulfur removal and control
26 p0217 A80-25072
Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471
Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602
Evaluation of a photochemical system for nitrogen oxides control --- coal fired boilers
26 p0287 N80-18583
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310
Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes
[PB80-108566] 26 p0297 N80-19678
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949
Hot gas cleanup process
[PB80-108467] 26 p0310 N80-20950
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV
[PB80-134729] 26 p0320 N80-21913

POLLUTION MONITORING
Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690
Outer continental shelf environment monitoring concerns
[PB-299861/5] 26 p0273 N80-16625
Adequacy analysis of air quality monitoring activities relevant to California thermal enhanced oil recovery fields
[SAN-12093-1] 26 p0309 N80-20929
Light-duty diesel gaseous emissions measurement - comparison of dilution tunnel test results to certification cell test results
[PB80-115991] 26 p0310 N80-20945

POLYCRYSTALS
Grain size and its influence on efficiency in polycrystalline GaAs solar cells
26 p0186 A80-21919
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444
Photovoltaic Materials and Device Measurements Workshop: Focus on polycrystalline thin film cells
[SERI/TP-49-185] 26 p0268 N80-16538

POLYESTER RESINS
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports
26 p0191 A80-22690

POLYMERIC FILMS
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091

POLYMERS
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172

POPULATION THEORY
Perspective on world energy
[DOE/TIC-10273] 26 p0307 N80-20898

POPULATIONS
A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920

POROUS MATERIALS
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis
26 p0196 A80-23113

POSITIONING DEVICES (MACHINERY)
Solar-powered sun tracker
[AD-A078653] 26 p0294 N80-19640

POTASSIUM COMPOUNDS
An evaluation of candidate seed processing systems for open cycle MHD --- sulfur removal and control
26 p0217 A80-25072

POTENTIAL ENERGY
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106
Energy storage --- Book
26 p0184 A80-21123

POTENTIAL FLOW
A comparison of aerodynamic analyses for the Darrieus Rotor
[AIAA 80-0605] 26 p0237 A80-28802

POTENTIOMETRIC ANALYSIS
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167

POWER CONDITIONING
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093
PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record
26 p0242 A80-28892
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908
Workshop on Power Conditioning for Alternative Energy Technologies, executive summary
[SERI-TP-35-217-PT-25] 26 p0265 N80-16505
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609
Measurement techniques for high power semiconductor materials and devices
[DOE/RA-0041] 26 p0301 N80-20506

POWER EFFICIENCY
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881
Possible use of honeycomb-type structures for high power batteries and fuel cells
26 p0190 A80-22169
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819

Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897
Characteristics of Salter's cam for extracting energy from ocean waves
26 p0251 A80-30802
Performance characteristics of a commercially available point-focus solar power --- systems analysis of a solar energy conversion system in terms of power efficiency and energy conversion efficiency
[SERI/TP-34-169] 26 p0268 N80-16529
Effect of geometry and operating conditions on spur gear system power loss
[NASA-TM-81426] 26 p0284 N80-18406
On influencing the operating temperatures of Motorola and Arco solar photovoltaic modules
[COO-4094-59] 26 p0295 N80-19649
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272

POWER PLANTS
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649

POWER SUPPLY CIRCUITS
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812
The application of DC-DC energy conversion in a solar energy system
[AD-A077112] 26 p0303 N80-20867

PRESSURE DROP
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076

PRESSURE EFFECTS
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371

PRESSURE OSCILLATIONS
Fluctuations in combustion MHD generator systems
26 p0221 A80-25105
Fluctuations in MHD generators
26 p0221 A80-25106

PRESSURE REDUCTION
Turbulent flows through annular spaces
26 p0250 A80-30614

PROCESS CONTROL (INDUSTRY)
The evolution of a large laser control system - From Shiva to Nova
26 p0185 A80-21901
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes
[PB80-108566] 26 p0297 N80-19678
Advanced coal gasification system for electric power generation, FY 1978
[FE-1514-93] 26 p0313 N80-21554
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AF-1227] 26 p0314 N80-21558

PRODUCT DEVELOPMENT
Superconducting MHD magnets - Technology development, procurement and the path to commercial scale
26 p0218 A80-25077
Possibilities and limits of the conception of an up-to-date compact vehicle for the nineties
26 p0236 A80-28481
The contribution of Volkswagenwerk AG to the automobile concept of the 90's
26 p0236 A80-28482
Electric vehicle in Japan
26 p0236 A80-28484
Future prospects for use of the gas turbine for automobiles
26 p0236 A80-28485
Proceedings of the 13th Project integration meeting
[NASA-CR-162787] 26 p0276 N80-17549
Development of improved wraparound contacts for silicon
[NASA-CR-159748] 26 p0285 N80-18554
Low cost point focus solar concentrator, phase 1
[NASA-CR-162848] 26 p0292 N80-19624
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838
Solar Central Receiver prototype heliostat, volume 1
[SAN-1604-1] 26 p0316 N80-21846

PRODUCTION ENGINEERING
Photovoltaic cost blitz spawns new silicon processes
26 p0186 A80-21913
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
Use of solar energy under terrestrial conditions - Automated production of solar generator components
26 p0229 A80-27204
Present state and future prospects of thermochemical hydrogen production
26 p0233 A80-28272
Processing of solid fossil-fuel deposits by electrical induction heating
26 p0242 A80-29007
Survey of potential chlorine production processes --- for energy efficiency
[ANL/OEPM-79-1] 26 p0257 N80-16131
Coal gasification
[DOE/ET-0067/3] 26 p0258 N80-16184
Alcoa wind turbines
26 p0261 N80-16464
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-162904] 26 p0302 N80-20814
Benefits of increased use of continuous casting by the United States steel industry
[PB80-104904] 26 p0314 N80-21612
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

PRODUCTIVITY
Projections of enhanced oil recovery, 1985 - 1995
[DOE/EIA-0183/11] 26 p0314 N80-21824

PROJECT MANAGEMENT
Overview of Federal wind energy program
26 p0261 N80-16454

PROJECT PLANNING
Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449
Hydrothermal electric and direct heat. Commercialization phase 3 planning
[DOE/SRD-0005] 26 p0269 N80-16545

PROPELLER BLADES
Torsional oscillations of the rotor disc for horizontal axis wind turbines with hinged or teetered blades, Part 12
[FFA-TN-AU-1499-PT-12] 26 p0319 N80-21881

PROPELLERS
The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology
26 p0196 A80-23110

PROPULSION SYSTEM CONFIGURATIONS
Future large cargo aircraft technology
26 p0229 A80-27269
International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies
26 p0235 A80-28470
Advanced electric propulsion system concept for electric vehicles
[NASA-CR-159651] 26 p0282 N80-17916
Fuel economy screening study of advanced automotive gas turbine engines
[NASA-TM-81433] 26 p0311 N80-21201
Energy storage systems for automobile propulsion
[UCID-18320] 26 p0312 N80-21211
Advanced automotive propulsion systems: Incentive financing
[CONS-5181-1] 26 p0321 N80-22128

PROPULSION SYSTEM PERFORMANCE
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471

PROTOTYPES
SWECS qualifications criteria for state tax incentive programs --- Small Wind Energy Conversion System
[AIAA 80-0650] 26 p0240 A80-28829
Specification, siting and selection of large WECS prototypes
26 p0261 N80-16459

PUBLIC HEALTH
Health benefits derived from a planned hydrogen community
26 p0205 A80-23193
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930

PULSED LASERS
Transverse self-focusing of a Gaussian beam - Moment method
26 p0229 A80-27195
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

PULSED RADIATION
Controlled fusion research in China
26 p0226 A80-25786

PUMPS
Pumped water storage
26 p0225 A80-25495
Solar powered liquid piston Stirling cycle irrigation pump
[SAN-1894-1] 26 p0294 N80-19641
Solar water pumps. Citations from the Engineering Index data base
[PB80-802531] 26 p0308 N80-20910

PURIFICATION
Electrical purifiers for dielectric fluids --- charged particle contaminants separation from fuels, oils and hydraulic fluids
26 p0254 A80-32287
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495

PYRHELIOMETERS
Normal incident solar radiation measurements at Upton, New York
[BNL-50939] 26 p0273 N80-16653

PYROLYSIS
In-situ combustion retorting of oil shale
26 p0192 A80-22764
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145
Thermoelectrochemical cycles for power and hydrogen production
26 p0201 A80-23157
Hydrogen energy research programs in Japan
26 p0233 A80-28271
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672

Q

QUALITY CONTROL
Qualification test procedures and results for Honeywell solar collector subsystem, single-family residence
[NASA-CR-161382] 26 p0302 N80-20813

QUARTZ TRANSDUCERS
High temperature electronics for geothermal energy
26 p0185 A80-21902

QUENCHING (ATOMIC PHYSICS)
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055

QUINOLINE
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292

R

RADIAL FLOW
Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483

RADIANT FLUX DENSITY
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287

RADIANT HEATING
Radiant heat for energy conservation
26 p0253 A80-32056

RADIATION DETECTORS
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656

RADIATION MEASUREMENT
Accuracies achievable with indirect measurements of the direct solar irradiance component
26 p0183 A80-21108
Estimation and prediction of global solar radiation over Greece
26 p0248 A80-29923
Normal incident solar radiation measurements at Upton, New York
[BNL-50939] 26 p0273 N80-16653

RADIATION TOLERANCE
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089

RADIATIVE HEAT TRANSFER
Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation --- Book
26 p0214 A80-24660
Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068
Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel
26 p0217 A80-25069

RADIATIVE TRANSFER
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573

RADIO ASTRONOMY
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525

RADIO FREQUENCY DISCHARGE
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483

RADIO FREQUENCY HEATING
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475

RADIO TELESCOPES
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525

RADIOACTIVE DECAY
Environmental development plan for space applications --- development of nuclear power supplies for use in space
[DOE/EDP-0057] 26 p0309 N80-20922

RADIOACTIVE WASTES
Space disposal of nuclear wastes
26 p0246 A80-29448

RADIOGRAPHY
Application of radiography to coal liquefaction
[SAND-79-1226C] 26 p0274 N80-17243

RADIOLYSIS
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201

RAFTS
Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design
26 p0251 A80-30804

RAIL TRANSPORTATION
Electric transport - The future prospects
26 p0189 A80-21956
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677
Light rail transit in the United States
26 p0252 A80-31770

RANKINE CYCLE
Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491
The 15 kW sub e (nominal) solar thermal electric power conversion concept definition study: Steam Rankine turbine system
[NASA-CR-159589] 26 p0264 N80-16493
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612

RAPID TRANSIT SYSTEMS
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677
The development of the magnetically suspended transportation system in the Federal Republic of Germany
26 p0235 A80-28458
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8] 26 p0274 N80-16974

RARE EARTH COMPOUNDS
Development of low cost nickel-rare earth hydrides for hydrogen storage
26 p0202 A80-23170

RARE GASES
Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086

REACTION KINETICS
The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions
26 p0196 A80-23111
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139
Hydrogen generation via photoelectrolysis of water - Recent advances
26 p0200 A80-23152
Photochemical production of hydrogen from water
26 p0201 A80-23154
Thermoelectrochemical cycles for power and hydrogen production
26 p0201 A80-23157
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions
26 p0247 A80-29894
Reaction kinetics between CO2 and oil-shale residual carbon. I - Effect of heating rate on reactivity
26 p0249 A80-30524
Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects
26 p0250 A80-30527
Reaction kinetics between steam and oil-shale residual carbon
26 p0250 A80-30528
Chemical kinetics in LNG detonations
[UCRL-82293-REV-1] 26 p0258 N80-16180
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292

REACTION WHEELS
Design and applications of flywheels, volume 1. Citations from the NTIS data base --- bibliographies
[PB80-900303] 26 p0280 N80-17591
Design and applications of flywheels, volume 2. Citations from the NTIS data base --- bibliographies
[PB80-800311] 26 p0280 N80-17592
Design and applications of flywheels. Citations from the Engineering Index data base --- bibliographies
[P80-800329] 26 p0280 N80-17593

REACTOR DESIGN
A speculation on a general photoelectrochemical reactor
26 p0193 A80-22794
Nuclear energy as a primary energy source for hydrogen production
26 p0194 A80-23102
A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482
Two-stroke tokamak reactor
26 p0213 A80-24487
Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978
26 p0214 A80-24661
The physics of field reversed mirrors
26 p0214 A80-24664
The mirror fusion test facility
26 p0214 A80-24665
The economic significance of Q for mirror reactors - Combinations of Q and M which look promising --- parameters affecting energy conversion efficiency in fusion reactor
26 p0215 A80-24666
Tandem mirror reactors
26 p0215 A80-24667
Field-reversed mirror reactor
26 p0215 A80-24668
Mirror hybrid reactors --- fusion-fission reactor design
26 p0215 A80-24670
Beam and plasma direct converters
26 p0215 A80-24671
Superconducting magnets for mirror machines
26 p0215 A80-24672

Plasma parametric studies and potential applications of driven fusion reactors
26 p0215 A80-24674
Neutral beam injectors
26 p0215 A80-24675
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626
Advanced development of a short-residence-time hydrogasifier
[FE-3125-5] 26 p0299 N80-20414

REACTOR MATERIALS
Material requirements for coal gasification
26 p0212 A80-23833
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160

REACTOR TECHNOLOGY
Non-electric fusion energy applications
26 p0215 A80-24676

RECEIVERS
Receiver assembly design studies for 2-m 90 deg parabolic-cylindrical solar collectors
[SAND-79-1026] 26 p0277 N80-17564

RECYCLING
Survey on metallurgical recycling processes
[ANL/OEPM-79-2] 26 p0282 N80-17918
Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap
26 p0290 N80-19492

REDUCTION (CHEMISTRY)
Nitrogen reducing solar cells
26 p0244 A80-29059

REFINING
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407

REFRACTORY METAL ALLOYS
Materials review for improved automotive gas turbine engine --- superalloys, refractory alloys, and ceramics
[NASA-CR-159673] 26 p0275 N80-17470

REFRIGERATING MACHINERY
Heat pumps --- Book
26 p0207 A80-23224

REGENERATION (ENGINEERING)
Regenerative energy sources --- technology impact on the Federal Republic of Germany
26 p0255 A80-32397
Regenerative burner system for thermoelectric power sources --- military equipment
[AD-A075955] 26 p0276 N80-17553

REGENERATIVE COOLING
Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522

REGIONAL PLANNING
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development --- for the generation of electric power
[DOE/ET-28432/1] 26 p0290 N80-19604
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 2: Regional program monitoring and progress evaluation --- for the generation of electric power
[DOE/ET-28432/2] 26 p0291 N80-19605
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation --- for generation of electric power
[DOE/ET-28432/3-1] 26 p0291 N80-19606
Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices --- for generation of electric power
[DOE/ET-28432/3-2] 26 p0291 N80-19607
Determining the feasibility of incorporating water resource constraints into energy models
[EPRI-EA-1147] 26 p0308 N80-20908

REGIONS
Regional environment-energy data book: Western region
[DOE/TIC-10114/2] 26 p0280 N80-17597
Regional environment-energy data book: Southern region
[DOE/TIC-10114/4] 26 p0281 N80-17598

RELATIVISTIC ELECTRON BEAMS
Progress in the production and energy flux concentration of the REB accelerator for ICF
26 p0226 A80-25785

RELIABILITY ENGINEERING
General reliability and safety methodology and its application to wind energy conversion systems
[SERI/TR-35-234] 26 p0294 N80-19645

REMOTE REGIONS
Lead-acid batteries for remote photovoltaic applications
26 p0232 A80-28014
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812

REMOTELY PILOTED VEHICLES
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
Power units for mini RPV's
26 p0246 A80-29662

RESEARCH AND DEVELOPMENT
Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449
Heat pumps --- Book
26 p0207 A80-23224
New standards in research and development
26 p0208 A80-23317
Exotic energy R&D has potential --- ocean wave and windpower utilization
26 p0213 A80-24124
National R&D program on MHD in Japan
26 p0220 A80-25100
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109
Current trends in the development of sodium-sulphur batteries
26 p0232 A80-28013
Stirling engine design and feasibility for automotive use --- Book
26 p0234 A80-28425
Future trends in the automobile
26 p0234 A80-28426
Air transport and travel in 2000 - Future requirements
26 p0234 A80-28427
The development of the magnetically suspended transportation system in the Federal Republic of Germany
26 p0235 A80-28458
Electric vehicle in Japan
26 p0236 A80-28484
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
Light rail transit in the United States
26 p0252 A80-31770
Advanced automotive propulsion systems: Incentive financing
[CONS-5181-1] 26 p0321 N80-22128

RESEARCH MANAGEMENT
Hydrogen energy research programs in Japan
26 p0233 A80-28271
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172
Coal gasification
[DOE/ET-0067/3] 26 p0258 N80-16184
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-79/1069/8] 26 p0271 N80-16563

Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909

RESEARCH VEHICLES

Marginal conditions in automobile construction and their implications on the design of upper-category vehicles
26 p0236 A80-28477

RESIDENTIAL AREAS

Federal demonstrations of solar heating and cooling on private residences: Only limited success
[PB-301123/6] 26 p0270 N80-16555

Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565

Overview of developing programs in solar desiccant cooling for residential buildings
[SERI/TP-34-187] 26 p0278 N80-17569

Characterization and assessment of selected solar thermal energy systems for residential and process heat applications
[LA-7995-TASE] 26 p0295 N80-19648

Geothermal energy market penetration: Development of a model for the residential section
[PB80-118359] 26 p0311 N80-21198

RESIDUES

Fluid coking of coal liquefaction residues: The fourth residue
[FE-2422-28] 26 p0289 N80-19304

RESISTANCE HEATING

MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation
26 p0209 A80-23366

Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator
26 p0219 A80-25090

RESOURCES MANAGEMENT

Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666

Analysis of current trends in U.S. petroleum and natural gas production
[PB80-116056] 26 p0301 N80-20800

Perspective on world energy
[DOE/TIC-10273] 26 p0307 N80-20898

Determining the feasibility of incorporating water resource constraints into energy models
[EPRI-EA-1147] 26 p0308 N80-20908

A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920

Geothermal energy: Obstacles and uncertainties impede its widespread use
[PB80-134430] 26 p0315 N80-21827

RETORT PROCESSING

In-situ combustion retorting of oil shale
26 p0192 A80-22764

Application of computer models to the retorting of oil shale
26 p0228 A80-26708

Oil shale processing technology
26 p0247 A80-29800

Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects
26 p0250 A80-30527

Reaction kinetics between steam and oil-shale residual carbon
26 p0250 A80-30528

RETROFITTING

The retrofit approach to MHD demonstration and commercialization --- for coal-fired MHD plants
26 p0221 A80-25102

REVERSE FIELD PINCH

The mirror fusion test facility
26 p0214 A80-24665

RIBBONS

Silicon ribbon growth using scanned lasers
26 p0229 A80-27337

RIDING QUALITY

Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990

RIGID ROTORS

WTG Energy Systems' MP1-200 200 kilowatt wind turbine generator --- a fixed pitch rotor configuration driving a synchronous generator
26 p0261 N80-16458

RIVER BASINS

Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433

ROTATING GENERATORS

Wind wheel electric power generator
[NASA-CASE-MFS-23515-1] 26 p0315 N80-21828

ROTATION

Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215

ROTOR AERODYNAMICS

Development of vertical axis wind turbines
26 p0187 A80-21929

Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept
26 p0211 A80-23533

Study of a vortex augmentor for a wind-powered turbine
26 p0227 A80-26002

A comparison of aerodynamic analyses for the Darrieus Rotor
[AIAA 80-0605] 26 p0237 A80-28802

Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[AIAA 80-0607] 26 p0237 A80-28804

Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data
[AIAA 80-0608] 26 p0237 A80-28805

Model wind rotors in wind tunnels - Performance and the effect of Reynolds number
[AIAA 80-0623] 26 p0238 A80-28815

New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems
[AIAA 80-0620] 26 p0241 A80-28840

Aerodynamic performance of the DOE/Sandia 17-m vertical axis wind turbine in the two-bladed configuration
[AIAA 80-0655] 26 p0241 A80-28842

WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473

Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497

ROTOR BLADES

Model wind rotors in wind tunnels - Performance and the effect of Reynolds number
[AIAA 80-0623] 26 p0238 A80-28815

Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836

A refined windmill rotor model
[AIAA 80-0628] 26 p0241 A80-28841

ROTOR BLADES (TURBOMACHINERY)

Coriolis Program - A review of the status of the ocean turbine energy system
26 p0233 A80-28261

Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463

Alcoa wind turbines
26 p0261 N80-16464

Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465

WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473

The use of wood for wind turbine blade construction
26 p0262 N80-16474

The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477

Status of the Southern California Edison Company 3 MW Wind Turbine Generator (WTG) demonstration project
26 p0263 N80-16478

System configuration improvement
26 p0263 N80-16481

Flutter analysis of small windturbine, designed for manufacture and use in developing countries
[UTH-LR-272] 26 p0284 N80-18415

ROTOR SPEED
A refined windmill rotor model
[AIAA 80-0628] 26 p0241 A80-28841
ROTORS
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613
Composite-laminate flywheel-rotor development program
[UCRL-83554] 26 p0317 N80-21855
RUBBER
Oils and rubber from arid land plants
26 p0253 A80-32055
RUBY LASERS
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915
RURAL AREAS
The potential for optimizing the economics of wind energy utilization on a dairy farm through load management
[AIAA 80-0640] 26 p0241 A80-28838

S

SAFETY DEVICES
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287
SAFETY FACTORS
Safety of liquid hydrogen in air transportation
[LA-UR-79-1416] 26 p0259 N80-16236
SAFETY MANAGEMENT
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656
General reliability and safety methodology and its application to wind energy conversion systems
[SERI/TR-35-234] 26 p0294 N80-19645
SAILS
New approaches to sailing
26 p0228 A80-26344
SALINITY
Non-convecting solar ponds
26 p0210 A80-23517
Salinity gradient energy conversion
26 p0233 A80-28262
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474
SATELLITE ANTENNAS
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
SATELLITE ORBITS
Solar power satellites and the ITU - Some U.S. policy options
26 p0223 A80-25253
SATELLITE POWER TRANSMISSION (TO EARTH)
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
The development of solar power satellites
26 p0207 A80-23219
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525
Solar power satellites and the ITU - Some U.S. policy options
26 p0223 A80-25253
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287
Solar power satellite system definition study, volume 4, phase 2
[NASA-CR-160565] 26 p0313 N80-21395
Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880
SATELLITE SOLAR POWER STATIONS
Space manufacturing, satellite power and human exploration
26 p0186 A80-21908
Solar power satellites and the ITU - Some U.S. policy options
26 p0223 A80-25253
Satellite solar power plants
26 p0252 A80-31200
Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880
SCALING LAWS
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938
Scaling MHD cyclone coal combustors
26 p0222 A80-25114
SCHOTTKY DIODES
Antireflection coatings on solar cells
26 p0186 A80-21914
The temperature dependence of the characteristics of sputtered a-Si-H solar cells
26 p0187 A80-21920
The doping of amorphous silicon for solar cells
26 p0187 A80-21921
Recombination in the space-charge region of Schottky barrier solar cells
26 p0207 A80-23272
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815
SCRAP
Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap
26 p0290 N80-19492
SEA WATER
The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology
26 p0196 A80-23110
Electrodes for generation of hydrogen and oxygen for seawater
26 p0196 A80-23115
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149
Characteristics of Salter's cam for extracting energy from ocean waves
26 p0251 A80-30802
Absorption of wave energy by elongated bodies --- in ocean water
26 p0251 A80-30805
SEISMOGRAMS
Computation of synthetic seismograms by the method of characteristics --- geophysical prospecting
26 p0287 N80-18593
SEISMOLOGY
GPS application to seismic oil exploration
26 p0222 A80-25159
SELENIUM
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653
SELF FOCUSING
Transverse self-focusing of a Gaussian beam - Moment method
26 p0229 A80-27195
SEMICONDUCTING FILMS
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014
Photoelectrochemical generation of hydrogen with hybrid electrodes
26 p0200 A80-23153
Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Photovoltaics. IV - Advanced materials
26 p0214 A80-24534
Photovoltaics. V - Amorphous silicon cells
26 p0214 A80-24535
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
Selective optical surfaces for solar energy convertors --- Russian book
26 p0228 A80-26511
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells
26 p0228 A80-27057
Silicon ribbon growth using scanned lasers
26 p0229 A80-27337

Growth and characterization of thin film III-V compound semiconductor material for solar cell applications 26 p0244 A80-29058
SEMICONDUCTOR DEVICES
A speculation on a general photoelectrochemical reactor 26 p0193 A80-22794
Photoelectrochemical cells --- with photoactive semiconducting electrodes 26 p0210 A80-23520
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis 26 p0225 A80-25679
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy 26 p0247 A80-29897
SEMICONDUCTOR DIODES
High temperature electronics for geothermal energy 26 p0185 A80-21902
SEMICONDUCTOR JUNCTIONS
Properties of ion-implanted junctions in mercury-cadmium-telluride 26 p0234 A80-28307
The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells 26 p0251 A80-30939
SEMICONDUCTORS (MATERIALS)
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions 26 p0234 A80-28305
Possible direct conversion of chemical energy into electrical energy in a semiconductor 26 p0247 A80-29795
Semiconductor grade, solar silicon purification project [NASA-CR-162746] 26 p0264 N80-16495
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se [DOE/ET-23005/T2] 26 p0296 N80-19653
Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base [PB80-802218] 26 p0296 N80-19656
Measurement techniques for high power semiconductor materials and devices [DOE/RA-0041] 26 p0301 N80-20506
SENSITIVITY
General sensitivity analysis of solar thermal-electric plants 26 p0313 N80-21379
SEPARATORS
Electrical purifiers for dielectric fluids --- charged particle contaminants separation from fuels, oils and hydraulic fluids 26 p0254 A80-32287
Flexible formulated plastic separators for alkaline batteries [NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries [NASA-CASE-LEW-12363-3] 26 p0285 N80-18556
SHADOWS
Shadow effect of adjacent solar collectors in large scale systems 26 p0183 A80-21107
SHALE OIL
In-situ combustion retorting of oil shale 26 p0192 A80-22764
Surface-active materials from Athabasca oil sands 26 p0192 A80-22770
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure 26 p0226 A80-25888
Gasification of oil shale 26 p0226 A80-25889
Application of computer models to the retorting of oil shale 26 p0228 A80-26708
Oil shale processing technology 26 p0247 A80-29800
Reaction kinetics between CO2 and oil-shale residual carbon. I - Effect of heating rate on reactivity 26 p0249 A80-30524
Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects 26 p0250 A80-30527
Reaction kinetics between steam and oil-shale residual carbon 26 p0250 A80-30528
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources --- in eastern Utah [PB-300536/0] 26 p0272 N80-16623
Energy from the situ processing of antrim oil shale [FE-2346-44] 26 p0278 N80-17576
The application of chromatography and ancillary techniques to the characterization of shale oil/oil shale compound classes and of organometallics 26 p0282 N80-18125
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes [FE-2315-37] 26 p0298 N80-20407
SHALES
Study of hydrocarbon-shale interaction [ORO-5197-14] 26 p0260 N80-16409
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis [METC/CR-79/28] 26 p0260 N80-16410
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons [ORO-5205-10] 26 p0310 N80-20973
SHIP HULLS
New approaches to sailing 26 p0228 A80-26344
SHIVA LASER SYSTEM
The evolution of a large laser control system - From Shiva to Nova 26 p0185 A80-21901
SHORT CIRCUITS
The spectral response of a front surface field solar cell 26 p0254 A80-32331
SHORT HAUL AIRCRAFT
Short haul transport for the 1990s 26 p0190 A80-22046
SILICON
Photovoltaic cost blitz spawns new silicon processes 26 p0186 A80-21913
Laser treatment of phosphorus-diffused silicon solar cells 26 p0186 A80-21915
The temperature dependence of the characteristics of sputtered a-Si-H solar cells 26 p0187 A80-21920
Silicon ribbon growth using scanned lasers 26 p0229 A80-27337
Silicon ribbon for photovoltaic cells 26 p0245 A80-29394
Studies of silicon p-n junction solar cells [NASA-CR-162832] 26 p0291 N80-19609
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project [NASA-CR-162828] 26 p0292 N80-19623
Analysis and evaluation in the production process and equipment area of the low-cost solar array project [NASA-CR-162904] 26 p0302 N80-20814
Phase 2 of the array automated assembly task for the low cost solar array project [NASA-CR-162628] 26 p0315 N80-21833
SILICON ALLOYS
Photovoltaics. V - Amorphous silicon cells 26 p0214 A80-24535
SILICON COMPOUNDS
Development of high efficiency, low cost ZnSiAs2 solar cells. [DOE/ET-23001/T1] 26 p0278 N80-17572
SILICON FILMS
Thin film solar cells based on amorphous silicon 26 p0245 A80-29395
Black a-Si solar selective absorber surfaces 26 p0254 A80-32325
SILICON JUNCTIONS
Structure of deformed silicon and implications for low-cost solar cells 26 p0191 A80-22526

Photovoltaics. II - Flat panels
26 p0214 A80-24532
Amorphous Si-F-H solar cells prepared by dc glow discharge
26 p0251 A80-30940
Field-dependent quantum efficiency in hydrogenated amorphous silicon --- for solar cells
26 p0251 A80-30942
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966

SILICON POLYMERS
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495

SILICONES
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-162840] 26 p0292 N80-19617

SINGLE CRYSTALS
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089

SLAGS
Electrical characteristics of an arc-mode slagging electrode generator --- in Faraday MHD generators
26 p0216 A80-25064
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2 --- in MHD generator coal combustor
26 p0217 A80-25073
Wettability and corrosion of MHD ceramics by Rosebud coal slag
26 p0217 A80-25074
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112

SLENDER BODIES
Absorption of wave energy by elongated bodies --- in ocean water
26 p0251 A80-30805

SLURRIES
Studies in biogas technology. III - Thermal analysis of biogas plants
26 p0188 A80-21940
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371

SNOW
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912

SODIUM COOLING
Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant
26 p0183 A80-21109

SODIUM SULFUR BATTERIES
Current trends in the development of sodium-sulphur batteries
26 p0232 A80-28013

SOIL SCIENCE
Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511

SOILS
Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511

SOLAR ARRAYS
Shadow effect of adjacent solar collectors in large scale systems
26 p0183 A80-21107
Calculation of performance of N collectors in series from test data on a single collector
26 p0184 A80-21113
Photovoltaic cost blitz spawns new silicon processes
26 p0186 A80-21913
Theoretical concentrations of solar radiation by central receiver systems
26 p0208 A80-23327
Present status and future prospects of silicon solar cell arrays and systems
26 p0210 A80-23518
Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908
Photovoltaic hybrid collectors
26 p0245 A80-29396
Evaluation of concentrated space solar arrays using computer modeling --- for spacecraft propulsion and power supplies
[NASA-CR-162681] 26 p0264 N80-16487
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495
Low-cost structures for photovoltaic arrays
[SAND-79-7006] 26 p0268 N80-16537
Proceedings of the 13th Project integration meeting
[NASA-CR-162787] 26 p0276 N80-17549
Suntech Solar Linear Array Thermal System (SLATS) test results
[SAND-79-0658] 26 p0277 N80-17563
Assessment of low-cost manufacturing process sequences --- photovoltaic solar arrays
[NASA-CR-162745] 26 p0278 N80-17575
Economic analysis of the design and fabrication of a space qualified power system
[NASA-TM-81418] 26 p0282 N80-18098
LSA field test
[NASA-CR-162798] 26 p0291 N80-19611
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-162840] 26 p0292 N80-19617
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623
Thermal performance evaluation of the Northrop model NSC-01-0732 concentrating solar collector array at outdoor conditions --- Marshall Space Flight Center solar house test facility
[NASA-CR-161354] 26 p0293 N80-19628
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-162904] 26 p0302 N80-20814
Solar power satellite system definition study, volume 4, phase 2
[NASA-CR-160565] 26 p0313 N80-21395
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

SOLAR CELLS
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
Antireflection coatings on solar cells
26 p0186 A80-21914
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915
Energy analysis of CdS:Cu2S sputtered solar cells
26 p0186 A80-21918
Grain size and its influence on efficiency in polycrystalline GaAs solar cells
26 p0186 A80-21919
Temperature dependence of the maximum theoretical efficiency in solar cells
26 p0187 A80-21922
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
Photoelectrochemical generation of hydrogen with hybrid electrodes
26 p0200 A80-23153
Recombination in the space-charge region of Schottky barrier solar cells
26 p0207 A80-23272
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
Present status and future prospects of silicon solar cell arrays and systems
26 p0210 A80-23518
Heterojunction solar cells
26 p0210 A80-23519

Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Photovoltaics. II - Flat panels
26 p0214 A80-24532
Photovoltaics. III - Concentrators
26 p0214 A80-24533
Photovoltaics. IV - Advanced materials
26 p0214 A80-24534
Photovoltaics. V - Amorphous silicon cells
26 p0214 A80-24535
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes --- German thesis
26 p0225 A80-25679
Technology and performance of a high concentration solar cell power supply
26 p0226 A80-25886
Carrier generation, recombination, and transport in amorphous silicon solar cells
26 p0227 A80-26340
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells
26 p0228 A80-27057
Use of solar energy under terrestrial conditions - Automated production of solar generator components
26 p0229 A80-27204
High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell
26 p0229 A80-27321
Lead-acid batteries for remote photovoltaic applications
26 p0232 A80-28014
Photovoltaic power for telecommunications
26 p0232 A80-28015
Computer modeling of a two-junction, monolithic cascade solar cell
26 p0234 A80-28330
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331
MOS and oxide-charge-induced /OCI/ BSF solar cells
26 p0234 A80-28337
Growth and characterization of thin film III-V compound semiconductor material for solar cell applications
26 p0244 A80-29058
Nitrogen reducing solar cells
26 p0244 A80-29059
Arabs turn their eyes to the sun --- solar energy development in Middle East
26 p0244 A80-29280
Heterojunction for thin-film solar cells
26 p0245 A80-29393
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394
Thin film solar cells based on amorphous silicon
26 p0245 A80-29395
Photovoltaic hybrid collectors
26 p0245 A80-29396
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815
The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell
26 p0247 A80-29817
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668
Amorphous Si-F-H solar cells prepared by dc glow discharge
26 p0251 A80-30940
Field-dependent quantum efficiency in hydrogenated amorphous silicon --- for solar cells
26 p0251 A80-30942
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
26 p0253 A80-31900
The spectral response of a front surface field solar cell
26 p0254 A80-32331
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
Federal photovoltaics utilization program
[DOE/EA-0087] 26 p0267 N80-16525
Photovoltaic effect, its present understanding and remaining mysteries
[DOE/ET-23103/6] 26 p0268 N80-16535
Photovoltaic Materials and Device Measurements Workshop: Focus on polycrystalline thin film cells
[SERI/TP-49-185] 26 p0268 N80-16538
Characterization of deliberately nickel-doped silicon wafers and solar cells --- microstructure, electrical properties, and energy conversion efficiency
[NASA-CR-162790] 26 p0276 N80-17551
Segmented dish concentrator design project
[SAND-79-7024] 26 p0277 N80-17561
Photovoltaic conversion research and development in the United Kingdom
[RAE-TM-SPACE-247] 26 p0279 N80-17583
Silicon solar cells, volume 3. Citations from the Engineering Index data base --- bibliographies
[PB80-800717] 26 p0280 N80-17588
Silicon solar cells, volume 3. Citations from the NTIS data base --- bibliographies
[PB80-800691] 26 p0280 N80-17589
Silicon solar cells, volume 2. Citations from the Engineering Index data base --- bibliographies
[PB80-800709] 26 p0280 N80-17590
Development of improved wraparound contacts for silicon
[NASA-CR-159748] 26 p0285 N80-18554
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620
On influencing the operating temperatures of Motorola and Arco solar photovoltaic modules
[COO-4094-59] 26 p0295 N80-19649
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653
Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base
[PB80-802218] 26 p0296 N80-19656
Comparison of theoretical and experimental solar cell performance
26 p0301 N80-20806
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-162904] 26 p0302 N80-20814
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838

SOLAR COLLECTORS
Shadow effect of adjacent solar collectors in large scale systems
26 p0183 A80-21107
Mirror enclosures for double-exposure solar collectors
26 p0184 A80-21110
Optimal controllers of the second kind --- for flat plate solar collectors
26 p0184 A80-21112
Calculation of performance of N collectors in series from test data on a single collector
26 p0184 A80-21113
The effect of a self consistent effective ambient temperature on collector efficiency parameters
26 p0184 A80-21115
Calculation of the monthly-average transmittance-absorptance product --- for solar collectors
26 p0184 A80-21117
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927
Storage of solar energy
26 p0188 A80-21937
Solar heat production - Generalizations
26 p0188 A80-21950

Industrial solar thermal collectors
26 p0189 A80-21951
The utilization of industrially produced moderate-temperature solar heat
26 p0189 A80-21952
Industrial solar thermal concentrators
26 p0189 A80-21953
The real problems of solar energy
26 p0189 A80-21955
Some geometrical design aspects of a linear Fresnel reflector concentrator
26 p0193 A80-22791
Economically working big scale solar power stations pneumatic light-weight construction
26 p0208 A80-23326
Theoretical concentrations of solar radiation by central receiver systems
26 p0208 A80-23327
Theoretical study of the heating of air in a plane honeycomb solar collector
26 p0208 A80-23333
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499
Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings
26 p0209 A80-23515
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors
26 p0212 A80-23998
Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Photovoltaics. III - Concentrators
26 p0214 A80-24533
Photovoltaics. IV - Advanced materials
26 p0214 A80-24534
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885
Tubular solar collector
26 p0231 A80-27730
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006
Arabs turn their eyes to the sun --- solar energy development in Middle East
26 p0244 A80-29280
Photovoltaic hybrid collectors
26 p0245 A80-29396
The prospects for solar energy use in industry within the United Kingdom
26 p0248 A80-29921
Transient response of thermosyphon solar collectors
26 p0248 A80-29922
Performance calculations of tubular cover collectors
26 p0248 A80-29924
Instantaneous collector thermal efficiencies in less time
26 p0248 A80-29925
Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772
Operating thresholds of solar collection systems
26 p0251 A80-30775
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021
Outdoor test for thermal performance evaluation of the Owens-Illinois Sunpack SEC-601 (air) solar collector
[NASA-CR-161339] 26 p0264 N80-16492
Characterization of crushed glass as a transpired air heating solar collector material
[LA-UR-79-1336] 26 p0265 N80-16498
Solar collector manufacturing activity
[DOE/EIA-0174/78] 26 p0265 N80-16500
Fixed mirror solar concentrator for application to a 100 MW(e) electric generating plant
[GA-A-15340] 26 p0266 N80-16508
Solar energy concentrator design and operations. Citations from the NTIS data base
[NTIS/PS-79/0926/0] 26 p0270 N80-16557
Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558
Addition of an air-cooled collector test capability to the solar collector test facility
[PB-300482/7] 26 p0270 N80-16562
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-79/0928/6] 26 p0271 N80-16566
Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567
Performance of a packaged solar space-heating system used with a mobile home
[PB-300890/1] 26 p0272 N80-16572
Information theory applied to solar radiation concentrators
26 p0275 N80-17539
Optical and thermal effects in linear solar concentrating collectors
26 p0275 N80-17541
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324] 26 p0277 N80-17560
Segmented dish concentrator design project
[SAND-79-7024] 26 p0277 N80-17561
Receiver assembly design studies for 2-m 90 deg parabolic-cylindrical solar collectors
[SAND-79-1026] 26 p0277 N80-17564
Performance of linear solar concentrating collectors
[SAND-79-1378C] 26 p0277 N80-17565
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
[NASA-TM-81385] 26 p0282 N80-18156
Solar energy design improvement: A methodology for hydronic flatplate collector systems
[AD-A076836] 26 p0286 N80-18567
High temperature solar thermal receiver
[NASA-CR-162831] 26 p0292 N80-19621
Low cost point focus solar concentrator. Phase 1: Preliminary design
[JPL-9950-273] 26 p0292 N80-19622
Low cost point focus solar concentrator, phase 1
[NASA-CR-162848] 26 p0292 N80-19624
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
Thermal performance evaluation of the Northrop model NSC-01-0732 concentrating solar collector array at outdoor conditions --- Marshall Space Flight Center solar house test facility
[NASA-CR-161354] 26 p0293 N80-19628
Annual technical report, fiscal year 1979. Volume 1: Executive summary
[NASA-CR-159715] 26 p0293 N80-19632
Combined solar collector and energy storage system
[NASA-CASE-LAR-12205-1] 26 p0302 N80-20810
Qualification test procedures and results for Honeywell solar collector subsystem, single-family residence
[NASA-CR-161382] 26 p0302 N80-20813
Computer simulation of a solar energy system which utilizes flat-plate collectors
[AD-A079906] 26 p0304 N80-20870
Installation and startup of the fixed mirror solar concentrator collector field subsystem
[GA-A-15344] 26 p0306 N80-20888
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899
Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors
[COO-2971-6] 26 p0307 N80-20900
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912
Solar ponds for residential heating, heat extraction from a salt gradient solar pond
[PB80-108624] 26 p0308 N80-20913
Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes
[UCRL-52851] 26 p0316 N80-21842

Application of glass technology to novel solar energy collectors
[CONF-7906118-1] 26 p0317 N80-21852
Technology assessment: Line-focus concentrators
[SAND-79-2221C] 26 p0318 N80-21871

SOLAR COOLING
Royal Society, Discussion on Solar Energy, London, England, November 15, 16, 1978, Proceedings
26 p0209 A80-23511
Solar space heating with air and liquid systems
26 p0209 A80-23512
Solar heating and air conditioning
26 p0209 A80-23516
Investigation of heat and mass transfer for a regenerator model of a solar cooling system
26 p0232 A80-28200
Prototype solar heating and combined heating cooling systems
[NASA-CR-161340] 26 p0264 N80-16485
Outdoor test for thermal performance evaluation of the Owens-Illinois Sunpack SEC-601 (air) solar collector
[NASA-CR-161339] 26 p0264 N80-16492
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520
Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522
Federal demonstrations of solar heating and cooling on private residences: Only limited success
[PB-301123/6] 26 p0270 N80-16555
Thermal mats for space heating and cooling
[BNL-51019] 26 p0276 N80-17555
Overview of developing programs in solar desiccant cooling for residential buildings
[SERI/TP-34-187] 26 p0278 N80-17569
National solar heating and cooling programs
[PB80-104987] 26 p0309 N80-20915
Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979
[PB80-115298] 26 p0311 N80-21197
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

SOLAR ENERGY
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180
Sweden beyond oil - Nuclear commitments and solar options
26 p0255 A80-32410
Comparative analysis of solar energy storage cycles
[SAND-79-1803C] 26 p0267 N80-16516
Preparation of thin films for solar energy utilization
[SAND-79-1754C] 26 p0267 N80-16517
Continuing regional solar energy information mini-center activities and updating the SOLCOST program
[COO-4643-T2] 26 p0267 N80-16521
Solar central test facility
[SAND-79-1730C] 26 p0267 N80-16524
Solar energy for agriculture: Review of research
[PB-298688/3] 26 p0271 N80-16568
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573
Energy accounting for solar and alternative energy sources
[ORAU/IEA-79-11(R)] 26 p0295 N80-19647
Characterization and assessment of selected solar thermal energy systems for residential and process heat applications
[LA-7995-TASE] 26 p0295 N80-19648
Solar energy heating system design package for a single-family residence at New Castle, Pennsylvania
[NASA-CR-161356] 26 p0303 N80-20865
Review of selected on-site DOE small solar thermal power plant experiments
[SAND-79-1040C] 26 p0317 N80-21854
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

SOLAR ENERGY ABSORBERS
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499
Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation --- Book
26 p0214 A80-24660
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657
Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743
Alternative grading profile for sputtered solar selective surfaces
26 p0246 A80-29744
Performance calculations of tubular cover collectors
26 p0248 A80-29924
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324] 26 p0277 N80-17560
Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes
[UCRL-52851] 26 p0316 N80-21842
Evaluation of selective absorbers
[TP-5461] 26 p0317 N80-21851

SOLAR ENERGY CONVERSION
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106
Accuracies achievable with indirect measurements of the direct solar irradiance component
26 p0183 A80-21108
Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant
26 p0183 A80-21109
Mirror enclosures for double-exposure solar collectors
26 p0184 A80-21110
Calculation of the monthly-average transmittance-absorptance product --- for solar collectors
26 p0184 A80-21117
Solar hydrogen energy
26 p0185 A80-21878
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903
Space manufacturing, satellite power and human exploration
26 p0186 A80-21908
Unique high concentration solar test facility
26 p0186 A80-21916
Temperature dependence of the maximum theoretical efficiency in solar cells
26 p0187 A80-21922
Storage of solar energy
26 p0188 A80-21937
Introduction to the study of solar technology
26 p0188 A80-21949
Solar heat production - Generalizations
26 p0188 A80-21950
The utilization of industrially produced moderate-temperature solar heat
26 p0189 A80-21952
The real problems of solar energy
26 p0189 A80-21955

Analyses of single and double exposure solar air heaters
26 p0193 A80-22792
On the potential of solar energy conversion into hydrogen and/or other fuels
26 p0195 A80-23107
The theoretical design of a solar engine for the production of hydrogen
26 p0195 A80-23108
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6 --- hydrogen production
26 p0200 A80-23144
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147
Bio-solar hydrogen production
26 p0201 A80-23155
Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems
26 p0201 A80-23156
A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199
Advances in energy systems and technology. Volume 2 --- Book
26 p0207 A80-23218
The development of solar power satellites
26 p0207 A80-23219
Onsite solar energy systems - Economics and system design
26 p0207 A80-23221
Solar and geothermal energy
26 p0208 A80-23328
Status and development of production of cheap hydrogen
26 p0208 A80-23330
Autonomous solar electricity production with hydraulic active storage systems on the territory
26 p0208 A80-23332
Royal Society, Discussion on Solar Energy, London, England, November 15, 16, 1978, Proceedings
26 p0209 A80-23511
Photoelectrochemical cells --- with photoactive semiconducting electrodes
26 p0210 A80-23520
Energy from the biological conversion of solar energy
26 p0210 A80-23522
Indirect utilization of solar energy --- utilization of wind power created by ocean surface waves
26 p0211 A80-23524
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261
Thermal storage in density-stratified fluids and phase-change materials
26 p0225 A80-25496
Soft-energy provision - A new Utopia --- present problems of solar and biomass energy conversion
26 p0227 A80-26169
Selective optical surfaces for solar energy convertors --- Russian book
26 p0228 A80-26511
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
Salinity gradient energy conversion
26 p0233 A80-28262
Computer modeling of a two-junction, monolithic cascade solar cell
26 p0234 A80-28330
MOS and oxide-charge-induced /OCI/ BSF solar cells
26 p0234 A80-28337
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824
An integrated approach to energy supply for small communities
[AIAA 80-0651] 26 p0240 A80-28830
Solar energy: Chemical conversion and storage --- Book
26 p0243 A80-29051
Solar energy conversion in photosynthesis - Features relevant to artificial systems for the photochemical conversion of solar energy
26 p0243 A80-29053
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
26 p0243 A80-29056
Heterojunction for thin-film solar cells
26 p0245 A80-29393
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394
The prospects for solar energy use in industry within the United Kingdom
26 p0248 A80-29921
Estimation and prediction of global solar radiation over Greece
26 p0248 A80-29923
Performance calculations of tubular cover collectors
26 p0248 A80-29924
Solar cells for photovoltaic generation of electricity: Materials, devices and applications --- Book
26 p0253 A80-31900
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491
The 15 kW sub e (nominal) solar thermal electric power conversion concept definition study: Steam Rankine turbine system
[NASA-CR-159589] 26 p0264 N80-16493
Use of solar energy for the production of electricity in the Alps
[SAND-79-6000] 26 p0265 N80-16499
Solar photovoltaic field tests and applications project
[COO-4094-26] 26 p0266 N80-16512
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
Proceedings: Photovoltaics user Review Panel
[SERI/TP-69-276] 26 p0266 N80-16514
Solar central test facility
[SAND-79-1730C] 26 p0267 N80-16524
Organic photochemical storage of solar energy
[COO-4380-2] 26 p0267 N80-16527
Midtemperature solar systems test facility experiment manual and test plan
[SAND-79-0379] 26 p0268 N80-16528
Performance characteristics of a commercially available point-focus solar power --- systems analysis of a solar energy conversion system in terms of power efficiency and energy conversion efficiency
[SERI/TP-34-169] 26 p0268 N80-16529
Solar energy concentrator design and operations. Citations from the NTIS data base
[NTIS/PS-79/0926/0] 26 p0270 N80-16557
Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-79/0928/6] 26 p0271 N80-16566
Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567
Heliostat system design and operation. Citations from the Engineering Index data base
[NTIS/PS-79/0930/2] 26 p0271 N80-16571
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557
State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562
Performance of solar passive buildings
[SAND-79-1574C] 26 p0277 N80-17566
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570
Continuing regional solar energy information Mini-Center activities and updating the SOLCOST program
[COO-4643-T1] 26 p0278 N80-17571

Development of high efficiency, low cost ZnSiAs2 solar cells. [DOE/ET-23001/T1] 26 p0278 N80-17572
Silicon solar cells, volume 3. Citations from the Engineering Index data base --- bibliographies [PB80-800717] 26 p0280 N80-17588
Silicon solar cells, volume 3. Citations from the NTIS data base --- bibliographies [PB80-800691] 26 p0280 N80-17589
Silicon solar cells, volume 2. Citations from the Engineering Index data base --- bibliographies [PB80-800709] 26 p0280 N80-17590
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system [NASA-CR-159591] 26 p0291 N80-19612
Solar power satellite system definition study. Volume 1, phase 2: Executive summary [NASA-CR-160540] 26 p0293 N80-19631
Annual technical report, fiscal year 1979. Volume 1: Executive summary [NASA-CR-159715] 26 p0293 N80-19632
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs [NASA-CR-162886] 26 p0294 N80-19634
Solar powered liquid piston Stirling cycle irrigation pump [SAN-1894-1] 26 p0294 N80-19641
Solar electric power generation, volume 3. Citations from the Engineering Index data base [PB80-803034] 26 p0296 N80-19657
Solar electric power generation, volume 2. Citations from the NTIS data base [PB80-803000] 26 p0296 N80-19658
Solar electric power generation, volume 3. Citations from the NTIS data base [PB80-803018] 26 p0296 N80-19659
Solar electric power generation, volume 2. Citations from the Engineering Index data base [PB80-803026] 26 p0296 N80-19660
Market definition study of photovoltaic power for remote villages in the United States [NASA-CR-159800] 26 p0302 N80-20812
Qualification test procedures and results for Honeywell solar collector subsystem, single-family residence [NASA-CR-161382] 26 p0302 N80-20813
The application of DC-DC energy conversion in a solar energy system [AD-A077112] 26 p0303 N80-20867
Computer simulation of a solar energy system which utilizes flat-plate collectors [AD-A079906] 26 p0304 N80-20870
Conversion system overview assessment. Volume 1: Solar thermoelectrics [SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Environmental assessment methodology: Solar power plant applications. Volume 3. Environmental impact assessment application [EPRI-ER-1070-VOL-3] 26 p0306 N80-20889
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant [LBL-7868-REV] 26 p0306 N80-20890
Performance of heat pumps at elevated evaporating temperatures with application to solar input [BNL-26772] 26 p0307 N80-20896
Methodology for evaluating physical constraints on residential solar energy use [UCRL-15001] 26 p0307 N80-20901
Solar water pumps. Citations from the Engineering Index data base [PB80-802531] 26 p0308 N80-20910
An economical solar heated and cooled residence for southern New Mexico [PB80-108616] 26 p0309 N80-20914
Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology [EPRI-ER-1070-VOL-1] 26 p0309 N80-20926
General sensitivity analysis of solar thermal-electric plants 26 p0313 N80-21379
Solar heating and hot water system installed at the Senior Citizen Center, Huntsville, Alabama [NASA-CR-161384] 26 p0315 N80-21835
Solar energy system performance evaluation: Seasonal report for IBM System 2, Togus, Maine [NASA-CR-161383] 26 p0315 N80-21836
Solar Central Receiver prototype heliostat, volume 1 [SAN-1604-1] 26 p0316 N80-21846
Solar thermal repowering systems integration [SERI/TR-8037-1] 26 p0316 N80-21847
Use of earth coupling in solar assisted heat pumps [BNL-26748] 26 p0316 N80-21849
Aerospace technology review for LBL window/passive solar program [LBL-3608] 26 p0316 N80-21850
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return [UCRL-52814] 26 p0317 N80-21853
Solar energy research at LASL [LA-7741-PR] 26 p0318 N80-21872
Solar pond for industrial process heat [SERI/TD-351-460] 26 p0319 N80-21876
Performance monitoring of a passive solar heated house, Stockton, California [EPRI-ER-1177] 26 p0319 N80-21879

SOLAR FLUX DENSITY
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions 26 p0251 A80-30774

SOLAR FURNACES
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace 26 p0199 A80-23142

SOLAR GENERATORS
The industrial applications of high-temperature heat - Solar thermal and electric plants 26 p0189 A80-21954
Small scale ammonia production as a means for hydrogen storage 26 p0201 A80-23160
Solar energy electrochemical storage 26 p0208 A80-23331
Autonomous solar electricity production with hydraulic active storage systems on the territory 26 p0208 A80-23332
Space-manufactured satellite power systems 26 p0227 A80-26003
Use of solar energy under terrestrial conditions - Automated production of solar generator components 26 p0229 A80-27204
Solar generators for terrestrial use 26 p0245 A80-29384
Study of advanced radial outflow turbine for solar steam Rankine engines [NASA-CR-159695] 26 p0263 N80-16483
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system [NASA-CR-159590] 26 p0264 N80-16491
Solar-powered sun tracker [AD-A078653] 26 p0294 N80-19640
Solar electric power generation, volume 3. Citations from the Engineering Index data base [PB80-803034] 26 p0296 N80-19657
Solar electric power generation, volume 2. Citations from the NTIS data base [PB80-803000] 26 p0296 N80-19658
Solar electric power generation, volume 3. Citations from the NTIS data base [PB80-803018] 26 p0296 N80-19659
Solar electric power generation, volume 2. Citations from the Engineering Index data base [PB80-803026] 26 p0296 N80-19660
Solar water pumps. Citations from the Engineering Index data base [PB80-802531] 26 p0308 N80-20910
Review of selected on-site DOE small solar thermal power plant experiments [SAND-79-1040C] 26 p0317 N80-21854

SOLAR HEATING
Energy resource requirements of a solar heating system 26 p0184 A80-21746
Fundamental characteristics of the reverse flat plate collector 26 p0187 A80-21927
Storage of solar energy 26 p0188 A80-21937

Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941
Solar heat production - Generalizations
26 p0188 A80-21950
The utilization of industrially produced moderate-temperature solar heat
26 p0189 A80-21952
Industrial solar thermal concentrators
26 p0189 A80-21953
The industrial applications of high-temperature heat - Solar thermal and electric plants
26 p0189 A80-21954
Analyses of single and double exposure solar air heaters
26 p0193 A80-22792
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143
Multifunctional collectors for dwellings - Examples of application
26 p0208 A80-23329
Theoretical study of the heating of air in a plane honeycomb solar collector
26 p0208 A80-23333
Royal Society, Discussion on Solar Energy, London, England, November 15, 16, 1978, Proceedings
26 p0209 A80-23511
Solar space heating with air and liquid systems
26 p0209 A80-23512
Results of solar heating experiments --- for full scale domestic system performance
26 p0209 A80-23513
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514
Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings
26 p0209 A80-23515
Solar heating and air conditioning
26 p0209 A80-23516
Non-convecting solar ponds
26 p0210 A80-23517
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858
The prospects for solar energy use in industry within the United Kingdom
26 p0248 A80-29921
Transient response of thermosyphon solar collectors
26 p0248 A80-29922
Instantaneous collector thermal efficiencies in less time
26 p0248 A80-29925
The energy impacts of solar heating
26 p0248 A80-29946
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
Prototype solar heating and combined heating cooling systems
[NASA-CR-161340] 26 p0264 N80-16485
Characterization of crushed glass as a transpired air heating solar collector material
[LA-UR-79-1336] 26 p0265 N80-16498
Computer simulation of ground coupled storage in a series solar assisted heat pump system
[BNL-26216] 26 p0266 N80-16507
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14] 26 p0268 N80-16532
Federal demonstrations of solar heating and cooling on private residences: Only limited success
[PB-301123/6] 26 p0270 N80-16555
Performance of a packaged solar space-heating system used with a mobile home
[PB-300890/1] 26 p0272 N80-16572
Solar energy control system
[NASA-CASE-MFS-25287-1] 26 p0275 N80-17544
Thermal mats for space heating and cooling
[BNL-51019] 26 p0276 N80-17555
Solar energy system performance evaluation: Seasonal report for SEMCO, Loxahatchee, Florida
[NASA-CR-161379] 26 p0293 N80-19627
Solar energy system performance evaluation: A seasonal report for SEMCO, Macon, Georgia
[NASA-CR-161380] 26 p0293 N80-19629
Installation guidelines for solar heating system, single-family residence at New Castle, Pennsylvania
[NASA-CR-161355] 26 p0293 N80-19630
Combined solar collector and energy storage system
[NASA-CASE-LAR-12205-1] 26 p0302 N80-20810
Solar energy heating system design package for a single-family residence at New Castle, Pennsylvania
[NASA-CR-161356] 26 p0303 N80-20865
Solar heating system design package for a single-family residence at William O'Brien State Park, Minnesota
[NASA-CR-161357] 26 p0303 N80-20866
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887
National solar heating and cooling programs
[PB80-104987] 26 p0309 N80-20915
Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979
[PB80-115298] 26 p0311 N80-21197
Solar heating and hot water system installed at the Senior Citizen Center, Huntsville, Alabama
[NASA-CR-161384] 26 p0315 N80-21835
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853
Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data
[COO-2704-T1] 26 p0318 N80-21875
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877
Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

SOLAR HOUSES
Performance effects of Trombe wall control strategies --- passive solar building heating
26 p0183 A80-21105
Solar heat production - Generalizations
26 p0188 A80-21950
Domestic space-heating and solar energy in Ireland
26 p0193 A80-22790
Multifunctional collectors for dwellings - Examples of application
26 p0208 A80-23329
Royal Society, Discussion on Solar Energy, London, England, November 15, 16, 1978, Proceedings
26 p0209 A80-23511
Solar space heating with air and liquid systems
26 p0209 A80-23512
Results of solar heating experiments --- for full scale domestic system performance
26 p0209 A80-23513
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514
Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings
26 p0209 A80-23515
Solar heating and air conditioning
26 p0209 A80-23516
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006

Outdoor test for thermal performance evaluation of the Owens-Illinois Sunpack SEC-601 (air) solar collector
[NASA-CR-161339] 26 p0264 N80-16492
Performance of a packaged solar space-heating system used with a mobile home
[PB-300890/1] 26 p0272 N80-16572
First passive solar home awards
[DSE-1020-T17] 26 p0276 N80-17556
Solar energy heating system design package for a single-family residence at New Castle, Pennsylvania
[NASA-CR-161356] 26 p0303 N80-20865
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887
Review of recent research on energy storage in residential solar total energy systems
[BNL-51012] 26 p0315 N80-21830

SOLAR PONDS (HEAT STORAGE)
Autonomous solar electricity production with hydraulic active storage systems on the territory
26 p0208 A80-23332
Non-convecting solar ponds
26 p0210 A80-23517
Salinity gradient energy conversion
26 p0233 A80-28262
Solar ponds for residential heating, heat extraction from a salt gradient solar pond
[PB80-108624] 26 p0308 N80-20913
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876

SOLAR POWER SATELLITES
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
Advances in energy systems and technology. Volume 2 --- Book
26 p0207 A80-23218
The development of solar power satellites
26 p0207 A80-23219
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525
Solar power satellites and the ITU - Some U.S. policy options
26 p0223 A80-25253
Space-manufactured satellite power systems
26 p0227 A80-26003
Satellite solar power plants
26 p0252 A80-31200
Solar power satellite system definition study. Volume 1, phase 2: Executive summary
[NASA-CR-160540] 26 p0293 N80-19631
Solar power satellite system definition study, volume 4, phase 2
[NASA-CR-160565] 26 p0313 N80-21395

SOLAR RADIATION
Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions
26 p0184 A80-21116
Theoretical concentrations of solar radiation by central receiver systems
26 p0208 A80-23327
Estimation and prediction of global solar radiation over Greece
26 p0248 A80-29923
Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504
Normal incident solar radiation measurements at Upton, New York
[BNL-50939] 26 p0273 N80-16653

SOLAR REFLECTORS
Unique high concentration solar test facility
26 p0186 A80-21916
Measurement of heliostat performance characteristics
26 p0250 A80-30773
Optical and thermal effects in linear solar concentrating collectors
26 p0275 N80-17541

SOLAR SEA POWER PLANTS
Advances in energy systems and technology. Volume 2 --- Book
26 p0207 A80-23218
Sea thermal power - Competitive electricity and chemicals from the sea
26 p0207 A80-23220
Solar sea power plants. Citations from the NTIS data base
[PB80-802580] 26 p0297 N80-19661
Solar seapower plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662

SOLAR TOTAL ENERGY SYSTEMS
Soft-energy provision - A new Utopia --- present problems of solar and biomass energy conversion
26 p0227 A80-26169
Decentralized energy: Technology assessment and systems description
[BNL-50987] 26 p0265 N80-16502
Environmental development plan: Solar thermal power systems
[DOE/EDP-0035] 26 p0265 N80-16503
First passive solar home awards
[DSE-1020-T17] 26 p0276 N80-17556
Criteria for an ideal solar photovoltaic powered industry
[HCP/T5433-01] 26 p0279 N80-17577
Review of recent research on energy storage in residential solar total energy systems
[BNL-51012] 26 p0315 N80-21830

SOLID ELECTRODES
The kinetics of oxygen evolution on non-traditional electrodic materials --- for hydrogen production by electrolysis of KOH aqueous solutions
26 p0196 A80-23111

SOLID SOLUTIONS
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014

SOLID WASTES
Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51065] 26 p0258 N80-16179

SOLID-SOLID INTERFACES
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815

SOLUTIONS
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055

SOLVENT EXTRACTION
Solvolysis liquefaction of coal
26 p0187 A80-21926
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371
Filtration in coal liquefaction - Influence of digestion conditions in the filtration of non-hydrogenated coal digests
26 p0255 A80-32372
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557

SOLVENTS
Performance of low rank coals in the Exxon Donor Solvent Process
26 p0230 A80-27419

SORPTION
The influence of Al on the hydrogen sorption properties of intermetallic compounds
26 p0203 A80-23173

SOUTH DAKOTA
Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
[DOE/TIC-10190] 26 p0306 N80-20895

SOUTHERN CALIFORNIA
Status of the Southern California Edison Company 3 MW Wind Turbine Generator (WTG) demonstration project
26 p0263 N80-16478

SOYBEANS
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

SPACE CHARGE
Recombination in the space-charge region of Schottky barrier solar cells 26 p0207 A80-23272

SPACE EXPLORATION
Just over the horizon in space 26 p0256 A80-32511

SPACE HEATING (BUILDINGS)
Performance effects of Trombe wall control strategies --- passive solar building heating 26 p0183 A80-21105
Energy resource requirements of a solar heating system 26 p0184 A80-21746
Warm water storage in district heating systems incorporating combined heat and power plant 26 p0185 A80-21825
Heat loss detection from flat roof buildings by means of aerial thermography 26 p0191 A80-22475
Domestic space-heating and solar energy in Ireland 26 p0193 A80-22790
Analyses of single and double exposure solar air heaters 26 p0193 A80-22792
Multifunctional collectors for dwellings - Examples of application 26 p0208 A80-23329
Solar space heating with air and liquid systems 26 p0209 A80-23512
Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings 26 p0209 A80-23515
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings 26 p0212 A80-24071
Thermography at the earth's surface and the energy efficiency of buildings 26 p0213 A80-24072
The thermodynamics of heating. I - The second law and conventional heating systems 26 p0213 A80-24512
The energy impacts of solar heating 26 p0248 A80-29946
Geothermal heating in Creil 26 p0255 A80-32499
Solar availability for winter space heating: An analysis of the calendar period 1953-1975 [ANL/SPG-14] 26 p0268 N80-16532
Federal demonstrations of solar heating and cooling on private residences: Only limited success [PB-301123/6] 26 p0270 N80-16555
Feasibility study of geothermal energy for heating greenhouses [PB-299517/3] 26 p0271 N80-16569
Performance of a packaged solar space-heating system used with a mobile home [PB-300890/1] 26 p0272 N80-16572
Performance of solar passive buildings [SAND-79-1574C] 26 p0277 N80-17566
Installation guidelines for solar heating system, single-family residence at New Castle, Pennsylvania [NASA-CR-161355] 26 p0293 N80-19630
Modeling the space conditioning energy demand of a community as a function of weather [COO-1340-65] 26 p0294 N80-19644
Characterization and assessment of selected solar thermal energy systems for residential and process heat applications [LA-7995-TASE] 26 p0295 N80-19648
Qualification test procedures and results for Honeywell solar collector subsystem, single-family residence [NASA-CR-161382] 26 p0302 N80-20813
Solar heating system design package for a single-family residence at William O'Brien State Park, Minnesota [NASA-CR-161357] 26 p0303 N80-20866
Energy efficient buildings program [LBL-9576] 26 p0304 N80-20877
Heat-pump-centered integrated community energy systems: System development [ANL/CNSV/TM-8] 26 p0305 N80-20880
Thermal energy storage application areas --- for building heating and cooling [CONS/5113-T4] 26 p0306 N80-20894
Solar ponds for residential heating, heat extraction from a salt gradient solar pond [PB80-108624] 26 p0308 N80-20913
An economical solar heated and cooled residence for southern New Mexico [PB80-108616] 26 p0309 N80-20914
Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979 [PB80-115298] 26 p0311 N80-21197
Geothermal energy market penetration: Development of a model for the residential section [PB80-118359] 26 p0311 N80-21198
Low cost performance evaluation of passive solar buildings [SERI/RR-63-223] 26 p0319 N80-21877

SPACE INDUSTRIALIZATION
The industrialisation of space 26 p0252 A80-31791

SPACE LAW
Solar power satellites and the ITU - Some U.S. policy options 26 p0223 A80-25253

SPACE MANUFACTURING
Space manufacturing, satellite power and human exploration 26 p0186 A80-21908
Space-manufactured satellite power systems 26 p0227 A80-26003

SPACE SHUTTLE ORBITERS
Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning [NASA-TM-80958] 26 p0291 N80-19610

SPACE TRANSPORTATION SYSTEM
The development of solar power satellites 26 p0207 A80-23219
Solar power satellite system definition study. Volume 1, phase 2: Executive summary [NASA-CR-160540] 26 p0293 N80-19631

SPACECRAFT POWER SUPPLIES
Evaluation of concentrated space solar arrays using computer modeling --- for spacecraft propulsion and power supplies [NASA-CR-162681] 26 p0264 N80-16487
Economic analysis of the design and fabrication of a space qualified power system [NASA-TM-81418] 26 p0282 N80-18098
A linear magnetic motor/generator --- to generate electric energy using magnetic flux for spacecraft's power supply [NASA-CASE-GSC-12518-1] 26 p0290 N80-19424
Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning [NASA-TM-80958] 26 p0291 N80-19610
Advanced technology light weight fuel cell program --- orbiting space vehicle long-life hydrogen oxygen fuel cell [NASA-CR-159807] 26 p0292 N80-19615
Solar power satellite system definition study. Volume 1, phase 2: Executive summary [NASA-CR-160540] 26 p0293 N80-19631
Lightweight fuel cell powerplant components program [NASA-CR-161412] 26 p0298 N80-20306
The 1979 Goddard Space Flight Center Battery Workshop [NASA-CP-2117] 26 p0302 N80-20820
Environmental development plan for space applications --- development of nuclear power supplies for use in space [DOE/EDP-0057] 26 p0309 N80-20922

SPACECRAFT PROPULSION
Evaluation of concentrated space solar arrays using computer modeling --- for spacecraft propulsion and power supplies [NASA-CR-162681] 26 p0264 N80-16487

SPANLOADER AIRCRAFT
The changing horizons for technical progress. II 26 p0229 A80-27270

SPARK IGNITION
Hydrogen injection two-stroke spark ignition engine 26 p0203 A80-23177
A technical conception for highly developed spark-ignition engines 26 p0235 A80-28471

Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472
A study on plasma plug --- high energy ignition plugs for exhaust pollution reduction and fuel consumption decrease in automotive gasoline engines
26 p0252 A80-31775
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340

SPARK PLUGS
A study on plasma plug --- high energy ignition plugs for exhaust pollution reduction and fuel consumption decrease in automotive gasoline engines
26 p0252 A80-31775

SPATIAL FILTERING
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

SPECIFICATIONS
The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477

SPECTRAL EMISSION
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657

SPECTRAL SENSITIVITY
Selective optical surfaces for solar energy convertors --- Russian book
26 p0228 A80-26511
Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325

SPECTRAL SIGNATURES
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

SPEED CONTROL
Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558

SPIN-SPIN COUPLING
Spin-aligned hydrogen --- atoms at lowest electronic energy magnetic sublevels as substance for molecular production
26 p0200 A80-23151

SPRINGS (WATER)
A model for the Sulphur Springs geothermal field St. Lucia
26 p0231 A80-27924

SPUTTERING
Energy analysis of CdS:Cu2S sputtered solar cells
26 p0186 A80-21918
Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743
Alternative grading profile for sputtered solar selective surfaces
26 p0246 A80-29744

STAINLESS STEELS
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186

STATISTICAL ANALYSIS
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

STATISTICAL WEATHER FORECASTING
A statistical methodology for study of wind characteristics from a close array of stations
26 p0211 A80-23536

STEAM
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139
Nuclear methane reforming for coal gasification
26 p0233 A80-28276
Coal gasification in steam at very high temperatures
26 p0249 A80-30522
Reaction kinetics between steam and oil-shale residual carbon
26 p0250 A80-30528

STEAM TURBINES
Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption
26 p0222 A80-25116
Gas turbines
26 p0255 A80-32399
Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483
The 15 kW sub e (nominal) solar thermal electric power conversion concept definition study: Steam Rankine turbine system
[NASA-CR-159589] 26 p0264 N80-16493
Waste heat recovery unit design for gas turbine propulsion systems
[AD-A078154] 26 p0290 N80-19503

STEEL STRUCTURES
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473
The MOD-1 steel blade
26 p0263 N80-16476

STEELS
Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap
26 p0290 N80-19492
Benefits of increased use of continuous casting by the United States steel industry
[PB80-104904] 26 p0314 N80-21612

STIRLING CYCLE
The theoretical design of a solar engine for the production of hydrogen
26 p0195 A80-23108
Stirling engine design and feasibility for automotive use --- Book
26 p0234 A80-28425
Solar powered liquid piston Stirling cycle irrigation pump
[SAN-1894-1] 26 p0294 N80-19641
Supporting research and technology for automotive Stirling engine development
[NASA-TM-81495] 26 p0311 N80-21200

STORAGE BATTERIES
Development of electrochemical storage batteries with improved energy density
[BMFT-FB-T-77-88] 26 p0279 N80-17582
Characterization of prototype secondary lithium battery
26 p0303 N80-20832
The Exxon rechargeable cells --- solar rechargeable clocks
26 p0303 N80-20834
Status of the DOE battery and electrochemical technology program
[MTR-8026] 26 p0307 N80-20902
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-7] 26 p0317 N80-21860

STORAGE STABILITY
Stability studies of coal liquids
[PETC/TR-79/5] 26 p0257 N80-16129
Hydrogen as a fuel --- automobiles
[TT-7903] 26 p0283 N80-18212
Stability survey of hydrocarbon fuels
[BETC-1778-4] 26 p0300 N80-20424

STORAGE TANKS
A storage tank for vehicular storage of liquid hydrogen
26 p0231 A80-27729
SEAS - A system for undersea storage of thermal energy
26 p0232 A80-28257

STRATIGRAPHY
Subsurface stratigraphy of the Middle and Upper Devonian clastic sequence in southern West Virginia and its relation to gas production
26 p0273 N80-16628

STRESS ANALYSIS
Mod 1 wind turbine generator failure modes and effects analysis
[NASA-CR-159494] 26 p0303 N80-20864

STRESS MEASUREMENT
Operational experience with VAWT blades --- structural performance
26 p0262 N80-16468

STRUCTURAL ANALYSIS
Operational experience with VAWT blades --- structural performance
26 p0262 N80-16468
Structural analysis considerations for wind turbine blades
26 p0262 N80-16469

STRUCTURAL DESIGN
Possibilities and limits of the conception of an up-to-date compact vehicle for the nineties
26 p0236 A80-28481
The contribution of Volkswagenwerk AG to the automobile concept of the 90's
26 p0236 A80-28482
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
Design evolution of large wind turbine generators
26 p0261 N80-16455
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456
The Boeing MOD-2 wind tunnel system rated at 2.5 MW
26 p0261 N80-16457
Structural analysis considerations for wind turbine blades
26 p0262 N80-16469
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
System configuration improvement
26 p0263 N80-16481
Low-cost structures for photovoltaic arrays
[SAND-79-7006] 26 p0268 N80-16537
Design, fabrication, test, and evaluation of a prototype 150-foot long composite wind turbine blade
[NASA-CR-159775] 26 p0276 N80-17548
First passive solar home awards
[DSE-1020-T17] 26 p0276 N80-17556
Segmented dish concentrator design project
[SAND-79-7024] 26 p0277 N80-17561
Receiver assembly design studies for 2-m 90 deg parabolic-cylindrical solar collectors
[SAND-79-1026] 26 p0277 N80-17564
Solar energy design improvement: A methodology for hydronic flatplate collector systems
[AD-A076836] 26 p0286 N80-18567
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443
Low cost point focus solar concentrator. Phase 1: Preliminary design
[JPL-9950-273] 26 p0292 N80-19622
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899

STRUCTURAL DESIGN CRITERIA
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807
Alcoa wind turbines
26 p0261 N80-16464
Large, low cost composite wind turbine blades
26 p0263 N80-16475

STRUCTURAL ENGINEERING
Fabrication of extruded vertical axis turbine blades
26 p0262 N80-16467
The use of wood for wind turbine blade construction
26 p0262 N80-16474
The MOD-1 steel blade
26 p0263 N80-16476
The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477
Proceedings of the 13th Project integration meeting
[NASA-CR-162787] 26 p0276 N80-17549

STRUCTURAL FAILURE
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186

STRUCTURAL MEMBERS
Low-cost structures for photovoltaic arrays
[SAND-79-7006] 26 p0268 N80-16537

STRUCTURAL PROPERTIES (GEOLOGY)
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410
Bibliography of geology and hydrology, eastern New Mexico
[PB-300832/3] 26 p0273 N80-16663

STRUCTURAL WEIGHT
Possibilities and limits of the conception of an up-to-date compact vehicle for the nineties
26 p0236 A80-28481

SUBMERGED BODIES
Flap type weather proof ocean wave energy converter
26 p0232 A80-28258
Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

SUBSONIC AIRCRAFT
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687

SUBSTRATES
The doping of amorphous silicon for solar cells
26 p0187 A80-21921
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-5] 26 p0313 N80-21520

SULFATES
An evaluation of candidate seed processing systems for open cycle MHD --- sulfur removal and control
26 p0217 A80-25072

SULFATION
Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501

SULFUR
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167

SULFUR COMPOUNDS
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494

SULFUR DIOXIDES
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128
The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300

SULFUR OXIDES

Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890

SULFURIC ACID

Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128

Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131

Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle
26 p0204 A80-23189

A heat penalty and economic analysis of the hybrid sulfuric acid process
26 p0245 A80-29406

SUPERCONDUCTING MAGNETS

Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures --- for superconducting energy storage magnet structural supports
26 p0191 A80-22690

Superconducting magnets for mirror machines
26 p0215 A80-24672

Superconducting MHD magnets - Technology development, procurement and the path to commercial scale
26 p0218 A80-25077

A modular design for a superconducting magnet for the ETF and larger MHD generators
26 p0218 A80-25078

A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute --- Coal-Fired Flow Facility
26 p0218 A80-25079

Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507

Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443

The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support
[LA-7885-MS-VOL-6] 26 p0307 N80-20897

SUPERCONDUCTING POWER TRANSMISSION

Permanent magnet and superconducting generators in airborne, high power systems --- computer program to predict weight of the generators and component systems
[AD-A078424] 26 p0284 N80-18311

Helium research in support of superconducting power transmission
[PB80-116502] 26 p0314 N80-21697

SUPERHEATING

The effect of superheating on the performance of floating droplet direct contact heat exchangers
26 p0260 N80-16293

SUPERSONIC DIFFUSERS

Design description and performance predictions for the first CDIF power train --- MHD generator combustor, power channel and diffusers
26 p0216 A80-25062

SUPERSONIC TRANSPORTS

The changing horizons for technical progress. II
26 p0229 A80-27270

SUPPLYING

Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

SURFACE PROPERTIES

Selective optical surfaces for solar energy convertors --- Russian book
26 p0228 A80-26511

The spectral response of a front surface field solar cell
26 p0254 A80-32331

SURFACE TEMPERATURE

Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504

SURFACE VEHICLES

Hydrogen energy in United States Post Office delivery systems
26 p0203 A80-23178

Light rail transit in the United States
26 p0252 A80-31770

SWITCHING CIRCUITS

A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008

SYNCHRONOUS MOTORS

WTG Energy Systems' MP1-200 200 kilowatt wind turbine generator --- a fixed pitch rotor configuration driving a synchronous generator
26 p0261 N80-16458

SYNTHETIC FUELS

Application of centrifugal separation to the production of hydrogen from coal
26 p0194 A80-22869

On the potential of solar energy conversion into hydrogen and/or other fuels
26 p0195 A80-23107

Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127

Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131

Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory
26 p0198 A80-23132

Coal liquefaction processes --- Book
26 p0242 A80-28953

The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants
26 p0248 A80-29938

Balancing the process of hydrating gasification of brown coal
26 p0250 A80-30597

Development studies on selected conversion of synthesis gas from coal to high octane gasoline
[FE-2276-27] 26 p0259 N80-16190

Gasohol: A technical memorandum
[PB80-105885] 26 p0259 N80-16194

Alcohol fuels. Citations from the American petroleum institute data base --- a bibliography with abstracts
[NTIS/PS-79/0911/2] 26 p0259 N80-16195

Production of synthetic gas from nuclear energy sources
[LA-7592-MS] 26 p0274 N80-17244

Experimental alcohol fuel plants
[ATF-P-5000-2] 26 p0283 N80-18203

Alcohol fuels information directory
[ATF-P-5000-3] 26 p0283 N80-18204

Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302

Synthesis gas demonstration plant program, phase 1
[FE-25770-6] 26 p0289 N80-19308

Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407

Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412

Liquid phase methanation/shift pilot plant operation and laboratory support work
[FE-2036-37] 26 p0298 N80-20413

Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

Biomass energy systems: Environmental readiness document
[DOE/ERD-0021] 26 p0308 N80-20905

SYSTEM EFFECTIVENESS

Energy accounting of alternative energy sources
26 p0193 A80-22868

Thermodynamics of heating. II
26 p0227 A80-26309

Geothermal heating in Creil
26 p0255 A80-32499

SYSTEM FAILURES

Mod 1 wind turbine generator failure modes and effects analysis
[NASA-CR-159494] 26 p0303 N80-20864

SYSTEMS ANALYSIS
A performance and economic evaluation of annual cycle energy storage /ACES/
26 p0223 A80-25260
Independent assessment of energy policy models
[EPRI-EA-1071] 26 p0266 N80-16510
Performance characteristics of a commercially available point-focus solar power --- systems analysis of a solar energy conversion system in terms of power efficiency and energy conversion efficiency
[SERI/TP-34-169] 26 p0268 N80-16529
Direct energy conversion systems
[COO-2218-117] 26 p0269 N80-16543
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary --- domestic energy supply systems analysis of coal fired power plants using fuel cells
[PB-299207/1] 26 p0271 N80-16564
First passive solar home awards
[DSE-1020-T17] 26 p0276 N80-17556
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

SYSTEMS ENGINEERING
Shadow effect of adjacent solar collectors in large scale systems
26 p0183 A80-21107
Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739
Heat pumps --- Book
26 p0207 A80-23224
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514
The economic significance of Q for mirror reactors - Combinations of Q and M which look promising --- parameters affecting energy conversion efficiency in fusion reactor
26 p0215 A80-24666
First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340
Photovoltaic power for telecommunications
26 p0232 A80-28015
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856
System configuration improvement
26 p0263 N80-16481
Prototype solar heating and combined heating cooling systems
[NASA-CR-161340] 26 p0264 N80-16485
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550
Solar energy control system
[NASA-CASE-MFS-25287-1] 26 p0275 N80-17544
A fluorescent radiation converter
[NASA-CASE-GSC-12528-1] 26 p0283 N80-18261
Solar energy heating system design package for a single-family residence at New Castle, Pennsylvania
[NASA-CR-161356] 26 p0303 N80-20865
Solar heating system design package for a single-family residence at William O'Brien State Park, Minnesota
[NASA-CR-161357] 26 p0303 N80-20866
Solar power satellite system definition study, volume 4, phase 2
[NASA-CR-160565] 26 p0313 N80-21395

SYSTEMS STABILITY
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088

T

TAR SANDS
Surface-active materials from Athabasca oil sands
26 p0192 A80-22770

TARS
Heavy hydrocarbons from coal gasification vapor pressures and dew point
26 p0257 N80-16111
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949

TAYLOR INSTABILITY
Application of plasma focus device to compression of toroidal plasma
26 p0229 A80-27058

TECHNOLOGICAL FORECASTING
Photovoltaic cost blitz spawns new silicon processes
26 p0186 A80-21913
Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Photovoltaics. II - Flat panels
26 p0214 A80-24532
The price of oil in the year 2000
[AAS 79-172] 26 p0215 A80-24717
Future large cargo aircraft technology
26 p0229 A80-27269
The changing horizons for technical progress. II
26 p0229 A80-27270
Lignite and coal in the U.S. energy future
26 p0230 A80-27420
Future trends in the automobile
26 p0234 A80-28426
Air transport and travel in 2000 - Future requirements
26 p0234 A80-28427
The future of the Diesel engine - A critical analysis
26 p0235 A80-28473
Just over the horizon in space
26 p0256 A80-32511
Energy conservation in industry: The present approach, the future opportunities
[PB-301244/0] 26 p0270 N80-16556
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
The role of technology as air transportation faces the fuel situation
[NASA-TM-81793] 26 p0297 N80-20260
Analysis of current trends in U.S. petroleum and natural gas production
[PB80-116056] 26 p0301 N80-20800
Projections of direct energy consumption by mode: The 1975 - 2000 baseline
[ANL/CNSV-4] 26 p0304 N80-20878
Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results
[DOE/FE-2344/2] 26 p0305 N80-20885

TECHNOLOGY ASSESSMENT
Canadian renewable energy prospects
26 p0183 A80-21104
An overview of photovoltaic market research
26 p0186 A80-21917
Temperature dependence of the maximum theoretical efficiency in solar cells
26 p0187 A80-21922
Overview of coal energy utilization technology in Japan
26 p0187 A80-21924
Present state and outlook of the electrolytic H2-production route
26 p0195 A80-23104
The role of metal hydrides in hydrogen storage and utilization
26 p0202 A80-23163
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code --- improved computer program for hydrogen production and nuclear reactor-chemical plant coupling processes
26 p0205 A80-23192

Advances in energy systems and technology. Volume 2 --- Book 26 p0207 A80-23218
Models for energy technology assessment 26 p0207 A80-23222
Systematic design assessment techniques for solar buildings 26 p0209 A80-23514
Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation --- Book 26 p0214 A80-24660
Superconducting MHD magnets - Technology development, procurement and the path to commercial scale 26 p0218 A80-25077
The OTEC connection - Power from the sea 26 p0222 A80-25115
The MINI-OTEC test 26 p0232 A80-28259
Ocean wave energy conversion concepts 26 p0232 A80-28260
The dual-mode bus and further bus developments in France 26 p0235 A80-28431
International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies 26 p0235 A80-28470
Future prospects for use of the gas turbine for automobiles 26 p0236 A80-28485
Solar water heating in the Midwest - An economic assessment based on measured performance 26 p0241 A80-28858
Energy politics --- economic and technological overview 26 p0246 A80-29475
Hydrogen as a fuel 26 p0257 N80-16177
Results of a utility survey of the status of large wind turbine development 26 p0263 N80-16479
Preparation of thin films for solar energy utilization [SAND-79-1754C] 26 p0267 N80-16517
Photovoltaic effect, its present understanding and remaining mysteries [DOE/ET-23103/6] 26 p0268 N80-16535
Comments on TEC trends [NASA-TM-79317] 26 p0273 N80-16885
Production of synthetic gas from nuclear energy sources [LA-7592-MS] 26 p0274 N80-17244
Development of electrochemical storage batteries with improved energy density [BMFT-FB-T-77-88] 26 p0279 N80-17582
Survey on metallurgical recycling processes [ANL/OEPM-79-2] 26 p0282 N80-17918
The role of technology as air transportation faces the fuel situation [NASA-TM-81793] 26 p0297 N80-20260
Survey of biomass gasification. Volume 1: Synopsis and executive summary [SERI/TR-33-239-VOL-1] 26 p0300 N80-20427
Overview of NASA battery technology program 26 p0302 N80-20821
Conversion system overview assessment. Volume 1: Solar thermoelectrics [SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Fusion technology development [DOE/ET-0116/1] 26 p0311 N80-21165
Advances in MHD technology [CONF-790598-5] 26 p0311 N80-21166
Technology assessment: Line-focus concentrators [SAND-79-2221C] 26 p0318 N80-21871
Energy from the west: Impact analysis report. Volume 1: Introduction and summary [PB80-113566] 26 p0319 N80-21884

TECHNOLOGY TRANSFER
Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program [BNL-26904] 26 p0296 N80-19654

TECHNOLOGY UTILIZATION
Heat pumps --- Book 26 p0207 A80-23224
Non-electric fusion energy applications 26 p0215 A80-24676
Application of black-liquor boiler technology to MHD heat and seed recovery equipment design 26 p0217 A80-25070
Metal/air batteries: Their status and potential - A review 26 p0231 A80-28012
Hydrogen energy research programs in Japan 26 p0233 A80-28271
The industrialisation of space 26 p0252 A80-31791
Space benefits: The secondary application of aerospace technology in other sectors of the economy [NASA-CR-162697] 26 p0274 N80-16950
State-of-the-art of solar control systems in industrial process heat applications [SERI/TP-39-240] 26 p0277 N80-17562
Criteria for an ideal solar photovoltaic powered industry [HCP/T5433-01] 26 p0279 N80-17577
NASA authorization, 1981, program review, volume 1 [GPO-53-814] 26 p0281 N80-17913
Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas [PB-299925/8] 26 p0285 N80-18547
National solar heating and cooling programs [PB80-104987] 26 p0309 N80-20915
Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979 [PB80-115298] 26 p0311 N80-21197
Hydro for the eighties: Bringing hydroelectric power to low income people, the work book. A slide presentation: Audio cassette and workbook [PB80-103948] 26 p0319 N80-21883

TECTONICS
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas 26 p0254 A80-32276
The Yallahs fan delta, southeastern Jamaica: A depositional model for active tectonic coastlines 26 p0273 N80-16632

TEETERING
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine [NASA-TM-81445] 26 p0291 N80-19613

TELECOMMUNICATION
Solar power satellites and the ITU - Some U.S. policy options 26 p0223 A80-25253
Photovoltaic power for telecommunications 26 p0232 A80-28015

TEMPERATURE DEPENDENCE
The temperature dependence of the characteristics of sputtered a-Si-H solar cells 26 p0187 A80-21920
Temperature dependence of the maximum theoretical efficiency in solar cells 26 p0187 A80-21922

TEMPERATURE EFFECTS
The doping of amorphous silicon for solar cells 26 p0187 A80-21921
Structure of deformed silicon and implications for low-cost solar cells 26 p0191 A80-22526
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems 26 p0254 A80-32371
Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes [UCRL-52851] 26 p0316 N80-21842

TEMPERATURE MEASUREMENT
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy 26 p0247 A80-29897
Solar energy control system [NASA-CASE-MFS-25287-1] 26 p0275 N80-17544

TEMPERATURE PROFILES
Assessment of low- to moderate-temperature geothermal resources of Nevada [NVO-01556-1] 26 p0301 N80-20792

TENNESSEE
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

TENSILE STRENGTH
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

TERRAIN ANALYSIS
Wind characteristics over complex terrain relative to WECS siting --- Wind Energy Conversion System
[AIAA 80-0645] 26 p0239 A80-28825

TEST EQUIPMENT
Light-duty diesel gaseous emissions measurement - comparison of dilution tunnel test results to certification cell test results
[PB80-115991] 26 p0310 N80-20945

TEST FACILITIES
Unique high concentration solar test facility
26 p0186 A80-21916
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute --- Coal-Fired Flow Facility
26 p0218 A80-25079
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097
A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098
A modular approach to an engineering test facility and beyond --- for coal-fired MHD generators
26 p0221 A80-25103
Solar central test facility
[SAND-79-1730C] 26 p0267 N80-16524
Midtemperature solar systems test facility experiment manual and test plan
[SAND-79-0379] 26 p0268 N80-16528
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864

TEST STANDS
One-stage cyclone combustor for coal fired test stand of 4MW thermal power --- for MHD generators
26 p0222 A80-25111
Addition of an air-cooled collector test capability to the solar collector test facility
[PB-300482/7] 26 p0270 N80-16562

TETHERED BALLOONS
Measurements of wind shear at the Mod-1 Site, Boone, N.C --- for wind turbine
[AIAA 80-0648] 26 p0240 A80-28828

THEMATIC MAPPING
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456

THERMAL ABSORPTION
A metal hydrogen heat pump as topping process for power generation
26 p0204 A80-23181

THERMAL BATTERIES
Improved thermal battery --- military applications
[AD-A075835] 26 p0276 N80-17554

THERMAL CONDUCTIVITY
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

THERMAL DECOMPOSITION
Open-loop thermochemical cycles for the production of hydrogen
26 p0233 A80-28274

THERMAL DIFFUSION
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145

THERMAL EMISSION
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657

THERMAL ENERGY
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
Energy storage
26 p0255 A80-32398
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547
Thermal energy storage, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0952/6] 26 p0279 N80-17584
Thermal energy storage, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0951/8] 26 p0279 N80-17585
Thermal energy storage, volume 1. Citations from the Engineering Index data base
[NTIS/PS-79/0953/4] 26 p0279 N80-17586
Thermal energy storage, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0954/2] 26 p0279 N80-17587
Thermal fluid selection for long-distance heat transmission
[CONF-790803-47] 26 p0305 N80-20879
Thermal energy storage application areas --- for building heating and cooling
[CONS/5113-T4] 26 p0306 N80-20894
Environmental development plan for space applications --- development of nuclear power supplies for use in space
[DOE/EDP-0057] 26 p0309 N80-20922
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379

THERMAL EXPANSION
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

THERMAL INSULATION
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings
26 p0212 A80-24071
Thermography at the earth's surface and the energy efficiency of buildings
26 p0213 A80-24072
Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456

THERMAL MAPPING
Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings
26 p0212 A80-24071
A model for the Sulphur Springs geothermal field St. Lucia
26 p0231 A80-27924

THERMAL RESISTANCE
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507

THERMAL SIMULATION
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514

THERMIONIC CONVERTERS
Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters
26 p0249 A80-30241
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242
DOE/JPL advanced thermionic technology program
[COO-3056-37] 26 p0304 N80-20873
Potentialities of TEC topping: A simplified view of parametric effects
[NASA-TM-81468] 26 p0321 N80-22083

THERMIONIC POWER GENERATION
Comments on TEC trends
[NASA-TM-79317] 26 p0273 N80-16885
DOE/JPL advanced thermionic technology program
[COO-3056-37] 26 p0304 N80-20873
Potentialities of TEC topping: A simplified view of parametric effects
[NASA-TM-81468] 26 p0321 N80-22083
THERMIONICS
Comments on TEC trends
[NASA-TM-79317] 26 p0273 N80-16885
THERMOCHEMICAL PROPERTIES
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126
Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127
Thermochemical water splitting cycles - Impact of thermal burdens and kinetics
26 p0199 A80-23138
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143
Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis
26 p0205 A80-23191
Engineering impact on the validity of the Mark-16 thermochemical cycle --- hydrogen production restrictions and prospects
26 p0205 A80-23198
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201
THERMOCHEMISTRY
Nuclear energy as a primary energy source for hydrogen production
26 p0194 A80-23102
On the potential of solar energy conversion into hydrogen and/or other fuels
26 p0195 A80-23107
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles
26 p0197 A80-23120
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128
The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131
Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory
26 p0198 A80-23132
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134
Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149
Thermoelectrochemical cycles for power and hydrogen production
26 p0201 A80-23157
Present state and future prospects of thermochemical hydrogen production
26 p0205 A80-23194
Status and development of production of cheap hydrogen
26 p0208 A80-23330
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888
Gasification of oil shale
26 p0226 A80-25889
Present state and future prospects of thermochemical hydrogen production
26 p0233 A80-28272
Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273
Open-loop thermochemical cycles for the production of hydrogen
26 p0233 A80-28274
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0233 A80-28275
The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407
THERMOCOUPLES
Solar energy control system
[NASA-CASE-MFS-25287-1] 26 p0275 N80-17544
THERMODYNAMIC COUPLING
Use of earth coupling in solar assisted heat pumps
[BNL-26748] 26 p0316 N80-21849
THERMODYNAMIC CYCLES
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles
26 p0197 A80-23120
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133
Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
Mixing effects of different types of hydrides
26 p0202 A80-23166
Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis
26 p0205 A80-23191
Engineering impact on the validity of the Mark-16 thermochemical cycle --- hydrogen production restrictions and prospects
26 p0205 A80-23198
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201
Present state and future prospects of thermochemical hydrogen production
26 p0233 A80-28272

Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273
Open-loop thermochemical cycles for the production of hydrogen
26 p0233 A80-28274
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0233 A80-28275

THERMODYNAMIC EFFICIENCY
The theoretical design of a solar engine for the production of hydrogen
26 p0195 A80-23108
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118
Thermochemical water splitting cycles - Impact of thermal burdens and kinetics
26 p0199 A80-23138
The thermodynamics of heating. I - The second law and conventional heating systems
26 p0213 A80-24512
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885
The MINI-OTEC test
26 p0232 A80-28259
Instantaneous collector thermal efficiencies in less time
26 p0248 A80-29925
Operating thresholds of solar collection systems
26 p0251 A80-30775
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
Thermal performance evaluation of the Northrop model NSC-01-0732 concentrating solar collector array at outdoor conditions --- Marshall Space Flight Center solar house test facility
[NASA-CR-161354] 26 p0293 N80-19628
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

THERMODYNAMIC EQUILIBRIUM
Active burn control of nearly ignited plasmas
26 p0224 A80-25480

THERMODYNAMIC PROPERTIES
Thermodynamics of heating. II
26 p0227 A80-26309

THERMODYNAMICS
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926
Basic research in engineering: Fluid dynamics and thermal processes --- workshop
[FE-2468-54] 26 p0301 N80-20551

THERMOELECTRIC GENERATORS
Geothermal energy and the environment - The global experience
26 p0223 A80-25259
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Analysis of a heat exchanger-thermoelectric generator system
[SERI/TP-35-253] 26 p0316 N80-21848

THERMOELECTRIC POWER GENERATION
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491
The 15 kW sub e (nominal) solar thermal electric power conversion concept definition study: Steam Rankine turbine system
[NASA-CR-159589] 26 p0264 N80-16493
Heliostat system design and operation. Citations from the Engineering Index data base
[NTIS/PS-79/0930/2] 26 p0271 N80-16571
Regenerative burner system for thermoelectric power sources --- military equipment
[AD-A075955] 26 p0276 N80-17553
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612
Annual technical report, fiscal year 1979. Volume 1: Executive summary
[NASA-CR-159715] 26 p0293 N80-19632
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634
Screening evaluation of electric power cycles integrated with coal gasification plants
[EPRI-AF-1160] 26 p0295 N80-19646
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869
Environmental assessment methodology: Solar power plant applications. Volume 3. Environmental impact assessment application
[EPRI-ER-1070-VOL-3] 26 p0306 N80-20889
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890

THERMONUCLEAR POWER GENERATION
Progress in the production and energy flux concentration of the REB accelerator for ICF
26 p0226 A80-25785
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567

THERMOPHYSICAL PROPERTIES
Mixture properties for hydrogen supplementation of natural gas
26 p0201 A80-23159
Experimental laboratory measurement of thermophysical properties of selected coal types
[NASA-CR-162913] 26 p0298 N80-20404

THERMOSIPHONS
Transient response of thermosyphon solar collectors
26 p0248 A80-29922

THIN FILMS
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014
Growth and characterization of thin film III-V compound semiconductor material for solar cell applications
26 p0244 A80-29058
Heterojunction for thin-film solar cells
26 p0245 A80-29393
Thin film solar cells based on amorphous silicon
26 p0245 A80-29395
Preparation of thin films for solar energy utilization
[SAND-79-1754C] 26 p0267 N80-16517
Photovoltaic Materials and Device Measurements Workshop: Focus on polycrystalline thin film cells
[SERI/TP-49-185] 26 p0268 N80-16538
Silicon solar cells, volume 3. Citations from the Engineering Index data base --- bibliographies
[PB80-800717] 26 p0280 N80-17588
Silicon solar cells, volume 3. Citations from the NTIS data base --- bibliographies
[PB80-800691] 26 p0280 N80-17589
Silicon solar cells, volume 2. Citations from the Engineering Index data base --- bibliographies
[PB80-800709] 26 p0280 N80-17590

THIOLS
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids --- quioline, indole, dibenzothiophene, and naphthalene
[FE-2028-15] 26 p0287 N80-19292

THRUST AUGMENTATION
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272

THYRISTORS
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501
Measurement techniques for high power semiconductor materials and devices
[DOE/RA-0041] 26 p0301 N80-20506

TIDE POWERED GENERATORS
Cheap electricity from French tides
26 p0214 A80-24537

TIMBER INVENTORY
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456

TIN
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620

TITANATES
Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273

TITANIUM ALLOYS
Use of binary titanium alloys for hydrogen storage
26 p0202 A80-23164
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171

TITANIUM BORIDES
Energy savings through use of an improved reduction cell cathode
[SAN-1257-T2] 26 p0267 N80-16515

TITANIUM CARBIDES
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167

TITANIUM COMPOUNDS
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184
Characterization of prototype secondary lithium battery
26 p0303 N80-20832

TITANIUM OXIDES
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503

TOKAMAK DEVICES
Gradient bounds for plasma confinement
26 p0213 A80-24223
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482
Two-stroke tokamak reactor
26 p0213 A80-24487
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498
Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978
26 p0214 A80-24661
Plasma parametric studies and potential applications of driven fusion reactors
26 p0215 A80-24674
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472
Shape control of doublets --- for tokamak plasma stability control
26 p0223 A80-25473
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478
Active burn control of nearly ignited plasmas
26 p0224 A80-25480
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483
US tokamak research
26 p0226 A80-25777
Controlled fusion research in China
26 p0226 A80-25786
Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas
26 p0229 A80-27263
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
Ideal magnetohydrodynamic stability of tokamak plasmas
26 p0250 A80-30554
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1
[EPRI-ER-1083-VOL-1] 26 p0281 N80-17863
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2
[EPRI-ER-1083-VOL-2] 26 p0281 N80-17864

TOROIDAL PLASMAS
Toroidal Trivelpiece-Gould modes --- quasi-electrostatic approximation for electron plasma waves in fusion reactor
26 p0189 A80-22042
MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation
26 p0209 A80-23366
Two-stroke tokamak reactor
26 p0213 A80-24487
Shape control of doublets --- for tokamak plasma stability control
26 p0223 A80-25473
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483
Application of plasma focus device to compression of toroidal plasma
26 p0229 A80-27058
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
Ideal magnetohydrodynamic stability of tokamak plasmas
26 p0250 A80-30554

TOWERS
Aerodynamic interference between two Darrieus wind turbines
[AIAA 80-0606] 26 p0237 A80-28803

TRACE ELEMENTS
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417

TRACKING (POSITION)
Solar-powered sun tracker
[AD-A078653] 26 p0294 N80-19640

TRANSIENT RESPONSE
Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025] 26 p0212 A80-23954
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498
Transient response of thermosyphon solar collectors
26 p0248 A80-29922

TRANSIT SATELLITES
The role of navigation satellites in oil exploration
26 p0222 A80-25152
TRANSITION METALS
Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055
TRANSITION POINTS
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926
TRANSLATIONAL MOTION
Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
TRANSMISSION EFFICIENCY
Free space microwave power transmission systems for microwave powered atmospheric platforms
26 p0228 A80-26813
TRANSMISSION LINES
Helium research in support of superconducting power transmission
[PB80-116502] 26 p0314 N80-21697
TRANSMISSIONS (MACHINE ELEMENTS)
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754
TRANSMITTANCE
Calculation of the monthly-average transmittance-absorptance product --- for solar collectors
26 p0184 A80-21117
TRANSPORT AIRCRAFT
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687
TRANSPORT PROPERTIES
Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249] 26 p0192 A80-22745
TRANSPORT THEORY
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
TRANSPORT VEHICLES
Electric transport - The future prospects
26 p0189 A80-21956
TRANSPORTATION ENERGY
Electric transport - The future prospects
26 p0189 A80-21956
Urban activity allocation under criteria of transportation energy efficiency
26 p0192 A80-22788
Hydrogen storage in metal hydrides
26 p0193 A80-22867
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175
Design considerations for the Riverside hydrogen bus
26 p0203 A80-23176
Hydrogen energy in United States Post Office delivery systems
26 p0203 A80-23178
A plan for active development of LH2 for use in aircraft
26 p0206 A80-23204
International Symposium on Traffic and Transportation Technologies, Hamburg, West Germany, June 18-20, 1979, Proceedings. Volumes C1 & C2 - Motor vehicle and road traffic technologies
26 p0235 A80-28470
The energy problem - Its effect on aircraft design. II - The effects of fuel cost
26 p0254 A80-32201
Worldwide transportation/energy demand forecast, 1975 - 2000
[ORNL/SUB-78/13536/1] 26 p0269 N80-16546
Contributions to the foundations of supply for energy and transportation: Concepts, economics, and technologies
[PB-300541/0] 26 p0269 N80-16554
Coping with energy limitations in transportation: Proposals for Michigan
[PB-239737/7] 26 p0270 N80-16559
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295
Projections of direct energy consumption by mode: The 1975 - 2000 baseline
[ANL/CNSV-4] 26 p0304 N80-20878
Urban mass transportation energy conservation: SBGP operating instructions and program documentation, volume 5
[DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205
Urban transportation energy conservation: Case city applications of analysis methodologies, volume 3
[DOE/PE-8628/1-VOL-3] 26 p0312 N80-21206
Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2
[DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207
Mechanical energy storage technology for transportation applications project plan
[UCRL-15138] 26 p0312 N80-21209
Energy storage systems for automobile propulsion
[UCID-18320] 26 p0312 N80-21211
Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies
[CONS-8626-T1-VOL-1] 26 p0317 N80-21857
TRANSPORTATION NETWORKS
The development of the magnetically suspended transportation system in the Federal Republic of Germany
26 p0235 A80-28458
TRAPPED PARTICLES
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482
TRAVELING WAVES
Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas
26 p0229 A80-27263
TREES (PLANTS)
Energy from the biological conversion of solar energy
26 p0210 A80-23522
TRIBOLOGY
Possible energy savings through tribological measures - Especially in automobiles
26 p0227 A80-26184
TUNDRA
Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SP-01525/1] 26 p0294 N80-19642
TURBINE BLADES
Coriolis Program - A review of the status of the ocean turbine energy system
26 p0233 A80-28261
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[AIAA 80-0607] 26 p0237 A80-28804
Dynamic rotor loads of a wind turbine via hand-held calculations
[AIAA 80-0611] 26 p0237 A80-28808
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
UTRC 8 kW wind turbine tests
[AIAA 80-0657] 26 p0240 A80-28831
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832
Aerodynamic performance of the DOE/Sandia 17-m vertical axis wind turbine in the two-bladed configuration
[AIAA 80-0655] 26 p0241 A80-28842
Low cost composite blades for large wind turbines
26 p0253 A80-32074
Alcoa wind turbines
26 p0261 N80-16464
Overview of Vertical Axis Wind Turbine (VAWT)
26 p0262 N80-16466

Fabrication of extruded vertical axis turbine blades
26 p0262 N80-16467
Operational experience with VAWT blades --- structural performance
26 p0262 N80-16468
Structural analysis considerations for wind turbine blades
26 p0262 N80-16469
Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico
26 p0262 N80-16470
Evaluation of an operating MOD-OA 200 kW wind turbine blade
26 p0262 N80-16471
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473
The use of wood for wind turbine blade construction
26 p0262 N80-16474
Large, low cost composite wind turbine blades
26 p0263 N80-16475
The MOD-1 steel blade
26 p0263 N80-16476
The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477
Design, fabrication, test, and evaluation of a prototype 150-foot long composite wind turbine blade
[NASA-CR-159775] 26 p0276 N80-17548
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497

TURBINE ENGINES

Future prospects for use of the gas turbine for automobiles
26 p0236 A80-28485

TURBINES

Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept
26 p0211 A80-23533
Water turbine technology for small power stations
26 p0213 A80-24125
A comparison of aerodynamic analyses for the Darrieus Rotor
[AIAA 80-0605] 26 p0237 A80-28802
Aerodynamic interference between two Darrieus wind turbines
[AIAA 80-0606] 26 p0237 A80-28803
Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data
[AIAA 80-0608] 26 p0237 A80-28805
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807
Experiments on an oscillating aerofoil and applications to wind energy converters
[AIAA 80-0624] 26 p0238 A80-28816
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Design evolution of large wind turbine generators
26 p0261 N80-16455
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456
The Boeing MOD-2 wind tunnel system rated at 2.5 MW
26 p0261 N80-16457
Characteristics of future Vertical Axis Wind Turbines (VAWTs) --- to generate utility grid electric power
26 p0261 N80-16462
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 1: Executive summary
[SAND-78-0962-VOL-1] 26 p0268 N80-16539
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 2: Economic optimization model
[SAND-78-0962-VOL-2] 26 p0268 N80-16540
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541
Economic analysis of Darrieus axis wind turbine systems for the generation of utility grid electrical power. Volume 4: Summary and analysis of the A. T. Kearney and Alcoa Laboratories point design economic studies
[SAND-78-0962-VOL-4] 26 p0269 N80-16542
Gust-rise exceedance statistics for wind turbine design
[PNL-2530] 26 p0277 N80-17567
Darrieus vertical axis wind turbine program overview
[SAND-79-2146C] 26 p0306 N80-20891
Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831

TURBOGENERATORS

Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption
26 p0222 A80-25116
Pumped water storage
26 p0225 A80-25495
Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers
26 p0237 A80-28801
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems
[AIAA 80-0620] 26 p0241 A80-28840

TURBOMACHINERY

Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819
Multi-speed electrical generator application to wind turbines
[AIAA 80-0635] 26 p0239 A80-28821
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822

TURBULENT FLOW

Turbulent flows through annular spaces
26 p0250 A80-30614

TURBULENT MIXING

Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303

TWO PHASE FLOW

Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084

U

U.S.S.R.

The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276

UNDERGROUND STORAGE

Large energy storage systems for utilities
26 p0231 A80-27731
Physical, chemical and energy aspects of underground hydrogen storage
26 p0234 A80-28278
Computer simulation of ground coupled storage in a series solar assisted heat pump system
[BNL-26216] 26 p0266 N80-16507

UNDERWATER STRUCTURES

SEAS - A system for undersea storage of thermal energy
26 p0232 A80-28257

UNIQUENESS THEOREM
MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems
26 p0254 A80-32318

UNITED KINGDOM
Energy accounting of alternative energy sources
26 p0193 A80-22868

UNITED STATES OF AMERICA
United States energy policy - The continuing failure
26 p0185 A80-21766
Monitoring urban population and energy utilization patterns from satellite data
26 p0207 A80-23293
Light rail transit in the United States
26 p0252 A80-31770
Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation
[PNL-2421] 26 p0278 N80-17574
Regional environment-energy data book: Northeast region
[DOE/TIC-10114/3] 26 p0279 N80-17578
Regional environment-energy data book: Western region
[DOE/TIC-10114/2] 26 p0280 N80-17597
Regional environment-energy data book: Southern region
[DOE/TIC-10114/4] 26 p0281 N80-17598
Regional environment-energy data book: Northwest region
[DOE/TIC-10114/5] 26 p0281 N80-17599
Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas
[PB-299925/8] 26 p0285 N80-18547
Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results
[DOE/PE-2344/2] 26 p0305 N80-20885
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912

URANIUM
Environmental system study on the development of fossil fuel resources in the Southwest
[PB-300526/1] 26 p0272 N80-16596

URBAN PLANNING
Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1
[DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208

URBAN RESEARCH
Monitoring urban population and energy utilization patterns from satellite data
26 p0207 A80-23293

URBAN TRANSPORTATION
Urban activity allocation under criteria of transportation energy efficiency
26 p0192 A80-22788
Design considerations for the Riverside hydrogen bus
26 p0203 A80-23176
The dual-mode bus and further bus developments in France
26 p0235 A80-28431
Hybrid drive-systems for municipal buses
26 p0235 A80-28475
Marginal conditions in automobile construction and their implications on the design of upper-category vehicles
26 p0236 A80-28477
Light rail transit in the United States
26 p0252 A80-31770
Simulation of an urban battery bus vehicle
[PB-300306/8] 26 p0282 N80-17923
Urban mass transportation energy conservation: SRGP operating instructions and program documentation, volume 5
[DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205
Urban transportation energy conservation: Case city applications of analysis methodologies, volume 3
[DOE/PE-8628/1-VOL-3] 26 p0312 N80-21206
Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2
[DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207
Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1
[DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208
Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies
[CONS-8626-T1-VOL-1] 26 p0317 N80-21857

USER REQUIREMENTS
An overview of photovoltaic market research
26 p0186 A80-21917
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887

UTAH
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources --- in eastern Utah
[PB-300536/0] 26 p0272 N80-16623
Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
[DOE/TIC-10190] 26 p0306 N80-20895

UTILITIES
Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101
Large energy storage systems for utilities
26 p0231 A80-27731
Economic incentives to wind systems commercialization
[AIAA 80-0617] 26 p0238 A80-28811
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480

V

V/STOL AIRCRAFT
The changing horizons for technical progress. II
26 p0229 A80-27270

VANADIUM COMPOUNDS
Electrochemistry of amorphous V2S5 in lithium cells
26 p0247 A80-29895

VAPOR DEPOSITION
Grain size and its influence on efficiency in polycrystalline GaAs solar cells
26 p0186 A80-21919

VAPOR PRESSURE
Heavy hydrocarbons from coal gasification vapor pressures and dew point
26 p0257 N80-16111

VAPORIZING
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2 --- in MHD generator coal combustor
26 p0217 A80-25073

VARIATIONAL PRINCIPLES
Ideal magnetohydrodynamic stability of tokamak plasmas
26 p0250 A80-30554

VEGETATION
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

VELOCITY DISTRIBUTION
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818

VERTICAL DISTRIBUTION
Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463

Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465
Fabrication of extruded vertical axis turbine blades
26 p0262 N80-16467
VERTICAL ORIENTATION
Darrieus vertical axis wind turbine program overview
[SAND-79-2146C] 26 p0306 N80-20891
VOLT-AMPERE CHARACTERISTICS
Recombination in the space-charge region of Schottky barrier solar cells
26 p0207 A80-23272
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088
Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091
Fluctuations in MHD generators
26 p0221 A80-25106
The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell
26 p0247 A80-29817
The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells
26 p0251 A80-30939
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966
VOLTAGE CONVERTERS (DC TO DC)
PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record
26 p0242 A80-28892
The application of DC-DC energy conversion in a solar energy system
[AD-A077112] 26 p0303 N80-20867
VOLTAGE REGULATORS
PESC '79; Power Electronics Specialists Conference, San Diego, Calif., June 18-22, 1979, Record
26 p0242 A80-28892
The application of DC-DC energy conversion in a solar energy system
[AD-A077112] 26 p0303 N80-20867
VORTEX GENERATORS
Study of a vortex augmentor for a wind-powered turbine
26 p0227 A80-26002
VORTICES
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818

W

WAFERS
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
Characterization of deliberately nickel-doped silicon wafers and solar cells --- microstructure, electrical properties, and energy conversion efficiency
[NASA-CR-162790] 26 p0276 N80-17551
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623
WAKES
Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817
WALL FLOW
Wall combustion in high-swirl combustors --- for coal-fired MHD generators
26 p0222 A80-25110
WALLS
Performance effects of Trombe wall control strategies --- passive solar building heating
26 p0183 A80-21105
WASHINGTON
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869
WASTE DISPOSAL
Incineration of industrial waste
26 p0192 A80-22766
Space disposal of nuclear wastes
26 p0246 A80-29448
WASTE ENERGY UTILIZATION
Nuclear energy as a primary energy source for hydrogen production
26 p0194 A80-23102
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106
Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption
26 p0222 A80-25116
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557
State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570
Combined cycle power generation. Citations from the Engineering Index data base --- bibliographies
[P80-800923] 26 p0280 N80-17595
Waste heat recovery unit design for gas turbine propulsion systems
[AD-A079154] 26 p0290 N80-19503
Energy conservation in the US: Some interdisciplinary approaches with an emphasis on industrial cogeneration
26 p0302 N80-20811
Thermal energy storage application areas --- for building heating and cooling
[CONS/5113-T4] 26 p0306 N80-20894
WASTE TREATMENT
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428
WASTE UTILIZATION
Biogas - Fuel of the future
26 p0227 A80-26175
Open-loop thermochemical cycles for the production of hydrogen
26 p0233 A80-28274
Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51055] 26 p0258 N80-16179
WASTE WATER
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545
WATER
Unipolar water electrolysers - A competitive technology
26 p0196 A80-23116
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
Thermochemical water splitting cycles - Impact of thermal burdens and kinetics
26 p0199 A80-23138
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147

Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis
26 p0205 A80-23191
Present state and future prospects of thermochemical hydrogen production
26 p0205 A80-23194
Theoretical efficiency limit of water electrolysis and practical means to approach it
26 p0205 A80-23197
A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199
Hydrogen production from water using fission-pumped laser
26 p0206 A80-23200
Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521
Pumped water storage
26 p0225 A80-25495
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888
Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273
Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152
The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407

WATER HEATING
Energy resource requirements of a solar heating system
26 p0184 A80-21746
Warm water storage in district heating systems incorporating combined heat and power plant
26 p0185 A80-21825
Solar space heating with air and liquid systems
26 p0209 A80-23512
Results of solar heating experiments --- for full scale domestic system performance
26 p0209 A80-23513
Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings
26 p0209 A80-23515
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887
SEAS - A system for undersea storage of thermal energy
26 p0232 A80-28257
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858
Transient response of thermosyphon solar collectors
26 p0248 A80-29922
The energy impacts of solar heating
26 p0248 A80-29946
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
Solar energy system performance evaluation: Seasonal report for SEMCO, Loxahatchee, Florida
[NASA-CR-161379] 26 p0293 N80-19627
Solar energy system performance evaluation: A seasonal report for SEMCO, Macon, Georgia
[NASA-CR-161380] 26 p0293 N80-19629
Installation guidelines for solar heating system, single-family residence at New Castle, Pennsylvania
[NASA-CR-161355] 26 p0293 N80-19630
Solar energy system performance evaluation: Seasonal report for IBM System 2, Togus, Maine
[NASA-CR-161383] 26 p0315 N80-21836
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876

WATER INJECTION
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272

WATER POLLUTION
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources --- in eastern Utah
[PB-300536/0] 26 p0272 N80-16623
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896

WATER QUALITY
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources --- in eastern Utah
[PB-300536/0] 26 p0272 N80-16623

WATER RESOURCES
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation --- for generation of electric power
[DOE/ET-28432/3-1] 26 p0291 N80-19606
Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices --- for generation of electric power
[DOE/ET-28432/3-2] 26 p0291 N80-19607
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801
Determining the feasibility of incorporating water resource constraints into energy models
[EPRI-EA-1147] 26 p0308 N80-20908

WATER TREATMENT
Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545

WATER VAPOR
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118

WATERWAVE ENERGY
Exotic energy R&D has potential --- ocean wave and windpower utilization
26 p0213 A80-24124
Characteristics of Salter's cam for extracting energy from ocean waves
26 p0251 A80-30802

WATERWAVE ENERGY CONVERSION
Indirect utilization of solar energy --- utilization of wind power created by ocean surface waves
26 p0211 A80-23524
Flap type weather proof ocean wave energy converter
26 p0232 A80-28258
Ocean wave energy conversion concepts
26 p0232 A80-28260
Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design
26 p0251 A80-30804
Absorption of wave energy by elongated bodies --- in ocean water
26 p0251 A80-30805
Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637
Hydropower, an energy source whose time has come again
[PB80-127715] 26 p0320 N80-21886

WATERWAVE POWERED MACHINES
Flap type weather proof ocean wave energy converter
26 p0232 A80-28258
Ocean wave energy conversion concepts
26 p0232 A80-28260

Submerged cylinder wave energy device - Theory and experiment 26 p0251 A80-30801

Characteristics of Salter's cam for extracting energy from ocean waves 26 p0251 A80-30802

Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design 26 p0251 A80-30804

WAVELENGTHS

A fluorescent radiation converter [NASA-CASE-GSC-12528-1] 26 p0283 N80-18261

WEAR

Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico 26 p0262 N80-16470

Evaluation of an operating MOD-OA 200 kW wind turbine blade 26 p0262 N80-16471

WEATHER

Modeling the space conditioning energy demand of a community as a function of weather [COO-1340-65] 26 p0294 N80-19644

WEATHER STATIONS

A statistical methodology for study of wind characteristics from a close array of stations 26 p0211 A80-23536

WEATHERPROOFING

AGT guideway and station technology. Volume 8: Weather protection concepts [PB-299746/8] 26 p0274 N80-16974

WEIBULL DENSITY FUNCTIONS

Describing wind data --- using characteristic wind speed and shape factor parameters 26 p0211 A80-23534

WEIGHT ANALYSIS

Permanent magnet and superconducting generators in airborne, high power systems --- computer program to predict weight of the generators and component systems [AD-A078424] 26 p0284 N80-18311

WELLS

Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis [METC/CR-79/28] 26 p0260 N80-16410

Energy from the situ processing of antrim oil shale [PE-2346-44] 26 p0278 N80-17576

WEST VIRGINIA

Subsurface stratigraphy of the Middle and Upper Devonian clastic sequence in southern West Virginia and its relation to gas production 26 p0273 N80-16628

WETTABILITY

Wettability and corrosion of MHD ceramics by Rosebud coal slag 26 p0217 A80-25074

WHEELS

The effect of material properties on the thermal efficiency of the Minto solar wheel 26 p0253 A80-31857

WIND MEASUREMENT

Wind energy research and development at Lincoln 26 p0211 A80-23535

Project windsheet - An interim report --- on wind measurement at sites in American Southwest [AIAA 80-0647] 26 p0239 A80-28827

Measurements of wind shear at the Mod-1 Site, Boone, N.C --- for wind turbine [AIAA 80-0648] 26 p0240 A80-28828

Wind characteristics for field testing of wind conversion systems [SAND-78-1563] 26 p0310 N80-20993

WIND PROFILES

Wind characteristics for field testing of wind conversion systems [SAND-78-1563] 26 p0310 N80-20993

Estimation of wind characteristics at potential wind energy conversion sites [PNL-3074] 26 p0321 N80-21955

WIND SHEAR

Measurements of wind shear at the Mod-1 Site, Boone, N.C --- for wind turbine [AIAA 80-0648] 26 p0240 A80-28828

WIND TUNNEL TESTS

Development of vertical axis wind turbines 26 p0187 A80-21929

Study of a vortex augmentor for a wind-powered turbine 26 p0227 A80-26002

Model wind rotors in wind tunnels - Performance and the effect of Reynolds number [AIAA 80-0623] 26 p0238 A80-28815

UTRC 8 kW wind turbine tests [AIAA 80-0657] 26 p0240 A80-28831

New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems [AIAA 80-0620] 26 p0241 A80-28840

WIND VARIATIONS

Gust-rise exceedance statistics for wind turbine design [PNL-2530] 26 p0277 N80-17567

WIND VELOCITY

Gust models for design and performance analyses of wind turbines [AIAA 80-0644] 26 p0240 A80-28833

Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power [ISBN-3-88148-164-8] 26 p0281 N80-17635

WIND VELOCITY MEASUREMENT

Describing wind data --- using characteristic wind speed and shape factor parameters 26 p0211 A80-23534

A statistical methodology for study of wind characteristics from a close array of stations 26 p0211 A80-23536

WINDMILLS (WINDPOWERED MACHINES)

Development of vertical axis wind turbines 26 p0187 A80-21929

An oscillatory wind energy convertor 26 p0211 A80-23537

Study of a vortex augmentor for a wind-powered turbine 26 p0227 A80-26002

The Lanchester-Betz limit --- energy conversion efficiency factor for windmills 26 p0227 A80-26004

A comparison of aerodynamic analyses for the Darrieus Rotor [AIAA 80-0605] 26 p0237 A80-28802

Aerodynamic interference between two Darrieus wind turbines [AIAA 80-0606] 26 p0237 A80-28803

Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades [AIAA 80-0607] 26 p0237 A80-28804

Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data [AIAA 80-0608] 26 p0237 A80-28805

Dynamic rotor loads of a wind turbine via hand-held calculations [AIAA 80-0611] 26 p0237 A80-28808

The wingmill - An oscillating-wing windmill [AIAA 80-0521] 26 p0238 A80-28813

Tension-field wind machine - A new concept in large-scale energy production [AIAA 80-0622] 26 p0238 A80-28814

Model wind rotors in wind tunnels - Performance and the effect of Reynolds number [AIAA 80-0623] 26 p0238 A80-28815

A refined windmill rotor model [AIAA 80-0628] 26 p0241 A80-28841

DOE/NASA wind turbine data acquisition. Part 1: Equipment [NASA-CR-159779] 26 p0275 N80-17543

Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques [NASA-CR-159737] 26 p0308 N80-20909

Torsional oscillations of the rotor disc for horizontal axis wind turbines with hinged or teetered blades, Part 12 [FFA-TN-AU-1499-PT-12] 26 p0319 N80-21881

WINDPOWER UTILIZATION

Wind power excites utility interest 26 p0190 A80-22281

Indirect utilization of solar energy --- utilization of wind power created by ocean surface waves 26 p0211 A80-23524

Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept 26 p0211 A80-23533

Wind energy research and development at Lincoln 26 p0211 A80-23535

A statistical methodology for study of wind characteristics from a close array of stations
26 p0211 A80-23536
Exotic energy R&D has potential --- ocean wave and windpower utilization
26 p0213 A80-24124
New approaches to sailing
26 p0228 A80-26344
Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers
26 p0237 A80-28801
Wind energy conversion system simulation program
[AIAA 80-0609] 26 p0237 A80-28806
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810
Economic incentives to wind systems commercialization
[AIAA 80-0617] 26 p0238 A80-28811
Experiments on an oscillating aerofoil and applications to wind energy converters
[AIAA 80-0624] 26 p0238 A80-28816
Technical and economic feasibility of wind-powered systems for dairy farms
[AIAA 80-0641] 26 p0239 A80-28823
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824
Wind characteristics over complex terrain relative to WECS siting --- Wind Energy Conversion System
[AIAA 80-0645] 26 p0239 A80-28825
Project windsheet - An interim report --- on wind measurement at sites in American Southwest
[AIAA 80-0647] 26 p0239 A80-28827
Measurements of wind shear at the Mod-1 Site, Boone, N.C --- for wind turbine
[AIAA 80-0648] 26 p0240 A80-28828
SWECS qualifications criteria for state tax incentive programs --- Small Wind Energy Conversion System
[AIAA 80-0650] 26 p0240 A80-28829
An integrated approach to energy supply for small communities
[AIAA 80-0651] 26 p0240 A80-28830
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832
Offshore wind energy conversion systems
[AIAA 80-0619] 26 p0241 A80-28839
Aerodynamic performance of the DOE/Sandia 17-m vertical axis wind turbine in the two-bladed configuration
[AIAA 80-0655] 26 p0241 A80-28842
Going with the wind
26 p0243 A80-29037
Large Wind Turbine Design Characteristics and R and D Requirements
[NASA-CP-2106] 26 p0260 N80-16453
Overview of Federal wind energy program
26 p0261 N80-16454
Operational experience with VAWT blades --- structural performance
26 p0262 N80-16468
Structural analysis considerations for wind turbine blades
26 p0262 N80-16469
Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico
26 p0262 N80-16470
Evaluation of an operating MOD-OA 200 kW wind turbine blade
26 p0262 N80-16471
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494
Decentralized energy: Technology assessment and systems description
[BNL-50987] 26 p0265 N80-16502
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 1: Executive summary
[SAND-78-0962-VOL-1] 26 p0268 N80-16539
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 2: Economic optimization model
[SAND-78-0962-VOL-2] 26 p0268 N80-16540
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541
Economic analysis of Darrieus axis wind turbine systems for the generation of utility grid electrical power. Volume 4: Summary and analysis of the A. T. Kearney and Alcoa Laboratories point design economic studies
[SAND-78-0962-VOL-4] 26 p0269 N80-16542
DOE/NASA wind turbine data acquisition. Part 1: Equipment
[NASA-CR-159779] 26 p0275 N80-17543
Design, fabrication, test, and evaluation of a prototype 150-foot long composite wind turbine blade
[NASA-CR-159775] 26 p0276 N80-17548
Gust-rise exceedance statistics for wind turbine design
[PNL-2530] 26 p0277 N80-17567
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power
[ISBN-3-88148-164-8] 26 p0281 N80-17635
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446
Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558
Appendix: MOD-1 wind turbine generator analysis and design report, volume 2
[NASA-CR-159496] 26 p0286 N80-18565
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[NASA-TM-81444] 26 p0292 N80-19614
General reliability and safety methodology and its application to wind energy conversion systems
[SERI/TR-35-234] 26 p0294 N80-19645
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868
Wind energy information directory
[SERI/SP-69-290] 26 p0305 N80-20883
Darrieus vertical axis wind turbine program overview
[SAND-79-2146C] 26 p0306 N80-20891
Wind energy systems
[SERI/PR-351-480] 26 p0306 N80-20892
Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques
[NASA-CR-159737] 26 p0308 N80-20909
Wind characteristics for field testing of wind conversion systems
[SAND-78-1563] 26 p0310 N80-20993
Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831
Estimation of wind characteristics at potential wind energy conversion sites
[PNL-3074] 26 p0321 N80-21955

WINDPOWERED GENERATORS
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976
Wind Energy Conference, Boulder, Colo., April 9-11, 1980, Technical Papers
26 p0237 A80-28801
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807
Economics of selected WECS dispersed applications
[AIAA 80-0618] 26 p0238 A80-28812
Tension-field wind machine - A new concept in large-scale energy production
[AIAA 80-0622] 26 p0238 A80-28814
Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817

Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819
Multi-speed electrical generator application to wind turbines
[AIAA 80-0635] 26 p0239 A80-28821
UTRC 8 kW wind turbine tests
[AIAA 80-0657] 26 p0240 A80-28831
Gust models for design and performance analyses of wind turbines
[AIAA 80-0644] 26 p0240 A80-28833
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836
Economic assessment of the Darrieus wind turbine
[AIAA 80-0614] 26 p0241 A80-28837
The potential for optimizing the economics of wind energy utilization on a dairy farm through load management
[AIAA 80-0640] 26 p0241 A80-28838
Offshore wind energy conversion systems
[AIAA 80-0619] 26 p0241 A80-28839
New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems
[AIAA 80-0620] 26 p0241 A80-28840
Wind power: Recent developments --- Book
26 p0242 A80-28954
Low cost composite blades for large wind turbines
26 p0253 A80-32074
Large Wind Turbine Design Characteristics and R and D Requirements
[NASA-CP-2106] 26 p0260 N80-16453
Design evolution of large wind turbine generators
26 p0261 N80-16455
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456
The Boeing MOD-2 wind tunnel system rated at 2.5 MW
26 p0261 N80-16457
WTG Energy Systems' MP1-200 200 kilowatt wind turbine generator --- a fixed pitch rotor configuration driving a synchronous generator
26 p0261 N80-16458
Specification, siting and selection of large WECS prototypes
26 p0261 N80-16459
The Danish large wind turbine program --- feasibility of wind power in a utility grid
26 p0261 N80-16460
Large wind energy converter: Growian 3 MW
26 p0261 N80-16461
Characteristics of future Vertical Axis Wind Turbines (VAWTs) --- to generate utility grid electric power
26 p0261 N80-16462
Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463
Alcoa wind turbines
26 p0261 N80-16464
Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465
Overview of Vertical Axis Wind Turbine (VAWT)
26 p0262 N80-16466
Fabrication of extruded vertical axis turbine blades
26 p0262 N80-16467
WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473
The use of wood for wind turbine blade construction
26 p0262 N80-16474
Large, low cost composite wind turbine blades
26 p0263 N80-16475
The MOD-1 steel blade
26 p0263 N80-16476
The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477
Status of the Southern California Edison Company 3 MW Wind Turbine Generator (WTG) demonstration project
26 p0263 N80-16478
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480
System configuration improvement
26 p0263 N80-16481
Cost of energy evaluation
26 p0263 N80-16482
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494
Design, fabrication, test, and evaluation of a prototype 150-foot long composite wind turbine blade
[NASA-CR-159775] 26 p0276 N80-17548
Flutter analysis of small windturbine, designed for manufacture and use in developing countries
[UTH-LR-272] 26 p0284 N80-18415
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497
Appendix: MOD-1 wind turbine generator analysis and design report, volume 2
[NASA-CR-159496] 26 p0286 N80-18565
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[NASA-TM-81444] 26 p0292 N80-19614
Mod 1 wind turbine generator failure modes and effects analysis
[NASA-CR-159494] 26 p0303 N80-20864
Wind energy information directory
[SERI/SP-69-290] 26 p0305 N80-20883
Darrieus vertical axis wind turbine program overview
[SAND-79-2146C] 26 p0306 N80-20891
Wind energy systems
[SERI/PR-351-480] 26 p0306 N80-20892
Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques
[NASA-CR-159737] 26 p0308 N80-20909
Wind wheel electric power generator
[NASA-CASE-MFS-23515-1] 26 p0315 N80-21828
Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831

WINDPOWERED PUMPS
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822

WING OSCILLATIONS
The wingmill - An oscillating-wing windmill
[AIAA 80-0621] 26 p0238 A80-28813

WINTER
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14] 26 p0268 N80-16532

WOOD
Wood gasification in a fluidized bed
26 p0244 A80-29154
Assessment of the technical and economic feasibility of converting wood residues to liquid and gaseous fuel products using state-of-the-art and advanced coal conversion technology
[COO-4862-3] 26 p0258 N80-16189
The use of wood for wind turbine blade construction
26 p0262 N80-16474

WORKING FLUIDS
The state-of-the-art of cryogenic heat pipes
[AIAA PAPER 80-0211] 26 p0212 A80-23956
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330
Analysis of the geothermal binary cycle using paraffin hydrocarbons as working fluids
26 p0285 N80-18553

WYOMING
Energy source book --- Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
[DOE/TIC-10190] 26 p0306 N80-20895

X

X RAY ANALYSIS
Application of radiography to coal liquefaction
[SAND-79-1226C] 26 p0274 N80-17243

Z

ZEEMAN EFFECT
Spin-aligned hydrogen --- atoms at lowest electronic energy magnetic sublevels as substance for molecular production
26 p0200 A80-23151

ZEOLITES
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106

ZINC
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

ZINC COMPOUNDS
Development of high efficiency, low cost ZnSiAs2 solar cells.
[DOE/ET-23001/T1] 26 p0278 N80-17572

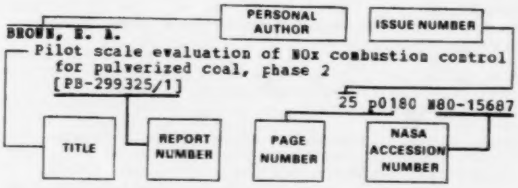
ZINC SELENIDES
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133

ZINC SULFIDES
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014

ZIRCONIUM OXIDES
The effect of electrochemical and arcing phenomena on electrode performance --- in coal-fired MHD generators
26 p0218 A80-25080

PERSONAL AUTHOR INDEX

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The issue, page and accession numbers are located beneath and to the right of the title, e.g., 25 p0180 N80-15687. Under any one author's name the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABBOTT, D. E.
Computer modeling of a two-junction, monolithic cascade solar cell
26 p0234 A80-28330

ABDELRAHMAN, M. A. M.
Technical evaluation of gaseous suspensions of graphite for the absorption of concentrated solar radiation
26 p0214 A80-24660

ABRAHAM, B. M.
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
Thermochemical water splitting cycles - Impact of thermal burdens and kinetics
26 p0199 A80-23138

ABRAHAM, R.
Air transport and travel in 2000 - Future requirements
26 p0234 A80-28427

ACHARD, J. C.
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds
26 p0234 A80-28277

ADAMS, M.
Plant power fuels hydrogen production
26 p0249 A80-30465

ADAMS, M. W. W.
Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

ADKINS, J. W.
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417

AGARWAL, R. C.
Tubular solar collector
26 p0231 A80-27730

AHMADI, G.
An oscillatory wind energy convertor
26 p0211 A80-23537

AHNER, D. J.
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
Screening evaluation of electric power cycles integrated with coal gasification plants
[EPRI-AF-1160] 26 p0295 N80-19646

AHRENKIEL, R. K.
Magnetooptical switch for synchronization of CO2 and red laser beams
26 p0236 A80-28735

AI, D. K.
Alcoa wind turbines
26 p0261 N80-16464

AIMAN, W. R.
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042

AIROLDI CRESCENTINI, A.
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498

AKIN, D. L.
Space-manufactured satellite power systems
26 p0227 A80-26003

AKINS, R. E.
Wind characteristics for field testing of wind conversion systems
[SAND-78-1563] 26 p0310 N80-20993

ALBANESE, A. S.
The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants
26 p0248 A80-29938

ALBERTS, R. D.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550

ALDRIDGE, M. H.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570

ALEFELD, G.
A metal hydrogen heat pump as topping process for power generation
26 p0204 A80-23181

ALEXANDER, G.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

ALFENAAR, M.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182

ALFORD, C.
SWECS qualifications criteria for state tax incentive programs
[AIAA 80-0650] 26 p0240 A80-28829

ALKAISI, M. M.
The temperature dependence of the characteristics of sputtered a-Si-H solar cells
26 p0187 A80-21920

ALLEN, G.
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869

ALLEN, R. J.
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870

ALLIER, J.
Multifunctional collectors for dwellings - Examples of application
26 p0208 A80-23329

ALLSUP, J.
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760
ALPAUGH, R. T.
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175
ALSON, J.
Light-duty diesel gaseous emissions measurement - comparison of dilution tunnel test results to certification cell test results
[PB80-115991] 26 p0310 N80-20945
ALVIS, R. L.
Review of selected on-site DOE small solar thermal power plant experiments
[SAND-79-1040C] 26 p0317 N80-21854
ANEEL, T. A.
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076
ANACONA, D. F.
Offshore wind energy conversion systems
[AIAA 80-0619] 26 p0241 A80-28839
ANASTASIA, L. J.
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305
ANCONA, D. F.
Overview of Federal wind energy program
26 p0261 N80-16454
ANDERSEN, T. S.
Multi-speed electrical generator application to wind turbines
[AIAA 80-0635] 26 p0239 A80-28821
ANDERSON, A.
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499
ANDERSON, B.
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525
ANDERSON, C. A.
Production of synthetic gas from nuclear energy sources
[LA-7592-MS] 26 p0274 N80-17244
ANDERSON, D. T.
Neutral-beam injection calculations for torsatrons
26 p0224 A80-25479
ANDERSON, E.
Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158
ANDERSON, J. H.
Sea thermal power - Competitive electricity and chemicals from the sea
26 p0207 A80-23220
ANDERSON, N. E.
Effect of geometry and operating conditions on spur gear system power loss
[NASA-TM-81426] 26 p0284 N80-18406
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754
ANDERSON, T. D.
Perspective on world energy
[DOE/TIC-10273] 26 p0307 N80-20898
ANDERSON, V. R.
Hydrogen energy in United States Post Office delivery systems
26 p0203 A80-23178
ANDRE, H.
Cheap electricity from French tides
26 p0214 A80-24537
ANDREWS, J. R.
Development of high efficiency, low cost ZnSiAs2 solar cells.
[DOE/ET-23001/T1] 26 p0278 N80-17572
ANDREWS, J. N.
Use of earth coupling in solar assisted heat pumps
[BNL-26748] 26 p0316 N80-21849
ANDREWS, J. W.
Computer simulation of ground coupled storage in a series solar assisted heat pump system
[BNL-26216] 26 p0266 N80-16507
ANG, P. G. P.
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167
ANGELLO, J.
Regenerative burner system for thermoelectric power sources
[AD-A075955] 26 p0276 N80-17553
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869
ANTONOPOULOS, A. A.
Environmental and economic evaluations of energy recovery from agricultural and forestry residues
[ANL/EES/TM-58] 26 p0297 N80-19668
APPELBAUM, J.
Shadow effect of adjacent solar collectors in large scale systems
26 p0183 A80-21107
APPELL, H. R.
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416
APPELMAN, E. H.
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
APPLEBY, A. J.
Improvements in electrolysis technology in alkaline solution
26 p0196 A80-23112
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128
ARMENTROUT, C. J.
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483
ARMSON, R.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
ARMSTRONG, J.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866
ASBURY, J. G.
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14] 26 p0268 N80-16532
Peak-load problem with storage technology
[ANL/SPG-8] 26 p0269 N80-16549
ASGARPOUR, S.
Performance calculations of tubular cover collectors
26 p0248 A80-29924
ASSARABOWSKI, R. J.
Wind energy conversion system simulation program
[AIAA 80-0609] 26 p0237 A80-28806
ATANASIAN, S. V.
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276
ATHERTON, T. J.
Urban transportation energy conservation: Case city applications of analysis methodologies, volume 3
[DOE/PE-8628/1-VOL-3] 26 p0312 N80-21206
Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2
[DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207
ATTIG, R. C.
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864
AUDET, E.
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070
AUER, P.
Advances in energy systems and technology. Volume 2
26 p0207 A80-23218
AUSTIN, H. E.
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006

AYER, F. A.
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV
[PB80-134729] 26 p0320 N80-21913

AYRES, R. U.
Worldwide transportation/energy demand forecast, 1975 - 2000
[ORNL/SUB-78/13536/1] 26 p0269 N80-16546

AZUMA, H.
Hydrogen injection two-stroke spark ignition engine
26 p0203 A80-23177

B

BACKUS, C. E.
Photovoltaics. III - Concentrators
26 p0214 A80-24533

BAEHR, H. D.
The thermodynamics of heating. I - The second law and conventional heating systems
26 p0213 A80-24512
Thermodynamics of heating. II
26 p0227 A80-26309

BAER, E.
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172

BAETSLE, L. H.
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0205 A80-23198
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0233 A80-28275

BAGHDADI, A.
Silicon ribbon growth using scanned lasers
26 p0229 A80-27337

BAGHDADL, A.
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394

BAILEY, D. Z.
Tension-field wind machine - A new concept in large-scale energy production
[AIAA 80-0622] 26 p0238 A80-28814

BAKER, G. G.
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418

BAKER, N. R.
Mixture properties for hydrogen supplementation of natural gas
26 p0201 A80-23159

BALDWIN, R. G.
Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504

BALLANTYNE, A.
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109

BALLARD, S. C.
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

BALMA, M.
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568

BALTENSPERGER, W.
Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202

BALTHASAR, W.
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141

BAMBERGER, C. E.
Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory
26 p0198 A80-23132
Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273

BANAS, J. F.
Technology assessment: Line-focus concentrators
[SAND-79-2221C] 26 p0318 N80-21871

BANCHAK, R. J.
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106

BANKSTON, C. A.
Solar energy research at LASL
[LA-7741-PR] 26 p0318 N80-21872

BANNEROT, R. B.
Instantaneous collector thermal efficiencies in less time
26 p0248 A80-29925

BANSAL, P. K.
Analyses of single and double exposure solar air heaters
26 p0193 A80-22792

BANY, J.
Shadow effect of adjacent solar collectors in large scale systems
26 p0183 A80-21107

BARD, A. J.
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897

BARIEAU, R. E.
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822

BARNA, G. J.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626

BARRETT, K.
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602

BARRETT, M.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

BARROWS, R. E.
WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473

BARRY, J. M.
Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475

BARSOTTI, A. F.
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study
26 p0301 N80-20720

BARTON, J. P.
Fluctuations in combustion MHD generator systems
26 p0221 A80-25105

BARTZ, W. J.
Possible energy savings through tribological measures - Especially in automobiles
26 p0227 A80-26184

BASIULIS, A.
The state-of-the-art of cryogenic heat pipes
[AIAA PAPER 80-0211] 26 p0212 A80-23956

BASS, J.
Fixed mirror solar concentrator for application to a 100 MW(e) electric generating plant
[GA-A-15340] 26 p0266 N80-16508

BAUCUM, W. E.
Characterization of dynamic influences in a coal-fired MHD system
26 p0219 A80-25094

BAUGHMAN, G. L.
Oil shale processing technology
26 p0247 A80-29800

BAYAZITOGLU, Y.
Performance calculations of tubular cover collectors
26 p0248 A80-29924

BAYLON, D.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

BECHTOLD, R.
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760

BECK, F.
Development of electrochemical storage batteries with improved energy density
[BMFT-FB-T-77-88] 26 p0279 N80-17582
BECK, S. R.
Wood gasification in a fluidized bed
26 p0244 A80-29154
BECKER, F.
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097
BECKER, F. E.
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109
BECKWITH, A. R.
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443
BEGHI, G. E.
Present state and future prospects of thermochemical hydrogen production
26 p0205 A80-23194
Present state and future prospects of thermochemical hydrogen production
26 p0233 A80-28272
BEIN, J.
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160
BEKEY, I.
Just over the horizon in space
26 p0256 A80-32511
BELKBIR, L.
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds
26 p0234 A80-28277
BELL, G. C.
Solar powered liquid piston Stirling cycle irrigation pump
[SAN-1894-1] 26 p0294 N80-19641
BELLEAU, C.
Materials review for improved automotive gas turbine engine
[NASA-CR-159673] 26 p0275 N80-17470
BELOUSOV, I. G.
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149
BENDT, P.
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893
BENENATI, R.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148
BENESCH, W.
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power
[ISBN-3-88148-164-8] 26 p0281 N80-17635
BENIZRI, R.
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131
BENNETT, J. E.
Electrodes for generation of hydrogen and oxygen for seawater
26 p0196 A80-23115
BENNETT, J. G.
The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support
[LA-7885-MS-VOL-6] 26 p0307 N80-20897
BENSON, D. K.
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
BENTSEN, L.
Wettability and corrosion of MHD ceramics by Rosebud coal slag
26 p0217 A80-25074
BERETTA, G. P.
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340
BEREZIN, I. V.
Solar hydrogen energy
26 p0185 A80-21878
BERG, C. A.
Energy conservation in industry: The present approach, the future opportunities
[PB-301244/0] 26 p0270 N80-16556
BERGEY, K. H.
The Lanchester-Betz limit
26 p0227 A80-26004
BERLAD, A. L.
Thermal mats for space heating and cooling
[BNL-51019] 26 p0276 N80-17555
BERNARD, C.
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
BERNAUER, O.
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172
BERNAUR, O.
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165
BERNHARDT, W.
Experience with alcohol fuels
26 p0236 A80-28476
BERRY, E. X.
Project windsheet - An interim report
[AIAA 80-0647] 26 p0239 A80-28827
BERT, C. W.
Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
BESSIERES, A.
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174
BESSIERES, J.
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174
BHAR, T. N.
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444
BHARDWAJ, R.
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
BIANCHINI, J.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866
BIBERMAN, L. M.
Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068
BIBLARZ, O.
Performance analysis of a type of electrohydrodynamic power generator
[AD-A076115] 26 p0283 N80-18307
BIEHL, G. E.
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725
BIENSTOCK, D.
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113
BIERY, J. C.
Production of synthetic gas from nuclear energy sources
[LA-7592-MS] 26 p0274 N80-17244
BIRD, B. M.
Electric transport - The future prospects
26 p0189 A80-21956
BIRD, R. E.
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573
BLACK, D. L.
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160
BLAKESLEE, A. E.
Grain size and its influence on efficiency in polycrystalline GaAs solar cells
26 p0186 A80-21919

BLANCHART, A.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
BLAND, T. J.
The 15 kW sub e (nominal) solar thermal electric power conversion concept definition study: Steam Rankine turbine system
[NASA-CR-159589] 26 p0264 N80-16493
BLASKO, T. J.
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099
BLITSHTEIN, A. A.
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349
BLOOMFIELD, D.
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884
BLURTON, K. F.
Metal/air batteries: Their status and potential - A review
26 p0231 A80-28012
BOARDMAN, N. K.
Energy from the biological conversion of solar energy
26 p0210 A80-23522
BOBROV, V. L.
End zone of a channel with segmented electrodes, carrying nonuniform flow
26 p0254 A80-32220
BOCHIN, V. P.
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881
BOCKRIS, J. O'M.
A speculation on a general photoelectrochemical reactor
26 p0193 A80-22794
BODANSKY, D.
Electricity generation choices for the near term
26 p0190 A80-22280
BODEN, D. P.
Lead-acid batteries for remote photovoltaic applications
26 p0232 A80-28014
BOEER, K. W.
Photovoltaic effect, its present understanding and remaining mysteries
[DOE/ET-23103/6] 26 p0268 N80-16535
BOERNER, B.
Energy politics
26 p0246 A80-29475
BOGART, S. L.
Non-electric fusion energy applications
26 p0215 A80-24676
BOHN, M.
Performance characteristics of a commercially available point-focus solar power
[SERI/TP-34-169] 26 p0268 N80-16529
BOIKO, IU. V.
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507
BOLSHAKOV, V. I.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026
BOLSHOV, L. A.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340
BOLTON, J. R.
Solar energy conversion in photosynthesis - Features relevant to artificial systems for the photochemical conversion of solar energy
26 p0243 A80-29053
BOMBEKE, H.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
BOMBERGER, D. C.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
BONDI, H.
Indirect utilization of solar energy
26 p0211 A80-23524
BONN, F.
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings
26 p0212 A80-24071
BOO, J.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
BOOTH, L. A.
Production of synthetic gas from nuclear energy sources
[LA-7592-MS] 26 p0274 N80-17244
BORDOLOI, K. C.
Hydrogen production from water using fission-pumped laser
26 p0206 A80-23200
BORGHI, C. A.
Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086
BORGWARDT, R. H.
Combined flue gas desulfurization and water treatment in coal-fired power plants
26 p0225 A80-25690
BORISOV, E. A.
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877
BOULTER, B.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859
BOWDEN, J. N.
Stability survey of hydrocarbon fuels
[BETC-1778-4] 26 p0300 N80-20424
BOWDEN, M.
Antireflection coatings on solar cells
26 p0186 A80-21914
BOWDITCH, F. W.
Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472
BOWERMAN, B. S.
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725
BOWERS, J. E.
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305
BOWMAN, M. G.
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134
BOWYER, J. M.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634
BOYD, C. A.
Energy Research Information System (ERIS) projects report, volume 4, number 1
[PB-300338/1] 26 p0270 N80-16561
BOYER, J. P.
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons
[ORO-5205-10] 26 p0310 N80-20973
BOZEK, J. M.
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-3] 26 p0285 N80-18556
BOZLER, C. O.
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089

BOZZUTO, C.
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097
BRAASCH, R. H.
Darrieus vertical axis wind turbine program overview
[SAND-79-2146C] 26 p0306 N80-20891
BRANCH, M. C.
In-situ combustion retorting of oil shale
26 p0192 A80-22764
BRANDVOLD, G. E.
Solar central test facility
[SAND-79-1730C] 26 p0267 N80-16524
BRASSELL, G. W.
Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456
BRAUNSTEIN, J.
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865
BRAUTIGAM, J.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859
BREELLE, Y.
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206
BREGER, A. KH.
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877
BREITSTEIN, L.
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949
BRENNAN, J. A.
Development studies on selected conversion of synthesis gas from coal to high octane gasoline
[FE-2276-27] 26 p0259 N80-16190
BRENNECKE, P.
Status and development of production of cheap hydrogen
26 p0208 A80-23330
BREWER, G. D.
A plan for active development of LH2 for use in aircraft
26 p0206 A80-23204
BRILMYER, G. H.
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897
BRINKWORTH, B. J.
Results of solar heating experiments
26 p0209 A80-23513
Thermal storage in density-stratified fluids and phase-change materials
26 p0225 A80-25496
BROCKHURST, F. C.
Permanent magnet and superconducting generators in airborne, high power systems
[AD-A078424] 26 p0284 N80-18311
BRODA, E.
Photochemical production of hydrogen from water
26 p0201 A80-23154
BRODRICK, J. R.
Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap
26 p0290 N80-19492
BROGGI, A.
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code
26 p0205 A80-23192
BROMBERG, L.
Active burn control of nearly ignited plasmas
26 p0224 A80-25480
BRONSTEIN, H. R.
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865
BROOMAN, E. W.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054
BROWER, A. S.
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
BROWN, D. G.
Short haul transport for the 1990s
26 p0190 A80-22046
BROWN, F. R.
Stability studies of coal liquids
[PETC/TR-79/5] 26 p0257 N80-16129
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417
BROWN, K. C.
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876
BROWN, R. J.
Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475
BROWN, W. C.
Free space microwave power transmission systems for microwave powered atmospheric platforms
26 p0228 A80-26813
BRUNELLI, B.
Driven magnetic fusion reactors; Proceedings of the Course, Erice, Italy, September 18-26, 1978
26 p0214 A80-24661
BRYANT, H. C.
Solar ponds for residential heating, heat extraction from a salt gradient solar pond
[PB80-108624] 26 p0308 N80-20913
BRZOZOWSKI, W. S.
One-stage cyclone combustor for coal fired test stand of 4MW thermal power
26 p0222 A80-25111
BUCHANAN, P.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
BUCHNER, H.
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172
BUGGE, J. A. C.
A refined windmill rotor model
[AIAA 80-0628] 26 p0241 A80-28841
BUHS, R.
Solar generators for terrestrial use
26 p0245 A80-29384
BULDHAUPT, L. F.
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653
BUNYAGIDJ, C.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570
BURAS, N.
Determining the feasibility of incorporating water resource constraints into energy models
[EPRI-EA-1147] 26 p0308 N80-20908
BURGER, D. R.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550
BURKHART, J. A.
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

BURNHAM, A. K.
Reaction kinetics between CO2 and oil-shale residual carbon. I - Effect of heating rate on reactivity
26 p0249 A80-30524
Reaction kinetics between CO2 and oil-shale residual carbon. II - Partial-pressure and catalytic-mineral effects
26 p0250 A80-30527
Reaction kinetics between steam and oil-shale residual carbon
26 p0250 A80-30528

BURNS, C. C.
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644

BURNS, R. K.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626

BUZNIKOV, A. E.
Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091

BYNUM, F. A.
Hydrogen production from water using fission-pumped laser
26 p0206 A80-23200

BYRNE, W. D.
Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1
[DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208
Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies
[CONS-8626-T1-VOL-1] 26 p0317 N80-21857

BYSTRYI, A. I.
Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348

C

CADOFF, L. H.
The effect of electrochemical and arcing phenomena on electrode performance
26 p0218 A80-25080

CAHILL, K. J.
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557

CAHN, D. F.
Aggregated vectorial model of petroleum flow in the United States
[LBL-8874] 26 p0258 N80-16178

CALL, R. L.
Segmented dish concentrator design project
[SAND-79-7024] 26 p0277 N80-17561

CALM, J. M.
Thermal fluid selection for long-distance heat transmission
[CONF-790803-47] 26 p0305 N80-20879

CALVIN, M.
Petroleum plantations
26 p0243 A80-29052

CALZONETTI, F. J.
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

CAMPBELL, B. C.
Development of Billings SPE electrolyzer
26 p0196 A80-23117

CAMPBELL, R. B.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

CAPE, J. A.
Unique high concentration solar test facility
26 p0186 A80-21916

CAPITAINE, G.
Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158

CARD, H. C.
Recombination in the space-charge region of Schottky barrier solar cells
26 p0207 A80-23272

CARDEN, P. O.
Physical, chemical and energy aspects of underground hydrogen storage
26 p0234 A80-28278

CARGAL, W.
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824

CARL, D. A.
Nonideal compensation in MHD generators
26 p0310 N80-21149

CARLSON, D. E.
Photovoltaics. V - Amorphous silicon cells
26 p0214 A80-24535

CARLSON, G. A.
Tandem mirror reactors
26 p0215 A80-24667
Field-reversed mirror reactor
26 p0215 A80-24668
Superconducting magnets for mirror machines
26 p0215 A80-24672

CARPENTER, P.
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513

CARPETIS, C.
A study on hydrogen storage by use of cryoadsorbents
26 p0201 A80-23161

CARRIGAN, B.
Silicon solar cells, volume 3. Citations from the Engineering Index data base
[PB80-800717] 26 p0280 N80-17588
Silicon solar cells, volume 3. Citations from the NTIS data base
[PB80-800691] 26 p0280 N80-17589
Silicon solar cells, volume 2. Citations from the Engineering Index data base
[PB80-800709] 26 p0280 N80-17590
Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base
[PB80-802218] 26 p0296 N80-19656

CARROLL, S.
Proceedings: Photovoltaics user Review Panel
[SERI/TP-69-276] 26 p0266 N80-16514

CARTER, G. C.
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183

CARTER, J., JR.
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612

CARTY, R. H.
A heat penalty and economic analysis of the hybrid sulfuric acid process
26 p0245 A80-29406

CASPER, D.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

CASTLE, J. M.
State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562

CASTRO, L. R.
Computation of synthetic seismograms by the method of characteristics
26 p0287 N80-18593

CAVAGNARO, D. M.
Alcohol fuels. Citations from the American petroleum institute data base
[NTIS/PS-79/0911/2] 26 p0259 N80-16195
Thermal energy storage, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0952/6] 26 p0279 N80-17584
Thermal energy storage, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0951/8] 26 p0279 N80-17585
Thermal energy storage, volume 1. Citations from the Engineering Index data base
[NTIS/PS-79/0953/4] 26 p0279 N80-17586
Thermal energy storage, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0954/2] 26 p0279 N80-17587

CHAFFEE, A.
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092

CHAKRABARTI, R. K.
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494
CHAMBERLAIN, R. G.
Assessment of low-cost manufacturing process sequences
[NASA-CR-162745] 26 p0278 N80-17575
CHANEY, R. E.
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495
CHANG, C. L.
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
CHAPMAN, P.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
CHAPMAN, R. L.
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089
CHARTOCK, M. A.
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884
CHASTEAU, V. A. L.
Experiments on an oscillating aerofoil and applications to wind energy converters
[AIAA 80-0624] 26 p0238 A80-28816
CHATTERJEE, R.
Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294
CHEN, C.
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949
CHEN, J. C.
Centrifugal fluidized combustion of coal
[FE-2516-9] 26 p0288 N80-19293
CHEN, K. I.
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478
CHEN, R. T.
Instantaneous collector thermal efficiencies in less time
26 p0248 A80-29925
CHEN, S. M.
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
CHEN, T. L. C.
Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
CHEN, W. S.
High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell
26 p0229 A80-27321
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653
CHENEY, M. C.
UTRC 8 kW wind turbine tests
[AIAA 80-0657] 26 p0240 A80-28831
CHENG, L. J.
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
CHERNIAK, V. M.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340
CHERNIAVSKY, E. A.
Multi-objective energy analysis
[BNL-26882] 26 p0317 N80-21856
CHERNILIN, IU. F.
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
CHERNYSHEV, V. K.
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567
CHEYNET, B.
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
CHIA, W. S.
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AP-1227] 26 p0314 N80-21558
CHIANG, S. H.
Photosensitization mechanisms for energy storing isomerizations
26 p0244 A80-29060
CHILCOTT, R. E.
Wind energy research and development at Lincoln
26 p0211 A80-23535
CHILINGARISHVILI, P. D.
Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters
26 p0249 A80-30241
CHIZHENKO, I. M.
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501
CHONG, S.-L.
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888
CHUNG, P. M.
Wall combustion in high-swirl combustors
26 p0222 A80-25110
CIHLAR, J.
Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475
CILIONE, A. R. C.
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310
CINQUEMANI, V.
Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504
CIPRIOS, G.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
CLAAR, T. D.
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547
CLARK, K. M.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
CLARK, R. N.
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822
CLARKE, J. W.
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371
Filtration in coal liquefaction - Influence of digestion conditions in the filtration of non-hydrogenated coal digests
26 p0255 A80-32372
CLINTON, J. R.
Performance effects of Trombe wall control strategies
26 p0183 A80-21105

CLUSEN, R. C.
Hydrothermal electric and direct heat. Commercialization phase 3 planning
[DOE/ERD-0005] 26 p0269 N80-16545

COATES, R.
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909

COHEN, L. C.
A comparative study of the energy alternatives for the State of New York
26 p0302 N80-20807

COHN, D. R.
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475
Active burn control of nearly ignited plasmas
26 p0224 A80-25480

COLE-APPEL, B. E.
Calculation of performance of N collectors in series from test data on a single collector
26 p0184 A80-21113

COLEMAN, M. M.
Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids
26 p0249 A80-30525

COLLIE, M. J.
Stirling engine design and feasibility for automotive use
26 p0234 A80-28425

COLLIER, R. K.
Characterization of crushed glass as a transpired air heating solar collector material
[LA-UR-79-1336] 26 p0265 N80-16498

COLLINS, A. R.
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743

COLLINS, J. L.
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[NASA-TM-81444] 26 p0292 N80-19614

COLP, J. L.
Magma energy research, 79-1
[SAND-79-1344] 26 p0277 N80-17568

COMBS, R. M.
Waste heat recovery unit design for gas turbine propulsion systems
[AD-A078154] 26 p0290 N80-19503

COMLY, J. B.
Solar heating and air conditioning
26 p0209 A80-23516

CONGER, W. L.
Open-loop thermochemical cycles for the production of hydrogen
26 p0233 A80-28274
A heat penalty and economic analysis of the hybrid sulfuric acid process
26 p0245 A80-29406

CONN, R. W.
Plasma parametric studies and potential applications of driven fusion reactors
26 p0215 A80-24674

CONNELL, H. L.
Addition of an air-cooled collector test capability to the solar collector test facility
[PB-300482/7] 26 p0270 N80-16562

COOK, C. S.
A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112

COOK, L. M.
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

COPENHAVER, C.
Ideal magnetohydrodynamic stability of tokamak plasmas
26 p0250 A80-30554

CORCORAN, W. P.
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858

COROTIS, R. B.
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912

CORPUS, J. R.
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106

COSTELLO, D.
An overview of photovoltaic market research
26 p0186 A80-21917
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513

COTTINGHAM, J. G.
Normal incident solar radiation measurements at Upton, New York
[BNL-50939] 26 p0273 N80-16653

COUGHLIN, R. W.
Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152
Electrochemical gasification of coal - Investigation of operating conditions and variables
26 p0249 A80-30526

COURVOISIER, P.
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131

COX, F. W.
Physical properties of gasoline/alcohol blends
[BERC/RI-79/4] 26 p0288 N80-19296

COX, K. E.
Irreversibility analysis of hydrogen separation schemes in thermochemical cycles
26 p0197 A80-23120

CRABBE, D.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

CRAIG, A. G., JR.
Fabrication of extruded vertical axis turbine blades
26 p0262 N80-16467

CRAIG, R. A.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054

CRANDALL, R.
Field-dependent quantum efficiency in hydrogenated amorphous silicon
26 p0251 A80-30942

CRANDALL, R. S.
Carrier generation, recombination, and transport in amorphous silicon solar cells
26 p0227 A80-26340

CREPY, G.
Improvements in electrolysis technology in alkaline solution
26 p0196 A80-23112

CRINER, D. E.
Feasibility of cogeneration application of a 4.8 MW fuel cell power plant at a Santa Clara, California paper mill
[SAN-2189-T1] 26 p0304 N80-20876

CRISTEA, P.
Solar energy electrochemical storage
26 p0208 A80-23331

CROMACK, D. E.
Model wind rotors in wind tunnels - Performance and the effect of Reynolds number
[AIAA 80-0623] 26 p0238 A80-28815

CROOKS, G.
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568

CROUSE, R. D.
Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025] 26 p0212 A80-23954

CROWL, D. A.
Application of computer models to the retorting of oil shale
26 p0228 A80-26708

CULVER, C.
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869

CUMMINS, J. J.
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888

CURRAN, W. T.
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

CURRIE, J. R.
Solar energy control system
[NASA-CASE-MFS-25287-1] 26 p0275 N80-17544

CUTTING, J. C.
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

D

DAFLER, J. R.
Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127

DAGUENET, M.
Theoretical study of the heating of air in a plane honeycomb solar collector
26 p0208 A80-23333

DAND, P. V.
Improved thermal battery
[AD-A075835] 26 p0276 N80-17554

DANEY, D. E.
Helium research in support of superconducting power transmission
[PB80-116502] 26 p0314 N80-21697

DANG, V.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

DANOV, V. M.
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567

DANTOWITZ, P.
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491

DARNELL, W. L.
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820

DARSEY, D. M.
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903

DASILVA, E. J.
Biogas - Fuel of the future
26 p0227 A80-26175

DAUZVARDIS, P.
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084

DAUZVARDIS, P. V.
High-temperature liquid-metal MHD generator experiments
26 p0218 A80-25085

DAVIES, J.
Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158

DAVIS, J. R.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

DAVISON, G. N.
The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477

DAWSON, A. M.
Superconducting MHD magnets - Technology development, procurement and the path to commercial scale
26 p0218 A80-25077

DAY, D. E.
Chemical and physical stability of refractories for use in coal gasification
[COO-2904-14] 26 p0300 N80-20429

DAYAN, J.
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890

DE BENI, G.
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125

DE POUS, O.
Use of binary titanium alloys for hydrogen storage
26 p0202 A80-23164
Effect of the interstitial hole size and electron concentration on complex metal hydride formation
26 p0202 A80-23168

DE RENZO, D. J.
Wind power: Recent developments
26 p0242 A80-28954

DEADMORE, D. L.
Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys
[NASA-TM-81384] 26 p0283 N80-18157

DEB, S. K.
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466

DECOCK, P.
Theoretical study of thermal losses: The use of hybrid and combined dry coolants
[NT-44-1978] 26 p0284 N80-18345

DEGTIAREV, L. M.
Two-stroke tokamak reactor
26 p0213 A80-24487

DELAIVE, P. J.
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055

DELAURIER, J.
The wingmill - An oscillating-wing windmill
[AIAA 80-0621] 26 p0238 A80-28813

DELICHATSOIS, M. M.
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109

DELLINGER, T. C.
Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099

DEMEO, E.
Going with the wind
26 p0243 A80-29037

DEMETRIADES, S. T.
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739
Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249] 26 p0192 A80-22745
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938
The STD/MHD codes - Comparison of analyses with experiments
[AIAA PAPER 80-0024] 26 p0212 A80-23953
Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025] 26 p0212 A80-23954

DEMIRJIAN, A.
Long duration channel development and testing
26 p0216 A80-25063

DEMLER, R.
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491

DEMSKI, R. J.
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113

DENEUVE, F.
Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis
26 p0205 A80-23191
DENMAN, O.
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
DEONIGI, D. E.
Factors affecting potential market penetration of laser fusion power plants
[PNL-2803] 26 p0269 N80-16552
DERBIDGE, T. C.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
DESANTIS, R. R.
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417
DESTEESE, J. G.
Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation
[PNL-2421] 26 p0278 N80-17574
DEVINE, W. D., JR.
Energy accounting for solar and alternative energy sources
[ORAU/IEA-79-11(R)] 26 p0295 N80-19647
DEVITT, T. W.
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912
DEY, A. N.
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions
26 p0247 A80-29894
DEYHIMY, I.
Unique high concentration solar test facility
26 p0186 A80-21916
DICKERT, J. J., JR.
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422
DICKINSON, K.
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112
DICKINSON, R. M.
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287
DICKINSON, W. C.
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853
DICKS, J. B.
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864
DIGGES, T. G., JR.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
DIGUET, D.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915
DILLON, H. K.
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
DILPARE, A. L.
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors
26 p0212 A80-23998
DIMOVA, D. I.
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014
DIPIPPO, R.
Economics of geothermal power
[COO-4051-43] 26 p0265 N80-16497
DIRMHIRN, I.
Accuracies achievable with indirect measurements of the direct solar irradiance component
26 p0183 A80-21108
DISANZO, F. P.
The application of chromatography and ancillary techniques to the characterization of shale oil/oil shale compound classes and of organometallics
26 p0282 N80-18125
DISMUKES, E. B.
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
DIVNOV, I. I.
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357
DOENITZ, W.
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118
DOKIYA, M.
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
DOMAN, G. S.
System configuration improvement
26 p0263 N80-16481
DONHAM, R. E.
Evaluation of an operating MOD-OA 200 kW wind turbine blade
26 p0262 N80-16471
DOOLEY, J. L.
Large energy storage systems for utilities
26 p0231 A80-27731
DORAN, J. C.
Gust models for design and performance analyses of wind turbines
[AIAA 80-0644] 26 p0240 A80-28833
DOUGLAS, R. R.
The Boeing MOD-2 wind tunnel system rated at 2.5 MW
26 p0261 N80-16457
DOWDING, C. H.
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912
DOWNEY, W. T.
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868
DOWNS, D.
Future trends in the automobile
26 p0234 A80-28426
DRACHEV, A. L.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026
DRACHEV, L. A.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026
DRAKE, J. F.
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
DREVINSKY, P. J.
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089
DRIVER, C.
The role of technology as air transportation faces the fuel situation
[NASA-TM-81793] 26 p0297 N80-20260
DUBBERLY, L. J.
Solar thermal repowering systems integration
[SERI/TR-8037-1] 26 p0316 N80-21847
DUBIN, F. S.
Heat-pump-centered integrated community energy systems: System development
[ANL/CNSV/TM-8] 26 p0305 N80-20880
DUCARROIR, M.
Optimization of a thermochemical water splitting cycle - Thermodynamic analysis - Experimental work with a solar furnace
26 p0199 A80-23142
DUENSING, G.
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power
[ISBN-3-88148-164-8] 26 p0281 N80-17635

DULIKRAVICH, D. S.
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[AIAA 80-0607] 26 p0237 A80-28804
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497

DUMITRESCU, H.
Optimal development strategies for a whole energy system based on hydrogen
26 p0205 A80-23190

DUNN, P. F.
High-temperature liquid-metal MHD generator experiments
26 p0218 A80-25085

DUPONT, B.
The dual-mode bus and further bus developments in France
26 p0235 A80-28431

DURAND, H.
Present status and future prospects of silicon solar cell arrays and systems
26 p0210 A80-23518

DUTTA, M. L.
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494

DYKHNE, A. M.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

E

EASLEY, S. M.
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8] 26 p0274 N80-16974

EASLEY, T. L.
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8] 26 p0274 N80-16974

EBELING, R. W., JR.
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

EBERHARDT, L. E.
Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666

ECKERT, M. S.
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

EDESESS, M.
General reliability and safety methodology and its application to wind energy conversion systems
[SERI/TR-35-234] 26 p0294 N80-19645
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876

EDESKUTY, F. J.
Safety of liquid hydrogen in air transportation
[LA-UR-79-1416] 26 p0259 N80-16236

EGGERS, G. H.
Installation and startup of the fixed mirror solar concentrator collector field subsystem
[GA-A-15344] 26 p0306 N80-20888

EHLERS, W. L.
Materials review for improved automotive gas turbine engine
[NASA-CR-159673] 26 p0275 N80-17470

EIERMANN, A.
Gas turbines
26 p0255 A80-32399

EL-NARAZKI, L. O.
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures
26 p0191 A80-22690

EL-TWATY, A. I.
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926

ELIEZER, I.
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2
26 p0217 A80-25073

ELIEZER, N.
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2
26 p0217 A80-25073

ELLIS, R. J.
Silicon ribbon growth using scanned lasers
26 p0229 A80-27337
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394

ELLIS, W.
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084

ELWAKIL, M. M.
Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors
[COO-2971-6] 26 p0307 N80-20900

EMMITT, G. D.
Measurements of wind shear at the Mod-1 Site, Boone, N.C
[AIAA 80-0648] 26 p0240 A80-28828

ENDLICH, R.
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568

ENGELMANN, F.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

ENOS, G.
Design description and performance predictions for the first CDIF power train
26 p0216 A80-25062

ERSKINE, D.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625

ESCHER, W. J. D.
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175

EVANS, D. V.
Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

EVANS, R. M.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601

EWE, H.
Status and development of production of cheap hydrogen
26 p0208 A80-23330

F

FABRIS, G.
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084

FAIMAN, D.
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887

FAKHR, A.
Chemical and physical stability of refractories for use in coal gasification
[COO-2904-14] 26 p0300 N80-20429

FALLON, P.
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185

FAN, J. C. C.
Shallow-homojunction GaAs cells with high resistance to 1-MeV electron radiation
26 p0183 A80-21089

FANG, C. Y. R.
Comparison of theoretical and experimental solar cell performance
26 p0301 N80-20806

FARCSIU, M.
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422

FAROOQUE, M.
Electrochemical gasification of coal - Simultaneous production of hydrogen and carbon dioxide by a single reaction involving coal, water, and electrons
26 p0244 A80-29152

Electrochemical gasification of coal - Investigation of operating conditions and variables
26 p0249 A80-30526

FARR, R. D.
Cogeneration of electric energy and nitric oxide
26 p0255 A80-32412

FEUELL, J.
Co-generation at a practical plant level - Single stage steam turbine generator set replaces pressure reducing station to reduce plant energy consumption
26 p0222 A80-25116

FICHTL, G. H.
Gust-rise exceedance statistics for wind turbine design
[PNL-2530] 26 p0277 N80-17567

FIEBELMANN, P.
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126

FIEBELMANN, P. J.
Electrolysis of hydrobromic acid
26 p0198 A80-23129

FIGARD, R. L.
Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data
[AIAA 80-0608] 26 p0237 A80-28805

FILLO, J. A.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

FINEGOLD, J.
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882

FINN, J. M.
Interchange stability of axisymmetric field reversed equilibria
26 p0250 A80-30552

FINSON, M. L.
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884

FIORI, G.
The kinetics of oxygen evolution on non-traditional electrodic materials
26 p0196 A80-23111

FISHER, J. L.
Active burn control of nearly ignited plasmas
26 p0224 A80-25480

FISHER, S. T.
Processing of solid fossil-fuel deposits by electrical induction heating
26 p0242 A80-29007

FISHER, W. L.
Lignite and coal in the U.S. energy future
26 p0230 A80-27420

FLAIM, S.
Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511

FLAMM, J.
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126

FLANAGAN, T. B.
Hysteresis in metal/hydrogen systems
26 p0246 A80-29725

FLEMING, J. R.
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623

FLOCAS, A. A.
Estimation and prediction of global solar radiation over Greece
26 p0248 A80-29923

FLOURSWETZ, L.
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899

FLYNN, T.
Assessment of low- to moderate-temperature geothermal resources of Nevada
[NVO-01556-1] 26 p0301 N80-20792

FOERSTER, H.-J.
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471

FOGARASSY, E.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

FOGELSON, S.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

FOH, S. E.
Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127

FONG, F. K.
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319

Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction
26 p0228 A80-26681

FOOTE, R. C.
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858

FORBES, F. R.
Advanced electric propulsion system concept for electric vehicles
[NASA-CR-159651] 26 p0282 N80-17916

FOREMAN, K. M.
Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept
26 p0211 A80-23533

FOREMAN, T. K.
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055

FORGUES, G.
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070

FOSS, A.
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890

FOX, D. A.
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908

FRALEY, D. W.
Factors affecting potential market penetration of laser fusion power plants
[PNL-2803] 26 p0269 N80-16552

FRASER, M. D.
Salinity gradient energy conversion
26 p0233 A80-28262

FREEMAN, A. L.
Methanol derivation from North Dakota lignite and use as a fuel
26 p0230 A80-27417

FREUND, E.
Storing hydrogen in the form of light alloy hydrides
[IFP-26-209] 26 p0274 N80-17246

FRIDMAN, A. A.
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881

FRITH, J. F. S.
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557

FROST, W.
Wind characteristics over complex terrain relative to WECS siting
[AIAA 80-0645] 26 p0239 A80-28825

FRUCHTER, E.
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885

FUERNISS, B.
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474

FUJII-E, Y.
Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083

FUJII, K.
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137

FUJISHIMA, A.
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897

FUJITA, J.
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481

FUJITA, K.
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys
26 p0202 A80-23169

FUJITA, T.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634

FUKUDA, K.
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121

FULLER, H.
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491

FURTH, H. P.
US tokamak research
26 p0226 A80-25777

FURUHAMA, S.
Hydrogen injection two-stroke spark ignition engine
26 p0203 A80-23177

G

GAGNON, J. L.
An investigation of preferences for various types of energy cost feedback
[PB-300314/2] 26 p0270 N80-16560

GALLAGHER, S. P.
Screening evaluation of electric power cycles integrated with coal gasification plants
[EPRI-AF-1160] 26 p0295 N80-19646

GANDHAM, B.
Antireflection coatings on solar cells
26 p0186 A80-21914

GANEFELD, R. V.
Turbulation of plasma in combustion chamber of an MHD generator
26 p0190 A80-22348

GANGWAL, S. K.
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

GARDNER, R. P.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550

GARSTANG, M.
Measurements of wind shear at the Mod-1 Site, Boone, N.C
[AIAA 80-0648] 26 p0240 A80-28828

GATES, B. C.
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids
[FE-2028-15] 26 p0287 N80-19292

GAU, S. C.
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091

GAUL, H.
Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772

GAUL, H. W.
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893

GAWAIN, T. H.
Performance analysis of a type of electrohydrodynamic power generator
[AD-A076115] 26 p0283 N80-18307

GELIN, P.
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206

GENENS, L.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079

GERARD, N.
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds
26 p0234 A80-28277

GERWIN, H. J.
Suntech Solar Linear Array Thermal System (SLATS) test results
[SAND-79-0658] 26 p0277 N80-17563

GEWEHR, H. W.
Large, low cost composite wind turbine blades
26 p0263 N80-16475
Design, fabrication, test, and evaluation of a prototype 150-foot long composite wind turbine blade
[NASA-CR-159775] 26 p0276 N80-17548

GIANNOTTI, C.
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055

GIBSON, R. A.
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966

GILBERT, B. L.
Technical development of the Diffuser Augmented Wind Turbine /DAWT/ concept
26 p0211 A80-23533

GILBERT, L. J.
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480

GILBERT, L. R.
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325

GILLILAND, M. W.
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

GILLILAND, R. G.
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677

GILLIS, D. J.
Heat loss detection from flat roof buildings by means of aerial thermography
26 p0191 A80-22475

GINER, J. D.
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557

GISBY, P.
Plant power fuels hydrogen production
26 p0249 A80-30465

GLADD, N. T.
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975

GLASER, P. E.
The development of solar power satellites
26 p0207 A80-23219

GLASGOW, J. C.
Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613

GLASS, E. C.
Methanol derivation from North Dakota lignite and use as a fuel
26 p0230 A80-27417

GOBRECHT, J.
Energy conversion and corrosion processes in electrochemical solar cells with semiconductor electrodes
26 p0225 A80-25679

GOEDDEL, D. L.
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles
[PB-300289/6] 26 p0282 N80-17922

GOH, T. N.
A statistical methodology for study of wind characteristics from a close array of stations
26 p0211 A80-23536

GOLD, H.
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896

GOLDENBLATT, M.
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810

GOLDFARB, A.
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602

GOLDMAN, A. L.
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818

GOLDMAN, R.
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-162904] 26 p0302 N80-20814

GOLDSCHMIED, F. R.
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819

GOLDSTEIN, R. F.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565

GOLDSTEIN, W.
United States energy policy - The continuing failure
26 p0185 A80-21766

GOLUBENKO, IU. G.
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507

GOMBERG, H. J.
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201

GONCZY, J.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079

GOOD, G. E.
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AF-1227] 26 p0314 N80-21558

GOODMAN, A. C.
Geothermal energy market penetration: Development of a model for the residential section
[PB80-118359] 26 p0311 N80-21198

GOODMAN, F., JR.
Going with the wind
26 p0243 A80-29037

GOODNOW, W. H.
Energy savings through use of an improved reduction cell cathode
[SAN-1257-T2] 26 p0267 N80-16515

GOOSSENS, W. R. A.
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0205 A80-23198
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0233 A80-28275

GORDON, J. M.
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887

GORMAN, D. N.
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856

GOROVE, S.
Solar power satellites and the ITU - Some U.S. policy options
26 p0223 A80-25253

GOUGEON, M.
The use of wood for wind turbine blade construction
26 p0262 N80-16474

GOVAER, D.
Optimization of a solar water heating system for a Negev kibbutz
26 p0226 A80-25887

GOVAN, D. R.
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106

GRANQVIST, C. G.
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499

GRAVELLE, G.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

GRAY, M. R.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565

GREENE, C. R.
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

GRETZ, J.
On the potential of solar energy conversion into hydrogen and/or other fuels
26 p0195 A80-23107

GRIEGER, G.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

GRISWOLD, J. W.
The retrofit approach to MHD demonstration and commercialization
26 p0221 A80-25102

GROB, A.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

GROB, J. J.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

GROHSE, P. M.
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

GROSS, S.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

GROSSMAN, G.
Development of a spherical reflector/tracking absorber solar energy collector
26 p0226 A80-25885

GROSSO, G.
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498

GROTH, R. H.
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099

GROVER, R. D.
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541

GRUEN, D. M.
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180

GRUENER, M.
New standards in research and development
26 p0208 A80-23317

GUAZZONI, G.
Regenerative burner system for thermoelectric power sources
[AD-A075955] 26 p0276 N80-17553
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869

GUERRERO, J. V.
SWECS qualifications criteria for state tax incentive programs
[AIAA 80-0650] 26 p0240 A80-28829

GUIDOTTI, R.
Wettability and corrosion of MHD ceramics by Rosebud coal slag
26 p0217 A80-25074

GUILLERM, C.
Storing hydrogen in the form of light alloy hydrides
[IFP-26-209] 26 p0274 N80-17246

GUINET, P.
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171

GUPTA, A.
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557

GURTLER, R. W.
Silicon ribbon growth using scanned lasers
26 p0229 A80-27337
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394

GURUSWAMY, V.
A speculation on a general photoelectrochemical reactor
26 p0193 A80-22794

GURWELL, W. E.
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570

GUSEV, IU. P.
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349

GUTH, T. D.
Nitrogen reducing solar cells
26 p0244 A80-29059

GVERDTSITELI, I. G.
Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters
26 p0249 A80-30241
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242

GWINNER, D.
A technical conception for highly developed spark-ignition engines
26 p0235 A80-28471

H

HABERCOM, G. E., JR.
Design and applications of flywheels, volume 1. Citations from the NTIS data base
[PB80-800303] 26 p0280 N80-17591
Design and applications of flywheels, volume 2. Citations from the NTIS data base
[PB80-800311] 26 p0280 N80-17592
Design and applications of flywheels. Citations from the Engineering Index data base
[P80-800329] 26 p0280 N80-17593

HABRON, R. P.
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819

HACKETT, C. E.
Comparative analysis of solar energy storage cycles
[SAND-79-1803C] 26 p0267 N80-16516

HADDEN, L. D.
The economics of producing hydrogen from a small air-blown coal gasifier
26 p0199 A80-23140

HAGEN, F. A.
Materials review for improved automotive gas turbine engine
[NASA-CR-159673] 26 p0275 N80-17470

HAGLER, R., JR.
Storage, transmission and distribution of hydrogen
26 p0194 A80-23103

HALFON, A.
Heat-pump-centered integrated community energy systems: System development
[ANL/CNSV/TM-8] 26 p0305 N80-20880

HALL, D.
Plant power fuels hydrogen production
26 p0249 A80-30465

HALL, D. O.
Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

HALL, T. A.
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

HALPERT, G.
The 1979 Goddard Space Flight Center Battery Workshop
[NASA-CP-2117] 26 p0302 N80-20820
Life test results of the NASA standard 20 ampere hour cells
26 p0303 N80-20846

HALS, F.
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097

HALS, F. A.
Parametric study of potential early commercial MHD power plants
[NASA-CR-159633] 26 p0286 N80-18559

HAMBLETON, D. J.
Industrial scale production of hydrogen from natural gas, naphtha and coal
26 p0199 A80-23141

HAMILTON, L. E.
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877

HAMILTON, L. D.
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930

HAMILTON, S. H.
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801

HAMMOND, R. P.
Large energy storage systems for utilities
26 p0231 A80-27731

HANCOX, R.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

HANSON, D.
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909

HANSON, W. C.
Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666

HAQUE, R.
Fluidized bed combustion of high sulphur coals
26 p0225 A80-25494

HARDING, G. L.
Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743
Alternative grading profile for sputtered solar selective surfaces
26 p0246 A80-29744
HAREN, P.
Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design
26 p0251 A80-30804
HARPER, J. P.
Environmental and economic evaluations of energy recovery from agricultural and forestry residues
[ANL/EES/TM-58] 26 p0297 N80-19668
HARRISON, R.
Energy analysis of CdS:Cu2S sputtered solar cells
26 p0186 A80-21918
HARRISS, R. C.
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
HARVEY, R. A.
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739
HARVEY, R. W.
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483
HASBROUCK, T. R.
Cost of energy evaluation
26 p0263 N80-16482
HASELMAN, L. C.
Chemical kinetics in LNG detonations
[UCRL-82293-REV-1] 26 p0258 N80-16180
HASTINGS, T.
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108
HATAKEYAMA, R.
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
HATMAKER, M. L.
Urban activity allocation under criteria of transportation energy efficiency
26 p0192 A80-22788
HATTA, Y.
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
HAUSER, R. K.
Project windsheet - An interim report
[AIAA 80-0647] 26 p0239 A80-28827
HAUTALA, R. R.
Solar energy: Chemical conversion and storage
26 p0243 A80-29051
The norbornadiene-quadricyclene energy storage system
26 p0244 A80-29061
HAYES, R. W.
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379
HAYS, R. L.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
HAZELRIGG, G. A., JR.
The price of oil in the year 2000
[AAS 79-172] 26 p0215 A80-24717
HEAP, R. D.
Heat pumps
26 p0207 A[illegible]0-23224
HEDMAN, P. O.
Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303
HEEGER, A. J.
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
HEID, W. G., JR.
Solar energy for agriculture: Review of research
[PB-298688/3] 26 p0271 N80-16568
HEIFERLING, P.
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
HEIN, L. A.
Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831
HEINKEL, J.
Projections of enhanced oil recovery, 1985 - 1995
[DOE/EIA-0183/11] 26 p0314 N80-21824
HEIZMANN, J. J.
Iron oxide reduction kinetics by hydrogen
26 p0203 A80-23174
HELENBROOK, R. G.
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687
HELLEBREKERS, W. M.
Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086
HELLING, J.
Hybrid drive-systems for municipal buses
26 p0235 A80-28475
HEMMING, D.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
HENDERSON, J.
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Analysis of a heat exchanger-thermoelectric generator system
[SERI/TP-35-253] 26 p0316 N80-21848
HENDERSON, R. E.
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858
HENRY, MR.
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500
HENSING, P. C.
Flutter analysis of small windturbine, designed for manufacture and use in developing countries
[UTH-LR-272] 26 p0284 N80-18415
HERCHAKOWSKI, A.
Regenerative burner system for thermoelectric power sources
[AD-A075955] 26 p027[illegible] N80-17553
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869
HERD, D.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579
HERGENROTHER, K. M.
Comparison of fuel economy and emissions for diesel and gasoline powered taxicabs
[PB-298609/9] 26 p0275 N80-17484
HERMAN, R. G.
Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302
HERZOG, P.
Heat-pump-centered integrated community energy systems: System development
[ANL/CNSV/TM-8] 26 p0305 N80-20880
HEWIG, G. H.
Heterojunction for thin-film solar cells
26 p0245 A80-29393
HEYWOOD, J. B.
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340
HIGGINBOTHAM, E. G.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601
HIGGINS, J.
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes
26 p0243 A80-29057

HIGHLEY, J.
The development of fluidized bed combustion
26 p0225 A80-25689

HILL, J. A.
Performance of a packaged solar space-heating system used with a mobile home
[PB-300890/1] 26 p0272 N80-16572

HILL, R.
Antireflection coatings on solar cells
26 p0186 A80-21914
Energy analysis of CdS:Cu2S sputtered solar cells
26 p0186 A80-21918

HILL, R. W.
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042

HINMAN, C. W.
Oils and rubber from arid land plants
26 p0253 A80-32055

HIRAOKA, T.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

HNAT, J. G.
Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099

HOBBS, R. B.
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456

HOCH, D.
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474

HOFBAUER, P.
The future of the Diesel engine - A critical analysis
26 p0235 A80-28473

HOFFMAN, J.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079

HOFFMAN, J. A.
Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques
[NASA-CR-159737] 26 p0308 N80-20909

HOFFMAN, M. Z.
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
26 p0243 A80-29056

HOLDEN, S. C.
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623

HOLLABAUGH, C. M.
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134

HOLLEBONE, B. R.
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106

HOLLOWAY, F. W.
The evolution of a large laser control system - From Shiva to Nova
26 p0185 A80-21901

HOLMES, J. A.
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482

HOLMES, J. T.
Solar central test facility
[SAND-79-1730C] 26 p0267 N80-16524

HOLMES, R. D.
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443

HOLMES, R. W.
Safety studies on Li/SO2 cells. II - Kinetics of lithium-organic solvent exothermic reactions
26 p0247 A80-29894

HOLTZ, M. J.
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877

HOMAN, H. S.
Combustion of multicomponent fuel droplets
[COO-4449-2] 26 p0257 N80-16126

HONMA, T.
National R&D program on MHD in Japan
26 p0220 A80-25100

HONDA, H.
Solvolysis liquefaction of coal
26 p0187 A80-21926

HONDA, K.
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897

HONG, J. Y.
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476

HOPENFELD, J.
Simplified correlations for prediction of NO/x/ emissions from MHD power plants
26 p0227 A80-26001

HOPPS, R. H.
The changing horizons for technical progress. II
26 p0229 A80-27270

HORIGOME, T.
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927

HORTON, E. J.
Advanced engine concepts - The Ford Proco engine
26 p0235 A80-28474

HORWITZ, C. M.
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743

HOSSAIN, S. M.
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310

HOULBERG, W. A.
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482

HOVESTREYDT, G.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182

HOWALD, R.
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2
26 p0217 A80-25073

HOWARD, J. F.
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

HRUBY, V.
Long duration channel development and testing
26 p0216 A80-25063

HSU, F. H.
Flap type weather proof ocean wave energy converter
26 p0232 A80-28258

HUANG, C. H.
Gust-rise exceedance statistics for wind turbine design
[PNL-2530] 26 p0277 N80-17567

HUANG, H. S.
Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501

HUANG, Y. C.
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys
26 p0202 A80-23169

HUBBARTT, J. E.
Study of a vortex augmentor for a wind-powered turbine
26 p0227 A80-26002

HUFFMAN, G. D.
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858

HUGOSSON, S.
Specification, siting and selection of large WECS prototypes
26 p0261 N80-16459

HULL, D. E., III
Optimal controllers of the second kind
26 p0184 A80-21112

HULSTROM, R. L.
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573

HULTGREN, L. S.
Torsional oscillations of the rotor disc for horizontal axis wind turbines with hinged or teetered blades, Part 12
[FFA-TN-AU-1499-PT-12] 26 p0319 N80-21881

HUMPHREY, A.
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092

HUNDEMANN, A. S.
Solar energy concentrator design and operations. Citations from the NTIS data base
[NTIS/PS-79/0926/0] 26 p0270 N80-16557
Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558
Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-79/1069/8] 26 p0271 N80-16563
Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-79/0928/6] 26 p0271 N80-16566
Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567
Heliostat system design and operation. Citations from the Engineering Index data base
[NTIS/PS-79/0930/2] 26 p0271 N80-16571
Electric automobiles. Citations from the NTIS data base
[NTIS/PS-79/0990/6] 26 p0274 N80-16976
Combined cycle power generation. Citations from the NTIS data base
[PB80-800915] 26 p0280 N80-17594
Combined cycle power generation. Citations from the Engineering Index data base
[PB0-800923] 26 p0280 N80-17595
Solar electric power generation, volume 3. Citations from the Engineering Index data base
[PB80-803034] 26 p0296 N80-19657
Solar electric power generation, volume 2. Citations from the NTIS data base
[PB80-803000] 26 p0296 N80-19658
Solar electric power generation, volume 3. Citations from the NTIS data base
[PB80-803018] 26 p0296 N80-19659
Solar electric power generation, volume 2. Citations from the Engineering Index data base
[PB80-803026] 26 p0296 N80-19660
Solar sea power plants. Citations from the NTIS data base
[PB80-802580] 26 p0297 N80-19661
Solar seapower plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662
Solar water pumps. Citations from the Engineering Index data base
[PB80-802531] 26 p0308 N80-20910

HUNDERI, O.
Nickel pigmented anodic aluminum oxide for selective absorption of solar energy
26 p0209 A80-23499

HUSSAIN, S. Q.
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330

HYDE, J. C.
Characterization and assessment of selected solar thermal energy systems for residential and process heat applications
[LA-7995-TASE] 26 p0295 N80-19648

I

IAKIMOV, O. S.
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501

IAKOVLEV, V. I.
The theory of a free-field inductive MHD-propulsor
26 p0216 A80-25021

IAKUBOV, I. T.
Promising fuels for MHD power stations
26 p0252 A80-31750

IAKUBOV, V. B.
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567

ICERMAN, L.
Net energy production history of the Geysers Geothermal Project
26 p0184 A80-21745
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824

IHARA, S.
On the study of hydrogen production from water using solar thermal energy
26 p0200 A80-23147

IKEGAMI, S.
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells
26 p0228 A80-27057

IKUTA, K.
Application of plasma focus device to compression of toroidal plasma
26 p0229 A80-27058

ILICHEV, N. N.
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

ILLIG, E. G.
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416

IM, K. H.
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071

INGLE, W. M.
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495

INOUE, S.
Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278

IQBAL, K. Z.
Analysis of the geothermal binary cycle using paraffin hydrocarbons as working fluids
26 p0285 N80-18553

ISAKSON, P.
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

ISEROV, A. D.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

ISHIDA, K.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

ISHIKAWA, M.
Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089

ISSACS, H.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

ITOH, K.
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278

J

JACKSON, W. D.
Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449

JACKSON, W. R.
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523

JACOB, A.
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976
Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558

JACOB, I.
The influence of Al on the hydrogen sorption properties of intermetallic compounds
26 p0203 A80-23173

JACOBSON, A. J.
Electrochemistry of amorphous V2S5 in lithium cells
26 p0247 A80-29895

JAFFE, P.
LSA field test
[NASA-CR-162798] 26 p0291 N80-19611

JAIN, S. C.
Salinity gradient energy conversion
26 p0233 A80-28262

JAMES, R. K.
Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator
26 p0219 A80-25090

JANDORF, E.
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899

JAUD, P.
Geothermal heating in Creil
26 p0255 A80-32499

JAUMOTTE, A. L.
Theoretical study of thermal losses: The use of hybrid and combined dry coolants
[NT-44-1978] 26 p0284 N80-18345

JAYADEV, T. S.
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876

JEFFREY, D. C.
Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

JELINEK, J.
Energy Research Information System (ERIS) projects report, volume 4, number 1
[PB-300338/1] 26 p0270 N80-16561

JENKINS, G.
Energy analysis of CdS:Cu2S sputtered solar cells
26 p0186 A80-21918

JENSEN, J.
Energy storage
26 p0184 A80-21123

JENSEN, R. N.
Combined solar collector and energy storage system
[NASA-CASE-LAR-12205-1] 26 p0302 N80-20810

JETER, S. M.
Optical and thermal effects in linear solar concentrating collectors
26 p0275 N80-17541

JINDRA, J.
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016

JOELS, R.
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code
26 p0205 A80-23192

JOHANSON, R. E.
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810

JOHANSSON, T. B.
Sweden beyond oil - Nuclear commitments and solar options
26 p0255 A80-32410

JOHN, D.
Energy source book
[DOE/TIC-10190] 26 p0306 N80-20895

JOHNSEN, R. L.
Performance sensitivity analysis of Department of Energy-Chrysler upgraded automotive gas turbine engine, S/N 5-4
[NASA-TM-79242] 26 p0274 N80-17467

JOHNSON, C.
GPS application to seismic oil exploration
26 p0222 A80-25159

JOHNSON, C. J.
Lithium battery discharge tests
26 p0303 N80-20831

JOHNSON, G. R.
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644

JOHNSON, I.
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430

JOHNSON, J. D.
Oils and rubber from arid land plants
26 p0253 A80-32055

JOHNSON, R.
A modular approach to an engineering test facility and beyond
26 p0221 A80-25103

JOHNSON, R. L.
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820

JOHNSON, S.
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

JOHNSON, T. R.
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071

JOHNSTON, W. D., JR.
Growth and characterization of thin film III-V compound semiconductor material for solar cell applications
26 p0244 A80-29058

JOMOTO, I.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

JONARDI, R. J.
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305

JONES, D. E.
Calculation of performance of N collectors in series from test data on a single collector
26 p0184 A80-21113
Performance of a packaged solar space-heating system used with a mobile home
[PB-300890/1] 26 p0272 N80-16572

JONES, G., II
Photosensitization mechanisms for energy storing isomerizations
26 p0244 A80-29060
Organic photochemical storage of solar energy
[COO-4380-2] 26 p0267 N80-16527

JONES, M. S.
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV
[PB80-134729] 26 p0320 N80-21913

JORGENSEN, G.
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

JOSEPHY, N. H.
A Newton method for the PIES energy model
[AD-A077102] 26 p0287 N80-18825

JOUBERT, J. I.
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113

JOURDAN, J.
Small scale ammonia production as a means for hydrogen storage
26 p0201 A80-23160

JU, F. D.
The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support
[LA-7885-MS-VOL-6] 26 p0307 N80-20897

JUDA, W.
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870

JURKSCH, G.
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power
[ISBN-3-88148-164-8] 26 p0281 N80-17635

JUSTI, E.
Status and development of production of cheap hydrogen
26 p0208 A80-23330

K

KABANSKII, A. E.
Possible direct conversion of chemical energy into electrical energy in a semiconductor
26 p0247 A80-29795

KADLEC, E. G.
Characteristics of future Vertical Axis Wind Turbines (VAWTs)
26 p0261 N80-16462
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541

KADOMTSEV, B. B.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

KADOTA, K.
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481

KAGAN, H. B.
Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions
26 p0184 A80-21116

KAHAN, D. J.
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183

KAISER, U.
Energy storage
26 p0255 A80-32398

KAKABAEV, A.
Investigation of heat and mass transfer for a regenerator model of a solar cooling system
26 p0232 A80-28200

KAKIYAMA, H.
Solvolysis liquefaction of coal
26 p0187 A80-21926

KALANKAROV, G. R.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026

KALANDARISHVILI, A. G.
Cesium vapor source with a gas-controlled heat pipe for thermionic energy converters
26 p0249 A80-30241

KALWA, G.
Material requirements for coal gasification
26 p0212 A80-23833

KALYONCU, R. S.
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons
[ORO-5205-10] 26 p0310 N80-20973

KAMATH, S.
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838

KAMEYAMA, H.
Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135

KAMEYAMA, T.
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121

KAMIYA, N.
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6
26 p0200 A80-23144

KANDPAL, T. C.
Some geometrical design aspects of a linear Fresnel reflector concentrator
26 p0193 A80-22791

KAPLAN, D.
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475

KAPLAN, J. I.
Solar water heating in the Midwest - An economic assessment based on measured performance
26 p0241 A80-28858

KAREEM, A.
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807

KARIM, G. A.
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139

KARL, H.
Photovoltaic hybrid collectors
26 p0245 A80-29396

KARN, F. S.
Stability studies of coal liquids
[PETC/TR-79/5] 26 p0257 N80-16129

KARPOV, O. P.
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357

KARST, R. H.
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305

KATO, K.
Theory of current generation by electrostatic traveling waves in collisionless magnetized plasmas
26 p0229 A80-27263

KATZER, J. R.
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids
[FE-2028-15] 26 p0287 N80-19292

KAUFMAN, J. W.
Wind wheel electric power generator
[NASA-CASE-MFS-23515-1] 26 p0315 N80-21828

KAUFMAN, R.
Coping with energy limitations in transportation: Proposals for Michigan
[PB-299737/7] 26 p0270 N80-16559

KAULEN, A. D.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026

KAUSHIK, S. C.
Analyses of single and double exposure solar air heaters
26 p0193 A80-22792

KAZA, K. R. V.
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446

KEAR, E. B.
The potential for optimizing the economics of wind energy utilization on a dairy farm through load management
[AIAA 80-0640] 26 p0241 A80-28838

KEATING, E. L.
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106

KECK, J. C.
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340

KEETON, S. C.
Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347

KELLER, C.
Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202

KELLER, J.
Model for hydrogen production on illuminated transition metal surfaces
26 p0206 A80-23202
KELLEY, J. H.
Storage, transmission and distribution of hydrogen
26 p0194 A80-23103
KELLY, H.
Photovoltaic power for telecommunications
26 p0232 A80-28015
KELLY, H. C.
Onsite solar energy systems - Economics and system design
26 p0207 A80-23221
KENNINGTON, J.
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909
KERNS, C. R.
Nuclear Science Symposium, 26th and Symposium on Nuclear Power Systems, 11th, San Francisco, Calif., October 17-19, 1979, Proceedings
26 p0231 A80-27656
KESSLER, R.
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097
KHAKI-KASHANI, A.
Energy conservation in the US: Some interdisciplinary approaches with an emphasis on industrial cogeneration
26 p0302 N80-20811
KHANDURDYEV, A.
Investigation of heat and mass transfer for a regenerator model of a solar cooling system
26 p0232 A80-28200
KHOZHAINOV, A. I.
A magnetohydrodynamic piston engine
26 p0254 A80-32221
KHRISTOFOROV, B. D.
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357
KIDRON, I.
Properties of ion-implanted junctions in mercury-cadmium-telluride
26 p0234 A80-28307
KILAR, L. A.
Offshore wind energy conversion systems
[AIAA 80-0619] 26 p0241 A80-28839
KIM, S.-H.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079
KIM, Y. C.
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
KIMEL, E.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866
KING, R. B.
Solar energy: Chemical conversion and storage
26 p0243 A80-29051
The norbornadiene-quadricyclene energy storage system
26 p0244 A80-29061
KIRICHENKO, T. K.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340
KIRSCHBAUM, H. S.
Wind-turbine power improvement with modern airfoil sections and multiple-speed generators
[AIAA 80-0633] 26 p0239 A80-28819
Multi-speed electrical generator application to wind turbines
[AIAA 80-0635] 26 p0239 A80-28821
KISS, Z.
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
KLANN, J. L.
Fuel economy screening study of advanced automotive gas turbine engines
[NASA-TM-81433] 26 p0311 N80-21201
KLAPSTE, B.
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016
KLEARMAN, D.
Energy source book
[DOE/TIC-10190] 26 p0306 N80-20895
KLEIN, H.
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0205 A80-23198
Engineering impact on the validity of the Mark-16 thermochemical cycle
26 p0233 A80-28275
KLEIN, S. A.
Calculation of the monthly-average transmittance-absorptance product
26 p0184 A80-21117
KLEINWACHTER, H.
Economically working big scale solar power stations pneumatic light-weight construction
26 p0208 A80-23326
KLEINWACHTER, J.
Economically working big scale solar power stations pneumatic light-weight construction
26 p0208 A80-23326
KLEIS, S. J.
Instantaneous collector thermal efficiencies in less time
26 p0248 A80-29925
KLETT, M. G.
Application of black-liquor boiler technology to MHD heat and seed recovery equipment design
26 p0217 A80-25070
KLIER, K.
Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302
KLIMAS, P. C.
Aerodynamic interference between two Darrieus wind turbines
[AIAA 80-0606] 26 p0237 A80-28803
KLINEDINST, K. A.
Lithium thionyl chloride high rate discharge
26 p0303 N80-20830
KLOKOV, B. G.
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357
KLOSE, G. J.
Test and evaluation report of the ERDC Hybrid-Electric Van (HEVAN)
[DOE/TIC-10232] 26 p0312 N80-21210
KNIEBEL, C. J.
Operability and materials testing for MHD air heaters
26 p0217 A80-25075
KNORR, R. E.
Projections of direct energy consumption by mode: The 1975 - 2000 baseline
[ANL/CNSV-4] 26 p0304 N80-20878
KNUDSON, C. L.
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418
KOBAK, J. A.
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532
KODRES, C. A., JR.
The effect of superheating on the performance of floating droplet direct contact heat exchangers
26 p0260 N80-16293
KOENIG, R. A.
Assessment of low- to moderate-temperature geothermal resources of Nevada
[NVO-01556-1] 26 p0301 N80-20792
KOENIG, H.
Coping with energy limitations in transportation: Proposals for Michigan
[PB-299737/7] 26 p0270 N80-16559
KOERBER, F.
Large wind energy converter: Growian 3 MW
26 p0261 N80-16461

KOESTER, J. K.
Electrical characteristics of an arc-mode slagging electrode generator
26 p0216 A80-25064
Local analysis of electrical performance of the U-25B generator
26 p0216 A80-25066
Fluctuations in combustion MHD generator systems
26 p0221 A80-25105

KOLENC, T.
Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483

KOLKHORST, H. E.
Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning
[NASA-TM-80958] 26 p0291 N80-19610

KOLODNY, A.
Properties of ion-implanted junctions in mercury-cadmium-telluride
26 p0234 A80-28307

KOLOMIISKII, A. N.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

KOLOTYRKIN, IA. M.
Use of nuclear reactors for simultaneous radiation and power generation as a cost effective means of hydrogen production
26 p0185 A80-21877

KOLTUN, M. M.
Selective optical surfaces for solar energy convertors
26 p0228 A80-26511

KOMAR, C. A.
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

KONAGAI, M.
Amorphous Si-P-H solar cells prepared by dc glow discharge
26 p0251 A80-30940

KONDO, I.
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672

KONDO, M.
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137

KONOPLEV, V. IU.
End zone of a channel with segmented electrodes, carrying nonuniform flow
26 p0254 A80-32220

KOONTZ, R.
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513

KOPSTEIN, M. J.
Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412

KORALEK, C.
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949

KORDOS, P.
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668

KORENAGA, S.
National R&D program on MHD in Japan
26 p0220 A80-25100

KORNMANN, M.
Analysis of the potential transmission of hydrogen by pipeline in Switzerland
26 p0201 A80-23158

KOTENEV, P. A.
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507

KOUTS, H.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

KOVALSKII, N. G.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

KOVBASIUK, V. I.
Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091

KOWALIK, R. M.
Experiments concerning inhomogeneities in combustion MHD generators
26 p0221 A80-25107

KOZLOWSKI, T.
One-stage cyclone combustor for coal fired test stand of 4MW thermal power
26 p0222 A80-25111

KOZOYED, L. M.
Solar energy design improvement: A methodology for hydronic flatplate collector systems
[AD-A076836] 26 p0286 N80-18567

KRAWCZONEK, W. M.
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476

KRAWIEC, S.
Economics of selected WECS dispersed applications
[AIAA 80-0618] 26 p0238 A80-28812

KREBS, J. J.
Magnetooptical switch for synchronization of CO2 and red laser beams
26 p0236 A80-28735

KRIKORIAN, O. H.
The ZnSe thermochemical cycle for hydrogen production - Chemical and process design studies
26 p0198 A80-23133

KRISHNAN, V. V.
Aggregated vectorial model of petroleum flow in the United States
[LBL-8874] 26 p0258 N80-16178

KRISHNASWAMY, S. V.
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325

KRUGER, C. H.
Plasma measurements of Joule heating effects in the near electrode region of an open cycle MHD generator
26 p0219 A80-25090
Experiments concerning inhomogeneities in combustion MHD generators
26 p0221 A80-25107

KRUPNICK, A. C.
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452

KRUZHILIN, N. A.
Promising fuels for MHD power stations
26 p0252 A80-31750

KUCK, H.-A.
The future of the Diesel engine - A critical analysis
26 p0235 A80-28473

KUDISH, A. I.
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261

KUH, E.
Independent assessment of energy policy models
[EPRI-EA-1071] 26 p0266 N80-16510

KUHLTHAU, A. R.
Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990

KULKARNI, S. V.
Composite-laminate flywheel-rotor development program
[UCRL-83554] 26 p0317 N80-21855

KUMAGAI, T.
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137

KUMAHARA, T.
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672

KUHNER, J. T.
Possible use of honeycomb-type structures for high power batteries and fuel cells
26 p0190 A80-22169

KUNSTREICH, S.
Theoretical efficiency limit of water electrolysis and practical means to approach it
26 p0205 A80-23197

KURCHATOV, I. V.
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149

KURILO, I. A.
Analysis of losses in a high-frequency converter with low-cosine capacitance load
26 p0252 A80-31501

KURITA, S.
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6
26 p0200 A80-23144

KUSH, E. A.
Performance of heat pumps at elevated evaporating temperatures with application to solar input
[BNL-26772] 26 p0307 N80-20896
Use of earth coupling in solar assisted heat pumps
[BNL-26748] 26 p0316 N80-21849

KUSHNER, A.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

KUTAL, C.
Solar energy: Chemical conversion and storage
26 p0243 A80-29051
The norbornadiene-quadricyclene energy storage system
26 p0244 A80-29061

KUZNETSOV, IU. K.
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472

KVATERNIK, R. G.
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446

KWART, H.
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids
[FE-2028-15] 26 p0287 N80-19292

L

LA HAYE, R. J.
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483

LACEY, R. E.
Energy by reverse electrodialysis
26 p0194 A80-22940

LACKNER, H.
Study of advanced electric propulsion system concept using a flywheel for electric vehicles
[NASA-CR-159650] 26 p0287 N80-18991

LADISH, J. S.
Helios, a 20 TW CO2 laser fusion facility
26 p0245 A80-29370

LAFOREST, J.
Thermography at the earth's surface and the energy efficiency of buildings
26 p0213 A80-24072

LAFRANCE, L. J.
Feasibility study of geothermal energy for heating greenhouses
[PB-299517/3] 26 p0271 N80-16569

LAHODA, E. J.
An evaluation of candidate seed processing systems for open cycle MHD
26 p0217 A80-25072

LAHODA, S. J.
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

LAKOVA, M. S.
Thin solid solution films Zn/x/Cd/1-x/S
26 p0194 A80-23014

LAL, P.
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008

LALONDE, D.
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126

LALONDE, D. R.
Electrolysis of hydrobromic acid
26 p0198 A80-23129

LAM, H. Y.
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557

LAMB, C. S. J.
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093

LAMICH, G.
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180

LAMORTE, M. F.
Computer modeling of a two-junction, monolithic cascade solar cell
26 p0234 A80-28330

LAMPERT, C. M.
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324] 26 p0277 N80-17560

LAMPIS, G.
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498

LANE, W. G.
Project windsheet - An interim report
[AIAA 80-0647] 26 p0239 A80-28827

LANGE, R. H.
Future large cargo aircraft technology
26 p0229 A80-27269

LANGENBACHER, F.
Performance effects of Trombe wall control strategies
26 p0183 A80-21105

LANGENKAMP, H.
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126
The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407

LANGFORD, C. H.
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106

LANSING, F. L.
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379

LANTZ, L. J.
Continuing regional solar energy information mini-center activities and updating the SOLCOST program
[COO-4643-T2] 26 p0267 N80-16521
Continuing regional solar energy information Mini-Center activities and updating the SOLCOST program
[COO-4643-T1] 26 p0278 N80-17571

LARKINS, F. P.
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523

LARSON, D. C.
Mirror enclosures for double-exposure solar collectors
26 p0184 A80-21110

LATIMER, D. A.
Power plant impacts on visibility in the west - Siting and emissions control implications
26 p0216 A80-24735

LATTA, A. F.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634

LAU, A. S.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520

LAU, S. K.
The effect of electrochemical and arcing phenomena on electrode performance
26 p0218 A80-25080

LAVI, A.
OTEC for hydrogen production
26 p0195 A80-23109

LAWFORD, T. W.
Today's geothermal power economics and risks
[CONF-790803-44] 26 p0277 N80-17558

LAWIT, R. L.
Application of black-liquor boiler technology to MHD heat and seed recovery equipment design
26 p0217 A80-25070

LAZZARO, E.
Model for description of transient behavior of a tokamak discharge
26 p0213 A80-24498

LE COMBER, P. G.
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966

LE PENHUIZIC, MR.
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500

LE, K. D.
Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101

LEACH, S. J.
Research at the Building Research Establishment into the applications of solar collectors for space and water heating in buildings
26 p0209 A80-23515

LEBED, S. A.
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472

LEBSANFT, E.
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

LECOANET, A.
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
Nuclear methane reforming for coal gasification
26 p0233 A80-28276

LEDUC, B.
Theoretical study of thermal losses: The use of hybrid and combined dry coolants
[NT-44-1978] 26 p0284 N80-18345

LEDWELL, T. A.
Canadian renewable energy prospects
26 p0183 A80-21104

LEE, J.
Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294

LEE, J. D.
Mirror hybrid reactors
26 p0215 A80-24670

LEE, S. H. D.
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430

LEGASOV, V. A.
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195

LEGER, D.
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

LEIGH, R. W.
Review of recent research on energy storage in residential solar total energy systems
[BNL-51012] 26 p0315 N80-21830

LEIPOLD, M. H.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526

LENNING, J.
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

LENNON, A. W., JR.
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1
[PB-299383/0] 26 p0259 N80-16192
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193

LEONARD, R. L.
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

LEONG, H. H.
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644

LEROY, R. L.
Unipolar water electrolysers - A competitive technology
26 p0196 A80-23116

LESK, I. A.
Silicon ribbon for photovoltaic cells
26 p0245 A80-29394

LESSART, P.
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131

LETT, R. G.
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417

LEVI, E.
Magnetohydrodynamic power generation - Program planning and status
26 p0184 A80-21449

LEVY, D. D.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054

LEVY, R. K.
Centrifugal fluidized combustion of coal
[FE-2516-9] 26 p0288 N80-19293

LEWIS, C. W.
The prospects for solar energy use in industry within the United Kingdom
26 p0248 A80-29921

LEWIS, F. A.
The significance of studies with palladium to basic problems of electrolytic hydrogen evolution
26 p0196 A80-23114

LEYERLE, R. W.
Optimization of Pt-doped Kocite (trade name) electrodes in H3Po4 fuel cells
[AD-A075372] 26 p0294 N80-19639

LI, Z.
Controlled fusion research in China
26 p0226 A80-25786

LIANG, S. S.
Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle
26 p0204 A80-23189

LICHTIN, N. N.
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
26 p0243 A80-29056

LIEBELT, K. H.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520

LIEBLEIN, S.
Large Wind Turbine Design Characteristics and R and D Requirements
[NASA-CP-2106] 26 p0260 N80-16453
LIEN, S.
Photobiological production of hydrogen
26 p0247 A80-29920
LIM, K. J.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601
LIN, S.
The effect of material properties on the thermal efficiency of the Minto solar wheel
26 p0253 A80-31857
LIND, M. A.
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774
LINDBERG, S. E.
Mercury partitioning in a power plant plume and its influence on atmospheric removal mechanisms
26 p0223 A80-25170
LINDHOLM, F. A.
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609
LINDSTORM, R. W.
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870
LINSCOTT, B. S.
Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico
26 p0262 N80-16470
LIPPERT, T. E.
An evaluation of candidate seed processing systems for open cycle MHD
26 p0217 A80-25072
Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101
LISSAMAN, P. B. S.
Coriolis Program - A review of the status of the ocean turbine energy system
26 p0233 A80-28261
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807
LIU, C. S.
Microtearing modes and anomalous transport in tokamaks
26 p0248 A80-29975
LIUBIMOV, G. A.
Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068
LJUNGSTROM, O.
New concepts in vertical axis wind turbines /VAWT/ and applications to large multi-MW size, off-shore wind turbine systems
[AIAA 80-0620] 26 p0241 A80-28840
LLOYD, W. G.
Experimental laboratory measurement of thermophysical properties of selected coal types
[NASA-CR-162913] 26 p0298 N80-20404
LOEWENTHAL, S. H.
Effect of geometry and operating conditions on spur gear system power loss
[NASA-TM-81426] 26 p0284 N80-18406
LOF, G. O. G.
Solar space heating with air and liquid systems
26 p0209 A80-23512
LOFERSKI, J. J.
Photovoltaics. I - Solar-cell arrays
26 p0214 A80-24531
Photovoltaics. IV - Advanced materials
26 p0214 A80-24534
LOMAX, G. R.
Current trends in the development of sodium-sulphur batteries
26 p0232 A80-28013
LONNROTH, M.
Sweden beyond oil - Nuclear commitments and solar options
26 p0255 A80-32410
LOTKER, M.
Economic incentives to wind systems commercialization
[AIAA 80-0617] 26 p0238 A80-28811
LOUIS, J. F.
Local analysis of electrical performance of the U-25B generator
26 p0216 A80-25066
LOUTHAN, M. R., JR.
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186
LOVELL, B.
Effect of solar power satellite transmissions on radio-astronomical research
26 p0211 A80-23525
LOWELL, C. E.
Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys
[NASA-TM-81384] 26 p0283 N80-18157
LOWENTHAL, S. H.
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754
LUCAS, J. W.
Annual technical report, fiscal year 1979. Volume 1: Executive summary
[NASA-CR-159715] 26 p0293 N80-19632
LUDWIG, H.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079
LUE, J. T.
The barrier height change and current transport phenomena with the presence of interfacial layer in MIS Schottky barrier solar cells
26 p0247 A80-29815
LUND, W. W., JR.
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
LUTZ, H. M.
Use of binary titanium alloys for hydrogen storage
26 p0202 A80-23164
Effect of the interstitial hole size and electron concentration on complex metal hydride formation
26 p0202 A80-23168
LY, K. H.
Experiments on an oscillating aerofoil and applications to wind energy converters
[AIAA 80-0624] 26 p0238 A80-28816
LYNCH, F. E.
The role of metal hydrides in hydrogen storage and utilization
26 p0202 A80-23163
LYNCH, S. J.
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482
LYNN, S.
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890

M

MA, T.-C.
MHD equilibrium and stability of axial symmetric toroidal plasma with an elliptic cross section of triangular deformation
26 p0209 A80-23366
MACCARLEY, C. A.
Electronic fuel injection techniques for hydrogen powered I.C. engines
26 p0206 A80-23205
MACDIARMID, A. G.
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
MACDONALD, D. D.
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474
MACHA, M.
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620

MACIOLEK, R. B.
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305

MACKNICK, A. B.
Heavy hydrocarbons from coal gasification vapor pressures and dew point
26 p0257 N80-16111

MACKNIGHT, W. J.
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172

MACLEOD, H. A.
Antireflection coatings on solar cells
26 p0186 A80-21914

MACMANN, J. P.
Urban mass transportation energy conservation: SRGP operating instructions and program documentation, volume 5
[DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205

MADIO, F. R.
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868

MAEDA, Y.
Simultaneous determination of quantum efficiency and energy efficiency of semiconductor photoelectrochemical cells by photothermal spectroscopy
26 p0247 A80-29897

MAISCH, W. G.
Magnetooptical switch for synchronization of CO2 and red laser beams
26 p0236 A80-28735

MAKAROV, IU. V.
End zone of a channel with segmented electrodes, carrying nonuniform flow
26 p0254 A80-32220

MAKSIMENKO, V. I.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

MALACHESKY, P. A.
The Exxon rechargeable cells
26 p0303 N80-20834

MALECKI, E. J.
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

MALHERBE, J.
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
Nuclear methane reforming for coal gasification
26 p0233 A80-28276

MALIUTIN, A. A.
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

MANASSE, F. K.
An integrated approach to energy supply for small communities
[AIAA 80-0651] 26 p0240 A80-28830

MANAUD, J. P.
Energy balance calculations and assessment of two thermochemical sulfur cycles
26 p0198 A80-23131

MANCINI, T. R.
An economical solar heated and cooled residence for southern New Mexico
[PB80-108616] 26 p0309 N80-20914

MANDALAKAS, J.
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092

MANDELKORN, J.
Technology and performance of a high concentration solar cell power supply
26 p0226 A80-25886

MANDELLI, C.
The kinetics of oxygen evolution on non-traditional electrodic materials
26 p0196 A80-23111

MANKAUSKAS, J. J.
Wind energy conversion system simulation program
[AIAA 80-0609] 26 p0237 A80-28806

MANNER, A. R.
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865

MANNING, J. R.
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183

MARASCHIN, R. A.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625

MARCH, F.
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868

MARDESICH, N.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526

MARECEK, V.
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016

MARI, C. M.
The kinetics of oxygen evolution on non-traditional electrodic materials
26 p0196 A80-23111

MARIANOWSKI, L. G.
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547

MARMAR, E. S.
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478

MARSDEN, D. J.
The potential for development of high performance light aircraft
26 p0208 A80-23307

MARSHALL, M.
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523

MARSHALL, R.
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613] 26 p0238 A80-28810

MARSTON, C. H.
A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098
Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099

MARSTON, P. G.
Superconducting MHD magnets - Technology development, procurement and the path to commercial scale
26 p0218 A80-25077

MARTENS, S. W.
Trends in the construction of Otto engines in the U.S
26 p0235 A80-28472

MARTIN, C.
Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483

MARTIN, P.
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568

MARTIN, R. E.
Advanced technology light weight fuel cell program
[NASA-CR-159807] 26 p0292 N80-19615
Lightweight fuel cell powerplant components program
[NASA-CR-161412] 26 p0298 N80-20306

MASKEW, J. T.
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

MASLENNIKOV, G. I.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

MASLOWSKI, C.
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14]
26 p0268 N80-16532

MASON, C. F. V.
The decomposition of hydrogen bromide using iron bromide and magnetite
26 p0198 A80-23130

MASON, H. B.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4]
26 p0272 N80-16601

MASSER, P.
Low-cost structures for photovoltaic arrays
[SAND-79-7006]
26 p0268 N80-16537

MASSEY, M. J.
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1]
26 p0289 N80-19305

MASTERSON, K. D.
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774

MASUTANI, T.
A study on plasma plug
26 p0252 A80-31775

MATAYA, K.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079

MATHUR, S. S.
Some geometrical design aspects of a linear Fresnel reflector concentrator
26 p0193 A80-22791

MATIUSHIN, G. A.
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

MATOBA, T.
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672

MATSUDA, Y.
Mixed electrolyte solutions of propylene carbonate and dimethoxyethane for high energy density batteries
26 p0247 A80-29898

MATSUMOTO, H.
Preparation and photovoltaic properties of screen printed CdS/Cu/X/S solar cells
26 p0228 A80-27057

MATSUNO, K.
Study of flywheel energy storage system for electric utilities
26 p0187 A80-21925

MATSUSHITA, M. J.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839]
26 p0293 N80-19625

MATSUTANI, K.
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088

MATTHEWS, J.
Adequacy analysis of air quality monitoring activities relevant to California thermal enhanced oil recovery fields
[SAN-12093-1]
26 p0309 N80-20929

MATTOX, D. M.
Preparation of thin films for solar energy utilization
[SAND-79-1754C]
26 p0267 N80-16517

MAXWELL, C.
A feasibility study of windpower for the New England area
[AD-A076614]
26 p0286 N80-18568

MAXWELL, C. D.
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180]
26 p0192 A80-22739
Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249]
26 p0192 A80-22745
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179]
26 p0212 A80-23938
The STD/MHD codes - Comparison of analyses with experiments
[AIAA PAPER 80-0024]
26 p0212 A80-23953
Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025]
26 p0212 A80-23954

MAYER, D. F.
Sea thermal power - Competitive electricity and chemicals from the sea
26 p0207 A80-23220

MAZUR, V. A.
Anomalous diffusion of alpha particles in a tokamak reactor due to the trapped-ion mode
26 p0224 A80-25482

MCCONNELL, R.
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478]
26 p0320 N80-21888

MCCONNELL, R. D.
General reliability and safety methodology and its application to wind energy conversion systems
[SERI/TR-35-234]
26 p0294 N80-19645

MCCORMICK, M. E.
Ocean wave energy conversion concepts
26 p0232 A80-28260

MCCREARY, S. T.
Methodology for evaluating physical constraints on residential solar energy use
[UCRL-15001]
26 p0307 N80-20901

MCCUTCHAN, D. A.
Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101

MCDONALD, G.
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
[NASA-TM-81385]
26 p0282 N80-18156

MCDONALD, R. C.
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733]
26 p0275 N80-17545

MCDONALD, R. R.
Proceedings of the 13th Project integration meeting
[NASA-CR-162787]
26 p0276 N80-17549

MCELROY, R. G.
Solar energy for agriculture: Review of research
[PB-298688/3]
26 p0271 N80-16568

MCGEAN, T. J.
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8]
26 p0274 N80-16974

MCGOWAN, J. G.
Technical and economic feasibility of wind-powered systems for dairy farms
[AIAA 80-0641]
26 p0239 A80-28823

MCIVER, A. E.
The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[FE-2449-9]
26 p0288 N80-19298

MCKENZIE, D. R.
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743

MCKIE, W. R.
A comparison of aerodynamic analyses for the Darrieus Rotor
[AIAA 80-0605]
26 p0237 A80-28802

MCKINNEY, W.
The wingmill - An oscillating-wing windmill
[AIAA 80-0621]
26 p0238 A80-28813

MCNEESE, L. E.
Fossil energy program
[ORNL-5487]
26 p0266 N80-16506

MCNITT, R. P.
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186

MEDIN, S. A.
Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068

MEHTA, G. D.
Salinity gradient energy conversion
26 p0233 A80-28262

MEI, C. C.
Characteristics of Salter's cam for extracting energy from ocean waves
26 p0251 A80-30802
Wave power extraction by a train of rafts - Hydrodynamic theory and optimum design
26 p0251 A80-30804
Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637

MEINKE, W. W.
Laser-fusion production of hydrogen by radiolytic-thermochemical cycles
26 p0206 A80-23201

MELISS, M.
Regenerative energy sources
26 p0255 A80-32397

MENABDE, N. E.
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242

MENDELSOHN, M.
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180

MENDELSOHN, R.
An economic analysis of air pollution from coal-fired power plants
26 p0230 A80-27649

MENTH, A.
Present state and outlook of the electrolytic H2-production route
26 p0195 A80-23104

MERCER-SMITH, J. A.
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055

MERTEL, G.
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code
26 p0205 A80-23192

MESSERLE, H. K.
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093

MESSIER, R.
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325

METWALLY, M. M.
A kinetic investigation of the reforming of natural gas for the production of hydrogen
26 p0199 A80-23139

METZ, P. D.
Computer simulation of ground coupled storage in a series solar assisted heat pump system
[BNL-26216] 26 p0266 N80-16507
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
[BNL-26219] 26 p0266 N80-16509
Use of earth coupling in solar assisted heat pumps
[BNL-26748] 26 p0316 N80-21849

METZ, W. C.
Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51065] 26 p0258 N80-16179

MEYER, C.
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206

MEYERS, R. E.
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580

MEZZINA, A.
Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program
[BNL-26904] 26 p0296 N80-19654

MICHLER, D. W.
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development
[DOE/ET-28432/1] 26 p0290 N80-19604

MICKA, K.
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves
26 p0232 A80-28016

MICKELSEN, R. A.
High photocurrent polycrystalline thin-film CdS/CuInSe2 solar cell
26 p0229 A80-27321
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653

MIGLIORE, P. G.
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832

MILANOVICH, F.
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295

MILEY, G. H.
Direct energy conversion systems
[COO-2218-117] 26 p0269 N80-16543

MILLER, D. R.
Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613

MILLER, J. L.
Open-cycle MHD powerplants - Performance, cost and technology demonstration strategies
[AIAA PAPER 80-0180] 26 p0192 A80-22739

MILLER, M.
Projections of direct energy consumption by mode: The 1975 - 2000 baseline
[ANL/CNSV-4] 26 p0304 N80-20878

MILLER, P. C.
Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SP-01525/1] 26 p0294 N80-19642

MILLER, R. D.
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416

MILLER, R. H.
Space-manufactured satellite power systems
26 p0227 A80-26003

MILLER, R. L.
Shape control of doublets
26 p0223 A80-25473

MILLER, R. S.
A performance and economic evaluation of annual cycle energy storage /ACES/
26 p0223 A80-25260

MILLNER, A. R.
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-57] 26 p0265 N80-16501

MIMS, C.
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108

MINICK, D. J.
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

MISHCHENKO, A. I.
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880

MISKELL, J. T.
Exotic energy R&D has potential
26 p0213 A80-24124

MITCHELL, F. O.
Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas
[PB-299925/8] 26 p0285 N80-18547

MITCHELL, J. W.
Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors
[COO-2971-6] 26 p0307 N80-20900

MITCHELL, T. O.
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422

MITCHELL, W. N.
Performance of low rank coals in the Exxon Donor Solvent Process 26 p0230 A80-27419

MITCHNER, M.
Fluctuations in combustion MHD generator systems 26 p0221 A80-25105

MITRA, S. K.
Development and operation of a high current density high pressure advanced electrolysis cell 26 p0197 A80-23119

MITSUI, A.
Bio-solar hydrogen production 26 p0201 A80-23155

MITTAL, M. L.
End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes 26 p0193 A80-22793

MIZUTA, S.
The magnesium-iodine cycle for the thermochemical decomposition of water 26 p0199 A80-23137

MNATSAKANIAN, A. KH.
Radiative and convective heat transfer in the MHD generator duct 26 p0217 A80-25068

MOELLER, C. P.
Observation of radio-frequency-driven plasma current in the octopole tokamak 26 p0224 A80-25483

MOFFITT, J. V.
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287

MOHAN, S. R.
Studies in biogas technology. I - Performance of a convectional biogas plant 26 p0188 A80-21938

MOIR, R. W.
Mirror hybrid reactors 26 p0215 A80-24670
Beam and plasma direct converters 26 p0215 A80-24671

MOISEYEV, N. N.
A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920

MOKHOV, V. N.
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage 26 p0230 A80-27567

MONTGOMERY, D. B.
Superconducting MHD magnets - Technology development, procurement and the path to commercial scale 26 p0218 A80-25077

MOORE, P. R.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes 26 p0243 A80-29054

MOOS, H. W.
Spatial profiles of light impurity ions in the Alcator A tokamak plasma 26 p0224 A80-25478

MORADPOUR, A.
Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions 26 p0184 A80-21116

MORALES, A. J.
Kinematic synthesis of drive mechanisms for solar concentrating collector using auxilliary mirrors 26 p0212 A80-23998

MORBELLO, M.
A method for the techno-economic evaluation of chemical processes - Improvements to the 'OPTIMO' code 26 p0205 A80-23192

MORENSKII, J.
Design description and performance predictions for the first CDIF power train 26 p0216 A80-25062

MORGAN, J. G.
The role of navigation satellites in oil exploration 26 p0222 A80-25152

MORGAN, W.
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants 26 p0220 A80-25097

MORI, S.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979 26 p0252 A80-31626

MORISAKI, H.
Photoelectrochemical generation of hydrogen with hybrid electrodes 26 p0200 A80-23153

MORONI, E. C.
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416

MORRIS, J. F.
Comments on TEC trends
[NASA-TM-79317] 26 p0273 N80-16885
Potentialities of TEC topping: A simplified view of parametric effects
[NASA-TM-81468] 26 p0321 N80-22083

MORRIS, P.
Photolysis of water for H2 production with the use of biological and artificial catalysts 26 p0210 A80-23521

MORRIS, S. C.
The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants 26 p0248 A80-29938
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930

MORRISON, C. B.
Application analysis and photovoltaic system conceptural design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550

MORRISON, D. N.
Surface-active materials from Athabasca oil sands 26 p0192 A80-22770

MORRISON, G. L.
Transient response of thermosyphon solar collectors 26 p0248 A80-29922

MOSCHOPEDIS, S. E.
Surface-active materials from Athabasca oil sands 26 p0192 A80-22770

MOSKOWITZ, P. D.
The global carbon dioxide problem - Impacts of U.S. synthetic fuel- and coal-fired electricity generating plants 26 p0248 A80-29938
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930

MOULTON, D. S.
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430

MOUNTZ, J.
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes 26 p0243 A80-29057

MOYER, J. W.
The retrofit approach to MHD demonstration and commercialization 26 p0221 A80-25102

MOZER, C. J.
Particulate size and rates of pressure drop increase in an MHD air preheater 26 p0217 A80-25076

MRHA, J.
Plastic bonded electrodes for nickel-cadmium accumulators. III - Influence of active layer composition on galvanostatic and potentiostatic discharge curves 26 p0232 A80-28016

MUBAYI, V.
Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294

MUELLER, R. O.
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14] 26 p0268 N80-16532
Peak-load problem with storage technology
[ANL/SPG-8] 26 p0269 N80-16549

MUKAI, Y.
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456

MULLER, J. C.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

MURALI, J.
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186

MURRAY, J. N.
Testing aqueous caustic electrolyzers at high temperatures
26 p0205 A80-23196

MUSHER, S. L.
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474

MYERS, W. N.
Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831

MYERSON, A. S.
Condensation of aluminum when used as a fuel additive in MHD power generation
26 p0242 A80-28859

MYNETT, A. E.
Characteristics of Salter's cam for extracting energy from ocean waves
26 p0251 A80-30802

MYSELS, K. J.
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122

N

NAGAR, H.
Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083

NAGEL, P.
Theoretical study of thermal losses: The use of hybrid and combined dry coolants
[NT-44-1978] 26 p0284 N80-18345

NAIR, K.
Environmental assessment methodology: Solar power plant applications. Volume 3. Environmental impact assessment application
[EPRI-ER-1070-VOL-3] 26 p0306 N80-20889
Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology
[EPRI-ER-1070-VOL-1] 26 p0309 N80-20926

NAKAMURA, H.
Geological and geochemical characteristics of geothermal resources in Japan
26 p0187 A80-21928

NAKATA, Y.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

NAKAYAMA, N.
Preparation and photovoltaic properties of screen printed CdS/Cu/x/S solar cells
26 p0228 A80-27057

NALOS, E. J.
Microwave power beaming for long range energy transfer
26 p0193 A80-22833

NARDELLA, J. A.
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896

NATHAN, G. K.
A statistical methodology for study of wind characteristics from a close array of stations
26 p0211 A80-23536

NAUGLE, J. E.
Just over the horizon in space
26 p0256 A80-32511

NAYAR, M. G.
Development and operation of a high current density high pressure advanced electrolysis cell
26 p0197 A80-23119

NEAL, D. W.
Subsurface stratigraphy of the Middle and Upper Devonian clastic sequence in southern West Virginia and its relation to gas production
26 p0273 N80-16628

NEEL, R. R.
Magma energy research, 79-1
[SAND-79-1344] 26 p0277 N80-17568

NEEPER, D. A.
Solar energy research at LASL
[LA-7741-PR] 26 p0318 N80-21872

NEFEDOV, A. P.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

NEILL, J. M.
Fixed mirror solar concentrator for application to a 100 MW(e) electric generating plant
[GA-A-15340] 26 p0266 N80-16508

NELLUMS, R. O.
Economic assessment of the Darrieus wind turbine
[AIAA 80-0614] 26 p0241 A80-28837
Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465

NELSON, E. V.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625

NELSON, L. A.
Methods for manufacturing heat pipes for circuit cards
[AD-A080188] 26 p0314 N80-21707

NELSON, M. R.
Hydrogen production from nuclear fission product waste heat and use in gas turbines
26 p0195 A80-23106

NELSON, R. D.
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172

NELSON, R. M.
Electrical characteristics of an arc-mode slagging electrode generator
26 p0216 A80-25064

NELSON, T. A.
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570

NELSON, V.
Wind turbines for irrigation pumping
[AIAA 80-0639] 26 p0239 A80-28822

NESBIT, W.
Going with the wind
26 p0243 A80-29037

NESTLE, R. E.
Urban mass transportation energy conservation: SRGP operating instructions and program documentation, volume 5
[DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205

NEUGROSCHEL, A.
MOS and oxide-charge-induced /OCI/ BSF solar cells
26 p0234 A80-28337
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609

NEUSTADTER, H. E.
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494

NEWMAN, J. N.
Absorption of wave energy by elongated bodies
26 p0251 A80-30805
Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637

NEUMAN, V. G.
Pumped water storage
26 p0225 A80-25495

NG, Y. S.
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AF-1227]
26 p0314 N80-21558

NICARIO, T. J.
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8]
26 p0274 N80-16974

NICHOLS, D. H.
Basic chemistry of a new cycle, based on reactions of Ce/III/ titanate, for splitting water
26 p0233 A80-28273

NICHOLSON, S. B.
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167

NIEMANN, R. C.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079

NIEMEYER, W. A.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839]
26 p0293 N80-19625

NIKITIN, G. A.
Electrical purifiers for dielectric fluids
26 p0254 A80-32287

NIXON, R. F.
Space disposal of nuclear wastes
26 p0246 A80-29448

NOBLE, J. E.
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905]
26 p0273 N80-16652

NOGUCHI, T.
Study of flywheel energy storage system for electric utilities
26 p0187 A80-21925

NOLL, R. B.
Tension-field wind machine - A new concept in large-scale energy production
[AIAA 80-0622]
26 p0238 A80-28814

NORMAN, J. H.
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122

NORTHAM, D. B.
Coal gasification in steam at very high temperatures
26 p0249 A80-30522

NOVACK, M.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3]
26 p0318 N80-21866

NOVIL, M.
Hydrogen-fueled railroad motive power systems - A North American view
26 p0203 A80-23175

NOWACKI, P.
Coal liquefaction processes
26 p0242 A80-28953

NOZIK, A. J.
Hydrogen generation via photoelectrolysis of water - Recent advances
26 p0200 A80-23152
Photoelectrochemical cells
26 p0210 A80-23520

NUNES, F. F.
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758]
26 p0300 N80-20430

NURGELDIEV, A.
Investigation of heat and mass transfer for a regenerator model of a solar cooling system
26 p0232 A80-28200

NWALOR, J.
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003]
26 p0318 N80-21865

O

OBEROI, H. S.
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM]
26 p0305 N80-20887

OBILADE, T.
Domestic space-heating and solar energy in Ireland
26 p0193 A80-22790

OBRIEN, J. P.
Gas turbines for automotive use
26 p0253 A80-31999

OCHIAI, H.
Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems
26 p0201 A80-23156

OCONNELL, L. G.
Energy storage systems for automobile propulsion
[UCID-18320]
26 p0312 N80-21211

OESTERWIND, D.
Soft-energy provision - A new Utopia
26 p0227 A80-26169

OGATA, A.
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672

OHTA, T.
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6
26 p0200 A80-23144
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145
Hydrogen energy research programs in Japan
26 p0233 A80-28271

OKADA, K.
Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089

OKEEFE, D. R.
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122

OKUTANI, T.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

OLEARY, B. T.
Space manufacturing, satellite power and human exploration
26 p0186 A80-21908

OLEARY, D. T.
Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes
[PB80-108566]
26 p0297 N80-19678

OLIVER, D. A.
Current transport mechanisms in the boundary regions of MHD generators
[AIAA PAPER 80-0249]
26 p0192 A80-22745
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179]
26 p0212 A80-23938
Transient response of large experimental MHD power generator flowtrain systems
[AIAA PAPER 80-0025]
26 p0212 A80-23954

OLSON, J. H.
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids
[FE-2028-15]
26 p0287 N80-19292

OMORI, S.
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112

ONEILL, G. K.
Space manufacturing, satellite power and human exploration
26 p0186 A80-21908

ONSTOTT, E. L.
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134

ONURSAL, A. B.
Hot gas cleanup process
[PB80-108467]
26 p0310 N80-20950

OONK, R. L.
Calculation of performance of N collectors in series from test data on a single collector
26 p0184 A80-21113
OOSAWA, Y.
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137
OSTROSKI, J. W.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833
OSTROVSKII, M. A.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026
OTAGAWA, T.
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6
26 p0200 A80-23144
OTSUKA, M.
Space- and time-resolved study of impurities by visible spectroscopy in the high-density regime of JIPP T-II tokamak plasma
26 p0224 A80-25481
OVEREND, R.
Canadian renewable energy prospects
26 p0183 A80-21104
OVERLY, P. T.
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
OVERTURF, B. W.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
OWENBY, J. R., JR.
Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504
OWENS, E. C.
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287
OWENS, T. C.
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418
OZAWA, T.
Geological and geochemical characteristics of geothermal resources in Japan
26 p0187 A80-21928

P

PAGANESSI, J. E.
Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412
PAGE, J. K.
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514
PAINTER, P. C.
Application of Fourier-transform infrared spectroscopy to the characterization of fractionated coal liquids
26 p0249 A80-30525
PALMER, M. R.
Nitrogen reducing solar cells
26 p0244 A80-29059
PALMITER, L. S.
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877
PANAYOTATOS, P.
Recombination in the space-charge region of Schottky barrier solar cells
26 p0207 A80-23272
PANICO, S.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866
PANOVKO, M. IA.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065
PARDOE, G. K. C.
The industrialisation of space
26 p0252 A80-31791
PASQUALETTI, M. J.
Geothermal energy and the environment - The global experience
26 p0223 A80-25259
PATEL, A. S.
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
PATERA, R. P.
Information theory applied to solar radiation concentrators
26 p0275 N80-17539
PATERSON, L.
Physical, chemical and energy aspects of underground hydrogen storage
26 p0234 A80-28278
PATTEN, J.
Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071
PAVELESCU, M.
Optimal development strategies for a whole energy system based on hydrogen
26 p0205 A80-23190
PAVLICHENKO, O. S.
Discharge start-up in a tokamak with a poloidal divertor
26 p0223 A80-25472
PEARSON, G. L.
Grown junction GaAs solar cells with a thin graded band-gap Al/x/Ga/1-x/As surface layer
26 p0250 A80-30668
PEDERSEN, K. B.
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428
PEDERSON, B. M.
The Danish large wind turbine program
26 p0261 N80-16460
PEEBLES, D. L.
Polyacetylene, /CH/x - Photoelectrochemical solar cell
26 p0183 A80-21091
PEERY, D. J.
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
PEFLEY, R.
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760
PELCZARSKI, W.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079
PELL, M.
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426
PEMSLER, J. P.
Survey on metallurgical recycling processes
[ANL/OEPM-79-2] 26 p0282 N80-17918
PENG, Y.-K. M.
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482
PERCHERON-GUEGAN, A.
Kinetics of hydrogen absorption and desorption by ternary LaNi5 type intermetallic compounds
26 p0206 A80-23203
Kinetics of hydrogen absorption and desorption by ternary LaNi5-type intermetallic compounds
26 p0234 A80-28277
PERELMAN, L. J.
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
PERERA, J.
Arabs turn their eyes to the sun
26 p0244 A80-29280
PERGAMENT, M. I.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340
PERRIN, G. R.
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

PERROUD, P.
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis
26 p0196 A80-23113
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171
PESCHKA, W.
A study on hydrogen storage by use of cryoadsorbents
26 p0201 A80-23161
PETERSON, R.
Oil and gas exploration by pattern recognition of lineament assemblages associated with bends in wrench faults
26 p0191 A80-22441
PETIT, G.
Technico-economic study of distributing hydrogen for automotive vehicles
26 p0207 A80-23206
PETRI, R. J.
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547
PETRICK, M.
Advances in MHD technology
[CONF-790598-5] 26 p0311 N80-21166
PETROW, H. G.
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870
PETTIT, R. B.
The sensitivity of solar transmittance, reflectance and absorptance to selected averaging procedures and solar irradiance distributions
26 p0251 A80-30774
PETTY, D.
The OTEC connection - Power from the sea
26 p0222 A80-25115
PETTY, S.
Design description and performance predictions for the first CDIF power train
26 p0216 A80-25062
Long duration channel development and testing
26 p0216 A80-25063
PICCIRELLI, R. A.
Application of computer models to the retorting of oil shale
26 p0228 A80-26708
PICHON, B.
Electrochemical aspects of the H2SO4-SO2 thermoelectrochemical cycle for hydrogen production
26 p0198 A80-23128
PIERINI, G.
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
PIERRE, D. A.
First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095
PIERSON, E. S.
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084
High-temperature liquid-metal MHD generator experiments
26 p0218 A80-25085
PIETROWSKA, H.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570
PILLAI, P. K. C.
Tubular solar collector
26 p0231 A80-27730
PILLSBURY, R. D., JR.
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443
PINCE, C.
Theoretical study of the heating of air in a plane honeycomb solar collector
26 p0208 A80-23333
PINKHASIK, D. S.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065
PISHCHIKOV, S. I.
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349
PISHCHIKOV, V. I.
Equivalent circuits for the channel of the magnetohydrodynamic generator
26 p0190 A80-22349
PISHIKOV, S. I.
Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091
PISTUNOVICH, V. I.
Two-stroke tokamak reactor
26 p0213 A80-24487
PLOETZ, G.
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles
[PB-300289/6] 26 p0282 N80-17922
PODGAETSKII, V. M.
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404
PODGORNYI, A. N.
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880
POETZ, F.
Gas turbines
26 p0255 A80-32399
POLLACK, I.
High-power-density liquid-metal MHD generator results
26 p0218 A80-25084
High-temperature liquid-metal MHD generator experiments
26 p0218 A80-25085
POMEROY, B. D.
Thermal energy storage in a packed bed of iron spheres with liquid sodium coolant
26 p0183 A80-21109
PONOMAREV-STEPNOI, N. N.
Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy
26 p0185 A80-21879
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
POOR, R. H.
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456
POSNER, D.
An overview of photovoltaic market research
26 p0186 A80-21917
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
POST, R. F.
The physics of field reversed mirrors
26 p0214 A80-24664
The mirror fusion test facility
26 p0214 A80-24665
POTTIER, J.
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
Nuclear methane reforming for coal gasification
26 p0233 A80-28276
POTTIER, MR.
Study of a French national energy system based on coal and nuclear energy
26 p0255 A80-32500
POULIN, E.
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491
POUND, R. V.
Radiant heat for energy conservation
26 p0253 A80-32056
POWELL, D. C.
Gust models for design and performance analyses of wind turbines
[AIAA 80-0644] 26 p0240 A80-28833

POWELL, J. D.
SEAS - A system for undersea storage of thermal energy
26 p0232 A80-28257
POWELL, J. R.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148
SEAS - A system for undersea storage of thermal energy
26 p0232 A80-28257
POWERS, E. J.
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
PRAGER, R. C.
The state-of-the-art of cryogenic heat pipes
[AIAA PAPER 80-0211] 26 p0212 A80-23956
PRAKASH, V.
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008
PRASAD, C. R.
Studies in biogas technology. III - Thermal analysis of biogas plants
26 p0188 A80-21940
Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941
PRESS, K. K.
Improved thermal battery
[AD-A075835] 26 p0276 N80-17554
PREVOST, C.
Problems concerning the interpretation of thermographic data for the detection of energy losses from buildings
26 p0212 A80-24071
PRIEST, C. C.
Space disposal of nuclear wastes
26 p0246 A80-29448
PRINS, B. E.
Computer simulation of a solar energy system which utilizes flat-plate collectors
[AD-A079906] 26 p0304 N80-20870
PRINZ, G. A.
Magnetooptical switch for synchronization of CO2 and red laser beams
26 p0236 A80-28735
PROK, G. M.
Initial characterization of an Experimental Referee Broadened-Specification (ERBS) aviation turbine fuel
[NASA-TM-81440] 26 p0283 N80-18205
PROTASOV, M. S.
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567
PROTSENKO, A. N.
Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy
26 p0185 A80-21879
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195
PUENTE CRUZ, I.
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905] 26 p0273 N80-16652
PUGH, E. R.
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884
PULLMAN, B.
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760
PUNWANI, D. V.
Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412
PURICA, I. I.
Synergetics of the fission electric cells
26 p0193 A80-22789
PURYEAR, J. R.
The utilization of ocean hydropower systems for advanced electrolytic hydrogen energy production technology
26 p0196 A80-23110
PUTHOFF, R. L.
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[NASA-TM-81444] 26 p0292 N80-19614

Q

QUARLES, E.
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869
QUASHIE, P.
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812
QUENTIN, G.
Control performance of an air-blown fixed bed coal gasification combined cycle plant in utility power systems application
26 p0213 A80-24256
QUIJANO, I.
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092
QURAESHI, S.
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479

R

RABL, A.
Incidence-angle modifier and average optical efficiency of parabolic trough collectors
26 p0250 A80-30772
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893
RADKEY, R. L.
Coriolis Program - A review of the status of the ocean turbine energy system
26 p0233 A80-28261
RAFTERY, A.
Domestic space-heating and solar energy in Ireland
26 p0193 A80-22790
RAGHURAMAN, P.
On influencing the operating temperatures of Motorola and Arco solar photovoltaic modules
[COO-4094-59] 26 p0295 N80-19649
RAGSDALE, C.
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812
RAGUNATHAN, P.
Development and operation of a high current density high pressure advanced electrolysis cell
26 p0197 A80-23119
RAI-CHOUDHURY, P.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833
RAIBLE, C. J.
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130
RAJABAPAIAH, P.
Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938
Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939
Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941
RAJAGOPALAN, V.
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976

Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558

RAJKANAN, K.
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331

RAMAKRISHNAN, S.
A rotary inverter system for a multiple-electrode MHD generator
26 p0219 A80-25093

RAMANAYYA, K. V.
Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938

RAMMEY-SMITH, A.
An investigation of preferences for various types of energy cost feedback
[PB-300314/2] 26 p0270 N80-16560

RANATUNGA, D. B. J.
Transient response of thermosyphon solar collectors
26 p0248 A80-29922

RANTELL, T. D.
Filtration in coal liquefaction - Influence of filtration conditions in non-hydrogenated systems
26 p0254 A80-32371
Filtration in coal liquefaction - Influence of digestion conditions in the filtration of non-hydrogenated coal digests
26 p0255 A80-32372

RAO, K.
Plant power fuels hydrogen production
26 p0249 A80-30465

RAO, K. K.
Photolysis of water for H2 production with the use of biological and artificial catalysts
26 p0210 A80-23521

RAPPAPORT, E. B.
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

RASH, D.
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523

RASHCHEPKIN, A. P.
Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream
26 p0252 A80-31509

RASMUSSEN, J.
Wettability and corrosion of MHD ceramics by Rosebud coal slag
26 p0217 A80-25074

RASTOIN, J.
Nuclear methane reforming for coal gasification
26 p0195 A80-23105
Nuclear methane reforming for coal gasification
26 p0233 A80-28276

RATHJEN, S. M.
Microwave power beaming for long range energy transfer
26 p0193 A80-22833

RATZEL, A. C.
Receiver assembly design studies for 2-m 90 deg parabolic-cylindrical solar collectors
[SAND-79-1026] 26 p0277 N80-17564

RAVINDRA, N. M.
Temperature dependence of the maximum theoretical efficiency in solar cells
26 p0187 A80-21922

RAWLINS, W. T.
Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300

RAYNARD, A. E.
Advanced electric propulsion system concept for electric vehicles
[NASA-CR-159651] 26 p0282 N80-17916

READ, M. E.
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183

REBIERE, J.
Technological aspects and characteristics of industrial hydrides reservoirs
26 p0203 A80-23171

RECKARD, N. K.
Decentralized energy: Technology assessment and systems description
[BNL-50987] 26 p0265 N80-16502

REDDY, A. K. N.
Studies in biogas technology. I - Performance of a convectional biogas plant
26 p0188 A80-21938
Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939
Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941

REED, K. A.
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893
Application of glass technology to novel solar energy collectors
[CONF-7906118-1] 26 p0317 N80-21852

REHKER, S.
Neutral-beam injection calculations for torsatrons
26 p0224 A80-25479

REICHMAN, J.
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
The current-voltage characteristics of semiconductor-electrolyte junction photovoltaic cells
26 p0251 A80-30939

REICHMUTH, H.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

REIHMAN, T. C.
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076

REILLY, J. J.
Hydrogen storage in metal hydrides
26 p0193 A80-22867

REILLY, R. W.
Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904

REISTER, D.
Possibilities and limits of the conception of an up-to-date compact vehicle for the nineties
26 p0236 A80-28481

REITER, E. R.
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644

REITTER, T. A.
Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes
[UCRL-52851] 26 p0316 N80-21842

REKLAITIS, G. V.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307

RENN, O.
Soft-energy provision - A new Utopia
26 p0227 A80-26169

RETALLICK, F. D.
Preliminary assessment of the requirements and potential of open cycle MHD as an electric utility power plant
26 p0220 A80-25101

REYNOLDS, C. D.
Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456

REYNOLDS, P.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

REZTSOV, V. F.
Effective thermal and electrical resistances of stabilized layered superconductors with nonideal phase contact
26 p0252 A80-31507

RICE, E. E.
Space disposal of nuclear wastes
26 p0246 A80-29448

RICH, S. M.
Electrochemistry of amorphous V2S5 in lithium cells
26 p0247 A80-29895

RICHARDS, J. R.
Evaluation of a photochemical system for nitrogen oxides control
26 p0287 N80-18583

RICHARDS, L. W.
Hydrogen as a fuel
[TT-7903] 26 p0283 N80-18212

RICHARDS, T. R.
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494

RICHARDSON, D. M.
Recent research on thermochemical hydrogen production at the Oak Ridge National Laboratory
26 p0198 A80-23132

RICHELS, R. G.
Models for energy technology assessment
26 p0207 A80-23222

RICHTER, D.
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

RICHTER, P. H.
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634

RIDDOCH, F.
The doping of amorphous silicon for solar cells
26 p0187 A80-21921

RIDGWAY, S. L.
Large energy storage systems for utilities
26 p0231 A80-27731

RIEBLING, R. W.
Overview of NASA battery technology program
26 p0302 N80-20821

RIGHELATO, R. C.
Microbial production of energy sources from biomass
26 p0210 A80-23523

RINKE, W.
Power consumption in the high-tension field between the government's responsibility to provide energy and politics
26 p0185 A80-21846

ROBERTS, F.
Energy accounting of alternative energy sources
26 p0193 A80-22868

ROBERTS, M. L.
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452

ROBERTS, R.
Status of the DOE battery and electrochemical technology program
[MTR-8026] 26 p0307 N80-20902

ROBERTSON, D. J.
Organic content of particulate matter in turbine engine exhaust
26 p0229 A80-27099

ROBERTSON, J.
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869

ROBINSON, C. W.
Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347

ROBINSON, P.
Short haul transport for the 1990s
26 p0190 A80-22046

ROBINSON, W. E.
Alkanes obtained by thermal conversion of Green River oil-shale kerogen using CO and H2O at elevated pressure
26 p0226 A80-25888

ROCKEY, D. E.
Evaluation of concentrated space solar arrays using computer modeling
[NASA-CR-162681] 26 p0264 N80-16487

RODGERS, G. G.
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514

ROERTGEN, H.
Balancing the process of hydrating gasification of brown coal
26 p0250 A80-30597

ROGERS, D.
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112

ROGERS, D. W. O.
Energy resource requirements of a solar heating system
26 p0184 A80-21746

ROGERS, S. R.
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1
[PB-299383/0] 26 p0259 N80-16192
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193

ROGG, D.
The development of the magnetically suspended transportation system in the Federal Republic of Germany
26 p0235 A80-28458

ROGUENANT, R.
Small scale ammonia production as a means for hydrogen storage
26 p0201 A80-23160

ROHATGI, A.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

ROHATGI, V. K.
End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes
26 p0193 A80-22793

ROHN, D. A.
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754

ROLLBUHLER, R. J.
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532

ROMANOS, M. C.
Urban activity allocation under criteria of transportation energy efficiency
26 p0192 A80-22788

ROME, J. A.
Low-density ignition scenarios in injection-heated tokamaks
26 p0213 A80-24482

RONCATO, J. P.
Thermochemical or hybrid cycles of hydrogen production techno-economical comparison with water electrolysis
26 p0205 A80-23191

ROSA, R. J.
Symposium on the Engineering Aspects of Magnetohydrodynamics, 18th, Butte, Mont., June 18-20, 1979, Preprints
26 p0216 A80-25061

ROSATI, R. W.
An ac/dc power converter for batteries and fuel cells
[EPRI-EM-662] 26 p0259 N80-16284

ROSE, R. P.
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1
[EPRI-ER-1083-VOL-1] 26 p0281 N80-17863
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2
[EPRI-NP-1083-VOL-2] 26 p0281 N80-17864

ROSLER, R. R.
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495

ROSSING, B. R.
The effect of electrochemical and arcing phenomena on electrode performance
26 p0218 A80-25080

ROSSOW, E. C.
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912

ROSZKIEWICZ, J.
Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel
26 p0217 A80-25069

ROTH, J. R.
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476

ROTHENBERG, S. J.
Coal combustion fly ash characterization - Adsorption of nitrogen and water
26 p0250 A80-30656

ROTHSTEIN, H. L.
Salinity gradient energy conversion
26 p0233 A80-28262

ROTINOV, A. G.
Promising fuels for MHD power stations
26 p0252 A80-31750

ROUNTREE, R. C.
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903

ROWLEY, L. P.
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479

RUDBERG, D.
A modular approach to an engineering test facility and beyond
26 p0221 A80-25103

RUDBERG, D. A.
First-principle component models for control system simulation of MHD-steam plants
26 p0220 A80-25095

RUDINS, G.
Advances in MHD technology
[CONF-790598-5] 26 p0311 N80-21166

RUDNITSKII, IU. P.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

RUELLAND, J.
Aerial thermography - A tool for making people aware of energy conservation
26 p0212 A80-24070

RULE, R. G.
Combined magnetic levitation and propulsion - The Mag-Transit concept
26 p0231 A80-27677

RUSANOV, V. D.
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881
Plasmochemical cycle of hydrogen production from the water
26 p0200 A80-23149

RUSELOWSKI, G.
Economic analysis of the design and fabrication of a space qualified power system
[NASA-TM-81418] 26 p0282 N80-18098

RUSSAK, M. A.
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466

RUSSELL, J. L., JR.
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143

RUTH, J.
Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880

RYAN, L. D.
The theoretical design of a solar engine for the production of hydrogen
26 p0195 A80-23108

RYBACKI, Z.
One-stage cyclone combustor for coal fired test stand of 4MW thermal power
26 p0222 A80-25111

S

SAARI, D. P.
Operability and materials testing for MHD air heaters
26 p0217 A80-25075

SACKS, R. A.
MHD electrical potentials - Uniqueness of solutions to an extended class of elliptic boundary value problems
26 p0254 A80-32318

SADLER, J. W.
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160

SADOWSKI, R. P.
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-5] 26 p0313 N80-21520

SAGERMAN, G. D.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626

SAITO, M.
Control of liquid metal-gas two phase flow by application of axial magnetic field
26 p0218 A80-25083

SAKAGUCHI, J. L.
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation
[DOE/ET-28432/3-1] 26 p0291 N80-19606

SAKO, K.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

SAKURAI, T.
Theoretical concentrations of solar radiation by central receiver systems
26 p0208 A80-23327

SAKUTA, K.
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927

SALAMA, A. M.
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
Characterization of deliberately nickel-doped silicon wafers and solar cells
[NASA-CR-162790] 26 p0276 N80-17551

SALEHI, J.
Nitrogen reducing solar cells
26 p0244 A80-29059

SALLES, Y.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

SALOVAARA, T.
Water turbine technology for small power stations
26 p0213 A80-24125

SALTER, S. H.
Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

SALVESEN, K. G.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601

SALZANO, F.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148

SAMMELLS, A. F.
Development of sulfur-tolerant components for the molten carbonate fuel cell
26 p0190 A80-22167
Metal/air batteries: Their status and potential - A review
26 p0231 A80-28012

SAMPLE, D. G.
Application of radiography to coal liquefaction
[SAND-79-1226C] 26 p0274 N80-17243

SAMUEL, O.
Storage of light energy by chemical systems - Comment on long-term efficiency of iterative cyclic reactions
26 p0184 A80-21116

SANDROCK, G. D.
Hydrogen storage in metal hydrides
26 p0193 A80-22867
Development of low cost nickel-rare earth hydrides for hydrogen storage
26 p0202 A80-23170

SAPP, C. D.
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600

SARMA, P. R.
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008
SARMA, P. R. L.
End effects with a slowly varying magnetic field in a MHD channel with segmented electrodes
26 p0193 A80-22793
SARNA, K. R.
Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes
[PB80-108566] 26 p0297 N80-19678
SAROFIM, A.
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108
SASTRI, M. V. C.
Hydrogen energy research programs in Japan
26 p0233 A80-28271
SATAKE, H.
Mixed electrolyte solutions of propylene carbonate and dimethoxyethane for high energy density batteries
26 p0247 A80-29898
SATHIANARAYAN, S. R. C.
Studies in biogas technology. III - Thermal analysis of biogas plants
26 p0188 A80-21940
Studies in biogas technology. IV - A novel biogas plant incorporating a solar water-heater and solar still
26 p0188 A80-21941
SATO, H.
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088
SATO, N.
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
SAWATA, S.
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927
SAWHNEY, B. K.
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330
SAWYER, J. W.
Environmental system study on the development of fossil fuel resources in the Southwest
[PB-300526/1] 26 p0272 N80-16596
SAWYER, J. W., JR.
Contributions to the foundations of supply for energy and transportation: Concepts, economics, and technologies
[PB-300541/0] 26 p0269 N80-16554
SCHACHTER, Y.
Gasification of oil shale
26 p0226 A80-25889
SCHAEFER, W.
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184
SCHAETZLE, H. J.
Lead-acid batteries for remote photovoltaic applications
26 p0232 A80-28014
SCHAPER, T. L.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520
SCHATZLE, P. R.
Aerodynamic interference between two Darrieus wind turbines
[AIAA 80-0606] 26 p0237 A80-28803
SCHEFFLER, R. L.
Status of the Southern California Edison Company 3 MW Wind Turbine Generator (WTG) demonstration project
26 p0263 N80-16478
SCHEIBLEY, D. W.
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-3] 26 p0285 N80-18556
SCHETTLER, P. D., JR.
Study of hydrocarbon-shale interaction
[ORO-5197-14] 26 p0260 N80-16409
SCHETZ, J. A.
Numerical solution of the flow near the rotor of a horizontal-axis wind turbine and comparisons with data
[AIAA 80-0608] 26 p0237 A80-28805
SCHILLING, H.-D.
Coal processing and utilization
26 p0255 A80-32396
SCHINKE, G. A.
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868
SCHMEHL, R. H.
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055
SCHMIDBERGER, R.
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118
SCHMIT, J. L.
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305
SCHOLZ, F.
Warm water storage in district heating systems incorporating combined heat and power plant
26 p0185 A80-21825
SCHRAUZER, G. N.
Nitrogen reducing solar cells
26 p0244 A80-29059
SCHREIBER, J. D.
Equilibrium effects in high-pressure hydrogen production from thermochemical water-splitting cycles
26 p0198 A80-23127
SCHREINER, F.
Experimental verification of the mercury-iodine thermochemical cycle for the production of hydrogen from water - ANL-4
26 p0199 A80-23136
SCHRODER, D. C.
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006
SCHUETZ, G.
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126
SCHUETZ, G. H.
Electrolysis of hydrobromic acid
26 p0198 A80-23129
SCHULTE, S. C.
Economics of thermal energy storage for compressed air energy storage systems
[PNL-SA-7949] 26 p0307 N80-20903
Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904
SCHULTEN, R.
Nuclear energy as a primary energy source for hydrogen production
26 p0194 A80-23102
SCHULTZ, D. F.
Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion
[NASA-TM-81472] 26 p0315 N80-21837
SCHULZ, K. F.
Surface-active materials from Athabasca oil sands
26 p0192 A80-22770
SCHULZ, V.
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474
SCHUSTER, J. R.
Solar-thermochemical production of hydrogen from water
26 p0200 A80-23143
Fixed mirror solar concentrator for application to a 100 MW(e) electric generating plant
[GA-A-15340] 26 p0266 N80-16508

SCHUSTER, P.
Balancing the process of hydrating gasification of brown coal
26 p0250 A80-30597

SCHWARTZ, F. M.
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899

SCHWERZEL, R. E.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054

SCOFIELD, M. P.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520

SCOLARI, P. V.
The kinetics of oxygen evolution on non-traditional electrodic materials
26 p0196 A80-23111

SCOTT, M. H.
Characterization of dynamic influences in a coal-fired MHD system
26 p0219 A80-25094

SEBALD, A. V.
Performance effects of Trombe wall control strategies
26 p0183 A80-21105

SECREST, J. A.
Accuracies achievable with indirect measurements of the direct solar irradiance component
26 p0183 A80-21108

SEIBERT, M.
Photobiological production of hydrogen
26 p0247 A80-29920

SEIFFERT, U.
The contribution of Volkswagenwerk AG to the automobile concept of the 90's
26 p0236 A80-28482

SEIFRITZ, W.
Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5
26 p0194 A80-23101

SEIZINGER, D. E.
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130

SEKHON, K. S.
Methods for manufacturing heat pipes for circuit cards
[AD-A080188] 26 p0314 N80-21707

SEKIGUCHI, I.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768

SEMAN, E. J.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

SEMENOV, V. D.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

SENATORE, S. J.
Salinity gradient energy conversion
26 p0233 A80-28262

SENG, G. T.
Initial characterization of an Experimental Referee Broadened-Specification (ERBS) aviation turbine fuel
[NASA-TM-81440] 26 p0283 N80-18205

SERMAN, D. D.
Characteristics of Salter's cam for extracting energy from ocean waves
26 p0251 A80-30802

SEVERSON, D. E.
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418

SEVIAN, W. A.
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930

SFORZA, P. M.
Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817

SHAFRANOV, V. D.
Two-stroke tokamak reactor
26 p0213 A80-24487

SHALTENS, R. K.
Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico
26 p0262 N80-16470

SHALTIEL, D.
The influence of Al on the hydrogen sorption properties of intermetallic compounds
26 p0203 A80-23173

SHANKAR, P. N.
Development of vertical axis wind turbines
26 p0187 A80-21929

SHANKLIN, R. V., III
Advances in MHD technology
[CONF-790598-5] 26 p0311 N80-21166

SHARMA, A. K.
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008

SHARPE, E. L.
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687

SHARPE, M. R.
Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452

SHEAHAN, R. R.
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903

SHEERIN, P.
Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817

SHEFT, I.
Materials and performance characteristics of the HYCSOS chemical heat pump and energy conversion system
26 p0204 A80-23180

SHEN, W.-Z.
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812

SHERMAN-WILLIS, M.
Photovoltaic cost blitz spawns new silicon processes
26 p0186 A80-21913

SHETH, P. R.
Application of black-liquor boiler technology to MHD heat and seed recovery equipment design
26 p0217 A80-25070

SHEWCHUN, J.
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331

SHIBATA, Y.
Theoretical concentrations of solar radiation by central receiver systems
26 p0208 A80-23327

SHIEH, C. F.
Wind characteristics over complex terrain relative to WECS siting
[AIAA 80-0645] 26 p0239 A80-28825

SHIER, P.
Domestic space-heating and solar energy in Ireland
26 p0193 A80-22790

SHIGEISHI, R. A.
Solar energy storage using chemical potential changes associated with drying of zeolites
26 p0183 A80-21106

SHIH, C. S.
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801

SHIH, H.
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474

SHIMAMURA, S.
Study of flywheel energy storage system for electric utilities
26 p0187 A80-21925

SHINN, N. R.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520

SHIODA, S.
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088

SHOHET, J. L.
Neutral-beam injection calculations for torsatrons
26 p0224 A80-25479

SHOLIN, G. V.
Decomposition of water in a nonequilibrium plasma
26 p0185 A80-21881

SHORT, D. P.
Power units for mini RPV's
26 p0246 A80-29662

SHUCK, R.
Kinetics of char burnout and ash vaporization in coal-fired MHD combustors
26 p0221 A80-25108

SHUEY, K. C.
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908

SHUMIATSKII, B. IA.
Electrical nonuniformities in U-25 MHD channels
26 p0219 A80-25091

SHYER, J.
Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51065] 26 p0258 N80-16179

SICHERMAN, A.
Environmental assessment methodology: Solar power plant applications. Volume 3. Environmental impact assessment application
[EPRI-ER-1070-VOL-3] 26 p0306 N80-20889
Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology
[EPRI-ER-1070-VOL-1] 26 p0309 N80-20926

SIEVERS, A. J.
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657

SIFFERT, P.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

SILBERSTEIN, S.
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930

SIMONS, G. A.
Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300

SIMPSON, H. R.
Synthesis gas demonstration plant program, phase 1
[FE-25770-6] 26 p0289 N80-19308

SINGER, J. M.
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

SINGH, R.
Native oxide and external dielectric polycrystalline GaAs MIS solar cells
26 p0223 A80-25444
Open-circuit voltage and interface study of silicon MOS solar cells
26 p0234 A80-28331

SINGH, R. N.
Some geometrical design aspects of a linear Fresnel reflector concentrator
26 p0193 A80-22791

SINHA, S. K.
Transverse self-focusing of a Gaussian beam - Moment method
26 p0229 A80-27195

SIROCKY, P. J., JR.
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472

SITTIG, M.
Solar cells for photovoltaic generation of electricity: Materials, devices and applications
26 p0253 A80-31900

SKARIATIN, V. D.
The use of different-scale multispectral space photographs of the earth for the geological study of lands with oil and natural gas
26 p0254 A80-32276

SKIDMORE, D. R.
Numerical modeling of heat flow in underground coal liquefaction
26 p0213 A80-24319
Combined ADI iteration and implicit central difference numerical method for solving nonlinear conjugated partial differential equations with moving boundary heat transfer in in-situ coal liquefaction
26 p0228 A80-26681

SKULACHEV, V. P.
Common properties of bacterial and visual rhodopsines - The conversion of optical energy into electric-potential difference
26 p0216 A80-25026

SLAGER, L. W.
Model wind rotors in wind tunnels - Performance and the effect of Reynolds number
[AIAA 80-0623] 26 p0238 A80-28815

SLAUGHTER, J.
Outer continental shelf environment monitoring concerns
[PB-299861/5] 26 p0273 N80-16625

SLAWSON, G. C., JR.
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources
[PB-300536/0] 26 p0272 N80-16623

SMIRNOV, R. V.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

SMIRNOV, V. P.
Progress in the production and energy flux concentration of the REB accelerator for ICF
26 p0226 A80-25785

SMITH, A. K.
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

SMITH, B.
New approaches to sailing
26 p0228 A80-26344

SMITH, D. H.
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865

SMITH, D. R.
Workshop on Power Conditioning for Alternative Energy Technologies, executive summary
[SERI-TP-35-217-PT-25] 26 p0265 N80-16505

SMITH, G. B.
The effect of a self consistent effective ambient temperature on collector efficiency parameters
26 p0184 A80-21115

SMITH, J. M.
Experiments on H2-O2MHD power generation
[NASA-TM-81424] 26 p0273 N80-16886

SMITH, P. L.
Methodology for evaluating physical constraints on residential solar energy use
[UCRL-15001] 26 p0307 N80-20901

SMITH, P. R.
An economical solar heated and cooled residence for southern New Mexico
[PB80-108616] 26 p0309 N80-20914

SMITH, R. J.
Wind power excites utility interest
26 p0190 A80-22281

SMITH, R. S.
Wall combustion in high-swirl combustors
26 p0222 A80-25110

SMITH, S. A.
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570

SMOOT, L. D.
Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303

SMORTO, M.
Further studies on wind turbine generator wakes
[AIAA 80-0626] 26 p0238 A80-28817

SMITH, R. R.
Operability and materials testing for MHD air heaters
26 p0217 A80-25075

SNAPE, E.
The role of metal hydrides in hydrogen storage and utilization
26 p0202 A80-23163

SNOW, J. W.
Measurements of wind shear at the Mod-1 Site, Boone, N.C
[AIAA 80-0648] 26 p0240 A80-28828

SNYDER, M. J.
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons
[ORO-5205-10] 26 p0310 N80-20973

SOBEK, A. A.
Environmental and economic evaluations of energy recovery from agricultural and forestry residues
[ANL/EES/TM-58] 26 p0297 N80-19668

SODERSTRAND, M. A.
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903

SODHA, M. S.
Transverse self-focusing of a Gaussian beam - Moment method
26 p0229 A80-27195

SOKOLOV, IU. N.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

SOLBES, A.
Design description and performance predictions for the first CDIF power train
26 p0216 A80-25062
Long duration channel development and testing
26 p0216 A80-25063
Design, construction and initial operation of an MHD inverter system for the Mark VI generator
26 p0219 A80-25092

SOLTIS, D. G.
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-3] 26 p0285 N80-18556

SOMOANO, R.
Characterization of prototype secondary lithium battery
26 p0303 N80-20832

SONI, Y.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307

SOOD, M. K.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307

SOUSTER, C. G.
Systematic design assessment techniques for solar buildings
26 p0209 A80-23514

SOUTHALL, H. L.
Permanent magnet and superconducting generators in airborne, high power systems
[AD-A078424] 26 p0284 N80-18311

SPAFFORD, R. B.
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672

SPAHR, H. R.
Aerodynamic interference between two Darrieus wind turbines
[AIAA 80-0606] 26 p0237 A80-28803

SPAITE, P. W.
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912

SPARACINO, C. M.
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

SPARKS, L.
Interchange stability of axisymmetric field reversed equilibria
26 p0250 A80-30552

SPAULDING, A. P., JR.
WTG Energy Systems' MP1-200 200 kilowatt wind turbine generator
26 p0261 N80-16458

SPEAR, W. E.
The characteristics of high current amorphous silicon diodes
26 p0253 A80-31966

SPEERSCHNEIDER, C. J.
Comparison of Hg/0.6/Cd/0.4/Te LPE layer growth from Te-, Hg-, and HgTe-rich solutions
26 p0234 A80-28305

SPEIGHT, J. G.
Surface-active materials from Athabasca oil sands
26 p0192 A80-22770

SPEKTOR, M. D.
Transverse confinement of a high-pressure plasma in a corrugated magnetic field
26 p0224 A80-25474

SPELTA, B.
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125

SPERA, D. A.
Design evolution of large wind turbine generators
26 p0261 N80-16455
Structural analysis considerations for wind turbine blades
26 p0262 N80-16469
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494

SPOND, D. E.
A storage tank for vehicular storage of liquid hydrogen
26 p0231 A80-27729

SRIDHAR, N.
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186

SRIVASTAVA, V. K.
Temperature dependence of the maximum theoretical efficiency in solar cells
26 p0187 A80-21922

STAFFA, N. G.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550

STAFFON, J. D.
High-temperature liquid-metal MHD generator experiments
26 p0218 A80-25085

STAKGOLD, I.
Gradient bounds for plasma confinement
26 p0213 A80-24223

STAMBAUGH, R. D.
Observation of radio-frequency-driven plasma current in the octopole tokamak
26 p0224 A80-25483

STAN, A. D.
Turbulent flows through annular spaces
26 p0250 A80-30614

STAPLETON, R. E.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

STAROSTIN, A. N.
Choice of an optimum multichannel Nd:glass laser system for fusion experiments
26 p0230 A80-27340

STARR, A. M.
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644

STECHSCHULTE, D. L.
Peak power tracking technique for photovoltaic arrays
26 p0242 A80-28908

STEELE, R. V.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565

STEEN, P.
Sweden beyond oil - Nuclear commitments and solar options
26 p0255 A80-32410

STEFFGEN, F. W.
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416

STEHFEST, H.
Optimizing a regional energy provision system for multi-task achievement
26 p0246 A80-29474

STEINBERG, M.
Hydrogen production from fusion reactors coupled with high temperature electrolysis
26 p0200 A80-23148
Thermoelectrochemical cycles for power and hydrogen production
26 p0201 A80-23157
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185

STEINHEIL, E.
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118

STEKLY, Z. J. J.
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443

STEPHENS, D. R.
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042

STERLINI, J.
Theoretical efficiency limit of water electrolysis and practical means to approach it
26 p0205 A80-23197

STEVENS, R. D.
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8] 26 p0274 N80-16974

STEWART, A.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

STEWART, B. B.
A high energy hybrid system: Hydrogen - chlorine - solar - water
26 p0206 A80-23199

STEWART, J. M.
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653

STICKLER, D. B.
Progress in coal combustion research at Avco Everett Research Laboratory, Inc.
26 p0221 A80-25109

STICKLER, J. J.
Simulation of an urban battery bus vehicle
[PB-300306/8] 26 p0282 N80-17923

STILES, A. B.
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids
[FE-2028-15] 26 p0287 N80-19292

STILLER, P. H.
Offshore wind energy conversion systems
[AIAA 80-0619] 26 p0241 A80-28839

STODDARD, W.
Dynamic rotor loads of a wind turbine via hand-held calculations
[AIAA 80-0611] 26 p0237 A80-28808

STOESSEL, F. P.
Toroidal Trivelpiece-Gould modes
26 p0189 A80-22042

STOHRER, M.
Cubic metal-alloys for hydrogen storage
26 p0202 A80-23165

STOICA, M.
Optimal development strategies for a whole energy system based on hydrogen
26 p0205 A80-23190

STOLIAREVSKII, A. IA.
Prospects of developing nuclear power plants with chemothermal accumulation of thermal energy
26 p0185 A80-21879
Main requirements on the nuclear installations used for hydrogen production and in technological processes
26 p0205 A80-23195

STONE, E. L.
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures
26 p0191 A80-22690

STOWELL, S. A.
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122

STRACKERJAN, B.
Marginal conditions in automobile construction and their implications on the design of upper-category vehicles
26 p0236 A80-28477

STRAUSS, W.
Development of high-temperature hydrides for vehicular applications
26 p0203 A80-23172

STREED, E. R.
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

STREICHER, R.
Hydrogen production by high temperature electrolysis of water vapour
26 p0197 A80-23118

STRICKLAND, G.
Hydrogen storage for automobiles
[BNL-26906] 26 p0305 N80-20886

STRICKLAND, J. H.
Preliminary work concerning the near wake structure of the Darrieus turbine
[AIAA 80-0627] 26 p0239 A80-28818

STROCK, O. J.
DOE/NASA wind turbine data acquisition. Part 1: Equipment
[NASA-CR-159779] 26 p0275 N80-17543

STROMBERG, R. P.
Performance of linear solar concentrating collectors
[SAND-79-1378C] 26 p0277 N80-17565
Performance of solar passive buildings
[SAND-79-1574C] 26 p0277 N80-17566

STRUCK, R. T.
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

STUART, A. K.
Unipolar water electrolysers - A competitive technology
26 p0196 A80-23116

STUCK, R.
Laser treatment of phosphorus-diffused silicon solar cells
26 p0186 A80-21915

STUCKI, S.
Present state and outlook of the electrolytic H2-production route
26 p0195 A80-23104

STUDER, P. A.
A linear magnetic motor/generator
[NASA-CASE-GSC-12518-1] 26 p0290 N80-19424

STWALLEY, W. C.
Spin-aligned hydrogen
26 p0200 A80-23151

STYROV, V. V.
Possible direct conversion of chemical energy into electrical energy in a semiconductor
26 p0247 A80-29795

SU, W. S.
State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562

SUBRAMANIAN, D. K.
Studies in biogas technology. II - Optimization of plant dimensions
26 p0188 A80-21939

SUDA, S.
Mixing effects of different types of hydrides
26 p0202 A80-23166

SUDAN, R. N.
Interchange stability of axisymmetric field reversed equilibria
26 p0250 A80-30552
SUDARSHAN, T. S.
Hydrogen embrittlement, stress state and design considerations
26 p0204 A80-23186
SUGAI, H.
Quiescent and turbulent plasmas under mirror-configurations of magnetic field
26 p0223 A80-25322
SUGITANI, M.
Electric vehicle in Japan
26 p0236 A80-28484
SUHRBIER, J. H.
Urban transportation energy conservation: Case city applications of analysis methodologies, volume 3
[DOE/PE-8628/1-VOL-3] 26 p0312 N80-21206
Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2
[DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207
Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1
[DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208
Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies
[CONS-8626-T1-VOL-1] 26 p0317 N80-21857
SULLIVAN, R. F.
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407
SULLIVAN, T. L.
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
SULLIVAN, W. N.
Overview of Vertical Axis Wind Turbine (VAWT)
26 p0262 N80-16466
Operational experience with VAWT blades
26 p0262 N80-16468
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 1: Executive summary
[SAND-78-0962-VOL-1] 26 p0268 N80-16539
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 2: Economic optimization model
[SAND-78-0962-VOL-2] 26 p0268 N80-16540
Economic analysis of Darrieus axis wind turbine systems for the generation of utility grid electrical power. Volume 4: Summary and analysis of the A. T. Kearney and Alcoa Laboratories point design economic studies
[SAND-78-0962-VOL-4] 26 p0269 N80-16542
SUMI, K.
Geological and geochemical characteristics of geothermal resources in Japan
26 p0187 A80-21928
SUNDARAM, M. S.
Photochemical conversion of coal to gasoline in an entrained bed reactor
26 p0283 N80-18202
SUNDARAM, S.
Photochemical conversion of coal to gasoline in an entrained bed reactor
[ORO-5020-T1] 26 p0299 N80-20415
SUNESON, G. A.
Characterization of dynamic influences in a coal-fired MHD system
26 p0219 A80-25094
SUSKI, G. J.
The evolution of a large laser control system - From Shiva to Nova
26 p0185 A80-21901
SUZUKI, A.
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6
26 p0200 A80-23144
SUZUKI, M.
Solar beam-assisted electrolyser applied to Yokohama Mark 5 and 6
26 p0200 A80-23144
SUZUKI, Y.
Design considerations of a CAMAC system for large tokamak JT-60
26 p0231 A80-27672
SWAB, P.
Black a-Si solar selective absorber surfaces
26 p0254 A80-32325
SWAIN, H.
Canadian renewable energy prospects
26 p0183 A80-21104
SWARTZENDRUBER, L. J.
Numerical physical property data for metal hydrides utilized for hydrogen storage - Three primary candidate materials
26 p0204 A80-23183
SWEAN, T. F.
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938
SWIFT-HOOK, D. T.
Describing wind data
26 p0211 A80-23534
SWIFT, A.
Demonstration and analysis of a combined wind-solar energy conversion system
[AIAA 80-0643] 26 p0239 A80-28824
SWITHENBANK, J.
Electrical conductivity of a seeded H2/O2 system
26 p0254 A80-32330
SYRETT, B. C.
Pitting resistance of engineering materials in geothermal brines. I - Low salinity brine
26 p0249 A80-30474
SZEPE, S.
Thermal fluid selection for long-distance heat transmission
[CONF-790803-47] 26 p0305 N80-20879
SZYDLIK, P. P.
Thermal mats for space heating and cooling
[BNL-51019] 26 p0276 N80-17555

T

TABOR, H.
Non-convecting solar ponds
26 p0210 A80-23517
TADA, M.
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys
26 p0202 A80-23169
TAGER, S. A.
Promising fuels for MHD power stations
26 p0252 A80-31750
TAKAHASHI, K.
Amorphous Si-F-H solar cells prepared by dc glow discharge
26 p0251 A80-30940
TAKEMORI, Y.
The magnesium-iodine cycle for the thermochemical decomposition of water
26 p0199 A80-23137
TAKEUCHI, S.
Estimation of primary production of vegetation in agricultural and forested areas using Landsat data
26 p0191 A80-22456
TALDA, G. R.
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880
TAMANUKI, S.
Overview of coal energy utilization technology in Japan
26 p0187 A80-21924
TAMIR, A.
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261
TANAKA, T.
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927
TANI, T.
Fundamental characteristics of the reverse flat plate collector
26 p0187 A80-21927
TANISHO, S.
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145

TANIYAMA, T.
A study on plasma plug
26 p0252 A80-31775

TANNER, R. K.
Incineration of industrial waste
26 p0192 A80-22766

TATARONIS, J. A.
Neutral-beam injection calculations for torsatrons
26 p0224 A80-25479

TATE, R.
High slag rejection, high carbon conversion rate, air cooled cyclone coal combustor for MHD regenerative heat exchangers
26 p0222 A80-25112

TAYLOR, J. R. M.
Submerged cylinder wave energy device - Theory and experiment
26 p0251 A80-30801

TAYLOR, S. F.
Light rail transit in the United States
26 p0252 A80-31770

TAYLOR, T. B.
Storage of solar energy
26 p0188 A80-21937

TAZIMA, T.
International tokamak reactor - Executive summary of the IAEA Workshop, 1979
26 p0252 A80-31626

TEARE, J. D.
Local analysis of electrical performance of the U-25B generator
26 p0216 A80-25066

TEMPELMEYER, K.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065

Condensation and deposition of seed in the MHD bottoming plant
26 p0217 A80-25071

TEMPLIN, R. J.
Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463

TENNIS, M.
Markets for wind energy systems - When, where and at what price
[AIAA 80-0613]
26 p0238 A80-28810

TERREY, L.
A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098

TERRIER, G.
The use of porous metallic diaphragm for hydrogen mass-production with alkaline water electrolysis
26 p0196 A80-23113

TERRY, J. L.
Spatial profiles of light impurity ions in the Alcator A tokamak plasma
26 p0224 A80-25478

THERIAULT, M.
Thermography at the earth's surface and the energy efficiency of buildings
26 p0213 A80-24072

THIBAULT, J. J.
The cryogenic storage of hydrogen
26 p0202 A80-23162

THIELE, H. A.
Large wind energy converter: Growian 3 MW
26 p0261 N80-16461

THOMAS, R. G.
Application of radiography to coal liquefaction
[SAND-79-1226C]
26 p0274 N80-17243

Catalyst characterization in coal liquefaction
[SAND-79-1969]
26 p0299 N80-20423

THOMAS, S. J.
Magnetooptical switch for synchronization of CO2 and red laser beams
26 p0236 A80-28735

THOMASIAN, J.
Adequacy analysis of air quality monitoring activities relevant to California thermal enhanced oil recovery fields
[SAN-12093-1]
26 p0309 N80-20929

THOMPSON, M. J.
The temperature dependence of the characteristics of sputtered a-Si-H solar cells
26 p0187 A80-21920

THOMPSON, S. W.
Semiconductor grade, solar silicon purification project
[NASA-CR-162746]
26 p0264 N80-16495

THORNHILL, J. W.
Development of improved wraparound contacts for silicon
[NASA-CR-159748]
26 p0285 N80-18554

THORNTON, J. P.
Measurement of heliostat performance characteristics
26 p0250 A80-30773

THORSNESS, C. B.
An underground coal gasification experiment - Hoe Creek II
26 p0251 A80-31042

THUR, G. M.
Future prospects for use of the gas turbine for automobiles
26 p0236 A80-28485

TIEN, H. T.
Photogalvanovoltaic cells and photovoltaic cells using glassy carbon electrodes
26 p0243 A80-29057

TIMOURIAN, H.
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697]
26 p0288 N80-19295

TISON, R. R.
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663]
26 p0275 N80-17547

TITOV, P. P.
Solar hydrogen energy
26 p0185 A80-21878

TIURIN, IU. L.
Possible direct conversion of chemical energy into electrical energy in a semiconductor
26 p0247 A80-29795

TOBAK, J. P.
The application of DC-DC energy conversion in a solar energy system
[AD-A077112]
26 p0303 N80-20867

TODORIKI, I.
National R&D program on MHD in Japan
26 p0220 A80-25100

TOEPLER, J.
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

TOMAZIC, W. A.
Supporting research and technology for automotive Stirling engine development
[NASA-TM-81495]
26 p0311 N80-21200

TOUCHAIS, M.
Introduction to the study of solar technology
26 p0188 A80-21949

Solar heat production - Generalizations
26 p0188 A80-21950

Industrial solar thermal collectors
26 p0189 A80-21951

The utilization of industrially produced, moderate-temperature solar heat
26 p0189 A80-21952

Industrial solar thermal concentrators
26 p0189 A80-21953

The industrial applications of high-temperature heat - Solar thermal and electric plants
26 p0189 A80-21954

The real problems of solar energy
26 p0189 A80-21955

Solar and geothermal energy
26 p0208 A80-23328

TOWNES, H. W.
Particulate size and rates of pressure drop increase in an MHD air preheater
26 p0217 A80-25076

TOWNLEY, D.
Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501

TRACHTE, K. L.
Performance of low rank coals in the Exxon Donor Solvent Process
26 p0230 A80-27419

TRAEGER, R. K.
Magma energy research, 79-1
[SAND-79-1344]
26 p0277 N80-17568

TREBLE, F. C.
Photovoltaic conversion research and development in the United Kingdom
[RAE-TM-SPACE-247] 26 p0279 N80-17583
TREPTOW, W.
Development of electrochemical storage batteries with improved energy density
[BMFT-FB-T-77-88] 26 p0279 N80-17582
TRESTER, P. W.
Material corrosion investigations for the General Atomic sulfur-iodine thermochemical water-splitting cycle
26 p0204 A80-23189
TREXLER, D. T.
Assessment of low- to moderate-temperature geothermal resources of Nevada
[NVO-01556-1] 26 p0301 N80-20792
TRIEZENBERG, D. M.
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480
TRIMBLE, L. C.
OTEC for hydrogen production
26 p0195 A80-23109
TRIPATHI, K. C.
A battery-run pulsed motor with inherent dynamic electronic switch control
26 p0242 A80-29008
TROTTER, D. M., JR.
Spectral selectivity of high-temperature solar absorbers
26 p0225 A80-25657
TROTTER, W. K.
Solar energy for agriculture: Review of research
[PB-298688/3] 26 p0271 N80-16568
TSAKADZE, L. M.
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242
TSATSARONIS, G.
Balancing the process of hydrating gasification of brown coal
26 p0250 A80-30597
TSINKOTSKI, B.
Storage peak gas-turbine power unit
[NASA-TM-75757] 26 p0314 N80-21755
TSKHAKAIA, V. K.
Low-temperature thermionic converter with an expanded-area collector
26 p0249 A80-30242
TSUTSUI, Y.
Study of flywheel energy storage system for electric utilities
26 p0187 A80-21925
TUDA, T.
Toroidal effects on nonlocal collisionless drift instability
26 p0229 A80-27278
TUDUCE, R.
Solar energy electrochemical storage
26 p0208 A80-23331
TUENGER, S.
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909
TURNER, G. B.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
TURNER, L. R.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079
TYE, R. P.
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932
TYE, W.
The energy problem: Its effect on aircraft design. I - Supply and demand
26 p0231 A80-27752
The energy problem - Its effect on aircraft design. II - The effects of fuel cost
26 p0254 A80-32201
TYULUMAN, S. A.
A microprocessor-based system for the monitoring and control of a solar installation
26 p0242 A80-29006

U

UCHIDA, H.
Mixing effects of different types of hydrides
26 p0202 A80-23166
UEDA, S.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
UNKEL, W. C.
Local analysis of electrical performance of the U-25B generator
26 p0216 A80-25066
URSU, I.
Synergetics of the fission electric cells
26 p0193 A80-22789

V

VAALER, L. E.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054
VACHON, W. A.
An assessment of utility-related test data from large wind turbine generator tests
[AIAA 80-0631] 26 p0240 A80-28834
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868
VALCKX, F. P. G.
Neutral beam injectors
26 p0215 A80-24675
VAN BOGAERT, G.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
VAN DEN BROECK, H.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
VAN POUCKE, L.
Prospects for an alkaline hydrogen air fuel cell system
26 p0204 A80-23182
VAN VELZEN, D.
The reaction of sulfur dioxide with water and a halogen - The cases of bromine and iodine
26 p0197 A80-23125
Development, design and operation of a continuous laboratory-scale plant for hydrogen production by the Mark-13 cycle
26 p0197 A80-23126
The oxidation of sulphur dioxide by bromine and water
26 p0245 A80-29407
VAN VORST, W. D.
Mixture properties for hydrogen supplementation of natural gas
26 p0201 A80-23159
Electronic fuel injection techniques for hydrogen powered I.C. engines
26 p0206 A80-23205
VANBRONKHORST, J.
The MOD-1 steel blade
26 p0263 N80-16476
VARDE, K. S.
Hydrogen fuel in air transportation and its effects around airports
26 p0204 A80-23179
VARFOLOMEEV, S. D.
Solar hydrogen energy
26 p0185 A80-21878
VARSHAVSKII, I. L.
Use of hydrogen as a fuel for automobile heat engines
26 p0185 A80-21880
VASILEVA, I. A.
Study of the U-25B MHD generator system in strong electric and magnetic fields
26 p0216 A80-25065
VAYENAS, C. G.
Cogeneration of electric energy and nitric oxide
26 p0255 A80-32412

VEEFKIND, A.
Experiments on the nonuniform discharge structure in noble gas MHD generators
26 p0219 A80-25086

VEILLETTE, D.
A control strategy for a variable-speed wind energy conversion system
26 p0194 A80-22976
Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558

VENDURA, G.
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838

VENERUSO, A. F.
High temperature electronics for geothermal energy
26 p0185 A80-21902

VENKATARAMANAN, D.
Some application of Landsat imagery interpretation for petroleum targetting in India
26 p0191 A80-22433

VERNON, S. M.
Grain size and its influence on efficiency in polycrystalline GaAs solar cells
26 p0186 A80-21919

VETTER, A. A.
Scale-up of advanced MHD generators
[AIAA PAPER 80-0179] 26 p0212 A80-23938
The STD/MHD codes - Comparison of analyses with experiments
[AIAA PAPER 80-0024] 26 p0212 A80-23953

VEZIROGLU, T. N.
Hydrogen energy system; Proceedings of the Second World Hydrogen Energy Conference, Zurich, Switzerland, August 21-24, 1978. Volumes 1-5
26 p0194 A80-23101

VIEHMANN, W.
A fluorescent radiation converter
[NASA-CASE-GSC-12528-1] 26 p0283 N80-18261

VISENTIN, R.
Autonomous solar electricity production with hydraulic active storage systems on the territory
26 p0208 A80-23332

VISWANADHAM, P.
A four-component model for the vaporization of seeded slags - The system KO/.5/-CaO-AlO/1.5/SiO2
26 p0217 A80-25073

VISWANATHAN, R.
Aerospace technology review for LBL window/passive solar program
[LBL-9608] 26 p0316 N80-21850

VISWANATHAN, S.
Solvent refined coal process: Data correlation and analysis
[EPRI-AF-1157] 26 p0313 N80-21557

VITERNA, L. A.
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494

VODOPIANOV, K. L.
Enhancement of the efficiency of neodymium lasers by conversion of the pump radiation in a luminescent liquid
26 p0209 A80-23404

VOGEL, C. A.
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896

VOGEL, G. J.
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430

VON BOOS, O.
The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell
26 p0247 A80-29817
The spectral response of a front surface field solar cell
26 p0254 A80-32331

VON ROSENBERG, C. W., JR.
Coal gasification in steam at very high temperatures
26 p0249 A80-30522

VONDERHAAR, S.
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905] 26 p0273 N80-16652

VOSS, A.
Soft-energy provision - A new Utopia
26 p0227 A80-26169

VUGINSHTEIN, A. R.
Electrical processes in the interaction of a magnetic field wave with an ionized-gas stream
26 p0252 A80-31509

W

WADDINGTON, D.
Measurement of heliostat performance characteristics
26 p0250 A80-30773

WADE, J. E.
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868

WAGNER, S.
Heterojunction solar cells
26 p0210 A80-23519

WAGONER, D. E.
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309

WAID, B. L.
The MINI-OTEC test
26 p0232 A80-28259

WAIDELICH, W.
Laser 79 opto-electronics; Proceedings of the Fourth Conference, Munich, West Germany, July 2-6, 1979
26 p0245 A80-29334

WAKAO, N.
Separation of hydrogen from the mixture of hydrogen iodide, hydrogen and iodine in thermogravitational column
26 p0200 A80-23145

WALKER, J. S.
Fluctuations in MHD generators
26 p0221 A80-25106

WALLACE, A.
The doping of amorphous silicon for solar cells
26 p0187 A80-21921

WALLACE, T. C., SR.
A study of the cerium-chlorine system for thermochemical production of hydrogen
26 p0198 A80-23134

WALTERS, R. E.
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832

WAMPLER, D. L.
Study of hydrocarbon-shale interaction
[ORO-5197-14] 26 p0260 N80-16409

WANG, S. J.
Wood gasification in a fluidized bed
26 p0244 A80-29154

WANG, S.-T.
A superconducting dipole magnet for the CFFF MHD facility at the University of Tennessee Space Institute
26 p0218 A80-25079

WARD, C. J.
Solar-powered sun tracker
[AD-A078653] 26 p0294 N80-19640

WARD, D. S.
Operating thresholds of solar collection systems
26 p0251 A80-30775
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887

WARD, J. C.
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887

WARD, P.
GPS application to seismic oil exploration
26 p0222 A80-25159

WARREN, R. L.
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272

WASHINGTON, L. J., JR.
Energy from the situ processing of antrim oil shale
[FE-2346-44] 26 p0278 N80-17576

WASYLENKO, W. J., JR.
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310

WATANABE, T.
Effect of Ni, Ce and Co on hydrogen absorption by La-Ni alloys
26 p0202 A80-23169

WATERLAND, L. R.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601

WATTS, A.
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479

WATTS, P. A.
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340

WATTS, R. L.
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570

WAY, S.
The transition MHD power plant concept
26 p0221 A80-25104

WEATHERFORD, W. D., JR.
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287

WEAVER, P. F.
Photobiological production of hydrogen
26 p0247 A80-29920

WEBB, N.
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas
[AD-A076145] 26 p0284 N80-18411

WEHREY, M. C.
The retrofit approach to MHD demonstration and commercialization
26 p0221 A80-25102

WEI, G. C.
Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456

WEIDE, W., JR.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307

WEIL, S. A.
Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522
Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412

WEILAND, J.
Numerical investigation of current driven dissipative drift wave turbulence including finite beta and quasilinear effects in a tokamak plasma
26 p0229 A80-27276

WEINBERG, A. M.
Limits to energy modeling
[ORAU/IEA-79-16(O)] 26 p0308 N80-20907
Are the alternative energy stategies achievable?
[ORAU/IEA-79-15(O)] 26 p0318 N80-21863

WEINGART, O.
Low cost composite blades for large wind turbines
[AIAA 80-0634] 26 p0239 A80-28820
Low cost composite blades for large wind turbines
26 p0253 A80-32074

WELCH, R.
Monitoring urban population and energy utilization patterns from satellite data
26 p0207 A80-23293

WELFORD, W. T.
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021

WELSH, L. B.
Optimization of Pt-doped Kocite (trade name) electrodes in H3Po4 fuel cells
[AD-A075372] 26 p0294 N80-19639

WENDELGASS, P. F.
Technical and economic feasibility of wind-powered systems for dairy farms
[AIAA 80-0641] 26 p0239 A80-28823

WENTWORTH, T. O.
Methanol derivation from North Dakota lignite and use as a fuel
26 p0230 A80-27417

WENZL, H.
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184

WERNER, R. W.
The economic significance of Q for mirror reactors - Combinations of Q and M which look promising
26 p0215 A80-24666

WESCOTT, W. A.
The Yallahs fan delta, southeastern Jamaica: A depositional model for active tectonic coastlines
26 p0273 N80-16632

WESTBROOK, C. K.
Chemical kinetics in LNG detonations
[UCRL-82293-REV-1] 26 p0258 N80-16180

WESTPHAL, W.
Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880

WESTRA, L.
Conceptual design of an MHD/steam power plant of pilot scale /ETF/ and preliminary analyses of early commercial MHD power plants
26 p0220 A80-25097

WESTSIK, J. H.
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557

WEXLER, A.
Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879

WEYANT, J. P.
Models for energy technology assessment
26 p0207 A80-23222

WHIPPLE, C.
The energy impacts of solar heating
26 p0248 A80-29946

WHISNANT, R. A.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550

WHITE, L. L.
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

WHITE, L. R.
Operability and materials testing for MHD air heaters
26 p0217 A80-25075

WHITE, N.
Hydrogenation of brown coal. I - The effects of additional quantities of the inorganic constituents
26 p0249 A80-30523

WHITE, O. L.
Fiscal year 1979 scientific and technical reports, articles, papers and presentations
[NASA-TM-78250] 26 p0274 N80-17014

WHITEHURST, D. D.
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422

WHITTEN, D. G.
Light-induced electron transfer reactions in solution, organized assemblies and at interfaces - Scope and potential applications
26 p0243 A80-29055
WICHANSKY, A. M.
Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990
WIEWIOROWSKA, K.
Satellite solar power plants
26 p0252 A80-31200
WILEMSKI, G.
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884
WILKINSON, C. R.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307
WILL, G.
Hydrogen in iron-titanium - Experimental investigations of structure, heat of solution, diffusion, and hydriding kinetics
26 p0204 A80-23184
WILLER, D. C.
Potential hydroelectric power, vertical turbine, spillway combine Broadwater Dam
[DOE/ID-01822-1] 26 p0295 N80-19651
WILLIAMS, J. R. C.
Superconducting MHD magnets - Technology development, procurement and the path to commercial scale
26 p0218 A80-25077
WILLIAMS, L. O.
Application of centrifugal separation to the production of hydrogen from coal
26 p0194 A80-22869
A storage tank for vehicular storage of liquid hydrogen
26 p0231 A80-27729
WILLIAMS, R.
Carrier generation, recombination, and transport in amorphous silicon solar cells
26 p0227 A80-26340
WILLIAMS, R. C.
Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data
[COO-2704-T1] 26 p0318 N80-21875
WILLIAMSON, D. G.
Chemical studies on the general atomic sulfur-iodine thermochemical water-splitting cycle
26 p0197 A80-23122
WILLIAMSON, K. H.
A model for the Sulphur Springs geothermal field St. Lucia
26 p0231 A80-27924
WILLSON, W. G.
Application of liquefaction processes to low-rank coals
26 p0230 A80-27418
WILSON, J. I. B.
The doping of amorphous silicon for solar cells
26 p0187 A80-21921
WILSON, R. E.
A comparison of aerodynamic analyses for the Darrieus Rotor
[AIAA 80-0605] 26 p0237 A80-28802
WINARSKI, C. P.
Master Control and Data Acquisition System for a Solar Central Receiver Electric Power Plant
26 p0186 A80-21903
WINDOW, B.
Graded metal carbide solar selective surfaces coated onto glass tubes by a magnetron sputtering system
26 p0246 A80-29742
Cylindrical magnetron sputtering system for coating solar selective surfaces onto batches of tubes
26 p0246 A80-29743
WINGENBACK, W.
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612
WINN, C. B.
Optimal controllers of the second kind
26 p0184 A80-21112
WINNICK, J.
Mixed potential analysis of sulfation of molten carbonate fuel cells
26 p0255 A80-32501
WINSTON, R.
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021
WINTERLING, G.
Thin film solar cells based on amorphous silicon
26 p0245 A80-29395
WISE, R. L.
Unconventional gas recovery program
[METC/SP-79/8] 26 p0258 N80-16181
WITZKE, H.
Thin film CdSe photoanodes for electrochemical photovoltaic cells
26 p0228 A80-26466
WOLF, D.
A central solar domestic hot water system - Performance and economic analysis
26 p0223 A80-25261
WOLF, M.
Photovoltaics. II - Flat panels
26 p0214 A80-24532
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-162904] 26 p0302 N80-20814
WOLF, R. A.
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
WOLF, T.
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884
WOLFBRANDT, G.
Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion
[NASA-TM-81472] 26 p0315 N80-21837
WOLFE, G.
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838
WOLFE, W. P.
Aerodynamic tests of Darrieus turbine blades
[AIAA 80-0625] 26 p0240 A80-28832
WOLFSON, R. G.
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623
WOLVERTON, B. C.
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545
WOOD, D. O.
Independent assessment of energy policy models
[EPRI-EA-1071] 26 p0266 N80-16510
WOOD, V. E.
The 'tandem photoelectrolysis plant' concept - A strategy for fuel production via biomass conversion wastes
26 p0243 A80-29054
WOOLLEY, R. L.
Design considerations for the Riverside hydrogen bus
26 p0203 A80-23176
WORSTELL, M. H.
Aerodynamic performance of the DOE/Sandia 17-m vertical axis wind turbine in the two-bladed configuration
[AIAA 80-0655] 26 p0241 A80-28842
Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465
WORTHMAN, S.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859
WRAY, K. L.
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884

WRIGHT, A. F.
Bibliography of geology and hydrology, eastern New Mexico
[PB-300832/3] 26 p0273 N80-16663
WRIGHT, B. R.
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287
WRIGHT, L. R.
Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522
WRIGHT, R. J.
Scaling MHD cyclone coal combustors
26 p0222 A80-25114
WU, C.-Y.
The open-circuit voltage of n/+/-n-p high-low-emitter /HLE/ junction solar cells in concentrated sunlight
26 p0209 A80-23496
The open-circuit voltage of back-surface-field /BSF/ p-n junction solar cells in concentrated sunlight
26 p0247 A80-29812
WU, S. F.
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856
WU, Y. C. L.
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864
WURM, J.
Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522
WYSOCKI, J.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866

X

XUAN, P. T.
Photosensitization mechanisms for energy storing isomerizations
26 p0244 A80-29060

Y

YAFFE, M. R.
Testing aqueous caustic electrolyzers at high temperatures
26 p0205 A80-23196
YAGI, T.
Attempts to produce hydrogen by coupling hydrogenase and chloroplast photosystems
26 p0201 A80-23156
YAMASAKI, H.
Experimental studies of an inert gas disk MHD generator with a small seed fraction
26 p0219 A80-25088
YANG, R. T.
Mechanochemical effects on coal conversion. I - Coal hydrogenation in gaseous hydrogen aided by mechanical energy
26 p0249 A80-30521
YAZAWA, K.
Photoelectrochemical generation of hydrogen with hybrid electrodes
26 p0200 A80-23153
YEH, J. T.
Development of a slagging cyclone gasifier for MHD applications
26 p0222 A80-25113
YEKUTIELI, G.
Technology and performance of a high concentration solar cell power supply
26 p0226 A80-25886
YOKOKAWA, H.
A feasibility study on thermochemical water-splitting cycles using sulfur compounds
26 p0197 A80-23121
YOKOYAMA, S.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
YOSHIDA, K.
Br-Ca-Fe water-decomposition cycles for hydrogen production
26 p0199 A80-23135
YOSHIDA, R.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
YOSHIDA, T.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
YOSHIDA, Y.
Effect of coal particle size on the coal hydrogenation reaction - In relation to the plasticity of coal
26 p0192 A80-22768
YOSHIKAWA, K.
Impurity effects on non-equilibrium MHD gas heated by a fossil fuel-fired heat exchanger
26 p0219 A80-25089
YOUNG, W. C.
Compressive fatigue tests on a unidirectional glass/polyester composite at cryogenic temperatures
26 p0191 A80-22690
YOUNGBLOOD, J. W.
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
YOUNGER, F. C.
Study of advanced electric propulsion system concept using a flywheel for electric vehicles
[NASA-CR-159650] 26 p0287 N80-18991
YUEN, S. Y.
Characteristics of lower-hybrid-wave-driven steady-state tokamak power reactors
26 p0224 A80-25475
YUNG, C. S.
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379

Z

ZACZEPINSKI, S.
Performance of low rank coals in the Exxon Donor Solvent Process
26 p0230 A80-27419
Fluid coking of coal liquefaction residues: The fourth residue
[FE-2422-28] 26 p0289 N80-19304
ZAMBRANO, T. G.
Wind loading definition for the structural design of wind turbine generators
[AIAA 80-0610] 26 p0237 A80-28807
ZANGRANDO, F.
Solar ponds for residential heating, heat extraction from a salt gradient solar pond
[PB80-108624] 26 p0308 N80-20913
ZAPOROWSKI, B.
Investigations of heat transfer from plasma flux to electrode and insulating walls of the MHD generator channel
26 p0217 A80-25069
ZAR, J. L.
A modular design for a superconducting magnet for the ETF and larger MHD generators
26 p0218 A80-25078
ZATELEPIN, V. N.
Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068
ZAUDERER, B.
A 250 MWt MHD Engineering Test Facility /ETF/ system design
26 p0220 A80-25098
ZHARINOV, E. I.
Possible solution of the controlled thermonuclear fusion problem based on magnetogasdynamic energy storage
26 p0230 A80-27567
ZHELEZNIAK, M. B.
Radiative and convective heat transfer in the MHD generator duct
26 p0217 A80-25068

ZIEGLER, E. N.
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580

ZIELKE, C. W.
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

ZIRK, W. E.
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

ZOELLNER, R.
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power
[ISBN-3-88148-164-8] 26 p0281 N80-17635

ZOSCHAK, R. J.
Design and testing of a cavity-type, steam-generating, central receiver for a solar thermal power plant
26 p0253 A80-31856

ZOTOV, N. I.
Explosive-driven magnetic generator with a plasma load
26 p0252 A80-31357

ZUTECK, M.
The use of wood for wind turbine blade construction
26 p0262 N80-16474

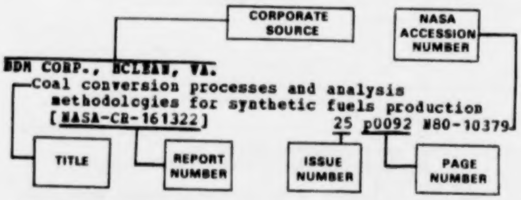
ZWEIG, R. M.
Health benefits derived from a planned hydrogen community
26 p0205 A80-23193

CORPORATE SOURCE INDEX

ENERGY / *A Continuing Bibliography (Issue 26)*

JULY 1980

Typical Corporate Source Index Listing



The title of the document is used to provide a brief description of the subject matter. The issue, page number and NASA or AIAA accession number are included in each entry to assist the user in locating the abstract in the abstract section of an individual supplement of *Energy*. If applicable, a report number is also included as an aid in identifying the document.

A

ACUREX CORP., MOUNTAIN VIEW, CALIF.
Environmental assessment of stationary source NOx control technologies
[PB-300469/4] 26 p0272 N80-16601
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625

AERONAUTICAL RESEARCH INST. OF SWEDEN, STOCKHOLM.
Torsional oscillations of the rotor disc for horizontal axis wind turbines with hinged or teetered blades, Part 12
[FFA-TN-AU-1499-PT-12] 26 p0319 N80-21881

AIR FORCE AERO PROPULSION LAB., WRIGHT-PATTERSON AFB, OHIO.
Permanent magnet and superconducting generators in airborne, high power systems
[AD-A078424] 26 p0284 N80-18311

AIR FORCE INST. OF TECH., WRIGHT-PATTERSON AFB, OHIO.
Computer simulation of a solar energy system which utilizes flat-plate collectors
[AD-A079906] 26 p0304 N80-20870

AIRESEARCH MFG. CO., TORRANCE, CALIF.
Flywheel energy storage switcher. Volume 1: Study summary and detailed description of analysis
[PB80-121478] 26 p0320 N80-21888

ALUMINUM CO. OF AMERICA, ALCOA CENTER, PA.
Alcoa wind turbines
26 p0261 N80-16464
Fabrication of extruded vertical axis turbine blades
26 p0262 N80-16467

AMERICAN UNIV., WASHINGTON, D. C.
The preparation of some novel electrolytes: Synthesis of partially fluorinated alkanesulfonic acids as potential fuel cell electrolytes
[AD-A078473] 26 p0286 N80-18570

APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL, MD.
Geothermal energy development in the eastern United States. Evaluation of potential geothermal resource areas
[PB-299925/8] 26 p0285 N80-18547
Geothermal energy market penetration: Development of a model for the residential section
[PB80-118359] 26 p0311 N80-21198
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB80-125651] 26 p0320 N80-21889

ARCO SOLAR, INC., CHATSWORTH, CALIF.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526

ARGONNE NATIONAL LAB., ILL.
Survey of potential chlorine production processes
[ANL/OEPM-79-1] 26 p0257 N80-16131
Solar availability for winter space heating: An analysis of the calendar period 1953-1975
[ANL/SPG-14] 26 p0268 N80-16532
Peak-load problem with storage technology
[ANL/SPG-8] 26 p0269 N80-16549
Energy Research Information System (ERIS) projects report, volume 4, number 1
[PB-300338/1] 26 p0270 N80-16561
Environmental and economic evaluations of energy recovery from agricultural and forestry residues
[ANL/EES/TM-58] 26 p0297 N80-19668
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428
Support studies in fluidized-bed combustion 1978 annual report
[PB80-112758] 26 p0300 N80-20430
Projections of direct energy consumption by mode: The 1975 - 2000 baseline
[ANL/CNSV-4] 26 p0304 N80-20878
Thermal fluid selection for long-distance heat transmission
[CONF-790803-47] 26 p0305 N80-20879
Advances in MHD technology
[CONF-790598-5] 26 p0311 N80-21166
Application of glass technology to novel solar energy collectors
[CONF-7906118-1] 26 p0317 N80-21852

ARIZONA UNIV., TUCSON.
Segmented dish concentrator design project
[SAND-79-7024] 26 p0277 N80-17561

ARMY ARMAMENT RESEARCH AND DEVELOPMENT COMMAND, DOVER, N. J.
The application of DC-DC energy conversion in a solar energy system
[AD-A077112] 26 p0303 N80-20867

ARMY AVIATION RESEARCH AND DEVELOPMENT COMMAND, CLEVELAND, OHIO.
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754

ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND, FORT MONMOUTH, N. J.
Militarized thermoelectric power sources
[AD-A075609] 26 p0304 N80-20869

ARMY ELECTRONICS TECHNOLOGY AND DEVICES LAB., FORT MONMOUTH, N. J.
Regenerative burner system for thermoelectric power sources
[AD-A075955] 26 p0276 N80-17553

AVCO CORP., WILMINGTON, MASS.
Parametric study of potential early commercial MHD power plants
[NASA-CR-159633] 26 p0286 N80-18559

B

BADGER PLANTS, INC., CAMBRIDGE, MASS.
Conceptual design of a coal-to-methanol-to-gasoline commercial plant: Executive summary
[FE-2416-43] 26 p0258 N80-16182

BADISCHE ANILIN- UND SODA-FABRIK A. G., LUDWIGSHAFEN AM RHEIN (WEST GERMANY).
Development of electrochemical storage batteries with improved energy density
[BMFT-FB-T-77-88] 26 p0279 N80-17582

BATTELLE COLUMBUS LABS., OHIO.
Space disposal of nuclear wastes
26 p0246 A80-29448
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 1
[PB-299383/0] 26 p0259 N80-16192
Proceedings: Symposium on coal cleaning to achieve energy and environmental goals held at Hollywood, Florida on September 1978, volume 2
[PB-299384/8] 26 p0259 N80-16193
Characterization and analysis of devonian shales as related to release of gaseous hydrocarbons
[ORO-5205-10] 26 p0310 N80-20973
BATTELLE MEMORIAL INST., GENEVA (SWITZERLAND).
Use of solar energy for the production of electricity in the Alps
[SAND-79-6000] 26 p0265 N80-16499
BATTELLE PACIFIC NORTHWEST LAB., SEQUIM, WASH.
Estimation of wind characteristics at potential wind energy conversion sites
[PNL-3074] 26 p0321 N80-21955
BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
Factors affecting potential market penetration of laser fusion power plants
[PNL-2803] 26 p0269 N80-16552
Gust-rise exceedance statistics for wind turbine design
[PNL-2530] 26 p0277 N80-17567
Some potential material supply constraints in solar systems for heating and cooling of buildings and process heat. A preliminary screening to identify critical materials
[PNL-2972] 26 p0278 N80-17570
Energy material transport, now through 2000, system characteristics and potential problems. Task 3: Petroleum transportation
[PNL-2421] 26 p0278 N80-17574
Regional environment-energy data book: Northwest region
[DOE/TIC-10114/5] 26 p0281 N80-17599
Alaskan environmental research. Section 12.0 of part 2: Ecological sciences
[PNL-2850-PT-2-SUPPL] 26 p0297 N80-19666
Economics of thermal energy storage for compressed air energy storage systems
[PNL-SA-7949] 26 p0307 N80-20903
Economics of compressed air energy storage employing thermal energy storage
[PNL-3191] 26 p0307 N80-20904
BECHTEL NATIONAL, INC., SAN FRANCISCO, CALIF.
Combined cycle for solar-fossil hybrid power generation
[CONF-790803-43] 26 p0276 N80-17557
BERG (CHARLES A.), BUCKFIELD, MAINE.
Energy conservation in industry: The present approach, the future opportunities
[PB-301244/0] 26 p0270 N80-16556
BERKELEY SOLAR GROUP, CALIF.
Performance monitoring of a passive solar heated house, Stockton, California
[EPRI-ER-1177] 26 p0319 N80-21879
BOEING AEROSPACE CO., SEATTLE, WASH.
Microwave power beaming for long range energy transfer
26 p0193 A80-22833
Solar power satellite system definition study. Volume 1, phase 2: Executive summary
[NASA-CR-160540] 26 p0293 N80-19631
Emerging materials systems for solar cell applications-Cu/sub 2-x/Se
[DOE/ET-23005/T2] 26 p0296 N80-19653
Lithium battery discharge tests
26 p0303 N80-20831
Solar power satellite system definition study, volume 4, phase 2
[NASA-CR-160565] 26 p0313 N80-21395
BOEING ENGINEERING AND CONSTRUCTION, SEATTLE, WASH.
The Boeing MOD-2 wind tunnel system rated at 2.5 MW
26 p0261 N80-16457
The MOD-1 steel blade
26 p0263 N80-16476
The Boeing MOD-2 wind turbine system rotor
26 p0263 N80-16477
Low cost point focus solar concentrator, phase 1
[NASA-CR-162848] 26 p0292 N80-19624
Solar Central Receiver prototype heliostat, volume 1
[SAN-1604-1] 26 p0316 N80-21846
BOISE CASCADE CORP., IDAHO.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520
BOOZ-ALLEN AND HAMILTON, INC., BETHESDA, MD.
Mechanical energy storage technology for transportation applications project plan
[UCRL-15138] 26 p0312 N80-21209
BOSTON UNIV., MASS.
Organic photochemical storage of solar energy
[COO-4380-2] 26 p0267 N80-16527
BRADFORD NATIONAL CORP., WASHINGTON, D.C.
Advanced automotive propulsion systems: Incentive financing
[CONS-5181-1] 26 p0321 N80-22128
BRAUN (C. F.) AND CO., ALHAMBRA, CALIF.
Coal-to-methanol via new processes under development: An engineering and economic evaluation
[EPRI-AF-1227] 26 p0314 N80-21558
BRIGHAM YOUNG UNIV., PROVO, UTAH.
Mixing and gasification of coal in entraining flow systems
[FE-2666-T1] 26 p0289 N80-19303
BROBECK (WILLIAM M.) AND ASSOCIATES, BERKELEY, CALIF.
Study of advanced electric propulsion system concept using a flywheel for electric vehicles
[NASA-CR-159650] 26 p0287 N80-18991
BROOKHAVEN NATIONAL LAB., UPTON, N. Y.
Preliminary assessment of the prospects for use of refuse-derived fuel in Maryland
[BNL-51065] 26 p0258 N80-16179
Flash hydropyrolysis of coal
[BNL-51010] 26 p0258 N80-16185
Decentralized energy: Technology assessment and systems description
[BNL-50987] 26 p0265 N80-16502
Computer simulation of ground coupled storage in a series solar assisted heat pump system
[BNL-26216] 26 p0266 N80-16507
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
[BNL-26219] 26 p0266 N80-16509
Status of pollutant removal technology for coal fired plants in the northeastern U.S.
[BNL-51004] 26 p0272 N80-16580
Normal incident solar radiation measurements at Upton, New York
[BNL-50939] 26 p0273 N80-16653
Thermal mats for space heating and cooling
[BNL-51019] 26 p0276 N80-17555
Regional environment-energy data book: Northeast region
[DOE/TIC-10114/3] 26 p0279 N80-17578
Potential of biomass conversion in meeting the energy needs of the rural populations of developing countries: An overview
[BNL-26721] 26 p0288 N80-19294
Electrolysis-based hydrogen storage systems overview and rationale of the Brookhaven National Laboratory managed program
[BNL-26904] 26 p0296 N80-19654
Hydrogen storage for automobiles
[BNL-26906] 26 p0305 N80-20886
Performance of heat pumps at elevated evaporating temperatures with application to solar input
[BNL-26772] 26 p0307 N80-20896
Coal-conversion technologies: Some health and environmental effects
[BNL-5103] 26 p0309 N80-20930
Helium research in support of superconducting power transmission
[PB80-116502] 26 p0314 N80-21697
Review of recent research on energy storage in residential solar total energy systems
[BNL-51012] 26 p0315 N80-21830
Use of earth coupling in solar assisted heat pumps
[BNL-26748] 26 p0316 N80-21849
Multi-objective energy analysis
[BNL-26882] 26 p0317 N80-21856
BRUSSELS UNIV. (BELGIUM).
Theoretical study of thermal losses: The use of hybrid and combined dry coolants
[NT-44-1978] 26 p0284 N80-18345

BUNDESMINISTERIUM FUER WISSENSCHAFT UND FORSCHUNG, VIENNA (AUSTRIA).
The storage of electrochemical energy
26 p0286 N80-18578

BUREAU OF MINES, PITTSBURGH, PA.
Thermal, mechanical, and physical properties of selected bituminous coals and cokes
[PB-300398/5] 26 p0273 N80-16932

BURNS AND MCDONNELL, KANSAS CITY, MO.
Feasibility of cogeneration application of a 4.8 MW fuel cell power plant at a Santa Clara, California paper mill
[SAN-2189-T1] 26 p0304 N80-20876

BURNS AND ROE, INC., WOODBURY, N. Y.
Conceptual design of an AFBC electric power generating plant. Volume 3: Appendices
[FE-2455-27-VOL-3] 26 p0318 N80-21866

C

CALIFORNIA UNIV., BERKELEY.
Heavy hydrocarbons from coal gasification vapor pressures and dew point
26 p0257 N80-16111
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905] 26 p0273 N80-16652
Molecular thermodynamics of dew-point calculations in coal gasification processes
26 p0273 N80-16926

CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.
Aggregated vectorial model of petroleum flow in the United States
[LBL-8874] 26 p0258 N80-16178
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324] 26 p0277 N80-17560
Regional environment-energy data book: Western region
[DOE/TIC-10114/2] 26 p0280 N80-17597
Regional environment-energy data book: Southern region
[DOE/TIC-10114/4] 26 p0281 N80-17598
Energy efficient buildings program
[LBL-9576] 26 p0304 N80-20877
Evaluation of a sulfur oxide chemical heat storage process for a steam solar electric plant
[LBL-7868-REV] 26 p0306 N80-20890
Methodology for evaluating physical constraints on residential solar energy use
[UCRL-15001] 26 p0307 N80-20901
Aerospace technology review for LBL window/passive solar program
[LBL-9608] 26 p0316 N80-21850

CALIFORNIA UNIV., LIVERMORE.
Economic analysis of solar industrial process heat systems. A methodology to determine annual required revenue and internal rate of return
[UCRL-52814] 26 p0317 N80-21853

CALIFORNIA UNIV., LIVERMORE. LAWRENCE LIVERMORE LAB.
Chemical kinetics in LNG detonations
[UCRL-82293-REV-1] 26 p0258 N80-16180
Methanol as a transportation fuel: Assessment of environmental and health research
[UCRL-52697] 26 p0288 N80-19295
Mechanical energy storage technology for transportation applications project plan
[UCRL-15138] 26 p0312 N80-21209
Energy storage systems for automobile propulsion
[UCID-18320] 26 p0312 N80-21211
Effect of a heated atmosphere on the temperature dependence of the total emittance of black chrome solar absorber pipes
[UCRL-52851] 26 p0316 N80-21842
Composite-laminate flywheel-rotor development program
[UCRL-83554] 26 p0317 N80-21855

CALIFORNIA UNIV., LOS ANGELES.
Energy conservation in the US: Some interdisciplinary approaches with an emphasis on industrial cogeneration
26 p0302 N80-20811

CAMBRIDGE SYSTEMATICS, INC., MASS.
Urban mass transportation energy conservation: SRGP operating instructions and program documentation, volume 5
[DOE/PE-8628/1-VOL-5] 26 p0312 N80-21205
Urban transportation energy conservation: Case city applications of analysis methodologies, volume 3
[DOE/PE-8628/1-VOL-3] 26 p0312 N80-21206
Urban transportation energy conservation: Analytic procedures for estimating changes in travel demand and fuel consumption, volume 2
[DOE/PE-8628/1-VOL-2] 26 p0312 N80-21207
Analytical procedures for urban transportation energy conservation: Summary of findings and methodologies, volume 1
[DOE/PE-8628/1-VOL-1] 26 p0312 N80-21208
Analytic procedures for urban transportation energy conservation. Volume 1: Summary of findings and methodologies
[CONS-8626-T1-VOL-1] 26 p0317 N80-21857

CARNEGIE-MELLON UNIV., PITTSBURGH, PA.
The chemistry of sulfur in char and the implications for hydrogasification/hydrodesulfurization
[FE-2449-9] 26 p0288 N80-19298

CASE WESTERN RESERVE UNIV., CLEVELAND, OHIO.
Polymer materials basic research needs for energy applications. Proceedings of a Workshop Recommending Future Directions in Energy-Related Polymer Research
[CONF-780643] 26 p0257 N80-16172
Resource and energy constraints of regional and global availability of aluminum copper, and iron 1975 - 2000: A computer study
26 p0301 N80-20720

CATALYTIC, INC., PHILADELPHIA, PA.
Application of coke plant control technologies to coal conversion
[PB80-108954] 26 p0290 N80-19310

CEDAR ASSOCIATES, EVANSTON, ILL.
Snow and ice accumulation at solar collector installations in the Chicago metropolitan area
[PB80-113749] 26 p0308 N80-20912

CENTER FOR LEGISLATIVE IMPROVEMENT, DENVER, COLO.
Energy source book
[DOE/TIC-10190] 26 p0306 N80-20895

CENTRAL MAINE POWER CO., AUGUSTA.
Cataract hydroelectric development expansion study
[DOE/ID-01796-1] 26 p0295 N80-19650

CHEM SYSTEMS, INC., NEW YORK.
Liquid phase methanation/shift pilot plant operation and laboratory support work
[FE-2036-37] 26 p0298 N80-20413

CHEVRON RESEARCH CO., RICHMOND, CALIF.
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-37] 26 p0298 N80-20407

CHICAGO UNIV., ILL.
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021

CHRYSLER CORP., DETROIT, MICH.
Materials review for improved automotive gas turbine engine
[NASA-CR-159673] 26 p0275 N80-17470

CITY OF HUNTSVILLE, ALA.
Solar heating and hot water system installed at the Senior Citizen Center, Huntsville, Alabama
[NASA-CR-161384] 26 p0315 N80-21835

COLORADO STATE UNIV., FORT COLLINS.
The Yallahs fan delta, southeastern Jamaica: A depositional model for active tectonic coastlines
26 p0273 N80-16632
Modeling the space conditioning energy demand of a community as a function of weather
[COO-1340-65] 26 p0294 N80-19644
Residential solar heating and cooling using evacuated tube solar collectors: CSU Solar House 3
[COO-2858-24-SUMM] 26 p0305 N80-20887

COMISION FEDERAL DE ELECTRICIDAD, MEXICO CITY (MEXICO).
Vertical movement along the Cerro Prieto transform fault, Baja California, Mexico - a mechanism for geothermal energy renewal
[LBL-8905] 26 p0273 N80-16652

COMMITTEE ON SCIENCE AND TECHNOLOGY (U. S. HOUSE).
NASA authorization, 1981, program review, volume 1
[GPO-53-814] 26 p0281 N80-17913

CONOCO COAL DEVELOPMENT CO., LIBRARY, PA.
Zinc halide hydrocracking process for distillate fuels from coal
[FE-1743-68] 26 p0300 N80-20426

D

DELAWARE UNIV., NEWARK.
Photovoltaic effect, its present understanding and remaining mysteries
[DOE/ET-23103/6] 26 p0268 N80-16535
Kinetics and mechanism of desulfurization and denitrogenation of coal-derived liquids
[FE-2028-15] 26 p0287 N80-19292

DELEUW, CATHER AND CO., CHICAGO, ILL.
AGT guideway and station technology. Volume 8: Weather protection concepts
[PB-299746/8] 26 p0274 N80-16974

DELTA RESEARCH CORP., ARLINGTON, VA.
Worldwide transportation/energy demand forecast, 1975 - 2000
[ORNL/SUB-78/13536/1] 26 p0269 N80-16546

DENVER UNIV., COLO.
Space benefits: The secondary application of aerospace technology in other sectors of the economy
[NASA-CR-162697] 26 p0274 N80-16950

DEPARTMENT OF ENERGY, BARTLESVILLE, OKLA.
Development of high temperature subtractive column and chromatographic analysis of hydrocarbons present in diesel exhaust
[BETC/RI-78/12] 26 p0257 N80-16130
Physical properties of gasoline/alcohol blends
[BERC/RI-79/4] 26 p0288 N80-19296

DEPARTMENT OF ENERGY, MORGANTOWN, W. VA.
Unconventional gas recovery program
[METC/SP-79/8] 26 p0258 N80-16181
Gas production of Devonian shale wells relative to photo lineament locations: A statistical analysis
[METC/CR-79/28] 26 p0260 N80-16410

DEPARTMENT OF ENERGY, PITTSBURGH, PA.
Stability studies of coal liquids
[PETC/TR-79/5] 26 p0257 N80-16129
Coal liquefaction with synthesis gas
[PETC/TR-79/1] 26 p0299 N80-20416
Trace and minor element analyses of coal liquefaction products
[PETC/TR-79/3] 26 p0299 N80-20417

DEPARTMENT OF ENERGY, WASHINGTON, D. C.
Coal liquefaction
[DOE/ET-0068/3] 26 p0258 N80-16183
Coal gasification
[DOE/ET-0067/3] 26 p0258 N80-16184
Environmental development plan: Underground coal gasification
[DOE/EDP-0047] 26 p0260 N80-16411
Overview of Federal wind energy program
26 p0261 N80-16454
Solar collector manufacturing activity
[DOE/EIA-0174/78] 26 p0265 N80-16500
Environmental development plan: Solar thermal power systems
[DOE/EDP-0035] 26 p0265 N80-16503
Federal photovoltaics utilization program
[DOE/EA-0087] 26 p0267 N80-16525
Hydrothermal electric and direct heat. Commercialization phase 3 planning
[DOE/ERD-0005] 26 p0269 N80-16545
Advanced electric generation. Commercialization in phase 3 planning
[DOE/ERD-0014] 26 p0269 N80-16547
Petroleum production at maximum efficient rate, Naval Petroleum Reserve no. 1 (Elk Hills), Kern County, California
[DOE/EIS-0012] 26 p0272 N80-16581
Issues concerning the light-duty diesel
[DOE/EV-0050/1] 26 p0290 N80-19510
Biomass energy systems: Environmental readiness document
[DOE/ERD-0021] 26 p0308 N80-20905
Environmental development plan: Coal extraction and preparation
[DOE/EDP-0050] 26 p0309 N80-20921
Environmental development plan for space applications
[DOE/EDP-0057] 26 p0309 N80-20922
Fusion technology development
[DOE/ET-0116/1] 26 p0311 N80-21165
Electric and hybrid vehicle program
[DOE/CS-0026/7] 26 p0311 N80-21204
Projections of enhanced oil recovery, 1985 - 1995
[DOE/EIA-0183/11] 26 p0314 N80-21824

DEPARTMENT OF THE TREASURY, WASHINGTON, D.C.
Experimental alcohol fuel plants
[ATF-P-5000-2] 26 p0283 N80-18203
Alcohol fuels information directory
[ATF-P-5000-3] 26 p0283 N80-18204

DEUTSCHER WETTERDIENST, OFFENBACH AM MAIN (WEST GERMANY).
Wind force analysis for the Federal Republic of Germany to determine the usefulness of wind power
[ISBN-3-88148-164-8] 26 p0281 N80-17635

DOW CHEMICAL CO., MIDLAND, MICH.
Energy from the situ processing of antrim oil shale
[FE-2346-44] 26 p0278 N80-17576

DOW CORNING CORP., MIDLAND, MICH.
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-162840] 26 p0292 N80-19617

DUBIN-BLOOME ASSOCIATES, NEW YORK.
Heat-pump-centered integrated community energy systems: System development
[ANL/CNSV/TM-8] 26 p0305 N80-20880

E

ECOLE POLYTECHNIQUE FEDERALE DE LAUSANNE (SWITZERLAND).
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

ECONOMICS, STATISTICS AND COOPERATIVES SERVICE, WASHINGTON, D. C.
Solar energy for agriculture: Review of research
[PB-298688/3] 26 p0271 N80-16568

ECOSYSTEMS, INC., MCLEAN, VA.
Potential for solar/conservation technologies in the state of Washington
[WAOENG-79-3] 26 p0317 N80-21859

EIC, INC., NEWTON, MASS.
Survey on metallurgical recycling processes
[ANL/OEPM-79-2] 26 p0282 N80-17918

ELECTRO-MECHANICAL RESEARCH, INC., SARASOTA, FLA.
DOE/NASA wind turbine data acquisition. Part 1: Equipment
[NASA-CR-159779] 26 p0275 N80-17543

ELTRA CORP., PLYMOUTH MEETING, PA.
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-7] 26 p0317 N80-21860

ENERGY AND ENVIRONMENTAL ANALYSIS, INC., ARLINGTON, VA.
Industrial fuel choice analysis model. Volume 2: Appendices to model documentation
[DOE/EIA-2832/1-VOL-2-APP] 26 p0299 N80-20419
Industrial Sector Technology Use Model (ISTUM): Industrial energy use in the United States, 1974 - 2000. Volume 2: Results
[DOE/FE-2344/2] 26 p0305 N80-20885
Adequacy analysis of air quality monitoring activities relevant to California thermal enhanced oil recovery fields
[SAN-12093-1] 26 p0309 N80-20929

ENERGY TECHNOLOGY, INC., CLEVELAND, OHIO.
Study of advanced radial outflow turbine for solar steam Rankine engines
[NASA-CR-159695] 26 p0263 N80-16483

ENGINEERING DEVELOPMENT ESTABLISHMENT, MARIBYRNONG (AUSTRALIA).
Laboratory investigation of the performance of a Holden engine operating on liquified petroleum gas
[AD-A076145] 26 p0284 N80-18411

ENGINEERING SOCIETIES COMMISSION ON ENERGY, INC., WASHINGTON, D. C.
Basic research in engineering: Fluid dynamics and thermal processes
[FE-2468-54] 26 p0301 N80-20551

ENVIRONMENTAL PROTECTION AGENCY, ANN ARBOR, MICH.
Light-duty diesel gaseous emissions measurement - comparison of dilution tunnel test results to certification cell test results
[PB80-115991] 26 p0310 N80-20945

EXXON ENTERPRISES, INC., SOMERVILLE, N.J.
The Exxon rechargeable cells
26 p0303 N80-20834

EXXON RESEARCH AND ENGINEERING CO., BAYTOWN, TEX.
Fluid coking of coal liquefaction residues: The fourth residue
[FE-2422-28] 26 p0289 N80-19304

F

FLORIDA UNIV., GAINESVILLE.
Studies of silicon p-n junction solar cells
[NASA-CR-162832] 26 p0291 N80-19609

FLUOR ENGINEERS AND CONSTRUCTORS, INC., IRVINE, CALIF.
Coal liquefaction test center
[FE-1517-78] 26 p0300 N80-20425

FOSTER-MILLER ASSOCIATES, INC., WALTHAM, MASS.
A 15kWe (nominal) solar thermal electric power conversion concept definition study: Steam Rankine reheat reciprocator system
[NASA-CR-159590] 26 p0264 N80-16491

FRANKLIN RESEARCH CENTER, PHILADELPHIA, PA.
First passive solar home awards
[DSE-1020-T17] 26 p0276 N80-17556

G

GARRETT CORP., TORRANCE, CALIF.
Advanced electric propulsion system concept for electric vehicles
[NASA-CR-159651] 26 p0282 N80-17916

GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C.
Federal demonstrations of solar heating and cooling on private residences: Only limited success
[PB-301123/6] 26 p0270 N80-16555
Analysis of current trends in U.S. petroleum and natural gas production
[PB80-116056] 26 p0301 N80-20800
How to burn coal efficiently and economically, and meet air pollution requirements: The fluidized-bed combustion process
[PB80-107501] 26 p0308 N80-20911
Geothermal energy: Obstacles and uncertainties impede its widespread use
[PB80-134430] 26 p0315 N80-21827
Hydropower, an energy source whose time has come again
[PB80-127715] 26 p0320 N80-21886

GENERAL ATOMIC CO., SAN DIEGO, CALIF.
Fixed mirror solar concentrator for application to a 100 MW(e) electric generating plant
[GA-A-15340] 26 p0266 N80-16508
Installation and startup of the fixed mirror solar concentrator collector field subsystem
[GA-A-15344] 26 p0306 N80-20888

GENERAL DYNAMICS CORP., SAN DIEGO, CALIF.
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443

GENERAL ELECTRIC CO., PHILADELPHIA, PA.
Coupled generator and combustor performance calculations for potential early commercial MHD power plants
26 p0220 A80-25099
The General Electric MOD-1 wind turbine generator program
26 p0261 N80-16456
Prototype solar heating and combined heating cooling systems
[NASA-CR-161340] 26 p0264 N80-16485
Appendix: MOD-1 wind turbine generator analysis and design report, volume 2
[NASA-CR-159496] 26 p0286 N80-18565
Mod 1 wind turbine generator failure modes and effects analysis
[NASA-CR-159494] 26 p0303 N80-20864

GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
Groundwater quality monitoring of western oil shale development. Identification and priority ranking of potential pollution sources
[PB-300536/0] 26 p0272 N80-16623

GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
Low cost point focus solar concentrator. Phase 1: Preliminary design
[JPL-9950-273] 26 p0292 N80-19622
Screening evaluation of electric power cycles integrated with coal gasification plants
[EPRI-AF-1160] 26 p0295 N80-19646

GEOLOGICAL SURVEY, ALBUQUERQUE, N. MEX.
Bibliography of geology and hydrology, eastern New Mexico
[PB-300832/3] 26 p0273 N80-16663

GEOLOGICAL SURVEY, RESTON, VA.
Energy Research Information System (ERIS) projects report, volume 4, number 1
[PB-300338/1] 26 p0270 N80-16561

GEORGIA INST. OF TECH., ATLANTA.
Optical and thermal effects in linear solar concentrating collectors
26 p0275 N80-17541

GILBERT ASSOCIATES, INC., READING, PA.
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096

GINER, INC., WALTHAM, MASS.
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557

GORHAM INTERNATIONAL, INC., MAINE.
Assessment of the technical and economic feasibility of converting wood residues to liquid and gaseous fuel products using state-of-the-art and advanced coal conversion technology
[COO-4862-3] 26 p0258 N80-16189

GOUGEON BROS., INC., BAY CITY, MICH.
The use of wood for wind turbine blade construction
26 p0262 N80-16474

GRACE (W. R.) AND CO., MEMPHIS, TENN.
Synthesis gas demonstration plant program, phase 1
[FE-25770-6] 26 p0289 N80-19308

GRUY FEDERAL, INC., ARLINGTON, VA.
Oil and gas replacement cost: Development and production. Volume 1: Discussion of methodology, exhibits, and projections
[DOE/TIC-10078] 26 p0258 N80-16187

GTE LABS., INC., WALTHAM, MASS.
Lithium thionyl chloride high rate discharge
26 p0303 N80-20830

H

HAMILTON STANDARD, WINDSOR LOCKS, CONN.
System configuration improvement
26 p0263 N80-16481
Cost of energy evaluation
26 p0263 N80-16482

HONEYWELL, INC., MINNEAPOLIS, MINN.
Qualification test procedures and results for Honeywell solar collector subsystem, single-family residence
[NASA-CR-161382] 26 p0302 N80-20813
Solar energy heating system design package for a single-family residence at New Castle, Pennsylvania
[NASA-CR-161356] 26 p0303 N80-20865
Solar heating system design package for a single-family residence at William O'Brien State Park, Minnesota
[NASA-CR-161357] 26 p0303 N80-20866

HUGHES AIRCRAFT CO., FULLERTON, CALIF.
Methods for manufacturing heat pipes for circuit cards
[AD-A080188] 26 p0314 N80-21707

HUGHES AIRCRAFT CO., LOS ANGELES, CALIF.
High efficiency solar panel, phase 2, gallium arsenide
[AD-A079635] 26 p0316 N80-21838

HYDROCARBON RESEARCH, INC., LAWRENCEVILLE, N. J.
Development of a fast fluid bed gasifier, task 2 and 3
[FE-2361-40] 26 p0289 N80-19306

I

IBM FEDERAL SYSTEMS DIV., HUNTSVILLE, ALA.
Outdoor test for thermal performance evaluation of the Owens-Illinois Sunpack SEC-601 (air) solar collector
[NASA-CR-161339] 26 p0264 N80-16492
Solar energy system performance evaluation: Seasonal report for SEMCO, Loxahatchee, Florida
[NASA-CR-161379] 26 p0293 N80-19627
Solar energy system performance evaluation: A seasonal report for SEMCO, Macon, Georgia
[NASA-CR-161380] 26 p0293 N80-19629

Solar energy system performance evaluation: Seasonal report for IBM System 2, Togus, Maine
[NASA-CR-161383] 26 p0315 N80-21836

IDAHO NATIONAL ENGINEERING LAB., IDAHO FALLS.
Commercial prototype design of a solar heating/cooling system for a manufactured home
[TREE-1384] 26 p0267 N80-16520
Today's geothermal power economics and risks
[CONF-790803-44] 26 p0277 N80-17558

ILLINOIS UNIV. AT CHICAGO CIRCLE, CHICAGO.
Nonideal compensation in MHD generators
26 p0310 N80-21149

ILLINOIS UNIV. AT URBANA-CHAMPAIGN.
Energy conservation in the U.S. economy from increased recycle of obsolete steel scrap
26 p0290 N80-19492

ILLINOIS UNIV., CHICAGO.
Thermal fluid selection for long-distance heat transmission
[CONF-790803-47] 26 p0305 N80-20879

ILLINOIS UNIV., URBANA.
Direct energy conversion systems
[COO-2218-117] 26 p0269 N80-16543

IMPERIAL COLL. OF SCIENCE AND TECHNOLOGY, LONDON (ENGLAND).
Design of nonimaging concentrators as second stages in tandem with image-forming first-stage concentrators
26 p0253 A80-32021

INDUSTRIAL ENVIRONMENTAL RESEARCH LAB., RESEARCH TRIANGLE PARK, N. C.
Pollution control practices, fuel conversion and its environmental effects
[PB80-119704] 26 p0320 N80-21896

INSTITUT DE RECHERCHE DE L'HYDRO-QUEBEC, VARENNES (CANADA).
Results of a utility survey of the status of large wind turbine development
26 p0263 N80-16479

INSTITUT FRANCAIS DU PETROLE, RUEIL-MALMAISON.
Storing hydrogen in the form of light alloy hydrides
[IFP-26-209] 26 p0274 N80-17246

INSTITUTE FOR ENERGY ANALYSIS, OAK RIDGE, TENN.
Energy accounting for solar and alternative energy sources
[ORAU/IEA-79-11(M)] 26 p0295 N80-19647
Are the alternative energy stategies achievable?
[ORAU/IEA-79-15(O)] 26 p0318 N80-21863

INSTITUTE OF GAS TECHNOLOGY, CHICAGO, ILL.
Solar-MEC development program, project 9103
[COO-4495-7] 26 p0267 N80-16522
High-temperature molten salt thermal energy storage systems
[NASA-CR-159663] 26 p0275 N80-17547
Environmental assessment of the HYGAS process. Volume 1: HYGAS environmental characterization, data synthesis, analysis, and interpretation, tests 37 - 64
[FE-2433-25-VOL-1] 26 p0289 N80-19305
Synthetic fuels from peat gasification
[CONF-790803-55] 26 p0298 N80-20412

INTERNATIONAL NICKEL CO., INC., SUFFERN, N. Y.
Evaluation of high chromium overlays to protect less alloyed substrates from corrosion in a coal gasification atmosphere
[FE-2621-5] 26 p0313 N80-21520

INTERNATIONAL SCIENCE AND TECHNOLOGY INST., INC., WASHINGTON, D. C.
Hydro for the eighties: Bringing hydroelectric power to low income people, the work book. A slide presentation: Audio cassette and workbook
[PB80-103948] 26 p0319 N80-21683

J

JAY - CARTER ENTERPRISES, INC., BURKBURNETT, TEX.
A 15 kWe (nominal) solar thermal-electric power conversion concept definition study: Steam Rankin reciprocator system
[NASA-CR-159591] 26 p0291 N80-19612

JET PROPULSION LAB., CALIFORNIA INST. OF TECH., PASADENA.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
Storage, transmission and distribution of hydrogen
26 p0194 A80-23103
The influence of a voltage ramp on the measurement of I-V characteristics of a solar cell
26 p0247 A80-29817
The spectral response of a front surface field solar cell
26 p0254 A80-32331
The effects of titanium impurities in N/+//P silicon solar cells
26 p0256 A80-32503
Evaluation of concentrated space solar arrays using computer modeling
[NASA-CR-162681] 26 p0264 N80-16487
Semiconductor grade, solar silicon purification project
[NASA-CR-162746] 26 p0264 N80-16495
Proceedings of the 13th Project integration meeting
[NASA-CR-162787] 26 p0276 N80-17549
Characterization of deliberately nickel-doped silicon wafers and solar cells
[NASA-CR-162790] 26 p0276 N80-17551
Assessment of low-cost manufacturing process sequences
[NASA-CR-162745] 26 p0278 N80-17575
Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287
LSA field test
[NASA-CR-162798] 26 p0291 N80-19611
Develop silicone encapsulation systems for terrestrial silicon solar arrays
[NASA-CR-162840] 26 p0292 N80-19617
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620
High temperature solar thermal receiver
[NASA-CR-162831] 26 p0292 N80-19621
Low cost point focus solar concentrator. Phase 1: Preliminary design
[JPL-9950-273] 26 p0292 N80-19622
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623
Low cost point focus solar concentrator, phase 1
[NASA-CR-162848] 26 p0292 N80-19624
Low-cost point-focus solar concentrator, phase 1
[NASA-CR-162839] 26 p0293 N80-19625
Annual technical report, fiscal year 1979. Volume 1: Executive summary
[NASA-CR-159715] 26 p0293 N80-19632
The effects of regional insolation differences upon advanced solar thermal electric power plant performance and energy costs
[NASA-CR-162886] 26 p0294 N80-19634
Characterization of prototype secondary lithium battery
26 p0303 N80-20832
Test and evaluation report of the ERDC Hybrid-Electric Van (HEVAN)
[DOE/TIC-10232] 26 p0312 N80-21210
General sensitivity analysis of solar thermal-electric plants
26 p0313 N80-21379
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833

JUNIATA COLL., HUNTINGDON, PA.
Study of hydrocarbon-shale interaction
[ORO-5197-14] 26 p0260 N80-16409

K

KAISER ALUMINUM AND CHEMICAL CORP., PLEASANTON, CALIF.
Energy savings through use of an improved reduction cell cathode
[SAN-1257-T2] 26 p0267 N80-16515

KAMAN AEROSPACE CORP., BLOOMFIELD, CONN.
Large, low cost composite wind turbine blades
26 p0263 N80-16475
Design, fabrication, test, and evaluation of a prototype 150-foot long composite wind turbine blade
[NASA-CR-159775] 26 p0276 N80-17548

KDI SCORE, INC., COCKEYSVILLE, MD.
Improved thermal battery
[AD-A075835] 26 p0276 N80-17554

KENTUCKY UNIV., LEXINGTON.
Experimental laboratory measurement of thermophysical properties of selected coal types
[NASA-CR-162913] 26 p0298 N80-20404

L

LAND-AIR, INC., BETHESDA, MD.
Engineering evaluation of control technology for H-Coal and Exxon donor solvent processes
[PB80-108566] 26 p0297 N80-19678
LAND-AIR, INC., HOLLOMAN, N. MEX.
Control technologies for particulate and tar emissions from coal converters
[PB80-108392] 26 p0310 N80-20949
Hot gas cleanup process
[PB80-108467] 26 p0310 N80-20950
LEHIGH UNIV., BETHLEHEM, PA.
Centrifugal fluidized combustion of coal
[FE-2516-9] 26 p0288 N80-19293
Methanol and methyl fuel catalysts
[FE-3177-4] 26 p0288 N80-19302
LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
Flywheel energy storage and conversion system for photovoltaic applications
[COO-4094-57] 26 p0265 N80-16501
Solar photovoltaic field tests and applications project
[COO-4094-26] 26 p0266 N80-16512
On influencing the operating temperatures of Motorola and Arco solar photovoltaic modules
[COO-4094-59] 26 p0295 N80-19649
LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS.
Wind energy in the mountains of New Hampshire as a potential energy source for Portsmouth Naval Shipyard
[AD-A076975] 26 p0303 N80-20868
LOCKHEED AIRCRAFT SERVICE, INC., ONTARIO, CALIF.
Evaluation of an operating MOD-OA 200 kW wind turbine blade
26 p0262 N80-16471
LOCKHEED MISSILES AND SPACE CO., SUNNYVALE, CALIF.
Evaluation of selective absorbers
[TP-5461] 26 p0317 N80-21851
LOS ALAMOS SCIENTIFIC LAB., N. MEX.
Safety of liquid hydrogen in air transportation
[LA-UR-79-1416] 26 p0259 N80-16236
Characterization of crushed glass as a transpired air heating solar collector material
[LA-UR-79-1336] 26 p0265 N80-16498
Production of synthetic gas from nuclear energy sources
[LA-7592-MS] 26 p0274 N80-17244
Characterization and assessment of selected solar thermal energy systems for residential and process heat applications
[LA-7995-TASE] 26 p0295 N80-19648
The 1-GWh diurnal load-leveling superconducting magnetic energy storage system reference design. Appendix C: Dewar and structural support
[LA-7885-MS-VOL-6] 26 p0307 N80-20897
Solar energy research at LASL
[LA-7741-PR] 26 p0318 N80-21872
LOUGHBOROUGH UNIV. OF TECHNOLOGY (ENGLAND).
Hydrogen as a fuel
[TT-7903] 26 p0283 N80-18212
LUMMUS CO., BLOOMFIELD, N. J.
Solvent refined coal process: Data correlation and analysis
[EPRI-AP-1157] 26 p0313 N80-21557

M

MAGNETIC CORP. OF AMERICA, WALTHAM, MASS.
Magnetohydrodynamic (MHD) magnet modeling
[AD-A078865] 26 p0290 N80-19443
MASCHINENFABRIK AUGSBURG-NUERNBERG A.G., AUGSBURG (WEST GERMANY).
Large wind energy converter: Growian 3 MW
26 p0261 N80-16461
MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
Independent assessment of energy policy models
[EPRI-EA-1071] 26 p0266 N80-16510
Wave power extraction by floating bodies
[AD-A078058] 26 p0294 N80-19637
Combustion and operating characteristics of spark-ignition engines
[NASA-CR-162896] 26 p0298 N80-20340
MASSACHUSETTS UNIV., AMHERST.
The application of chromatography and ancillary techniques to the characterization of shale oil/oil shale compound classes and of organometallics
26 p0282 N80-18125
MCELROY (RALPH) CO., AUSTIN, TEX.
Production of methane using an anaerobic filter
[ANL-TRANS-1164] 26 p0300 N80-20428
MIAMI UNIV., CORAL GABLES, FLA.
Information theory applied to solar radiation concentrators
26 p0275 N80-17539
MICHIGAN UNIV., ANN ARBOR.
Coping with energy limitations in transportation: Proposals for Michigan
[PB-299737/7] 26 p0270 N80-16559
MIDWEST RESEARCH INST., GOLDEN, COLO.
Soil fertility and soil loss constraints on crop residue removal for energy production
[SERI/RR-52-324] 26 p0266 N80-16511
Objectives and strategies of the International Photovoltaic Program Plan
[SERI/TR-52-250] 26 p0266 N80-16513
Proceedings: Photovoltaics user Review Panel
[SERI/TP-69-276] 26 p0266 N80-16514
Performance characteristics of a commercially available point-focus solar power
[SERI/TP-34-169] 26 p0268 N80-16529
Photovoltaic Materials and Device Measurements Workshop: Focus on polycrystalline thin film cells
[SERI/TP-49-185] 26 p0268 N80-16538
State-of-the-art of solar control systems in industrial process heat applications
[SERI/TP-39-240] 26 p0277 N80-17562
Overview of developing programs in solar desiccant cooling for residential buildings
[SERI/TP-34-187] 26 p0278 N80-17569
Aerosols and solar energy
[SERI/TP-36-309] 26 p0278 N80-17573
General reliability and safety methodology and its application to wind energy conversion systems
[SERI/TR-35-234] 26 p0294 N80-19645
Survey of biomass gasification. Volume 1: Synopsis and executive summary
[SERI/TR-33-239-VOL-1] 26 p0300 N80-20427
Conversion system overview assessment. Volume 1: Solar thermoelectrics
[SERI/TR-35-078-VOL-1] 26 p0305 N80-20882
Wind energy information directory
[SERI/SP-69-290] 26 p0305 N80-20883
Wind energy systems
[SERI/PR-351-480] 26 p0306 N80-20892
Optical analysis and optimization of line focus collectors
[SERI/TR-34-092] 26 p0306 N80-20893
Analysis of a heat exchanger-thermoelectric generator system
[SERI/TP-35-253] 26 p0316 N80-21848
Solar pond for industrial process heat
[SERI/TD-351-460] 26 p0319 N80-21876
Low cost performance evaluation of passive solar buildings
[SERI/RR-63-223] 26 p0319 N80-21877
MISSOURI UNIV. -ROLLA.
Chemical and physical stability of refractories for use in coal gasification
[COO-2904-14] 26 p0300 N80-20429
MITRE CORP., MCLEAN, VA.
A review of standards of performance for new stationary sources: Petroleum refineries
[PB-300480/1] 26 p0272 N80-16602
Outer continental shelf environment monitoring concerns
[PB-299861/5] 26 p0273 N80-16625
Status of the DOE battery and electrochemical technology program
[MTR-8026] 26 p0307 N80-20902
MOBIL RESEARCH AND DEVELOPMENT CORP., PAULSBORO, N. J.
Development studies on selected conversion of synthesis gas from coal to high octane gasoline
[FE-2276-27] 26 p0259 N80-16190
MOBIL RESEARCH AND DEVELOPMENT CORP., PRINCETON, N. J.
Exploratory studies in catalytic coal liquefaction
[EPRI-AF-1184] 26 p0299 N80-20422

MOTOROLA, INC., PHOENIX, ARIZ.
Silicon ribbon growth using scanned lasers
26 p0229 A80-27337
Low-cost structures for photovoltaic arrays
[SAND-79-7006] 26 p0268 N80-16537
Market definition study of photovoltaic power for remote villages in the United States
[NASA-CR-159800] 26 p0302 N80-20812

N

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL, WASHINGTON, D. C.
Hydrogen as a fuel
26 p0257 N80-16177

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
Just over the horizon in space
26 p0256 A80-32511
Control strategy for a variable-speed wind energy conversion system
[NASA-TM-75512] 26 p0285 N80-18558
Overview of NASA battery technology program
26 p0302 N80-20821
A global biogeocenotical biosphere simulation
[NASA-TM-76042] 26 p0309 N80-20920
Storage peak gas-turbine power unit
[NASA-TM-75757] 26 p0314 N80-21755

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. EARTH RESOURCES LABS., BAY ST. LOUIS, MISS.
Energy from aquatic plant wastewater treatment systems
[NASA-TM-X-72733] 26 p0275 N80-17545

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.
A fluorescent radiation converter
[NASA-CASE-GSC-12528-1] 26 p0283 N80-18261
A linear magnetic motor/generator
[NASA-CASE-GSC-12518-1] 26 p0290 N80-19424
The 1979 Goddard Space Flight Center Battery Workshop
[NASA-CP-2117] 26 p0302 N80-20820
Life test results of the NASA standard 20 ampere hour cells
26 p0303 N80-20846

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEX.
Orbiter fuel cell performance constraints. STS/OPS Pratt Whitney fuel cells. Operating limits for mission planning
[NASA-TM-80958] 26 p0291 N80-19610

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, LANGLEY STATION, VA.
Durability of foam insulation for LH2 fuel tanks of future subsonic transports
26 p0191 A80-22687
Airborne spacecraft - A remotely powered, high-altitude RPV for environmental applications
26 p0228 A80-26820
Aeroelastic equations of motion of a Darrieus vertical-axis wind-turbine blade
[NASA-TM-79295] 26 p0284 N80-18446
The role of technology as air transportation faces the fuel situation
[NASA-TM-81793] 26 p0297 N80-20260
Combined solar collector and energy storage system
[NASA-CASE-LAR-12205-1] 26 p0302 N80-20810

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LEWIS RESEARCH CENTER, CLEVELAND, OHIO.
Oxygen-enriched air for MHD power plants
26 p0220 A80-25096
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[AIAA 80-0607] 26 p0237 A80-28804
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[AIAA 80-0638] 26 p0241 A80-28835
Teetered, tip-controlled rotor - Preliminary test results from Mod-0 100-kW experimental wind turbine
[AIAA 80-0642] 26 p0241 A80-28836
Large Wind Turbine Design Characteristics and R and D Requirements
[NASA-CP-2106] 26 p0260 N80-16453
Design evolution of large wind turbine generators
26 p0261 N80-16455
Structural analysis considerations for wind turbine blades
26 p0262 N80-16469
Blade design and operating experience on the MOD-OA 200 kW wind turbine at Clayton, New Mexico
26 p0262 N80-16470
Design, fabrication, and test of a steel spar wind turbine blade
26 p0262 N80-16472
Simulation studies of multiple large wind turbine generators on a utility network
26 p0263 N80-16480
Preliminary analysis of performance and loads data from the 2-megawatt mod-1 wind turbine generator
[NASA-TM-81408] 26 p0264 N80-16494
Comments on TEC trends
[NASA-TM-79317] 26 p0273 N80-16885
Experiments on H2-O2MHD power generation
[NASA-TM-81424] 26 p0273 N80-16886
Performance sensitivity analysis of Department of Energy-Chrysler upgraded automotive gas turbine engine, S/N 5-4
[NASA-TM-79242] 26 p0274 N80-17467
Economic analysis of the design and fabrication of a space qualified power system
[NASA-TM-81418] 26 p0282 N80-18098
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
[NASA-TM-81385] 26 p0282 N80-18156
Effects of impurities in coal-derived liquids on accelerated hot corrosion of superalloys
[NASA-TM-81384] 26 p0283 N80-18157
Initial characterization of an Experimental Referee Broadened-Specification (ERBS) aviation turbine fuel
[NASA-TM-81440] 26 p0283 N80-18205
Effect of geometry and operating conditions on spur gear system power loss
[NASA-TM-81426] 26 p0284 N80-18406
Numerical calculation of steady inviscid full potential compressible flow about wind turbine blades
[NASA-TM-81438] 26 p0284 N80-18497
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-4] 26 p0285 N80-18555
Flexible formulated plastic separators for alkaline batteries
[NASA-CASE-LEW-12363-3] 26 p0285 N80-18556
Catalyst surfaces for the chromous/chromic redox couple
[NASA-CASE-LEW-13148-2] 26 p0285 N80-18557
Teetered, tip-controlled rotor: Preliminary test results from Mod-0 100-kW experimental wind turbine
[NASA-TM-81445] 26 p0291 N80-19613
Installation and checkout of the DOE/NASA Mod-1 2000-kW wind turbine generator
[NASA-TM-81444] 26 p0292 N80-19614
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary
[NASA-TM-81400] 26 p0293 N80-19626
Effect of water injection and off scheduling of variable inlet guide vanes, gas generator speed and power turbine nozzle angle on the performance of an automotive gas turbine engine
[NASA-TM-81415] 26 p0298 N80-20272
Factors affecting cleanup of exhaust gases from a pressurized, fluidized-bed coal combustor
[NASA-TM-81439] 26 p0301 N80-20532
Supporting research and technology for automotive Stirling engine development
[NASA-TM-81495] 26 p0311 N80-21200
Fuel economy screening study of advanced automotive gas turbine engines
[NASA-TM-81433] 26 p0311 N80-21201
Parametric tests of a traction drive retrofitted to an automotive gas turbine
[NASA-TM-81457] 26 p0314 N80-21754
Flame tube parametric studies for control of fuel bound nitrogen using rich-lean two-stage combustion
[NASA-TM-81472] 26 p0315 N80-21837

Potentialities of TEC topping: A simplified view of parametric effects
[NASA-TM-81468] 26 p0321 N80-22083

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.

Space disposal of nuclear wastes
26 p0246 A80-29448

Aluminium or copper substrate panel for selective absorption of solar energy
[NASA-CASE-MFS-23518-3] 26 p0260 N80-16452

Fiscal year 1979 scientific and technical reports, articles, papers and presentations
[NASA-TM-78250] 26 p0274 N80-17014

Solar energy control system
[NASA-CASE-MFS-25287-1] 26 p0275 N80-17544

Installation guidelines for solar heating system, single-family residence at New Castle, Pennsylvania
[NASA-CR-161355] 26 p0293 N80-19630

Wind wheel electric power generator
[NASA-CASE-MFS-23515-1] 26 p0315 N80-21828

Amplified wind turbine apparatus
[NASA-CASE-MFS-23830-1] 26 p0315 N80-21831

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. PASADENA OFFICE, CALIF.

Microwave power transmission beam safety system
[NASA-CASE-NPO-14224-1] 26 p0283 N80-18287

NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.

Helium research in support of superconducting power transmission
[PB80-116502] 26 p0314 N80-21697

NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.

Silicon ribbon growth using scanned lasers
26 p0229 A80-27337

An investigation of preferences for various types of energy cost feedback
[PB-300314/2] 26 p0270 N80-16560

Performance of a packaged solar space-heating system used with a mobile home
[PB-300890/1] 26 p0272 N80-16572

Measurement techniques for high power semiconductor materials and devices
[DOE/RA-0041] 26 p0301 N80-20506

Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

NATIONAL CLIMATIC CENTER, ASHEVILLE, N. C.

Input data for solar systems
[DOE/TIC-10193-REV-1] 26 p0265 N80-16504

NATIONAL RESEARCH COUNCIL OF CANADA, OTTAWA (ONTARIO).

Design characteristics of the 224 kW Magdalen Islands VAWT
26 p0261 N80-16463

NATIONAL SWEDISH BOARD FOR ENERGY SOURCE DEVELOPMENT, SPANGA.

Specification, siting and selection of large WECS prototypes
26 p0261 N80-16459

NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA.

Alcohol fuels. Citations from the American petroleum institute data base
[NTIS/PS-79/0911/2] 26 p0259 N80-16195

Solar energy concentrator design and operations. Citations from the NTIS data base
[NTIS/PS-79/0926/0] 26 p0270 N80-16557

Solar energy concentrator design and operations. Citations from the Engineering Index data base
[NTIS/PS-79/0927/8] 26 p0270 N80-16558

Energy policy and research planning, volume 3. A bibliography with abstracts
[NTIS/PS-79/1069/8] 26 p0271 N80-16563

Flat plate solar collector design and performance. Citations from the NTIS data base
[NTIS/PS-79/0928/6] 26 p0271 N80-16566

Flat plate solar collector design and performance. Citations from the Engineering Index data base
[NTIS/PS-79/0929/4] 26 p0271 N80-16567

Heliostat system design and operation. Citations from the Engineering Index data base
[NTIS/PS-79/0930/2] 26 p0271 N80-16571

Electric automobiles. Citations from the NTIS data base
[NTIS/PS-79/0990/6] 26 p0274 N80-16976

Thermal energy storage, volume 2. Citations from the NTIS data base
[NTIS/PS-79/0952/6] 26 p0279 N80-17584

Thermal energy storage, volume 1. Citations from the NTIS data base
[NTIS/PS-79/0951/8] 26 p0279 N80-17585

Thermal energy storage, volume 1. Citations from the Engineering Index data base
[NTIS/PS-79/0953/4] 26 p0279 N80-17586

Thermal energy storage, volume 2. Citations from the Engineering Index data base
[NTIS/PS-79/0954/2] 26 p0279 N80-17587

Silicon solar cells, volume 3. Citations from the Engineering Index data base
[PB80-800717] 26 p0280 N80-17588

Silicon solar cells, volume 3. Citations from the NTIS data base
[PB80-800691] 26 p0280 N80-17589

Silicon solar cells, volume 2. Citations from the Engineering Index data base
[PB80-800709] 26 p0280 N80-17590

Design and applications of flywheels, volume 1. Citations from the NTIS data base
[PB80-800303] 26 p0280 N80-17591

Design and applications of flywheels, volume 2. Citations from the NTIS data base
[PB80-800311] 26 p0280 N80-17592

Design and applications of flywheels. Citations from the Engineering Index data base
[P80-800329] 26 p0280 N80-17593

Combined cycle power generation. Citations from the NTIS data base
[PB80-800915] 26 p0280 N80-17594

Combined cycle power generation. Citations from the Engineering Index data base
[P80-800923] 26 p0280 N80-17595

Cadmium sulfide solar cells, volume 1. Citations from the NTIS data base
[PB80-802218] 26 p0296 N80-19656

Solar electric power generation, volume 3. Citations from the Engineering Index data base
[PB80-803034] 26 p0296 N80-19657

Solar electric power generation, volume 2. Citations from the NTIS data base
[PB80-803000] 26 p0296 N80-19658

Solar electric power generation, volume 3. Citations from the NTIS data base
[PB80-803018] 26 p0296 N80-19659

Solar electric power generation, volume 2. Citations from the Engineering Index data base
[PB80-803026] 26 p0296 N80-19660

Solar sea power plants. Citations from the NTIS data base
[PB80-802580] 26 p0297 N80-19661

Solar sea power plants. Citations from the Engineering Index data base
[PB80-802598] 26 p0297 N80-19662

Solar water pumps. Citations from the Engineering Index data base
[PB80-802531] 26 p0308 N80-20910

NATIONAL ZOOLOGICAL PARK, WASHINGTON, D.C.

National solar heating and cooling programs
[PB80-104987] 26 p0309 N80-20915

NAVAL CIVIL ENGINEERING LAB., PORT HUENEME, CALIF.

Solar-powered sun tracker
[AD-A078653] 26 p0294 N80-19640

NAVAL POSTGRADUATE SCHOOL, MONTEREY, CALIF.

Performance analysis of a type of electrohydrodynamic power generator
[AD-A076115] 26 p0283 N80-18307

Solar energy design improvement: A methodology for hydronic flatplate collector systems
[AD-A076836] 26 p0286 N80-18567

Waste heat recovery unit design for gas turbine propulsion systems
[AD-A078154] 26 p0290 N80-19503

NEVADA BUREAU OF MINES AND GEOLOGY, RENO.

Assessment of low- to moderate-temperature geothermal resources of Nevada
[NVO-01556-1] 26 p0301 N80-20792

NEW MEXICO ENERGY INST., LAS CRUCES.

Addition of an air-cooled collector test capability to the solar collector test facility
[PB-300482/7] 26 p0270 N80-16562

Feasibility study of geothermal energy for heating greenhouses
[PB-299517/3] 26 p0271 N80-16569

An economical solar heated and cooled residence for southern New Mexico
[PB80-108616] 26 p0309 N80-20914

NEW MEXICO UNIV., ALBUQUERQUE.
Solar powered liquid piston Stirling cycle irrigation pump
[SAN-1894-1] 26 p0294 N80-19641
Solar ponds for residential heating, heat extraction from a salt gradient solar pond
[PB80-108624] 26 p0308 N80-20913

NORTH CAROLINA STATE UNIV. AT RALEIGH.
Comparison of theoretical and experimental solar cell performance
26 p0301 N80-20806

NORTH CAROLINA UNIV. AT CHAPEL HILL.
Evaluation of a photochemical system for nitrogen oxides control
26 p0287 N80-18583

O

OAK RIDGE ASSOCIATED UNIVERSITIES, TENN.
Limits to energy modeling
[ORAU/IEA-79-16(0)] 26 p0308 N80-20907

OAK RIDGE NATIONAL LAB., TENN.
Fossil energy program
[ORNL-5487] 26 p0266 N80-16506
Perspective on world energy
[DOE/TIC-10273] 26 p0307 N80-20898
Outgassing behavior of carbon-bonded carbon-fiber thermal insulation
[CONF-790625-8] 26 p0313 N80-21456
Molten carbonate fuel cell program: EMF and temperature relaxation in LiKCO 3 tiles, transference cell measurements
[ORNL/TM-7003] 26 p0318 N80-21865

OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D. C.
Gasohol: A technical memorandum
[PB80-105885] 26 p0259 N80-16194
Benefits of increased use of continuous casting by the United States steel industry
[PB80-104904] 26 p0314 N80-21612

OKLAHOMA STATE UNIV., STILLWATER.
Photochemical conversion of coal to gasoline in an entrained bed reactor
26 p0283 N80-18202
Photochemical conversion of coal to gasoline in an entrained bed reactor
[ORO-5020-T1] 26 p0299 N80-20415

OKLAHOMA UNIV., NORMAN.
Lateral and tilt whirl modes of flexibly mounted flywheel systems
26 p0259 N80-16215
Analysis of the geothermal binary cycle using paraffin hydrocarbons as working fluids
26 p0285 N80-18553
Energy from the west: Impact analysis report. Volume 2. Site-specific and regional impact analyses
[PB80-113574] 26 p0296 N80-19655
Energy from the west: Impact analysis report. Volume 1: Introduction and summary
[PB80-113566] 26 p0319 N80-21884

OLD WEST REGIONAL COMMISSION, BILLINGS, MONT.
Energy Research Information System (ERIS) projects report, volume 4, number 1
[PB-300338/1] 26 p0270 N80-16561

OPEN UNIV., MILTON (ENGLAND).
Report on the gas supply industry
[ERG-027] 26 p0286 N80-18579

P

PARAGON PACIFIC, INC., EL SEGUNDO, CALIF.
Wind Energy System Time-domain (WEST) analyzers using hybrid simulation techniques
[NASA-CR-159737] 26 p0308 N80-20909

PARSONS-BRINCKERHOFF-TUDOR-BECHTEL, SAN FRANCISCO, CALIF.
Potential hydroelectric power, vertical turbine, spillway combine Broadwater Dam
[DOE/ID-01822-1] 26 p0295 N80-19651

PEDCO-ENVIRONMENTAL, INC., CINCINNATI, OHIO.
Overview of pollution from combustion of fossil fuels in boilers of the United States
[PB80-124969] 26 p0320 N80-21912

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
Performance of a solar energy-assisted heat pump heating system: Analysis and correlation of field-collected data
[COO-2704-T1] 26 p0318 N80-21875

PENNSYLVANIA UNIV., PHILADELPHIA.
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-162904] 26 p0302 N80-20814

PHYSICAL SCIENCES, INC., WOBURN, MASS.
Coal processing fuel cell utilization. Task 8: H2S removal by calcium-based sorbents
[PSI-TR-167] 26 p0288 N80-19300
Performance model for molten carbonate fuel cells
[TR-190] 26 p0305 N80-20884

PLANCO, INC., DALLAS, TEX.
Survey of the research into energy-economic interactions. Volume 2: Annotated bibliography
[DOE/TIC-10134-VOL-2] 26 p0281 N80-17909

PRINCETON UNIV., N. J.
Combustion of multicomponent fuel droplets
[COO-4449-2] 26 p0257 N80-16126

PHOTOTECH, INC., NEWTON HIGHLANDS, MASS.
Energy savings by means of fuel cell electrodes in electro-chemical industries
[COO-4881-6] 26 p0318 N80-21870

PURDUE UNIV., LAFAYETTE, IND.
Systems studies of coal conversion processes using a reference simulator
[FE-2275-11] 26 p0289 N80-19307

R

REAL ESTATE RESEARCH CORP., CHICAGO, ILL.
Marketing and market acceptance data from the Residential Solar Demonstration Program. Volume 1: Detailed analysis, autumn 1979
[PB80-115298] 26 p0311 N80-21197

RENSSELAER POLYTECHNIC INST., TROY, N. Y.
A comparative study of the energy alternatives for the State of New York
26 p0302 N80-20807

RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors, task 1 report
[SAND-78-7032] 26 p0269 N80-16550
Development of high efficiency, low cost ZnSiAs2 solar cells.
[DOE/ET-23001/T1] 26 p0278 N80-17572
Pollutants from synthetic fuels production: Sampling and analysis methods for coal gasification
[PB80-104656] 26 p0289 N80-19309
Symposium Proceedings: Environmental Aspects of Fuel conversion technology, IV
[PB80-134729] 26 p0320 N80-21913

RESOURCES FOR THE FUTURE, INC., WASHINGTON, D. C.
Contributions to the foundations of supply for energy and transportation: Concepts, economics, and technologies
[PB-300541/0] 26 p0269 N80-16554
Environmental system study on the development of fossil fuel resources in the Southwest
[PB-300526/1] 26 p0272 N80-16596

ROCKWELL INTERNATIONAL CORP., CANOGA PARK, CALIF.
Advanced development of a short-residence-time hydrogasifier
[FE-3125-5] 26 p0299 N80-20414

ROYAL AIRCRAFT ESTABLISHMENT, FARNBOROUGH (ENGLAND).
Photovoltaic conversion research and development in the United Kingdom
[RAE-TM-SPACE-247] 26 p0279 N80-17583

ROYAL INST. OF TECH., STOCKHOLM (SWEDEN).
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885

S

SAN DIEGO STATE UNIV., CALIF.
Research on dynamics of tundra ecosystems and their potential response to energy resource development
[DOE/SF-01525/1] 26 p0294 N80-19642

SANDERS ASSOCIATES, INC., NASHUA, N. H.
High temperature solar thermal receiver
[NASA-CR-162831] 26 p0292 N80-19621
SANDIA CORP., ALBUQUERQUE, N. MEX.
Mechnical energy storage technology development
[SAND-79-1151] 26 p0304 N80-20874
SANDIA LABS., ALBUQUERQUE, N. MEX.
Characteristics of future Vertical Axis Wind Turbines (VAWTs)
26 p0261 N80-16462
Test results of the DOE/Sandia 17 meter VAWT
26 p0262 N80-16465
Overview of Vertical Axis Wind Turbine (VAWT)
26 p0262 N80-16466
Operational experience with VAWT blades
26 p0262 N80-16468
Workshop on Power Conditioning for Alternative Energy Technologies, executive summary
[SERI-TP-35-217-PT-25] 26 p0265 N80-16505
Comparative analysis of solar energy storage cycles
[SAND-79-1803C] 26 p0267 N80-16516
Preparation of thin films for solar energy utilization
[SAND-79-1754C] 26 p0267 N80-16517
Solar central test facility
[SAND-79-1730C] 26 p0267 N80-16524
Midtemperature solar systems test facility experiment manual and test plan
[SAND-79-0379] 26 p0268 N80-16528
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 1: Executive summary
[SAND-78-0962-VOL-1] 26 p0268 N80-16539
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 2: Economic optimization model
[SAND-78-0962-VOL-2] 26 p0268 N80-16540
Economic analysis of Darrieus vertical axis wind turbine systems for the generation of utility grid electrical power. Volume 3: Point designs
[SAND-78-0962-VOL-3] 26 p0269 N80-16541
Economic analysis of Darrieus axis wind turbine systems for the generation of utility grid electrical power. Volume 4: Summary and analysis of the A. T. Kearney and Alcoa Laboratories point design economic studies
[SAND-78-0962-VOL-4] 26 p0269 N80-16542
Application of radiography to coal liquefaction
[SAND-79-1226C] 26 p0274 N80-17243
Suntech Solar Linear Array Thermal System (SLATS) test results
[SAND-79-0658] 26 p0277 N80-17563
Receiver assembly design studies for 2-m 90 deg parabolic-cylindrical solar collectors
[SAND-79-1026] 26 p0277 N80-17564
Performance of linear solar concentrating collectors
[SAND-79-1378C] 26 p0277 N80-17565
Performance of solar passive buildings
[SAND-79-1574C] 26 p0277 N80-17566
Magma energy research, 79-1
[SAND-79-1344] 26 p0277 N80-17568
Catalyst characterization in coal liquefaction
[SAND-79-1969] 26 p0299 N80-20423
Darrieus vertical axis wind turbine program overview
[SAND-79-2146C] 26 p0306 N80-20891
Wind characteristics for field testing of wind conversion systems
[SAND-78-1563] 26 p0310 N80-20993
Review of selected on-site DOE small solar thermal power plant experiments
[SAND-79-1040C] 26 p0317 N80-21854
Technology assessment: Line-focus concentrators
[SAND-79-2221C] 26 p0318 N80-21871
SANDIA LABS., LIVERMORE, CALIF.
Engine combustion technology overview
[SAND-78-8801] 26 p0260 N80-16347
SANTA CLARA UNIV., CALIF.
Exhaust characterization of neat alcohol fueled IC engines
[BETC/P-B-8-1943-1] 26 p0314 N80-21760
SES, INC., NEWARK, DEL.
Photovoltaic effect, its present understanding and remaining mysteries
[DOE/ET-23103/6] 26 p0268 N80-16535
SOL/LOS, INC., LOS ANGELES, CALIF.
A new method of metallization for silicon solar cells
[NASA-CR-162823] 26 p0292 N80-19620
SOLAR ENVIRONMENTAL ENGINEERING CO., INC., FORT COLLINS, COLO.
Continuing regional solar energy information mini-center activities and updating the SOLCOST program
[COO-4643-T2] 26 p0267 N80-16521
Continuing regional solar energy information Mini-Center activities and updating the SOLCOST program
[COO-4643-T1] 26 p0278 N80-17571
SOUTHERN CALIFORNIA EDISON CO., ROSEMEAD.
Status of the Southern California Edison Company 3 MW Wind Turbine Generator (WTG) demonstration project
26 p0263 N80-16478
SOUTHERN RESEARCH INST., BIRMINGHAM, ALA.
Analysis of thermal decomposition products of flue gas conditioning agents
[PB80-111818] 26 p0297 N80-19672
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
Diesel engine endurance test with water-containing fire-resistant fuel
[AD-A078665] 26 p0287 N80-19287
Stability survey of hydrocarbon fuels
[BETC-1778-4] 26 p0300 N80-20424
SPECTROLAB, INC., SYLMAR, CALIF.
Structure of deformed silicon and implications for low-cost solar cells
26 p0191 A80-22526
Development of improved wraparound contacts for silicon
[NASA-CR-159748] 26 p0285 N80-18554
Design and fabrication of prototype combined photovoltaic/thermal non-tracking collector
[SAND-79-7014] 26 p0307 N80-20899
SRI INTERNATIONAL CORP., MENLO PARK, CALIF.
Comparative assessment of residential energy supply systems that use fuel cells: Executive summary
[PB-299207/1] 26 p0271 N80-16564
Comparative assessment of residential energy supply systems that use fuel cells
[PB-299208/9] 26 p0271 N80-16565
A feasibility study of windpower for the New England area
[AD-A076614] 26 p0286 N80-18568
Estimation of wind characteristics at potential wind energy conversion sites
[PNL-3074] 26 p0321 N80-21955
STANFORD UNIV., CALIF.
Determining the feasibility of incorporating water resource constraints into energy models
[EPRI-EA-1147] 26 p0308 N80-20908
STEARNS-ROGER CORP., DENVER, COLO.
Solar thermal repowering systems integration
[SERI/TR-8037-1] 26 p0316 N80-21847
SUNDSTRAND CORP., ROCKFORD, ILL.
The 15 kW sub e (nominal) solar thermal electric power conversion concept definition study: Steam Rankine turbine system
[NASA-CR-159589] 26 p0264 N80-16493
SYSTEM DEVELOPMENT CORP., SANTA MONICA, CALIF.
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 1: Implementation plan development
[DOE/ET-28432/1] 26 p0290 N80-19604
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 2: Regional program monitoring and progress evaluation
[DOE/ET-28432/2] 26 p0291 N80-19605
Regional systems development for geothermal energy resources. Pacific region: California and Hawaii. Task 3: Water resources evaluation
[DOE/ET-28432/3-1] 26 p0291 N80-19606
Regional systems development for geothermal energy resources. Pacific region: (California and Hawaii). Task 3: Water resources evaluation, appendices
[DOE/ET-28432/3-2] 26 p0291 N80-19607

T

TECHNICAL INFORMATION CENTER, OAK RIDGE, TENN.
Energy information data base
[DOE/TIC-4579-R10-SUPPL-6] 26 p0305 N80-20881
TECHNICAL TRANSLATION SERVICE, ALBUQUERQUE, N. MEX.
Use of solar energy for the production of electricity in the Alps
[SAND-79-6000] 26 p0265 N80-16499
TECHNICAL UNIV. OF DENMARK, LYNGBY.
The Danish large wind turbine program
26 p0261 N80-16460
Data requirements and thermal performance evaluation procedures for solar heating and cooling systems
[PB80-120173] 26 p0320 N80-21885
TECHNISCHE HOGESCHOOL, DELFT (NETHERLANDS).
Flutter analysis of small windturbine, designed for manufacture and use in developing countries
[UTH-LR-272] 26 p0284 N80-18415
TECHNISCHE UNIV., BERLIN (WEST GERMANY).
Study on European aspects of solar power satellites, volume 1
[ESA-CR(P)-1266] 26 p0319 N80-21880
TENNESSEE UNIV., TULLAHOMA.
Development program for MHD direct coal-fired power generation test facility
[FE-1760-34] 26 p0318 N80-21864
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA.
Remote sensing of sulfur dioxide effects on vegetation - photometric analysis of aerial photographs
[PB-300460/3] 26 p0272 N80-16600
TEXAS TECHNOLOGICAL UNIV., LUBBOCK.
Computation of synthetic seismograms by the method of characteristics
26 p0287 N80-18593
TEXAS UNIV., AUSTIN.
The effect of a weak vertical magnetic field on fluctuation-induced transport in a Bumpy-Torus plasma
26 p0224 A80-25476
TEXAS UNIV. AT SAN ANTONIO.
Analysis of water resources requirement for the enhanced (tertiary) oil recovery in the southern plains region of the United States
[PB80-110869] 26 p0301 N80-20801
THERMO ELECTRON CORP., WALTHAM, MASS.
DOE/JPL advanced thermionic technology program
[COO-3056-37] 26 p0304 N80-20873
TIPPETTS-ABBETT-MCCARTHY-STRATTON, WASHINGTON, D.C.
Cataract hydroelectric development expansion study
[DOE/ID-01796-1] 26 p0295 N80-19650
TRANSPORTATION SYSTEMS CENTER, CAMBRIDGE, MASS.
Comparison of fuel economy and emissions for diesel and gasoline powered taxicabs
[PB-298609/9] 26 p0275 N80-17484
Analysis of life-cycle costs and market applications of flywheel energy-storage transit vehicles
[PB-300289/6] 26 p0282 N80-17922
Simulation of an urban battery bus vehicle
[PB-300306/8] 26 p0282 N80-17923
Implications of fuel-efficient vehicles on ride quality and passenger acceptance: Workshop proceedings
[NASA-CP-2096] 26 p0287 N80-18990
TRW, INC., MCLEAN, VA.
Thermal energy storage application areas
[CONS/5113-T4] 26 p0306 N80-20894

U

UNITED TECHNOLOGIES CORP., SOUTH WINDSOR, CONN.
An ac/dc power converter for batteries and fuel cells
[EPRI-EM-662] 26 p0259 N80-16284
Advanced technology light weight fuel cell program
[NASA-CR-159807] 26 p0292 N80-19615
Lightweight fuel cell powerplant components program
[NASA-CR-161412] 26 p0298 N80-20306
UNIVERSITY OF SOUTHEASTERN MASSACHUSETTS, NORTH DARTMOUTH.
Economics of geothermal power
[COO-4051-43] 26 p0265 N80-16497
UOP, INC., DES PLAINES, ILL.
Optimization of Pt-doped Kocite (trade name) electrodes in H3Po4 fuel cells
[AD-A075372] 26 p0294 N80-19639
UTAH UNIV., SALT LAKE CITY.
The effect of superheating on the performance of floating droplet direct contact heat exchangers
26 p0260 N80-16293

V

VARIAN ASSOCIATES, LEXINGTON, MASS.
Slicing of silicon into sheet material. Silicon sheet growth development for the large area silicon sheet task of the low cost solar array project
[NASA-CR-162828] 26 p0292 N80-19623
VERSAR, INC., SPRINGFIELD, VA.
Survey of potential chlorine production processes
[ANL/OEPM-79-1] 26 p0257 N80-16131

W

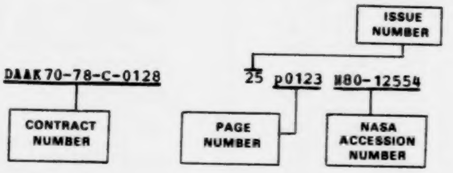
WASHINGTON STATE UNIV., PULLMAN.
Washington state energy use profile, 1960-1978
[WAOENG-79-1] 26 p0318 N80-21869
WEST VIRGINIA UNIV., MORGANTOWN.
Subsurface stratigraphy of the Middle and Upper Devonian clastic sequence in southern West Virginia and its relation to gas production
26 p0273 N80-16628
WESTINGHOUSE ELECTRIC CORP., MADISON, PA.
Advanced coal gasification system for electric power generation, FY 1978
[FE-1514-93] 26 p0313 N80-21554
WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 1
[EPRI-ER-1083-VOL-1] 26 p0281 N80-17863
Design study of a fusion-driven Tokamak hybrid reactor for fissile fuel production, volume 2
[EPRI-NP-1083-VOL-2] 26 p0281 N80-17864
Development, testing and evaluation of MHD materials and components designs
[FE-2248-22] 26 p0311 N80-21160
WESTINGHOUSE RESEARCH AND DEVELOPMENT CENTER, PITTSBURGH, PA.
Phase 2 of the array automated assembly task for the low cost solar array project
[NASA-CR-162628] 26 p0315 N80-21833
WISCONSIN UNIV. - MADISON.
A Newton method for the PIES energy model
[AD-A077102] 26 p0287 N80-18825
Interferometric study of the natural convection characteristics of flat plate, slat and vee-corrugated solar collectors
[COO-2971-6] 26 p0307 N80-20900
WIZARD RESEARCH AND DEVELOPMENT GROUP, INC., WASHINGTON, D.C.
Criteria for an ideal solar photovoltaic powered industry
[HCP/T5433-01] 26 p0279 N80-17577
WOODARD-CLYDE CONSULTANTS, SAN FRANCISCO, CALIF.
Environmental assessment methodology: Solar power plant applications. Volume 3. Environmental impact assessment application
[EPRI-ER-1070-VOL-3] 26 p0306 N80-20889
Environmental assessment methodology: Solar power plant applications. Volume 1. Environmental impact assessment methodology
[EPRI-ER-1070-VOL-1] 26 p0309 N80-20926
WTG ENERGY SYSTEMS, INC., BUFFALO, N.Y.
WTG Energy Systems' MP1-200 200 kilowatt wind turbine generator
26 p0261 N80-16458
WTG Energy Systems' rotor: Steel at 80 feet
26 p0262 N80-16473
WYLE LABS., INC., HUNTSVILLE, ALA.
Outdoor test for thermal performance evaluation of the Owens-Illinois Sunpack SEC-601 (air) solar collector
[NASA-CR-161339] 26 p0264 N80-16492
Thermal performance evaluation of the Northrop model NSC-01-0732 concentrating solar collector array at outdoor conditions
[NASA-CR-161354] 26 p0293 N80-19628

CONTRACT NUMBER INDEX

ENERGY / *A Continuing Bibliography (Issue 26)*

JULY 1980

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the *IAA* accession numbers appearing first. The accession number denotes the number by which the citation is identified in either the *IAA* or *STAR* section. Preceding the accession number are the issue and page number in the particular supplement in which the citation may be found.

AF PROJ. 682J
26 p0316 N80-21838
AF PROJ. 3145
26 p0276 N80-17554
26 p0284 N80-18311
26 p0290 N80-19443
AFOSR MIPR 78-0002
26 p0283 N80-18307
AT-(40-1)-2598
26 p0250 A80-30554
CEC-063-76-EHF
26 p0205 A80-23197
CSA-B9AA-007
26 p0319 N80-21883
DA PROJ. 1L1-61102-AH-51
26 p0286 N80-18570
DA PROJ. 1L1-62705-AH-94
26 p0276 N80-17553
26 p0304 N80-20869
DA PROJ. 1L1-62733-AH-20
26 p0294 N80-19639
DAAB07-78-C-0563
26 p0247 A80-29894
DAAG29-75-C-0024
26 p0287 N80-18825
DAAG29-77-G-0063
26 p0243 A80-29055
DAAG53-76-C-0003
26 p0287 N80-19287
DAAG53-76-C-0014
26 p0294 N80-19639
DAAK40-77-C-0242
26 p0314 N80-21707
DAAK70-77-C-0047
26 p0286 N80-18570
DAAK70-78-C-0001
26 p0287 N80-19287
DE-AC01-79CS-30108
26 p0309 N80-20915
DE-AC01-79ET-15529
26 p0218 A80-25080
DE-AC03-78ET-21074
26 p0251 A80-30942
DE-AC03-79ET-23038
26 p0254 A80-32325
DE-AC04-76DP-00789
26 p0241 A80-28837
26 p0241 A80-28842
26 p0251 A80-30774
26 p0261 N80-16462
26 p0262 N80-16465
26 p0262 N80-16466
26 p0262 N80-16468
26 p0306 N80-20891
DE-AC04-76PD-00789
26 p0185 A80-21902
DE-AC04-78CS-15361
26 p0317 N80-21851
DE-AC04-79ET-23001
26 p0278 N80-17572
DE-AC04-79ET-23005
26 p0296 N80-19653
DE-AC05-76ET-05135
26 p0240 A80-28832
DE-AC05-79ET-21001
26 p0233 A80-28262
DE-AI01-79ET-20485
26 p0302 N80-20812
DE-AI01-79ET-27025
26 p0311 N80-21198
DE-A101-79ET-27025
26 p0285 N80-18547
DEN3-26
26 p0308 N80-20909
DEN3-49
26 p0302 N80-20812
DEN3-51
26 p0286 N80-18559
DEN3-52
26 p0220 A80-25099
DEN3-61
26 p0264 N80-16493
DEN3-62
26 p0264 N80-16491
DEN3-63
26 p0291 N80-19612
DEN3-78
26 p0287 N80-18991
DEN3-81
26 p0282 N80-17916
DEN3-86
26 p0263 N80-16483
DEN3-98
26 p0275 N80-17543
DGRST-76-7-1514
26 p0198 A80-23128
DI-14-34-0001-8120
26 p0301 N80-20801
DOE TASK 95
26 p0243 A80-29054
DOT-FR-777-4247-1
26 p0320 N80-21888
DOT-UT-70066
26 p0274 N80-16974
E(40-1)-5255
26 p0204 A80-23186
E(45-1)-2443
26 p0239 A80-28825
E(49-26)-1028
26 p0284 N80-18446
EC-76-C-01-8628
26 p0312 N80-21208
EC-76-C-03-1257
26 p0267 N80-16515
EC-77-A-31-1011
26 p0287 N80-18991
EC-77-A-31-1040
26 p0274 N80-17467
26 p0298 N80-20272
26 p0311 N80-21201
EC-77-A-31-1044
26 p0282 N80-17916
EC-77-A-31-1062
26 p0293 N80-19626
26 p0321 N80-22083
EC-77-C-01-5113
26 p0306 N80-20894
EC-77-S-02-4449
26 p0257 N80-16126
EC-77-S-05-5522
26 p0245 A80-29406
EC-77-X-01-1883
26 p0203 A80-23175
EE-77-S-03-1525
26 p0294 N80-19642
EEC-183-77-EHF
26 p0198 A80-23128
EEC-435-78-ESUK
26 p0187 A80-21921
EF-77-A-01-2593
26 p0283 N80-18157
26 p0315 N80-21837
EF-77-A-01-2674
26 p0286 N80-18559
EF-77-A-31-1011
26 p0314 N80-21754
EF-77-C-01-2455
26 p0318 N80-21866
EF-77-C-01-2468
26 p0301 N80-20551
EF-77-C-01-2614
26 p0218 A80-25078
EF-77-C-01-2621
26 p0313 N80-21520
EF-77-S-02-2666
26 p0289 N80-19303
EG-76-C-01-4042
26 p0268 N80-16529
EG-77-A-01-4071
26 p0315 N80-21835
EG-77-C-01-4042
26 p0247 A80-29920
26 p0250 A80-30772
26 p0251 A80-30774
26 p0265 N80-16505
26 p0266 N80-16511
26 p0266 N80-16513
26 p0266 N80-16514
26 p0268 N80-16538
26 p0277 N80-17562
26 p0278 N80-17569
26 p0278 N80-17573
26 p0294 N80-19645
26 p0300 N80-20427
26 p0305 N80-20882
26 p0305 N80-20883
26 p0306 N80-20892
26 p0306 N80-20893
26 p0316 N80-21847
26 p0316 N80-21848
26 p0319 N80-21876
26 p0319 N80-21877
EG-77-C-01-4053
26 p0238 A80-28811
EG-77-C-02-4495
26 p0267 N80-16522
EG-77-C-02-4643
26 p0267 N80-16521
26 p0278 N80-17571
EG-77-C-03-1458
26 p0229 A80-27321
EG-77-C-03-1604
26 p0316 N80-21846
EG-77-C-05-5544
26 p0194 A80-22940
EG-77-C-05-5560
26 p0233 A80-28262
EG-77-G-01-4066
26 p0233 A80-28262
EG-77-G-01-4099
26 p0317 N80-21859
EG-77-S-02-4183-A002
26 p0224 A80-25480
EG-77-S-02-4380
26 p0267 N80-16527
EG-77-S-02-4519-A000
26 p0184 A80-21112
EG-77-S-07-1656
26 p0183 A80-21108
EI-78-C-01-6346
26 p0281 N80-17909
EJ-78-C-01-2832
26 p0299 N80-20419
EM-76-C-01-8628
26 p0312 N80-21205
26 p0312 N80-21206
26 p0312 N80-21207
26 p0317 N80-21857
EM-76-S-04-4221
26 p0183 A80-21105
EM-78-C-01-5181
26 p0321 N80-22128
EM-78-C-03-1725
26 p0183 A80-21109
EM-78-C-04-5302
26 p0254 A80-32325
EPA-R-804979
26 p0289 N80-19309
EPA-68-01-1916
26 p0296 N80-19655
26 p0319 N80-21884
EPA-68-02-2160
26 p0272 N80-16601
EPA-68-02-2163
26 p0259 N80-16192
26 p0259 N80-16193
EPA-68-02-2167
26 p0290 N80-19310
EPA-68-02-2180
26 p0271 N80-16564
26 p0271 N80-16565
EPA-68-02-2200
26 p0297 N80-19672
EPA-68-02-2526
26 p0272 N80-16602
EPA-68-02-2601
26 p0297 N80-19678
26 p0310 N80-20949
26 p0310 N80-20950
EPA-68-02-2603
26 p0320 N80-21912
EPA-68-02-3132
26 p0320 N80-21913
EPA-68-03-2449
26 p0272 N80-16623
EPRI PROJ. 551
26 p0306 N80-20889
26 p0309 N80-20926
EPRI PROJ. 1015-1
26 p0266 N80-16510
EQ7AD505
26 p0270 N80-16556
EQ8AC020
26 p0273 N80-16625
ERB-76-259
26 p0270 N80-16562
ES-77-C-02-4149
26 p0206 A80-23201
ESA-3705/78-F-DK(SC)
26 p0319 N80-21880

ET-77-C-01-2577
26 p0289 N80-19308
ET-78-C-01-3087
26 p0217 A80-25073
26 p0217 A80-25076
26 p0220 A80-25095
26 p0221 A80-25103
ET-78-C-01-3092
26 p0309 N80-20929
ET-78-C-01-3106
26 p0222 A80-25112
ET-78-C-01-3125
26 p0299 N80-20414
ET-78-C-01-3295
26 p0307 N80-20902
ET-78-C-02-3019
26 p0224 A80-25478
ET-78-C-02-4862
26 p0258 N80-16189
ET-78-C-02-4881
26 p0318 N80-21870
ET-78-C-03-1530
26 p0290 N80-19604
26 p0291 N80-19605
26 p0291 N80-19606
26 p0291 N80-19607
ET-78-C-03-2051
26 p0276 N80-17557
ET-78-C-03-2083
26 p0305 N80-20884
ET-78-C-03-2189
26 p0304 N80-20876
ET-78-C-03-2219
26 p0227 A80-26340
ET-78-C-03-2240
26 p0266 N80-16508
ET-78-G-03-1894
26 p0294 N80-19641
ET-78-S-01-3177
26 p0288 N80-19302
ET-78-S-02-4646
26 p0224 A80-25475
ET-78-S-02-5069
26 p0224 A80-25479
ET-78-S-08-1556
26 p0301 N80-20792
ET-78-X-01-5433
26 p0279 N80-17577
EW-78-A-21-8450
26 p0288 N80-19300
EW-78-C-03-1778
26 p0300 N80-20424
EW-78-C-19-0042
26 p0298 N80-20412
EW-78-F-07-1796
26 p0295 N80-19650
EW-78-F-07-1822
26 p0295 N80-19651
EW-78-X-48-0409
26 p0306 N80-20895
EW-78-Y-04-4183
26 p0274 N80-17244
EW-79-G-47-1025
26 p0239 A80-28824
EX-76-A-29-1020
26 p0276 N80-17556
EX-76-A-29-1041
26 p0265 N80-16504
EX-76-A-29-1060
26 p0264 N80-16491
26 p0264 N80-16493
26 p0291 N80-19612
EX-76-A-31-1011
26 p0312 N80-21210
EX-76-A-36-1008
26 p0285 N80-18547
26 p0311 N80-21198
EX-76-C-01-1514
26 p0313 N80-21554
EX-76-C-01-1517
26 p0300 N80-20425
EX-76-C-01-1760
26 p0219 A80-25094
EX-76-C-01-2028
26 p0287 N80-19292
EX-76-C-01-2036
26 p0298 N80-20413
EX-76-C-01-2238
26 p0222 A80-25112
EX-76-C-01-2243
26 p0212 A80-23953
EX-76-C-01-2248
26 p0218 A80-25080
26 p0311 N80-21160
EX-76-C-01-2275
26 p0289 N80-19307
EX-76-C-01-2276
26 p0259 N80-16190
EX-76-C-01-2297
26 p0258 N80-16183
EX-76-C-01-2315
26 p0298 N80-20407
EX-76-C-01-2341
26 p0219 A80-25090
26 p0221 A80-25105
26 p0221 A80-25107
EX-76-C-01-2344
26 p0305 N80-20885
EX-76-C-01-2346
26 p0228 A80-26708
26 p0278 N80-17576
EX-76-C-01-2361
26 p0289 N80-19306
EX-76-C-01-2422
26 p0289 N80-19304
EX-76-C-01-2433
26 p0289 N80-19305
EX-76-C-01-2449
26 p0288 N80-19298
EX-76-C-02-1743
26 p0300 N80-20426
EX-76-C-02-2416
26 p0258 N80-16182
EX-76-C-23-1030
26 p0268 N80-16535
EX-76-I-01-1028
26 p0276 N80-17548
26 p0291 N80-19613
EX-76-S-01-2516
26 p0288 N80-19293
EX-77-A-29-1010
26 p0264 N80-16494
26 p0286 N80-18565
26 p0292 N80-19614
26 p0303 N80-20864
EX-78-C-01-3005
26 p0217 A80-25075
EY-76-A-29-1012
26 p0278 N80-17575
EY-76-C-2-2616
26 p0211 A80-23533
EY-76-C-01-1760
26 p0318 N80-21864
EY-76-C-01-2297
26 p0258 N80-16184
EY-76-C-02-0016
26 p0201 A80-23157
26 p0248 A80-29938
26 p0249 A80-30521
26 p0258 N80-16179
26 p0258 N80-16185
26 p0265 N80-16502
26 p0266 N80-16507
26 p0266 N80-16509
26 p0272 N80-16580
26 p0273 N80-16653
26 p0276 N80-17555
26 p0279 N80-17578
26 p0288 N80-19294
26 p0296 N80-19654
26 p0305 N80-20886
26 p0309 N80-20930
26 p0315 N80-21830
26 p0316 N80-21849
26 p0317 N80-21856
EY-76-C-02-2708
26 p0257 N80-16177
EY-76-C-02-2749
26 p0275 N80-17470
EY-76-C-02-3056
26 p0304 N80-20873
EY-76-C-02-3073
26 p0226 A80-25777
EY-76-C-02-4094
26 p0265 N80-16501
26 p0266 N80-16512
26 p0295 N80-19649
EY-76-C-03-0167
26 p0223 A80-25473
EY-76-C-03-1110
26 p0250 A80-30773
EY-76-C-04-0789
26 p0260 N80-16347
26 p0265 N80-16505
26 p0267 N80-16517
26 p0267 N80-16524
26 p0268 N80-16528
26 p0268 N80-16537
26 p0268 N80-16539
26 p0268 N80-16540
26 p0269 N80-16541
26 p0269 N80-16542
26 p0269 N80-16550
26 p0274 N80-17243
26 p0277 N80-17561
26 p0277 N80-17563
26 p0277 N80-17564
26 p0277 N80-17565
26 p0277 N80-17566
26 p0277 N80-17568
26 p0299 N80-20423
26 p0304 N80-20874
26 p0306 N80-20888
26 p0306 N80-20891
26 p0307 N80-20899
26 p0310 N80-20993
26 p0317 N80-21854
26 p0318 N80-21871
EY-76-C-05-0033
26 p0295 N80-19647
26 p0308 N80-20907
26 p0318 N80-21863
EY-76-C-05-5205
26 p0310 N80-20973
EY-76-C-06-1830
26 p0240 A80-28828
26 p0240 A80-28833
26 p0251 A80-30774
26 p0269 N80-16552
26 p0277 N80-17567
26 p0278 N80-17570
26 p0278 N80-17574
26 p0297 N80-19666
26 p0307 N80-20903
26 p0307 N80-20904
26 p0321 N80-21955
EY-76-C-07-1570
26 p0267 N80-16520
26 p0277 N80-17558
EY-76-S-02-1340
26 p0294 N80-19644
EY-76-S-02-2218
26 p0269 N80-16543
EY-76-S-02-2704
26 p0318 N80-21875
EY-76-S-02-2711
26 p0224 A80-25478
EY-76-S-02-2858
26 p0305 N80-20887
EY-76-S-02-2889
26 p0243 A80-29056
EY-76-S-02-2904
26 p0300 N80-20429
EY-76-S-02-2971
26 p0307 N80-20900
EY-76-S-02-3170
26 p0250 A80-30552
EY-76-S-02-4051
26 p0265 N80-16497
EY-76-S-04-3779
26 p0244 A80-29154
EY-76-S-05-5020
26 p0299 N80-20415
EY-76-S-05-5197
26 p0260 N80-16409
F33615-76-C-2144
26 p0276 N80-17554
F33615-77-C-3117
26 p0290 N80-19443
F33615-77-C-3150
26 p0316 N80-21838
F33615-77-C-5142
26 p0234 A80-28305
JPL-954374
26 p0292 N80-19623
JPL-954376
26 p0229 A80-27337
JPL-954442
26 p0264 N80-16495
JPL-954506
26 p0191 A80-22526
JPL-954796
26 p0302 N80-20814
JPL-954873
26 p0315 N80-21833
JPL-954995
26 p0292 N80-19617
JPL-955208
26 p0293 N80-19625
JPL-955210
26 p0292 N80-19622
JPL-955318
26 p0292 N80-19620
JPL-955381
26 p0298 N80-20404
JPL-955454
26 p0292 N80-19621
JPL-955565
26 p0253 A80-32021
JPL-995209
26 p0292 N80-19624
MEI-78-1-41
26 p0183 A80-21107
MOESC-211112
26 p0201 A80-23156
NASW-3113
26 p0274 N80-16950
NASW-3198
26 p0314 N80-21755
NASW-3199
26 p0285 N80-18558
NAS3-20058
26 p0286 N80-18565
26 p0303 N80-20864
NAS3-20065
26 p0285 N80-18554
NAS3-20600
26 p0276 N80-17548
NAS3-20806
26 p0275 N80-17547
NAS3-21257
26 p0292 N80-19615
NAS7-100
26 p0191 A80-22526
26 p0194 A80-23103
26 p0254 A80-32331
26 p0264 N80-16487
26 p0276 N80-17549
26 p0276 N80-17551
26 p0291 N80-19611
26 p0292 N80-19623
26 p0293 N80-19632
26 p0294 N80-19634
26 p0298 N80-20404
26 p0315 N80-21833
NAS8-30637
26 p0298 N80-20306
NAS8-32036
26 p0264 N80-16492
26 p0293 N80-19627
26 p0293 N80-19628
26 p0293 N80-19629
26 p0315 N80-21836
NAS8-32092
26 p0264 N80-16485
NAS8-32093
26 p0293 N80-19630
26 p0302 N80-20813
26 p0303 N80-20865
26 p0303 N80-20866
NAS8-32391
26 p0246 A80-29448
NAS9-15196
26 p0193 A80-22833
NAS9-15636
26 p0293 N80-19631
26 p0313 N80-21395
NBS PROJ. 7422413
26 p0320 N80-21885
NIH-GM-15238-11
26 p0243 A80-29055
NR PROJ. 521-710
26 p0303 N80-20868
NR PROJECT 062-228
26 p0251 A80-30804
NSC-68E-0404(02)
26 p0209 A80-23496
26 p0247 A80-29812
NSF AER-75-11171-A01
26 p0201 A80-23155
NSF AER-75-16163
26 p0269 N80-16554

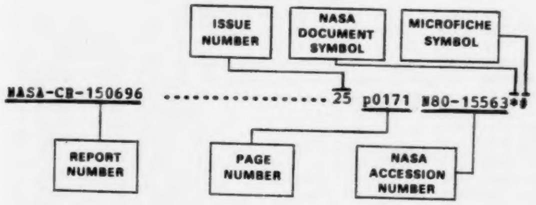
26 p0272 N80-16596
NSF AER-77-11545
26 p0201 A80-23155
NSF CHE-76-01074
26 p0243 A80-29055
NSF CHE-76-10890
26 p0244 A80-29059
NSF DMR-76-81083
26 p0225 A80-25657
NSF ENG-74-23778
26 p0221 A80-25106
NSF ENG-76-15063
26 p0207 A80-23272
NSF ENG-77-27500
26 p0255 A80-32412
NSF MCS-74-20584
26 p0287 N80-18825
NSG-3018
26 p0291 N80-19609
NSG-3089
26 p0224 A80-25476
NSG-3245
26 p0298 N80-20340
N00014-76-C-0214
26 p0294 N80-19637
N00014-79-C-0536
26 p0303 N80-20868
N00014-79-C-0539
26 p0286 N80-18568
OEFFWF-2781/S
26 p0189 A80-22042
PROJ. 3832-27
26 p0297 N80-19672
PROJ. 61014
26 p0289 N80-19305
SRI PROJ. 8569
26 p0286 N80-18568
SWEDBESD-5061.012
26 p0319 N80-21881
W-31-109-ENG-36
26 p0318 N80-21872
W-31-109-ENG-38
26 p0218 A80-25085
26 p0257 N80-16131
26 p0268 N80-16532
26 p0269 N80-16549
26 p0282 N80-17918
26 p0297 N80-19668
26 p0300 N80-20430
26 p0304 N80-20878
26 p0305 N80-20879
26 p0305 N80-20880
26 p0311 N80-21166
26 p0317 N80-21852
26 p0317 N80-21860
W-7405-ENG-26
26 p0198 A80-23132
26 p0223 A80-25170
26 p0233 A80-28273
26 p0266 N80-16506
26 p0269 N80-16546
26 p0281 N80-17598
26 p0307 N80-20898
26 p0313 N80-21456
26 p0318 N80-21865
W-7405-ENG-36
26 p0259 N80-16236
26 p0265 N80-16498
26 p0281 N80-17599
26 p0295 N80-19648
26 p0307 N80-20897
W-7405-ENG-48
26 p0185 A80-21901
26 p0198 A80-23133
26 p0214 A80-24664
26 p0214 A80-24665
26 p0249 A80-30524
26 p0250 A80-30527
26 p0251 A80-31042
26 p0258 N80-16178
26 p0258 N80-16180
26 p0273 N80-16652
26 p0277 N80-17560
26 p0280 N80-17597
26 p0288 N80-19295
26 p0304 N80-20877
26 p0306 N80-20890
26 p0307 N80-20901
26 p0312 N80-21209
26 p0312 N80-21211
26 p0316 N80-21842
26 p0316 N80-21850
26 p0317 N80-21853
26 p0317 N80-21855
W-7405-ENG-92
26 p0243 A80-29054
WA-76-4707
26 p0203 A80-23175
ZF57571001
26 p0294 N80-19640
01-78-ET-11058.000
26 p0217 A80-25070
530-04-13-01
26 p0297 N80-20260

REPORT/ACCESSION INDEX

ENERGY */A Continuing Bibliography (Issue 26)*

JULY 1980

Typical Report/Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The issue and page number indicate the actual Supplement and page where the citation may be located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

AAS 79-172 .... 26 p0215 A80-24717

ACUREX-FR-79-340 .... 26 p0293 N80-19625*#

AD-A075372 .... 26 p0294 N80-19639 #
AD-A075609 .... 26 p0304 N80-20869 #
AD-A075835 .... 26 p0276 N80-17554 #
AD-A075955 .... 26 p0276 N80-17553 #
AD-A076115 .... 26 p0283 N80-18307 #
AD-A076145 .... 26 p0284 N80-18411 #
AD-A076614 .... 26 p0286 N80-18568 #
AD-A076836 .... 26 p0286 N80-18567 #
AD-A076975 .... 26 p0303 N80-20868 #
AD-A077102 .... 26 p0287 N80-18825 #
AD-A077112 .... 26 p0303 N80-20867 #
AD-A078058 .... 26 p0294 N80-19637 #
AD-A078154 .... 26 p0290 N80-19503 #
AD-A078424 .... 26 p0284 N80-18311 #
AD-A078473 .... 26 p0286 N80-18570 #
AD-A078653 .... 26 p0294 N80-19640 #
AD-A078665 .... 26 p0287 N80-19287 #
AD-A078865 .... 26 p0290 N80-19443 #
AD-A079635 .... 26 p0316 N80-21838 #
AD-A079906 .... 26 p0304 N80-20870 #
AD-A080188 .... 26 p0314 N80-21707 #

AD-E400363 .... 26 p0303 N80-20867 #

AER-1713 .... 26 p0264 N80-16493*#

AFAPL-TR-79-2027 .... 26 p0276 N80-17554 #
AFAPL-TR-79-2045 .... 26 p0290 N80-19443 #
AFAPL-TR-79-2058 .... 26 p0316 N80-21838 #
AFAPL-TR-79-2073 .... 26 p0284 N80-18311 #

AFIT/GAE/AA/79D-15 .... 26 p0304 N80-20870 #

AFLRL-94 .... 26 p0287 N80-19287 #

AIAA PAPER 80-0024 .... 26 p0212 A80-23953 #
AIAA PAPER 80-0025 .... 26 p0212 A80-23954 #
AIAA PAPER 80-0179 .... 26 p0212 A80-23938 #
AIAA PAPER 80-0180 .... 26 p0192 A80-22739 #
AIAA PAPER 80-0211 .... 26 p0212 A80-23956 #
AIAA PAPER 80-0249 .... 26 p0192 A80-22745 #
AIAA 80-0605 .... 26 p0237 A80-28802 #
AIAA 80-0606 .... 26 p0237 A80-28803 #
AIAA 80-0607 .... 26 p0237 A80-28804*#
AIAA 80-0608 .... 26 p0237 A80-28805 #
AIAA 80-0609 .... 26 p0237 A80-28806 #
AIAA 80-0610 .... 26 p0237 A80-28807 #
AIAA 80-0611 .... 26 p0237 A80-28808 #
AIAA 80-0613 .... 26 p0238 A80-28810 #
AIAA 80-0614 .... 26 p0241 A80-28837 #
AIAA 80-0617 .... 26 p0238 A80-28811 #
AIAA 80-0618 .... 26 p0238 A80-28812 #
AIAA 80-0619 .... 26 p0241 A80-28839 #
AIAA 80-0620 .... 26 p0241 A80-28840 #
AIAA 80-0621 .... 26 p0238 A80-28813 #
AIAA 80-0622 .... 26 p0238 A80-28814 #
AIAA 80-0623 .... 26 p0238 A80-28815 #
AIAA 80-0624 .... 26 p0238 A80-28816 #
AIAA 80-0625 .... 26 p0240 A80-28832 #
AIAA 80-0626 .... 26 p0238 A80-28817 #
AIAA 80-0627 .... 26 p0239 A80-28818 #
AIAA 80-0628 .... 26 p0241 A80-28841 #
AIAA 80-0631 .... 26 p0240 A80-28834 #
AIAA 80-0633 .... 26 p0239 A80-28819 #
AIAA 80-0634 .... 26 p0239 A80-28820 #
AIAA 80-0635 .... 26 p0239 A80-28821 #
AIAA 80-0638 .... 26 p0241 A80-28835*#
AIAA 80-0639 .... 26 p0239 A80-28822 #
AIAA 80-0640 .... 26 p0241 A80-28838 #
AIAA 80-0641 .... 26 p0239 A80-28823 #
AIAA 80-0642 .... 26 p0241 A80-28836*#
AIAA 80-0643 .... 26 p0239 A80-28824 #
AIAA 80-0644 .... 26 p0240 A80-28833 #
AIAA 80-0645 .... 26 p0239 A80-28825 #
AIAA 80-0647 .... 26 p0239 A80-28827 #
AIAA 80-0648 .... 26 p0240 A80-28828 #
AIAA 80-0650 .... 26 p0240 A80-28829 #
AIAA 80-0651 .... 26 p0240 A80-28830 #
AIAA 80-0655 .... 26 p0241 A80-28842 #
AIAA 80-0657 .... 26 p0240 A80-28831 #

AIAA-PAPER-80-0607 .... 26 p0284 N80-18497*#

AIRESEARCH-79-15651-1 .... 26 p0320 N80-21888 #
AIRESEARCH-79-16182 .... 26 p0282 N80-17916*#

ANL-TRANS-1164 .... 26 p0300 N80-20428 #

ANL/CEN/FE-78-10 .... 26 p0300 N80-20430 #
ANL/CNSV-4 .... 26 p0304 N80-20878 #
ANL/CNSV/TM-8 .... 26 p0305 N80-20880 #
ANL/EES/TM-58 .... 26 p0297 N80-19668 #
ANL/OEPM-78-7 .... 26 p0317 N80-21860 #
ANL/OEPM-79-1 .... 26 p0257 N80-16131 #
ANL/OEPM-79-2 .... 26 p0282 N80-17918 #
ANL/SPG-8 .... 26 p0269 N80-16549 #
ANL/SPG-14 .... 26 p0268 N80-16532 #

APL/JHU/GEMS-006 .... 26 p0311 N80-21198 #
APL/JHU/QM-79-163-GT .... 26 p0285 N80-18547 #
APL/JHU/QM-79-209 .... 26 p0311 N80-21198 #

AR-2 .... 26 p0272 N80-16601 #

ARMID-TR-78002 .... 26 p0303 N80-20867 #

ATF-P-5000-2 .... 26 p0283 N80-18203 #
ATF-P-5000-3 .... 26 p0283 N80-18204 #

AVRADCOM-TR-80-C-2 .... 26 p0284 N80-18406*#
AVRADCOM-TR-80-8 .... 26 p0314 N80-21754*#

BERC/RI-79/4 .... 26 p0288 N80-19296 #

BETC-1778-4 .... 26 p0300 N80-20424 #

BETC/P-8-8-1943-1 .... 26 p0314 N80-21760 #
BETC/RI-78/12 .... 26 p0257 N80-16130 #

BM-RI-8364 .... 26 p0273 N80-16932 #

BMFT-FE-T-77-88 .... 26 p0279 N80-17582 #

BNL-5103 .... 26 p0309 N80-20930 #
BNL-24867 .... 26 p0279 N80-17578 #
BNL-26216 .... 26 p0266 N80-16507 #
BNL-26219 .... 26 p0266 N80-16509 #
BNL-26721 .... 26 p0288 N80-19294 #
BNL-26748 .... 26 p0316 N80-21849 #
BNL-26772 .... 26 p0307 N80-20896 #
BNL-26882 .... 26 p0317 N80-21856 #
BNL-26904 .... 26 p0296 N80-19654 #
BNL-26906 .... 26 p0305 N80-20886 #
BNL-50939 .... 26 p0273 N80-16653 #
BNL-50987 .... 26 p0265 N80-16502 #
BNL-51004 .... 26 p0272 N80-16580 #
BNL-51010 .... 26 p0258 N80-16185 #
BNL-51012 .... 26 p0315 N80-21830 #
BNL-51019 .... 26 p0276 N80-17555 #
BNL-51065 .... 26 p0258 N80-16179 #

BR57075 .... 26 p0279 N80-17583 #

CCMS-109 .... 26 p0309 N80-20915 #

CEL-TN-1556 .... 26 p0294 N80-19640 #

CONF-780508-73 .... 26 p0269 N80-16543 #
CONF-780643 .... 26 p0257 N80-16172 #
CONF-781050-1 .... 26 p0260 N80-16347 #
CONF-790240-1 .... 26 p0301 N80-20551 #
CONF-790451-1 .... 26 p0278 N80-17575*#
CONF-790541-7 .... 26 p0265 N80-16498 #
CONF-790541-25 .... 26 p0266 N80-16507 #
CONF-790541-27 .... 26 p0266 N80-16509 #
CONF-790541-44 .... 26 p0268 N80-16535 #
CONF-790598-5 .... 26 p0311 N80-21166 #
CONF-790601 .... 26 p0268 N80-16538 #
CONF-790625-8 .... 26 p0313 N80-21456 #
CONF-790678-3 .... 26 p0278 N80-17569 #
CONF-790803-10 .... 26 p0266 N80-16508 #
CONF-790803-43 .... 26 p0276 N80-17557 #
CONF-790803-44 .... 26 p0277 N80-17558 #
CONF-790803-47 .... 26 p0305 N80-20879 #
CONF-790803-55 .... 26 p0298 N80-20412 #
CONF-790803-56 .... 26 p0316 N80-21848 #
CONF-790808-17 .... 26 p0268 N80-16529 #
CONF-790828-1-REV-1 .... 26 p0258 N80-16180 #
CONF-790850-1 .... 26 p0277 N80-17565 #
CONF-790850-2 .... 26 p0277 N80-17566 #
CONF-790854-3 .... 26 p0265 N80-16501 #
CONF-790917-11 .... 26 p0288 N80-19294 #
CONF-790924-1 .... 26 p0267 N80-16524 #
CONF-790942-1 .... 26 p0259 N80-16236 #
CONF-790954-1 .... 26 p0267 N80-16516 #
CONF-791005-5 .... 26 p0277 N80-17562 #
CONF-791008-2 .... 26 p0274 N80-17243 #
CONF-791013-2 .... 26 p0267 N80-16517 #
CONF-791021-1 .... 26 p0277 N80-17560 #
CONF-791024-10 .... 26 p0318 N80-21871 #
CONF-791024-11 .... 26 p0319 N80-21876 #
CONF-791052-1 .... 26 p0317 N80-21854 #
CONF-791097-1 .... 26 p0306 N80-20891 #
CONF-791119-1 .... 26 p0316 N80-21849 #
CONF-791127-4 .... 26 p0296 N80-19654 #
CONF-791127-5 .... 26 p0305 N80-20886 #
CONF-791152-1 .... 26 p0317 N80-21856 #
CONF-791205-15 .... 26 p0307 N80-20896 #
CONF-7904111 .... 26 p0260 N80-16453*#
CONF-7906108-1 .... 26 p0278 N80-17573 #
CONF-7906118-1 .... 26 p0317 N80-21852 #

CONS-5181-1 .... 26 p0321 N80-22128 #
CONS-8626-T1-VOL-1 .... 26 p0317 N80-21857 #

CONS/5113-T4 .... 26 p0306 N80-20894 #

COO-1340-65 .... 26 p0294 N80-19644 #
COO-2218-117 .... 26 p0269 N80-16543 #
COO-2704-T1 .... 26 p0318 N80-21875 #
COO-2858-24-SUMM .... 26 p0305 N80-20887 #
COO-2904-14 .... 26 p0300 N80-20429 #
COO-2971-6 .... 26 p0307 N80-20900 #
COO-3056-37 .... 26 p0304 N80-20873 #
COO-4051-43 .... 26 p0265 N80-16497 #
COO-4094-26 .... 26 p0266 N80-16512 #
COO-4094-57 .... 26 p0265 N80-16501 #
COO-4094-59 .... 26 p0295 N80-19649 #
COO-4380-2 .... 26 p0267 N80-16527 #
COO-4449-2 .... 26 p0257 N80-16126 #
COO-4495-7 .... 26 p0267 N80-16522 #
COO-4643-T1 .... 26 p0278 N80-17571 #
COO-4643-T2 .... 26 p0267 N80-16521 #
COO-4862-3 .... 26 p0258 N80-16189 #
COO-4881-6 .... 26 p0318 N80-21870 #

CSA/LN-2435 .... 26 p0319 N80-21883 #

DELET-TR-79-16 .... 26 p0276 N80-17553 #
DELET-TR-79-17 .... 26 p0304 N80-20869 #

DOE/CS-0026/7 .... 26 p0311 N80-21204 #
DOE/EA-0087 .... 26 p0267 N80-16525 #
DOE/EDP-0035 .... 26 p0265 N80-16503 #
DOE/EDP-0047 .... 26 p0260 N80-16411 #
DOE/EDP-0050 .... 26 p0309 N80-20921 #
DOE/EDP-0057 .... 26 p0309 N80-20922 #
DOE/EIA-0174/78 .... 26 p0265 N80-16500 #
DOE/EIA-0183/11 .... 26 p0314 N80-21824 #
DOE/EIA-2832/1-VOL-2-APP .... 26 p0299 N80-20419 #
DOE/EIS-0012 .... 26 p0272 N80-16581 #
DOE/ERD-0005 .... 26 p0269 N80-16545 #
DOE/ERD-0014 .... 26 p0269 N80-16547 #
DOE/ERD-0021 .... 26 p0308 N80-20905 #
DOE/ET-0067/3 .... 26 p0258 N80-16184 #
DOE/ET-0068/3 .... 26 p0258 N80-16183 #
DOE/ET-0116/1 .... 26 p0311 N80-21165 #
DOE/ET-23001/T1 .... 26 p0278 N80-17572 #
DOE/ET-23005/T2 .... 26 p0296 N80-19653 #
DOE/ET-23103/6 .... 26 p0268 N80-16535 #
DOE/ET-28432/1 .... 26 p0290 N80-19604 #
DOE/ET-28432/2 .... 26 p0291 N80-19605 #
DOE/ET-28432/3-1 .... 26 p0291 N80-19606 #
DOE/ET-28432/3-2 .... 26 p0291 N80-19607 #
DOE/EV-0050/1 .... 26 p0290 N80-19510 #
DOE/FE-2344/2 .... 26 p0305 N80-20885 #
DOE/ID-01796-1 .... 26 p0295 N80-19650 #
DOE/ID-01822-1 .... 26 p0295 N80-19651 #
DOE/JPL-1012-29 .... 26 p0276 N80-17549*#
DOE/JPL-1012-34 .... 26 p0276 N80-17551*#
DOE/JPL-1012-38 .... 26 p0291 N80-19611*#
DOE/JPL-1060-17-REV-1 .... 26 p0294 N80-19634*#
DOE/JPL-954374-79/10 .... 26 p0292 N80-19623*#
DOE/JPL-954442-78/12 .... 26 p0264 N80-16495*#
DOE/JPL-954796-79/7 .... 26 p0302 N80-20814*#
DOE/JPL-954873-79/08 .... 26 p0315 N80-21833*#
DOE/JPL-954995-80/6 .... 26 p0292 N80-19617*#
DOE/JPL-955318-79/3 .... 26 p0292 N80-19620*#
DOE/NASA/0026-79/1 .... 26 p0308 N80-20909*#
DOE/NASA/0049-80/1 .... 26 p0302 N80-20812*#
DOE/NASA/0051-79/1 .... 26 p0286 N80-18559*#
DOE/NASA/0058-79/1 .... 26 p0303 N80-20864*#
DOE/NASA/0058-79/2-VOL-2-APP ... 26 p0286 N80-18565*#
DOE/NASA/0061-79/1 .... 26 p0264 N80-16493*#
DOE/NASA/0062-79/1 .... 26 p0264 N80-16491*#
DOE/NASA/0063-79/1 .... 26 p0291 N80-19612*#
DOE/NASA/0078-79/1 .... 26 p0287 N80-18991*#
DOE/NASA/0081-79/1 .... 26 p0282 N80-17916*#
DOE/NASA/0086-79/1 .... 26 p0263 N80-16483*#
DOE/NASA/0600-79/1 .... 26 p0276 N80-17548*#
DOE/NASA/0806-79/1 .... 26 p0275 N80-17547*#
DOE/NASA/1010-79/5 .... 26 p0264 N80-16494*#
DOE/NASA/1010-80/6 .... 26 p0292 N80-19614*#
DOE/NASA/1011-80/4 .... 26 p0314 N80-21754*#
DOE/NASA/1028-79/25 .... 26 p0284 N80-18446*#
DOE/NASA/1028-80/26 .... 26 p0291 N80-19613*#
DOE/NASA/1040-79/9 .... 26 p0274 N80-17467*#
DOE/NASA/1040-80/10 .... 26 p0298 N80-20272*#
DOE/NASA/1040-80/11 .... 26 p0311 N80-21201*#
DOE/NASA/1040-80/13 .... 26 p0311 N80-21200*#
DOE/NASA/1062-80/4 .... 26 p0293 N80-19626*#
DOE/NASA/1062-80/5 .... 26 p0321 N80-22083*#
DOE/NASA/2593-79/13 .... 26 p0283 N80-18157*#
DOE/NASA/2593-80/15 .... 26 p0315 N80-21837*#
DOE/NASA/2749-79/4-VOL-4 .... 26 p0275 N80-17470*#
DOE/PE-8628/1-VOL-1 .... 26 p0312 N80-21208 #
DOE/PE-8628/1-VOL-2 .... 26 p0312 N80-21207 #
DOE/PE-8628/1-VOL-3 .... 26 p0312 N80-21206 #
DOE/PE-8628/1-VOL-5 .... 26 p0312 N80-21205 #
DOE/RA-0041 .... 26 p0301 N80-20506 #
DOE/SP-01525/1 .... 26 p0294 N80-19642 #
DOE/TIC-4579-R10-SUPPL-6 .... 26 p0305 N80-20881 #
DOE/TIC-10078 .... 26 p0258 N80-16187 #
DOE/TIC-10114/2 .... 26 p0280 N80-17597 #
DOE/TIC-10114/3 .... 26 p0279 N80-17578 #
DOE/TIC-10114/4 .... 26 p0281 N80-17598 #
DOE/TIC-10114/5 .... 26 p0281 N80-17599 #
DOE/TIC-10134-VOL-2 .... 26 p0281 N80-17909 #
DOE/TIC-10190 .... 26 p0306 N80-20895 #
DOE/TIC-10193-REV-1 .... 26 p0265 N80-16504 #

DOE/TIC-10232 .... 26 p0312 N80-21210 #
DOE/TIC-10273 .... 26 p0307 N80-20898 #

DOT-TSC-RSPA-79-21 .... 26 p0287 N80-18990*#

DOT-TSC-UMTA-78-77 .... 26 p0282 N80-17922 #
DOT-TSC-UMTA-79-15 .... 26 p0282 N80-17923 #
DOT-TSC-UMTA-79-30 .... 26 p0275 N80-17484 #

DSE-1020-T17 .... 26 p0276 N80-17556 #

DTS-532 .... 26 p0287 N80-18990*#

D180-25461-1-VOL-1-REV-A .... 26 p0293 N80-19631*#
D180-25461-4 .... 26 p0313 N80-21395*#

E-147 .... 26 p0274 N80-17467*#
E-206 .... 26 p0283 N80-18205*#
E-238 .... 26 p0284 N80-18446*#
E-273 .... 26 p0273 N80-16885*#
E-292 .... 26 p0283 N80-18157*#
E-293 .... 26 p0282 N80-18156*#
E-312 .... 26 p0293 N80-19626*#
E-322 .... 26 p0264 N80-16494*#
E-333 .... 26 p0298 N80-20272*#
E-339 .... 26 p0282 N80-18098*#
E-350 .... 26 p0284 N80-18406*#
E-357 .... 26 p0311 N80-21201*#
E-361 .... 26 p0284 N80-18497*#
E-364 .... 26 p0292 N80-19614*#
E-365 .... 26 p0291 N80-19613*#
E-382 .... 26 p0301 N80-20532*#
E-399 .... 26 p0321 N80-22083*#
E-400 .... 26 p0311 N80-21200*#
E-405 .... 26 p0315 N80-21837*#

EDE-28/79 .... 26 p0284 N80-18411 #

EEB-W-79-13 .... 26 p0316 N80-21850 #

EEB-79-5 .... 26 p0304 N80-20877 #

EMD-79-55 .... 26 p0270 N80-16555 #
EMD-80-12 .... 26 p0308 N80-20911 #
EMD-80-24 .... 26 p0301 N80-20800 #
EMD-80-30 .... 26 p0320 N80-21886 #
EMD-80-36 .... 26 p0315 N80-21827 #

EMR-827053 .... 26 p0275 N80-17543*#

EPA-450/3-79-008 .... 26 p0272 N80-16602 #
EPA-600/J-79-032 .... 26 p0320 N80-21896 #
EPA-600/7-79-023 .... 26 p0272 N80-16623 #
EPA-600/7-79-082A .... 26 p0319 N80-21884 #
EPA-600/7-79-082B .... 26 p0296 N80-19655 #
EPA-600/7-79-098A .... 26 p0259 N80-16192 #
EPA-600/7-79-098B .... 26 p0259 N80-16193 #
EPA-600/7-79-105A .... 26 p0271 N80-16564 #
EPA-600/7-79-105B .... 26 p0271 N80-16565 #
EPA-600/7-79-138 .... 26 p0272 N80-16600 #
EPA-600/7-79-147 .... 26 p0272 N80-16601 #
EPA-600/7-79-168 .... 26 p0297 N80-19678 #
EPA-600/7-79-169 .... 26 p0310 N80-20950 #
EPA-600/7-79-170 .... 26 p0310 N80-20949 #
EPA-600/7-79-179 .... 26 p0297 N80-19672 #
EPA-600/7-79-184 .... 26 p0290 N80-19310 #
EPA-600/7-79-201 .... 26 p0289 N80-19309 #
EPA-600/7-79-203 .... 26 p0300 N80-20430 #
EPA-600/7-79-217 .... 26 p0320 N80-21913 #
EPA-600/7-79-233 .... 26 p0320 N80-21912 #

EPRI-AF-1157 .... 26 p0313 N80-21557 #
EPRI-AF-1160 .... 26 p0295 N80-19646 #
EPRI-AF-1184 .... 26 p0299 N80-20422 #
EPRI-AF-1227 .... 26 p0314 N80-21558 #

EPRI-EA-1071 .... 26 p0266 N80-16510 #
EPRI-EA-1147 .... 26 p0308 N80-20908 #

EPRI-EM-662 .... 26 p0259 N80-16284 #

EPRI-ER-1070-VOL-1 .... 26 p0309 N80-20926 #
EPRI-ER-1070-VOL-3 .... 26 p0306 N80-20889 #
EPRI-ER-1083-VOL-1 .... 26 p0281 N80-17863 #
EPRI-ER-1177 .... 26 p0319 N80-21879 #

EPRI-NP-1083-VOL-2 .... 26 p0281 N80-17864 #

ERG-027 .... 26 p0286 N80-18579 #

ESA-CR(P)-1266 .... 26 p0319 N80-21880 #

ESCS-67 .... 26 p0271 N80-16568 #

ETI-1279 .... 26 p0263 N80-16483*#

FCR-1656 .... 26 p0298 N80-20306*#
FCR-1657 .... 26 p0292 N80-19615*#

FE-1514-93 .... 26 p0313 N80-21554 #
FE-1517-78 .... 26 p0300 N80-20425 #
FE-1743-68 .... 26 p0300 N80-20426 #
FE-1760-34 .... 26 p0318 N80-21864 #
FE-2028-15 .... 26 p0287 N80-19292 #
FE-2036-37 .... 26 p0298 N80-20413 #
FE-2248-22 .... 26 p0311 N80-21160 #
FE-2275-11 .... 26 p0289 N80-19307 #
FE-2276-27 .... 26 p0259 N80-16190 #
FE-2315-37 .... 26 p0298 N80-20407 #
FE-2346-44 .... 26 p0278 N80-17576 #
FE-2361-40 .... 26 p0289 N80-19306 #
FE-2416-43 .... 26 p0258 N80-16182 #
FE-2422-28 .... 26 p0289 N80-19304 #
FE-2433-25-VOL-1 .... 26 p0289 N80-19305 #
FE-2449-9 .... 26 p0288 N80-19298 #
FE-2455-27-VOL-3 .... 26 p0318 N80-21866 #
FE-2468-54 .... 26 p0301 N80-20551 #
FE-2516-9 .... 26 p0288 N80-19293 #
FE-2621-5 .... 26 p0313 N80-21520 #
FE-2666-T1 .... 26 p0289 N80-19303 #
FE-3125-5 .... 26 p0299 N80-20414 #
FE-3177-4 .... 26 p0288 N80-19302 #
FE-25770-6 .... 26 p0289 N80-19308 #

FFA-TN-AU-1499-PT-12 .... 26 p0319 N80-21881 #

FRA/ORD-79/20.1-VOL-1 .... 26 p0320 N80-21888 #

FR79-12-292 .... 26 p0314 N80-21707 #

GA-A-15340 .... 26 p0266 N80-16508 #
GA-A-15344 .... 26 p0306 N80-20888 #

GE77TMP-51 .... 26 p0272 N80-16623 #

GPO-53-814 .... 26 p0281 N80-17913 #

HAC-REF-E0773 .... 26 p0316 N80-21838 #

HAC-SCG-90324N .... 26 p0316 N80-21838 #

HCP/T5433-01 .... 26 p0279 N80-17577 #

HUD-0050579 .... 26 p0311 N80-21197 #

IFP-26-209 .... 26 p0274 N80-17246 #

IFR-2 .... 26 p0258 N80-16182 #

ISBN-3-88148-164-8 .... 26 p0281 N80-17635

ISSN-0140-9751 .... 26 p0283 N80-18212 #

JHU/APL/EQR/79-3 .... 26 p0320 N80-21889 #

JPL-PUB-79-39-REV-1 .... 26 p0294 N80-19634*#
JPL-PUB-79-87 .... 26 p0264 N80-16487*#
JPL-PUB-79-88 .... 26 p0276 N80-17549*#
JPL-PUB-79-112-VOL-1 .... 26 p0293 N80-19632*#
JPL-PUB-79-116 .... 26 p0276 N80-17551*#
JPL-PUB-80-5 .... 26 p0291 N80-19611*#

JPL-9550-28 .... 26 p0293 N80-19625*#
JPL-9950-272 .... 26 p0292 N80-19623*#
JPL-9950-273 .... 26 p0292 N80-19622*#
JPL-9950-279 .... 26 p0292 N80-19624*#
JPL-9950-283 .... 26 p0292 N80-19621*#
JPL-9950-288 .... 26 p0292 N80-19620*#
JPL-9950-317 .... 26 p0298 N80-20404*#

JSC-16255 .... 26 p0291 N80-19610*#

LA-UR-79-1336 .... 26 p0265 N80-16498 #
LA-UR-79-1416 .... 26 p0259 N80-16236 #

LA-7592-MS .... 26 p0274 N80-17244 #
LA-7741-PR .... 26 p0318 N80-21872 #
LA-7885-MS-VOL-6 .... 26 p0307 N80-20897 #

LA-7995-TASE .... 26 p0295 N80-19648 #

LBL-7821 .... 26 p0280 N80-17597 #
LBL-7868-REV .... 26 p0306 N80-20890 #
LBL-8874 .... 26 p0258 N80-16178 #
LBL-8905 .... 26 p0273 N80-16652 #
LBL-9324 .... 26 p0277 N80-17560 #
LBL-9576 .... 26 p0304 N80-20877 #
LBL-9608 .... 26 p0316 N80-21850 #

LC-79-600177 .... 26 p0314 N80-21612 #

MCA-WP13-01 .... 26 p0290 N80-19443 #

MCGER-79/003 .... 26 p0311 N80-21198 #

METC/CR-79/28 .... 26 p0260 N80-16410 #
METC/SP-79/8 .... 26 p0258 N80-16181 #

MOTOROLA-2257/12 .... 26 p0264 N80-16495*#

MRC-TRC-1971 .... 26 p0287 N80-18825 #

MTR-79W00192 .... 26 p0273 N80-16625 #
MTR-7825 .... 26 p0272 N80-16602 #
MTR-8026 .... 26 p0307 N80-20902 #

NAS-7845 .... 26 p0264 N80-16491*#

NASA-CASE-GSC-12518-1 .... 26 p0290 N80-19424*#
NASA-CASE-GSC-12528-1 .... 26 p0283 N80-18261*#

NASA-CASE-LAR-12205-1 .... 26 p0302 N80-20810*

NASA-CASE-LEW-12363-3 .... 26 p0285 N80-18556*#
NASA-CASE-LEW-12363-4 .... 26 p0285 N80-18555*#
NASA-CASE-LEW-13148-2 .... 26 p0285 N80-18557*#

NASA-CASE-MFS-23515-1 .... 26 p0315 N80-21828*
NASA-CASE-MFS-23518-3 .... 26 p0260 N80-16452*
NASA-CASE-MFS-23830-1 .... 26 p0315 N80-21831*#
NASA-CASE-MFS-25287-1 .... 26 p0275 N80-17544*#

NASA-CASE-NPO-14224-1 .... 26 p0283 N80-18287*

NASA-CP-2096 .... 26 p0287 N80-18990*#
NASA-CP-2106 .... 26 p0260 N80-16453*#
NASA-CP-2117 .... 26 p0302 N80-20820*#

NASA-CR-159494 .... 26 p0303 N80-20864*#
NASA-CR-159496 .... 26 p0286 N80-18565*#
NASA-CR-159589 .... 26 p0264 N80-16493*#
NASA-CR-159590 .... 26 p0264 N80-16491*#
NASA-CR-159591 .... 26 p0291 N80-19612*#
NASA-CR-159633 .... 26 p0286 N80-18559*#
NASA-CR-159650 .... 26 p0287 N80-18991*#
NASA-CR-159651 .... 26 p0282 N80-17916*#
NASA-CR-159663 .... 26 p0275 N80-17547*#
NASA-CR-159673 .... 26 p0275 N80-17470*#
NASA-CR-159695 .... 26 p0263 N80-16483*#
NASA-CR-159715 .... 26 p0293 N80-19632*#
NASA-CR-159737 .... 26 p0308 N80-20909*#
NASA-CR-159748 .... 26 p0285 N80-18554*#
NASA-CR-159775 .... 26 p0276 N80-17548*#
NASA-CR-159779 .... 26 p0275 N80-17543*#
NASA-CR-159800 .... 26 p0302 N80-20812*#
NASA-CR-159807 .... 26 p0292 N80-19615*#
NASA-CR-160540 .... 26 p0293 N80-19631*#
NASA-CR-160565 .... 26 p0313 N80-21395*#
NASA-CR-161339 .... 26 p0264 N80-16492*#
NASA-CR-161340 .... 26 p0264 N80-16485*#
NASA-CR-161354 .... 26 p0293 N80-19628*#
NASA-CR-161355 .... 26 p0293 N80-19630*#
NASA-CR-161356 .... 26 p0303 N80-20865*#
NASA-CR-161357 .... 26 p0303 N80-20866*#
NASA-CR-161379 .... 26 p0293 N80-19627*#
NASA-CR-161380 .... 26 p0293 N80-19629*#
NASA-CR-161382 .... 26 p0302 N80-20813*#
NASA-CR-161383 .... 26 p0315 N80-21836*#
NASA-CR-161384 .... 26 p0315 N80-21835*#
NASA-CR-161412 .... 26 p0298 N80-20306*#
NASA-CR-162628 .... 26 p0315 N80-21833*#
NASA-CR-162681 .... 26 p0264 N80-16487*#
NASA-CR-162697 .... 26 p0274 N80-16950*
NASA-CR-162745 .... 26 p0278 N80-17575*#
NASA-CR-162746 .... 26 p0264 N80-16495*#
NASA-CR-162787 .... 26 p0276 N80-17549*#
NASA-CR-162790 .... 26 p0276 N80-17551*#
NASA-CR-162798 .... 26 p0291 N80-19611*#
NASA-CR-162823 .... 26 p0292 N80-19620*#
NASA-CR-162828 .... 26 p0292 N80-19623*#
NASA-CR-162830 .... 26 p0292 N80-19622*#
NASA-CR-162831 .... 26 p0292 N80-19621*#
NASA-CR-162832 .... 26 p0291 N80-19609*#
NASA-CR-162839 .... 26 p0293 N80-19625*#
NASA-CR-162840 .... 26 p0292 N80-19617*#
NASA-CR-162848 .... 26 p0292 N80-19624*#
NASA-CR-162886 .... 26 p0294 N80-19634*#
NASA-CR-162896 .... 26 p0298 N80-20340*#
NASA-CR-162904 .... 26 p0302 N80-20814*#
NASA-CR-162913 .... 26 p0298 N80-20404*#

NASA-TM-X-72733 .... 26 p0275 N80-17545*#

NASA-TM-75512 .... 26 p0285 N80-18558*#
NASA-TM-75757 .... 26 p0314 N80-21755*#
NASA-TM-76042 .... 26 p0309 N80-20920*#
NASA-TM-78250 .... 26 p0274 N80-17014*#
NASA-TM-79242 .... 26 p0274 N80-17467*#
NASA-TM-79295 .... 26 p0284 N80-18446*#
NASA-TM-79317 .... 26 p0273 N80-16885*#
NASA-TM-80958 .... 26 p0291 N80-19610*#
NASA-TM-81384 .... 26 p0283 N80-18157*#
NASA-TM-81385 .... 26 p0282 N80-18156*#
NASA-TM-81400 .... 26 p0293 N80-19626*#
NASA-TM-81408 .... 26 p0264 N80-16494*#
NASA-TM-81415 .... 26 p0298 N80-20272*#
NASA-TM-81418 .... 26 p0282 N80-18098*#
NASA-TM-81424 .... 26 p0273 N80-16886*#
NASA-TM-81426 .... 26 p0284 N80-18406*#
NASA-TM-81433 .... 26 p0311 N80-21201*#
NASA-TM-81438 .... 26 p0284 N80-18497*#
NASA-TM-81439 .... 26 p0301 N80-20532*#
NASA-TM-81440 .... 26 p0283 N80-18205*#
NASA-TM-81444 .... 26 p0292 N80-19614*#
NASA-TM-81445 .... 26 p0291 N80-19613*#
NASA-TM-81457 .... 26 p0314 N80-21754*#
NASA-TM-81468 .... 26 p0321 N80-22083*#
NASA-TM-81472 .... 26 p0315 N80-21837*#
NASA-TM-81495 .... 26 p0311 N80-21200*#
NASA-TM-81793 .... 26 p0297 N80-20260*#

NBS-GCR-79-181 .... 26 p0308 N80-20912 #

NBSIR-79-1618 .... 26 p0314 N80-21697 #
NBSIR-79-1756 .... 26 p0301 N80-20506 #
NBSIR-79-1771 .... 26 p0270 N80-16560 #
NBSIR-79-1799 .... 26 p0272 N80-16572 #
NBSIR-80-1980 .... 26 p0320 N80-21885 #

NMEI-16 .... 26 p0309 N80-20914 #
NMEI-41 .... 26 p0271 N80-16569 #
NMEI-43 .... 26 p0270 N80-16562 #
NMEI-45 .... 26 p0308 N80-20913 #

NPS67-79-006 .... 26 p0283 N80-18307 #

NSF/RA-790116 .... 26 p0269 N80-16554 #
NSF/RA-790117 .... 26 p0272 N80-16596 #

NT-44-1978 .... 26 p0284 N80-18345 #

NTIS/PS-75/070 .... 26 p0280 N80-17592 #
NTIS/PS-75/346 .... 26 p0296 N80-19659 #
NTIS/PS-75/490 .... 26 p0274 N80-16976 #
NTIS/PS-75/628 .... 26 p0280 N80-17589 #
NTIS/PS-75/691 .... 26 p0296 N80-19659 #
NTIS/PS-75/743 .... 26 p0280 N80-17592 #
NTIS/PS-76/0560 .... 26 p0274 N80-16976 #
NTIS/PS-76/0710 .... 26 p0271 N80-16563 #
NTIS/PS-76/0767 .... 26 p0280 N80-17592 #
NTIS/PS-76/0768 .... 26 p0280 N80-17593 #
NTIS/PS-76/0796 .... 26 p0296 N80-19659 #
NTIS/PS-76/0797 .... 26 p0296 N80-19657 #
NTIS/PS-76/0800 .... 26 p0280 N80-17589 #
NTIS/PS-76/0801 .... 26 p0280 N80-17588 #
NTIS/PS-76/0901 .... 26 p0297 N80-19661 #
NTIS/PS-76/0902 .... 26 p0297 N80-19662 #
NTIS/PS-77/0635 .... 26 p0274 N80-16976 #
NTIS/PS-77/0839 .... 26 p0271 N80-16563 #
NTIS/PS-77/0882 .... 26 p0280 N80-17592 #
NTIS/PS-77/0883 .... 26 p0280 N80-17593 #
NTIS/PS-77/0898 .... 26 p0296 N80-19659 #
NTIS/PS-77/0900 .... 26 p0296 N80-19657 #
NTIS/PS-77/0956 .... 26 p0280 N80-17589 #
NTIS/PS-77/0958 .... 26 p0280 N80-17588 #
NTIS/PS-77/0991 .... 26 p0280 N80-17594 #
NTIS/PS-77/0992 .... 26 p0280 N80-17595 #

NTIS/PS-77/1056 .... 26 p0297 N80-19661 #
NTIS/PS-77/1057 .... 26 p0297 N80-19662 #
NTIS/PS-77/1161 .... 26 p0308 N80-20910 #
NTIS/PS-78/0838 .... 26 p0270 N80-16557 #
NTIS/PS-78/0839 .... 26 p0270 N80-16558 #
NTIS/PS-78/0840 .... 26 p0271 N80-16566 #
NTIS/PS-78/0841 .... 26 p0271 N80-16567 #
NTIS/PS-78/0842 .... 26 p0271 N80-16571 #
NTIS/PS-78/0880 .... 26 p0274 N80-16976 #
NTIS/PS-78/0962 .... 26 p0271 N80-16563 #
NTIS/PS-78/0997 .... 26 p0280 N80-17592 #
NTIS/PS-78/0998 .... 26 p0280 N80-17593 #
NTIS/PS-78/1108 .... 26 p0296 N80-19659 #
NTIS/PS-78/1109 .... 26 p0296 N80-19657 #
NTIS/PS-78/1115 .... 26 p0280 N80-17589 #
NTIS/PS-78/1116 .... 26 p0280 N80-17588 #
NTIS/PS-78/1156 .... 26 p0280 N80-17594 #
NTIS/PS-78/1157 .... 26 p0280 N80-17595 #
NTIS/PS-78/1223 .... 26 p0297 N80-19661 #
NTIS/PS-78/1224 .... 26 p0297 N80-19662 #
NTIS/PS-78/1288 .... 26 p0308 N80-20910 #
NTIS/PS-79/0911/2 .... 26 p0259 N80-16195 #
NTIS/PS-79/0926/0 .... 26 p0270 N80-16557 #
NTIS/PS-79/0927/8 .... 26 p0270 N80-16558 #
NTIS/PS-79/0928/6 .... 26 p0271 N80-16566 #
NTIS/PS-79/0929/4 .... 26 p0271 N80-16567 #
NTIS/PS-79/0930/2 .... 26 p0271 N80-16571 #
NTIS/PS-79/0951/8 .... 26 p0279 N80-17585 #
NTIS/PS-79/0952/6 .... 26 p0279 N80-17584 #
NTIS/PS-79/0953/4 .... 26 p0279 N80-17586 #
NTIS/PS-79/0954/2 .... 26 p0279 N80-17587 #
NTIS/PS-79/0990/6 .... 26 p0274 N80-16976 #
NTIS/PS-79/1069/8 .... 26 p0271 N80-16563 #

NVO-01556-1 .... 26 p0301 N80-20792 #

ORAU/IEA-79-11(R) .... 26 p0295 N80-19647 #
ORAU/IEA-79-15(O) .... 26 p0318 N80-21863 #
ORAU/IEA-79-16(O) .... 26 p0308 N80-20907 #

ORNL-5483 .... 26 p0281 N80-17598 #
ORNL-5487 .... 26 p0266 N80-16506 #

ORNL/SUB-78/13536/1 .... 26 p0269 N80-16546 #
ORNL/TM-7003 .... 26 p0318 N80-21865 #

ORO-5020-T1 .... 26 p0299 N80-20415 #
ORO-5197-14 .... 26 p0260 N80-16409 #
ORO-5205-10 .... 26 p0310 N80-20973 #

OTA/TM/E-1 .... 26 p0259 N80-16194 #
OTA/TM/ISC-2 .... 26 p0314 N80-21612 #

OWRC/ERIS-7906 .... 26 p0270 N80-16561 #

OWRT-B-218-TEX(1) .... 26 p0301 N80-20801 #

PB-298609/9 .... 26 p0275 N80-17484 #
PB-298688/3 .... 26 p0271 N80-16568 #
PB-299207/1 .... 26 p0271 N80-16564 #
PB-299208/9 .... 26 p0271 N80-16565 #
PB-299383/0 .... 26 p0259 N80-16192 #
PB-299384/8 .... 26 p0259 N80-16193 #
PB-299517/3 .... 26 p0271 N80-16569 #
PB-299737/7 .... 26 p0270 N80-16559 #
PB-299746/8 .... 26 p0274 N80-16974 #
PB-299861/5 .... 26 p0273 N80-16625 #
PB-299925/8 .... 26 p0285 N80-18547 #
PB-300289/6 .... 26 p0282 N80-17922 #
PB-300306/8 .... 26 p0282 N80-17923 #
PB-300314/2 .... 26 p0270 N80-16560 #
PB-300338/1 .... 26 p0270 N80-16561 #
PB-300398/5 .... 26 p0273 N80-16932 #
PB-300460/3 .... 26 p0272 N80-16600 #
PB-300469/4 .... 26 p0272 N80-16601 #
PB-300480/1 .... 26 p0272 N80-16602 #
PB-300482/7 .... 26 p0270 N80-16562 #
PB-300526/1 .... 26 p0272 N80-16596 #
PB-300536/0 .... 26 p0272 N80-16623 #
PB-300541/0 .... 26 p0269 N80-16554 #
PB-300832/3 .... 26 p0273 N80-16663 #
PB-300890/1 .... 26 p0272 N80-16572 #
PB-301123/6 .... 26 p0270 N80-16555 #
PB-301244/0 .... 26 p0270 N80-16556 #

PB80-103948 .... 26 p0319 N80-21883 #
PB80-104656 .... 26 p0289 N80-19309 #
PB80-104904 .... 26 p0314 N80-21612 #
PB80-104987 .... 26 p0309 N80-20915 #
PB80-105885 .... 26 p0259 N80-16194 #
PB80-107501 .... 26 p0308 N80-20911 #
PB80-108392 .... 26 p0310 N80-20949 #
PB80-108467 .... 26 p0310 N80-20950 #
PB80-108566 .... 26 p0297 N80-19678 #
PB80-108616 .... 26 p0309 N80-20914 #
PB80-108624 .... 26 p0308 N80-20913 #
PB80-108954 .... 26 p0290 N80-19310 #
PB80-110869 .... 26 p0301 N80-20801 #
PB80-111818 .... 26 p0297 N80-19672 #
PB80-112758 .... 26 p0300 N80-20430 #
PB80-113566 .... 26 p0319 N80-21884 #
PB80-113574 .... 26 p0296 N80-19655 #
PB80-113749 .... 26 p0308 N80-20912 #
PB80-115298 .... 26 p0311 N80-21197 #
PB80-115991 .... 26 p0310 N80-20945 #
PB80-116056 .... 26 p0301 N80-20800 #
PB80-116502 .... 26 p0314 N80-21697 #
PB80-118359 .... 26 p0311 N80-21198 #
PB80-119704 .... 26 p0320 N80-21896 #
PB80-120173 .... 26 p0320 N80-21885 #
PB80-121478 .... 26 p0320 N80-21888 #
PB80-124969 .... 26 p0320 N80-21912 #
PB80-125651 .... 26 p0320 N80-21889 #
PB80-127715 .... 26 p0320 N80-21886 #
PB80-134430 .... 26 p0315 N80-21827 #
PB80-134729 .... 26 p0320 N80-21913 #
PB80-800303 .... 26 p0280 N80-17591 #
PB80-800311 .... 26 p0280 N80-17592 #
PB80-800691 .... 26 p0280 N80-17589 #
PB80-800709 .... 26 p0280 N80-17590 #
PB80-800717 .... 26 p0280 N80-17588 #
PB80-800915 .... 26 p0280 N80-17594 #
PB80-802218 .... 26 p0296 N80-19656 #
PB80-802531 .... 26 p0308 N80-20910 #
PB80-802580 .... 26 p0297 N80-19661 #
PB80-802598 .... 26 p0297 N80-19662 #
PB80-803000 .... 26 p0296 N80-19658 #
PB80-803018 .... 26 p0296 N80-19659 #
PB80-803026 .... 26 p0296 N80-19660 #
PB80-803034 .... 26 p0296 N80-19657 #

PETC/TR-79/1 .... 26 p0299 N80-20416 #
PETC/TR-79/3 .... 26 p0299 N80-20417 #
PETC/TR-79/5 .... 26 p0257 N80-16129 #

PNL-RAP-28 .... 26 p0281 N80-17599 #

PNL-SA-7949 .... 26 p0307 N80-20903 #

PNL-2421 .... 26 p0278 N80-17574 #
PNL-2530 .... 26 p0277 N80-17567 #
PNL-2803 .... 26 p0269 N80-16552 #
PNL-2850-PT-2-SUPPL .... 26 p0297 N80-19666 #
PNL-2972 .... 26 p0278 N80-17570 #
PNL-3074 .... 26 p0321 N80-21955 #
PNL-3191 .... 26 p0307 N80-20904 #

PPI-1030-6 .... 26 p0308 N80-20909*#

PR-7 .... 26 p0258 N80-16185 #
PR-13 .... 26 p0276 N80-17549*#
PR-14 .... 26 p0260 N80-16409 #
PR-37 .... 26 p0304 N80-20873 #

PSI-TR-167 .... 26 p0288 N80-19300 #

P80-800329 .... 26 p0280 N80-17593 #
P80-800923 .... 26 p0280 N80-17595 #

QPR-1 .... 26 p0278 N80-17572 #
QPR-4 .... 26 p0313 N80-21554 #

QR-3 .... 26 p0258 N80-16189 #
QR-3 .... 26 p0299 N80-20423 #
QR-9 .... 26 p0264 N80-16485*#
QR-13 .... 26 p0287 N80-19292 #

QTPR-2 .... 26 p0296 N80-19653 #
QTPR-2 .... 26 p0299 N80-20414 #
QTPR-8 .... 26 p0289 N80-19303 #
QTPR-06 .... 26 p0289 N80-19308 #

R-1575 .... 26 p0276 N80-17548*#

RAE-TM-SPACE-247 .... 26 p0279 N80-17583 #

REPT-78-805-4-005 .... 26 p0304 N80-20876 #
REPT-79-FM-45 .... 25 p0291 N80-19610*#

REPT-2613-005-001 .... 26 p0312 N80-21209 #

SAN-1257-T2 .... 26 p0267 N80-16515 #
SAN-1604-1 .... 26 p0316 N80-21846 #
SAN-1894-1 .... 26 p0294 N80-19641 #
SAN-2189-T1 .... 26 p0304 N80-20876 #
SAN-12093-1 .... 26 p0309 N80-20929 #

SAND-78-0962-VOL-1 .... 26 p0268 N80-16539 #
SAND-78-0962-VOL-2 .... 26 p0268 N80-16540 #
SAND-78-0962-VOL-3 .... 26 p0269 N80-16541 #
SAND-78-0962-VOL-4 .... 26 p0269 N80-16542 #
SAND-78-1563 .... 26 p0310 N80-20993 #
SAND-78-7032 .... 26 p0269 N80-16550 #
SAND-78-8801 .... 26 p0260 N80-16347 #
SAND-79-0379 .... 26 p0268 N80-16528 #
SAND-79-0658 .... 26 p0277 N80-17563 #
SAND-79-1026 .... 26 p0277 N80-17564 #
SAND-79-1040C .... 26 p0317 N80-21854 #
SAND-79-1151 .... 26 p0304 N80-20874 #
SAND-79-1226C .... 26 p0274 N80-17243 #
SAND-79-1344 .... 26 p0277 N80-17568 #
SAND-79-1378C .... 26 p0277 N80-17565 #
SAND-79-1574C .... 26 p0277 N80-17566 #
SAND-79-1730C .... 26 p0267 N80-16524 #
SAND-79-1754C .... 26 p0267 N80-16517 #
SAND-79-1803C .... 26 p0267 N80-16516 #
SAND-79-1969 .... 26 p0299 N80-20423 #
SAND-79-2146C .... 26 p0306 N80-20891 #
SAND-79-2221C .... 26 p0318 N80-21871 #
SAND-79-6000 .... 26 p0265 N80-16499 #
SAND-79-7006 .... 26 p0268 N80-16537 #
SAND-79-7014 .... 26 p0307 N80-20899 #
SAND-79-7015 .... 26 p0306 N80-20888 #
SAND-79-7024 .... 26 p0277 N80-17561 #

SDSB-79/04 .... 26 p0310 N80-20945 #

SERI-TP-35-217-PT-25 .... 26 p0265 N80-16505 #

SERI/PR-351-480 .... 26 p0306 N80-20892 #
SERI/RR-52-324 .... 26 p0266 N80-16511 #
SERI/RR-63-223 .... 26 p0319 N80-21877 #
SERI/SP-69-290 .... 26 p0305 N80-20883 #
SERI/TD-351-460 .... 26 p0319 N80-21876 #
SERI/TP-34-169 .... 26 p0268 N80-16529 #
SERI/TP-34-187 .... 26 p0278 N80-17569 #
SERI/TP-35-253 .... 26 p0316 N80-21848 #
SERI/TP-36-309 .... 26 p0278 N80-17573 #
SERI/TP-39-240 .... 26 p0277 N80-17562 #
SERI/TP-49-185 .... 26 p0268 N80-16538 #
SERI/TP-69-276 .... 26 p0266 N80-16514 #
SERI/TR-33-239-VOL-1 .... 26 p0300 N80-20427 #
SERI/TR-34-092 .... 26 p0306 N80-20893 #
SERI/TR-35-078-VOL-1 .... 26 p0305 N80-20882 #
SERI/TR-35-234 .... 26 p0294 N80-19645 #
SERI/TR-52-250 .... 26 p0266 N80-16513 #
SERI/TR-8037-1 .... 26 p0316 N80-21847 #

SORI-EAS-79-267 .... 26 p0297 N80-19672 #

TID-4500 .... 26 p0309 N80-20930 #

TP-5461 .... 26 p0317 N80-21851 #

TR-6 .... 26 p0294 N80-19639 #
TR-190 .... 26 p0305 N80-20884 #

TR/ES/79-30 .... 26 p0314 N80-21824 #

TREE-1384 .... 26 p0267 N80-16520 #

TT-7903 .... 26 p0283 N80-18212 #

TVA/ONR-79/01 .... 26 p0272 N80-16600 #

UCID-18320 .... 26 p0312 N80-21211 #

UCRL-15001 .... 26 p0307 N80-20901 #
UCRL-15138 .... 26 p0312 N80-21209 #
UCRL-52697 .... 26 p0288 N80-19295 #
UCRL-52814 .... 26 p0317 N80-21853 #
UCRL-52851 .... 26 p0316 N80-21842 #
UCRL-82293-REV-1 .... 26 p0258 N80-16180 #
UCRL-83554 .... 26 p0317 N80-21855 #

UM-HSRI-79-13 .... 26 p0270 N80-16559 #

UMTA-IT-06-0152-79-7 .... 26 p0274 N80-16974 #

UMTA-MA-06-0044-78-2 .... 26 p0282 N80-17922 #
UMTA-MA-06-0066-79-1 .... 26 p0275 N80-17484 #
UMTA-MA-06-0093-79-1 .... 26 p0282 N80-17923 #

US-PATENT-APPL-SN-058658 .... 26 p0285 N80-18556*#
US-PATENT-APPL-SN-061555 .... 26 p0285 N80-18557*#
US-PATENT-APPL-SN-079914 .... 26 p0285 N80-18555*#
US-PATENT-APPL-SN-098570 .... 26 p0275 N80-17544*#
US-PATENT-APPL-SN-111439 .... 26 p0283 N80-18261*#
US-PATENT-APPL-SN-119336 .... 26 p0290 N80-19424*#
US-PATENT-APPL-SN-129780 .... 26 p0315 N80-21831*#
US-PATENT-APPL-SN-829390 .... 26 p0260 N80-16452*
US-PATENT-APPL-SN-880726 .... 26 p0315 N80-21828*
US-PATENT-APPL-SN-900843 .... 26 p0302 N80-20810*
US-PATENT-APPL-SN-910793 .... 26 p0260 N80-16452*
US-PATENT-APPL-SN-951829 .... 26 p0283 N80-18287*

US-PATENT-CLASS-126-417 .... 26 p0260 N80-16452*
US-PATENT-CLASS-126-419 .... 26 p0302 N80-20810*
US-PATENT-CLASS-126-434 .... 26 p0302 N80-20810*
US-PATENT-CLASS-126-437 .... 26 p0302 N80-20810*
US-PATENT-CLASS-126-901 .... 26 p0260 N80-16452*
US-PATENT-CLASS-165-32 .... 26 p0302 N80-20810*
US-PATENT-CLASS-310-306 .... 26 p0283 N80-18287*
US-PATENT-CLASS-343-100R 26 p0283 N80-18287*
US-PATENT-CLASS-343-100ST 26 p0283 N80-18287*
US-PATENT-CLASS-415-2 .... 26 p0315 N80-21828*
US-PATENT-CLASS-415-101 .... 26 p0315 N80-21828*
US-PATENT-CLASS-428-629 .... 26 p0260 N80-16452*
US-PATENT-CLASS-428-650 .... 26 p0260 N80-16452*
US-PATENT-CLASS-428-658 .... 26 p0260 N80-16452*
US-PATENT-CLASS-428-675 .... 26 p0260 N80-16452*
US-PATENT-CLASS-428-680 .... 26 p0260 N80-16452*

US-PATENT-4,104,134 .... 26 p0260 N80-16452*
US-PATENT-4,177,325 .... 26 p0260 N80-16452*
US-PATENT-4,187,506 .... 26 p0283 N80-18287*
US-PATENT-4,191,505 .... 26 p0315 N80-21828*
US-PATENT-4,192,290 .... 26 p0302 N80-20810*

USGS/WRD/WRI-79/060 .... 26 p0273 N80-16663 #
USGS/WRI-79/76 .... 26 p0273 N80-16663 #

UTH-LR-272 .... 26 p0284 N80-18415 #

WAOENG-79-1 .... 26 p0318 N80-21869 #
WAOENG-79-3 .... 26 p0317 N80-21859 #

WMB/A-4500-131-3-R1 .... 26 p0287 N80-18991*#

WYLE-TR-531-37R .... 26 p0264 N80-16492*#
WYLE-TR-531-39 .... 26 p0293 N80-19628*#

W80-01005 .... 26 p0301 N80-20801 #

1. Report No
NASA SP-7043 (26)

2. Government Accession No.

3. Recipient's Catalog No.

4. Title and Subtitle
Energy
A Continuing Bibliography (Issue 26)

5. Report Date
July 1980

6. Performing Organization Code

7. Author(s)

8. Performing Organization Report No.

9. Performing Organization Name and Address
National Aeronautics and Space Administration
Washington, D.C. 20546

10. Work Unit No.

11. Contract or Grant No.

12. Sponsoring Agency Name and Address

13. Type of Report and Period Covered

14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This bibliography lists 1134 reports, articles, and other documents introduced into the NASA Scientific and Technical Information System from April 1, 1980 through June 30, 1980.

17. Key Words (Suggested by Author(s))
Bibliographies
Energy Conversion
Energy Policy
Solar Energy
Wind Energy

18. Distribution Statement
Unclassified - Unlimited

19. Security Classif. (of this report)
Unclassified

20. Security Classif. (of this page)
Unclassified

21. No. of Pages
326

22. Price*
$15.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

NASA-Langley, 1980

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley

COLORADO
University of Colorado, Boulder

DISTRICT OF COLUMBIA
Library of Congress

GEORGIA
Georgia Institute of Technology, Atlanta

ILLINOIS
The John Crerar Library, Chicago

MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge

MISSOURI
Linda Hall Library, Kansas City

NEW YORK
Columbia University, New York

OKLAHOMA
University of Oklahoma, Bizzell Library

PENNSYLVANIA
Carnegie Library of Pittsburgh

WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library

COLORADO
Denver Public Library

CONNECTICUT
Hartford Public Library

MARYLAND
Enoch Pratt Free Library, Baltimore

MASSACHUSETTS
Boston Public Library

MICHIGAN
Detroit Public Library

MINNESOTA
Minneapolis Public Library

MISSOURI
Kansas City Public Library
St. Louis Public Library

NEW JERSEY
Trenton Public Library

NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library

OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library

TENNESSEE
Memphis Public Library

TEXAS
Dallas Public Library
Fort Worth Public Library

WASHINGTON
Seattle Public Library

WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from: ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.

National Aeronautics and
Space Administration

Washington, D.C.
20546

Official Business
Penalty for Private Use, $300

SPECIAL FOURTH CLASS MAIL
BOOK

Postage and Fees Paid
National Aeronautics and
Space Administration
NASA-451

U.S.MAIL

3 2 SP-7043, 082080 S02378DU
GOVERNMENT PRINTING OFFICE
LIBRARY DIV
ATTN: MAE S COLLINS, CHIEF LIBRARY DIV
5236 EISENHOWER AVE
ALEXANDRIA VA 22304

NASA

POSTMASTER: If Undeliverable (Section 158
Postal Manual) Do Not Return

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP-7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546

FEB 12 1981

Item 830-J-5

NAS 1.21:7043(27)

NASA

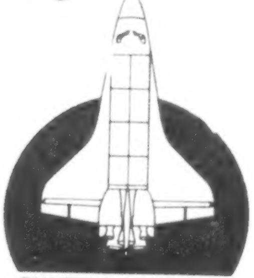
No Jacket
672

Energy
A Continuing
Bibliography
with Indexes

NASA SP-7043(27)
October 1980

contin

9099



SHUTTLE LAUNCH
MARCH 1981

National Aeronautics and
Space Administration

y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E
rgy Energy Energ
nergy Energy Ene
y Energy Energy E

NASA SP-7043 (27)

ENERGY

A Continuing Bibliography

With Indexes

Issue 27

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced from July 1 through September 30, 1980 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*

Scientific and Technical Information Branch 1980
National Aeronautics and Space Administration
Washington, DC

This supplement is available as NTISUB/026/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of $15.00 domestic; $30.00 foreign.

INTRODUCTION

This issue of *Energy: A Continuing Bibliography with Indexes* (NASA SP-7043(27)) lists 1920 reports, journal articles, and other documents announced between July 1, 1980 and September 30, 1980 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of this continuing bibliography was published in May 1974 and succeeding issues are published quarterly.

The coverage includes regional, national and international energy systems; research and development on fuels and other sources of energy; energy conversion, transport, transmission, distribution and storage, with special emphasis on use of hydrogen and of solar energy. Also included are methods of locating or using new energy resources. Of special interest is energy for heating, lighting, for powering aircraft, surface vehicles, or other machinery.

Each entry in the bibliography consists of a standard bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections, *IAA Entries* and *STAR Entries* in that order. The citation, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR* including the original accession numbers from the respective announcement journals. This procedure, which saves time and money accounts for the slight variation in citation appearances.

Five indexes -- subject, personal author, corporate source, contract number, and report number -- are included.

AVAILABILITY OF CITED PUBLICATIONS

IAA ENTRIES (A78-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at $6.00 per document up to a maximum of 20 pages. The charge for each additional page is $0.25. Microfiche(1) of documents announced in *IAA* are available at the rate of $2.50 per microfiche on demand, and at the rate of $1.10 per microfiche for standing orders for all *IAA* microfiche. The price for the *IAA* microfiche by category is available at the rate of $1.25 per microfiche plus a $1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of $1.35 per microfiche.

Minimum air-mail postage to foreign countries is $1.00 and all foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

STAR ENTRIES (N78-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page vii.

Microfiche is available regardless of age for those accessions followed by a # symbol.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Unit.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the * symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard $3.00 price, for those documents identified by a # symbol.)

---

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.

Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.

Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)

Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.

Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

GENERAL AVAILABILITY

All publications abstracted in this bibliography are available to the public through the sources as indicated in the *STAR Entries* and *IAA Entries* sections. It is suggested that the bibliography user contact his own library or other local libraries prior to ordering any publication inasmuch as many of the documents have been widely distributed by the issuing agencies, especially NASA. A listing of public collections of NASA documents is included on the inside back cover.

SUBSCRIPTION AVAILABILITY

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the quarterly supplements is $50.00 domestic; $100.00 foreign. All questions relating to the subscriptions should be referred to NTIS, Attn: Subscriptions, 5285 Port Royal Road, Springfield, Virginia 22161.

ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics
and Astronautics
Technical Information Service
555 West 57th Street, 12th Floor
New York, New York 10019

British Library Lending Division,
Boston Spa, Wetherby, Yorkshire,
England

Commissioner of Patents and
Trademarks
U.S. Patent and Trademark Office
Washington, D.C. 20231

Department of Energy
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service
ESRIN
Via Galileo Galilei
00044 Frascati (Rome) Italy

Her Majesty's Stationery Office
P.O. Box 569, S.E. 1
London, England

NASA Scientific and Technical Information
Facility
P.O. Box 8757
B. W. I. Airport, Maryland 21240

National Aeronautics and Space
Administration
Scientific and Technical Information
Branch (NST-41)
Washington, D.C. 20546

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161

Pendragon House, Inc.
899 Broadway Avenue
Redwood City, California 94063

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

University Microfilms
A Xerox Company
300 North Zeeb Road
Ann Arbor, Michigan 48106

University Microfilms, Ltd.
Tylers Green
London, England

U.S. Geological Survey
1033 General Services Administration
Building
Washington, D.C. 20242

U.S. Geological Survey
601 E. Cedar Avenue
Flagstaff, Arizona 86002

U.S. Geological Survey
345 Middlefield Road
Menlo Park, California 94025

U.S. Geological Survey
Bldg. 25, Denver Federal Center
Denver, Colorado 80225

Fachinformationszentrum Energie, Physik,
Mathematik GMBH
7514 Eggenstein Leopoldshafen
Federal Republic of Germany

NTIS PRICE SCHEDULES

Schedule A

STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1980)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	$ 3 50	$ 5 25
A02	001-025	5 00	10 00
A03	026-050	6 00	12 00
A04	051-075	7 00	14 00
A05	076-100	8 00	16 00
A06	101-125	9 00	18 00
A07	126-150	10 00	20 00
A08	151-175	11 00	22 00
A09	176-200	12 00	24 00
A10	201-225	13 00	26 00
A11	226-250	14 00	28 00
A12	251-275	15 00	30 00
A13	276-300	16 00	32 00
A14	301-325	17 00	34 00
A15	326-350	18 00	36 00
A16	351-375	19 00	38 00
A17	376-400	20 00	40 00
A18	401-425	21 00	42 00
A19	426-450	22 00	44 00
A20	451-475	23 00	46 00
A21	476-500	24 00	48 00
A22	501-525	25 00	50 00
A23	526-550	26 00	52 00
A24	551-575	27 00	54 00
A25	576-600	28 00	56 00
A99	601-up	1/	-- 2/

1/ Add $1 00 for each additional 25 page increment or portion thereof for 601 pages up

2/ Add $2 00 for each additional 25 page increment or portion thereof for 601 pages and more

Schedule E

EXCEPTION PRICE SCHEDULE

Paper Copy & Microfiche

Price Code	North American Price	Foreign Price
E01	$ 5 50	$ 11 50
E02	6 50	13 50
E03	8 50	17 50
E04	10 50	21 50
E05	12 50	25 50
E06	14 50	29 50
E07	16 50	33 50
E08	18 50	37 50
E09	20 50	41 50
E10	22 50	45 50
E11	24 50	49 50
E12	27 50	55 50
E13	30 50	61 50
E14	33 50	67 50
E15	36 50	73 50
E16	39 50	79 50
E17	42 50	85 50
E18	45 50	91 50
E19	50 50	100 50
E20	60 50	121 50
E99 - Write for quote		
N01	28 00	40 00

TABLE OF CONTENTS

Subject Categories

Abstracts in this Bibliography are grouped under the following categories: *page:*

01 ENERGY POLICIES AND ENERGY SYSTEMS ANALYSIS 323
Includes energy requirements, energy conservation, and environmental impacts of energy systems.

02 SOLAR ENERGY 357
Includes solar collectors, solar cells, solar heating and cooling systems, and solar generators.

03 HYDROGEN 459
Includes hydrogen production, storage, and distribution.

04 FUELS AND OTHER SOURCES OF ENERGY 465
Includes fossil fuels, nuclear fuels, geothermal and ocean thermal energy, tidal energy, and wind energy.

05 ENERGY CONVERSION 505
Includes photovoltaic, thermoelectric, geothermal, ocean thermal, and wind energy conversion. Also includes nuclear reactors and magnetohydrodynamic generators.

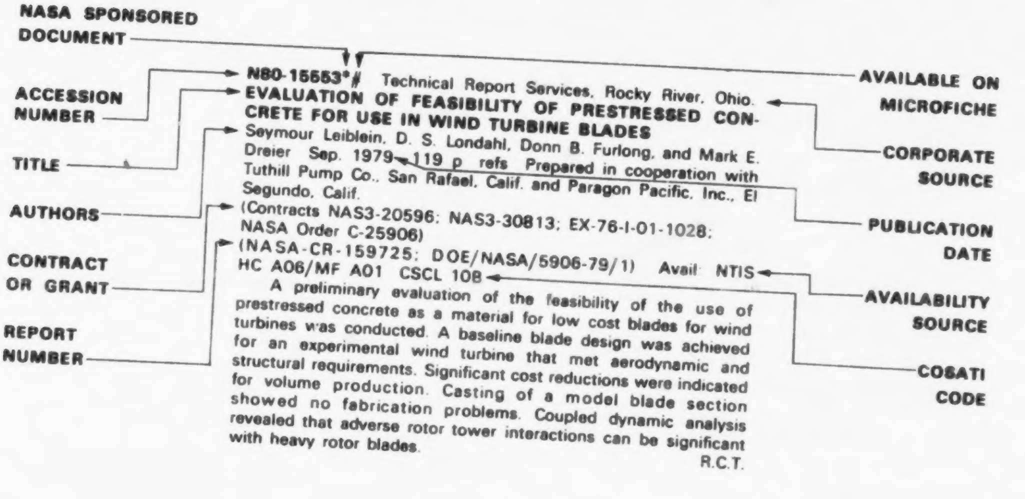
06 ENERGY TRANSPORT, TRANSMISSION, AND DISTRIBUTION 539
Includes transport of fuels by pipelines, tubes, etc., microwave power transmission, and superconducting power transmission.

07 ENERGY STORAGE 545
Includes flywheels, heat storage, underground air storage, compressed air, storage batteries, and electric hybrid vehicles.

08 GENERAL 567

SUBJECT INDEX A-1
PERSONAL AUTHOR INDEX B-1
CORPORATE SOURCE INDEX C-1
CONTRACT NUMBER INDEX D-1
REPORT/ACCESSION NUMBER INDEX E-1

TYPICAL CITATION AND ABSTRACT FROM *STAR*

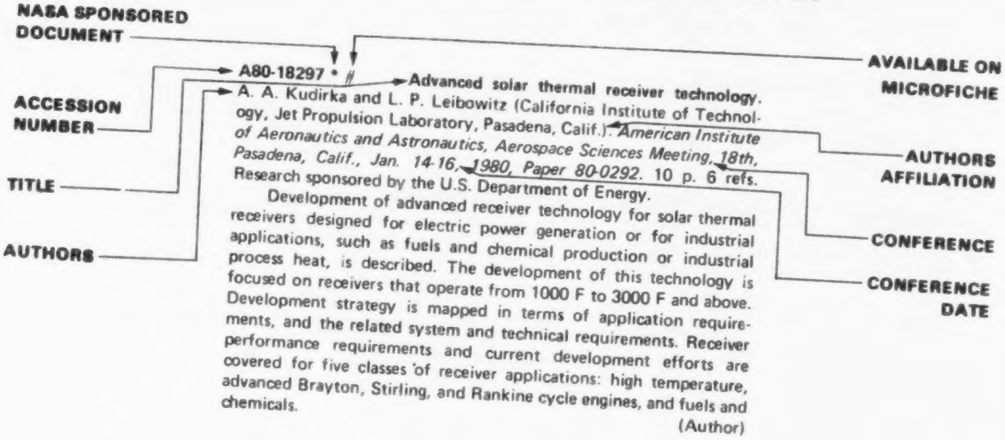

NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
CONTRACT OR GRANT
REPORT NUMBER
AVAILABLE ON MICROFICHE
CORPORATE SOURCE
PUBLICATION DATE
AVAILABILITY SOURCE
COSATI CODE

N80-15553*# Technical Report Services, Rocky River, Ohio.
EVALUATION OF FEASIBILITY OF PRESTRESSED CONCRETE FOR USE IN WIND TURBINE BLADES
Seymour Leiblein, D. S. Londahl, Donn B. Furlong, and Mark E. Dreier Sep. 1979 119 p refs Prepared in cooperation with Tuthill Pump Co., San Rafael, Calif. and Paragon Pacific, Inc., El Segundo, Calif.
(Contracts NAS3-20596; NAS3-30813; EX-76-I-01-1028; NASA Order C-25906)
(NASA-CR-159725; DOE/NASA/5906-79/1) Avail: NTIS HC A06/MF A01 CSCL 10B

A preliminary evaluation of the feasibility of the use of prestressed concrete as a material for low cost blades for wind turbines was conducted. A baseline blade design was achieved for an experimental wind turbine that met aerodynamic and structural requirements. Significant cost reductions were indicated for volume production. Casting of a model blade section showed no fabrication problems. Coupled dynamic analysis revealed that adverse rotor tower interactions can be significant with heavy rotor blades.

R.C.T.

TYPICAL CITATION AND ABSTRACT FROM *IAA*


NASA SPONSORED DOCUMENT
ACCESSION NUMBER
TITLE
AUTHORS
AVAILABLE ON MICROFICHE
AUTHORS AFFILIATION
CONFERENCE
CONFERENCE DATE

A80-18297 * # Advanced solar thermal receiver technology.
A. A. Kudirka and L. P. Leibowitz (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *American Institute of Aeronautics and Astronautics, Aerospace Sciences Meeting, 18th, Pasadena, Calif., Jan. 14-16, 1980, Paper 80-0292.* 10 p. 6 refs. Research sponsored by the U.S. Department of Energy.

Development of advanced receiver technology for solar thermal receivers designed for electric power generation or for industrial applications, such as fuels and chemical production or industrial process heat, is described. The development of this technology is focused on receivers that operate from 1000 F to 3000 F and above. Development strategy is mapped in terms of application requirements, and the related system and technical requirements. Receiver performance requirements and current development efforts are covered for five classes of receiver applications: high temperature, advanced Brayton, Stirling, and Rankine cycle engines, and fuels and chemicals.

(Author)

A Listing of Energy Bibliographies Contained In This Publication:

1. Solar power satellites. Citations from the International Aerospace Abstracts data base p0541 N80-22861
2. Solar space heating and air conditioning, volume 3. Citations from the NTIS data base p0424 N80-22864
3. Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base p0425 N80-22865
4. Solar space heating and air conditioning, volume 4. Citations from the NTIS data base p0425 N80-22866
5. Passive solar space heating and cooling. Citations from the engineering index data base p0425 N80-22867
6. Passive solar space heating and cooling. Citations from the NTIS data base p0425 N80-22868
7. Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base p0425 N80-22869
8. Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base p0425 N80-22870
9. Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base p0425 N80-22871
10. Cadmium sulfide solar cells, volume 2. Citations from the NTIS data base p0425 N80-22872
11. Cadmium sulfide solar cells. Citations from the Engineering Index data base p0426 N80-22873
12. Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base p0491 N80-25478
13. Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base p0491 N80-25479
14. Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base p0346 N80-25678
15. Diesel exhaust emissions. Citations from the American Petroleum Institute data base p0347 N80-25679

16.	Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base	p0492 N80-25770
17.	Research to identify components of energy-related wastes: A state-of-the-art report --- environment effects, bibliographies	p0351 N80-25943
18.	Coal gasification technology. Citations from the NTIS data base	p0503 N80-27525
19.	Coal liquefaction technology. Citations from the NTIS data base	p0503 N80-27526
20.	Coal gasification technology. Citations from the NTIS data center	p0503 N80-27527
21.	Solar process heat. Citations from the NTIS data base	p0457 N80-27823

ENERGY

A Continuing Bibliography (Issue 27)

OCTOBER 1980

01

ENERGY POLICIES AND ENERGY SYSTEMS ANALYSIS

Includes energy requirements, energy conservation, and environmental impacts of energy systems.

A80-33433 **Energy self-sufficiency in monsoonal Australia.** T. R. Lee (Environment Council /N.J./, Inc., Darwin, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 173-177.

The paper presents the development concept of the Darwin Solar Village project, an energy self-sufficient residential development now in construction on the north coast of Australia. The project will employ windmill water pumping, commercial solar hot water systems, solar electrical systems, aerogeneration, and solar air conditioning. The use of methane produced from household wastes and wastes from agricultural and animal husbandry activities will have an important role in reducing the electrical power demand, primarily for cooking. The social requirements for the achievement of energy self-sufficiency are also discussed. V.L.

A80-33436 **Canada's federal solar energy program.** R. M. Aldwinckle (National Research Council, Ottawa, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 187-191.

A80-33437 **Solar energy R & D projects in Denmark.** V. Korsgaard and T. V. Esbensen (Danmarks Tekniske Hojskole, Lyngby, Denmark). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 192-194.

A80-33441 **National solar heating and cooling programme in the Netherlands.** K. Joon, P. F. Sens (Netherlands Energy Research Foundation, Petten, Netherlands), and C. W. J. van Koppen (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 215-218.

A80-33442 **National solar heating and cooling programme - New Zealand.** R. F. Benseman and M. A. Collins. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 219-223. 10 refs.

A80-33443 **Solar Heating '85 - Sweden's national solar heating program.** L. O. Matsson (Solar Energy Association of Scandinavia, Stockholm, Sweden). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 224-228.

A80-33444 **Solar energy research in Sweden.** L. Kristoferson (Kungl. Svenska Vetenskapsakademien, Beijer Institutet; Swedish Energy R&D Commission, Stockholm, Sweden). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 229-232. 10 refs.

A80-33445 **The United Kingdom solar heating programme.** D. W. Jefferson-Loveday (Department of Energy, Energy Technology Support Unit, Harwell, Oxon, England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 233-237. 7 refs.

A80-33446 **Status of the United States' Solar Heating and Cooling Program.** F. H. Morse (U.S. Department of Energy, Office of Solar Applications, Washington, D.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 238-242. 5 refs.

A80-33672 **International development assistance for renewable technologies - Current programs and institutional requirements.** J. H. Ashworth and R. E. Meunier (Solar Energy Research Institute, Golden, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1460-1464.

Within the last several years, foreign assistance donor agencies have begun to provide significant aid for the search for renewable energy sources in developing nations. This paper reports preliminary results from a survey of development assistance projects in renewable energy sources, indicating which areas are extensions of traditional assistance areas and which are new areas of involvement. The last two portions of the paper indicate certain shortcomings in the current effort, and linkages which must be emphasized in order to increase the effectiveness of the range of donor activities. (Author)

A80-33675 **A renewable energy system for developing countries.** H. J. Allison (Oklahoma State University, Stillwater, Okla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1475-1479. Research sponsored by the United Nations Environment Program.

Decentralized power systems which operate from renewable energy resources can supply reliable energy to remote areas of the developing nations of the world. Such systems can do much to improve the quality of life for millions of people throughout the world. This paper describes an energy system which integrates solar, wind, and biomass resources in a manner which produces a more flexible and reliable power source than could be made available from separate uses of these renewable resources. Prototype systems based on the concepts described in this paper are planned for Sri Lanka, Senegal, and Mexico. (Author)

A80-33677 **Energy systems based on local renewable energy resources for a rural community in a developing country.** D. Cavard and P. Criqui (CNRS, Institut Economique et Juridique de l'Energie, Grenoble, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1485-1489.

The application of energy balance to a particular case, an isolated, rural developing community, shows the following relevant facts: (1) a relatively great actual importance and a large potentiality of the renewable energy sources, which could solve certain problems of development, (2) in general, present energy needs remain largely unsatisfied, and (3) the increase of the consumption of imported energy resources (mainly oil products) might cause some socio-economic disequilibria in this area. It is shown that it will be advantageous for such a country to develop all the biomass energy resources and the wind and photovoltaic solar sources in order to provide for the local needs of electricity and water-pumping.

(Author)

A80-33690 **Integrating energy approaches in a large office building.** M. Villecco. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1561-1564.

The TVA office complex for Chattanooga will be a demonstration of energy conscious design, pushing the state of the art in combining urban density with a solar envelope and in using daylight as a primary energy strategy. The paper describes the quantitative and qualitative design objectives of the project, the interdisciplinary team approach, and the technical conclusions of the design team. The paper also discusses the impact of the project on Chattanooga in terms of solar zoning and efforts to use cogeneration with renewable resources to provide off-the-grid power.

(Author)

A80-33706 **Design and performance of low heat loss window systems.** A. L. Berlad, Y. J. Yeh, N. Tutu, and R. Jaung (New York, State University, Stony Brook, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1652-1655.

A80-34018 # **Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents.** A. H. Rosenfeld and F. C. Winkelmann (California, University, Berkeley, Calif.). *CODATA Bulletin*, no. 23, May 1977, p. 1-3; Discussion, p. 3, 4. ERDA-supported research.

Two new energy information bases, ERDI/West and ESIDD are described. ERDI/West is a computer-based inventory destined to cover all energy-related activity in the Western Region of the U.S. It now contains information on projects and investigators in California, but ultimately will also have document and data files. ERDI/West is expected to be a useful tool for administrators, legislators, and researchers in planning, funding, or conducting energy research and development in the West. The second data base, ESIDD, Energy Savings and Investment Data and Documents, contains up-to-date information on existing documents and data on annual energy savings and required investment for different energy conservation measures in homes, commercial buildings, industry, and in home appliance selection. To illustrate the importance of cost-to-saving data for setting energy priorities, two energy strategies are compared: producing more energy by building a $1.6 billion synthetic gas plant, versus conserving energy by adding extra insulation to existing homes and appliances.

(Author)

A80-34056 # **Siemens/Düwag H-Bahn - Technology and comparative assessment.** F. Frederich (Waggonfabrik Uerdingen AG, Krefeld-Uerdingen, West Germany). In: Advanced transit and urban revitalization - An international dialogue; Proceedings of the International Conference, Indianapolis, Ind., April 25-28, 1978. Volume 1. Washington, D.C., Advanced Transit Association, 1978. 19 p. 16 refs. Research supported by the Bundesministerium für Forschung und Technologie.

The paper deals with the technology of the H-Bahn. A brief description is given of the system components, comprising the track beams, track support columns, points, cabins and cars of various sizes and running gear units with linear and rotating motor drives, as well as the automatic control system. A comparison with existing rapid transit systems proves the suitability of the H-Bahn as a rapid transit system. The criteria applied are capacity, riding comfort, noise propagation, width of traffic corridor, pollution emission, energy consumption, capital investment and operating costs.

(Author)

A80-34067 # **The bus systems, passenger transit system of the future.** M. Krüger (Maschinenfabrik Augsburg-Nürnberg AG, Munich, West Germany). In: Advanced transit and urban revitalization - An international dialogue; Proceedings of the International Conference, Indianapolis, Ind., April 25-28, 1978. Volume 1. Washington, D.C., Advanced Transit Association, 1978. 21 p. 14 refs.

The paper examines future bus systems which will integrate passenger requirements, vehicle design, and operation for improved reliability, frequency, speed, and comfort of bus riding. Traffic density, areas required for traffic, energy consumption, and safety are discussed, presenting an improved system which integrates the infrastructure such as the bus route, the bus stop, and traffic signals; the organization of passenger handling in regard to travel routes, ticket information and ticket purchase; and bus designs incorporating low energy consumption, low emissions, and independence from the use of oil.

A.T.

A80-34122 **Investigation of further economics development of regional electricity supply concerns (Untersuchung zur weiteren wirtschaftlichen Entwicklung regionaler EVU).** K. Hubig and G. Sickmüller (Uberlandwerk Oberfranken AG, Bamberg, West Germany). *Energiewirtschaftliche Tagesfragen*, vol. 30, Apr. 1980, p. 225-229. In German.

The article examines the year-end results of the power plant operating costs during 1977 and 1978 in the Federal Republic of Germany. A complete economic analysis is made considering such factors as productivity and stagnation of capital budgets.

M.E.P.

A80-34124 **The energy supply of today and tomorrow (Die Energieversorgung von heute und morgen).** W. Janssen (Überlandwerk Unterfranken AG, Würzburg, West Germany). *Energiewirtschaftliche Tagesfragen*, vol. 30, Apr. 1980, p. 280-286. In German.

The paper examines present worldwide energy demand and compares it with predictions of future demand. Topics discussed include the exhaustible energies, regenerative energies, nuclear energy, electrical power, power plant capacities, safety and the environment, and the necessity and possibilities for energy conservation.

M.E.P.

A80-34125 **The influence of the federal council on the formulation of the 'Regulation on general conditions for the supply of electricity for tariff customers' and the 'Second regulation on altering of the federal electricity tariff structure' - Attempt at a critical assessment (Zum Einfluss des Bundesrates auf die Fassung der 'Verordnung über Allgemeine Bedingungen für die Elektrizitätsversorgung von Tarifkunden /AVBEltV/' und der 'Zweiten Verordnung zur Anderung der Bundestarifordnung Elektrizität' - Versuch einer kritischen Würdigung).** B. D. Sanders (Hannover-Braunschweigische Stromversorgungs-AG, Hanover, West Germany). *Energiewirtschaftliche Tagesfragen*, vol. 30, Apr. 1980, p. 286-298. 16 refs. In German.

A80-34600 **The trace element chemistry of coal during combustion and the emissions from coal-fired plants.** R. D. Smith (Battelle Pacific Northwest Laboratories, Richland, Wash.). *Progress in Energy and Combustion Science*, vol. 6, no. 1, 1980, p. 53-119. 155 refs.

A80-35649 **Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments.** D. W. Evans, J. G. Wiener (Georgia, University, Aiken, S.C.), and J. H. Horton. *Air Pollution Control Association, Journal*, vol. 30, May

1980, p. 567-573. 25 refs. U.S. Environmental Protection Agency Contract No. IAG-D5-B681; Contract No. EY-76-C-09-0819.

A80-35740 # **Wind energy from a utility planning perspective.** N. G. Butler (Bonneville Power Administration, Portland, Ore.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 305-310.

A method of potential wind generation assessment is presented which has the objective of extracting the maximum amount of energy per year at the lowest cost. The method consists in examining existing regional data, estimating the annual average wind power, estimating the annual energy production of different sizes of wind turbines by using the 'Harder curve', and the total number of turbines per site. The estimated output per wind turbine and the total number of turbines per site combine to produce an estimate of the wind field energy production potential, once the extent of the wind field has been determined. The cost of energy is estimated from the standard cost of energy equation. V.L.

A80-35878 **Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters.** S. C. Hunter and W. A. Carter (KVB, Inc., Tustin, Calif.). *AIChE Symposium Series,* vol. 75, no. 188, 1979, p. 14-26. 12 refs.

Seven petroleum refinery process heaters were tested to evaluate the feasibility of combustion system adjustments as a means of pollutant emissions reduction. Adjustments evaluated included fuel heat content variation, load variation, adjustment of excess air, burner air register adjustments, and removal of burners from service. Most refinery heaters use natural draft burners and the five units tested of that type showed less flexibility for combustion system adjustments compared with mechanical draft heaters and boilers. The largest NO(x) reduction obtained while firing refinery gas was about 20% and some heaters showed no response. There were significant effects of fuel heat content and load changes that used further investigation. Two mechanical draft single-burner heaters were tested. Reduction of excess air reduced NO(x) on gas fuel but had no effect on NO(x) when firing No. 6 oil. One mechanical draft unit that had air preheat produced significantly higher NO(x) emissions than did the other heaters. (Author)

A80-35879 **Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace.** R. A. Brown, H. B. Mason (Acurex Corp., Mountain View, Calif.), D. W. Pershing, and J. O. L. Wendt (Arizona, University, Tucson, Ariz.). *AIChE Symposium Series,* vol. 75, no. 188, 1979, p. 27-47. 33 refs.

A80-35880 **Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur.** G. T. Rochelle (Texas, University, Austin, Tex.) and C. J. King (California, University, Berkeley, Calif.). *AIChE Symposium Series,* vol. 75, no. 188, 1979, p. 48-61. 39 refs.

New and existing process alternatives are reviewed for stack-gas desulfurization by aqueous, buffered scrubbing with H2S regeneration to produce elemental sulfur. The existing commercial processes include the citrate and phosphate processes, which use a single regeneration loop. Analysis of the reaction kinetics and stoichiometry indicates that the rate of H2S regeneration is probably controlled by liquid-phase mass transfer resistance. Liquid circulation through the air flotation cells and main reactor could be greatly reduced by recycling scrubber solution after partial reaction with H2S. Such a double-loop process could also provide a capability for intermediate storage of solution between scrubbing and regeneration. A number of alternative buffer systems are considered which could provide less expensive alternatives for purging sulfates and chlorides. (Author)

A80-35890 **Particulate sulfur and trace metal emissions from oil fired power plants.** R. L. Bennett and K. T. Knapp (U.S. Environmental Protection Agency, Research Triangle Park, N.C.). *AIChE Symposium Series,* vol. 75, no. 188, 1979, p. 174-180.

Particulate emissions from five oil-fired electric utility power plants have been chemically characterized. One plant was studied on two separate field tests while consuming different fuels: Venezuelian and Middle East oil. Emission samples were collected for a variety of plant operating parameters including power load, levels of excess oxygen, sulfur content of fuel, trace metal (principally vanadium and nickel) concentrations of fuel, and use of fuel additives. Elemental emission concentrations were determined by wavelength dispersive X-ray fluorescence (XRF) measurement of particulate samples collected on a variety of filter substrates. The relative merits and limitations of each type of filter are discussed. Particle size distribution of the chemical elements in the emissions were determined by XRF analyses of samples collected by cascade impactors. (Author)

A80-35897 **Planning air quality control systems for power generation.** P. N. Cheremisinoff (New Jersey Institute of Technology, Newark, N.J.) and R. A. Salib (Ebasco Services, Inc., New York, N.Y.). *AIChE Symposium Series,* vol. 75, no. 188, 1979, p. 274-283.

The paper covers the examination of the step-by-step procedures required for optimization of air quality control systems (AQCSs) as applied to a 500-MW unit sample case scheduled to go on line in early 1980. A historical review of the power industry's thinking is presented whenever applicable. The steps of the AQCS optimization procedures are identified. An optimization technique based on large-scale fuel and ash analyses is presented, and its potential savings for industry is discussed. S.D.

A80-36053 **Oil from shale - The potential, the problems, and a plan for development.** A. E. Lewis (California, University, Livermore, Calif.). *Energy* (UK), vol. 5, Apr. 1980, p. 373-387. 23 refs. Contract No. W-7405-eng-48.

A unitized management and development of the government-owned oil shale in Colorado is expected to make it technically and economically practical to obtain very large production rates of shale oil from this source. The paper discusses the resource potential, impediments to development of resource, technology for development of government land and government organization and policy required for development. Important differences exist in the nature of the oil-shale resource held by the government and that held by private companies. These differences are crucial both in estimating production costs and incentives necessary for production and for defining applicable technology. It is proposed that a single federal authority, Piceance Basin Authority, be given the responsibility and authority for developing this government resource under a legislative charter from the Congress. S.D.

A80-36419 **Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds.** P. V. Hobbs, J. L. Stith, and L. F. Radke (Washington, University, Seattle, Wash.). *Journal of Applied Meteorology,* vol. 19, Apr. 1980, p. 439-451. 14 refs. NSF Grant No. ENV-75-19701.

A80-36476 **Chemical characteristics of oil refinery plumes in Los Angeles.** F. P. Parungo, R. F. Pueschel, and D. I. Wellman (NOAA, Atmospheric Physics and Chemistry Laboratory, Boulder, Colo.). *Atmospheric Environment,* vol. 14, no. 5, 1980, p. 509-522. 14 refs. Research supported by the U.S. Environmental Protection Agency.

Airborne in situ measurements of gases (NO, NO2, SO2, O3) and aerosol size distributions have been made in the vicinity of oil refineries in southern Los Angeles. Filter and impactor samples have been collected for post-flight chemical particle analyses using the BaCl2 and Nitron reaction spot techniques, and X-ray energy spectrometry. It was found that the refinery operations increase the number concentration of aerosols in the size range between 0.05 micron and 23.5 microns particle radius. Sulfate and nitrate particles have been identified as oxidation productions of SO2 and NOx, respectively. Sulfate particles have been found with a mode of less than 0.1 micron diameter, whereas inorganic nitrates dominate the mode between 1 and 10 microns. The strong affinity for water of the nitrates strongly affects visibility, cloud formation and the cloud drop size spectrum.

(Author)

A80-36477 **Air quality measurements in the coal fired power plant environment of Colstrip, Montana.** J. D. Ludwick, D. B. Weber, K. B. Olsen, and S. R. Garcia (Battelle Pacific Northwest Laboratories, Richland, Wash.). *Atmospheric Environment,* vol. 14, no. 5, 1980, p. 523-532. 18 refs. U.S. Environmental Protection Agency Contract No. IAG-D7-0473.

A80-36550 **Energy prices (Les prix de l'énergie).** L. Gouni (Electricité de France, Paris, France). *Revue de l'Energie,* vol. 31, Apr. 1980, p. 185-195. In French.

Numerous studies exist concerning energy prices and more specially, concerning price perspectives for the end of the 20th Century. This article deals with oil price futurology as little as possible and concentrates on trying to draw conclusions from the history of the past three decades. It includes: several remarks about price and cost concepts which enable the author to emphasize ambiguities in this field, observations about prices as seen from the consumer's angle, observations about costs and prices as seen from the energy supplier's angle, and observations concerning the notion of energy reference prices.

(Author)

A80-36976 **Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings (Journées Scientifiques sur l'Automobile: Economies d'Energie et Pollution Atmosphérique, Paris, France, December 6, 7, 1979, Compte Rendu Integral).** Workshop sponsored by the Association pour la Prévention de la Pollution Atmosphérique, Ministère de l'Environnement et du Cadre de Vie, Ministère de la Santé, Ministère de l'Industrie, and Ministère des Transports. *Pollution Atmosphérique,* vol. 22, Jan.-Mar. 1980. 208 p. In French.

Papers are presented on the biological effects, physical chemistry, and characterization of automobile-produced air pollutants and the effects of energy conservation and traffic control measures on automobile pollution levels. Specific topics include the physical chemistry of automobile pollutants, the fine analysis of polynuclear aromatic hydrocarbons, the detection of toxic and carcinogenic effects of pollutant compounds and mixtures, and the effects of automobile pollution on vegetation. Attention is also given to the Bordeaux automatic traffic control system, diesel engine optimization with respect to pollution and noise, fuel conservation objectives in the transportation sector, electric vehicle development, a casinghead-gas-fueled urban bus, and the development of three-way catalytic converters.

A.L.W.

A80-37331 # **Impacts of fossil fuel use on environment and climate.** W. Bach (Münster, Universität, Münster, West Germany). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt,.1979, p. 4.1-4.23. 53 refs.

This paper reviews the physical impacts of fossil fuel use on the environment and climate system. Such an analysis involves the assessment of the future world fossil fuel resources and their relative share in a future global energy mix. The specific environmental impacts are shown for conventional and unconventional coal, oil and gas production and combustion. The impact on climate is demonstrated for the release of heat, particles and CO2. Results of temperature change due to CO2-increase are shown for a low (30TW) and a high (50TW) energy supply scenario. It is noted that the perception of the general impacts of fossil fuel use on the environment is not very high, whereas the specific impact of increasing CO2 on climate is presently perceived as the greatest risk. Uncertainties in the CO2-impact assessment make it, however,

pollution monitoring and alert network currently being set up are indicated, and planned systematic studies are presented. A.L.W.

A80-37332 # **Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water.** W. Peschka (Deutsche Forschungs- und Versuchsantstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. , Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 5.1-5.14. 8 refs.

The paper compares the environmental pollution of different fuels. This is significant due to increasing pollution with NO(x), CO, and hydrocarbons. The release of carbon dioxide may be a crucial problem, and the consumption of fossil fuels and carbon-free fuels such as hydrogen may provide a solution. It is expected that the air industry will use kerosene in the future and poor quality crude oil due to increased prices; the alternative sources such as oil shale and coal will require large amounts of hydrogen and energy, and fuels made from synthetic crude oils will have a higher nitrogen content contributing to pollution. Liquid hydrogen will produce none of the carbon-related pollutants, and will be the most environmentally acceptable fuel. It is concluded that whether hydrogen fuel will be utilized for clean energy will be determined by the air industry because of its energy consumption, and it represents an essential link in the production-consumption chain.

A.T.

A80-37351 **Consumer experience with electric vehicles.** M. A. Kocis (New York State, Dept. of Transportation, Planning and Research Bureau, Albany, N.Y.). *Journal of Advanced Transportation,* vol. 14, Spring 1980, p. 13-22. 5 refs. Research sponsored by the New York State Department of Transportation.

The results of a study intended to show how present electric vehicle owners use their vehicles, what problems are encountered, and the prospects for repurchase, are presented. Aspects covered include vehicle descriptions, comparison with internal combustion engine vehicles, and an overall rating. It is concluded that user's experience shows that electric vehicles can replace internal combustion engine vehicles in many situations. Finally, owner acceptance of the electric vehicle concept has relied on energy, environmental and economic considerations, yet these owners feel that longer range, faster speeds, and reasonable costs are important factors for future purchases decisions and for further acceptability.

M.E.P.

A80-37353 **Transportation energy contingencies - A status report on public response and government roles.** D. T. Hartgen (New York State, Dept. of Transportation, Albany, N.Y.). *Journal of Advanced Transportation,* vol. 14, Spring 1980, p. 47-72. 31 refs.

Recent work at NYSDOT to develop transportation energy contingency plans for dealing with energy crises such as experienced in 1973-74 and 1979, is summarized. On the basis of recent household data from New York, these two recent crises are described and compared with respect to shortfall, price rises and public response. In both cases shortfalls of 11-13% and price rises of 30-35% were found. In general, it is reported, public responses were similar, focusing on driving slower and cuts in discretionary shop travel, however the 1979 crisis also showed major savings in vacation related actions and purchases of fuel-efficient cars. It is concluded that clearer government roles and responsibilities for contingency actions, coupled with current contingency plan development by local government and recent establishment of state conservation targets, should mean greater effectiveness in dealing with these events and hence generally less impact than in the past.

M.E.P.

A80-37618 **Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems.** H. T. Karlsson and H. S. Rosenberg (Battelle Columbus Laboratories, Columbus, Ohio). *Air Pollution Control Association Journal,* vol. 30, June 1980, p. 710-714. 9 refs.

A80-37680 Silicon carbide-tungsten heat pipes for high-temperature service. L. B. Lundberg (California, University, Los Alamos, N. Mex.). *(American Chemical Society and Chemical Society of Japan, Chemical Congress, Honolulu, Hawaii, Apr. 1-6, 1979.) I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 19, June 1980, p. 241-244. 8 refs.

Silicon carbide is being considered for use as the structural material in liquid metal heat pipes to be used in high-temperature, waste-heat recovery from plants operating with fossil fuels. In order to protect the SiC from attack by the sodium or lithium metal working fluid, the SiC must be coated internally with tungsten. Experiments have been performed to determine the rate of reaction (layer growth) between SiC and tungsten in a vacuum over the temperature range 1875 to 2075 K. This reaction rate is similar to that observed for the tungsten-carbon reaction forming W2C. The reaction layer developed from the SiC-W reaction consists of two phases, W5Si3 and W2C. Based on the observed reaction rate, it is estimated that for heat pipe operating lifetimes of 20 years and tungsten coating thickness of 0.25 mm, the practical steady operating temperature limit is about 1575 K. (Author)

A80-37691 Fuel - A system problem of major proportions. W. T. Hardaker (Air Transport Association of America, Washington, D.C.). In: Air Traffic Control Association, Annual Fall Conference, 24th, Atlantic City, N.J., October 15-19, 1979, Proceedings. Washington, D.C., Air Traffic Control Association, Inc., 1979, p. 10-14.

In the present paper, some substantial achievements of the airlines in reducing fuel consumption by computer-aided flight planning, purchase of more efficient aircraft and engines, and better utilization of aircraft are reviewed, and means of addressing the challenge to use the available fuel more efficiently are examined. These include optimum utilization of airports, maximum use of established fuel-conservation descent procedures and existing gate-hold procedures, mimization of circuitous tourings and of the adverse effects of airspace reservations, improved information on expected arrival delays to the pilot - enabling him to save fuel by reducing speed, and implementation of the Wake Vortex Advisory System, to mention only a few of the ATC actions that can be taken. V.P.

A80-37984 California State energy efficient State Office Building. B. S. Setty (Benham-Blair and Affiliates, Inc., Falls Church, Va.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 1029-1055.

Advanced energy technology, utilizing concentrated solar collectors and ice storage system was employed to achieve the lowest energy consumption and lowest life cycle cost. The paper will discuss the functions of the concentrating collectors and its integration with ice storage systems as follows: (1) utilization of concentrating solar collectors passive systems in order to save nonrenewable sources of energy; (2) modes and tracking mechanism of the concentrated solar collectors; (3) concentrating collector system interaction with high temperature storage system; (4) conversion of solar energy into ice, its implications, and its interaction with the ice storage system; and (5) system's flexibilility to provide solar heat at maximum efficiency. (Author)

A80-37989 Use of renewable fuels in the rural development of India. G. C. Pandey (Jawaharlal Nehru University, New Delhi, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 1119-1131.

An analysis is made of the possible application of renewable energy sources for domestic use, especially in rural areas in tropical and semitropical countries, using available technology. Attention is given to the use of solar cookers and to biogas technology, by which a savings of firewood as well as oil and oil products, such as synthetic fertilizers, can be realized. The actual implementation of such energy sources is discussed, and factors are taken into account. J.P.B.

A80-38017 French solar energy program and its application for international cooperation. M. J. Pheline (Délégation aux Energies Nouvelles, Paris, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1937-1949.

A large-scale solar energy development program is now underway in France which includes: thermal conversion and its applications for space heating, thermodynamic conversion and power production, direct conversion by photocells, bioconversion, and various applications, such as cooking, desalination, and solar communications. Consideration is also given to various cooperative actions with other countries in solar energy research and applications. It is predicted that by 1985 solar and geothermal energy will contribute 1 to 2 percent of the total primary energy consumption in France. V.L.

A80-38018 An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry. C. G. Orsak, R. Barnstone, Y. Jani, H. Gibson, and J. Morehouse (Navarro College, Corsicana, Tex.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1976-2002.

A research project has been carried out by Navarro College for the Department of Energy with the objective of determining the national need for manpower trained in solar energy technology. The project had three basic tasks: to conduct a survey of solar heating and cooling systems, review existing consumer demand studies to forecast manpower requirements, and conduct a skills study to determine the types of curriculum required. The analysis shows that there will be at least 2.4 million solar units installed by 1985. Accordingly, by that year there must be a minimum of 25,000 skilled workers in the solar field; one fifth of these must be trained at the technician level. To meet the demands for solar workers, 80 schools, each graduating 50 solar technicians per year will be needed between 1978 and 1985. V.L.

A80-38210 Heat pumps for heating, cooling, and energy recovery 1976-1990 (Wärmepumpen für Heizung, Kühlung und Energierückgewinnung 1976-1990). R. Rudolph, G. Purper, R. Frische, F. Grüning, H. Jansen, I. Paul, and C. Rode (Battelle-Institut, Frankfurt am Main, West Germany). Cologne, Verlag TÜV Rheinland GmbH, 1979. 192 p. 46 refs. In German. $14.66.

The present status and future possibilities of heat pumps are surveyed. Attention is given to technology, noting that electric compression heat pumps are the most developed. Systems discussed include monovalent and bivalent electro-heat pumps with heat sources such as water, ground, ambient air, and solar energy. It is shown that the emphasis of development is on the improvement of individual components such as the working medium, the condensor, and heat exchanger. Also examined are costs and economy, as well as the market potential for heat pumps. Further, an assessment is made of how heat pumps will affect the ecology, governmental policy, the economy, and society. M.E.P.

A80-38303 Energy and environmental politics in the 80's (Energie- und Umweltpolitik in den 80er Jahren). G. Weiser (Ministerium für Ernährung, Landwirtschaft und Umwelt, Stuttgart, West Germany). *(Arbeitsgemeinschaft Regionaler Energieversorgungs-Unternehmen, Jahrestagung, Stuttgart, West Germany, Apr. 29, 1980.) Energiewirtschaftliche Tagesfragen*, vol. 30, May 1980, p. 323-327. In German.

Factors involved in determining energy and environmental policy in the FRG are surveyed. Attention is given to the goals of the energy policy in Baden-Württemberg: (1) to assure the supply of energy for all consumers over the long term and under the most

favorable conditions, (2) attaining an economical and rational use of energy, and (3) protecting the environment while meeting the demand for energy. A detailed description is given of the strategy of the program which includes the following measures: (a) reduction of dependence on oil, (b) increased energy conservation by consumers, (c) accelerated development of regenerative energy sources, (d) expansion of natural gas and long distance heating supply, (e) encouraging rational energy generation and usage, and (f) increased usage of coal and nuclear energy.
M.E.P.

A80-38304 **Topical questions of energy economics (Aktuelle Fragen der Energiewirtschaft).** G. Hecker (Arbeitsgemeinschaft regionaler Energieversorgungs-Unternehmen; ELEKTROMARK kommunales Elektrizitätswerk Mark AG, Hagen, West Germany). *(Arbeitsgemeinschaft Regionaler Energieversorgungs-Unternehmen, Jahrestagung, Stuttgart, West Germany, Apr. 29, 1980.) Energiewirtschaftliche Tagesfragen*, vol. 30, May 1980, p. 333-336. In German.

A survey is made of the factors affecting the economics of energy in the FRG. Attention is given to the fact that the development of the power distribution in the FRG during 1978-79 was greater than the economic growth rate. Also examined is the need for rational and economic energy utilization, which involves a rational integration of electricity, gas, and utilization of long distance heating on the basis of power-heat-coupling and industrial waste heat. Consideration is also given to the problem that new techniques such as coal gasification and coal liquefaction will increase the demand beyond what can be met. In addition, the need for more nuclear power is stressed.
M.E.P.

A80-38366 **Practical application of flue gas de-NO/x/ system using honey-comb type catalyst.** M. Yamamoto, J. Miyake, T. Sengoku, T. Shiomi (Mitsubishi Heavy Industries, Ltd., Tokyo, Japan), S. Minagawa (Mitsubishi Heavy Industries, Ltd., Hiroshima Shipyard and Engine Works, Hiroshima, Japan), N. Yokoyama (Mitsubishi Heavy Industries, Ltd., Hiroshima Technical Institute, Hiroshima, Japan), and T. Miyagawa (Mitsubishi Heavy Industries, Ltd., Nagasaki Shipyard and Engine Works, Nagasaki, Japan). *Mitsubishi Heavy Industries Technical Review*, vol. 17, Feb. 1980, p. 11-18.

A system based on a honeycomb type catalyst has been developed for removing NO(x) from flue gases emitted from heavy-oil or coal-fired boilers. This paper reviews the design of the system and describes its performance during two years of operation at the Sodegaura Refinery.
B.J.

A80-38905 * # **Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft.** I. M. Goldsmith (Douglas Aircraft Co., Long Beach, Calif.) and J. V. Bowles (NASA, Ames Research Center, V/STOL Systems Technology Branch, Moffett Field, Calif.). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1090.* 10 p.

It is noted that several NASA-sponsored studies have identified a substantial potential fuel savings for high subsonic speed aircraft utilizing the propfan concept compared to the equivalent technology turbofan aircraft. Attention is given to a feasibility study for propfan-powered short- to medium-haul commercial transport aircraft conducted to evaluate potential fuel savings and identify critical technology requirements using the latest propfan performance data. An analysis is made of the design and performance characteristics of a wing-mounted and two-aft-mounted derivative propfan aircraft configurations, based on a DC-9 Super 80 airframe, which are compared to the baseline turbofan design. Finally, recommendations for further research efforts are also made.
M.E.P.

A80-38983 # **Lightweight diesel aircraft engines for general aviation.** A. P. Brouwers (Teledyne Continental Motors, Muskegon, Mich.). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1238.* 12 p.

This project reintroduces the diesel engine as an aircraft powerplant. A concept design study of two engines was conducted to define configurations and applicable advanced technologies. The information generated in the course of this study was then used to evaluate the performance of two aircraft: a six-place twin and a four-place single. The computer generated aircraft performance data show a vast improvement over current gasoline powered aircraft. Next the 186 cruise kW engine was also designed utilizing the experience gained from the concept design study. The development program of this engine is in process.
(Author)

A80-39554 **Paving the way for energy-saving innovations.** D. G. Jansson and G. C. Newton, Jr. (MIT, Cambridge, Mass.). *Technology Review*, vol. 83, June-July 1980, p. 42-53.

The paper examines the Energy Related Inventions Program of DOE which aims at stimulating the innovative process to assure that energy saving products reach the marketplace and are assimilated into economy. Specifically, the program will enable the inventors to compete effectively for public or private contract support, and to form new enterprises for production of their inventions; it will also help to negotiate the commercialization of their inventions. Five inventions, including equipment for waste heat utilization for commercial cooking equipment and a wastewater aeration power control device were evaluated for viability and energy impact; the evaluation consisted of estimates of the possible energy impact, assessments of invention's business potential, barriers to commercialization, and the role of DOE support in stimulating technology. A.T.

A80-40313 **New Technology Transport for fuel critical economy.** P. A. Hudak (Boeing Co., Seattle, Wash.) and K. A. B. Macdonald (Boeing Commercial Airplane Co., Seattle, Wash.). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 101-105.

The design objective of the New Technology Transport (NTT) which will have fly-by-wire, power-by-wire, digital data bus communication honeycomb primary structure, electric engine start, and will require no auxiliary unit is described. The impact of OPEC on the wholesale price index and airline economic parameters are discussed, and NTT studies to reduce operating costs by fuel efficiency improvement including the use of a high bypass turbofan, active boundary layer control, and high turbine inlet temperature are examined. Reducing crew and maintenance costs are considered, noting that structural corrosion and fatigue maintenance costs will be diminished by the use of a honeycomb primary structure in the fuselage, wing, and empennage. Finally, the elimination of the auxiliary power unit maintenance and fuel cost, and the reduced electronic/electric maintenance costs are noted.
A.T.

A80-40344 **Common Cause Failures - A dilemma in perspective.** A. M. Smith (General Electric Co., Sunnyvale, Calif.) and I. A. Watson (U.K. Atomic Energy Authority, Lancs., England). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 332-339. 31 refs.

This paper identifies the broad spectrum of Common Cause Failure (CCF) definitions used by various authors. These definitions, as applied to real aircraft and nuclear reactor failure events, lead to a divergence of interpretation and a resultant confusion that obscures meaningful progression in CCF analysis. A new definition is proposed, explained, and tested against the examples. Technical as well as Administrative Practices are cited as ways to control or eliminate the product defects that lead to CCF.
(Author)

A80-40349 **A Boolean approach to common cause analysis.** R. B. Worrell and D. W. Stack (Sandia Laboratories, Albuquerque, N. Mex.). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings.

New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 363-366. 14 refs.

It is shown that a transformation of variables can be used to achieve qualitative common cause analysis. Transformation equations that relate cause events to the primary events of a fault tree are described, and the substitutions that change the minimal cut set equation for the top event of the fault tree from a function of primary events to a function of cause events are explained. Examples are presented which show that different kinds of common cause analysis are accomplished by simple modifications of the transformation equations. (Author)

A80-40751 **Liquid fuel supplies.** H. Perry. *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 103-107. 6 refs.

This paper presents an overview of United States and world petroleum, natural gas, and natural gas liquids presumed recoverable but as yet undiscovered resources and suggests that the depletion of these fuels may not occur as quickly as frequently predicted. The paper points out that the construction of a synthetic fuels industry will be very costly and will provide only a small amount of increased energy independence. The fear is expressed that haste in accepting a specific synfuels process on the basis of present technology may serve to forestall the development of a better technology. The paper suggests that we construct relatively few plants now each using a different technology in order to gain better understanding of the various technologies, more information on costs and the essential but as yet unknown information on environmental and socioeconomic effects of large scale plants. (Author)

A80-40759 **Environmental concerns for coal synfuel commercialization.** F. E. Witmer (U.S. Department of Energy, Environmental Control Technology Div., Washington, D.C.). *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 185-195. 8 refs.

The control of multimedia environmental impacts (air, land, water) for commercial U.S. coal synfuel facilities is briefly discussed, based on process design data and environmental standards. While environmental control technology appears to be adequate, there is a critical need for confirmatory data from large-scale operating plants. Worker exposure to fugitive emissions and the disposal of solid waste are of special concern. The major environmental impediments to the commercialization of existing coal synfuel technology are time delays, facility size limitations, and 'non-acceptance' by the impacted community. (Author)

A80-40825 **Synthetic fuels from coal: Overview and assessment.** L. L. Anderson (Utah, University, Salt Lake City, Utah) and D. A. Tillman (Washington, University, Seattle, Wash.). New York, Wiley-Interscience, 1979. 170 p. 154 refs. $16.95.

The book contains a critical analysis of today's synthetic fuels option from the point of view of both user and producer. The principles of coal conversion and the history of synthetic fuel production are reviewed. Specific fuel types (low, medium, and high Btu gases, heavy and light liquids) and such synthetic fuels as petrochemical feedstocks are considered. Economic and environmental costs associated with synthetic fuel production are examined. V.T.

A80-40935 **A global and long-range picture of energy developments.** W. Häfele (International Institute for Applied Systems Analysis, Laxenburg, Austria). *Science,* vol. 209, July 4, 1980, p. 174-182. 22 refs.

An analysis of the balance between energy supply and demand for the next 50 years has been made for seven major world regions for two scenarios: one in which world energy consumption increases from today's 8.2 terawatt/yr to 22 TW/yr and the other where the increase is to 35 TW/yr. Factors considered with regard to energy demand include population growth, economic growth and technological progress, and energy sources such as oil, coal, nuclear and solar power are discussed. It is shown that time will be the limiting constraint in adapting the energy supply infrastructure to changing resource availability, and that resources will be available but a strong shift to low-grade fossil fuels such as shale oil and tar sands will be required. J.P.B.

A80-40944 # **The energy problem - Its effect on aircraft design. IV - The unforecastable future.** W. Tye. *Aircraft Engineering,* vol. 52, June 1980, p. 2-4.

Future supplies of energy for aviation and their affect on aircraft design are considered. Attention is given to proven and ultimately recoverable reserves of oil and gas and to the use of coal for fuel oil. Also discussed are advanced aircraft concepts, including laminar flow and the associated requirements of the porous surfaced wing and the suction system. In addition, the use of liquid hydrogen and of multibladed turbo-propellers with large blade chords, small thickness and high tip speeds, efficient up to a Mach number of 0.8, is considered. J.P.B.

A80-40945 # **Fuel economy in the airlines.** T. Ford. *Aircraft Engineering,* vol. 52, June 1980, p. 5-8.

Fuel savings during flight procedures are examined with regard to takeoff, climb optimization and automatic flight management using autopilot and autothrottle systems. The importance of the leading edge to the flow characteristics is also considered, along with engine design, development and maintenance. Research into terminal area capacity and efficiency, the improvement of approach and landing capability in adverse weather and the reduction of noise impact through operating procedures is discussed. In addition, the improvement of aircraft fuel efficiency by recovering deterioration losses and by incorporating drag reduction/engine fuel saving modifications is considered. J.P.B.

A80-40965 **Equitable performance comparison and economic evaluation of active and passive solar energy systems.** M. S. Drew and R. B. G. Selvage (S-Matrix Enterprises, Ltd., Richmond, British Columbia, Canada). *Energy* (U.K.), no. 5, May 1980, p. 407-415. 5 refs. Research supported by the British Columbia Ministry of Education, Science and Technology.

An evaluation of active and passive solar energy systems is made which assigns to both systems an equal energy demand. Active systems with baseline energy requirements equivalent to those of passive systems are identified by making a careful accounting of what passive solar energy properly belongs in the building load. This analysis allows an equitable economic comparison between the two alternative design solutions to the problem of maximizing life cycle savings for a system which supplies heat to a structure with specified floor area and heating load per unit floor area. (Author)

A80-41469 # **High temperature heat pipes for waste heat recovery.** M. A. Merrigan and E. S. Keddy (California, University, Los Alamos, N. Mex.). *American Institute of Aeronautics and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1505.* 8 p. 5 refs. Research sponsored by the U.S. Department of Energy.

Operation of heat pipes in air at temperatures above 1200 K has been accomplished using SiC as a shell material and a chemical vapor deposit (CVD) tungsten inner liner for protection of the ceramic from the sodium working fluid. The CVD tungsten has been used as a distribution wick for the gravity-assisted heat pipe through structure, achieved by control of the metal vapor deposition rate. Wick performance has been demonstrated in tests at approximately 2 kW through-put with a 19-mm-i.d. SiC heat pipe. Operation of ceramic heat pipes in repeated start cycle tests has demonstrated their ability to withstand temperature rise rates of greater than 1.2 K/s. (Author)

A80-41472 * # **A high performance cocurrent-flow heat pipe for heat recovery applications.** E. W. Saaski and J. C. Hartl (Sigma Research, Inc., Richland, Wash.). *American Institute of Aeronautics* *and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1508*. 9 p. 24 refs. NASA-supported research.

By the introduction of a plate-and-tube separator assembly into a heat pipe vapor core, it has been demonstrated that axial transport capacity in reflux mode can be improved by up to a factor of 10. This improvement is largely the result of eliminating the counter-current shear that commonly limits reflux heat pipe axial capacity. With benzene, axial heat fluxes up to 1800 W/sq cm were obtained in the temperature range 40 to 80 C, while heat flux densities up to 3000 W/sq cm were obtained with R-11 over the temperature range 40 to 80 C. These very high axial capacities compare favorably with liquid metal limits; the sonic limit for liquid sodium, for example, is 3000 W/sq cm at 657 C. Computational models developed for these cocurrent flow heat pipes agreed with experimental data within + or - 25%.

(Author)

A80-41488 # **Determination of the extinction coefficient of glass fiber insulation.** T. J. Love and A. Saboonchi (Oklahoma, University, Norman, Okla.). *American Institute of Aeronautics and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1528*. 4 p.

In case of radiative equilibrium the transport of thermal radiation depends only on the extinction coefficient for both scattering and homogeneous media. A method of determination of the extinction coefficient for light density glass fiber insulation is presented with values of the measurement for a typical domestic glass fiber insulation.

(Author)

A80-41506 * # **Fuel conservation through active control of rotor clearances.** R. S. Beitler, A. A. Saunders, and R. P. Wanger (General Electric Co., Aircraft Engine Group, Evendale, Ohio). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1087*. 8 p. Contract No. NAS3-20643.

Under the NASA-sponsored Energy Efficient Engine (EEE) Project, technology is being developed which will significantly reduce the fuel consumption of turbofan engines for subsonic transport aircraft. One technology concept being pursued is active control of rotor tip clearances. Attention is given to rotor tip clearance considerations and an overview of preliminary study results as well as the General Electric EEE clearance control approach is presented. Finally, potential fuel savings with active control of rotor clearances for a typical EEE mission are predicted.

M.E.P.

A80-41558 **Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor.** G. J. Newton, R. L. Carpenter, H.-C. Yeh, and E. R. Peele (Lovelace Biomedical and Environmental Research Institute, Albuquerque, N. Mex.). *Environmental Science and Technology*, vol. 14, July 1980, p. 849-853. 11 refs. Contract No. EY-76-C-04-1013.

Methods and equipment used to characterize respirable aerosol samples from the exhaust system of an experimental 18-inch ID atmospheric pressure fluidized bed coal combustor are presented. Sampling is performed by the extraction of a small sample of the effluent aerosols at four separate locations within the exhaust system by a probe moving at a velocity 1.2 times greater than the average velocity of the highly turbulent duct flow, followed by the dilution of the sample and its piping to a chamber from which samples could be obtained under milder conditions. Equipment includes 3-ft long, 0.5-in. OD stainless steel sampling probes, a radically injected diluter designed to reduce thermophoretic losses, a Tenax gas chromatography sampling system, and a sampling chamber serving to screen out particles with aerodynamic diameters greater than 10 microns and containing various sampling instruments. The apparatus has been found to be effective in sampling aerosols resulting from the fluidized bed combustion of Montana Rosebud subbituminous coal, Texas lignite, Western Kentucky high-sulfur bituminous coal and Paraho oil shale.

A.L.W.

A80-41559 **Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash.** R. L. Carpenter, G. J. Newton, S. J. Rothenberg, and P. B. DeNee (Lovelace Biomedical and Environmental Research Institute, Albuquerque, N. Mex.). *Environmental Science and Technology*, vol. 14, July 1980, p. 854-859. 26 refs. Contract No. EY-76-C-04-1013.

The respirable fraction of the exhaust aerosol produced by an experimental 18-in. atmospheric pressure fluidized bed coal combustor was sampled to assess the potential inhalation hazard associated with this technology. Aerosol sampling instrumentation and the basis for its choice are described. Respirable fly ash aerosol parameters at four locations in the exhaust cleanup system are reported, as is the penetration of system cleanup devices by the respirable aerosol. Particle morphology was examined by transmission and scanning electron microscopy. The specific surface area of the fly ash was determined as was the adsorption and desorption half-time of water vapor. These data were determined for fly ash particles obtained when the combustor was operated using a western low-sulfur subbituminous coal, an eastern high-sulfur bituminous coal, lignite, lignite refuse, and Paraho oil shale. The data show that the fly ash escaping the fluidized bed exhaust cleanup system has a mass median aerodynamic diameter on the order of 2 microns and consists of unfused particles having high specific surface areas.

(Author)

A80-41571 # **Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD.** P. E. Blackburn and C. E. Johnson (Argonne National Laboratory, Argonne, Ill.). *American Institute of Aeronautics and Astronautics, Fluid and Plasma Dynamics Conference, 13th, Snowmass, Colo., July 14-16, 1980, Paper 80-1344*. 6 p. Research sponsored by the U.S. Department of Energy.

A computer code has been developed that calculates equilibrium compositions of the gas and condensed phases in the coal-fired MHD system. The code, MHD80, is based on the laws of mass action, conservation of mass, and, for the condensate, an assumed ideal solution of stable compounds in two immiscible phases. Potassium activities predicted with the code agree with measurements at NBS on synthetic slags and at Argonne on UTSI slag. The code has been used to determine condensation temperatures, loss of potassium to slag, conditions for removal of sulfur as potassium sulfate, and the chemical form of trace impurities.

(Author)

A80-41664 **Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants.** C. D. Sapp (Tennessee Valley Authority, Air Quality Branch, Muscle Shoals, Ala.). In: Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers. Tullahoma, Tenn., University of Tennessee, 1980, p. 9-27. 7 refs. U.S. Environmental Protection Agency Contract No. IAG-D6-E721.

A80-41826 **Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's (Energiewirtschaftliche Enfordermisse der Bundesrepublik Deutschland und daraus folgende Konsequenzen für die Energiepolitik der 80er Jahre).** F. J. Spalthoff (Rheinisch-Westfälisches Elektrizitätswerk AG, Essen, West Germany). *(Rheinisch-Westfalisches Elektrizitätswerk, Workshop Energie, St. Engelmar, West Germany, Nov. 7, 1979.) Energiewirtschaftliche Tagesfragen*, vol. 30, June 1980, p. 386, 388, 390, 392, 394. In German.

A80-41842 **Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience.** C. A. Johnson (Peabody Process Systems, Inc., Stamford, Conn.) and R. Hutcheson (Alabama Electric Cooperative, Inc., Leroy, Ala.). *Air Pollution Control Association, Journal*, vol. 30, July 1980, p. 744-748.

The design factors contributing to the exceptionally good operating and maintainence performance of limestone flue gas desulfurization systems for two 225-MW coal-fired generators are discussed, and the experience obtained is examined in detail. Attention is given to the spray tower absorber, mist eliminator chemistry control by use of hydroclones, simplicity of design, absorber liner material selection and installation, and the adaptability of the design to actual operating conditions. The actual performance of the systems with respect to start-up (push-button), SO2 removal and limestone utilization (high efficiency and utilization), power and manpower requirements (both low) and availability (up to 97%) is reviewed, and problems with the ball mill system, the dampers, instrumentation and the slurry transfer line are indicated. A.L.W.

A80-41849 **Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology.** H. T. Karlsson and H. S. Rosenberg (Battelle Columbus Laboratories, Columbus, Ohio). *Air Pollution Control Association, Journal,* vol. 30, July 1980, p. 822-826. 8 refs.

Instrumentation and particulate removal and sludge disposal technology for lime/limestone scrubbers for coal-fired power plants is discussed. Consideration is given to means for gas flow determination, SO2 sampling, slurry concentration, mist concentration/distribution and pH monitoring and SO2 monitoring for process control purposes. Particulate removal by electrostatic precipitators and/or wet scrubbing and means of removing the mist formed when the flue gas passes through SO2 absorber units are considered, and methods for flue gas reheating following scrubbing and operational aspects of dampers and fans are indicated. Finally, the treatment and disposal of the sludge collected are discussed, and it is concluded that although safe and trouble-free equipment for vital component systems is not available, great progress towards this end has been made. A.L.W.

A80-42158 # **Continuously variable ratio transmissions for single-shaft gas turbines.** H. J. Förster (Daimler-Benz AG, Stuttgart, West Germany). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-21.* 7 p. Members, $1.50; nonmembers, $3.00.

The single-shaft gas turbine was combined with various CVR transmissions. Of the three variants studied in detail - purely hydrostatic transmission, hydrostatic transmission with internal power splitting, and hydrodynamic transmission with variable pitch converter - the latter gives the best transmission efficiency. However, comparison with the two-shaft gas turbine shows quite clearly that in practically all cases a large part of the gain in efficiency achieved by increasing the process temperature to 1623 K is absorbed by the losses from the CVR transmissions. Because of the great significance attached today to fuel consumption, the combination of single-shaft gas turbine with CVR transmission - on the basis of these investigations - cannot be recommended. This statement would even apply if it was to be proved that the simple design of the single-shaft gas turbine alone permitted the use of ceramic material and thus the higher process temperatures. This is because the conditions along the traction resistance line for level ground have a much greater effect on everyday fuel consumption than the efficiency ratings at full load. The latter only has an effect during acceleration or when steep gradients are being negotiated. (Author)

A80-42159 # **The Perbury transmission.** F. G. Perry (Perbury Engineering, Ltd., Whitehead, Northern Ireland). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-22.* 6 p. Members, $1.50; nonmembers, $3.00.

The paper presents an overview of the Perbury transmission system principles, background, development status and applications. Future development areas covering traction fluids, rolling component fatigue life, regime gearing arrangements and production packaging are discussed noting that whatever the form of prime mover, large improvements in vehicle fuel economy are possible with correct engine management. S.D.

A80-42190 * # **An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results.** D. A. Bittker (NASA, Lewis Research Center, Cleveland, Ohio). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-60.* 11 p. 19 refs. Members, $1.50; nonmembers, $3.00.

The influence of ground-based gas turbine combustor operating conditions and fuel-bound nitrogen (FBN) found in coal-derived liquid fuels on the formation of nitrogen oxides and carbon monoxide is investigated. Analytical predictions of NOx and CO concentrations are obtained for a two-stage, adiabatic, perfectly-stirred reactor operating on a propane-air mixture, with primary equivalence ratios from 0.5 to 1.7, secondary equivalence ratios of 0.5 or 0.7, primary stage residence times from 12 to 20 msec, secondary stage residence times of 1, 2 and 3 msec and fuel nitrogen contents of 0.5, 1.0 and 2.0 wt %. Minimum nitrogen oxide but maximum carbon monoxide formation is obtained at primary zone equivalence ratios between 1.4 and 1.5, with percentage conversion of FBN to NOx decreasing with increased fuel nitrogen content. Additional secondary dilution is observed to reduce final pollutant concentrations, with NOx concentration independent of secondary residence time and CO decreasing with secondary residence time; primary zone residence time is not observed to affect final NOx and CO concentrations significantly. Finally, comparison of computed results with experimental values shows a good semiquantitative agreement. A.L.W.

A80-42225 # **Fuel-flexible combined cycles for utility power and cogeneration.** P. B. Roberts, T. E. Duffy (Solar Turbines International, San Diego, Calif.), and H. Schreiber (Electric Power Research Institute, Palo Alto, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-101.* 14 p. Members, $1.50; nonmembers, $3.00. Research supported by the Electric Power Research Institute.

Two combustion turbine combined cycle power plants have been studied for performance and operating economics. Both power plants are in the sizing range that will be suitable for small utility application and use less than 106 GJ/hr (100 million Btu/hr). The first power plant is based on the Solar Turbines International (STI) Mars industrial gas turbine. The combined gas turbine/steam cycle is direct fired with No. 2 diesel fuel. A total installed cost for the system is estimated to be within the band 545 to 660 $/kW. The second power plant is based on STI's Centaur industrial gas turbine. The combined gas turbine/steam cycle is indirectly fired with solid fuel although it is intended that the installation can be initially fired with a liquid fuel. (Author)

A80-42227 # **Utility system planning effects on the economic merit of advanced combined cycle power systems.** W. Fraize, F. Davis (Mitre Corp., Bedford, Mass.), and G. Manning (U.S. Department of Energy, Washington, D.C.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-105.* 6 p. 6 refs. Members, $1.50; nonmembers, $3.00. Contract No. ET-78-C-01-3179.

A80-42254 **Design study for a fuel efficient turbofan engine.** R. C. Kingcombe and S. W. Dunning (National Gas Turbine Establishment, Farnborough, Hants., England). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-141.* 9 p. 8 refs. Members, $1.50; nonmembers, $3.00.

An engine design study is presented in which the target is a 15 percent reduction in installed specific fuel consumption over the large engines currently in service while still meeting anticipated noise and emissions regulations. The fuel saving is achieved with a low specific thrust (bypass ratio 10) and a high overall cycle pressure ratio (42 at cruise). A three-shaft design is proposed, employing highly loaded components in order to reduce the number of turbomachinery stages and hence keep down cost and weight. It is argued that this approach is the one most compatible with projected technological advances. The engine configuration is given and the key features explained, highlighting areas where further research would be of particular advantage. Finally, the predicted engine performance is given, together with an estimate of the savings in direct operating cost. (Author)

A80-42255 * # **The Energy Efficient Engine /E3/ - Advancing the state of the art.** W. B. Gardner and D. E. Gray (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-142.* 11 p. 7 refs. Members, $1.50; nonmembers, $3.00. NASA-sponsored research.

The NASA-sponsored Energy Efficient Engine (E3) Program, intended to develop and demonstrate the technology for reducing fuel consumption in future environmentally acceptable turbofan engines, is presented. The development of the flight propulsion system design is outlined and the resulting preliminary design is presented. Component design and subcomponent supporting technology verification work in progress is discussed, with attention given to fabrication development, the transition duct, mixer design, the fan, the high-pressure compressor, the combustor, and the high-pressure turbine. It is noted that the detailed design of the core components is essentially complete and fabrication of the hardware has begun, with the program on schedule toward testing in 1982. A.L.W.

A80-42258 * # **Results from tests on a high work transonic turbine for an energy efficient engine.** D. E. Crow, H. Welna, I. D. Singer (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.), and M. R. Vanco (NASA, Lewis Research Center, Cleveland, Ohio). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-146.* 9 p. Members, $1.50; nonmembers, $3.00. Contract No. NAS3-20646.

The experimental results of the evaluation of two high work, transonic, single-stage turbines investigated under the Energy Efficient Engine (E3) Program are presented. The objective of the E3 program is to provide an advanced technology base for a new generation of fuel-conservative turbofan engines. A single-stage turbine required fewer cooled airfoils, a reduced number of leakage paths and no interstage seals. These advanced energy efficient engines require high engine pressure ratios resulting in high expansion ratio, transonic, turbine designs which must have high aerodynamic efficiency. The goal of the turbine program is to develop a high pressure turbine that is compatible with the overall engine design and has an uncooled efficiency of 90.8 percent. (Author)

A80-42273 # **Industrial AFB-fired gas turbine systems with topping combustors.** C. L. Marksberry and B. C. Lindahl (FluiDyne Engineering Corp., Minneapolis, Minn.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-163.* 12 p. 5 refs. Members, $1.50; nonmembers, $3.00.

An Atmospheric Fluidized Bed (AFB) combustor providing thermal input to gas turbines is a promising near-term means of decreasing national premium fuel consumption. In an AFB many solid fuels, including marginal fuels such as anthracite culm, bituminous gob, high sulfur coals, lignite, and petroleum coke, can be used effectively providing both very low emission levels and acceptable return-on-investment. This paper discusses the state of AFB/gas turbine cogeneration technology with reference to typical industrial plant applications. Design considerations and design limits for both the AFB heat exchangers and the topping combustor are discussed and compared. An example based on plant process data and commercially available components is also presented. Both the heat exchangers and the combustors are viewed with reference to state-of-the-art technology. (Author)

A80-42282 # **Evaluation method for closed cycle gas turbines in cogeneration applications.** H. C. Daudet and S. W. Trimble (AiResearch Manufacturing Company of Arizona, Phoenix, Ariz.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-176.* 14 p. 11 refs. Members, $1.50; nonmembers, $3.00. Contract No. EF-77-C-01-2611.

The utilization of coal-fired closed cycle gas turbine/atmospheric fluidized bed (CCGT/AFB) electrical power generating plants for cogeneration was investigated. Both industrial process and district heating and cooling applications in the 10- to 50-MWe range were considered. An evaluation procedure was developed in which cogeneration plant capital, operating, maintenance, and financing costs are compared with the cost of providing equivalent services by traditional methods. Computer optimized conceptual designs of the CCGT/AFB plants were prepared, and performance and capital costs were estimated. A broad spectrum of applications including towns, military bases, universities, and industrial processes was surveyed. This paper presents the general evaluation procedure, typical plant designs, and the evaluation of two applications. (Author)

A80-42450 **Prospects for energy responsive urban planning and design.** A. Bowen (Miami, University, Coral Gables, Fla.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 555-585. 8 refs.

Effective energy utilization through appropriate urban planning and design is discussed. Climate-derived urban patterns are considered in terms of the effects on building volume for dry as well as humid conditions in hot, temperate and cold regions. Emphasis is placed on the use of appropriate energies, including ambient and conventional, in a cold climate where a hemispherical building constructed from concrete is recommended; a temperate climate requiring 'A' frame construction with north/south elevation sloped to latitudinal response, and a hot-dry climate with a building shaped like a hollow doughnut cambered outward to prevent year-round heat gain through the walls. Also considered are solar geometry, wind patterns and computer programs available as aids in urban design and planning. J.P.B.

A80-42451 **Regional planning strategies for hybrid energy optimization.** A. Bowen (Miami, University, Coral Gables, Fla.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 587-628.

A review is presented of available fuels and energy sources with regional planning strategies for hybrid energy optimization. The fuels include coal, crops, nuclear sources, geothermal, hydraulic power, and solar; energy sources are classified as genotypes which are easily applied at scaled levels within a defined region, and phenotypes which are modifications of regional sources to suit any site within a district. Regional energy genotypes include renewable ambient energies such as solar, wind, and geothermal, and nonrenewable energies exemplified by coal, natural gas, oil, and waste heat; phenotypes use the appropriate genotype energy for its most suitable use in its available or modified version as determined by site constraints, wind barriers, and precipitation. The regional ambient energy patterns in the US are summarized in terms of solar radiation, humidity, and comfort indicators, noting the effects of climate manipulation through landscape treatments. A.T.

A80-42925 # **A utility company's view of energy from waste.** T. E. Gieruszczak (Consumers' Gas Co., Toronto, Canada). *CanInfo Communications, Energy from Waste Seminar: A Decade of Development, Toronto, Canada, Nov. 21, 22, 1979, Paper.* 25 p.

Energy supplies and conservation are discussed, particularly with regard to the situation in Canada, and attention is given to the natural gas surplus and the need to import oil. Emphasis is placed on alternative energy sources including peat, lignite, tidal power from the Bay of Fundy, the thermochemical gasification of biomass, gasohol and a combination wind turbine-diesel generator. Near-term solutions to the energy crisis are considered such as conservation, systems cogenerating power and heat, and energy from solid waste: examples of incineration systems with major heat recovery operations are presented. J.P.B.

A80-42926 # **Role of the public utility in developing energy from waste.** R. E. Waters and R. J. Walters (Ontario Hydro, Toronto, Canada). *CanInfo Communications, Energy from Waste Seminar: A Decade of Development, Toronto, Canada, Nov. 21, 22, 1979, Paper.* 11 p.

Energy from waste products is discussed along with the efficient use of resources and in particular, the utilization of heat. Emphasis is placed on burning garbage produced in cities in steam-raising incinerators and district heating, as well as the high load densities required. Also considered are process steam applications, such as in forest products industries, waste heat, and the temperature of condenser cooling water discharges. Present projects with regard to refuse burning and the heat supply from thermal stations are also examined. J.P.B.

A80-42927 # **Energy recovery in the sludge treatment process at Toronto's main treatment plant.** N. J. Perkins (Gore and Storrie, Ltd., Toronto, Canada). *CanInfo Communications, Energy from Waste Seminar: A Decade of Development, Toronto, Canada, Nov. 21, 22, 1979, Paper.* 9 p.

A80-43304 * # **Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane.** B. J. Holmes (NASA, Langley Research Center, Hampton, Va.). *American Institute of Aeronautics and Astronautics, Aircraft Systems Meeting, Anaheim, Calif., Aug. 4-6, 1980, Paper 80-1846.* 13 p.

A design study has been conducted to optimize a single-engine airplane for a high-performance cruise mission. The mission analyzed included a cruise speed of about 300 knots, a cruise range of about 1300 nautical miles, and a six-passenger payload (5340 N (1200 lb)). The purpose of the study is to investigate the combinations of wing design, engine, and operating altitude required for the mission. The results show that these mission performance characteristics can be achieved with fuel efficiencies competitive with present-day high-performance, single- and twin-engine, business airplanes. It is noted that relaxation of the present Federal Aviation Regulation, Part 23, stall-speed requirement for single-engine airplanes facilitates the optimization of the airplane for fuel efficiency. (Author)

A80-43305 # **Fuel efficiency of small aircraft.** B. H. Carson (U.S. Naval Academy, Annapolis, Md.). *American Institute of Aeronautics and Astronautics, Aircraft Systems Meeting, Anaheim, Calif., Aug. 4-6, 1980, Paper 80-1847.* 9 p. 10 refs.

There is a basic mismatch between the amount of power installed in small propeller-driven aircraft and that required for efficient cruising, which results from climb performance requirements. It is shown in this paper that there is a way of using excess power for most efficient cruise, the resulting airspeed coming closest to the Gabrielli-von Karman limit line of vehicular performance. A survey of 111 light aircraft was conducted, and it is found that many are operated at this optimum, while many more are not. A figure of merit is developed that measures cruise performance. Rationale is presented that is directly applicable to design for cruise efficiency. (Author)

A80-43341 # **Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power.** R. E. Barber (Barber-Nichols Engineering Co., Arvada, Colo.). *American Society of Mechanical Engineers, Energy Technology Conference and Exhibition, New Orleans, La., Feb. 3-7, 1980, Paper 80-Pet-27.* 6 p. 5 refs. Members, $1.50; nonmembers, $3.00.

Development work presently being carried on for solar and geothermal applications is applicable to utilize the waste heat from petroleum processes in the less than 700 F range. Much waste heat is presently being recovered by process modifications. This paper shows the efficiency expected and the estimated equipment cost of Rankine engines as a function of waste heat temperature and some examples of solar and geothermal Rankine engines that might be applicable to accomplish this energy savings. (Author)

A80-43741 **Development of a NO/x/-free combustion system.** M. Sadakata, T. Furusawa, D. Kunii (Tokyo, University, Tokyo, Japan), M. Imagawa (Tanabe Kakoki Co., Ltd., Japan), and M. Nawada (Hitachi, Ltd., Tokyo, Japan). *Energy Developments in Japan*, vol. 2, Apr. 1980, p. 355-373.

The development of a NO(x)-free combustion-heating system realizing both pollution control and energy savings is described. An experiment was carried out by using a small model plant. The system consists of a combustion furnace and a new-type multifunctional heat exchanger. The heat exchanger is a rotary continuous type designed for soot collection and for catalytic combustion of CO and H2 as well as for preheating combustion air. V.T.

A80-43828 **Energy analysis of wave and tidal power.** R. Harrison (Sunderland Polytechnic, Sunderland, England), K. G. Smith (South Australia Institute of Technology, Whyalla, Australia), and J. S. Varley (IPC Science and Technology Press, Ltd., Guildford, Surrey, England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews*, vol. 127, pt. A, no. 5, June 1980, p. 274-278. 12 refs.

Energy requirements for building wave- and tidal-power systems are estimated and the relationship between energy requirements and extraction efficiency is examined for wavepower systems. It is found that a point of maximum net output is reached, beyond which further increases in extraction efficiency result in decreased net energy. In this manner, the energy analysis identifies a limit on the energy which could, in principle, be extracted by a wave-energy system. Finally, it is noted that although similar limits could be identified for other types of energy sources, the tidal power analysis is confined to a brief comparison of energy inputs and outputs. M.E.P.

A80-43829 **Economic and operational implications of a complex of wind-driven generators on a power system.** E. D. Farmer (Central Electricity Generating Board, Central Electricity Research Laboratory, Leatherhead, Surrey, England), V. G. Newman, and P. H. Ashmole (Central Electricity Generating Board, Planning Dept., London, England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews*, vol. 127, pt. A, no. 5, June 1980, p. 289-295. 8 refs.

An assessment is presented of the technical and economic implications of integrating a sizeable complex of aerogenerators into a power system. An important economic and operational factor is the variable and uncertain nature of the wind. However, it is shown that the effects of the more rapid fluctuations are mitigated by the incoherency of different machine outputs; a diversity factor is defined in terms of the spacing of an array of machines and the turbulence length scale. In contrast, the slower variations require a significant enhancement of the operational reserve capacity without addition of dedicated storage in order to accommodate wind-power penetration up to 20% of maximum demand. The increased uncertainty of the residual generation affects the economics of utilization of pumped-storage and gas-turbines as standby plant. The results of an analysis of a year's data, pertaining to demand and wind speed at 4 well separated sites, are presented. (Author)

A80-43833 **Heat-pump applications to single-family dwellings - An analysis by computer model.** J. Sundell and J. A. Bubenko, Sr. (Kungl. Tekniska Hogskolan, Stockholm, Sweden). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews*, vol. 127, pt. A, no. 5, June 1980, p. 320-325.

N80-22326*# Teledyne Continental Motors, Muskegon, Mich.
DESIGN STUDY: A 186 kW LIGHTWEIGHT DIESEL AIRCRAFT ENGINE Final Report
Alex P. Brouwers Apr. 1980 24 p
(Contract NAS3-20830)
(NASA-CR-3261) Avail: NTIS HC A02/MF A01 CSCL 21E

The design of an aircraft engine capable of developing 186 kW shaft power at a 7620 m altitude is described. The 186 kW design takes into account expected new developments in aircraft designs resulting in a reassessment of the power requirements at the cruise mode operation. Based on the results of this analysis a three phase technology development program is projected resulting in production dates of 1985, 1992, and 2000.
R.E.S.

N80-22520# Institute of Gas Technology, Chicago, Ill.
DEVELOPMENT OF COMBUSTION DATA TO UTILIZE LOW-Btu GASES AS INDUSTRIAL PROCESS FUELS. PROJECT 61004 SPECIAL REPORT NO. 8: BOILER BURNER
R. T. Waibel and E. S. Fleming May 1979 40 p refs
(Contract EX-76-C-01-2489)
(FE-2489-45) Avail: NTIS HC A03/MF A01

Data were gathered to determine the performance of a boiler burner with a gun-type fuel injector when retrofit with three low-Btu gases, the performance of natural gas was used as a base line for comparison. The burner was fired on the IGT pilot-scale test furnace, simulating one burner in a multiburner array of an industrial boiler. In order to fire the low-Btu gases at the 3.0 million Btu/hr rate and upstream pressure of 30 psia used for natural gas, the fuel injector was modified by increasing the sizes of the fuel orifices to permit delivery of the required fuel volume at sonic velocity. With the appropriate fuel injector, all the low-Btu fuels exhibited stable flames at fuel enthalpy inputs of 3.0 million Btu/hr. All the low-Btu fuel gases had longer flame lengths than natural gas, although not long enough to create flame impingement problems. The thermal efficiencies of the low-Btu gases ranged from 29.5 percent for Koppers-Totzek oxygen to 26 percent for Winkler air compared with 32 percent for natural gas.
DOE

N80-22523# Katzen (Raphael) Associates, Cincinnati, Ohio.
GRAIN MOTOR FUEL ALCOHOL TECHNICAL AND ECONOMIC ASSESSMENT STUDY
Jun. 1979 368 p refs
(Contract EJ-78-C-01-6639)
(HCP/J6639-01) Avail: NTIS HC A16/MF A01

The technical and economical feasibility for production of motor fuel alcohol from a plant with a capacity of 50 million US gallons per year is evaluated. Included are a detailed process design using proven technology, a complete budget estimate of the plant investment including working capital, a detailed analysis of the annual operating cost using corn as the primary feedstock, and a complete financial analysis which establishes the alcohol selling price required to net to the investor a 15 percent discounted cash flow (interest rate or return). Other considerations for production of motor fuel alcohol are evaluated and discussed, namely: excursions on plant capacities; excursions on feedstock material; sensitivity analyses on financial parameters; and substitution of corn stover for coal as the fuel source. An assessment and commmentary on the agricultural, technological, and economic impact of a major gasohol program in the US are also given.
DOE

N80-22527# Pullman Kellogg, Houston, Tex.
COAL CONVERSION CONTROL TECHNOLOGY. VOLUME 1: ENVIRONMENTAL REGULATIONS; LIQUID EFFLUENTS Final Report, Apr. 1977 - Nov. 1978
L. E. Bostwick, M. R. Smith, D. O. Moore, and D. K. Webber Oct. 1979 540 p
(Contract EPA-68-02-2198)
(PB80-126469; EPA-600/7-79-228A-Vol-1) Avail: NTIS HC A23/MF A01 CSCL 13B

Environmental regulations for gaseous, liquid, and solid wastes, and the control technology for liquid effluents are addressed. Available and developing control technology was evaluated in view of federal, state, regional, and international environmental standards.
GRA

N80-22528# Pullman Kellogg, Houston, Tex.
COAL CONVERSION CONTROL TECHNOLOGY. VOLUME 2: GASEOUS EMISSIONS; SOLID WASTES Final Report, Apr. 1977 - Nov. 1978
L. E. Bostwick, M. R. Smith, and D. K. Webber Oct. 1979 384 p
(Contract EPA-68-02-2198)
(PB80-126477; EPA-600/7-79-228B-Vol-2) Avail: NTIS HC A17/MF A01 CSCL 13B

The control technology of gaseous emissions and solid wastes is discussed. Available and developing control technology was evaluated in view of the requirements of federal, state, regional, and international environmental standards.
GRA

N80-22649# Kentucky Univ., Lexington. Dept. of Mechanical Engineering.
BASIC RESEARCH ENGINEERING: FLUID DYNAMICS AND THERMAL PROCESSES
L. D. Conta and R. F. Hill Aug. 1979 28 p Workshop held at Lexington, Ky., 1-2 Feb. 1979 Prepared in cooperation with Engineering Societies Commission on Energy, Inc., Washington, D.C.
(Contract EF-77-C-01-2468)
(FE-2468-53) Avail: NTIS HC A03/MF A01

Specific research needs in fluid dynamics and thermal processes were identified during a workshop held to emphasize the importance of basic research in developing new technologies for meeting national energy problems. Specific research projects related to fluid dynamics, separation phenomena, energy processing, and energy reactions as well as programs for assessing the status of technology advancement in these fields and for making the results of these assessments accessible and useful to practicing engineers are recommended.
DOE

N80-22764# Oak Ridge National Lab., Tenn. Energy Div.
WATER AVAILABILITY FOR ENERGY IN 1985 AND 1990
Jerome E. Dobson and Alf D. Shepherd Oct. 1979 108 p refs
(Contract W-7405-eng-26)
(ORNL/TN-6777) Avail: NTIS HC A06/MF A01

The effects of the National Energy Plan (NEP) on water for energy demands in 1985 and 1990 are examined. Estimates of total consumption are compared with estimates of critical monthly surface-water supply, derived from streamflow and reservoir use data, in each WRC Aggregated Subarea in the conterminous United States. It is concluded that water availability will not inhibit implementation of the NEP because its conservation goals actually retard the growth of water for energy demands in most basins compared with what might be expected without the NEP. However, the results of this assessment and previous corroborative water for energy analyses show that, with or without the NEP, energy development will cause additional water availability problems on already stressed streams and reservoirs throughout much of the western United States, southern Florida, the Ohio River Basin, and the highly urbanized areas of the Eastern Seaboard.
DOE

N80-22782*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
DISPERSED STORAGE AND GENERATION CASE STUDIES
Khosrow Bahrami, John A. Stallkamp, and Amy Walton 15 Mar. 1980 187 p refs
(Contracts NAS7-100; DE-AI01-79ET-29026)
(NASA-CR-162996; JPL-Pub-79-98) Avail: NTIS HC A09/MF A01 CSCL 10A

Three installations utilizing separate dispersed storage and generation (DSG) technologies were investigated. Each of the systems is described in costs and control. Selected institutional and environmental issues are discussed, including life cycle costs. No unresolved technical, environmental, or institutional problems were encountered in the installations. The wind and solar photovoltaic DSG were installed for test purposes, and appear to be presently uneconomical. However, a number of factors are decreasing the cost of DSG relative to conventional alternatives, and an increased DSG penetration level may be expected in the future. R.E.S.

N80-22837# General Atomic Co., San Diego, Calif.
CLOSED-CYCLE GAS TURBINE: A PROVEN COGENERATION PLANT ADAPTABLE TO FOSSIL, NUCLEAR, AND SOLAR HEAT SOURCES
C. F. McDonald Jun. 1979 71 p refs Presented at Conf. on Energy Conversion and Solar Energy, Milan, Italy, 26 Sep. 1979
(Contract EY-76-C-03-0167)
(GA-A-15322; CONF-790383-1) Avail: NTIS HC A04/MF A01

Existing operational closed-cycle gas turbine (CCGT) plants and projects nuclear, fossil, and solar plants of the future are reviewed. The benefits of the CCGT are discussed. DOE

N80-22847# Iowa State Univ. of Science and Technology, Ames. Dept. of Mechanical Engineering.
ENERGY CONSERVATION VIA HEAT TRANSFER ENHANCEMENT Quarterly Progress Report, 1 Jan. - 31 Mar. 1979
A. E. Bergles, G. H. Junkhan, and R. L. Webb Jun. 1979 48 p refs
(Contract ET-78-S-02-4649)
(COO-4649-5) Avail: NTIS HC A03/MF A01

The theory and practice of heat transfer enhancement are discussed. A technical literature file and manufacturers' file are reported and the initial patent technology information file is evaluated. Application studies on enhancement of waste heat recuperators and laminar internal flow heat transfer are described and data for the heat transfer and friction characteristics of internally finned tubes is discussed. Natural convection from rough surfaces is assessed. Major effort was directed toward planning of the Research Workshop on Energy Conservation Through Enhanced Heat Transfer. The Workshop, scheduled for May 24 and May 25, 1979 in Chicago, will be co-sponsored by NSF. DOE

N80-22848# Midwest Research Inst., Golden, Colo.
END-USE MATCHING OF SOLAR ENERGY SYSTEMS
F. Kreith, D. Kearney, and A. Bejan (Colo. Univ., Boulder) 1979 25 p refs Presented at the 2d Law of Thermodyn. Workshop, Washington, D.C., 14-16 Aug. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-34-325) Avail: NTIS HC A02/MF A01

The choice among available energy sources for a given task requires technical and economic tradeoffs on the part of the individual investor. From the national perspective, however, the effectiveness with which available energy sources are utilized may well become an overriding consideration. End-use matching is a procedure for introducing solar energy into the national energy infrastructure. The result of end-use matching is an identification of the most cost-effective combination of process energy needs, solar collector technology, geographic location, and economics by matching currently available solar system hardware with particular industrial processes and their locations. End-use matching methodology is discussed and first and second law thermodynamics analyses applied to a solar system producing process steam are illustrated. DOE

N80-22849# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
COMMUNICATION STRATEGY TO COMMERCIALIZE PASSIVE SOLAR ENERGY
D. R. Wolcott (Intern. Business Serv., Inc., Washington, D.C.) and F. F. Shoemaker 1979 6 p refs Presented at the Natl. Passive Solar Energy Conf., Kansas City, Mo., 3-5 Oct. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-69-412; CONF-791022-10) Avail: NTIS HC A02/MF A01

Although certain technical and economic issues remain to be clarified, passive solar market development is increasingly dependent upon communications such as information dissemination, education, training and promotional activities. Target audiences are identified as both recipients, and disseminators of passive solar communications. Form and quality of information are discussed in terms of the stages of an innovation adoption decision-making process. Several communication-related barriers which impede the commercialization of passive solar are discussed and general information and education response are suggested. A statement of precepts which should guide passive solar communication programs is also included. DOE

N80-22860# ICF, Inc., Washington, D. C.
ENERGY EXTENSION SERVICE PILOT PROGRAM EVALUATION REPORT: THE FIRST YEAR. VOLUME 2: PILOT STATE REPORTS
Sep. 1979 638 p Prepared in cooperation with Westat Res. Inc., Rockville, Md.
(Contract EY-77-C-01-2671)
(DOE/CS-2671-3) Avail: NTIS HC A99/MF A01

A discussion of the operations of the ten EES pilot-state programs during the period from October 1, 1977 through September 30, 1978 is presented. Each of the ten pilot states, Alabama, Connecticut, Michigan, New Mexico, Pennsylvania, Tennessee, Texas, Washington, Wisconsin, and Wyoming, received a grant to develop and implement a 19 month program. A case study description of the operations of the pilot program in each state is presented with special attention given to the two programs selected in each state for more detailed study and survey research. DOE

N80-22876# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN: MAGNETOHYDRODYNAMICS
May 1979 199 p refs
(DOE/EDP-0045) Avail: NTIS HC A09/MF A01

The updated environmental development plan (EDP) for DOE's magnetohydrodynamics (MHD) program is presented. A brief summary of the environmental concerns identified in the original MHD EDP is given. MHD technology and DOE's MHD program are described and environmental concerns are identified. The environmental concerns associated with MHD are addressed and resolved are tabulated. An environmental concerns is developed. DOE

N80-22878# Exxon Nuclear Idaho Co., Inc., Idaho Falls.
LOW-LEVEL AIRBORNE MONITORING TECHNIQUES UTILIZED IN A FIELD MEASUREMENT PROGRAM AT OPERATING PRESSURIZED WATER REACTORS
D. W. Akers, N. K. Bihl, S. W. Duce, J. W. Tkachyk, and B. G. Motes 1979 14 p Presented at the 23rd Conf. on Anal. Chem. in Energy Technol., Gatlinburg, Tenn., 9 Oct. 1979
(Contract EY-76-C-07-1570)
(CONF-791049-8) Avail: NTIS HC A02/MF A01

An in-plant measurement program underway at commercial nuclear power stations is described. Measurements were made of low level airborne radioactivity concentrations and release rates. A discussion of the measurement methods is given. The monitoring methods discussed include several types of radioiodine species samplers in addition to an atmospheric C-14 and tritium sampler. Each method is individually evaluated with emphasis upon: system description, observed detection limits, sample preparation, analysis, problems encountered in field use, and appropriate usage in a nuclear power plant ventilation system. DOE

N80-22882# Los Alamos Scientific Lab., N. Mex.
NATIONAL IMPACTS ON VISUAL AIR QUALITY FROM A FUTURE ENERGY SCENARIO
D. Nochumson, M. Wecksung, and G. Gurule 1979 11 p refs Presented at ACPA Conf. on Visibility, Denver, 26 Nov. 1979
(Contract W-7405-eng-36)
(LA-UR-79-3214; CONF-791139-1) Avail: NTIS HC A02/MF A01

A methodology was developed to evaluate impacts on atmospheric visual air quality for nonurban areas caused by

regional haze. Estimated values of median visual range for 39 nonurban ambient air quality monitoring sites were shown to have a high correlation with observed values. A decline in median visual range is projected in regions of the west and the Gulf Coast where there is a substantial growth in the combustion of sulfur containing fossil fuels--coal in particular. The projected decline in median visual range in mandatory Class One Federal areas, particularly in the Western US, may confict with Congress's goal of protecting these areas against visibility impairment. Regulations for defining visibility impairment remain to be defined. The meeting of the emission limitations of the state implementation plans is projected to significantly improve the low visibilities experienced in the Eastern US, particularly in the Ohio Valley and the surrounding region.
DOE

N80-22883# Battelle Pacific Northwest Labs., Richland, Wash.
USE OF RECONNAISSANCE LEVEL INFORMATION FOR ENVIRONMENTAL ASSESSMENT
R. F. Foster, W. H. Rickard, J. A. Strand, and M. L. Warner Nov. 1979 46 p
(Contract EY-76-C-06-1830)
(NUREG-CR-0990; PNL-3080) Avail: NTIS HC A03/MF A01

Reconnaissance level inforamtion (RLI) sufficient for comparing the environmental and socio-economic features of candidate sites for nuclear power stations and for guiding plant design, baseline surveys, and operational practices is discussed. Environmental concerns of special importance for site evaluation include: aquatic ecology, terrestrial ecology, land and water use, socioeconomics, and institutional constraints. A scheme is suggested for using RLI to assign classifications to candidate sites based on the potential level of concern associated with the different environmental features.
DOE

N80-22888# Research Triangle Inst., Research Triangle Park, N. C.
PROCEEDINGS: SYMPOSIUM ON FLUE GAS DESULFURIZATION, VOLUME 1
Franklin A. Ayer, comp. Mar. 1979 638 p refs Proc. held at Las Vegas, Nev. 5-8 Mar. 1979
(Contract EPA-68-02-2612)
(PB80-133168; EPA-600/7-79-167A) Avail: NTIS HC A99/MF A01 CSCL 13B

Contents: overview of control technology-the bridge between energy utilization and environmental goals; health effects of SO2 and sulfates; energy, environmental, and economic impacts of flue gas desulfurization under alternative new source performance standards; status of development, energy and economic aspects of alternative technologies; economic and energy requirements of sulfur oxides control processes; combined coal cleaning and FGD; the interagency flue gas desulfurization evaluation study; status of flue gas desulfurization in the United States; recent results from EPA's lime/limestone scrubbing programs; compliance programs for SO2 emission; and SO2 and NOx removal technology in Japan.
GRA

N80-22889# Research Triangle Inst., Research Triangle Park, N. C.
PROCEEDINGS: SYMPOSIUM ON FLUE GAS DESULFURIZATION, VOLUME 2
Franklin A. Ayer Mar. 1979 631 p refs Symp. held at Las Vegas, Nev., 5-8 Mar. 1979
(Contract EPA-68-02-2612)
(PB80-133176; EPA-600/7-79-167B) Avail: NTIS HC A99/MF A01 CSCL 13B

Contents: utility conventional combustion comparative environmental assessment - coal and oil; design and commercial operation of lime/limestone FGD sludge stabilization systems; power plant flue gas desulfurization using alkaline fly ash from western coals; environmental effects of FGD disposal - a laboratory/field landfill demonstration; summary of utility dual alkali system; the FGD reagent dilemma - lime, limestone, or thiosorbic lime. The status of industrial boiler FGD applications in the United States; status of the project to develop standards of performance for industrial fossil-fuel-fired boilers; and flue gas desulfurization applications to industrial boilers.
GRA

N80-22895# Battelle Columbus Labs., Ohio.
CRITERIA FOR ASSESSMENT OF ENVIRONMENTAL POLLUTANTS FROM COAL CLEANING PROCESSES Final Report, Sep. 1976 - Apr. 1979
R. A. Ewing, B. W. Cornaby, P. VanVoris, J. C. Zuck, and G. E. Raines 1979 202 p refs
(Contract EPA-68-02-2163)
(PB80-102791; EPA-600/7-79-140) Avail: NTIS HC A10/MF A01 CSCL 06F

The development of criteria for assessing environmental pollutants associated with coal cleaning processes is described. The major criterion for ranking the importance of any pollutant is the relationship between its expected environmental concentration and the maximum concentration which presents no long-term hazard to humans or biota. Environmental concentrations depend on emission rates and the effects of physical transport and dispersion.
GRA

N80-23131# Battelle Pacific Northwest Labs., Richland, Wash.
HIGH-LEVEL WASTE IMMOBILIZATION PROGRAM: AN OVERVIEW
W. R. Bonner Sep. 1979 46 p refs
(Contract EY-76-C-06-1830)
(PNL-3094) Avail: NTIS HC A03/MF A01

Technology to allow safe, affordable immobilization and disposal of nuclear waste is reviewed. Waste forms and processes are being developed on a schedule consistent with national needs for immobilization of high-level wastes stored at Savannah River, Hanford, Idaho National Engineering Laboratory, and West Valley, New York. This technology is directly applicable to high-level wastes from potential reprocessing of spent nuclear fuel. Topics covered include: (1) waste form development and characterization; (2) process development; and (3) radioactive process demonstration.
DOE

N80-23214*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
TRACTION STUDIES OF NORTHEAST CORRIDOR RAIL PASSENGER SERVICE: EXECUTIVE SUMMARY
T. W. Macie and J. A. Stallkamp 15 Mar. 1980 64 p refs Sponsored in part by DOE
(Contract NAS7-100)
(NASA-CR-162997; JPL-Pub-80-3) Avail: NTIS HC A04/MF A01 CSCL 13F

The enabling legislation of 1976 for improvement of service in the Northeast corridor (NEC) requires a schedule of 2 h 40 min between Washington and New York City by 1981 and 3 h 40 min between NYC and Boston, when the electrification is completed. Various options of the NEC operation that may satisfy the legislation were investigated, particularly in terms of travel time and energy consumption. NEC operations were compared with overseas systems and practices. The emerging new technology of AC traction was also evaluated.
A.R.H.

N80-23215*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
ASSESSMENT OF THE POTENTIAL OF HYBRID VEHICLES: SUMMARY
F. T. Surber et al 15 Mar. 1980 70 p refs
(Contracts NAS7-100; EM-78-I-01-4290; JPL Proj. 5030-345)
(NASA-CR-163059; JPL-Pub-80-13) Avail: NTIS HC A04/MF A01 CSCL 13F

The potential of hybrid vehicles as a replacement of the conventional gasoline or diesel fueled internal combustion engine vehicle within the next 20 to 30 years, was assessed. Hybrid vehicle designs and applications which are technically and economically viable were studied to determine if reductions in petroleum usage were large enough to warrant major expenditures of research and development funds. Critical technical areas where research and development can be most usefully concentrated were indentified.
E.D.K.

N80-23477# Argonne National Lab., Ill.
ENVIRONMENTAL ASSESSMENT OF THE UTILIZATION OF ALCOHOL FUELS IN HIGHWAY VEHICLE APPLICATIONS
Oreste M. Bevilacqua and Martin J. Bernard, III 1979 11 p

refs Presented at 2d Intern. Conf. on Energy Use Management, Los Angeles, 22-26 Oct. 1979
(Contract W-31-109-eng-38)
(CONF-791009-19) Avail: NTIS HC A02/MF A01

Four alternative alcohol fuel utilization scenarios are described. The development of the utilization scenarios was based on an evaluation of a broad range of implementation constraints and considerations. The final set of utilization scenarios will be used in the environmental assessment to bracket the probable environmental impacts and implications during the foreseeable future. DOE

N80-23485# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT. VOLUME 3: ENVIRONMENTAL Interim Final Report, 31 Aug. 1977 - 1 Mar. 1979
Mar. 1979 216 p
(Contract EX-76-C-01-2416)
(FE-2416-43-Vol-3; IFR-2) Avail: NTIS HC A10/MF A01

The environmental considerations associated with an industrial manufacturing complex are addressed with specific reference to a coal-to-gasoline manufacturing facility. The environmental laws and regulations affecting the design of the coal-to-gasoline facility are summarized. Environmental control methods and equipment are outlined that will yield a zero plant discharge of all process waste water streams. Gaseous emissions are tabulated and methods of treatment and control are also described. Waste disposal by landfill methods are also considered. DOE

N80-23629# California Univ., Livermore. Lawrence Livermore Lab.
BATTERY-POWERED, DIFFERENTIAL INFRARED ABSORPTION SENSOR FOR METHANE, ETHANE, AND OTHER HYDROCARBONS
G. E. Bingham, C. H. Gillespie, and J. H. McQuaid 8 Oct. 1979 21 p refs Presented at the Gas Res. Inst. Symp. on Methane Detection and Measurement, Chicago, 27 Aug. 1979
(Contract W-7405-eng-48; Grant NSF DEB-77-16327)
(UCRL-83317; CONF-790887-1) Avail: NTIS HC A02/MF A01

The performance goals, design considerations and physical details of the miniature infrared absorption sensor developed for the liquefied natural gas spill safety program are presented. The sensor is lightweight, battery-powered, portable, self-contained, and able to interface readily to large array data systems. Essentially a precision infrared differential spectrometer capable of operating over the full range of gas concentrations expected in the spill diffusion tests, the sensor is expected to cost less than $7000 per unit. The present design of this open-cell fast response sensor allows it to measure two components, but it can be modified to measure additional components at a reduced sampling frequency. To minimize temperature effects and power consumption, the sensor has a single source, single detectors design which includes a rotating chopper-filter wheel. A CMOS microprocessor interfaced with a arithmetic chip is used to linearize sensor output and correct for component interference. DOE

N80-23662# General Electric Co., Schenectady, N. Y. Gas Turbine Div.
DEVELOPMENT OF HIGH-TEMPERATURE TURBINE SUBSYSTEM TECHNOLOGY TO A TECHNOLOGY READINESS STATUS, PHASE 2 Quarterly Report, Apr. - Jun. 1978
A. Caruvana, E. D. Alderson, N. R. Antrim, H. V. Doering, R. P. Dubois, M. Dreedman, and R. Frishmuth Jul. 1978 185 p refs
(Contract EX-76-C-01-1806)
(FE-1806-48) Avail: NTIS HC A09/MF A01

Progress is reported in a program design to bring to technology readiness, over a six- to ten year duration, a coal-derived fuel at a firing temperature of 2600 F with growth capability 3000 F. The objectives of phase 2 are to: perform component design and trade-off analyses in sufficient depth to support the component design and test tasks; and update the phase 1 combined cycle studies to evaluate the commercial viability of a GE-TRV turbine system. Information is included on hot gas path development test facilities, low BTU gas cleanup system, motorized rig test air turbine tests, liquid- and gas-fueled combined cycle power plants, turbine subsystem design, update of verification tests system definition and technology readiness vehicle design. DOE

N80-23779*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE EFFECT OF CATALYST LENGTH AND DOWNSTREAM REACTOR DISTANCE ON CATALYTIC COMBUSTOR PERFORMANCE
David Anderson 1980 24 p refs Presented at the 4th Workshop on Catalytic Combust., Cincinnati, 14-15 May 1980; sponsored by EPA
(Contract EC-77-A-31-1040)
(NASA-TM-81475; DOE/NASA/1040-80/14; E-409) Avail: NTIS HC A02/MF A01 CSCL 10B

A study was made to determine the effects on catalytic combustor performance which resulted from independently varying the length of a catalytic reactor and the length available for gas-phase reactions downstream of the catalyst. Monolithic combustion catalysts from three manufacturers were tested in a combustion test rig with no. 2 diesel fuel. Catalytic reactor lengths of 2.5 and 5.4 cm, and downstream gas-phase reaction distances of 7.3, 12.4, 17.5, and 22.5 cm were evaluated. Measurements of carbon monoxide, unburned hydrocarbons, nitrogen oxides, and pressure drop were made. The catalytic-reactor pressure drop was less than 1 percent of the upstream total pressure for all test configurations and test conditions. Nitrogen oxides and unburned hydrocarbons emissions were less than 0.25 g NO2/kg fuel and 0.6 g HC/kg fuel, respectively. The minimum operating temperature (defined as the adiabatic combustion temperature required to obtain carbon monoxide emissions below a reference level of 13.6 g CO/kg fuel) ranged from 1230 K to 1500 K for the various conditions and configurations tested. The minimum operating temperature decreased with increasing total (catalytic-reactor-plus-downstream-gas-phase-reactor-zone) residence time but was independent of the relative times spent in each region when the catalytic-reactor residence time was greater than or equal to 1.4 ms. R.E.S.

N80-23780*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SUMMARY AND EVALUATION OF THE PARAMETRIC STUDY OF POTENTIAL EARLY COMMERCIAL MHD POWER PLANTS (PSPEC)
Peter J. Staigner and John M. Abbott 1980 11 p refs Presented at the 7th Intern. Conf. on Magnetohydrodyn. Elec. Generation, Cambridge, Mass., 16-20 Jun. 1980, sponsored by the Symp on the Eng. Aspects of Magnetohydrodynam., Inc.
(Contract EF-77-A-31-2674)
(NASA-TM-81497; DOE/NASA/2674-80/9; E-434) Avail: NTIS HC A02/MF A01 CSCL 10B

Two parallel contracted studies were conducted. Each contractor investigated three base cases and parametric variations about these base cases. Each contractor concluded that two of the base cases (a plant using separate firing of an advanced high temperature regenerative air heater with fuel from an advanced coal gasifier and a plant using an intermediate temperature metallic recuperative heat exchanger to heat oxygen enriched combustion air) were comparable in both performance and cost of electricity. The contractors differed in the level of their cost estimates with the capital cost estimates for the MHD topping cycle and the magnet subsystem in particular accounting for a significant part of the difference. The impact of the study on the decision to pursue a course which leads to an oxygen enriched plant as the first commercial MHD plant is described. R.E.S.

N80-23782# Delta Electronic Control Corp., Irvine, Calif.
DESIGN, CONSTRUCTION AND TESTING OF A 60 kW SOLAR ARRAY AND POWER CONVERSION SYSTEM Final Report, Jan. 1978 - Aug. 1979

J. S. Suelzle Aug. 1979 138 p
(Contract DAAK70-78-C-0018)
(AD-A080877; DECC-61211-003) Avail: NTIS
HC A07/MF A01 CSCL 10/1

A 60 kW photovoltaic array and power conversion system was designed, constructed, tested and installed by Delta Electronic Control Corporation. The system is currently operative, augmenting a remote diesel power generating station at Mt. Laguna Air Force Station. The system, which operates without on-site energy storage, operates unattended, extracting the maximum available power from the solar array. GRA

N80-23786# Woodard-Clyde Consultants, San Francisco, Calif. Fossil Fuel and Advanced Systems Div.
ENVIRONMENTAL ASSESSMENT METHODOLOGY: SOLAR POWER PLANT APPLICATIONS. VOLUME 2: INDUSTRIAL IMPLICATIONS AND SECONDARY-IMPACT METHODOLOGY
K. Nair and A. Sicherman Apr. 1979 123 p refs Sponsored by the Elec. Power Res. Inst.
(EPRI Proj. 551)
(EPRI-ER-1070-Vol-2) Avail: NTIS HC A06/MF A01

A methodology for assessing industrial implication and secondary impacts of central solar electric stations was developed using an input output formulation, and a computer model was developed to help estimate these impacts. An independent assessment of the market penetration of solar energy to the year 2000 was made using Bayesian statistical techniques to evaluate different future scenarios. Techniques for assessing the likelihood of these scenarios were also developed. DOE

N80-23794# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
BASIC RESEARCH NEEDS IN ENERGY CONSERVATION
Jack M. Hollander Oct. 1979 28 p refs
(Contract W-7405-eng-48)
(LBL-9939) Avail: NTIS HC A03/MF A01

The role of research in energy conservation, the role of government in conservation research and the role of basic research in conservation are discussed with information on the need for research on the physical, environmental, social, and economic aspects of energy conservation in the residential, industrial, and transportation sectors, and the outlook for U.S. energy supply and demand. DOE

N80-23799# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
CONVERSION SYSTEM OVERVIEW ASSESSMENT. VOLUME 2: SOLAR-WIND HYBRID SYSTEMS
T. S. Jayadev, J. Henderson, and C. Bingham Aug. 1979 34 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-35-078-Vol-2) Avail: NTIS HC A03/MF A01

Solar-wind hybrid systems are discussed. It is shown that there are large areas in the United States where solar and wind resources are comparable in magnitude and there are diurnal and seasonal complementarities which offer the potential for cost-effective hybrid systems. There are also distinct engineering features of the two conversion technologies. Electric power generation from wind is straightforward and cost-effective, whereas solar thermal conversion to generate heat is more cost-effective than to generate electricity. Examples of hybrid systems utilizing these features on total energy application are presented. DOE

N80-23802# Los Alamos Scientific Lab., N. Mex.
ENERGY FROM HOT DRY ROCK
Robert H. Hendron 1979 22 p refs Presented at the Conf. on Long-Term Energy Resources, 3 Dec. 1979; sponsored by UNITAR
(Contract W-7405-eng-36)
(LA-UR-79-3256; CONF-791216-1) Avail: NTIS
HC A02/MF A01

The Hot Dry Rock Geothermal Energy Program is described. The system, operation, results, development program, environmental implications, resource, economics, and future plans are discussed. DOE

N80-23803# New Zealand Energy Research and Development Committee, Auckland.
ELECTRICITY FROM REFUSE
M. White 1979 51 p refs
(NZERDC-44; ISSN-0110-1692) Avail: NTIS
HC A04/MF A01

The conversion of refuse to electricity for Auckland involves the combustion of refuse directly or as a refuse-derived fuel to release heat energy, which in turn is converted to high-pressure steam for driving steam turbogenerators. Domestic/commercial collected refuse, privately deposited domestic refuse and industrial/commercial refuse are used. Only those technologies are considered that have been basically proven by commercial operation and systems designed to make use, whenever possible, of existing plant and equipment. The following options are examined for close technical and economic assessment: mass burning in sloping grate boiler plant, semi-suspension combustion boiler plant, supplementary firing of a refuse-derived fuel and refuse-fueled power station using semi-suspension combustion boiler plant. Extensive data are compiled on: refuse from the Auckland urban area; design of systems; environmental and technical aspects. DOE

N80-23805# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
PROPOSITION ON ENERGY ANALYSIS AND ECONOMIC EFFICIENCY
Donald I. Hertzmark Oct. 1979 22 p refs
(Contract EG-77-C-01-4042)
(SERI/RR-51-332) Avail: NTIS HC A02/MF A01

Analytical results of an attempt to simultaneously optimize economic and thermodynamic efficiency are presented and discussed. The attempt to impose complete mathematical rationality and consistency on the pricing of energy commodities failed since it was not possible to consistently weigh purely physical efficiency measures, much less social factors. Nevertheless, the use of both material balance and entropy analysis is valuable for evaluating nonmarket decisions, as well as identifying opportunities for process improvements. DOE

N80-23807# Los Alamos Scientific Lab., N. Mex.
RESIDENTIAL PASSIVE SOLAR SYSTEMS: REGIONAL SENSITIVITY TO SYSTEM PERFORMANCE COSTS, AND ALTERNATIVE PRICES
C. Kirschner, S. Ben-David, and F. Roach 1979 32 p Presented at the 2nd Miami Intern. Conf. on Alternatives Energy Sources, Miami Beach, Fla., 10-13 Dec. 1979
(Contract W-7405-eng-36)
(LA-UR-79-3390; CONF-791204-12) Avail: NTIS
HC A03/MF A01

The economic potential of two passive space heating configurations were analyzed. These were a masonary thermal storage wall (trombe) and a direct gain system - both with night insulation. A standard tract home design for each of the two passive systems was used throughout the analysis to allow interregional comparisons. The economic performance of these two systems was evaluated on a regional basis (223 locations) throughout the United States. A sensitive analysis was conducted on two conventional energy types (electricity and natural gas) to determine the impact of alternative fuel price escalation rates and solar costs upon feasibility of the two solar systems. Cost goals for solar system prices were established under one set of future fuel prices and stated economic conditions. DOE

N80-23820# Los Alamos Scientific Lab., N. Mex.
PRELIMINARY DEFINITION AND CHARACTERIZATIONS OF SOLAR INDUSTRIAL PROCESS HEAT TECHNOLOGY AND MANUFACTURING PLANT FOR THE YEAR 2000
Richard T. Meyer and Ted Prythero 1979 7 p Presented at the Solar Ind. Process Heat Conf., Oakland, Calif., 31 Oct. - 2 Nov. 1979
(Contract W-7405-eng-36)

(LA-UR-79-2812; CONF-791024-4) Avail: NTIS HC A02/MF A01

The findings and projections of this preliminary definition and characterization of a solar industrial process heat technology and manufacturing plant for the year 2000 indicate that the technology and the manufacturing would be significantly more sophisticated and expanded than exists in the solar industry today. The solar process heat technology is defined to be a parabolic trough collector system and to utilize a combustion of the more advanced materials and components under current development. The manufacturing operations are projected to include glass-making, silvering, electroplating and plastic-forming, which, while standard industrial procedures, will be additions to or expansions of existing solar manufacturing plants. These integrated operations for the year 2000 solar facility will introduce important environmental residuals which will need to be managed and controlled to satisfy local, state, and federal environmental standards. DOE

N80-23830# Systems Consultants, Inc., Washington, D. C.
REGIONAL APPLICATION OF FOSSIL ENERGY TECHNOLOGIES: AN ANALYTICAL APPROACH Final Report
W. Rebello, D. Canete, H. Phipps, and R. Smith Sep. 1979 312 p refs
(Contract EX-76-C-01-2442)
(DOE/ET-2442-1) Avail: NTIS HC A14/MF A01

Energy supply/demand profiles are presented for the 50 states and the nine US census regions using 1974 statistics. These profiles include quality and type of energy reserves, annual primary resource production, and consumption by end-use sector. A method for use by energy planners in assessing the effects of policy decision on energy profiles was developed. A series of energy indices was derived for each census region. The indices are defined to include the effect of consumption of relatively scarce fuels (oil and gas) versus plentiful fuels (coal). A number of fossil energy technologies under development are described. The potential impact of the maturation of these technologies on each census region's energy posture is discussed in conjunction with any regional constraints that may exist. Finally, a number of sample what if scenarios are discussed and the impact of fossil fuel replacements on national, regional, and sector energy consumption quantitatively is assessed. DOE

N80-23833# IBM Federal Systems Div., Huntsville, Ala.
ENVIRONMENTAL DATA FOR SITES IN THE NATIONAL SOLAR DATA NETWORK
May 1979 266 p
(Contract EG-77-C-01-4049)
(Solar/0010-79/05) Avail: NTIS HC A12/MF A01

A major goal of the National Solar Heating and Cooling Demonstration Program is to collect and analyze data which will be used to determine the thermal performance of selected solar energy systems. To meet the goals and objectives of the Demonstration Program, the National Solar Data Network was developed. The network consists of sensors which measure key performance parameters at a selected site, a site data acquistion system, telephone transmission circuits and a central data processing system which collects data and performs the computations required for system performance analysis. The output of the National Solar Data Network is a monthly performance report which defines the energy contribution of the solar energy system and resultant fossil fuel savings. The performance data for homes throughout the US is included. DOE

N80-23841# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
FEDERAL REPUBLIC OF GERMANY: ESTIMATES OF FUTURE ENERGY/GDP RELATIONSHIPS
R. Bruce Williamson and Edward L. Allen Dec. 1979 64 p refs
(Contracts EY-76-C-05-0033; DE-AC05-76OR-00033)
(ORAU/IEA(M)-79-22) Avail: NTIS HC A04/MF A01

Postwar trends in the West German economy, demography, and energy use were analyzed. The base year is 1976, and projections are made up to the year 2000 for gross domestic product (GDP) and sectoral energy demand. West Germany's 2.8 percent average annual GDP growth rate for the 1970s contrasts sharply with the 5.4 percent rate achieved in the 1960s. Future GDP growth is projected to level off at 2.9 percent a year on the average between now and 2000. This projection places German economic growth below that of Japan, Canada, and France but ahead of that projected for Italy and the United Kingdom. The relationship between West Germany energy demand and economic growth was stable in the postwar period. In 1976, total energy consumption stood at 9.8 quads and is projected to increase to 12.7 quads in 2000, an average annual 1.1 percent increase. The E/GDP ratio is expected to improve substantially by the year 2000, with the residential sector leading the way in energy efficiency. DOE

N80-23847# Urban Systems Research and Engineering, Inc., Cambridge, Mass.
DIRECT REGIONAL ENERGY/ECONOMIC MODELING (DREEM) DESIGN Final Report
P. [illegible] Hall and C. J. Pleatsikas Oct. 1979 146 p refs
(Contract EI-78-C-01-6345)
(DOE/EIA/6345-1) Avail: NTIS HC A07/MF A01

The use of regional and multiregional economic models for estimating the indirect and induced impacts of Federally-mandated energy policies was investigated. Alternative types of energy policies that can impact regional economics and the available analytical frameworks for measuring the magnitudes and spatial extents of these impacts were examined. The models capabilities for addressing various energy policy issues are summarized. Then the applicability of the model in specified contexts is demonstrated by developing appropriate input data for three scenarios. These scenarios concern the multi-state impacts of alternative coal mining development decisions, multi-regional impacts of macroeconomic change, and the comprehensive effects of an alternative national energy supply trajectory. DOE

N80-23848# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
UNITED KINGDOM: ESTIMATES OF FUTURE ENERGY/GDP RELATIONSHIP
J. C. Gehman and Edward L. Allen Dec. 1979 106 p refs
(Contracts EY-76-C-05-0033; DE-AC05-76OR-00033)
(ORAU/IEA(M)-79-25) Avail: NTIS HC A06/MF A01

The UK economy is expected to grow in real terms due, for the most part, to advances in productivity. With productivity increasing, but at a declining rate, real GDP is projected at 50 percent above the 1976 level. The historical shift from goods production to services is expected to continue, but at a slower pace; by the year 2000 service output is expected to reach 55 percent of GDP. In the transport sector the historical shift toward the passenger car is expected to saturate at about 70 percent of total ton-miles, while the shift toward truck freight is expected to continue and reach 70 percent of total ton-miles. Goods production is expected to stagnate and could fall to 33 percent of GDP by 2000. Historically, E/GDP has fallen steadily in the United Kingdom due almost exclusively to industrial conservation (investment in new and more efficient plant and equipment). Conservation should spread to all other sectors of the economy as a result of government policy. The E/GDP ratio is expected to fall by another 28 percent by the year 2000. This implies total energy consumption of 8.7 quads. DOE

N80-23849# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
CANADA: ESTIMATES OF FUTURE ENERGY/GNP RELATIONSHIPS
E. L. Allen, James A. Edmonds, and R. Bruce Williamson Dec. 1979 61 p refs
(Contracts EY-76-C-05-0033; DE-AC05-76OR-00033)
(ORAU/IEA(M)-79-24) Avail: NTIS HC A04/MF A01

The Canadian economy expanded at an annual rate of 4.6 percent in the 1970s (GNP growth), second only to the remarkable record of Japan. In the future, Canadian economic development is expected to fall below past rates of achievement, primarily because of declining numbers of new entrants in the labor force. However, other factors affecting growth remain favorable. Canada, in particular, is virtually self-sufficient in energy. Government policy is to carry out a vigorous program of

conservation, and to parallel this effort with domestic energy price increases which will move up to world levels over the next few years. As to economic growth, GNP expansion is expected to remain well above 3 percent a year for the balance of this century. Energy consumption is expected to grow from 7.51 Btu x 10 to the 15th power (quads) in 1976 to 13.3 quads by 2000. This means that energy growth, as a consequence of determined conservation, is expected to be about half as rapid as economic growth to 1990.
DOE

N80-23854# Massachusetts Inst. of Tech., Cambridge.
PROCESS APPLICATIONS FOR GEOTHERMAL ENERGY RESOURCES Progress Report
1 Oct. 1979 9 p
(Contract ET-78-S-02-4896)
(COO-4896-T1) Avail: NTIS HC A02/MF A01

Energy use characteristics of the major energy using industries in the US were examined. Using the pulp and paper industry, two analyses were performed of the potential for substituting geothermal energy for fossil fuel in specific plants. The lack of industry interest is discussed.
DOE

N80-23857# Brookhaven National Lab., Upton, N. Y.
SERIES SOLAR HEAT PUMP AND ENERGY CONSERVATION
Edward A. Kush 1979 24 p refs Presented at the 2nd Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10-13 Dec. 1979
(Contract EY-76-C-02-0016)
(BNL-27012; CONF-791204-13) Avail: NTIS HC A02/MF A01

An overview is given of the series solar heat pump concepts and the reasons why it can serve an important role in energy convservation in space heating. These are highlighted by elevated coefficients of performance (COP's) and the use of low temperature potentially inexpensive solar collectors. The characteristics required of the subsystems and integrated system are detailed. Particular emphasis is given to the performance of the heat pump itself at high temperature source conditions corresponding to those of solar input, and recent laboratory results which demonstrate very high COP's using practical components are shown. The reasons why the high COP's are a necessary but not sufficient condition for competitive overall system performance are detailed and methods for applying the high COP's to an effective solar assisted heat pump system are discussed. Ongoing development work in the field is summarized.
DOE

N80-23866# Transportation Research Board, Washington, D.C. Commission on Sociotechnical Systems.
ENERGY POLICY IMPACT EVALUATION
Susan Singer-bart, ed., Raisin K. Mufti (Princeton Univ.), Michael J. Munson (Princeton Univ.), Kenneth Chomitz (California Univ., Irvine), Richard A. Margiotta (Tennessee Univ., Knoxville), Lawrence J. Reilly (Harvard Univ., Cambridge Mass.), David T. Hartgen (New York State Dept. of Transportation, Albany), Leon Rudman (DOE, Cambridge, Mass.), Robin Dubin (Johns Hopkins Univ., Baltimore), David L. Greene (ORNL, Tenn.) et al 1979 44 p refs Sponsored in part by DOE
(PB80-137953; TRB/TRR-726; ISBN-0-309-02979-1; LC-79-607912; ISSN-0361-1981) Avail: NTIS HC A03/MF A01. Paper copy also available from Transportation Res. Board, 2101 Constitution Ave., Washington, D. C. 20418 CSCL 10A

Five papers are presented which deal with the following areas: approach to assessing the impact of energy conservation policies on transportation demand; survey and analysis of energy intensity estimates for urban transportation modes; foreign oil dependence; state-level analysis; vehicle kilometers traveled; evaluation of existing data sources; and multivariate classification of automobiles by use of an automobile characteristics data base.
GRA

N80-23873 Pennsylvania State Univ., University Park.
THE CHEMICAL TRANSFORMATION OF SULFUR DIOXIDE TO SULFATE IN THE PLUME OF THE COAL-BURNING KEYSTONE POWER PLANT Ph.D. Thesis
Allen Conrad Dittenhoefer 1979 137 p
Avail: Univ. Microfilms Order No. 8010048

Measurements of the oxidation rate of sulfur dioxide to sulfate particles were made in the plume of the coal-fired Keystone power plant using instrumented aircraft. Aerosol number concentrations in nine distinct size intervals spanning the range 0.01-2.0 micrometer diameter were obtained using a condensation nucleus counter, an optical particle counter, and an electrical aerosol analyzer. These measurements were combined with cascade impactor sampling and quantitative sulfate analysis of individual plume and background particles using a transmission electron microscope to determine the mass concentration of sulfate at various positions in and out of the plume. From cross sectional plume mappings of the horizontal and vertical concentration profiles of SO2 and sulfate mass it was possible to calculate the SO2 conversion rate in the plume. It was found that although plume sulfate particle size distributions were highly dependent on both ambient relative humidity and solar radiative flux, relative humidity was the predominant parameter governing the SO2 transformation rate within the initial one to two hours of plume transport.
Dissert. Abstr.

N80-23876# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN FOR BIOMASS ENERGY SYSTEMS
Sep. 1979 56 p refs
(DOE/EDP-0032) Avail: NTIS HC A04/MF A01

Key elements of the Biomass Energy Systems Program are briefly described. Significant environmental concerns and requirements are identified. These include effects on soil erosion, soil quality, water quality, ecosystems, and air quality. J.M.S.

N80-23877# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN: GEOTHERMAL ENERGY SYSTEMS
Aug. 1979 77 p refs
(DOE/EDP-0036) Avail: NTIS HC A05/MF A01

All current and planned activities of the DOE Geothermal Energy Systems Program are covered. Major elements of this program include exploration of resources, confirmation of reservoirs, development of energy extraction systems, demonstration of utilization systems, identification and removal of institutional barriers, and a loan guaranty program. Environmental concerns and requirements for resolution of these concerns are discussed in detail. In terms of immediate need and importance in getting power online, the emission of H2S is the most important concern and the demonstration of an effective abatement system is the most significant requirement. Other significant concerns are the management or disposal of spent geothermal fluids, the potential of land subsidence, questions of water availability for heat rejection systems, land use conflicts, and socio-economic and cultural problems. The requirements to appropriately research and mitigate these and other concerns in time to permit orderly and timely development of geothermal energy systems are presented.
J.M.S.

N80-23878# California Univ., Livermore. Lawrence Livermore Lab.
POTENTIAL AIR QUALITY IMPACT OF GEOTHERMAL POWER PRODUCTION IN THE IMPERIAL VALLEY
P. H. Gudiksen, D. L. Ermak, K. C. Lamson, M. C. Axelrod, and R. A. Nyholm Oct. 1979 42 p refs
(Contract W-7405-eng-48)
(UCRL-52797) Avail: NTIS HC A03/MF A01

A regional assessment of the potential impact on air quality of developing the Imperial Valley's geothermal resources for power production is presented. A network of six stations was installed to characterize the air quality and atmospheric transport properties for the valley before development. These measured the ambient air concentrations of H2S, SO2, O3, NO, NO/x, CO2, Hg, Rn, and particulates. The geothermal fluids were analyzed chemically to estimate potential emission rates from future power plants. Using these data and advanced air quality modeling led to the prediction of the potential valley-wide impact of a 3000 MW development scenario. The impact analysis reveals that H2S is the principal gaseous pollutant of concern. The ambient H2S concentrations that would result from generating 3000 MW without emission controls exceed the California air quality standard (30 ppb) at least 1% of the time for an area in the northern part of the valley that is roughly 1500 sq km in size. DOE

N80-23881# Department of Energy, Washington, D. C. Div. of Technology Assessments.
ENVIRONMENTAL DEVELOPMENT PLANS FOR ENERGY TECHNOLOGY PROGRAMS Summary Report
Oct. 1979 110 p
(DOE/EDP-0062) Avail: NTIS HC A06/MF A01

A review of 30 environmental development plans prepared in 1979 covering the Department of Energy's programs in the solar geothermal conservation, fossil, and nuclear energy technology areas is presented. For each area, the key environmental, health and safety concerns are identified, and the research required to resolve the concerns is discussed. Abbreviated milestones for technology and environmental activities are presented, and the completion dates for mandated environmental documents are summarized. DOE

N80-23904# Pullman Kellogg, Houston, Tex.
ENVIRONMENTAL STANDARDS FOR COAL CONVERSION PROCESSES. VOLUME 1: MOST STRINGENT, FEDERAL, AND SELECTED STATE REGULATIONS Final Report, Feb. 1977 - Jan. 1979
D. K. Webber and D. E. Whittaker Oct. 1979 268 p refs
(Contract EPA-68-02-2198)
(PB80-126980; EPA-600/7-79-231-A) Avail: NTIS HC A12/MF A01 CSCL 13B

Existing and proposed environmental standards are synopsized as a guide for evaluating the efficiency of available and developing technology for controlling liquid, gaseous, and solid wastes from coal conversion processes. Within the U.S., the Federal (including EPA) standards and guidelines for air, water, and solid wastes were gathered together with standards for 22 states (selected for their potential in installing coal conversion facilities) and two regional commissions. Because environmental effects can cross national borders, standards and guidelines for Mexico, the Dominion of Canada, two Canadian provinces, and the international Joint Commission of U.S. and Canada were synopsized and added to the U.S. standards. All standards and guidelines are compared; from them the most stringent standards are summarized. GRA

N80-24146# Canadian Industries Ltd., Kingston (Ontario). Environmental Improvement Business Area.
SWARU: SOLID WASTE DISPOSAL RESOURCE SYSTEM
[1979] 13 p
(NP-24196) Avail: NTIS HC A02/MF A01

The SWARU solid waste disposal resource recovery process a comprehensive system which can accept garbage and wastes of all kinds and converts the constituents to their highest and best economic use, is described. The incineration and materials handling technology, which facilitates resource recovery and ensures high thermal efficiency is evaluated and emissions from the plant are analyzed. DOE

N80-24217# Argonne National Lab., Ill.
ELECTRIC AND HYBRID VEHICLES IN THE URBAN FUTURE
Margaret K. Singh and Martin J. Bernard, III 1979 11 p refs
Presented at the 2nd Intern. Conf. on Energy Use Management, Los Angeles, 22-26 Oct. 1979
(Contract W-31-109-eng-38)
(CONF-791009-23) Avail: NTIS HC A02/MF A01

Basic electric and hybrid vehicle (EHV) information is outlined for transportation energy planners and engineers. Topics covered include: (1) the market potential for EHVs (trucks, buses, and automobiles) based on the work of several research groups and on expected technological characteristics of EHVs; (2) an assessment of the impact of EHVs on the urban structure and transport systems as well as urban environmental systems; and (3) current programs designed to accelerate the utilization of EHVs. In the assessment, 61 types of vehicles are characterized and set in five distinct market scenarios. It is concluded that the potential for significant EHV markets by the year 2000 is high and an overall net benefit to urban areas will result. DOE

N80-24316*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ADVANCED COMPONENT TECHNOLOGIES FOR ENERGY-EFFICIENT TURBOFAN ENGINES
Neal T. Saunders 1980 19 p refs Presented at the 16th Joint Propulsion Conf., Hartford, 30 Jun. - 2 Jul. 1980; cosponsored by AIAA, ASME and SAE
(NASA-TM-81507; E-445) Avail: NTIS HC A02/MF A01 CSCL 21E

A cooperative government-industry effort, the Energy Efficient Engine Project, to develop the advanced technology base for future commercial development of a new generation of more fuel conservative turbofan engines for airline use is described. Engine configurations that are dependent upon technology advances in each major engine component are defined and current design and development of the advanced components are included. J.M.S.

N80-24383# Electrochemical Technology Corp., Seattle, Wash.
SURVEY OF ORGANIC ELECTROLYTIC PROCESSES Final Report
T. R. Beck, R. T. Ruggeri, R. C. Alkirk (Illinois Univ., Urbana), M. A. Stadherr (Illinois Univ., Urbana), and N. L. Weinberg Nov. 1979 272 p refs
(Contract W-31-109-eng-38)
(ANL/OEPM-79-5) Avail: NTIS HC A12/MF A01

The commercial status of electroorganic processes and whether there would be significant possible energy savings by introduction of electroorganic processes to replace conventional chemical processes for production of certain large-tonnage organic chemicals were determined. A list was compiled of the 220 organic chemicals that were produced at greater than 10,000 tons per year in 1975 in the United States. Search of the Swann and of the Fichter Bibliographies of electroorganic literature yielded references on 95 of these compounds. By application of selection rules to obtain promising candidates, nine chemicals with diverse electrochemical processes were chosen for detailed process energy calculations. Parallel calculations were made for presently-used commercial chemical routes to these products. Two of the nine electrochemical processes, adiponitrile and methyl ethyl ketone, had energy savings in comparison to the corresponding chemical processes. DOE

N80-24475# Battelle Columbus Labs., Ohio.
CARBOHYDRATE CROPS AS A RENEWABLE RESOURCE FOR FUELS PRODUCTION. VOLUME 2: IDENTIFICATION OF KEY POLICY ISSUES, ALTERNATIVES, AND IMPLICATIONS RELATING ENERGY FROM BIOMASS
D. A. Scantland, T. A. McClure, and E. S. Lipinsky 30 May 1979 75 p refs
(Contract W-7405-eng-92)
(BMI-2031-Vol-2) Avail: NTIS HC A04/MF A01

Significant quantities of ethanol from carbohydrate crops could be produced from the equivalent number of dollars currently diverted and expected to be spent under the Food and Agriculture Act of 1977; however the the production of ethanol from sugar crops or corn would mean that significant changes in the prices of agricultural products could be expected (all other things being equal). In the initial development of ethanol fuels, ethanol from corn appears to be the least expensive as compared to sugarcane, sugar beets, and sweet sorghum. This is primarily because of high by-product credits. The crop with the greatest long term potential is sweet sorghum. Various policy incentive programs will continue to be directed towards stimulating biomass energy production. Four policy incentive programs are described. DOE

N80-24493# Midwest Research Inst., Golden, Colo.
ENVIRONMENTAL AND INSTITUTIONAL CONSIDERATIONS IN THE DEVELOPMENT AND IMPLEMENTATION OF BIOMASS ENERGY TECHNOLOGIES
Charlotte Schwab Sep. 1979 46 p refs

(Contract EG-77-C-01-4042)
(SERI/TR-62-264) Avail: NTIS HC A03/MF A01

The photosynthetic energy stored in plant and organic waste materials in the United States amounts to approximately 40% of the nation's total energy consumption. The conversion of the biomass energy source, in the form of biomass residues and wastes, can create problems. Environmental impacts may be significant, and legal responses to these impacts are a key determinant to the widespread adoption of biomass technologies. The major legal areas which will impact on biomass energy conversion include (1) the effect of existing state and federal legislation; (2) the role of regulatory agencies in the development of biomass energy; (3) governmental incentives to biomass development; and (4) legal issues surrounding the functioning of the technologies themselves. Emphasis is placed on the near-term technologies whose environmental impacts and institutional limitations are more readily identified. If biomass energy is to begin to achieve its apparently great potential, these questions must receive immediate attention.
DOE

N80-24503# National Transportation Policy Study Commission, Washington, D. C.
UTILIZATION CONCERNS OF POTENTIAL TRANSPORTATION FUELS
Gretchen Coar Apr. 1979 43 p refs
(PB80-138498; NTPSC/WP-79-37) Avail: NTIS HC A03/MF A01 CSCL 10A

The known utilization problems for fuels which were identified as likely near and midterm alternatives to petroleum (synthetics from oil shale and coal, and alcohols from various sources) are identified and discussed. The focus is on distribution and handling, material compatibility, vehicle performance, fuel economy, environmental effects, safety and toxicity, and potential utilization in alternative engines.
GRA

N80-24693*# Los Alamos Scientific Lab., N. Mex.
POTENTIAL PREDICTION NEEDS IN SUPPORT OF ENERGY SYSTEMS
Richard L. Blake *In* NASA. Marshall Space Flight Center Solar-Terrest. Predictions Proc., Vol. 2 Dec. 1979 p 198-202 ref Sponsored in part by DOE

Avail: NTIS HC A99/MF A01 CSCL 10B

The relationship between emerging energy systems and the natural environment is discussed, including selected examples to show that energy systems are tied to global solar terrestrial processess. The interdependence of resources, technology, and environmental impact is considered in terms of needed geophysical, atmospheric, and solar terrestrial data inputs. The need for long term basic research on the solar terrestrial system is emphasized.
J.M.S.

N80-24736# Department of Energy, Washington, D. C. Office of Leasing Policy Development.
ANALYSIS OF EXPLORATION, DEVELOPMENT AND PRODUCTION ACTIVITY ON FEDERAL OUTER CONTINENTAL SHELF LEASES
J. A. Gribbin, G. M. Kaitz, S. W. Edwards, and K. W. Erickson Dec. 1979 152 p refs
(DOE/RA-0044) Avail: NTIS HC A08/MF A01

Because the Outer Continental Shelf Lands Act Amendments of 1978 reconfirmed Congress' desire to ensure that persons holding Federal Outer Continental Shelf (OCS)leases act in a diligent manner to explore and develop the resources on these leases. The actual history of operations on all Federal OCS leases was examined. The primary objective of the analysis was to determine and to describe the actual record of exploration, development, and production activity on Federal OCS leases. The analysis was designed also to identify factors that influence the rate of this activity.
DOE

N80-24764*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
FEDERAL POLICIES TO PROMOTE THE WIDESPREAD UTILIZATION OF PHOTOVOLTAIC SYSTEMS. SUPPLEMENT: REVIEW AND CRITIQUE
J. L. Smith 15 Apr. 1980 115 p
(Contracts NAS7-100; EX-76-A-29-1012)
(NASA-CR-163148; DOE/JPL-1012-45; JPL-80-32) Avail: NTIS HC A06/MF A01 CSCL 10A

Review comments of the Congressional report entitled 'Federal Policies to Promote the Widespread Utilization of Photovoltaic Systems' are presented. Responses to the review comments by the Jet Propulsion Laboratory, preparer of the Congressional report, are also presented. The Congressional report discussed various issues related to promoting the deployment of photovoltaic systems through the Federal Photovoltaic Program. Various program strategies and funding levels were examined.
R.E.S.

N80-24797*# General Electric Co., Schenectady, N. Y. Energy Technology Operation.
COGENERATION TECHNOLOGY ALTERNATIVES STUDY (CTAS). VOLUME 1: SUMMARY REPORT Final Report
H. E. Gerlaugh, E. W. Hall, D. H. Brown, R. R. Priestley, and W. F. Knightly Jan. 1980 154 p
(Contract DEN3-31)
(NASA-CR-159765; GE79ET0102; DOE/NASA/0031-80/1) Avail: NTIS HC A08/MF A01 CSCL 10B

Large savings can be made in industry by cogenerating electric power and process heat in single energy conversion systems rather than separately in utility plants and in process boilers. About fifty industrial processes from the largest energy consuming sectors were used as a basis for matching a similar number of energy conversion systems that are considered as candidates which can be made available by the 1985 to 2000 time period. The sectors considered included food, textiles, lumber, paper, chemicals, petroleum, glass, and primary metals. The energy conversion systems included steam and gas turbines, diesels, thermionics, stirling, closed-cycle and steam injected gas turbines, and fuel cells. Fuels considered were coal, both coal and petroleum-based residual and distillate liquid fuels, and low Btu gas obtained through the on-site gasification of coal. An attempt was made to use consistent assumptions and a consistent set of ground rules for determining performance and cost in individual plants and on a national level. It was found that: (1) atmospheric and pressurized fluidized bed steam turbine systems were the most attractive of the direct coal-fired systems; and (2) open-cycle gas turbines with heat recovery steam generators and combined-cycles with NO(x) emission reduction and moderately increased firing temperatures were the most attractive of the coal-derived liquid-fired systems.
R.E.S.

N80-24802# Logistics Management Inst., Washington, D. C.
THE PROJECT INDEPENDENCE EVALUATION SYSTEM (PIES). VOLUME 1: DESCRIPTION OF THE SYSTEM, EXECUTIVE SUMMARY
Oct. 1978 51 p
(Contract EA-78-X-01-1321)
(HCP/I-1321-01/1) Avail: NTIS HC A04/MF A01

The project independence evaluation system (PIES) a national energy forecasting system used to provide baseline forecasts of energy prices, supplies, demand, and conversion activities is described. It is an analytical tool that can be used to examine the potential impact of changes in Federal policies by the specification of alternate scenarios. An overview which described the main features of the PIES; a discussion of the regional representation within the system; descriptions of the major supply and conversion submodels; a description of available documentation; and appendices that describe the modeling of refineries and utilities are provided.
DOE

N80-24804# Argonne National Lab., Ill.
INSTITUTIONAL TOTAL ENERGY CASE STUDIES
D. Wulfinghoff Jul. 1979 51 p
(Contract W-31-109-eng-38)
(ANL/CNSV-TM-15) Avail: NTIS HC A04/MF A01

Profiles of three total energy systems in institutional settings are presented. The plants are those of Franciscan Hospital, a 384 bed facility in Rock Island, Illinois; Franklin Foundation Hospital, a 100 bed hospital in Franklin, Louisiana; and the North American Air Defense Command Cheyenne Mountain

Complex, a military installation near Colorado Springs, Colorado. The case studies include descriptions of plant components and configurations, operation and maintenance procedures, reliability, relationships to public utilities, staffing, economic efficiency, and factors contributing to success. DOE

N80-24813# Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.
HEAT-PUMP-CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS Final Report
Nov. 1979 214 p refs Supersedes ANL/ICES-TM-31 Prepared for Argonne National Lab., Ill.
(Contract W-31-109-eng-38)
(ANL/CNSV-TM-18; ANL/ICES-TM-31) Avail: NTIS HC A10/MF A01

A Heat Pump Centered-Integrated Community Energy System (HP-ICES) concept was explored and developed that is based on use of privately owned ice-making heat pumps in each building or complex within a community. These heat pumps will provide all of the space heating, space cooling and domestic hot water needs. All of the community input energy required is provided by electrical power, thereby eliminating a community's dependence on gas or oil supplies. The heat pumps will operate in both air and water source modes, deriving performance advantages of both. The possible forms of an HP-ICES system, the technical and economic limitations, environmental impacts and other factors are discussed from a general viewpoint. The concept is applied to a specific planned community and its performance and economic features are examined in detail. It is concluded that the HP-ICES concept is technically viable, but that its economical desirability as compared with conventional heat pump systems is hampered by much higher initial costs, and that the economic feasibility of HP-ICES systems will depend on future fuel source costs and supply and on electric power rates. DOE

N80-24814# General Accounting Office, Washington, D. C.
FEDERAL GOVERNMENT NEEDS A COMPREHENSIVE PROGRAM TO CURB ITS ENERGY USE
E. B. Staats 12 Dec. 1979 66 p refs
(EMD-80-11) Avail: NTIS HC A04/MF A01

According to this GAO analysis, the Federal Government is not making a sufficient commitment to curbing its energy use. Its program to conserve energy is in disarray. Although the Congress and the President have enacted and issued legislative and executive guidance, a comprehensive and aggressive energy conservation program for the Federal sector has not been developed. The Department of Energy's efforts have been minimal and Federal agencies have resisted Energy's attempts to establish a meaningful program. The Federal Government - the Nation's largest consumer of energy needs a comprehensive, centrally directed program to curb energy use. Recommendations to the Congress, The President, and the Department of Energy to establish such a program are presented. DOE

N80-24822# Rocket Research Corp., Redmond, Wash. System Development.
HEAT-PUMP-CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS Final Report
Nov. 1979 69 p refs
(Contract W-31-109-eng-38)
(ANL/CNSV-TM-20) Avail: NTIS HC A04/MF A01

Heat-pump-centered integrated community energy systems (HP-ICES) are energy systems for communities which provide heating, cooling and/or other thermal energy services through the use of heat pumps. Since heat pumps primarily transfer energy from existing and otherwise probably unused sources, rather than convert it from electrical or chemical to thermal form, HP-ICES offer significant potential for energy savings. Secondary benefits of HP-ICES include reduction of adverse environmental effects as compared to conventional systems, reliable production of services in contrast to the increasingly frequent utility curtailments and interruptions, and delivery of services to consumers at costs lower than those for conventional systems (including acquisition, operation, and maintenance costs). The objective of this multiphase project is development and demonstration of HP-ICES concepts leading to one or more operational systems by the end of 1984. The results of the system development phase of the HP-ICES Project are reported. Information is presented on: central heat pump and distributed heat pump ICES; potential application; waste heat availability; system performance and economics; environmental impacts; site requirements; component testing requirements; mathematical analysis of heat balance and cost relations; and performance and economic analyses of HP-ICES located near Seattle, Washington and San Antonio, Texas. DOE

N80-24838# Georgetown Univ., Washington, D.C.
GEORGETOWN UNIVERSITY GENERIC INTEGRATED COMMUNITY ENERGY SYSTEM GU ICES DEMONSTRATION PROJECT. MODIFIED WORK MANAGEMENT PLAN Final Report
Apr. 1979 330 p refs
(Contract EC-77-C-02-4488)
(COO-4488-2) Avail: NTIS HC A14/MF A01

This Phase 2 Modified Work Management Plan reflects the change from a Coal Using ICES to a Generic ICES Program. Book 2 deals with an energy audit conducted at the campus in the fall of 1978 to establish a gross baseline from which to measure and evaluate the contributions of selected alternative energy subsystems both from an energy and cost standpoint. Book 1 proceeds from a discussion of an ICES through an explanation of the scope of effort in each phase expanded into detailed task descriptions by phase together with schedules, PERT and GANTT charts, milestones and levels of effort by task for the Feasibility Analysis, and schedules for the overall program. A description of examples of alternative subsystems to be considered is also included. A detailed Management Plan for the conduct of the effort by General Electric completes the plan. Appendices related to cogeneration, life cycle costing, GE energy subsystems, the GU Master Energy Plan, and typical regulatory processes to be encountered are included. Book 2 treats the Energy Audit under the three committed task areas of System Description, Analysis and Survey, and Criteria for Energy Usage. The five major energy systems utilized at Georgetown are considered: electrical, chilled water, steam, gas and fuel oil, and city water. A top level analysis yields significant results and recommendations for further action with respect to a detailed measurements program, particularly of steam and electric power usage, over a one year period. DOE

N80-24852# Institute for Energy Analysis, Washington, D.C.
FRANCE: ESTIMATES OF FUTURE ENERGY/GDP RELATIONSHIPS
Edward L. Allen Dec. 1979 67 p refs
(Contracts EY-76-C-05-0033; DE-AC05-76OR-00033)
(ORAU/IEA-79-23(M)) Avail: NTIS HC A04/MF A01

Compared with other OECD nations, France's postwar economic growth has been above average. Gross domestic product (GDP) grew at an annual rate of 4.1% in the 1970s. A high rate of new investment (fixed, nonresidential investment) was achieved during these years to bolster productivity gains. Since France depends primarily on imports for its energy supplies, energy use has become relatively efficient. Government policy emphasizes energy saving in all sectors: the E/GDP ratio increased only slightly to 1973 and thereafter fell sharply. As to the future, economic growth, as measured by GDP, is expected to moderate over the balance of this century, to a level of 2.8% annually by the 1995-2000 period. Labor force growth will decline because of decreased domestic fertility and the more restrictive immigration policy. In addition, the length of the workweek, which has remained relatively high, is expected to follow the declining trend already evident in other OECD countries. DOE

N80-24859# California Univ., Livermore. Lawrence Livermore Lab.
PROSPECTS FOR USING IMPROVED CLIMATE INFORMATION TO BETTER MANAGE ENERGY SYSTEMS
William J. Quirk and John E. Moriarty (Federal Energy Regulatory Commission, Washington, D.C.) Jan. 1980 12 p refs Presented at the Intern. Workshop on Energy/Climate Interactions, Munster, W. Germany, 3-7 Mar. 1980

(Contract W-7405-eng-48)
(UCRL-83813; CONF-800309-2) Avail: NTIS
HC A02/MF A01

The impacts that climate anomalies have had on energy systems in the United States, and the resulting impacts on society are described. It is pointed out that better use of climate information could alleviate some of the adverse consequences of these anomalies. The possibility of international cooperation in using climate information to avoid potentially worsening conditions during a global energy shortage is also examined. DOE

N80-24860# Alabama Univ., University. Bureau of Engineering Research.
HEAT-PUMP-CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS Final Report
Walter J. Schaetzle, C. Everett Brett, and Marvin S. Seppanen
Dec. 1979 283 p refs Supersedes ANL/ICES-TM-30
(Contract W-31-109-eng-38)
(ANL/CNSV-TM-25; ANL/ICES-TM-30) Avail: NTIS
HC A13/MF A01

The heat-pump-centered integrated community energy system supplies district heating and cooling using heat pumps and a thermal energy storage which is provided by nature in underground porous formations filled with water, i.e., aquifers. The proposed system was analyzed as demonstration projects for a downtown portion of Louisville, Kentucky, and a section of Fort Rucker, Alabama. The downtown Louisville demonstration project is tied directly to major buildings while the Fort Rucker demonstration project is tied to a dispersed subdivision of homes. The Louisville project shows a payback of approximately 3 y, while Fort Rucker is approximately 30 y. The primary difference is that at Fort Rucker new heat pumps are charged to the system. In Louisville, either new construction requiring heating and cooling systems or existing chillers are utilized. DOE

N80-24863# Franklin Research Center, Philadelphia, Pa.
HEAT-PUMP-CENTERED INTEGRATED COMMUNITY ENERGY SYSTEMS Final Report
Richard E. Crane and Robert G. Werden (Werden (R.G.) and Assoc., Philadelphia) Dec. 1979 223 p refs Supersedes ANL/ICES-TM-26
(Contract W-31-109-eng-38)
(ANL/CNSV-TM-24; ANL/ICES-TM-26-Rev) Avail: NTIS
HC A10/MF A01

Heat-pumps-centered integrated community energy systems (HP-ICES) are energy systems for communitites which provide heating, cooling and/or other thermal energy services through the use of heat pumps. Since heat pumps primarily transfer energy from existing and otherwise probably unused sources, rather than convert it from electrical or chemical to thermal form, HP-ICES offer significant potential for energy savings. Information is presented on the following: the HP-ICES concept; its application potential; variations in the basic HP-ICES concept which could lead to improved performance; applications of the concept to specific communities; design; economics; environmental impacts; and component testing requirements. DOE

N80-24868# Oak Ridge National Lab., Tenn. Energy Div.
ENERGY AVAILABILITIES FOR STATE AND LOCAL DEVELOPMENT: 1975 DATA VOLUME
J. B. Mills, P. L. Rice, and D. P. Vogt Jan. 1980 285 p
(Contract W-7405-eng-26)
(ORNL/TM-6951) Avail: NTIS HC A13/MF A01

The supply, demand, and net imports of seven fuel types of four final consuming sectors for Bureau of Economic Analysis Areas (BEAs), states, census regions, and the nation in 1975 are presented. The data are formatted to present regional energy availability from primary extraction as well as from regional transformation processes. Extensive tables depict energy balances between availability and use for each specific fuel. A consistent base of historic and projected energy information is presented within a standard format. Such a framework should aid regional policy makers in their consideration of regional-growth issues that may be influenced by the regional energy system. For analysis of specific regions, however, this basic data should be supplemented by additional information which only the local policy analyst can bring to bear in his assessment of the energy conditions that characterize his region. DOE

N80-24869# Oak Ridge Associated Universities, Tenn. Inst. for Energy Analysis.
JAPAN: ESTIMATES OF FUTURE ENERGY/GNP RELATIONSHIPS IN ENERGY USE
J. A. Edmonds and Edward L. Allen Dec. 1979 95 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA-79-21(M)) Avail: NTIS HC A05/MF A01

As a consequence of continued rapid economic expansion, Japan's energy consumption is projected to more than double between 1976 and 2000. At the same time GNP is projected to triple, accompanied by lowering of the Japanese energy/GNP ratio by 30%. Industrial and transportation sector energy efficiency gains are expected to lead the way, with residential and commercial sector consumption growing almost abreast with GNP. The delayed home appliance revolution is expected to offset much of the gains from slow population growth. On the other hand, the Japanese automobile population explosion is expected to proliferate more energy-efficient automobiles throughout the economy, rapidly raising overall fleet performance. A significant shift toward water transport of freight also improves the overall performance of the transport sector. DOE

N80-24870# Department of Energy, Washington, D. C. Office of Analytical Sciences.
NATIONAL ENERGY PLAN 2, MAY 1979. APPENDIX A: WORLD OIL PRICES
1979 65 p refs
(DOE/TIC-10203-App-A) Avail: NTIS HC A04/MF A01

The detailed assumptions and projections used to develop the Second National Energy Plan (NEP-2) world oil price cases are presented in three major sections. The first section presents assumptions about potential world demand and production of oil, assuming constant real future world oil prices. Included is a discussion of alternative theories of OPEC behavior. The second section presents world oil price paths generated by mathematical models of world oil supply and demand. The models calculate oil prices that act through price elasticities to change the assumed constant-price oil demand and supply conditions to achieve a balanced oil market. The final section synthesizes the various model projections into the range of world oil price cases used in NEP-2 and reports major conclusions resulting from the world oil price analysis. DOE

N80-24871# Department of Energy, Washington, D. C. Office of Building and Community Systems.
ENERGY PERFORMANCE STANDARDS FOR NEW BUILDINGS: ECONOMIC ANALYSIS
Jan. 1980 402 p
(DOE/CS-0129) Avail: NTIS HC A18/MF A01

The major economic impacts of the implementations of the standards on affected groups were assessed and the effectiveness of the standards as an investment in energy conservation was evaluated. The methodology used to evaluate the standards for the various building types and perspectives is described. The net economic effect of changes in building cost and energy use are discussed for three categories of buildings: single family residential, commercial and multifamily residential, and mobile homes. Forecasts of energy savings and national costs and benefits both with and without implementation of the standards are presented. The effects of changes in energy consumption and construction of new buildings on the national economy, including such factors as national income, investment, employment, and balance of trade are assessed. DOE

N80-24873# National Bureau of Standards, Washington, D.C. National Engineering Lab.
EVALUATION OF ENERGY CONSERVING MODIFICATIONS FOR WATER HEATERS Final Report
Robert L. Palla, Jr. Jul. 1979 53 p refs
(PB80-133853; NBSIR-79-1783) Avail: NTIS
HC A04/MF A01 CSCL 10A

The effects of various energy-conserving modifications on water heating energy consumption were evaluated based on laboratory tests. Nine storage-type residential water heaters, representative of standard and energy-saving electric gas, and oil fueled models currently on the market, were obtained for testing. Federally-promulgated water heat test procedures were used to measure the energy consumption of each unit before and after modifications. GRA

N80-24876# Bechtel National, Inc., San Francisco, Calif. Research and Engineering Dept.
PROJECTED ANNUAL RESOURCE REQUIREMENTS AT THE NATIONAL AND REGIONAL LEVEL FOR THE DEPARTMENT OF COMMERCE ENERGY FORECAST 1985 AND 2000
Andrea L. Watson and Ralph G. J. Zimmerman Mar. 1979 205 p Sponsored by Dept. of Commerce
(PB80-126956) Avail: NTIS HC A10/MF A01 CSCL 10A

An analysis is presented of the national and regional resource requirements (capital, material, manpower, etc.) associated with future energy development in the U.S. The analysis, using Bechtels Energy Supply Planning Model (ESPM) indicates projected cumulative capital requirements of $1.6 trillion (January 1978 dollars) during the 1977 - 2000 forecast period. The largest requirements by energy sector are for electric power generation facilities (53%) coal-fired plants in particular. Although the U.S. is projected to become more and more dependent upon western energy resources, both capital and labor requirements are projected to move from Western to Eastern regions - by the year 2000 - again primarily because of electrical generation requirements. GRA

N80-24884# Brookhaven National Lab., Upton, N. Y. Dept. of Energy and Environment.
ENVIRONMENTAL CONTROL TECHNOLOGY FOR THE FLASH HYDROPYROLYSIS OF COAL Progress Report, 1 Apr. - 31 Dec. 1978
Feb. 1979 81 p refs
(Contract EY-76-C-02-0016)
(BNL-50983; PR-3) Avail: NTIS HC A05/MF A01

Based on experimental results and analytical studies, preliminary environmental and economic assessments of a conceptual, industrial scale FHP-Refinery Complex were made. Three cases were considered, one for the production of pipeline gas, the second for the production of liquid hydrocarbons such as motor gasoline and liquid prepared gas LPG, and the third for the production of both liquid and gaseous effluents for each case gaseous products. Solid, liquid and gaseous products. Solid, liquid and gaseous effluents for each case were evaluated, and required effluent treatment facilities and potential problem areas identified. Thermal efficiency range from 50% to 72%, depending upon the mode of operation of the Complex, and investment costs from 834 to 936 million dollars. The installed cost of environmental equipment is estimated at about 5% of total plant investment for all three cases. DOE

N80-24885# Oak Ridge National Lab., Tenn. Environmental Sciences Div.
ANALYSIS OF ENVIRONMENTAL IMPACTS OF WATER LEVEL FLUCTUATION IN RESERVOIRS AT HYDROELECTRIC SITES
A. T. Szluha, J. M. Loar, R. R. Turner, and S. G. Hildebrand 1979 8 p refs Presented at the Waterpower 79 Intern. Conf.: Small Scale Hydropower, Washington, D.C., 1 Oct. 1979
(Contract W-7405-eng-26)
(CONF-791056-2) Avail: NTIS HC A02/MF A01

Potential significance, on a site-specific basis, of water-level-fluctuation impacts ranges from begin (run-of-the river plants) to possibly significant enough to require mitigation. It is emphasized that efforts to develop small hydroelectric sites that entail water level fluctuation should include a careful analysis of the types of impacts. The potential significance of these impacts should be evaluated as an integral part of initial studies of site feasbility. DOE

N80-24886# Niagra Univ., New York, N.Y.
ENVIRONMENTAL CONSEQUENCES OF ATMOSPHERIC KRYPTON-85 Final Report, 1 Jan. 1977 - 30 Sep. 1979
W. L. Boeck 1979 17 p refs
(Contract EE-77-S-02-4364)
(COO-4364-2) Avail: NTIS HC A02/MF A01

Krypton-85 is a radioactive inert gas produced during normal operations of the nuclear fuel cycle. The quantities of krypton-85, that will be produced in the next century, are sufficient, if released to alter the electrical state of the atmosphere. The principal hypothesis is that an anthropogenic alteration of the electric state of the atmosphere could alter other meterological phenomena and lead to significant environmental impacts. The goal was to explore some areas of basic science related to the evaluation of that hypothesis. The approach was primarily theoretical. The following topics were addressed: a first approximation model to estimate the effects of krypton-85 on the electrical state of the atmosphere; an analysis of the pathways between krypton-85 production and the atmosphere; an analytical model for fair weather atmospheric electricity; and a dipole model for atmospheric electricity. The results will provide a framework on which detailed models can be built. The results should provide better understanding of some topics in atmospheric electricity. DOE

N80-24888# Brookhaven National Lab., Upton, N. Y. Process Sciences Div.
ENVIRONMENTAL CONTROL TECHNOLOGY FOR ATMOSPHÈRIC CARBON DIOXIDE
Meyer Steinberg and Anthony S. Albanese 1980 31 p refs Presented at the Intern. Workshop on the Energy/Climate Interactions, Munster, West Germany, 3-7 Mar. 1980
(Contract EY-76-C-02-0016)
(BNL-27164; CONF-800309-1) Avail: NTIS HC A03/MF A01

The impact of fossil fuel use in the United States on worldwide CO2 emissions and the impact of increased coal utilization on CO2 emission rates are assessed. The aspects of CO2 control are discussed as well as the available CO2 control points (CO2 removal sites). Two control scenarios are evaluated, one based on the absorption of CO2 contained in power plant flue gas by seawater; the other, based on absorption of CO2 by (mono ethanol amine-MEA). Captured CO2 is injected into the deep ocean in both cases. The analyses indicate that capture and disposal by seawater is energetically not feasible, whereas capture and disposal using MEA is a possibility. However, the economic penalties of CO2 control are significant. The use of nonfossil energy sources, such as hydroelectric, nuclear or solar energy is considered as an alternative for limiting and controlling CO2 emissions resulting from fossil energy usage. DOE

N80-24890# Environmental Protection Agency, Research Triangle Park, N.C. Emission Standards and Engineering Div.
CONTROL TECHNIQUES FOR CARBON MONOXIDE EMISSIONS Final Report
Jun. 1979 410 p refs
(PB80-140510; EPA-450/3-79-006) Avail: NTIS HC A18/MF A01 CSCL 13B

This document characterizes carbon monoxide emission sources and controls for use by states in revising state implementation plans. It is intended for use by state and local air pollution control engineers to provide basic available information on carbon monoxide emissions from mobile sources, stationary combustion sources, and industrial process sources. Both demonstrated and feasible control strategies are presented for each source. Information is also provided on emission reduction benefits, energy requirements of controls, and annualized and operating costs of controls. GRA

N80-24896# Tennessee Valley Authority, Chattanooga. Power Research Staff.
DESIGN OF A MONITORING PROGRAM FOR ASH POND EFFLUENTS Final Report, May 1975 - Apr. 1979
F. A. Miller, III, T. V. J. Chu, and R. J. Ruane Nov. 1979 207 p refs Sponsored by EPA
(PB80-128457; PRS-41; EPA-600/7-79-236) Avail: NTIS HC A10/MF A01 CSCL 13B

A procedure is described for designing an effective monitoring program for fossil-fueled power plant ash pond effluents. Factors

that influence effluent characteristics and are important in designing such a monitoring program were determined following a review of plant operating characteristics and ash pond effluent characteristics of TVA's fossil-fueled power plant system. A statistical procedure for determining the sampling frequency of chemical characteristics in ash pond effluents precision are described: method 1 involves selecting a precision value to estimate the population mean within a given percentage; method 2 involves calculating a precision value by subtracting an estimate of the population mean from either the ash pond effluent limitation established by EPA or a desirable water quality criterion. Method 2 gives the number of samples required to show that the effluent is in compliance with the effluent limitation or below the water quality criteria. The method chosen to compute the precision depends on the purpose of the monitoring program. The procedure was demonstrated for two TVA ash pond systems.
GRA

N80-24898# Rockwell International Corp., Newbury Park, Calif. Air Monitoring Center.
QUALITY ASSURANCE IN SUPPORT OF ENERGY RELATED MONITORING ACTIVITIES Annual Report
Mark Cher Jun. 1979 69 p refs
(Contract EPA-68-02-2412)
(PB80-135270; AMC-8303.135-AR-2; EPA-600/7-79-136; AR-2) Avail: NTIS HC A04/MF A01 CSCL 13B

A program to establish a quality assurance data base for ambient air monitoring around present and proposed energy development projects, and to provide technical assistance to enable existing monitoring networks to achieve a high level of data quality is described. Results from laboratory performance surveys carried out for the analysis of sulfate, nitrate, SO2, NO2, and CO and for weight measurements and high volume flow rate are given.
GRA

N80-25207# Argonne National Lab., Ill.
MARKET PENETRATION OF NEW ENERGY SYSTEMS ESTIMATED BY ECONOMETRIC AND STOCHASTIC METHODOLOGY
Arvind P. S. Teotia, Chinmei Lee, and Allen S. Kennedy 1979 15 p refs Presented at the IGT Symp. on Energy Modeling 2: The Interface Between Model Builder and Decision Maker, Colorado Springs, Colo., 13-19 Aug. 1979
(Contract W-31-109-eng-38)
(CONF-790852-2) Avail: NTIS HC A02/MF a01

An econometric and stochastic model approach is used to analyze the technical, economic, and market factors influencing the possible market penetration of new energy systems. The market model methodology includes four phases: segment the new technology/end-use market; estimate the technical market; estimate the economic market; and estimate the market penetration. The market penetration of integrated community energy systems (ISCE) is estimated by this methodology. To illustrate the methodology, highlights of the ICES application are included.
DOE

N80-25213# Science Applications, Inc., McLean, Va.
ASSESSMENT OF THE TECHNOLOGY TRANSFER POTENTIAL OF FEDERAL PHOTOVOLTAIC POWER SYSTEM APPLICATIONS TO COMMERCIAL MARKETS Final Report
T. F. Jaras, Michael McDonnell, and Richard A. Moyle Jun. 1979 153 p
(Contract EM-78-C-04-4261)
(ALO-4261-T8) Avail: NTIS HC A08/MF A01

An assessment of the market potential of photovoltaic power supplies is presented. Markets analyzed include the water pumping market, marine navigational aids, cathodic protection, remote general power sources, telecommunications, air navigational aids, mobile generator market, instrumentation, and utility connected applications.
DOE

N80-25332*# Pratt and Whitney Aircraft Group, East Hartford, Conn. Commercial Products Div.
ENGINE COMPONENT IMPROVEMENT: PERFORMANCE IMPROVEMENT, JT9D-7 3.8 AR FAN Progress Report, Jan. 1978 - Feb. 1979
W. O. Gaffin 12 Jun. 1980 57 p ref
(Contract NAS3-20630)
(NASA-CR-159806; PWA-5515-114) Avail: NTIS HC A04/MF A01 CSCL 21E

A redesigned, fuel efficient fan for the JT9D-7 engine was tested. Tests were conducted to determine the effect of the 3.8 AR fan on performance, stability, operational characteristics, and noise of the JT9D-7 engine relative to the current 4.6 AR Bill-of-Material fan. The 3.8 AR fan provides increased fan efficiency due to a more advanced blade airfoil with increased chord, eliminating one part span shroud and reducing the number of fan blades and fan exit guide vanes. Engine testing at simulated cruise conditions demonstrated the predicted 1.3 percent improvement in specific fuel consumption with the redesigned 3.8 AR fan. Flight testing and sea level stand engine testing demonstrated exhaust gas temperature margins, fan and low pressure compressor stability, operational suitability, and noise levels comparable to the Bill-of-Material fan.
Author

N80-25477# Argonne National Lab., Ill.
ENVIRONMENTAL CONTROL TECHNOLOGY FOR BIOMASS FLASH PYROLYSIS
J. B. L. Harkness, R. D. Doctor (Science Applications, Inc.), and W. H. Seward (Mittelhauser Corp.) 1980 32 p refs Presented at the Energy from Biomass and Wastes Conf., Orlando, Fla., 21 Jan. 1980
(Contract W-31-109-eng-38)
(CONF-800129-2) Avail: NTIS HC A03/MF A01

The effluent emission and control technologies for a dual fluid-bed pyrolysis unit is characterized. The system produces a raw products gas that is passed through a catalytic liquefaction system to produce a fuel comparable to no. 2 fuel oil. A program that will survey several biomass systems to standardize the sampling techniques, prioritize standard analyses and develop a data base so that environmental issues later may be addressed before they limit or impede the commercialization of biomass gasification and pyrolysis technologies was conducted. Emissions were related to both the current and anticipated emissions standards to generate material balances and set design parameters for effluent treatment systems. This permits an estimate to be made of the capital and operating costs associated with these technologies.
E.J.R.

N80-25481# Tennessee Valley Authority, Muscle Shoals, Ala. Emission Control Development Projects.
EVALUATION OF PHYSICAL/CHEMICAL COAL CLEANING AND FLUE GAS DESULFURIZATION Final Report, Jun. 1978 - Oct. 1979
T. W. Tarkington, F. M. Kennedy, and J. G. Patterson Nov. 1979 378 p refs Sponsored by EPA
(PB80-147622; ECDP/B-5; EPA-600/7-79-250) Avail: NTIS HC A17/MF A01 CSCL 13B

The results of evaluations of physical coal cleaning (PCC), chemical coal cleaning (CCC), and coal cleaning combined with flue gas desulfurization (FGD). Process descriptions, cleaning performances, comparative capital investments, and annual revenue requirements are included.
GRA

N80-25678# National Technical Information Service, Springfield, Va.
DIESEL EXHAUST EMISSION CONTROL FOR MOTOR VEHICLES, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1978 - Jan. 1980
Diane M. Cavagnaro Feb. 1980 110 p
(PB80-805401; NTIS/PS-79/0038) Avail: NTIS HC $30.00/MF $30.00 CSCL 13B

Citation to worldwide research were selected that discuss the control of exhaust gases from diesel motor vehicle engines. Most of the studies are concerned with emission control through engine design; however, some studies also cover the use of fuel additives for pollution control. This updated bibliography contains 103 abstracts, 48 of which are new entries to the previous edition.
GRA

N80-25679# National Technical Information Service, Springfield, Va.
DIESEL EXHAUST EMISSIONS. CITATIONS FROM THE AMERICAN PETROLEUM INSTITUTE DATA BASE Progress Report, 1974 - Dec. 1980
Diane M. Cavagnaro Feb. 1980 204 p Supersedes NTIS/PS-79/0039
(PB80-805419; NTIS/PS-79/0039) Avail: NTIS HC $30.00/MF $30.00 CSCL 13B

This bibliography cites research reports concerning exhaust emissions from diesel motor vehicles. Topics include engine design, techniques of measuring gases, pollution control, and fuel additives. GRA

N80-25792*# United Technologies Corp., South Windsor, Conn. Power System Div.
COGENERATION TECHNOLOGY ALTERNATIVES STUDY. VOLUME 1: SUMMARY REPORT Final Report
Jan. 1980 125 p
(Contracts DEN3-30; EC-77-A-31-1062)
(NASA-CR-159759; DOE/NASA/0030-80/1;
UTC-FCR-1333-Vol-1) Avail: NTIS HC A06/MF A01 CSCL 10A

Data and information in the area of advanced energy conversion systems for industrial congeneration applications in the 1985-2000 time period was studied. Six current and thirty-one advanced energy conversion systems were defined and combined with appropriate balance-of-plant equipment. Twenty-six industrial processes were selected from among the high energy consuming industries to serve as a framework for the study. Each conversion system was analyzed as a cogenerator with each industrial plant. Fuel consumption, costs, and environmental intrusion were evaluated and compared to corresponding traditional values. Various cogeneration strategies were analyzed and both topping and bottoming (using industrial by-product heat) applications were included. The advanced energy conversion technologies indicated reduced fuel consumption, costs, and emissions. Typically fuel energy savings of 10 to 25 percent were predicted compared to traditional on-site furnaces and utility electricity. With the variety of industrial requirements, each advanced technology had attractive applications. Overall, fuel cells indicated the greatest fuel energy savings and emission reductions. Gas turbines and combined cycles indicated high overall annual cost savings. Steam turbines and gas turbines produced high estimated returns. In some applications, diesels were most efficient. The advanced technologies used coal-derived fuels, or coal with advanced fluid bed combustion or on-site gasification systems. R.E.S.

N80-25793*# United Technologies Corp., South Windsor, Conn. Power Systems Div.
COGENERATION TECHNOLOGY ALTERNATIVES STUDY. VOLUME 2: INDUSTRIAL PROCESS CHARACTERISTICS Final Report
Jan. 1980 697 p refs
(Contracts DEN3-30; EC-77-A-31-1062)
(NASA-CR-159760; DOE/NASA/0030-80/2;
UTC-FCR-1333-Vol-2) Avail: NTIS HC A99/MF A01 CSCL 10A

Information and data for 26 industrial processes are presented. The following information is given for each process: (1) a description of the process including the annual energy consumption and product production and plant capacity; (2) the energy requirements of the process for each unit of production and the detailed data concerning electrical energy requirements and also hot water, steam, and direct fired thermal requirements; (3) anticipated trends affecting energy requirements with new process or production technologies; and (4) representative plant data including capacity and projected requirements through the year 2000. R.E.S.

N80-25794*# United Technologies Corp., South Windsor, Conn. Power Systems Div.
COGENERATION TECHNOLOGY ALTERNATIVES STUDY. VOLUME 4: HEAT SOURCES, BALANCE OF PLANT AND AUXILIARY SYSTEMS Final Report
Jan. 1980 296 p
(Contracts DEN3-30; EC-77-A-31-1062)
(NASA-CR-159762; DOE/NASA/0030-80/4;
UTC-FCR-1333-Vol-4) Avail: NTIS HC A13/MF A01 CSCL 10A

Data and information established for heat sources balance of plant items, thermal energy storage, and heat pumps are presented. Design case descriptions are given along with projected performance values. Capital cost estimates for representative cogeneration plants are also presented. R.E.S.

N80-25795*# United Technologies Corp., South Windsor, Conn. Power Systems Div.
COGENERATION TECHNOLOGY ALTERNATIVES STUDY. VOLUME 6: COMPUTER DATA Final Report
Jan. 1980 535 p
(Contracts DEN3-30; EC-77-A-31-1062)
(NASA-CR-159764; DOE/NASA/0030-80/6;
UTC-FCR-1333-Vol-6) Avail: NTIS HC A22/MF A01 CSCL 10A

The potential technical capabilities of energy conversion systems in the 1985 - 2000 time period were defined with emphasis on systems using coal, coal-derived fuels or alternate fuels. Industrial process data developed for the large energy consuming industries serve as a framework for the cogeneration applications. Ground rules for the study were established and other necessary equipment (balance-of-plant) was defined. This combination of technical information, energy conversion system data ground rules, industrial process information and balance-of-plant characteristics was analyzed to evaluate energy consumption, capital and operating costs and emissions. Data in the form of computer printouts developed for 3000 energy conversion system-industrial process combinations are presented. R.E.S.

N80-25804# Oak Ridge Associated Universities, Inc., Washington, D.C. Inst. for Energy Analysis.
ITALY: ESTIMATES OF FUTURE ENERGY/GDP RELATIONSHIPS
C. Davison and Edward L. Allen Dec. 1979 61 p refs
(Contract EY-76-C-05-0033)
(ORAU/IEA(M)-79-20 Avail: NTIS HC A04/MF A01

The Italian economy has experienced very rapid growth since World War II, accompanied by a sharp increase in the consumption of energy, the growth of which has been more rapid than the development of the economy. For the period 1960-76, energy consumption grew an average of 6.7% annually, compared with an annual growth rate of 4.6% for gross domestic product. The ratio of energy use per unit of GNP increased in every year from the early 1960s until the oil price rise in 1973 and after a brief pause then began to rise again. By 1975, when the E/GDP ratios of other industrialized OECD countries were hitting record lows, Italy's ratio was at an all-time high. This increasing E/GDP ratio was largely the result of Italy's very rapid industrial expansion and its attempt to catch up with the stage of industrial maturity already achieved in other developed countries. It is anticipated that the E/GDP ratio will decline in the future as Italy's industrial expansion slows down. Increased efficiencies will flow from the application of new technologies and replacement of old plants. Pressure from higher oil prices and structural changes in Italian society also will dampen the E/GDP ratio, as it has in other industrialized countries. GDP growth will slacken as the fertility rate continues its downward trend and the average workweek falls. It is that by the year 2000 gross energy consumption in Italy will total 6.7 quads, or about 25% above the 1976 level, and that the E/GDP index (1976 = 100) will decline to about 79, with the residential and industrial sectors accounting for almost all of the decline. DOE

N80-25827# Argonne National Lab., Ill. Office of Program Management Support.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 1: COUNTRY DATA, AF-CO
Jun. 1979 345 p refs 11 Vol.
(Contract W-31-109-eng-38)
(ANL/PMS-79-2-Vol-1) Avail: NTIS HC A15/MF A01

The World Energy Data System contains organized data on those countries and international organizations that may have critical impact on the world energy scene. Country data on Afghanistan, Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Brazil, Burma, Canada, China, and Colombia are included in volume 1. The following topics are covered for most of the countries: economic, demographic, and educational profiles; energy exports, imports of energy supplies; environmental considerations; power production facilities; energy industries; commercial applications of energy; research and development activities of energy; and international activities. DOE

N80-25828# Argonne National Lab., Ill. Office of Program Management Support.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 2: COUNTRY DATA, CZ-KS
Jun. 1979 361 p refs 11 Vol.
(Contract W-31-109-eng-38)
(ANL/PMS-79-2-Vol-2) Avail: NTIS HC A16/MF A01

The World Energy Data System contains organized data on those countries and international organizations that may have critical impact on the world energy scene. Country data on Libya, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Niger, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, and Portugal are presented. The following topics are covered for most of the countries: economic, demographic, and educational profiles; energy policy; indigenous energy resources and uses; forecasts demand, exports, imports of energy supplies; environmental considerations of energy supplies; power production facilities; energy industries; commercial applications of energy; research and development activities of energy; and international activities. DOE

N80-25829# Argonne National Lab., Ill. Office of Program Management Support.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 2: COUNTRY DATA, LY-PO
Jun. 1979 364 p refs
(Contract W-31-109-eng-38)
(ANL/PMS-79-2-Vol-3) Avail: NTIS HC A16/MF A01

The World Energy Data System contains organized data on those countries and international organizations that may have critical impact on the world energy scene. Included in this volume, volume 2, are Czechoslovakia, Denmark, Egypt, Finland, France, Germany(East), Germany (West), Greece, Guinea, India, Indonesia, Iran, Italy, Japan, and Korea (South). The following topics are covered for most of the countries; economic, demographic, and educational profiles; energy policy; indigenous energy resources and uses; forecasts; demand, exports, imports of energy supplies; environmental considerations of energy use; power production facilities; energy industries; commercial applications of energy; research and development activities of energy; and international activities. DOE

N80-25830# Argonne National Lab., Ill. Office of Program Management Support.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 4: COUNTRY DATA, SG-YO
Jun. 1979 407 p refs 11 Vol.
(Contract W-31-109-eng-38)
(ANL/PMS-79-2-Vol-4) Avail: NTIS HC A18/MF A01

The World Energy Data System contains organized data on those countries and international organizations that may have critical impact on the world energy scene. Included in this volume are Senegal, South Africa, Soviet Union, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Turkey, United Kingdom, United States, Upper Volta, Venezuela, and Yugoslavia. The following topics are covered for most of the countries; economic, demographic, and educational profiles; energy policy; indigenous energy resources and uses; forecasts, demand, exports, imports of energy supplies; environmental considerations of energy supplies; power production facilities; energy industries; commercial applications of energy; research and development activites of energy; and international activities. DOE

N80-25831# Argonne National Lab., Ill. Office of Program Management Support.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 5: INTERNATINAL ORGANIZATION DATA
Jun. 1979 156 p refs 11 Vol.
(Contract W-31-109-eng-38)
(ANL/PMS-79-2-Vol-5) Avail: NTIS HC A08/MF A01

The World Energy Data System (WENDS) contains organized data on those countries and international organization that may have critical impact on the world energy scene. WENDS has acquired and organized information on the following energy-related organizations: Asian Development Bank; European Community; InterAmerican Development Bank; International Atomic Energy Agency; International Energy Agency; Nuclear Energy Agency; United Nations; and World Bank. Within each organization grouping most of the following topics are addressed; organization background, government background, energy background (energy policy and objectives), energy research and development activities, and international activities. DOE

N80-25841# Institute of Gas Technology, Chicago, Ill.
BENEFICIAL USE OF REJECTED HEAT FROM ELECTRIC POWER PLANTS Final Summary Report
Robert W. Porter Aug. 1979 17 p refs
(Contract EC-77-S-02-4531)
(COO-4531-9) Avail: NTIS HC A02/MF A01

The in situ beneficial uses of rejected heat from steam-electric power plants are evaluated. Applications, which include direct discharge into a municipal water supply, interaction with wastewater treatment, and open field irrigation, were examined. In each case, a thermal and economic systems analysis was performed and operational, legal, and other problems were assessed. In the case of the municipal water supply, the savings in cost of closed-cycle cooling and water-heater energy appear to offset operational problems in the water supply and may be sufficient to justify public acceptance. A number of more advanced wastewater treatment processes would benefit from dilution with a portion of condenser discharge. The treated mixture would serve as makeup for a smaller modified closed cycle cooling system and the balance would constitute a water product. Unfortunately, open-field irrigation does not seem feasible due to the large land areas required. DOE

N80-25849# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
EVALUATION OF RESIDENTIAL BUILDING ENERGY PERFORMANCE STANDARDS
Mark D. Levine, David B. Goldstein, Arthur H. Lokmanhekim, and Arthur H. Rosenfeld Dec. 1979 37 p refs Presented at Conf. on Thermal Performance of the Exterior Envelopes of Buildings, Orlando, Fla., 3-5 Dec. 1979
(Contract W-7405-eng-48)
(LBL-9816; CONF-791233-2) Avail: NTIS HC A03/MF A01

The development and analysis of energy performance standards for residential buildings in the United States is described. The approach involves an assessment of the economic costs and benefits of alternative standards and provides quantitative estimates of the reduction of energy use resulting from the implementation of standards. The sensitivities of building energy use to design parameters of buildings - including size, orientation, aspect ratio, basement type, window area, and construction material - are assessed. The DOE-2 building energy utilization analysis program was used to evaluate the heating and cooling loads of residential buildings. Residential buildings were simulated in ten weather climates using hourly weather data with a variety of energy conservation measures. DOE

N80-25880# California Univ., Livermore. Lawrence Livermore Lab.
SITE AND BUILDING ENERGY-CONSERVATION STUDY: SURVEY OF BUILDING 251, DIAGNOSTIC CHEMISTRY
Oct. 1979 68 p
(Contract W-7405-eng-48)
(UCRL-15190) Avail: NTIS HC A04/MF A01

An energy-conservation study of Building 251, Diagnostic Chemistry, at Lawrence Livermore Laboratory was performed.

The survey of Building 251 was based on a review of the design drawings, an on-site inspection of the 30,500 sq ft building, and discussions with the building manager and various operating personnel. Data were collected regarding the number of people occupying the building, operating schedules, and the energy loads imposed by installed and temporary equipment. The heating, ventilating, and air conditioning systems were investigated. The building energy systems were simulated using the DOE-1 energy program. A base year energy consumption run was made, together with simulation of the building's performance assuming installation of each of nine energy conservation opportunities (ECO's) identified. A summary of the energy savings that would result from implementation of the ECO's is presented. DOE

N80-25881# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.

INTERNATIONAL ANALYSIS OF RESIDENTIAL ENERGY USE AND CONSERVATION

Lee Schipper Oct. 1979 28 p refs Presented at Intern. Conf. on Energy Use Management, Los Angeles, 22 Oct. 1979
(Contract W-7405-eng-48)
(LBL-9383; CONF-791009-27) Avail: NTIS HC A03/MF A01

Data were collected and are being analyzed on residential energy use from Canada, Japan, UK, West Germany, France, Italy, and Sweden. Preliminary inspection indicates that much of the variation of energy use depends on structural of lifestyle factors such as incomes, house or appliance size, hot water, and indoor temperature habits. There appears to exist a wide range of energy intensities within each narrow end use category, each of these ranges suggest that there are interesting prospects for energy conservation in any one country based on technologies or ideas common elsewhere DOE

N80-25884# Department of Energy, Washington, D. C.

PHOTOVOLTAIC ENERGY SYSTEMS: PROGRAM SUMMARY

Jan. 1980 466 p refs
(DOE/CS-0146) Avail: NTIS HC A20/MF A01

The DOE Photovoltaic Energy Systems Program is designed to expand as rapidly as possible the commercial use of photovoltaic systems through a program of research, process development in support of the manufacturing industry, tests and applications, and general support of market development. The objective of the Photovoltaic Energy Systems Program is to reduce system costs to a competitive level in both distributed and centralized grid-connected applications. The program is also examining the technical, institutional, legal, environmental and social issues involved in fostering widespread adoption of photovoltaic energy systems. Activities of the program are divided into the following subprograms: advanced research and development; technology development; systems engineering and standards; test and applications; commercialization; and planning, assessment, and integration. Summary sheets for each of the contractors in this program are presented. The summaries include project title, contractor, contract number, funding, principal investigator, and a brief description of the contract. DOE

N80-25892# California Univ., Berkeley. Energy and Resources Group.

RISK OF RENEWABLE ENERGY SOURCES: A CRITIQUE OF THE INHABER REPORT

John P. Holdren, Kent Anderson, Peter H. Gleick, Irvin Mintzer, Gregory Morris, and Mirk R. Smith (East-West Center Honolulu, Hawaii) Jun. 1979 142 p refs
(Contract W-7405-eng-48)
(ERG-79-3) Avail: NTIS HC A07/MF A01

The Inhaber report, Risk of Energy Production (Atomic Energy Control Board Report AECB-1119, Ottawa, Canada, 1978;EAPA 5:15) is refuted. Error and the consequences of correcting are described. Also discussed are the circumstances - including the roles of the author, the sponsors, and the knowledgeable tehnical community - that permitted to report to gain widespread credibility DOE

N80-25894# Argonne National Lab., Ill.

RELIABILITY, ENERGY AND COST EFFECTS OF WIND INTEGRATION WITH CONVENTIONAL ELECTRICAL GENERATING SYSTEMS

W. A. Buehring, K. A. Hub, C. C. Huber, J. C. Vankuiken, and J. G. Gros (DOE, Washington, D.C.) 1979 14 p refs Presented at the 2nd Miami Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10-13 Dec. 1979
(Contract W-31-109-eng-38)
(CONF-791204-32) Avail: NTIS HC A02/MF A01

The importance of system integration analysis in evaluating the effects of wind powered generation on an electrical utility system was studied. For the assumed utility and wind conditions it was shown that an intermittent energy source such as wind can contribute to overall system reliability. Since reliability indices are the primary criteria for utility expansion planning, it should be possible to reduce conventional capacity installations in response to the reliability improvements associated with wind generation. With both energy and reliability benefits it appears that there is a reasonable potential for wind generators to be competitive, in limited penetrations, with conventional capacity. DOE

N80-25896# Brookhaven National Lab., Upton, N. Y.

OPTIMIZATION OF SOLAR ASSISTED HEAT PUMP SYSTEMS VIA A SIMPLE ANALYTIC APPROACH

John W. Andrews 1980 6 p refs Presented at the 2d Ann. Systems Simulation and Econ. Anal. Conf., San Diego, Calif., 23-25 Jan. 1980
(Contract EY-76-C-02-0016)
(BNL-27316; CONF-800101-17) Avail: NTIS HC A02/MF A01

An analytic method for calculating the optimum operating temperature of the collector/storage subsystem in a solar assisted heat pump is presented. A tradeoff exists between rising heat pump coefficient of performance and falling collector efficiency as this temperature is increased, resulting in an optimum temperature whose value increases with increasing efficiency of the auxiliary energy source. Electric resistance is shown to be a poor backup to such systems. A number of options for thermally coupling the system to the ground are analyzed and compared. DOE

N80-25901# Department of Energy, Washington, D. C. Office of Buildings and Community Systems.

PROPOSED ENERGY PERFORMANCE STANDARDS FOR NEW BUILDINGS: STANDARD BUILDING OPERATING CONDITIONS

Nov. 1979 79 p
(DOE/CS-0118) Avail: NTIS HC A05/MF A01

The process of developing energy budget levels for new commercial buildings, in conjunction with the energy-performance standards for new buildings, includes the use of energy-analysis computer programs. These programs are used to estimate the design energy requirements of randomly selected commercial buildings. The input to these programs includes a set of data known as the Standard Building Operating Conditions (SBOC). These SBOC consist of temperatures, human-occupancy densities and profiles, lightning-usage profiles, and the like. They describe typical conditions under which a commercial or multifamily residential building would operate during the course of a day. The standardization of the building operating conditions is described. Alternative ways that SBOC may be applied in a regulatory compliance context are discussed as well as the advantages and disadvantages of each alternative. The implications of the standardization of operating conditions are examined. DOE

N80-25902# Department of Energy, Washington, D. C. Office of Buildings and Community Systems.

PROPOSED ENERGY-PERFORMANCE STANDARDS FOR NEW BUILDINGS: PASSIVE AND ACTIVE SOLAR HEATING ANALYSIS

Nov. 1979 70 p
(DOE/CS-0117) Avail: NTIS HC A04/MF A01

The use of passive and active solar thermal heating technologies was analyzed in order to develop standards for new buildings.

Maximum permissible levels of annual building design energy consumption were established for different building types in various climates. Besides reducing the use of depletable energy, the standards are intended to achieve maximum practicable increases in the use of nondepletable sources of energy. Cost and energy savings estimates were developed for optimally-sized passive solar systems corresponding to the prototype house characteristics represented by each point on the conservation cost/performance curves (from previous studies). An analysis was performed for each of the ten (Atlanta, Burbank, Chicago, Fresno, Ft. Worth, Houston, Minneapolis, Phoenix, Portland, and Washington) representative cities in the conservation study analysis. The key elements of the methodology were: thermal performance estimation, optimum system size determination, and sensitivity analysis.
DOE

N80-25904# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
SOLAR ENERGY PROGRAM. CHAPTER FROM THE ENERGY AND ENVIRONMENT DIVISION REPORT Annual Report
Aug. 1979 42 p refs
(Contract W-7405-eng-48)
(LBL-9630) Avail: NTIS HC A03/MF A01

Important aspects of assessing solar applications are discussed. The amount and character of circumsolar radiation is examined with respect to geographic location, climate, season, time of day, and observed wavelength. The major optical, physical, and chemical considerations involved in designing, building, and operating a solar receiver are evaluated. The application of passive solar design concepts to the nonresidential building sector are explored.
R.C.T.

N80-25919# Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Quality Planning and Standards.
NATIONAL EMISSIONS DATA SYSTEM (NEDS), FUEL USE REPORT
Aug. 1979 127 p
(PB80-146905; EPA-450/4-79-020) Avail: NTIS HC A07/MF A01 CSCL 21D

Annual estimates of total consumption of major fuels such as coal, fuel, oil, natural gas, gasoline, and diesel fuel are summarized. Estimates of the consumption of a number of other comparatively minor fuels are also included. The data are distributed according to major categories of air pollutant emissions as a whole and for individual states, territories, and the District of Columbia.
GRA

N80-25923# Argonne National Lab., Ill.
CONSEQUENCES OF INCREASED COAL UTILIZATION
Arnold J. Goldbert, L. J. Hoover, and Terrance Surles 1979 42 p ref Presented at 72nd Ann. Am. Inst. of Chem. Engr. Meeting, San Francisco, 25-29 Nov. 1979 Prepared jointly with Brookhaven Nat. Lab.; Los Alamos Sci. Lab., California Univ. Lawrence Berkley Lab., Oak Ridge Nat. Lab., and Pacific Northwest Labs.
(Contract W-31-109-eng-38)
(CONF-791108-16) Avail: NTIS HC A03/MF A01

The consequences of increasing coal use to meet the proposed goals of the National Energy Plan (1977) were regionally analyzed. Ten technical areas were considered: siting, air quality, long-range transport of sulfur dioxide, water quality, availability, solid wastes, socioeconomics, national economics, and occupational safety and health effects. The results of the analyses are summarized. DOE

N80-25926# Department of Energy, Washington, D. C. Div. of Environmental Control Technology.
DIVISION OF ENVIRONMENTAL CONTROL TECHNOLOGY PROGRAM, 1978 Annual Report
Jun. 1979 259 p refs
(DOE/EV-0042; AR-2) Avail: NTIS HC A12/MF A01

The independent overview and assessment of environmental control aspects of both the U.S. Department of Energy's research, development, and demonstration programs and the Nation's energy policies and the reduction of potential environmental hazards at the radioactively contaminated sites that are presently owned or were formerly used by the Government are reviewed. A short summary is presented of objectives, approach, progress and results, future plans, and a reference bibliography for each research, development, or assessment project within the program areas described.
DOE

N80-25927# Argonne National Lab., Idaho Falls, Idaho.
ENVIRONMENTAL ASSESSMENTS OF ALTERNATIVE ENERGY STRATEGIES IN THE UNITED STATES
Stephen W. Ballou and Arthur Katz (DOE, Washington, D.C.) 1979 18 p refs Presented at the Intern. Inst. for Appl. Systems Analysis, Vienna, 5-9 Nov. 1979
(Contract W-31-109-eng-38)
(CONF-791172-1) Avail: NTIS HC A02/MF A01

The evaluation of the regional impacts of future energy development is discussed. The impacts described for 1990 are based on a national energy projection (scenario) that assumes medium energy demand and fuel supply through 1990, but does not incorporate the policies of the 1978 National Energy Act. County level patterns for utility, industry and mining activities for 1990 are developed from the federal region totals. Energy sources addressed are coal, nuclear, oil, oil shale, gas, geothermal, hydroelectric, and solar. The impact of these county-level patterns of utility, industry, and mining activities on the air, water, and land resources of the country and on the socioeconomic and health and safety aspects of the nation's welfare are analyzed.
DOE

N80-25928# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
ENVIRONMENTAL ASSESSMENT OF SMALL WIND SYSTEMS Progress Report
Kathryn Lawrence, Carol Strojan, and Daniel ODonnell Feb. 1980 37 p refs
(Contract EG-77-C-01-4042)
(SERI/PR-354-420) Avail: NTIS HC A03/MF A01

The first formal product of the environmental assessment of small wind energy conversion systems (SWECS) study is presented. An overview of the study's structure, planned activities, and a synopsis of task progress is given.
DOE

N80-25930# Automotive Testing Labs., Inc., Aurora, Colo.
A STUDY OF EMISSIONS FROM PASSENGER CARS IN SIX CITIES, VOLUME A Final Report
Jan. 1979 868 p 2 Vol.
(Contract EPA-68-03-2593)
(PB80-149800; EPA-460/3-78-011A) Avail: NTIS HC A99/MF A01 CSCL 13B

This is the first of two volumes presenting results from a series of exhaust emission and fuel economy tests performed on a representative sample of vehicles in six U.S. cities. Data presented in the following sections are generated in appendix form as part of a contract with the EPA to perform work for the FY 77 Passenger Car Emission Factor Program. Volume A includes a technical discussion of test and data handling procedures, laboratory facility descriptions, and test instrument maintenance and calibration practices. Pertinent data concerning vehicle sample composition and results of Federal Test Procedure, Highway Fuel Economy and Federal Short Cycle Tests are also presented.
GRA

N80-25936# Battelle Columbus Labs., Ohio.
METHODS FOR ANALYZING INORGANIC COMPOUNDS IN PARTICLES EMITTED FROM STATIONARY SOURCES Interim Report, Jan. 1977 - Jul. 1978
William M. Henry Sep. 1979 130 p refs
(Contract EPA-68-02-2296)
(PB80-141781) Avail: NTIS HC A07/MF A01 CSCL 14B

Methods to identify and measure inorganic compounds in particulate emissions which emanate from sources using or processing fossil fuels were developed. Large masses, 20 to 100 grams of field samples were collected representative of a range of both coal and oil-fired fly ashes, and the selected methodology development efforts were evaluated on these field samples as well as synthesized samples. Fourier transform infrared spectroscopy, X-ray diffraction, and chemical phase separations and analyses are the methods which have provided the most definitive identification of inorganic compounds. The structural findings by these methods are complemented by complete cation-anion chemical determinations. GRA

N80-25940# Bureau of Mines, Salt Lake City, Utah. Research Center.
FLUE GAS DESULFURIZATION BY THE MODIFIED CITRATE PROCESS: REPORT OF INVESTIGATIONS
R. H. Lien, D. A. Martin, and W. I. Nissen 1979 24 p refs
(PB80-134836; BM-RI-8403) Avail: NTIS HC A02/MF A01 CSCL 13B

A flue gas desulfurization process was developed. The process known as the citrate process, involves absorption of sulfur dioxide (SO2) in a buffered solution of citric acid. As an adjunct to the citrate process, bench scale research shows that SO2-loaded citrate or glycolate solutions can be regenerated by countercurrent contact with steam (stripping) in packed towers. Stripping steam requirements were determined for treatment of 0.25, .50, 1.0, and 2.0% SO2 waste gases. Steam requirements decreased with increasing SO2 concentrations in the simulated waste gases. GRA

N80-25943# Gulf South Research Inst., New Orleans, La.
RESEARCH TO IDENTIFY COMPONENTS OF ENERGY-RELATED WASTES: A STATE-OF-THE-ART REPORT Final Report, Nov. 1976 - Nov. 1978
J. E. Gebhart and Mary M. McKown Dec. 1979 526 p
(Contract EPA-68-03-2487)
(PB80-137961; EPA-600/7-79-255) Avail: NTIS HC A23/MF A01 CSCL 13B

Pertinent abstracts from a survey of current (post 1976) research projects were categorized according to energy-related activity. Subjects include coal strip mines, oil refineries, oil shale operations, coal-fired power plants, geothermal energy production, coal liquefaction plants, and potential quality control standards. Abstracts of available technical reports are also presented using the same energy categories. These reports were obtained from a variety of sources, including MEDLINE, TOXLINE, BIOS,IS, CAIN, NTIS, DIALOG, and Chemical Abstracts. Federal energy research centers supplied a large number of pertinent documents. This state-of-the-art summary is provided as an aid to researchers concerned with the environmental effects of energy-related activites. GRA

N80-25947# TRW Defense and Space Systems Group, Redondo Beach, Calif.
THE USE OF pH AND CHLORIDE ELECTRODES FOR THE AUTOMATIC CONTROL OF FLUE GAS DESULFURIZATION SYSTEMS Final Report, Sep. 1978 - Jul. 1979
Clinton Ung, Toby Accian, and Ray Maddalone Nov. 1979 80 p ref
(Contract EPA-68-02-2165)
(PB80-138464; EPA-600/2-79-202) Avail: NTIS HC A05/MF A01 CSCL 13B

The applicability of chloride and pH electordes in automated control systems was investigated via a survey of chloride and pH electrodes in different flue gas desulfurization (FGD) systems and an evaluation of an industrial pH electrodes system. The survey showed that chloride ion measurements were necessary only where high chloride values correspond with FGD unit corrosion and when chloride values were used at correction factors in ph calculations. Chloride ion measurements are unnecessary for most of the surveyed companies. All survey companies use pH measurement to control scaling or to attain optimum performance in FGD units. The most common pH electrode problem was residue buildup (scaling) around the electrode, caused by the use of non-self-cleaning (standard) pH electrodes. The performance of self-cleaning and standard industrial pH electrodes was evaluated. GRA

N80-26003# California Univ., Livermore. Lawrence Livermore Lab.
CLIMATE PROGRAM PLAN, VOLUME 1
Jan. 1980 90 p refs 2 Vol.
(Contract W-7405-eng-48)
(DOE/EV-0062/1) Avail: NTIS HC A05/MF A01

The perceived and potential effects of energy technologies on climate that merit assessment are discussed along with the need for research on the prediction of weather and climate variations and assessment of their effects on power production. The need for assessing the cycles and budgets of the entire range of substances emitted in power production by the many technologies now in use is emphasized. To provide the basis for assessing the impacts of these emissions, specialized, mission-oriented research to improve understanding of processes that determine how these emissions are transported, transformed, and scavenged in the atmosphere, and of the natural processes that can be affected by energy activities are suggested. This latter category includes potential modification of surface properties caused, for example, by large arrays of solar collectors, extensive biomass production and wind power modification of the boundary layer. DOE

N80-26219# Office of Technology Assessment, Washington, D. C.
IMPACT OF ADVANCED GROUP RAPID TRANSIT TECHNOLOGY
Jan. 1980 68 p
(PB80-153323; OTA-T-106; LC-80-600001) Avail: NTIS HC A04/MF A01 CSCL 13B

This assessment of advanced group rapid transit (AGRT) was made in response to a request of the House Committee on Appropriations to evaluate the need for this technology and its relationship to national mass transportation goals. Increases in traffic congestion, petroleum shortages, and decreasing mobility for the transit-dependent reflect a growing need for more efficient and effective transportation options. The need for further advances in automated guideway transit (AGT) technology, are examined and their potential impacts on various stakeholder groups are evaluated. GRA

N80-26441# Little (Arthur D.), Inc., Cambridge, Mass.
SURVEY OF POTENTIAL PROCESSES FOR THE MANUFACTURING OF ALUMINUM
Dec. 1979 84 p refs
(Contract W-31-109-eng-38)
(ANL/OEPM-79-4) Avail: NTIS HC A05/MF A01

Alternative processes to the Hall-Heroult cell for the production of primary aluminum direct carbothermic reduction of alumina are considered: reduction of bauxite to an aluminum silicon alloy; the subchloride process; the disproportionation of aluminum sulphide; the production through a nitride intermediate; and electrolysis of aluminum chloride aluminum sulphide and aluminum nitride; and plating from nonaqueous solvents. Energy consumption requirements for these techniques are compared with current Hall-Heroult technology and with projected improved technology - particularly titanium diboride cathodes and permanent anodes. The major conclusion is that the only alternative technology at present is the Alcoa chloride electrolysis process but that sulphide and nitride electrolytic processes offer potential advantages in the future. With the exception of thermal reduction to an aluminum - silicon alloy, none of the carbothermic processes is competitive because they require electric furnaces. Significant improvements in energy consumption could be achieved with titanium diboride cathodes in the Hall-Heroult cell. DOE

N80-26550# Department of Energy, Washington, D. C. Federal Energy Management Program.
ARCHITECTS AND ENGINEERS GUIDE TO ENERGY CONSERVATION IN EXISTING BUILDINGS
1 Feb. 1980 468 p
(DOE/CS-0132) Avail: NTIS HC A20/MF A01

A field-tested approach to identifying, analyzing, and recommending action on the wide range of opportunities and options available to reduce energy use in most existing buildings is offered. Besides a review of the principles of energy use and conservation, the manual provides a step-by-step methodology for assessing and improving the year-round energy performance of buildings, as well as a series of forms, charts, and nomographs designed

to enhance and simplify the work of those architects and engineers whose practice includes the analysis and modification of existing buildings to reduce both fuel consumption and operating costs.
A.R.H.

N80-26568# Kaiser Engineers, Oakland, Calif.
SITE AND BUILDING ENERGY-CONSERVATION STUDY: SURVEY OF BUILDING 435, MFE RESEARCH
Oct. 1979 70 p Prepared in cooperation with Consultants Computation Bureau, Oakland, Calif. Prepared for Calif. Univ., Livermore; Lawrence Livermore Lab.
(Contract W-7405-eng-48)
(UCRL-15198; REPT-79-72-RE) Avail: NTIS HC A04/MF A01

Review of the design drawings, an on-site inspection of the 49,700-sq ft building, and discussions with the building manager and various operating personnel are discussed. Data were collected regarding the number of people occupying the building, operating schedules, and the energy loads imposed by installed and temporary equipment. The heating, ventilating, and air conditioning systems were investigated. The building energy systems were simulated using the DOE-1 energy program. A base-year energy consumption run was made, together with simulations of the building's performance assuming installation of each of eleven energy-conservation opportunities (ECO's) identified. A summary of the energy savings that would results from implementation of the ECO's is given.
DOE

N80-26600# Environmental Law Inst., Washington, D. C.
STATE OPTIONS IN LIGHTING: EFFICIENCY STANDARDS FOR EXISTING PUBLIC BUILDINGS
Frank Meeker Jun. 1979 51 p refs
(Contract EM-78-C-01-5255)
(DOE/CS-5255/2) Avail: NTIS HC A04/MF A01

Requirements and options for state lighting efficiency standards for existing public buildings under the Energy Policy and Conservation Act are discussed. It is recommended that states adopt a requirement that owners of all public buildings submit reports of lighting energy audits and estimates of energy savings from modifications to comply with substantive standards. It is further recommended that while filing of reports should be mandatory, substantive compliance, at least initially, need not be. It is recommended that exemptions from the standards be limited to small buildings and that variances under a mandatory standard be available only when an applicant can show insufficient capital to make required modifications, even though they would soon pay for themselves in reduced operating costs. It is suggested that a lighting standard of the kind recommended should substantially reduce wasted energy in lighting, be simple enough to be easily understood and applied, be technically and economically reasonable, and allow for needed exemptions without loopholes.
E.D.K.

N80-26627# Science Applications, Inc., La Jolla, Calif.
STATE-OF-THE-ART ASSESSMENT OF HYBRID HEAT PUMPS Final Report
M. H. Blatt and R. C. Erickson Dec. 1979 171 p refs
(EPRI Proj. 1201-6)
(EPRI-EM-1261) Avail: NTIS HC A08/MF A01

The hybrid heat pump is evaluated and is compared with other heating, ventilating, and air conditioning (HVAC) system options. A hybrid heat pump is an HVAC system which includes an electrically driven heat pump and supplementally fired gas or oil boiler. This system was compared with heat pumps, oil-fired boilers, and gas-fired boilers.
DOE

N80-26670# Argonne National Lab., Ill.
CLASSIFICATION AND EVALUATION OF ELECTRIC MOTORS AND PUMPS
Feb. 1980 251 p refs
(Contract W-31-109-eng-38)
(DOE/CS-0147) Avail: NTIS HC A12/MF A01

Classification and evaluation of electric motors and pumps are discussed. The industrial, transportation, commercial, agricultural, and municipal sectors of the US economy are studied. The range of electric motors included all ac and dc integral and fractional hp units equalling or exceeding 1/6 hp. However, units of less than 1/6 hp and those in use in other than the previously defined sectors were treated to ensure completeness. Pump equipment covered included the wide range of fluid handling equipment powered by all energy forms. The range of sizes analyzed correlated with those for motors, roughly 1/6 to 20,000 shaft hp. An analysis task called for developing scenarios for the policy options based on labeling and standards, evaluating barriers to their implementation, and then evaluating probable results.
DOE

N80-26749# Central Intelligence Agency, Washington, D.C.
THE WORLD OIL MARKET IN THE YEARS AHEAD: A RESEARCH PAPER
Aug. 1979 87 p
(ER-79-10327U) Avail: NTIS HC A05/MF A01

A review of the oil market before 1973, during the period 1973 to 1978, and at the present time is given. The outlook for the world oil market over the next several years is analyzed. Oil production in the industrial countries, supplies from the developing countries, net exports from communist countries, and OPEC supplies are discussed. Alternative energy sources and the energy supply outlook for OECD countries are also considered. Other topics covered are factors affecting demand, the future energy market, and oil supplies in the long term.
J.M.S.

N80-26772*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
GEOTHERMAL DIRECT HEAT USE: MARKET POTENTIAL/PENETRATION ANALYSIS FOR FEDERAL REGION 9
William Powell, ed. and Kenneth Tang, ed. May 1980 337 p
(Contract NAS7-100)
(NASA-CR-163267; JPL-Pub-80-41) Avail: NTIS HC A15/MF A01 CSCL 10B

A preliminary study was made of the potential for geothermal direct heat use in Arizona, California, Hawaii, and Nevada (Federal Region 9). An analysis was made of each state to: (1) define the resource, based on the latest available data; (2) assess the potential market growth for geothermal energy; and (3) estimate the market penetration, projected to 2020. Findings of the study include the following: (1) Potentially economical hydrothermal resources exist in all four states of the Region; however, the resource data base is largely incomplete, particularly for low to moderate temperature resources. (2) In terms of beneficial heat, the total hydrothermal resource identified so far for the four states is on the order of 43 Quads, including an estimated 34 Quads of high temperature resources which are suitable for direct as well as electrical applications. (3) In California, Hawaii, and Nevada, the industrial market sector has somewhat greater potential for penetration than the residential/commercial sector. In Arizona, however, the situation is reversed, due to the collocation of two major metropolitan areas (Phoenix and Tucson) with potential geothermal resources.
R.E.S.

N80-26784*# Aerospace Corp., El Segundo, Calif.
CENTRAL STATION APPLICATIONS PLANNING ACTIVITIES AND SUPPORTING STUDIES Final Report
S. L. Leonard and B. Siegel Apr. 1980 117 p refs
(Contract JPL-955434)
(NASA-CR-163042; JPL-9950-372; ATR-80(7820-04)-2) Avail: NTIS HC A06/MF A01 CSCL 10B

The application of photovoltaic technology in central station (utility) power generation plants is considered. A program of data collection and analysis designed to provide additional information about the subset of the utility market that was identified as the initial target for photovoltaic penetration, the oil-dependent utilities (especially municipals) of the U.S. Sunbelt, is described along with a series of interviews designed to ascertain utility industry opinions about the National Photovoltaic Program as it relates to central station applications.
J.M.S.

N80-26786# Committee on Science and Technology (U. S. House).
OVERSIGHT: INDUSTRIAL ENERGY CONSERVATION, VOLUME 10

Washington 1979 327 p refs Hearing before Subcomm. on Energy Develop. and Appl. of the Comm. on Sci. and Technol., 96th Congr., 1st Sess., no. 49, 11 Sep. 1979
(GPO-53-020) Avail: SOD

Testimony delivered and statements received in support of industrial energy conservation through cogeneration are presented. The Federal government's role and policy on industrial energy conservation is discussed. R.E.S.

N80-26787# Central Technical Inst. TNO, Apeldoorn (Netherlands). Afdeling. Warmte- en Koudetechniek.
LECTURES ON HEAT TECHNOLOGY IN THE NETHERLANDS [VOORDRACHTEN VAN DE 39 STE VAKANTIE-LEERANG VOOR WARMTETECHNIEK, GEHOUDEN OP 23 EN 24 AUGUSTUS, 1977]
1977 69 p refs In DUTCH; ENGLISH summary Lectures of the 39th Summer Course on Heat Technol., 23-24 Aug. 1977 Prepared in cooperation with Koninkelijke Inst. van Ingenieurs, The Hague, Netherlands Technische Vereniging voor Verwarming en Luchtbehandeling
Avail: NTIS HC A04/MF A01; Central Tech. Inst., Apeldoorn, Netherlands FL 30

Lectures were given dealing with heat-activated heat pumps, heat pumps in home heating, air/air heat pumps, energy consumption and possible savings in office buildings, solar water heating, and design of a home solar heating unit through use of a mathematical model.

N80-26789# Central Technical Inst. TNO, Apeldoorn (Netherlands). Afdeling Warmte- en Koudetechniek.
SURVEY OF FOREIGN RESEARCH IN THE FIELD OF HEAT PUMPS FOR THE HEATING OF DWELLINGS [OVERZICHT VAN BUITENLANDSE ONDERZOEKEN AAN WARMTEPOMPEN VOOR WONINGVERWARMING]
W. E. J. deBeyer *In its* Lectures on Heat Technol. in the Netherlands 1977 p 19-29 refs In DUTCH

Avail: NTIS HC A04/MF A01; Central Tech. Inst., Apeldoorn, Netherlands Fl 30

The literature of the U.S.A., Germany, France, Sweden, Denmark, Switzerland, and England shows that parallel and often overlapping research is being done. Topics covered are: heat recovery; cycle systems; waste heat recovery; cryogenics; unitary heat pumps; thermal flow; and mono and bivalent heat pumps. Economic aspects are also discussed. Author (ESA)

N80-26790# Central Technical Inst. TNO, Apeldoorn (Netherlands). Afdeling Warmte- en Koudetechniek.
CASE STUDY OF AN AIR TO AIR HEAT PUMP [PRAKTIJKONDERZOEK AAN EEN LUCHT/LUCHT WARMTEPOMP]
J. F. vanderHorst *In its* Lectures on Heat Technol. in the Netherlands 1977 p 31-38 refs In DUTCH

Avail: NTIS HC A04/MF A01; Central Tech. Inst., Apeldoorn, Netherlands FL 30

A commercially available, electrically operated air-to-air heat pump was installed and tested in a single family dwelling in the Netherlands. The unit functioned reliably, but no energy savings was possible. Air transport via the evaporator and condenser was insufficient, and did not permit the manufacturers specifications to be met. Author (ESA)

N80-26791# Technische Physische Dienst TNO-TH, Delft (Netherlands).
EXAMINATION OF ENERGY CONSUMPTION AND THE POSSIBILITIES OF ENERGY SAVINGS IN OFFICE BUILDINGS [ONDERZOEK OUER HET ENERGIEVERBRUIK EN OVER DE MOGELIJKHEDEN TOT ENERGIEBESPARING IN UTILITEITSGEBOUWEN]
P. Euser, M. Hugenholtz (Adviesbureau), and P. W. Deerns (Bureau Deerns) *In* Central Tech. Inst. Lectures on Heat Technol. in the Netherlands 1977 p 39-50 refs In DUTCH

Avail: NTIS HC A04/MF A01; Central Tech. Inst., Apeldoorn, Netherlands, FL 30

Projected energy savings were computed for various building shapes and orientations with respect to the Sun. The effects of making better use of daylight, of using lower light levels, of directing light at work areas, and of continuously regulating the levels of artificial lighting, are shown. Author (ESA)

N80-26808# Kaiser Engineers, Oakland, Calif.
SITE AND BUILDING ENERGY-CONSERVATION STUDY: SURVEY OF BUILDING 3, EXPERIMENTAL PHYSICS
Oct. 1979 106 p Prepared in cooperation with Consultants Computation Bureau, Oakland, Calif. Prepared for Calif. Univ., Livermore. Lawrence Livermore Lab.
(Contract W-7405-eng-48)
(UCRL-15195; REPT-79-65-RE) Avail: NTIS HC A06/MF A01

An energy conservation study of Building 3, Experimental Physics was conducted. The survey was based on a detailed review of the as-built drawings, an onsite inspection of the 100,000-sq ft building, and discussions with the building manager and various operating personnel. Data were collected regarding the number of people occupying the building, operating schedules, and the energy loads imposed by installed and temporary equipment. The heating, ventilating and air conditioning systems were investigated. A base-year energy-consumption run was made, together with simulations of the building's performance assuming installation of each of nine energy conservation opportunities (ECO's) and combinations identified. The energy savings resulting from the implementation of the ECO's are summarized. DOE

N80-26810# TRW Systems Group, McLean, Va.
COMPARISON OF COSTS FOR AUTOMOBILE ENERGY CONSERVATION VS SYNTHETIC FUEL PRODUCTION
Richard Gorman and Kenneth L. Heitner 1980 32 p refs Presented at the 5th Symp. on Automotive Propulsion Systems, Dearborn, Mich., 14 Apr. 1980
(Contract AC01-79PE-70151)
(CONF-800419-1) Avail: NTIS HC A03/MF A01

The analysis suggests that there are a large number of potential technical options for reducing energy consumption in automobiles. Furthermore, the cost to the user of purchasing these conservation options is less than the discounted cost of purchasing the additional fuel required if the conservation option is not chosen. There is a significant cost savings even if fuel costs remain at current levels. These savings would increase if fuel prices continue to rise or if more costly than synthetic fuels, at least for another 15 to 20 years. Cost effective conservation could enable new vehicles to reach 40 to 50 mpg corporate average fuel economy by the year 2000. It is clear that the potential for making these changes exists, but better data are needed to evaluate many of these options and to ensure the development and implementation of those that are desirable. DOE

N80-26817# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
PROJECTS FROM FEDERAL REGION 9: DEPARTMENT OF ENERGY APPROPRIATE ENERGY TECHNOLOGY PROGRAM, PART 2
C. W. Case, H. R. Clark, J. Kay, F. B. Lucarelli, and S. Rizer Jan. 1980 50 p refs
(Contract W-7405-eng-48)
(LBL-10098) Avail: NTIS HC A03/MF A01

Details and progress of appropriate energy technology programs in Region 9 (Arizona, California, and Hawaii) are presented. Each on-going project is individually described and includes details on direct and indirect energy savings. Also included are information on innovative features, regional or national demonstration possibilities, and aspects of the project which can be replicated elsewhere either on a regional or national scale. R.E.S.

N80-26833# Institut Francais de l'Energie, Paris.
GUIDE FOR ENERGY COMPATIBILITY
M. J. Braun and J. Lefebvre May 1979 160 p refs In FRENCH
(NP-24016; Rept-65) Avail: NTIS (US Sales Only)

HC A08/MF A01; DOE Depository Libraries

A guide for the energy manager in the acquisition and processing of data necessary for energy conservation is presented. Energy conservation is defined and its objectives outlined. The principles and characteristics of measurement devices used are given. The use of the measurements in the establishment of energy balances is described. Examples are given of establishments that have instituted energy conservation plans. Tables are presented of comparative characteristics, by manufacturer and by type of measurement device, for 300 manufacturers operating in the French market. DOE

N80-26861# Department of Energy, Washington, D. C. Office of Energy Technology.

SOLAR, GEOTHERMAL, ELECTRIC AND STORAGE SYSTEMS PROGRAM SUMMARY DOCUMENT, FY 1980

Jul. 1979 449 p Sponsored by DOE
(DOE/ET-0102) Avail: NTIS HC A19/MF A01

Current and planned programs in solar technology, geothermal energy, electric energy systems, and energy storage systems are covered. After national energy policy with respect to these programs is introduced, the program structure, FY 1980 budget request, strategies, and management are identified. For each energy technology program, activity areas are described and their status outlined. Program aspects which crosscut all energy technologies (e.g., regional activities, commercialization, environmental and socioeconomic aspects, small and minority business utilization, and international programs) are described. DOE

N80-26881# American Association for the Advancement of Science, Washington, D.C. Office of Public Sector Programs.

ENERGY AND RESOURCE RECOVERY FROM SOLID WASTE: REPORT FROM A WORKSHOP CONSIDERING PROBLEMS IDENTIFIED BY THE INTERGOVERNMENTAL SCIENCE, ENGINEERING, AND TECHNOLOGY ADVISORY PANEL

1979 237 p refs Conf. held in Lanham, Md., 24-26 Sep. 1979
(Grant NSF OPA-78-24464)
(PB80-150790; AAAS/PUB-79/R/17; NSF/RA-790345) Avail: NTIS HC A11/MF A01 CSCL 13B

Problem areas considered by a workshop on energy and resource recovery from solid waste include: institutional and economic issues; environment and health issues; production technology issues; and use technology issues. Separate working groups, set up to consider each of these issues, prepared draft reports which make up the separate sections of this report. GRA

N80-26882# Illinois Inst. of Natural Resources, Springfield.

ILLINOIS STATE PLAN: ENERGY CONSERVATION IN INSTITUTIONS (INSTITUTIONAL BUILDINGS GRANT PROGRAM)

Steven K. Thomas, Steven L. Tuma, and John Shum 15 Aug. 1979 96 p Prepared in cooperation with Contract Research Corp., Chicago
(PB80-148182) Avail: NTIS HC A05/MF A01 CSCL 10A

The Illinois state plan for the Institutional Buildings Grant Program is presented. The plan addresses very narrow legislative requirements of the Energy Conservation Policy Act. The plan illustrates the strategies and commitments to achieve full implementation of the Energy Grant Program in Illinois. GRA

N80-26907# National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.

MECHANISMS AND RATES OF FORMATION OF SULFUR AEROSOLS IN POWER PLANT PLUMES

R. F. Pueschel and Y. Mamane (Technion - Israel Inst. of Tech.) *In* WMO The Long-Range Transport of Pollutants and its Relation to Gen. Circulation Including Stratospheric/Tropospheric Exchange Processes 1979 p 141-148 refs

Avail: NTIS HC A19/MF A01

Aerosol size distributions, aerosol elemental composition, and the concentrations of fine particles and trace gases at three typical locales in order to explore the potential effects on the environment of coal-fired power plant operations. The three cases are the plume proper of a 2150 megawatt power plant burning low sulfur coal, the atmosphere outside but close to the plume, and the atmosphere of a region hundreds of miles away from any industrial operation. The aerosol dynamics, discussed in terms of the lumped mode heterodisperse coagulation model show that the formation rates of condensation nuclei are similar for the power plant plume and the rural atmosphere. However, the rural aerosol is of natural origin and is dominated by organic particles, whereas the plume aerosol consists of siliceous spheres mixed with sulfate particles. The aerosol dynamics further show that the accumulation mode at around 0.1 micron radius is the most persistent feature of the atmospheric aerosol with turnover times of weeks to months. The particle concentration and modal radius of this mode is larger in the plume and its immediate vicinity than it is in the rural atmosphere. The data also show a significant increase in aerosol concentration in the plume at the coarse particle mode of radii larger than 1 micron. However, rapid settling of these relatively large particles results in turnover times of only hours. M.G.

N80-26942# Washington Univ., St. Louis, Mo. Center for Air Pollution Impact and Trend Analysis.

SYNOPTIC-SCALE DISTRIBUTION OF MAN-MADE AEROSOLS

R. B. Husar and D. E. Patterson *In* WMO The Long-Range Transport of Pollutants and its Relation to Gen. Circulation Including Stratospheric/Tropospheric Exchange Processes 1979 12 p refs
(Grants EPA-R-803896; EPA-R-806548)
Avail: NTIS HC A19/MF A01

Sulfate aerosol from fossil fuel combustion can be monitored on the regional scale by relating it to reduced visual range measured at most meteorological stations. The synoptic or regional scale is shown to be appropriate for the impact assessment of sulfates and other agrosols. A global pollution dispersion model is presented, based upon projected fossil fuel combustion and hemispheric winds. Author (ESA)

N80-26956# Brookhaven National Lab., Upton, N. Y. Progress Sciences Div.

ENVIRONMENTAL CONTROL TECHNOLOGY FOR ATMOSPHERIC CARBON DIOXIDE Final Report

Anthony S. Albanese and Meyer Steinberg Sep. 1979 58 p refs
(Contracts EY-76-C-02-0016; DE-AC02-76CH-00016)
(BNL-51116) Avail: NTIS HC A04/MF A01

The impact of fossil fuel use in the United States on worldwide CO2 emissions and the impact of increased coal utilization on CO2 emission rates are assessed. The aspects of CO2 control are discussed as well as the available CO2 control points (CO2 removal sites). The primary factor affecting the practicability of a CO2 control system is the energy required by the control system. Of the three potential CO2 control points, removal from the stacks of fossil fuel power plants appears to require the least amount of energy. Estimates of the energy required to capture and recover CO2 from coal-fired power plant stacks by various processes are presented. Although capture and recovery of CO2 is an important consideration in the overall scheme of CO2 control, disposal or reuse of recovered CO2 may be the weakest link in the CO2 control chain. Of the several options considered, deep ocean storage appears to be the most promising. Two control scenarios are evaluated, one based on the absorption of CO2 contained in power plant flue gas by seawater; the other, based on absorption of CO2 by monoethanolamine (MEA). Captured CO2 is injected into the deep ocean in both cases. Analysis indicate that capture and disposal by seawater is not feasible, whereas capture and disposal using MEA is a possibility. However, the economic penalties of CO2 control are significant; for example, at a CO2 removal efficiency of 50%, it is estimated that the power generation efficiency of a conventional coal fired power plant would be reduced from 34 to about 25%. The cost of power generation would be expected to double. For 90% CO2 removal, power generation efficiency is reduced to between 15 and 6% and the cost of power generation increases by a factor of from 4 to 7. DOE

N80-26958# Colorado Univ., Boulder.
HETEROGENEOUS CHEMISTRY OF IMPORTANCE IN DECISIONS CONCERNING THE ENVIRONMENTAL IMPACT OF ENERGY PRODUCTION AND THE SITING OF NEW ENERGY SOURCES Progress Report, 1 Mar. 1979 - 29 Feb. 1980
A. W. Castleman, Jr. Feb. 1980 17 p refs
(Contract EP-78-S-02-4776)
(COO-4776-2) Avail: NTIS HC A02/MF A01

The following are reported: (1) the formation, stability, and structure of ion-clusters both by high pressure mass spectrometric experiments and approximate molecular orbital quantum mechanical calculations; (2) the exchange of energy and angular momentum during ion-molecule association reactions using computer dynamics calculations; (3) related experimental and theoretical studies of nucleation and solvation phenomena; (4) laser photophysics of ion clusters including measurement of cross sections for photodissociation, fluorescence, and energy exchange by pulsed infrared techniques; (5) the growth, stability, and structure of weakly-bound van der Waals and charge-transfer complexes employing electric deflection techniques and taking advantage of the first-order Stark effect; and (6) the multiphoton ionization of metal atom clusters to prove the transition from the isolated atomic to the condensed metallic state, and to elucidate their electronic states and potential as sites for the catalytic conversion of absorbed pollutants. DOE

N80-27207# Environmental Law Inst., Washington, D. C.
ENERGY-EFFICIENT PROCUREMENT IN STATE AND LOCAL GOVERNMENTS
Joe W. Russell, Jr. Jul. 1979 70 p refs
(Contract EM-78-C-01-5255)
(DOE/CS-5255/1) Avail: NTIS HC A04/MF A01

State and local governments have been slow in preparing and implementing plans for energy conservation with resepect to the development of energy efficient standards and policies. This lack of compliance with the Energy Policy and Conservation Act is due to a lack of reliable information on many energy-consuming products, a resistance to change on the part of purchasing officials to their superiors, and reluctance in the tax revolt era to spend money in order to save money and energy as well. To overcome these obstacles, states and localities should consider mandating energy-efficient procurement pratices through either executive orders or legislation. In addition, states and localities should consider adopting institutional arrangements, such as centralized purchasing and joint or cooperative purchasing that will facilitate energy-efficient procurement. Life cycle costs should be considered as bid evaluation criterion. To further state and local efforts in this area, the federal government should provide technical and financial assistance to an organization of purchasing officials to establish an information clearinghouse. A.R.H.

N80-27239# Massachusetts Inst. of Tech., Cambridge. Center for Transportation Studies.
POTENTIAL CHANGE STRATEGIES IN URBAN TRANSPORTATION: AN OVERVIEW AND TENTATIVE APPRAISAL Final Report, Jul. 1975 - Jan. 1978
Alan Altshuler, James Womack, and John Pucher Dec. 1979 87 p refs
(Contract DOT-OST-50240)
(PB80-155278; DOT/RSPA/DPB/50-79/8) Avail: NTIS HC A05/MF A01 CSCL 13B

Innovations in the urban transportation system which combine political feasibility and cost effectiveness are identified. Problems of urban transportation in the United States are emphasized. GRA

N80-27355# Federal Aviation Administration, Washington, D. C. Office of Environment and Energy.
ENERGY CONSERVATION POTENTIAL OF GENERAL AVIATION ACTIVITY
Sep. 1979 52 p refs
(AD-A081182; FAA/EE-79-20) Avail: NTIS HC A04/MF A01 CSCL 01/2

Three approaches for reducing energy consumption were investigated: hardware modification, pilot education, and air traffic control. It is recommended that research into new aircraft engine designs, automatic mixture controls, conventional engine fuel saving improvements, composite materials development, and aerodynamic drag reduction continue and that this hardware be introduced into the fleet when cost, reliability and safety considerations allow. It is further recommended that the pilot awareness and education programs listed above be implemented by the FAA and the general aviation industry; and finally, that the ATC actions listed should be further evaluated to determine whether the anticipated fuel savings justify their implementation. GRA

N80-27361*# Curtiss-Wright Corp., Wood-Ridge, N.J.
PERFORMANCE, EMISSIONS, AND PHYSICAL CHARACTERISTICS OF A ROTATING COMBUSTION AIRCRAFT ENGINE, SUPPLEMENT A
R. K. Lamping, I. Manning, D. Myers, and B. Tjoa May 1980 74 p
(Contract NAS3-20808)
(NASA-CR-135119; CW-WR-76-028.3) Avail: NTIS HC A04/MF A01 CSCL 21E

Testing was conducted using the basic RC2-75 engine, to which several modifications were incorporated which were designed to reduce the hydrocarbon emissions and reduce the specific fuel consumption. The modifications included close-in surface gap spark plugs, increased compression ratio rotors, and provisions for utilizing either side or peripheral intake ports, or a combination of the two if required. The proposed EPA emissions requirements were met using the normal peripheral porting. The specific fuel economy demonstrated for the modified RC2-75 was 283 g/kW-hr at 75% power and 101 brake mean effective pressure (BMEP) and 272.5 g/kW-hr at 75% power and 111 BMEP. The latter would result from rating the engine for takeoff at 285 hp and 5500 rpm, instead of 6000 rpm. E.D.K.

N80-27364*# General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
CF6-6D ENGINE PERFORMANCE DETERIORATION
Ray H. Wulf, W. H. Kramer, J. E. Pass, and J. J. Smith Jan. 1980 286 p refs
(Contract NAS3-20631)
(NASA-CR-159786; R80AEG218) Avail: NTIS HC A13/MF A01 CSCL 21E

Cruise cockpit recordings and test cell performance data in conjunction with hardware inspection data from airline overhaul shops were analyzed to define the extent and magnitude of performance deterioration of the General Electric CF6-6D model engine. These studies successfully isolated short-term deterioration from the longer term, and defined areas where a significant reduction in aircraft energy requirements for the 1980's can be realized. Unrestored losses which remain after engine refurbishment represent over 70% of the loss at engine shop visit. Sixty-three percent of the unrestored losses are cost-effective to restore which could reduce fuel consumed by CF6-6D engines in 1980 by 10.9 million gallons Author

N80-27803*# Wichita State Univ., Kans.
FEASIBILITY STUDY OF AILERON AND SPOILER CONTROL SYSTEMS FOR LARGE HORIZONTAL AXIS WIND TURBINES Final Report
W. H. Wentz, Jr., M. H. Snyder, and J. T. Calhoun May 1980 69 p refs
(Grant NsG-3277; Contract EX-76-I-01-1028)
(NASA-CR-159856; DOE/NASA/3277-1; WER-10) Avail: NTIS HC A04/MF A01 CSCL 10A

The feasibility of using aileron or spoiler controls as alternates to pitch control for large horizontal axis wind turbines was studied. The NASA Mod-0 100 kw machine was used as the basis for the study. Specific performance studies were conducted for 20% chord ailerons over the outboard 30% span, and for 10% chord spoilers over the same portion of the span. Both control systems utilized control deflections up to 60 deg. Results of the study show that either ailerons or spoilers can provide the control necessary to limit turbine power in high wind conditions. The aileron system, as designed, provides overspeed protection at hurricane wind speeds, low wind speed starting torque of

778 N-m (574 ft. lb) at 3.6 m/sec. and a 1.3 to 1.5% increase in annual energy compared to a fixed pitch rotor. The aileron control system preliminary design study includes aileron loads analysis and the design of a failsafe flyweight actuator for overspeed protection in the event of a hydraulic system failure.
L.F.M.

N80-27805*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPACT OF PROPULSION SYSTEM R AND D ON ELECTRIC VEHICLE PERFORMANCE AND COST
Harvey J. Schwartz and Andrew L. Gordan 22 May 1980 16 p refs Presented at 3d Intern. Electric Vehicle Exposition and Conf., St. Louis, 20-22 May 1980
(Contract EC-77-A-31-1044)
(NASA-TM-81548; DOE/NASA/1044-9; E-504) Avail: NTIS HC A02/MF A01 CSCL 10B

The efficiency, weight, and manufacturing cost of the propulsion subsystem (motor, motor controller, transmission, and differential, but excluding the battery) are major factors in the purchase price and cost of ownership of a traffic-compatible electric vehicle. The relative impact of each was studied, and the conclusions reached are that propulsion system technology advances can result in a major reduction of the sticker price of an electric vehicle and a smaller, but significant, reduction in overall cost of ownership.
L.F.M.

N80-28244# General Accounting Office, Washington, D. C. International Div.
US ENERGY ASSISTANCE TO DEVELOPING COUNTRIES: CLARIFICATION AND COORDINATION NEEDED Report to the Congress
28 Mar. 1980 72 p
(PB80-162720; ID-80-7) Avail: NTIS HC A04/MF A01 CSCL 05D

An assessment of U.S. energy assistance to developing countries is given. Primary Federal agencies involved include the Departments of State and Energy, the International Development Cooperation Agency, and the Agency for International Development. Energy assistance activities could be improved with the establishment of comprehensive U.S. policy, clarification of the roles and relationships of the agencies, and better coordination among involved agencies and international organizations. GRA

N80-28256*# Eaton Engineering and Research Center, Southfield, Mich.
SMALL PASSENGER CAR TRANSMISSION TEST-CHEVROLET 200 TRANSMISSION Final Report
M. P. Bujold Mar. 1980 381 p
(Contracts DEN3-124; EC-77-A-31-1044)
(NASA-CR-159835; DOE/NASA/0124-1; ERC-L18-79168) Avail: NTIS HC A17/MF A01 CSCL 13F

The small passenger car transmission was tested to supply electric vehicle manufacturers with technical information regarding the performance of commercially available transmissions which would enable them to design a more energy efficient vehicle. With this information the manufacturers could estimate vehicle driving range as well as speed and torque requirements for specific road load performance characteristics. A 1979 Chevrolet Model 200 automatic transmission was tested per a passenger car automatic transmission test code (SAE J651b) which required drive performance, coast performance, and no load test conditions. The transmission attained maximum efficiencies in the mid-eighty percent range for both drive performance tests and coast performance tests. Torque, speed and efficiency curves map the complete performance characteristics for Chevrolet Model 200 transmission.
L.F.M.

02
SOLAR ENERGY

Includes solar collectors, solar cells, solar heating and cooling systems, and solar generators.

A80-32856 # **Solar central receiver hybrid - A cost effective future power alternative.** D. G. Beshore, C. N. Bolton, and J. E. Montague (Martin Marietta Aerospace, Denver, Colo.). *American Institute of Aeronautics and Astronautics, International Meeting and Technical Display on Global Technology 2000, Baltimore, Md., May 6-8, 1980, Paper 80-0841*. 8 p. 5 refs.

System analyses and conceptual designs of solar central receiver hybrid concepts using molten salt (60% NaNO3, 40% KNO3 by weight) and fossil fired nonsolar energy sources (coal, oil, or gas) have been performed. Analyses have developed plant configurations with various solar energy storage capacities and fossil fuels. Economic analyses support the final configuration selection based on minimization of the cost of energy produced from the plant. A 500 MWe commercial plant size installed for a 1990 initial year of operation is competitive with new coal, oil, and nuclear power generation sources. This hybrid plant will save an estimated 5 million barrels of oil per year. (Author)

A80-32867 # **An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection.** J. Bogart (Utah, University, Salt Lake City, Utah). *American Institute of Aeronautics and Astronautics, International Meeting and Technical Display on Global Technology 2000, Baltimore, Md., May 6-8, 1980. Paper 80-0869*. 11 p. 8 refs. NSF-supported research.

The purpose of this research was to examine the performances of two thermosiphon hot water heaters. One system ran a 50-50 ethylene glycol-water solution through a flat plate type collector and a copper coil heat exchanger placed inside the storage tank. The other system is conventional and ran the storage tank water through the collector with open pipes into and out of the storage tank (i.e. no heat exchanger). Obviously the heat exchanger system will perform less efficiently because of higher fluid viscosity and losses in the heat exchanger. But because this system will not freeze, it could be used in winter and doesn't need draining to prevent pipe freezing. The research centered on determining the exact extent of the decrease in efficiency of this type of system from the more conventional type of system. The results showed that the system with the heat exchanger performed, on the average, 9% less efficiently than the system without the heat exchanger. This figure is acceptable and such an ethylene glycol system is recommended for use in winter or when there is a possibility of freezing on cool nights from radiation losses. (Author)

A80-32933 **A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency.** G. Hodes (Weizmann Institute of Science, Rehovot, Israel). *Nature*, vol. 285, May 1, 1980, p. 29, 30. 6 refs.

A thin-film polycrystalline CdSe(0.65)Te(0.35)/polysulfide-based photoelectrochemical solar cell with an energy conversion efficiency of up to 8% is presented. Cell electrodes were prepared by painting a slurry of sintered CdSe(0.65)Te(0.35) powder onto a Ti substrate and then annealing in an inert atmosphere and etching by various means. Solar efficiencies of the electrodes immersed in an aqueous electrolyte 1 M in KOH, Na2S and S with a counter electrode of sulfide brass gauze of up to 5% were obtained following a HCl:HNO3 etch, up to 5.5% following etching in dilute aqueous CrO3 and up to 8.0% following photoetching and K2CrO4 treatment. The spectral response of the anode in polysulfide solution exhibits a short-wavelength cutoff due to electrolyte absorption, a flat plateau region, and a fairly sharp long-wavelength cut-off indicating an effective band gap of about 1.45 eV, similar to that of CdTe. Output stability has been found to decrease with increasing output current, remaining stable for more than 21 h at a current of 20 mA/sq cm. A.L.W.

A80-33184 **Solar industrial process heat.** S. L. Sargent, B. H. Glenn, and D. W. Kearney (Solar Energy Research Institute, Golden, Colo.). *Environmental Science and Technology*, vol. 14, May 1980, p. 518-522.

The article reports on the Solar IPH (industrial process heat) Conference organized for the DOE's Agricultural and Industrial Systems Branch, which provided a forum for interaction between researchers and potential users of solar IPH systems. In addition, the status of existing IPH products was examined, and the technical readiness and expected future developments of solar IPH systems and components was reviewed. Attention is given to solar IPH field tests results, typical operating temperatures of solar IPH technologies, and market considerations. M.E.P.

A80-33401 **Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 & 3.** Congress sponsored by the International Solar Energy Society. Edited by K. W. Boer (Delaware, University, Newark, Del.) and B. H. Glenn (Solar Energy Research Institute, Golden, Colo.). Elmsford, N.Y., Pergamon Press, Inc., 1979. Vol. 1, 981 p.; vol. 2, 768 p.; vol. 3, 612 p. Price of three volumes, $275.

Papers are presented on such topics as solar agriculture, fuels from biomass, photochemical and thermochemical processes, solar heating and cooling of buildings, solar air heaters, low temperature collectors, concentrator collector performance, linear concentrators, nonimaging optics, solar heat storage, open cycle cooling, solar/heat pump systems, and solar domestic water heaters. Also considered are solar ponds, industrial process heat, high temperature storage, design methods for solar thermal systems, concentrating optics, advanced receivers, controls for solar systems, solar energy in developing countries, passive systems, materials and innovative systems, and greenhouses and solariums. Photovoltaics is considered in detail. B.J.

A80-33402 **Nitrogen fertilizer production by solar energy.** R. W. Treharne, D. R. Moles, M. R. Bruce, C. K. McKibben (Charles F. Kettering Research Laboratory, Yellow Springs, Ohio), and B. K. Rein (Nebraska, University, Lincoln, Neb.). In: Sun II, Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2-5. 7 refs. Research supported by the Rockefeller Foundation; Contract No. EY-76-C-02-4094.

A prototype system designed to produce nitrogen fertilizer on a farm using solar power has been developed for field testing. The system consumes only air, water, limestone and electrical power in the production of nitrogen fertilizer and is designed to be powered by a solar photovoltaic array. In the basic chemical process of the system, the nitrogen and oxygen in air are combined to produce nitrogen oxide by means of an electric arc driven by the solar array. The nitrogen oxides then are reacted with water and limestone to produce calcium nitrate fertilizer to be fed to crop land via a solar-powered irrigation system. (Author)

A80-33403 **Development and evaluation of a multiple use solar energy system for agriculture.** M. A. Hellickson, W. H. Peterson, and L. R. Verma (South Dakota State University, Brookings, S. Dak.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 6-9.

Solar energy has been shown to be a technically feasible alternative for crop drying and agricultural space heating applications, but economics, engineering and optimization are preventing widespread application of this alternative energy resource. Research in the Department of Agricultural Engineering at South Dakota State University has led to a solar energy intensifier system that appears to have excellent potential for solving these problems. The system incorporates the low temperature rise and continuous air flow characteristics of crop drying and agricultural space heating applications with the economic advantages of a large area solar reflector to achieve significant system cost reductions and simplifications. (Author)

A80-33404 **The application of existing solar energy collecting equipment in agriculture, horticulture and fishculture.** F. Vogt (Central London, Polytechnic, London, England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 10-14. 15 refs.

A80-33405 **Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio.** R. N. Misra and H. M. Keener (Ohio Agricultural Research and Development Center, Wooster, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 20-24. Research supported by the U.S. Department of Energy and U.S. Science and Education Administration.

A80-33408 **High intensity mass algae culture requirements and limitations.** G. L. Mauldin (New Mexico Solar Energy Institute, Las Cruces, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 41-45. 18 refs.

The design of algae culture units intended to maximize the growth of algae in sunlight is discussed, considering CO2 and oxygen supply, culture depth, temperature control, and cell suspension density. Emphasis is placed on photosynthesis, photorespiration, the partial processes involved, rates of oxygenation of ribulose-1.5-bisphosphate, and the net quantities of ATP and NADPH which may be utilized from a given quantity of light with regard to C4 and C3 plants. It is shown that maximum efficiencies of solar energy conversion to chemical potential energy in biomass can only be achieved when the photon flux density is the rate-limiting factor, which requires that the O2 and CO2 concentrations at the carboxylation site must be maintained such that the carboxylase reaction is proceeding near maximum rate, and the oxygenase activity is completely or nearly completely inhibited. J.P.B.

A80-33421 **Association of chlorophyll with surfactants on a particle surface.** G. R. Seely (Charles F. Kettering Research Laboratory, Yellow Springs, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 112-116. 11 refs.

The proposed model system for the imitation of photosynthesis employs polyethylene particles swollen to about four times their dry volume with a low molecular weight diluent, such as undecane. Spectra of chlorophyll absorbed to these particles are characteristic of the surfactant adsorbed with it; the pigment remains strongly fluorescent at relatively high surface coverages. Chlorophyll adsorption data are presented for various concentrations of N,N-dimethylmyristamide, a non-ionic surfactant. V.L.

A80-33423 **Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent.** W. E. Wentworth, D. W. Johnston (Houston, University, Houston, Tex.), and W. M. Raldow (Kungl. Tekniska Hogskolan, Stockholm, Sweden). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 122-125. 6 refs. Contract No. N68305-77-C-0043.

The decomposition of metal salt complexes can be used in chemical heat pump reactions for solar heating and cooling. It is shown that the decomposition of CaCl2.8NH3 and SrCl2.8NH3 can be carried out effectively as a slurry or suspension in an inert solvent. The reaction rates are increased by an order of magnitude and the reactions appear to be more complete. Three solvents were considered and the results showed that the nature of the solvent is important. (Author)

A80-33425 **Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones.** D. P. Rao, S. V. Babu, and V. S. Rao (Indian Institute of Technology, Kanpur, India). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 130-134.

A80-33426 **Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system.** C. H. Li and E. W. Schmidt (Rocket Research Co., Redmond, Wash.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 135-139. 8 refs. Contract No. N00173-78-C-0272.

Three different designs of chemical converter-heat exchangers, as applied to a SO2/SO3 distributed solar energy collection system, were studied. All three designs comprise spiral passages wound around a cylindrical cavity into which the sunlight is focused. The innermost passage serves as the chemical converter, while the remaining outer passages serve as the heat exchanger. Detailed mathematical models are developed to predict and compare the steady-state performances of the chemical converter-heat exchangers. The results of the models indicate that significant mass transfer resistance exists between the fluid and the catalyst wall coating. They also indicate that the reverse reaction of SO2 recombining with O2 could be important near the exit of the chemical converter. Unfortunately this effect has been neglected in the existing kinetic data. (Author)

A80-33427 **Solar energy collection using the reversible ammonia dissociation reaction.** J. H. Wright and T. G. Lenz (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 140-144. 8 refs.

An experimental program has been developed to verify the predicted performance of a solar-thermochemical receiver utilizing ammonia as the working fluid in a closed-loop energy collection and transport system. Specifically, a 10 kW(th) NH3 dissociation reactor-heat exchanger assembly has been designed. It consists of 43 catalyst filled tubes mounted around the perimeter of a one foot diameter cavity. A counter-flow heat exchanger wraps around the assembly to transfer the sensible heat from the exiting dissociated gas mixture to the incoming ammonia. In addition, a single-tube experiment has been designed to simulate a single tube of the 10 kW(th) reactor to provide design verification information. (Author)

A80-33428 **Ammonia dissociation for solar thermochemical absorbers.** O. M. Williams and P. O. Carden (Australian National University, Canberra, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 145-148. 5 refs.

A high pressure ammonia dissociator has been tested for solar thermochemical absorber operation. High thermal energy storage efficiencies are obtained when the dissociation reaction proceeds towards completion. A 90% efficient long-life cavity absorber operated at the focus of a paraboloidal concentrator can be based on nickel alloy tube technology and has potential for meeting a cost goal of 10 US dollars per square metre of collector area. The stored chemical energy is transported to a central plant where high grade heat is released during ammonia synthesis. It is shown that the maximum value of available work defined by the Gibbs' free energy change for the synthesis reaction may be approached provided the temperature profile of the synthesis reactor is suitably tailored. The sources of available work are identified in order to facilitate matching the high grade heat output to the input of a heat engine. (Author)

A80-33429 **Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling.** C. C. Hiller (Sandia Laboratories, Livermore, Calif.) and E. C. Clark (Rocket Research Co., Redmond, Wash.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 149-153. 9 refs. Research supported by the U.S. Department of Energy.

A80-33430 **Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry.** T. G. Lenz and L. S. Hegedus (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 154-158. 17 refs.

Diels-Alder systems are investigated with regard to their thermodynamic, kinetic, and physical properties. Liquid phase Diels-Alder chemistry, with reversible catalytic reactions available over the temperature range of 100-500 C, could be useful in solar-chemical energy conversion systems. Characteristics are given for the 1, 3 cyclooctadiene-diethyl maleate-adduct system chosen on the basis of best-estimate match of the criteria used to evaluate solar thermochemical systems. A need for further laboratory research is emphasized. V.L.

A80-33431 **Solar flash pyrolysis of biomass.** M. J. Antal, Jr. (Princeton University, Princeton, N.J.), M. Rodot, C. Royere, and A. Vialaron (CNRS, Odeillo, Pyrénées-Orientales, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 159-163. 26 refs. Research supported by the Solar Thermal Test Facilities Users Association and Centre National de la Recherche Scientifique.

The use of solar heat for biomass gasification is discussed with reference to the chemistry of the process and projected economics of solar powered biomass gasification systems. Particular consideration is given to flash pyrolysis by direct solar gasification which is the most economical method of biomass gasification. The cost of the gas derived from wastes is estimated at $2.85 per MM Btu and the cost of the power tower is found to be a fraction of the overall cost of the facility. V.L.

A80-33432 **Australian programme for solar heating and cooling.** W. R. W. Read (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Highett, Victoria, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 168-172.

A80-33434 **Solar City - Mount Cotton.** S. V. Szokolay (Queensland, University, Brisbane, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 178-182.

The design of a solar demonstration house built for the proposed Solar City project near Brisbane is presented. The solar systems of the house include space heating and air conditioning, hot water supply (coupled to the above), swimming pool heating system, and a token amount of photovoltaic electricity generation. The main criterion of the design is the thermal efficiency of the building. Design data are given for the generator, evaporator, condenser and absorber. V.L.

A80-33435 **The Belgian solar heating R & D program.** A. Pilatte (Mons, Faculté Polytechnique, Mons, Belgium). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 183-186.

A80-33438 **Solar energy projects for heating of buildings in Germany.** F. J. Friedrich (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 195-199.

A80-33439 **French programs of research and experimentation aiming at the development of solar energy in buildings.** M. Bellanger (Commissariat à l'Energie Solaire, Paris, France), M. Rodot (CNRS, Paris, France), and J. P. Marie (Ministère de l'Equipement, Paris, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 200-203.

A80-33440 **Industrial solar energy activity in Monaco.** J. H. Millar (Flextube, S.A., Monaco). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 210-214.

A80-33447 **Derivation of efficiency and loss factors for solar air heaters.** B. F. Parker (Kentucky, University, Lexington, Ky.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 244-248. 8 refs.

A80-33448 * **The effects of air leaks on solar air heating systems.** R. Elkin and M. Cash (NASA, Marshall Space Flight Center, Huntsville, Ala.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 249-253. 5 refs.

This paper presents the results of an investigation to determine the effects of leakages in collector and duct work on the system performance of a typical single-family residence solar air heating system. Positive (leakage out) and negative (leakage in) pressure systems were examined. Collector and duct leakage rates were varied from 10 to 30 percent of the system flow rate. Within the range of leakage rates investigated, solar contribution to heated space and domestic hot water loads was found to be reduced up to 30 percent from the no-leak system contribution with duct leakage equally divided between supply and return duct; with supply duct leakage greater than return leakage a reduction of up to 35 percent was noted. The negative pressure system exhibited a reduction in solar contribution somewhat larger than the positive pressure system for the same leakage rates. (Author)

A80-33449 **New air-heating collector design and performance.** H. Koizumi, Y. Kawada, K. Matsui, and T. Ariga (Toshiba Corp., Consumer Products Engineering Laboratory, Kawasaki, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 254-258. 5 refs.

Thermal performance data are presented for a solar collector consisting of a glass cover, a transparent plastic film, and a corrugated aluminum absorber. Outdoor tests were performed, and results were compared with those for three other collectors. Results show that, under typical operating conditions, the new collector has a 16% greater efficiency than the collector used in the first Toshiba solar house. Its light weight, easy assembly, and lower cost make it suitable for many applications. B.J.

A80-33450 **The characterization of crushed glass as a transpired air heating solar collector material.** R. K. Collier (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 264-268. 3 refs. Research sponsored by the U.S. Department of Energy.

The use of crushed glass matrices as the heat-absorbing media in air heating solar collectors is investigated. An experimental program was undertaken to characterize the most likely candidate glass types and sizes by measuring pressure drops, optical extinction coefficients, and volumetric heat transfer coefficients. Bed efficiencies were also measured and found to be similar to those expected for screen matrices unless critical amounts of clear glass were used as a top layer, which results in lowered efficiency. (Author)

A80-33451 **Design and performance of a roof integrated solar air heater.** M. K. Peck and D. Proctor (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Highett, Victoria, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 269-273. 13 refs.

A closed-loop space heating system is presented which combines solar air heaters and a rockbed thermal store located under the floor of the house. The system heats the rooms by radiation and convection from the floor and so avoids the need for some of the ductwork and controls used in conventional solar air-heating systems. A mathematical model is proposed for the evaluation of different integrated roof collector designs and for the comparison of the predicted and the measured performance. The limited experimental data presented validate the mathematical model used to design the air heater. V.L.

A80-33452 **An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems.** A. W. K. MacGregor (Napier College, Edinburgh, Scotland). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 278-282. Research supported by the Science Research Council of England.

A80-33453 **Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography.** R. Lazzarin (Padova, Università, Padua, Italy), M. Pacetti, and G. Latini (Ancona, Università, Ancona, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 283-287.

A80-33454 **Theoretical and experimental investigation of the flow in a flat plate collector.** A.-M. Dalbert-Conseil, J.-L. Peube, F. Penot, and J.-F. Robert (Poitiers, Université, Poitiers, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 288-292. 5 refs.

A80-33455 **Forced convection in solar collectors.** D. M. McEligot (Arizona, University, Tucson, Ariz.) and C. A. Bankston (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 293-297. 10 refs. Research supported by the U.S. Department of Energy, University of Arizona, and NSF.

The sensitivity of the solar collector performance to the forced convective heat transfer between an absorber and coolant is studied. It is concluded that the thermal performance of water-cooled flat plate collectors is generally insensitive to the internal forced convective problem. V.T.

A80-33456 **Analysis of matrix air heaters.** D. A. Neeper (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 298-301. 5 refs. Research supported by the U.S. Department of Energy.

By using a physical analogy, this paper develops an analytic expression that approximates Beckman's (1978) calculated bed efficiency. This analytic expression for bed efficiency should be useful for computation of overall collector efficiency. Furthermore, it is shown that under certain stringent assumptions the bed efficiency may be compared with the flat-plate collector parameter F(R) in order to compare the expected performance of a matrix collector with that of a flat plate. (Author)

A80-33457 **Thermal performance of compounds used to improve heat transfer in solar collectors.** S. A. Mumma (Arizona State University, Tempe, Ariz.) and D. G. Hansen (Tennessee Valley Authority, Knoxville, Tenn.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 307-311.

The thermal conductances of potential thermal conducting materials for the improvement of heat exchange between the absorber plate and the heat transfer fluid in solar collectors are measured. Thermal conductances of the Thermon heat transfer cements T-802, T-85 and E-1, the Devcon plastic steels A and SF, bronze putty R, plastic aluminum F, lead putty L and stainless steel putty ST, Wakefield thermal conducting paste and Pelco colloidal silver paste were determined from the heat flux through two copper bars joined by the heat transfer material. Conductances are found to range between 1063.5 and 3836.1 W/sq m per C, and to represent an order of magnitude improvement over the lack of a conducting material. Calculations for specific absorber designs show 13-77% increases in total useful collector gain brought about by the use of the material found to have the highest conductance, Thermon T-802. A.L.W.

A80-33458 **Heat transfer through collector glass covers.** K.-E. Hassan (Centre for Solar Energy Studies, Tripoli, Libya). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 312-316. 7 refs.

Analysis is carried out for radiant exchange between two parallel isothermal plates of infinite dimensions separated by a number of transparent absorbing surfaces, taking into consideration the conductance between the surfaces involved. An extension of the so-called 'radiosity method' is used and the problem is expressed as a system of algebraic equations. In the absence of conductance, these equations are linear and could be put in a more convenient dimensionless form. The solution for the special case of solar collector covers made of a number of transparent (usually glass) plates is solved and compared with the results in the literature. A solution is also given for the temperature distribution within a thick plate subjected to radiation and conductance. (Author)

A80-33459 **Three dimensional ray tracing through concentric tubular elements using vector methods.** S. H. Janke (Montana State University, Bozeman, Mont.) and R. F. Boehm (Utah, University, Salt Lake City, Utah). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 317-321.

Using vector methods, a three dimensional ray trace is developed for a direct ray incident upon a tubular element of circular cross section. This ray approaches the element in a plane not perpendicular to the long axis, but rather in a plane always parallel to that axis. Relations are developed for the various angles of incidence and refraction as the ray is partially transmitted and/or internally reflected, for its in-glass path length, and for the minimum distance from the fraction passed to the interior cavity and the long axis. The results are useful in determining a transmittance absorptance product for such an element with concentric absorber of circular section. (Author)

A80-33460 **Cylindrical glass tubes for flat plate collector covers.** W. M. Worek and Z. Lavan (Illinois Institute of Technology, Chicago, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 322-326.

A80-33461 **The effect of pressure on the performance of cylindrical solar collectors.** W. M. Worek and Z. Lavan (Illinois Institute of Technology, Chicago, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 327-330.

The combined effect of vacuum and a selective absorbing surface is extensively used in high temperature solar collectors. In the analysis of such collectors it is usually assumed that radiation is the primary mode of heat loss and that all other modes of heat transfer can be neglected. The present work is concerned with the variation of collector heat loss with pressure in the annulus between the absorber and the outer glass envelope of a single Owens-Illinois Sunpak collector tube. In particular, the results show the effect of pressure on conduction heat loss and the pressure level at which conduction heat loss can be neglected. (Author)

A80-33462 **Effect of off-south orientation on optimum conditions for maximum solar energy absorbed by flat plate collector augmented by plane reflector.** I. S. Taha and S. M. Eldighidy (King Abdul Aziz University, Jeddah, Saudi Arabia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 332-336. 9 refs.

A80-33463 **The unitary solar collector - A new approach to low-cost, flat-plate systems.** R. A. Erb (Franklin Institute, Philadelphia, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 338-341.

The unitary solar collector is a seamless, glazed, flat-plate collector panel coextruded from thermoplastic material (e.g., clear UV-stabilized and black polycarbonate for an air-heating system). The advantages of this new system include: low cost, light weight, good structural strength, capability for mass production, and design possibilities not practical with conventional systems. Prototype panels (10 cm wide) have been coextruded in polycarbonate. A small-scale test in Florida under stagnant flow conditions for over 2.5 years (reaching temperatures to 137 C) has shown that the panels withstand these severe conditions. (Author)

A80-33464 **Low cost high temperature adhesive bonded solar collectors.** R. E. Dame and J. J. Dalton (Mega Engineering, Silver Spring, Md.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 343-347. 17 refs.

A80-33465 **Integration of solar collectors in large prefabricated roof/wall sections.** D. L. Spencer (Iowa, University, Iowa City, Iowa) and R. A. Strub (Component Homes, Inc., Iowa City, Iowa). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 348-352.

A80-33466 **Testing the performance of solar collectors under standard conditions.** W. Dittes and D. R. Goettling (Stuttgart, Universität, Stuttgart, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 355-359. 11 refs.

The paper compares standard test procedures for solar collectors as proposed by ASHRAE/NBS, BSE, DFVLR, and NASA. ASHRAE/NBS recommend outdoor tests, while BSE admits both outdoor and indoor tests. According to DFVLR and NASA, solar collectors are tested with a solar simulator. In two cases the efficiency is calculated by the quotient of the useful heat rate and the incident radiation. In the third case, the efficiency is computed using the difference of the maximum useful heat rate and the rate of heat loss divided by the incident radiation. Consideration is given to the measurement of the rate of heat loss, determination of the standard flow rate and other standard conditions, and the determination of the efficiency curve. V.L.

A80-33467 **Equations for representing the UL-dependence in collector test procedures.** E. C. Shewen and K. G. T. Hollands (Waterloo, University, Waterloo, Ontario, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 360-364. 10 refs.

Various methods of accounting for collector heat loss coefficient variability are reviewed. A new method is presented which is particularly suited to being implemented in the three-factor test procedure described by Smith and Weiss (1977). V.T.

A80-33468 **Tests of all-day collector performance.** C. D. Beach, J. C. Huggins, and J. D. Roland (Florida Solar Energy Center, Cape Canaveral, Fla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 370-374.

As part of a program to evaluate collectors used in the national solar heating and cooling demonstration program, 23 flat-plate collectors were tested for efficiency while they operated for an entire day at a constant inlet temperature and flow rate. As many as four all-day tests were performed on some of the collectors to provide data at different operating temperatures and for various types of days. When efficiencies are referenced to ambient temperature and total available solar irradiance, in a manner analogous to the plots of ASHRAE collector efficiency data, results show a performance advantage for glass covers as compared to plastic. Results also show a wide variation in performance among collectors with selective absorber surfaces but much less variation among those with flat black coatings. While the all-day test data are easier to interpret than ASHRAE performance curves, and also simplify collector comparison, more test time is required to make a conclusive evaluation. (Author)

A80-33469 **Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors.** P. P. Yaneske and I. C. Wiles (Strathclyde, University, Glasgow, Scotland). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 375-379. 5 refs. Research supported by the Glynwed Group Services.

A80-33470 **CSIRO collector test facilities.** D. Proctor and M. K. Peck (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Highett, Victoria, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 380-384. 13 refs.

The paper describes the collector testing facilities used by the CSIRO Division of Mechanical Engineering in Australia. It is shown that the equipment is used to obtain the absolute performance characteristics of solar collectors for research purposes, and on a 'fee for service' basis for manufacturers. The high temperature test rig and the solar simulator are described, as well as the test procedure and data reduction. M.E.P.

A80-33471 **Laboratory tests for flat plate solar collectors.** K. Kraus, E. Hahne, and J. Sohns (Stuttgart, Universität, Stuttgart, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 385-389. 8 refs. Bundesministerium für Forschung und Technologie Contract No. ET-4045-A.

A80-33472 **Proposed method for testing of radiative cooling flat-plate collectors.** H. L. Connell and G. T. Pytlinski (New Mexico State University, Las Cruces, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 391-395. 11 refs.

A80-33473 **An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency.** W. Youngblood, W. Schultz, R. Barber (Wyle Laboratories, Huntsville, Ala.), and E. R. Streed (National Bureau of Standards, Center for Building Technology, Washington, D.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 396-400. Contract No. EG-77-C-01-4050.

A80-33474 **Weatherability test of plastic glazing materials for collectors.** A. F. Clark (California, University, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 401-404. Contract No. W-7405-eng-48.

Various plastics were tested by exposing them to direct sunlight (about 8 suns) and also to accelerated weathering. The plastics tested included acrylics, weatherable vinyl (PVC), polyethylene (PE), polypropylene (PP), Tedlar coated fiberglass, and Tedlar coated vinyl. Comparable exposures gave consistent degradations. Heat seals degraded rapidly, especially at the edges. Acrylics lasted for the equivalent of 20 years; weatherable PE performs adequately for about a year, weatherable PVC for two years, Tedlar coated PVC for eight years. B.J.

A80-33475 **Results of long term natural weathering effects on solar collectors under stagnation conditions.** B. Henderson, W. E. Schultz, and R. Barber (Wyle Laboratories, Huntsville, Ala.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 405-407.

A80-33476 **A method for balancing flow rates in rows of parallel collectors.** R. T. Lydon, R. P. Smith, and E. M. Barber, Jr. (Sunsearch, Inc., Guilford, Conn.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 408-412. Research supported by Enthone, Inc.

The development of a method for balancing flow rates in long rows of parallel-plumbed, liquid cooled solar collectors is described. The development effort involved computer simulations, testing and hardware development. The advantages of this method include increased thermal efficiency of long rows of solar heat collectors, ease of use, low cost, and ability to fit into internally manifolded collectors. (Author)

A80-33477 **Small-scale solar simulator for indoor testing of collector modules and materials.** D. P. Grimmer and L. Bronisz (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 413-416. 6 refs. Research sponsored by the U.S. Department of Energy.

A small-scale solar simulator has been constructed for the indoor testing of collector modules and materials at LASL. The simulator design follows general construction guidelines suggested in the work of Yass and Curtis of NASA-Lewis, but modifications were necessary to insure a + or - 10% uniform flux over a 0.1 sq m area. Considerable adjustments were necessary to achieve desired performance for the testing of collector modules and materials. These adjustments and details of simulator construction, including design schematics and simulator mounting, are described. Also presented are flux maps for the twelve-lamp array. Finally, construction materials costs are discussed for this inexpensive solar simulator suitable for many testing applications. (Author)

A80-33478 **Design of an inexpensive solar simulator.** P. Krusi and R. Schmid (Sydney, University, Sydney, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 417-421. 9 refs. Research supported by the University of Sydney.

An inexpensive solar simulator (about $10,000 Australian) has been developed for an indoor solar collector test facility. The light subsystem of the simulator employs 18 compact source iodide 1000-W lamps mounted in a hexagonal pattern on a yoke. These lamps are sealed beam discharge lamps of the metal halide type, which provide good spectral match to sunlight, require no maintenance, have compact size, low cost, and a lifetime expectancy of 1000 hr. Results are presented for a single glass, selective flat-plate collector tested on the solar simulator as well as on an outdoor test rig. V.L.

A80-33479 **Prediction of long-term performance of closed-loop concentrating solar collector systems.** W. A. Ryan, S. A. Klein, and W. A. Beckman (Wisconsin, University, Madison, Wis.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 430-433. 7 refs.

A80-33480 * **Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector.** M. K. Selcuk and A. Aghan (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 434-438. 5 refs. Contract No. E(49-26)-1024.

The paper summarizes the mathematical analysis and presents the experimental results for a vee-trough/evacuated tube collector (VTETC). Test results reported represent the performance of the VTETC based on an aperture area. The effectiveness of vee-trough reflectors is demonstrated by comparing the useful heat collected by a receiver tube with and without concentrators. V.T.

A80-33481 **Evaluation of linear concentrating collectors.** S. M. Jeter (Georgia Institute of Technology, Atlanta, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 439-443. 10 refs.

A modeling procedure particularly useful for linear concentrating collectors is presented. Thermal, hydraulic, and optical (including off-normal degradation) effects can be considered. Example evaluation of performance parameters and collector output projections are presented. (Author)

A80-33482 **A data analysis program for collector testing.** J. H. McDowell and R. B. Uselton (Northrup, Inc., Hutchins, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 444-448.

A sun-collector data analysis program is presented which accurately calculates specific volume and enthalpy, collector geometry and performance. Features used in the data analysis include a multivariate stepwise regression program which may be used for statistical analysis of specified parameters. This module provides a statistical method for determining correlation between all parameters and shows the least squares fit to a line between the dependent and the independents. The program also provides the user with the ability to perform hourly or daily integration on a number of specified parameters. A collector performance predictor equation is derived using heat loss and heat collection data sets. V.L.

A80-33483 **Design and development of a paraboloidal dish solar collector for intermediate temperature service.** D. A. Kugath, G. Drenker, and A. A. Koenig (General Electric Co., King of Prussia, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 449-453.

A80-33484 **Economic analysis of a point focusing concentrating collector system.** W. E. Rogers, D. N. Borton, M. P. Rice (Rensselaer Polytechnic Institute, Troy, N.Y.), and R. J. Rogers (Power Kinetics, Inc., Troy, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 454-458. Research supported by the U.S. Department of Energy and New York State Energy Research and Development Authority.

An analysis of a point focusing concentrating collector system is presented. A 70 kW thermal parabolic Fresnel reflector point focusing concentrating solar collector developed for the business community is described; the factors of risk, use of land, capital costs, working capital requirements, solar system performance, and solar availability are discussed. An example is given of a company requiring 760 megawatt hours of steam a year which would return energy at the cost of $9.20 per megawatt hour. A.T.

A80-33485 **Suntec/Hexcel parabolic trough.** G. G. Brucker and J. H. Davison (Suntec Systems, Inc., St. Paul, Minn.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 459-463.

The paper presents the technical data on the line-focusing collectors with single-axis tracking and the experimental tests to demonstrate the effects of collector spacing and orientation on annual energy output. Solar energy must be capable of supplying energy to the industrial process market which will require temperatures over 500 F; these can be supplied by such line-focusing collectors. The collector layout, the receiver assembly and the collector testing are discussed concluding that the physical layout is one of the most significant variables which can affect the performance of a solar collector system. A.T.

A80-33486 **Analysis of experimental test results on a high temperature receiver model.** G. Francia (Genova, Università; Ansaldo S.p.A., Genoa, Italy), A. Barutti, and R. Floris (Ansaldo S.p.A., Genoa, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 464-466.

This paper presents some of the results obtained from the experimental tests on a high-temperature receiver model within the frame of EEC Demonstration Solar Power Plant Project. The main results presented are related to the influence of an anti-radiating structure on the receiver efficiency; the validation of computer programs for calculating the solar energy density distribution on the absorbing pipes, and the definition of a philosophy for the control system of a water-steam cooled solar receiver. (Author)

A80-33487 **Environmental testing of solar reflector structures.** R. E. Allred, D. W. Miller, and B. L. Butler (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 472-476. 10 refs. Contract No. DE-AC04-76DP-00789.

The reflector support structure of a concentrating solar collector provides and maintains the required shape for the reflective surface; it must perform its functions to the required accuracy over a 20-30 year life cycle with a minimum of maintenance. A program to determine the aging behavior of candidate reflector support materials and processes has been conducted since 1975. Materials evaluated include laminates, sandwiches and molded structures constructed of metals, ceramics, forest products and fiber-reinforced composites. Accelerated temperature-humidity cycling data and real time exposures indicate that a variety of material constructions may eventually meet the operational and lifetime requirements. Constructions which performed well in this study include plywood, fiberglass skin and core sandwiches, melamine skin/paper core sandwiches, aluminum skin/aluminum core sandwiches, and molded structures of sheet molding compound with integral ribs. The data also indicate that designers should be particularly concerned about maintaining thermal compatibility throughout the reflector structure, producing high integrity adhesive bonds, protecting the reflective surface from corrosion and using moisture-insensitive materials. (Author)

A80-33488 **Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season.** T. D. Harrison and W. H. McCulloch (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 477-481. 6 refs. Contract No. DE-AC04-76DP-00789.

A80-33489 **Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers.** A. Lucifredi, E. Ravina (Genova, Università, Genoa, Italy), M. Bisagni, and P. Castellazzi (Ansaldo S.p.A., Genoa, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 482-486.

A80-33490 **Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance.** B. D. Wood, P. J. Fiore, and C. R. Christopherson (Arizona State University, Tempe, Ariz.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 487-491. 10 refs. Research supported by the U.S. Department of Energy.

A80-33491 **Low cost, low technology 3.4x concentrating collector for industrial/agricultural applications.** A. F. Naccach (Aton Solar Manufacturing, Novato, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 492-495. 14 refs.

A80-33492 * **Low cost vee-trough evacuated tube collector module.** M. K. Selcuk (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 496-500.

A low cost solar collector capable of operating at 150-200 C is described. An evacuated tube receiver is combined with asymmetric vee-trough concentrators. Peak efficiencies of about 40% at 120 C and 30% at 180 C are expected. Predicted future collector cost is $70/sq m which yields an energy cost of $4.20/GJ at 120 C. During the development of the vee trough/evacuated tube collector both mathematical models to predict thermal and optical performance were developed and tests run to verify theory. The asymmetric vee trough concentrator increases the solar flux intensity for an average value of 2 for year-round performance. Optimized collector module has reflector angles of 55 deg/85 deg. The aperture plane is tilted to the latitude. The reflector is made of electropolished aluminum. The supporting frame is formed by bending sheet metal. Evacuated tube receivers are Pyrex, 15 cm diam and 2.4 m long. The module has 12 tubes on right and left sides altogether. Attainable operation at temperatures on the order of 150-200 C are suitable for absorption refrigeration and power generation via Rankine engines. (Author)

A80-33493 **Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors.** M. Collares-Pereira (Chicago, University, Chicago, Ill.; Centro de Fisica da Materia Condensata, Lisbon, Portugal), J. O'Gallagher, A. Rabl, and R. Winston (Chicago, University, Chicago, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 501-505. 11 refs. Contract No. EY-77-S-02-2446.

The paper describes the fabrication and testing of a prototype ideal type collector, consisting of a nonimaging Fresnel lens and a secondary concentrator of the compound parabolic concentrator (CPC) type with a tubular receiver. The geometric concentration ratio is 16, which is the maximum possible concentration consistent with the requirements that (1) the collector perform properly with a fixed tilt position for the tracking axis (polar mount), and (2) the tracking be accomplished by means of a simple clock drive. The test results confirm the large acceptance angle of the design (6 deg). B.J.

A80-33494 **Development of a 3X CPC with evacuated receiver.** R. W. Ballheim (Chamberlain Manufacturing Corp., Waterloo, Iowa). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 506-510. Contract No. ET-78-C-04-4239.

This paper presents some of the considerations involved in the design and development of a 2.6X compound parabolic concentrator (CPC) with an evacuated receiver. A truncated version of a CPC trough reflector system and the General Electric Company tubular evacuated receiver have been integrated with a mass producible collector design suitable for operation at 250 to 450 F. The key criterion for optimization of the design was minimization of the cost per BTU collected annually at an operating temperature of 400 F. A ray tracing program was used in conjunction with a heat gain math model to compare the effect of collector parameters on the annual performance of the collector. The parameters studied included CPC acceptance angle, truncation height, reflector error, receiver placement error, glazing transmissivity, receiver tube transmissivity, reflector material reflectivity, and insolation diffuse/beam ratio. An optimum design is selected and performance predictions on an annual basis are presented for specified design conditions. (Author)

A80-33495 **Experimental and theoretical evaluation of a novel concentrating solar energy collection system.** A. B. Maish and J. T. Beard (Virginia, University, Charlottesville, Va.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 511-515. Research supported by the Solar Associates Co.

A new concentrating solar energy system was evaluated theoretically and experimentally at the University of Virginia Solar Test Facility. The modular, two-axis tracking collector combined an aluminized mylar reflector with a flat-plate absorber. Radiation collected from the 7-sq-m frontal area was concentrated by a factor of five, making the collector suitable for intermediate temperature applications. The thermal performance of the collector was determined theoretically on a digital computer using a nodal approach to model the heat transfer processes. Collector sensitivities to environmental parameters were calculated. An experimental testing program conducted according to the ASHRAE testing standards verified the predicted results. (Author)

A80-33496 **Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors.** M. J. O'Neill (E-Systems, Inc., Energy Technology Center, Dallas, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 516-520.

A80-33497 **Cylindrical 'elastical' concentrating solar collectors.** J. F. Tan, D. Langridge, C. D. Letham, and P. G. McCormick (Western Australia, University, Nedlands, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 522-525. Research supported by the Solar Energy Research Institute of Western Australia.

The paper includes a theoretical analysis of the elastical shape and gives examples of computed ray traces plotted for various rim angles. Also included is a theoretical plot of incidence factor versus concentration ratio for three different rim angles. Experimental performance figures for an elastical collector are presented for two different concentration ratios. (Author)

A80-33498 **Parabolic trough collector with thermal or photovoltaic receiver.** G. Bado, R. Floris, and G. Tomei (Ansaldo S.p.A., Genoa, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 526-530.

The paper describes a universal parabolic trough collector which is suitable to concentrate solar radiation onto both a strip of photovoltaic cells or the opening of a thermal linear cavity receiver. A supporting structure and receivers can be used at every latitude with only a few modifications of the construction layout. V.T.

A80-33499 **A unique new Fresnel lens solar concentrator.** M. J. O'Neill (E-Systems, Inc., Energy Technology Center, Dallas, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 531-535.

A new Fresnel lens solar concentrator has been developed. The design of each prism in the lens has been optimized for maximal transmittance. Additionally, the new lens provides a smaller solar image and allows shorter focal lengths to be used than for prior lenses. A prototype combined photothermal/photovoltaic collector has been built and successfully tested, fully confirming the theoretical performance of the new concentrator. The paper presents the theory, configuration and performance of the new concentrator. (Author)

A80-33500 **Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications.** E. Lorenzo and G. Sala (Madrid, Universidad Politécnica, Madrid, Spain). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 536-539. 8 refs.

A80-33501 **Applications of CPC's in solar energy - An overview.** M. Collares-Pereira, J. O'Gallagher, A. Rabl, R. Winston (Chicago, University, Chicago, Ill.), R. Cole, A. Gorski, W. McIntire, K. Reed, and W. Schertz (Argonne National Laboratory, Argonne, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 542-546. 19 refs. Contracts No. EY-76-S-02-4446; No. W-31-109-eng-38.

The principles of compound parabolic concentrators (CPC) are outlined. CPC thermal collectors with evacuated and nonevacuated receivers are discussed. Consideration is given to photovoltaic applications, second stage concentrators, and asymmetric CPCs. V.T.

A80-33502 **Incidence angle modifier and average optical efficiency of parabolic trough collectors.** H. Gaul and A. Rabl (Solar Energy Research Institute, Golden, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 547-551. 12 refs. Contract No. EG-77-C-01-4042.

A80-33503 **The geometrical vector flux and some new nonimaging concentrators.** R. Winston (Chicago, University, Chicago, Ill.) and W. T. Welford (Imperial College of Science and Technology, London, England). In: Sun II; Proceedings of the Silver Jubilee

Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 552-556. 7 refs. Research supported by the U.S. Department of Energy.

In the present paper, the geometrical vector flux - a quantity related to measures of illumination - is defined, and some of its properties are used to develop new forms of nonimaging concentrators. It is shown that the lines of flow of the geometrical vector flux form no-flux surfaces along which, under appropriate conditions, mirrors can be placed without disturbing the flux field. V.P.

A80-33504 **A stationary prism concentrator for solar cells.** D. R. Mills, J. E. Giutronich, and E. Harting (New South Wales, University, Kensington, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 561-564.

A80-33505 **Optical and thermal properties of truncated compound circular arc concentrators.** R. E. Jones, Jr. and G. C. Anderson (Lakehead University, Thunder Bay, Ontario, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 565-569. 8 refs. Research supported by the National Research Council of Canada.

An economical way to form non-focusing concentrators would be to support aluminized plastic films at the edges, and inflate them into circular cylinders. Here, the optical and thermal properties of circular arc approximations to truncated compound parabolic concentrators are investigated. Annual solar fractions for residential heating loads are found to be nearly the same for low and medium concentrations. (Author)

A80-33506 **A non-tracking inflated cylindrical solar concentrator.** J. W. Gerich (California, University, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 570-574. 6 refs. Contract No. W-7405-eng-48.

A concentrating solar collector is being developed to produce pressurized hot water up to a temperature of 175 C. The collector structure consists mainly of an inflated thin-film plastic cylinder that is clear on the upper portion and is an aluminized reflector on the lower portion. The reflector concentrates sunlight on a receiver tube which is jacketed with a heat transfer suppressing, thin-film plastic cylinder. The first experimental collectors verified the performance modeling codes. The second generation collectors now being constructed address cost considerations and ease of fabrication, installation, and maintenance. It is found that the installed cost of the inflated concentrator is likely to be one-fifth that of parabolic trough concentrators. An experimental apparatus is built to measure the total hemispherical emittance of full size receiver tubes. Test results indicate a rather dramatic increase in the room temperature value at typical concentrator operating temperatures. (Author)

A80-33507 **The actual benefits of thermally stratified storage in a small and a medium size solar system.** C. W. J. van Koppen, J. P. S. Thomas, and W. R. Veltkamp (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 576-580. 5 refs.

Thermally stratified storage in solar power systems is examined, utilizing a simulation model and comparing results with previous observations made on two actual solar heating systems in the Netherlands. Although the benefits of stratification are small when the mass flow rate is large, the good agreement between the simulation and experimental results indicates that a more widespread utilization of thermally stratified storage in combination with much lower collector flow rates than usual will lead to considerable improvements in the performance of solar space heating and hot water supply systems. Experiments have also shown that the floating inlet, which is a wide, thin-walled, flexible plastic hose connected to the inlet stud for delivering the hot water from the collector at exactly the level of temperature in the storage tank, improves the stratification by a factor of 2 compared to natural stratification. J.P.B.

A80-33508 **Economical optimum TES size via marginal analysis.** W. Kahan and R. C. Estes (Singer Co., Fairfield, N.J.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 581-585. Contract No. EG-77-C-03-1467.

The paper presents an analytical derivation of the relationship between the economically optimum thermal energy storage (TES) size in a solar energy system and different parameters. These parameters are local weather persistence, solar energy collection efficiency, component costs, and energy cost. V.T.

A80-33509 **Effects of baffles on thermal stratification in themocline storage tanks.** E. I. H. Lin and W. T. Sha (Argonne National Laboratory, Argonne, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 586-590. Research sponsored by the U.S Department of Energy.

A80-33524 **Open-cycle solar air conditioner.** H. I. Robison, S. H. Houston (South Carolina University, Conway, S.C.), W. Harper (Horry-Georgetown Technical College, Conway, S.C.), J. W. Mitchell, M. J. Brandemuehl, and J. J. Jurinak (Wisconsin, University, Madison, Wis.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 667-669. Research supported by the Coastal Educational Foundation, Horry County Higher Education Commission, University of South Carolina, and Horry-Georgetown Technical College.

An open-cycle solar air conditioner is presented which uses rotary heat wheels to dehumidify the air and to recover the heat of sorption. The solar air conditioner will be used to obtain low temperature reactivation data for other combinations of sensible and latent heat wheels. This information will be used with the transient simulated computer program data to accurately simulate operation with different dessicants in various configurations. V.L.

A80-33525 **Solar operated crossflow desiccant cooling system.** V. Mei, W. Worek, B. Mathiprakasam, Z. Lavan, and D. Gidaspow (Illinois Institute of Technology, Chicago, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 671-675. Contract No. EG-77-C-03-1589.

A cross-cooled solar powered air conditioning system using silica gel is being studied. The system consists of two identical fixed bed dehumidifiers. One dehumidifies while the other is being regenerated. Cross-cooling is achieved with air flowing through rectangular channels and the process stream flows in perpendicular channels which are lined with paper-like sheets consisting of micron size silica gel particles held in a Teflon web. A prototype dehumidifier was constructed and tested and the results are compared with computer simulation predictions. A complete cooling system based on optimum COP and minimum pressure drop (for a given size) will be designed, built and tested. Preliminary calculations predict a COP of about 0.50 with 82 C regeneration temperature. Due to the low pressure drop in the channels the electric coefficient of performance (EER) is very high. (Author)

A80-33526 **Solar cooling through cycles using microporous solid adsorbents.** F. Meunier and B. Mischler (Paris XI, Université, Orsay, Essonne, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 676-680. 7 refs. Commission of the European Communities Contract No. 524-78-2-ESF.

A80-33527 **Design and operation of a liquid-desiccant type solar air conditioning system.** A. Johannsen (South African Council for Scientific and Industrial Research, National Mechanical Engineering Research Institute, Pretoria, Republic of South Africa). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 681-685. 6 refs.

The design and operation of a full-scale experimental liquid desiccant-type solar air conditioning system is discussed. The system was designed for 20 kW of peak cooling capacity and 24 kW of peak heating capacity using 52 sq m of double glazed regenerating collectors and triethylene glycol as desiccant. The COP of the entire system defined as the ratio of the plant cooling capacity to the energy reaching the collectors, varied from 25 to 33 per cent at collector temperatures between 75 and 80 C and cooling tower leaving water temperature of 25 C. (Author)

A80-33528 **Theoretical and experimental investigations of a countercurrent solar regenerator.** P. Gandhidasan (University of the West Indies, Saint Augustine, Trinidad and Tobago), V. Sriramulu, and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 686-690. 5 refs.

The heat and mass transfer processes occurring in a countercurrent solar regenerator are investigated theoretically. The rate of mass transfer is predicted by determining the point of flow reversal and treating the region between the solution film and the point of flow reversal as a stagnant layer through which mass transfer takes place only by diffusion. The use of approximate as well as numerical methods in solving the governing equations is discussed. Experiments using calcium chloride solution as the absorbent, and conducted for different flow rates of solution and air have yielded results in agreement with theoretical predictions. In addition, the ratio of solution to air velocity is found to be an important parameter influencing performance. J.P.B.

A80-33529 **Test results of the solar powered Rankine cycle refrigerator installed in the experimental house.** E. Nishiyama, J. Kai, M. Sugihara, K. Kashiwamura (Mitsubishi Electric Corp., Central Research Laboratory, Amagasaki, Japan), and M. Ohtsubo (Mitsubishi Electric Corp., Consumer Products Research Laboratory, Kamakura, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 691-695. Research sponsored by the Ministry of International Trade and Industry of Japan.

The paper discusses the design principles and the structure of the solar powered heating and cooling system and Rankine cycle refrigerator used for two years in an experimental house. Flat plate-type solar collectors were used; for the high temperature storage material, water was used for the first year and ammonium alum the second, and the chilled water tank used water along with sodium acetate trihydrate as the heat storage material. Design conditions of the high temperature storage unit are given, including maximum storage enthalpy of 10,500 kcal at about 94 C. Attention is given to the Rankine cycle refrigerator, utilizing a two-fluids system and a sliding vane-type expander. The performance of the collectors, heat storage units, and refrigerator was found to be almost the same as shown by laboratory tests, while revealing no signs of deterioration. J.P.B.

A80-33530 **Two stage evaporative cooling using a rockbed associated with the active clearview solar collector.** J. F. Peck, H. J. Kessler, and T. L. Thompson (Arizona, University, Tucson, Ariz.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 697-701. Research supported by the Tucson Gas and Electric Co., Arizona Solar Energy Research Commission, University of Arizona, U.S. Department of Agriculture, and ERDA.

Two-stage evaporative cooling (TSEC) is discussed, as well as the design, behavior and performance of a rockbed as the storage medium, and the use of such systems in two homes in Tucson. TSEC is attained by precooling air without humidification before further cooling by evaporation; by integrating such a system with an active hot air solar space heating system, many of the same components are useful the entire year. Attention is given to the rockbed, which is constructed similarly to a standard 1.4 m deep basement, and the movement of heat through the rockbed is examined utilizing the thermal wave concept. TSEC performed well in the hot, dry climate of the Southwest, and the large rockbed is found essentially to add a third stage to standard TSEC since it makes use of cool nighttime temperatures produced by nocturnal radiation. J.P.B.

A80-33532 **Experimental investigation on control modes for an absorption chiller of low capacity.** R. M. Lazzarin (Padova, Università, Padua, Italy) and B. Boldrin (CNR, Laboratorio per la Tecnica del Freddo, Padua, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 710-714. Research supported by the Consiglio Nazionale delle Ricerche.

Various control modes have been examined for a solar-powered absorption chiller, via an experimental study on a water-lithium bromide absorption unit of low capacity. The efficiency of ON-OFF cycling is found to decrease strongly when ON-OFF frequencies or STOP length increase. Variation of the heating fluid flow rate to the generator is more suitable, but the control range is restricted. Also possible is heating fluid temperature variation, but transient operation may penalize performance. J.P.B.

A80-33533 **Evaluation of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator.** P. C. Auh (Brookhaven National Laboratory, Upton, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 715-719. Research sponsored by the U.S. Department of Energy.

A80-33534 **Solar powered environment control - Criteria and realization.** J. L. Lando, I. Vardi, J. M. Bourne, Y. Kimchi, J. Ben-Dror (TADIRAN Israel Electronic Industries, Ltd., Tel Aviv, Israel), and G. Grossman (Technion - Israel Institute of Technology, Haifa, Israel). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 720-724.

A 50 TR lithium bromide absorption chiller is described, which consists of two hermetically sealed steel drums, each having two heat exchangers. A computerized analytical model is discussed, which was developed to predict machine performance under different operating conditions. Very good agreement was found between the computer values and results of experiments made for more than a year on a 50 TR machine. Higher than normal heat transfer coefficients were obtained, and the machine functioned at generator temperatures as low as 59 C, and at cooling water as low as 15 C. J.P.B.

A80-33535 **Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems.** W. W. S. Charters (Melbourne, University, Melbourne, Australia) and W. D. Chen. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 725-728.

A80-33536 **Solar absorption cycle cooling installations in Sydney, Australia.** G. B. Smith and M. Riley (New South Wales Institute of Technology, Broadway, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 729-733.

The paper deals with two installations of widely different cooling capacity that were used to assess the suitability and economic viability of solar absorption cycle cooling in the temperate, often humid, coastal climate of Sydney. The relative performance of the collectors is discussed, and the difficulties encountered in achieving expected performance are noted. V.P.

A80-33537 **Experimental comparison between solar assisted compression and absorption heat pump.** R. Lazzarin, M. Sovrano (Padova, Università, Padua, Italy), R. Camporese, and G. Scalabrin (CNR, Laboratorio per la Tecnica del Freddo, Padua, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 734-738. 6 refs. Research supported by the Consiglio Nazionale delle Ricerche.

A80-33538 **On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings.** F. Meunier, B. Mischler (Paris XI, Université, Orsay, Essonne, France), J. J. Guilleminot, and M. H. Simonot (Dijon, Université, Dijon, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 739-743. Commission of the European Communities Contract No. 524-78-1-ESF.

It is noted that an important problem in solar cooling is the temperature of the heat sink. It is shown that the zeolite 13X-H2O cycle allows for an air cooled heat sink. Attention is also given to the need for providing cooling of the buildings as well as hot water in summer and heating in the winter. A solution is suggested which uses an intermittent cycle in order to solve these problems. M.E.P.

A80-33539 **A direct solar-heated R22-DMF absorption refrigerator.** I. Takeshita and S. Hozumi (Matsushita Electric Industrial Co., Ltd., Moriguchi, Osaka, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 744-748.

Testing was undertaken on a solar absorption air conditioning system comprising a combined solar collector, refrigerant vapor generator and solution heat-exchanger. Fluorocarbon R22 was used as the refrigerant and n,n-dimethylformamide as the absorbent. The results show that the thermal COP of the absorption refrigerator is 0.51 - 0.53 and the system COP is 0.23 - 0.24. The cooling effect is about 1800 kcal/h for an insolation of 700 - 800 kcal/sq mh and the effective collector area of 10.6/sq m. (Author)

A80-33540 **Theoretical and experimental investigations of an intermittent solar refrigerator.** A. Venkatesh, V. Sriramulu, and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 749-753. 8 refs.

A80-33541 **Reducing solar costs with the Solar-Assisted-Templifier.** A. Weinstein and G. J. Van Zuiden (Westinghouse Electric Corp., Falls Church, Va.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 757-761.

The concept of a solar-assisted heat pump is based on the assumption that it is more efficient to collect solar energy at lower temperatures (40-120 F) and then boost it to the required temperature with a heat pump. The Solar-Assisted-Templifier, a series solar heat pump system capable of meeting heating loads requiring temperatures up to 220 F, is shown to reduce collector area and initial costs up to 50%, generate after-tax rates of return in excess of 8%, and reduce payback periods to less than 10 years. V.L.

A80-33542 **A design method for parallel solar-heat pump systems.** J. V. Anderson, J. W. Mitchell, and W. A. Beckman (Wisconsin, University, Madison, Wis.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 763-766. 5 refs. Research supported by the U.S. Department of Energy.

A procedure has been developed for predicting the thermal performance of a parallel solar-heat pump system for residential space and water heating. The performance of the system is calculated first using a method such as that of the f-chart (Beckman, et al., 1977). The remaining portion of the load that is met by the heat pump is determined from calculations based on the bin method for a heat pump only system. The procedure accounts for the interaction of the two systems to yield the performance of the combined system. The predicted results are compared to those from detailed simulations, and are found to agree to within 2 percent. (Author)

A80-33543 **Economics of solar-assisted heat pump heating systems for residential use.** W. F. Bessler and B.-C. Hwang (General Electric Co., Schenectady, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 767-771. Contract No. EG-78-C-03-1719.

A80-33544 **Comparison of combined solar heat pump systems to conventional alternatives.** P. J. Hughes, J. H. Morehouse (Science Applications, Inc., McLean, Va.), and T. Swanson (Mueller Associates, Inc., Baltimore, Md.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 772-776. 20 refs. Contract No. DE-8C04-78CS-34261.

This analysis is distinguished from past studies by the method of thermal and economic comparison. Since the purpose of space conditioning equipment is to provide thermal comfort, models have been formulated to force this requirement on all systems. The thermal performance maps (fraction of the load met with free energy vs. collector area) presented herein include the effects of the comfort requirement and of parasitic energy consumption for blower and pump operation. Economic comparisons are made after sizing collectors and storage for the combined solar heat pump systems; the sizing technique establishes a thermal design point for each system. This, combined with life cycle cost analysis, allows collector cost goals to be established which, if met, would allow combined solar heat pump systems to compete with conventional alternatives. (Author)

A80-33545 **A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis.** A. Cocchi, G. Raffellini (Bologna, Università, Bologna, Italy), and V. Stopponi (Industrie Merloni Fabriano, Fabriano, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 777-781. 5 refs.

A80-33546 **A comparative study of solar assisted heat pump systems for Canadian locations.** M. Chandrashekar, N. T. Le, H. F. Sullivan, and K. G. T. Hollands (Waterloo, University, Waterloo, Ontario, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 782-786. Research supported by the Canadian Electrical Association.

The feasibility of solar assisted heat pump systems for space heating and domestic hot water preheating in Canada is examined by simulating the performance of these systems on a computer using WATSUN. Simulations are carried out using meteorological data for seven representative Canadian cities, two different building types, and six types of system configurations. Results of the study show that the solar assisted heat pump systems conserve significant amounts of energy over resistance heating and heat pump systems. On the life cycle unit cost basis, solar assisted heat pump system costs are relatively insensitive to location. Liquid based dual source solar assisted heat pump systems are found to be cost effective over resistance heating (but not over an air-to-air heat pump) system at some of the locations for multiplex units. They are not cost effective for single family dwellings at the present time. (Author)

A80-33547 **Computer simulation of ground coupled storage in a series solar assisted heat pump system.** J. W. Andrews and P. D. Metz (Brookhaven National Laboratory, Upton, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 787-791. 7 refs. Research sponsored by the U.S. Department of Energy.

A quantitative study of the effect of thermal coupling between the ground and the heat storage element of a series solar assisted heat pump system is presented. The transient simulation computer program TRNSYS is used to simulate the solar portion of this system. A program to simulate the thermal interaction of the storage element with the ground is incorporated into TRNSYS as a sub-routine. This program calculates heat flow through the ground in discrete steps over space and time. Boundary conditions are established. The ground coupled storage is driven by thermal inputs from the solar portion of the system and from the changing ambient and ground temperatures. (Author)

A80-33548 **Heat pump impact upon solar collection design and cost.** J. W. Andrews (Brookhaven National Laboratory, Upton, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 792-796. 9 refs. Research sponsored by the U.S. Department of Energy.

Required collector area in series solar assisted heat pump systems is determined for three cities as a function of collector performance characteristics and compared with systems in which the solar-derived heat is used directly. Effect on system performance of improvements in heat pump performance is discussed. A cost vs yield analysis of several existing collectors is performed. (Author)

A80-33549 **Earth coils and geo-thermal wells used as solar energy storage devices.** J. E. Bose (Oklahoma State University, Stillwater, Okla.), C. W. Ledbetter (A.C. Service Co., Stillwater, Okla.), and J. R. Partin (Geo-Systems, Inc., Stillwater, Okla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 797-801. 9 refs. Contract No. EM-78-S-01-4257.

A field demonstration laboratory using unprepared earth as a heat/sink storage device has been designed, constructed, and operated successfully during the 1977-78 winter, the 1978 summer, and the 1978-79 winter months. A 1,000-foot earth coil system was operated during the 1977-78 and 1978-79 winters and provided the necessary heat source for a commercial, 27,000 Btu/Hr. heat pump. The test provided base line data to determine earth coil lengths for sustained operation without solar input. A 250-foot geo-thermal well was drilled and used as a heat rejection system during the 1978 summer season and as a heat source during the 1978-79 winter season. The 250-foot well was used as a heat storage device for a 200 sq ft solar system and as the heat source for a 33,000 Btu/Hr. heat pump. The study has shown that both systems, earth coils and geo-thermal wells, provide excellent heat storage devices for solar energy since temperature drawdown which occurs over long, sustained operation can be minimized. (Author)

A80-33550 **A solar assisted heat pump experiment.** A. Cordier, A. Dreuil, and G. Gessinn (Toulouse III, Université, Toulouse, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 802-806. 6 refs.

A heat pump whose evaporator is made up of a series of solar collectors has been operating for three years at the University of Toulouse (France). A description is given of the solar collectors used, which have neither glass nor insulation, and a comparison is made between the experimental results obtained and the predictions of a mathematical model. This model is then used to study a solar heating system with heat pump whose evaporator is fed with water circulating in collectors having neither glass nor insulation. (Author)

A80-33551 **Some performance characteristics of the UNIMELB air source solar boosted heat pump system.** W. W. S. Charters (Melbourne, University, Melbourne, Australia) and C. W. Dixon. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 807-811. 6 refs. Research supported by the Electrical Research Board and Australian Research Grants Committee.

The University of Melbourne Solar Boosted Heat Pump combines solar technology and heat pump technology in a single flat plate evaporator heat pump unit using Freon 12 as the working fluid. By collecting the solar energy incident on the unit at high effectiveness as the evaporator collector plate operates just above or below ambient temperature and adding this to the ambient air heat exchange, this unit provides a performance level about twice that of the same heat pump unit at the same operational temperature differential with the plate shaded. In addition, the outdoor flat plate evaporator is design optimized to operate using natural convection thereby eliminating the need for an outdoor fan. This provides cost savings and also ensures a quieter operation of the unit. Reverse cycle operation of the unit gives a capability for air conditioning as well as the direct heating capacity allowing better utilization of the installed equipment on an annual basis for most climate zones. (Author)

A80-33552 **Experimental performance study of a series solar heat pump.** E. A. Kush (Brookhaven National Laboratory, Upton, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 812-816. 5 refs. Research sponsored by the U.S. Department of Energy.

The results of the tests of a residential size liquid-to-liquid heat pump assembled from off-the-shelf components are reported. The results indicate that an increased coefficient of performance is obtained at evaporating temperatures as high as 96 F by using variable compressor speed, large heat exchangers, and proper selection of expansion device. The results apply also to heat pump nonsolar sources, such as reclaim or geothermal heat. V.L.

A80-33554 **Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate.** D. W. Spencer, B. Murphy, J. Healey, and R. Stewart (New York, State University, Albany, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 830-833. Research supported by the New York State Energy Research and Development Authority.

A80-33555 **Development of an effective solar fraction.** L. Palmiter (National Center for Appropriate Technology, Butte, Mont.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 843-846.

The concept of effective solar fraction is developed as a correction to the conventional solar fraction. The effective solar fraction accounts for solar system coefficient of performance, auxiliary system efficiency, area and U-value of wall replaced by the solar system. The effective solar fraction makes it possible to compare solar space heating systems of any type and is directly related to dollar and energy savings. The proposed concept is illustrated by examples. V.L.

A80-33556 **Real time identification of parameters in building models.** D. K. Hays (Solar Environmental Engineering Co., Fort Collins, Colo.), B. W. Parkinson (Rockwell International Corp., El Segundo, Calif.), and C. B. Winn (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress,

Atlanta, Ga., May 28-June 1, 1979. Volume 1.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 847-851. 5 refs.

A method for identifying various physical parameters of a building in real time has been developed. This method is directly applicable to improved control strategies for space heating and system performance evaluation. The development as well as the results of computer simulations of the identification techniques are presented. (Author)

A80-33557 **Adaptive control for a multiple tank, multiple temperature solar energy storage system.** L. F. Jesch and A. Zekios (Birmingham, University, Birmingham, England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 852-856. 13 refs. Research supported by the Bournville Village Trust.

A closed-circuit solar water system with a microprocessor-based programmable control is presented. The system has two sets of transparent plastic collectors with a total surface area of 120 sq m, two external heat exchangers, two insulated dump tanks, three separate storage tanks, and four sets of variable flow rate pumps. The programmable control system performs logging and command functions and is capable of adapting the scanning rate and limiting values to the changing needs of the operating conditions. V.L.

A80-33558 **Mass flow considerations for solar air heating systems.** T. A. Newell, S. R. Swanson, and R. F. Boehm (Utah, University, Salt Lake City, Utah). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 857-861. 10 refs.

This paper presents the results from a computer simulation study of the mass flow rate effect in solar air collector/rock bin storage systems. The results show that there can be a fairly wide range of mass flow rates in a solar air heating system over which the system's performance does not vary significantly. Two aspects of a solar air heating system are shown to contribute to the system's performance insensitivity to mass flow rate. The implications of a solar air heating system's mass flow rate has a direct impact on the economic and design considerations of the system. (Author)

A80-33559 **Solar heating systems in Scandinavian climate - Reality or daydreams.** V. Girdo (Kungl. Tekniska Hogskolan, Stockholm, Sweden). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 863-867.

The paper considers solar heating system in the Scandinavian climate, covering the energy requirements for buildings and the efficiency of solar radiation in Sweden. It is expected to save up to 0-0.5 TWh/yr up to 1985 and about 8-12 TWh/yr up to 1995, with the total energy consumption for Swedish buildings of about 170 TWh gross/yr. The heat from local solar heating systems should cost 0.07-0.09 S/kWh with 100% of self-sufficiency. This may mean that the costs for solar heating systems will be at least double the costs of conventional heating systems. A.T.

A80-33560 **A survey of existing solar system simulation methods.** P. L. Versteegen (Science Applications, Inc., McLean, Va.) and D. E. Cassel (Mueller Associates, Inc., Baltimore, Md.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 869-873. Contract No. DE-8C04-78CS-34261.

A survey was made of various analysis methods that exist for the design and study of solar heating and cooling systems, both for buildings and agricultural and industrial process applications. The survey includes analysis techniques for both active and passive solar systems. The survey is divided in two categories of methods: the computer methods that require a large-scale or mini-computer, and hand methods under which is listed everything else. The various methods were analyzed and their capabilities and characteristics displayed in a series of tables. (Author)

A80-33561 **Solar heating simulation - Accuracy and precision of a model using daily data.** A. E. McGarity (Swarthmore College, Swarthmore, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 879-883. 6 refs.

A80-33562 **The layout of solar hot water systems, using statistical meteo- and heat demand data.** P. Kesselring and A. Duppenthaler (Zürich Eidgenössische Technische Hochschule, Würenlingen, Switzerland). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 884-888.

A80-33563 **Simulation of the FSEC solar cooling system.** H. Klee (Central Florida, University, Orlando, Fla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 889-893.

A TRNSYS simulation of the Florida Solar Energy Center solar cooling system was developed. The simulation is site specific incorporating all appropriate building thermal characteristics, system control logic and one month's measured weather data at the center. A simulation summary provides complete information about solar fraction, average collector efficiency, average room temperature, etc., in order to evaluate system performance. (Author)

A80-33564 **User perspectives of selected solar energy system design tools.** T. T. Lewis, G. P. Toomey, and T. L. Webster (PRC Energy Analysis Co., McLean, Va.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 895-899.

The paper presents solar energy system sizing methods which are classified by levels of complexity into four groups: (1) handbook calculation methods, (2) hand-held calculator methods, (3) simplified computer program methods, and (4) detailed computer program methods. The handbook and calculator methods should be used for preliminary sizing and initial estimates. The simplified and detailed computer methods are suitable for final design and parametric studies provided they are applied to the standard systems on which the program methodology is based. All methods are sensitive to user load inputs. V.L.

A80-33565 **Study of the nonlinear dynamics of a flat-plate collector.** A. J. De Ron (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 900-904. 5 refs.

For the design and control of a solar collector, knowledge of its nonlinear dynamics may be very important. It is demonstrated that simulations using a complete nonlinear model confirm the tentative conclusions obtained by analysis of a linearized model. The study results in a hybrid collector model: linear for insolation changes, nonlinear for flow changes. The influence of the wind speed and ambient temperature are ignored because these are small compared with the influences caused by the insolation and the flow. It is concluded that the transient effect, as defined in the literature, is almost only a nonzero effect for flow variations. (Author)

A80-33566 **The Saskatchewan Conservation House - A year of performance data.** R. W. Besant, R. S. Dumont, and G. J. Schoenau (Saskatchewan, University, Saskatoon, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 907-911. 5 refs.

The Saskatchewan Conservation House, completed in 1977, is a residence designed to provide 100% solar space heating in a cold climate. Heating is primarily by passive solar gain and internal heat generation from normal electricity usage and from people. The performance of the house is reviewed over the period starting from January 1978 to the present date. V.P.

A80-33567 **Honeywell General Offices concentrating collector system - Installation and operation.** R. C. Gee (Solar Energy Research Institute, Golden, Colo.) and P. D. Kruger (Honeywell Energy Resources Center, Minneapolis, Minn.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 912-915.

The paper describes a solar energy system for Honeywell's General Offices in Minneapolis, Minn. Consideration is given to solar cooling, heating, solar domestic hot water, and thermal storage. System installation and operation problems are discussed. V.T.

A80-33568 **A manufactured solar home.** M. P. Scofield, A. S. Lau, K. H. Liebelt (Idaho National Engineering Laboratory, Idaho Falls, Idaho), and N. R. Shinn (Boise Cascade Corp., Boise, Idaho). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 916-918.

The paper deals with an active solar heating and cooling system installed in two nearly identical solar houses. The system uses simple air collectors, rock storage, and a heat exchanger to preheat hot water. Summer cooling is provided by blowing cool night air through the rock bed and then circulating house air through the cool rocks. V.P.

A80-33569 **Report on five years of operating experience with four pioneer school heating experiments.** L. O. Herwig and E. Doering (U.S. Department of Energy, Solar Energy Div., Washington, D.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1 Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 919-923.

The four 'proof-of-concept' school heating experiments undertaken in 1974 are chronicled and analyzed. It is shown that these large-scale user-oriented projects have met a wide range of general objectives, including projected system performance requirements for thermal energy production. V.P.

A80-33570 **Solar heating and cooling performance in CSU Solar House III.** D. S. Ward and H. S. Oberoi (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 928-932. Research supported by the U.S. Department of Energy.

A80-33571 **Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report.** T. M. Conway, W. S. Duff, G. O. G. Löf, and R. G. Pratt (Colorado State University, Fort Collins, Colo.). In Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 933-937. Research supported by the U.S. Department of Energy.

A80-33572 **The operation results of the Yazaki Experimental Solar House One and the Ishibashi Solar House.** T. Ishibashi (Yazaki Shigen Co., Ltd., Hamamatsu, Shizuoka, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 938-942.

A80-33573 **Solar heating and hot water supply system of Fuji Electric Solar House.** M. Nishio and S. Sugiura (Fuji Electric Co., Ltd., Yokosuka, Kanagawa, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 948-952.

A80-33574 **Analysis of solar water heating systems.** W. E. Buckles, S. A. Klein, and J. A. Duffie (Wisconsin, University, Madison, Wis.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 959-963. 8 refs.

Several different types of solar domestic water heating systems have appeared on the market during the past few years. The paper presents a study of the comparative performance of four common types of solar domestic water heating systems: (1) single tank/external heat exchanger; (2) double tank/external heat exchanger; (3) single tank/internal heat exchanger; and (4) double tank/internal heat exchanger. The purpose of this study is to determine the applicability of the F-chart method to the design of the various types of solar water heating systems now available. A simulation approach is chosen to investigate the thermal performance of the four types of representative systems. It is shown that the F-chart method, as modified to account for auxiliary energy losses, can be used to provide estimates of the long-term average performance of all four systems, even though it was derived for the two tank/external heat exchanger system. S.D.

A80-33575 **Design and evaluation of solar installation workshops and the HUD solar DHW installation guidelines.** P. Hollander and M. O'Neill (Franklin Research Center, Philadelphia, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 964-966.

A80-33576 **Performance vs prediction for four classes of solar hot water systems.** J. G. Bergman (Delaware, University, Newark, Del.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 967-971.

The paper reports on a project whose major goal was to assess the performance of four actual solar heat water systems and to do so in a manner which would permit meaningful comparisons with F-chart (or similar) predictions for long-term behavior. To accomplish this objective, the actual daily performance of each system is successfully characterized using multiple regression techniques, and these performances are then extrapolated for comparison with the values predicted by the F-chart. A schematic which outlines the methodology is given. The methodology is rather a tool whereby daily measured performance can be interpreted and extrapolated to yield estimates for average long-term solar fraction. This methodology also permits one to quickly assess the effects of system modifications on long-term performance. S.D.

A80-33577 **Experimental system performance and comparison with computer predictions for six solar domestic hot water systems.** A. H. Fanney and S. T. Liu (National Bureau of Standards, Thermal Solar Group, Washington, D.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 972-976. Research sponsored by the U.S. Department of Energy.

The paper considers the experimental system performance of six solar domestic hot water systems and compares it with computer predictions. Three computer programs, F-chart, SOLCOST, and TRNSYS, are utilized for the design of solar space heating and domestic hot water systems; the accuracy of their predictions must be verified with experimental data, and this paper describes the test facility and the experimental results and compares them with the computer predictions for the first eight months of the operation. A.T.

A80-33578 **The thermal performance of solar water heaters in the UK.** J. L. J. Rosenfeld (Shell Research, Ltd., Thornton Research Centre, Chester, England). In: Sun II; Proceedings of the

Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 977-981. 5 refs.

As a contribution to the preparation of a code of practice by the British Standards Institution technical committee on solar water heaters, the long-term thermal performance of domestic solar water heaters has been estimated, using a computer program developed at Thornton Research Centre. This model is described, and results are presented showing the effect on thermal performance of varying some system parameters. The results are consistent with those obtained by others using models incorporating different kinds of approximations, and with the scant experimental data. (Author)

A80-33579 **Mean monthly performance of solar water heaters with natural circulation.** M. Daneshyar (University of Technology, Isfahan, Iran). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 983-987. 7 refs. Research supported by the Ministry of Science and Higher Education of Iran.

The predictions of the transient performance of a natural circulation solar water heater obtained by a theoretical method have been compared with experimental data. The comparisons have shown that transient and final system temperatures can be predicted with an accuracy of about 10%. The prediction method has, therefore, been used in order to study the mean monthly performance of a natural circulation solar water heater with no drawoff at a particular location, and the predicted instantaneous values of the mean storage tank temperatures and collection efficiencies for a mean day of each month are presented and discussed. (Author)

A80-33580 **Solar plus waste heat recovery hybrid water heating system.** E. T. Pitkin (Connecticut, University, Storrs, Conn.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 988-992.

The potential of combining heat recovery from waste water with a solar hot water system is examined via computer simulation. The simulation program is first verified by comparison with data from a real solar water heater. It is then used to show that approximately one third of domestic water heat can be obtained from waste hot water. (Author)

A80-33581 **Design of the solar water heater system for TVA's Memphis Initiative.** T. M. Carney (Tennessee Valley Authority; Tennessee, University, Chattanooga, Tenn.) and F. R. Robertson (Tennessee Valley Authority, Knoxville, Tenn.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 993-997.

The design constraints imposed on solar water heaters by requiring off-peak electrical auxiliary power are described. A two-tank system satisfying these constraints is proposed, and components are sized using the FCHART simulation and a life cycle return criterion. Experimental confirmation of the off-peak auxiliary performance is included. The system resulting from this study is being used in TVA's Memphis Initiative. (Author)

A80-33582 **Membrane stratified solar ponds.** J. R. Hull (Iowa State University of Science and Technology; U.S. Department of Energy, Ames Laboratory, Ames, Iowa). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1000-1004. 12 refs. Research supported by the Iowa State University of Science and Technology and U.S. Department of Energy.

The membrane stratified solar pond is a body of liquid utilizing closely spaced transparent membranes to quench convective heat transfer in the top part of the pond. Several suitable pond liquids and membrane materials are discussed. Conditions for suppression of convection are described for several membrane geometries, and radiation transmission is discussed for the horizontal sheet configuration. Thermal behavior is similar to that of salt gradient solar ponds, but much deeper heat storage layers are feasible. In some cases aquaculture farming may be suitable in the storage layer. (Author)

A80-33583 **Construction and initial operation of the Miamisburg salt-gradient solar pond.** R. S. Bryant (Miamisburg City, Parks and Recreation Dept., Miamisburg, Ohio), R. P. Bowser, and L. J. Wittenberg (Monsanto Research Corp., Miamisburg, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1005-1009. 10 refs. Contract No. DE-AC04-76DP-00053.

The construction and operation of the largest salt-gradient solar pond is examined. The pond is 2020 sq m in area and was installed for $35/sq m. A new technique was successfully demonstrated for the formation of the gradient zone in which fresh water was injected horizontally below the surface of the concentrated salt solution; without any useful heat removed, the storage layer water of 18.5% NaCl reached a temperature of 51.1 C and a minimum temperature of 28.4 C. The projected heat cost is 2.5 cents/kW-hr based on amortization of 10% per year. A.T.

A80-33584 **Control of gradient zone boundaries.** C. E. Nielsen (Ohio State University, Columbus, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1010-1014. 9 refs. Research supported by the Ohio State University and U.S. Department of Energy.

The role of zone boundaries in salinity gradient solar pods is reviewed and the factors influencing boundary equilibrium are discussed. It is pointed out that the equilibrium positions of boundaries can be substantially changed without loss of internal gradient zone stability. Such changes are brought about by modifying the salinity profile through the use of liquid injection and transfer procedures adapted from earlier injection experiments. Given a well-defined process combining diffusion and liquid injection or transfer, the equilibrium salinity profile is readily calculated. A continuous liquid injection procedure is described that modifies the salinity profile and changes the salinity gradient at zone boundaries. It is shown qualitatively that injection produces the expected gradient modification. S.D.

A80-33585 **Salt concentration gradient solar ponds - Modeling and optimization.** T. S. Jayadev and J. Henderson (Solar Energy Research Institute, Golden, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1015-1019.

The paper discusses a computer simulation program, SOLPOND, for predicting the thermal performance of salinity gradient solar ponds. Finite element techniques are used to model pond thermal performance, and the program is structured to perform discrete time solutions. This program is used for several illustrative examples. Simulation results highlight pond sensitivity to seasonal load profile, storage layer depth, and optical transmission through the salt solution. Thermal losses through the pond edges are evaluated for several pond sizes and found to be significant for ponds as large as 100 m. A simple economical optimization technique to maximize delivered energy per capital cost is also presented. S.D.

A80-33586 **The development and demonstration of a solar pond for heating greenhouses.** T. H. Short, P. C. Badger, and W. L. Roller (U.S. Department of Agriculture, Ohio Agricultural Research and Development Center, Wooster, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1021-1025. 9 refs.

The paper describes a solar pond for demonstrating space heating of a commercial greenhouse. Another greenhouse of the same size and shape was heated with natural gas and compared with the solar-pond-greenhouse system. The solar pond was tested and modified to improve its efficiency and a polystyrene-pellet nighttime insulation is being developed for large greenhouses. This new combination is projected to provide all the greenhouse heat by passive and active solar technology, but some solar operational problems still exist. A.T.

A80-33587 The physics of a saturated $\mathrm{Na_2O.2B_2O_3.10H_2O}$ non-convecting solar pond. T. L. Ochs and J. O. Bradley (Nevada, University, Boulder City, Nev.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1026-1028.

A80-33588 The application of shallow solar ponds for industrial process heat - Case histories. A. B. Casamajor (California, University, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1029-1032. 5 refs. Contract No. W-7405-eng-48.

The shallow-solar-pond collector system developed by the Lawrence Livermore Laboratory is approaching commercialization. Three prototype or demonstration projects, Sohio Petroleum Company, Sweet Sue Kitchens, and Fort Benning, are described. A critique of each project points out the significant factors that affect the individual projects and shallow-solar-pond technology in general. Particular attention is drawn to problems encountered and solutions proposed. Finally, possible marketing organization and strategies are discussed. (Author)

A80-33589 Solar energy system with heat pump augmentation for industrial process heat - An update. H. F. Schuler, D. F. Rost, and G. Ameduri (General Extrusions, Inc., Youngstown, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1034-1036.

In September, 1977, General Extrusions completed installation of a solar energy system with heat pump augmentation to furnish power for a cleaning tank in their aluminum anodizing line. The array was 100 modules (304 sq m) of their Model LTC-367 Solar Collector and the heat pump was a Westinghouse Templifier TBP060. During the last 261 days the solar system has been operated 83 days supplying energy to the process. 31 days of potential operation were missed as the plant operated on a five day a week schedule much of the time. A mini-computer-based energy monitor system is under construction for this solar system and will give detailed operational results as well as automatic control. (Author)

A80-33590 Operation of an industrial solar drying system. E. J. Carnegie, P. W. Niles, and W. B. Stine (California Polytechnic State University, San Luis Obispo, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1037-1041. 6 refs. Contract No. EY-76-C-05-5123.

The paper describes a solar hot air raisin and prune drying system in Fresno, Calif. The solar heating system consists of 1951 sq m of solar collectors, a 396 sq m rock storage facility, and a heat recovery unit. The operation of this system is described, and the actual operation is compared on a day-to-day basis to a computer simulation program used in the analysis and design of this project. It was concluded that this system will produce more energy then required to build it, and will pay back its cost within 11 to 17 years. A.T.

A80-33591 Application of solar energy to food industry - A distillery. F. Moisan (CNRS, Paris, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1042-1045.

The use of concentration collectors will permit to produce steam for various industrial processes, especially in the food industry. A project, presently developed in France, is applied to a distillery; 5000 sq m of collecting area will save 360 tons of fuel per year; the cost of collectors, if they are mass produced, will permit the competitivity of solar heat versus fuel at middle term. (Author)

A80-33592 A prototype of solar linear concentrators plant installed to supply industrial heat. O. A. Barra, E. P. Carratelli (Calabria, Università, Arcavacata, Italy), and A. Barutti (Ansaldo Dim/Isol, Cornigliano, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1046-1050. 9 refs. Research sponsored by the Birra Peroni Italian Factories.

A 50 sq m solar linear concentrator plant with cavity boilers has been realized in a brewery to evaluate the applicability of using solar energy to supply industrial process heat in the 120-300 C range. The aims of this plant include the experimental testing of a mathematical computer model to obtain a general computer code simulating the heat and mass transfer phenomena in the plant, measuring the plant and cavity boiler photothermal conversion efficiency, and solving the problems arising from the joining of the solar plant with the preexisting brewery water-steam network. Linear parabolic concentrators which track the sun were used, having mirrors with an 0.86 reflectivity; the plant is used to overheat pressurized water before entering the traditional boilers for vaporization. Preliminary experimental results indicate that thermal losses from the Cu pipes are strongly dependent on atmospheric conditions, necessitating the soldering of the pyrex glass and the Al-Fe boiler envelope. J.P.B.

A80-33593 Solar energy for kilning malt. C. C. Smith (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1051-1055. Research supported by the Fleischmann Malting Co.

A technical and economic feasibility study was conducted at Colorado State University on the use of solar energy for kilning malt. The study showed that an economic optimum results when the kiln cycle peak demand coincides with the maximum solar output. Therefore the objective of the system design study was to maximize the use of solar supplied heat by scheduling kilning operations with regard to the diurnal solar period. (Author)

A80-33594 Solar heat generation for industrial process heating applications. W. R. W. Read (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Highett, Victoria, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1056-1060.

The use of solar energy for industrial applications is discussed, including characteristics of industrial systems, design approaches, and the results of two demonstration programs. A solar energy system consisting of 94 sq m of double-glazed collectors mounted in a series-parallel arrangement and connected by a heat transfer loop to a 20 cu m storage tank was used for can warming at a soft drink manufacturing plant. Data taken over an 18-month period show collector efficiency of 32% and utilization efficiency of 72%. A second system of 178 sq m of double- and single-glazed collector units were used to provide some of the heat for beer pasteurizing. Data for the four months of January to April, 1979, indicate monthly solar energy utilization efficiencies of 75%, 66%, 63%, and 53%. It is concluded from these programs that solar heat generating systems can be successfully integrated with suitable industrial process heating applications. J.P.B.

A80-33595 * The Point-Focusing Thermal and Electric Applications Project - A progress report. A. T. Marriott (California

Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1062-1066. 9 refs. Research supported by the U.S. Department of Energy.

The paper discusses the Point-Focusing Thermal and Electric Applications Project which encompasses three primary activities: (1) applications analysis and development, in which potential markets for small power systems (less than 10 MWe) are identified and characterized in order to provide requirements for design and information for activities relating to market development; (2) systems engineering and development, for analyses that will define the most appropriate small power system designs based on specific user requirements; and (3) experiment implementation and test, which deals with the design and placement of engineering experiments in various applications environments in order to test the readiness of the selected technology in an operational setting. Progress to date and/or key results are discussed throughout the text. S.D.

A80-33596 **Small solar plants for electricity supply.** J.-P. Durand and L. Pirot (Société d'Etudes Thermiques et d'Energie Solaire, Montargis, Loiret, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1067-1071.

By describing the solar project for Diakhao in Senegal, Western Africa, this paper introduces the present stage of technology developed by SOFRETES. Taking in account the environment of remote areas of this part of the world and the technology based on practical applications, a low temperature solar thermal conversion technology is used including flat plate collectors, hot water, thermal storage and Rankine cycle thermal loop. This paper describes the demand for electricity of a small African community (Diakhao) and the solar technology selected to satisfy this demand. Components and their integration in the system are described. Factory tests are planned to take place at the end of this year. The Diakhao solar plant will be under operation in 1980. (Author)

A80-33597 **The International Energy Agency Small Solar Power Plants Project.** A. C. Kalt (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Cologne, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1077-1081.

The SSPS Project (Small Solar Power Systems Project) includes the design and erection of two solar power plants of different technical concepts, on the same site, with a view toward evaluating and comparing the relative economic viability of such plants. One plant is a distributed collector system and the other a central receiver system. Objectives and design goals of the SSPS Project are presented, followed by a discussion of basic technical specifications and of technical design baseline. The two plants are to be built on a common site near Almeria, southern Spain. S.D.

A80-33598 **Performance and cost optimisation of small solar power stations.** J. E. Feustel (Maschinenfabrik Augsburg-Nürnberg AG, Munich, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1082-1086.

Small solar farm power systems using parabolic trough collectors and power conversion systems following the Rankine principle are discussed. Overall system efficiency is considered in terms of the selection of optimum operational temperature, storage size, and design day; it is noted that collector field efficiency drops with increasing temperature, while power conversion efficiency increases with higher temperature. Attention is also given to optical, thermal, and transmission losses with regard to the collector field, and a two stage screw expander in the 100 kW range is described with regard to the prime mover cycle. The planning and realization of a number of solar farm projects in the 50-500 kW range, as well as the development of a combined solar power-diesel power station are also discussed. J.P.B.

A80-33599 **30/50 kWE solar thermal power plant of the distributed type.** R. Koehne (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für technische Physik, Stuttgart, West Germany) and M. Kraft (M.A.N.-Neue Technologie, Munich, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1087-1089.

A joint project between M.A.N., Germany and AUXINI, Spain is presented which describes a small solar thermal power plant of the distributed type delivering a maximum electric power output of 30 kW and 50 kW resp. if a storage is used additionally to the collector field. The plant built up at Getafe near Madrid, Spain, consists presently of a first collector field with parabolic trough collectors mounted rigidly on a platform which is tracked azimuthally. Collector system efficiencies have been measured and are compared with theoretically predicted values from a transient simulation model. Different temperature spreads and inlet temperatures (between 60 . . . 240 C) are investigated and some results of the measured collector system efficiencies regarding also the influence of dust covers on the glass mirrors are given. (Author)

A80-33600 **The Ansaldo 35 kW solar power system.** G. Bado, G. Tomei (Ansaldo S.p.A., Genoa, Italy), T. Angelino, M. Gaia, and E. Macchi (Milano, Politecnico, Milan, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1090-1094.

The conceptual design of a 35 kW solar power system based on the use of linear concentrating collectors is presented. Each collector module consists of two parabolic troughs capable of both elevational and azimuthal alignment. The thermal engine of the system is an organic fluid (perfluorocarbon) multistage turbine prime mover with an efficiency of 25% at 300 C collectors' cooling loop exit temperature. The system is designed for stand alone and for grid-connected operation and, if requested, for the combined generation of power and heat. (Author)

A80-33601 **Research and development on solar energy for electric and mechanical power generation.** R. Almanza, J. Garibay, S. López, F. Muñoz, and R. Zárate (Universidad Nacional Autónoma de México, Mexico City, Mexico). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1095-1099. 8 refs.

A review of the development of solar energy for electric and mechanical power generation is presented. The first thermal mechanical conversion system under study is a device of 1/2 kW made of focusing collectors which follows the sun during the day. The system consisting of 24 sq m of collectors uses steam as a working fluid, and it is connected to a piston engine. A new system has been started to generate 35 kW which will consist of about 1000 sq m of parabolic collectors with an absorption tube of Cr(x)O(y). A.T.

A80-33602 **Small solar thermal power plants.** G. Prast (Philips Gloeilampenfabrieken, Philips Research Laboratories, Eindhoven, Netherlands). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1100-1104.

The most important use of small solar thermal power plants is expected to be in the rural areas of developing countries, where power for irrigation is an essential need. A solar power plant of a few kW capacity needed for this purpose must have a very high reliability, as for such units hardly any service will be available. An attempt is being made to develop a solar thermal power plant which attains pertinent requirements. The discussion focuses on a short description of the system, the collector system, the Sterling engine, and the latent heat storage system. It is shown that it is possible to construct small solar thermal power systems by collecting heat with focusing collectors, storing the heat for short periods in a latent heat storage, and transforming the heat with a free-piston Sterling engine. S.D.

A80-33603 **Midtemperature Solar Thermal Systems Design Handbook - Parabolic troughs.** R. W. Harrigan (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1106-1110.

This paper outlines ongoing efforts at Sandia Laboratories (SLA) to develop a Solar Thermal System's Design Handbook. The handbook deals, at this time, only with parabolic trough collector systems operating up to 315 C (600 F). While useful to anyone doing solar thermal design involving parabolic troughs, the handbook application is primarily aimed at commercial Architectural and Engineering firms. Publication of the handbook is anticipated for the Fall 1979. Updating of the handbook is expected to occur continuously as the rapidly developing solar technology matures. (Author)

A80-33604 **Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe.** G. Mordchelles-Regnier, G. Dahan, and J.-L. Boy-Marcotte (Société Bertin et Cie., Plaisir, Yvelines, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1111-1115.

The design parameters for a medium-sized (100-1000 kWe) concentrating collector solar thermal power station intended to provide energy with little maintenance and at competitive costs in remote regions are discussed. Consideration is given to the selection of operating temperature, type and degree of solar energy concentration, and thermal engine and organic working fluid, and to system optimization. The parabolic cylindrical collectors with mobile aluminum mirrors rotating around stationary receiver tubes and the Rankine-cycle turbine engines selected for the system are presented. A measured net energy conversion efficiency of 10 percent for the system is noted, and possible industrial applications of the system in the production and recovery of heat are indicated. A.L.W.

A80-33605 **Solar thermal electric power in the range of medium size units - The French programme 'THEK'.** G. Peri, J. Desautel, B. Imbert, M. Audibert, R. Pasquetti, J. P. Battistelli (Aix-Marseille I, Université, Marseille, France), J. Deflandre, and J. P. Traisnel (CNRS, Paris, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1121-1124.

The French THEK program of solar energy utilization is concerned with the design of small heliopower units utilizing the parabolic dish and modular helio-to-thermal converters. The study, design, realization, and experimentation of two full-scale prototype modules using segmented parabolic dishes are discussed. These modules incorporated three types of exchangers differing in shape (semi-cavity and flat), tubing, and material (copper and iron), and two concentration ratios (170 and 230) were tested. Attention is given to the installation of a thermal loop, an automatic system of regulation, and exchanger, and a steam generator. The effects of optical and thermal losses on efficiency are noted, and the use of a better glass for the mirrors and a higher concentration ratio to improve efficiency are considered. S.D.

A80-33606 **A solar thermal-electric experimental plant.** M. Rubeck and W. D. Beverly (Boeing Engineering and Construction Co., Seattle, Wash.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1125-1129.

One approach to generating electricity from solar energy is to employ an open Brayton-cycle in a central receiver type solar thermal-electric power plant. A nine-month study was conducted to develop a conceptual design and definition of an open Brayton-cycle experimental plant of about 1.5 MW electrical output. The paper deals with the assumptions, analyses, and results of the conceptual design effort. The solar plant is assumed to be composed of four subsystems: (1) the collector (or heliostat) subsystem; (2) the receiver subsystem; (3) the electrical power generation subsystem; and (4) the master control subsystem. Attention is given to the parametric analyses and design studies which led to this plant configuration. S.D.

A80-33607 **A self supporting solar power system for an isolated community.** M. J. Bignon (CETHEL, Paris, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1130-1133.

The paper describes a 500 kW self-supporting combined solar-thermal power production system suited to the needs of an isolated community. Attention is given to the solar receiver, the condensing steam turbine chosen for maintenance and operating reasons, and the mirror field comprised of 120 to 150 or more heliostats with a reflecting area of about 54 sq m each. The tracking system is made by computed coordinates, and each heliostat has its own microprocessor to control the position. The dry condenser used for the power production system is considered, as well as the conventional Diesel engine with a generator when power is required for startup, or when the storage is low. Emphasis is placed on economic factors. J.P.B.

A80-33608 **The solar ten megawatt pilot plant.** R. W. Hallet, Jr. and R. L. Gervais (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1137-1140.

The paper describes the system requirements, characteristics, and operating modes of a 10-megawatt solar thermal central receiver pilot plant located in the Mojave desert. The system can be characterized as a surrounded field configuration with radial stagger heliostat layout, capable of generating 10 MWe net directly from insolation, and 7 MWe net from thermal storage. Attention is given to system control utilizing computers, and the capability to orient the reflective surface such that the mirrors can be stowed vertical or inverted, and open-loop control. Requirements for the receiver subsystem are presented, including maximum incident power of about 47 MWt and maximum flux level of 0.31 MWt/sq m. The therma storage subsystem is described, considering the central storage unit, thermal charging loop, and heat-extraction loop. Also discussed is the electrical power generating subsystem which consists of a nominal 12.5 MWe (gross) turbine-generator set, and includes an in-line demineralizer and polisher. J.P.B.

A80-33609 **Thermal fatigue analysis of the Department of Energy Barstow Pilot Plant.** J. F. Jones (Sandia Laboratories, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1141-1145. 6 refs. Contract No. DE-AC04-76DP-00789.

This paper discusses two types of thermal fatigue which might occur in the Department of Energy Barstow Pilot Plant: fatigue due to oscillations of the point of departure from nucleate boiling (DNB) in the once-through boiler and fatigue due to the daily cycling of the plant. The results of the two fatigue calculations indicate that the Barstow Pilot Plant should not have a serious fatigue problem from either DNB oscillations or daily cycling, although the design life does not greatly exceed the desired 30 years. In addition, the possible mitigating effects of tube bending are considered, but it is found that little improvement in fatigue life can be expected from this source. (Author)

A80-33610 **Sodium cooled solar central receiver power station.** T. L. Johnson, L. E. Glasgow, W. B. Thomson, and A. Z. Frangos (Rockwell International Corp., Energy Systems Group, Canoga Park, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1146-1150. Contract No. EG-77-C-03-1483.

A study of a sodium system central receiver-type solar thermal power plant is presented. The sodium system central receiver plant is similar to the water/steam system to be built in Barstow; however, liquid sodium is heated in the receiver at the top of the tower instead of water, and steam is generated at the ground level using sodium-to-water heat exchangers. The economic analysis shows that these plants with storage duration of about 13-hr capability have a busbar energy cost comparable to or less than that for new fossil-fueled electric generating plants. A.T.

A80-33611 **A solar-fossil hybrid power system using a combined cycle.** E. Y. Lam (Bechtel National, Inc., San Francisco, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1151-1155. Contract No. DE-AC03-78ET-21050.

This paper describes a solar central receiver hybrid power system concept which uses a gas turbine/heat recovery steam generator/steam turbine combined cycle to generate electricity from both solar and fossil fuel energy. The concept description dwells primarily on a near term 100 MWe (net) system that utilizes a state-of-the-art combined cycle with a gas turbine inlet temperature of 1093 C (2000 F). This system is implementable in the 1985 time frame. An advanced system that uses an inlet temperature of 1316 C (2400 F) is also described. Performance comparisons of these two systems are given. Major advantages of the system concept as well as its technical issues are highlighted. (Author)

A80-33612 **Assessment of solar hybrid repowering for electric utilities.** D. J. Groves, Jr., J. D. Maddox (Public Service Company of New Mexico, Albuquerque, N.M.), W. R. Lang (Stearns-Roger Engineering Co., Denver, Colo.), and W. G. Parker (Westinghouse Electric Corp., Pittsburgh, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1156-1160. Research supported by the Electric Power Research Institute, Western Energy Supply and Transmission Associates, Arizona Power Authority, Public Service Company of Oklahoma, San Diego Gas and Electric Co., and Tucumcari Power and Light; Contract No. EG-77-C-03-1608.

An assessment of the solar hybrid repowering concept for electric utility application is presented. The concept consists of locating solar hardware connected to existing gas-fueled and oil-fueled electric generation units to displace the fossil fuel used during daylight hours. The market potential was established by a survey of utilities in the southwestern U.S.; a cost benefit analysis indicates that the solar hybrid repowering concept can be attractive for utility applications when compared with conventional electric power generation. A conceptual design was prepared for a 50% solar repowering based on the central receiver concept designed for a 10-MWe pilot plant. A.T.

A80-33613 **Economic implications of a low cost heliostat design.** C. R. Easton and J. B. Blackmon (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1161-1165.

Design and costs of a prototype heliostat for the Central Receiver Solar Thermal Power System are presented and comparisons made with commonly manufactured items. Central receiver thermal energy costs are shown to be competitive with fossil fuels. (Author)

A80-33614 **Utility problems of central tower solar plant in Italy.** D. Borgese and G. Cefaratti (Ente Nazionale per l'Energia Elettrica, Milan, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1167-1171.

A80-33615 **Economic analysis of the STEPS in Japan.** T. Tani, S. Sawata, T. Tanaka, M. Kamimoto, K. Sakuta, N. Ezawa, and T. Horigome (Ministry of International Trade and Industry, Electrotechnical Laboratory, Tokyo, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1172-1176. 6 refs.

The simulation program was developed for the estimation of optimum electrical energy cost of STEPS (Solar Thermal Electric Power System) in Japan using hourly normal solar flux data, various collector area, storage capacities, turbine inlet temperatures and cost model. In Japan, the minimum electrical energy costs of the distributed system and the tower heliostat system were estimated from viewpoints of the collector area, storage capacities and electric capacities. (Author)

A80-33616 **The cost and value of washing heliostats.** E. D. Eason (Sandia Laboratories, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1177-1180. 6 refs. Contract No. DE-AC04-76DP-00789.

An equation is derived for the washing frequency that minimizes cost per unit energy for solar collectors of any type. Central receiver heliostats of two designs are used in an example, and the results for Albuquerque soiling rates show that washing 15-30 times per year is worthwhile. The optimal frequency is directly or inversely proportional to the square root of the relevant parameters, but it is not sensitive to number of collectors or plant size. The frequency for minimum cost per unit energy corresponds to the strategy of washing whenever the value of the extra energy from cleaner mirrors will pay for the cost of the wash. (Author)

A80-33617 **Physical and chemical properties of phase change materials for application in solar tower and solar farm plants.** D. Heine, F. Heess, and M. Groll (Stuttgart, Universität, Stuttgart, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1187-1191. 7 refs.

Latent heat storage materials for use in the temperature ranges 200 to 450 C and 700 to 900 C are investigated with reference to their corrosion resistance against container materials and thermodynamic stability. The mass loss and corrosion rate for the materials applicable in the range 200-450 C differ considerably from each other. The material combinations for 700-900 C have no significant differences in their corrosion rates and are classified as corrosion resistant. The storage media for the temperature range 700-900 C, MgCl2, NaCl, and KF, have been found thermally stable; no changes have been observed within the first 30 cycles. V.L.

A80-33618 **Solar design by the 'Cosine Hour' method.** U. Bossel (Solentec GmbH, Adelebsen, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1195-1198. 6 refs.

A new approach is suggested for the prediction of the solar energy received by surfaces of arbitrary tilt and orientation. The method is based on the 'Cosine Hour' integral. This geometric parameter measures the time-equivalent of solar exposure in units of hours of perpendicular insolation. For any surface and day the number of Cosine Hours becomes directly proportional to the amount of energy received under ideal weather conditions. For partially cloudy skies the 'Cosine Hour' method yields excellent answers when a 3-modal insolation model is used. Surface orientations can be easily optimized with respect to energy collection by inspection methods when the Cosine Hour Tables (Bossel, 1979) are used. (Author)

A80-33619 **Survey of simplified design methodologies for solar heating and cooling systems.** P. J. Hughes and P. L. Versteegen (Science Applications, Inc., McLean, Va.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1199-1202. 25 refs. Contract No. DE-8C04-78CS-34261.

This paper reviews the approaches that have been taken in developing simplified design procedures for assessing the performance of solar heating and cooling systems. The term 'simplified' is indicative of a calculational process that involves simple hand computational tools, such as tables, graphs, equations, and a hand-held calculator. Many methods have been proposed in the literature applicable to the analysis of heating and hot-water systems. Few methods have been proposed for the analysis of cooling systems, passive systems, and photovoltaic systems. Furthermore, few of the methods have been tested extensively against experimental data. This paper provides insight to the basic, underlying assumptions of the proposed methods so that the reader better understands the applicability of each to the performance prediction of various systems. (Author)

A80-33620 **A simplified solar cooling design method for closed-loop liquid systems.** D. K. Anand, R. B. Abarcar, and R. W. Allen (Maryland, University, College Park, Md.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1203-1207. 8 refs. Contract No. EY-76-S-05-4976.

The paper examines a simplified solar cooling design method for closed loop liquid systems. At the present state-of-the-art, solar cooling system performance can only be predicted by a detailed computer simulation. A simulation program (SHASP) has been used in solar cooling systems analysis; however, since not all designers have access to computers that can handle detailed simulation, an alternative is presented in a simplified cooling design method derived from the correlation of detailed simulation results. One such correlation is the cooling fraction chart which can be used to predict solar heating contribution to within 5% of the actual SHASP result. A.T.

A80-33621 * **Performance analysis for collector-side reflector systems.** P. N. Espy (NASA, Marshall Space Flight Center, Huntsville, Ala.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1208-1212. 10 refs.

The F-Chart method of solar collector performance evaluation is extended to a flat-plate collector system augmented with planar side reflectors. The modified F-Chart evaluations show that the augmentation of the collector has approximately the effect of increasing the collector area by 60%, and the energy supplied by the collector better matches the load. The installed reflector cost of about 10% of the collector cost is shown to be well justified. V.L.

A80-33622 **Cooling system parameter analysis.** P. S. Bremner, D. S. Ward, and G. O. G. Lof (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1213-1217. Research supported by the U.S. Department of Energy.

CSU Solar House III operated with a solar cooling system during the summer of 1978. Research was conducted by simulating the solar house and by using analysis results to quantify the piping losses. The goal is the development of design techniques for system parameters such as piping losses. Preliminary results of the research on cooling system parameters are presented. The indications are that these parameter effects can be characterized and accounted for. Proper design of system parameters is an important part of the overall performance. S.D.

A80-33623 * **Thermic diode performance characteristics and design manual.** D. E. Bernard (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) and S. Buckley (MIT, Cambridge, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1218-1222. 5 refs. Contract No. EG-77-S-02-4383.

Thermic diode solar panels are a passive method of space and hot water heating using the thermosyphon principle. Simplified methods of sizing and performing economic analyses of solar heating systems had until now been limited to passive systems. A mathematical model of the thermic diode including its high level of stratification has been constructed allowing its performance characteristics to be studied. Further analysis resulted in a thermic diode design manual based on the f-chart method. (Author)

A80-33624 **Optimization of the combined structural components of large-power solar central receiver systems.** V. Dunder (Sandia Laboratories, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1224-1228. 5 refs. Research supported by the U.S. Department of Energy.

A80-33625 **An optimization procedure for solar thermal electric power plant design.** W. M. Bohon and S. L. Levy (Black and Veatch Consulting Engineers, Kansas City, Mo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1229-1232.

The design of a solar thermal electric power plant to produce electricity at the least cost involves a great number of performance/cost evaluations. A sound engineering approach to this optimization task is through suboptimization, e.g., maximize the performance (energy output) of each plant design considered and then select the best design via differential cost estimates (minimize cost of electricity). A procedure is presented for designing a solar thermal electric power plant such that plant performance is maximized. (Author)

A80-33626 **DELSOL - A code for central receiver performance and optimization calculations.** T. A. Dellin and M. J. Fish (Sandia Laboratories, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1233-1237. 6 refs. Contract No. DE-AC04-76DP-00789.

DELSOL is a quick and accurate computer program for calculating the field performance, field layout and optimal system design for solar central receiver plants. The code consists of a detailed model of the optical performance, a simpler model of the non-optical performance, and algorithms for field layout and finding the best system design. The latter two features are coupled to a cost model of central receiver components and an economic model for calculating energy costs. The code can handle flat, focused and/or canted heliostats and external cylindrical, multi-aperture cavity, and flat plate receivers. The program optimizes the tower height, receiver size, and field layout as a function of power level. (Author)

A80-33627 **The cost/performance of large central receiver power systems as a function of heliostat design parameters.** M. J. Fish and T. A. Dellin (Sandia Laboratories, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May

28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1238-1242. 8 refs. Contract No. DE-AC04-76DP-00789.

The heliostat field comprises the largest expense as a subsystem of a solar central receiver power plant. Potential cost reductions might be achieved by either total redesigns or subcomponent substitution in existing designs. This paper discusses the value of changing any of several design specifications in the current baseline glass/metal heliostat. Results are quantified in terms of the breakeven cost, i.e., the cost of a new design which will yield the same total system energy cost as the baseline system. Changes in pointing accuracy, surface quality, mirror reflectivity, canting and focusing strategy, and heliostat size are evaluated. (Author)

A80-33628 An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant. M. D. Walzel (Houston, University, Houston, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1243-1247. Contract No. EG-77-C-04-3974.

An investigation of optimum heliostat spacings for the subtower region of a solar power plant is presented. This information is obtained from a cellular structure of the heliostat field which has a representative at the center of each cell; finding an optimum solution for the inner cells adjacent to the tower can become a problem, along with mechanical limits when solutions require heliostats to be placed closer than allowed. The annual performance, shading, and blocking losses are compared in the hexagonal close-packed arrays oriented along a north-south and an east-west direction. A.T.

A80-33629 Theoretical consideration on solar concentrations by central receiver systems. T. Sakurai. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga. May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1248-1252.

Solar concentrations by central receiver systems have been calculated theoretically assuming that plane heliostat-mirrors, sufficiently small in dimension, cover a circular field without clearance. For the solar radiation incident normal to the heliostat-field, the volume- as well as area-concentration were found to be maximum when the radius of heliostat-field was nearly the same as the height of receiver. The optimum radius showed a slight increase with increasing obliquity of incident radiation. The decrease of concentration with increasing mirror-dimension was estimated by a convenient method. The effect of the geometry of composite mirror on the concentration was discussed also. (Author)

A80-33630 Optical analysis of paraboloidal concentrators with secondary reflectors. A. J. McDanal (E-Systems, Inc., Dallas, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1256-1260.

The paper presents the results of an optical performance analysis of a paraboloidal solar concentrator for a family of secondary reflectors. Solar-thermal-electric power systems are under development which require flux concentration ratios on the order of 2000 or greater to achieve the high temperature for efficient heat engine operation. The optically-perfect parabolic dish concentrators produce high concentration ratios, but require the bulky receiver/heat engine at the focal point of the parabola; the optically perfect paraboloidal concentrator with an optimized secondary reflector yields a concentration ratio of 9200 and has an advantage of the receiver/heat engine located at the vertex of the paraboloid. A.T.

A80-33631 • Optical analysis of Cassegrainian concentrator systems. A. H. Bass, Jr., G. L. Schrenk (Pennsylvania, University, Philadelphia, Pa.), P. T. Y. Poon, and S. N. Higgins (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1261-1265. 6 refs. Research sponsored by the U.S. Department of Energy.

Cone optics procedures have been developed to treat optical systems employing multiple reflectors. The objective of the procedures is to develop efficient techniques to treat multiple reflections of cones when the secondary reflecting surface is curved - in fact, curved differently in different directions. The particular optical system under consideration is the Cassegrainian Concentrator System - a system consisting of a paraboloidal primary reflector and a confocal hyperboloidal secondary reflector. Multiple reflection cone optics methodology as well as preliminary results for the flux distributions and intercept factors based on it are presented in this paper. It is shown that neglecting local curvature effects of the secondary reflector, i.e. even in the differential solid angle within the sun's cone, may overestimate the peak of the flux distribution at the receiver aperture by a factor of two or more. (Author)

A80-33632 A numerical approach to the flux density integral for reflected sunlight. F. W. Lipps (Houston, University, Houston, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1266-1270. Contract No. EG-77-C-04-3974.

A numerical approach to the flux density integral for reflected sunlight is proposed, assuming isotropic Gaussian guidance errors. The flux density integral reduces to several iterated single integrals which are precalculated and stored in a table for interpolation. The LBL solar telescope data are fed into a convolution integral representing the guidance errors and at this point Aureole effects can be switched on or off. A vector of convoluted solar data is input to another integration which gives the table of normalized flux contributions. The tabular values are shown to depend on the position of the flux point with respect to an edge of the heliostat as seen in the image plane. L.M.

A80-33633 A study on mirror fields for tower type solar power plants. G. Francia (Genova, Università, Genoa, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1271-1275.

The paper discusses the use in solar power plants of double curvature mirrors (DCMs), which are capable of rotating about their normal so that the minimum mirror curvature remains on the sun-mirror-receiver plane. DCMs are proposed as a replacement for paraboloid sectors, since the paraboloid changes with the apparent motion of the sun. Attention is given to the movement of DCMs, and the possibility of commanding the rotation of the mirror around its normal by mechanical or electrical means. Also discussed are caustics and image enlargement, and a comparison of DCMs with spherical mirrors is presented. J.P.B.

A80-33634 Analytical and experimental determination of radiation and temperature distributions inside solar receivers. D. Blay and C. Haziza (CNRS, Laboratoire d'Energétique Solaire, Poitiers, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1276-1280. 5 refs.

A80-33635 Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine. N. I. Hamilton and P. O. Jarvinen (MIT, Lexington, Mass.) In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1281-1285. Research sponsored by the U.S. Department of Energy.

A80-33636 Unfolding concentrator slope errors from reflected-beam measurements. F. Biggs, C. N. Vittitoe, and D. L. King (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1286-1288. Contract No. DE-AC04-76DP-00789.

A measured flux-density pattern in the reflected beam of a heliostat is analyzed to unfold the distribution of surface slope errors for a heliostat reflecting surface. It is found that two-dimensional effects in this error distribution are within the resolution of the measurements. (Author)

A80-33637 **Helios and reconcentrators.** C. N. Vittitoe, F. Biggs, L. K. Mathews, and L. O. Seamons (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1289-1293. Contract No. AT(29-1)-789.

Computer predictions for solar energy collection are compared with image data produced by 23 heliostats and with data from a single facet. Two-dimensional surface slope errors and reflectance properties necessary to explain the single-facet results are outlined. V.T.

A80-33638 **Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers.** M. Collares-Pereira, J. O'Gallagher, A. Rabl, R. Winston (Chicago, University, Chicago, Ill.), R. Cole, W. McIntire, K. Reed, and W. Schertz (Argonne National Laboratory, Argonne, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1295-1299. 12 refs. Contracts No. EY-76-S-02-2446; No. W-31-109-eng-38.

A80-33639 **Process steam generation by a facetted, non-imaging solar concentrator.** U. Ortabasi, J. A. Atienza, K. G. Soderstrom, A. M. Lopez, L. M. Ozakcay (Center for Energy and Environment Research, Mayagues, P.R.), and R. Winston (Chicago, University, Chicago, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1300-1303. Research supported by the Bacardi Corp., Center for Energy and Environment Research, and University of Chicago.

A modular non-imaging trough collector for the generation of process steam in a tropical environment has been designed and built. The concentrator design has the desirable features of low cost and light weight. Transportation and installation costs are reduced by its modular aspect. The most innovative feature of this concentrator is that the mirror surface consists of long and narrow planar facets sealed inside low cost glass tubes. The absorber for this collector is also a new design. (Author)

A80-33640 **Specular reflectance properties of solar mirrors as a function of incident angle.** D. N. Glidden (Albuquerque Academy, Albuquerque, N. Mex.) and R. B. Pettit (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1304-1308. 8 refs. Contract No. DE-AC04-76DP-00789.

The specular reflectance properties of several solar mirror materials have been measured as a function of wavelength, polarization and incident angle. Results for a 3-mm thick, silvered float glass mirror and an aluminized acrylic stretched film are presented. For the silvered glass mirror, measured specular and hemispherical reflectance properties are in excellent agreement with reflectance values calculated from a multiple beam reflectance model. At 65 deg from normal, the average solar reflectance is decreased only about 4% from the value at normal incidence. For the aluminized acrylic mirror, measured specular reflectance values at 15 mrad are in agreement with hemispherical reflectance values, while calculated reflectance values are as much as 2% high for one polarization. The average solar reflectance decreases only 2% at an incident angle of 65 deg from normal, while the width of the specular beam increases slightly with incident angle. (Author)

A80-33641 **A computational alignment method for paraboloidal collectors.** B. Edwards (Australian National University, Canberra, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1309-1313. 6 refs.

The proposed alignment method for solar collectors requires no adjustments and relies only on measurements. The method consists in the determination of the calibration constants, i.e., the positions of the zero points and axis direction. The mathematical description of the process is given and implementation details are presented. The accuracy of the system is determined as a function of the system variables. For error ratios of 1.0, the computation for each alignment is estimated at $0.10. V.L.

A80-33642 **Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility.** H. L. Teague, C. T. Brown, C. J. Swafford, and G. C. Lewis (Georgia Institute of Technology, Atlanta, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1315-1318.

A80-33643 **Collector deflections due to wind gusts and control scheme design.** B. Edwards (Australian National University, Canberra, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1319-1323. 7 refs.

The paper considers the relationship between the spectrum of collector deflections due to winds and the composition of the guidance system controlling the collector. It is shown that the interface between these two factors is the required rigidity of the collector, noting that it is important that the collector is not over- or under-designed in this respect. The average sun following error is presented as a function of collector rigidity and guidance and control system type. Further, the required collector rigidity is also presented as a function of average sun following error and guidance and control system type. It is concluded that the contents of the work are applicable to both direct tracking collectors and heliostats. M.E.P.

A80-33644 **A simple technique for measuring slope or surface error of a concentrator.** J. Sanchez and W. Saylor (General Electric Co., Space Div., Valley Forge, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1324-1327.

A technique is developed for measuring both sag and slope error of a concentrator. The test method uses a helium-neon laser as a light source, and two sheets of transparent acrylic, which, when suspended vertically and weighted, define parallel planes. The laser is aligned so that its beam is perpendicular to the two planes. This can be checked by seeing that the laser light which is reflected by the two sheets is directed straight back and onto the laser. The concentrator is then placed so that a hypothetical normal to the bottom of the collector is parallel to the direction of the incident laser light. In other words, if the laser is simulating light from the sun, the concentrator is aligned to face the laser as it would normally be aligned to face incident solar radiation. With the positioning of test pieces completed, one can begin measurements and analysis. This method offers two distinct advantages: the procedure is simple and does not require elaborate test equipment, and the method permits one to simultaneously determine both cumulative sag and actual slope error. S.D.

A80-33645 **How to measure the optical quality of focusing solar collectors without laser ray tracing.** P. Bendt, H. Gaul, and A. Rabl (Solar Energy Research Institute, Golden, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1328-1332. 12 refs.

A novel alternative to the laser ray trace technique is proposed. The new method does not require any equipment beyond what is

used for measuring collector efficiency. The question arises whether instantaneous efficiency measurements can somehow be used to determine sigma(optical), the rms angular beam spread caused by optical imperfections. It is shown that this can indeed be accomplished by misaligning the collector slightly away from the sun and measuring the efficiency for several values of the misalignment angle. The optical error sigma(optical) is then extracted by finding the theoretical curve which best fits these misalignment data. Thus, the determination of sigma(optical) could become part of the standard test procedures for concentrating solar collectors. The theory underlying this method is described, and test results for a parabolic trough collector with cylindrical receiver are presented. The data obtained with this collector point to an acceptable accuracy (within + or -10%) of this method.
S.D.

A80-33646 **Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators.** R. B. Pettit, C. N. Vittitoe, and F. Biggs (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1333-1337. 10 refs. Contract No. DE-AC04-76DP-00789.

A80-33647 **Effects of outdoor exposure on the solar reflectance properties of silvered glass mirrors.** J. M. Freese (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1340-1344. 5 refs. Contract No. DE-AC04-76DP-00789.

As solar energy grows in importance, a basic understanding of how environmental factors affect the performance of solar collectors becomes necessary. To this end, the present work studied the specular reflectance properties of silvered glass heliostat mirrors during a 15-month period of exposure to outdoor weather conditions. Initial experiments were designed to obtain a broad, general understanding of the effects of dust accumulation and weather conditions on glass mirror reflectivity. A systematic cleaning procedure was used to determine whether the long-term reflectance losses could be predicted from shorter cleaning cycle results. S.D.

A80-33648 **Thermodynamic trade-offs for gas cooled high temperature solar tower receivers.** F. D. Heidt and W. Schwarzott (Dornier System GmbH, Friedrichshafen, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1346-1349.

With regard to power generation by means of central solar tower plants, receiver configuration is analyzed, considering the radiative exchange between the isothermal receiver wall area and the aperture area where the solar power enters the receiver. Attention is given to the dependence of receiver efficiency on geometry, operational data, and thermooptical constants. Also considered are the optimum size of the aperture area and optimized gas temperatures for cavity/Brayton cycle systems. A comparison between external and cavity receivers indicates that, for infrared emittance of 0.60 and cavity ratio of 0.10, flux densities greater than 400 kW/sq m and temperatures lower than 900 deg C should be handled by cavity receivers.
J.P.B.

A80-33649 **Advanced solar receiver development.** P. O. Jarvinen (MIT, Lexington, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1350-1354. Research sponsored by the U.S. Department of Energy.

Ceramic receivers for advanced solar Brayton and advanced solar tirling thermal power systems are considered which utilize impingement jet cooled silicon carbide ceramic dome heat exchanger modules in conjunction with a cavity receiver geometry to heat a ressurized gaseous heat transfer fluid to temperatures in the range om 1800 to 2400 F. Conceptual designs of single and multiple-me ceramic cavity receivers are presented and analyzed and a combined analytical and experimental program to develop a high temperature seal for the ceramic dome module is reported. (Author)

A80-33650 **Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation.** G. Olalde (CNRS, Laboratoire d'Energétique Solaire, Odeillo, Pyrénées-Orientales, France), J. L. Peube (CNRS, Laboratoire d'Energétique Solaire, Poitiers, France), and M. Daguenet (Perpignan, Centre Universitaire, Perpignan, Pyrénées-Orientales, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1355-1358. 6 refs.

The high-temperature heating of gases is considered theoretically and experimentally. A homogeneous solid material and a gas which is transparent to the radiation are studied under steady-state conditions and with constant physical properties, while the radiative fluxes are assumed to be uniform on the front surface of a porous medium. A system of dimensionless equations comprising one order-4 differential equation and one order-2 differential equation, with constant coefficients, is applied to the theoretical analysis of gas circulating both in the direction and in the opposite direction of the heat flow. Profiles of dimensionless solid and gas temperatures as a function of dimensionless distance are determined. Results from experiments using a cylindrical porous material bed of 70 mm O.D. and 75 mm length are presented graphically.
J.P.B.

A80-33651 **Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power.** A. D. Baranyi, C. J. Stournaras, M. K. Murthy (Ontario Research Foundation, Mississauga, Canada), and T. A. Chubb (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1359-1361.

As part of the Solchem concept of chemical transfer of solar energy from collectors to a central receiver, a new cordierite ceramic converter-heat exchanger has been developed for the thermal conversion of SO3 to SO2+O2. The ceramic converter-heat exchanger has good mechanical strength at high temperatures, low thermal expansion, low porosity and good resistance to attack by SO3 and SO2. Conversion of SO3 to SO2+O2 has been demonstrated in straight pieces of the ceramic converter-heat exchanger with platinum catalyst at temperatures from 800 to 1000 C. Conversion of SO3 at 1000 C approaches 95% (maximum theoretical efficiency).
(Author)

A80-33652 **A new solar thermal receiver utilizing small particles.** A. J. Hunt (California, University, Berkeley, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1362-1366. 8 refs. Contract No. W-4705-eng-48.

A new type of solar thermal receiver is developed which utilizes the dispersion of very small particles suspended in a gas to absorb the radiant energy from concentrated sunlight. An open Brayton-cycle heat engine utilizing a small particle heat exchange receiver operates by injecting a very small mass of submicron carbon particles into the compressed gas stream before it enters the receiver. The operating temperature of the particle-gas mixture is determined by the vaporization rate of the carbon allotrope used to make the particles. Plant efficiencies in excess of 40% appear feasible without the use of cooling towers or bottoming cycles. Several methods of producing the particles are considered. Carbon is selected because of its optical, chemical and physical properties. The concept has been demonstrated in the laboratory.
S.D.

A80-33653 **Study and realisation of a high temperature air cooled solar receiver.** B. D'Utruy, D. Blay, and F. Ortiz (CNRS, Laboratoire d'Energétique Solaire, Poitiers, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1367-1370.

An elementary solar panel is developed to warm up air up to 800 C in view of further application of Brayton cycle associated to air turbine. A honey comb cell profile is retained to absorb the radiant energy in small cavities and to warm up the air by forced convection. A theoretical approach is made to evaluate the metal temperature of the panel (40 x 60 cm) under steady state conditions. Theoretical values are compared to experimental data obtained on a test set up with 72 kw quartz lamps. (Author)

A80-33654 **Users group for central receiver testing.** F. B. Smith (STTF Users Association, Albuquerque, N. Mex.) and A. F. Hildebrandt (Houston, University, Houston, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1372-1376. 13 refs.

The paper considers the solar thermal test facilities Users Association (UA), which acts as the point of contact for users of such facilities, and which solicits and reviews proposals and makes recommendations to DOE regarding their utilization. Solar facilities with which the UA is involved are briefly described, including the Sandia central receiver test facility in Albuquerque, and the Georgia Tech 400-kW thermal central tower facility in Atlanta. The types of high-temperature solar experiments of interest to the UA include steam and hot gases for process heat and chemical transmission, in which high-temperature solar energy is used to split a compound over a catalyst into two or more higher-energy gaseous components. In addition, potential solar chemicals and fuels applications are discussed, such as converting biomass and coal or lignite into usable gases or liquid fuels, as well as the production of hydrogen via a water-splitting reaction, of carbon monoxide via solar coal gasfication, and of ammonia and nitrogen fertilizer. J.P.B.

A80-33655 **Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility.** J. Gintz, R. Zentner (Boeing Engineering and Construction, Seattle, Wash.), B. Marshall, and L. Matthews (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1377-1381. 5 refs.

A80-33656 **Testing of the 10-MWe pilot plant solar central receiver.** G. C. Coleman (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.) and J. F. Friefeld (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1382-1386.

Insolation testing conducted at the Central Receiver Test Facility (CRTF) in New Mexico to validate the design of the pilot plant receiver panel and controls is discussed. Thermodynamic performance of the receiver is investigated, as well as pilot plant preheater panel performance, panel lateral heat flux gradients, and receiver surface-coating performance and durability. The description of the pilot plant receiver includes panel subassemblies, water manifold, backup structure, and individual tubular panel assemblies, as well as CRTF test receiver panel and flow components. Testing confirmed satisfactory preheater operation, panel expansion heliostat control, and feedwater temperature, pressure, and flow control. Proper functioning of the master control and data computer systems, receiver controller logic and the facility heat rejection system was also demonstrated. In addition, derated steam conditions of 660 degrees F and 1515 psia have been achieved and maintained during normal insolation periods. J.P.B.

A80-33657 **One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology.** A. Poirier, S. Davis, D. Ross, T. Nussdorfer (Sanders Associates, Inc., Nashua, N.H.), T. Brown, C. Seminario, and H. Teague (Georgia Institute of Technology, Atlanta, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1387-1389. Contract No. EG-77-C-03-1555.

A80-33658 **Stability of plasma-sprayed coatings tested at White Sands Solar Facility.** J. M. Schreyer, C. R. Schmitt (Oak Ridge National Laboratory, Oak Ridge, Tenn.), R. A. Hays, and D. Farwell (U.S. Army, White Sands Missile Range, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1390-1394. Contract No. W-7405-eng-26.

Plasma-sprayed coatings on steel plates were tested at the White Sands Solar Facility at temperatures from 200 C to 1000 C. Analysis of the specimens before and after testing showed erbium dodecaboride (ErB12), yttrium hexaboride (YB6), titanium diboride (TiB2), and chromium oxide (Cr2O3) to be stable above 600 C. A heat balance on the water-cooled specimens of these coatings showed 73% to 97% heat recovery efficiency. (Author)

A80-33659 **Treatment of molybdenite ore with laboratory scale solar furnaces.** J. P. Coutures, G. Benezech, R. Renard (CNRS, Laboratoire des Ultra-Réfractaires, Odeillo, Pyrénées-Orientales, France), and S. R. Skaggs (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1395-1399. Research supported by the Centre National de la Recherche Scientifique.

A80-33660 **Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments.** C. E. Seminario and B. C. Skelton (Georgia Institute of Technology, Atlanta, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1401-1405.

A80-33661 **Mini-computer-based energy monitor system.** H. F. Schuler, D. F. Rost, and G. Ameduri (General Extrusions, Inc., Youngstown, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1408-1410.

A mini-computer-based energy monitor system is under development for the solar industrial process heat system at General Extrusions, Youngstown, Ohio. The design goals are low cost, reasonable accuracy, control capability, coherent presentation of results, and sufficient hardware and software understanding to allow customization to this application as well as demonstrating the generic capabilities for energy monitor systems for Ohio industries. The major components are from the Heath Company, Benton Harbor, Michigan, because they offer a wide range of components specifically designed to work together and excellent hardware and software documentation. The temperature and flow sensors have not yet been specified. The work is supported by the Ohio Department of Energy. (Author)

A80-33662 **A pin programmable controller for research systems.** T. N. Bechtel, S. Karaki, G. D. Murphy (Colorado State University, Fort Collins, Colo.), and P. R. Armstrong (Altas Corp., Santa Cruz, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga. May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1411-1415. Research supported by the U.S. Department of Energy and Colorado State University.

A pin programmable logic array based controller has been designed and assembled specifically to accommodate the control needs of a solar heating and cooling research and development facility. The controller is suitable for systems covering a wide range of configurations and operating strategies and facilitates control changes with a diode pin programmable logic array. This logic element allows the user to establish the desired relationship between inputs (usually temperatures) and outputs (system components) according to control criteria by insertion of diode pins into the appropriate location of the logic array board. A prototype has been installed and used in the experimental parallel heat pump, solar air heating and cooling system of CSU Solar House II during the 1978-1979 heating season. Experience has confirmed operation of the control unit according to design specifications. (Author)

A80-33663 **The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems.** D. K. Hays (Solar Environmental Engineering Co., Fort Collins, Colo.), B. W. Parkinson (Rockwell International Corp., El Segundo, Calif.), and C. B. Winn (Colorado State University, Fort Collins, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1416-1420.

There has been a considerable amount of interest in the use of off-peak storage devices and/or heat pumps with solar heating systems. The control of such devices can lead to significant savings in fuel use if the future values of the ambient temperature are accurately predicted. Both a methodology and hardware for implementation of the methodology have been developed for accurately predicting ambient temperatures for up to 24 hours in advance. This system is referred to as the ATOP system, an acronym for Ambient Temperature Observer/Predictor. The methodology and applications are described in this paper. Also presented are some prediction results which are directly applicable to improved control of off-peak storage devices. (Author)

A80-33664 **Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems.** A. Orbach, R. Fischl, P. R. Herczfeld, and S. Konyk, Jr. (Drexel University, Philadelphia, Pa.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1421-1425. 13 refs. Contract No. E-8-77-5-02-4512.

This paper is concerned with the control of liquid flow in the collector loop for solar heating application. The purpose of the paper is three fold: First a dynamic model which accurately reflects the dynamic behavior of the solar collector is given. Second, an optimal and suboptimal control strategy which maximizes the net usable energy is obtained using this dynamic model. Third, the implementation of the suboptimal policy via a thermostat on/off controller is investigated. Specifically, criteria are given for the selection of the control set points. (Author)

A80-33665 **Control systems for interfacing solar agricultural dryers with other energy sources.** J. H. Schlag, A. P. Sheppard, W. E. Baird (Georgia Institute of Technology, Atlanta, Ga.), and J. M. Wood (Southern Solar Energy Center, Atlanta, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1426-1428.

A80-33666 **The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center.** N. Schmitt, W. T. Jones, and T. M. Murray, Jr. (Louisville, University, Louisville, Ky.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1430-1434. 8 refs.

A80-33667 **Measurements of performance and efficiency of solar energy systems.** J. M. Suter and P. Kesselring (Zürich, Eidgenössische Technische Hochschule, Wurenlingen, Switzerland). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1435-1439. Research supported by the Swiss National Energy Research Foundation.

Measurements on different types of solar energy systems throughout Switzerland have been made in order to detect principal layout defects, evaluate the actual potential of the technology, and provide recommendations for architects and engineers. In particular, the control device and its interaction with various components are to be examined in detail, and the collectors are considered as an integrated part of the system. Attention is given to a microprocessor controlled, modular data acquisition unit comprised of 16 analog and 6 digital input channels and 15 recorded output quantities, which is used to determine the efficiencies of the collector, space heating boiler, and overall system, as well as storage losses and overall system energy balance. Results indicate that the most important reason for poor overall system efficiency is due to the design of the system itself: there are large storage losses and badly designed hydraulic loops, and the importance of heat storage measurement is often underestimated. J.P.B.

A80-33668 **Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors.** J. M. Freese (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1440-1444. Contract No. DE-AC04-76DP-00789.

A80-33669 **Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings.** C. J. Packard (Alternative Energy Resources, Inc., El Paso, Tex.), R. L. San Martin (U.S. Department of Energy, Washington, D.C.), and D. Fenton (New Mexico State University, Las Cruces, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1445-1449.

A methodology of instrumentation system design is developed which supports multiple levels of hardware complexity and associated cost, while allowing valid performance comparisons to be made between solar buildings employing different levels of instrumentation. The key to the successful design of any instrumentation system is a systems analysis approach. A tool useful in this approach is the energy flow map. A case study of the New Mexico Department of Agriculture Building is presented which illustrates the use of the methodology. S.D.

A80-33671 **Monitoring solar heated houses in the European community - Procedures, results and future activities.** D. M. Lush (Ove Arup Partnership, London, England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1453-1457. 9 refs. Commission of the European Communities Contracts No. 509-78-2; No. 642-78-7.

The evaluation of solar heating systems in domestic premises is covered, for a wide range of climatic conditions, varying building standards and different occupancy patterns. The strategies for obtaining the necessary information are defined. The theoretical and practical requirements of monitored projects which have already been examined are discussed, together with some alternatives for possible future projects. (Author)

A80-33673 **Characteristics of rural energy demand and major barriers and tasks and implementation of potentially viable solar technologies.** J. Gururaja (Department of Science and Technology, New Delhi, India) and A. Ramachandran (HABITAT, Nairobi, Kenya). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1466-1470.

A80-33674 **Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems.** J. L. Sloop, M. H. Watt (PRC Energy Analysis Co., McLean, Va.), and J. J. Gordon (Mitre Corp., Metrek Div., McLean, Va.). In: Sun II;

Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1471-1474. 10 refs.

A80-33676 **Prospects for solar cooling applications in Nigeria.** B. A. Ajakaiye (Ife, University, Ile-Ife, Nigeria). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1481-1484.

A80-33678 **A solar-powered irrigation system for Bakel, Senegal.** J. Keiser, P. Dustin (Thermo Electron Corp., Waltham, Mass.), J. P. Durand, and L. Pirot (Société d'Etudes Thermiques et d'Energie Solaire, Montargis, Loiret, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1492-1495.

A80-33679 **A free cylinder Stirling engine solar powered water pump.** W. T. Beale (Sunpower, Inc., Athens, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1496-1500. 7 refs.

This paper describes a free cylinder Stirling engine expressly designed for use as a solar water pump. The pumping action takes place as a result of the reciprocating motion of the cylinder of the sealed free piston engine, this cylinder motion being used to directly drive a reciprocating water pump. A 250 watt unit is described, comprised of a free cylinder engine, a faceted focusing collector containing many small mirrors, an equitorial mount, clock drive, tracker and tensioned cable pump. Expected cost of a complete system delivering 250 watts to the water (25 liter-meters/sec) is about $500 in large scale production. (Author)

A80-33680 **Operational experience of a 3.0 kW solar powered water pump.** C. Macciò, G. Tomei (Ansaldo S.p.A., Genoa, Italy), G. Angelino, M. Gaia, and E. Macchi (Milano, Politecnico, Milan, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1501-1505.

During the Spring of 1978 a solar powered pumping system has been put in operation on the roof of an office building at Ansaldo, for demonstration and experimental purpose. In the paper, the plant design and operation is described, and the obtained results on the performance of the organic Rankine cycle engine, having a single stage turbine as the expander, are presented. (Author)

A80-33681 **Rotary expander for a solar thermo-mechanical conversion system.** R. Chicurel (Universidad Nacional Autonoma de Mexico, Mexico City, Mexico). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1507-1510. 7 refs.

The third and latest version of a rotary steam engine under development at the Engineering Institute of the National Autonomous University of Mexico is described. The working chamber is bounded by four oval-shaped rotors and two side cover plates. The rotors rotate at the same constant speed and in the same direction. Two impulses occur per revolution. The engine's displacement is 208 cu cm and the expansion ratio is 4.15. It will form part of a solar powered Rankine system operating with water as working fluid. The design output is 2 kW of mechanical power. If tests prove satisfactory, a larger engine will be built for a scaled-up system producing 35 kW. (Author)

A80-33682 **A 500 gallons per day hybrid desalination plant using wind/solar energy.** E. Lumsdaine and I. Tag (New Mexico Solar Energy Institute, Las Cruces, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1512-1516.

An analysis of a modular wind/solar distillation plant is presented. The design is based on a constant year-round demand of 500 gallons per day. In arid areas where wind power is available, cost analysis shows that the hybrid system is economically feasible compared with electricity which could only be generated from a conventional source such as a diesel engine. Solar stills are of the basin type while the wind energy conversion system is a horizontal axis type. The selection of the type of wind machine (whether constant speed or variable speed) depends on the meteorological conditions and the frequency of water demand. (Author)

A80-33683 **A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain.** F. Roach (California, University, Los Alamos, N. Mex.) and S. Ben-David (New Mexico, University, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1521-1525. 12 refs.

A80-33684 **A simple procedure for assessing thermal comfort in passive solar heated buildings.** W. O. Wray (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1530-1534. Research sponsored by the U.S. Department of Energy.

The Fanger thermal comfort equation is linearized and used to develop a procedure for assessing thermal comfort levels in passive solar heated buildings. In order to relate comfort levels in non-uniform environments to uniform conditions, a new thermal index called the 'equivalent uniform temperature' is introduced. (Author)

A80-33685 **Thermopond applicability to climate and structure.** H. R. Hay (Skytherm Processes and Engineering, Los Angeles, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1535-1539. 5 refs. Research supported by the U.S. Department of Energy.

Collection, storage, dissipation and transfer of heat from Thermoponds with movable insulation have newly recognized potentials for solar heating, for replacing air conditioners, and for lessening peak power demand. The state-of-the-art for Skytherm natural heating and cooling of residential and commercial buildings is presented; fire protection and sound control are additional assets. Designs for high seismic, wind, and Thermopond loads are adapted in several illustrated architectural and structural forms. (Author)

A80-33686 **The characterization of the performance of passive solar heating systems.** A. M. Clausing and B. L. Drolen (Illinois, University, Urbana, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1540-1544. 8 refs.

The proposed method of thermal performance evaluation of passive solar heating systems employs three dimensionless performance indicators: efficiency, effectiveness, and comfort index. These indicators are used to quantify the thermal performance characteristics of direct gain and storage wall systems. Typical ranges are presented for key parameters in order to facilitate system design. Explicit analytical solutions are found for three- and four-node models which provide performance bounds for passive solar systems. It is concluded that the method is useful in sizing designs, analyzing the effect of system parameters, such as nighttime insulation, and evaluating the relative performance of various designs. V.L.

A80-33687 **An experimental approach for studying direct solar gain optics of model interiors.** J. F. McClelland, R. Fuchs, and R. N. Kniseley (Iowa State University of Science and Technology, Ames, Iowa). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2.

Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1620-1624. Research supported by the Consiglio Nazionale delle Ricerche.

A numerical method for the geometric location of the shadows produced by a building on a vertical or horizontal surface is developed. The method also determines the area of the shadows and especially the 'shadow factor', defined as the area of that part of the shadow which intersects a unit rectangle, suitably selected on the surface. In view of its application to several problems (urban planning, correction of thermic load tables), the dependence of the 'shadow factor' upon some parameters is studied. The results for particular cases are presented. (Author)

A80-33688 **Physical modeling of buildings.** K.-E. Hassan (Centre for Solar Energy Studies, Tripoli, Libya), G. M. Zaki, and A. A. El-Shibani (Alfateh University, Tripoli, Libya). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1551-1555. 11 refs.

The present paper treats the problem of simulating the thermal behavior of a building by a scale model. It takes into consideration insolation on and into the building, and the energy that may be removed by a solar device. The similarity groups that control modeling are deduced from the governing mathematical relations. The effect of each of these groups is studied in some detail. (Author)

A80-33689 **Hybrid active-passive designs - Synergy or conflict.** J. D. Balcomb, J. C. Hedstrom, and R. D. McFarland (California, University, Los Alamos, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1556-1560. 5 refs. Research sponsored by the U.S. Department of Energy.

Hybrid combinations of active and passive solar heating systems are analyzed using hour-by-hour simulation analysis for a combined space heating and domestic hot water load in Albuquerque and Madison. Various mixes of passive and active solar collection area are studied. The passive system is a Trombe wall design and the active system uses liquid heating collectors. (Author)

A80-33691 **Utilization of natural/passive energy systems in a University Office/Teaching Laboratory Building.** R. J. Martin (Everett, Zeigel, Tumpes and Hand, Boulder, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1565-1568.

A80-33692 **Economic aspects of passive solar remodeling in existing buildings.** J. L. Mickelson, Jr. and M. M. Sizemore (Sizemore/CRS, Atlanta, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1569-1573.

A80-33693 **Preliminary winter comparison results of four passive test cells in Omaha, Nebraska.** B. Chen, J. Maloney, J. Thorp, K. Pedersen, W. Holmes, C. Sedlacek, R. Sash, and E. Hollingsworth (Nebraska, University, Omaha, Neb.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1583-1587.

Four test cells incorporating various passive solar energy techniques have undergone testing since the end of December 1978. The purpose of this research is to evaluate the suitability of passive solar energy to the midwestern winter climate and to compare the performance of the direct gain with the Trombe wall type of passive system. In order to accomplish these goals, the predicted computer performance studies are being corroborated by test cells. (Author)

A80-33694 **Performance of passive test units during the 1978-79 heating season.** T. Wheeling, B. Wadsworth, and L. Palmiter (National Center for Appropriate Technology, Butte, Mont.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1589-1593.

Several passive solar test units have been monitored at the National Center for Appropriate Technology since January, 1978. The design, intrumentation, and performance of the direct gain and Trombe wall cells, during the 1978-79 heating season, are discussed. A continuous sequence of hourly measurements, including incident radiation, air temperatures, and thermal storage temperatures has been recorded for the six month period, November 1978 through April 1979. These measurements have been used for the validation of a simple computer simulation model developed at NCAT. (Author)

A80-33695 **Performance analysis of a natural convection collector system.** J. Cook (Arizona State University, Tempe, Ariz.) and S. Morris. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1594-1598.

A 100% passive heated solar house in the mountains of Arizona, utilizing a full-scale, natural convection collector system with a rock bed storage, has been extensively monitored. An intensive examination of a one-day cycle, as well as a continuous six-day sequence, graphic analyses, plus numerical calculations and evaluation are presented. The results show efficiencies ranging between 30.5% and 43.3% during the demanding period of December 20 to 28. Documentation illustrates the parameters and advantages of such passive solar collector systems with isolated thermal storage. Recommendations and conclusions are made for final adjustments to this system and for the design of future convective systems. (Author)

A80-33696 **Measured performance of a passive solar residence in Bozeman, Montana.** C. W. Fowlkes (Fowlkes Engineering, Bozeman, Mont.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1600-1604. 5 refs.

This paper summarizes the thermal performance of a passive solar house. Hourly data taken over a three month period during one of the coldest winters on record showed that the solar system was providing 65% of the heating load. The average house temperature was 19 C and the average daily variation was 6.4 C. A low-cost data acquisition system utilizing a Radio Shack TRS-80 computer was developed for this project. (Author)

A80-33697 **A new and simple method for estimating the monthly and yearly performance of passive solar systems.** R. O. Warrington, R. E. Stotts, R. L. Mussulman, and W. R. Martindale (Montana State University, Bozeman, Mont.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1606-1609. 6 refs. Research supported by the Montana State University.

A80-33698 **Monthly average daily insolation on overhang shaded windows.** R. E. Jones, Jr. (Colorado, University, Colorado Springs, Colo.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1610-1614. 8 refs.

A method is presented for calculation of the monthly average daily insolation on windows of arbitrary azimuth shaded by overhangs of effectively infinite lateral extent. The method considers beam, diffuse and reflected radiation and is based on an extension to a totally arbitrary orientation of the methods of Liu and Jordan (1961) and of Klein (1977) for estimating the radiation on tilted surfaces. This extension also allows the determination of daily insolation on skylights and windows having orientations away from the equator. (Author)

A80-33699 **A procedure for determining solar heat gain factors for south-facing vertical surfaces on average days.** G. L. Powell and J. I. Yellott (Arizona State University, Tempe, Ariz.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1615-1619. 15 refs.

A80-33700 **Determination of the shadows area induced on horizontal and vertical surfaces anyway oriented.** A. Calarco and M. De Luca (Istituto Universitario Statale di Architettura, Reggio Calabria, Italy). In: Sun II; Proceedings of the Silver Jubilee Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1546-1550. 7 refs. Research supported by the U.S. Department of Energy.

An experimental approach is discussed for measuring the effective solar absorptivity and related optical properties of direct gain interiors. Measurements can be made on a zone or total interior basis using easily constructed models. The study covers characterization requirements, experimental methods, measurement theory, and preliminary experimental results. The data that can be acquired through this approach will be of use in the economical integration of direct gain solar collection with a wide variety of building interiors. (Author)

A80-33703 **An application of phase change materials in passive solar systems.** S. Faunce, J. Sliwkowski, and S. Guceri (Delaware, University, Wilmington, Del.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1637-1641. Research supported by the U.S. Department of Energy, Baltimore Gas and Electric Co., and Pennsylvania Power and Light Co.

A modular, hybrid passive solar energy collection and storage unit which is based on energy storage in phase-change materials has been developed for use in a passive solar heating system. The unit, termed the Thermal Wall Panel, is essentially a flat-plate solar collector mounted in the south-facing wall of a structure which uses the phase-change material Na2SO4(10H2O) as an energy storage medium. Results of tests of a 24-sq ft panel during March indicate that the unit can capture and deliver as heat up to 45% of incident solar energy, and supply up to 56% of the heating requirements for a typical 1800 sq ft house in the mid-Atlantic region if coupled with direct solar gain for daytime heating. A computer model developed for the thermal Wall Panel has been found to be in good agreement with experimental measurements. Cost estimates have shown that the system can be installed at an incremental cost of $6 to $8 per sq ft and have a simple payback period of seven to nine years. It is recommended that full-scale testing of the system be initiated as a further step in its commercialization. A.L.W.

A80-33704 **Analytical and economic evaluation of heat pipe augmented passive solar heating systems.** J. M. Corliss and G. H. Stickford (Battelle Memorial Institute, Columbus, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1642-1646. Contract No. DE-SA04-77AL-04222.

A80-33705 **Dual desiccant-bed dehumidifier with solar-heated regeneration.** F. Moore, J. Cantrell, and G. Willeke (Miami University, Oxford, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1647-1650. 10 refs. Research supported by the Miami University.

A80-33708 **Solar-cladding - Insulation plus insolation.** A. W. K. MacGregor (Napier College of Commerce and Technology, Edinburgh, Scotland). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1665-1668.

This is an investigation into the possibilities of applying translucent insulation material to the outside surface of existing solid walled buildings, so that the basic heat loss is reduced and, unlike conventional opaque insulation, the solar gain through the wall is increased. Theoretical analysis and experimental work both indicate that the potential energy savings per unit area are of the same order as for solar water heating systems - but with costs at least an order of magnitude less. The main area of application is likely to be in high latitude, maritime regions where overheating is not a problem. (Author)

A80-33709 **Hybrid passive for motel guest rooms.** R. Wright, L. Dieckmann, R. Selby, and S. Wright (Hawkweed Group, Ltd., Chicago, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1669-1673.

A 19,000 square foot solar-heated motel at Osseo, Wisconsin, contains twenty guest rooms, three shops, banquet facilities, restaurant and lobby. An appropriate integral system was selected for each area of the building based upon occupancy profile. Systems used include mass walls at guest rooms, direct gain at shops and site-built flat plate air type collectors at public spaces. This paper describes the various systems, the design process and construction methods. (Author)

A80-33710 **Retrofit sun room thermal performance based on the typical meteorological year weather data.** F. C. Wessling, E. L. Harley, P. J. Roache, W. C. Marrable, and B. C. Litz (New Mexico, University, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1684-1688. 6 refs.

A80-33711 **Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H.** A. O. Converse, M. Hall-Martindale (Dartmouth College, Hanover, N.H.), and C. S. White (Banwell, White and Arnold, Architects, Hanover, N.H.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1689-1693. Contract No. EG-77-6-04-4139.

A80-33712 **European progress in photovoltaic development.** R. J. van Overstraeten (Leuven, Katholieke Universiteit, Louvain, Belgium). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1721-1724.

Photovoltaic industrial production and research and development activities in Europe are reviewed. Consideration is given to materials, cells, and small power systems. System studies are also outlined. V.T.

A80-33713 **A 100 kW peak photovoltaic power system for the Natural Bridges National Monument.** E. F. Lyon (MIT, Lexington, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1732-1736. Research sponsored by the U.S. Department of Energy.

The implementation of a 100-kW peak photovoltaic power system for the Natural Bridges National Monument in southeastern Utah is considered. The site, PV power system, and its operation are described. V.T.

A80-33714 **The Ramón Areces concentration photovoltaic array.** G. Sala, G. L. Araújo, A. Luque, J. M. Ruíz, A. Coello, E. Lorenzo, F. Chenlo, J. Sanz, and A. Alonso (Madrid, Universidad Politécnica, Madrid, Spain). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p.

1737-1741. 10 refs. Research supported by the Ramón Areces Foundation.

The project of the 1.8-kW Ramón Areces concentrating photovoltaic array is described, and the results obtained are presented. The objectives of this project are to identify the relevant subjects for research, to determine the real costs of concentrated photovoltaic generators, to evaluate their efficiency and operation modes along the year, and to test the reliability of their active and passive components. The operating characteristics of the array along the year are calculated using measured parameters of the fabricated cells. S.D.

A80-33715 **Autonomous solar-powered beacon for air navigation use.** D. Lamant and D. Pero (Instituto Universitario de Tecnología, Caracas, Venezuela). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1746-1748.

Radio-aid equipment for air navigation, used in Venezuela, is described along with its characteristics and locations. The feasibility of installing solar-powered radio-aid beacons to improve the present network is discussed. V.T.

A80-33716 **A 20 kW photovoltaic flat panel power system in El Paso, Texas.** B. Blevins, R. Hsiao, A. Masud, H. Zwibel (New Mexico Solar Energy Institute, Las Cruces, N. Mex.), J. Brown (El Paso Electric Co., El Paso, Tex.), J. Morrison (Fouts, Langford, Gomez and Moore, El Paso, Tex.), L. Golucke (Golucke Consulting, El Paso, Tex.), and P. Locke (Photon Power, El Paso, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1749-1753. Contract No. ET-78-C-04-5402.

Two designs for a 20-kW photovoltaic power system utilizing cadmium and silicon modules are described. Consideration is given to photovoltaic modules and system and economic tradeoffs. V.T.

A80-33717 **Photovoltaic module performance and degradation at various MIT/LL test sites.** S. E. Forman (MIT, Lexington, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1759-1763. Research sponsored by the U.S. Department of Energy.

The report summarizes the performance of a 25-kW photovoltaic module array. The physical and electrical changes which have occurred due to weathering and soil accumulation since system turn-on are discussed. V.T.

A80-33718 **The photovoltaic effect, its present understanding and remaining mysteries.** K. W. Boer (Delaware, University; SES, Inc., Newark, Del.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1766-1770. 26 refs. Research supported by the U.S. Department of Energy.

The paper presents an analysis of the photovoltaic effect. Current-voltage characteristics, high-field effects, heterojunction, and junction or interface recombination are discussed. It is noted that several factors need more work and clarification. V.T.

A80-33719 **A fabrication process for Cu2S-CdS thin film solar cells.** W. H. Bloss, W. Arndt, G. Bilger, G. H. Hewig, F. Pfisterer, and H.-W. Schock (Stuttgart, Universität, Stuttgart, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1773-1776. 10 refs. Bundesministerium für Forschung und Technologie Contract No. ET-4045; European Economic Community Contract No. 428-78-EsD.

A fabrication process for Cu2S-CdS thin film solar cells was developed and is described in detail. The Cu2S-CdS heterojunction is produced using the Clevite process. Sheet glass is used as substrate and encapsulation. On the back contact, a CdS layer is evaporated, whereas the Cu2S-layer is produced topotaxially in a dipping process. The front contact is produced using silk screening and etching techniques. On a 7 x 7 sq cm large area substrate glass, encapsulated thin film solar cells with a Cu2S area of 42 sq cm are produced, which show conversion efficiencies of 7.3%. (Author)

A80-33720 **Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells.** A. M. Barnett, J. D. Meakin, and A. Rothwarf (Delaware, University, Newark, Del.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1777-1781. 13 refs. Contract No. EG-77-C-03-1576.

The paper describes the techniques utilized to analyze losses, and the improved designs and production technologies of thin-film polycrystalline CdS/Cu2S solar cells, that resulted in systematic increases in energy conversion efficiencies from 7.8 to 8.55 and 9.15%. Analytical and experimental results are presented. V.T.

A80-33721 **Design and performance of silicon solar cells under concentrated sunlight.** H. T. Weaver and R. D. Nasby (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1782-1785. 10 refs. Research supported by the U.S. Department of Energy.

The paper examines theoretically two concentrator solar cell designs: a baseline /n(+)-p/, and a back-surface-field /p(+)-n-n(+)/ cell. Results of these analyses are compared with experimental data from cells fabricated at several facilities. Agreement between calculations and observations is within 10%; this is somewhat surprising in view of the simplicity of the model of the high-doped regions. Projected maximum efficiencies for both cell designs occur near 25 suns concentration for the assumed 0.02-omega series resistance. Current fabrication techniques have produced, on a best-effort basis, efficiencies of about 18.5% for both designs. S.D.

A80-33722 **MIS solar cells on crystalline, polycrystal, and thin film silicon.** S. L. Hyland, J. K. Kim, A. E. Delahoy (Rutgers University, Piscataway, N.J.), W. A. Anderson, and K. Rajkanan (New York, State University, Buffalo, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1786-1789.

The performance characteristics of MIS solar cells using single crystal, polycrystalline, ribbon and thin film silicon are investigated. Overall cell efficiencies, open-circuit voltages, short-circuit current densities and diffusion lengths were measured for chromium-silicon oxide-silicon cells fabricated on single crystal substrates and the less costly polycrystalline, ribbon, edge-defined film-fed growth and electron-beam deposited silicon. Results reveal cell efficiency to be lower in cells fabricated from the less costly substrates, due to lower short-circuit currents arising from recombination near crystal defects and decreased open-circuit voltage attributed to surface defects. It is concluded that the use of MIS semiconductor solar cells based on silicon, with efficiencies up to 12%, represents progress in attaining photovoltaics costing less than 50 cents/W. A.L.W.

A80-33723 **Photovoltaic concentrator design comparison.** M. Edenburn, E. Boes, and B. Shafer (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1793-1796. Research supported by the U.S. Department of Energy.

In the past few years a variety of different designs for photovoltaic concentrators have been proposed. This paper provides a comparison of some of these designs. The comparison is given both in terms of descriptive design features, such as geometric concentration ratio or type of optics used, and in terms of design quality expressed in terms of component efficiencies, array material costs, and $/W. The selection of concentrator array designs for inclusion in this comparison was based primarily on the degree of development of the designs and the desire for a representative variety. (Author)

A80-33724 **The performance of silicon solar cells under concentrated sunlight.** C. E. Backus, B. C. Chambers, T. T. Rule, and R. W. Sanderson (Arizona State University, Tempe, Ariz.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1798-1802. 6 refs. Research supported by the U.S. Department of Energy.

Silicon solar cells especially designed for concentration systems are now available with efficiencies of 18-19% under illumination levels of 30-300 suns at temperatures at 28 C. These efficiencies decrease approximately linearly with temperature. The temperature coefficient decreases slightly at increased concentration levels. (Author)

A80-33725 **Analytical evaluation of a solar thermophotovoltaic /TPV/ converter.** M. W. Edenburn (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1803-1807. Contract No. AT(29-1)-789.

This parametric analysis of a thermophotovoltaic (TPV) converter considers emitter temperature, cell reflectance to radiation with energy below the cell's bandgap energy, and concentration ratio requirements. The concentration ratio is rigorously considered to determine its influence on converter performance. Important conclusions are that an emitter temperature of 2000 K is optimal; a cell reflectance value of 0.98 is required for below-bandgap irradiation; a secondary concentrator must be used with a parabolic-dish primary; and a mirror quality resulting in a 4-mrad reflected-beam dispersion is required for a 24% conversion efficiency. (Author)

A80-33726 * **Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators.** P. Greenman, J. O'Gallagher, R. Winston (Chicago, University, Chicago, Ill.), and E. Costogue (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1808-1812. 5 refs. Contract No. JPL-954563.

The reduction of nonuniformities in the intensity distribution of light focused on a photovoltaic array by a compound parabolic concentrator is investigated. The introduction of small distortions into the surfaces of the reflector in order to diffuse the incident collimated light to fill the angular acceptance of the concentrator is calculated by means of ray tracing to decrease the irradiance nonuniformity at the cost of a lowered effective concentration of the concentrator. Measurements of the intensity distribution on a scale test model in terrestrial sunlight with corrugated aluminized mylar reflectors are shown to be in good agreement with the ray tracing results. A two-stage concentrator consisting of a focusing primary and a nonimaging secondary is also shown to result in a fairly uniform intensity distribution except in the case of a 4-deg incidence angle, which may be corrected by the introduction of distortions into one or both concentration stages. A.L.W.

A80-33727 **Quasi-static concentrated array with double side illuminated solar cells.** A. Luque, J. M. Ruiz, A. Cuevas, J. Eguren, J. Sangrador, G. Sala, J. M. Gómez Agost, and J. del Alamo (Madrid, Universidad Politécnica, Madrid, Spain). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1813-1817. 16 refs.

Double side illuminated (DSI) cells placed in proper quasi-static concentrators allow for double theoretical gain than that of conventional cells. A concentrator prototype is presented which provides double side illumination with a practical gain of 8 and an acceptance (half gain) angle of plus or minus 11 deg. This concentrator also provides cooling for the cells so that they can operate at 10 C over the ambient under an irradiance of 90 mW/sq cm and wind velocity of 1 m/sec. Three types of DSI cells are being developed. Practical efficiencies of 15.5 percent have been practically demonstrated. (Author)

A80-33728 **Development of 1pKW photovoltaic module with concentration.** S. Pizzini (Montedison Sistemi S.p.A., Istituto Ricerche, Novara, Italy), M. Giuffrida, P. Zani (Ansaldo S.p.A., Genoa, Italy), G. Scarpi, G. Dionisio (Officine Galileo, Florence, Italy), M. Conti, and A. Modelli (SGS-ATES Componenti Elettronici S.p.A., Milan, Italy). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1818-1821. Research supported by the Consiglio Nazionale delle Recerche and European Community.

A 1-pKW concentration photovoltaic array with silicon cells, afocal lenses and passive cooling has been designed and developed. The concentrator consists of a mounting frame, whose tracking mode is altazimuthal and ten individual modules. The selected concentration ratio is 50. The afocal lenses provide an optimum flux distribution on the plane of the cell, reduce the incidence of chromatic aberration and tolerate partial shadowing without affecting the illumination profile. The cells have an n/p(+) structure, a Ti-Pd-Ag front metallization pattern, an Al-Cr-Ni-Au back metallization and a silicon nitride AR layer. They display efficiencies in excess of 16%. The tracking system consists of two independent motors for zenithal and azimuthal motion which are driven by two control units: the azimuthal movement has a constant speed basis plus a superimposed increment derived by the sun sensor. The zenithal movement is completely controlled via a suitable operational amplifier and a comparator, by the sun sensor. (Author)

A80-33729 **A novel mildly concentrating photovoltaic/thermal total energy system.** S. J. Strong (Solar Design Associates, Canton, Mass.), A. J. Manelas (Solectro-Thermo, Inc., Dracut, Mass.), and F. K. Manasse (New Hampshire, University, Durham, N.H.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 2. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1822-1824.

A mildly concentrating cone collector photovoltaic/thermal energy system concept is discussed. The module design, installation, and performance of the system are considered. V.T.

A80-33730 **The DOE photovoltaic concentrator project.** D. G. Schueler, E. C. Boes, B. D. Shafer, and J. F. McDowell (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1826-1829. Research supported by the U.S. Department of Energy.

Three major task areas of a photovoltaic concentrator project are described. The technology development activities in each of these areas include design, analysis, prototype and hardware development, evaluation, and production cost analysis V.T

A80-33731 **Design and analysis of a solar cell concentrating system using a flux redistributor.** J. E. Wennstrom (Idaho Power Co., Boise, Idaho) and R. E. Warner (Idaho, University, Moscow, Idaho). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1835-1839. Research supported by the University of Idaho, Washington Water Power Co., and Idaho Power Co.

A concentrating system which focused sunlight on an actively cooled array of silicon solar cells was built and tested. A concentration ratio of 11.7 was provided by a parabolic cylinder with a secondary mirror arrangement near the focal line to redistribute the solar flux. Relationships between optical, electrical, and thermal efficiencies are presented for two mounting positions. Solar cell voltage-current characteristics and the effects of pointing error on cell output power were examined. Test results show the flux redistributor has an equivalent reflectance of .75, but it provides convection suppression, a 1.0 intercept factor, flux uniformity across the cell surface, and insensitivity to tracking or mirror surface errors. The cells produced .05 W/sq cm with a photovoltaic efficiency of 6.5% and a system efficiency of 4.1% for the conversion of direct beam sunlight to electricity at a cell temperature of 64 C. (Author)

A80-33732 **Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems.** V. E. Wood, R. P. Kenan, and G. B. Gaines (Battelle Columbus Laboratories, Columbus, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1840-1843. 8 refs. Research supported by the U.S. Department of Energy.

Solar-cell encapsulation for environmental protection affects cells' electrical output and operating temperature. Such effects are particularly significant in concentrator systems requiring high-technology cells and operating above ambient temperature. We have made an initial calculation of effects of encapsulation on optical, thermal, and electrical behavior of low-resistivity solar cells with Fresnel-lens concentrators. Our objectives were to determine flux absorbed, power produced, and steady-state temperature distribution; to determine how these quantities changed on encapsulation; to look for beneficial design modifications. Parameters varied included antireflection-coating thickness, ambient temperature, and heat transfer coefficients. Absorbed heat was assumed dissipated by free convection and radiation. Two representative incident solar spectra were considered. Optical, thermal, and electrical analyses were necessarily carried out in an interdependent way. Encapsulation causes unavoidable power reduction which must be balanced against expected service-life improvements. Steady-state cell temperature increases resulting from encapsulation are small. (Author)

A80-33733 **Status of the photovoltaic systems definition project.** K. L. Biringer, G. J. Jones, D. R. Smith, and H. N. Post (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1846-1850. 14 refs. Research supported by the U.S. Department of Energy.

The paper deals with a photovoltaic systems definition project which is an integral part of the U.S. DOE's National Photovoltaic Conversion Program. Two areas of project responsibility are considered: systems analysis and subsystem technology development. V.T.

A80-33734 **Connection losses in photovoltaic arrays.** A. Luque, E. Lorenzo, and J. M. Ruiz (Madrid, Universidad Politécnica, Madrid, Spain). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1851-1855. Research supported by the Fundacion Ramón Areces.

The shortcircuit current, opencircuit voltage and connection losses of arrays of solar cells, either for normal or concentrated sunlight are analyzed under either series or parallel connection. The parameters of the individual cells are considered as random variables. The main conclusion reached is that the shortcircuit current of the cells connected in series must be carefully monitored in order to avoid any excessive losses. The losses in parallel arrays are small except in some cases in which the cell parameters suffer from an extreme dispersion. (Author)

A80-33735 **Photovoltaic array reliability project.** N. W. Patapoff (Southern California Edison, Rosemead, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1861-1864.

Southern California Edison, a southwestern electric utility, has installed a 2.2 KW (peak) flat plate photovoltaic array at its General Office in Rosemead, California, a suburb of Los Angeles. The array has given an indication of the reliability and operating characteristics of commercial panels. Results since initial operation in April 1978 have been encouraging. There have been no complete electrical failures, though there has been a significant number of visual degradations. These visual degradations are, for the time being, apparently cosmetic, because no difference was evident between I-V curves taken in June 1978 and April 1979. This project is a first step in the hardware portion of a two-pronged Edison program to examine P/V and its potential to supply energy. (Author)

A80-33736 **Evaluation of combined photovoltaic/thermal collectors.** S. D. Hendrie (MIT, Lexington, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1865-1869. Research supported by the U.S. Department of Energy.

The thermal and electric performance of an air and a liquid-type combined photovoltaic/thermal solar collector has been evaluated, yielding close correlation with theoretical results. Maximum thermal efficiencies of 45.2% and 40% for the liquid and air collectors without electric power production respectively decreased to 40.4% and 32.9% when electrical power was produced. Maximum electrical efficiencies of 6.8% were measured. (Author)

A80-33737 **Optimization of photovoltaic/thermal collector heat pump systems.** M. C. Russell and E. C. Kern, Jr. (MIT, Lexington, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1870-1874. Research supported by the U.S. Department of Energy.

Combined photovoltaic/thermal (PV/T) collectors convert insolation directly to both electrical and thermal energy. These collectors are potentially less costly and have smaller space requirements than equivalent separate collectors operating to satisfy residential heating, cooling, hot water and electric power demands. TRNSYS simulation of PV/T collector-heat pump systems for residences in New York and Fort Worth climates, and analysis of the technical and economic results are discussed. The parallel heat pump configuration with 40 square meters of PV/T collectors was found to be the least-cost system option for the New York residence. (Author)

A80-33738 **What is black chrome.** P. M. Driver (Western Australia, University, Nedlands, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1887-1891. 51 refs.

The paper studies the composition and structure of black chrome coatings and the interrelationship of these parameters together with deposition methods including electrodeposition, chemical vapor, and sputter deposition. Chromium particles and chromium dendrites in a dielectric matrix, and an amorphous structure of chromium and its compounds, are considered. It is concluded that black chromes are still poorly characterized due to their varying structures and limited thin film analysis techniques. A.T.

A80-33739 **Thermal degradation of a black chrome solar selective absorber coating - Short term.** C. M. Lampert (California, University, Berkeley, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1892-1896. 9 refs. Contract No. W-7405-eng-48.

The energy absorption properties and chemical microstructure of CHROM-ONYX were investigated using electron microscopy and X-ray diffraction techniques. Different temperatures for short annealing times were used to evaluate this coating's temperature resistance along with possible degradation mechanisms for stagnation situations. Each sample was characteristically similar, with air acting to mildly accelerate optical degradation at higher temperatures.

Below 300-400 C black chrome exhibited a structural transformation precipitating Cr2O3. Above 500 C this phase grew, while chromium was depleted. For practical purposes black chrome optically degraded between 500-600 C during short exposure times. (Author)

A80-33740 **Thermal aging characteristics of electrodeposited black chrome solar coatings.** R. B. Pettit and R. R. Sowell (Sandia Laboratories, Albuquerque, N. Mex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1897-1901. 7 refs. Contract No. DE-AC04-76DP-00789.

A80-33741 **Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control.** J. Ohno, Y. Shindoh, J. Oka, and H. Okada (Nippon Steel Corp., Fundamental Research Laboratories, Kawasaki, Japan). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1902-1906.

A80-33742 **Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system.** G. L. Harding, B. Window, C. Horwitz, A. R. Collins, and D. R. McKenzie (Sidney, University, Sidney, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1912-1916. 11 refs. Research supported by the University of Sidney.

A cylindrical magnetron sputter coater has been constructed for deposition of selective absorbing surfaces onto batches of 1.5 m long glass tubes. A selective surface consisting of reactively sputtered mixed iron chromium and nickel carbides overlayed on sputtered copper on glass has been used to evaluate the properties of the coater. Absorptances, emittances and ageing properties of selective surfaces produced by the coater are discussed. (Author)

A80-33743 **Selective electrodeposited chromium black coatings - Optical properties, selectivity model.** J. Lafait, S. Berthier, and J.-M. Behaghel (Paris VI, Université, Paris, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1922-1925. 6 refs.

A80-33744 **Photoacoustic determination of absorptance and emittance of solar selective coatings.** S. I. Yun (Busan National University, Busan, South Korea). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1926-1930. 24 refs.

A new approach to the study of radiation characteristics of solar selective coatings is reported. When chopped light impinges on a solid in an enclosed cell, an acoustic signal is produced and detected by a sensitive microphone. This photoacoustic effect is the basis of the new approach. This paper reports the design and performance characteristics of a photoacoustic spectrometer suitable for recording absorptance and emittance spectra of the solar selective coatings. The dependence of photoacoustic signal on various experimental parameters is explored and some of its usefulness and limitations of the photoacoustic spectrometry in determining absorptance and emittance of the prepared sample has been made. For comparison, both absorptance spectra obtained by photoacoustic technique and conventional Gier-Dunkle reflectometer are reported. A calibration procedure for the photoacoustically determined absorptance and emittance is also discussed. (Author)

A80-33745 **Radiative selectivity and the oxidation of stainless steels.** V. C. Sharma (Benin, University, Benin City, Nigeria) and M. G. Hutchins (University College, Cardiff, Wales). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1940-1944. 14 refs. Research supported by the Science Research Council.

A comparison of spectrally selective surfaces formed by both chemical and thermal oxidation of 300 series stainless steels has been made. The optical properties, solar absorptance and thermal emittance, have been measured and the compositions and growth of the surface oxides have been studied using Auger electron spectroscopy. A dark blue, chemically-oxidized surface was found to have the most favorable combination of radiative properties, though further development to produce higher solar absorptance is needed for both chemically and thermally produced surfaces. (Author)

A80-33746 **Absorptance and emittance measurements of AlPbS and Zh dust selective surfaces.** B. K. Gupta, F. K. Tewari, R. Thangaraj, S. S. Mathur, and O. P. Agnihotri (Indian Institute of Technology, New Delhi, India). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1945-1949. 7 refs.

Measurements of the visible absorptance and infrared emittance of the low-cost potential solar energy absorbers Al-PbS and coated zinc dust are presented. Selective absorption surfaces were obtained by the spraying of solutions of PbS in various concentrations of lead acetate and thiourea in water onto Al-coated surfaces and the electroless deposition of CuO, CuS and CuS + PbS coatings onto zinc dust to form a selective black paint which is applied onto metal sheets. PbS coatings produced in a solution with a 1:3 ratio of lead acetate to thiourea are found to exhibit the best absorptivity (0.93), with an emissivity of 0.21. The coated metal dust surfaces are observed also to have high absorptivities (around 0.95) but with relatively higher emissivities (0.42-0.51), which are attributed to the uncontrollable amount of black coating deposited on the metal particles. A.L.W.

A80-33747 **Ion implanted materials as selective absorbers for photothermal solar energy conversion.** G. Chassagne, A. Delmas, and M. Treilleux (Lyon I, Université, Villeurbanne, Rhône, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1950-1954.

Composite materials are produced by implantation at room temperature of alkali metal ions, K(plus), Li(plus), Na(plus), in magnesium oxide single crystals. Thermal treatment precipitates metal aggregates in implantation zone. These precipitates are observed by electron microscopy. The optical properties of these composite materials, principally MgO:Na, are studied with consideration given to their applicability as selective solar energy absorbers. (Author)

A80-33748 **Nickel pigmented anodic aluminium oxide for selective absorption of solar energy.** C. G. Granqvist (Chalmers Tekniska Hogskola, Goteborg, Sweden), O. Hunderi (Norges Tekniske Hogskole, Trondheim, Norway), and A. Andersson (Granges Aluminium, Finspang, Sweden). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1955-1959. 29 refs.

A80-33749 **Studies of directly absorbing fluids for mid-temperature solar thermal applications.** A. R. Burke, D. E. Etter, C. J. Wiedenheft, and L. J. Wittenberg (Monsanto Research Corp., Miamisburg, Ohio). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 1960-1964. 7 refs. Contract No. DE-AC04-76DP-00053.

Thermal, photochemical, and optical absorptivity studies at elevated temperatures were initiated on various heat transfer fluids containing chromophoric materials. The solar absorption efficiency of the fluids and chromophores were calculated at ambient and elevated temperatures. Density, viscosity, and heat capacity measurements for specific solutions were also determined. Eight chromophoric solutions have been identified, thus far, for further study as candidates for directly absorbing fluids for use up to 100 C. (Author)

A80-33751 **Comparison of costs for solar derived electrical sources with diesel generators in remote locations.** F. K. Manasse (New Hampshire, University, Durham, N.H.) and R. L. Borofsky (AETA Corp., Dover, N.H.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2102-2106. 11 refs.

This paper looks specifically at three alternative sources for generating power in remote regions of the world. These include diesel electric, photovoltaic and solar thermal electric devices. Fuel cost, and more specifically, transportation costs of that fuel, dramatically change which device will be most cost effective under specific conditions. In areas where fuel is readily available, diesel appears to be the best alternative financially. Even today, however, solar thermal generators appear to make sense in a number of realistic scenarios, especially those involving LDCs. Photovoltaics do not seem to be competitive at this time, but technical advances may in fact change this in the future. These comparisons are all represented graphically and numerically in the body of this paper. (Author)

A80-33752 **The economics of solar hot water heating in multifamily units.** H. B. Zien (Zien Mechanical Contractors, Milwaukee, Wis.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2107-2110.

A80-33754 **Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies.** J. J. Iannucci and J. D. Fish (Sandia Laboratories, Livermore, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2116-2120. 13 refs. Contract No. DE-AC04-76DP-00789.

Chemical storage is the only mode now under consideration for solar thermal electric plants which might satisfy the concept of inexpensive, easily transportable, long duration, ambient temperature storage. The predicted thermal-to-chemical-to-thermal efficiencies for the most prominent of the candidate reactions, however, have been disappointingly low. These low efficiencies are shown to be natural outgrowths from fundamental thermodynamic and engineering principles. Close analogies are drawn between the efficiency of thermal to electric conversion and the efficiency of chemical energy storage processes. (Author)

A80-33755 **Cost and performance evaluation of passive solar systems.** R. Gorman, K. L. Heitner, K. H. Mehta, A. B. Molander, P. S. Moritz, and C. J. Thomas (TRW Energy Systems Group, McLean, Va.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2132-2136.

The paper deals with a computer program developed for rapid design of optimum passive solar systems with thermal storage walls. The program performs the combined functions of selecting the optimum glazing-reflector-insulation-storage configuration in each climate, correctly sizing the thermal storage wall configuration, and calculating the economics and fuel savings for the optimal installations. V.T.

A80-33757 **The effect of an auxiliary load management strategy on solar system performance.** T. Newell, S. Swanson, and R. Boehm (Utah, University, Salt Lake City, Utah). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2143-2147. 7 refs. Research supported by the Utah Power and Light Co.

Electric utilities typically have peaking problems caused by seasonal and time-of-day variations in demand. This report presents the results of an analysis performed to determine whether solar systems could be used for electric utility load management. A straight-forward strategy was devised that consisted of adding heat energy to the solar system heat storage during off-peak (night time) hours, bringing the sensible heat storage up to a controlled temperature level. This strategy was then investigated by means of a detailed computer simulation of system performance, using Salt Lake City weather data. The elevated storage temperature due to the load management led to a reduction in the solar system performance, which was compensated by a shift of the utility load to off-peak times. The tradeoff looks quite favorable as a large shift to off-peak energy usage is accompanied by only a small reduction in solar system performance. (Author)

A80-33758 **A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility.** D. A. Murry (Stone and Webster Management Consultants, Inc., Washington, D.C.) and R. Zumwalt (C.H. Guernsey and Co., Oklahoma City, Okla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2148-2151.

The paper deals with a project designed to assess the potential benefits and costs for the New Mexico Electric Service Company (NMESC) resulting from the interconnection of various solar electric plant systems. Eight solar electric configurations, each with and without storage, are considered at two separate sites. The impact of a solar R&D facility on the NMESC will depend on the specific type, size and location of plant selected, and on the treatment of the incremental benefits/costs as to whether or not such effects are passed onto rate payers or stockholders. S.D.

A80-33759 **Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025.** M. J. Claverie and A. P. Dupas (CNRS, Paris, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2152-2156. 15 refs.

The potential production of solar power plants in the year 2025 is calculated, assuming moderate growth of energy demand and rather fast economic development. Population distribution and the fraction of energy consumption used for the generation of electricity in each world region are taken into account in predicting the future demands for centralized as well as decentralized electrical energy. Future solar power plant production is discussed, considering latitude and the expected costs of power plant investment and fuel. It is concluded that there will be a market of 1000 GW from solar power plants in 2025, producing 2500 Twh/year, that is, 5% of global electricity demand, supplying 17-28% of the earth's population. J.P.B.

A80-33761 **Application of circumsolar measurements to concentrating collectors.** D. F. Grether, D. Evans, A. Hunt, and M. Wahlig (California, University, Berkeley, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2193-2197. Contract No. W-7405-eng-48.

A systematic measurement program is being carried out to assess the effects of circumsolar radiation (the solar aureole) on the performance of solar conversion systems using concentrating collectors. Four instrument systems have been constructed and are providing detailed intensity vs. angle profiles of the solar and circumsolar (out to 3 deg from the center of the sun) as well as other solar measurements. The instruments are briefly described. Results are presented of the average effect of the circumsolar radiation on the solar energy available to an idealized point focusing system. Results are also presented for an analysis of two specific Central Receiver designs. (Author)

A80-33763 **The simulation of partially and fully tracking flat plate collectors in northern latitudes.** J. R. Simonson (City University, London, England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2214-2218. Research supported by Hall Thermotank.

A computer programme was written to calculate the incident energy available on the surface of a flat plate collector, using hourly measured radiation data for horizontal surfaces at Kew. An optimum annual incidence of 1004 kWh/sq m was calculated for a collector of 31 deg slope, pointing due south with normal ground reflectance. In partial tracking the collector followed the sun's azimuth angle, the slope being fixed. Increases were achieved with partial and full tracking, the small additional increase with full tracking being due to the relatively large amounts of diffuse radiation. (Author)

A80-33764 **The measurement of solar irradiance on a tilted surface.** B. Justin (Pilkington Brothers, Ltd., Lathom, Lanc., England), D. B. Pye, and J. L. J. Rosenfeld (Shell Research, Ltd., Chester, Middx., England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2219-2221.

The measurement of solar irradiance on a tilted plane has been compared using two methods. The irradiance was calculated from the measured total and diffuse irradiance in the horizontal plane assuming an isotropic sky and compared with that measured in the tilted plane. Differences were observed which depended on how the tilted solarimeter was mounted. It is concluded that provided errors of about 5% can be tolerated, the irradiance on a tilted surface may be estimated from measurements with horizontally placed instruments, assuming sky isotropy. If a tilted instrument is used, it is important to ensure adequate radiation shielding and ventilation around the back of the instrument. (Author)

A80-33766 **Markov chains to solar energy storage calculations.** R. O. Fernández (R. Fernández y Asociados, Buenos Aires, Argentina) and M. V. García (Comisión Nacional de Investigaciones Espaciales, San Miguel, Argentina). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2227-2231.

The statistic theory of Markov chains has been used to make probabilistic predictions of sequences of variable length of cloudy days starting in a typical day. The calculations were made in Buenos Aires and La Plata, for thirty years of observations of cloudiness based on data of bright sunshine distributed in four intervals. The probabilities of various sequences of different length, and the corresponding storage capacities for different thermics loads have been determined. (Author)

A80-33782 **General formulation of the current-voltage characteristic of a p-n heterojunction solar cell.** S. J. Fonash (Pennsylvania State University, University Park, Pa.). *Journal of Applied Physics,* vol. 51, Apr. 1980, p. 2115-2118. 12 refs.

A derived current-voltage (I-V) characteristic for p-n heterojunction solar cells of the form window/absorber is obtained. The development lends itself to a simple, diagrammatical interpretation of the step-by-step collection of the photocurrent flowing out of the base of the absorber. The resulting general I-V characteristic under illumination is in a form useful for the design of these devices and for the interpretation of their performance. (Author)

A80-33785 **Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination.** P. Smith, R. Singh, and J. DuBow (Colorado State University, Fort Collins, Colo.). *Journal of Applied Physics,* vol. 51, Apr. 1980, p. 2164-2166. 10 refs. Contract No. XS-9-8232-1.

Recently, Rodriquez and co-workers (1979) reported anomalous photocurrent in reverse-biased tin oxide/silicon solar cells. The present authors have observed no anomalous photocurrent in indium tin oxide/silicon semiconductor-insulator-semiconductor (SIS) solar cells. In this paper, a possible explanation of why the authors of the above referred paper have observed anomalous photocurrent in tin oxide/silicon solar cells whereas no such effect has been observed in the indium tin oxide/silicon SIS solar cells of the present authors has been offered. (Author)

A80-33786 **Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces.** F. G. Courreges, A. L. Fahrenbruch, and R. H. Bube (Stanford University, Stanford, Calif.). *Journal of Applied Physics,* vol. 51, Apr. 1980, p. 2175-2183. 23 refs. Research supported by the U.S. Department of Energy.

The properties of indium-tin oxide (ITO)/CdTe junction solar cells prepared by RF sputtering of ITO on P-doped CdTe single-crystal substrates have been investigated through measurements of the electrical and photovoltaic properties of ITO/CdTe and In/CdTe junctions, and of electron beam induced currents in ITO/CdTe junctions. In addition, surface properties of CdTe related to the sputtering process were investigated as a function of sputter etching and thermal oxidation using the techniques of surface photovoltage and photoluminescence. ITO/CdTe cells prepared by this sputtering method consist of an n(+)-ITO/n-CdTe/p-CdTe buried homojunction with about a 1-micron-thick n-type CdTe layer formed by heating of the surface of the CdTe during sputtering. Solar efficiencies up to 8% have been observed with an open-circuit voltage of 0.82 V and a short-circuit current density of 14.5 mA/sq cm. The chief degradation mechanism involves a decrease in open-circuit voltage with a transformation of the buried homojunction structure to an actual ITO/CdTe heterojunction. (Author)

A80-33805 **Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors.** C. J. Sletten, F. S. Holt, and S. B. Herskovitz (Solar Energy Technology, Inc., Bedford, Mass.). *Applied Optics,* vol. 19, May 1, 1980, p. 1439-1453. 7 refs. Contract No. DE-FG04-77CS-34163.

This paper presents new optical methods for the design of nontracking solar energy concentrators with acceptance angles of 60 deg in the elevation (altitude) plane and plus or minus 50 deg in azimuth sectors. A two-point corrected cylindrical stepped prism lens (SPL) with 30.48-cm aperture height and F/D approximately equal to 1, which focuses well over the acceptance interval, has been designed and constructed. Image collapsing subreflector (ICS) surfaces are synthesized that reflect the incident illumination refracted by the lens onto a small fixed absorbing area or shelf 7.6 cm wide resulting in near maximum theoretical concentration ratios for these broad acceptance angles. Nearly 100% of the incident optical rays intercept the absorber shelf. The wide-angle and image collapsing optical properties were confirmed by laser and solar experiments. Rooftop thermal tests on a 30.5 x 30.5-cm collector section using selectively absorbing tubes with water as circulant were conducted that indicate aperture efficiencies of 60% could be expected on large area collectors based on this design. (Author)

A80-33852 **n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple.** L. F. Schneemeyer, M. S. Wrighton (MIT, Cambridge, Mass.), A. Stacy, and M. J. Sienko (Cornell University, Ithaca, N.Y.). *Applied Physics Letters,* vol. 36, Apr. 15, 1980, p. 701-703. 10 refs. Research supported by the Massachusetts Institute of Technology, U.S. Navy, and U. S. Air Force.

The paper demonstrates that single-crystal, n-type MoSe2 can be used as a stable photoanode in an electrochemical cell using a nonaqueous solution of Cl2/Cl/-/ as the redox active material. The MoSe2 is qualitatively better than MoS2 which has a larger band gap, and both materials are stable in a nonaqueous solution, while both photocorrode in aqueous Cl/-/ solutions. The stable Cl2/Cl/-/ system show that a transparent, reversible, non-O2-sensitive redox couple can be useful in n-type semiconductor-based liquid-junction cells using a direct band gap material with optimum solar response. A.T.

A80-33854 # Improved model of In2O3/SnO2-SiO/x/-nSi solar cells (Uluchshennaia model' solnechnykh preobrazovatelei na osnove struktury In2O3/SnO2-SiO/x/-nSi). A. I. Malik, V. B. Baraniuk, and V. A. Manasson (Akademiia Nauk Ukrainskoi SSR, Institut Prikladnykh Problem Mekhaniki i Matematiki, Chernovtsy, Ukrainian SSR). *Geliotekhnika,* no. 1, 1980, p. 3, 4. In Russian.

A80-33855 # Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators (Analiz teplovykh poter' i nekotorye puti povysheniia effektivnosti panel'nykh solnechnykh termoelektrogeneratorov /STEG/). I. I. Kokhova, Iu. N. Malevskii, and A. I. Tsvetkov (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *Geliotekhnika,* no. 1, 1980, p. 5-11. 9 refs. In Russian.

Ways to improve the efficiency of solar thermoelectric generators by reducing heat losses are discussed. Different heat transfer conditions are examined: single and double layer glass coatings, selective coatings on the collector, ordinary and vacuum-type heat insulation, and air and water cooling. B.J.

A80-33856 # Calculation of the angular error of a solar cylindrical concentrator made from sheet material (Raschet uglovoi pogreshnosti solnechnogo tsilindricheskogo kontsentratora iz listovogo materiala). M. A. Markman, L. M. Simanovskii, and O. P. Zakharova (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *Geliotekhnika,* no. 1, 1980, p. 15-18. In Russian.

A80-33857 # Geometric and kinematic characteristics of solar-tower heliostats (Geometricheskie i kinematicheskie kharakteristiki geliostatov SES bashennogo tipa). R. R. Aparisi, D. I. Tepliakov, and B. G. Khantsis (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *Geliotekhnika,* no. 1, 1980, p. 19-25. 5 refs. In Russian.

Equations for the geometric and kinematic characteristics of solar-tower heliostats are obtained and used for the direct calculation (based on the method of angular coordinate determination) of the positions of typical heliostats. Velocities of the azimuth and zenith rotations of heliostats are determined. B.J.

A80-33858 # The electronic aberrogram recorder (Elektronnyi registrator aberrogramm). R. A. Zakhidov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *Geliotekhnika,* no. 1, 1980, p. 26-29. In Russian.

The electronic aberrogram recorder (EAR) is an optoelectronic device designed for monitoring the operation of solar concentrators. The device is used to record the point of incidence of light beams reflected by the concentrator; this is accomplished by the transformation of incidence-point coordinates into voltages, that can be viewed on an oscillograph or plotted. Particular attention is given to an EAR system which uses a photodiode array as the photosensitive surface. B.J.

A80-33859 # Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors (Issledovanie svetopogloshchaiushchikh pokrytii, poluchennykh sovmestnoi kondensatsiei parov metalla i dielektrika). U. Kh. Gaziev, Sh. A. Faiziev, V. V. Li, and V. S. Trukhov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *Geliotekhnika,* no. 1, 1980, p. 30-32. 6 refs. In Russian.

The paper examines metal/dielectric light-absorbing coatings (for use on solar collectors) prepared by thermal vapor deposition in high vacuum. Results on spectral reflectance were obtained for the following materials (in the dielectric to metal concentration ratio range from 3:1 to 1:3): SiO2-Ni, CeO2-Ni, and SiO2-Cr. The study showed that the light-absorbing properties of the coatings are stable to temperatures of 400 C. B.J.

A80-33860 # Test results on solar turbogenerators (Nekotorye rezul'taty ispytanii solnechnogo turbogeneratora). A. K. Alimov, L. M. Drabkin, G. Ia. Umarov, and P. U. Khatamov (Vsesoiuznyi Zaochnyi Institut Inzhenerov Zheleznodorozhnogo Transporta, Moscow, USSR; Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *Geliotekhnika,* no. 1, 1980, p. 36-38. In Russian.

The dynamic characteristics of a full-scale solar turbogenerator were obtained for a direct solar radiation power of 650 W/sq m, a maximum collector-wall temperature of 423 C, and an air flowrate of 0.03 kg/sec. Specifically, attention was given to the dependence of the number of rotations on the temperature of the working fluid, and to transient temperatures in the generator. B.J.

A80-33861 # The use of solar energy storage for heating and cooling applications (K ispol'zovaniiu akkumuliatorov solnechnoi energii dlia teplo- i khladosnabzheniia). A. Davletov, A. A. Petrova, and F. A. Guseinova (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *Geliotekhnika,* no. 1, 1980, p. 39-43. In Russian.

The paper examines the development of solar heat storage systems for the heating and cooling of houses in desert regions (the Turkmenian SSR is considered as an example). The choice of heat storage materials is considered (the advantages of paraffin are emphasized), and the thermodynamic properties of the materials are examined. B.J.

A80-33862 # Choice of cycle parameters for solar Freon air conditioning equipment of ejector type (Vybor raschetnykh parametrov tsikla gelioezhektornoi Freonovoi kholodil'noi mashiny /GEFKhM/). S. Z. Zhadan and N. A. Shchetinina (Odesskii Tekhnologicheskii Institut Kholodil'noi Promyshlennosti, Odessa, Ukrainian SSR). *Geliotekhnika,* no. 1, 1980, p. 44-47. In Russian.

A method for calculating the cycle parameters of a solar air conditioning system of ejector type is described; calculations are made for solar radiation conditions typical of Odessa in July. A combined analysis of the efficiencies of the solar and cooling parts of the system is used to determine the optimal temperature of the working fluid. B.J.

A80-33863 # Development of a combined solar heating/heat pump system for conditions typical of the Crimea (Razrabotka kombinirovannoi sistemy solnechnogo teplosnabzheniia s teplovym nasosom v usloviiakh Kryma). S. I. Smirnov and A. S. Troshin (Gosudarstvennyi Nauchno-Issledovatel'skii Energeticheskii Institut, Moscow, USSR). *Geliotekhnika,* no. 1, 1980, p. 75-80. 9 refs. In Russian.

The feasibility of developing solar-assisted heat pump systems for Crimean conditions is examined. Particular consideration is given to a solar heating system with flat-plate collectors and a compression-type heat pump; a diagram of the system is provided and the basic parameters are examined. B.J.

A80-33864 Dynamic modelling and verification of a flat-plate solar collector. A. J. de Ron (Eindhoven, Technische Hogeschool, Eindhoven, Netherlands). *Solar Energy,* vol. 24, no. 2, 1980, p. 117-128. 14 refs.

In the modelling of flat-plate solar collectors the dynamic effects have often been neglected. But because the solar collector is inherently exposed to variable weather conditions, its dynamics may be important to the design and control. It is demonstrated that it is not necessary to ignore the dependence of the various temperatures on the location in the direction of flow (which is often done to avoid complications) provided the model is developed in the frequency domain. The linearised model has been verified in the frequency domain by means of a least squares estimator. The verification was performed with a part of a full-size collector, as has been applied in some solar houses, and an artificial sun. It is concluded from the results of the verification that the developed model describes the collector dynamics quite satisfactorily. The differences between the theoretical and estimated heat resistances was about 10 per cent. The verification and estimation procedure proved to be a useful tool for comparing various collectors because the collector has to be fitted with only two temperature sensors. It is shown that the simple models discussed in the literature give responses which are not representative of the collector's dynamics. For well-designed collectors a simplified model is derived. Finally, some desirable sampling rates are given. (Author)

A80-33867 **Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south.** W. R. McIntire (Argonne National Laboratory, Argonne, Ill.). *Solar Energy,* vol. 24, no. 2, 1980, p. 169-175. 7 refs. Contract No. W-31-109-eng-38.

Design optimization of solar collectors for tubular evacuated receivers aligned north-south is discussed, with attention given to the choice of acceptance angles and truncation parameters. Considerations involved in this choice include the effects of reflection losses, reflector-receiver alignment errors, variation of selective surface absorptance with angle of incidence on the receiver, and losses through the gap between the receiver and the reflector. Wide-acceptance-angle reflectors are found to enhance the performance of tubular evacuated receivers, and the performance of collectors using these reflectors is not a sensitive function of acceptance angle in the range near 60 deg. The reflectors' wide acceptance angles and ideal nonimaging optics allow manufacturing tolerances without requiring that the concentrator be designed for undersize receivers. L.M.

A80-33869 **Thermosyphon circulation in solar collectors.** G. L. Morrison (New South Wales, University, Kensington, Australia) and D. B. J. Ranatunga (National Engineering Research and Development Centre, Solar Energy Div., Colombo, Sri Lanka). *Solar Energy,* vol. 24, no. 2, 1980, p. 191-198. 13 refs.

Theoretical predictions of flow rate in thermosyphon solar collectors are compared with experimental measurements obtained using a laser Doppler anemometer. Modifications to the usual method of analysis are proposed to improve the accuracy of the predictions, and the results are compared with flow rate predictions and measurements in other investigations. (Author)

A80-33871 **Optimization of flat-plate collector-flat mirror systems.** D. C. Larson (Drexel University, Philadelphia, Pa.). *Solar Energy,* vol. 24, no. 2, 1980, p. 203-207. 9 refs. Research supported by the U.S. Department of Energy.

Solar collection capabilities of a flat-plate collector with a flat specular mirror are analyzed in order to determine the optimal geometries and tilting strategies of the collector and mirror for a variety of solar energy applications. Maximum enhancement factors and associated tilt angles for year-round collection are graphically determined as a function of the mirror length relative to the panel length (L), and it is found that for mirror lengths ranging from one to two times the panel length the panel should be tilted phi + 15 deg (where phi is the latitude angle) from the horizontal and the front mirror tilt from the horizontal should increase from 55 - phi for L = 1 to 65 - phi for L = 2. L.M.

A80-33872 **Fluid circulation control in conventional and heat pipe planar solar collectors.** H. F. W. de Vries, W. Kamminga, and J. C. Francken (Groningen, Rijksuniversiteit, Groningen, Netherlands). *Solar Energy,* vol. 24, no. 2, 1980, p. 209-213.

The efficiencies of a planar heat pipe solar collector and a conventional flat plate solar collector are compared with respect to the transient behavior during periods in which the absorber temperature becomes lower than the storage temperature. A simple mathematical model is used and equations for the oscillating insolation of the sinusoidal and square wave types are obtained in order to investigate the impact of the pump on/off switch and the diode resistance on the collector efficiencies for different oscillating periods. It is found that the performance of the heat pipe collector used without fluid circulation control is as good as that of a conventional collector used with control; hence, the control unit can be omitted in the heat pipe collector. However, then a manual or automatic cut-off is required during the night. L.M.

A80-34561 **A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/.** N. Ito, K. Matsuda (Tokyo Metropolitan University, Tokyo, Japan), A. Ishii (Kyushu Institute of Design, Kyushu, Japan), and H. Osawa (Ministry of Construction, Building Research Institute, Japan). *(Solar Energy,* vol. 4, no. 2, 1978, p. 5-10.) *Energy Developments in Japan,* vol. 2, Jan. 1980, p. 253-263. Translation.

Experimental results are reported for a simple open type solar collector - a water trickle type collector - used in combination with a massive concrete slab for energy storage. This relatively low cost system was installed on a typical Japanese house in Yokohama City and measurements were made of the interior temperature. The system showed considerable promise for application in Japan. (Author)

A80-34598 **Solar collectors for low and intermediate temperature applications.** F. Kreith, A. Rabl (Solar Energy Research Institute, Golden, Colo.), G. O. G. Lof (Colorado State University, Fort Collins, Colo.), and R. Winston (Chicago, University, Chicago, Ill.). *Progress in Energy and Combustion Science,* vol. 6, no. 1, 1980, p. 1-34. 53 refs.

To provide a rational basis for deciding which type of low or intermediate temperature solar collector is best suited for a particular application, various flat-plate and nonfocusing solar concentrators are compared in terms of their most important general characteristics, viz. concentration, acceptance angle, sensitivity to mirror errors, size of reflector area, and thermal efficiency. This summary of low and intermediate temperature solar collectors first outlines the principles of flat-plate collectors, then discusses the performance of liquid and air flat-plate collectors from experimental and analytical standpoints, and finally presents the theory and design of low concentration type of nonimaging collectors. S.D.

A80-34637 **Photovoltaic materials.** E. A. Perez-Albuerne and Y.-S. Tyan (Eastman Kodak Co., Rochester, N.Y.). *Science,* vol. 208, May 23, 1980, p. 902-907. 38 refs.

The materials requirements of typical solid-state photovoltaic cells for the various solar cell configurations under investigation are reviewed. The operating principles of photovoltaic cells are discussed, with particular attention given to the loss mechanisms which limit the efficiency of charge generation and separation. The development and photovoltaic properties of single-crystal and polycrystalline silicon cells, gallium arsenide cells, thin film cadmium sulfide/copper sulfide cells and amorphous silicon cells are then surveyed, and other promising semiconductor materials are indicated. It is concluded that while systems characterized by ease of fabrication, high efficiency or long-term stability have been developed, further advances in materials properties and automated, large-volume, cost-effective manufacturing processes must be made in order to attain the properties necessary for large-scale application simultaneously in a single substrate. A.L.W.

A80-34778 **Selection of materials and development of processes for the fabrication of solar reflector panels.** M. R. Boyaner and H. K. Lauer (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: New horizons - Materials and processes for the eighties; Proceedings of the Eleventh National Conference, Boston, Mass., November 13-15, 1979. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 424-431.

The MDAC central receiver solar thermal power system is based on the concept of multiple solar energy reflectors (solar reflector panels) directing the sun's energy on a receiver unit, where the concentrated heat from the sun is used to convert water into steam. This paper presents the trade studies and tests performed to select the core material, the back face sheet, and the adhesives and sealants used to bond and seal the reflector panels. The processes for adhesive application and panel assembly are discussed. The selected heliostat reflector panel design is a sandwich panel consisting of a styrofoam core bonded to a second surface mirror on one side, and a sheet of galvanized steel on the other side. The periphery of the panel is sealed by bonding on a galvanized steel edge member incorporating the use of a dual seal system. (Author)

A80-34779 **Solar materials R & D overview emphasizing solar thermal power systems.** B. L. Butler (Solar Energy Research Institute, Golden, Colo.). In: New horizons - Materials and processes for the eighties; Proceedings of the Eleventh National Conference, Boston, Mass., November 13-15, 1979. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 432-436. 5 refs.

A80-34780 * **Silicon material task - Low cost solar array project /JPL/DOE/.** R. Lutwack (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: New horizons - Materials and processes for the eighties; Proceedings of the Eleventh National Conference, Boston, Mass., November 13-15, 1979. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 437-440.

The paper describes the silicon material task of the low-cost solar array project, which has the objective of establishing a silicon production capability equivalent to 500 mW per year at a price less than 10 dollars/kg (1975 dollars) in 1986. The task program is divided into four phases: technical feasibility, scale-up studies (the present phase), experimental process system development units, and implementation of large-scale production plants, and it involves the development of processes for two groups of materials, that is, semiconductor grade and solar cell grade. In addition, the effects of impurities on solar cell performance are being investigated. Attention is given to problem areas of the task program, such as environmental protection, material compatibility between the reacting chemicals and materials of construction of the equipment, and waste disposal. J.P.B.

A80-34781 **Low-cost, high-performance solar selective paint coatings.** W. D. McKelvey and P. B. Zimmer (Honeywell, Inc., Avionics Div., Minneapolis, Minn.). In: New horizons - Materials and processes for the eighties; Proceedings of the Eleventh National Conference, Boston, Mass., November 13-15, 1979. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 453-462. Research supported by the U.S. Department of Energy.

The development of low-cost, high-performance solar selective paint coatings for flat-plate collectors is described. Some of the coatings hold the promise of on-site application by unskilled personnel. The selective paints were made by optimizing coating thickness, pigment volume concentration and pigment particle size. Coatings were shown to be optically efficient with solar absorptance of 0.90 and infrared emittance of 0.10. Material cost for typical thickness-sensitive selective paint coatings was estimated at 1 cent/sq. ft. Thickness insensitive paints using binary pigment combinations were also developed providing values of solar absorptance equal to 0.90 and infrared emittance equal to 0.30. Coatings of this type are independent of either thickness or substrate surface and offer considerably wider versatility for commercial and residential applications than thickness sensitive coatings. (Author)

A80-34782 * **Glass fiber reinforced concrete for terrestrial photovoltaic arrays.** H. Maxwell (California Institute of Technology, Jet Propulsion Laboratory, Applied Mechanics Section, Pasadena, Calif.). In: New horizons - Materials and processes for the eighties; Proceedings of the Eleventh National Conference, Boston, Mass., November 13-15, 1979. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 463-470.

The use of glass-fiber-reinforced concrete (GRC) as a low-cost structural substrate for terrestrial solar cell arrays is discussed. The properties and fabrication of glass-reinforced concrete structures are considered, and a preliminary design for a laminated solar cell assembly built on a GRC substrate is presented. A total cost for such a photovoltaic module, composed of a Korad acrylic plastic film front cover, an aluminum foil back cover, an ethylene/vinyl acetate pottant/adhesive and a cotton fabric electrical isolator in addition to the GRC substrate, of $9.42/sq m is projected, which is less than the $11.00/sq m cost goal set by the Department of Energy. Preliminary evaluations are concluded to have shown the design capabilities and cost effectiveness of GRC; however, its potential for automated mass production has yet to be evaluated. A.L.W.

A80-34841 **Solar energy utilization.** T. Michels (Londe, Parker, Michels, Inc., St. Louis, Mo.). New York, Van Nostrand Reinhold Co., 1979. 265 p. 285 refs. $18.50.

The book is presented in five chapters: energy conservation, the sun with the earth, solar energy collectors, solar energy storage, and sizing. Energy conservation is discussed with general comments and relative to specific concepts for the residential sector, walls, windows, infiltration, ceilings and attics, floors, and ventilation. Chapters 2 to 4 present the necessary background solar information so that one can understand what has been done and, generally, why. This information is required to establish an informed judgment. Chapter 5 is designed to ensure that basic, preliminary design decisions are made that facilitate design development. S.D.

A80-34847 * **Solar cell array design handbook - The principles and technology of photovoltaic energy conversion.** H. S. Rauschenbach (TRW Defense and Space Systems Group, Redondo Beach, Calif.). Research supported by NASA; Contract No. JPL-953913. New York, Van Nostrand Reinhold Co., 1980. 564 p. 433 refs. $42.50.

Photovoltaic solar cell array design and technology for ground-based and space applications are discussed from the user's point of view. Solar array systems are described, with attention given to array concepts, historical development, applications and performance, and the analysis of array characteristics, circuits, components, performance and reliability is examined. Aspects of solar cell array design considered include the design process, photovoltaic system and detailed array design, and the design of array thermal, radiation shielding and electromagnetic components. Attention is then given to the characteristics and design of the separate components of solar arrays, including the solar cells, optical elements and mechanical elements, and the fabrication, testing, environmental conditions and effects and material properties of arrays and their components are discussed. A.L.W.

A80-34999 * # **Large space structures - Fantasies and facts.** M. F. Card and W. J. Boyer (NASA, Langley Research Center, Hampton, Va.). In: Structures, Structural Dynamics, and Materials Conference, 21st, Seattle, Wash., May 12-14, 1980, Technical Papers. Part 1. New York, American Institute of Aeronautics and Astronautics, Inc., 1980, p. 101-114. 37 refs. (AIAA 80-0674)

A review of large space structures activities from 1973 to 1979 is presented. Long-range studies of space colonies, gigantic solar power stations and projected earth applications revived interest in space activities. Studies suggest opportunities for advanced antenna and platform applications. Matching low-thrust propulsion to large flexible vehicles will be a key technology. Current structures technology investigations include deployable and erectable structures and assembly techniques. Based on orbited structures experience, deployment reliability is a critical issue for deployable structures. For erectable structures, concepts for earth-fabricated and space-fabricated members have been demonstrated. (Author)

A80-35335 **Thin-film solar cells - A unified analysis of their potential.** A. M. Barnett (Delaware, University, Newark, Del.) and A. Rothwarf (Drexel University, Philadelphia, Pa.). *IEEE Transactions on Electron Devices*, vol. ED-27, Apr. 1980, p. 615-630. 43 refs.

The development and deployment of low-cost thin-film solar cells for the direct conversion of sunlight to electricity can be accelerated by the utilization of loss minimization and cost minimization methodologies. The solar cell is separated into its five constituent layers to provide a common basis for the development of these methodologies. Photovoltaic theory, materials science, and loss analysis are combined to develop the loss minimization methodology which can be used to systematically improve and optimize performance of any solar-cell material system. The techniques of the chemical process industry have been applied to achieve cost minimization. The loss- and cost-minimization methodologies have been combined into a generalized procedure for the accelerated development of all low-cost thin-film photovoltaic material systems. (Author)

A80-35336 **Characteristics of MOS solar cells built on /n-type/ In P substrates.** K. P. Pande (Rutgers University, Piscataway, N.J.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 631-634. 20 refs.

An examination is made of the electrical and photovoltaic characteristics of Au-(n-type) InP Schottky-barrier solar cells with and without a thin anodic oxide layer at the interface. Cells built on anodized surface (MOS type) exhibit a reduction of dark current by three orders of magnitude and an increase in the barrier height about (0.80 eV) by 0.30 eV, over conventional Schottky-barrier devices. Current transport in both type of cells is limited by thermionic emission of carriers and an increase in n factor from 1.02 to 1.16 is observed for MOS cells. Under illumination, MOS cells show an increase of open-circuit voltage to 0.46 V without any reduction in the short-circuit current which is obtained as 17.20 mA/sq cm. The efficiency has been found to go up from 3.45 to 6 percent for MOS cells which show an excellent spectral response, almost flat over a large portion of the visible spectrum. (Author)

A80-35337 **The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation.** K. P. Pande (Rutgers University, Piscataway, N.J.), D. H. Reep, S. K. Shastry, A. S. Weiner, J. M. Borrego, and S. K. Ghandhi (Rensselaer Polytechnic Institute, Troy, N.Y.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 635-640. 11 refs. Research supported by the Solar Energy Research Institute.

A80-35338 **Deposition and characterization of gallium arsenide films for solar cells applications.** S. S. Chu, T. L. Chu, and Y. T. Lee (Southern Methodist University, Dallas, Tex.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 640-645. 14 refs. Research supported by the Solar Energy Research Institute; Contract No. EG-77-C-01-4042.

Gallium arsenide films have been deposited on tungsten-coated graphite substrates by the reaction of gallium, hydrogen chloride, and arsine in a hydrogen flow. It has been found that the presence of hydrogen chloride in the gallium monochloride-arsenic mixture is essential in obtaining large-area gallium arsenide films with sufficiently good microstructure suitable for photovoltaic devices. Schottky-barrier and MOS structures have been prepared from n-GaAs/n(+)-GaAs films on tungsten/graphite substrates, and their electrical properties investigated. Under AM1 conditions, MOS structures of area 9 sq cm have conversion efficiencies of up to 4.4 percent (without antireflection (AR) coating, would be about 6.7 percent with proper coating), and the conversion efficiencies can be increased to 5 percent (without AR coating, would be about 7.5 percent with proper coating) by using a thin gallium arsenide-phosphide film at the surface of gallium arsenide. (Author)

A80-35339 **The design and fabrication of thin-film CdS/Cu_2S cells of 9.15-percent conversion efficiency.** J. A. Bragagnolo, A. M. Barnett, J. E. Phillips, R. B. Hall, J. D. Meakin (Delaware, University, Newark, Del.), and A. Rothwarf (Drexel University, Philadelphia, Pa.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 645-651. 25 refs.

A80-35340 **The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells.** K. R. Sarma and M. J. Rice, Jr. (Motorola, Inc., Solar Energy Research and Development Dept., Phoenix, Ariz.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 651-656. 11 refs. Contract No. ET-78-C-03-2207.

A new technique - Thermal Expansion Shear Separation (TESS) is described for producing thin self-supporting polycrystalline silicon ribbons using temporary molybdenum substrates. The TESS substrates and separated silicon ribbons were characterized to determine the shear separation mechanism, limits to substrate recyclability, and the quality of the silicon ribbon for efficient solar-cell fabrication. Solar cells fabricated on the silicon ribbons separated from molybdenum substrates have exhibited AM1 conversion efficiencies of up to 11.8 percent after ribbon-to-ribbon (RTR) grain enhancement. By recycling the Mo substrate its cost contribution can be as low as $0.0074/peak watt of electricity produced. (Author)

A80-35341 **Optimization of oxide-semiconductor/base-semiconductor solar cells.** R. Singh (Colorado State University, Fort Collins, Colo.), K. Rajkanan (General Instrument Corp., Hicksville, N.Y.), D. E. Brodie, and J. H. Morgan (Waterloo, University, Waterloo, Ontario, Canada). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 656-662. 53 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

In order to get the maximum output from an oxide-semiconductor/base-semiconductor solar cell, one has to incorporate an ultrathin insulating layer so that the resulting configuration is a semiconductor-insulator-semiconductor (SIS) diode. The performance of such SIS diodes is equivalent to a metal-insulator-semiconductor (MIS) solar cell. The key parameters in the optimization are the thickness of the insulating layer and the work function of the oxide semiconductor. Using the existing knowledge of the parameters for a number of oxide semiconductors one would conclude that ITO, ZnO, and SnO_2 are good oxides for the fabrication of SIS solar cells. Some properties of highly conducting and highly transparent ZnO films which have been fabricated are presented. These results suggest that these ZnO films should be useful for fabricating low-cost SIS solar cells. (Author)

A80-35342 **Design considerations for a-Si solar cells.** V. L. Dalal (Delaware, University, Newark, Del.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 662-670. 21 refs. Contract No. ET-79-03-23034.

The design considerations which can be used to develop high-efficiency devices from a-Si are studied. The design analysis takes full advantage of the flexibility in bandgap and other material properties offered by a-Si. Several structures, such as light-trapped cells, graded layer cells, and tandem junction a-Si/a-Si cells are analyzed in detail for collection efficiency and fill factors. It is shown that using these innovative structures, realistic conversion efficiencies exceeding 10 percent can be realized in a-Si in spite of the very low diffusion lengths about 0.1 micron. Technological considerations for achieving such structures are also discussed. (Author)

A80-35343 **Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon.** T. Saitoh, T. Warabisako, E. Kuroda, H. Itoh, S. Matsubara, and T. Tokuyama (Hitachi, Ltd., Central Research Laboratory, Kokubunji, Tokyo, Japan). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 671-676. 19 refs. Research supported by the Ministry of International Trade and Industry.

A80-35345 **Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells.** C.-M. M. Wu, E. S. Yang, W. Hwang, and H. C. Card (Columbia University, New York, N.Y.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 687-692. 14 refs. NSF Grant No. ENG-78-19426; Contract No. ET-78-R-03-1876.

Schottky-barrier diodes using aluminum on p-type polycrystalline silicon have been fabricated. The contrast of the orientation of neighboring grains is observed after chemical etching of the surface. Comparing the surface morphology of the substrate with the electronic behavior of the Schottky diode, the influence of grain boundaries is identified. The experimental data indicate that recombination centers and traps are introduced, resulting in an increase in recombination current and a reduction of the effective mobility. The conduction mechanisms for the two types of diodes are clearly distinguishable both in the dark and under illumination. (Author)

A80-35346 **Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells.** J. G. Fossum and F. A. Lindholm (Florida, University, Gainesville, Fla.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 692-700. 17 refs. Contract No. EG-77-C-01-4042.

The physics controlling recombination in polysilicon p-n-junction solar cells is described. Analytic models characterizing this recombination, whose parameters can be related directly to experiment, are developed. The analysis reveals that, in general, the description of intragrain and grain-boundary recombination in a polysilicon solar cell requires the solution of a nonlinear three-dimensional boundary-value problem. Cases of practical interest for which this problem is tractable are discussed. The analysis predicts an exp (qV/2kT) dependence (the reciprocal slope factor is exactly two) for carrier recombination at a grain boundary within the junction space-charge region of a nonilluminated, forward-biased cell. This result, and others of the analysis, are consistent with preliminary experimental data. (Author)

A80-35348 **MIS and SIS solar cells.** J. Shewchun, D. Burk, and M. B. Spitzer (Brown University, Providence, R.I.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 705-716. 32 refs.

This review paper shows that MIS (metal-insulator-semiconductor) and SIS (semiconductor-insulator-semiconductor) solar cells are basically one and the same type of device, even though they are usually regarded as being separate and are reported as such. Experimental results on the two most common systems, Al-Si(x)-pSi and ITO-SiO(x)-pSi (ITO designates indium-tin-oxide) are presented to support a model where tunnel current through the insulator or interface is the transport mechanism between the metal or oxide semiconductor (acting as a collecting grid) and the base converting semiconductor. However, the I-V characteristics of the devices are dominated by diffusion current flow in the bulk of the base converting substrate and display the usual Shockley diode equation behavior, in the absence of additional defect current mechanisms. (Author)

A80-35349 **A comparison of majority- and minority-carrier silicon MIS solar cells.** K. K. Ng (Bell Telephone Laboratories, Inc., Murray Hill, N.J.) and H. C. Card (Columbia University, New York, N.Y.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 716-724. 54 refs. Grant No. DAAG-79-C-0079; Contract No. ET-78-R-03-1876.

The photovoltaic properties of majority-carrier and minority-carrier MIS solar cells are investigated as a function of the thickness of the insulating layer. The performance of majority-carrier (Au-SiO2-nSi) and minority-carrier (Al-SiO2-pSi) structures is compared for SiO2 layers prepared under identical oxidation conditions. The short-circuit current densities are found to be suppressed by tunneling through the SiO2 layers for a thickness of 17 A or less, whereas fill factors begin to decrease at even smaller thicknesses. For the majority-carrier cells the effective AM1 conversion efficiency reaches an optimum value of 9-10% as compared to 11-12% for minority-carrier cells. V.L.

A80-35350 **Spray-deposited ITO-silicon SIS heterojunction solar cells.** A. Ashok, S. J. Fonash (Pennsylvania State University, University Park, Pa.), and P. P. Sharma (Fairchild Camera and Instrument Corp., San Jose, Calif.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 725-730. 20 refs.

A systematic study of semiconductor-insulator-semiconductor (SIS) solar cells has been undertaken on n-type silicon using spray-deposited indium-tin-oxide (ITO) for the window layer of the heterostructure. The optical and electrical characteristics of the ITO layer as well as the thickness of the I layer have been optimized. The dark I-V characteristics have also been evaluated to identify the mechanisms of barrier formation and current flow. (Author)

A80-35351 **Detailed modeling of inversion-layer solar cells.** C. E. Norman (Universidad Nacional del Centro del Perú, Huancayo, Peru) and R. E. Thomas (Carleton University, Ottawa, Canada). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 731-737. 22 refs. Research supported by the National Research Council of Canada.

Numerical modeling of inversion-layer (IL) solar cells is described. The steady-state continuity equations are solved for both electrons and holes. A novel integrated recombination technique is applied to accurately find the one-dimensional current flow. Two-dimensional resistive and grid geometry effects are modeled to predict the output current-voltage curve for the cell. Modeled results are in excellent agreement with those measured for a real cell. The model is used to investigate the operation of IL cells and to determine how their performance can be improved through process changes. Practical AM1 efficiencies up to 17 percent are predicted and a theoretical maximum efficiency of 21 percent is calculated. Many of the modeling techniques and results can be applied to other solar-cell structures. (Author)

A80-35352 **High-efficiency silicon minMIS solar cells Design and experimental results.** R. B. Godfrey (Tideland Energy Pty, Ltd., Sydney, Australia) and M. A. Green (New South Wales, University, Kensington, Australia). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 737-745. 36 refs. Research supported by the Australian Department of National Development.

Grating minority-carrier Metal-Insulator-Semiconductor (minMIS) solar cells have been fabricated on a range of Czochralski (CZ) and float-zone (FZ) substrates. The most efficient cells result when the semiconductor surface between the grating lines is inverted. To characterize the measured short-circuit current of grating cells, the concept of an effective minority-carrier collection distance is introduced. Record open-circuit voltages of 655 mV (AM0, 25 C) for 0.1-ohm cm FZ substrates have been achieved. AM1 active area efficiencies of 17.6 percent for polished substrates and 17.4 percent for texture substrates have been measured. (Author)

A80-35353 **Upper limit of thermophotovoltaic solar-energy conversion.** P. Würfel and W. Ruppel (Karlsruhe, Universität, Karlsruhe, West Germany). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 745-750. 5 refs.

The efficiency of the conversion of solar energy into electrical energy by solar cells is improved if the incident solar radiation is first absorbed by an intermediate absorber. The reemitted radiation is directed onto the solar cell. This mode of operation is known as thermophotovoltaic energy conversion. A black-body intermediate absorber is advantageous for small-bandgap solar cells. An even higher improvement is, however, achieved by a selective intermediate absorber with an absorption edge at the energy of the bandgap of the solar cell. Furthermore, if only a narrow spectral interval of radiation near the absorption edge is transmitted through a filter from the intermediate absorber to the solar cell, a maximum efficiency of 65 percent is obtained for a solar cell and absorber with a bandgap of 0.8 eV. (Author)

A80-35354 * **Updating the limit efficiency of silicon solar cells.** M. Wolf (Pennsylvania, University, Philadelphia, Pa.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 751-760. 23 refs. Contract No. JPL-KM-68903.

The limit efficiency of a silicon solar cell is investigated using an analytical approach. The analytical model is based on the solution of a transport equation for minority carriers derived from the Shockley equations. On the basis of the computations, a 'narrow-region' design approach is suggested for both the front and the back regions of the solar cell. The design relies on low effective surface-recombination velocities, a textured front surface, and an optical internally reflecting back surface. With this approach, the limit efficiency is near 25%, and the optimum cell is 50 to 150 microns thick. V.L.

A80-35355 **A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight.** T. I. Chappell (IBM Thomas J. Watson Research Center, Yorktown Heights, N.Y.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 760-766. 30 refs.

The conversion efficiency limit of p(+)-i-n(+) silicon solar cells in concentrated sunlight is explored with numerical simulations of an idealized p(+)-i-n(+) cell having field-induced junctions. Conversion efficiencies greater than 30 percent are calculated for this cell operating in sunlight concentrated 1000 times. The relative importance of bulk and surface recombination in limiting the cell conversion efficiency is illustrated for operation in 1 to 1000 suns. For surface recombination velocities below 100 cm/s, it is shown that bulk recombination losses limit the cell performance rather than recombination losses occuring in the p(+) or n(+) regions. The results show that Auger recombination in the bulk region will limit ultimately the cell conversion efficiency. (Author)

A80-35356 **Unified model of fundamental limitations on the performance of silicon solar cells.** D. Redfield (RCA Laboratories, Princeton, N.J.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 766-771. 17 refs. Research supported by RCA; Contract No. DE-AC01-79ET-23108.

Previous attempts to explain the substantial discrepancy between observed and predicted efficiencies in silicon solar cells are shown to have treated inadequately two important features of typical devices: (1) in the diffused region the electric-field distribution is much wider than generally believed and the field values away from the junction are generally higher; (2) Auger processes in heavily doped regions have a more pervasive impact than has been recognized. By incorporating a suitable modification of the junction model and a consistent treatment of Auger effects into the analysis, a unified model is developed for the principal limitations on the performance of Si solar cells. This model accounts for limits to Isc and Voc arising in either the front or base region. The present analysis reinterprets the violet-cell observations of the effect of the diffusion profile and presents an alternative to the bandgap-narrowing model of the heavy-doping effect on Voc. A new method is developed for evaluating the junction saturation current in heavily doped regions of such solar cells and transistor emitters. (Author)

A80-35358 **A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection.** C. Goradia. *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 777-785. 13 refs.

A one-dimensional theoretical model of the Tandem-Junction Solar Cell with high base resistivity and under low-level injection is derived. The model provides a theoretical basis for a previously published conceptual model and allows for the calculation of the spectral response and other performance parameters, namely, I(sc), V(oc), P(m), FF, and eta, under variation of one or more of the geometrical and material parameters and 1-MeV electron fluence. Sample calculation results of computer simulation of this model are presented. (Author)

A80-35359 **Physics underlying the performance of back-surface-field solar cells.** J. G. Fossum (Florida, University, Gainesville, Fla.), R. D. Nasby (Sandia Laboratories, Albuquerque, N. Mex.), and S. C. Pao (Burroughs Corp., San Diego, Calif.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 785-791. 17 refs. Research supported by the U.S. Department of Energy.

A description of the physics of back-surface-field (BSF) solar cells is presented, in which several key approximations, valid for effective BSF cells, have been used to express the results of the analysis in ways that make them useful in understanding the performance of high-efficiency BSF cells. A silicon p(+)-n-n(+) BSF solar cell, developed in conjunction with the theoretical treatment, provides experimental support for the theory. Measured current-voltage characteristics, together with the analysis, are used to describe the important physical mechanisms that control the performance of the BSF solar cell. For example, the analysis enables the determinations of the carrier lifetimes in the base region and of the effective surface recombination velocity at the low-high junction. (Author)

A80-35360 * **A study of the factors which control the efficiency of ion-implanted silicon solar cells.** E. C. Douglas and R. V. D'Aiello (RCA David Sarnoff Research Center, Princeton, N.J.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 792-802. 18 refs. Research supported by RCA; Contract No. JPL-954868.

The objective of this work was to determine experimentally the ion-implantation parameters and furnace annealing conditions required to produce high-efficiency solar cells. A comprehensive experimental study was conducted in which the optimum ion-implantation parameters were found by a systematic variation of the implant parameters followed by detailed studies of solar-cell devices. Two furnace heat-treatment techniques were found which effectively anneal the implanted layers and at the same time preserve or improve the diffusion length in the bulk silicon. Detailed characteristics of both the junction and bulk properties of solar cells fabricated over the spectrum of implant parameters are discussed. Optimized implant parameters and annealing conditions were found which allow for the fabrication of 14-15-percent (AM1) efficient solar cells. (Author)

A80-35361 * **Tailored emitter, low-resistivity, ion-implanted silicon solar cells.** J. A. Minnucci, A. R. Kirkpatrick, and K. W. Matthei (Spire Corp., Bedford, Mass.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 802-806. 8 refs. Contract No. NAS3-20823.

Open-circuit voltages as high as 0.645 V (AM0, 25 C) have been obtained by a new process developed for low-resistivity silicon. The process utilizes high-dose phosphorus implantation followed by furnace annealing and simultaneous oxide growth. The effect of the thermally grown oxide is a reduction of surface recombination velocity; the oxide also acts as a moderately efficient antireflection (AR) coating. Boron-doped, float-zone silicon with resistivities from 0.1 to 1.0 (omega)(cm) has been processed according to this sequence; results show that the highest open-circuit voltage is obtained with 0.1(omega)(cm) starting material. The effects of Auger recombination and bandgap narrowing caused by high doping concentrations in the n(+)junction region have been investigated by implanting phosphorus over a wide range of dose levels. The effects of emitter-phosphorus concentrations tailored to optimize electric fields in the emitter have also been investigated. (Author)

A80-35362 **Pulsed laser techniques for solar cell processing.** R. T. Young, R. F. Wood, J. Narayan, C. W. White, and W. H. Christie (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 807-815. 23 refs. Contract No. W-7405-eng-26.

Q-switched lasers can serve as energy sources to replace conventional high-temperature furnaces in p-n junction formation in solar cells. They have been used to anneal ion-implantation damage, to produce laser-assisted dopant diffusion, and to regrow doped amorphous layers deposited on single-crystal Si substrates. It has been demonstrated that all these methods are suitable candidates for the processing of high-efficiency Si solar cells. Because they provide ultra-rapid heating and cooling of the near-surface region, these laser techniques can be used for p-n junction formation in thin-film polycrystalline material to prevent enhanced dopant diffusion along grain boundaries and for compound semiconductors, such as GaAs, to avoid the need for surface encapsulation during the annealing of ion implantation damage. Defects in the near-surface region such as the 'dead layer' produced by conventional high-temperature diffusion can be completely removed by laser irradiation. (Author)

A80-35363 **Laser processing in the preparation of silicon solar cells.** J. C. Muller, E. Fogarassy, D. Salles, R. Stuck, and P. M. Siffert (CNRS, Centre de Recherches Nucléaires de Strasbourg, Strasbourg, France). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 815-821. 31 refs.

Besides cheaper techniques of growing the starting silicon, the reduction of manufacturing costs of terrestrial solar cells needs new automated approaches for the preparation of the junction. The possibilities given by laser processing are considered for three different structures: diffused junctions, ion implanted and alloyed diodes prepared from layers of dopants just deposited on surface. (Author)

A80-35364 **Material and device considerations for cascade solar cells.** S. M. Bedair, S. B. Phatak (Research Triangle Institute, Research Triangle Park, N. C.), and J. R. Hauser (North Carolina State University, Raleigh, N.C.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 822-831. 25 refs. Research supported by the U.S. Department of Energy and U.S. Air Force.

The cascade solar cell using two or more junctions has the potential for significantly increasing the efficiency of solar cells beyond that of single-junction cells. Theoretical calculations give AM0, one sun efficiencies of 30 percent or slightly higher. Before these efficiencies can be achieved, many material and device problems must be solved. This paper discusses these major material and device problems as related to the cascade solar cell concept. Also presented are some experimental results on materials and devices which are presently being explored for use in the cascade solar cell. (Author)

A80-35365 **Cascade solar-cell design for high-temperature operation.** M. F. Lamorte and D. H. Abbott (Research Triangle Institute, Research Triangle Park, N.C.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 831-840. 16 refs. Research supported by the U.S. Department of Energy and Sandia Laboratories.

The cascade solar-cell optimization design procedure developed using computer modeling to obtain a cell design that results in maximum conversion efficiency under a given set of operating conditions has been extended. Earlier work reported optimized designs for operation at 300 K, AM0, and AM1.5. In this work, optimized designs are determined for a two-junction, monolithic, cascade solar cell for operation at eight temperatures in the range from 300 to 475 K, AM1.0, and one million cm/sec surface-recombination velocity. The device performance characteristics for each of the eight optimized designs are studied over the 300 to 600 K operating-temperature range. (Author)

A80-35366 **A new technology to fabricate high-efficiency silicon concentrator solar cells.** M. Finetti, P. Ostoja, S. Solmi, and G. Soncini (CNR, Laboratorio LAMEL, Bologna, Italy). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 841-843. 9 refs. Research supported by the Consiglio Nazionale delle Ricerche.

A new procedure to fabricate silicon concentrator solar cells based on phosphorus diffusion into the semiconductor through a thin polysilicon film is described. The polysilicon reduces the high-diffusivity tail of the conventional phosphorus-doping profile and avoids interdiffusion phenomena at the metal-semiconductor interface during sintering, thus allowing Al to be used as front grid contact. Outdoor testing of 2 x 2-sq cm solar cells computer-designed to operate at 50 suns showed conversion efficiencies higher than 17%. (Author)

A80-35367 **'Band readjustment' effect with applications to solar cells.** S.-C. Lee and G. L. Pearson (Stanford University, Stanford, Calif.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 844-850. 16 refs. NSF Grants No. DMR-76-84373; No. DMR-79-01661.

Double-layer Au-(n)AlGaAs-(n)GaAs Schottky-barrier devices were examined. The interaction of the closely space Au-AlGaAs Schottky barrier and the AlGaAs-GaAs heterojunction was found to produce a novel phenomenon termed 'band readjustment.' This effect is applied to the design of high-efficiency solar cells. Three criteria are presented by which the open-circuit voltage and the short-circuit current of the solar cells can be improved separately. Current transport through the potential barrier, located within the heterojunction depletion region, is also discussed. (Author)

A80-35368 **Barrier height enhancement in heterojunction Schottky-barrier solar cells.** H.-T. Yang, Y.-D. Shen, D. Edwall, D. L. Miller, and J. S. Harris, Jr. (Rockwell International Corp., Electronics Research Center, Thousand Oaks, Calif.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 851-856. 11 refs. Research supported by the U. S. Department of Energy.

A80-35369 * **Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells.** S. S. Li, W.-L. Wang, P.-W. Lai (Florida, University, Gainesville, Fla.), R. Y. Loo, G. S. Kamath, and R. C. Knechtli (Hughes Research Laboratories, Malibu, Calif.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 857-864. 19 refs. Grant No. NsG-1425.

A80-35370 # **Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects.** D. E. Sawyer (Chevron Research Co., Richmond, Calif.) and H. K. Kessler (National Bureau of Standards, Electron Devices Div., Washington, D.C.). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 864-872. 9 refs. Contract No. EA-77-A-6010.

A new optical scanning technique was developed to map solar-cell operation over the cell area and reveal several types of cell defects. The technique, which makes use of the distributed nature of the cell, an intrinsic property shared by all cells, allows one to detect potentially harmful cracks with a sensitivity greater than any other optical technique reported previously, and it permits one, for the first time, to locate regions of poor metallization. It has also been used to determine efficacy of cell design and to study cell degradation processes. The new scanning technique employs forward biasing of the cell during scanning. Biasing may be achieved through the use of a steady-state light source, or for cells made using conventional semiconductor materials, e.g., silicon and gallium arsenide, the use of an external current source. The scanning technique is nondamaging; it requires no electrical contacts to the cell other than those already present, and it can be used on encapsulated or unencapsulated cells in almost any laboratory or test environment. (Author)

A80-35372 **Upper limit for the conversion of solar energy.** W. Ruppel and P. Würfel (Karlsruhe, Universität, Karlsruhe, West Germany). *IEEE Transactions on Electron Devices,* vol. ED-27, Apr. 1980, p. 877-882. 8 refs.

A semiconductor in the solar radiation field acts as a thermal electronic engine. It converts absorbed radiation heat into chemical energy of the excited electron-hole gas. In flow equilibrium, a homogeneous semiconductor gives off this chemical energy by radiative recombination to the surroundings. If provision is made, as by a p-n junction, to divert the excited electrons and holes, before they recombine, from their point of generation, their chemical energy may be converted into electrical energy. The ratio of this chemical energy current, which constitutes an upper limit for the obtainable electrical energy current, to the absorbed heat current is computed as a function of the value of the bandgap of the semiconductor. Under the assumption that the absorptivity of the electron-hole system of the semiconductor is unity for photon energies larger than the bandgap and zero for smaller photon energies, the conversion efficiency for unfocussed sunlight has a maximum of 30 percent for a bandgap of 1.3 eV. (Author)

A80-35385 **Effect of titanium, copper and iron on silicon solar cells.** A. Rohatgi, J. R. Davis, R. H. Hopkins, P. Rai-Choudhury, P. G. McMullin (Westinghouse Research and Development Center, Pittsburgh, Pa.), and J. R. McCormick (Hemlock Semiconductor Corp., Hemlock, Mich.). *Solid-State Electronics,* vol. 23, May 1980, p. 415-419, 421, 422. 19 refs. Research sponsored by the U.S. Department of Energy.

The effect of Ti, Cu, and Fe on silicon solar cells has been investigated. Ti severely degrades cell performance above a concentration of 10 to the 11th per cu cm. A higher Ti level results in a 63% loss in cell performance and more than an order of magnitude

reduction in carrier lifetime; Ti produces two deep levels in Si at Ev + 0.30 eV and Ec - 0.27 eV. Copper, at concentrations below 10 to the 16th per cu cm, has negligible effect on cell performance and carrier lifetime. Fe begins to damage the cell performance above a concentration of 2 x 10 to the 14th per cu cm; at the concentration of 1.7 x 10 to the 15th per cu cm it causes a 46% loss in cell efficiency and about an order of magnitude reduction in lifetime.
A.T.

A80-35467 **Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques.** C. H. Seager, D. S. Ginley (Sandia Laboratories, Albuquerque, N. Mex.), and J. D. Zook (Honeywell Corporate Technology Center, Bloomington, Minn.). *Applied Physics Letters*, vol. 36, May 15, 1980, p. 831-833. 12 refs. Contract No. DE-AC04-76DP-00789.

Electron-beam-induced-current- and dark-current-voltage measurements have been made on p/n photovoltaic cells fabricated from polycrystalline silicon. These data have demonstrated that grain-boundary hydrogenation greatly reduces grain-boundary minority carrier recombination and improves diode current-voltage characteristics.
(Author)

A80-35474 **Properties of photoelectrochemical cells with a chemically sprayed photoanode.** C.-H. J. Liu and J. H. Wang (New York, State University, Buffalo, N.Y.). *Applied Physics Letters*, vol. 36, May 15, 1980, p. 852, 853. 7 refs. NSF Grant No. PCM-77-5502.

Chemically sprayed CdSe thin films were used as photoanodes in photoelectrochemical solar cells. The power characteristics of the cell ITO/CdSe/Na2S-S-NaOH/Pt was measured. The energy conversion efficiency of this cell was 7.8% at 640 nm and 5.2% under 50-mW/sq cm white light.
(Author)

A80-35480 **Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 1.** Workshop sponsored by the U.S. Department of Energy and Solar Energy Research Institute. Edited by D. E. Sawyer (National Bureau of Standards, Electron Devices Div., Washington, D.C.). *Solar Cells*, vol. 1, Feb. 1980. 123 p.

A collection of papers on solar cells is presented regarding their science, technology, applications and economics. Attention is given to polycrystalline materials and the associated thin-film solar-cells. Topics of interest include perspective on photovoltaic material and device measurements, new techniques for the study and control of grain boundary effects, grain size and its influence on efficiency in polycrystalline GaAs solar cells, scanning light spot analysis of faulty solar cells, and effective diffusion length in polycrystalline semiconductor thin films.
S.D.

A80-35482 **Electron-beam-induced current characterization of polycrystalline silicon solar cells.** J. I. Hanoka (Mobil Tyco Solar Energy Corp., Waltham, Mass.). *(Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells*, vol. 1, Feb. 1980, p. 123-139. 15 refs.

The use of the electron-beam-induced current mode of the scanning electron microscope for recombination studies in polycrystalline silicon solar cells is reviewed. The potential and some limits of the technique are discussed. Quantitative studies and representative results for edge-defined film-fed growth (EFG) ribbon solar cells and other kinds of silicon solar cells are presented and compared. Questions concerning recombination by impurities and defects such as dislocations, grain boundaries and SiC particles and the interactive effects of all these are discussed at some length.
(Author)

A80-35486 **The Zn/x/Cd/1-x/S/Cu2S heterojunction - Review and recent measurements.** L. C. Burton (Virginia Polytechnic Institute and State University, Blacksburg, Va.). *(Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells*, vol. 1, Feb. 1980, p. 159-174. 36 refs.

Development of the Zn(x)Cd(1-x)S/Cu2S thin-film solar cell is reviewed. Several possible mechanisms that could account for differences between solar cells made from Zn(x)Cd(1-x)S and CdS are described. It is found that there is an accumulation of zinc under the Zn(x)Cd(1-x)S/Cu2S interface for junctions formed by ion exchange. It is proposed that this zinc-rich region is inhomogeneous when the Cu2S is formed in aqueous solution, resulting in current blocking behavior over a fraction of the cell area. The open-circuit voltage of these cells is controlled by the nonblocking regions of lower barrier height. Composition measurements of the Zn(x)Cd(1-x)S/Cu2S interfacial region are related to a modified model which can account for some of the properties of the junction that are not well understood.
S.D.

A80-35488 **Etching of CdS films.** F. A. Shirland (Westinghouse Research and Development Center, Pittsburgh, Pa.). *(Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells*, vol. 1, Feb. 1980, p. 183-197. 13 refs. Research supported by the Westinghouse Electric Corp.; Contract No. EG-77-C-03-1577.

In the processing of front-wall CdS thin film solar cells the films are given a strong HCl etch prior to formation of the Cu2S layer. This results in substantially higher cell outputs. Preliminary data are reported of a study of how HCl attacks CdS films and how the attack is affected by changes in the etching parameters, particularly time, temperature and acid concentration. Etched CdS films and replicas of etched CdS film surfaces were examined by scanning electron microscopy (SEM) and selected SEM photographs are presented to illustrate the effects. It is shown that etching textures the front surface of the CdS films and forms deep pits into the films. Pitting is the factor which varies most widely on differently processed films and which seems to correlate with the output level achievable from cells made from such films. The underlying substrate seems to be the factor having most influence on the etch pits.
(Author)

A80-35490 **Photoconductivity as a probe of polycrystalline films.** R. H. Bube (Stanford University, Stanford, Calif.). *Solar Cells*, vol. 1, Feb. 1980, p. 209-212. 9 refs. Abridged.

The paper shows how photoconductivity measurements can provide information about the properties of polycrystalline films through a variety of direct and indirect effects. The temperature dependence of the photoconductivity decay, or its associated phenomenon of thermally stimulated conductivity, may be used to obtain information and to evaluate parameters of imperfections. Measurements that allow separation of density and mobility effects are discussed. A model proposed by Petritz (1956) provides a useful framework within which to consider barrier modulation effects with photoexcitation. The discussion is illustrated by two specific examples involving polycrystalline films of CdS and PbS.
S.D.

A80-35491 **Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements.** C. Moses (New York, State University, Canton, N.Y.) and D. Wasserman (Cornell University, Ithaca, N.Y.). *Solar Cells*, vol. 1, Feb. 1980, p. 218-221. 5 refs. Abridged.

A80-35492 **The design and utilization of a microprocessor-controlled absolute spectral response system.** L. M. Kilgren, N. C. Wyeth, and W. E. Devaney (Delaware, University, Newark, Del.). *(Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells*, vol. 1, Feb. 1980, p. 225-231. 5 refs.

A fully automated spectral response system for solar cells has been developed and utilized in the study of CdS/Cu2S and Zn3P2 solar cells. Four types of measurements were carried out: (1) spectral response under bias light conditions to study the effects of light intensity and spectral content on cell response; (2) spectral response on thick absorbing layers to determine their diffusion length and absorption coefficient; (3) spectral response beyond the intrinsic absorption region to determine the internal photoemission barrier height; (4) the response at a given wavelength as a function of the voltage bias and light bias on the cell to determine the voltage dependence of the light-generated current and its effect upon the fill factor of the cell.
(Author)

A80-35493 **Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells.** N. Inoue, S. M. Goodnick, and C. W. Wilmsen (Colorado State University, Fort Collins, Colo.). *Solar Cells,* vol. 1, Feb. 1980, p. 233-236. Abridged.

A80-35500 * # **Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors.** G. McDonald (NASA, Lewis Research Center, Cleveland, Ohio). *American Vacuum Society, International Conference on Metallurgical Coatings, San Diego, Calif., Apr. 21-25, 1980, Paper.* 14 p. 8 refs.

Black cobalt oxide coatings were deposited on thin layers of silver or gold which had been deposited on oxidized stainless steel substrates. The reflectance properties of these coatings were measured at various thicknesses of cobalt oxide for integrated values of the solar and infrared spectrum. The values of absorptance and emittance were calculated from the measured reflectance values before and after exposure in air at 650 C for 1000 hours. Also, these cobalt oxide/noble metal/oxide diffusion barrier coatings have absorptances greater than 0.90 and emittances of approximately 0.20 even after about 1000 hours at 650 C. (Author)

A80-35838 **Heat losses of a static low-concentration solar collector.** F. Grasso, G. Guerriera, F. Musumeci, and A. Triglia (Catania, Università; Centro Siciliano di Fisica Nucleare e Struttura della Materia, Catania, Italy). *Nuovo Cimento C, Serie 1,* vol. 2C, Sept.-Oct. 1979, p. 537-542. 11 refs.

A static low-concentration collector has been designed and manufactured. The collector geometry reduces the thermal convection, and the selective coating of the absorber reduces radiative losses. The total heat losses have been measured as a function of temperature difference between absorber and ambient up to 150 C. A typical loss figure is 160 W/sq m for a temperature difference of 80 C. B.J.

A80-36052 **An assessment of solar hot water heating in the Washington, D.C. area - Implications for local utilities.** M. W. Stuart (George Washington University, Washington, D.C.). *Energy* (UK), vol. 5, Apr. 1980, p. 331-342. 19 refs.

A survey of residential solar hot water heating in the Washington, D.C. area is presented with estimates of the total solar energy contribution per year. These estimates are examined in relation to a local utility's peak-load curves to determine the impact of a substantial increase in solar domestic hot water use over the next 20 yr in the area of utility management. The results indicate that a 10% market penetration of solar water heaters would have no detrimental effect on the utility's peak-load profile and could save several million dollars in new plant construction costs. (Author)

A80-36121 **A circuit for measurement of the fill factor of solar cells.** G. Popkirov (B'lgarska Akademiia na Naukite, Tsentralna Laboratoriia po Sl'ncheva Energiia i Novi Energiini Iztochnitsi, Sofia, Bulgaria). *Journal of Physics E - Scientific Instruments,* vol. 13, May 1980, p. 496.

A simple, accurate electronic circuit for the direct measurement of the fill factor of solid-state solar cells is presented. The circuit provides for solar cell operation in the short circuit, open circuit and applied voltage modes, and fill factor is determined from the ratio of the product of the maximum applied current and voltage to the product of the short-circuit current and open-circuit voltage. Depending on component precision, accuracies of 1% or better can be obtained. A.L.W.

A80-36242 **Observation of an active photoinductive component in high intensity solar cells.** F. C. Jain (Connecticut, University, Storrs, Conn.). *Journal of Applied Physics,* vol. 51, May 1980, p. 2685-2692. 25 refs.

Observations of a photoinductive reactance in Si and GaAs p-n junction diodes under photon flux densities above a certain threshold value are discussed. Results of experimental measurements of the capacitance and inductance of a n(+)-p Si diode, a p(+)p-n Si diode, two n(+)n-pp(+) Si diodes and a p(+)-n GaAs diode as a function of photon flux density expressed in terms of diode short circuit current are presented for virtually dc open-circuited solar cell conditions, and a crossover to inductive behavior at threshold photon flux densities from 2.75 to 21 times as intense as solar radiation at air mass 2, depending on diode structure and wavelength of incident light, is demonstrated. Theoretical considerations are presented which show that an explicit inductive component originates in the conductivity-modulated section of the base region when the photogenerated minority carrier concentration becomes comparable to that of the majority carriers. Theoretical computations of reactance characteristics on the basis of this model are then shown to be in agreement with experimental results. A.L.W.

A80-36245 **An analytical model of a backwall MIS Schottky barrier solar cell.** B. L. Krauter and R. J. Soukup (Nebraska, University, Lincoln, Neb.). *Journal of Applied Physics,* vol. 51, May 1980, p. 2914-2919. 25 refs.

The paper analyzes various factors which determine the performance of a backwall MIS Schottky barrier solar cell, including the short-circuit current density, the MIS Schottky barrier junction behavior, and resistive losses. The study concentrates on the Al-Al2O3-GaAs-metal structure. It is shown that the maximum current occurs when the GaAs thickness is in the 500 A to 1.2 microns range, depending on the minority carrier diffusion and surface recombination velocity. An optimum open circuit voltage is achieved for an Al2O3 thickness of 15 A. Conversion efficiencies as high as 6% are predicted for this structure despite rather poor electrical properties of the GaAs films. V.L.

A80-36587 **Processes degrading the electrophysical characteristics of photoconverters in long-term operation.** G. S. Daletskii, I. V. Karpenko, M. M. Koltun, V. A. Karpukhin, Iu. N. Ksendzatskaia, V. M. Kuznetsov, S. V. Riabikov, and R. N. Tykvenko (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 7-12.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 1-5. 8 refs. Translation.

Causes of the degradation of the photoelectric characteristics of silicon and thin-film photoconverters during long-term operation are considered. Laboratory tests in high-vacuum conditions under a simulator have shown that a transparent bonding compound based on low molecular weight silicone rubber has greater resistance to the ultraviolet radiation of the sun and to nuclear particle irradiation than epoxy cements, and maintains its elasticity at temperatures down to -180 C. The stability of cells in which polycrystalline films of n-type cadmium sulfide and telluride form the base region of the solar cells was investigated; the potential barrier is formed at Cu2Te-CdTe and Cu2S-CdS heterojunctions, where a p-type layer of copper chalcogenide is produced by a chemical substitution reaction (Cu2S) or by discrete deposition in vacuum (Cu2Te). It is concluded that silicon single-crystal solar cells using the system of optical coatings developed and thin-film solar cells based on A2B6 compounds may be used for space and ground applications. A.T.

A80-36588 **Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells.** S. A. Azimov, M. M. Mirzabaev, K. Rasulov, A. Iskanderov, and M. Tursunov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 13-16.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 6-9. 6 refs. Translation.

The behavior of solar cells using n-GaAs-P-GaAs-P-Al(x)Ga(1-x)As systems with an intermediate diffused layer is studied for high solar-radiation conditions. It has been shown by Alferov (1977, 1978) and Agaev et al. (1978) that heterophotoconvertors (HPC) based on GaAs-AlGaAs with an intermediate radiation conversion and an intermediate conversion layer, and graded heterostructures with forbidden gap widths that expand toward the irradiated surface can operate at high illumination and temperature levels. This study made it possible to determine the method by which the basic HPC energy parameters depend on illumination, temperature and structural characteristics of the contacts. The operating efficiency of the HPC at elevated illumination levels depends on the spreading resistance of the upper layer; if this is reduced through selection of an optimal contact structure, the output power and efficiency of the cells will be increased. A.T.

A80-36591 Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters. A. I. Marchenko, I. I. Stepko, G. A. Fedorus, and G. I. Sheremetova (Akademiia Nauk Ukrains'koi RSR, Institut Napivprovidnikiv, Kiev, Ukrainian SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 34-37.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 27-30. 7 refs. Translation.

The development of Cu(2-x)-CdS heterogeneous photoconverters with parameters which appear promising for solar batteries is presented. Typical specimens of ceramic solar cells (SC) using CdS for solar radiation power of 75 mW/sq cm and AMI conditions were used, with the solar batteries (SB) having 10, 20, 40, and 80 individual photoconverters, each with an area of 3 sq cm. The devices were installed on a flat micarta board with various types of leads, making it possible to change the interconnection of individual modules. Investigation of the operating characteristics of the SB under laboratory and natural conditions demonstrated the possibility of their utilization as independent power sources; it was also established that additional improvement is required in the construction of the SB and its protection against the environment, since the use of varnish as the protective coating is inadequate because it is affected by moisture. A.T.

A80-36592 Evaluating the performance of reflecting concentrating systems. R. A. Zakhidov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 38-42.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 31-36. Translation.

Methods for evaluating the performance of mirror elements of reflecting concentrators are described. A system for the inspection of reflecting surfaces combining several methods of determining the geometric-optic characteristics of the reflectors was developed; the system consists of devices for local and integral inspection of geometric accuracy and reflectance of the surfaces. The contact (profilometry) and contactless (optical) methods are local; the calorimeter, thermoelectric, and photoelectric methods are integral. The profilometer inspection-measurement setup includes a coordinate stand and a micrometer measurement head with an interchangeable dial-type indicator; the optical unit includes a coordinate illuminator with a laser; the unit for investigating the shape of reflecting-surface elements by moiré method uses the 'mechanical' interference of a reference grating and a grating pattern reflected from the mirror surface. Finally, the integral-inspection devices and installations, and the unit for determining the reflectance of concentrating surfaces are discussed, noting possibilities for future automation. A.T.

A80-36593 Obtaining film materials with solar furnaces. I. N. Frantsevich, V. S. Dverniakov, I. E. Kasich-Pilipenko, V. L. Tikush, G. V. Rusakov, L. A. Gaevskaia, L. R. Shaginian, and R. S. Biriukova (Akademiia Nauk Ukrainskoi SSR, Institut Problem Materialovedeniia, Kiev, Ukrainian SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 43-47.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 37-40. 8 refs. Translation.

It is shown that it is possible to produce films of various materials by means of solar energy. A single-crystal type KE silicon was used as a substrate, and coatings of silicon monoxide, silicon, and aluminum were applied. The electron diffraction studies showed that silicon monoxide applied to single-crystal silicon has an amorphous structure, aluminum films deposited on these substrates have a polycrystalline textured structure, and silicon layers on the same substrate are polycrystalline with inclusions of single crystal blocks. It is concluded that solar energy films in a wide range of thicknesses can be produced and used as dielectrics, semiconductors, and metals. A.T.

A80-36594 Electrolytic coatings of 'black chromium' type for solar collectors. G. Ia. Umarov, U. Kh. Gaziev, Sh. A. Faiziev, V. V. Li, and V. S. Trukhov (Akademiia Nauk Uzbekskoi SSR, Fiziko-Tekhnicheskii Institut, Tashkent, Uzbek SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 50-55.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 44-48. 11 refs. Translation.

Results are reported for investigations of a 'black chromium' type electrolytic coating. The 'black chromium' deposits obtained on copper and nickel substrates have good optical characteristics: a solar-radiation absorptance of 0.9-0.93 and an emissivity of 0.1. (Author)

A80-36596 Technical-economic validation for selection of solar resources as energy sources. R. B. Salieva (Tashkentskii Elektrotekhnicheskii Institut Sviazi, Tashkent, Uzbek SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 74-77.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 67-70. 5 refs. Translation.

The paper presents calculations for technical-economic validation of the choice of solar resources as energy sources using mathematical-economic models for calculation stages. The economic justification of the energy base for construction of solar-power and wind-power systems is especially important for areas with scarcity of water and energy; this applies to the deserts and arid steppes of Central Asia and Kazakhstan. The basic energy technical-economic considerations are the reduction of the variants compared to an identical energy effect, and the evaluation of the one-time and annual expenditures for the variants are compared. The solar and wind plants for which the total output over the period of utilization would make it possible to meet the total demand for the facilities serviced with the required insurance standards is considered; this is followed by the calculation for regulation of output of the solar and wind plants. A.T.

A80-36597 Development and investigation of solar thermoelectric generator using a tubular module. Ch. Agabaev, G. A. Gukhman, N. V. Kolomoets, M. A. Markman, N. G. Milevskaia, and N. Rozyev (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 82, 83.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 77-79. Translation.

A technical-economic comparison was made for the effectiveness of using solar desalination plants (SDP) and water lines in a pressure water-supply system. It is shown that in a desert-pasture water supply, solar desalination plants are more economical than water lines. Thus, utilization of SDP in the area of operation of the Erbent, Turkmenia water line produced a 55% reduction in capital investment for construction of a water-supply system. A.T.

A80-36598 Evaluating certain ways of storing solar energy. A. V. Sheklein. *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 92-96.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 87-91. 9 refs. Translation.

An evaluation of large-scale utilization solar energy storage methods is presented. The photosynthesis method can be embodied in growing of algae with subsequent production of gas, liquid, or solid fuel by pyrolysis or hydrogasification; the photoelectric method with generation of electric power is promising for large-scale energy systems; and the thermal method may be used in the production of electric power by means of thermodynamic cycles and power generation by thermoelements. The photochemical reaction methods, including fission, synthesis, or isomerization can be used for storage, although it has a drawback of the relatively low quantum yield of many reactions and low storage capacity. It is concluded that photochemical storage of radiant energy, especially when using photolysis of water and production of a nearly ideal fuel, hydrogen, is fully competitive with other types of energy accumulation. A.T.

A80-36821 **Energy balance of solar thermoelectric generator.** V. A. Baum, C. Agabaev, and N. Ovezsakhatov (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad,

The paper develops a computational method for determining the maximum efficiency of a solar thermoelectric generator. It is shown that the efficiency of a solar thermoelectric system with natural cooling and without radiation concentration is less than 1%. B.J.

A80-36822 **Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators.** A. Ia. Gliberman, I. I. Kovalev, V. I. Krasilovskii, and L. M. Medvedeva (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 3, 1979, p. 7-10.) *Applied Solar Energy,* vol. 15, no. 3, 1979, p. 5-8. 5 refs. Translation.

A80-36824 **Thin-film and ceramic solar converters based on cadmium sulfide and selenide.** V. N. Komashenko, A. I. Marchenko, and G. A. Fedorus (Akademiia Nauk Ukrainskoi SSR, Institut Poluprovodnikov, Kiev, Ukrainian SSR). *(Geliotekhnika,* no. 3, 1979, p. 15-21.) *Applied Solar Energy,* vol. 15, no. 3, 1979, p. 13-19. 12 refs. Translation.

A80-36825 **Calculation principles for heliostat fields of solar power plants.** R. A. Zakhidov (Akademiia Nauk Uzbekskoi SSR, Tsentral'noe Proektno-Konstruktorskoe i Tekhnologicheskoe Biuro Nauchnogo Priborostroeniia, Uzbek SSR). *(Geliotekhnika,* no. 3, 1979, p. 22-27.) *Applied Solar Energy,* vol. 15, no. 3, 1979, p. 20-25. 14 refs. Translation.

The paper attempts to develop a general computational model for solar-tower concentrating systems. The model takes into account a number of factors, including the solar radiation characteristics, the arrangement of heliostats, the shape of mirrors, collector configurations, etc. Formulas are obtained for calculating insolation for collectors and heliostats of arbitrary configuration. B.J.

A80-36826 **Heating characteristics of concentrator/receiver system employing a selective absorbing surface.** O. I. Kudrin and A. Abdurakhmanov. *(Geliotekhnika,* no. 3, 1979, p. 28-33.) *Applied Solar Energy,* vol. 15, no. 3, 1979, p. 26-31. 5 refs. Translation.

A80-36829 **Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters.** B. A. Bazarov and B. D. Tairov (Akademiia Nauk Turkmenskoi SSR, Fiziko-Tekhnicheskii Institut, Ashkhabad, Turkmen SSR). *(Geliotekhnika,* no. 4, 1979, p. 10-13.) *Applied Solar Energy,* vol. 15, no. 4, 1979, p. 8-11. Translation.

The paper examines the operation of a solar energy system combining solar cells and a thermomechanical converter based on a Freon turbine with power output up to 10 kW. The basic thermodynamic and design parameters of such a system are investigated and compared to that of other Freon and water-vapor systems. B.J.

A80-36830 **High-voltage multijunction solar-energy photoelectric converter.** V. G. Doroshenko, M. B. Zaks, V. A. Kalash'ian, V. N. Lozovskii, Iu. V. Skokov, and O. I. Solodukha. *(Geliotekhnika,* no. 4, 1979, p. 14-18.) *Applied Solar Energy,* vol. 15, no. 4, 1979, p. 12-15. Translation.

The paper examines the photoelectric properties of single-crystal silicon high-voltage solar cells with bulk arrangement of p-n junctions, obtained through gradient zone recrystallization. The temperature dependence of the basic properties of such cells was studied in the 100-400-K range, and volt-ampere characteristics at high illumination intensities were examined. B.J.

A80-36832 **Evaluating the mass of current conductors and required voltage level for large orbiting solar batteries.** A. Kh. Cherkasskii (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 4, 1979, p. 25-29.) *Applied Solar Energy,* vol. 15, no. 4, 1979, p. 21-25. Translation.

Estimates are obtained in a dimensionless form for the necessary mass of conductors for a large satellite solar array. In addition, necessary voltage levels at array output terminals are estimated as a function of area. B.J.

A80-36833 **Development and application of high-power lightpipes.** V. S. Dverniakov, V. V. Pasichnyi, I. E. Kasich-Pilipenko, T. V. Eremina, D. K. Sattarov, M. I. Murav'eva, and I. E. Galant (Akademiia Nauk Ukrainskoi SSR, Institut Problem Materialovedeniia, Kiev, Ukrainian SSR). *(Geliotekhnika,* no. 4, 1979, p. 36-39.) *Applied Solar Energy,* vol. 15, no. 4, 1979, p. 32-35. 6 refs. Translation.

The paper examines the possibility of using optical waveguides to transmit high-flux solar radiation in solar-furnace type systems. The waveguides will be used to deliver concentrated solar radiation for such manufacturing processes as zone melting, welding, and heat treatment. Design parameters and materials selection for such waveguides are considered. B.J.

A80-36834 **Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant.** O. I. Kudrin, A. Abdurakhmanov, and I. A. Aggeeva. *(Geliotekhnika,* no. 4, 1979, p. 40-48.) *Applied Solar Energy,* vol. 15, no. 4, 1979, p. 36-43. Translation.

The use of selectively absorbing surfaces to increase the efficiency of high-temperature solar energy systems is examined. Particular attention is given to the application of selective absorption to: (1) a high-temperature Stirling-engine system and (2) a solar thermal rocket engine. B.J.

A80-36898 **Screen printed thin film CdS/CdTe solar cell.** N. Nakayama, H. Matsumoto, A. Nakano, S. Ikegami (Matsushita Electric Industrial Co., Ltd., Wireless Research Laboratory, Osaka, Japan), H. Uda, and T. Yamashita (Matsushita Electric Industrial Co., Ltd., Materials Research Laboratory, Moriguchi, Osaka, Japan). *Japanese Journal of Applied Physics,* vol. 19, Apr. 1980, p. 703-712. 14 refs. Research supported by the Agency of Industrial Science and Technology.

A screen-printed thin-film solar cell with a CdS/CdTe junction is considered. Microstructures of the cell near the boundary of CdS and CdTe films are discussed along with the photovoltaic properties of the cell. In the most efficient cell, the peak of electron voltaic effect exists within 1 micron of the CdTe side from the CdS/CdTe metallurgical boundary. A 1-watt solar cell module consisting of 25 elements with a module efficiency of 2.9% is described. V.T.

A80-36933 * **Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells.** G. F. J. Garlick (Southern California, University, Los Angeles, Calif.) and A. H. Kachare (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Applied Physics Letters,* vol. 36, June 1, 1980, p. 911-913. 16 refs. Research sponsored by the U.S. Department of Energy.

Excess currents due to field-assisted tunneling in both forward and reverse bias directions have been observed in n(+)-p silicon solar cells. These currents arise from the effect of conducting paths produced in the depletion layer by n(+) diffusion and cell processing. Forward-bias data indicate a small potential barrier with height of 0.04 eV at the n(+) end of conducting paths. Under reverse bias, excess tunneling currents involve a potential barrier at the p end of the conducting paths, the longer paths being associated with smaller barrier heights and dominating at the lower temperatures. Low-reverse-bias data give energy levels of 0.11 eV for lower temperatures (253-293 K) and 0.35 eV for higher temperatures (293-380 K). A model is suggested to explain the results. (Author)

A80-36937 **Charge collection and spectral response of amorphous-silicon solar cells.** R. O. Bell (Mobil Tyco Solar Energy Corp., Waltham, Mass.). *Applied Physics Letters,* vol. 36, June 1, 1980, p. 936-938. Contract No. DE-AC03-79ET-20460.

Current generation in hydrogenated amorphous silicon, a-Si(H), was found to be predominately from the space-charge region. The mobility-lifetime products were the order of 5 x 10 to the -10th sq cm/V for both holes and electrons. It was necessary to consider trapping and recombination of the optically generated carriers in the space charge region to interpret solar cell and spectral response data. (Author)

A80-37012 **Medium and high temperature solar processes.** J. F. Kreider (Jan F. Kreider and Associates, Boulder, Colo.). New York, Academic Press, Inc., 1979. 358 p. 148 refs. $38.

The subject matter of this book is concerned with those solar-thermal processes that operate above 100 C. A broad division between medium- and high-temperature processes is made at 300-400 C, corresponding to practical operating temperatures achieved by single- and compound-curvature solar concentrators. An attempt is made to present an analytical framework for comparing the many features of thermal, solar, and nonsolar systems in an unbiased manner so that technically and economically optimal systems for performing a given task may be designed. Seven problem areas are discussed: solar systems economics and environmental impacts of solar systems; principles of solar radiation and optics; selected topics

if the maximum temperature increase on discharge is to be kept below 5-10 C to avoid electrolyte loss via evaporation/condensation processes. Conversely, use of only one or two layers leads to an unacceptably high penalty in the energy density. (Author)

A80-37190 **Characterization of commercial black chrome coatings.** D. M. Fell, L. L. Tongson, S. V. Krishnaswamy, R. Messier, and I. S. T. Tsong (Pennsylvania State University, University Park, Pa.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology*, vol. 17, Jan.-Feb. 1980, p. 358-361. 21 refs.

A comparative study of the optical properties and chemical composition of three commercially prepared black chrome solar absorber coatings has been made. In all these samples, the visible and IR spectra were nearly the same and showed no peaks corresponding to hydrated chromium oxides. The chemical composition was obtained by AES and sputter-induced photon spectrometry (SIPS). The hydrogen profiles by SIPS indicated the presence of H (or OH) at varying levels in these coatings. Although the AES and SIPS analyses showed significant compositional profile differences among samples, their optical properties were quite comparable. (Author)

A80-37191 **Preparation of thin films for solar energy utilization.** D. M. Mattox (Sandia Laboratories, Albuquerque, N. Mex.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology*, vol. 17, Jan.-Feb. 1980, p. 370-373. 36 refs.

Thin film deposition techniques have made and are making a contribution to solar energy utilization. Commercial applications of thin films include photothermal selective absorbers formed by electroplating, chemical conversion, and vacuum processing; solar reflectors formed by vacuum processes; heat reflectors formed by vacuum processes and spray pyrolysis; and antireflection coating formed by vacuum processes and chemical leaching and the metallization of photovoltaic cells. CdS/Cu2S photovoltaics formed by vacuum processes and spray pyrolysis are also close to commercial utilization. Principal problems in thin films applications include economics of fabrication and environmental stability of the thin film materials. For many applications the best and most economical film deposition technology is not yet defined. One of the problems with thin film evaluation is the lack of acceptable testing procedures particularly as related to lifetime. Research is continuing in the application of sophisticated thin films to photovoltaic conversion and other applications. This paper reviews the status of thin film in solar energy utilization. (Author)

A80-37192 **Importance of the interface in noncrystalline /poly and amorphous/ conductor-insulator-semiconductor /CIS/ solar cells.** R. Singh (Waterloo, University, Waterloo, Ontario, Canada) and K. Rajkanan (New York, State University, Buffalo, N.Y.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology*, vol. 17, Jan.-Feb. 1980, p. 376-379. 27 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

Recently a new class of photovoltaic device, classified as a conductor-insulator-semiconductor (CIS) solar cell, has been developed. On the top layer of these devices there may be a transparent metal film, oxide-semiconductor, or a combination of these leading to a wide variety of metal-insulator-semiconductor (MIS) and semiconductor-insulator-semiconductor (SIS) solar cells. Due to improved understanding of the interface between the top layer and the single crystal base semiconductor, efficiencies above 17% have been realized. However, CIS-type solar cells made on nonrecrystallized poly and amorphous semiconductors usually have low efficiency. It is shown that the native grown oxide may not be capable of forming a good interface and deposited dielectrics are required for noncrystalline CIS solar cells. The criteria for selecting the insulating layer are presented. (Author)

A80-37195 **Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells.** L. L. Kazmerski and P. J. Ireland (Solar Energy Research Institute, Boulder, Colo.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology*, vol. 17, Jan.-Feb. 1980, p. 525-528. 14 refs.

The chemistry and composition of grain boundaries in polycrystalline GaAs grown by liquid phase epitaxy (LPE) and molecular beam epitaxy (MBE) are examined using complementary Auger electron spectroscopy (AES), secondary ion mass spectroscopy (SIMS) and X-ray photoelectron spectroscopy (XPS). The effects of an unintentional residual-oxygen partial pressure during LPE growth are investigated in terms of grain boundary passivation. Depth-compositional data verify the grain boundary localization of oxides using an in situ, UHV fracturing technique. Indications of distributions of these oxides over the grain boundary are presented. The performances of Au Schottky barrier solar cells fabricated from the polycrystalline LPE and MBE GaAs are compared and differences are explained in terms of grain boundary activity. (Author)

A80-37297 **An array of directable mirrors as a photovoltaic solar concentrator.** W. B. Ittner, III (IBM Corp., Federal Systems Div., Gaithersburg, Md.). *Solar Energy*, vol. 24, no. 3, 1980, p. 221-234.

Calculations of the optics of heliostats for use in large thermal power towers have been carried out in considerable detail, chiefly by Vant-Hull et al. This paper describes a simplified method for calculating the images generated by a special type of concentrator, i.e. an array of independently steered mirrors on a single frame, intended to direct the solar image onto a flat photovoltaic solar cell target. The case of interest is one in which the field of illumination on the target is as uniform as possible, and the emphasis is thus on small 'rim angle' geometries (a configuration which also minimizes mirror interference effects). Calculations are presented for constructing the individual mirror target images in terms of three angles: (1) the angle between the photovoltaic target normal and the reflecting mirror (called here the mirror position angle), (2) the angle between the target center and the sun as measured from the center of the reflecting mirror, and (3) the angle at which the plane defined by the center of the sun, the mirror center and the target center intersects the plane of the target. The overall system efficiency for various mirror configurations, characterized by such parameters as the maximum mirror angle (i.e. 'rim angle'), target-mirror plane separation, and mirror aiming accuracy is discussed in terms of the specifications desirable in an optical concentrator designed specifically to illuminate uniformly a photovoltaic solar cell target. (Author)

A80-37299 **Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique.** M. J. Peterson and F. H. Cocks (Duke University, Durham, N.C.). *Solar Energy*, vol. 24, no. 3, 1980, p. 249-253. 20 refs. Research supported by the Selenium-Tellurium Development Association.

Selective absorber surfaces with a/e ratios greater than 33:1 have been produced by the angled vapor deposition of Te thin films onto specular metal substrates. Such Te films have a remarkable surface texture structure which results in highly absorptive behavior for incident sunlight. The emissivity of the surface is determined by the specular substrate when the Te film is thin, thus producing the extremely high a/e ratio observed. The present work appears to yield substantially higher a/e ratios than those previously studied. Se, which also shows a distinctly different surface texture effect, was not found to yield a/e ratios greater than 2:1. (Author)

A80-37300 **Design and cost analysis for an ammonia-based solar thermochemical cavity absorber.** O. M. Williams (Australian National University, Canberra, Australia). *Solar Energy,* vol. 24, no. 3, 1980, p. 255-263. 12 refs.

A design and cost analysis is introduced for a solar thermochemical cavity absorber operated at the focus of a tracking paraboloidal concentrator and based on the ammonia dissociation reaction. The absorber design consists of a catalyst-filled nickel alloy tube wound into a spiral forming the inner cavity wall and shaped to match the incident power density profile to the reactor heat requirements. The reactor tube is welded to a coaxial counterflow heat exchanger. The relationships among the power density profile, the reaction thermodynamics and kinetics, and the heat transfer characteristics are examined in detail and it is shown that an installed cost goal of typically 10 U.S. dollars per square meter of solar collector area can be achieved through use of high activity ammonia dissociation catalyst. The optimum absorber size for a given paraboloidal dish area is calculated for a system pressure of 20 MPa and it is shown that a cost effective absorber suitable for 100,000-hr operation would operate at 90% efficiency at 750 C wall temperature. (Author)

A80-37301 **Maximally concentrating collectors for solar energy applications.** E. J. Guay (Wisconsin, University, Madison, Wis.). *Solar Energy,* vol. 24, no. 3, 1980, p. 265-270.

The performance characteristics of a solar energy collector can be described by a function relating the concentration to the direction of incident radiation. A strict bound on the integral of this function is established. This is used to define a realistic class of collectors with maximal concentration which can serve as a basis for design and optimality studies. (Author)

A80-37302 **Use of solar energy to reduce carbon dioxide.** L. R. Martin (Aerospace Corp., Los Angeles, Calif.). *Solar Energy,* vol. 24, no. 3, 1980, p. 271-277. 27 refs. Contract No. E(04-3)-1101.

Several thermodynamically possible ways are outlined in which solar energy could be used to decompose carbon dioxide into carbon or carbon monoxide and oxygen, thereby providing a new source of carbon-based fuels which do not contribute to the environmental problems of mining operations, sulfur pollution, and carbon dioxide buildup in the atmosphere. It is shown that these methods are analogous to cyclic thermochemical processes for the decomposition of water into hydrogen. While these cycles have not yet been proven practical in the laboratory, it is suggested that the thermodynamics are sufficiently favorable that experimental study is recommended. Finally, since the approach has much in common with the hydrogen economy, some of the basic aspects of the hydrogen proposal are reviewed. M.E.P.

A80-37305 **Solar coal gasification.** D. W. Gregg, W. R. Aiman, H. H. Otsuki, and C. B. Thorsness (California, University, Livermore, Calif.). *Solar Energy,* vol. 24, no. 3, 1980, p. 313-321. 18 refs. Contract No. W-7405-eng-48.

A preliminary evaluation of the technical and economic feasibility of solar coal gasification has been performed. The analysis indicates that the medium-Btu product gas from a solar coal-gasification plant would not only be less expensive than that from a Lurgi coal-gasification plant but also would need considerably less coal to produce the same amount of gas. A number of possible designs for solar coal-gasification reactors are presented. These designs allow solar energy to be chemically stored while at the same time coal is converted to a clean-burning medium-Btu gas. (Author)

A80-37306 **Absorption enhancement in solar collectors by multiple reflections.** J. J. O'Gallagher, R. Winston (Chicago, University, Chicago, Ill.), A. Rabl (Chicago, University, Chicago, Ill.; Solar Energy Research Institute, Golden, Colo.), and W. McIntire (Argonne National Laboratory, Argonne, Ill.). *Solar Energy,* vol. 24, no. 3, 1980, p. 323-326. 5 refs. Contracts No. ER-78-5-02-4657; No. W-31-109-eng-38.

This technical note examines the problem of effective absorption enhancement from the standpoint of the second law of thermodynamics. A limit is derived for the enhancement factor, and it is shown that the limit can indeed be reached in cases of practical interest if the receiver is coupled to an involute reflector with concentration less than unity. A simple formula is obtained for the enhancement factor which agrees well with ray-trace results. An analysis is presented which can be visualized conceptually in terms of any of the typical trough configurations which have been proposed for evacuated glass tubular absorbers, such as the flat diffuse reflector, specular V-trough, specular cylinder and specular involute, as shown schematically. The results are readily generalized to the case where the incidence angles are restricted and the maximum concentration is greater than unity. S.D.

A80-37937 **Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volumes 1-4.** Symposium-Workshop sponsored by the National Science Foundation. Edited by T. N. Veziroglu (Miami, University, Coral Gables, Fla.). New York, Pergamon Press, Inc., 1980. Vol. 1, 619 p.; vol. 2, 556 p.; vol. 3, 570 p.; vol. 4, 604 p. Price of four volumes, $300.

The symposium concentrated on solar energy collection, storage, and applications. The major topics included: solar radiation, flat plate collectors, concentrating collectors, collector technology and research, thermal storage, heating and cooling systems, biological and chemical conversion, direct electrical conversion, and solar power plants. Other subjects were distillation and desalination using solar energy, agricultural and industrial applications of solar energy systems, combination of solar and wind energies, national and international solar energy programs, and solar energy economics and policies. V.L.

A80-37940 **Solar energy at ground surface.** N. H. Helwa (National Research Centre, Solar Energy Laboratory, Cairo, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 41-55. 8 refs.

Information is presented on weather conditions and the rates of incident solar radiation on different oriented surfaces at various months of the year required for the planning of a solar project. The total solar radiation incident on a horizontal surface, the ambient air temperature, the relative humidity, the wind speed, and the direct solar radiation incident on a plane normal to the solar beam were recorded by meteorological stations in Egypt; some of these measurements were mapped, including the hourly variations of direct solar radiation, monthly average of solar radiation, and the calculated amount of the total solar radiation at Giza. The uses of solar energy including heating of water, sea water desalination, and drying of crops are also discussed. A.T.

A80-37943 **The flat plate solar collector - Its steady-state and transient state behaviour.** E. Hahne, N. Fisch, and A. Arafa (Stuttgart, Universität, Stuttgart, West Germany). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 159-186. 6 refs. Bundesministerium für Forschung und Technologie Contract No. ET-4045-A.

The efficiency and effectiveness of the flat plate collectors were calculated in their steady-state and transient state behavior. The studied parameters were grouped into collector, operation, and meteorological parameters. The effects of these parameters and their relation to other factors were obtained by their individual variation in computer programs; the numerical results were compared to experimental data. The agreement was satisfactory with deviations of less than 10% as an average for efficiency and less than 2 K for transient outlet temperatures of more than 30 C. A.T.

A80-37944 **Flat-plate solar collectors - Influence of design material and configuration on performance.** S.-E. Ransmark (Lund Institute of Technology, Lund, Sweden). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 187-214.

A study was made of the effect of various materials, designs, and mass flow rates on the efficiency of a flat-plate solar collector. It showed that a mass flow rate higher than 0.05 kg/s/sq m will give a minimal efficiency increase; that with a metal absorber the efficiency will be approximately the same for risers of 5, 10, and 20 mm in diameter as long as the number of risers per meter is the same; and that with 10 or more risers per meter the efficiency will be approximately the same for absorbers of copper, aluminum, and steel. In addition, it was found that an absorber of plastic has to be water cooled, and that parallel risers or tubes in serpentine provide the same efficiency if the total tube length is the same, and if the mass flow is 0.05 kg/s/sq m or larger. It was concluded that small dimensions will reduce the heat capacity, which will shorten the collector start-up time and increase efficiency, at least in areas with varying cloudiness. A.T.

A80-37945 **My new types of flat plate solar collectors.** R. Jankovic. In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 215-238. 6 refs.

The paper presents new types of flat plate solar collector, and the collection efficiency factors for flat plate solar collector with rectangular tubes between two plates. The absorber of a semielliptic flat plate collector is described along with the absorber of a trapezoidal collector; details are given of construction of a flat plate collector with and without a glass cover. Collection efficiency factors are calculated for flat plate collectors with rectangular tubes, and the main parameters are depicted for the flat plate collector with a rectangular channel. Finally, an equation is derived for the fin efficiency factor which may be used to estimate the efficiency factor of the flat plate solar collector with rectangular channels. A.T.

A80-37946 **Measurements on a flat thermal solar energy collector with a cellular structure after Francia.** A. Bahr, H. Piwecki, and L. Rigolini (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 239-257.

A thermal flat plate solar energy collector with a cellular structure after Francia has been tested in outdoor conditions. The results have been compared with measurements done at the same collector but with the cellular structure removed. Besides this measurements have been performed to determine separately the influence of the cellular structure on the internal heat transfer in the collector by radiation and by natural convection. The method applied - comparison of cover glass temperature in the selected working conditions - furthermore allows the determination of the influence of the absorption of solar radiation by the cover glass and the cellular structure on the effective power. (Author)

A80-37947 **Flat plate boosters for elevating temperatures.** I. A. Sakr and A. I. Hegazi (National Research Centre, Solar Energy Laboratory, Cairo, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 274-297. 5 refs.

A stationary concentrating solar flat-plate booster (SFPB) with a flat absorber suited for moderate temperature applications is presented. It has the features of a trapezoidal enclosure, with two reflecting sides, flat absorbing passage at the bottom and a glass cover at the top. Mathematical expressions are deduced for the geometrical parameter, 'L, W, H' of the SFPB with apex angles between 5.0 and pi/2. Concentration gain and effective transmission factors are deduced for different SFPBs concerning the effect of beam deviation, apex angles and surface reflectivity. The year-round performance of different SFPBs is computed for the Egyptian solar conditions. It is shown that concentration ratios up to 4 times that associated with temperatures up to 180 C and effective transmission factors higher than 70% can be obtained with this class of solar boosters, depending on its apex angle and surface quality. (Author)

A80-37948 **A black liquid flat plate collector for economical applications.** R. S. Daryan and P. K. C. Pillai (Indian Institute of Technology, New Delhi, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 298-307. 8 refs.

A black liquid flat plate solar energy collector for economical applications has been designed and tested. A rectangular pattern of thin transparent glass tubing is used as the collector fluid container, in which a highly absorbent 'black' liquid flows and directly absorbs the solar energy. The liquid is the hottest substance in the collector and does not require any metal in the design. The structure is enclosed in a thermally insulated box with a two-glass cover. The collector efficiency with different black liquids, in which black ingredient and working fluid are used in different proportion, was calculated and a comparison with other conventional type flat plate collectors was made. (Author)

A80-37949 **Passive solar wall collectors.** A. Faist and J. B. Gay (Lausanne, Ecole Polytechnique Fédérale, Lausanne, Switzerland). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 308-323.

A study of front covers to be used in passive solar wall systems for building insulation is presented. Nineteen covers were investigated, including glass, translucid plastics and metal plates. The measurements were made under natural conditions on small concrete elements of about 0.5 sq m front surface. A mathematical model was developed and adapted to each case; by fitting the different measured curves, all the physical characteristics of the different covers were obtained. The measurements for 19 covers were presented; the results of a mathematical simulation based on meteorological data near Lausanne of two periods during the 1976-1977 winter were presented for four covers. A.T.

A80-37950 * **A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector.** F. L. Lansing (California Institute of Technology, Jet Propulsion Laboratory, DSN Engineering Section, Pasadena, Calif.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 328-350. Contract No. NAS7-100.

A numerical procedure was established using the finite-difference technique in the determination of the time-varying temperature distribution of a tubular solar collector under changing solar radiancy and ambient temperature. Three types of spatial discretization processes were considered and compared for their accuracy of computations and for selection of the shortest computer time and cost. The stability criteria of this technique were analyzed in detail to give the critical time increment to ensure stable computations. The results of the numerical analysis were in good agreement with the analytical solution previously reported. The numerical method proved to be a powerful tool in the investigation of the collector sensitivity to two different flow patterns and several flow control mechanisms. (Author)

A80-37951 **Optical and thermal performances of a half-circular, cylindrical concentrator.** K. Bordoloi, T. Murray, F. Bynum, and E. Chaves (Louisville, University, Louisville, Ky.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 351-377. 10 refs.

An investigation of the optical and thermal performances of a non-tracking, half-circular cylindrical concentrator is presented. The study of the optical and thermal properties has resulted in the selection of a class of receivers for the non-tracking mode in which the concentrator can be used. The receiver is designed to have placement and size to take into account the changing orientation of the incident solar radiation as the declination changes throughout the year; the main type of receivers considered are circular and triangular. The study focused on: (1) the geometrical consideration of the concentrator and the receiver for the optimum absorption of sunlight, (2) the study of optical parameters such as the concentration ratio and the average number of reflections, and (3) the analysis of the collector in terms of the heat transfer coefficient, heat loss coefficient, useful energy gain, and the efficiency of the collector. The results suggest that the concentrator performs satisfactorily even under non-tracking mode when compared with a flat-plate collector; the cost effectiveness of such a concentrator is favorable, if used for space heating and cooling. A.T.

A80-37952 **Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes.** K. Bordoloi, C. Hoang, and F. Bynum (Louisville, University, Louisville, Ky.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 378-391. 15 refs.

Previously a mathematical model for the thermal performance was developed for a V-trough collector. Essentially, it was an application to this configuration of an H-B-W zero capacitance node model. In this present paper this analysis is extended to take into account the effects of thermal capacitance. The collector involved is formed of a linear array of V-troughs, is non-concentrating in nature and it heats a stream of air going through the channels above the blackened heat-absorbing plate and below a transparent cover. Direct comparison is made of the results of calculations between the zero capacitance node model and the present version which includes the capacitance effects. In each case identical sets of time-changing inputs are used. The method of study is by the digital simulation of the collector's overall performance. (Author)

A80-37953 * **High-efficiency solar concentrator.** F. L. Lansing and J. Dorman (California Institute of Technology, Jet Propulsion Laboratory, DSN Engineering Section, Pasadena, Calif.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 392-403. Contract No. NAS7-100.

A new type of solar concentrator is presented using liquid lenses and simple translational tracking mechanism. The concentrator achieves a 100:1 nominal concentration ratio and is compared in performance with a flat-plate collector having two sheets of glazing and non-selective coating. The results of the thermal analysis show that higher temperatures can be obtained with the concentrator than is possible with the non-concentrator flat-plate type. Furthermore, the thermal efficiency far exceeds that of the comparative flat-plate type for all operating conditions. (Author)

A80-37955 **Thermo-fluid analysis of a cylindrical solar heat absorber.** M. F. Khalil (Alexandria, University, Alexandria, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 412-430. 7 refs.

In this paper, a theoretical analysis for the fluid flow through a cylindrical solar heat absorber is considered, taking into consideration the heat loss to the surroundings due to convection and radiation. The variation of fluid density and viscosity with temperature is also considered. The continuity, momentum and energy equations in cylindrical co-ordinates, are reduced in such a way to describe the flow and temperature fields along the absorber. These equations are solved numerically using the Runge-Kutta method. The effect of radiative and convective heat losses from the absorber is demonstrated. The effect of fluid thermal conductivity and absorber thermal capacity are considered on the fluid temperature rise, pressure drop for fluid flow along the absorber, and finally on the absorber efficiency. (Author)

A80-37956 **An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector.** K. K. Rao and S. B. Ahmed (Indian Institute of Technology, Madras, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 431-445.

The comparative performance of a header-type compound parabolic concentrator and a flat-plate collector has been experimentally investigated. Two configurations of the collectors, one in which the absorber tubes were all oriented in the east-west direction, and another in which the absorber tubes of the FPC were oriented north-south, three different flow rates and three angles of tilt were considered. The hourly efficiency and useful thermal energy gain have been obtained as a function of the hour of day, and efficiency vs Delta T/I curves have been drawn. The results show that in configuration I, the CPC was more efficient than the FPC for about two to three hours around noon when kept at an angle equal to latitude or declination. The mean daily efficiency was about the same for both collectors. When kept horizontal the CPC was quite inefficient. In configuration II, the CPC was more efficient than the FPC for about two hours around noon when kept at the declination angle; when kept at an angle equal to the latitude the FPC had the better overall performance. (Author)

A80-37957 **Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors.** B. A. Meyer, K. R. Randall, M. M. El-Wakil, and J. W. Mitchell (Wisconsin, University, Madison, Wis.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 446-462. 14 refs. Contract No. E(11-1)-2941.

An interferometric study is presented which determined the local and average values of the Nusselt number in moderate and small aspect ratio flat-plate enclosures. The investigation was made of collector tilt angles from 45 to 90 deg, aspect ratios from .25 to 36 and slat angles from 45 to 90 deg. The results show that aspect ratios between .5 and 10 are undesirable because of a convective loss; collector geometries with slat angles less than 90 deg are effective in reducing convective losses. Heat transfer rates in an enclosure bounded by a heated vee-corrugated surface on the bottom and a cooled flat surface on the top were also examined for vee aspect ratios of .75, 1, and 2 and tilt angles of 0, 45, and 60 deg. It is concluded that the average heat transfer for this geometry is considerably higher than for the flat-plate collector operating under similar conditions. A.T.

A80-37958 **Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation.** N. M. Rafat, M. M. Elkotb, and M. F. El-Refaie (Cairo, University, Giza, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-

Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 463-489. 5 refs.

The steady state performance of a multipass radiation fluid heater is investigated when the distribution of the incident thermal radiation is non-uniform in cross direction. This condition may occur in a multipass solar collector combined with a parabolic reflection trough; the analysis presented is valid for any general form of radiant energy distribution. Mathematical expressions are derived for the fluid and wall temperature distributions along the serpentine; these expressions are given in terms of a number of convenient dimensionless groups. The performance of the heater is evaluated, and a new effectiveness index is used, together with conventional efficiency, to describe the performance. When the heater passes are exposed to different radiation densities, the sequence of flow through the different passes will be of importance; the effect of the flow arrangement on the performance is studied and the optimum flow pattern is determined. A.T.

A80-37959 **Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating.** F. Rocaries, G. Olalde, P. Granier, B. N'Doye, and M. Daguenet (Perpignan, Université, Perpignan, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 490-511. 5 refs.

The authors study heat transfer phenomena with numerical methods. Because of the experimental difficulties, it is useful of course to simulate the behavior of solar systems. Simulation is available for high temperatures systems (gas reheaters in focusing devices); for solar stills; flat plate collectors, etc. Simulation enables an accurate prevision of the behavior, and a systematical study of all the parameters effects. This last study points out the major parameters, to simplify the model. The present study regards: solar stills, various flat collectors, high temperatures gas re-heaters. The authors give appropriate organigrams and graphical results. (Author)

A80-37960 **Low cost spiral shaped solar collector.** P. K. C. Pillai and R. C. Agarwal (Indian Institute of Technology, New Delhi, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 512-521.

The details of the design and development of an inexpensive solar collector system are given in this paper. A spiral-shaped plastic tube coated with a black paint constitutes the solar absorber in the above collector. The above structure is enclosed in a wooden box with 4 in. thick glass wool insulation at the bottom and also provided with a glass cover at the top. Water is used as a working fluid. For high temperature applications with higher efficiencies, plastic tubing is replaced by a metallic tubing. Studies on the characteristics of this solar collector with and without selective absorptive coatings are also being made. (Author)

A80-37961 **Optimum inclination of linear reflectors.** B. A. Khalefa and A. S. Hegazy (Minufiya University, Shibin el Kom, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 529-535.

This paper presents a computer model for determining the optimum angle of inclination of a linear reflector for a specified site and a certain time period. This optimum angle of inclination is selected on the basis of maximum solar radiation energy reflected from the concentrator and received by its target during the testing time period. This proposed model was applied to some sites in Egypt for certain time periods of the month and year. (Author)

A80-37962 **Phase change collector wall versus water collector wall.** L. Bourdeau and A. Jaffrin (CNRS, Laboratoire d'Ecothermique Solaire, Nice, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 549-564.

Two experimental cells have been constructed to study under true weather conditions the thermal behavior of collector - storage walls containing a phase changing material or plain water. Recorded temperatures show that the latent heat wall collects solar energy with a much larger efficiency (up to 100%) and stores twice more heat than the water wall of same volume, while acting as a very good temperature filter. (Author)

A80-37963 **On the evaluation of the feasibility of solar collectors for electrical power generation applications.** A. Gokhman and N. Ozboya (Miami, University, Coral Gables, Fla.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 1. New York, Pergamon Press, Inc., 1980, p. 565-576.

In this paper certain technical parameters have been proposed for economical evaluation of solar collectors for electric power generation applications. In the analysis only high temperature concentrating collectors have been considered. These parameters could be useful for government agencies and power companies in order to compare various solar collector subsystems quickly and correctly. (Author)

A80-37964 **Performance of a storage unit coupled to a flat plate solar collector.** S. B. Ahmed and V. Sriramulu (Indian Institute of Technology, Madras, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 593-603. 6 refs.

A storage unit is an indispensable component of a solar power generating unit. A thermal storage unit coupled to a system of flat plate collectors is described. In a thermal storage unit stabilization effects are always present; the processes occurring in such a system have been simulated on a digital computer to determine the performance characteristics of the unit for a given load pattern. The analysis considers a selectively coated surface employing water as the working medium. The temperature distribution in the storage unit undergoes a change when the water flow rate is altered. The storage volume does not affect the performance significantly in the range of volumes investigated. (Author)

A80-37969 **Solar heating systems with air collectors and rock bed storage.** W. L. Dutre, L. Cypers, J. Berghmans, and A. Debosscher (Leuven, Katholieke Universiteit, Heverlee, Belgium). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 697-730.

A domestic air heating system based on air collectors and rock bed storage is studied in this paper. For the system being considered a dynamic model has been developed, including the regulation criteria and the dynamic behaviour of the building. Making use of the climatological data for temperature and solar radiation as half-hour averages for the Belgian climatological reference year, the year round performance of the system has been calculated over a wide range of the most important design parameters, such as collector area, thermal capacity of the storage system, the total heat demand and its distribution. Results of these calculations are reported in this paper and the relative influence of system component size as well as the importance of each of the possible operation modes under the climatic conditions being considered are discussed. (Author)

A80-37970 **Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system.** A. F. Orlando, L. Goldstein, Jr., and D. Magnoli (Centro de Tecnologia Promon, Rio de Janeiro, Brazil). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. New York, Pergamon Press, Inc., 1980, p. 731-744. 5 refs.

The development and testing of a double loop thermosyphon solar heater is described. It is reported that the absorbers in the collector are non selective and of the roll-bond aluminum type. Further, it is shown that for the required consumption hot water temperature range (40-60 C), single glazing collectors are more efficient than double glazing collectors. In addition, the design of the heat exchanger is found to be critical to the technical and economic performance of the water heater. The influence of the heat exchanger is analyzed in terms of the coefficient of performance COP. It is concluded that the system is found to be more efficient for larger ratios between the heat exchanger surface and collector.
M.E.P.

A80-37971 **Hot water production by means of a solar thermosyphon loop.** W. L. Dutré, L. Cypers, J. Berghmans, and A. Debosscher (Leuven, Katholieke Universiteit, Heverlee, Belgium). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 745-766. Research supported by the Belgian National Research and Development Programme on Solar Energy Applications.

The results of a study of hot water production using a solar thermosyphon loop are reported. A dynamic model has been developed describing the behaviour of the loop consisting of a number of solar collectors and a water tank placed above the collectors. The loop is segmented and for each segment the time-dependent mass conservation, momentum and energy equations are satisfied. The solution of these equations is obtained numerically and is compared to temperature distributions determined experimentally. It is found that good agreement can be obtained between theoretical predictions and experiment. Using the temperature and solar radiation data for a typical Belgian year, the dynamic model allows one to calculate the energy produced by the thermosyphon system as a function of system parameters: collector size, storage tank size, daily consumption rate, etc. Energy savings with respect to an all-electric heater are reported as a function of the system parameters.
(Author)

A80-37972 **Effectiveness of packed-bed solar air heaters.** S. C. Gupta (Allahabad, University, Allahabad, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 767-777. 8 refs.

The fabrication and performance testing of a single glass cover solar air heater with a packed-bed absorber made of iron shavings as well as one of iron wires and scraps of aluminum are reported. A test procedure recommended by the National Bureau of Standards has been followed during experimentation. The comparative efficiencies of both heaters are evaluated with and without the use of a metallic tray of absorbers. In addition, the effect of mass flow rate, aspect ratio, length of absorber, air temperatures and solar insolation are also studied. Finally, it is found that the collection efficiencies of these absorbers are as high as 70 to 75% at outlet air temperatures of 50 to 53 C.
M.E.P.

A80-37973 **Performance comparison of different types of solar water heaters under Egyptian conditions.** S. W. Youssef and I. A. Sakr (National Research Centre, Solar Energy Laboratory, Cairo, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 778-792.

The design details of four different types of solar water collectors, suitable for providing enough hot water for domestic demand are reported. It is shown that the collectors are designed in a way that they can be easily manufactured with local materials and technology and can operate optimally under the climatic conditions of Egypt. Attention is given to performance tests of these different types under identical conditions. Further, a study is carried out to determine which available materials can be used most economically in the production of solar water heaters. Finally, the results obtained are analyzed to select the most suitable type for operating under the local conditions described.
M.E.P.

A80-37974 **Solar water heaters.** D. Buxey (Dr. Beck and Co. /India/, Ltd., Bombay, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 793-801.

The salient features of world developments and new developments in the field of solar heaters are briefly summarized. Attention is given to the importance of adapting the heater to varying needs which vary not only due to locale but also habits. The first major industrial installation in a hotel in Matheran, near Bombay, is described noting the the absorption and storing in same and separate units, and the dual circulation system. Further, the various factors affecting design, such as heat removal, orientation and transmittance of glass covers, are examined, and trends in the improvement of design are discussed. Finally, auxiliary heating and the design of a solar switch are also considered.
M.E.P.

A80-37975 **Latent heat diode wall.** L. Bourdeau and A. Jaffrin (Nice, Observatoire, Nice, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 802-826.

A composite wall with separate collector side and storage volume operating as a thermal diode is proposed. The storage uses a latent heat material called chliarolithe. Laboratory experiments performed on the storage side show that it is possible to define satisfactory conditions both for the collector side and for the heat restitution: relatively low temperature in collector, little external losses, storage equivalent to 75 cm of concrete in the form of 5 cm of chliarolithe, excellent temperature control on the internal side.
(Author)

A80-37976 **Comparison between two absorption cooling systems of the 'open' type under different climate conditions.** M. Bolzan and R. Lazzarin (Padova, Università, Padua, Italy). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 827-854. 12 refs.

Two open-type solar cooling systems are described and compared: (1) the dehumidification-humidification (DH) system and (2) Baum's system which consists only of evaporator and absorber, and with the generator in the open air. The DH systems are shown to be more efficient in the three climates in which tests were conducted (hot dry, hot humid, and Mediterranean). Some advantages of Baum's cycle are noted.
B.J.

A80-37977 **Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector.** A. Venkatesh and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 870-885.

The paper is concerned with the thermodynamic analysis of an ammonia-water intermittent solar refrigerator which uses a simple flat plate collector for generating ammonia vapors from the ammonia-water solution. A digital computer is used to simulate the processes which constitute the cycle. The following parameters are evaluated and discussed: heat absorbed during generation, amount of vapors generated and amount of ammonia condensed, minimum evaporator temperature, effective refrigeration, and coefficient of performance. The solar refrigerator has no moving parts and hence it is easy to maintain. In addition, it has no pumps, fans or any gadgets that require electricity.
S.D.

A80-37978 * **A thermodynamic analysis of a solar-powered jet refrigeration system.** F. L. Lansing and V. W. Chai (California

Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 886-897. 5 refs. Contract No. NAS7-100.

The article describes and analyzes a method of using solar energy to drive a jet refrigeration system. A new technique is presented in the form of a performance nomogram combining the energy and momentum equations to determine the performance characteristics. A numerical example, using water as the working fluid, is given to illustrate the nomogram procedure. The resulting coefficient of performance was found comparable with other refrigeration systems such as the solar-absorption system or the solar-Rankine turbocompressor system. (Author)

A80-37979 **Development of a solar desiccant dehumidifier.** Z. Lavan, D. Gidaspow, M. Onischak, S. Chaturvedi, B. Mathiprakasam, and S. Perkari (Illinois Institute of Technology, Chicago, Ill.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 898-931. 9 refs. Contract No. EG-77-C-03-1589.

A preliminary design of a cross-cooled two-ton silica gel dehumidifier is presented. The system consists of two identical fixed bed units; one dehumidifies while the other is being regenerated. The cross cooling is achieved with room or ambient air flowing through rectangular channels; the process stream flows in perpendicular channels which are lined with paper-like sheets consisting of micron-size silica gel particles held in a Teflon web. The silica gel was tested in an isothermal channel and found to perform satisfactorily. Detailed calculations have shown that the low regeneration temperatures of the silica gel result in sufficient dehumidification for air conditioning applications. The low regeneration temperature permits the use of flat plate solar collectors. B.J.

A80-37980 **Liquid desiccant solar heat pump for developing nations.** H. Robison (South Carolina, University, Conway, S.C.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 932-938. 11 refs.

A redesign of the U.S.C. liquid sorbent solar air collector to include a heating cycle, while being more economical to construct and operate, is described. It is reported that the triethylene glycol desiccant has been replaced by a calcium chloride solution. Concentration of the desiccant by direct solar radiation absorbed by the colored liquid is shown to allow collector operation at low temperature and high efficiency. Attention is given to the fact that the easily constructed open-channel trickle collector system is not used for transfer of sensible heat, but rather is used for mass transfer of water absorbate from the absorbent solution to the natural ambient air stream. It is stressed that the hardware necessary to build the system is readily available worldwide. Finally, a detailed description of the cooling and heating modes is given. M.E.P.

A80-37981 **A review of the historical developments of the use of passive solar systems.** C. L. Robbins (Florida Agricultural and Mechanical University, Tallahassee, Fla.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 939-959. 34 refs.

The historical development of passive solar systems from 3000 BC in Mesopotamia to the present is reviewed. Attention is given to the systems design, performance characteristics, and energy conservation criteria of convective self-flow thermal systems and passive (natural) lighting systems. B.J.

A80-37982 **Natural lighting in buildings - A passive solar system.** C. L. Robbins (Florida Agricultural and Mechanical University, Tallahassee, Fla.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 960-982. 35 refs.

This paper reviews the issue of using natural lighting in buildings. In general, there are four basic reasons why natural lighting systems are required by building codes in many parts of the world. These reasons are: (1) to facilitate the performance of visual tasks and ensure visual comfort; (2) to provide visual communication channels between people and their outdoor environment; (3) to provide psychological impact to lighting schemes; and (4) to conserve lighting energy, during daylight hours, and help reduce the total energy requirements in buildings. The realization that there is a need to conserve energy in the United States has brought about a reviewed interest in the use of natural lighting systems to provide light within buildings during daylight hours. This interest has caused the development of new techniques to study daylight as well as new natural lighting systems called Planned Supplemental Lighting Systems. (Author)

A80-37983 **Solar collector related research and development in the United States for heating and cooling of buildings.** R. K. Collier (California, University, Los Alamos, N. Mex.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 991-1028. 19 refs. Research sponsored by the U.S. Department of Energy.

This paper describes some of the research funded by the Research and Development Branch of the Heating and Cooling Division of Solar Energy of the United States Energy Reseach and Development Administration. Specifically, this paper deals with collector and collector materials research reported on during FY-1977. The R&D Branch has funded research in open and closed cycle liquid heating flat plate collectors, air heating flat plate collectors, heat pipe collectors, concentrating collectors, collector heat transfer studies, honeycomb glazings, evacuated tube collectors, ponds both salt gradient and viscosity stabilized, materials exposure testing, collector testing standards, absorber surface coatings, and corrosion studies. A short description of the nature of the research is provided as well as a presentation of the significant results. (Author)

A80-37985 * **A quinone-assisted photoformation of energy-rich chemical bonds.** S. W. Fox, T. Adachi, and W. Stillwell (Miami, University, Coral Gables, Fla.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 1056-1074. 18 refs. Grant No. NGR-10-007-008.

In a study of biochemical means of solar energy conversion, ADP and inorganic phosphates were converted to ATP by white light in the nonaqueous solvent dimethylformamide in the presence of tetrachloro-p-quinone or ubiquinone. Conversion of ADP to ATP has been accomplished in aqueous suspension by the use of cell-like structures aggregated from poly(aspartic acid, glutamic acid, tyrosone). This is believed to occur through the formation of dopaquinone in the peptide structure during illumination. The way in which the quantitative yield of ATP has been influenced by pH and by added substances, such as FeCl2, was studied. B.J.

A80-37990 **Physics and economics of photovoltaic solar energy conversion.** Y. Marfaing (CNRS, Laboratoire de Physique des Solides, Bellevue, Hauts-de-Seine France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1132-1153. 13 refs.

This paper presents principles of the photovoltaic effect. From this description are derived the basic properties required for the semiconducting materials to be used in photovoltaic solar converters. Then, the structure and the performances of various photovoltaic devices produced by industry or studied in the laboratory are presented. Finally, some considerations are given about the cost of electric energy supplied by photovoltaic generators for the present time and to be expected in the future. (Author)

A80-37991 **Realization of p-n junction solar cells by an ion implantation doping procedure.** J. C. Muller, M. Hage-Ali, and P. Siffert (CNRS, Centre de Recherches Nucléaires de Strasbourg, Strasbourg, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1154-1166. 13 refs.

The possibility of using a low cost ion implantation procedure for the preparation of junction solar cells has been investigated. The method employs a dc glow discharge ion source and a short post acceleration structure, without any mass separation. Preparation of the cells in a continuous way is possible at competitive speeds since the ion beam current density reaches 1 mA/sq cm. The properties of silicon cells, obtained by discharge bombardment in BF3 or PF5 atmosphere followed by recrystallization of the damaged layer either by thermal annealing or fast surface laser pulses, have been investigated. Rutherford backscattering, SIMS, electrical measurements have been used. Finally, characteristics and performance of the devices are presented. (Author)

A80-37992 **Solar energy conversion by fluorescent materials for utilization in space communication systems.** A. K. Sen and J. S. Sehra (Calcutta, University, Calcutta, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1167-1183. 52 refs.

In space communication, solar energy is widely employed to obtain the electrical power required to operate various electrical systems in a spacecraft. However, the efficiency of conversion of solar energy to electrical energy is typically under 10%. A major part of the electrical power obtained is utilized for the operation of the onboard communication systems. Direct utilization of solar energy for communication may increase the overall efficiency of the energy conversion involved. There are two ways in which such direct utilization can be affected. Firstly, solar energy can be utilized directly as the carrier of intelligence and secondly, solar energy may be utilized directly as a pump source for an onboard laser. The use of fluorescent materials may further extend the possibilities of using lasers at longer wavelengths for which the pump is derived from the fluorescent emission. There is also a possibility of utilizing the fluorescent emission directly as a carrier of intelligence. All these possibilities have been studied in this paper with special reference to space communication systems. (Author)

A80-37993 **New possibilities of solar energy conversion by means of refractory thermoelements.** S. Abdalla, J. M. Dusseau, F. Roche, and J. M. Darolles (Montpellier II, Université, Montpellier, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1184-1191.

It is shown that high-efficiency thermoelectric conversion can be obtained by using refractory compounds with low thermal conductivity and high thermoelectric power. Boron silicon compounds with a high boron concentration such as B14Si are considered. Samples are obtained by chemical vapor deposition by pyrolysis of mixture of BBr3 and SiBr4 under reduced pressure. Experimental results show that the thermoelectric figure of merit is 3.75 x 10 to the -3rd/deg and zT(H) equals 7.5 at 1700 K; moreover, the total conversion efficiency would exceed 20 percent. This is particularly interesting for solar energy conversion. (Author)

A80-37994 **On direct conversion of sunlight to electricity.** M. A. Melehy (Connecticut, University, Storrs, Conn.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1192-1209. 10 refs.

A new physical theory for homojunction and heterojunction solar cells is presented. The theory relates the voltage-current characteristics of such cells to the device physical parameters and the spectral distribution of the incident radiation. The derived formula is shown to be accurately in agreement with experiment for Si solar cells. In the treatment, the photon-generated electron-hole pairs are considered and their transport through the device and its battery (or load) is determined. The analysis is based on this author's thermodynamic theory of generalized fields (TTGF). The TTGF is a theory particularly developed for interfacial phenomena and more generally for all systems which have gradients of any physical parameters, when the particle fluxes are vanishing in the system. (Author)

A80-37995 **Performance of the noval solar cell substitute for the future.** S. C. Rastogi (M.M.M. Engineering College, Gorakhpur, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1210-1215.

This paper deals with a future solar cell, in which solar radiations obtained from the sun have been utilized for the phase transformation of the electrolytic crystal by developing a potential difference between the electrodes placed in different phases (viz., solid, liquid). The paper also reviews the earlier investigations made by the author regarding the working principle, experimental observations and design considerations. Further investigation has been carried out on long-life performance of the cell in respect to power. An effort has also been made for improvement in the design of the proper electrode. The investigations show a great potential of such a cell in the future. (Author)

A80-37996 **MOS solar cells.** H. M. Kizilyalli (Middle East Technical University, Ankara, Turkey). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1216-1229. 36 refs.

The solid state physical principles of MOS structure and their electrical characteristics is reviewed for its application to solar cells. The various parameters like insulator thickness, resistivity of the substrate, insulator charge, surface-state density, minority carrier lifetime, and crystal orientation that affects the performance of MOS solar cells will be discussed. The paper is concluded with a summary of recent developments in the field. (Author)

A80-37998 **Optimization of graded doping CdTe solar cells.** A. S. Bouazzi (Laboratoire d'Energie Solaire, Tunis, Tunisia). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1242-1256. 5 refs.

From the CdTe band gap value (1.5 eV), a high efficiency is predicted for CdTe solar cells. The high surface recombination velocity and the small minority carrier lifetime make the present efficiency below 7%. The existence of an electric field in the frontal region of CdTe solar cells can counterbalance the recombination effects by accelerating the minority carriers towards the junction. A p-n CdTe junction with a traded frontal doping is studied; its efficiency is computed to fix the optimum depth of the junction and the optimum frontal electric field resulting from the graded doping. Two recombination parameters are taken into account: the surface recombination velocity and the minority carrier lifetime. The quantum responses of the optimized structure are simulated by the computer and the results are compared to those of the CdTe homojunction and to the graded-band-gap CdHgTe heterojunction. (Author)

A80-37999 **Solar thermal power plant - Thermodynamic analysis.** A. A. Samuel, U. S. P. Shet, and M. C. Gupta (Indian Institute of Technology, Madras, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1279-1292. Research supported by the Council of Scientific and Industrial Research.

There have been several proposals for solar thermal power plants using a Rankine cycle with a low boiling point fluid as the working medium. Organic Rankine-cycle engines are particularly suited for a number of reasons such as, high thermal efficiency and reliability, relatively uncomplicated mechanical components and adaptability for use over a wide power range. In this study three working fluids: butane, dichloro tetrafluoroethane and trichloro trifluoroethane are examined. These three fluids were chosen in view of their desirable properties such as high molecular weight, low boiling point and the slope of their vapor saturation curve. (Author)

A80-38000 **Solar power units with screw expanders.** J. M. Merigoux and P. Pocard (Alsthom-Atlantique, Bruyères-le-Châtel, Essonne, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1293-1317.

A low-power solar electric generator based on a screw expander which drives an ac motor is presented. The choices of flat plate or concentrating Rankine or Brayton cycle, and an oil-injected screw expander motor in the development of the unit are examined, and the effects of Mediterranean and subtropical locations on plant performance are discussed. Results of solar engine performance simulation testing are presented, and an application of the screw expander solar unit as a deep well pump is illustrated. It is concluded that the screw expander is well adapted to low-power solar energy applications due to (1) its small efficiency variation over a large range of expansion ratios and rotating speeds, (2) its compatibility with low-concentration solar collectors and (3) its ability to be used with conventional organic working fluids and inexpensive heat transfer fluids. A.L.W.

A80-38001 **New developments for future solar power plants.** J. Lorenz, J. Feustel, and M. Kraft (M.A.N.-Neue Technologie, Munich, West Germany). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1318-1328.

The development of a planned solar farm providing 15 to 500 kW of electrical and mechanical energy in regions with high insolation is discussed. In the proposed power plant, 200 to 300 C heat generated in tracking parabolic cylindrical collectors is used to produce high-pressure steam as a source of mechanical energy, electricity or low-temperature heat. The optimization of system operating temperature and collector area with respect to collector and machine efficiency is discussed, and the first plant prototype is presented. Advanced development of the modular collector units and the energy conversion circuit, which consists of the boiler, expansion machine, electrical generator, condenser, cooling tower and control, monitoring and auxiliary devices, is then considered. A.L.W.

A80-38002 **Power from the sun by thermodynamics French tower type projects.** M. J. Bignon (CETHEL, Paris, France). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1329-1337.

The main features of three solar-power tower-type projects designed in France are discussed. Consideration is given to THEMIS, INTI 800(R), and EEC developments. The THEMIS prototype 2 MWe unit utilizing a cavity receiver with molten salt transfer and storage is due for start-up in 1980. V.T.

A80-38003 **Steam and gas turbines for small outputs using solar energy.** K. Bammert (Hannover, Universität, Hanover, West Germany) and H. Pösentrup (M.A.N.-Neue Technologie, Munich, West Germany). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1338-1350.

The conversion of the solar energy into electrical or mechanical energy in turbine power plants requires new design criteria. The choice of the working fluid and the configuration of the cycle are of great importance. Not every variant is suitable for the solar farm and the solar tower concept in the same way. The design of the turbomachinery and the other components of the cycle do strongly influence each other. An important point of view in designing a small solar power station is the simplicity of the construction so that no special service is required in remote locations. The efficiency should be as high as possible. Some important criteria for the choice and design of small power turbine plants using solar energy are discussed. The advantages of open cycle air turbines are compared with steam turbines. Indications to the choice of suitable cycles and turbomachinery are given. (Author)

A80-38004 **Turbine selection for small capacity solar-power generation.** A. Mobarak, N. Rafat (Cairo, University, Cairo, Egypt), and M. Saad (UNESCO, Regional Office, Cairo, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1351-1367. 10 refs.

In developing countries lying within the solar belt, there is an urgent need for power generation systems of sufficient capacity to supply power to small communities in remote areas. The turbine for small power units in the range from 1 to 100 kW is not of the conventional type and requires special design. To attain high cycle efficiency (Rankine cycle) for power systems of small capacity, the enthalpy drop should be as high as possible whereas the mass flow rate is small. This leads to problems such as partial admission, multistaging, high rotative speeds, etc. The present study indicates that the most suitable choice of turbine is a multistage radial Ljungstrom-type turbine. (Author)

A80-38005 **A helioelectric farm.** O. J. M. Smith and P. S. Smith. In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1368-1407. 17 refs.

A multi-modular solar thermal electric plant based on conventional materials and engineering techniques is presented. In the proposed 100-MW system, the electrical generator is driven by a conventional steam turbine utilizing heat derived from 600 concentrating collector modules covering a total of 5.5 sq km in a solar farm. A sophisticated computer design program is used for the optimization of mirror dimensions, and spacing, module dimensions, tower height and receptor dimensions for cost reduction, and the mirrors are computer controlled to track the sun. The 300,000 small mirrors and 600 short towers permit mass production techniques which significantly reduce production costs, which are estimated at $175,000,000 for a 100-MW plant. Half of the construction costs are direct labor wages, which would have a desirable impact on local economy, while environmental effects are minimal. A.L.W.

A80-38006 **A central receiver solar power system for remote locations.** R. J. Holl (McDonnell Douglas Astronautics Co., Huntington Beach, Calif.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1408-1425. 11 refs.

A solar power plant was designed to supply electrical and/or thermal power for remote locations isolated from a utility grid. Applications include domestic, agricultural, and light industrial use.

Means of achieving attractive economics are identified. Simplicity in system design and maximum use of commercial equipment are stressed. A small central receiver is used for solar energy collection, and steam is utilized as the working fluid. Modular thermal storage matches various applications without changing the system balance. S.D.

A80-38007 **Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants.** N. S. Abdelhafiez (Alexandria, University, Alexandria, Egypt) and M. A. Abdelsalam (Helwan University, Cairo, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1426-1442. 37 refs.

The present paper suggests a generalized equation which gives the heat flux of the pool boiling of refrigerants from horizontal surfaces at the normal earth gravity. The suggested relationship was obtained by using the dimension analysis theory and regression analysis. A large volume of experimental data, up to 600 points collected from 12 different researches with P/Per in the range of 0.003-0.78 was used in the analysis with the aid of a digital computer. Verification of the obtained equation shows that the absolute average deviation of the Nusselt number calculated by it, from that obtained by experimentation, does not exceed 10%. (Author)

A80-38008 **The use of solar furnaces in materials research.** D. Suresh (Indian Institute of Science, Bangalore, India) and P. K. Rohatgi (Council of Scientific and Industrial Research, Trivandrum, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 3. New York, Pergamon Press, Inc., 1980, p. 1443-1473. 54 refs. Research supported by the Tata Energy Research Institute.

Solar furnaces are promising tools for studying ultrahigh temperature properties of materials. In this paper, the applications of solar furnaces in the field of materials research are reviewed in detail and some of their industrial applications are briefly projected. Research on crystal growth, high temperature phase diagrams of oxide systems, ignition of materials, purification and stabilization of refractories is being conducted, utilizing the very high temperatures attainable in solar furnaces, without any contamination. Specific future opportunities for research in these areas have been identified. Some of the future prospects of solar furnaces could be the study on freezing of superheated alloys, zone-refining of large quantities of materials, growing new single crystals for semiconductor and laser applications, vacuum welding and materials research in outer space. (Author)

A80-38009 **Street lighting by sunlight.** J. G. Sakas. In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1723-1741.

The feasibility of street lighting by sunlight reflected or diffused satellites in orbit around the earth is examined. The following systems are considered: a large oriented mirror rotating with a constant velocity on a circular orbit around the earth, plane mirrors of random orientation, spheres and objects of similar shape, cubic mirrors, and light diffusing satellites. The construction of a large oriented mirror of sufficient illumination capacity is shown to be impossible. All other systems, while technically possible, are found to be uneconomical, unless the reflected sunlight also used for purposes other than street lighting, e.g. for ice melting or in agriculture. V.L.

A80-38010 **The first solar energy system in West-Germany for industrial utilization.** I. Hoffmann (Consulting Office for Solar Technology, Vechta, West Germany). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1742-1747.

About 3000 to 4000 liters of water are consumed daily in the steam pressing facilities of the coat factory. This water is prewarmed up to 333 K by means of a solar energy system. For this purpose a thermal heat storage of 1300 l is used. In the summer a factory swimming pool is also heated; in this case a heat storage of 14,000 l is used. The solar energy system has a collector surface area of 85 square meters facing south and inclined at 45 deg. Switching for both applications is arranged so that they can be operated either simultaneously or separately. (Author)

A80-38011 **A simple water pump, powered by solar energy.** K. Speidel (Dornier System GmbH, Friedrichshafen, West Germany). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1748-1761. Research sponsored by the Bundesministerium für Forschung und Technologie.

A project is being implemented whose objective is to design a simple solar water pump system which could meet the drinking water requirements in small village communities, far from other sources of energy. The basic specifications of the system are: pump energy output at about 1 kW, delivery head of 20-50 m, self-priming every day with sufficient solar radiation, and maintenance interval of one year; the system should be easy to construct and repair. Because of the requirement of a simple design, flat plate solar collectors will be used. Several drive system designs are considered, and it is shown that only expansion machines can meet the desired specifications. A double-acting cylinder machine has been designed and is being constructed. To improve the total efficiency, a new direct evaporator will be used. V.L.

A80-38013 **Comfortable heating and cooling by solar reflectors and wind.** S. A. Husain (Aligarh Muslim University, Aligarh, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1850-1861. 7 refs.

A solar and wind energy system is proposed which would meet the home heating, cooling, lighting, hot water, and cooking requirements in tropical countries. Direct and diffused solar radiation together with radiation reflected from frame-mounted reflectors is collected by a flat-plate collector mounted on the room window. The collector carries water tubes for heating and three generators connected to the ammonia absorption unit for cooling the room. At night, room insulation helps to retain to a certain extent the heat or cold of the day. The reflectors can be used partly for heating and cooling, and partly for cooking food from 8 A.M. to 4 P.M. Wind energy is used for energizing ceiling fans and to power a generator which would supply heating, cooking, and lighting power needs. An immersion heater will be used for warming water. V.L.

A80-38014 **Combination of wind and solar energies at the Northern Coast of Egypt.** I. A. Sakr (National Research Centre, Solar Energy Laboratory, Cairo, Egypt), M. S. Abdel Hafiez (Alexandria, University, Alexandria, Egypt), and A. S. Hegazy (Minufiya University, Shibin el Kom, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1862-1890. 7 refs.

Various combinations of wind and solar units are analyzed in order to determine the effect of such combinations on the storage system capacity and performance. The analysis is made for the site of Mersa Matruh on the Northern Coast of Egypt. Wind and solar energy may be combined either in a direct arrangement, whereby all energy produced by wind and solar units is first accumulated in a storage unit, or in a bypassing arrangement, in which only the power produced in excess of the load demand is accumulated in the storage unit. It is shown that the storage losses are greater in the direct arrangement. A method is proposed to select the optimum solar fraction at which the storage capacity is minimum; this fraction is found to be 0.68 for a wind machine combined with a focusing collector, and 0.70 for a wind machine combined with a flat plate collector. V.L.

A80-38015 **Solar energy - UNIDO programme of action for developing countries.** S. Rao (United Nations, Industrial Development Organization, Vienna, Austria). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1901-1910.

UNIDO activities with regard to the promotion, development, and utilization of solar energy in developing countries include: feasibility studies, strengthening of existing solar energy research and development institutions or establishment of new ones, establishment of prototype pilot manufacturing units and industrial liaison, manufacturing and investment promotion, training, and information dissemination. In this program UNIDO will rely on cooperation among the developing countries in the fields of training, research, and development, as well as on technology transfer from industrialized countries: information and expertise exchange, joint research and development programs, manufacturing promotion, and training programs. V.L.

A80-38019 **Economic considerations of solar energy.** J. D. Parker (Oklahoma State University, Stillwater, Okla.) and J. A. Tipton (U.S. Department of Energy, Bartlesville Energy Research Center, Bartlesville, Okla.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2021-2043.

The performance and economics of several solar systems are discussed, including a solar home, an asphalt heater, and a water heater for a research building. Summary of economic data is also presented for the world's largest solar water heating system for an industrial laundry in California, and the world's largest solar installation on a secondary school in Arizona. In the latter system, 343 collectors give a receiver area of about 20,000 sq ft and heat 280 gallons of water per minute for space heating, cooking, and domestic hot water. It has a 50,000 gallon underground storage tank and can handle 80% of the school's peak load. The system cost $769,000 and is expected to save $1 million over the 20 year life of the system. V.L.

A80-38020 **The comparative economics of passive and active systems.** F. Roach, S. Noll, and S. Ben-David (California, University, Los Alamos, N. Mex.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2044-2083. 13 refs. Research supported by the U.S. Department of Energy.

Design criteria, solar performance characteristics, and incremental solar cost are examined for one passive design, the thermal mass storage wall, and compared to those of one active design, the air collector/rock storage. It is shown that the potential use of passive solar system in residential space heating applications is enhanced by incentives against all fuel types. This enhancement is especially evident in the natural gas and heating oil comparisons. The passive design is economically competitive against the electric resistance alternative in all but a few states, and is feasible today on a life cycle cost basis. Employment of the low interest loan incentive option gives rise to higher solar fractions than under the proposed NEA income tax credit option. V.L.

A80-38021 **An economic analysis of solar energy alternatives.** D. A. Huettner, B. J. Taylor, C. A. Ingene, and J. F. Horrell (Oklahoma, University, Norman, Okla.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2084-2105. 5 refs.

The economic feasibility of several central station solar electric systems is analyzed with comparison to four traditional power generating options (nuclear, oil, gas, and coal). Mass production, optimal scale of production, and compliance with environmental laws are used for costing each of the solar and non-solar options, with consideration of energy storage and electrical distribution costs. The analysis is made for a specific site - Hobbs, New Mexico. It is shown that the best solar option should become competitive with nuclear and imported oil options under a reasonable range of assumptions, but are not generally competitive with low sulfur coal, except under the scenario of escalating fuel costs. If non-quantifiable costs (cost of pollution, mortality) are considered, central station solar electric power may be preferred to low sulfur coal on an overall basis toward the end of the century even without major technological breakthroughs. V.L.

A80-38022 **Impact of solar heating and cooling of buildings on electric utilities.** A. S. Debs (Georgia Institute of Technology, Atlanta, Ga.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2106-2125. 22 refs.

The effect of widespread utilization of solar heating and cooling of buildings on the planning cost and production of electric power systems is discussed with special reference to the techniques for reducing peaks of electrical demand by adequately designed solar systems. After considering utility production costs, their relation to electric load profiles, electric generation planning, and load management, several basic solar systems with electrical backup are analyzed and a two-level optimization problem is formulated involving the utility and its customers. It is shown that by means of modified designs and peak-sharing control systems, solar systems for heating and cooling can contribute positively to reductions in the cost of electric energy production. V.L.

A80-38023 * **Evaluation of solar thermal power plants using economic and performance simulations.** N. El-Gabawali (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2138-2161. 5 refs. Contract No. NAS7-100.

An energy cost analysis is presented for central receiver power plants with thermal storage and point focusing power plants with electrical storage. The present approach is based on optimizing the size of the plant to give the minimum energy cost (in mills/kWe hr) of an annual plant energy production. The optimization is done by considering the trade-off between the collector field size and the storage capacity for a given engine size. The energy cost is determined by the plant cost and performance. The performance is estimated by simulating the behavior of the plant under typical weather conditions. Plant capital and operational costs are estimated based on the size and performance of different components. This methodology is translated into computer programs for automatic and consistent evaluation. V.L.

A80-38024 **The American experience with solar energy in centralized electricity generation - Technology and economics.** D. L. Hurwood (Energy Economics and Alternatives, New York, N.Y.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2162-2188. 27 refs.

The technological and economical feasibility of solar power for central-station generation is examined within the framework of existing fuel power technologies. Consideration is given to the fuel trends expected through 1986, cost of conventional fuels, impediments to early utilization of solar energy, prospects for growing decentralization of electricity generation, utility response to growing public and industry interest in solar power, advances in solar electric technologies, and a balanced program for electricity generation in the

United States. It is shown that solar technologies may play a part in a balanced electric energy 'mix' based on nuclear power, renewable sources (hydro, solar, and wind), and the orderly exploitation of existing and still-to-be discovered fossil-fuel deposits. V.L.

A80-38025 **Solar energy - Will it conserve our nonrenewable resources.** S. Baron (Burns and Roe, Inc., Oradell, N.J.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2210-2229. 22 refs.

Solar energy applications, including heating, thermal electric, and photovoltaic, are examined in terms of consumed energy-intensive materials in order to determine their economic expediency. These applications will be justified economically if the energy consumed for fabrication, construction, and operation of solar power plants is less than the energy recovered by the plants over their operating life. It is shown that solar thermal electric plants in the Southwest United States will pay back their energy requirements in less than five years, which is not the case in other U.S. areas. Photovoltaic plants are highly energy-intensive, and an assessment shows that in operating such a plant for 30 years, the energy payback would be close to 20 years. The solar energy development program must concentrate on designs and technological developments that utilize less energy consuming materials in order to be competitive with present energy alternatives. V.L.

A80-38026 **Accelerated commercialization of solar energy - A new priority for international action.** L. Rishell and N. D. Jorstad (Rishell International, Inc., Potomac, Md.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 2251-2269. 13 refs.

International activities in the field of solar energy commercialization, involving the United States, are reviewed. Synergistic and reinforcing effects of combining the purchasing power of cost-effective markets in several countries could be most favorable for the economics of solar energy systems. A plan is formulated in which international solar markets can be aggregated for mutual benefit by establishing an Organization of Solar Energy Countries (OSEC) which would concentrate on the current and proposed solar energy initiatives, both national and international. V.L.

A80-38274 **Three-dimensional numerical evaluation of heat loss through natural convection in a solar boiler.** P. Le Quere and T. Alziary de Roquefort (Poitiers, Université, Poitiers, France). In: Conference on Numerical Methods in Fluid Mechanics, 3rd, Cologne, West Germany, October 10-12, 1979, Proceedings. Braunschweig, Friedr. Vieweg und Sohn Verlagsgesellschaft mbH, 1980, p. 241-250. 6 refs.

An implicit finite difference method is presented for the integration of compressible Navier Stokes equations. The scheme involves a generalized linearization process and the Douglas-Gunn ADI technique. The variables are defined on a variable mesh staggered grid and the spatial differencing satisfies some integral conservation properties for mass, momentum and energy. Stability is demonstrated for time steps much larger than the CFL limit. The method is applied to the computation of free convection flows in two and three dimensions with high values of the Grashoff number. (Author)

A80-38282 **Detailed balance limit of the efficiency of tandem solar cells.** A. De Vos (Gent, Rijksuniversiteit, Ghent, Belgium). *Journal of Physics D - Applied Physics*, vol. 13, May 14, 1980, p. 839-846. 10 refs.

The fundamental (detailed balance) limit of the performance of a tandem structure is presented. The model takes into account the fact that a particular cell is not only illuminated by part of the solar irradiance but also by the electroluminescence of other cells of the set. Whereas under 1 sun irradiance a single solar cell only converts 30% of the solar energy, a tandem structure of two cells can convert 42%, a tandem structure of three cells can convert 49%, etc. Under the highest possible light concentration, these efficiencies are 40% (one cell), 55% (two cells), 63% (three cells), etc. The model also allows one to predict the ideal efficiency of a stack with an infinite number of solar cells. Such a tandem system can convert 68% of the unconcentrated sunlight, and 86% of the concentrated sunlight. (Author)

A80-38305 **Wangen EVS-solarhouse with a positive balance sheet (EVS-Sonnenhaus Wangen mit positiver Bilanz).** *Energiewirtschaftliche Tagesfragen*, vol. 30, May 1980, p. 347-349. In German.

The results achieved with a solar house after one year of operation are reviewed. It is stressed that conventional solar collectors are not sufficient for heating the test house. Further, improvements are also needed for the task of hot water heating. Other disadvantages of solar collectors and of heatpumps working only with ambient air are discussed. It is demonstrated that a heat pump system using solar absorbers and a heat storage tank of damp the weekly to annual average values with the RMSE decreasing from 5 down to 2, respectively. A sensitivity study of these four improvements indicated that the first three were the most significant. (Author)

A80-39055 **I-V and C-V characteristics of Au/TiO2 Schottky diodes.** N. Szydlo and R. Poirier (Thomson-CSF, Laboratoire Central de Recherches, Orsay, Essonne, France). *Journal of Applied Physics*, vol. 51, June 1980, p. 3310-3312. 14 refs. Délégation Générale à la Recherche Scientifique et Technique Contract No. 77-7-1203.

A80-39061 **Single-crystal solar cell heterojunctions involving N-cadmium sulfide.** M. Arienzo and J. J. Loferski (Brown University, Providence, R.I.). *Journal of Applied Physics*, vol. 51, June 1980, p. 3393-3403. 24 refs. NSF-sponsored research.

A chemical vapor deposition method capable of depositing high-quality epitaxial layers of CdS on single-crystal substrates was used for the fabrication of heterojunction photovoltaic devices of the type n-CdS/p-InP, n-CdS/p-CdTe, n-CdS/p-GaAs and n-CdS/p-Ge. An analysis of the photovoltaic responses shows that all the devices have good collection efficiency, i.e. that at zero bias, photogenerated carriers crossing the junction do not suffer appreciable recombination at interface states. The solar energy conversion efficiency is, however, strongly influenced by the interface states through the open circuit voltage and the fill factor; analysis of the dark current-voltage characteristics shows the existence of a low temperature low-bias voltage tunneling current in all of the devices. A.T.

A80-39288 **The sunship - The case for a solar powered airship.** G. A. Khoury (Imperial College of Science and Technology, London, England). In: Economics and technology of airships; International Symposium, Paris, France, March 28-30, 1979, Proceedings. Volume 1. Paris, Association d'Etude et de Recherche sur les Aéronefs Allégés, 1979, p. 147-156.

The solar-powered airship is examined with reference to overall design, solar cell arrays, solar power speed, the weight problem, costs, and areas of application. It is noted that a sunship has, in addition to the known merits of an ordinary airship, the advantage of constant weight and an evenly distributed fuel system. It does not require refueling facilities and is even safer than an ordinary airship in that it does not carry inflammable fuel. Its operations, however, will be limited to the sunny regions of the world, where it can only sustain an average of nine hours flight a day unless satisfactory electrical storage units are installed or an auxiliary fuel system is used to support extended daily flights. B.J.

A80-39785 # **Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator (Opredelenie nestatsionarnykh teplovykh potokov v fokal'noi ploskosti kontsentratora energii izlucheniia).** P. G. Krukovskii and K. B. Isaev. *Promyshlennaia Teplotekhnika,* vol. 2, May-June 1980, p. 3-6. In Russian.

A two-dimensional nonlinear inverse heat conduction problem is examined, which consists of determining, on the basis of given temperature measurements, the law of heat flux variation at the face of a cylindrical titanium specimen during the process of radiative heat transfer in the focal plane of a solar radiant-energy concentrator. A numerical solution is obtained, using an explicit finite-difference scheme to approximate the differential equation of the heat-transfer model. The obtained expressions for calculating the temperature field and the thermal fluxes are discussed. V.P.

A80-39937 **Properties of low cost, high volume glasses.** M. A. Lind, J. S. Hartman, and C. Q. Buckwalter (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Physical properties of optical materials; Proceedings of the Seminar, San Diego, Calif., August 27, 28, 1979. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1980, p. 111-117. Contract No. EY-76-C-06-1830.

The properties of new and weathered samples of low cost, high volume glasses have been studied to determine their usefulness for solar energy applications. Glasses of varying compositions produced by float, drawn, rolled, fusion, and twin ground techniques were examined. Spectral transmittance and reflectance were measured and solar weighted values calculated. Laser raytrace techniques were used to evaluate surface parallelism and bulk homogeneity. Compositional changes were examined with scanning electron microscopy, X-ray fluorescence, and Auger electron spectroscopy. These techniques were used in conjunction with ellipsometry to study the surface effects associated with weathering. (Author)

A80-40252 * **Ion-implanted laser annealed silicon solar cells.** J. S. Katzeff (Lockheed Missiles and Space Co., Inc., Sunnyvale, Calif.). In: Laser applications in materials processing; Proceedings of the Seminar, San Diego, Calif., August 27-28, 1979.

Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1980, p. 42-48. Research sponsored by the U.S. Department of Energy and NASA.

Development of low cost solar cells fabrication technology is being sponsored by NASA JPL as part of the Low Cost Solar Array Project (LSA). In conformance to Project requirements ion implantation and laser annealing were evaluated as junction formation techniques offering low cost-high throughput potential. Properties of cells fabricated utilizing this technology were analyzed by electrical, transmission electron microscopy, Rutherford backscattering and secondary ion mass spectrometry techniques. Tests indicated the laser annealed substrates to be damage free and electrically active. Similar analysis of ion implanted furnace annealed substrates revealed the presence of residual defects in the form of dislocation lines and loops with substantial impurity redistribution evident for some anneal temperature/time regimes. Fabricated laser annealed cells exhibited improved spectral response and conversion efficiency in comparison to furnace annealed cells. An economic projection for LSA indicates a potential for considerable savings from laser annealing technology. (Author)

A80-40334 **Application of reliability, maintainability, and availability engineering to solar heating and cooling systems.** P. S. Chopra and R. M. Wolosewicz (Argonne National Laboratory, Argonne, Ill.). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 248-253. 12 refs. Research supported by the U.S. Department of Energy.

This paper compares the reliability of solar hot-water and heating systems with that of conventional systems using block diagrams, failure modes and effects analysis, and fault trees. Although stand-alone solar-energy systems are not as reliable as conventional systems, the RMA of the combined solar and conventional system can be made comparable to currently available heating and hot-water systems. An availability matrix is presented that can be used to develop maintenance schedules that do not decrease the system's availability. Field data presented on operating solar heating and cooling systems indicate that these systems experience four major generic problems: freezing, leakage, controls, and collectors. (Author)

A80-40473 **Class of axisymmetric mirrors with uniform flux concentration properties along their axes.** U. H. Kurzweg (Florida, University, Gainesville, Fla.). *Optical Society of America, Journal,* vol. 70, June 1980, p. 750-752. 5 refs.

The shape of axisymmetric mirrors capable of producing a constant concentrated flux density along a coaxial cylindrical surface is determined via both a series solution and a phase plane analysis of the governing second-order nonlinear differential equation. It is shown that there exists a class of such concentrators and that they all have a characteristic bell shape with two finite principal radii of curvature. Mirrors of this type may find application in processes requiring concentrated uniform illumination over extended areas such as in photovoltaic energy conversion. (Author)

A80-40474 **Required minimum value of barrier height in minority-carrier M.I.S. solar cells.** O. M. Nielsen (Danmarks Tekniske Hojskole, Lyngby, Denmark). *IEE Proceedings, Part I - Solid-State and Electron Devices,* vol. 127, pt. I, no. 3, June 1980, p. 105-108. 9 refs.

The saturation currents of minority-and majority-carrier MIS solar cells have been compared to find the value of the barrier height where the dominating saturation current changes from a majority-carrier current to a minority-carrier current. For an interfacial oxide layer of 20A the value of the barrier height has been calculated to be in the range 750-800 mV, whereas for an oxide layer of 10A, the barrier height is found to be about 900-950mV. (Author)

A80-40538 **The effect of a black chrome selective surface on the thermal performance of a solar collector.** J. A. Manrique and R. Suarez (Monterrey, Instituto Tecnológico y de Estudios Superiores, Monterrey, Mexico). *Letters in Heat and Mass Transfer,* vol. 7, Jan.-Feb. 1980, p. 25-31. 5 refs. Research supported by the United Nations Developing Program and UNESCO.

The radiation properties of a black chrome selective surface are presented in this work. Similarly, a comparison between the thermal performance of a flat plate solar collector with and without selective surface on the absorber is described. (Author)

A80-40709 **Attenuation of solar energy by high, thin clouds.** V. E. Derr (NOAA, Wave Propagation Laboratory, Boulder, Colo.). *Atmospheric Environment,* vol. 14, no. 6, 1980, p. 719-729. 22 refs.

The paper discusses the attenuation of solar energy by high, thin clouds. The estimates of the effect of clouds on solar energy rarely include high ice curriform clouds because of the difficulty of direct, human detection. Lidar studies and aircraft observations show that cirrus is frequently present; the attenuation of solar energy by curriform clouds is calculated, and the data used in combination with cirrus frequency results to estimate average effects of cirrus on solar energy devices. The marginal cost effectiveness of large solar installations requires that the effects of cirrus be considered in design. A.T.

A80-40712 **Review of amorphous and polycrystalline thin film silicon solar cell performance parameters.** H. K. Charles, Jr. and A. P. Ariotedjo (PRC Energy Analysis Co., McLean, Va.). *Solar*

Energy, vol. 24, no. 4, 1980, p. 329-339. 40 refs. Contract No. EG-77-C-01-4024.

The paper presents a state-of-the-art technology review for amorphous and polycrystalline thin film silicon solar cells. It details the performance parameters for the diversity of cell types and structures (e.g., p-n junctions, p-i-n and MIS structures, Schottky barriers, and heterojunctions) fabricated with amorphous and polycrystalline silicon film materials. Trends in performance improvement and fabrication techniques are outlined. V.T.

A80-40714 * **New technologies for solar energy silicon - Cost analysis of BCL process.** C. L. Yaws, K.-Y. Li (Lamar University, Beaumont, Tex.), C. S. Fang (Southwestern Louisiana, University, Lafayette, La.), R. Lutwack, G. Hsu, and H. Leven (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.). *Solar Energy*, vol. 24, no. 4, 1980, p. 359-365. 46 refs. Research sponsored by the U.S. Department of Energy.

New technologies for producing polysilicon are being developed to provide lower cost material for solar cells which convert sunlight into electricity. This article presents results for the BCL Process, which produces the solar-cell silicon by reduction of silicon tetrachloride with zinc vapor. Cost, sensitivity, and profitability analysis results are presented based on a preliminary process design of a plant to produce 1000 metric tons/year of silicon by the BCL Process. Profitability analysis indicates a sales price of $12.1-19.4 per kg of silicon (1980 dollars) at a 0-25 per cent DCF rate of return on investment after taxes. These results indicate good potential for meeting the goal of providing lower cost material for silicon solar cells. (Author)

A80-40717 **Measurement of wind speed distributions across a solar collector.** M. V. Oliphant (South Australia, Flinders University, Bedford Park, Australia). *Solar Energy*, vol. 24, no. 4, 1980, p. 403-405.

A80-40718 **Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors.** J. G. Symons (Commonwealth Scientific and Industrial Research Organization, Div. of Mechanical Engineering, Highett, Victoria, Australia) and R. Gani (Monash University, Clayton, Victoria, Australia). *Solar Energy*, vol. 24, no. 4, 1980, p. 407-410. 10 refs.

The long-term thermal performances of high-temperature flat-plate solar collectors are compared for typical process heating loads in significantly different climates. Consideration is given to the collectors which are double and triple glazed and to those with a single cover and convention suppression device. V.T.

A80-40721 **Solar elevation angle probability distribution.** D. C. Larson and C. R. Acquista (Drexel University, Philadelphia, Pa.). *Solar Energy*, vol. 24, no. 4, 1980, p. 417-420. 5 refs. Research supported by the U.S. Department of Energy.

The probability distribution of solar elevation angles is determined, and the importance of this distribution on concentrator design is discussed. It is concluded that the time probability function for the solar elevation angle is important when considering alternative low-concentration systems for year-round or seasonal applications. V.T.

A80-40937 **Temperature distributions in the flat-plate collector under actual unsteady insolation.** M. F. El-Refaie and M. A. Hashish (Cairo University, Giza, Egypt). *Applied Mathematical Modelling*, vol. 4, June 1980, p. 181-186. 7 refs.

The dynamic behavior of the flat-plate solar energy collector is analyzed taking into account the continuous variation of the received radiant flux. Closed-form mathematical formulas are derived for the fluid and absorber-plate temperatures as functions of both the time and the position along the collector. Different mathematical forms are given for the diurnal heating and the nocturnal cooling periods. The temperature expressions are presented in dimensionless form in terms of a limited number of dimensionless groups. Samples of the results obtained by using the derived formulas are displayed graphically. (Author)

A80-41324 **Solar energy economics - Orbiting reflectors for world energy.** K. W. Billman, W. P. Gilbreath, and S. W. Bowen. In: How big and still beautiful. Macro-engineering revisited. Boulder, Colo., Westview Press, Inc. (AAAS Selected Symposia Series, No. 40), 1980, p. 293-342. 19 refs.

The paper outlines a recent study made on a space-terrestrial solar energy system (SOLARES) consisting of a set of orbiting mirrors that provide nearly continuous reflected sunlight to a world-distributed set of solar conversion sites. This solar concept is examined under the four criteria which any candidate energy system must satisfy: (1) technical feasibility, (2) significant and renewable energy impact, (3) economic feasibility, and (4) social/political acceptability. V.T.

A80-41470 # **Design of a heat pipe absorber for a concentrating solar water heater.** K. T. Feldman, Jr. (New Mexico, University; Energy Engineering, Inc., Albuquerque, N. Mex.) and D. L. Noreen (Solar Energy Research Institute, Golden, Colo.). *American Institute of Aeronautics and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1506*. 9 p. 16 refs. Research supported by the New Mexico Department of Energy and Minerals.

The heat pipes used in the absorber of a solar water heater with a concentrating collector were analyzed. The absorber was made of one or more gravity-assisted heat pipes. The heat pipe analysis included the effects of counterflow liquid-vapor shear and nucleate boiling. It was found that 2.09 to 2.66 cm inside diameter (3/4 to 1 inch nominal pipe) heat pipes operated horizontally or at small tilt angles could provide the required axial heat transport rate over the reasonably long distances encountered in concentrating solar collectors. A heat pipe solar collector can be highly cost-effective. December performance of 46% thermal efficiency with 61 deg C (142 deg F) end-of-day water temperature in a 208 kg (55 gal) tank was predicted for a 4 m long non-tracking collector with a 4 sq m area. Experimental results agree closely with the analysis predictions. (Author)

A80-41471 # **Heat pipe receiver for a 20 MWe solar tower.** H. Kreeb and K. Schaber (Dornier System GmbH, Friedrichshafen, West Germany). *American Institute of Aeronautics and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1507*. 7 p.

Since October 1978 a German industrial group is working on the plant design and the development of a 20 MWe gas cooled central receiver solar power plant. During the phase of preliminary design, which is now finished, various configurations for each of the main components of the power plant have been investigated and a conception for further work is defined. The objective point of this project will be the erection of a pilot plant in a partner country, to be designated, and the commencement of operation in 5 years. The design of the central heat pipe receiver, using air up to 800 C as coolant, is described in detail. (Author)

A80-41502 # **Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling.** C. S. P. Peng and J. R. Howell (Texas, University, Austin, Tex.). *American Institute of Aeronautics and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1546*. 11 p. 23 refs.

A80-41948 **Plastic solar collectors for 'low energy' applications.** A. Addeo, G. Campanile, L. Nicolais, and G. Romeo (Montedison - DIRS, Naples Research Centre, Naples, Italy). *Applied Energy*, vol. 6, July 1980, p. 265-274. Research supported by the Consiglio Nazionale delle Ricerche.

The possibility of constructing, with plastic materials, solar collectors for 'low temperature' (less than 60 C) applications is investigated. Several prototypes are analyzed for their performance and efficiency. The results indicate a strong possibility of large-scale use of these solar collectors for many applications. (Author)

02 SOLAR ENERGY

A80-41950 **Concentration characteristics of composite parabolic concentrators.** R. N. Singh, S. S. Mathur, and T. C. Kandpal (Indian Institute of Technology, New Delhi, India). *Applied Energy*, vol. 6, July 1980, p. 315-321. 5 refs.

The effects of the widths of individual strip mirrors in a composite cylindrical parabolic solar concentrator on the concentration ratio are investigated. Calculations of the geometrical concentration ratios for a circular cylindrical receiver and a flat plate receiver are presented as a function of rim angle, and the effects of strip widths are illustrated for rim angles of 60 and 45 deg for the circular cylindrical and flat plate receivers, respectively. It is pointed out that the concentration decreases sharply at first with increasing strip width, attaining a more or less constant value at widths greater than approximately 10 cm. A.L.W.

A80-41951 **Thermal insulation of a low capital cost solar-energy collector.** B. Norton and S. D. Probert (Cranfield Institute of Technology, Cranfield, Beds., England). *Applied Energy*, vol. 6, July 1980, p. 323-327. 5 refs. Research supported by the Science Research Council.

To achieve least steady-state heat losses across the atmospheric pressure air in a concentric horizontal cavity between a heated inner cylinder and a naturally cooled surrounding cylinder, the radial supports along the length of the cavity should be at approximately 60 deg from the vertically downwards position. This design recommendation has been incorporated in a simple prototype solar energy collector. (Author)

A80-42101 **Current from the sun - A look at the economics of solar cells.** J. J. Loferski (Brown University, Providence, R.I.). *The Sciences*, vol. 20, July-Aug. 1980, p. 6-9, 29.

The use and cost efficiency of photovoltaic solar cells in space and terrestrially is surveyed. Attention is given to systems in which lenses or mirrors are used to concentrate sunlight, and to flat plate collector systems which do not employ concentration. Lowering costs of silicon cells is considered along with the substitution of polycrystalline or amorphous semiconductor thin films for the single crystal silicon wafers. Also discussed is the use of high efficiency cells such as in tandem solar cell systems. J.P.B.

A80-42135 **Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities.** V. K. Tewary (Birla Institute of Technology and Science, Pilani, India), L. S. Kothari (Delhi, University, Delhi, India), and S. C. Jain (Solid State Physics Laboratory, Delhi, India). *Applied Physics Letters*, vol. 37, July 1, 1980, p. 58, 59.

A80-42140 **Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells.** A. P. Genis, P. A. Smith, K. Emery, R. Singh, and J. B. DuBow (Colorado State University, Fort Collins, Colo.). *Applied Physics Letters*, vol. 37, July 1, 1980, p. 77-79. 8 refs. Research supported by the Solar Energy Research Institute.

The fabrication of high efficiency (10.94%,AMI) and large area (11.46 sq cm) indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells using neutralized-ion-beam sputtering is discussed. It was shown that the proper surface preparation and the incorporation of hydrogen during milling and oxidation of the substrate are important fabrication steps. The photovoltaic conversion parameters were the open circuit voltage of 0.526 V, the short-circuit density of 27.39 mA/sq cm, and the FF of 0.759. A.T.

A80-42161 # **The prospects for solar-powered closed-cycle gas turbines.** S. C. Kuo, T. L. O. Horton, and H. T. Shu (United Technologies Research Center, East Hartford, Conn.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-26*. 9 p. 14 refs. Members, $1.50; nonmembers, $3.00.

This paper presents the results of a systems study to evaluate the technological and economic feasibility of utilizing closed-cycle gas turbines integrated with an advanced-design central receiver for solar power generation. Applicable turbomachinery technologies were reviewed to estimate their future advances expected. System design-point performance, component size, and cost characteristics of closed-cycle air turbines were estimated, and system operational and control characteristics, including off-design and part-load performance characteristics, are discussed. Critical system components were reviewed to estimate the appropriate testing and development time and cost schedules required. (Author)

A80-42167 # **Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation.** Z. P. Tilliette and B. Pierre (Commissariat à l'Energie Atomique, Division d'Etude et de Développement des Réacteurs, Gif-sur-Yvette, Essonne, France). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-34*. 7 p. 8 refs. Members, $1.50; nonmembers, $3.00.

Gas turbine systems are investigated for solar energy conversion because they can offer satisfactory performances, particularly in case of combined cycles, and interesting solutions for plant operation. Hybrid concepts, associating solar heating with fossil firing, reduce the need for energy storage. Key problems are: matching of combined gas and steam cycles for performance enhancement, coupling of solar heating with fossil firing, use of as much solar energy as possible and priority use of solar energy at medium temperature (200/650 C), because, within this temperature range, technology is more readily available for the solar receiver system (central receiver, fixed mirror concentrators, parabolic dish collectors) and for the primary circuit (Gilotherm, Dowtherm, sodium, molten salts). (Author)

A80-42244 # **The design of a solar receiver for a 25-kWe gas turbine engine.** M. Greeven, M. Coombs, and J. Eastwood (AiResearch Manufacturing Company of California, Torrance, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-131*. 5 p. Members, $1.50; nonmembers, $3.00.

This paper describes a solar receiver designed to be used with a single-point-focus, parabolic concentrator. The receiver accepts the concentrated solar radiation and uses it to heat the working gas of a small, open-cycle gas turbine to about 1500 F (815 C). The receiver employs a high-efficiency, metallic plate-fin heat transfer surface to effect this energy transfer. The thermal and mechanical design features of the receiver are discussed. (Author)

A80-42435 **Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures.** Course supported by the University of Waterloo, U.S. Department of Energy, and International Centre for Theoretical Physics. Edited by A. E. Dixon and J. D. Leslie (Waterloo, University, Waterloo, Ontario, Canada). Toronto and New York, Pergamon Press, 1979. 1324 p. $60.

The course concentrated on solar radiation and collectors, selective surfaces, heating and cooling of buildings, architecture and planning, direct conversion, control and measurement, bioconversion, and biomass. Papers were presented on basics of solar energy, technology of flat plate collectors, concentrating collectors, spectrally selective surfaces, solar energy air systems, cooling of buildings, solar architecture, hybrid energy optimization, polycrystalline solar cells, MIS and SIS solar cells, sensors, microprocessors, bioconversion of solar energy, solar powered refrigeration, and wind power. A.T.

A80-42436 **Basics of solar energy.** A. A. M. Sayigh (Riyadh, University, Riyadh, Saudi Arabia). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1-7.

Basic data related to solar energy are summarized, including mass, radius, average density, and average surface temperature of the sun, as well as definitions of the common terminology. Equations are given for the calculation of the solar declination and the length of the day. V.L.

A80-42437 Characteristics of solar radiation. A. A. M. Sayigh (Riyadh, University, Riyadh, Saudi Arabia). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 9-36. 14 refs.

The intensity and spectral and temporal characteristics of solar energy received at the earth's surface are discussed in relation to solar energy applications. Measurements of the solar constant and the extraterrestrial solar spectral energy distribution are presented, and the determination of total and spectral solar irradiance at ground level taking into account the variability of incident solar energy due to solar inclination, cloud cover and atmospheric attenuation is considered. The calculation of direct solar radiation incident on an inclined surface, diffuse and reflected solar radiation on inclined and horizontal surfaces and total or global radiation on an inclined surface is then examined, and the effects of turbidity and surface albedo on solar radiation intensity are indicated. Finally, various means for the estimation of total solar radiation are reviewed and a new formula is proposed. A.L.W.

A80-42438 Methods for the estimation of solar energy on vertical and inclined surfaces. J. K. Page (Sheffield, University, Sheffield, England). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 37-99. 23 refs. Science Research Council of England Grants No. B/RG/93199; No. GR/A/34788.

The paper presents two methods for the assessment of monthly mean solar radiation falling on vertical and inclined surfaces anywhere in the inhabited world. Both methods involve splitting the incident flux into three components: direct, sky diffuse, and ground reflected diffuse using mean monthly sunshine data as their starting point. The first method is simple and provides daily values of the irradiation on slopes; the second method involves more complex mathematical modelling and is dependent on the availability of digital computers, and it rapidly produces hourly values of the mean monthly irradiance on slopes which check with field observations. This model does not assume isotropic radiation from the sky. A.T.

A80-42439 The technology of flat plate collectors. A. A. M. Sayigh (Riyadh, University, Riyadh, Saudi Arabia). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 101-124. 23 refs.

The capabilities and limitations of flat plate collectors of solar energy for heating are discussed. The properties of commonly used insulation materials are presented, and it is shown how collector efficiency varies with the temperature gain of the collector per unit insolation for different kinds of covers. Attention is given to the optimum air gap between the absorber and the glass covers as well as to reducing losses due to convection by producing a vacuum in the collector spacing or by placing transparent honeycombs in the air gap. Also considered are the radiative interchange within the gap between the hot collector plate and the top transparent cover, and processes of heat transfer by convection. J.P.B.

A80-42440 Free convection in solar collectors. K. G. T. Hollands (Waterloo, University, Waterloo, Ontario, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 125-147. 7 refs.

Free convective heat transfer in solar collectors is discussed. The heat transfer coefficient in a stationary fluid is considered along with buoyancy and viscous forces, and both the horizontal and inclined air layers. Attention is also given to combined free convective and radiative coefficients across air layers. In addition, the practical problems of choosing the spacing between the individual covers and between the inner cover and the absorber plate in a flat plate solar collector are addressed. J.P.B.

A80-42441 Advanced non-concentrating solar collectors. K. G. T. Hollands (Waterloo, University, Waterloo, Ontario, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 149-166. 15 refs.

Three classifications of advanced flat plate collector designs are considered. In the reduced pressure solar collector, the pressure in the air layer between the absorbing surface and the transparent cover is reduced as well as the tendency for free convection, with virtually no effect on the thermal conductivity of the air until very low pressures are reached. In evacuated collectors reduction in the heat transfer across an air layer is achieved by obtaining such a high vacuum that the thermal conductivity of air is effected; difficulties with regard to the unbalanced pressure force acting on the glass cover and maintenance of the vacuum against leaks are addressed. In honeycomb collectors the inner set of covers are cut into lengths and placed perpendicular to the absorber plate with the result that reflections of solar radiation are not lost and absorption in the partitions can be avoided; attention is given to cell size and calculation of radiant exchange across a honeycomb. J.P.B.

A80-42442 Concentrating collectors. A. S. Roy. In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 185-252. 86 refs. Contract No. W-7405-eng-26.

A review of the state-of-art of solar concentrating collectors is presented. Moderately concentrating systems which are defined as those operating below the intensity ratios of three are discussed including evacuated tube absorbers, vee-troughs, and compound parabolic concentrators; strongly concentrating collectors are being developed which utilize reflecting, refracting, mirror, and Fresnel optical principles, and parabolic, spherical, and flat contours. Point-focusing parabolic dish collectors, a 2-G axis parabolic dish, fixed-mirror two-axis focusing concentrators, and fixed-reflector-rotating absorber types are described. Economic considerations are analyzed, presenting a simplified model which computes the cost of electricity and the system efficiency; finally, the optical losses are examined by the consideration of point focusing paraboloidal reflectors and absorber efficiency. A.T.

A80-42443 Spectrally selective surfaces in photothermal solar energy conversion. B. O. Seraphin (Arizona, University, Tucson, Ariz.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 287-329. 14 refs. Contracts No. EY-76-S-04-3709; No. ER-78-S-02-4899.

The paper examines photothermal conversion which directly converts solar into thermal energy. The principle is illustrated by depicting the energy flow in a conversion unit, and showing that the ideal converter should have an absorption profile that resembles a Fermi function. The spectral selectivity requirement depends on the flux concentration and the converter surface operating temperature; selective surfaces must have a proper spectral profile, and the properties of the surface must resist elevated temperatures. Methods of obtaining spectral selectivity including the single material approach, based on the spectral positions of the plasma edge in As-doped germanium and Ag, and the spectral selectivity of Mo-MoO3 thin films are discussed; the temperature dependence of optical properties is described by thermal emittances vs temperature of metals. Absorber-reflector tandems used because of inability of obtaining an ideal selective surface with a single material are examined, concluding with a discussion of interference coatings, such as the Al2O3-Mo-Al2O3 type. A.T.

A80-42444 **Solar air systems.** G. O. G. Lof (Colorado State University, Fort Collins, Colo.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 331-375. 14 refs.

The paper examines solar air systems and compares them with solar liquid systems. The solar air systems built since 1945 in houses including an overlapped glass plate heater are described, along with the design of a typical collector which includes a pebble bed heat storage unit, a thermostat, air handler, hot water preheat tank, an evaporative cooler, and an auxiliary furnace. Pebble bed heat storage performance is evaluated, noting that the heat at the highest temperature is available from the collector, and it can be stored and delivered later; also, during the winter months, one end of the chamber remains unheated so that the collector is nearly always at about 70 F. This increases the collector efficiency so that it can operate with poorer sunshine and for longer periods than if warmer fluid was circulated. It is concluded that the air system is superior for residential use due to high reliability and low maintenance, but liquid systems are more economical for commercial and industrial application because of larger air duct and pebble bed storage requirements. A.T.

A80-42445 **Solar energy for heating and cooling.** J. R. Williams (Georgia Institute of Technology, Atlanta, Ga.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 377-391.

Active and passive approaches to solar heating, hot water and cooling systems are reviewed. Consideration is given to passive solar heating systems, including direct gain systems, thermal storage walls, thermal storage roofs, attached greenhouses and convective loops, to active solar heating and cooling systems based on flat plate solar collectors using various absorber plate and cover plate materials, and to active solar domestic hot water systems. Solar heating and cooling systems developed for applications in Kuwait, at an elementary school in Georgia and in a large new multipurpose community center are indicated, and the cost advantages of active and passive systems in different areas of the world are discussed. It is pointed out, however, that in addition to cost, factors such as performance, durability, reliability and appearance must also be considered in the selection of a solar system. A.L.W.

A80-42446 **Cooling of buildings.** R. K. Swartman (Western Ontario, University, London, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 393-416. 13 refs.

The cooling of buildings is discussed and possible systems utilizing solar energy for this end are considered. The science of psychrometrics, which deals with the thermal properties of moist air, is introduced, and the three major processes for conditioning the atmosphere of a space, sensible cooling, cooling and dehumidification and cooling and humidification, are examined. The effects of environmental conditions on human comfort are considered, and the components and determination of building cooling loads are discussed. The various types of solar cooling systems are then examined in detail, with attention given to solar sorption cooling by absorption and adsorption cycles, solar-mechanical systems and solar-related cooling using heat pumps, sky radiation, rock bed regenerators, passive systems and flat-plate solar collectors. It is pointed out that cooling seems to be the most attractive application for solar energy, due to the concurrence of supply and demand, and can make significant contributions to saving money and energy. A.L.W.

A80-42447 **A completely instrumented solar building - The Shenandoah Solar Recreational Center.** J. R. Williams (Georgia Institute of Technology, Atlanta, Ga.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 417-433.

The hydronic solar energy system of the Shenandoah Solar Recreational Center, with double glazed black chrome selectively coated copper tube-in-strip flat plate solar collectors, contains 63 collectors that are each 8.61 by 20.7 ft. A sawtooth roof structure is employed and the entire system is pressurized. The design incorporates the use of constant circulating loops, aluminum reflectors instead of aluminized mylar and the avoidance of downdrain for freeze protection; basically, one or more loops are used to control energy transfer to or from a component and each of these subsystems operates somewhat independently of the others. Attention is given to building load calculations, operation when there is sufficient or excess insolation and problems encountered with the freeze protection system. J.P.B.

A80-42449 **Fundamentals of solar architecture.** A. Bowen (Miami, University, Coral Gables, Fla.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 481-553. 18 refs.

The paper reviews fundamentals of solar architecture with emphasis on the thermal and luminous properties of building materials. The exterior factors such as solar, wind, and precipitation which affect the building site, and the interior specifications such as the number of occupants, volume, and floor area are discussed considering that the prime provision of buildings is shelter from climate. Insulation characteristics of materials are tabulated, noting that they are classified into 'resistance insulation' and 'capacity insulation'; thermal reflectivities and emissivities of material surfaces are summarized, noting that solar radiation is reradiated in the long wave infrared range. Thermal exchange in buildings as caused by thermal conduction through walls and solar heat gain through openings is expressed in a thermal balance equation. Luminous behavior of materials is analyzed, along with factors which determine channels of daylight in buildings. It is concluded that solar engineering equipment can be used to satisfy energy needs of passive vernacular solar buildings, dynamic energy responsive designs and hybrid solar mechanically equipped buildings. A.T.

A80-42452 **Systematic techniques of design for solar houses in high latitudes.** J. K. Page (Sheffield, University, Sheffield, England). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 629-713. 34 refs. Science Research Council Grants No. B/RG/93199; No. GR/A/34788.

The paper discusses techniques of design of high altitude solar houses. Computer design methods are particularly valuable in reducing analysis time; eventually, architectural rules of thumb should be formulated, but at this stage it is too early to predict when this will be accomplished. The dangers of copying solar houses from other locations out of environmental context without adequate performance analysis are great; every unsatisfactory solar building makes it more difficult for designers to build other solar houses. It is concluded that the design of solar houses at high altitudes will remain a difficult challenge since the amount of available solar energy in winter is low. A.T.

A80-42453 **The potential of renewable energies in planning the development of rural areas.** T. A. Lawand (McGill University, Sainte Anne de Bellevue, Quebec, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 757-771.

A80-42454 **Review of solid state physics.** A. E. Dixon (Waterloo, University, Waterloo, Ontario, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 773-784.

A solid state physics background necessary to understand solar cell physics is presented. Some physical insight into the band structure of solids is provided, and the band structure is used to explain the physical properties of semiconductors. These properties are then used to illustrate the workings of a simple pn junction. V.T.

A80-42455 **Silicon solar cells. I - Basics. II - Practical aspects.** R. E. Thomas (Carleton University, Ottawa, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 785-803, 805-830. 67 refs.

The paper reviews the principles and practical aspects of silicon solar cells. The photovoltaic effect which generates electrical energy by absorption of ionizing radiation is produced in semiconductors used in solar cells; the cell operation is depicted, noting that its limiting behavior can be predicted by determining the photocurrent and the diode (dark) current. Expressions are derived for the dark current density of the diode and the conversion efficiency of the solar cell. The conversion efficiency is discussed relative to voltage and fill factors as a function of energy gap and temperature; current efficiency can be determined as the ratio of collected current to the maximum photon current. The solar cell equivalent circuit is examined with respect to the effect of shunt and series resistances on I-V characteristics, and factors affecting cell efficiency such as surface reflection, junction depth, and cell thickness are analyzed. A.T.

A80-42456 **Polycrystalline solar cells.** D. E. Brodie (Waterloo, University, Waterloo, Ontario, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 831-841.

Polycrystalline solar cells are discussed as possible low-cost components for solar energy conversion systems. Consideration is given to the properties and problems of crystalline heterojunction solar cells, including optimum parameters for providing a high conversion efficiency. The application of polycrystalline films with crystallites large compared to film thickness in heterojunction solar cells is then discussed, and factors such as film thickness, grain boundaries and fabrication methods that should be controlled in order to produce a useful cell are indicated. A.L.W.

A80-42457 **Metal-insulator-semiconductor /MIS/ and semiconductor-insulator-semiconductor /SIS/ solar cells. I - Basic principles. II - Performance characteristics.** J. Shewchun (McMaster University, Hamilton, Ontario, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 843-867, 869-884. 16 refs.

The paper examines metal-insulator-semiconductor (MIS) and semiconductor-insulator-semiconductor (SIS) principles and performance characteristics. They are of interest in solar cells applications because of possible processing cost reductions; since the junctions are virtual or induced, it may be possible to use polycrystalline film semiconductors to avoid grain boundary effects. It may also be possible to reduce or eliminate grids and built-in AR coatings; however, it should be noted that these devices are controlled by very thin interfacial layers which are difficult to produce. At present, a 12% efficiency plateau has been reached with these systems, and their features include the control by diffusion current flow in the bulk of the base semiconductor, and the ability to measure the interfacial layer directly and predict its effect on efficiency. It is concluded that the loss mechanisms which limit the efficiency can be removed and the performance should be limited only by the bulk characteristics of the base semiconductor. A.T.

A80-42458 **Basic electrochemistry.** A. F. Janzen (Western Ontario, University, London, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 885-903. 8 refs.

The concept and definitions of electrochemistry are introduced. A cyclic photogalvanic silver halide cell is used as an example. Oxidation reduction reactions are discussed, electrochemical potentials are outlined, and losses in electrochemical cells are considered. Emphasis is placed on frictional losses, concentration polarization, and overvoltage. V.T.

A80-42460 **Short course in microprocessors for solar energy applications - Microprocessors, microcomputers and single chip computers.** B. E. Paton (Dalhousie University, Halifax, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 939-951. 12 refs.

A80-42461 **Short course in microprocessors for solar energy applications - Sensors.** B. E. Paton (Dalhousie University, Halifax, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 953-965. 7 refs.

In the first part of the paper, it is shown how a microprocessor could be used to produce a computer controlled light meter which is capable of measuring both instantaneous and integrated solar light power. The second part deals with a thermistor interfaced to a single chip computer. The computer is used to convert measured resistance into temperature. V.T.

A80-42462 **Short course in microprocessors for solar energy applications - Control.** B. E. Paton (Dalhousie University, Halifax, Nova Scotia, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 967-978. 5 refs.

The paper shows how microcomputers may be interfaced with simple (on-off) mechanical relays and proportional mechanical devices. Single channel operation where each output line is connected to only one output device is considered. In the other example, a link between the digital and mechanical parts of a system is provided with a stepping motor. These motors may be used to control flow rates by operating a valve or to track the sun. V.T.

A80-42463 **Short course in microprocessors for solar energy applications - Systems.** B. E. Paton (Dalhousie University, Halifax, Nova Scotia, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 979-992. 10 refs.

A 16-channel data logger with a RS 232C serial output port is described. The circuit requires four integrated circuits: a data acquisition chip, DAS voltage reference, Vref single-chip computer, and line driver. Consideration is given to a microprocessor module with emphasis placed on a computer program. V.T.

A80-42464 **Short course in microprocessors for solar energy applications - The microcomputer family.** B. E. Paton (Dalhousie University, Halifax, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 993-1004. 6 refs. Research supported by the National Research Council of Canada.

Microprocessors and their applications, particularly for solar energy systems, are described. Consideration is given to a single-chip, single-board, and multiboard computers. Arithmetic using microprocessors are outlined, and distributing processing is emphasized. V.T.

A80-42465 **Bioconversion of solar energy.** D. O. Hall (King's College, London, England). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1005-1057. 143 refs.

The paper discusses the bioconversion of solar energy. Plant photosynthesis fixes about 2 x 10 to the 11th tons of carbon yearly with an energy content of 3 x 10 to the 21st J which is 10 times the world annual use and 200 times the food energy consumption. All the atmospheric CO2 is cycled through plants every 300 years, all the O2 every 2000 years, and the H2O every 2 million years. The magnitude and role of photosynthesis is unrecognized primarily because such a small fraction of the fixed carbon is utilized and the recycling phenomena are not understood; however, the plants are very adaptable and exist in great diversity, so they can indefinitely supply renewable quantities of food, fiber, fuel, and chemicals. It is suggested to evaluate what photosynthesis can provide by various methods such as H2 production and carbon fixation. (Author)

A80-42468 **Solar power.** J. R. Williams (Georgia Institute of Technology, Atlanta, Ga.). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1129-1136.

Solar-thermal-electric technologies, whereby solar radiation is converted into heat from which electric power is generated, are considered. These technologies consist of central receiver systems which use a field of mirrors to concentrate sunlight onto the heat receiver to generate power, and dispersed systems. Attention is given to the thermodynamic efficiency of solar power plants and to concentrating solar collectors, both point- and line-focusing systems. The parabolic trough concentrator and linear single axis tracking concentrators are also considered, along with a total energy plant that uses four types of collectors as well as tanks of oil for thermal storage. J.P.B.

A80-42469 **Solar powered refrigeration.** E. Bilgen (Ecole Polytechnique, Montreal, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1223-1243. 35 refs.

Utilization of solar powered refrigeration units in cooling and food preservation is reviewed. Refrigeration for air-conditioning is discussed, including absorption systems. Refrigeration machines suitable for food preservation, such as intermittent or continuous-type absorption systems are considered. It is noted that there has been no systematic development of solar powered refrigeration units for ice making. V.T.

A80-42471 **Solar energy at the P.E.I. Ark.** K. T. Mackay and D. Bergmark. In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1267-1277. 7 refs.

The use of solar energy in the Prince Edward Island Ark, a 490-sq m alternative energy and agriculture demonstration facility containing a home, two greenhouses, an aquaculture facility and office/laboratory space, is discussed. The passive solar system, which makes use of south and west-facing glass doors for collection and rocks, concrete and water for heat storage, provides over 50% of the heating requirements, without overheating in the summer. Supplemental heating and hot water is supplied by an active solar system comprised of 36 flat plate collectors mounted vertically at the peak of the building, with an efficient air-tight wood stove as back up. The commercial greenhouse employs a hybrid solar system with both active and passive features and has produced crops year round. Greenhouse horticulture involves solar-driven biological processes in place of energy-intensive processes, and is associated with a solar-driven aquaculture system employing algae as a purification system for the hatching of trout. Many of the techniques tested at the Ark have been incorporated into other projects. A.L.W.

A80-43118 **Scanning light spot analysis of faulty solar cells.** K. Lehovec and A. Fedotowsky (Southern California, University, Los Angeles, Calif.). *Solid-State Electronics,* vol. 23, June 1980, p. 565-576. 35 refs. NBS-supported research.

Current output patterns of a solar cell panel exposed to a scanning light spot are computed for fault-free and for faulty cell containing either cracks with leakage conductances across the exposed junction at the crack, or point shorts in series with various spreading resistances. Low light level, uniform attenuation length, and an external panel termination of low impedance are assumed. It is shown that various boundary conditions can be satisfied by appropriate imaging techniques. A general equivalency theorem for the cell output of an illuminated point with that of an illuminated line through that point parallel to the finger electrode is derived and utilized. The preferred attenuation length of about half the finger electrode spacing can be achieved by modulating the light beam at an appropriate frequency which is typically in the low MHz range. Output patterns generated by a modulated light beam are compared with those obtained by unmodulated light. (Author)

A80-43122 **A low-high-junction solar-cell model developed for use in tandem cell analysis.** R. J. McPartland and A. G. Sabnis (Pittsburgh, University, Pittsburgh, Pa.). *Solid-State Electronics,* vol. 23, June 1980, p. 605-610. 16 refs.

A comprehensive low-high (L-H) junction solar cell model has been developed. It accounts for actual solar spectrum related photogeneration of carriers in all regions of the n-p-p(+) cell and allows for any value of rear surface-recombination-velocity (SRV). In typical GaAs L-H junction solar cells, photogeneration in the p(+) region, but not the p region, is found to be negligible. The L-H junction's space-charge-layer recombination current density is also negligible. Assigning a non-infinite value of rear surface SRV makes this model applicable to tandem multi-junction structures made from materials with different band gaps. (Author)

A80-43344 * # **Generalized shading analysis for paraboloidal collector fields.** D. B. Osborn (Ford Aerospace and Communications Corp., Newport Beach, Calif.). *American Society of Mechanical Engineers, Energy Technology Conference and Exhibition, New Orleans, La., Feb. 3-7, 1980, Paper 80-Pet-33*. 8 p. 8 refs. Members, $1.50; nonmembers, $3.00. Contract No. JPL-955115.

This paper presents the development and results of a generalized shading analysis for a field of point-focus parabolic dish concentrators. Shading of one concentrator by another with attendant loss of energy is a function of the position of the sun and the relative locations of the concentrators within the field. A method is presented for determining the annualized energy loss which includes a trade-off of system life-cycle energy as a function of concentrator spacing and field geometric layout. System energy output is computed on an annualized basis, employing 15 minute-increment environmental data tapes for the year 1976 at Barstow, California. For a land cost of $5000 per acre, lowest system energy cost occurs at about a 25 percent packing fraction (concentrator area/land area) for a typical 1-MWe dish-Stirling solar thermal power plant. Basic equations are given for computing the shading and concomitant energy loss as a function of concentrator center-to-center spacing, field layout site location. (Author)

A80-43367 **Quasi-optimum pseudo-Lambertian reflecting concentrators - An analysis.** A. Luque (Madrid, Universidad Politécnica, Madrid, Spain). *Applied Optics,* vol. 19, July 15, 1980, p. 2398-2402. 9 refs.

A two-stage concentrator is analyzed, in which the first stage is reflective and the second stage considers the first one as a Lambertian source in order to obtain the highest possible gain. The profile and the position of this first stage, which happens to be a parabola, is determined, and the value of the gain is calculated as a function of the acceptance angle and the focal length of the first stage. M.E.P.

A80-43368 **Information theory and solar energy collection.** R. P. Patera and H. S. Robertson (Miami, University, Coral Gables, Fla.). *Applied Optics,* vol. 19, July 15, 1980, p. 2403-2407. 7 refs.

Information theory is applied to the problem of solar radiation collection. It is found that the optimum solar concentrator corresponds to a perfect imaging system, i.e., one that images the entire sky on the absorber with no aberrations. For a nonisotropic distribution of radiation at the collector aperture, many thermally separated absorber segments are necessary at the absorber for optimum performance. The heat transfer fluid is first passed through the warm segments and then passed sequentially through the progressively hotter segments. (Author)

A80-43473 **Medium and high temperature solar processes.** J. F. Kreider (Jan F. Kreider and Associates, Boulder, Colo.). New York, Academic Press, Inc., 1979. 357 p. 150 refs. $38.

The subject matter of the book is concerned with those solar-thermal processes operating above 100 C. A broad division between medium- and high-temperature processes is made at 300-400 C, corresponding to practical operating temperatures achieved by single- and compound-curvative solar concentrators. Systems for power production, shaft power, industrial process heat, and total energy (shaft power plus thermal power) are treated. Engineering design data for high-temperature collectors and their use in solar furnaces, central solar power plants, distributed power plants, and solar thermionics are described. V.T.

A80-43477 **The estimation of global and sky radiation in Austria.** F. Neuwirth (Zentralanstalt für Meteorologie und Geo- unit area is noted. To evaluate this influence, comparative space-diversity measurements were made (1976 through 1978) with different instruments. It was found that for a procedure based on the application of surface gauge data to the correction of radar calculations, the best results could be obtained using the mean value of two-hour measurements made with three gauges spaced 100 to 200 m apart. V.P.

A80-43479 **Solar thermoelectric generation using bismuth telluride alloys.** H. J. Goldsmid, J. E. Giutronich, and M. M. Kaila (New South Wales, University, Kensington, Australia). *Solar Energy,* vol. 24, no. 5, 1980, p. 435-440. 7 refs.

The possibility of using thermocouples made from Bi2Te3 alloys in solar thermoelectric generators is investigated. Experiments have been carried out for two systems. The first employs a commercial thermoelectric module operating at the relatively low source temperatures that can be achieved with a flat plate collector. The second system uses an asymmetric stationary concentrator with thermocouples fabricated so as to withstand higher temperatures. Present overall efficiencies are less than one percent but this could rise to about three percent with improvements in the concentration system. (Author)

A80-43482 **Cusp mirror - Heat pipe evacuated tubular solar thermal collector.** U. Ortabasi and F. P. Fehlner (Corning Glass Research and Development Laboratories, Corning, N.Y.). *Solar Energy,* vol. 24, no. 5, 1980, p. 477-489. 22 refs. Contract No. EY-76-C-02-2608.

A solar thermal collector was constructed based on an internal 1.15 X cusp concentrator, thermal insulation involving a vacuum and selective absorber, and thermal transfer to a manifold via heat-pipe action. Performance of the collector was compared with that of an evacuated, selectively coated, flat-plate absorber equipped with flow-through heat transfer. It was shown that with single collector tubes, mirror losses lowered the optical efficiency of the cusp, heat-pipe collector below that of the flat plate, while the smaller absorber area of the heat pipe reduced thermal losses at absorber temperatures above ambient. Thus, a crossover in efficiency occurred such that the flat plate was more efficient at low Delta T/H while the cusp-heat pipe was more efficient at high Delta T/H. The testing of modules showed that manifold losses and gains could dominate these collector effects when the collector area approximately equaled the manifold area. (Author)

A80-43484 **The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period.** J. M. Sulock (North Carolina, University, Asheville, N.C.). *Solar Energy,* vol. 24, no. 5, 1980, p. 505, 506. 5 refs.

A80-43485 **On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications.** U. H. Kurzweg (Florida, University, Gainesville, Fla.). *Solar Energy,* vol. 24, no. 5, 1980, p. 507-509. 5 refs.

Substantial cost reduction in photovoltaic conversion of solar energy can be achieved by means of solar concentrators. However, the concentrators must be inexpensive as compared to the cost of an equivalent area of solar cells, have concentration ratios in the range of ten to several hundred suns, and must be capable of providing a uniform flux density over each of the individual solar cells of an array of optimal conversion efficiency. In the present paper, some new configurations which meet these requirements are proposed. V.P.

A80-43486 **Transmission of diffuse radiation through CPC and flat plate collector glazings.** M. J. Brandemuehl and W. A. Beckman (Wisconsin, University, Madison, Wis.). *Solar Energy,* vol. 24, no. 5, 1980, p. 511-513.

Solar-collector glazings reduce convective losses from the absorber to the environment and protect the absorber from dust and other contaminants. Expressions for the transmittance of a glazing system as a function of the angle of incidence are currently available. To obtain the transmittance of a glazing system for diffuse radiation, the expressions must be integrated numerically over the appropriate range of incidence angles. A compound parabolic collector (CPC) accepts diffuse radiation over a lune-shaped segment of the hemisphere, while a tilted flat plate collector receives one level of diffuse radiation from the sky and a different level from the ground. In the present paper, effective beam radiation incidence angles are calculated for these two collector types. V.P.

A80-43513 **Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers.** D. E.

Soule (Argonne National Laboratory, Argonne, Ill.; Western Illinois University, Macomb, Ill.) and G. T. Reedy (Argonne National Laboratory, Argonne, Ill.). In: Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volume 1. Lausanne, Elsevier Sequoia, S.A., 1979, p. 175-181. 10 refs. Research supported by the U.S. Department of Energy.

A80-43514 **Optical and topographical properties of selective black chrome.** P. K. Gogna and K. L. Chopra (Indian Institute of Technology, New Delhi, India). In: Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volume 1. Lausanne, Elsevier Sequoia, S.A., 1979, p. 183-187. 5 refs.

The optical and surface topographical properties of black chrome deposited onto differently treated substrates were investigated to study the effect of substrate surface roughness. Coatings with a solar absorptance of 0.94 and a thermal emittance of 0.14 at 100 C were obtained on steel substrates with dull nickel overlayers and anodically etched nickel overlayers. A polarimetric technique was employed to study the angular dependence of the reflectance of the coatings. (Author)

A80-43516 **The design and fabrication of high efficiency thin film CdS/Cu2S solar cells.** R. B. Hall and J. D. Meakin (Delaware, University, Newark, Del.). In: Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volume 1. Lausanne, Elsevier Sequoia, S.A., 1979, p. 203-211. 18 refs. Contract No. EG-77-C-03-1576-2.

Thin film photovoltaic cells of CdS/Cu2S which exhibit conversion efficiencies in excess of 9% have been designed and fabricated. Specific cell designs are prepared from an analysis of optical and electronic loss mechanisms operative in the cell. Material and engineering modifications to the fabrication process are then made to minimize specific energy conversion losses. The present cell design consists of five thin film layers which are sequentially prepared on a copper substrate 35 microns thick. In addition to the material control required for each component layer, the electrical, chemical, mechanical and topological compatibilities at the interfaces between each adjoining layer must be assured to achieve the desired cell performance. The present analysis shows that a fully optimized solar cell based on a CdS/Cu2S junction will have a practical conversion efficiency limit of about 11%. It is anticipated that practical conversion efficiencies of 14-15% can be achieved utilizing a (CdZn)S/Cu2S junction designed to produce the maximum open-circuit voltage possible using Cu2S as the absorbing layer. Present cell results which incorporate this design are presented. (Author)

A80-43528 **A field ion microscope study of microstructural features of solar collector coatings.** O. T. Inal and W. Yarbrough (New Mexico Institute of Mining and Technology, Socorro, N. Mex.). In: Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volume 2. Lausanne, Elsevier Sequoia, S.A., 1979, p. 129-141. 12 refs. Contract No. ER-78-04-4226.

The nucleation and growth characteristics of the systems electroplated nickel on stainless steel and black chrome on nickel were investigated for thin coverages and for thick coverages utilizing the techniques of field ion microscopy (FIM) and scanning electron microscopy (SEM). The SEM study shows that increasing the plating voltage and/or decreasing the nickel concentration in the plating bath produces finer overgrowths in the nickel/stainless steel system, whereas this trend is reversed for black chrome electroplatings on nickel field emission end forms. FIM analysis of the plated growths shows an epitaxial attachment at thin coverages (less than 50 atomic layers), while at thicker deposits (greater than 50 atomic layers) the overgrowth goes through a zone of excessive defect structure to a polycrystalline layer of the plated material with its own lattice structure. These results are consistent with earlier studies of Cu/W systems utilizing the deposition of copper through cementation, electroplating and flash evaporation. (Author)

A80-43583 **An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact.** N. G. Tarr, D. L. Pulfrey (British Columbia, University, Vancouver, Canada), and P. A. Iles (Applied Solar Energy Corp., City of Industry, Calif.). *Journal of Applied Physics,* vol. 51, July 1980, p. 3926-3929. 12 refs. Research supported by the Natural Sciences and Engineering Research Council of Canada.

A80-43589 **A computer analysis of heteroface solar cells with ultrathin window layer.** A. Yoshikawa (Chiba University, Chiba, Japan). *Journal of Applied Physics,* vol. 51, July 1980, p. 3990-3992. 8 refs. Research supported by the Sakkokoi Foundation.

A computer analysis of heteroface solar cells with thin window layer has been performed regarding the effects of multiple reflections in the window layer, as well as in antireflection layers. It is shown that the thickness of the window layer greatly affects the reflection characteristic of the cell, and there is an optimum thickness for the window, so the window layer thickness must be defined so as to minimize the reflection loss, as well as the absorption loss by the window. (Author)

A80-43761 **Grain boundary defects in thin semicrystalline material.** Z. C. Putney and W. F. Regnault (Semix, Inc., Gaithersburg, Md.). *(Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells,* vol. 1, May 1980, p. 285-292.

The effects of grain boundaries on the electrical performance of semicrystalline silicon solar cells were investigated. It was found that there are at least three distinct types of grain boundaries. Type 1 is present in high efficiency cells and has little or no effect on the cell's performance. Type 2 is characterized by an ohmic shunting of the cell, possibly due to diffusion which has proceeded along open grain boundaries. This type of grain is also characterized by an enhanced red-to-blue ratio. Type 3 grain boundaries also lead to a shunted cell but in this case the shunting mechanism is apparently due to generation-recombination centers in the depletion region. Several experimental techniques were employed to substantiate these conclusions. (Author)

A80-43762 **Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon.** W. A. Anderson, K. Rajkanan (New York, State University, Buffalo, N.Y.), A. E. Delahoy, and S. L. Hyland (Rutgers University, Piscataway, N.J.). *(Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells,* vol. 1, May 1980, p. 305-310. 7 refs. Contract No. ET-78-R-03-1876.

Chromium metal-insulator-silicon (MIS) solar cells fabricated on Wacker polycrystalline silicon and electron-beam-deposited thin film silicon were studied to determine current flow mechanisms. Wacker polycrystalline p-type silicon was shown to produce MIS solar cells which exhibit surface-state-controlled current for T greater than 150 K and tunneling-controlled current at lower temperatures. MIS cells on unpolished Wacker silicon are clearly space charge limited. Electron-beam-deposited polycrystalline silicon 20-30-microns thick has a conductivity which may be limited by the grain boundary trap density or the availability of free carriers. Surface state analysis, laser scan data and diffusion length studies also show the limitations which exist at grain boundaries of polycrystalline silicon. (Author)

A80-43763 **Noise spectral density as a device reliability estimator.** J. Dubow and C. Osterwald (Colorado State University, Fort Collins, Colo.). *(Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells,* vol. 1, May 1980, p. 315-318. 10 refs.

The measurement of noise spectral density is proposed as an estimator of solar cell device reliability. The use of associated temperature and bias stresses is investigated as a nondestructive rapid test method. A novel technique which employs the cooling rather than the heating of the device was utilized. In certain cases the predominant failure mechanisms may be derived. Data are presented on indium-tin oxide/silicon as well as p-n junction devices. (Author)

A80-43764 **Measurement techniques in thin film polycrystalline materials and devices /solar cells/.** H. K. Charles, Jr., R. J. King, and A. P. Ariotedjo (PRC Energy Analysis Co., McLean, Va.). *(Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells,* vol. 1, May 1980, p. 327-346. 53 refs. Contract No. EG-77-C-01-4024.

Measurement techniques used in the analysis of polycrystalline thin film materials and devices are surveyed to determine the most widely applied thin film resistivity and Hall effect measurement methods. Measurement techniques for other relevant parameters (e.g. minority carrier lifetime, diffusion length, etc.) are also identified, and an estimate of their efficiency in yielding results (i.e. parameter values) for thin films consistent with overall device performance is made. V.T.

A80-43836 * **Implications for the UK of solar-power satellites /s.p.s/ as an energy source.** R. M. Shelton (British Aerospace, Dynamics Group, Filton, Glos., England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews,* vol. 127, pt. A, no. 5, June 1980, p. 336-343. 13 refs. Research supported by the U.S. Department of Energy and NASA.

The solar power satellite concept which would make the sun's radiation available on earth as a source of energy, is discussed. Attention is given to the concept currently under evaluation in the USA, and also in Europe, though to a lesser extent. The advantages and problems associated with its adoption by the UK as a major source of electrical energy are discussed. The discussion covers topics such as sizing, reference system, and construction, costs, and problem areas. M.E.P.

N80-22774*# Florida Solar Energy Center, Cape Canaveral.
SOLAR HEATING AND COOLING DEMONSTRATION PROJECT AT THE FLORIDA SOLAR ENERGY CENTER Final Report
Feb. 1980 175 p refs Sponsored in part by NASA
(Contract EG-77-A-01-4074)
(NASA-CR-161413) Avail: NTIS HC A08/MF A01 CSCL 10A

The retrofitted solar heating and cooling system installed at the Florida Solar Energy Center is described. The system was designed to supply approximately 70 percent of the annual cooling and 100 percent of the heating load. The project provides unique high temperature, nonimaging, nontracking, evacuated tube collectors. The design of the system was kept simple and employs five hydronic loops. They are energy collection, chilled water production, space cooling, space heating and energy rejection. Information is provided on the system's acceptance test results operation, controls, hardware and installation, including detailed drawings. R.E.S.

N80-22781*# Interactive Resources, Inc., Point Richmond, Calif.
SOLAR PROCESS WATER HEAT FOR THE IRIS IMAGES CUSTOM COLOR PHOTO LAB Final Report
Mar. 1980 126 p Sponsored by NASA. Marshall Space Flight Center.
(Contract EX-76-C-01-2381)
(NASA-CR-161414) Avail: NTIS HC A07/MF A01 CSCL 10B

The solar facility located at a custom photo laboratory in Mill Valley, California is described. It was designed to provide 59 percent of the hot water requirements for developing photographic film and domestic hot water use. The design load is to provide 6 gallons of hot water per minute for 8 hours per working day at 100 F. It has 640 square feet of flat plate collectors and 360 gallons of hot water storage. The auxillary back up system is a conventional gas-fired water heater. Site and building description, subsystem description, as-built drawings, cost breakdown and analysis, performance analysis, lessons learned, and the operation and maintenance manual are presented. R.E.S.

N80-22784*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
HANDBOOK OF SOLAR ENERGY DATA FOR SOUTH-FACING SURFACES IN THE UNITED STATES. VOLUME 2: AVERAGE HOURLY AND TOTAL DAILY INSOLATION DATA FOR 235 LOCALITIES. ALASKA - MONTANA
Jeff H. Smith 15 Jan. 1980 473 p Sponsored by NASA and DOE, Washington, D. C. 3 Vol.
(NASA-CR-162999; DOE/JPL-1012-25-Vol-2;
JPL-Pub-79-103-Vol-2) Avail: NTIS HC A20/MF A01 CSCL 10A

Average hourly and daily total insolation estimates for 235 United States locations are presented. Values are presented for a selected number of array tilt angles on a monthly basis. All units are in kilowatt hours per square meter. R.C.T.

N80-22785*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
HANDBOOK OF SOLAR ENERGY DATA FOR SOUTH-FACING SURFACES IN THE UNITED STATES. VOLUME 3: AVERAGE HOURLY AND TOTAL DAILY INSOLATION DATA FOR 235 LOCALITIES. NORTH CAROLINA - WYOMING
Jeff H. Smith 15 Jan. 1980 476 p Sponsored by NASA and DOE, Washington, D. C. 3 Vol.
(NASA-CR-163000; DOE/JPL-1012-25-Vol-3;
JPL-Pub-79-103-Vol-3) Avail: NTIS HC A21/MF A01 CSCL 10A

The daily and hourly profiles used to compute total insolation data for 235 locations in the United States are presented. R.C.T.

N80-22791*# Department of Energy, Washington, D. C. Energy Storage Systems Div.
SOLAR APPLICATIONS ANALYSIS FOR ENERGY STORAGE
T. Blanchard *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 43-46

Avail: NTIS HC A99/MF A01 CSCL 10B

The role of energy storage as it relates to solar energy systems is considered. Storage technologies to support solar energy applications, the status of storage technologies, requirements and specifications for storage technologies, and the adequacy of the current storage research and development program to meet these requirements are among the factors discussed. Emphasis is placed on identification of where the greatest potential exists for energy storage in support of those solar energy systems which could have a significant impact on the U.S. energy mix. J.M.S.

N80-22821*# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
THE SERI SOLAR ENERGY STORAGE PROGRAM
Robert J. Copeland, John D. Wright, and Charles E. Wyman *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 361-374 refs
Avail: NTIS HC A99/MF A01 CSCL 10A

In support of the DOE thermal and chemical energy storage program, the solar energy storage program (SERI) provides research on advanced technologies, systems analyses, and assessments of thermal energy storage for solar applications in support of the Thermal and Chemical Energy Storage Program of the DOE Division of Energy Storage Systems. Currently, research is in progress on direct contact latent heat storage and thermochemical energy storage and transport. Systems analyses are being performed of thermal energy storage for solar thermal applications, and surveys and assessments are being prepared of thermal energy storage in solar applications. A ranking methodology for comparing thermal storage systems (performance and cost) is presented. Research in latent heat storage and thermochemical storage and transport is reported. A.R.H.

N80-22839# California Univ., Livermore. Lawrence Livermore Lab.
SOLAR-HEATED GAS-TURBINE PROCESS USING SULFUR OXIDES FOR POWER PRODUCTION AND ENERGY STORAGE M.S. Thesis
George Kohler Tyson, Scott Lynn, and Alan Foss Sep. 1979 108 p refs
(Contract W-7405-eng-48)
(LBL-9472) Avail: NTIS HC A06/MF A01

If any system of solar power generation is to provide a significant fraction of the power requirements of a community, some means of economical energy storage must be used. A process configuration using the heat of reaction of 2 SO3 reversible 2 SO2 + O2 for energy storage was developed and evaluated. The process uses the sulfur oxides directly in a gas turbine in a hybrid Brayton-Rankine cycle to produce electricity. Heat for the system is supplied during sunlit hours by a field of heliostats focused on a central solar receiver. When sunlight is not available, the storage system provides the heat to drive the gas turbine. An efficient process configuration for this power cycle is proposed. Detailed material and energy balances are presented for a base case that represents a middle range of expected operating conditions. The average cost of the electricity produced is estimated to be 7.7 cents/kW/sub e/hr. DOE

N80-22843# Institute of Gas Technology, Chicago, Ill.
LITHIUM-METAL SULFIDE AND SODIUM-SULFUR BATTERIES FOR SOLAR ENERGY STORAGE
A. F. Sammells 19 Dec. 1978 12 p refs Presented at Reliability of Mater. for Solar Energy Workshop, Denver, Colo., 18 Dec. 1978
(Contract EC-77-C-02-4235)
(CONF-781228-3) Avail: NTIS HC A02/MF A01

The need for low-cost advanced batteries for solar energy storage is discussed, and the characteristics of the title batteries are described. The emphasis of the paper is on the status of materials problems associated with these batteries, including electrodes, current collectors, seals, and interelectrode spacing means. DOE

N80-22851# Waterloo Univ. (Ontario).
METHODS FOR REDUCING HEAT LOSSES FROM FLAT PLATE SOLAR COOLECTORS, PHASE 3 Final Report, 1 May 1977 - 31 Jan. 1979
K. G. T. Hollands, G. D. Raithby, F. B. Russell, and R. G. Wilkinson Mar. 1979 88 p refs
(Grant EY-76-G-02-2597)
(COO-2597-5) Avail: NTIS HC A05/MF A01

The present study extends earlier studies by examining the effect of the emissivities of both the absorber plate and the glass cover on the honeycomb's ability to suppress free convection, and on the radiative and conductive heat transfer which takes place across the honeycomb in the absence of free conversion. By means of heat transfer measurements on ten Mylar honeycomb, it is shown that the effect of the above emissivities on the suppression of convection by the honeycomb is slight and can probably be ignored. On the other hand, the measurements also showed that the effect of these emissivities on the nonconvective heat transfer is substantial, but not nearly so large as would have been predicted by existing theories. To explain this latter result theories were developed which take into account the important coupling (ignored by previous theories) between the conductive and radiative modes of heat transfer. These new theories predict the measured heat transfer rates to with about +-15%, depending on the emissivities. The results have direct application to evaluating solar collectors which combine a selective surface with a honeycomb. DOE

N80-22856*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: SEASONAL REPORT FOR FERN, TUNKHANNOCK, PENNSYLVANIA Contractor Report, May 1978 - Apr. 1979
Jan. 1980 81 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161392) Avail: NTIS HC A05/MF A01 CSCL 10A

The operational and thermal performance of a variety of solar systems installed in operational test sites are described. The analysis is based on instrumented system data monitored and collected for at least one full season of operation. The long-term field performance of the installed system is reported, and technical contributions to the definition of techniques and requirements for solar energy system design are made. The solar energy system was designed to supply space heating and domestic hot water for single-family residences. The system consists of air flat plate collectors, storage tank, pumps, heat exchangers, associated plumbing, and controls. F.O.S

N80-22857# Messerschmitt-Boelkow-Blohm G.m.b.H., Ottobrunn (West Germany). Unternehmensbereich Raumfahrt.
DEVELOPMENT AND PREPARATION FOR SERIES PRODUCTION OF A MODULAR SOLAR SPACE HEATING SYSTEM, PHASES 1 AND 2 Final Summary Report
Ruediger Eichlepp, Herbert Grallert, Veit Merges, and Karl-Heinz Ott May 1979 247 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-79-02) Avail: NTIS HC A11/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Germany DM 51,45

A modular solar space heating system for residential use at central European latitudes was examined experimentally. Technical as well as economic factors were included. The system selected for the experimental test consisted of flat plate solar collectors and cubic water tanks for energy storage. Two test houses in Germany were equipped with this system, both of then single-family houses. One of these houses is a special, newly constructed prefabricated home, the other was retrofitted with the system. Results are presented. Author (ESA)

N80-22860# Stuttgart Univ. (West Germany). Inst. fuer die Technische Nutzung Solarer Energie.
TECHNICAL APPLICATIONS OF SOLAR ENERGY Final Report
Abdelraouf Arafa, Wolfgang Arndt, and Gerhard Bilger Bonn Bundesmin. fuer Forsch. u. Technol. Jul. 1979 272 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-79-06) Avail: NTIS HC A12/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Germany DM 56,70

Experimental and theoretical investigations of the conversion of solar energy are presented, including: laboratory investigations with flat plate water collectors; hot water heat storage; development and measurements of selective surfaces; thermoelectric energy conversion; measurements of meteorological and radiation data; data acquisition; outdoor testing of water and air flat plate collectors; and measurement of the energy balance in a solar house. Photovoltaic experiments with flat and concentrating generators, a system study on photovoltaic systems, hybrid flat plate collectors (thermal and photovoltaic), and technology of Cu2S-CaS thin film solar cells are included. The improvement of solar cell use by light conversion with luminiscent substances and time resolved measurement of the global radiation spectrum is also considered. Author (ESA)

N80-22864# National Technical Information Service, Springfield, Va.
SOLAR SPACE HEATING AND AIR CONDITIONING, VOLUME 3. CITATIONS FROM THE NTIS DATA BASE Progress Report, Sep. 1977 - Sep. 1978
Audrey S. Hundemann Dec. 1979 99 p
(PB80-801707) Avail: NTIS HC $30.00/MF $30.00 CSCL 13A

Design, technical feasibility, performance, and economic factors pertaining to solar heating and cooling of buildings are discussed. Commercial buildings, schools, and residential buildings are covered, with emphasis on the assessment of solar heating and cooling systems for residential buildings. Solar energy as a national energy resource, solar energy research program alternatives, and social, environmental, and institutional factors affecting the feasibility of using solar energy for heating and cooling buildings are included. This updated bibliography contains 90 abstracts, none of which are new entries to the previous edition. GRA

N80-22865# National Technical Information Service, Springfield, Va.

SOLAR SPACE HEATING AND AIR CONDITIONING, VOLUME 3. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, Sep. 1977 - Oct. 1979

Audrey S. Hundemann Dec. 1979 153 p Supersedes NTIS/PS-78/1017; NTIS/PS-77/0829; NTIS/PS-76/0728

(PB80-801723; NTIS/PS-78/1017; NTIS/PS-77/0829; NTIS/PS-76/0728) Avail: NTIS HC $30.00/MF $30.00 CSCL 13A

Citations from worldwide literature on the use of solar energy to heat and cool buildings are presented, with emphasis on the heating and cooling of residential buildings, and performance simulation studies are cited. Abstracts pertaining to solar assissted heat pump systems and assessment of solar heated Rankine cycle cooling are included. This updated bibliography contains 146 abstracts, 49 of which are new entries to the previous edition. GRA

N80-22866# National Technical Information Service, Springfield, Va.

SOLAR SPACE HEATING AND AIR CONDITIONING, VOLUME 4. CITATIONS FROM THE NTIS DATA BASE Progress Report, Oct. 1978 - Oct. 1979

Audrey S. Hundemann Dec. 1979 235 p Supersedes NTIS/PS-78/1015; NTIS/PS-77/0827; NTIS/PS-76/0727; NTIS/PS-75/689; NTIS/PS-75/345

(PB80-801715; NTIS/PS-78/1015; NTIS/PS-77/0827; NTIS/PS-76/0727; NTIS/PS-75/689; NTIS/PS-75/345) Avail: NTIS HC $30.00/MF $30.00 CSCL 13A

Design, technical feasibility, performance, and economic factors pertaining to solar heating and cooling of buildings are discussed. Commercial buildings, schools, and residential buildings are covered, with emphasis on the assessment of solar heating and cooling systems for residential buildings. Solar energy as a national energy resource, solar energy research program alternatives, and social, environmental, and institutional factors affecting the feasibility of using solar energy for heating and cooling buildings are included. This updated bibliography contains 226 abstracts, all of which are new entries to the previous edition. GRA

N80-22867# National Technical Information Service, Springfield, Va.

PASSIVE SOLAR SPACE HEATING AND COOLING. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Oct. 1979

Audrey S. Hundemann Dec. 1979 50 p

(PB80-801749) Avail: NTIS HC $30.00/MF $30.00 CSCL 13A

Studies from worldwide literature on the passive solar heating and cooling of buildings are discussed. Abstracts cover design and performance simulation studies of trombe walls and air thermo-siphon solar heating systems. This report contains 45 abstracts. GRA

N80-22868# National Technical Information Service, Springfield, Va.

PASSIVE SOLAR SPACE HEATING AND COOLING. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Oct. 1979

Audrey S. Hundemann Dec. 1979 66 p

(PB80-801731) Avail: NTIS HC $30.00/MF $30.00 CSCL 13A

Design, technical feasibility, performance, and economic factors pertaining to passive solar heating and cooling of buildings are discussed. Abstracts cover trombe walls and air thermo-siphon solar heating systems, comparative economics of passive and active systems, and performance simulation studies. Contains 58 abstracts. GRA

N80-22869# National Technical Information Service, Springfield, Va.

OPTICAL COATINGS FOR SOLAR CELLS AND SOLAR COLLECTORS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report 1970 - Dec. 1979

Brian Carrigan Jan. 1980 230 p Supersedes NTIS/PS-78/1342

(PB80-803794; NTIS/PS-78/1342) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

This bibliography of worldwide journal literature cites reports on materials and research for the development of selective coatings for solar energy conversion devices. These materials include types of coatings or covers used to reflect or transmit solar radiation in order to optimize solar conversion to heat or electricity. Most studies concern antireflection, thermal control, or reflective coatings. Coatings which act as optical filters are also covered. This updated bibliography contains 223 abstracts, 54 of which are new entries to the previous edition. GRA

N80-22870# National Technical Information Service, Springfield, Va.

OPTICAL COATINGS FOR SOLAR CELLS AND SOLAR COLLECTORS, VOLUME 1. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - 1978

Brian Carrigan Jan. 1980 248 p

(PB80-803778) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Materials and research for the development of selective coatings for solar energy conversion devices are described in these citations. These materials include types of coatings or covers used to reflect or transmit solar radiation in order to optimize solar conversion to heat or electricity. Most studies concern antireflection, thermal control, or reflective coatings. Coatings which act as optical filters are also covered. This updated bibliography contains 241 abstracts, none of which are new entries to the previous edition. GRA

N80-22871# National Technical Information Service, Springfield, Va.

OPTICAL COATINGS FOR SOLAR CELLS AND SOLAR COLLECTORS, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1979

Brian Carrigan Jan. 1980 47 p Supersedes NTIS/PS-78/1341; NTIS/PS-77/1036; NTIS/PS-76/0855; NTIS/PS-75/692; NTIS/PS-75/137

(PB80-803786; NTIS/PS-78/1341; NTIS/PS-77/1036; NTIS/PS-76/0855; NTIS/PS-75/692; NTIS/PS-75/137) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

The different development towards selective coating for solar energy conversion devices are described. This includes types of coatings or covers used to reflect or transmit solar radiation in order to optimize solar conversion to heat or electricity. Most studies concern antireflection, thermal control, or reflective coatings. Coatings which act as optical filters are also covered. This updated bibliography contains 40 abstracts, all of which are new entries to the previous edition. GRA

N80-22872# National Technical Information Service, Springfield, Va.

CADIUM SULFIDE SOLAR CELLS, VOLUME 2. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1978 - Nov. 1979

Brian Carrigan Dec. 1979 43 p Supersedes NTIS/PS-78/1213; NTIS/PS-77/7051; NTIS/PS-76/0929; NTIS/PS-75/693 and NTIS/PS-75/089

(PB80-802226; NTIS/PS-78/1213; NTIS/PS-77/1051; NTIS/PS-76/0929; NTIS/PS-75/693; NTIS/PS-75/089) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Citations from Federally-funded research on cadmium sulfide solar cell theory, design, development, fabrication, and degradation are presented. Studies include junctions with thin films of copper sulfide, selenides, and tellurides. The performance, testing, analysis, efficiency, and costs of these cells are covered. This updated bibliography contains 35 abstracts, 22 of which are new entries to the previous edition. GRA

N80-22873# National Technical Information Service, Springfield, Va.

CADMIUM SULFIDE SOLAR CELLS. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - Nov. 1979

Brian Carrigan Dec. 1979 233 p Supersedes NTIS/PS-78/1214; NTIS/PS-77/1052 and NTIS/PS-76/0930
(PB80-802234; NTIS/PS-78/1214; NTIS/PS-77/1052; NTIS/PS-76/0930) Avail: NTIS HC $30.00/MF $30.00 CSCL 10B

Worldwide research on cadmium sulfide solar cell design, development, fabrication, heterojunctions, doping, and performance are cited in this bibliography. Studies on defects, protective coatings, and arrays are included. Thin films of copper indium selenide, copper sulfide, indium phosphide, cadmium selenides, and cadmium tellurides are among those described in these photovoltaic systems. This updated bibliography contains 227 abstracts, 55 of which are new entries to the previous edition. GRA

N80-23179 Columbia Univ., New York.

OPTOELECTRONIC AND PHOTOVOLTAIC PROPERTIES OF METAL-SiO2-SILICON TUNNELING STRUCTURES Ph.D. Thesis

Kwok Ng 1979 117 p
Avail: Univ. Microfilms Order No. 8009362

The short wave length (lambda) response of near-ideal silicon Schottky barrier photodetectors was studied. It is shown that the major cause of reduced quantum efficiency in this range of lambda is the collection by the metal of majority carriers photogenerated within the image force maximum. The potential barriers of ultrathin SiO2 layers to electrons and holes tunneling between the semiconductor and the metal were measured independently on the same MOS samples. The results show that the tunnelling barriers for holes are consisently much larger than those for electrons. Metal-SiO2-silicon (MIS) solar cells were investigated as a function of SiO2 thickness d. Both majority carrier and minority carrier structures were studied and their performance compared for SiO2 layers prepared under identical oxidation conditions and with identical silicon surface treatments. The short circuit current densities and the optimum conversion efficiencies for the majority carrier cells and for the minority carrier cells are given. Dissert. Abstr.

N80-23180*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

RADIATION DAMAGE IN HIGH VOLTAGE SILICON SOLAR CELLS

Irving Weinberg, Henry Brandhorst, Jr., Clifford K. Swartz, and Victor G. Weizer 1980 11 p refs Presented at 2nd European Symp. on Photovoltaic Generators in Space, Heidelberg, 15-17 Apr. 1980
(NASA-TM-81478; E-412) Avail: NTIS HC A02/MF A01 CSCL 20L

Three high open-circuit voltage cell designs based on 0.1 ohm-cm p-type silicon were irradiated with 1 MeV electrons and their performance determined to fluences as high as 10 to the 15th power/sq cm. Of the three cell designs, radiation induced degradation was greatest in the high-low emitter (HLE cell). The diffused and ion implanted cells degraded approximately equally but less than the HLE cell. Degradation was greatest in an HLE cell exposed to X-rays before electron irradiation. The cell regions controlling both short-circuit current and open-circuit voltage degradation were defined in all three cell types. An increase in front surface recombination velocity accompanied time dependent degradation of an HLE cell after X-irradiation. It was speculated that this was indirectly due to a decrease in positive charge at the silicon-oxide interface. Modifications aimed at reducing radiation induced degradation are proposed for all three cell types. Author

N80-23600*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

FLUID CIRCULATING PUMP OPERATED BY SAME INCIDENT SOLAR ENERGY WHICH HEATS ENERGY COLLECTION FLUID

Earl R. Collins *In* NASA. Langley Res. Center Proc. of the 14th Aerospace Mech. Symp. May 1980 p 47-56 refs

(Contract NAS7-100)
Avail: NTIS HC A15/MF A01 CSCL 13K

The application of using a spacecraft solar powered pump terrestrially to reduce or eliminate the need for fossil fuel generated electricity for domestic solar hot water systems was investigated. A breadboard prototype model was constructed utilizing bimetals to convert thermal energy into mechanical motion by means of a toggle operated shutter mechanism. Although it did not meet expected thermal efficiency, the prototype model was sufficient to demonstrate the mechanical concept. R.E.S.

N80-23651# Los Alamos Scientific Lab., N. Mex.

DIRECT SOLAR PUMPED LASER

Howard C. Volkin Jul. 1979 33 p refs
(Contract W-7405-eng-36)
(LA-7982-MS) Avail: NTIS HC A03/MF A01

The development of a direct solar pumped laser is described. Laser operation on the phosphorescence transition T reacts with S, with a suitable dye/solvent system is described. The set of coupled rate equations that governs the solar pumping kinetics are formulated. The compatability of the laser system with useful CW laser operation is discussed. DOE

N80-23766 Brown Univ., Providence, R. I.

SOLAR CELL HETEROJUNCTIONS INVOLVING N-CADMIUM SULFIDE AND CERTAIN P-TYPE SEMICONDUCTOR SINGLE CRYSTALS Ph.D. Thesis

Arienzo Maurizio 1979 214 p
Avail: Univ. Microfilms Order No. 8006969

The fabrication and testing of heterojunction photovoltaic solar cells of the type n-CdS/p-Ge, n-CdS/p-InP, n-CdS/p-GaAs and n-CdS/p-CdTe is described. The CdS layer was found to be single crystalline when it was grown on substrates whose lattice mismatch with CdS was less than 4%, i.e., in the case of growth on InP, GaAs and Ge. Analysis of the dark current characteristics revealed that in all of these heterojunction devices, there exists a low temperature, low bias voltage tunneling current. Analysis of the photovoltaic responses showed that they generally had respectable collection efficiencies; i.e., that the interface states did not act as recombination sites of photogenerated carries crossing the junction. The solar energy conversion efficiency is, however, strongly influenced by interface states through the open circuit voltage and the fill factor. A maximum conversion efficency without antireflection coating of 6.5% for n-CdS/p-InP under natural sunlight having an intensity of 74 mW/cm was observed. Dissert. Abstr.

N80-23767 Stanford Univ., Calif.

PROPERTIES OF SPUTTERED ITO/CdTe SOLAR CELLS Ph.D. Thesis

Francis Georges Courreges 1980 135 p
Avail: Univ. Microfilms Order No. 8011619

The properties of indium tin oxide/cadmium telluride (ITO/CdTe) solar cells prepared by RF sputtering of ITO on phosphorus-doped CdTe single crystals is investigated through measurements of dark and light current-voltage characteristics of ITO/CdTe heterojunctions and In/CdTe junctions and of surface photovoltage and photoluminescence of CdTe surfaces. An observed reduction in solar efficiency of ITO/CdTe solar cells with time and/or heat treatment is describable in terms of the change from a n(+)-ITO/n-CdTe/p-CdTe homojunction structure to a n(+)-ITO/p-CdTe heterojunction, characterized by high collection efficiency and poor rectifying properties. Dissert. Abstr.

N80-23771*# Spire Corp., Bedford, Mass.
DEVELOPMENT OF PULSED PROCESSES FOR THE MANUFACTURE OF SOLAR CELLS Final Report, Apr. 1979
J. A. Minnucci Apr. 1979 238 p refs Sponsored in part by DOE
(Contract JPL-954786)
(NASA-CR-153188; DOE/JPL-954786-79/02; JPL-9950-324; FR-79-10052) Avail: NTIS HC A11/MF A01 CSCL 10A

Low-energy ion implantation processes for the automated production of silicon solar cells were investigated. Phosphorus ions at an energy of 10 keV and dose of 2 x 10 to the 15th power/sq cm were implanted in silicon solar cells to produce junctions, while boron ions at 25 keV and 5 x 10 to the 15th power were implanted in the cells to produce effective back surface fields. An ion implantation facility with a beam current up to 4 mA and a production throughput of 300 wafers per hour was designed and installed. A design was prepared for a 100 mA, automated implanter with a production capacity of 100 MW sub e/sq cm per year. Two process sequences were developed which employ ion implantation and furnace or pulse annealing. A computer program was used to determine costs for junction formation by ion implantation and various furnace annealing cycles to demonstrate cost effectiveness of these methods. R.E.S.

N80-23772*# Solarex Corp., Rockville, Md.
ANALYSIS OF THE EFFECTS OF IMPURITIES IN SILICON Final Report, 19 Jan. 1979 - 31 Jan. 1980
J. H. Wohlgemuth and M. N. Giuliano 1980 95 p refs Sponsored in part by DOE
(Contract JPL-955307)
(NASA-CR-163133; DOE/JPL-955307; JPL-9950-325) Avail: NTIS HC A05/MF A01 CSCL 10A

A solar cell fabrication and analysis program was conducted to determine the effects on the resultant solar cell efficiency of impurities intentionally incorporated into silicon. It was found that certain impurities such as titanium, tantalum, and vanadium were bad, even in very small concentrations. Cell performance appeared relatively tolerable to impurities such as copper, carbon, calcium, chromium, iron and nickel (in the concentration levels which were considered). R.E.S.

N80-23774*# Quality Inn of Key West, Miami Beach, Fla.
SOLAR HOT WATER SYSTEM INSTALLED AT QUALITY INN, KEY WEST, FLORIDA Final Report
Apr. 1980 25 p Sponsored in part by NASA
(Grant EG-77-G-01-1633)
(NASA-CR-161434) Avail: NTIS HC A02/MF A01 CSCL 10A

The solar energy hot water system installed in the Quality Inn, Key West, Florida, which consists of four buildings is described. Three buildings are low-rise, two-story buildings containing 100 rooms. The fourth is a four-story building with 48 rooms. The solar system was designed to provide approximately 50 percent of the energy required for the domestic hot water system. The solar system consists of approximately 1400 square feet of flat plate collector, two 500 gallon storage tanks, a circulating pump, and a controller. Operation of the system was begun in April 1978, and has continued to date with only three minor interruptions for pump repair. In the first year of operation, it was determined that the use of the solar facility resulted in forty percent fuel savings. R.E.S.

N80-23776*# Gilbert (W. E.) and Associates, Inc., Greenwood, S.C.
SOLAR HEATING SYSTEM INSTALLED AT BLAKEDALE PROFESSIONAL CENTER, GREENWOOD, SOUTH CAROLINA Final Report
Mar. 1980 33 p Sponsored in part by NASA
(Contract EX-76-C-01-2389)
(NASA-CR-161435) Avail: NTIS HC A03/MF A01 CSCL 10B

Information on the solar heating system installed at the Blakedale Professional Center, in Greenwood, South Carolina is presented. The information consists of site and building description, solar system description, performance evaluation, system problems and installation drawings. The solar system was designed to provide approximately 85 percent of the building's heating requirements. The system was installed concurrently with building construction and heats 4,440 square feet of the building. There are 954 square feet of liquid flat plate collectors that are proof-mounted and have a drain-down system to protect the collectors from freezing. A 5,000 gallon steel, polyurethane insulated tank buried underground provides storage. The system was fully instrumented for performance evaluation and integrated into the National Solar Data Network. R.E.S.

N80-23777*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REDOX STORAGE SYSTEMS FOR SOLAR APPLICATIONS
Norman H. Hagedorn and Lawrence H. Thaller 1980 28 p refs Proposed for presentation at Power Sources Conf., Brighton, England, 15-18 Sep. 1980
(Contract EF-77-A-31-1002)
(NASA-TM-81464; DOE/NASA/1002-80/5; E-383) Avail: NTIS HC A03/MF A01 CSCL 10A

The NASA Redox energy storage system is described. The system is based on soluble aqueous iron and chromium chloride redox couples. The needed technology advances in the two elements (electrodes and membranes) that are key to its technological feasibility have been achieved and system development has begun. The design, construction, and test of a 1 kilowatt system integrated with a solar photovoltaic array is discussed. R.E.S.

N80-23791# Hittman Associates, Inc., Columbia, Md.
SOLAR APPLICATIONS OF THERMAL ENERGY STORAGE Final Report
C. Lee, L. Taylor, A. J. DeVries, and S. Heibein Jan. 1979 158 p refs
(Contract EM-78-C-01-4275)
(TID-29430) Avail: NTIS HC A08/MF A01

The preparation technology assessment on solar energy systems which use thermal energy storage was studied. The characterization of the current state-of-the-art of thermal energy storage, an assessment of the energy storage needs of solar energy systems, and the synthesis of this information into preliminary design criteria which would from the basis for detailed designs of thermal energy storage are included. Since the goal of the solar thermal energy storage program is to provide optimum storage units for solar thermal energy systems, the focus was on storage concepts that are either commercially available or will be commercially available by 1979. DOE

N80-23792# Department of Energy, Washington, D. C. Office of Energy Technology.
NOAA'S ROLE IN THE SOLAR ENERGY PROGRAM Annual Report, 1978
Aug. 1979 244 p refs
(DOE/ET-0110) Avail: NTIS HC A11/MF A01

The efforts of the National Oceanic and Atmospheric Administration toward monitoring and documenting the USA solar radiation and related weather data are reported. A format to be used for transfer and processing of related solar data sets is presented. Solar radiation maps of the U.S. for total and direct radiation on a monthly and annual basis are presented and discussed. A section on solar and climatic data applied to subdivisions of the U.S. that are quasi-homogeneous in solar radiation heating demand and topography is included. A listing of the periods of record of all available wind observations in the National Climatic Center's meteorological archives is given. The computational of extra-terrestrial solar radiation, solar evaluation angle, and true solar time of sunrise and sunset is described. Also, research on the effects of aerosols and clouds on solar radiation is described. DOE

N80-23798# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
SOLAR ENERGY PROGRAM EVALUATION: AN INTRODUCTION
Peter deLeon Sep. 1979 112 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-51-294) Avail: NTIS HC A06/MF A01

An overview of the practice and methodology of program evaluation is presented which defines more precisely the evaluation techniques and methodologies that are the most appropiate to government organizations which are actively involved in the research, development, and commercialization of solar energy systems. There are four basic types of evalution designs: the pre-experimental design; the quasi-experimental design based of time series; the quasi-experimental design based on comparision groups; and the true experimental design. DOE

N80-23800# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
DEVELOPMENT OF A SOLAR THERMAL RECEIVER FOR HIGH TEMPERATURE APPLICATIONS
M. Bohn and G. Bessler Nov. 1979 7 p refs Presented at the Semiann. Conf. for Adv. Solar Thermal Tech., Phoenix, Ariz., 11 Dec. 1979
(Contract EG-77-C-02-4042)
(SERI/TP-333-485; CONF-791221-1) Avail: NTIS HC A02/MF A01

A thermal receiver for point focus collectors is described. The receiver uses as a buffer between the cavity surface and the heat transfer fluid a thermal mass, which with a very small temperature drop penalty smooths the flux distribution to eliminate hot spots. The design of the receiver enables significant spillage flux at the receiver to be used. Thus, lower quality optics can be employed in applications not requiring very high temperatures. Design and construction features of the receiver are presented and the testing program is described. DOE

N80-23806# Sandia Labs., Livermore, Calif.
HELIOSTAT DESIGN COST/PERFORMANCE TRADEOFFS
Miriam J. Fish and T. A. Dellin Nov. 1979 50 p refs
(Contracts EY-76-C-04-0789; DE-AC04-76DP-00789)
(SAND-79-8248) Avail: NTIS HC A03/MF A01

The heliostat field comprises the most expensive subsystem of a solar central receiver power plant. Cost reductions might be achieved by either total heliostat redesign or component substitution in existing design. The value of changing any of several design specifications, in the current baseline glass/metal heliostat is discussed. Results are quantified in terms of the breakeven cost; i.e., the cost of a new design which will yield the same total system energy cost as the baseline system. Changes in mirror reflectivity, pointing accuracy, surface quality, canting and focusing strategy, heliostat size, and stow requirements were evaluated. DOE

N80-23810# California Univ., Berkeley. Lawrence Berkeley Lab. Materials and Molecular Research Div.
METAL FOILS FOR DIRECT APPLICATION OF ABSORBER COATINGS ON SOLAR COLLECTORS
Carl M. Lampert Aug. 1979 19 p refs Presented at the 2nd Am. Electroplaters Soc. Symp. on Coatings for Solar Collectors, St. Louis, 16-17 Oct. 1979
(Contract W-7405-eng-48)
(LBL-9324-Rev; CONF-791021-1-Rev) Avail: NTIS HC A02/MF A01

The basic materials and processing associated with the production of coated metal foils for solar collector absorber surfaces are discussed. Also covered are details of heavier metal strips for direct fabrication of solar collectors. Techniques including bonding methods and the use of adhesive are surveyed. Commercial solar foil manufacturers are covered along with the research efforts in this area. In conclusion, advantages and disadvantages are outlined, with specific recommendations. DOE

N80-23811# Monsanto Research Corp., Dayton, Ohio.
LOW-COST MIRROR CONCENTRATOR BASED ON DOUBLE-WALLED METALLIZED, TUBULAR FILMS Semiannual Technical Progress Report, 20 Aug. 1978 - 19 Feb. 1979
J. W. Leffingwell, G. L. Ball, III, J. L. Schuendeman, and T. A. Orofino 30 Mar. 1979 44 p refs
(Contract EM-78-C-04-4227)
(ALO-4227-12; SAPR-2) Avail: NTIS HC A03/MF A01

The development of a potentially, low cost, air inflatable tubular plastic, nontracking 3X solar collector is described. The design employs joined truncated cylindrical sections which reduce both cover and mirror material requirements by 40% compared with a conventional cylindrical design. Aluminum foil-plastic laminates were selected as an alternative to aluminized polyester films because of their low cost, ease of fabrication, good durability, high strength, and acceptable reflectivity. Specially UV-stabilized and polyester scrim reinforced flexible polyvinyl chloride film was selected for use as the outer transparent cover material because of its mechanical and optical durability, acceptable transmission characteristics and its potential low cost. DOE

N80-23812# Foster Wheeler Corp., Livingston, N.J.
SOLAR PRODUCTION OF INDUSTRIAL PROCESS STEAM RANGING IN TEMPERATURE FROM 300 DEG F TO 550 DEG F, PHASE 1. VOLUME 3: APPENDICES (CONT) Final Report, 30 Sep. - 30 Jun. 1979
30 Jun. 1979 243 p refs
(Contract ET-78-C-03-2199)
(DOE/CS-32199-3) Avail: NTIS HC A11/MF A01

The following appendices are included: (1) instruments, (2) electrical specifications, (3) protective coverings, (4) welding requirements, (5) engineering specifications, and (6) administrative. DOE

N80-23813# Foster Wheeler Corp., Livingston, N.J.
SOLAR PRODUCTION OF INDUSTRIAL PROCESS STEAM RANGING IN TEMPERATURE FROM 300 DEGREES F TO 550 DEGREES F, PHASE 1. VOLUME 2: APPENDICES Final Report
30 Jun. 1979 232 p
(Contract ET-78-C-03-2199)
(DOE/CS-32199-2) Avail: NTIS HC A11/MF A01

The following appendices are presented: (1) equipment requisitions, (2) instrument list, (3) mechanical subcontract requisition, (4) electrical subcontract requisition, (5) site preparation and subcontract requisition, (6) building subcontract requisition, and (7) job specifications. DOE

N80-23814# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
SOLAR THERMAL REPOWERING UTILITY VALUE ANALYSIS Final Report
Roger Taylor, John Day (Westinghouse Electric Corp., Pittsburgh), Brian Reed (Westinghouse Electric Corp., Pittsburgh), and Mike Malone (Westinghouse Electric Corp., Pittsburgh) Dec. 1979 225 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-8016-1) Avail: NTIS HC A10/MF A01

The value of a retrofitting central receiver energy supply systems to existing steam-electric generating stations (repowering) is assessed. The modeling tools and assumption used are described and the results are presented and interpreted. DOE

N80-23815# Alabama Univ., Huntsville. Environmental and Energy Center.
DATA HANDBOOK FOR THE NATIONAL SOLAR ENERGY DEMONSTRATION PROGRAM
David L. Christensen May 1979 97 p
(Contract EM-78-S-01-5216)
(DSE/5216-T3) Avail: NTIS HC A05/MF A01

Information is presented in a matrix format listing the technical and programmatic data concerning the various project sites selected for the National Solar Energy Demonstration Program. It incorporates the commercial, residential, and other demonstration projects which are now a part of the national program. DOE

N80-23816# Mega Analytical Research Services, Inc., Silver Spring, Md. Mega Engineering Div.
STUDY AND ANALYSIS OF A LOW COST CEMENT BONDED FLAT PLATE SOLAR COLLECTOR Final Report
Jan. 1979 136 p refs

(Contract EG-77-04-4122)
(ALO-4122-T1) Avail: NTIS HC A07/MF A01

A flat plate collector was designed and tested using low cost materials. This collector absorber plate included copper circulating tubes bonded to a flat sheet of conductive material using high service temperature, low outgassing, high conductivity adhesives. A series of candidate adhesive were evaluated. Structural and thermal tests were performed using galvanized sheet steel collector plates and aluminum collector plates with copper tubes to determine the conductivity of bond joints. The structural integrity of bond joints was evaluated under relative thermal expansion forces at various temperatures (ranging from 35 C to 300 C). Thermal cycling tests were conducted to evaluate fatigue of bond joints and to evaluate the degradation of thermal conductivity of these bond joints. A cost/performance summary was made (using F-chart) to determine the potential cost sevings realized compared with conventional systems. DOE

N80-23817# Monsanto Research Corp., Dayton, Ohio.
NON-CONCENTRATING COLLECTORS FOR SOLAR HEATING APPLICATIONS (MEDIUM TEMPERATURE AIR HEATERS BASED ON DURABLE TRANSPARENT FILMS) Final Report, 30 Sep. 1977 - 31 Oct. 1978
J. W. Leffingwell, J. L. Schwendeman, G. L. Ball, and T. A. Orofino Mar. 1979 143 p refs
(Contract EG-77-C-04-4147)
(ALO-4147-T1; MRC-DA-867) Avail: NTIS HC A07/MF A01

A special UV-stablized and scrim-reinforced flexible photovoltaic conversion film was developed, characterized, and tested on an air solar heater. Solar energy transmission of early precontract 20/mil thick film was determined to be about 83% after two months outdoor Florida exposure, dropping to 78% after two years. Outdoor exposure and artificial UV aging tests indicate that a 10 year lifetime could be possible. The fabricated solar heater had a lower efficiency than predicted from computer modeling (43% for 129 F output with 62 F temperature rise at an ambient temperature of 60 F) suggesting design problems which could most easily be overcome by changing from a double-glazed non-selective absorber collector to a single-glazed-selective absorber heater. DOE

N80-23822# California Univ., Livermore. Lawrence Livermore Lab.
APPLICATION OF SHALLOW SOLAR PONDS FOR INDUSTRIAL PROCESS HEAT: CASE HISTORIES
Alan B. Casamajor 4 May 1979 13 p refs Presented at the Intern. Solar Energy Soc., Atlanta, 28 May - 1 Jun. 1979 Submitted for publication
(Contract W-7405-eng-48)
(UCRL-82367; CONF-790541-57) Avail: NTIS HC A02/MF A01

The shallow solar pond collector system is approaching commercialization. Three prototype or demonstration projects, Sohio Petroleum Company, Sweet Sue Kitchens, and Fort Benning, are described. A critique of each project points out the significant factors that affect the individual projects and shallow-solar pond technology in general. Particular attention is drawn to problems encountered and solutions proposed. Finally, possible marketing organization and strategies are discussed. DOE

N80-23826# Northeast Solar Energy Center, Cambridge, Mass.
STATUS OF INSOLATION RESOURCE ASSESSMENT IN THE NORTHEAST
Susan L. Kannenberg Dec. 1979 35 p refs
(Contract EM-78-C-01-4274)
(NESEC-6) Avail: NTIS HC A03/MF A01

The status of insolation resource assessment is described. Activities performed, services offered, and general features of solar radiation which are significant to the application of solar energy in the Northeast are summarized. DOE

N80-23827# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
OFF-PEAK ELECTRIC AUXILIARY HEAT FOR SOLAR AIR-HEATING SYSTEMS Final Report, 1 Jun. 1977 - 31 Dec. 1978
Thomas B. Jones and Paul J. Wilbur Jan. 1979 51 p refs
(Contract EG-77-S-02-4516)
(COO-4516-1) Avail: NTIS HC A04/MF A01

The performance of various solar auxiliary heating system options was examined by means of computer simulation. A storage reservoir which is separate from the solar reservoir was found to be preferable. Performance was generally not found to be sensitive to the time at which off-peak energy is available. Control schemes that predict energy requirements for a forthcoming on-peak period and account for energy in solar storage are preferable and a reservoir heater that can be staged so heating can be accomplished over the full duration of the on-peak period to supply different levels of energy is desirable. The system installed in a solar house for testing is described. DOE

N80-23836# CCB/CUMALI Associates, Oakland, Calif.
PASSIVE SOLAR CALCULATION METHODS Interim Report
15 Apr. 1979 70 p refs
(Contract EM-78-C-01-5221)
(DSE/5221-T1) Avail: NTIS HC A04/MF A01

The results accomplished under the following tasks: (1) evaluation of existing passive solar calculation methods, (2) BLAST/DOE-1 program interface and comparison with BR-202, and (3) development of analytic relationships between the thermal balance and weighting factor techniques are detailed. The various methods available for use in thermal load analysis are presented with detailed information on algorithm used in the thermal balance and weighting factor techniques. DOE

N80-23837# Bechtel National, Inc., San Francisco, Calif. Research and Engineering Operation.
DESIGN OF LOW-COST STRUCTURES FOR PHOTOVOLTAIC ARRAYS. VOLUME 2: TECHNICAL STUDIES AND APPENDICES Final Report
Nov. 1979 238 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7002-Vol-2) Avail: NTIS HC A11/MF A01

A study of low cost support structures for flat photovoltaic panels set at a fixed angle to the ground was conducted. The work began with a survey of solar system manufacturers. The results showed a diverse approach to the design of support structures and a lack of systematic design criteria. Therefore, a series of conceptual designs of support structures and their foundations were developed based on the use of concrete, steel or aluminum, and timber. A 6 MWe peak baseline photovoltaic power plant was conceptualized in order to bring a practical perspective to cost estimating for the designs. Detailed civil-structural design criteria were developed. These criteria identified loadings for normal operating conditions and extreme environmental conditions. The study results include detailed designs for eight array support structures and foundations for flat plate arrays using 8 foot wide panels with foundations spaced 20 feet apart along the rows in the east-west direction. Cost estimates for supports and foundations were shown to vary between $2 to $3 per square foot of supported panels (deflated to 1975 dollars). DOE

N80-23852# Toledo Univ., Ohio. College of Engineering.
PERFORMANCE IMPROVEMENT OF A SOLAR HEATING SYSTEM UTILIZING OFF-PEAK ELECTRIC AUXILIARY Semiannual Progress Report, 18 Jun. - 31 Dec. 1979
A. H. Eltimsahy Dec. 1979 10 p
(Contract DE-FG02-79R5-10140)
(DOE/R5/10140-1) Avail: NTIS HC A02/MF A01

A solar-assisted heat pump system, which was designed, installed, and operated in an experimental solar house, is described. The heat pump system is capable of operating in a wide range of temperatures which is needed in a solar house utilizing off-peak storage from the electric utility. The complete system consists of 584.1 square feet of flat plate solar collectors, a 5 horsepower compressor, an evaporator, a condensor, thermal storage units, and associated equipment. During the installation and initial operation of the system, numerous aspects of the feasibility of the system design were evaluated. Many of these aspects point to the potentially improved operating performance of a solar heating system utilizing off-peak storage from the electric utility. DOE

N80-23853# Sandia Labs., Albuquerque, N. Mex.
LOW COST STRUCTURES FOR PHOTOVOLTAIC ARRAYS
H. Post 1980 6 p refs Presented at the 14th Photovoltaics Specialists Conf., San Diego, Calif., 7 Jan. 1980
(Contract EY-76-C-04-0789)
(SAND-80-0142C; CONF-800106-9) Avail: NTIS HC A02/MF A01

The design and analysis of low cost, ground-mounted flat plate non-tracking array structures for use in large intermediate and central power station applications are described. Design requirements for the array structure, especially wind loading criteria, are discussed and problem areas associated with the integration of the module panel and support structure are identified. Support system costs which include site preparation, foundation and support structure, and installation costs are summarized. Wind effects data derived from comprehensive wind tunnel tests of flat plate array field models are presented and compared with wind loading estimates based on existing design standards. DOE

N80-23855# Lincoln Lab., Mass. Inst. of Tech., Lexington.
SOLAR PHOTOVOLTAIC PROJECT: MATERIALS, AND TESTING ACTIVITIES Quarterly Report, 1 Apr. - 1 Jun. 1979
S. E. Foreman and M. P. Themelis 31 Oct. 1979 36 p refs
(Contract EY-76-C-02-4094)
(COO-4094-60) Avail: NTIS HC A03/MF A01

Terrestrial photovoltaic modules were tested in the field to determine the extent of physical and electrical degradation which had taken place since previous inspections. Several modules were removed from the sites for more detailed laboratory analysis. In addition degradation analysis of modules from the rooftop of the Chicago Museum of Science and Industry, and failure analysis of modules from the Lincoln Laboratory Rooftop Test Bed and Residential Test Beds was performed. The results of both field testing and the laboratory analyses are reported. DOE

N80-23856# Midwest Research Inst., Kansas City, Mo. Solar Energy Research Inst.
SOLPOND: A SIMULATION PROGRAM FOR SALINITY GRADIENT SOLAR PONDS
Jon Henderson and Cecile M. Leboeuf Jan. 1980 7 p refs Presented at the 2nd Ann. Systems Simulation and Econ. Analysis Conf., San Diego, Calif., 23-25 Jan. 1980
(Contract EG-77-C-01-4042)
(SERI/TP-351-559; CONF-800101-4) Avail: NTIS HC A02/MF A01

A computer simulation design tool was developed to simulate dynamic thermal performance for salinity gradient solar ponds. Dynamic programming techniques allow the user significant flexibility in analyzing pond performance under realistic load and weather conditions. Finite element techniques describe conduction heat transfer through the pond, earth, and edges. Results illustrate typical thermal performance of salinity gradient ponds. Sensitivity studies of salty pond thermal performance with respect to geometry, load, and optical transmission are included. Experimental validation of the program with an operating pond is also presented. DOE

N80-23858# Boeing Computer Services, Inc., Seattle, Wash. Energy Technology Applications Div.
DEVELOPING AND UPGRADING OF SOLAR SYSTEM THERMAL ENERGY STORAGE SIMULATION MODELS Technical Progress Report, 1 Sep. 1978 - 28 Feb. 1979
J. K. Kuhn, G. F. vonFuchs, and A. P. Zob May 1979 70 p refs
(Contract EG-77-C-02-4482)
(BCS-40252) Avail: NTIS HC A04/MF A01

The rock bed solar energy storage model selected for validation was further explored and compared to test data. Correlation with data from different experiments is showing improvement over the correlations reported earlier. Two more water tank models were obtained. Work is continuing with model testing, validation and evaluation. Additional laboratory test data on water tank performance was obtained. Some significant improvements were made in the SOLSYS algorithm resulting in a more powerful simulation tool referred to as the extended SOLSYS model. DOE

N80-23859# Battelle Pacific Northwest Labs., Richland, Wash.
SOLAR REFLECTOR MATERIALS
M. A. Lind 1979 23 p Presented at the USPE Seminar on High-Level Solar Energy, Seattle, 18 May 1979
(Contract EY-76-C-06-1830)
(PNL-SA-7698; CONF-7905134-1) Avail: NTIS HC A02/MF A01

A overview is given of the current state-of-the-art in solar reflector materials which outlines the uses of reflectors in the solar industry and presents some insights into the operational and materials considerations that must be incorporated into the solar reflector design. Current problem areas and research goals are also emphasized. DOE

N80-23867# National Bureau of Standards, Washington, D.C.
SOLAR ENERGY SYSTEMS: TEST METHODS FOR COLLECTOR INSULATIONS
McClure Godette, Jack Lee, and James Fearn Oct. 1979 40 p Sponsored in part by DOE
(PB80-132038; NBSIR-79-1908) Avail: NTIS HC A03/MF A01 CSCL 10A

A preliminary study was performed to evaluate potential procedures for screening the insulation used in collectors. Both standard test methods and newly developed non-standard procedures were used to evaluate twenty-one insulation materials. The insulation parameters measured were selected on the basis of how and to what extent they were affected by the unique environmental conditions within solar collectors. Results of the laboratory tests are discussed and those procedures which offer a potential for screening insulations used in solar collectors are presented. GRA

N80-23868# National Bureau of Standards, Washington, D. C. Structures and Materials Div.
SOLAR ENERGY SYSTEMS: STANDARDS FOR RUBBER HOSE
Robert D. Stiehler and John L. Michalak Nov. 1979 38 p Sponsored in part by DOE
(PB80-129828; NBSIR-79-1917) Avail: NTIS HC A03/MF A01 CSCL 10A

A study of commercial rubber hose was made to develop standards for hoses used in solar energy systems. Twelve hoses were evaluated by cycling between temperatures of about 100 C and temperatures as low as -40 C during a period of about seven months. Laboratory tests for bursting strength, compatibility with metals, compression set, ozone resistance, and water vapor transmission were also made. The results of the tests are presented. Based on these findings a standard for rubber hose used in solar energy systems is proposed. GRA

N80-23869# National Bureau of Standards, Washington, D.C.
SOLAR COLLECTOR FLUID PARAMETER STUDY Final Report, Nov. 1978 - Jun. 1979
Wallace W. Youngblood, William Schultz, and Ralph Barber Oct. 1979 130 p
(Contract EG-77-C-01-4050)
(PB80-125891; NBS-GCR-79-184) Avail: NTIS HC A07/MF A01 CSCL 10A

A series of instantaneous thermal performance tests were performed on four differently constructed, commercially available flat plate solar collectors with each of four commonly used heat transfer fluids. The tests were designed to illustrate the magnitude of fluid parameter effects on the thermal performance of flat plate solar collectors. The configurations were selected to provide a broad variety of flow conditions. The heat transfer fluids used were as follows: (1) water; (2) an ethylene glycol (Prestone 11) water solution (50 percent by weight); (3) a silicone based heat transfer fluid (SLYTHERM 444); and (4) a synthetic hydrocarbon (Therminol 44). GRA

N80-24205# Midwest Research Inst., Golden, Colo. Solar Energy Researh Inst.

TECHNICAL INFORMATION DISSEMINATION PLAN FOR THE US DEPARTMENT OF ENERGY, ETS/SOLAR DIVISIONS

Pete Mourning, Barbara Glenn, Stephen A. Rubin, F. Floyd Shoemaker, and Rob Soto Jan. 1979 74 p
(Contract EG-77-C-01-4042)
(SERI/SP-69-071) Avail: NTIS HC A04/MF A01

A plan for a technical information dissemination (TID) program is presented, the purpose of which is to build the most effective information transfer mechanisms possible to support the earliest appropriate commercialization of solar research and development (R&D) results in five technologies: photovoltaics, solar thermal power, biomass, ocean thermal energy conversion, and wind energy conversion. Coordination, evaluation, and maximum use of ongoing information support services, information activities where the leverage effect appears reasonably high in meeting the goals of the TID program, and involvement of in house and contractor personnel in planning, evaluating, and implementing these technical information dissemination activities are described. Users of solar R&D results are to be involved in external evaluation of technical information activities in each of the five solar technologies. DOE

N80-24344*# Lockheed Missiles and Space Co., Sunnyvale, Calif.

STUDY OF MULTI-kW SOLAR ARRAYS FOR EARTH ORBIT APPLICATION

30 Apr. 1980 334 p
(Contract NAS8-32981)
(NASA-CR-161453; LMSC-D715841) Avail: NTIS HC A14/MF A01 CSCL 22B

Low cost low Earth orbit (LOW) and geosynchronous Earth orbit (GEO) Solar Array concepts in the 300 to 1000 kW range which could be reduced to hardware in the mid 1980's, are identified. Size scaling factors and longer life demands are recognized as the prime drivers for the designs if low life cycle costs for energy are to be achieved. Technology is identified which requires further development in order to assure component readiness and availability. Use of the low concentration ratio (CR) concentrator, which uses gallium arsenide solar cells for both LEO and GEO applications, is recommended. E.D.K.

N80-24345*# Lockheed Missiles and Space Co., Sunnyvale, Calif.

STUDY OF MULTI-kW SOLAR ARRAYS FOR EARTH ORBIT APPLICATION Progress Report, 15 Mar. 1979 - 1 Mar. 1980

21 Mar. 1980 202 p
(Contract NAS8-32981)
(NASA-CR-161452; LMSC-D715827) Avail: NTIS HC A10/MF A01 CSCL 22B

Planar and concentrator solar array configurations based on silicon and gallium arsenide solar cells were conceptualized and on-orbit maintainability was addressed. Four basic categories emerged: (1) planar (non concentrated) with silicon cells, (2) low-CR (concentration ratio = 3.4) with silicon cells, (3) low-CR with GaAs, and (4) high-CR (concentration ratio = 62.5) with GaAs. A very high-CR (concentration ratio = 200) was investigated but rejected on thermal grounds. Nonrecurring and recurring cost elements for each of the four concepts selected were compared over a 15 year life cycle. Under conditions where the gallium arsenide cells can be produced for less than $25 per 2 x 2 cm, the low CR concentrator emerges as the most cost effective configuration. However, the producibility risk remains higher on the gallium arsenide cell. R.E.S.

N80-24495# Sandia Labs., Livermore, Calif. Solar Programs Dept.

OVERALL EFFICIENCIES FOR CONVERSION OF SOLAR ENERGY TO A CHEMICAL FUEL

J. D. Fish 1979 22 p refs Presented at the 2nd Miami Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10 Dec. 1979
(Contracts EY-76-C-04-0789; DE-AC04-76DP-00789)
(SAND-79-8636; CONF-791204-9) Avail: NTIS HC A02/MF A01

A complete and consistent schema for determining the overall efficiency of a generalized process for the conversion of solar energy into a chemical fuel was developed and applied to seven conversion processes. The overall efficiency of each of these processes is determined by ten common factors: maximum theoretical efficiency; inherent absorption losses; inherent internal losses; rate limiting effects; reflection losses; transmission losses; coverage losses; system construction requirements; parasitic losses; and harvesting and conversion losses. DOE

N80-24741* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD OF MITIGATING TITANIUM IMPURITIES EFFECTS IN P-TYPE SILICON MATERIAL FOR SOLAR CELLS Patent

Amal M. Salama, inventor (to NASA) (JPL) Issued 6 May 1980 7 p Filed 31 Jan. 1979 Supersedes N79-17315 (17 - 08, p 1001) Sponsored by NASA
(NASA-Case-NPO-14635-1; US-Patent-4,210,622;
US-Patent-Appl-SN-008212; US-Patent-Class-156-605;
US-Patent-Class-156-617SP; US-Patent-Class-156-DIG.64;
US-Patent-Class-136-89SG; US-Patent-Class-252-62.3E) Avail: US Patent and Trademark Office CSCL 10A

An economical way to reduce the deleterious effects of titanium, one of the impurities present in metallurgical grade silicon material, is disclosed. By adding copper to approximately the same concentration level of the titanium during the melting process, the conversion efficiency will be restored to about 99.3% of what it would have been if the single crystal silicon had been grown free of titanium impurities.

Official Gazette of the U.S. Patent and Trademark Office

N80-24742*# PRC Systems Services Co., Huntsville, Ala.

SOLAR ARRAY SUBSYSTEMS STUDY Final Report, Mar. 1979 - May 1980

P. W. Richardson, F. Q. Miller, and M. B. Badgley 6 Jun. 1980 284 p
(Contract NAS3-21926)
(NASA-CR-159857) Avail: NTIS HC A13/MF A01 CSCL 10A

The effects on life cycle costs of a number of technology areas are examined for a LEO, 500 kW solar array. A baseline system conceptual design is developed and the life cycle costs estimated in detail. The baseline system requirements and design technologies are then varied and their relationships to life cycle costs quantified. For example, the thermal characteristics of the baseline design are determined by the array materials and masses. The thermal characteristics in turn determine configuration, performance and hence life cycle cost. Author

N80-24744*# Tao (William) and Associates, St. Louis, Mo.

SOLAR HEATING AND HOT WATER SYSTEM INSTALLED AT SAINT LOUIS, MISSOURI Final Report

Apr. 1980 68 p refs Sponsored by NASA
(Grant EG-77-G-01-4085)
(NASA-CR-161420) Avail: NTIS HC A04/MF A01 CSCL 10A

The solar heating and hot water system installed at the William Tao & Associates, Inc., office building in St. Louis, Missouri is described, including maintenance and construction problems, final drawings, system requirements, and manufacturer's component data. The solar system was designed to provide 50 percent of the hot water requirements and 45 percent of the space heating needs for a 900 sq ft office space and drafting room. The solar facility has 252 sq ft of glass tube concentrator collectors and a 1000 gallon steel storage tank buried below a concrete slab floor. Freeze protection is provided by a propylene glycol/water mixture in the collector loop. The collectors are roof mounted on a variable tilt array which is adjusted seasonally and is connected to the solar thermal storage tank by a tube-in-shell heat exchanger. Incoming city water is preheated through the solar energy thermal storage tank. R.E.S.

N80-24745*# Wyle Labs., Inc., Huntsville, Ala. Solar Energy Systems Div.
COMPARISON OF INDOOR-OUTDOOR THERMAL PERFORMANCE FOR THE SUNPAK EVACUATED TUBE LIQUID COLLECTOR
Mar. 1980 48 p Sponsored by NASA
(Contract DEN-000006)
(NASA-CR-161421; Wyle-TR-531-40-R) Avail: NTIS HC A03/MF A01 CSCL 10A

Performance data for current Sunpak production collectors is presented. The effects of an improved manifold are seen from the test results. The test results show excellent correlation between the solar simulator derived test results and outdoor test results. Also, because of different incident angle modifiers, the all-day efficiency of this collector with a diffuse reflector is comparable to the performance with the standard shaped specular reflector. R.E.S.

N80-24746*# General Electric Co., Philadelphia, Pa. Space Div.
SOLAR HEATING AND COOLING SYSTEM DESIGN AND DEVELOPMENT Final Report
Oct. 1979 106 p ref Sponsored in part by DOE
(Contract NAS8-32092)
(NASA-CR-161422) Avail: NTIS HC A06/MF A01 CSCL 10A

The design and development of marketable solar heating and cooling systems for single family and commercial applications is described. The delivery, installation, and monitoring of the prototype systems are discussed. Seven operational test sites are discussed in terms of system performance. Problems encountered with equipment and installation were usually due to lack of skills required for solar system installation. R.E.S.

N80-24747*# National Aeronautics and Space Administration. Pasadena Office, Calif.
SOLAR-HEATED FLUIDIZED BED GASIFICATION SYSTEM Patent Application
Shaik A. Qader, inventor (to NASA) (JPL) Filed 15 May 1980 13 p
(Contract NAS7-100)
(NASA-Case-NPO-15071-1; US-Patent-Appl-SN-150115) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar-powered fluidized bed gasification system for gasifying carbonaceous material is disclosed. The system includes a solar gasifier which is heated by fluidizing gas and steam. Energy to heat the gas and steam is supplied by a high heat capacity refractory honeycomb which surrounds the fluid bed reactor zone. The high heat capacity refractory honeycomb is heated by solar energy focused on the honeycomb by solar concentrator through solar window. The fluid bed reaction zone is also heated directly by thermal contact to the high heat capacity ceramic honeycomb with the walls of the fluidized bed reactor. Provisions are also made for recovering and recycling catalysts used in the gasification process. A back-up furnace is provided for start-up procedures and for supplying heat to the fluid bed reaction zone when adequate supplies of solar energy are not available. NASA

N80-24750*# Jet Propulsion Lab., California Inst. of Tech., Pasadena
SOLAR THERMAL POWER SYSTEMS POINT-FOCUSING THERMAL AND ELECTRIC APPLICATIONS PROJECTS. VOLUME 1: EXECUTIVE SUMMARY Annual Technical Report, fiscal year 1979
A. Marriott 15 Jan. 1980 36 p 2 Vol.
(Contracts NAS7-100, DE-AI01-79ET-20307; JPL Proj. 5103-93)
(NASA-CR-163147; DOE/JPL-1060-31-Vol-1; JPL-Pub-79-118-Vol-1) Avail: NTIS HC A03/MF A01 CSCL 10A

The activities of the Point-Focusing Thermal and Electric Applications (PETEA) project for the fiscal year 1979 are summarized. The main thrust of the PFTEA Project, the small community solar thermal power experiment, was completed. Concept definition studies included a small central receiver approach, a point-focusing distributed receiver system with central power generation, and a point-focusing distributed receiver concept with distributed power generation. The first experiment in the Isolated Application Series was initiated. Planning for the third engineering experiment series, which addresses the industrial market sector, was also initiated. In addition to the experiment-related activities, several contracts to industry were let and studies were conducted to explore the market potential for point-focusing distributed receiver (PFDR) systems. System analysis studies were completed that looked at PFDR technology relative to other small power system technology candidates for the utility market sector. R.E.S.

N80-24751*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SOLAR THERMAL POWER SYSTEMS POINT-FOCUSING DISTRIBUTED RECEIVER TECHNOLOGY PROJECT. VOLUME 2: DETAILED REPORT Annual Technical Report, fiscal year 1979
1 Apr. 1980 134 p refs Prepared in part by NASA. Lewis Res. Center, Cleveland, Ohio 2 Vol.
(Contracts NAS7-100; DE-AI01-79ET-20307; JPL Proj. 5104-61)
(NASA-CR-159715; DOE/JPL-1060-30-Vol-2; JPL-Pub-79-112-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 10A

The accomplishments of the Point-Focusing Distributed Receiver Technology Project during fiscal year 1979 are detailed. Present studies involve designs of modular units that collect and concentrate solar energy via highly reflective, parabolic-shaped dishes. The concentrated energy is then converted to heat in a working fluid, such as hot gas. In modules designed to produce heat for industrial applications, a flexible line conveys the heated fluid from the module to a heat transfer network. In modules designed to produce electricity the fluid carries the heat directly to an engine in a power conversion unit located at the focus of the concentrator. The engine is mechanically linked to an electric generator. A Brayton-cycle engine is currently being developed as the most promising electrical energy converter to meet near-future needs. R.E.S.

N80-24752*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
RESULTS OF THE 1979 NASA/JPL BALLOON FLIGHT SOLAR CELL CALIBRATION PROGRAM
C. H. Seaman and R. S. Weiss 1 May 1980 17 p refs
(Contract NAS7-100)
(NASA-CR-163013; JPL-Pub-80-31) Avail: NTIS HC A02/MF A01 CSCL 10A

Calibration of solar cells to be used as reference standards in simulator testing of cells and arrays was accomplished. Thirty-eight modules were carried to an altitude of about 36 kilometers during the solar cell calibration balloon flight. E.D.K.

N80-24753*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
THE APPLICABILITY OF DOE SOLAR CELL AND ARRAY TECHNOLOGY TO SPACE POWER
John A. Scott-Monck, Paul M. Stella, and Paul A. Berman 1 May 1980 27 p refs
(Contract NAS7-100)
(NASA-CR-163143; JPL-Pub-80-29) Avail: NTIS HC A03/MF A01 CSCL 10B

An evaluation of the main terrestrial photovoltaic development projects was performed. Technologies that may have applicability to space power are identified. Where appropriate, recommendations are made for programs to capitalize on developed technology. It is concluded that while the funding expended by DOE is considerably greater than the space (NASA and DOD) budget for photovoltaics, the terrestrial goals and the means for satisfying them are sufficiently different from space needs that little direct benefit currently exists for space applications. R.E.S.

N80-24755*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

PROPOSED METHOD FOR DETERMINING THE THICKNESS OF GLASS IN SOLAR COLLECTOR PANELS
Donald M. Moore 1 Mar. 1980 74 p refs
(Contracts NAS7-100; EX-76-A-29-1012)
(NASA-CR-163151; DOE/JPL-1012-41; JPL-Pub-80-34) Avail: NTIS HC A04/MF A01 CSCL 10A

An analytical method was developed for determining the minimum thickness for simply supported, rectangular glass plates subjected to uniform normal pressure environmental loads such as wind, earthquake, snow, and deadweight. The method consists of comparing an analytical prediction of the stress in the glass panel to a glass breakage stress determined from fracture mechanics considerations. Based on extensive analysis using the nonlinear finite element structural analysis program ARGUS, design curves for the structural analysis of simply supported rectangular plates were developed. These curves yield the center deflection, center stress and corner stress as a function of a dimensionless parameter describing the load intensity. A method of estimating the glass breakage stress as a function of a specified failure rate, degree of glass temper, design life, load duration time, and panel size is also presented. R.E.S.

N80-24760*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
PROCEEDINGS OF THE FIRST SEMIANNUAL DISTRIBUTED RECEIVER PROGRAM REVIEW
15 May 1980 241 p refs Proc. held at Lubbock, Tex., 22-24 Jan. 1980; sponsored in part by Texas Tech. Univ.
(Contracts NAS7-100; DE-AI01-79ET-20307)
(NASA-CR-163135; DOE/JPL-1060-33; JPL-Pub-80-10) Avail: NTIS HC A11/MF A01 CSCL 10B

Point focus and line focus distributed receiver solar thermal technology for the production of electric power and of industrial process heat is addressed. Concentrator, receiver, and power conversion development are covered along with hardware tests and evaluation. Mass production costing, parabolic dish applications, and trough and bowl systems are included.

N80-24761*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
HEAT AND ELECTRICITY FROM THE SUN USING PARABOLIC DISH COLLECTOR SYSTEMS
Vincent C. Truscello and A. Nash Williams *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 19-26 refs
Avail: NTIS HC A11/MF A01 CSCL 10A

Point focus distributed receiver solar thermal technology for the production of electric power and of industrial process heat is addressed. The thermal power systems project which emphasizes the development of cost effective systems which will accelerate the commercialization and industrialization of plants up to 10 MWe, using parabolic dish collectors is described. The projected size of the isolated load market in the 1990-2000 time period is 300 to 1000 MW/year. Although this market is small in comparison to the grid connected utility market, it is indicated that by assuming only a 20 percent market penetration, up to 10,000 power modules per year would be required to meet this need. At a production rate of 25,000 units/year and assuming no energy storage, levelized bus bar energy costs of 75 mills/kWeh are projected. These numbers are based on what is believed to be a conservative estimate regarding engine-generator conversion efficiency (40 percent) for the 1990 time period. With a more optimistic estimate of efficiency (i.e., 45 percent), the bus bar cost decreases to about 67 mills/kWeh. At very large production rates (400,000 modules/years), the costs decrease to 58 mills/kWeh. Finally, the present status of the technology development effort is discussed. J.M.S.

N80-24762*# Sandia Labs., Albuquerque, N. Mex. Solar Energy Projects Dept.
LINE-FOCUS CONCENTRATING COLLECTOR PROGRAM
Virgil L. Dugan *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 27-33

Avail: NTIS HC A11/MF A01 CSCL 10A

The Line-Focus Concentrating Collector Program has emphasized the development and dissemination of concentrating solar technology in which the reflected sunlight is focused onto a linear or line receiver. Although a number of different types of line-focus concentrators were developed, the parabolic trough has gained the widest acceptance and utilization within the industrial and applications sectors. The trough is best applied for application scenarios which require temperatures between 140 and 600 F. Another concept, the bowl, is investigated for applications which may require temperatures in the range between 600 and 1200 F. Current technology emphases are upon the reduction of system installation cost and the implementation of production oriented engineering. J.M.S.

N80-24763*# E-Systems, Inc., Dallas, Tex. Energy Technology Center.
TEST BED CONCENTRATOR (TBC)
Vernon R. Goldberg *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 35-39

Avail: NTIS HC A11/MF A01 CSCL 10A

A point focussing concentrator design adapted from an existing communications antenna for use in a solar test bed application is described. The structure design, configured for use with JPL's spherical radius mirror panels, made no attempt toward optimization. The key objectives of stiffness, pointing accuracy, and timely delivery were exceeded. The system weight is approximately 16,000 Kg (36,000 lbs) and has a calculated 1 sigma system error of 0.03 degrees. J.M.S.

N80-24764*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
TEST BED CONCENTRATOR MIRRORS
M. J. Argoud *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 41-46

Avail: NTIS HC A11/MF A01 CSCL 10A

The test bed concentrator (TBC) was des point focusing distributed receiver (PFDR) systems. The reflective surface of the concentrator was fabricated using mirror facet designs and techniques. The facets are made by bonding mirrored glass to spherically-conducted substrates. Several aspects of earlier work were reevaluated for application to the TBC: optimum glass block size, material selection, environmental test, optical characteristics, and reliability. A detailed explanation of tooling, substrate preparation, testing techniques, and mirror assembly is presented. J.M.S.

N80-24765*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
INITIAL TEST BED CONCENTRATOR CHARACTERIZATION
D. J. Starkey *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 47-51

Avail: NTIS HC A11/MF A01 CSCL 10A

The operational characteristics and the mirror alignment technique of the test bed concentrator control system are highlighted. The final design of the TBC control system provided one axis of fast slew capability so that either the Sun acquisition or emergency off-Sun mode could be obtained in a minimum time. The procedure for getting on and off Sun is to run the elevation axis up to the approximate elevation of the Sun for the particular time of acquisition and then slew the concentrator on Sun in azimuth. The automatic Sun-acquisition system is controlled by two Sun sensors, one for each axis; each has a 2 deg acquisition cone angle within which the concentrators are programmed to point. The mirror alignment technique chosen utilized a semi-distant incandescent light source which produced a reflected image on the focal point target. The concentrator was boresighted to the light by moving the concentrator while sighting along the cross hairs and through the apertures in the disks to the light source resulting in a maximum point error of 0.11 deg. Test plans to install a solar flux mapper to characterize the solar spot and to measure the size, shape, and intensity of the Sun's image are outlined. J.M.S.

N80-24766*# OMNIUM-G Co., Anaheim, Calif.
THE OMNIUM-G HTC-25 TRACKING CONCENTRATOR
S. Zelinger *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 53-57

Avail: NTIS HC A11/MF A01 CSCL 10A

A point focusing, two axis tracking, high concentration ratio parabolic reflector is described. Field experience coupled with engineering improvements are shown to have manifested a design that is economic in the areas of manufacturing, packaging, delivering, installing, and commissioning the system into operation. The initial problems specifically with the OMNIUM-G model HTC-25 tracking concentrator are addressed. J.M.S.

N80-24767*# General Electric Co., Philadelphia, Pa. Advanced Energy Dept.
THE SHENANDOAH CONCENTRATOR
A. J. Poche *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 59-61 refs

(Contracts DE-AC04-77ET-20260; EG-77-C-04-3985)
Avail: NTIS HC A11/MF A01 CSCL 10A

A 7 meter diameter, parabolic dish solar collector was designed and developed for first application at Shenandoah, Georgia. Key features and requirements for the collector are outlined. Performance test results for collector testing at Sandia Laboratories in Albuquerque are summarized. The key features, requirements and performance of the solar collector subassemblies/subsystems are discussed: mount and drives, reflector, receiver, and collector control unit. Problems experienced during collector testing in Albuquerque are identified and solutions described. J.M.S.

N80-24768*# General Electric Co., Philadelphia, Pa.
THE 1ST GENERATION LOW COST POINT FOCUS SOLAR CONCENTRATOR
J. Zimmerman *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 63-67
Avail: NTIS HC A11/MF A01 CSCL 10A

A point focus solar concentrator that, given a high volume of production, will optimize the ratio of performance to cost is considered. The concentrator design approach has evolved by a systematic process of examining the operating requirements particular to the solar application, minimizing material content through detail structural design and structurally efficient subsystem features, and utilizing materials and processes compatible with high volume production techniques. The design approach, the rationale for the configuration and subsystem selections, and the development status are described. J.M.S.

N80-24769*# Acurex Corp., Mountain View, Calif.
A CELLULAR GLASS SUBSTRATE SOLAR CONCENTRATOR
Roger Bedard and D. Bell *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 69-73

Avail: NTIS HC A11/MF A01 CSCL 10A

The design of a second generation point focusing solar concentration is discussed. The design is based on reflective gores fabricated of thin glass mirror bonded continuously to a contoured substrate of cellular glass. The concentrator aperture and structural stiffness was optimized for minimum concentrator cost given the performance requirement of delivering 56 kWth to a 22 cm diameter receiver aperture with a direct normal insolation of 845 watts sq m and an operating wind of 50 kmph. The reflective panel, support structure, drives, foundation and instrumentation and control subsystem designs, optimized for minimum cost, are summarized. The use of cellular glass as a reflective panel substrate material is shown to offer significant weight and cost advantages compared to existing technology materials. R.E.S.

N80-24770*# AiResearch Mfg. Co., Torrance, Calif.
THE DEVELOPMENT OF AN AIR BRAYTON AND A STEAM RANKINE SOLAR RECEIVER
Max V. Greeven *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 75-85 refs

Avail: NTIS HC A11/MF A01 CSCL 10B

An air Brayton and a steam Rankine solar receiver now under development are described. These cavity receivers accept concentrated insolation from a single point focus, parabolic concentrator, and use this energy to heat the working fluid. Both receivers were designed for a solar input of 85 kw. The air Brayton receiver heats the air to 816 C. A metallic plate-fin heat transfer surface is used in this unit to effect the energy transfer. The steam Rankine receiver was designed as a once-through boiler with reheat. The receiver heats the water to 704 C to produce steam at 17.22 MPa in the boiler section. The reheat section operates at 1.2 MPA, reheating the steam to 704 C. R.E.S.

N80-24771*# Ford Aerospace and Communications Corp., Newport Beach, Calif. Aeronutronic Div.
AN ORGANIC RANKINE RECEIVER FOR THE SCSTPE PROGRAM
D. B. Osborn *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 87-93 refs

Avail: NTIS HC A11/MF A01 CSCL 10B

The organic Rankine cycle receiver which is presently being developed is described. The receiver employs an integrated cavity/pool boiler which permits the design of a small, lightweight, low cost and efficient moderate temperature receiver for use in a dish-Rankine solar thermal system. R.E.S.

N80-24777*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
OMNIUM-G CONCENTRATOR TEST RESULTS
Jack D. Patzold *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 125-131
Avail: NTIS HC A11/MF A01 CSCL 10A

A performance evaluation was conducted on a commercially available point-focus solar concentrator, the Heliodyne model HTC-25s tracker/concentrator. Thermal power test results indicate that slightly more than six kilowatts of thermal energy is available from a system of this configuration using a 10 cm aperture. R.E.S.

N80-24779*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
COSTING THE OMNIUM-G SYSTEM 7500
H. R. Fortgang *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 139-144

Avail: NTIS HC A11/MF A01 CSCL 05C

A complete OMNIUM-G System 7500 was cost analyzed for annual production quantities ranging from 25 to 10,000 units per year. Parts and components were subjected to in-depth scrutiny to determine optimum manufacturing processes, coupled with make or buy decisions on materials and small parts. When production quantities increase both labor and material costs reduce substantially. A redesign of the system that was analyzed could result in lower costs when annual production runs approach 100,000 units/year. Material and labor costs for producing 25, 100, 25,000 and 100,00 units are given for 17 subassembly units. A.R.H.

N80-24780*# Pioneer Engineering and Mfg. Co., Inc., Warren, Mich.
TBC COSTING
Henry L. Kaminski *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 145-152

Avail: NTIS HC A11/MF A01 CSCL 05C

Procedures to be used in determining the cost of producing and installing a parabolic dish collector in annual production volumes of 10,000, 50,000, 100,000, and 1,000,000 units include (1) evaluating each individual part for material cost and for the type and number of operations required to work the raw material into the finished part; (2) costing labor, burden, tooling, gaging, machinery, and equipment; (3) estimating facilities requirements for each production volume; and (4) considering suggestions for design and material alterations that could result in cost reduction. A.R.H.

N80-24782*# Ford Aerospace and Communications Corp., Newport Beach, Calif. Aeronutronic Div.

THE DISH-RANKINE SCSTPE PROGRAM (ENGINEERING EXPERIMENT NO. 1)

Robert L. Pons and Carl E. Grigsby *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 159-167 ref

Avail: NTIS HC A11/MF A01 CSCL 10A

Activities planned for phase 2 of the Small Community Solar Thermal Power Experiment (PFDR) program are summarized with emphasis on a dish-Rankine point focusing distributed receiver solar thermal electric system. Major design efforts include: (1) development of an advanced concept indirect-heated receiver;(2) development of hardware and software for a totally unmanned power plant control system; (3) implementation of a hybrid digital simulator which will validate plant operation prior to field testing; and (4) the acquisition of an efficient organic Rankine cycle power conversion unit. Preliminary performance analyses indicate that a mass-produced dish-Rankine PFDR system is potentially capable of producing electricity at a levelized busbar energy cost of 60 to 70 mills per KWh and with a capital cost of about $1300 per KW. A.R.H.

N80-24783*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

SITING SOLAR THERMAL POWER EXPERIMENTS

Herbert J. Holbeck *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 169-173

Avail: NTIS HC A11/MF A01 CSCL 10A

The Small Community Solar Thermal Power Experiment will test a point-focusing, distributed receiver system in a small community, electric utility application. Site planning is becoming increasingly important for solar experiments as well as all kinds of development due to increased competition for desirable sites and increased complexity of regulatory requirements. Siting issues can be categorized as: (1) resources and physical environmental at this site; (2) acquisition, permits and regulations; and (3) development requirements and costs. These issues are addressed with respect to the unique requirements of solar thermal power experiments. A.R.H.

N80-24784*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

THE JPL ISOLATED APPLICATION EXPERIMENT SERIES

Richard R. Levin *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 175-179

Avail: NTIS HC A11/MF A01 CSCL 10A

A set of small (approximately 60-150 kWe) solar thermal power experiments, each of which is meant to address a separate isolated load application, will employ point focusing distributed receiver technology with emphasis on electric and possibly some thermal power applications. The program will be closely integrated with the technology development element of the thermal power systems project with the objective of utilizing the technologies being developed under that program. A.R.H.

N80-24785*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.

INDUSTRIAL APPLICATION EXPERIMENT SERIES

Steven A. Bluhm *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 181-184

Avail: NTIS HC A11/MF A01 CSCL 10A

The deployment of parabolic dish systems into the industrial sector for the purpose of providing users, suppliers, sponsors, and developers with a realistic assessment of system feasibility in selected near-term industrial applications will be accomplished initially through the industrial module experiment and later through additional experiments involving thermal, electric, and combined thermal and electrical systems. The approach is to progress through steps, from single module to multi-module systems, from thermal-only applications to more complex combined thermal and electric applications. The experience of other solar thermal experiments, particularly those involving parabolic dish hardware, will be utilized to the fullest extent possible in experiment planning and implementation. A.R.H.

N80-24786*# General Electric Co., Philadelphia, Pa.

SPS MARKET ANALYSIS

Hugh C. Goff *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 185-189

Avail: NTIS HC A11/MF A01 CSCL 05C

A market analysis task included personal interviews by GE personnel and supplemental mail surveys to acquire statistical data and to identify and measure attitudes, reactions and intentions of prospective small solar thermal power systems (SPS) users. Over 500 firms were contacted, including three ownership classes of electric utilities, industrial firms in the top SIC codes for energy consumption, and design engineering firms. A market demand model was developed which utilizes the data base developed by personal interviews and surveys, and projected energy price and consumption data to perform sensitivity analyses and estimate potential markets for SPS. A.R.H.

N80-24787*# BDM Corp., McLean, Va.

MILITARY MARKETS FOR SOLAR THERMAL ELECTRIC POWER SYSTEMS

James S. Hauger *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 191-195

Avail: NTIS HC A11/MF A01 CSCL 10B

The Departmant of Defense maintains an inventory of over 1,800 MW of engine-generators 15 KW and larger, with an estimated procurement rate of over 140 MW/year. Nearly the entire requirement could be met by advanced heat engines of the types being developed as point-focussing, distributed receiver power plants. A conceptual system consisting of a heat engine which efficiently burns liquid fossil or synthetic fuels, with a 'solarization kit' for conversion to hybrid solar operation could meet existing DOD requirements for new systems which are quieter, lighter, and multi-fueled. An estimated 24 percent (33 MW/year) or more could operationally benefit from the solar option. Baseline cost projections indicate levelized energy cost goals of 210 to 120 mills/KWh (15 to 1000 KW systems). Fuel cost escalation is the major factor affecting the value of the solar option. A baseline calculation for fuel at $0.59/gal in spring, 1979, escalating at 8 percent above general inflation indicates a value of $2700/KWe for a solarization kit. A.R.H.

N80-24788*# Science Applications, Inc., McLean, Va.

SOLAR THERMAL PLANT IMPACT ANALYSIS AND REQUIREMENTS DEFINITION

Yudi P. Gupta *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 197-209

(Contract JPL-955238)

Avail: NTIS HC A11/MF A01 CSCL 10B

Progress on a continuing study comprising of ten tasks directed at defining impact and requirements for solar thermal power systems (SPS), 1 to 10 MWe each in capacity, installed during 1985 through year 2000 in a utility or a nonutility load in the United States is summarized. The point focus distributed receiver (PFDR) solar power systems are emphasized. Tasks 1 through 4, completed to date, include the development of a comprehensive data base on SPS configurations, their performance, cost, availability, and potential applications: user loads, regional characteristics, and an analytic methodology that incorporates the generally accepted utility financial planning methods and several unique modifications to treat the significant and specific characteristics of solar power systems deployed in either central or distributed power generation modes, are discussed. E.D.K.

N80-24789*# Little (Arthur D.), Inc., San Francisco, Calif.
A STUDY OF MASS PRODUCTION AND INSTALLATION OF SMALL SOLAR THERMAL ELECTRIC POWER SYSTEMS
John F. Butterfield *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 211-215

Avail: NTIS HC A11/MF A01 CSCL 10B

Technological constraints, materials availability, production capacity, and manufacturing and installations plans and costs at different production levels are included in a study of concentrating collector industrialization. As cobalt for the engine and receiver is supply limited, alternative lower temperature alloys and higher temperature materials such as ceramics are discussed. Economics and production efficiency favor co-location of cellular and thin glass production for reflectors. Assembly and installation are expensive for small sites and few alternatives exist to apply mass production techniques to lower these costs for the selected design. Stepping motors in the size and quantities required are not commercially available today but could be in the future. E.D.K.

N80-24790*# Texas Technological Univ., Lubbock. Dept. of Electrical Engineering.
THE CROSSBYTON PROJECT
John D. Reichert *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 217-220

Avail: NTIS HC A11/MF A01 CSCL 10B

The Analog Design Verification System (ADVS), the largest single solar collector built, was tested. Referred to as the Solar Gridiron or Bowl Concept, it employs a stationary mirror, with tracking accomplished by the mirror. E.D.K.

N80-24791*# Acurex Corp., Mountain View, Calif.
IEA/SPS 500 kW DISTRIBUTED COLLECTOR SYSTEM
Temple W. Neumann and Creighton D. Hartman *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 221-227
Avail: NTIS HC A11/MF A01 CSCL 10A

Engineering studies for an International Energy Agency project for the design and construction of a 500 kW solar thermal electric power generation system of the distributed collector system (DCS) type are reviewed. The DCS system design consists of a mixed field of parabolic trough type solar collectors which are used to heat a thermal heat transfer oil. Heated oil is delivered to a thermocline storage tank from which heat is extracted and delivered to a boiler by a second heat transfer loop using the same heat transfer oil. Steam is generated in the boiler, expanded through a steam turbine, and recirculated through a condenser system cooled by a wet cooling tower. E.D.K.

N80-24792*# Arizona Univ., Tucson. Dept. of Soils, Water and Engineering.
COOLIDGE SOLAR POWERED IRRIGATION PUMPING PROJECT
Dennis L. Larson *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 229-233 refs

Avail: NTIS HC A11/MF A01 CSCL 10B

A 150 kW solar thermal electric power plant which includes over 2100 square meters of parabolic trough type collectors and an organic Rankine cycle turbine engine was constructed on an irrigated farm. The plant is interconnected with the electrical utility grid. Operation is providing an evaluation of equipment performance and operating and maintenance requirements as well as the desirability of an on farm location. E.D.K.

N80-24793*# Battelle Columbus Labs., Ohio.
THE 50-HORSEPOWER SOLAR-POWERED IRRIGATION FACILITY LOCATED NEAR GILA BEND, ARIZONA
Wilbur A. Smith, G. Alexander, and D. F. Busch *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 235-239
Avail: NTIS HC A11/MF A01 CSCL 10B

The 50 horsepower solar powered irrigation facility near Gila Bend, Arizona which includes a Rankine cycle demonstrates the technical feasibility of solar powered pumping. The design of a facility specifically for the irrigation farmer using the technology that has been developed over the last four years is proposed. E.D.K.

N80-24794*# New Mexico State Univ., Las Cruces.
PRELIMINARY OPERATIONAL RESULTS FROM THE WILLARD SOLAR POWER SYSTEM
Donald L. Fenton, G. H. Abernathy, G. Krivokapich, D. E. Ellibee, and V. Chilton *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 241-246 refs

Avail: NTIS HC A11/MF A01 CSCL 10B

The solar powered system located near Willard, New Mexico, generates mechanical or electrical power at a capacity of 19 kW (25 HP). The solar collection system incorporates east/west tracking parabolic trough collectors with a total aperture area of 1275 sq m (13,720 sq ft). The hot oil type thermal energy storage is sufficient for approximately 20 hours of power system operation. The system utilizes a reaction type turbine in conjunction with an organic Rankine cycle engine. Total collector field efficiency reaches a maximum of 20 percent near the winter solstice and about 50 percent during the summer. During the month of July, 1979, the system pumped 60 percent of the 35,300 cu m (28.6 acre-feet) of water delivered. Operating efficiencies for the turbine component, organic Rankine cycle engine and the complete power system are respectively 65 to 75 percent, 12 to 15 percent and 5 to 6 percent. Significant maintenance time was expended on both the collector and power systems throughout the operational period. Author

N80-24795*# Georgia Power Co., Atlanta.
SOLAR TOTAL ENERGY-LARGE SCALE EXPERIMENT, SHENANDOAH, GEORGIA
Walter R. Hensley *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 247-249

Avail: NTIS HC A11/MF A01 CSCL 10A

The design and development of a 7 meter diameter parabolic dish solar collector are discussed. Each of the four main subsystems of the collector: (1) reflector, (2) mount and drives, (3) receiver and (4) the controls, is discussed briefly with the major emphasis on the receiver design. To minimize development risks and production costs, a dish design based on use of stamped aluminum petals (sectors) was chosen. This design is similar to the design of a communication antenna already commercially produced. The reflective surface of the petals has a total reflectance of .86 and a specularity (dispersion) of 8 mrd. This performance is obtained by mechanical polishing and chemical brightening of the petal surface, followed by application of a clear RTV silicone protective coating. Selection of the material and weather proofing coated are discussed. Results from performance tests on an engineering development dish collector are presented and compared with pretest predictions. J.M.S.

N80-24796*# General Electric Co., Philadelphia, Pa.
SOLAR TOTAL ENERGY PROJECT AT SHENANDOAH, GEORGIA SYSTEM DESIGN
A. J. Poche *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 251-255

(Contracts EG-77-C-04-3985; DE-AC04-77ET-20260)
Avail: NTIS HC A11/MF A01 CSCL 10B

The solar total energy system (STES) was to provide 50% of the total electrical and thermal energy requirements of the 25,000 sq ft Bleyle of America knitwear plant located at the Shenandoah Site. The system will provide 400 kilowatts electrical and 3 megawatts of thermal energy. The STES has a classical, cascaded total energy system configuration. It utilizes one hundred twenty (120), parabolic dish collectors, high temperature (750 F) trickle oil thermal energy storage and a steam turbine generator. The electrical load shaving system was designed for interconnected operation with the Georgia Power system and for operation in a stand alone mode. J.M.S.

N80-24798*# Rockwell International Corp., Huntsville, Ala.
STUDY OF MULTI-kW SOLAR ARRAYS FOR EARTH ORBIT APPLICATIONS: MIDTERM PERFORMANCE REVIEW
26 Jul. 1979 98 p
(Contract NAS8-32988)
(NASA-CR-161467) Avail: NTIS HC A05/MF A01 CSCL 10A

Planar and concentrator solar array concepts capable of providing 300 kW to 1000 kW in low Earth orbit applications in the 1987 time period at an array recurring cost less than or equal to thirty dollars per watt are examined. Silicon and gallium arsenide solar cell applicability are evaluated. On-orbit maintenance by space shuttle is also investigated. Design configurations for the solar arrays and solar cells are recommended. R.E.S.

N80-24805# Midwest Research Inst., Kansas City, Mo.
SOLAR REFLECTANCE, TRANSMITTANCE AND ABSORPTANCE OF COMMON MATERIALS
B. C. Butler, P. J. Call, G. L. Jorgensen, and R. B. Pettit (Sandia Labs., Albuquerque, N.M.) Oct. 1979 8 p refs Presented at the Solar Industrial Process Heat Conf., San Francisco, 31 Oct. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-334-457; CONF-791024-9) Avail: NTIS HC A02/MF A01

The solar reflectance, transmittance, and absorptance of common materials used for solar collector fabrication were compiled for easy reference. The data are derived from solar weighted averaging techniques and can be used for initial calculations of collector performance. DOE

N80-24807# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
RESIDENTIAL SOLAR HEATING AND COOLING USING EVACUATED TUBE SOLAR COLLECTORS: CSU SOLAR HOUSE 3 Final Report, Management Summary, 1 Feb. 1976 - 30 Sep. 1978
Dan S. Ward, John C. Ward, and H. S. Oberoi Mar. 1979 11 p
(Contract EY-76-S-02-2858)
(COO-2858-24-Summ) Avail: NTIS HC A02/MF A01

An integrated evacuated tube solar collector and absorption space cooling system installed in a solar house was designed, tested, and evaluated. The seasonal performance was compared with two other solar heating and cooling systems installed in adjacent buildings with virtually identical thermal characteristics. The two comparison system consist of conventional solar water heating and air heating flat plate collectors. DOE

N80-24816# California Univ., Berkeley. Lawrence Berkeley Lab.
SENSIBLE HEAT STORAGE FOR A SOLAR THERMAL POWER PLANT M.S. Thesis
Thomas F. Baldwin, Scott Lynn, and Alan S. Foss Jul. 1979 195 p refs
(Contract W-7405-eng-48)
(LBL-9321) Avail: NTIS HC A09/MF A01

One possible configuration for a solar power plant with a sensible-heat storage unit was investigated. The proposed flowsheet allows thermal energy storage between the heat collection unit and the power generation unit without a reduction in the thermodynamic availability of the energy supplied to the power turbines. Energy is stored by heating a checkerwork of magnesia bricks. A gas that is circulated from the solar collector through the storage unit and the power plant boiler serves as the heat-transfer medium. Nitrogen was found to be preferable to helium for this purpose. A computer model was used to predict the behavior of the sensible-heat storage unit and to aid in sizing the storage unit. Procedures were developed to estimate the cost of electricity generated by the solar power plant. The effects on the storage unit and on the total plant design of changing several processes and design parameters were then evaluated. Two alternative process configurations for solar power plants with sensible-heat storage were developed. DOE

N80-24817# Aerospace Corp., Los Angeles, Calif. Energy and Resources Div.
SOLAR THERMAL SMALL POWER SYSTEMS STUDY. INVENTORY OF US INDUSTRIAL SMALL ELECTRIC POWER GENERATING SYSTEMS
1 Jun. 1979 59 p ref
(Contract ET-78-C-03-2226)
(ATR-79(7780)-1) Avail: NTIS HC A04/MF A01

This inventory of small industrial electric generating systems was assembled to provide a data base for analyses being conducted to estimate the potential for displacement of these fossil fueled systems by solar thermal electric systems no larger than 10 MW in rated capacity. The approximately 2100 megawatts generating capacity of systems in this category constitutes a potential market for small solar thermal and other solar electric power systems. The sources of data for this inventory were the (former) Federal Power Commission (FPC) Form 4 Industrial Ledger and Form 12-C Ledger for 1976. Alphabetical lists are presented of generating systems located at industrial plants and at Federal government installations in each of the 50 states. These systems are differentiated by type of power plant: steam turbine, diesel generator, or gas turbine. Each listing is designed as a power system rather than a power unit because the GPC Ledgers do not provide a means of determining whether more than one unit is associated with each industrial installation. The user should consider each listing to be a system capacity rating wherein the system may consist of one or more generating units with less than 10 MW/sub e/ combined rating. DOE

N80-24818# Minnesota Univ., Minneapolis. Dept. of Electrical Engineering.
COMPOSITION PROFILING OF SOLAR COATING MATERIALS Final Report, 16 Apr. 1976 - 15 Apr. 1979
G. K. Wehner Sep. 1979 39 p refs
(Contract EY-76-S-02-2953)
(COO-2953-4) Avail: NTIS HC A03/MF A01

Auger electron composition vs. depth and optical analysis revealed that a very inexpensive-to-produce (15 min. 900 C heat treatment in air) Cr2O3 layer on stainless steels provides an excellent diffusion barrier for preventing stainless steel constitutents from entering into an IR reflective Mo coating. It was shown that with sputter deposition of Mo at high rate in a clean noble gas plasma, one can obtain Mo coatings of excellent IR reflectance. The optical properties of various other absorber surfaces such as stacked razor blades, cone or whisker-covered metal surfaces, plasma-sprayed chromic oxide coatings etc. were measured and explored. DOE

N80-24820# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
MEAN MONTHLY PERFORMANCE OF PASSIVE SOLAR WATER HEATERS
W. Place, M. Daneshyar (Univ. of Technology, Esfahan, Iran), and R. Kammerud Oct. 1979 8 p ref Presented at the 4th Natl. Passive Solar Energy Conf., Kansas City, Kas., 3 Oct. 1979
(Contract W-7405-eng-48)
(LBL-9295; CONF-791022-11) Avail: NTIS HC A02/MF A01

A simplified analysis was used to compare the average monthly performance of a compact heater (having combined collection and storage) and a thermosiphon heater (using natural convective transfer from a collector to an insulated tank). The comparison which was made for a range of climates and a variety of load profiles indicates that the performance of the thermosiphon is substantially superior to that of the compact heater. DOE

N80-24821# Springborn Labs., Inc., Enfield, Conn.
SOLAR COLLECTORS Technical Progress Report, 5 Sep. 1978 - 5 Mar. 1979
B. Baum and Michael Gage 27 Apr. 1979 54 p
(Contract EM-78-C-04-5359)
(ALO-5359-T1; TPR-1) Avail: NTIS HC A04/MF A01

A broad information search was carried out in four areas: glazings, housing materials, acrylic coatings, etching processes and AR coatings. An extensive list of all (known) US transparent polymers was developed as well as tables of plastic, ceramic and metallic materials that could conceivably function as a housing. In addition, a compilation was made of commercially available solvent and water base acrylic coatings for use as a uv protective coating for the glazing. Eighteen transparent polymers were chosen as possible glazings and twelve materials (plastic and wood) as possible housings and exposed in the Weather-Ometer as tensile bars and for the glazings as disks for optical transmission. These same materials were also exposed on our roof to monitor soiling. A variety of solvent and water base acrylics were selected as protective coatings and ordered. Two commercial films, Tedlar 20 and Halar 500, with strong absorption in the uv and two commercial films containing uv absorbers, Tedlar UT and Korad 201R, were laminated by several different processes to four promising glazing materials: polyvinyl fluoride (Tedlar), polymethyl methacrylate (Plexiglass), crosslinked ethylene/vinyl acetate and thermoplastic polyester (Llumar). A variety of etching processes were briefly explored and AR coating studies started on the above four glazing films. DOE

N80-24823# Westinghouse Electric Corp., Pittsburgh, Pa. Research and Development Center.
HETEROSTRUCTURE SINGLE CRYSTAL SILICON PHOTOVOLTAIC SOLAR CELLS Final Report, 27 Sep. 1976 - 31 Jul. 1979
J. R. Szedon, T. A. Temofonte, T. W. OKeeffe, H. C. Dickey, S. J. Fonash, and T. E. Sullivan 31 Jul. 1979 209 p refs Prepared in cooperation with Pennsylvania State Univ., Univ. Park
(Contract EY-76-C-03-1282)
(DOE/ET/20408-1) Avail: NTIS HC A10/MF A01

Technical and commercial practicability (specifically, conversion efficiency of 10 percent or greater at a module selling price below $0.50/peak watt in 1975 dollars) for power generation of metal-heterojunction silicon solar cell of the metal-insulator semiconductor (MIS) variety is assessed. Empirical and theoretical studies were made of cells using both single crystal (n- and p-type) and polycrystalline (p-type) silicon with a variety of metals (Al, Au, Ag, Pd) and silicon dioxide lasers of various thicknesses. Performance limitations were identified. Means to improve cell performance were evaluated, including material modifications, layer thickness control and changes in device structure. It is concluded that the program goals can be met. Encouraging results in analysis of cells made with polycrystalline material provide a good basis for proceeding with future work to assess the prospects of even lower cost cells. DOE

N80-24824# Midwest Research Inst., Golden, Colo. Thermal Conversion Branch.
FEASIBILITY EVALUATION FOR SOLAR INDUSTRIAL PROCESS HEAT APPLICATIONS
S. A. Stadjuhar Jan. 1980 7 p refs Presented at the Systems Simulation and Econ. Analysis Conf., San Diego, Calif., 23 Jan. 1980
(Contract EG-77-C-01-4042)
(SERI/TP-333-538; CONF-800101-3) Avail: NTIS HC A02/MF A01

An analytical method for assessing the feasibility of Solar Industrial Process Heat applications was developed and implemented in a flexible, fast-calculating computer code, PROSYS/ECONMAT. The performance model PROSYS predicts long-term annual energy output for several collector types, including flat-plate, nontracking concentrator, one-axis tracking concentrator, and two-axis tracking concentrator. Solar equipment cost estimates, annual energy capacity cost, and optional net present worth analysis are provided by ECONMAT. User input consists of detailed industrial process information and optional economic parameters. Internal program data includes meteorological information for 248 US sites, characteristics of more than 20 commercially available collectors representing several generic collector types, and defaults the economic parameters. Because a fullscale conventional back-up fuel system is assumed, storage is not essential and is not included in the model. DOE

N80-24826# Foster Wheeler Corp., Livingston, N.J.
SOLAR PRODUCTION OF INDUSTRIAL PROCESS STEAM RANGING IN TEMPERATURE FROM 300 F TO 550 F (PHASE 1), VOLUME 1 Final Report, 30 Sep. 1978 - 30 Jun. 1979
30 Jun. 1979 176 p refs
(Contract ET-78-C-03-2199)
(DOE/CS/32199-1; FWDC-9-41-4010) Avail: NTIS HC A09/MF A01

This section summarizes the Phase 1 solar industrial process steam system and includes a system schematic, a brief system description, general specifications of the major system components, expected system performance, and a cost estimate summary for Phases 2 and 3. The objectives of Phase 1 are: (1) design a cost-effective solar steam generating system using state-of-the-art components and technology to supply steam for Dow Chemical Company's Dalton, Georgia, plant; (2) predict the performance of the solar process steam plant; (3) conduct a safety evaluation and an environmental impact assessment of the solar steam system; (4) conduct an economic analysis to determine the potential economic benefits of a solar-augmented process steam production system compared with an existing fossil-fuel-fired steam generator; and (5) promote the project extensively to make it visible to industry and the general public. DOE

N80-24828# American Science and Engineering, Inc., Cambridge, Mass.
DEVELOPMENT OF A SECOND-GENERATION CONCENTRATING TRACKING SOLAR COLLECTOR Technical Progress Report, 20 Jun. - 27 Dec. 1978
Roy W. Miller 16 Jan. 1979 58 p refs
(Contract EM-78-C-04-4375)
(ASE-4371) Avail: NTIS HC A04/MF A01

The objective is to develop a second generation parabolic mirror concentrator with a variation of the cylindrical blackbody receiver to provide a minimum concentration ratio of ten. Performance characteristics are to be determined by tests using a prototype unit. Probable mass production costs for the collector will be generated. Work performed during the first six months of the effort is described. The design of the prototype collector was completed. The collector design is described in detail. The performance analysis for the second generation collector was also completed during the first six months of the contract. The work consists of collector tradeoff studies together with optical and thermal analysis of detailed configurations. The analysis is described in detail with computer programs included and results given for conditions of interest. The performance analysis was conducted in concert with the collector design effort. Thus, the collector design features were driven by performance considerations and design details are optimum with respect to performance. The result is a collector design capable of producing outlet field of high enough temperature to drive air conditioning equipment. Concentration ratio is 12 and predicted efficiency is 60% at fluid outlet temperature of 200 F. DOE

N80-24829# Aerospace Corp., Los Angeles, Calif. Energy Systems Directorate.
NEW APPLICATIONS OF HIGH-TEMPERATURE SOLAR ENERGY FOR THE PRODUCTION OF TRANSPORTABLE FUELS AND CHEMICALS AND FOR ENERGY STORAGE
19 Jan. 1979 178 p refs
(Contract EY-76-C-03-1101)
(ATR-78(7691-04)-1) Avail: NTIS HC A09/MF A01

The solar fuels and chemicals study was limited to the examination of processes requiring temperatures in excess of 1000 K since lower temperature processes had already been examined in studies concerned with the application of waste heat from nuclear power plants to industrial processes. In developing the carbon cycle processes, the primary activity included an extensive literature search and the thermodynamic evaluation of a number of candidate chemical cycles. Although both hydrogen and carbon closed- and open-loop chemical cycles were studied, it was concluded that the carbon cycles offered sufficient additional potential to warrant concentrating on them in subsequent work. The section on new ideas for transportable fuels presents the elements of a new concept for a carbon cycle recovery technique to produce transportable fuels. The elements discussed are sources of carbon dioxide, solar energy reduction of CO2, potential carbon cycles, and use of carbon monoxide as fuel and feedstocks. Another section presents some new concepts for the use of high temperature solar energy in the production of essential materials and for closed-loop chemical storage, as well as for the production of hydrogen as a fuel and open-loop applications. Potential problem areas pertinent to solar derived fuels and chemicals have been identified. These problems are primarily associated with the limited high temperature experience in industry and include materials compatibility, separation of reaction products, development of solid electrolytes and high temperature electrodes, selective emission of receiver coatings at high temperature, and a lack of chemical kinetics data, and high temperature thermodynamic data. DOE

N80-24831# Midwest Research Inst., Golden, Colo.
BIOLOGICAL SOLAR CELLS
M. Seibert and A. F. Janzen Nov. 1979 7 p refs Presented at the 2nd Miami Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10 Dec. 1979 Prepared in cooperation with Photochemical Research Associates, Inc., London (Canada).
(Contract EG-77-C-01-4042)
(SERI/TP-332-476; CONF-791204-7) Avail: NTIS HC A02/MF A01

The bacterial photosynthetic reaction center isolated from Rhodopseudomonas sphaeroides was attached directly onto an SnO2 electrode. The light-induced primary charge separation processes which occur across the reaction center macromolecule were then coupled to the electrode. In a two-electrode configuration, photovoltages as high as 70 mV and photocurrents as high as 0.5 micron A/sq cm are observed in an external circuit. Such reaction center electrodes may be the forerunner of future biological solar cells or may serve as model systems for future organic photovoltaic devices. DOE

N80-24832# Sandia Labs., Albuquerque, N. Mex.
PHOTOVOLTAIC CONCENTRATORS
E. C. Boes 1980 10 p refs Presented at the 14th Photovoltaics Specialist Conf., San Diego, Calif., 7 Jan. 1980
(Contract EY-76-C-04-0789)
(SAND-80-0143C; CONF-800106-7) Avail: NTIS HC A02/MF A01

A status report on photovoltaic (PV) concentrators technology is presented. The major topics covered are as follows: (1) current PV concentrator arrays; designs, performances, and costs; (2) current PV concentrator array components; cells and cell assemblies, optical concentrators, support structures, tracking, and drive; (3) design of PV concentrator arrays; and (4) array manufacturing technology. DOE

N80-24833# Sandia Labs., Albuquerque, N. Mex. Large Power Systems Div.
SOLAR CENTRAL RECEIVER SYSTEMS PROGRAMS
J. D. Fish 1979 5 p refs Presented at the Solar Ind. Process Heat Conf., San Francisco, 31 Oct. 1979
(Contract EY-76-C-04-0789)
(SAND-79-8777; CONF-791024-5) Avail: NTIS HC A02/MF A01

Major elements of the Solar Central Receiver Systems program include: (1) development of storage-coupled and hybrid system concepts; (2) the Central Receiver Test Facility in Albuquerque, NM; (3) the pilot plant under construction at Barstow, CA; (4) proposed repowering/industrial retrofit plants; and (5) heliostat, receiver, and storage subsystems development work. Current and proposed activities within each element are discussed. DOE

N80-24836# Mitre Corp., McLean, Va. METREK Div.
SOLAR THERMAL REPOWERING: UTILITY/INDUSTRY MARKET POTENTIAL IN THE SOUTHWEST
N. Lord, P. Curto, and S. True Dec. 1978 177 p refs
(Contract ET-78-C-01-2854)
(MTR-7919) Avail: NTIS HC A09/MF A01

An analysis of the utility and industrial solar thermal repowering market potential in the Southwest is presented. Repowering involves adding the solar thermal central receiver (power tower) system as a retrofit power source for existing utilities and industries. It would provide steam to drive utility turbogenerator or supply process heat for industry. The potential for repowering oil and gas using steam turbine utility sites with a capacity greater than 25 MWe and sufficient land adjacent to the plant for a minimum 25 MWe addition is analyzed. Industry projections based on an analysis of the energy requirements for the chemicals and petroleum industries in Texas and estimates of land availability are included. It is estimated that the potential solar thermal repowering market for utilities and industries in the Southwest is approximately one quad. DOE

N80-24837# Massachusetts Inst. of Tech., Cambridge.
BATTERY CHARGE/SOLAR CONTROLLER FOR A RESIDENTIAL SIZE PHOTOVOLTAIC POWER SYSTEM
R. N. Cadieux 31 Oct. 1979 20 p refs
(Contract EY-76-C-02-4094)
(COO-4094-62) Avail: NTIS HC A02/MF A01

A controller was designed to meet the initial requirements of an off-peak, utility-interactive solar photovoltaic power system now undergoing tests. A physical description of the controller, an explanation of the control algorithm, a circuit description and the theory of operation are presented. DOE

N80-24839# Delaware Univ., Newark. Inst. of Energy Conversion.
AMORPHOUS Si SOLAR CELLS Quarterly Report, 1 Apr. - 30 Jun. 1979
V. L. Dalal Aug. 1979 56 p refs
(Contract DE-AC03-79ET-23034)
(DOE/ET/23034-T1; QR-2) Avail: NTIS HC A04/MF A01

An analysis of a-Si devices was completed. The analysis shows that even with limited diffusion length and high defect density, a-Si devices can achieve J/sub sc/ approximately = to 15 mA/sq cm, V/sub oc/ approximately = to IV and FF approximately = to 0.72. Novel a-Si devices were also designed and analyzed. The analysis shows that the flexibility in material properties offered by a-Si can be used advantageously to design high quality devices. DOE

N80-24840# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
APPLICATION OF CIRCUMSOLAR MEASUREMENTS TO CONCENTRATING COLLECTORS
D. F. Grether, D. Evans, A. Hunt, and M. Wahlig Jun. 1979 6 p refs Presented at the Intern. Solar Energy Soc. Meeting, Atlanta, 28 May 1979
(Contract W-7405-eng-48)
(LBL-9412; CONF-790541-58) Avail: NTIS HC A02/MF A01

A systematic measurement program is being carried out to assess the effects of circumsolar radiation (the solar aureole) on the performance of solar conversion systems using concentrating collectors. Four instrument systems were constructed and are providing detailed intensity vs. angle profiles of the solar and circumsolar (out to 3 deg from the center of the Sun) as well as other solar measurements. The instruments are briefly described. Results are presented of the average effect of the circumsolar radiation on the solar energy available to an idealized point focusing system. Results are also presented for an analysis of two specfic central receiver designs. DOE

N80-24842# Sandia Labs., Albuquerque, N. Mex.
EXTRINSIC LOSSES IN SOLAR CELLS FOR LINEAR FOCUS SYSTEMS 4
C. Michael Garner Dec. 1979 42 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1781) Avail: NTIS HC A03/MF A01

Solar cell efficiency is dependent on the intrinsic one dimensional diode efficiency and on the extrinsic losses (i.e., contact shadowing, series resistance and losses arising from nonuniform illumination). These extrinsic losses can depend on

cell size and should be considered in the design of concentrator systems. The carrier transport and junction phenomena are arbitarily called intrinsic effects, and the efficiency resulting from the one dimensional transport equations will be called the intrinsic efficiency. The under consideration will be called extrinsic effects. The I sq R and shadowing losses have been calculated as a function of cell size, contact thickness and number of buses. In addition, losses resulting from nonuniform illumination and temperature have been calculated. These results should give clear guidelines for the design of receivers for linear focus systems.
DOE

N80-24847# Westinghouse Research and Development Center, Pittsburgh, Pa.

CADMIUM SULFIDE/COPPER SULFIDE HETEROJUNCTION CELL RESEARCH Final Report, 30 Sep. 1977 - 31 Jul. 1979

J. R. Szedon, F. A. Shirland, W. J. Biter, T. W. OKeeffe, J. A. Stoll, and S. J. Fonash (Pennsylvania State Univ., University Park) 31 Jul. 1979 186 p refs
(Contract EG-77-C-03-1577)
(DOE/ET/20429-1) Avail: NTIS HC A09/MF A01

The objective of this program is to conduct research on solar cells of the copper sulfide/cadmium sulfide (and cadmium sulfide-zinc sulfide alloy) type with the goal of producing thin film cells capable of 10% AM1 conversion efficiency with less than 5% degradation in performance over a period of 20 years. New evaluation methods reveal cell microstructure details (grain size, Cu2S penetration into grain boundaries, etch pit depth and density) whose modification and control should allow reproducible achievement of at least 9% conversion efficiency. Cell degradation primarily involves changes in heterojunction collection efficiency, not minority carrier transport in the thin CU2S, light absorbing layer. Analysis of current technology predicts a selling price of $0.53/peak watt(1975 dollars) for glass encapsulated, 8% efficient modules. More conservative material use, especially gold grid electrode, should allow a selling price of $0.38/peak watt. DOE

N80-24853# FMC Corp., Santa Clara, Calif. Engineered Systems Div.

LINE FOCUS SOLAR THERMAL CENTRAL RECEIVER RESEARCH STUDY Final Report, 30 Apr. 1977 - 31 Mar. 1979

D. G. DiCanio, William J. Treytl, Frank A. Jur, and C. Don Watson Apr. 1979 314 p refs
(Contract EY-76-C-03-1246)
(DOE/ET/20426-1) Avail: NTIS HC A14/MF A01

The results of a study to examine the line focus central receiver alternative for solar thermal generation of electric power on a commercial scale are presented. The baseline concept consists of the following elements: (1) A solar collector (heliostat) whose geometry is the equivalent of a focused parabolic cylinder. The heliostat reflecting surface is composed of an array of flexible rectangular mirror panels supported along their long edges by a framework which rotates about an axis parallel to the ground plane. (2) A linear cavity receiver, composed of 61 meter (200-foot) sections supported by towers at an elevation of 61 meters (200 feet). Each section receives feedwater and produces turbine-rated steam. (3) Heliostat control, consisting of a local controller at each heliostat module which communicates with a master control computer to perform elevation tracking and focal length adjustment. The control logic is open-loop, with sun position computer by the master computer with an algorithm.
DOE

N80-24855# Aerospace Corp., Los Angeles, Calif. Energy and Resources Div.

SOLAR THERMAL SMALL POWER SYSTEMS STUDY. PHASE 2: STUDY RESULTS

D. E. Lapedes, P. K. Munjal, and L. R. Sitney 12 Jul. 1979 239 p refs
(Contract ET-78-C-03-2226)
(DOE/ET/20516-2) Avail: NTIS HC A11/MF A01

This study of small solar power systems (SSPS) was structured to determine conditions under which SSPS can be cost-effective sources of electric power in the US in the period 1985 to 2015. An extensive data base, which provides a discrete identification of all utility and industrial electric generating units up to ans including 10 MW/sub e/ in rated capacity, was prepared. This data base defines the market for which comparative evaluations are made of SSPS and alternative fossil-fueled power plants. The market penetration of SSPS is determined and the effect of economic incentives on accelerating the penetration is evaluated. The solar electric power system is evaluated as either a complete replacement for existing conventional electric power systems or as a repowering installation for boilers supplying steam to turbine-driven generators. The cost data used in the market penetration analysis are for a central receiver-type of small solar thermal power system. While the market penetration discussed is for this type of SSPS, the sensitivity data in the report can be used to determine the market penetration of other types of solar thermal power systems (e.g., point focus distributed receiver) with different system costs. DOE

N80-24858# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.

PERFORMANCE EVALUATION OF A SOLAR AIR-HEATING AND NOCTURNAL COOLING SYSTEM IN CSU SOLAR HOUSE 2 Final Report, 1 Jun. 1977 - 30 Sep. 1978

Susumu Karaki Apr. 1979 173 p refs
(Contract EY-76-S-02-2868)
(COO-2868-5) Avail: NTIS HC A08/MF A01

The solar heating system in Colorado solar house No.2 consists of 67.1 sq m of double glazed air-heating collectors with flat-black absorbers, 10.3 cu m of pebble bed storage, air-to-water heat exchanger for preheating domestic water, and one blower to circulate the air through the system. The nocturnal cooling system consists of an evaporative cooler and utilizes the pebble bed for cool storage. A schematic diagram of the system is presented.
DOE

N80-24862# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.

STANDARD ASSUMPTIONS AND METHODS FOR SOLAR HEATING AND COOLING SYSTEMS ANALYSIS

Cecile M. Leboeuf Jan. 1980 7 p refs Presented at the 2nd Ann. Systems Simulation and Econ. Anal. Conf., San Diego, Calif., 23-25 Jan. 1980
(Contract EG-77-C-01-4042)
(SERI/TP-351-548; CONF-800101-9) Avail: NTIS HC A02/MF A01

A set of inputs, assumptions, analytical methods, and a reporting format is presented to help compare the results of residential and commercial solar system analyses being performed by different investigators. For residential heating and cooling systems, three locations were selected. The weather data chosen to characterize these cities are the Typical Meteorological Year (TMY). A house for each location was defined that is typical of new construction in that locale. Hourly loads for each location were calculated using a computerized load model that interacts with the system specified inputs characterizing each house. Four locations for commercial cooling analyses were selected from among the existing sites for which TMYs were available. A light commercial (nominal 25 ton cooling load) office building was defined and is used in all four locations. Hourly cooling and heating loads were computed for each city. DOE

N80-24867# Du Pont de Nemours (E. I.) and Co., Aiken, S. C.

SOLAR-POWERED ENVIRONMENTAL DATA COLLECTION SYSTEM

H. W. Randolph Feb. 1980 18 p
(Contract EY-76-C-09-0001)
(DP-1529) Avail: NTIS HC A02/MF A01

A solar powered system consisting of a multipurpose remote data collector, a radio data link, and a data receiving station was designed to acquire data from various remote areas at the Savannah River Plant. A prototype system was built to monitor gamma radiation at the plant perimeter. It is operating satisfactorily and will be installed to monitor gamma radiation or other environmental parameters at many remote locations on the plant. DOE

N80-24874# New Mexico Energy Inst., Albuquerque.
PREPARATION OF HIGHLY EFFICIENT SOLAR CELLS AND CORROSION STUDIES ON SOLAR CELL MATERIALS Final Report, 1 Jul. 1978 - 30 Jun. 1979
Su-Moon Park Jul. 1979 69 p refs Sponsored by New Mexico Energy and Minerals Dept.
(PB80-141294; NMEI-46) Avail: NTIS HC A04/MF A01 CSCL 10B

The Pourbaix diagram was applied to the prediction and understanding of corrosion properties of semiconductor materials. With the aid of flat band potential information, the thermodynamic stability of semiconductor materials under various operating conditions, types of electrodes (n- or p-), conversion efficiencies, types of redox couples, and the proper operating pH-region can be determined. Electrolyte and pH dependencies of flat band potentials were studied to be able to design more efficient semiconductor-liquid junction solar cells. Various effects of electrolytes on flat band potentials were also studied. GRA

N80-24878# Rensselaer Polytechnic Inst., Troy, N. Y. Dept. of Civil Engineering.
SNOW AND ICE ACCUMULATION AROUND SOLAR COLLECTOR INSTALLATIONS Final Report
Michael J. ORourke Aug. 1979 75 p refs Sponsored in part by DOE
(Contract NB79-NAAA-6099)
(PB80-127053; NBS-GCR-79-180) Avail: NTIS HC A04/MF A01 CSCL 13A

Half the installations had the collectors mounted flush with the roof surface, while the remainder had collectors mounted on racks at an angle to the roof. Contours of snow depth on the roof, snow densities, measurements of snow on the ground adjacent to the building, sketches, and photographs of the roofs, and comments of the owners of the installations are included in addition to a discussion of the state of the art of predicting snow accumulation on roofs of buildings. The effect of solar collectors on the design of roof structures for the support of snow loads is discussed and recommendations for future research are made. GRA

N80-25618# Virginia Polytechnic Inst. and State Univ., Blacksburg.
HEAT CONDUCTION IN PARTIAL VACUUM Technical Progress Report, 7 Aug. 1978 - 31 Jan. 1979
J. R. Thomas Feb. 1979 32 p refs
(Contract EM-78-C-04-5367)
(ALO-5367-1) Avail: NTIS HC A03/MF A01

Basic theoretical work on heat conduction in evacuated solar collectors is reported. The results include estimates for minimum partial vacuum necessary to eliminate conduction, and the effects of helium penetration into the region. DOE

N80-25778 Oklahoma State Univ., Stillwater.
DESIGN PARAMETERS FOR SOLAR POWERED ABSORPTION COOLING SYSTEMS WITH CHILLED WATER STORAGE Ph.D Thesis
Ping-Shian Shih 1979 120 p
Avail: Univ. Microfilms Order No. 8013046

A simulation model of a solar cooling system with chilled water storage was formulated. Simulations were performed using typical meteorological year data of seven SOLMET stations to study the relationship between the performance of the system and design parameters. The chilled water storage was found to be an effective scheme for improving the performance of the solar cooling system. The effectiveness of this scheme depends largely on the proper sizing of the chilled water storage, and collector area. The predictions of the semi-empirical equation were found to be within six percent accuracy of the simulation results. This equation was also found to be valid for locations with considerable differences in their weather patterns. The annual cost analysis showed that proper sizing of the chilled water storage, hot water storage, and collector area can improve significantly the economics of the solar cooling system. Although the solar cooling system is not economically feasible at the present time due to the high cost of the solar energy collector and the low cost of the conventional fuel, a properly designed solar cooling system can become economically attractive when the fuel cost becomes more expensive. Dissert. Abstr.

N80-25782*# Pennsylvania Univ., Philadelphia. School of Electrical Engineering.
ANALYSIS AND EVALUATION IN THE PRODUCTION PROCESS AND EQUIPMENT AREA OF THE LOW-COST SOLAR ARRAY PROJECT Annual Report, Oct. 1978 - Oct. 1979
H. Goldman and M. Wolf Oct. 1979 203 p refs
(Contract JPL-954796)
(NASA-CR-163208; JPL-9950-342; DOE/JPL-954796-79/7) Avail: NTIS HC A10/MF A01 CSCL 10A

Analyses of slicing processes and junction formation processes are presented. A simple method for evaluation of the relative economic merits of competing process options with respect to the cost of energy produced by the system is described. An energy consumption analysis was developed and applied to determine the energy consumption in the solar module fabrication process sequence, from the mining of the SiO2 to shipping. The analysis shows that, in current technology practice, inordinate energy use in the purification step, and large wastage of the invested energy through losses, particularly poor conversion in slicing, as well as inadequate yields throughout. The cell process energy expenditures already show a downward trend based on increased throughput rates. The large improvement, however, depends on the introduction of a more efficient purification process and of acceptable ribbon growing techniques. R.E.S.

N80-25783*# Wyle Labs., Inc., Huntsville, Ala. Solar Energy Systems Div.
TEST RESULTS ON THE FRENCHMAN'S REEF SOLAR DATA ACQUISITION AND CONTROL SYSTEM
15 Jan. 1980 19 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161449) Avail: NTIS HC A02/MF A01 CSCL 10A

The Frenchman's Reef Data Acquisition and Control System (DACS), Sunlogger model 10000-1 was evaluated to determine the accuracy of control functions and the performance of the system in the environment of the planned installation site. The Sunlogger system was verified to perform normally in an environment of 100 F and approximately 90% humidity. It is recommended however that the Sunlogger be installed in a controlled environment with temperatures and humidity significantly lower than those referenced above. R.E.S.

N80-25784*# Radian Corp., Austin, Tex.
SOLAR HEATING AND COOLING DEMONSTRATION PROJECT AT RADIAN CORPORATION, AUSTIN, TEXAS Final Report
May 1980 41 p Sponsored in part by NASA
(Contract EX-76-C-01-2396)
(NASA-CR-161442) Avail: NTIS HC A03/MF A01 CSCL 10A

The solar heating and cooling system located at the Radian Corporation, Austin, Texas, is discussed. A technical description of the solar system is presented. The costs of the major components and the cost of installing the system are described. Flow diagrams and photographs of the solar system are provided. R.E.S.

N80-25786*# Telex Communications, Inc., Blue Earth, Minn.
SOLAR HEATING SYSTEM INSTALLED AT TELEX COMMUNICATIONS, INC., BLUE EARTH, MINNESOTA Final Report
26 Oct. 1977 177 p
(Contract E(49-18)-2376)
(NASA-CR-161437) Avail: NTIS HC A09/MF A01 CSCL 10A

The solar heating system for space heating a 97,000 square foot building which houses administrative offices, assembly areas, and warehouse space is summarized. Information on system description, test data, major problems and resolutions, performance, operation and maintenance manual, manufacturer's literature, and as-built drawings is presented. R.E.S.

N80-25787*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION:

SEASONAL REPORT FOR DECADE 80 HOUSE, TUCSON, ARIZONA Progress Report, Nov. 1973 - Sep. 1979
May 1980 103 p refs Prepared for DOE
(Contract NAS8-32036)
(NASA-CR-161450) Avail: NTIS HC A06/MF A01 CSCL 10A

The operational and thermal performance of the Decade 80 solar energy system is described. The system was designed by Cooper Development Association, Inc. with space heating and space cooling to a one-story, single family residence located in Tucson, Arizona. The Decade 80 House was designed and built in the mid-70's to be a showplace/workshop for solar energy utilization. Superior construction techniques, the use of quality materials and a full time maintenance staff have served to make the entire system an outstanding example of the application of solar energy for residential purposes. The luxury of a full time, on-site maintenance person is perhaps the single most important aspect of this program. While most installations cannot support this level of maintenance, it was very useful in keeping all subsystems operating in top form and allowing for a full season data collection to be obtained. Several conclusions were drawn from the long term monitoring effort, among which are: (1) flat plate collectors will support cooling; (2) definite energy savings can be realized; and (3) more frequent periodic maintenance may be required on solar energy systems that are not custom built. R.E.S.

N80-25788*# Gilliland-Bell Associates, Inc., Greenwood, S.C.
SOLAR HEATING AND HOT WATER SYSTEM INSTALLED AT MUNICIPAL BUILDING COMPLEX, ABBEVILLE, SOUTH CAROLINA Final Report
Nov. 1979 54 p Sponsored in part by NASA
(Contract EM-78-F-01-5202)
(NASA-CR-161443) Avail: NTIS HC A04/MF A01 CSCL 10A

Information on the solar energy system installed at the new municipal building for the City of Abbeville, SC is presented, including a description of solar energy system and buildings, lessons learned, and recommendations. The solar space heating system is a direct air heating system. The flat roof collector panel was sized to provide 75% of the heating requirement based on an average day in January. The collectors used are job-built with two layers of filon corrugated fiberglass FRP panels cross lapped make up the cover. The storage consists of a pit filled with washed 3/4 in - 1 1/2 in diameter crushed granite stone. The air handler includes the air handling mechanism, motorized dampers, air circulating blower, sensors, control relays and mode control unit. Solar heating of water is provided only those times when the hot air in the collector is exhausted to the outside. R.E.S.

N80-25789*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
UNFULFILLED TECHNOLOGY NEEDS IN SPACE POWER SYSTEMS
Luther W. Slifer, Jr. Apr. 1980 21 p refs Proposed for presentation at 15th Intersoc. Energy Conversion Engr. Conf., Seattle, 18-22 Aug. 1980
(NASA-TM-80677) Avail: NTIS HC A02/MF A01 CSCL 10A

Major power system technology development needs related to the solution of currently existing problems are defined. The identified problems were initially listed and categorized by technical area. They were then translated into terms of technology development requirements and consolidated where commonality was found. From these requirements, a set of ten specific recommendations for technology development was formulated. R.E.S.

N80-25790*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: SEASONAL REPORT FOR IBM SYSTEM 1A, HUNTSVILLE, ALABAMA Contractor Report, Sep. 1978 - Aug. 1979
May 1980 85 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161464) Avail: NTIS HC A05/MF A01 CSCL 10A

The operational and thermal performance of the solar energy system, Sims Prototype System 1A, is described. The system was designed by IBM to provide 50 to 60 percent of the space heating and domestic hot water preheating load to a 2,000 square foot floor space single family residence in the Huntsville area. The load design temperature inside the building was to be maintained at 70 degrees fahrenheit with auxiliary energy for heating supplied by an electric heat pump assisted by an electric resistance strip heater. In general the disappointing operation of this system is attributed to the manner in which it was used. The system was designed for residential application and used to satisfy the demands of an office environment. The differences were: (1) inside temperature was not maintained at 70 F as expected; and (2) hot water usage was much lower than expected. The conclusion is that the solar energy system must be designed for the type of application in which it is used. Misapplication usually will have an adverse affect on system performance. R.E.S.

N80-25791*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATON: SEASONAL REPORT FOR SOLARON-AKRON, AKRON, OHIO Contractor Report, Nov. 1978 - Oct. 1979
May 1980 87 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161465) Avail: NTIS HC A05/MF A01 CSCL 10A

The operational and thermal performance of the solar energy system by Solaron Corporation is described. The system was designed to provide an 1940 square foot floor area with space heating and domestic hot water for a dual-level single family residence in Akron, Ohio. The solar energy system uses air as the heat transport medium, has a 546 square foot flat plate collector array subsystem, a 270 cubic foot rock thermal storage bin subsystem, a domestic hot water preheat tank, pumps, controls and transport lines. In general, the performance of the Solaron Akron solar energy system was somewhat difficult to assess for the November 1978 through October 1979 time period. The problems relating to the control systems, various solar energy leakages, air flow correction factors and instrumentation cause a subjectivity to be involved in the performance assessment for this solar energy system. Had these problems not been present, it is felt that this system would have exhibited a resonably high level of measured performance. R.E.S.

N80-25798# CCB/CUMALI Associates, Oakland, Calif.
PASSIVE SOLAR CALCULATION METHODS Final Report, 15 Oct. 1978 - 15 Jun. 1979
Zulfikar O. Cumali, A. Osman Sezgen, and Robert Sullivan 15 Jun. 1979 112 p refs
(Contract EM-78-C-01-5221)
(DSE-5221-T1) Avail: NTIS HC A06/MF A01

An analytical treatment related to the generation of space specific weighting factors is presented using a recursion relationship which employs a heat balance of both the outside and inside surface. The multizone problem is then discussed. The use of frequency domain methods is detailed such that the amplitude ratio and phase shift characteristics for a sinusoidal excitation are derived for the thermal load resulting from radiation heat gain/loss and space air temperature fluctuations. The results of a parametric study related to variable floor properties, radiation distributions and space sizes are presented. The weighting factors generated for each perturbation were used to define the expected differences in space response characteristics. DOE

N80-25806# Colorado State Univ., Fort Collins. Solar Applications Energy Lab.
CSU SOLAR HOUSE 3: SOLAR HEATING AND COOLING SYSTEM PERFORMANCE Progress Report, 1 Oct. 1978 - 31 May 1979
D. S. Ward Aug. 1979 47 p refs
(Contract DE-AC02-79CS-30122)
(COO-30122-3) Avail: NTIS HC A03/MF A01

During the period 1 October 1978 through 31 March 1979, the Chamberlain liquid-heating state-of-the-art flat-plate solar collector was evaluated for a complete heating season. Significant and important results of the systems evaluation include: (1) the demonstration of the critical importance of temperature differentials between the collector outlet and the absorption chiller generator inlet, the effects of alternative control strategies, the marginal feasibility of cool storage, the devastating effect on system performance due to heat losses from the thermal storage unit, and the importance of minimizing electrical parasitic power requirements in obtaining feasibilty for solar absorption cooling systems; (2) the concept of overall system efficiency was shown to be essential in the determination of the feasibility of any solar installation; and (3) evaluation of acquired data on the performance of the Colorado solar house system has provided the theoretical construction and experimental No.3 verification of the importance of solar operating threshold. DOE

N80-25811# Chicago Univ., Ill. Enrico Fermi Inst.
DESIGN AND TEST OF NON-EVACUATED SOLAR COLLECTORS WITH COMPOUND PARABOLIC CONCENTRATORS
A. Rabl, J. OGallagher, and R. Winston Jul. 1979 60 p refs
(Contract EY-76-S-02-2446)
(EFI-79-42) Avail: NTIS HC A04/MF A01

The intermediate range of concentration ratios (1.5X-10X) which can be achieved with CPC's without diurnal tracking provides both economic and thermal advantages for solar collector design even when used with nonevacuated absorbers. The present paper summarizes more than 3 years of research on nonevacuated CPC's and reviews measured performance data and critical design considerations. Concentrations in the upper portions of the practical range (e.g., 6X) can provide good efficiency (40 percent to 50 percent) in the 100 C to 160 C temperature range with relatively frequent tilt adjustments (12 to 20 times per year). At lower concentrations (e.g., 3X) performance will still be substantially better than for a double glazed flat plate collector above about 70 C and competitive below, while requiring only semiannual adjustments for year round operation. In both cases the cost savings associated with inexpensive reflectors, and the optimal coupling to smaller, simple inexpensive absorbers (e.g., tubes, fins, etc.) can be as important an advantage as the improved thermal performance. DOE

N80-25812# GTE Labs., Inc., Waltham, Mass.
DEVELOPMENT OF MATERIALS FOR A LUMINESCENT SOLAR COLLECTOR Annual Progress Report, 1 Sep. 1978 - 31 Aug. 1979
A. Lempicki, L. Andrews, and B. C. McCollum 1979 42 p refs
(Contract ER-78-C-02-4996)
(COO-4996-1) Avail: NTIS HC A03/MF A01

The objectives of the research involved preparation of a number of Cr(3+) doped glasses beginning with common commercial types, and expansion of the number and variety of glasses as time allowed. The Cr(3+) doped glasses were evaluated by spectroscopic measurements which included absorption and emission as well as quantum yield determinations. In addition, the influence of concentration quenching was measured by studying the luminescence decay kinetics at various concentrations in a variety of glasses. As the program developed, and the problem of rather low quantum yields became apparent in all the glasses, a rather detailed investigation was undertaken to better understand the radiationless decay of Cr(3+) in order to best evaluate the future direction of the program. The results are summarized. DOE

N80-25813# General Electric Co., Philadelphia, Pa. Advanced Energy Program.
SOLAIR HEATER PROGRAM: SOLAIR APPLICATIONS STUDY Final Report
Dec. 1977 96 p
(Contract EY-76-C-02-2705)
(COO-2705-3) Avail: NTIS HC A05/MF A01

The evaluation identified attractive applications, evaluated corresponding control procedures, estimated system performance, compared economically insolation and insulation, and evaluated the repackaging of off-the-shelf equipment for improved cost effectiveness. A detailed commercialization study of a residential domestic water heating system using the Solair concept which has been selected as the most attractive application was done. Other attractive applications are space/domestic water heating and a heat pump assisted solar system/domestic water heating where the heat pump and the solar system function in parallel. A prime advantage of heated air solar systems over liquid systems is cost and longer life which results in higher Btu's/dollar. Other air system advantages are no liquid leakage problems, no toxicity of freezing problems, and less complicated equipment. A hybrid solar system has been identified that can improve the market penetration of solar energy. Details of this system are provided. DOE

N80-25814# Argonne National Lab., Ill. Solar Energy Group.
DESIGN OF A SYSTEM USING CPC COLLECTORS TO COLLECT SOLAR ENERGY AND TO PRODUCE INDUSTRIAL PROCESS STEAM
C. K. Hsieh (Florida Univ., Gainesville) Aug. 1979 105 p refs
(Contract W-31-109-eng-38)
(ANL-79-102) Avail: NTIS HC A06/MF A01

A system was designed to use CPC collectors to collect solar energy and to generate steam for industrial process heat purposes. The system is divided into two loops with the collectors in the collector loop to operate a preheater and the collectors in the boiler loop to heat water to elevated pressures and temperatures. A flash boiler is used to throttle the heated water to steam. Two types of CPC collectors are chosen. In the collector loop the CPC collectors are fitted with concentric tube receivers. In the boiler loop the collectors employ heat pipes to transmit heat. This design is able to alleviate the scaling and plumbing problems. A fragile receiver tube can also be employed without rupture difficulties. The thermal processes in the collectors were analyzed using a computer modeling. The results were also used to develop a thermodynamic analysis of the total system. Calculations show that the design is technically feasible. The CPC collector is shown to have an efficiency that is very weakly dependent on its operating temperatures, which makes the collector particularly attractive in high temperature applications. DOE

N80-25816# International Business Machines Corp., Gaithersburg, Md.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION. ALBUQUERQUE WESTERN NO. 1, ALBUQUERQUE, NEW MEXICO Progress Report, Oct. 1978 - Mar. 1979
C. M. Fu 1979 65 p refs
(Contract EG-77-C-01-4049)
(SOLAR/1011-79/14) Avail: NTIS HC A04/MF A01

The Albuquerque Western site is a four story, 110 unit apartment building in Albuquerque, New Mexico. The solar energy system consists of two independently controlled systems: one system serves domestic hot water (DHW) preheating needs, the other serves to preheat hot water used in space heating. Only the DHW system is described. The solar energy system has an array of tracking collectors with a gross area of 1782 square feet. The array faces south at an angle of 35 degrees to the the horizontal. Water is the transfer medium that delivers solar energy from the collector array to storage. Solar energy is stored in a 2000 gallon wooden tank that contains a plastic liner. The DHW is continuously circulated throughout the building. When solar energy is insufficient to satisfy the hot water energy requirements, auxiliary heating is provided by an inline gas-fired boiler. An operational summary of the performance of the system for the period October 1978 through March 1979 is presented. DOE

N80-25817# Los Alamos Scientific Lab., N. Mex.
HIGH TEMPERATURE HYDROGEN CYCLES FOR SOLAR HEAT SOURCES
M. G. Bowman 1979 16 p refs Presented at Solar Fuels Workshop, Albuquerque, N. Mex., 28-29 Nov. 1979; sponsored by Solar Thermal Test Facilities Users Assoc. Submitted for publication

(Contract W-7405-eng-36)
(LA-UR-80-184; CONF-791143-3) Avail: NTIS HC A02/MF A01

Some of the criteria required for high temperature thermochemistry hydrogen cycles to couple efficiently with solar heat sources are defined. Some of the experimentally validated cycles that have been developed over the years in terms of these criteria are examined and potential cycles that are being considered for the higher temperatures potentially available from solar concentrators are discussed. Cycles discussed include oxide sulfate cycles, halide hydrolysis cycles, direct decomposition of H2O and CO2, oxide cycles, and sulfuric acid-metal cycles. DOE

N80-25818# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR A-FRAME INDUSTRIES' SINGLE FAMILY RESIDENCE: KANEOHE, HAWAII
27 Jul. 1979 44 p
(Contracts EX-76-A-29-1020; HUD-H-2372)
(SOLAR/1010-79/50) Avail: NTIS HC A03/MF A01

A solar energy system designed to provide domestic hot water heating is described. The system uses city water as the common heat transfer medium, and contains no energy storage tank or DHW tank heat exchanger loop. Therefore, the total operating energy is in the energy collection and storage subsystem (ECSS). The house has been fully instrumented for performance evaluation of the solar system since February 1978 and the compiled data are discussed. Original cost estimates for provisioning and installation of the solar system are given. DOE

N80-25819# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION. ALBUQUERQUE WESTERN-2 MULTI-DWELLING BUILDING ALBUQUERQUE, NEW MEXICO
D. Moore 23 Nov. 1979 43 p refs
(Contracts EX-76-A-29-1020; HUD-H-2372)
(SOLAR/1090-79/50) Avail: NTIS HC A03/MF A01

The Albuquerque Western-2 site is a four-story, 110 unit apartment building in Albuquerque, New Mexico. The solar energy system consists of a controlled system to preheat hot water used in space heating. The solar energy system is designed to provide approximately 54 percent of the conditioned space heating load. The system has an array of tracking collectors with a gross area of 6429 square feet. The array faces south at an angle of 35 degrees to the horizontal. Water is used as the medium for delivering energy from the collector array to storage. Solar energy is stored underground in a 57,000 gallon concrete storage tank. During the space heating season, the heated water from storage is continuously circulated through the building to satisfy the space heating needs for each apartment. Auxiliary heating is provided by three inline gas-fired boilers. The system has three modes of operation. Original cost estimates for provisioning and installation of the solar system are given. DOE

N80-25821# Boeing Aerospace Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR PERL-MACK ENTERPRISES' SINGLE FAMILY RESIDENCES, DENVER, COLORADO
21 Aug. 1979 50 p
(Contracts EG-77-C-01-4049; HUD-H-2372)
(SOLAR/1015-79/50) Avail: NTIS HC A03/MF A01

The Perl-Mack Enterprises Co. solar energy systems, which are installed in a total of 25 single family dwellings located in Denver, Colorado, are described. The 25 dwellings are of three different configurations. Two of the twenty-five dwellings have been fully instrumented for performance monitoring and evaluation since September 1977. All the solar systems are designed to provide approximately 69 percent of the space heating and energy requirements for each dwelling. Solar energy is collected by an array of flat plate collectors having a gross area of 470 square feet. A water-glycol mixture is used as the medium for delivering solar heat from the collection to the storage tank. The storage tank has a total capacity of 945 gallons. A liquid-to-liquid heat exchanger, within the storage tank, transfers the stored heat from the transfer medium to the domestic hot water tank of the house. DOE

N80-25822# Bell Telephone Labs., Inc., Philadelphia, Pa.
WEST CHESTER WORK CENTER: SOLAR SPACE HEATING DEMONSTRATION PROJECT
May 1979 47 p ref
(Contract EY-76-C-02-4048)
(DOE/CS-4048/2; COO-4048-2) Avail: NTIS HC A03/MF A01

The construction stage of an integrated system providing solar energy space heating for 9982 sq ft, newly built, one-story building is described. The building is located at 966 Matlack Street, West Goshen Township, Chester County, Pennslyvania. Functionally, the building consists of two sections: an office and a storeroom. The office section is heated by solar-assisted water-to-air heat pump units. The storeroom section is heated by an air-handing unit, containing a water-to-air coil. Solar energy is expected to provide 62% of the heating load, with the balance provided by a back-up electric boiler. The system includes 1900 active (2112 gross) square feet of flat-plate solar collectors, and a 6000 gallon above ground indoor storage tank. Freeze protection is provided by a gravity drain-down scheme combined with nitrogen pressurization in a closed circuit. DOE

N80-25823# Wisconsin Univ. - Madison. Solar Energy Lab.
SIMULATION AND DESIGN OF SOLAR THERMAL PROCESSES
31 Oct. 1979 16 p refs
(Contract EY-76-S-02-2588)
(COO-2588-T1) Avail: NTIS HC A02/MF A01

Research on simulation using TRNSYS and FCHART methods is described including systems analysis, user services, design procedures, and model validation. DOE

N80-25825# General Electric Co., Philadelphia, Pa. Advanced Energy Dept.
SOLAR TOTAL ENERGY PROJECT SHENANDOAH Final Design Report
10 Jan. 1980 340 p
(Contract EG-77-C-04-3985; DE-AC04-77ET-20260)
(ALO-3985-1-Rev-1) Avail: NTIS HC A15/MF A01

A description of the final design for the Solar Total Energy System to be installed at the Shenandoah, Georgia, site of utilization by the Bleyle knitwear plant, is presented. The system is a fully cascaded total energy system design featuring high temperature paraboloidal dish solar collectors with a 235 concentration ratio, a steam Rankine cycle power conversion system capable of supplying 100 to 400 kW(e) output with an intermediate process steam take-off point, and a back pressure condenser for heating and cooling. The design also includes an integrated control system employing the supervisory control concept to allow maximum experimental flexibility. The system design criteria and requirements are presented including the performance criteria and operating requirements, environmental conditions of operation; interface requirements with the Bleyle plant and the Georgia Power Company lines; maintenance, reliability, and testing requirements; health and safety requirements; and other applicable ordinances and codes. DOE

N80-25826# BDM Services Co., Albuquerque, N. Mex.
CONCEPTUAL DESIGN AND ANALYSIS OF A 100 MWe DISTRIBUTED LINE FOCUS SOLAR CENTRAL POWER PLANT Topical Report, 29 Sep. 1978 - 4 May 1979
M. G. Semmens, A. Fong, G. J. Collaros, R. E. Dascher, R. E. Grassberger, D. B. Griego, and T. F. Stueber 1979 327 p
(Contract ET-78-C-03-2073)
(SAN-2073-1) Avail: NTIS HC A15/MF A01

A program to develop the optimum line focus solar central power plant system conceptual design is reported in detail. The approach consisted of a parametric analysis of each of the seven major subsystems: collector, receiver tube, working fluid, heat transport subsystem, energy storage subsystem, electric power generating subsystem, and master control subsystem. Systems analysis and selection of the baseline 100 MWe line focus power plant are described. Detailed performance and cost summaries are included. DOE

N80-25839# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
SOLAR TECHNOLOGY APPLICATION TO ENHANCED OIL RECOVERY
P. deLeon, K. C. Brown, J. W. Margolis, and L. H. Nasr Dec. 1979 101 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-352-392) Avail: NTIS HC A06/MF A01

Solar energy systems which generate steam for thermal enhanced oil recovery are discussed. Six solar technologies are evaluated and two parabolic troughs and central receivers are selected for closer study. The legal and environmental issues attending solar enhanced oil recovery are analyzed. The petroleum producing companies' preferences and requirements are discussed. Alternative means of financing solar enhanced oil recovery are addressed. DOE

N80-25843# Varian Associates, Palo Alto, Calif.
NOVEL SOLAR CELL CONCENTRATOR PHOTOVOLTAIC CONVERTER SYSTEM Final Report
L. W. James and A. VanderPlas Dec. 1979 91 p refs Prepared for Sandia Labs., Albuquerque, New Mex.
(Contract EY-76-C-04-0789)
(SAND-79-7048) Avail: NTIS HC A05/MF A01

Attainment of photovoltaic conversion efficiencies greater than 25% to 30% thought necessary to make concentrator photovoltaics economical, seems possible if the soalr spectrum is more efficiently used by splitting the spectrum and using solar cells of different bandgaps,. For initial work on multi-bandgap concentrator solar cells, the spectrum was split by an optical filter which transmits light above 1.6 eV and below 1.1 eV and reflects light between 1.1 and 1.6 eV. Theoretical modeling of possible conversion efficiencies led to the choice of the filter bandpass energies and practical solar cell fabrication considerations have led to the choice of silicon and the Al(x) Ga(1-x)As system for initial development work. Special silicon concentrator solar cells with a p(+):n(-):n(+) structure designed for this application and have attained apparent cell conversion efficiencies of 16.2% at a current ratio of 455 suns. DOE

N80-25850# Sperry Univac, St. Paul, Minn.
SOLAR COLLECTOR STUDIES FOR SOLAR HEATING AND COOLING APPLICATIONS Technical Progress Report, 18 Sep. 1978 - 18 Mar. 1979
S. O. Jensen, J. E. Kovacic, and J. H. Anderson (Scientific Sunsource Systems) 10 Mar. 1979 56 p refs
(Contract EM-78-C-04-5355)
(ALO-5355-T1) Avail: NTIS HC A04/MF A01

A summary of the literature, especially patent teachings pertaining to black fluid solar collectors, is given. Laboratory tests to determine the suspension stability of various carbon types in water/ethylene glycol are reported. The suspensions were aged at 160 F for 2000 hours and at -15 F for 500 hours. Tests to date demonstrate that colloidal carbon with Zanflow gum as the suspending agent gave excellent, stable suspensions even after evaporation and resuspension with water/ethylene glycol 50:50 solution. It is suggested that the suspending agent interacts with electrical charges on the carbon particles to prevent agglomeration. DOE

N80-25851# American Science and Engineering, Inc., Cambridge, Mass.
DEVELOPMENT OF A SECOND-GENERATION CONCENTRATING TRACKING SOLAR COLLECTOR Technical Progress Report, 28 Dec. 1978 - 19 Jun. 1979
William D. Antrim, Jr. 16 Aug. 1979 29 p
(Contract EM-78-C-04-4275)
(ASE-4460) Avail: NTIS HC A03/MF A01

A second generation concentrating tracking solar collector was developed. The approach combines an array of parabolic trough mirror concentrators each combined with a variation of the cylindrical blackbody receiver to provide a collector with a minimum concentration ratio of ten. The design of the prototype collector was completed, engineering model hardware produced, tested, and the design iterated. The collector design and some of the model hardware used to develop certain design features are described in detail. DOE

N80-25852# California Univ. at Berkeley. Sanitary Engineering Research Lab.
SOLAR ENERGY CONVERSION THROUGH BIOPHOTOLYSIS Annual Report, 1 Apr. 1978 - 31 Mar. 1979
J. R. Benemann, M. A. Murry, P. C. Hallenbeck, K. Miyamoto, A. G. Olafsen, D. J. Esteva, and L. V. Kochian 1 May 1979 236 p refs
(Contract EY-76-S-03-0034)
(SAN-0034-239-T1; AR-3) Avail: NTIS HC A11/MF A01

The state-of-the-art of biophotolysis was reviewed and a bioengineering analysis carried out. The conclusions were that practical biophotolysis systems are feasible; however, they will require, in most cases, relatively long-term R and D. The biophotolysis system developed, utilizing heterocystous blue-green algae, was demonstrated both indoors and outdoors with a model converter system using the heterocystous blue-green alga Anabaena cylindrica. Maximal light energy conversion efficiencies were 2.5 percent indoors and about 0.2 percent outdoors, averaged for periods of about two weeks. Achievement of such rates required optimization of N2 supply and culture density. DOE

N80-25855# Solar Turbines International, San Diego, Calif.
DEVELOPMENT OF POLYIMIDE MATERIALS FOR USE IN SOLAR ENERGY SYSTEMS Semiannual Progress Report, 1 Aug. 1978 - 31 Jan. 1979
A. L. Wilcoxson, U. A. Sorathia, and J. Gagliani 1979 39 p refs
(Contracts EM-78-C-04-5305)
(DOE/CS-35305/T1; SR-79-R-4650-09) Avail: NTIS HC A03/MF A01

Two separate and distinct products were studied, a lightweight flexible insulating foam and a high density rigid, load bearing insulating foam. These products are derived from a polyimide resin. A critical characterization criteria was established in the form of environment exposure resistance. The foams were evaluated on the basis of this direct exposure test. Studies initiated to improve the resistance included additive studies, using reinforcements and uv absorbers, and postcure studies. The various formulations were also screened on the basis of humidity resistance. On the basis of testing conducted, four different resin formulations at a foam density of approximately 16 kg/cu m are meeting minimum requirements. The rigid foam was optimized through a glass reinforcement study and a process parameter study. The result was an optimized glass strand/microballoon reinforced foam which meets the tested property goals at a density of approximately 240 kg/cu m. DOE

N80-25858# Sandia Labs., Albuquerque, N. Mex.
SOLARIZATION OF HELIOSTAT GLASSES
J. Vitko, Jr. and J. E. Shelby Dec. 1979 26 p refs Presented at the Solar Reflective Mater. Workshop, San Francisco, 12-14 Feb. 1980
(Contracts EY-76-C-04-0789; DE-AC04-79DP-00789)
(SAND-79-8754) Avail: NTIS HC A03/MF A01

A solar induced decrease in FE(2+) absorption in heliostat glasses from the solar furnace at Odeillo, France, has been observed. This decrease occurs throughout the sampled (not just at the exposed surface) and is of sufficient magnitude to result in an increase of 2.5% in solar transmittance in a period of nine years. Optical and ESR studies did not detect a corresponding increase in FE(3+) concentration. The implication of these results on a microscopic model for the observed solarization is discussed. Solar simulation studies produced effects of magnitude and sign similar to those observed in the field exposed samples, and appear to offer an attractive means for screening samples for solarization tendencies. DOE

N80-25860# McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
CLEANING AGENTS AND TECHNIQUES FOR CONCENTRATING SOLAR COLLECTORS
V. L. Morris 1980 65 p refs Presented at 2nd Solar Reflective Mater. Workshop, San Franciso, 12 Feb. 1980
(Contract EY-76-C-04-0789)
(SAND-80-7005C; CONF-800220-2) Avail: NTIS HC A04/MF A01

Tests were conducted to determine the nature of the soil which is irreversibly deposited on solar collectors during environmental exposure. Mehods of removing this soil were investigated. The mechanism of attachment of the soil to the surface was determined as a potential aid to cleaning agent formulation. Reflector specimens were environmentally exposed at several industrial sites. Three types of reflector surfaces were studied: second surface silvered glass, aluminized FEK-244 film on aluminum substrate, and RTV 670 on aluminum. Cleaning procedures were evaluated by microscopic examination of the solid surfaces before and after cleaning by measurement of specular reflectance. The effect of local environmental degradation specific to an industrial process on solar collector surfaces was investigated. DOE

N80-25862# Department of Energy, Washington, D. C.
ENVIRONMENTAL DEVELOPMENT PLAN: SOLAR AGRICULTURAL AND INDUSTRIAL PROCESS HEAT
Sep. 1979 41 p refs
(DOE/EDP-0033) Avail: NTIS HC A03/MF A01

The Environmental Development Plan system which provides a common basis for planning, managing, and reviewing the environmental aspects of solar agricultural and industrial process heat is described. Solar heating for fossil fuel generated process heat is considered along with shelter heating, drying, process hot water, process steam, and cooling and refrigeration. Materials development, system analysis, and component development and testing are among the factors discussed. R.G.D.

N80-25864# Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
COMPARATIVE PERFORMANCE OF TWO TYPES OF EVACUATED TUBULAR SOLAR COLLECTORS IN A RESIDENTIAL HEATING AND COOLING SYSTEM Final Report, 1 Oct. 1977 - 30 Sep. 1978
G. O. G. Loef and W. F. Duff Sep. 1979 16 p
(Contract EY-76-S-02-2577)
(COO-2577-19) Avail: NTIS HC A02/MF A01

Two types of evacuated tubular solar collectors were operated in space heating, cooling, and domestic hot water heating systems in Colorado State University Solar House 1. A flat absorber plate inside a single walled glass tube is used in the Corning design, whereas heat is conducted through a single glass wall to an external heat exchanger plate in the Philips collector. The respective aperture areas are 50.0 sq m and 44.7 sq m. Since system designs and conditions of operation were not identical, efficiencies and energy deliveries of the two evacuated tubular collectors should not be compared without recognition of these factors. But in comparison with conventional flat plate collectors, both types show substantially reduced heat losses and improved efficiency. DOE

N80-25866# Argonne National Lab., Ill. Energy and Environmental Systems Div.
RELIABILITY AND MAINTAINABILITY EVALUATION OF SOLAR COLLECTOR AND MANIFOLD INTERCONNECTIONS
J. A. Mavec, R. Wolosewicz, A. Clark, P. Wang, and P. S. Chopra Mar. 1979 50 p refs
(Contract W-31-109-eng-38)
(SOLAR/0902-79/70; ANL/SDP/TM-79-4) Avail: NTIS HC A03/MF A01

The problem associated with the interconnection devices currenty in use at demonstration sites were examined. The nature and causes of interconnection-related failures are presented, together with the corrective actions that were taken. Design criteria for interconnections in solar-energy systems were developed, and a number of guidelines are provided to assist designers in avoiding interconnection difficulties. DOE

N80-25867# Argonne National Lab., Ill.
TWO-TANK SEASONAL STORAGE CONCEPT FOR SOLAR SPACE HEATING OF BUILDINGS
B. K. Cha, D. W. Connor, and R. O. Mueller 1979 15 p refs
Presented at the APS Electron and Atomic Phys. Meeting, Houston, Tex., 10-12 Dec. 1979
(Contract W-31-109-eng-38)
(CONF-791226-2) Avail: NTIS HC A02/MF A01

An analysis of a novel two tank water storage system is presented, consisting of a large primary water tank for seasonal storage of solar energy plus a much smaller secondary water tank for storage of solar energy collected during the heating season. The system offers the advantage of high collection efficiency during the early stages of the heating season, a period when the temperature of the primary tank is generally high. The resulting improvement in annual system efficiency through the addition of a small secondary tank is found to be substantial - for the site considered (Madison, Wisconsin), the relative percentage gain in annual performance is in the range of 10 to 20%. A simple computer model permits accurate hour-by-hour transient simulation of thermal performance over a yearly cycle. Results are presented of detailed simulations of collector and storage sizing and design tradeoffs for solar energy systems supplying 90 to 100% of annual heating load requirements. DOE

N80-25872# Argonne National Lab., Ill.
EVALUATION OF RELIABILITY OF OPERATIONAL SOLAR-ENERGY SYSTEMS
J. A. Mavec, E. Waite, and R. Wolosewicz 1979 8 p refs
Presented at Ann. Solar Heating and Cooling Systems Operational Results, Colorado Springs, Colo., 27 Nov. 1979
(Contract W-31-109-eng-38)
(CONF-791105-2) Avail: NTIS HC A02/MF A01

A reliability study of two solar heating systems using air as the heat transfer medium is presented. Failure modes and effects analysis were used to examine the controls of the systems for three operating modes. Principal components were identified for each mode, and a fault tree and reliability block diagram was constructed to structure the fault or failed sequence. Established failure rates were assigned to each component, and an exponential failure distribution was assumed. For components operating on demand at a given average frequency, the adjusted demand and normal operating failure rates were combined to reflect the total contribution. Representative operational times and component frequencies were found for each operating mode. A fault tree computer code was used to determine minimal outsets to the top event, remove redundant events, and perform necessary calculations. DOE

N80-25873# Alabama Univ. in Huntsville. Environmental Energy Center.
DATA HANDBOOK FOR THE NATIONAL SOLAR ENERGY DEMONSTRATION BOOK
David L. Christensen May 1979 87 p
(Contract EM-78-S-01-5216)
(DSE-5216-T4) Avail: NTIS HC A05/MF A01

Information is provided in a matrix format listing technical and programmatic data concerning the various project sites selected for the National Solar Energy Demonstration Program. The commercial, residential, and other demonstration projects which are now a part of the national program, are incorporated into one handbook, as a reference source for technical and research purposes on a state-by-state basis. DOE

N80-25875# Rockwell International Corp., Canoga Park, Calif. Energy Systems Group.
CONCEPTUAL DESIGN OF ADVANCED CENTRAL RECEIVER POWER SYSTEMS SODIUM-COOLED RECEIVER CONCEPT. VOLUME 1: EXECUTIVE SUMMARY Final Report
Jun. 1979 64 p
(Contract EG-77-C-03-1483)
(SAN-1483-1/1; ESG-79-2-Vol-1) Avail: NTIS HC A04/MF A01

The conceptual design of an advanced receiver power system using liquid sodium as a heat transport medium was completed. The technical and economic advantages of this concept were determined for commercial-scale power plants. Topics covered included: (1) review and analysis of preliminary specification

(2) parametric analysis; (3) select commercial configuration; (4) commercial plant conceptual design; (5) assessment of commercial plant; (6) advanced central receiver power system development plan; (7) program plan; (8) reports and data; (9) program management; and (10) safety analysis. A programmatic overview of the accomplishments of this program is given. The 100 MW conceptual commercial plant, the 281 MW optimum plant, and the 10 MW pilot plant are described. DOE

N80-25876# Rockwell International Corp., Canoga Park, Calif. Energy Systems Group.
CONCEPTUAL DESIGN OF ADVANCED CENTRAL RECEIVER POWER SYSTEMS SODIUM-COOLED RECEIVER CONCEPT. VOLUME 2, BOOK 1: COMMERCIAL PLANT CONCEPTUAL DESIGN Final Report
Mar. 1979 400 p refs
(Contract EG-77-C-03-1483)
(SAN-1483-1/2; ESG-79-2-Vol-2-BK-1) Avail: NTIS HC A17/MF A01

The conceptual design of the 100 MW solar tower focus commercial power plants is described in detail. Sodium is pumped up to the top of the tall tower where the receiver is located. The sodium is heated in the receiver and then flows down the tower, through a pressure reducing device, and into a large, hot storage tank made to meet a specific thermal energy storage capacity requirement. The sodium is pumped by a separate pump, through a system of sodium to water steam generators. The sodium flowing from the evaporator unit is piped to a cold storage tank. From the cold storage tank, sodium is then pumped up to the tip of the tower to complete the cycle. The steam generated in the steam generators is fed to a conventional off-the-shelf, high-efficiency turbine. The steam loop operates in a conventional rankine cycle with the steam generators serving the same purpose as a conventional boiler and water being fed to the evaporator with conventional feedwater pumps. DOE

N80-25883# Department of Energy, Washington, D. C. Office of Solar Applications.
SOLAR ENERGY PROJECT: AN OVERVIEW
Jan. 1980 44 p refs
(DOE/CS-0124) Avail: NTIS HC A03/MF A01

The secondary school project is described which was developed by divisions of the University of the State of New York including the State Education Department, the University at Albany's Atmospheric Sciences Research Center and secondary schools represented by 80 participating science teachers. This cooperative effort of scientist and educator resulted in 43 classroom-tested activities suitable for infusion into five science curriculum areas, including junior high science, earth science, biology, chemistry and physics. These activities are also appropriate for the development of a separate solar energy course of study. National dissemination and pilot testing of this project will begin during the fall of 1978. DOE

N80-25886# Boston Univ., Mass. Dept. of Chemistry.
PHOTOCHEMICAL DETERMINANTS OF THE EFFICIENCY OF PHOTOGALVANIC CONVERSION OF SOLAR ENERGY
Morton Z. Hoffman and Norman N. Lichtin 1979 35 p refs
(Contract EY-76-S-02-2889)
(COO-2889-5) Avail: NTIS HC A03/MF A01

A photogalvanic cell is a battery in which the cell solution absorbs light directly to generate species which, upon back reaction through an external circuit with the aid of suitable electrodes, produces electric power; photoactivation of the electrodes is not involved. The charge-carrying species have storage capacity if they are long-lived and can be prevented from engaging in degradative back reactions in bulk solution. The efficiency of a photogalvanic cell for the conversion of photon energy into electrical energy is determined by photochemical and electrochemical factors. Among the latter are the choice of electrode materials and the kinetics of electron transfer at the heterogeneous surfaces. The photochemical determinants of the efficiency of photogalvanic cell operations are examined: the absorption spectral characteristics of the cell solution, the efficiency of formation of separated charge carriers, and the lifetimes of the carriers toward back electron transfer. Modulation of bulk solution dynamics can be achieved by variation of the solution medium. The photochemical determinants are discussed with particular reference to the use of thionine or RU(bpy)2/3(+) as the light absorbing species. DOE

N80-25903# SRI International Corp., Menlo Park, Calif.
LINE-FOCUS SOLAR CENTRAL POWER SYSTEMS PHASE 1 Topical Report, 29 Sep. 1978 - 30 Apr. 1979
A. J. Slemmons May 1979 115 p refs
(Contract EY-76-C-03-0015)
(SAN-0115-140-1) Avail: NTIS HC A06/MF A01

The subsystem and system parametric analysis for a 100 MW/sub e/ solar central power plant of the high temperature, line focus, cavity receiver type were completed. Annual levelized busbar energy costs of 55 mills/kWh are projected for the 80th plant. The conceptual design of the plant was initiated. DOE

N80-25905# California Univ., Livermore. Lawrence Livermore Lab.
SOLAR-ASSISTED HEAT PUMP-SWIMMING POOL SYNERGISTICS FOR DOMESTIC HEATING
T. R. Galloway Oct. 1979 11 p refs Presented at Systems Simulation and Econ. Analysis Conf., San Diego, Calif., 23 Jan. 1980
(Contract W-7405-eng-48)
(UCRL-83458; CONF-800101-1) Avail: NTIS HC A02/MF A01

A 150 cu m home, clear performance and economic advantages are shown for a solar assisted heat pump, providing domestic hot water and space heating and cooling. The pump uses a year round solar heated swimming pool as a large thermal energy reservoir. The pool cycles seasonably between 18 and 31 C, allowing year round swimming, and provides an excellent water source for the heat pump and low cost, low temperature plastic solar panels operating at their near optimum efficiency. The system was optimized by examining the performance and cost characteristics of different glazed and unglazed solar panel collector (areas from 28 to 150 cu m and orientation from horizontal to 60 deg tilt) for sites in San Francisco Bay Area and in San Joaquin Valley. DOE

N80-25906# Southern California Gas Co., Los Angeles.
SAGE, SOLAR ASSISTED GAS ENERGY Summary Report
S. J. Cunningham and J. Rice Sep. 1979 34 p
(Grant NSF PTP-75-03457)
(PB80-144363; NSF/RA-790330) Avail: NTIS HC A03/MF A01 CSCL 13A

A multidiciplinary effort to examine the problems of introducing solar energy into the United States building industry was conducted. The following were emphasized: (1) field installations and tests to evaluate new vs. retrofit installations; (2) market assessment of the potential for a SAGE water heating system in apartment buildings; and (3) policy analysis of strategies that would contribute to widespread utilization of SAGE water heating. Technical results of field installations and tests are described for two installations using the system configuration chosen from pilot plant analysis. GRA

N80-25907# Southern California Gas Co., Los Angeles.
SAGE, SOLAR ASSISTED GAS ENERGY Final Report
S. J. Cunningham Sep. 1979 225 p refs
(Grant NSF PTP-75-03457)
(PB80-153836; NSF/RA-790331) Avail: NTIS HC A10/MF A01 CSCL 13A

A technical and economic baseline for assessing the practical potential of solar water heating for apartments was developed. Several steps were involved in the development: (1) installing and testing two solar assisted gas energy (SAGE) water heating systems; (2) assessing the market potential for a SAGE water heating system and possible business arrangements; and (3) analyzing strategies that would contribute to wide-spread utilization of SAGE water heating. Project findings are reported with respect to technical results, cost analysis, system performance and maintenance results, market assessment and policy analysis. GRA

N80-25982# Northrop Services, Inc., Huntsville, Ala.
SOLAR RADIATION DATA FORECAST AND INTERPOLATION ANALYSIS. FOLDER 1, PART 1: EXECUTIVE SUMMARY. PART 2: TECHNICAL ANALYSIS (TASKS 1 AND 2). PART 3: APPENDICES (TASKS 1 AND 2) Final Report
John Woo, Jr. Apr. 1979 184 p refs
(Contract EG-77-C-02-4494)
(COO-4494-1) Avail: NTIS HC A09/MF A01

Data were evaluated from the rehabilitated 52 station SOLMET solar radiation network. Techniques were established to transform radiation measurements taken on a horizontal surface to an inclined surface. A climatological cell statistics (CCS) method was developed to obtain the statistics of up to 24 variables occurring in combination with each other using surface meteorological data and to relate these statistics to the solar radiation measurements. A method to evaluate the differences between two insolation data sets, called the Wedge method, was developed to determine the representative area of a radiation measurement site. These methods were used to evaluate the capabilities of the NOAA solar radiation model to interpolate between measurement sites. Twenty-four methods of calculating solar radiation on inclined surfaces were investigated. All algorithms were rewritten in a common convention and nomenclature and the measurements required for each method were categorized. DOE

N80-26075# Sandia Labs., Albuquerque, N. Mex.
COMPARISON BETWEEN RESULTS OF THE HELIOS AND MIRVAL COMPUTER CODES APPLIED TO CENTRAL RECEIVER SOLAR-ENERGY COLLECTION
Charles N. Vittitoe, Frank Biggs, and Patricia L. Leary (Sandia Labs., Livermore, Calif.) Jan. 1980 27 p refs
(Contract EY-76-C-04-0789)
(SAND-79-8266) Avail: NTIS HC A03/MF A01

The computer codes HELIOS and MIRVAL, developed to predict the optical performance of reflecting solar concentrators and to model power collection by central-receiver solar energy power plants are compared in regard to their performance predictions. HELIOS is an analytic code, whereas MIRVAL use Monte Carlo ray-tracing techniques. The sample problems for comparison consists of a rectangular target and alt-azimuth heliostats deployed in a north field. The results indicate that HELIOS and MIRVAL closely agree on prediction of field performance and of power density on the target plane. DOE

N80-26143# Cornell Univ., Ithaca, N. Y.
OPTICAL PROPERTIES OF METALLIC SURFACES, SMALL PARTICLES AND COMPOSITE COATINGS FOR SOLAR ENERGY CONVERSION APPLICATIONS Final Technical Report, 1 Apr. 1977 - 31 Aug. 1979
N. W. Ashcroft, R. A. Buhrman, A. J. Sievers, and J. W. Wilkins Dec. 1979 26 p refs
(Contract EG-77-S-03-1456)
(DOE/ET-20413/1) Avail: NTIS HC A03/MF A01

A combined theoretical experimental-program to understand the optical properties of heterogeneous materials is described. The primary experimental quantity measured was the optical response from the visible to the far infrared. The production, structure and optical properties of composite metal-insulator cermet films were investigated. Using effective medium theories the optical properties were calculated and compared to experimental measurements. Studies of the design of spectrally selective solar energy absorbers using cermet films were made both experimentally and with computer simulation. Composite films were produced by controlled coevaporation of the metal and an insulator. The materials used include Ni, V, Fe, and Pt metals with dielectrics Al_2O_3, SiO_2, MgO and ZrO_2. Some preliminary results on amorphous aluminum are described. Crystalline aluminum has the disadvantage that its reflectance in the visible is smaller than those of some good free electron metals such as silver, which is unsuitable as a front surface reflector because of rapid corrosion. Interband transitions depress the reflectivity of aluminum in the solar spectrum. If these interband transitions could be eliminated and the free electron reflectance of aluminum obtained, a superior reflective coating would result. DOE

N80-26182*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE PLANAR MULTIJUNCTION CELL: A NEW SOLAR CELL FOR EARTH AND SPACE
John C. Evans, An-Ti Chai, and Chandra Goradia 1980 8 p refs Proposed for presentation at 15th Intern. Energy Conversion Engr. Conf., Seattle, Wash., 18-22 Aug. 1980; sponsored by AIAA, presented at 14th IEEE Photovoltaic Specialists Conf., San Diego, Calif., 7-10 Jan. 1980
(NASA-TM-81526) Avail: NTIS HC A02/MF A01 CSCL 20L

A family of high-voltage solar cells, called the planar multijunction (PMJ) cell is being developed. The new cells combine the attractive features of planar cells with conventional or interdigitated back contacts and the vertical multijunction solar cell. The PMJ solar cell is internally divided into many voltage-generating regions, called unit cells, which are internally connected in series. The key to obtaining reasonable performance from this device was the separation of top surface field regions over each active unit cell area. Using existing solar cell fabricating methods, output voltages in excess of 20 volts per linear centimeter are possible. Analysis of the new device is complex, and numerous geometries are being studied which should provide substantial benefits in both normal sunlight usage as well as with concentrators. Author

N80-26255# Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
LA RECHERCHE AEROSPATIALE, BIMONTHLY BULLETIN NUMBER 1979-6
1979 92 p refs Transl. into ENGLISH of La Rech. Aerospatiale, Bull. Bimestriel (Paris), no. 1979-6, Nov. - Dec. 1979 p 346-409 Original French report available from ONERA, Paris FF 36 Prepared for ESA
(ESA-TT-632; ONERA-NT-1979-6) Avail: NTIS HC A05/MF A01

Topics include: instrumentation for Earth radiation budget measurements, a solar powered air turbine thermal power system, high stability quartz oscillators, plate equilibrium problems, numerical bracketing of the eigen frequencies of complex linear structures, and identification of the elastic characteristics of composite materials.

N80-26257# Office National d'Etudes et de Recherches Aerospatiales, Paris (France). Turbomachines Div.
AN OPEN CYCLE TURBINE SOLAR THERMAL POWER SYSTEM
Emile LeGrives *In its* La Rech. Aerospatiale, Bimonthly Bull. No. 1979-6 (ESA-TT-632) 1979 p 11-38 refs Transl. into ENGLISH Of La Rech. Aerospatiale, Bull. Bimestriel (Paris), No. 1979-6, Nov. - Dec. 1979 p 355-373 Original report in FRENCH previously announced as A80-19989

Avail: NTIS HC A05/MF A01

Solar electrical power generation using a heated air turbine in conjunction with a tower mounted central receiver and heliostat field was hybrid fossil fuel fired so as to avoid thermal storage problems. Using a regenerative gas turbine open cycle, no cooling system was required. It is shown that with a solar receiver concept allowing a fast thermal response to transient radiation situations, a turbine inlet temperature of 1100 to 1150 K can be reached with an overall efficiency (power available on turbine shaft/power radiated into receiver) of 25 percent, with a 2000 Sun concentration ratio. Solar receiver, turbocompressor and regenerator sizes are given for a thermal power input of 1 MW into the receiver. Author (ESA)

N80-26403# Dow Corning Corp., Midland, Mich.
DEVELOPMENT OF IMPROVED INSULATION MATERIALS Final Technical Report, 1 Sep. 1978 - 30 Sep. 1979
J. A. Rabe, S. Spells, G. R. Homan, D. M. Rasch, C. L. Lee, and R. C. Parmele Sep. 1979 168 p refs
(Contract EM-78-C-04-4295)
(ALO-4295-T2) Avail: NTIS HC A08/MF A01

Evaluations of three types of silicone foam, for use as insulation in flat plate solar collectors are presented. The three types of foam were: Type 1A: a two part, room temperature curing foam corss linked through identical with SiOSi identical with linkages; Type 1B: a one part, heat activated foam also crosslinked through identical with SiOSi identical with bonds; and Type 2: a two part, room temperature curing foam cross linked with = NCOS(CH2)3 identical with linkages. A composite, in which a thin layer of type 1A foam protects a secondary layer of less expensive but thermally unstable isocyanurate foam, is also evaluated. DOE

N80-26409*# Institute of Gas Technology, Chicago, Ill.
STUDIES OF THERMOCHEMICAL WATER-SPLITTING CYCLES Final Report
R. J. Remick and S. E. Foh May 1980 48 p refs
(Contracts NAS7-100; JPL-955494)
(NASA-CR-163029; JPL-9950-371) Avail: NTIS HC A03/MF A01 CSCL 07D

Higher temperatures and more isothermal heat profiles of solar heat sources are developed. The metal oxide metal sulfate class of cycles were suited for solar heat sources. Electrochemical oxidation of SO2 and thermochemical reactions are presented. Electrolytic oxidation of sulfur dioxide in dilute sulfuric acid solutions were appropriate for metal oxide metal sulfate cycles. The cell voltage at workable current densities required for the oxidation of SO2 was critical to the efficient operation of any metal oxide metal sulfate cycle. A sulfur dioxide depolarized electrolysis cell for the splitting of water via optimization of the anode reaction is discussed. Sulfuric acid concentrations of 30 to 35 weight percent are preferred. Platinized platinum or smooth platinum gave the best anode kinetics at a given potential of the five materials examined. B.D.

N80-26611# Mission Research Corp., Albuquerque, N. Mex.
TRANSIENT EFFECTS FROM LIGHTNING. VOLUME 1: TRANSIENT ELECTROMAGNETIC FIELDS FROM LIGHTNING DISCHARGES
H. Fowles, L. Scott, and J. Hamm Jan. 1980 184 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7051-Vol-1) Avail: NTIS HC A09/MF A01

The effects of lightning on solar photovoltaic systems in the 100 kilowatt to 1 megawatt power range, and methods for protecting these systems from lightning are discussed. The statistics of lightning strokes is reviewed, and the model which predicts the electromagnetic fields and optical power density is summarized. Coupling of the electromagnetic fields to photovoltaic system elements is also discussed, and the experience of power and telephone companies with lightning transients is drawn upon. A theoretical model for predicting damage thresholds for modern terrestrial solar cells is presented. The thresholds are presented in the form of peak currents as a function of pulse width for two separate failure modes: melting of the deposited metal grid and burnout of the junction. Lightning protection techniques which are technically and economically feasible for photovoltaic systems are discussed. The techniques of shielding and terminal protection are discussed. DOE

N80-26766*# Travis-Braun and Associates, Inc., Dallas, Tex.
SOLAR ENERGY FACILITY AT NORTH HAMPTON RECREATION CENTER, DALLAS, TEXAS Final Report
May 1980 141 p
(Contract EX-76-C-01-2543)
(NASA-CR-161444) Avail: NTIS HC A07/MF A01 CSCL 10A

The solar energy facility located at the North Hampton Park Recreation and Health Center, Dallas, Texas is presented. The solar energy system is installed in a single story (two heights), 16,000 sq ft building enclosing a gymnasium, locker area, and health care clinic surrounded by a recreational area and athletic field. The solar energy system is designed to provide 80 percent of the annual space heating, 48 percent of the annual space cooling, and 90 percent of the domestic hot water requirements. The system's operation modes and performance data acquisition system are described. The system's performance during the months of June, July, August, September, and October of 1979 are presented and show a negative savings of energy. Experience to date indicates however that the system concept has promise of acceptable performance. It is concluded that if proper control and sequencing components was maintained, then the system performance would improve to an acceptable level. R.E.S.

N80-26768*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
PHOTOVOLTAIC RESIDENTIAL APPLICATIONS PROGRAM IMPLEMENTATION WORKSHOP PROCEEDINGS
R. H. Barbieri 15 May 1980 166 p Workshop held at Calif. Inst. of Tech., Pasadena, 12-13 Feb. 1980
(Contract NAS7-100; EX-76-A-29-1012)
(NASA-CR-163274; JPL-Pub-80-22) Avail: NTIS HC A08/MF A01 CSCL 10B

Two major aspects of the workshop are presented: (1) presentations on the Photovoltaic program and the National Solar Heating and Cooling Demonstration program, and (2) discussions on the issues pertinent to the Residential Application program. R.E.S.

N80-26770*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
THERMAL POWER SYSTEMS (TPS); POINT-FOCUSING THERMAL AND ELECTRIC APPLICATIONS (PFTEA). VOLUME 2: DETAILED REPORT, FISCAL YEAR 1979
15 Jan. 1980 146 p refs
(Contracts NAS7-100; Contract DE-AI01-79ET-20397)
(NASA-CR-163023; DOE/JPL-1060/31-Vol-2; JPL-Pub-79-118-Vol-2) Avail: NTIS HC A07/MF A01 CSCL 10A

Progress in the development of systems which employ point focusing distributed receiver technology is reported. Emphasis is placed on the first engineering experiment, the Small Community Solar Thermal Power Experiment. Procurement activities for the Military Module Power Experiment the first of a series of experiments planned as part of the Isolated Load Series are included. J.M.S.

N80-26771*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
COST OF CZOCHRALSKI WAFERS AS A FUNCTION OF DIAMETER
M. H. Leipold, C. Radics, and A. Kachare 15 Feb. 1980 20 p
(Contracts NAS7-100; EX-76-A-29-1012)
(NASA-CR-163277; DOE/JPL-1012/37; JPL-Pub-80-25) Avail: NTIS HC A02/MF A01 CSCL 10A

The impact of diameter in the range of 10 to 15 cm on the cost of wafers sliced from Czochralski ingots was analyzed. Increasing silicon waste and decreasing ingot cost with increasing ingot size were estimated along with projected costs. Results indicate a small but continuous decrease in sheet cost with increasing ingot size in this size range. Sheet costs including silicon are projected to be $50 to $60/sq m (1980 $) depending upon technique used. R.E.S.

N80-26776*# General Electric Co., Philadelphia, Pa.
DESIGN, FABRICATION, TEST, AND QUALIFICATION AND PRICE ANALYSIS OF THIRD GENERATION DESIGN SOLAR CELL MODULES
N. F. Shepard 31 Mar. 1980 113 p
(Contract JPL-955401)
(NASA-CR-163028; DOE/JPL-955401-80/1; JPL-9950-353) Avail: NTIS HC A06/MF A01 CSCL 10A

The Block 4 shingle type module makes it possible to apply a photovoltaic array to the sloping roof of a residential building by simply nailing the overlapping hexagon shaped shingles to the plywood roof sheathing. This third-generation shingle module design consists of nineteen series connected 100 mm diameter solar cells which are arranged in a closely packed hexagon configuration to provide in excess of 75 watts/sq m of exposed module area under standard operating conditions. The solar cells are individually bonded to the embossed underside of a 4.4 mm thick thermally tempered piece of glass. An experimental silicone pottant was used as the transparent bonding adhesive between the cells and glass. The semi-flexible portion of each shingle module is a composite laminate construction consisting of an outer layer of FLEXSEAL bonded to an inner core of closed cell polyethylene foam. Silaprene is used as the substrate laminating adhesive. The module design has satisfactorily survived qualification testing program which includes 50 thermal cycles between -40 and +90 C, a seven day temperature-humidity exposure test, and a wind resistance test. E.J.R.

N80-26777*# Sanders Associates, Inc., Nashua, N. H. Energy Systems Center.
DEVELOPMENT OF AN AIR BRAYTON SOLAR RECEIVER
[1980] 149 p
(Contract JPL-955120)
(NASA-CR-163027; JPL-9950-351) Avail: NTIS HC A07/MF A01 CSCL 10A

Various receiver configurations and operating conditions were examined. The interface requirements between the receiver/concentrator/power module were addressed. Production cost estimates were obtained to determine the cost of the receiver during the 1980 timeframe. A conceptual design of an air Brayton solar receiver is presented based on the results. The following design goals were established: (1)peak thermal input power - 85 KWt; (2)receiver outlet air temperature - 1500 F; (3)receiver inlet air temperature - 1050 F; (4)design mass flow rate - 0.533 lb/sec; and (5)design receiver inlet pressure - 36. 75 psia. J.M.S.

N80-26778*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: SEASONAL REPORT FOR ELCAM TEMPE ARIZONA STATE UNIVERSITY, TEMPE, ARIZONA Progress Report, Jun. 1979 - Jan. 1980
May 1980 71 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161466) Avail: NTIS HC A04/MF A01 CSCL 10A

The solar system, Elcam-Tempe, was designed by Elcam Incorporated, Santa Barbara, California, to supply commercial domestic hot water heating systems to the Agriculture Department residence at Arizona State University. The building is a single story residence located at the agriculture experiment farm of the Arizona State University. The energy system's four modes of operation are described. Electrical energy savings at the site was a net of 5.54 million Btu after the 0.17 million Btu of operating energy required to operate collector loop circulating pump were subtracted. The energy savings due to solar was less than the system's potential. On an average, twice as much hot water could have been used with signifient solar energy contribution. The system corrosion and deposits caused by using dissimilar metals in the collector loop was the only problem noted with the Elcam-Tempe system. R.E.S.

N80-26781*# Bechtel National, Inc., San Francisco, Calif.
STUDY OF CURVED GLASS PHOTOVOLTAIC MODULE AND MODULE ELECTRICAL ISOLATION DESIGN REQUIREMENTS Final Report
Jun. 1980 182 p refs
(Contract JPL-954698)
(NASA-CR-163033; DOE/JPL-954698-80/2; JPL-9950-365)
Avail: NTIS HC A09/MF A01 CSCL 10A

The design of a 1.2 by 2.4 m curved glass superstrate and support clip assembly is presented, along with the results of finite element computer analysis and a glass industry survey conducted to assess the technical and economic feasibility of the concept. Installed costs for four curved glass module array configurations are estimated and compared with cost previously reported for comparable flat glass module configurations. Electrical properties of candidate module encapsulation systems are evaluated along with present industry practice for the design and testing of electrical insulation systems. Electric design requirements for module encapsulation systems are also discussed. R.E.S.

N80-26782*# Spectrolab, Inc., Sylmar, Calif.
HIGH RESOLUTION, LOW COST SOLAR CELL CONTACT DEVELOPMENT Final Report
N. Mardesich Dec. 1979 50 p
(Contracts NAS7-100; JPL-955298)
(NASA-CR-163289; DOE/JPL-955298-80/2; JPL-9950-368)
Avail: NTIS HC A03/MF A01 CSCL 10A

The experimental work demonstrating the feasibility of the MIDFILM process as a low cost means of applying solar cell collector metallization as reported. Cell efficiencies of above 14% (AMI, 28 C) were achieved with fritted silver metallization. Environmental tests suggest that the metallization is slightly humidity sensitive and degradation is observed on cells with high series resistance. The major yield loss in the fabrication of cells was due to discontinuous grid lines, resulting in high series resitance. Standard lead-tin solder plated interconnections do not appear compatible with the MIDFILM contact. Copper, nickel and molybdenum base powder were investigated as low cost metallization systems. The copper based powder degraded the cell response. The nickel and molybdenum base powders oxidized when sintered in the oxidizing atmosphere necessary to ash the photoresin. Author

N80-26792# Technische Physische Dienst TNO-TH, Delft (Netherlands).
THE POTENTIAL FOR HEAT PRODUCTION WITH SOLAR WATER HEATERS IN THE NETHERLANDS CLIMATE [DE POTENTIELE WARMTEPRODUKTIE MET EEN ZONNEBOILER IN HET NEDERLANDSE KLIMAAT]
C. denOuden *In* Central Tech. Inst. Lectures on Heat Technol in the Netherlands 1977 p 51-57 refs In DUTCH

Avail: NTIS HC A04/MF A01; Central Tech. Inst., Apeldoorn, Netherlands FL 30

The technical aspects of the solar water heater are described, and various designs presented. The energy production during an average year in the Netherlands using different configurations is computed. An economic analysis based upon a system with a 4 sq m collector is given. Author (ESA)

N80-26793# Technische Physische Dienst TNO-TH, Delft (Netherlands).
THE DESIGN OF A SOLAR HOME HEATING INSTALLATION, USING A MATHEMATICAL MODEL [HET ONTWERPEN VAN EEN ZONNEVERWARMINGS- INSTALLATIE VOOR EEN WONING MET BEHULP VAN EEN REKENMODEL]
E. vanGalen, A. J. T. M. Wijsman, and C. denOuden *In* Central Tech. Inst. Lectures on Heat Technol. in the Netherlands 1977 p 59-69 ref In DUTCH Sponsored by Netherlands Min. van Econ. Zaken
Avail: NTIS HC A04/MF A01; Central Tech. Inst., Apeldoorn, Netherlands FL 30

The model is capable of simulating a complete system, including the collector and the distribution system in the home. Efficiencies of various types of collectors are accommodated. Results of some runs are presented. Comparative cost data for solar and conventional systems are given. Solar systems are shown to be economical for home heating only in well-insulated buildings. Author (ESA)

N80-26797# Research Triangle Inst., Research Triangle Park, N. C.
DEVELOPMENT OF HIGH EFFICIENCY STACKED MULTIPLE BANDGAP SOLAR CELLS Final Report, 1 Aug. 1978 - 30 Sep. 1979
S. M. Bedair, J. R. Hauser, M. F. Lamorte, S. Phatak, M. L. Timmons, J. E. Andrews, and M. Simmons Wright-Patterson AFB AFAPL Oct. 1979 102 p refs
(Contract F33615-78-C-2077)
(AD-A083092; RTI-41U-1678; AFAPL-TR-79-2116) Avail: NTIS HC A06/MF A01 CSCL 10/2

The objective of this research was to develop the technology required to fabricate two-junction, cascade solar cell assemblies having conversion efficiencies exceeding 25 percent when operating at 25 deg C under 1 sun, AM O conditions. The experimental effort has focused on several different III-V ternary and quaternary materials that show promise for use in fabricating a cascade cell. These include GaAlAs, GaInAs, GaInP, GaAsSb, and GaAlAsSb. The work also includes theoretical calculations of cascade solar cell performance over a wide range of operating temperatures. GRA

N80-26801# Boeing Engineering and Construction, Seattle, Wash.
SOLAR CENTRAL RECEIVER PROTOTYPE HELIOSTAT. VOLUME 3: COST ESTIMATES
1 Jun. 1978 149 p
(Contract EG-77-C-03-1604)
(SAN-1604-3) Avail: NTIS HC A07/MF A01

The Boeing heliostat design was produced and installed for a capital cost of $42 per square meter at high commercial plant quantities and rates. This is 14% less than the DOE cost target. Even at a low commercial plant production rate of 25,000 heliostats per year the captial cost of $48 per square meter 2% less than the cost goal established by the DOE. Projected captial cost and 30 year maintenance costs for three scenarios of production and installation are presented: (1) commercial rate production of 25,000, 25,000 and 1,000,000 heliostats per year; (2) a one-time only production of 25,000 heliostats per year with each plant (25,000 heliostats) installed at widely dispersed sites throughout the southwestern United States. These three scenarios for solar plant locations and the manufacturing/installation processes are fully described, and detailed cost breakdowns for the three scenarios are provided. DOE

N80-26802# Jalar Associates, San Francisco, Calif.
INDUSTRIAL COMPRESSED AIR APPLICATIONS FOR SOLAR ENERGY CONVERSION/STORAGE DEVICES Final Report
Laurence B. McEwen, Jr. and John W. Swain, Jr. Jan. 1980 162 p refs Prepared for Sandia Labs., Albuquerque
(Contract EY-76-C-04-0789)
(SAND-79-7077) Avail: NTIS HC A08/MF A01

A survey was made of industrial compressed air installations in this country with emphasis on air usage patterns, types of equipment, and energy/power requirements. This was followed by an investigation into the technical feasibility of utilizing solar energy conversion systems to power representative industrial compressed air systems. The final task was to evaluate the economic merits of three diverse scenarios of conceptual industrial compressed-air installation. None of the three were found to be economically attractive until approximately 10 years after completion of construction with one of the primary reasons being the high capitalized cost of the associated solar powered air compression systems. A proper combination of technological improvements in solar energy conversion systems, reduced capital costs, accelerated rises in utility rates, and continued uncertainty in fossil fuel availability is regarded as necessary before further pursuit of this concept is warranted. DOE

N80-26811# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR ZIEN MECHANICAL CONTRACTORS-I SINGLE FAMILY RESIDENCE, MILWAUKEE, WISCONSIN
D. Beers 5 Feb. 1980 48 p
(Contract EX-76-A-29-1020)
(SOLAR/1057-79/50-Pt-1) Avail: NTIS HC A03/MF A01

The Zien Mechanical site is a single family residence located in Milwaukee, Wisconsin. The home has two separate solar energy systems: an air system for space heating and cooling; a liquid system to preheat the potable hot water. The space heating and cooling system design and operation modes are described. The space heating system is designed to apply approximately 44 percent of the space heating requirements for the 1388 square foot residence. Engineering drawings are provided and the performance evaluation instrumentation is described. R.E.S.

N80-26812# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR ALPHA CONSTRUCTION COMPANY'S SINGLE FAMILY RESIDENCE, CANTON, OHIO
D. Beers 21 Sep. 1979 53 p
(Contract EX-76-A-29-1020)
(SOLAR/1034-79/50) Avail: NTIS HC A04/MF A01

The solar energy system for a new single family detached residence in Canton, Ohio, preheats domestic hot water and supplements heating energy for 2460 square feet of occupied space. The solar energy system is designed to provide approximately 50 percent of the space heating and 70 percent of the hot water energy requirements for the home. The system design and operation modes are described. Engineering drawings are provided and the performance evaluation instrumentation is described. R.E.S.

N80-26813# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR STEWART-TEELE-MITCHELL SINGLE FAMILY RESIDENCE, MALTA, N.Y.
D. Beers 5 Dec. 1979 51 p
(Contract EX-76-A-29-1020)
(SOLAR/1018-79/50) Avail: NTIS HC A04/MF A01

The Stewart-Teele-Mitchell solar energy system is installed in a 1900 square-foot, single family dwelling located in Malta, New York. The system is designed to provide solar energy for space heating, and domestic hot water heating. The system design and operation modes are described. Engineering drawings are provided and the performance evaluation instrumentation is described. R.E.S.

N80-26814# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR WASHINGTON NATURAL GAS COMPANY'S SINGLE FAMILY RESIDENCE, KIRKLAND, WASHINGTON
D. Beers 12 Sep. 1979 48 p
(Contract EX-76-A-29-1020)
(SOLAR/1001-79/50) Avail: NTIS HC A03/MF A01

The solar energy system for a new single family detached residence in Kirkland, Washington, preheats domestic hot water and heats 2607 square feet of occupied space. The system design and operation modes are described. Engineering drawings are provided and the performance evaluation instrumentation is described. R.E.S.

N80-26815# Boeing Co., Seattle, Wash.
SOLAR PROJECT DESCRIPTION FOR ZIEN MECHANICAL 2 SINGLE FAMILY RESIDENCE, MILWAUKEE, WISONSIN
5 Feb. 1980 44 p
(Contracts EX-76-A-29-1020; H-2372)
(SOLAR/1057-79/50-Pt-2) Avail: NTIS HC A03/MF A01

Zien Mechanical Contractors No. 2 is a single-family residence in Milwaukee, Wisonsin. The home has approximately 1304 square feet of conditioned space. The solar energy system consists of two independently controlled systems: one system is used for domestic hot water preheating, the other is used for space heating and cooling. The domestic hot water system design and operation modes are described. Engineering drawings are provided and the performance evaluation instrumentation is described. R.E.S.

N80-26816# Burt, Hill, Kosar, Rittleman, and Associates, Butler, Pa.
SOLAR-ASSISTED LOW ENERGY DWELLINGS Final Report
Torben V. Esbensen Feb. 1980 113 p refs
(Contract EY-76-S-05-4908)
(DOE/CS-0145; CCMS-93) Avail: NTIS HC A06/MF A01

The Zero Energy House Group was formed as a subproject of the CCMS Solar Energy Pilot Study in 1974 by seven participating countries experimenting with solar-assisted low-energy dwellings for temperate and northern European climatic conditions. A Zero Energy House is one in which solar energy is used to meet the reduced energy needs of buildings incorporating various thermal energy conservation features. This is the final report of the Zero Energy House Group. It includes brief descriptions of 13 major low-energy dwellings in the participating CCMS countries. An overall assessment of the state-of-the-art in solar-assisted low-energy dwellings is given. DOE

N80-26818# Mississippi State Univ., Mississippi State. Engineering and Industrial Research Station.

ADDITION OF INEXPENSIVE SOLAR AIR-HEATERS TO A PRE-ENGINEERED METAL BUILDING Final Report, 25 Sep. 1977 - 25 Mar. 1979

Richard E. Forbes and Ronald W. McClendon May 1979 52 p refs
(Contracts EG-77-G-04-4086; EG-77-C-29-0001)
(ALO-4086-1) Avail: NTIS HC A03/MF A01

The use of site built solar collectors for heating air in poultry houses was studied in order to design and test a functional air heater solar collector which would be inexpensive to construct and acceptable to poultry producers. The results reported are an extension of the original concept. The basic concept is to use a pre-engineered metal building for the structure and incorporate the solar air heaters as an integral part of the south facing wall of the building. The outer skin of the building is used as the absorber plate for the collectors. Construction and testing of the solar collectors and heat storage systems are discussed, and the performance characteristics of the site built solar collectors are described. DOE

N80-26819# Rockwell International Corp., Thousand Oaks, Calif. Electronics Research Center.

DEVELOPMENT OF POLYCRYSTAL GaAs SOLAR CELLS Quarterly Technical Progress Report, 1 Aug. - 30 Oct. 1979

D. L. Miller, Marshall J. Cohen, J. S. Harris, Jr., Joseph Ballantyne (Cornell Univ., Itahaca, N.Y.), and Elias Stefanakos (N.C. A and T State Univ., Greensboro) Dec. 1979 49 p
(Contract EG-77-C-01-4042)
(DSE-4042-T28; QTPR-3) Avail: NTIS HC A03/MF A01

Progress on the development of thin film polycrystal GaAs solar cells with 10% conversion efficiency is described. Highlights include the growth of Ge on Fe substrates and the investigation of various grain boundary passivation schemes. DOE

N80-26820# Midwest Research Inst., Golden, Colo.

SERI SOLAR ENERGY STORAGE PROGRAM

Robert J. Copeland, John D. Wright, and Charles E. Wyman Feb. 1980 12 p refs Presented at the Thermal Energy Storage Review Meeting, Tysons Corner, Va., 3 Dec. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-333-497; CONF-791232-1) Avail: NTIS HC A02/MF A01

Research on advanced technologies, system analyses, and assessments of thermal energy storage for solar applications in support of the Thermal and Chemical Energy Storage program are presented. Currently, research is in progress on direct contact latent heat storage and thermochemical energy storage and transport. Systems analyses are being performed of thermal energy storage for solar thermal applications, and surveys and assessments are being prepared of thermal energy storage in solar applications. DOE

N80-26822# Stanford Linear Accelerator Center, Calif.

MORE ON DUAL PURPOSE SOLAR-ELECTRIC POWER PLANTS

F. F. Hall Feb. 1980 17 p refs Presented at the 2nd Miami Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10 Dec. 1979
(Contract EY-76-C-03-0515)
(SLAC-PUB-2477; CONF-791204-33) Avail: NTIS HC A02/MF A01

Dual purpose solar-electric plants are discussed. The rationale for such plants is reviewed and plant elements are listed. Heat extraction, energy storage, and plant costs are discussed. DOE

N80-26823# Trident Engineering Associates, Inc., Annapolis, Md.

SURVEY AND EVALUATION OF CURRENT DESIGN OF EVACUATED COLLECTORS Final Technical Report

B. J. Graham 30 Sep. 1979 192 p refs
(Contract EM-78-C-04-5350)
(ALO-5350-1) Avail: NTIS HC A09/MF A01

The general development of evacuated collectors is described. A table summarizing all of the available collectors, along with their characteristics, is presented. There are four evacuated collectors which have been tested, used in demonstration sites, and developed for the market. These collectors are described in detail, and they are compared in performance and cost with a well engineered, double glazed, selectively coated, flat plate collector. A rather simple model system of about 2000 sq ft of collector area for each of the four evacuated collectors and the flat plate collector is described, along with the support structure and the piping for each. Details of the cost are presented in order to compare collector costs with component costs. All of the available efficiency curves of collectors were plotted for comparison with the effeciency curve of a good, flat plate collector. DOE

N80-26824# Argonne National Lab., Ill. Energy and Environmental Systems Div.

RELIABILITY AND MATERIALS PERFORMANCE OF SOLAR HEATING AND COOLING SYSTEMS

P. S. Chopra Jun. 1979 24 p refs
(Contract W-31-109-eng-38)
(SOLAR/0906-79/70; ANL/SDP-TM-79-8) Avail: NTIS HC A02/MF A01

The reliability field information collected to date from the solar heating and cooling systems sponsored by the US Department of Energy and the evaluation of four system-reliability problems freezing, leaks, controls, and collectors are summarized. An example of a reliability analysis for a hot water preheating system is presented using data on component failures obtained primarily from nonsolar sources. The status of material assessment activities is discussed along with the results of initial studies of the properties of heat transfer fluids and the scaling caused by the fluids. DOE

N80-26826# California Univ., Berkeley. Lawrence Berkeley Lab. Energy Analysis Program.

ASSESSMENT OF SOLAR ENERGY WITHIN A COMMUNITY: SUMMARY OF THREE COMMUNITY-LEVEL STUDIES Summary Report

Ronald L. Ritschard Oct. 1979 37 p refs Sponsored by DOE
(DOE/EV-0054) Avail: NTIS HC A03/MF A01

An analysis of the potential health, environmental, and social/economic consequences of large-scale (national in scope) commercialization of solar technologies is discussed. A summary of three studies concentrating on the potential community-level impacts of such commercialization is given. The results of these studies provide enrichment of the national-level project by identifying for policymakers specific community-level issues that may arise as a result of federal policy. The three studies are: (1) community-level environmental impacts of decentralized solar technologies; (2) community impediments to implementation of solar energy; and (3) three solar urban futures: characterizations of a future community under three energy supply scenarios. DOE

N80-26828# Exxon Research and Engineering Co., Linden, N.J. Advanced Energy Systems Labs.

THIN FILM POLYCRYSTALLINE SILICON SOLAR CELLS Quarterly Report, 1 Jul. - 30 Sep. 1979

Amal K. Ghosh, Tom Feng, and H. Paul Maruska 1979 30 p refs
(Contract DE-AC03-79ET-23047)
(DOE/SF/23047-3; QR-3) Avail: NTIS HC A03/MF A01

The details of the fabrication procedures for making SnO2/nSi, ITO/n-Si, and metal insulated semiconductors solar cells are given. A low cost and highly reproducible spray deposition process for tin oxide and indium tin oxide (ITO was used to make SnO2/n-Si and ITO/n-Si, solar cells with power conversion efficiencies of 10 and 13% for polycrystalline and single crystal silicon, respectively. Continued improvements in the efficiencies of diffused p-n junction cells were made; efficiencies of 10.3 and 9% were obtained for polysilicon cells of 1- and 20-cu cm sizes, respectively. The effects of grain boundaries on the generation of photocurrent were studied. The Hall mobility of polysilicon in the dark and under illumination, developed a served resistivity and mobility results. A comparison of the spectral response curves of SnO2/n-Si heterojunction and diffused p/n junction cells indicates a lower diffusion length in the diffused cells. The stability studies of the SnO2/n-Si cells were continued. DOE

N80-26830# General Electric Co., Philadelphia, Pa. Space Div.
CONCENTRATING ARRAY PRODUCTION PROCESS DESIGN. VOLUME 1: STUDY SUMMARY. VOLUME 2: STUDY RESULTS Final Report
Ronald C. Hodge, A. Koeing, A. Hetzel, J. Nichols, A. Zucker, M. McCullough, R. Fogaroli, R. McCarthy, R. Drummond, and J. Dougherty Mar. 1980 213 p refs Prepared for Sandia Labs, Albuquerque, N.M.
(Contract EY-76-C-04-0789)
(SAND 78-7072-Vol-1/2) Avail: NTIS HC A10/MF A01

Existing P/V concentrator designs are evaluated in terms of their performance and low production and life cycle cost potential. Alternate designs and modifications are defined that will be potentially less costly to produce in large scale production. Manufacturing processes commensurate with four levels of production are defined for a prime array design. Manufacturing and life cycle costs are determined as a function of production level, category, and salient design features, e.g., optical type. DOE

N80-26835# Los Alamos Scientific Lab., N. Mex.
VALIDATION OF SOLAR SYSTEM SIMULATION CODER BY THE INTERNATIONAL ENERGY AGENCY
James C. Hedstrom and Thomas L. Freeman (Atlas Corp., Santa Cruz, Calif.) 1980 7 p refs Presented at 2nd Ann. Systems Stimulation and Econ. Analysis Conf., San Diego, Calif., 23-25 Jan. 1980
(Contract W-7405-eng-36)
(LA-UR-80-387; CONF-800101-18) Avail: NTIS HC A02/MF A01

Validation of active solar energy system simulation codes by the International Energy Agency using data from the Los Alamos Study Center is described. Two rounds of comparisons of predicted to measure performance were completed. In the first round, all participants were given detailed system description data and a period of measured hourly weather and loads data with the corresponding measured hourly performance data. In the second round, the participants were given minor changes to the system description and a second period of measured hourly performance. In the first round, each of the participants was able to predict the results provided. However, this required an undocumented series of adjustments to the user input and the models and comparisons of measured and predicted results. Agreement of measured and predicted results were nearly as good in the second round except for two codes that predicted significantly erroneous results. As a result of this exercise, errors and shortcomings were found and corrected in most of the codes and confidence in the ability of all codes to model real systems has been increased. However, the questions of a workable methodology for validation and the means of dealing with user error remain unanswered. DOE

N80-26836# Department of Energy, Washington, D. C. Office of Energy Research.
PRELIMINARY ENVIRONMENTAL ASSESSMENT FOR THE SATELLITE POWER SYSTEM (SPS), REVISION 1. VOLUME 2: DETAILED ASSESSMENT
Jan. 1980 205 p refs
(DOE/ER-00362-Vol-2) Avail: NTIS HC A10/MF A01

The satellite power system (SPS) collects solar energy through a system of satellites in space and transfers this energy to Earth. A reference system is described that converts the energy to microwaves and transmit the microwave energy via directive antennas to large receiving/rectifying antennas (rectennas) located on the Earth. At the rectennas, the microwave energy is converted into electricity. The key environmental issues associated with the SPS which concern human health and safety, ecosystems, climate, and electromagnetic systems interactions are addressed. Microwave-radiation health and ecological effects; nonmicrowave health and ecological effects; atmospheric effects; effects on communication systems due to ionospheric disturbance, and electromagnetic compatibility are among the factors discussed. DOE

N80-26837# New Mexico Univ., Albuquerque. Dept. of Physics and Astronomy.
DEMONSTRATION SALT GRADIENT SOLAR POND Ph.D. Thesis
Federica Zangrando and H. C. Bryant 10 Jul. 1979 149 p refs
(Contract EG-77-S-04-3977)
(ALO-3977-T1; SAPR-4) Avail: NTIS HC A07/MF A01

A thorough account is given of a solar pond study underway at the University of New Mexico since 1975. This report consists of the Ph.D. dissertation of Federica Zangrando entitled Observation and Analysis of a Full-Scale Experimental Salt Gradient Solar Pond. The stability condition for a nonconstant gradient, doubly-diffusive system is derived and a precription for the routine detection of potential instabilities is presented. Techniques for handling unstable regions are described. Conclusions so far strongly support the viability of the solar pond concept. Salt gradient ponds appear to have a very definite niche in the ecology of energy production. DOE

N80-26839# Arizona Public Service Co., Phoenix.
AIRPORT SOLAR PHOTOVOLTAIC CONCENTRATOR PROJECT, PHASE 1 Final Report, 1 Jun. 1978 - 28 Feb. 1979
Dec. 1979 347 p Prepared in cooperation with Motorola, Inc., Scottsdale, Ariz.
(Contract ET-78-C-04-5317)
(DOE/CS-05317/1) Avail: NTIS HC A15/MF A01

The system design, analysis, and specification, site preparation, and operation and evaluation plan for a 500 kWe photovoltaic power supply to be located at the Phoenix Sky Harbor International Airport in Phoenix, Arizona, are presented. The solar cell arrays are concentrator silicon solar cells with tracking 70X Cassegrain-type concentrators. The power conditioning system, tracking system, and control systems are described. Environmental impact studies are described. Component specifications and drawings are included. DOE

N80-26841# Battelle Columbus Labs., Ohio.
DEVELOPMENT OF A LOW-TEMPERATURE, LOW-COST, BLACK LIQUID SOLAR COLLECTOR, PHASE 2 Semiannual Report, 1 Sep. 1979 - 29 Feb. 1980
D. K. Landstrom, S. G. Talbert, and V. D. McGinniss 20 Mar. 1980 24 p refs
(Contract DE-AC04-79CS-30171)
(ALO-30171-1) Avail: NTIS HC A02/MF A01

The long-term durability of various plastic materials and solar collector designs was evaluated and sufficient outdoor performance data to design a full-scale demonstration of a black-liquid solar collector for a commercial application were obtained. Besides conducting indoor weathering tests of various plastic materials, two outdoor automated test facilities were built. One unit was in use for about two winter months in Columbus, Ohio, and the other unit is ready for testing in Phoenix, Arizona. Extruded polycarbonate panels and extruded acrylic panel designs were investigated. DOE

N80-26842# Department of Energy, Washington, D. C. Office of Solar Applications for Buildings.
SOLAR FEDERAL BUILDINGS PROGRAM PLAN
Feb. 1980 27 p
(DOE/CS-0147A) Avail: NTIS HC A03/MF A01

The Solar Federal Buildings Program (SFBP) is a multi-year program designed to stimulate the growth and improve the efficiency of the solar industry by providing funds to Federal agencies for the design, acquisition, construction, and installation of commercially applicable solar hot water, heating, cooling, and process systems in new and existing Federal buildings. The program plan to be used in implementing this major solar commercialization effort is outlined. DOE

N80-26844# Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.
LOW-COST SOLAR ANTIREFLECTION COATINGS Annual Report, 24 Jul. 1978 - 24 Sep. 1979

R. J. H. Lin, J. C. Lee, and P. B. Zimmer Oct. 1979 99 p refs
(Contracts EM-78-C-04-5300; DE-AC04-78CS-35300)
(ALO-5300-T2) Avail: NTIS HC A05/MF A01

The etched antireflection (AR) coating process was scaled up to etch full size glass panes but the chemical control of the etching solution remains a problem. Analytical methods including high pressure liquid chromatography (HPLC), flame excited atomic absorption, infrared spectroscopy, Coulter counter techniques, and liquid index of refraction measurements were examined for application to this process monitor and control problem. A phenomenological model for the key reaction species in the etching process is presented along with a monitor control scheme using refractive index measurements to set the initial reactant concentrations and HPLC to track in process concentrations. The environmental durability of the organic AR coating of fused FEP-120 Teflon dispersion was improved by the use of a hydrofluoric acid etch/silane coupling agent pretreatment. Improved coating processing technique were developed culminating in the demonstration of scale up feasibility for glass panels up to 1 ft by 1 ft with good batch sample to sample repeatability.
DOE

N80-26845# EIC, Inc., Newton, Mass.
CORROSION PROTECTION OF SOLAR-COLLECTOR HEAT EXCHANGERS WITH ELECTROCHEMICALLY DEPOSITED FILMS Semiannual Report, 1 Dec. 1978 - 31 May 1979
S. B. Brummer, V. R. Koch, and G. H. Schnaper Jul. 1979 44 p refs
(Contract EM-78-C-04-4297)
(COO-4297-2; SAR-2) Avail: NTIS HC A03/MF A01

A novel corrosion protection technique was demonstrated for the common solar collector metals Al, Cu, and Fe as mild steel. This involves the potentiostatic electrochemical deposition of thin, adherent polymer films on the interior of heat exchanger tubes by application of a current in the presence of a suitable organic monomer. Polyphenylene oxide (PPO) films were anodically deposited onto Al, Cu and Fe coupons from methanolic media. However, defects in these films afforded poor corrosion protection. Suitably functionalized PPO films have been crosslinked via Schiff base formation in a subsequent chemical step. While these chemically modified PPO films were demonstrably more resistant to ethylene glyco H2O media at elevated temperatures, they too were undetermined by the thermal transfer medium. Cinnamaldehyde, a styrene type monomer, has been successfully electrodeposited onto Al coupons. This process involved a constant, albeit unreferenced potential technique in which the Al is made the negative electrode.
DOE

N80-26846# International Business Machines Corp., Huntsville, Ala. Federal Systems Div.
COLLECTOR ARRAY PERFORMANCE REPORT FOR SITES OF THE NATIONAL SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM
Jul. 1979 146 p
(Contract EG-77-C-01-4049)
(SOLAR/0021-79/07) Avail: NTIS HC A07/MF A01

The following data are given: (1) single-panel instantaneous efficiency curve coefficients; (2) current month instantaneous efficiency curve coefficients; (3) cumulative (through current month) instantaneous efficiency curve coefficients; (4) cumulative (through current month) second order curve coefficients; (5) daily energy gain comparisons for the current month; (6) properties of the collector transport fluid; (7) array flow rate (average for the month); (8) single panel flow rate; (9) array temperature gain (average for the month); and (10) monthly energy gain comparisons for the most recent 12 months.
DOE

N80-26847# Los Alamos Scientific Lab., N. Mex.
ADDITIONAL SOLAR/LOAD RATIO CORRELATIONS FOR DIRECT GAIN BUILDINGS
William O. Wray 1980 6 p refs Presented at the Ann. Meeting of the Am. Sect. of ISES, Phoenix, Ariz., 2-6 Jun. 1980
(Contract W-7405-eng-36)
(LA-UR-80-854; CONF-800604-2) Avail: NTIS HC A02/MF A01

Solar/load ratio (SLR) correlations were developed for two new reference direct gain designs. The new reference designs are identical to the originals except that the glazing air gap has been increased from 1/4 in. to 1/2 in. and a vector average of the local hourly windspeed was used in the thermal network calculations rather than an assumed average value of 15 mph. Both of these modifications are realistic and enhance the predicted performance of direct gain buildings. A comprehensive set of mass sensitivity calculations was performed in order to provide information needed to select an appropriate set of parameters for new lightweight direct gain designs for which additional SLR correlations will be developed.
DOE

N80-26848# Northrop Services, Inc., Huntsville, Ala.
EVALUATION OF HEAT TRANSFER ENHANCEMENT IN AIR-HEATING COLLECTORS Final Report
Donald L. Mattox Jun. 1979 187 p refs
(Contracts EM-78-C-04-5352; DE-AC04-78CS-05352)
(ALO-5352-T1) Avail: NTIS HC A09/MF A01

Increasing the thermal efficiency of air heating solar collectors through identification and development of optimum design and operation criteria for solar absorber to air heat exchangers is reported. A transient heat transfer analysis of a complete solar air heating collector was used to demonstrate that an optimum absorber to air heat exchanger design could be provided with several interrupted fin configurations. Additional analyses were performed to establish that the maximum solar collector thermal performance to required pumping power was realized for a Reynolds number range of 1000 to 2000. This Reynolds number range was used to establish a theoretical design limit curve for maximum thermal performance versus required pumping power for all interrupted fin designs as published in the open literature. Heat and momentum transfer empirical relationships were defined for scaling the state of the art high conductance fin designs identified from a conpact configuration for the less compact designs needed for solar collectors.
DOE

N80-26849# Midwest Research Inst., Golden, Colo.
END-USE MATCHING FOR SOLAR INDUSTRIAL PROCESS HEAT Final Report
Kenneth C. Brown, Douglas W. Hooker, Ari Rabl, Shirley A. Stadjuhar, and Ronald E. West Jan. 1980 235 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-34-091) Avail: NTIS HC A11/MF A01

Because of the large energy demand of industry (37% of US demand) and the wide spectrum of temperatures at which heat is required, the industrial sector appears to be very suitable for the matching of solar thermal technology with industrial process heat (IPH) requirements. A methodology for end-use matching was devised, complete with required data bases and an evaluation program PROSYS/ECONMAT. Six cities in the United States were selected for an analysis of solar applications to IPH. Typical process heat requirements for 70% of the industrial plants in each city were identified and evaluated in conjunction with meteorological and economic data for each site to determine lowest cost solar systems for each application. The flexibility and scope of PROSYS/ECONMAT is shown in a variety of sensitivity studies that expand the results of the six city analysis. Case studies of two industrial plants were performed to evaluate the end use matching procedure. these results are reported. DOE

N80-26851# Tennessee Technological Univ., Cookeville.
WIND EFFECTS ON COLLECTORS Final Report, 1 Oct. 1978 - 1 Oct. 1979
Hudy C. Hewitt, Jr. and Edwin I. Griggs 1 Nov. 1979 113 p refs
(Contract EM-78-C-04-5364)
(DOE/CS-35364/T1) Avail: NTIS HC A06/MF A01

Consideration was given to modeling wind speed data and to a scheme for correlating data between two separate stations. A sensor system was developed to measure the effect of wind on collector performance. The specifications for the sensor are presented, and a discussion of the calibration of the sensor is given. Four experiments were performed to determine wind flow patterns around buildings. The velocity profile over an actual collector was also measured as a function of free stream velocity. A mathematical model for a solar collector and three experimental efforts to measure the effect of wind on collector performance are reported. DOE

N80-26856# Toronto Univ. (Ontario). Dept. of Mechanical Engineering.

DESIGN OF ANNUAL STORAGE SOLAR SPACE HEATING SYSTEMS

F. C. Hooper and J. D. Cook Nov. 1979 13 p refs Presented at the 72nd Ann. AICHE Meeting, San Francisco, 25-29 Nov. 1979 Submitted for publication
(Contract EY-76-C-02-2939)
(DOE/CS-32939/10; CONF-791106-20) Avail: NTIS HC A02/MF A01

A simulation model for the performance of such systems is described, and a method of classifying system configurations is proposed. It is shown that annual systems sized for unconstrained performance, with no unused collector or storage capacity, and no rejected heat, minimize solar acquisition costs. The optimal performance corresponds to the condition where the marginal storage-to-collector sizing ratio is equal to the corresponding marginal cost ratio. DOE

N80-26863# Brookhaven National Lab., Upton, N. Y.

DEVELOPMENT OF HARDWARE SIMULATORS FOR TESTS OF SOLAR COOLING/HEATING SUBSYSTEMS AND SYSTEMS. PHASE 1: RESIDENTIAL SUBSYSTEM HARDWARE SIMULATOR AND STEADY STATE SIMULATION

Paul C. Auh Sep. 1979 29 p refs
(Contract EY-79-C-02-0016)
(BNL-51120) Avail: NTIS HC A03/MF A01

The proposed hardware simulator was successfully built and has been operational since its construction. The hardware simulator has the following unique features: it has been incorporated with a measurement double checking system, it is a totally closed loop system, it employs three separate energy storage tanks, and it has been automated to perform instantaneous data collection and reduction. With the external energy storage, all the external test conditions can be easily set up for any steady state or transient run. The simulator is described in detail with schematics and actual photographs. The steady state testing of Arkla's Solaire 36 absorption chiller has been performed. The test dealt primarily with chiller capacity or coefficient of performance as a function of generator hot water inlet temperature (1) with condenser cooling water inlet temperature as parameter, and (2) with evaporator chilled water outlet temperature as parameter. DOE

N80-26866# Research Triangle Inst., Research Triangle Park, N. C.

APPLICATION ANALYSIS AND PHOTOVOLTAIC SYSTEM CONCEPTUAL DESIGN FOR SERVICE/COMMERCIAL/INSTITUTIONAL AND INDUSTRIAL SECTORS. VOLUME 2: TECHNICAL REPORT Final Report

R. A. Whisnant, C. B. Morrison, N. G. Staffa, and R. D. Alberts Dec. 1979 219 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7020-Vol-2) Avail: NTIS HC A10/MF A01

Data on the attributes of the applications that are germane to solar photovoltaic systems application were identified and acquired, and the figure of merit, utilizing the collected data, that indicates the relative photovoltaic potential for displacement of conventionally generated electricity of the various of applications were devised and applied. The expected profitability of photovoltaic application was determined from the discounted future costs of conventional energy sources, capital costs, and projected operating and maintenance costs over the life of the system. This was combined with the energy consumption of the application to obtain an estimte of the energy market potential. The application ranking and subjective evaluations of market size diversity, and public exposure were used to select five applications and their locations for design of a suitable photovoltaic system. For each of the selected applications, the various relevant characteristics are identified, potential photovoltaic system configurations are identified, and performance and economic models are used to design a representative system. DOE

N80-26867# Oak Ridge National Lab., Tenn. Solar and Special Studies Div.

PHOTOVOLTAIC APPLICATIONS: PAST AND FUTURE

Stephen I. Kaplan 1980 6 p Presented at the 14th Photovoltaics Specialists Conf., San Diego, Calif., 7 Jan. 1980
(Contract W-7405-eng-26)
(CONF-800106-4) Avail: NTIS HC A02/MF A01

Three planned or proposed photovoltaic projects are described. The 240 kWe system at Mississippi County Community College consists of an array of 270 106 unit strings of single crystal Si cells mounted at the focus of 40x concentrating parabolic troughs. The system is expected to be complete in the spring of 1980. The four 50 kWp photovoltaic systems planned for Northwest Mississippi Junior College consist of different types of solar cells using different types of concentrators. The system is expected to go into operation in the summer of 1980. The proposed system for Georgetown University has not reached the hardware grant stage. DOE

N80-26868# Midwest Research Inst., Golden, Colo.

ANALYSIS METHODS FOR PHOTOVOLTAIC APPLICATIONS

[1980] 7 p
(Contract EG-77-C-01-4042)
(SERI/SP-35-230) Avail: NTIS HC A02/MF A01

Brief descriptions of a variety of photovoltaic power systems simulation models and design tools are given. Services available through photovoltaic module manufacturers are outlined, and computer codes for systems analysis are described. DOE

N80-26869# Lincoln Lab., Mass. Inst. of Tech., Lexington.

PHASE 2 EXPERIMENT TEST PLAN: SOLAR PHOTOVOLTAIC/THERMAL RESIDENTIAL EXPERIMENT

Duncan B. Sheldon 23 Jan. 1980 27 p refs
(Contract EY-76-C-02-4094)
(COO-4094-65) Avail: NTIS HC A03/MF A01

The Solar Photovoltaic/Thermal Energy Project requires a Phase 2 test plan for its Solar Energy Research (SERF). This Phase 2 test plan is provided. The purpose of the research being conducted at the SERF is reviewed, and references describing Phase 1 work are listed. DOE

N80-26870# Los Alamos Scientific Lab., N. Mex.

PASSIVE SOLAR DESIGN HANDBOOK. VOLUME 2 OF TWO VOLUMES: PASSIVE SOLAR DESIGN

J. Douglas Balcomb, Dennis Barley, Robert McFarland, Joseph Perry, Jr., William O. Wray, and Scott Noll Jan. 1980 230 p
(Contract W-7405-eng-48)
(DOE/CS-0127/2) Avail: NTIS HC A11/MF A01

A manual for the design and performance evaluation and analysis of passive solar heating systems is presented. Two passive solar building types are analyzed: direct gain and thermal storage walls. Rules of thumb for the schematic design phase and simpified procedure for the design development phase are described. Analysis methods for the construction documents phase are given. The design procedure for fan-forced rock beds for hybrid systems is presented. Economic analysis methods for passive solar buildings are described. Tables of monthly average solar radiation, temperature and degree days for various locations in the US and southern Canada are included. DOE

N80-26871# Midwest Research Inst., Golden, Colo.

ANALYSIS METHODS FOR SOLAR HEATING AND COOLING APPLICATIONS: PASSIVE AND ACTIVE SYSTEMS, THE SECOND EDITION

Jan. 1980 19 p refs
(Contract EG-77-C-01-4042)
(SERI/SP-35-232R) Avail: NTIS HC A02/MF A01

Brief descriptions of analysis methods and design tools which are valuable in performing parametric studies of candidate designs are presented. The methods included range from rules-of-thumb for builders to the simulation packages used by researchers.
DOE

N80-26873# Department of Housing and Urban Development, Washington, D. C. Office of Policy Development and Research.

SOLAR HEATING AND COOLING DEMONSTRATION PROGRAM: A DESCRIPTIVE SUMMARY OF HUD CYCLE 4 AND 4A SOLAR RESIDENTIAL PROJECTS

Jul. 1979 167 p
(Contract EX-76-A-29-1020)
(HUD-PDR-455) Avail: NTIS HC A08/MF A01

The US Department of Housing and Urban Development (HUD) has awarded nearly $8.5 million in grants for the purchase and installation of solar energy equipment in 6,851 residences. This cycle is fourth in a series of five cycles of residential demonstration projects with solar heating and cooling systems sponsored by HUD in a national effort to demonstrate widespread use of solar energy. Each project is summarized. The grantee and the location and size of the project are described. A rendering of the unit is given along with a description of energy system.
DOE

N80-26876# Entwicklungs- und Forschungslabor, Lorrach (West Germany).

WATER HEATING BY SOLAR ENERGY WITH PLASTIC COLLECTORS Final Report

Juergen Kleinwaechter Bonn Bundesmin. fuer Forsch. u. Technol. Sep. 1979 163 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-79-29) Avail: NTIS HC A08/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 34

A low price, high efficiency, light weight, and easy to transport solar collector was developed using a plastic monotube with transparent top and dark bottom. Various synthetic materials were examined with regard to their optical and thermal properties and their durability. Prototype installations for swimming pool heating, domestic hot water and house heating in combination with a heat pump are described.
Author (ESA)

N80-26877# Grammer (Willibald), Amberg (West Germany). Abteilung Solar-Klima-Technik.

SOLAR COLLECTOR SYSTEM USING AIR COLLECTORS FOR A PRE-DRYING FACILITY IN A GRASS DRYING PLANT Final Report

Hermann Barthel Bonn Bundesmin. fuer Forsch. u. Technol. Sep. 1979 19 p In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(SKT-Teil-1; BMFT-FB-T-79-30) Avail: NTIS HC A02/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 3,60

The design, construction, and installation of a solar collector system for the drying of grass with hot air is described. The collector surface measures 1456 square meters. Measurements were taken during field tests and their results are reported. Water removal is about 18%.
Author (ESA)

N80-26879# Austrian Solar and Space Agency, Vienna.

COLLECTOR TEST METHODS: ANALYSIS OF TEST METHODS FOR THE DETERMINATION OF THE THERMAL EFFICIENCY OF FLAT-PLATE COLLECTORS

Manfred Bruck, Walter Heindl, Harald Koch, Gottfried Schaffar (Technische Univ., Vienna), and Peter Varga Sep. 1979 236 p refs Sponsored by Austrian Federal Ministry of Science and Research
(ASSA-FA-10; ISBN-3-7041-0050-1) Avail: NTIS HC A11/MF A01

Test methods were evaluated for the determination of the thermal efficiency of flat-plate solar collectors with a liquid as the transfer fluid by means of a mathematical simulation. A comparison of experimental results obtained from tests conducted by the National Bureau of Standards (NBS) and by the International Energy Agency (IEA) with the results of the theoretical analysis shows that the observed scatter of data is primarily caused by systematic errors when conducting the test. However, the scatter is also caused by production-dependent changes of the collector properties and by the fact that ambient conditions were not sufficiently considered. The analysis of the test methods by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) and by the Bundesverband fuer Solarenergie (BSE) showed that the BSE standard yields better results - particularly for the climatic conditions in Central Europe - than the ASHRAE standard. A simple correction of the systematic deviations observed in BSE tests, causec by the fact that the temperature of the absorber is lower than of the transfer fluid, is suggested.
Author (ESA)

N80-26983# Toronto Univ. (Ontario). Dept. of Mechanical Engineering.

A MODEL FOR THE ANGULAR DISTRIBUTION OF SKY RADIANCE

F. C. Hooper and A. P. Brunger Aug. 1979 7 p refs Presented at Joint ASME/AIChE 18th Natl. Heat Transfer Conf., San Diego, Calif., 6-8 Aug. 1979
(Contract EY-76-C-02-2939)
(DOE-CS-32939-9; CONF-790808-23) Avail: NTIS HC A02/MF A01

A flexible mathematical model is introduced which describes the radiance of the dome of the sky under various conditions. This three component continuous distribution (TCCD) model is compounded by the superposition of three separate terms, the isotropic, circumsolar and horizon brightening terms, each representing the contribution of a particular sky characteristic. In use a particular sky condition is characterized by the values of the coefficients of each of these three terms, defining the distribution of the total diffuse component. The TCCD model was demonstrated to fit both the normalized clear sky data and the normalized overcast sky data with an RMS error of about ten percent of the man overall sky radiance. By extension the model could describe variable or partly clouded sky conditions. The model can aid in improving the prediction of solar collector performance.
DOE

N80-27219*# National Aeronautics and Space Administration, Washington, D. C.

LESSONS OF THE NASA TECH HOUSE

Howard Allaway 1980 41 p Original contains color illustrations
(NASA-SP-442; LC-80-607024) Avail: NTIS MF A01; SOD HC $3.00 CSCL 13B

The performance and effectiveness of the various systems incorporated into the NASA Technology House are described and evaluated in relation to the HUD reference house. The various aerospace technologies used (advanced electronics, solar energy utilization, water recycling, fire retardant materials) are discussed as well as the improved materials, design configurations, and construction techniques developed under other government programs and by industry. Tabular data show the consumption and conservation of electrial energy and water for each month over one full weather cycle, during which time a family of four was in residence.
A.R.H.

N80-27800*# Lutz-Sotire Partnership, Stamford, Conn.

SOLAR HEATING SYSTEM INSTALLED AT STAMFORD, CONNECTICUT Final Report

Sep. 1979 83 p Sponsored in part by DOE
(Contract EX-76-C-01-2377)
(NASA-CR-161436) Avail. NTIS HC A05/MF A01 CSCL 10A

The solar heating system installed at the Lutz-Sotire Partnership Executive East Office Building, Stamford, Connecticut is described. The Executive East Office Building is of moderate size with 25,000 sq ft of heated space in 2 1/2 stories. The solar system was designed to provide approximately 50 percent of the heating requirements. The system components are described. Appended data includes: the system design acceptance test, the operation and maintenance manual, and as-built drawings and photographs.
R.E.S.

N80-27802*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION: SEASONAL REPORT FOR CONTEMPORARY-MANCHESTER, MANCHESTER, NEW HAMPSHIRE Progress Report, Mar. 1979 - Feb. 1980
30 Jul. 1980 80 p Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161471) Avail: NTIS HC A05/MF A01 CSCL 10A

The operational and thermal performance of the solar energy system, Contemporary-Manchester, is described. The system was designed by Contemporary Systems Incorporated to provide space heating and domestic hot water preheating for a three story dwelling located on the New Hampshire Vocational Technical College campus, Manchester, New Hampshire. The net fossil energy savings for the period from March, 1979 to February, 1980 was 14.52 million Btu. However, the performance of the system must be degraded due to the fact that the building was unoccupied throughout the data assessment and analysis period. The unoccupied status prevented the normal adjustment of heating and ventilating controls for maintenance of comfort levels within the building. This lack of occupancy also prevented the typical family hot water usage, which would have allowed for more realistic evaluation of the hot water subsystem. R.E.S.

N80-27806*# IBM Federal Systems Div., Huntsville, Ala.
SOLAR ENERGY SYSTEM PERFORMANCE EVALUATION-SEASONAL REPORT FOR ELCAM SAN DIEGO, SAN DIEGO, CALIFORNIA Progress Report, Mar. - Sep. 1979
May 1980 71 p refs Sponsored in part by DOE
(Contract NAS8-32036)
(NASA-CR-161481) Avail: NTIS HC A04/MF A01 CSCL 10A

The solar energy system, Elcam San Diego, was designed to supply domestic hot water heating for a single family residence located in Encinitas, California. System description, performance assessment, operating energy, energy savings, maintenance, and conclusions are presented. The system is a 'Sunspot' two tank cascade type, where solar energy is supplied to either a 66 gallon preheat tank (solar storage) or a 40 gallon domestic hot water tank. Water is pumped directly from one of the two tanks, through the 65 square feet collector array and back into the same tank. Freeze protection is provided by automatically circulating hot water from the hot water tank through the collectors and exposed plumbing when freezing conditions exist. Auxiliary energy is supplied by natural gas. Analysis is based on instrumented system data monitored and collected for one full season of operation. L.F.M.

N80-27807*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ASHMET: A COMPUTER CODE FOR ESTIMATING INSOLATION INCIDENT ON TILTED SURFACES
Robert F. Elkin and Ronald G. Toelle May 1980 44 p refs Sponsored in part by DOE
(NASA-TM-78286) Avail: NTIS HC A03/MF A01 CSCL 10A

A computer code, ASHMET, was developed by MSFC to estimate the amount of solar insolation incident on the surfaces of solar collectors. Both tracking and fixed-position collectors were included. Climatological data for 248 U. S. locations are built into the code. The basic methodology used by ASHMET is the ASHRAE clear-day insolation relationships modified by a clearness index derived from SOLMET-measured solar radiation data to a horizontal surface. L.F.M.

N80-27813*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 5: SPACE TRANSPORTATION ANALYSIS, PHASE 3 Final Report, Dec. 1979 - May 1980
Jun. 1980 153 p refs 5 Vol.
(Contract NAS9-15636)
(NASA-CR-160746; D180-25969-5-Vol-5) Avail: NTIS HC A08/MF A01 CSCL 10A

A small Heavy Lift Launch Vehicle (HLLV) for the Solar Power Satellites (SPS) System was analyzed. It is recommended that the small HLLV with a payload of 120 metric tons be adopted as the SPS launch vehicle. The reference HLLV, a shuttle-derived option with a payload of 400 metric tons, should serve as a backup and be examined further after initial flight experience. The electric orbit transfer vehicle should be retained as the reference orbit-to-orbit cargo system. L.F.M.

N80-27821# SRI International Corp., Menlo Park, Calif.
COMMUNITY IMPEDIMENTS TO IMPLEMENTATION OF SOLAR ENERGY
M. D. Armstrong and J. E. Armstrong Nov. 1979 112 p refs
(Contract W-7405-eng-48)
(DOE/EV-0059) Avail: NTIS HC A06/MF A01

The complete array of institutional problems expected to emerge when solar technology is implemented on a national scale is assembled. The findings of the study are presented in two formats. First, the results are organized by the time frames of delays in solar implementation caused by the inherent difficulties a national energy policy would encounter in changing the way a given institution responds to specific solar technologies. Delay categories of 10 years or more, 6 to 8 years, and 3 to 5 years were selected; all were assigned under the assumption that a strong national policy promoting adoption of solar technologies would be in effect. The second format constitutes a description of the difficulties at the community level, associated with implementing each solar technology. DOE

N80-27822# Midwest Research Inst., Golden, Colo.
HETEROJUNCTION SOLAR CELLS
S. Wagner 1978 17 p refs Presented at Royal Soc. Discussion Meeting on Solar Energy, London, 15 Nov. 1978
(Contract EG-77-C-01-4042)
(SERI/TP-32-134; CONF-7811142-1) Avail: NTIS HC A02/MF A01

A qualitative description of semiconductor/semiconductor heterojunction solar cells is given. The two groups of heterojunctions of greatest economic potential, very highly efficient cells for concentrator applications and moderately efficient thin film cells for flat plates, are described with examples. These examples illustrate the role of heterojunctions in surface passivation, monolithic multijunction devices, devices with semiconductors of only one conductivity type, and low-temperature fabrication techniques. DOE

N80-27823# National Technical Information Service, Springfield, Va.
SOLAR PROCESS HEAT. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1964 - Mar. 1980
Audrey S. Hundemann Apr. 1980 67 p
(PB80-807936) Copyright Avail: NTIS HC $30.00/MF $30.00 CSCL 10A

Feasibility, design, cost, and economic potential of solar process heat are discussed. Potential applications to industries using hot water or steam and to heat used for dehydration processes in agriculture are covered. Contains 60 abstracts. GRA

N80-27827# National Bureau of Standards, Washington, D.C. National Engineering Lab.
ANALYSIS OF CODE RELATED RESPONSES FROM THE SOLAR DEMONSTRATION PROGRAM Final Report
Jan. 1980 156 p Sponsored in part by HUD and DOE
(PB80-153968; NBSIR-79-1957) Avail: NTIS HC A08/MF A01 CSCL 10A

The building regulatory information gathered during the course of the Residential Solar Demonstration Program from inception of the program through September 30, 1978 is documented. It is concluded that existing codes do not present a barrier to the installation and acceptance of solar systems; however, code officials need additional training and better back-up material to properly evaluate solar systems. GRA

N80-27828# New Mexico Energy Inst., Albuquerque.
DEVELOPMENT OF A LOW-COST NON-TRACKING HEAT

PIPE CONCENTRATING COLLECTOR **Final Report, 1 Jul. 1978 - 30 Jun. 1979**
K. T. Feldman, Jr. and Darryl Lee Noreen Jul. 1979 182 p refs Sponsored in part by New Mexico Energy and Minerals Dept.
(PB80-160443; NMEI-23) Avail: NTIS HC A09/MF A01 CSCL 13A

A solar water heater which uses a multi-heat-pipe energy absorber is discussed. In the absorber configuration, wickless heat pipes which rely on only gravity and a puddle-flow mechanism are used. In order to design an energy absorber with sufficient heat transfer capability, the performance of a puddle-flow gravity-assisted heat pipe is theoretically investigated. The maximum heat transport capability of methanol, water, and Freon-11 heat pipes was studied. The relationship between various heat pipe parameters and axial heat transport capability is discussed. GRA

N80-27829# Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.
AN INVESTIGATION OF WIND LOADS ON SOLAR COLLECTORS. APPENDIX 2: NET PRESSURE COEFFICIENTS **Final Report**
H. W. Tieleman, R. E. Akins, and P. R. Sparks Jan. 1980 170 p
(Contract EO-A01-78-3605)
(PB80-158769; VPI-E-80-1-App-2) Avail: NTIS HC A08/MF A01 CSCL 10A

A wind tunnel study of a series of model solar collector installations (flat-plate collectors) immersed in a thick turbulent shear layer was undertaken in order to determine design wind loads on such installations. Wind tunnel measurements were made of the mean and fluctuating pressures on a model of a single flat plate collector which was a component of different multipanel installations. The pressures were spatially integrated over the top and bottom of the single collector separately. GRA

N80-27843# California Univ., Berkeley. Energy and Environment Div.
LAND USE AND ENVIRONMENTAL IMPACTS OF DECENTRALIZED SOLAR ENERGY USE
Robert H. Twiss, Patricia L. Smith, Allen E. Gatzke, and Scott T. McCreary Jan. 1980 206 p refs
(Contract W-7405-eng-48)
(DOE/EV-0067) Avail: NTIS HC A10/MF A01

The physical, spatial and land-use impacts of decentralized solar technologies applied at the community level by the year 2000 are examined. The results are intended to provide a basis for evaluating the way in which a shift toward reliance on decentralized energy technologies may eventually alter community form. Six land-use types representative of those found in most US cities are analyzed according to solar penetration levels identified in the maximum solar scenario for the year 2000. The scenario is translated into shares of end use demand in the residential, commercial and industrial sectors. These proportions become the scenario goals to be met by the use of decentralized solar energy systems. The percentage of total energy demand is assumed to be 36.5 percent, 18.8 percent and 22.6 percent in the residential, commercial and industrial sectors respectively. The community level scenario stipulated that a certain percentage of the total demand be met by on-site solar collection, i.e. photovoltaic and thermal collectors, and by passive design. This on-site solar goal is 31.9 percent (residential), 16.8 percent (commercial) and 13.1 percent (industrial). DOE

03

HYDROGEN

Includes hydrogen production, storage, and distribution.

A80-33406 Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae. A. Mitsui, E. Duerr, S. Kumazawa, E. Phlips, and H. Skjoldal (Miami, University, Miami, Fla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 31-35. 8 refs. NSF Grants No. PFR-77-11545-A01; No. PFR-76-17159.

Experiments have been conducted with a view to developing intact cell marine blue-green algal systems capable of producing hydrogen and fixing nitrogen. Numerous strains of photosynthetic microorganisms with these capabilities have been isolated in tropical and subtropical Atlantic environments. One of these species, a tropical blue-green alga, has demonstrated the capability for sustained periods of hydrogen production at high rates (1 ml H2/ml algal suspension/3 day). Biochemical studies have shown that the high yield is due to the absence of uptake hydrogenase activity in this strain. Further research with these or similar organisms could lead to the development of biological solar energy technologies. V.L.

A80-33407 H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy. K. K. Rao, M. W. W. Adams, P. Morris, D. O. Hall (Kings's College, London, England), E. C. Hatchikian, J. Le Gall (CNRS, Laboratoire de Chimie Bacterienne, Marseille, France), K. Schneider, and H. G. Schlegel (Göttingen, Universität, Göttingen, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 36-40. 31 refs. Research supported by the Science Research Council of England and Commission of the European Communities.

An in vitro system containing chloroplasts, ferredoxin and hydrogenase evolves H2 on illumination. The duration of H2 production depends on the light and oxygen sensitivity of the components of the system. Some of the biological constituents of the system are replaceable by synthetic analogues. Attempts are also made to stabilize the chloroplasts and enzymes by immobilization on solid supports. Optimal rates of 50 micromole of H2 per mg chlorophyll per h, continuous for four to six hours, are obtained at present. (Author)

A80-33410 Light-dependent hydrogen production by C. reinhardi. S. Lien (Solar Energy Research Institute, Golden, Colo.), C. McBride, R. Togasaki, and A. San Pietro (Indiana University, Bloomington, Ind.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 51-55. 13 refs. NSF Grants No. BMS-75-03415; No. AER-75-16962; Contract No. EG-77-C-0104-042.

The activity of hydrogenase in nonsynchronous, photoheterotrophically grown cells of C. reinhardi is a function of culture age. Rapidly growing cultures (exponential phase) exhibit lower hydrogenase activity than early stationary phase cultures. During prolonged dark anaerobic incubation the hydrogenase activity attains a maximal value in two to five hours. The activity declines rapidly after three to four hours of anaerobic incubation unless the pH of the suspending medium is maintained above 6.0. In C. reinhardi the source of electrons for hydrogen photoproduction appears to be derived mainly from water oxidation. However, when the water-splitting complex of photosystem II is impaired by a mutational block, the organism can utilize intracellular organic reductants as substrate for H2 production in a light-dependent reaction involving both PSII and PSI. When photosynthetic electron transport is uncoupled from phosphorylation, a rate of 174 micromoles of hydrogen evolved per mg cells per hour is observed. This rate of hydrogen photoproduction corresponds to 76% of the reductant generating capacity of PSII under steady-state photosynthesis. (Author)

A80-35189 Hydrogen production using fusion energy and thermochemical cycles. V. D. Dang and M. Steinberg (Brookhaven National Laboratory, Upton, N.Y.). *International Journal of Hydrogen Energy*, vol. 5, no. 2, 1980, p. 119-129. 21 refs. Contract No. EY-76-C-02-0016.

Thermochemical cycles for the production of synthetic fuels would be especially suited for operation in conjunction with controlled thermonuclear fusion reactors because of very high temperature energy which such reactors could supply. Several high-temperature, two step thermochemical cycles for the production of hydrogen are examined. A thermodynamic analysis of the Fe3O4-FeO, CrCl3-CrCl2, and UCl4-UCl3 pairs reveals the feasibility of the processes. A more detailed process analysis is given for the Fe3O4-FeO system using steam as the heat transfer medium for decomposing the higher valent metal oxide for oxygen production, and hydrolyzing the lower oxide for hydrogen production. The steam could be heated to high temperatures by refractory materials absorbing the 14 MeV neutrons in the blanket region of a fusion reactor. Process heat transfer and recovery could be accomplished by regenerative reactors. Proposed operating conditions, the energy balance, and the energy efficiency of water decomposition process are presented. With a fusion blanket temperature of 2500 K, thermal efficiencies for hydrogen production (HHV) of 74.4% may be obtained. (Author)

A80-35190 The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents. G. De Beni, G. Pierini, and B. Spelta (EURATOM and Comitato Nazionale per l'Energia Nucleare, Centro Comune di Ricerche, Ispra, Italy). *International Journal of Hydrogen Energy*, vol. 5, no. 2, 1980, p. 141-149. 12 refs.

Experimental work on the reaction of SO2, H2O and I2 is described in this paper. This reaction gives rise to separation problems which may be overcome by the use of a large excess of SO2 and/or by the addition of suitable organic solvents. The results obtained with SO2 only and with addition of diethylether and TBP are discussed, also in view of application of this reaction in possible thermochemical cycles. (Author)

A80-35192 Application of magnesium rich rare-earth alloys to hydrogen storage. B. Darriet, M. Pezat, A. Hbika, and P. Hagenmuller (Bordeaux I, Université, Talence, Gironde, France). *International Journal of Hydrogen Energy*, vol. 5, no. 2, 1980, p. 173-178. 12 refs. Research supported by the Délégation Générale à la Recherche Scientifique et Technique.

The hydriding behavior of the LnMg12, Ln2Mg17 and Ln5Mg1 alloys (Ln equals La, Ce or mischmetal) has been investigated. They decompose during hydriding to give magnesium hydride and the corresponding rare-earth hydride. The study of absorption-desorption hydriding cycles at different temperatures and various pressures shows that such alloys could be used as high performance hydrogen storage materials. (Author)

A80-35193 Comment on 'The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation'. W. J. D. Escher (Escher Technology Associates, St. Johns, Mich.). *International Journal of Hydrogen Energy*, vol. 5, no. 2, 1980, p. 205, 206. 5 refs.

03 HYDROGEN

A80-36653 **Hydrogen in metals - Notable properties and examples for their utilization. I (Wasserstoff in Metallen - Herausragende Eigenschaften und Beispiele für deren Nutzung. I).** H. Wenzl (Kernforschungsanlage Jülich GmbH, Institut für Festkörperforschung, Jülich, West Germany). *Metall*, vol. 34, May 1980, p. 407-412. In German.

A80-37330 **Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, and Supplement.** Symposium sponsored by the Deutsche Gesellschaft für Luft- und Raumfahrt and Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979. Proceedings, 443 p.; Supplement, 171 p. $39.14.

The Symposium emphasizes future oil prospects, experience with gaseous hydrogen pipeline systems, hydrogen fueled turbofan engines, liquid hydrogen airport requirements, and a liquid hydrogen experimental airline project. Papers were given on the impacts of fossil fuel on the environment, alternate fuels for aircraft, production of hydrogen by coal gasification, production of hydrogen from solar energy and water, handling of hydrogen, liquid hydrogen fueled aircraft, turbofan engine and fuel system for liquid hydrogen use, liquid hydrogen engines, and design concept for LH2 airport facilities. A.T.

A80-37333 # **Hydrogen from fossil fuels.** D. P. Gregory and P. B. Tarman (Institute of Gas Technology, Chicago, Ill.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 7.1-7.29. 7 refs.

Hydrogen is manufactured on an industrial scale by steam reforming of natural gas, partial oxidation of heavy oil, and coal gasification. As hydrogen becomes less available and more expensive, a reassessment of processes is necessary to evaluate hydrogen production. This paper contains descriptions of existing processes for the production of hydrogen from gas, oil, and coal by electrolysis. Emphasis is given to the Steam-Iron Process because it represents a novel method of producing pure hydrogen, which might be well adapted to liquid hydrogen production for aircraft fuel use. Estimates of hydrogen costs for each process are compared on an economic basis, and the effects of changes in the major cost factors, such as feedstock costs and by-product credits, are evaluated. The principal by-products are sulfur, oxygen in the case of electrolysis, and electric power in the case of the Steam-Iron Process. In some situations, a combined steam-iron/electrolysis process appears attractive. (Author)

A80-37334 # **Description of processes for producing hydrogen by coal gasification.** H. U. Karwat (Linde AG, Munich, West Germany). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 8.1-8.35. 6 refs.

Commercial installations for coal gasification, now producing ammonia, methanol and (town) gas production, are based on the reaction of steam and oxygen with coal and are potential hydrogen producers. Besides the processes which obtain their heat supply by burning coal, those concepts which utilize process heat from nuclear reactors are of interest. Raw gas treating is similar to the proven techniques of ammonia manufacture. The envisaged production of 800 to 1500 t/d of hydrogen requires gas generator and gas treating plants 4 to 7 times larger than those installed for a 1000 t/d coal based ammonia plant. (Author)

A80-37335 # **Description of processes for producing hydrogen by advanced electrolysis.** M. Braun. In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 9.1-9.18.

A review of water electrolysis technology is presented. Electrolysis is not inferior to thermochemical methods for producing hydrogen from nonfossil heat sources on a large scale since the efficiency of both processes is limited to the same value by the second law of thermodynamics. The two types of electrolysis systems, aqueous alkaline electrolysis at elevated temperatures and pressure and the use of a cation exchange membrane, offer the possibility of reaching a cell voltage of about 1.7 V at the plant investment cost of about 100 dollars/kw within the next 8 years. A.T.

A80-37336 * # **Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments.** J. A. Hanson (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.) and W. J. D. Escher (Escher-Foster Technology Associates, Inc., St. Johns, Mich.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 11.1-11.28. 31 refs. Research sponsored by the U.S. Department of Energy.

The paper examines technologies of hydrogen production. Its delivery, distribution, and end-use systems are reviewed, and a classification of solar energy and hydrogen production methods is suggested. The operation of photoelectric processes, biophotolysis, photocatalysis, photoelectrolysis, and of photovoltaic systems are reviewed, with comments on their possible hydrogen production potential. It is concluded that solar hydrogen derived from wind energy, photovoltaic technology, solar thermal electric technology, and hydropower could supply some of the hydrogen for air transport by the middle of the next century. A.T.

A80-37337 # **Safe handling of hydrogen in large quantities.** M. Müller (Messerschmitt-Bölkow-Blohm GmbH, Ottobrunn, West Germany). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 13.1-13.29.

Safe handling of hydrogen which is used as a propellant in rocket engines is examined. The supply system consisting of vehicles of 1000 to 6000 l capacities for transport of liquid hydrogen is described; the hydrogen is released to a storage tank of 10,000 l capacity. The test facility has a high pressure capability of the propellant feed system, and it enables the development and optimization of the combustion system without the use of the rocket's pumping and turbine unit. Safety measures require that the materials in contact with hydrogen must have a sufficient low temperature ductility or must be resistant to embrittlement which occurs when in contact with pressurized gas at ambient temperatures. For normal stress, a conventional stainless steel 1.4541 (German standard) was used, while for a higher stress, as in tubes and tanks, a nitrogen alloyed austenitic steel 1.4429 is utilized. Finally, several accidents involving a hydrogen leak, explosions, and failures of electronic equipment leading to accidents were described. A.T.

A80-37338 # **Hydrogen as an alternative fuel - An intermediate report on research and development funding by the Federal Ministry for Research and Technology.** D. Frenzel (Bundesministerium für Forschung und Technologie, Bonn, West Germany). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 14.1-14.17.

The paper considers hydrogen as an alternative fuel suitable for balanced, integrated transportation to meet the interests of users, operators, and the environment. The alternative fuel is required to be economical, safe, toxicologically acceptable, environmentally safe, and producible from readily available materials. The main problem in applying hydrogen in the elementary state is storage which can be handled by using gas cylinders, cryotanks, and metal hydride storage devices, noting that the hydride storage device is best for use in motor vehicles. The spinoff applications from hydrogen storage research such as air conditioning and auxiliary heating of vehicle interiors are discussed. These hydrogen investigations are intended to analyze and evaluate the entire energy chain, including production, distribution, storage, the application in vehicles taking into consideration various operating conditions. A.T.

A80-37339 # **Surface transportation systems using hydrogen energy.** W. J. D. Escher and R. W. Foster (Escher-Foster Technology Associates, Inc., St. Johns, Mich.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 15.1-15.13; Appendixes, 20 p. 31 refs.

Application of hydrogen energy to surface transportation systems is considered from today's limited research and demonstration projects standpoint, and from tomorrow's prospective uses. Emphasis is on providing substantial supporting theoretical and experimental background, both on hydrogen's comparative fuel characteristics and on internal combustion engines fueled with hydrogen. Aspects of hydrogen, as an alternative fuel for conventional diesel-powered rail motive power systems, are related from the viewpoint of an ongoing effort in alternative fuels for medium speed diesel engines. From this case-in-point experience, some suggestions are offered toward the successful promotion of hydrogen for other transportation sectors, including air. (Author)

A80-37340 # **Characteristics of liquid hydrogen-fueled aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, Calif.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 16.1-16.24. 17 refs.

A summary of the effect of liquid hydrogen on long range quality and performance of liquid-hydrogen fueled aircraft is presented. It shows that the use of liquid hydrogen will reduce the wing dimensions, require larger fuselage, and reduce the gross weight. It will also reduce engine noise; diminish hydrocarbon, CO, SO, and NO pollution; lower life cycle energy; and produce cost reductions by increasing engine life, and will improve safety. It is concluded that there are considerable benefits to be gained by using LH2, but there are also reasons to continue kerosene-type fuel as long as it is available on an economic basis. A.T.

A80-37341 # **Safety of liquid hydrogen in air transportation.** F. J. Edeskuty (California, University, Los Alamos, N. Mex.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 18.1-18.17. 29 refs. Research sponsored by the U.S. Department of Energy.

Safety in the use of liquid hydrogen in air transportation is discussed. The use of cryogenic hydrogen involves the hazards from low temperatures and from combustibles. The hydrogen properties and their effect on airline operation are considered, showing that several safety problems require additional experimentation. The storage and refueling system should be automated, and buildings in the vicinity of aircraft and fueling systems should be kept at a positive pressure. Hydrogen spills and dispersion are discussed in terms of models which include the rate and size of spill, and which can predict the dispersion and distribution of hydrogen as a function of time and distance from the spill point. It is concluded that the safety record of producing and handling LH2 has been good and it will require a continued effort in safety engineering. A.T.

A80-37342 * # **Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen.** C. F. Baerst and J. C. Riple (AiResearch Manufacturing Company of Arizona, Phoenix, Ariz.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 19.1-19.25. 9 refs. NASA-sponsored research.

A study of design concepts for the application of the properties of LH2 in a turbofan engine for air transport is presented. The study showed the benefits from the reduction of aircraft direct operating cost. Design concepts for the engine fuel delivery and control system, including the engine high pressure fuel pump, were developed and general concept feasibility was demonstrated. Recommendations were made for the advanced development required for design application for both the engine, the fuel delivery, and the control system. A.T.

A80-37343 # **Liquid hydrogen engines.** R. C. Mulready (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 21.1-21.43.

The paper discusses the development of liquid hydrogen engines. The 500 lb/day hydrogen liquefaction plant, the hydrogen tube trailers, and the test stand structures constructed to dissipate any hydrogen which may leak are described. The tests of valves, seals, heat exchangers, and pumps are discussed; the pumps which produced the design pressure rise of 1100 psi at 25,000 rpm are considered. The hydrogen expander cycle called the 304 was selected for the Suntan engine to take advantage of hydrogen's properties as a turbine working fluid. In this engine, hydrogen alone was used in the turbine at the inlet temperature of 1335 F producing the 12,000 HP to drive the fan at a sea level. A larger 60,000 lb/day hydrogen plant which employed expanders in the refrigeration cycle was operated in 1958, and a rocket engine was designed with hydrogen as the working fluid. The hydrogen turbopump has launched most of the large communication satellites and deep space missions, including the Voyager series. A.T.

A80-37344 # **Design concept for LH2 airport facilities.** J. G. Hoyt (Ralph M. Parsons Co., Pasadena, Calif.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 22.1-22.39.

A study of impact on airports of converting a portion of the air transport system to the use of liquid hydrogen (LH2) as a fuel is presented. Studies assumed that gaseous hydrogen (GH2) would be available at the boundary of the airport; this paper summarizes one prototypical system for the distribution and transfer of the cryogenic fuel, and outlines the requirements for the liquefaction and a storage facility. The system uses four liquefier modules, five vacuum perlite-insulated storage dewars, and a pump-fed, two pipe distribution loop system serving hydrants at conventional gas positions. Fuel transfer is by a 'cherry picker' assembly, providing insulated connections from the hydrant to aircraft fuel-inlet and vent-access points and carrying all systems for purification, transfer, inerting, and operational safety. The paper concludes with a summary of costs from these studies and indicates that there is no problem with adapting airports to the LH2 service. A.T.

A80-37345 # **A proposed liquid hydrogen development program for aircraft.** G. D. Brewer (Lockheed-California Co., Burbank, Calif.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979, p. 24.1-24.22. 9 refs.

On the basis of theoretical considerations liquid hydrogen has been shown to be a very attractive candidate fuel for transport aircraft. It is superior in all of the criteria considered to be of primary importance: global availability, safety, pollution, and level of noise generated around airports. To provide experimental data based on practical experience a comprehensive technology development plan which includes operation of LH2-fueled transport aircraft in international commercial cargo service is suggested. The proposed program will provide the technology base needed to intelligently evaluate LH2 when the ultimate decision must be made to select a fuel for future transport aircraft. (Author)

A80-37346 # **Hydrogen production from water by use of nuclear energy.** R. Schulten and H. Barnert (Kernforschungsanlage Jülich GmbH, Jülich, West Germany). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, Supplement.
Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979. 24 p. 21 refs.

The paper discusses future prospects regarding the production of hydrogen from water as well as other secondary energy carriers on the basis of nuclear energy converted into heat energy in a high-temperature reactor (HTR). The discussion covers the following: (1) aspects of future energy supply relative to energy demand and nuclear contribution, the heat market and high-quality secondary energy carriers; (2) fission energy conversion and conservation in terms of the HTR in competition with other reactors as well as conservation of uranium and nonproliferation; (3) high temperature heat production; (4) high-temperature heat conversion processes; and (5) R&D for HTR applications and international cooperation on HTR. S.D.

A80-37347 * # **Analysis and design of insulation systems for LH2-fueled aircraft.** G. R. Cunnington, Jr. (Lockheed Research Laboratories, Palo Alto, Calif.). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, Supplement.
Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979. 27 p. 22 refs. Contract No. NAS1-14614.

An analytical program was conducted to evaluate the performance of 15 potential insulations for the fuel tanks of a subsonic LH2-fueled transport aircraft intended for airline service in the 1990-1995 time period. As a result, two candidate insulation systems are proposed for subsonic transport aircraft applications. Both candidates are judged to be the optimum available and should meet the design requirements. However, because of the long-life cyclic nature of the application and the cost sensitivity of airline operations, an experimental tank/insulation development or proof-of-concept program is recommended. This program should be carried out with a nearly full-scale system which would be subjected to the cyclic thermal and mechanical inputs anticipated in aircraft service. S.D.

A80-37348 # **Hydrogen fueled high bypass turbofans in subsonic aircraft.** R. J. Payzer and S. W. Renninger (General Electric Co., Cincinnati, Ohio). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, Supplement. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979. 34 p.

Some results are presented from a study conducted to evaluate the potential payoff of hydrogen fuel in high bypass turbofan engines suitable for application in long range subsonic logistic aircraft. The discussion focuses on engine cycle configurations, cycle comparison, evaluation model, evaluation of basic cycles, composite cycle evaluation, and composite cycle design factors. It is shown that for the basic turbofan cycle, there is a definite thermodynamic benefit in switching from JP to hydrogen fuel due to the difference in fuel properties. However, the additional complexity associated with use of hydrogen in composite cycles does not appear to be justified. These cycles provide little or no benefit in terms of improved aircraft performance over and above the basic hydrogen turbofan cycle and represent high risk approaches. S.D.

A80-37349 # **Hydrogen liquefaction, storage and transfer on an airport site.** J. J. Thibault (L'Air Liquide, Sassenage, Isère, France). In: Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, Supplement. Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1979. 24 p. 8 refs.

The paper deals only with cryogenic problems. A number of exploratory studies were conducted for evaluating the feasibility and cost impact of the use of LH2 as a fuel on an airport site. Once LH2 is produced and stored, it must be delivered to the planes through cryogenic transfer lines, a few kilometers long, and cryogenic fueling systems between the lines and the planes. The liquefaction, storage and transfer components are reviewed and their size and complexity compared with those of existing equipment. Some research and technology development fields are stressed. S.D.

A80-37987 **Electrolytic hydrogen production and its potential utilization for ship propulsion.** C. A. Schmidt (Comisión Chilena de Energia Nuclear, Santiago, Chile). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 1094-1108. 12 refs.

The electrolytic hydrogen technology available today, and the one expected to be developed within the next 20 years, is examined from a technical and the economical point of view. Light Water Reactors (LWR) for the near term and Liquid Metal Fast Breeder Reactors (LMFBR) as primary energy sources are used to produce electrolytic hydrogen. Potential utilization of hydrogen as a fuel for ships, is examined with some practical examples in WSEV. (Author)

A80-38117 **The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production.** E. L. Klosterman, R. T. Taussig, T. S. Vaidyanathan, P. Cassady, L. Steinhauer, and M. Shirazian (Mathematical Sciences Northwest, Inc., Bellevue, Wash.). In: Shock tubes and waves; Proceedings of the Twelfth International Symposium, Jerusalem, Israel, July 16-19, 1979. Jerusalem, Magnes Press, 1980, p. 446-456. 22 refs. Contract No. ET-78-C-06-1095.

The gas dynamics aspects of applying an unsteady chemical wave reactor to CO/H2 production have been investigated. It is shown that multiple wave processes minimize flow velocities and therefore friction losses. Similarly, significant amounts of helium diluent (30 to 60 percent) are necessary to minimize the same losses while retaining high CO/H2 yields. Efficient freezing of the chemical reaction products at the high peak temperatures would be possible with predicted CO yields of 13 percent. Overall cycle efficiencies of 34 percent appear possible with a 90 percent reactor performance efficiency. V.L.

A80-40970 **The significance of hydrogen as a future environmentally sound secondary energy source in energy and propulsion technology (Die Bedeutung von Wasserstoff als zukünftiger umweltfreundlicher Sekundärenergieträger in der Energie- und Antriebstechnik).** W. Peschka (Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt, Institut für Technische Physik, Stuttgart, West Germany). *DFVLR-Nachrichten*, June 1980, p. 24-28. In German.

Hydrogen as a rocket fuel is an important secondary energy source in space flight. In recent years, the potential use of hydrogen as a secondary energy source next to electricity has been examined. Attention is given to the ecological aspects of hydrogen production, storage of secondary energy by means of hydrogen, hydrogen and solar energy, and hydrogen as an alternate fuel. M.E.P.

A80-42459 **Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell.** A. F. Janzen (Western Ontario, University, London, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures.
Toronto and New York, Pergamon Press, 1979, p. 905-921, 923-937. 27 refs.

The physical and chemical processes involved in photoelectrolysis are outlined. The restrictions for hydrogen production by photoelectrolysis are discussed, and an estimate of maximum efficiency for energy storage is given. Examples of photogalvanic cells, recent developments, and critical processes are presented. Iron-thionine, methylene blue-iron, and azura-A-iron systems are considered. An estimate of the maximum conversion efficiency of photogalvanic cells is made. V.T.

A80-43772 **Mössbauer surface studies on TiFe hydrogen storage material.** A. Bläsius and U. Gonser (Saarland, Universität, Saarbrücken, West Germany). *Applied Physics*, vol. 22, July 1980, p. 331, 332. 6 refs. Research supported by the Deutsche Forschungsgemeinschaft.

By means of Conversion Electron Mössbauer Spectroscopy (CEMS) Fe clusters have been found on the surface of activated TiFe specimens. The magnetic moments of the Fe precipitates order ferromagnetically with a field of 328 kOe and are aligned parallel to the surface. The Fe precipitates are produced by the thermal treatment under hydrogen atmosphere and can be regarded as catalysts for the dissociation of the H2 molecules. (Author)

N80-23478# Brookhaven National Lab., Upton, N. Y.
HYDROGEN STORAGE MATERIALS RESEARCH AND DEVELOPMENT WORK AT BROOKHAVEN NATIONAL LABORATORY
John R. Johnson 1979 4 p refs Presented at the DOE Chem. Energy Storage and Hydrogen Energy Systems Contracts Rev. Meeting, Reston, Va., 12 Nov. 1979
(Contract EY-76-C-02-0016)
(BNL-26813; CONF-791127-2) Avail: NTIS HC A02/MF QA01

The utilization of TiCr2 intermetallics (parent compounds or substituted systems) as energy storage media or for nonmechanical compression/liquefaction applications is discussed. Preliminary research into the feasibility of hydrogen separation from mixed gas streams, using intermetallic compounds, is briefly reported. DOE

N80-23797# Sandia Labs., Livermore, Calif. Energy Systems Study Div.
FIXED SITE HYDROGEN STORAGE. 1: APPLICATIONS IMPACT
J. J. Iannucci and S. L. Robinson 1979 11 p refs Presented at the 2nd Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10 Dec. 1979
(Contract EY-76-C-04-0789)
(SAND-79-8647; CONF-791204-10) Avail: NTIS HC A02/MF A01

The potential applications and requirements for fixed site storage in a scenario of wide spread hydrogen use are examined and quantified. An envisioned hydrogen production/distribution/end-use cycle is scrutinized to identify the storage needs for both continuous and intermittent sources including solar. The most pressing need for storage is found to be at the distribution point, in concurrence with current natural gas practice. Caverns and similar underground storage techniques are shown to be the most promising modes due to their low cost relative to all other options examined. Since a large volume of natural gas storage is presently in service, a pressing need to develop fixed site hydrogen storage technology (beyond the conversion of this underground storage to hydrogen) has not been identified. DOE

N80-23865# European Space Agency, Paris (France).
PHOTOLYTIC DECOMPOSITION OF WATER INTO OXYGEN AND HYDROGEN AS AN ALTERNATIVE ENERGY UTILIZATION OF HOUSEHOLDS AND SMALL CONSUMERS
Wolfgang U. Wendekamm Nov. 1979 54 p refs Transl. into ENGLISH of "Photolytisches Zersetzung von Wasser zu Wauerstoff und Wasserstoff als Alternative Energieversorgung von Haushalten und Kleinverbrauchern", Rept. DFVLR-FB-78-77 DFVLR, Trauen, West Germany, Jan. 1978 Original report in GERMAN previously announced as N79-30836 Original German report available from ZLDI, Munich DM 19,90
(ESA-TT-582; DFVLR-FB-78-17) Avail: NTIS HC A04/MF A01

The photolytic decomposition of water into oxygen and hydrogen is one of the possible alternatives for the transformation of solar energy into storable secondary energy for practical utilization by households and small consumers. After a survey of the possible cycles of water decomposition, the chemical and physical fundamentals of the photolytic decomposition of water using inorganic catalysts and sensitizers are described. Finally, a total house energy supply system is presented as one illustration of the application possibilities Author (ESA)

N80-24477# Midwest Research Inst., Golden, Colo.
PHOTOBIOLOGICAL HYDROGEN PRODUCTION
M. Seibert, S. Lien, and P. F. Weaver 1979 20 p refs Presented at the US/USSR Joint Working Group in Microbiol., Riga, 2-5 Oct. 1979
(Contract EG-77-C-01-4042)
(SERI/TP-33-410) Avail: NTIS HC A02/MF A01

Hydrogen production by phototrophic organisms, which has been known since the 1930's, occurs at the expense of light energy and electron-donating substrates. Three classes of organisms, namely, photosynthetic bacteria cyanobacteria, and algae carry out this function. The primary hydrogen-producing enzyme systems, hydrogenase and nitrogenase, are discussed along with the manner in which they couple to light-driven electron transport. In addition, the feasibility of using in vivo and in vitro photobiological hydrogen producing systems in future solar energy conversion applications are examined. DOE

N80-24483# Brookhaven National Lab., Upton, N. Y. Energy Storage and Conversion Div.
BULK HYDROGEN STORAGE USING METAL HYDRIDES
G. Strickland and M. J. Russo, Jr. Dec. 1979 10 p refs Presented at the 2nd Miami Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10-13 Dec. 1979
(Contract EY-76-C-02-0016)
(BNL-27093; CONF-791204-14) Avail: NTIS HC A02/MF A01

The considerations involved in design and use of a process unit, or reservoir, for storing bulk quantities of hydrogen via solid particles of titanium-iron-maganese are described along with several applications. One style of reservoir having improved design features, and the service system in which it was installed for testing are discussed. The reservoir has a nominal storage capacity of 50 lb (23 kg) of hydrogen and is rated for hydrogen charging and discharging times in the 5 to 10 hour range. DOE

N80-25464# Scientific Design Co., Inc., New York.
EVALUATION OF THE TEXACO SYNTHESIS GAS GENERATION PROCESS FOR THE PRODUCTION OF HYDROGEN FROM SRC-2 RESIDUE
T. Y. Chang and Allan S. West Dec. 1979 87 p
(Contract W-7405-eng-26)
(ORNL/Sub-7240/6) Avail: NTIS HC A05/MF A01

The results are presented of an evaluation of the Texaco Synthesis Gas Generation Process for the production of hydrogen from SRC-II vacuum bottoms residue. Preliminary process designs for a gasification facility for a commercial scale coal liquefaction plant were prepared. A number of studies were performed to establish a near-optimal operating pressure and method of acid gas removal. Plant investment and operating cost estimates are included. It is concluded that the gasifier is well suited for the efficient production of hydrogen from SRC-II residue and only minimal developmental work is needed prior to commercializations. Because of the short duration of the test runs, refractory and burner lives are a point of concern. Based on the current state of oxygen compression technology the gasifier should be designed to operate at about 800 psig. DOE

N80-25467# Los Alamos Scientific Lab., N. Mex.
LIQUID HYDROGEN-FUELED VEHICLE PROJECT
Walter F. Stewart 1979 16 p refs Presented at the Automotive Technol. Develop. Contractor's Coord. Meeting, Dearborn, Mich., 23-25 Oct. 1979
(Contract W-7405-eng-36)

(LA-UR-79-2883; CONF-791082-1) Avail: NTIS HC A02/MF A01

A cooperative evaluation and state-of-the-art demonstration project for liquid hydrogen vehicle onboard storage and refueling techniques is discussed. Safety, economic, and energy assessments for liquid hydrogen as a fuel are also include. A baseline system is provided representing present capabilities in engine conversion, liquid hydrogen storage, and liquid hydrogen refueling. DOE

N80-26538# Los Alamos Scientific Lab., N. Mex.

UTILIZATION OF SOLAR THERMAL SOURCES FOR THERMOCHEMICAL HYDROGEN PRODUCTION

Melvin G. Bowman 1980 6 p refs Presented at the Am. Sect. of the Intern. Solar Energy Soc. Conf., Phoenix, Ariz., 2-6 Jun. 1980 Submitted for publication
(Contract W-7405-eng-36)
(LA-UR-80-837; CONF-800604-3) Avail: NTIS HC A02/MF A01

The utilization of high temperature solar heat for the production of electricity and/or fuels is considered. Solar concentrator systems are discussed in terms of cost and practicallity. Conversion efficiency and energy storage requirements are also considered. DOE

N80-27816# Defense Intelligence Agency, Washington, D.C.

HYDROGEN TECHNOLOGY: FOREIGN, CHANGE 1 Report for period ending Feb. 1980

James D. Busi and Phillip Greenbaum 14 Apr. 1980 66 p
(AD-A083665; DIA-DST-1860S-522-78-CHG-1) Avail: NTIS HC A04/MF A01 CSCL 10/2

Hydrogen is both a promising medium for the efficient storage and transmission of energy and a potential alternate fuel. Hydrogen is not a primary energy source, however, since its production is dependent upon other energy sources (thermal, electrical, and radiant). To be practicable as a fuel, hydrogen must be produced in bulk quantities with a standardized purity that will satisfy consumer specifications. In addition, improved distribution systems must make hydrogen widely available to military, industrial, and domestic consumers if the successful evolution of a hydrogen economy is to occur. The greatest potential military impact of hydrogen lies in its use as an aviation fuel. Because of its high specific energy (124 kJ/kg--2.7 times greater than conventional aviation fuels), hydrogen has potential use as a fuel for subsonic transports, supersonic aircraft, and helicopters; however, safety measures, logistics, and storage and handling systems must be developed and standardized before this capability can be achieved. Initial experimental use of hydrogen in military aircraft may occur in the 1980s. A followup conversion and modification of aircraft and airports to hydrogen will require an additional 10 to 15 years. Secondary military interests include the use of hydrogen fuel cells for portable and transportable power generation, and its use as a propellant in aerospace applications. GRA

04

FUELS AND OTHER SOURCES OF ENERGY

Includes fossil fuels, nuclear fuels, geothermal and ocean thermal energy, tidal energy, and wind energy.

A80-32857 # **Fusion - An energy source for synthetic fuels.** J. A. Fillo, J. Powell, and M. Steinberg (Brookhaven National Laboratory, Upton, N.Y.). *American Institute of Aeronautics and Astronautics, International Meeting and Technical Display on Global Technology 2000, Baltimore, Md., May 6-8, 1980, Paper 80-0844.* 10 p. 23 refs. Research sponsored by the U.S. Department of Energy.

An important first step in the synthesis of liquid and gaseous fuels is the production of hydrogen. Thermonuclear fusion offers an inexhaustible source of energy for the production of hydrogen from water. Depending on design, electric generation efficiencies of 40 to 60% and hydrogen production efficiencies by high temperature electrolysis of 50 to 70% are projected for fusion reactors using high temperature blankets. Fusion/coal symbiotic systems appear economically promising for the first generation of commercial fusion synfuels plants. In the long term, there could be a gradual transition to an inexhaustible energy system based solely on fusion. (Author)

A80-32930 **The influence of Tidal Generating Force on windflow - A preliminary study.** V. Sutton-Vane. *Wind Engineering,* vol. 3, no. 4, 1979, p. 263-268. 5 refs.

The correlation between Tidal Generating Force (the cyclically varying resultant effect of lunar and solar gravitational forces and their directions) and windflow has been investigated and a close relationship appears to exist. For observing windflow behavior and evaluation of TGF, mean windflow figures for central London and daily predictions of high water at London Bridge for 1979 were used. From the preliminary study it is suggested that TGF affects the atmosphere in a similar way to the sea, leading to the concept of the existence of a Tidal Atmosphere with spring and neap tides coinciding with periods of greater and lesser wind activity. Further study is required for more substantial conclusions and if the concept appears to be correct it would become possible to realize long term predictions of periods of maximum and minimum wind activity and reduce the unpredictability of wind when used as a source of power. From the results already obtained, it should be possible to predict periods of higher or lower than average windflow, a year or more ahead with an approximate accuracy of plus or minus two and a half days. O.L.

A80-33126 **Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production.** M. D. Hanisak, L. D. Williams (Harbor Branch Foundation, Inc., Fort Pierce, Fla.), and J. H. Ryther (Woods Hole Oceanographic Institution, Woods Hole, Mass.). *Resource Recovery and Conservation,* vol. 4, Apr. 1980, p. 313-323. 16 refs. Contract No. EY-76-S-02-2948.

The floating freshwater macrophyte Eichhornia crassipes (water hyacinth) was fermented anaerobically to produce 0.4 l of biogas/g volatile solids at 60% methane with a bioconversion efficiency of 47%. Both the liquid and solid digester residues were a rich source of nutrients that were recycled to produce additional biomass. An approximate balance of the nitrogen recycled through the culture-digester-culture system indicated that nitrogen was conserved within the digester. All of the nitrogen originally added to the digester in the form of shredded water hyacinths could be found in the liquid (48%) and solid (52%) residues; 65.5% of the nitrogen in these residues could be reassimilated by cultures of water hyacinths. This study indicated the potential of bioconversion of aquatic macrophytes to methane as a possible means of both producing and conserving energy. (Author)

A80-33127 **Solid fossil-fuel recovery by electrical induction heating in situ - A proposal.** S. Fisher (F.T. Fisher's Sons, Ltd., Montreal, Canada). *Resource Recovery and Conservation,* vol. 4, Apr. 1980, p. 363-368. 5 refs.

A technique, termed electrical induction heating, is proposed for in situ processes of energy production from solid fossil fuels, such as bitumen production from underground distillation of oil sand; oil by underground distillation of oil shale; petroleum from heavy oil by underground mobilization of heavy oil, from either residues of conventional liquid petroleum deposits or new deposits of viscous oil; methane and coal tar from lignite and coal deposits by underground distillation of coal; and generation of electricity by surface combustion of low calorific-value gas from underground coke gasification by combustion of the organic residue left from the underground distillation of coal by induction heating. A method of surface distillation of mined coking coal by induction heating to produce coke, methane, and coal tar is also proposed. V.P.

A80-33409 **Microalgal biomass systems for fuels, chemicals, and fertilizers.** J. R. Benemann (Ecoenergetics, Inc., Richmond, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 46-50. 20 refs.

A80-33411 **Conversion processes for liquid fuels from biomass.** J. M. Radovich, C. F. Pomeroy, S. S. Sofer, and C. M. Sliepcevich (Oklahoma, University, Norman, Okla.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 58-62. 10 refs. Research supported by the Electric Power Research Institute.

Several conversion processes for producing liquid fuels from biomass are evaluated in terms of net thermal efficiency, energy benefit ratio, and liquid fuel recovery. The evaluated processes are based on four basic routes for converting biomass to liquid fuels: production of 'pyrolytic oil' via pyrolysis and direct hydrogenation; production of syngas for conversion to methanol or Fischer-Tropsch liquids; production of SNG by anaerobic digestion with subsequent conversion of SNG to methanol or Fischer-Tropsch liquids; and production of alcohol by fermentation. It is shown that the most efficient processes are those involving biomass gasification followed by liquid fuel synthesis, and biochemical conversion. V.L.

A80-33412 **Liquid fuel production from biomass.** J. E. Sanderson, D. V. Garcia-Martinez, J. J. Dillon, G. S. George, and D. L. Wise (Dynatech R/D Co., Cambridge, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 63-67. Contract No. EG-77-C-002-4388.

Previous work on the production of methane via nonsterile anaerobic fermentation has been expanded by the modification of the process to produce longer-chain aliphatic hydrocarbons instead of methane. This product may be used without further modification as a fuel for diesel engines or as a substitute feedstock for the production of gasoline. The work to date uses marine algae as the primary substrate, but work is currently in progress to adapt the process for use with other aquatic and terrestrial forms of biomass. In the modified fermentation, the approach has been to suppress methane formation and to extract the organic acids from the fermentation broth for electrolytic oxidation (Kolbe electrolysis) to aliphatic hydrocarbons. Preliminary economic analysis based on a 1000 ton/day plant design and assumed biomass costs indicates that this process is capable of producing liquid fuels at a cost competitive with the most optimistic forecasts for alternative processes. (Author)

A80-33413 **Economics of energy recovery from biomass using fluidized-bed combustion.** J. W. Stallings (Energy, Inc., Idaho Falls, Idaho). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 73-77. 7 refs.

A system is presented which utilizes fluidized-bed combustion to recover low-pressure steam from wood chips which have been harvested expressly for that purpose. Using published values for the cost of wood chips delivered to a central site, the economics of the $1.3 million steam-generating system are analyzed. In a sample calculation using $10/ton as the cost of as-received chips, a steam price of $3.02 per thousand pounds is derived. (Author)

A80-33414 **Pellets of immobilized yeast cells as biocatalysts for transforming biomass.** R. Villet (Solar Energy Research Institute, Golden, Colo.), J. Dillon, and G. Manderson (Massey University, Palmerston North, New Zealand). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 78-82. 14 refs. Contract No. EG-77-C-01-4042.

There is scope for improving the efficiency of biotechnological processes for converting sugars to ethanol. One aspect of this is to develop novel bioreactors as an alternative to conventional fermentation systems. Experiments were performed on immobilized yeast cells in the form of biocatalyst pellets. Optimal conditions were determined for the encapsulation of Kluyveromyces fragilis in polyacrylamide gels. Rates of production of ethanol from lactose were measured in batch fermentations, comparing immobilized with free cells. Kinetic parameters which can be utilized in the design of continuous fermentation systems were determined. The long-term stability of the biocatalyst pellets was assessed. Some experiments were performed also with immobilized Saccharomyces cerevisiae. (Author)

A80-33415 **A modular system for bio-gas production using farm waste.** J. Keable and C. Dodson (Helix Multi Professional Services, Reading, Berks., England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 83-87. 7 refs.

A80-33416 **Development and characterization of ethanol tolerance in clostridium thermocellum.** A. A. Herrero, R. F. Gomez, and D. I. C. Wang (MIT, Cambridge, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 88-92. 8 refs. Contract No. EG-77-S-02-4198.

Clostridium thermocellum, an anerobic and thermophilic bacterium, is able to degrade cellulosic materials and use them as sole carbon sources. The conversion of cellulose to ethanol by C. thermocellum is limited by its low resistance to ethanol. Through a selection procedure, C. thermocellum derivatives have been adapted to grow at higher ethanol concentrations than the wild type. One of the mutants (C-9) is able to grow in the presence of 25g of ethanol per liter. The effect that increasing concentrations of acetate, lactate and ethanol, has on the fermentation profiles of cellobiose, by C. thermocellum and its C-9 derivate, was investigated. It was determined that, in both microorganisms, lactate and acetate shifted the catabolic pathway towards ethanol. This is presumably due to a regulatory effect exerted by acetate and lactate on their own formation, thus diverting carbon and reduced pyridine nucleotide towards ethanol. (Author)

A80-33417 **Xylose recovery from hemicellulose by selective acid hydrolysis.** M. L. Limbaugh, R. P. Chambers, C. Kallianpur, and Y. Y. Lee (Auburn University, Auburn, Ala.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 93-96. 8 refs. Contract No. DE-AS01-79ET-2305.

Hemicellulose in oak hardwood was hydrolyzed at temperatures ranging from 140 C to 180 C and H2SO4 acid catalyst concentrations ranging from 0.0% to 0.40%. A maximum xylose yield of 83% was obtained at 150 C and 0.20% H2SO4 by weight. The hemicellulose hydrolysis reaction at these operating conditions was found to have a high degree of selectivity since the cellulose hydrolysis to glucose was only 17% and the hemicellulose conversion to furfural, a decomposition product of xylose, was only 8%. Substantial yields of carbohydrate polysaccharides were observed at 0.05% acid catalyst concentration and the lower temperature range. (Author)

A80-33750 **The potential of crop residues as a fuel for power generation.** N. Bhagat, H. Davitian, and R. Pouder (Brookhaven National Laboratory, Upton, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2025-2029. 13 refs.

Crop residues, the portions of extractable plant material remaining after crop harvest, could serve as an alternative energy source for electric power generation in agricultural regions of the United States. Current estimates indicate that the U.S. annual production of residues has an energy value of about 5 quads, but, in practice it may be possible to collect only a fraction of this for use as an energy resource. Cost estimates for preparation of residues as fuel indicate they are approximately competitive with conventional fuels with costs ranging from $0.70 to $1.25 per million Btu depending on crop type. Two 3-5 kW farm power systems and one 8 MW regional power generator were assessed as to market potential and breakeven capital costs. In some cases, these generators were found to be economically competitive at electricity prices slightly higher than current prices. (Author)

A80-33753 **The energy-food interface - An economic analysis of Brazil's alcohol plan.** N. Rask (Ohio State University, Columbus, Ohio) and R. I. Adams (Rio Grande do Sul, Universidade, Porto Alegre, Brazil). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2111-2115.

A vertically integrated and regionally competitive linear programming model is used to determine potential adjustments to energy crop production in the agricultural sector. Several agricultural regions are studied. Under present world petroleum prices, alcohol cannot be produced competitively. However, alcohol production is competitive within the energy price policy parameters now existing in Brazil and within present price estimates for other alternatives to petroleum (coal liquefaction, shale oil, etc.). Within the agricultural sector, regional production centers, labor surplus areas and alternative source crops are all competitive with centrally located major sugar production. While increased energy prices reduce agricultural income through increased input costs, energy crop production more than offsets this loss resulting in a net aggregate gain for agricultural income especially in non-mechanized areas. Employment in agriculture also shows net gains with energy crop production. (Author)

A80-33769 **Simulation of correlated wind speeds for sites and arrays.** R. B. Corotis (Northwestern University, Evanston, Ill.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2257-2261. 11 refs. Contract No. EY-76-S-06-2342.

The horizontal wind speed components at a site are often modelled as independent, identically distributed, zero-mean, Gaussian random variables. The effects of unequal variances and of correlated components are investigated and seem to not substantially alter the basic Rayleigh form of the speed distribution. Temporal correlation and array considerations are discussed briefly. Data with various averaging times and sampling rates are used to compare wind characteristics with those found from National Weather Service data. Specifically, sampling rate does not significantly affect variances and autocorrelations, while the latter is very sensitive to averaging time. (Author)

A80-33771 **A new approach of wind speed characterization for wind energy studies.** T. N. Goh and G. K. Nathan (University of Singapore, Singapore). In: Sun II; Proceedings of the Silver Jubilee

Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2267-2271.

The paper describes an investigation of wind speeds recorded at six meteorological stations in Singapore, an island situated at approximately 1 deg 15 min N, 105 deg 45 min E. The study illustrates the analysis of information from wind data through the use of appropriate methods of time series analysis and modelling. The models provide an understanding of the dynamics of wind data in the area through characterizations in the time domain. (Author)

A80-33772 **Redesign of windmill towers - A cost reduction study.** L. J. Cubitt and L. J. McGrath (Ballarat College of Advanced Education, Ballarat, Australia). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2272-2276. 8 refs.

In the case of wind energy there are three major difficulties in obtaining the energy in a useful form. These difficulties are the intermittent nature of the wind, the low energy density of the wind (i.e. energy/unit volume) compared with thermal power station, and the high capital cost of windmills. In this paper, a brief analysis is given to explain the decline of the use of windmills in Australia, along with a redesign of the most expensive element of the windmill system, viz. the tower. The criteria for the design are intended to reduce the cost of wind mill system, and for the new tower to have the same or better life expectancy than the present system. It is shown that guyed steel poles and reinforced concrete poles are significantly cheaper than the commonly used 4 or 3 posted tower. S.D.

A80-34019 # **Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions.** J. A. Fair and S. L. Phillips (California, University, Berkeley, Calif.). *CODATA Bulletin,* no. 23, May 1977, p. 15-21; Discussion, p. 21, 22. 13 refs. ERDA-supported research.

A National Geothermal Information Resource (GRID) has been established with the objective to compile and disseminate evaluated data on geothermal science and technology, including the physical chemistry category. The data base for aqueous solutions includes enthalpy, heat capacity, activity coefficient, osmotic coefficient, PVTX, viscosity, thermal conductivity, and electrical conductivity. A bibliography of references to this data, which currently contains 1100 citations, is annotated and stored on magnetic tape for quick retrieval. The bibliography covers the properties of aqueous solutions of NaCl, KCl, and CaCl2 from 1965 to January 1976. The citations are input into a hierarchically structured computerized data base. Typical examples of brine data are presented. V.L.

A80-34531 **A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology.** M. I. Greene, C. J. Ladelfa, and S. J. Bivacca (Cities Service R & D Co., Cranbury, N.J.). *(American Chemical Society, EIC Symposium, Anaheim, Calif., Mar. 12-17, 1978.) Fuel Processing Technology,* vol. 3, May 1980, p. 75-99. 23 refs.

Flash hydropyrolysis (FHP) of coal is an emerging technology for the direct production of methane, ethane and BTX in a single-stage, high throughput reactor. The FHP technique involves the short residence time (1-2 seconds), rapid heatup of coal in a dilute-phase, transport reactor. When integrated into an overall, grass-roots conversion complex, the FHP technique can be utilized to generate a product consisting of SNG, ethylene/propylene, benzene and Fischer-Tropsch-based alcohols. This paper summarizes the process engineering and economics of conceptualized facility based on an FHP reactor operation with a lignitic coal. The plant is hypothetically sited near the extensive lignite fields located in the Texas region of the United States. Utilizing utility-financing methods for the costing of SNG, and selling the chemicals cogenerated at petrochemical market prices, the 20-year average SNG cost has been computed to vary between $3-4/MM Btu, depending upon the coal costs, interest rates, debt/equity ratio, coproduct chemicals prices, etc. (Author)

A80-34532 **Chemical nature of coal hydrogenation oils. I - The effect of catalysts.** J. R. Kershaw, G. Barrass, and D. Gray (Fuel Research Institute of South Africa, Pretoria, Republic of South Africa). *Fuel Processing Technology,* vol. 3, May 1980, p. 115-129. 33 refs.

Hydrogenation of the same coal was carried out with no catalyst and with 1, 5, 10 and 15% stannous, zinc and ferrous chloride catalysts. The oils (hexane soluble portion) were fractionated by silica gel chromatography and by extraction with acid and base. The oils and fractions derived from them were investigated by C-13- and H-1-nuclear magnetic resonance, infrared, ultraviolet, fluorescence and phosphorescence spectroscopy. Increasing the amount of catalyst used decreased the percentage of polar compounds in the oil while the gross hydrocarbon structure showed little change with catalyst concentration. The decrease in the percentage of polar compounds in the oil results in a reduction in the viscosity of the oil due to decreased hydrogen bonding, which was shown by infrared and nuclear magnetic resonance studies. (Author)

A80-34533 **Chemical nature of coal hydrogenation oils. II - The effect of temperature.** J. R. Kershaw, G. Barrass, I. C. Du Preez, and D. Gray (Fuel Research Institute of South Africa, Pretoria, Republic of South Africa). *Fuel Processing Technology,* vol. 3, May 1980, p. 131-140. 14 refs.

Hydrogenation of the same coal was carried out at 400, 450, 500, 550, 600, 650 and 700 C. H-1-nuclear magnetic resonance spectra of the oils (hexane soluble portion) showed an increase in the percentage of aromatic protons and a decrease in the percentage of aliphatic protons as the temperature increases, while the percentage of benzylic protons remained constant. The aromaticity of the oils as calculated by the Brown-Ladner equation increases with the reactor temperature. C-13-nuclear magnetic resonance spectra of the oils indicates that the long aliphatic chains present decrease in both number and length as the reactor temperature increases. The molecular weight and viscosity of the oil as well as the percentage of polar compounds in the oil decrease with increasing temperature. (Author)

A80-34534 **Vehicle gas producers.** E. E. Donath. *Fuel Processing Technology,* vol. 3, May 1980, p. 141-153. 8 refs.

The present petroleum supply situation with the possibility of unscheduled interruptions and the definite expectation of continued price increases calls for an investigation of the use of solid fuels for the propulsion of vehicles. The paper reviews the use of solid fuel gas producers with high thermal efficiency on motor vehicles, especially trucks and buses. Some economic comparisons are presented for pre-World War II conditions. Suggestions are made for possible future development of vehicle gas producers. The types of producers are described, along with their performance, special problems, and the importance of fuel properties. S.D.

A80-34539 **Oil shales and carbon dioxide.** E. T. Sundquist (U.S. Geological Survey, Reston, Va.) and G. A. Miller (U.S. Geological Survey, Grand Junction, Colo.). *Science,* vol. 208, May 16, 1980, p. 740, 741. 13 refs.

During retorting of oil shales in the western United States, carbonate minerals are calcined, releasing significant amounts of carbon dioxide. Residual organic matter in the shales may also be burned, adding more carbon dioxide to the atmosphere. The amount of carbon dioxide produced depends on the retort process and the grade and mineralogy of the shale. Preliminary calculations suggest that retorting of oil shales from the Green River Formation and burning of the product oil could release one and one-half to five times more carbon dioxide than burning of conventional oil to obtain the same amount of usable energy. The largest carbon dioxide releases are associated with retorting processes that operate at temperatures greater than about 600 C. (Author)

04 FUELS AND OTHER SOURCES OF ENERGY

A80-34859 **Windpower principles - Their application on the small scale.** N. G. Calvert (Liverpool, University, Liverpool, England). New York, Halsted Press, 1979. 122 p. 16 refs. $17.50.

The book provides a theoretical treatment of the small-scale applications and technology of wind-powered machines, with particular emphasis on the sail mill windmill. The background, fluid mechanics and component characteristics of wind-powered machines are reviewed, and the aerodynamics and possible geometries of the airfoil are considered. Sails, sail mills and vertical axis mills are examined, and windmill control and performance testing and wind measurement are discussed. The calculation of the power available from various types of windmills in various sites is treated, and the construction of a small pilot wind power plant is discussed, with attention given to an evaluation of possible construction materials. Consideration is also given to windmills at sea and free-spinning, high-speed windmills, and to various means of energy storage. A.L.W.

A80-35172 **Hydro-power - The use of water as an alternative source of energy.** C. Simeons. Oxford, Pergamon Press, Ltd., 1980. 556 p. 64 refs. $75.

The discussion covers such areas as wave power, tidal power, hydrogen power, energy storage, hydroelectric power, and national hydropower programs. Emphasis is on technical characteristics and specific energy schemes. B.J.

A80-35716 **Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings.** Conference and Workshop sponsored by the U.S. Department of Energy and American Meteorological Society; Contract No. EY-76-C-06-1830. Boston, Mass., American Meteorological Society, 1979. 486 p. $25.

Wind characteristics for design and performance, wind characteristics for operations, wind energy resource assessment, and wind energy siting methodologies are the specific topics discussed. Particular papers are presented on such topics as wind turbine dynamic blade loads due to wind gusts and wind direction changes, the potential impact of automated wind guidance on wind energy conversion operations, agricultural applications of wind resource assessments, and remote sensing applications to wind power facility siting. B.J.

A80-35719 * # **Modified power law equations for vertical wind profiles.** D. A. Spera and T. R. Richards (NASA, Lewis Research Center, Cleveland, Ohio). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 47-56; Discussion, p. 57, 58. 14 refs.

In an investigation of windpower plant siting, equations are presented and evaluated for a wind profile model which incorporates both roughness and wind speed effects, while retaining the basic simplicity of the Hellman power law. These equations recognize the statistical nature of wind profiles and are compatible with existing analytical models and recent wind profile data. Predictions of energy output based on the proposed profile equations are 10% to 20% higher than those made with the 1/7 power law. In addition, correlation between calculated and observed blade loads is significantly better at higher wind speeds when the proposed wind profile model is used than when a constant power model is used. B.J.

A80-35720 # **A model for the probability structure of atmospheric turbulence.** J. A. Dutton and J. Hojstrup (Riso National Laboratory, Roskilde, Denmark). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 59-67, 69. Research supported by the U.S. Department of Energy and Universitat Karlsruhe.

A Gaussian patch model is developed for the investigation of turbulence in the atmospheric boundary layer. The theoretical basis is that the quantities of interest can be calculated if the joint distribution of turbulent velocities u(t) and u(t + Delta t) is known for various Delta t. A theoretical model for these joint distributions is proposed, and it is demonstrated with calculations based on two samples of data that the model is worthy of further study. B.J.

A80-35721 # **Wind fluctuations described as discrete events.** D. C. Powell (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 71-79.

A wind fluctuation description that is expressed as the frequency occurrence of some specifically defined class of turbulence events is presented. This frequency of occurrence could be called the frequency of occurrence of discrete gusts if a technical definition of gusts is given which includes any series of discrete events that may be defined from a turbulence time series according to some rule of utility. Two definitions of discrete gusts are discussed, and the concept is illustrated by the analysis of anemometer data. The approach may be useful in calculating the frequency of occurrence of events harmful to wind energy machines. B.J.

A80-35722 # **Wind statistics at the Boulder Atmospheric Observatory tower.** J. C. Kaimal (NOAA, Wave Propagation Laboratory, Boulder, Colo.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 81-90. 5 refs. Contract No. DE-AI06-79ET-23115.

Recent analyses of wind fluctuation data obtained from the 300-m tower of the Boulder Atmospheric Observatory (BAO) are described; the analyses are part of an effort to provide turbulence statistics for use in the design of wind turbine generators. The BAO data are well suited to provide information on factors which affect the performance and life of large rotor blades; these factors include the vertical gradient of the horizontal wind velocity, wind direction variability with time, and gust distribution over the plane of the blades. A preliminary survey of 1978 data concerning the effects of irregular terrain on boundary layer structure and the evolution of the daytime convective boundary layer is presented. B.J.

A80-35723 # **Effect of complex terrain on wind fluctuations.** H. A. Panofsky, J. M. Vilardo, H. N. Shirer, R. C. Lipschutz, and D. E. Larko (Pennsylvania State University, University Park, Pa.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 91-100; Discussion, p. 101. 12 refs.

In an effort to investigate the effects of variances on wind power machines, the paper describes techniques which make possible the estimation of certain statistics of the natural wind from easily accessible meteorological and terrain variables, with emphasis on strong winds and complex terrain. The statistics investigated are variances and spectra of the three wind components; variances affect wind power machines in a number of ways; for example, the stronger the variances, the greater is the likelihood that strong winds will cause the machine to fail. It is shown that it is not sufficient to study variances; the spectral composition is also needed in order that the variances over proper frequency bands can be found. B.J.

A80-35728 # **Wind direction variations in strong winds.** J. C. Doran (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 151-159. Contract No. EY-76-C-06-1830.

Fluctuations in both the magnitude and direction of the wind may be an important factor in the design and performance of wind turbines. This paper describes some measurements of wind direction fluctuations and presents a means of interpreting them that may be useful to designers. The method of interpretation is based on probability distributions of observed angular values; it is shown that significant differences exist between angular fluctuations experienced at a fixed point, averaged over a disk of rotation, and those experienced by a blade element rotating about a horizontal axis. The static and dynamic descriptions of these fluctuations are an important aspect in design considerations and in the development of tracking strategies. B.J.

A80-35729 # **A method for estimating the impact of WECS on utility operating reserve requirements.** M. Goldenblatt (JBF Scientific Corp., Wilmington, Mass.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 169-177.

By statistically combining the uncertainty in predicting the next day's loads with the uncertainty in predicting the next day's WECS power output levels, a total uncertainty in predicting available equipment requirements can be determined when WECSs are added to the utility generating equipment. The difference between the required operating reserve resulting from this total uncertainty in available capacity requirements and operating reserve required without WECS is defined as the WECS operating reserve and is the amount of additional operating reserve necessitated by the presence of WECS. It is shown that the amount of additional operating reserve is directly related to the accuracy of the available WECS power predictions. V.L.

A80-35731 # **The potential impact of automated wind guidance on wind energy conversion operations.** G. M. Carter and D. B. Gilhousen (NOAA, Techniques Development Laboratory, Camp Springs, Md.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 191-203, 205. 15 refs.

Numerical-statistical forecasts of surface winds based on the model output statistics (MOS) technique and intended primarily as guidance for aviation and public weather forecasters, are discussed with reference to their accuracy and the use of the MOS approach for future energy-related applications. It is shown how the MOS technique is currently used to produce several types of reliable, fully-automated wind forecasts which are as accurate as, or better than, comparable subjective forecasts. The MOS guidance is also superior to the forecasts based on climatology or persistence. With some limitations, the MOS approach is shown to be well suited to the prediction of hourly winds for power estimation. V.L.

A80-35732 # **Pacific Northwest regional assessment.** W. R. Barchet and D. L. Elliott (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 213-226; Discussion, p. 227. Contract No. EY-76-C-06-1830.

Techniques used in the assessment of the wind energy potential of the Northwest region are outlined. The techniques are based on a maximum use of the available wind data and various indirect indicators of wind energy, such as supplemental information on regional climatology, meteorology, topography, vegetation, and eolian landforms. The wind data and qualitative indicators of wind power were combined to analyze the geographical distribution of wind energy in the region. The final phase in the assessment was to prepare a Northwest wind-energy atlas with maps and graphs for describing the geographical distribution of the wind resource on a regional and state scale and for detailing wind characteristics for selected stations. V.L.

A80-35733 # **Wind energy resource development in California.** M. Ginosar, C. Cook, and D. Waco (California Energy Commission, Sacramento, Calif.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 229-239, 241.

A80-35734 # **Alaskan wind power study - A large area wind characteristics survey.** T. Wentink, Jr. (Alaska, University, Fairbanks, Alaska). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 243-251. 10 refs. Contract No. EY-76-S-06-2229. DOE Task 12.

A80-35735 # **Wind energy potential in the northern part of Germany.** G. Tetzlaff and R. Beyer (Hannover, Universität, Hanover, West Germany). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 253-257, 259. 6 refs.

A80-35736 # **Wind energy resource assessment of New Zealand.** N. J. Cherry (Lincoln College, Canterbury, New Zealand). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 261-271. 7 refs.

A80-35737 # **Meteorological and topographical indicators of wind energy for regional assessments.** D. L. Elliott (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 273-283. Contract No. EY-76-C-06-1830.

Weather patterns and topographical influences associated with high or low wind energy are discussed with a view to a better understanding of the geographical distribution of wind energy. In the Northwest regional analysis, some of the meteorological and topographical features indicative of high wind energy areas are corridors in areas of frequent strong pressure gradients, long valleys parallel to prevailing wind direction and extending down from mountain ranges, and high elevation plains and plateaus in areas of strong geostrophic winds. Low wind power areas (less than 100 W/sq m at 10 m) are associated with valleys perpendicular to the prevailing wind condition aloft, sheltered basins, short or narrow valleys and canyons, and areas of high surface roughness. V.L.

A80-35741 # **Statistical reliability of wind power assessments.** R. B. Corotis (Northwestern University, Evanston, Ill.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 311-321; Discussion, p. 323, 324. 12 refs. Contract No. EY-76-S-06-2342.

General principles of wind data analysis in the development of site and regional wind power assessments are outlined. Particular consideration is given to the statistical confidence that can be assigned to certain observed quantities as a function of record length, and to the probability models which can be used to derive some quantities in terms of other, more readily available or more easily analyzable ones. The models for the probability density function of hourly wind speed and for the probability distribution of wind speed persistence above and below fixed reference speeds are examined and found appropriate for initial site assessment. V.L.

A80-35743 # **Boundary layer wind shear.** R. C. Heald (Oregon State University, Corvallis, Ore.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 343-351. 8 refs.

Statistics on boundary layer wind shear and its diurnal variation across a layer corresponding to the region swept out by the blades of a modern horizontal-axis wind turbine, the NASA MOD-2, are presented. Wind measurements were performed at several locations over nearly level terrain and relatively homogeneous surface conditions at heights of from 10 to 100 m, and the shear direction components parallel and perpendicular to a wind turbine axis aligned with the mean wind at hub height are computed. Frequency distributions of the total shear and shear components within the layer and day and night average wind speed profiles and total shear are presented. Shear in the wind turbine layer is shown to be appreciably larger at night, due to deceleration below the generator layer and low-level-jet-associated acceleration above it, and may lead to increased machine fatigue as well as significantly greater wind power. Smaller directional changes are observed at night, usually clockwise in the Northern Hemisphere, and may make the design of a turnable wind turbine advantageous. A.L.W.

A80-35744 # **Application of power laws for wind energy assessment.** D. L. Sisterson and B. B. Hicks (Argonne National Laboratory, Argonne, Ill.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 353-359; Discussion, p. 361. 9 refs.

Variations in the exponent in the power law relating height to wind velocity are investigated for a series of measurements of nocturnal low-level winds in northern Illinois in order to determine the applicability of power laws in estimates of attainable wind power. Hourly, seasonal and annual frequency distributions of power law exponents representing the best fit to wind profiles obtained between heights of 5 and 50 m are presented which reveal that the exponents exceed 0.4, indicative of the decoupling of faster-moving upper air from a ground-based, stable inversion, on 50% of summer nights and 15% of winter nights. It is shown that under these conditions, wind energies estimated from low-level wind data and the standard 1/7 power law are 40% less than those derived from actual wind data. The stresses on wind turbine blades caused by these greater wind shears are also shown to be greater than anticipated. It is concluded that a simple power law cannot accurately describe a wind profile, particularly in stable conditions, however, it may be used as a simple estimate of wind energy and shear once the power law exponent distribution has been determined. A.L.W.

A80-35745 # **Trees as an indicator of wind power potential.** J. E. Wade and E. W. Hewson (Oregon State University, Corvallis, Ore.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 363-372; Discussion, p. 373. 5 refs.

Techniques for using tree deformation as an indicator of wind power potential are presented and their limitations are discussed. Consideration is given to the Griggs-Putnam index of wind deformation, which is based on the degree of permanent bending of coniferous tree needles, twigs, branches and trunk, the deformation ratio, which represents the amount of wind-induced crown asymmetry and trunk deflection, and the compression ratio, which measures wind influence on reaction wood formation. Calibrations of these indices with mean annual wind speed for Douglas fir on ponderosa pine trees are presented and results of prediction error determinations estimating an average error for the three indices of 18% and the greatest accuracy of the Griggs-Putnam index are indicated. It is cautioned that these wind speed indices should be used only as rough estimates of mean annual wind speed and may not be applicable where strong winds come from three or more directions or where afternoon winds may be strong but decrease considerably at night. It is concluded, however, that estimates of mean annual wind speed based on wind-deformed trees are a simple, quick and inexpensive criterion in the preliminary ranking of potential wind power sites. A.L.W.

A80-35746 # **Remote sensing applications to wind power facility siting.** C. L. Rosenfeld and P. A. Maule (Oregon State University, Corvallis, Ore.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 375-379.

The application of remote sensing techniques to the assessment of potential wind power sites according to various indicators is discussed. The key wind-power indicators are grouped as vegetation, snow covers, eolian features and topoclimatic indicators, and each group is matched with appropriate sensing platforms and parameters to be used in regional assessment, area evaluation and specific site selection. Procedures for initial regional-scale screening based on regional wind field data and satellite imagery and high-altitude aerial photographs and for medium-scale evaluation based on vertical aerial photography supplied by various agencies and unconventional photointerpretation techniques such as vegetation deformation and electronic image processing are examined. Aerial or field reconnaissance efforts are then presented as appropriate means for the verification of specific candidate sites for wind instrumentation. A.L.W.

A80-35747 # **The utility and verification of mathematical windfield models for wind energy regional screening and site selection.** R. M. Traci, G. T. Phillips, and K. C. Rock (Science Applications, Inc., La Jolla, Calif.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 381-391. 5 refs.

A80-35749 # **Wind energy assessment of the San Gorgonio Pass Region.** S. N. Walker and T. G. Zambrano (Aerovironment, Inc., Pasadena, Calif.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 405-415. 5 refs.

A80-35800 **Automotive fuels from coal (Motorkraftstoffe aus Kohle).** K. H. Eisenlohr and H. Gaensslen (Lurgi Kohle und Mineralöltechnik GmbH, Frankfurt am Main, West Germany). *Erdol und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 33, May 1980, p. 201-207. In German.

The paper surveys present technical methods for transforming coal into automotive fuels. Consideration is given to the overall thermal efficiency as an important economic criterion in the evaluation of the different processes. Further, capital investment and production costs are determined and compared with each other. Finally, an analysis is made of the influence of the selling price of gaseous byproducts on the cost of automotive fuels. M.E.P.

A80-35898 * # **The impact of fuels on aircraft technology through the year 2000.** J. Grobman and G. M. Reck (NASA, Lewis Research Center, Cleveland, Ohio). *American Institute of Aeronautics and Astronautics, International Meeting and Technical Display on Global Technology 2000, Baltimore, Md., May 6-8, 1980, Paper 80-0896.* 24 p. 29 refs.

In the future, it may be necessary to use jet fuels with a broader range of properties in order to insure a more flexible and reliable supply and to minimize energy consumption and processing costs at the refinery. This paper describes research being conducted to (1) determine the potential range of properties for future jet fuels, (2) establish a data base of fuel property effects on propulsion system components, (3) evolve and evaluate advanced component technology that would permit the use of broader property fuels and (4) identify technical and economic trade-offs within the overall fuel production-air transportation system associated with variations in fuel properties. (Author)

A80-36051 **Closed cycle osmotic power plants for electric power production.** M. Reali (Ente Nazionale per l'Energia Elettrica, Milan, Italy). *Energy* (UK), vol. 5, Apr. 1980, p. 325-329. 19 refs.

The paper deals with closed-cycle osmotic power plants (CCOPPs), which are not meant for the exploitation of natural salinity gradients but, rather, for the exploitation of those abundant heat sources having temperatures slightly higher than ambient temperature, e.g., geothermal fields, ocean temperature gradients, waste heat from power plants, and solar energy. The paper gives a general description of the CCOPP, along with some indications of its potential for energy generation. The concept of the CCOPP lies in producing electric power by means of the osmotic flows of suitable solvents and subsequently in separating them again from their solutes by means of thermal energy obtained from any available heat source. The discussion covers osmotic phenomena and the CCOPP, as well as important features of the CCOPP. S.D.

A80-36314 **How clean gas is made from coal.** R. M. Felder, R. M. Kelly, J. K. Ferrell, and R. W. Rousseau (North Carolina State University, Raleigh, N.C.). *Environmental Science and Technology*, vol. 14, June 1980, p. 658-666. U.S. Environmental Protection Agency Grant No. R-804811-02.

Currently, many processes to gasify coal exist, but the technology of synthesis gas cleanup is not as well developed. The present paper deals with the operating experience and some preliminary results from a fluidized-bed pilot plant built with the objective to characterize completely the gaseous and condensed-phase emissions from the gasification-gas-cleaning process and to determine how emission rates of various pollutants and methanation catalyst poisons depend on adjustable process parameters. V.P.

A80-36424 **On the vertical extrapolation of mean wind power density.** L. Sedefian (New York State, Dept. of Environmental Conservation, Div. of Air Resources, Albany, N.Y.). *Journal of Applied Meteorology*, vol. 19, Apr. 1980, p. 488-493. 19 refs.

With the onset of the energy crisis, research has turned to wind power as a possible source of energy. In this paper, a simple method is proposed for determining the height variation of the mean wind power density. A limited data base is used to assess this method and compare it to previously suggested methods. The results show that the proposed method gives the most accurate estimate of the extrapolated mean wind power densities. In conclusion, the proposed method is capable of estimating the mean wind power density at aerogenerator hub heights. S.D.

A80-36625 # **Geothermal energy - Extracting heat from hot dry rock masses.** S. Nemat-Nasser (Northwestern University, Evanston, Ill.). In: Midwestern Mechanics Conference, 16th, Manhattan, Kan., September 19-21, 1979, Proceedings.

Manhattan, Kan., Kansas State University of Agriculture and Applied Science, 1979, p. 285-297. 26 refs. NSF Grant No. ENG-77-22155.

In this lecture the exploitation of geothermal energy for commercial use is briefly examined. Attention is focused on the extraction of heat from hot dry rock masses, a concept which has recently been developed and implemented at the Los Alamos Scientific Laboratory, New Mexico. Recent work by the author and his associates on the thermomechanics of fluid flow and heat transfer, and thermally induced tension cracks in rocks, is summarized. Particular attention is paid to the theory of stability of a system of interacting tension cracks, and its application to other fields. New results in this area by the author and coworkers are briefly summarized. (Author)

A80-36983 **The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/ (L'autobus urbain et le gaz de pétrole liquéfié /Bilan d'une première expérimentation/).** G. Canal (Régie Autonome des Transports Parisiens, Paris, France). *(Association pour la Prévention de la Pollution Atmosphérique, Ministère de l'Environnement et du Cadre de Vie, Ministère de la Santé, Ministère de l'Industrie, and Ministère des Transports, Journées Scientifiques sur l'Automobile: Economies d'Energie et Pollution Atmosphérique, Paris, France, Dec. 6, 7, 1979.) Pollution Atmosphérique*, vol. 22, Jan.-Mar. 1980, p. 138-148. In French.

Results obtained from the experimental operation of the first French urban bus integrally powered by liquefied casinghead gas (LCG) are presented. Following a review of the various types of fuel in use in the French urban bus fleet since the turn of the century and the availability of LCG, the LCG bus experiment is described, with attention given to the fitting of an ordinary diesel engine bus to run on LCG, qualification tests, and the performance of the experimental bus on a city bus line. Operational experience indicates that the LCG bus consumes more fuel than a conventional diesel bus while being less reliable, in part due to its experimental nature. Advantages to the LCG bus are observed in its lower noise and emission levels. An economic analysis indicates substantial operating cost penalties in the utilization of buses fueled by liquefied casinghead gas. It is thus concluded that the application of LCG buses for selected urban uses would require government support, and areas for future development of the system are indicated. A.L.W.

A80-37504 # **Bioconversion.** C. Schnell and L. Hoffmann. *Dornier-Post* (English Edition), no. 1, 1980, p. 26-29.

The paper examines biotechnology and materials research by the Dornier System. The System has evaluated the current status and future possibilities of alternative biological-technical energy supply systems and possible uses of plant wastes by chemical industry. The System also estimated potential of the production of ethanol from plant products as a fuel substitute showing that the possibilities for energy and raw material savings for the industralized countries are limited, but the economic contribution can be made in some fields by additional development work. It is concluded that future problems can be investigated in the fields of thermal balance, material selection, analysis and testing, and the use of alternative sources of energy relating to bioconversion. A.T.

A80-37617 **Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal.** J. A. Shearer, G. W. Smith, K. M. Myles, and I. Johnson (Argonne National Laboratory, Argonne, Ill.). *Air Pollution Control Association, Journal*, vol. 30, June 1980, p. 684-688. 9 refs. Research sponsored by the U.S. Department of Energy and U.S. Environmental Protection Agency.

A80-37676 **Engineering kinetics of short residence time coal liquefaction processes.** R. K. Traeger (Sandia Laboratories, Albuquerque, N. Mex.). *(American Institute of Chemical Engineers, National Meeting, Houston, Tex., Apr. 2, 1978.) I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 19, June 1980, p. 143-146. 15 refs. Contract No. DE-AC04-76DP-00789.

Conversion of coal to liquid products occurs rapidly at temperatures over 350 C and can be significant in preheaters or short residence time reactors. The extent of conversion can have an effect on the operation of preheaters or effectiveness of subsequent reactors. To obtain process information, Illinois No. 6 coal in SRC II heavy distillate was reacted at 13.8 MPa, temperatures of 400, 425, and 450 C, and at slurry space velocities of 3200-96,000 kg/h-cu m. Product compositions and viscosities were measured. High concentrations of preasphaltenes occur in early reactions resulting in a high viscosity product, but subsequent reactions to asphaltenes and oils are less rapid. (Author)

A80-37678 # **Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944.** M. J. Baird (U.S. Department of Energy, Pittsburgh Energy Technology Center, Pittsburgh, Pa.; Ashland Oil, Inc., Catlettsburg, Ky.), R. R. Schehl, W. P. Haynes (U.S. Department of Energy, Pittsburgh Energy Technology Center, Pittsburgh, Pa.), and J. T. Cobb, Jr. (Pittsburgh, University, Pittsburgh, Pa.). *I & EC - Industrial and Engineering Chemistry, Product Research and Development*, vol. 19, June 1980, p. 175-191. 75 refs.

A discussion of Fischer-Tropsch investigations conducted by the

Pittsburgh Energy Technology Center of the DOE since 1944 is presented. Attention is given to iron catalysts used in the oil circulation, slurry, fluidized-bed, and hot-gas-recycle reactors and most recently in the tube wall reactor. A brief historical background is given of the Fischer-Tropsch process, and each reactor system is described along with some of the important experimental results. M.E.P.

A80-37679 **Utilization of cellulosic feedstock in the production of fuel grade ethanol.** J. Yu (Bechtel National, Inc., San Francisco, Calif.) and S. F. Miller (Bechtel National, Inc., San Francisco; Cutter Laboratories, Inc., Berkeley, Calif.). *(American Chemical Society and Chemical Society of Japan, Chemical Congress, Honolulu, Hawaii, Apr. 1-6, 1979.) I & EC - Industrial and Engineering Chemistry, Product Research and Development,* vol. 19, June 1980, p. 237-241. 9 refs.

A80-37986 **Ethanol, a clean burning bio-solar fuel - Its production and utilization.** H. B. Mathur (Indian Institute of Technology, New Delhi, India). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 1075-1093. 5 refs.

The production of ethanol from various substances is considered, and the use of ethanol as an automotive fuel is discussed. Extensive experimental tests and theoretical investigations have shown that ethanol can be used in existing automotive engines in the form of ethanol gasoline blends. Further, future ethanol engines can be developed for total ethanol operation with consequent high specific output and 10-15% higher thermal efficiency as compared to present-day engines. The use of ethanol to meet the transportation energy needs of a developing country like India is noted. B.J.

A80-38016 **End use energy in Brazil and the solar technologies.** I. C. Macedo (Campinas, Universidade Estadual, Campinas, São Paulo, Brazil). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1928-1936. 5 refs.

Energy consumption by end-users, the contribution made by each generating sector, and the temperature spectrum of energy used, are estimated in order to assess the possibilities of solar technologies, including thermal conversion and bioconversion. Of the total of 99 MTEP (million metric tons, oil equivalent) energy used in Brazil in 1976, 44% was derived from petroleum or natural gas, 24% was hydroelectric, and about 29% was contributed by bioconversion of solar energy (wood, sugar cane, and bagasse). Energy consumption analysis indicates that even without the need for space heating, there is a significant amount of thermal energy used at low temperatures (below 100 C), e.g. water and air heating, and preheating for higher temperature systems. The use of solar collectors would be the most obvious way to reduce fuel consumption. Another program is the production of coal from planted forests (eucalyptus and pinus) and ethanol production from sugar cane. V.L.

A80-38221 # **NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation.** V. A. Burtsev (Nauchno-Issledovatel'skii Institut Elektrofizicheskoi Apparatury, Leningrad, USSR). In: Advances in inertial confinement systems; Proceedings of the Meeting, Osaka, Japan, October 29-November 1, 1979. Suita, Japan, Osaka University, 1980, p. 227-256. 26 refs.

A80-38300 **Fuel gases from coal gasification for the gas/steam turbine process (Brenngase durch Kohlevergasung für den Gas-/Dampfturbinen-Prozess).** K. Tippmer (Carl Still GmbH und Co., Recklinghausen, West Germany). *Brennstoff-Wärme-Kraft,* vol. 32, May 1980, p. 203-212. 14 refs. In German.

The basic principles of gasification are surveyed and various gasification methods are detailed. Attention is given to the principle structure of the methods as well as individual procedure steps, such as coal preparation, coal introduction, gasification, and dealing with harmful materials. Emphasis is given to such gasification methods which supply fuel gases for combined gas/steam processes. Finally, by means of a model investigation, various methods are compared with respect to fuel gas production, waste water treatment, desulfurization and their economic value. M.E.P.

A80-38801 # **Contribution of remote sensing to the geological problems of the country (Contributo del telerilevamento ai problemi geologici del paese).** R. Cassinis (Società Italiana per il Telerilevamento, Milan, Italy). In: Applications of remote sensing and ranging systems from space; International Scientific Conference on Space, 20th, Rome, Italy, March 11-13, 1980, Proceedings. Rome, Rassegna Internazionale Elettronica Nucleare ed Aerospaziale, 1980, p. 191-198. 19 refs. In Italian.

The relationship between data observed by remote sensing and by other methods is considered with regard to geological exploration. Geological objectives of remote sensing include the study of geodynamic problems, structures favoring the accumulation of hydrocarbons, and the search for minerals and subterranean water. The application of remote sensing to geological problems in Italy has resulted in the relocation of historical epicenters of earthquakes and the definition of active seismic lines; and remote sensing is also used to search for geothermal energy and active volcanoes. Attention is given to the study of seismicity in Italy and the exploration for surface thermal inertia within the HCMM experiment. J.P.B.

A80-39304 **Gaseous fuels for airship propulsion.** E. Mowforth (Airfloat Transport, Ltd.; Surrey, University, Guildford, England). In: Economics and technology of airships; International Symposium, Paris, France, March 28-30, 1979, Proceedings. Volume 2. Paris, Association d'Etude et de Recherche sur les Aéronefs Allégés, 1979, p. 365-372.

The rising costs of oil fuels make the alternative use of gaseous fuels increasingly attractive, and the airship is inherently better suited to the adoption of such fuels in vapor form than is any other form of aircraft owing to the relative ease with which it may carry large volumes of gas. This paper examines some of the advantages and difficulties in using gaseous fuels (i.e., hydrogen, methane, and propane) and outlines possible airship propulsion systems using gaseous fuels alone or in combination with oil fuel. Particular attention is given to the occasionally conflicting requirements of safety, aerodynamic and structural compatibility, and ease of refueling. B.J.

A80-39419 **Coal liquefaction catalysts.** J. F. Patzer, II and A. A. Montagna (Gulf Research and Development Co., Pittsburgh, Pa.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development,* vol. 19, July 1980, p. 382-386. 9 refs.

A simple coal liquid hydrogenation catalyst evaluation technique is described for the screening of potential coal liquefaction catalysts. Eleven catalysts are evaluated by this technique. Three of the catalysts are also evaluated in actual coal liquefaction service. A correspondence between hydrogenation activity as measured by the coal liquid evaluation and hydrogenation activity in coal liquefaction service is noted. Also, a potential relation between denitrogenation activity in the coal liquid evaluation and hydrocracking in coal liquefaction is posited. (Author)

A80-39420 **Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents.** E. A. Grens, II, F. Hershkowitz, R. R. Holten, J. H. Shinn, and T. Vermeulen (California, University, Berkeley, Calif.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development,* vol. 19, July 1980, p. 396-401. 15 refs. Contract No. W-7405-eng-48.

A80-39421 **Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale.** S.-M. Shih and H. Y. Sohn

(Utah, University, Salt Lake City, Utah). *I & EC - Industrial and Engineering Chemistry, Process Design and Development*, vol. 19, July 1980, p. 420-426. 8 refs. Contract No. DE-AS03-78ET-13095.

A nonisothermal technique using various heating rates has been applied to the determination of the intrinsic kinetics of oil generation from oil shale. From an engineering standpoint the rate of oil generation can adequately be described by overall first-order kinetics with a constant activation energy of 199 kJ/mol. Various methods are applied to the determination of the kinetics parameters. The relative merits of these methods are discussed. The results are compared with data reported in the literature. The nonisothermal technique has the advantages of short experimental time and the elimination of difficulties due to the initial heat-up period accompanying the isothermal experiments. (Author)

A80-39422 **Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency.** A. Judzis, Jr., R. E. Hiatt, B. Williams, and A. Judzis (Michigan, University, Ann Arbor, Mich.). *I & EC - Industrial and Engineering Chemistry, Process Design and Development*, vol. 19, July 1980, p. 465-469. 10 refs.

A80-39630 # **An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing.** H. W. Gershman (Gordian Associates, Inc., Washington, D.C.). *ASME, Transactions, Journal of Energy Resources Technology*, vol. 102, June 1980, p. 77-81. 8 refs.

An approach for determining the economic feasibility of refuse-derived fuel production and the recovery of materials is presented. This information is based on data developed for the metropolitan Washington, D.C. area as input for the consideration of a regional resource recovery program which would eventually encompass 4000 t/day of municipal solid waste; it is designed to recover refuse-derived fuel (RDF), ferrous and nonferrous metals, flint and color-mixed glass cullet, color-mixed glass fines, and waste newspapers. The planning process requires estimates of recovery product revenues and of process feasibility; since materials revenues can be predicted with a greater degree of certainty than RDF revenues, it becomes necessary to determine what revenues will be required from the sale of RDF so that predicted economics can be the same as the alternative disposal practice. A technique is described which will assist the decisionmaker in evaluating the economic feasibility of the proposed project by determining the RDF 'Indifference Value'. A.T.

A80-39762 # **Stabilizing in situ oil shale retorts with injected grout.** *Energy and Technology Review*, Mar. 1980, p. 9-15. 9 refs.

A retort grouting process has been developed which would solve certain problems associated with in situ recovery of crude oil by retorting oil shale, such as surface subsidence, disturbance of groundwater flow, and accumulation of spent shale at the surface. Essentially, the process consists of using the spent shale to make a grout that can be injected into the retort after processing is completed. Bench-scale experiments using a high-temperature process show that grout can be prepared with sufficient strength, mobility, and permeability to stabilize processed in situ oil shale retorts. By reducing the need for surface disposal of spent shale and by increasing the quantity of shale that can be retorted in a given area, the grouting method should significantly improve the economics of the oil recovery process while also offering environmental advantages over surface processing of the shale. V.L.

A80-39765 # **Hoe Creek No. 3 - First long-term underground coal gasification experiment with oxygen-steam injection.** *Energy and Technology Review*, May 1980, p. 17-25. 7 refs.

The paper describes the first long-term underground coal gasification experiment with oxygen-steam injection. In the Hoe Creek No. 3 underground experiment, linkage paths were established between the injection and production wells by drilling a horizontal borehole between them near the bottom of the coal seam. The drilled linkage hole was enlarged by reverse burning, and then the forward gasification process was started - first with air injection for one week, then with oxygen-steam injection for the remainder of the experiment. During the oxygen-steam injection period, about 3900 tons of coal were gasified in 47 days, at an average rate of 83 tons per day. The heating value of the dry product gas averaged 218 Btu/scf, suitable for input to a processing plant for upgrading to pipeline quality, which is about 900 Btu/scf. A.T.

A80-40336 **RMA engineering applications to Fossil Energy projects.** J. R. Sims, D. Q. Bellinger, and E. E. Halili (TRW Energy Systems, McLean, Va.). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 259-267. 8 refs.

The paper provides information on RMA applications to Fossil Energy (FE) projects. It gives an overview of the DOE FE programs including the expansion of domestic production of coal, oil, and gas, conversion of coal to synthetic liquids and gas, and the improvement of the efficiency and economics of fossil fuel use by 1990. The RMA applications involved the preparation of a 'Contractual Specification Guide', and 'FE Project Manager's Manual' and the 'Fossil Energy Equipment Data System Procedures' for failure reporting. The current RMA activities include analyses of failure modes and recommendations for additions of spare pumps, the use of emergency bypass devices, and a provision for redundant transformers. Finally, the development of the RMA standards and failure/discrepancy reporting and corrective action systems are described, concluding that FE must also develop methodology of its own to achieve more effective RMA programs. A.T.

A80-40525 **In-situ gasification and liquefaction show promise.** J. T. Miskell. *Energy*, vol. 5, Spring 1980, p. 10, 11, 16.

Recent progress in the development of in-situ coal gasification and shale liquefaction is discussed. The presence of potentially gasifiable subbituminous, bituminous and lignite coal reserves in the United States amounting to 1800 billion tons, compared with minable coal reserves of 430 billion tons, is pointed out as a major motivation for the development of in-situ extraction techniques, which are estimated to be some of the least expensive potential sources of synthetic natural gas. The successful test of an underground gasification unit operating for 35 days in a 23-ft thick coal seam dipping at 63 deg to produce low-Btu fuel gas and nitrogen-free synthesis gas that can be converted to hydrocarbons is presented, and operational, geological, environmental and economic constraints on the operation of such a unit are considered. In-situ extraction of kerogen from shale using conventional or RF methods is presented as the most promising means for utilizing the great reserves of shale in the United States, requiring little water and causing least disturbance to the environment, and it is noted that the RF process will probably become available by the mid-1980s. A.L.W.

A80-40753 **Fundamental aspects of catalysed coal char gasification.** S. K. Gangwal and R. S. Truesdale (Research Triangle Institute, Research Triangle Park, N.C.). *International Journal of Energy Research*, vol. 4, Apr.-June 1980, p. 113-126. 69 refs. Research supported by the U.S. Environmental Protection Agency.

A brief review of the basic aspects of catalysed coal char gasification is presented. Kinetics and mechanisms of catalysed and uncatalysed gasification reactions of coal char with steam, carbon dioxide and hydrogen are discussed. Mass transport effects and internal structure of coals are shown to be important in determining rates of these reactions. The importance of the type of catalyst used is also discussed. Such factors as catalyst cations and anions, the method by which the catalyst is contacted with the coal char, and physical and chemical states of the catalyst both prior to and during reaction are shown to be important in the gasification process. Finally, research instruments and equipment used recently for studies in catalysed gasification are reviewed. These include various types of reactor systems for following the course of these reactions and analytical instruments for assessing the physical and/or chemical state of the catalysts and/or coal char both prior to and during the gasification reactions. (Author)

A80-40754 **Coal gasification development and commercialization of the Texaco coal gasification process.** W. G. Schlinger (Texaco Montebello Research Laboratory, Montebello, Calif.). *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 127-136. 8 refs.

The development of the Texaco coal gasification process which uses an entrained bed downflow slagging gasifier is reviewed. The advantages of the process include its simplicity and lack of formation of environmentally unacceptable and undesirable byproducts. The treatment of the crude gasification product gas to produce a clean gas for use as fuel or as a feedstock for chemical manufacture is discussed, and the status of the commercialization of the process is considered. B.J.

A80-40755 **Catalytic coal gasification for SNG manufacture.** J. E. Gallagher, Jr. and C. A. Euker, Jr. (Exxon Research and Engineering Co., Linden, N.J.). *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 137-147. Contracts No. E(49-18)-2369; No. ET-78-C-01-2777.

The predevelopment phase of research on the Exxon catalytic coal gasification (CCG) process was completed in early 1978 and included bench-scale research on catalyst recovery and kinetics, the operation of a 6 in. diameter times 30 ft long fluid bed gasifier, and supporting engineering studies. As part of the engineering program, a conceptual design has been developed for a pioneer commercial CCG plant producing SNG from Illinois No. 6 bituminous coal. This paper reviews the status of research and development on the CCG program and describes the conceptual design and economics for the commercial scale CCG plant. B.J.

A80-40756 **The U-GAS process.** J. G. Patel (Institute of Gas Technology, Chicago, Ill.). *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 149-165. Research sponsored by the U.S. Department of Energy, American Gas Association, and Memphis Light, Gas and Water Co.

The U-GAS process has been developed by the Institute of Gas Technology to produce a low to medium Btu fuel gas from coal in an environmentally acceptable manner. The process accomplishes decaking, devolatilization, and gasification of coal in addition to separation of ash in a single-stage fluidized bed reactor. A 24 ton per day pilot plant has been successfully operated on a variety of feedstocks including a high-sulfur, caking Illinois basin bituminous coal. Recent operation of the pilot plant has established process feasibility, and safe and reliable operation, and provided a strong data base for the preliminary design of a demonstration plant in Memphis. B.J.

A80-40757 **The zinc chloride process for the hydrocracking of coal.** F. E. Biasca, C. R. Greene (Shell Development Co., Houston, Tex.), W. E. Clark, and R. T. Struck (Conoco Coal Development Co., Library, Pa.). *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 167-171. Contract No. EX-76-C-01-1743.

The molten zinc chloride process is a hydrocracking system that converts coal to gasoline in a single step. An economically attractive process is currently under development at the one ton per day process development unit scale. The design and economics of a plant for the production of 53,000 bbl/day of gasoline with 90-92 unleaded research octane number from Western coals are discussed. B.J.

A80-40758 **Economic and market potential for SRC-II products.** B. K. Schmid, J. C. Koenig, and D. M. Jackson (Gulf Mineral Resources Co., Denver, Colo.). *International Journal of Energy Research,* vol. 4, Apr.-June 1980, p. 173-184. 8 refs.

The SRC-II (solvent refined coal) process has shown considerable promise in pilot plant work, and plans are being made to demonstrate the process using commercial size equipment in a 6000 tons/day plant to be located near Morgantown, W. Virginia. It is shown that low-sulfur distillate fuel produced from coal by the SRC-II process can be economically competitive with comparable petroleum fuels within the 1980s. In addition to fuel oil, the process produces substantial quantities of methane, light hydrocarbons, and naphtha. The potential value of these products as feedstock for the preparation of pipeline gas, ethylene, and high-octane unleaded gasoline may make the SRC-II process incrementally more attractive. B.J.

A80-40826 **Plasma physics for nuclear fusion.** K. Miyamoto (Nagoya University, Nagoya, Japan). Cambridge, Mass., MIT Press, 1980. 625 p. 367 refs. Translation. $50.

The book focuses on the properties of gaseous plasmas needed in the attainment of controlled fusion reactions. The first five chapters develop the fundamentals of plasma physics and present the conditions of nuclear fusion reactions. The next four provide a magnetohydrodynamic description of plasmas, followed by four chapters that explain wave phenomena and instabilities by means of a kinetic model. The three final chapters deal with the problems of heating, diagnostics, and confinement. V.T.

A80-40830 **Wood for energy production.** N. P. Cheremisinoff (Exxon Research and Engineering Co., Florham Park; New Jersey Institute of Technology, Newark, N.J.). Ann Arbor, Mich., Ann Arbor Science Publishers, Inc., 1980. 159 p. 150 refs. $20.

The current potential of wood as an alternative renewable energy source is surveyed. Following a review of the major industries that depend on wood, total world energy reserves and the potential supplies of wood as an energy source, the chemical, structural, species, physical and thermal properties of wood are examined. Combustion technologies for industry and the home are surveyed, with attention given to wood waste fuels, conventional steam generation, fluid bed incineration, fireplace, wood stove, multifueled and wood furnace designs, and thermoconversion technologies including pyrolysis, gasification, methanation and methanol production. Harvesting and preparation techniques for industry and the home are discussed, and the concept of the wood biomass energy plantation is examined. It is concluded that wood has the potential to make a major contribution to energy supplies, allowing less dependence to be placed on fossil fuel reserves. A.L.W.

A80-40832 **Solid waste conversion to energy: Current European and U.S. practice.** H. Alter (Chamber of Commerce of the United States, Washington, D.C.) and J. J. Dunn, Jr. (Black and Veatch Consulting Engineers, Silver Spring, Md.). New York, Marcel Dekker, Inc., 1980. 179 p. 175 refs. $24.75.

The book provides an introduction to the background and technology of resource recovery from municipal solid wastes, as practiced in the United States and Europe. Quantity and composition of wastes in the United States and Europe are analyzed, and recovery of materials from waste in Europe is studied. Examples of waste-to-energy conversion and use technologies are discussed. Decision making for waste-to-energy system planning and implementation is considered, and marketing recovered products are outlined. V.T.

A80-41169 **Basic elements in waste treatment operations.** B. G. Kreiter (Stichting Verwijdering Afoalstoffen, Amersfoort, Netherlands). *(European Commission and Koninklijke Nederlandse Jaarbeurs, Congress on Packaging, Recovery and Reuse: Governmental and Industrial Viewpoints, Utrecht, Netherlands, Oct. 23, 24, 1979.) Resource Recovery and Conservation,* vol. 5, June 1980, p. 27-37. 8 refs.

This paper indicates and clarifies a number of basic elements in waste treatment operations. These are mostly specific for the Netherlands. Therefore, the introduction of new approaches or new processes for waste treatment should be considered in this specific context. Some emphasis is put on energy-related aspects because of growing concern for the energy supply of the Western world. It is common practice to consider municipal solid waste as an energy carrier and, therefore, as an alternative for the usual sources of energy. Finally, an indication is given about the marketability of products from waste. (Author)

A80-41171 **Packaging materials - Industrial possibilities for resource recovery.** A. V. Bridgwater (Aston, University, Birmingham, England). *(European Commission and Koninklijke Nederlandse Jaarbeurs, Congress on Packaging, Recovery and Reuse: Governmental and Industrial Viewpoints, Utrecht, Netherlands, Oct. 23, 24, 1979.) Resource Recovery and Conservation,* vol. 5, June 1980, p. 51-72.

Consideration is given to possible industrial means for the recovery, recycling reuse and fuel conversion of packaging materials. The need for incentives for the industrial development and implementation of resource recovery programs is pointed out, and various techniques for the separation of packaging wastes from refuse are indicated. Possible techniques for the disposal, reuse, recovery, pyrolysis, compatibilization and fuel conversion of plastics, the recycling and conversion of paper, the recovery, separation and reuse of glass and the recycling and recovery of iron and steel and aluminum are then examined. A.L.W.

A80-41172 **Recovery and reuse - Mechanical processing.** H. Alter (National Center for Resource Recovery, Inc., Washington, D.C.). *(European Commission and Koninklijke Nederlandse Jaarbeurs, Congress on Packaging, Recovery and Reuse: Governmental and Industrial Viewpoints, Utrecht, Netherlands, Oct. 23, 24, 1979.) Resource Recovery and Conservation,* vol. 5, June 1980, p. 73-83. 26 refs.

This paper reviews mechanical processes for the processing of municipal solid waste for the recovery of magnetic metals, aluminium, glass, paper and the conversion of separated organic materials into various forms of refuse-derived fuel. Where possible, the descriptions of the processes are related to the purity and form requirements of product specifications which are available or under development. (Author)

A80-41174 **Waste incineration and pyrolysis.** A. V. Bridgwater (Aston, University, Birmingham, England). *(European Commission and Koninklijke Nederlandse Jaarbeurs, Congress on Packaging, Recovery and Reuse: Governmental and Industrial Viewpoints, Utrecht, Netherlands, Oct. 23, 24, 1979.) Resource Recovery and Conservation,* vol. 5, June 1980, p. 99-115.

The treatment of waste materials by incineration, gasification and pyrolysis is examined. Incineration, in which complete combustion or oxidation occurs, provides waste reduction by weight and volume, a sterile residue and the possibility of heat and/or power recovery, and is expected to become more viable as an energy source as energy costs increase. Thermal processing by gasification, in which incomplete combustion or oxidation occurs, and by pyrolysis, in which thermal degradation is effected by the noncombustive addition of heat, provides waste reduction by weight and volume, a sterile residue and, depending on conditions, a mixture of fuel gas, pyrolytic oil, aqueous condensate and a carbonaceous solid residue. Pyrolysis processes for the production of such fuels and chemicals as methanol are more complex and costly than incineration, and implementation is not likely to occur for a considerable time, although research is continuing. A.L.W.

A80-41213 # **Gas turbine combustor design challenges for the 1980's.** G. J. Sturgess (United Technologies Corp., Pratt and Whitney Aircraft Group, East Hartford, Conn.). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1285.* 20 p. 45 refs.

The challenges in combustion, facing the industry at the beginning of this decade are discussed, including improved combustor durability, broad-based and synthetic fuels, and the design and development process itself. Their origins and salient features are briefly described, and areas where more knowledge is required are highlighted. V.T.

A80-41662 **Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers.** Edited by F. Shahrokhi and T. Paludan (Tennessee, University, Tullahoma, Tenn.). Tullahoma, Tenn., University of Tennessee, 1980. 379 p.

Topical problems involving computer-controlled and manual systems for interpreting multispectral photography, and scanner data are discussed along with sensor technology, information applications, and data flow schemes. Particular consideration is given to site-specific mapping of surface temperature based on NOAA-5 satellite VHRR data, digital resampling of Landsat forest imagery for multidate registration, estimation of vegetation biomass in bunchgrass rangelands of Alberta using Landsat imagery, and the applicability of Landsat imagery for mapping soils in arid and semiarid regions. B.J.

A80-41871 # **Energy and civil aviation (Energia ed aviazione civile).** G. Nicosia (Alitalia, Rome, Italy). *Istituto Italiano di Navigazione, Atti,* Jan.-Mar. 1980, p. 5-16. In Italian.

Repercussions of the energy crisis on air transport are examined, considering available resources of oil, natural gas, coal, sands and bituminous shales. Attention is given to the utilization of nuclear energy and of hydrogen, the synthesizing of fuel, and the amount of fuel used in air transport. The relationships between energy, economics and demand are also addressed, and a comparison is presented between the amount of fuel used by a Boeing 747 and the supersonic Concorde making the same Paris-New York flight. J.P.B.

A80-41892 **Specific heats of Colorado oil shales - A differential scanning calorimetry study.** D. B. Jones, K. Rajeshwar, and J. B. DuBow (Colorado State University, Fort Collins, Colo.). *I & EC - Industrial and Engineering Chemistry, Product Research and Development,* vol. 19, Mar 1980, p. 125-128. 14 refs. Research supported by the U.S. Department of Energy.

A80-42019 # **Measurement of geothermal fluxes by aerial thermal surveys (O registratsii geotermal'nykh potokov teplovoi aeros'emkoi).** B. V. Shilin, V. I. Gornyi, and V. E. Karizhenskii (Laboratoriia Aerometodov, Leningrad, USSR). *Akademiia Nauk SSSR, Doklady,* vol. 252, no. 2, 1980, p. 321-323. 7 refs. In Russian.

It is shown that aerial thermal surveys of geothermal fluxes have not succeeded in detecting geothermal anomalies smaller than those of the order of several degrees. This problem has occurred in spite of the high sensitivity of airborne television systems and is found to be associated with considerable temperature contrasts arising as a result of solar radiation heating of the earth surface. In the present paper, the minimum values of anomalous geothermal heat flux that can be detected by aerial thermal surveys are determined. B.J.

A80-42151 # **Autoignition and vaporization of no. 3 diesel oil spray under lean conditions.** D. J. White (Solar Turbines International, San Diego, Calif.) and E. Cichanowicz (Electric Power Research Institute, Palo Alto, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-10.* 8 p. Members, $1.50; nonmembers, $3.00. Research supported by the Electric Power Research Institute.

Spray or heterogeneous autoignition has recently taken on great importance with the advent of low emission (NOx) combustors requiring precise control of the primary zone equivalence ratio. Many of these combustors, particularly lean premixed systems, rely on the prevaporation and mixing of the fuel and air prior and external to the primary zone combustion process. At high pressures and temperatures, heterogeneous autoignition occurs readily and it can prevent the necessary (for low NOx) premixing and prevaporization of the fuel and air. Experimental results of an investigation into the relationship between vaporization and autoignition has revealed that the necessary level of mixing and vaporization for low NOx can be achieved without autoignition for most of the present industrial gas turbine engines. (Author)

A80-42186 *#* **Fuel property effects on life characteristics of aircraft turbine engine combustors.** C. C. Gleason and D. W. Bahr (General Electric Corp., Aircraft Engine Group, Cincinnati, Ohio). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-55.* 9 p. 8 refs. Members, $1.50; nonmembers, $3.00. Contracts No. F33615-77-C-2042; No. F33615-77-C-2043.

Results of a program to determine the effects of fuel properties on the life characteristics of two USAF/General Electric aircraft turbine engine combustors are presented. Thirteen test fuels were evaluated in an older technology cannular combustion system (J79) and in an advanced technology, virtually smokeless, compact, annular combustion system (F101) over wide ranges of simulated engine operating conditions. Fuel variables were hydrogen content, aromatic structure, volatility and distillation end point. Significant increases in combustor liner temperatures were observed as fuel hydrogen content was decreased. With fuel hydrogen contents of 14.5, 14.0, 13.0 and 12.0, the resulting relative combustor liner cyclic life predictions are 1.00, 0.78, 0.52, and 0.35 for the J79 combustor and 1.00, 0.72, 0.52 and 0.47 for the F101 combustor, respectively. Based on these findings, it is concluded that improved liner cooling design features will be needed in most current technology combustors to accommodate the projected lower hydrogen contents of future fuels. (Author)

A80-42194 *#* **Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner.** P. P. Singh, E. R. Bazarian, P. R. Mulik (Westinghouse Electric Corp., Pittsburgh, Pa.), G. W. Bauserman (Westinghouse Electric Corp., Concordville, Pa.), A. Cohn (Electric Power Research Institute, Palo Alto, Calif.), and T. R. Stein (Mobil Research and Development Corp., Princeton, N.J.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-64.* 10 p. Members, $1.50; nonmembers, $3.00. Research supported by the Electric Power Research Institute.

Tests have been made in a combustion turbine burner using six petroleum-derived surrogate (PDS) fuels simulating six coal-derived liquid (CDL) fuels tested earlier. The purpose was to examine their suitability for use in place of scarce CDL fuels for combustor development. The PDS and CDL fuels were matched in terms of aromaticity and fuel bound nitrogen although differences in viscosity, distillation range and constituent species existed. In three cases, the low fuel bound nitrogen present in the PDS fuels was made equal to their coal liquid counterparts via the addition of quinoline. All six PDS fuels were evaluated on a 0.14-m-dia combustor while one of the surrogate fuels was evaluated on a 0.3-m-dia Westinghouse commercial combustor. (Author)

A80-42197 *#* **Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results.** P. P. Singh (Westinghouse Electric Corp., Pittsburgh, Pa.), P. W. Pillsbury, G. W. Bauserman (Westinghouse Electric Corp., Concordville, Pa.), T. R. Stein (Mobil Research and Development Corp., Paulsboro, N.J.), A. Cohn (Electric Power Research Institute, Palo Alto, Calif.), P. R. Mulik, and E. R. Bazarian. *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-67.* 11 p. 13 refs. Members, $1.50; nonmembers, $3.00.

The paper discusses coal derived liquid fuels and results obtained from tests in a subscale combustor. Emission measurements were made of NOx, smoke, CO, and unburned hydrocarbons, establishing that fuel-bound nitrogen influences NOx production. In particular, the coal and shale derived liquid fuels tested are found to be basically satisfactory for use in present combustion turbines from an operational standpoint. Certain fuels containing high FBN may produce NOx above that allowed from emission regulations. All fuels burned satisfactorily and with no more difficulty than with petroleum-derived fuels with similar properties. S.D.

A80-42198 *#* **Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests.** G. W. Bauserman (Westinghouse Electric Corp., Concordville, Pa.), C. J. Spengler (Westinghouse Electric Corp., Pittsburgh, Pa.), and A. Cohn (Electric Power Research Institute, Palo Alto, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-68.* 11 p. 8 refs. Members, $1.50; nonmembers, $3.00.

The paper describes the combustion tests on over twelve types of coal derived liquid fuels from the EDS, H-coal, SRC-I and SRC II processes and three shale oil fuels conducted in gas turbine combustors. Emission measurements were made of the NO(x) smoke, CO, and unburned hydrocarbons; combustor wall temperature profiles were measured. The results were correlated with the fuel properties: percent nitrogen, hydrogen, and aromaticity. This paper (Part II) describes the results of full scale combustor testing and of a long term corrosion-deposition test; a companion paper by Cohn et al. (Part I, 1980) discusses the fuels used in the program and the subscale combustor test results. A.T.

A80-42199 * *#* **Low NO/x/ heavy fuel combustor program.** E. Lister (U.S. Department of Energy, Germantown, Md.), R. W. Niedzwiecki, and L. Nichols (NASA, Lewis Research Center, Cleveland, Ohio). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-69.* 10 p. Members, $1.50; nonmembers, $3.00.

The paper deals with the 'Low NO/x/ Heavy Fuel Combustor Program'. Main program objectives are to generate and demonstrate the technology required to develop durable gas turbine combustors for utility and industrial applications, which are capable of sustained, environmentally acceptable operation with minimally processed petroleum residual fuels. The program will focus on 'dry' reductions of oxides of nitrogen (NO/x/), improved combustor durability and satisfactory combustion of minimally processed petroleum residual fuels. Other technology advancements sought include: fuel flexibility for operation with petroleum distillates, blends of petroleum distillates and residual fuels, and synfuels (fuel oils derived from coal or shale); acceptable exhaust emissions of carbon monoxide, unburned hydrocarbons, sulfur oxides and smoke; and retrofit capability to existing engines. (Author)

A80-42200 *#* **Fuel character effects on J79 and F101 engine combustor emissions.** C. C. Gleason (General Electric Aircraft Engine Group, Cincinnati, Ohio) and J. A. Martone (USAF, Engineering and Services Center, Tyndall AFB, Fla.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-70.* 8 p. 12 refs. Members, $1.50; nonmembers, $3.00. USAF-supported research.

Results of a program to determine the effects of fuel properties on the pollutant emissions of two U.S. Air Force aircraft gas turbine engines are presented. Thirteen test fuels, including baseline JP-4 and JP-8, were evaluated in a cannular (J79) and a full annular (F101) combustor. The principal fuel variables were hydrogen content, aromatic structure, volatility, and distillation end point. Data analysis shows that fuel hydrogen content is a key fuel property, particularly with respect to high power emissions (oxides of nitrogen and smoke), and that low power emissions (carbon monoxide and hydrocarbons) are more dependent on fuel atomization and evaporation characteristics. (Author)

A80-42226 * # **Status of the DOE/NASA critical gas turbine R & T Project.** J. S. Clark (NASA, Lewis Research Center, Cleveland, Ohio). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-104.* 10 p. 14 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

The purpose of the DOE/NASA CRT (Critical Research and Technology) Project at the Lewis Research Center is to provide an R&T data base for utility gas turbine systems burning coal-derived fuels. Coal-derived fuels present difficult problems in combustion (because of the high organically-bound nitrogen in the fuel), and materials (because of the trace metal contaminant levels in the fuels, leading to corrosion and deposition in the turbine hot section). The combustion task includes (1) an effort to model the rich-lean combustion process, to predict NOx emissions; (2) a two-stage flame tube experiment to study the effects of combustion operating conditions and fuel properties on NOx conversion; and (3) scaled combustor tests to evaluate the NOx-reduction potential of several staged-combustion concepts. The materials-corrosion resistance effort attacks the problem on three sides. (Author)

A80-42230 # **Design and test of a 73-MW water cooled gas turbine.** A. Caruvana, R. S. Rose, E. D. Alderson, and G. A. Cincotta (General Electric Co., Gas Turbine Div., Schenectady, N.Y.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-112.* 20 p. 13 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

This paper presents a preliminary design of a water-cooled gas turbine capable of operating on coal derived fuels and producing 73 MW when burning low Btu coal gas. Particular emphasis is placed on the critical technology issues of combustion and heat transfer at 2600 deg firing temperature. The recent technology developments, i.e., materials developments, composite construction, water cooling, fuels cleanup, etc., which now make this advanced concept possible are discussed. Detailed descriptions of the hot gas path components, the staged sectoral combustor, the water cooled nozzles and buckets, are described showing the implementation of these recent developments. The component development test program which is underway is described and, where testing results are available, design confirmation is demonstrated. Future plans for the construction of a full scale prototype machine and for design verification testing are presented. An analytical evaluation is included which demonstrates the advantages of the water-cooled gas turbine in an integrated gasification combined cycle. (Author)

A80-42231 # **Survey of integrated gasification combined cycle power plant performance estimates.** J. W. Larson (Mitre Corp., Metrek Div., McLean, Va.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-113.* 14 p. 28 refs. Members, $1.50; nonmembers, $3.00.

The idea of a combined cycle power plant integrated with a coal gasification process has attracted broad interest in recent years. This interest is based on unique attributes of this concept which include potentially low pollutant emissions, low heat rate and competitive economics as compared to conventional steam plants with stack gas scrubbing. Results from a survey of technical literature containing performance and economic predictions have been compiled for comparison and evaluation of this new technique. These performance and economic results indicate good promise for near-term commercialization of an integrated gasification combined cycle power plant using current gas turbine firing temperatures. Also, these data show that advancements in turbine firing temperature are expected to provide sufficiently favorable economics for the concept to penetrate the market now held by conventional steam power plants. (Author)

A80-42243 # **Diagnostics and instrumentation requirements for advanced power systems.** D. R. Hardesty (Sandia Laboratories, Livermore, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-129.* 18 p. 71 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

The paper summarizes a preliminary assessment of the diagnostics and instrumentation requirements for coal-fired gas turbine systems. Attention is given to diagnostics needs which are common to most of the Fossil Energy programs. Emphasis is placed on diagnostics needs related to material studies, in particular to the in situ detection of material surface properties. V.T.

A80-42245 # **2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant.** A. D. Harper (AiResearch Manufacturing Company of Arizona, Phoenix, Ariz.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-132.* 8 p. Members, $1.50; nonmembers, $3.00. Research supported by the Electric Power Research Institute.

A80-42267 # **High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems.** H. W. Carpenter, J. Campbell, Jr., L. H. Russell, and D. E. Wright (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-155.* 6 p. Members, $1.50; nonmembers, $3.00. Contract No. EF-77-C-01-2612.

High-temperature, coal-fired combustors with ceramic heat exchangers were designed for CCGT systems. The objective in evaluating CCGT systems is to convert U.S. coal to electricity with higher efficiency. Higher temperatures are required to accomplish this goal and ceramic heat exchanger surfaces allow the use of working fluid temperatures to 2500 F and higher. The results of a comprehensive government study are described in which an atmospheric fluidized bed and cyclone fired combustor/heat exchanger were designed for operation at 1750 and 2250 F. (Author)

A80-42271 # **Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption.** S. J. Lehman, A. J. Giramonti (United Technologies Research Center, East Hartford, Conn.), and R. H. Meyer (Northeast Utilities Service Co., Berlin, Conn.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-161.* 7 p. 9 refs. Members, $1.50; nonmembers, $3.00.

A80-42278 # **Low Btu coal gas combustion in high temperature turbines.** R. L. Vogt (General Electric Co., Gas Turbine Div., Schenectady, N.Y.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-170.* 9 p. 13 refs. Members, $1.50; nonmembers, $3.00.

This paper defines the combustion consequences of burning low Btu coal gas in high temperature gas turbines. It identifies the limits of their application regarding the heating value and its thermodynamic constraints on turbine firing temperature, operating flammability limits, product carbon monoxide, oxides of nitrogen and combustor turndown ratio. Sensitivity to reaction zone radiation and effects on combustor hot gas path flow area are discussed. The effect of these constraints on the conceptual design of a combustor is described herein. The example discussed is the sectoral combustor which was designed under contract to the Department of Energy for use in the High Temperature Turbine Technology program. The sectoral combustor is to be fired on coal gas to within 250 C of the homogeneous, adiabatic, stoichiometric flame temperature limit. (Author)

A80-42289 # **High temperature combustor designed for operation with coal derived low Btu gaseous fuels.** T. R. Koblish and L. M. Nucci (Curtiss-Wright Corp., Wood-Ridge, N.J.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-187.* 9 p. 6 refs. Members, $1.50; nonmembers, $3.00.

A80-42290 # **Development of a high temperature turbine for operation on coal-derived fuel.** J. C. Wolf, S. Moskowitz (Curtiss-Wright Corp., Wood-Ridge, N.J.), and G. B. Manning (U.S. Department of Energy, Washington, D.C.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-188.* 8 p. Members, $1.50; nonmembers, $3.00. Contract No. EX-76-C-01-2291.

The efficiency of an integrated coal gasification-combined cycle powerplant can be improved above that of conventional coal-fired steam powerplants by increasing the gas turbine component firing temperature and pressure ratio while limiting component cooling requirements. A stage of the development of a transpiration-air-cooled turbine for operation at 2600 F (1427 C) and above in a combusted coal-derived fuel environment is presented. Results are presented from 300 hr of turbine cascade and 400 hr of rig-engine tests conducted at up to 3000 F (1649 C) using a jet fuel 'doped' with aluminum oxide or flyash to simulate the potentially erosive and corrosive nature of coal derived fuels. The metallographic examinations and flow permeability are discussed in terms of the effects from particle deposition. (Author)

A80-42448 **Passive cooling systems in hot arid regions.** M. N. Bahadori (Shiraz, University, Shiraz, Iran). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 461-479. 7 refs. Research supported by the University of Shiraz.

The paper describes the principle of operation of wind towers and curved roofs used for natural circulation of air through buildings. The wind towers can provide both sensible and evaporative cooling of the air, while the wind blowing over the curved roofs provides an entrainment and sensible cooling of the ambient air through the building. The natural production of ice on clear winter nights and storage of cold water in deep cisterns are discussed; the natural ice making depends on thermal radiation losses to the clear sky. The water in cisterns is kept cool through the summer months by maintaining an evaporation rate from its surface by the draft produced by several wind towers. A.T.

A80-42466 **Pyrolytic gasification of renewable biomass resources.** E. E. Robertson (Biomass Energy Institute, Inc., Winnipeg, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1059-1089. 12 refs.

Pyrolytic biomass gasifiers are discussed, including updraft, downdraft, and cross-draft reactors and attention is given to the catalytic conversion of forest and field crops. In addition, gasification technology with regard to wood is traced along with the generic development of gasifiers. Also considered are the chemical constituents of wood, that is, cellulosic carbohydrates and lignin, and the reactions (drying, pyrolysis and oxidation) occurring in a fixed bed updraft unit, concerning which it is noted that the efficiency of gasification will not exceed about 70% (cold gas basis) due to temperature requirements in the pyrolysis zone. J.P.B.

A80-42467 **Compaction and densification of fuels from biomass.** E. E. Robertson (Biomass Energy Institute, Inc., Winnipeg, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1091-1103. 11 refs.

A80-42470 **Wind power.** G. M. Bragg (Waterloo, University, Waterloo, Ontario, Canada). In: Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures. Toronto and New York, Pergamon Press, 1979, p. 1245-1265. 9 refs.

The fundamentals of wind power utilization are described with emphasis placed on the information needed to determine the basic geometry of wind power devices and to discuss the availability of wind for power generation. The economics and social acceptance of wind power systems at the present time are analyzed. V.T.

A80-42700 # **The utilization of wind-energy resources (Ob ispol'zovanii vetroenergeticheskikh resursov).** V. I. Sidorov, V. V. Sidorov, and V. M. Kuznetsov. *Akademiia Nauk SSSR, Izvestiia, Energetika i Transport,* May-June 1980, p. 73-82. 11 refs. In Russian.

A review of developments in wind-energy in the Soviet Union, U.S., and West Europe is presented. The resources of the USSR are evaluated in three zones with the highest wind-energy potential, and designs of a 5 MW wind generator are analyzed along with a multirotor unit of 40 MW which will serve as the basis of an experimental 1000 MW system. The latter will be used as the first stage of utilization of wind-energy resources for electrical power generation. The wind-energy programs in the U.S., West Germany, Denmark, and Sweden are described which plan to produce 2 to 10% of electrical energy from wind energy by the year 2000. A.T.

A80-42800 **Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions (Modelle für die Wasserstoffvergasung von Steinkohle - Analyse und Deutung der Methanbildungsreaktionen).** K. J. Huttinger and H. Kirrmann (Karlsruhe, Universität, Karlsruhe, West Germany). *Erdöl und Kohle Erdgas Petrochemie vereinigt mit Brennstoff-Chemie,* vol. 33, June 1980, p. 267-271. 27 refs. In German. Research supported by the Deutsche Forschungsgemeinschaft.

A study is reported in which four samples of open-burning coal, one coking type of coal, one-short-flaming (smokeless) coal, as well as defined pvc-pyrolysis residues were gasified in a fixed bed reactor. Three areas of methane formation are analyzed and the results of these methane formations examined. It is found that the methane formation between 500 and 600 C can be traced back to the rupture of methyl groups and methylene bridges. Further, the methane formation between 700 and 800 C is based on the maximum disorder of the paracrystalline coke residue. Finally, the catalytic activity of iron on coke gasification is considered, noting that it leads to the formation of methane above 850 C, and that since iron acts as a catalyst only under pressure, methane formation in this range is noticed only in pressure gasification. M.E.P.

A80-42928 # **Burning refuse-derived fuel - 'The Woodstock experience'.** R. Luka (Canada Cement Lafarge, Ltd., Woodstock, Ontario, Canada). *CanInfo Communications, Energy from Waste Seminar: A Decade of Development, Toronto, Canada, Nov. 21, 22, 1979, Paper.* 5 p.

The paper deals with a field test of a substituting part of a plant's normal kiln fuel by refuse (RDF). The discussion is limited to the description of the facilities installed for RDF use. The plant has a nominal cement production capacity of 575,000 tons per annum. The RDF facility is conceived to receive, shred, meter, and pneumatically convey the quantities of RDF as required to the kiln. RDF is air classified paper fraction of shredded municipal solid waste. Some mention is made of heat recovery from RDF but data available is minimal. V.T.

A80-42929 # **The region of Peel Resource Recovery Plant - Resource recovery and energy from waste in partnership.** C. C. Kemp (Grumman Energy Systems, Inc., Ronkonkoma, N.Y.). *CanInfo Communications, Energy from Waste Seminar: A Decade of Development, Toronto, Canada, Nov. 21, 22, 1979, Paper.* 6 p.

A resource recovery system is described. A proprietary materials separation technology has been selected for a materials recovery system. An energy recovery system is based on the VKW Dusseldorf Roller Grate technology described as a mass burning process. The whole system is considered to be a reliable means for reducing household and commercial solid waste to a small volume of safely landfillable residue and at the same time to be a dependable source of steam for industry, electricity for the community. V.T.

A80-42930 # **Potential for conversion of refuse to energy in Ontario.** R. M. R. Higgin. *CanInfo Communications, Energy from Waste Seminar: A Decade of Development, Toronto, Canada, Nov. 21, 22, 1979, Paper.* 4 p. 8 refs.

The current energy from waste situation in Canada and Ontario is considered with regard to wood residues and municipal waste. Attention is also given to the direct economic viability of energy from waste projects. It is concluded that prepared solid refuse-derived fuel plans have the highest internal rate of return of all options, that mass burning waterwall incinerators show considerable economics of scale, and that batch-fed mass burning controlled air incinerators in the range of 50-100 tonnes/day appear to be economic for commercial and residential heating. J.P.B.

A80-43186 # **An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products.** E. T. Sherwin and A. R. Nollet (AENCO, Inc., New Castle, Del.). *American Society of Mechanical Engineers, Intersociety Environmental Systems Conference, San Diego, Calif., July 14-17, 1980, Paper 80-ENAs-9.* 8 p. 10 refs. Members, $1.50; nonmembers, $3.00.

Twenty-six large solid waste resource recovery plants have been designed and/or built since 1971. These plants are designed to burn the solid waste to produce steam, or to produce refuse-derived fuel (RDF). After taking credit for energy produced, and for other resources recovered, these plants must charge a 'tipping fee' of between $15 and $40 per ton to break-even. This compares with 'tipping fees' of about $7.50 per ton to operate sanitary landfilling. Thus, resource recovery costs more than does landfilling. This paper discusses a recently-developed system to produce graded paper pulps from mixed solid waste. Such graded pulps have a market value two to five times the fuel value of paper. (Author)

A80-43831 **Wave energy.** I. Glendenning (Central Electricity Generating Board, Plant Engineering Dept., Barnwood, Glos., England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews,* vol. 127, pt. A, no. 5, June 1980, p. 301-307. 24 refs.

It is noted that wave-energy studies to date have aimed at producing outline system designs and realistic estimates of their performance and costs. Generic work is reported to have shown that the resource size is less than originally believed, and that wave-directional effects, equipment reliability and basic device/converter efficiency lead to a maximum productivity of about 25%, about 60-70 TWhe/yr or 10% of UK energy needs. Attention is given to ways of improving wave-energy economics with consideration given to such factors as device efficiency, maintenance assessments, and performance and cost of structures. It is concluded that improved systems capable of 5-10 p/KWh should be possible, but wave energy is unlikely to compete economically with nuclear power. M.E.P.

A80-43834 **Fossil-fuel heat pumps for domestic, commercial and industrial space heating.** R. E. Critoph (Warwick, University, Coventry, England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews,* vol. 127, pt. A, no. 5, June 1980, p. 326-329. 7 refs.

N80-22421 Oklahoma State Univ., Stillwater.
COAL DERIVED LIQUIDS HYDROTREATMENT-CATALYSTS DEACTIVATION STUDY Ph.D. Thesis
Mohammed Mushtaq Ahmed 1979 375 p
Avail: Univ. Microfilms Order No. 7928189

The hydrotreatment catalysts activity decay while processing coal derived liquids is assessed. Two Co-Mo-alumina catalysts and one Ni-Mo-alumina catalyst were tested. Experimental runs were conducted at 10,400 KPa (1500 psig) for temperatures in the range of 371 C to 454 C using four different coal derived liquids as feedstocks. A semimechanistic model has been developed to represent the data obtained in the study. Carbonaceous depositions seem to be the primary cause for catalyst activity decay. Inorganic depositions are also responsible for catalyst activity decay and can result in permanent deactivation due to a loss in surface area, pore volume, and dilution of the active species on the catalyst surface. Dissert. Abstr.

N80-22428 Pennsylvania State Univ., University Park.
PREDICTION OF THERMOPHYSICAL PROPERTIES OF PETROLEUM FRACTIONS Ph.D. Thesis
Mohammad-Reza Riazi 1979 243 p
Avail: Univ. Microfilms Order No. 8006043

Thermophysical properties of a petroleum fraction were predicted using properties of pure compounds together with a molecular type analysis of the fraction. For light (molecular weight (M) < 200) olefin free fractions, a n-alkane, n-alkylcyclopentane,

n-alkylbenzene(NP-NN-NA) model was developed which describes the structure of the fraction. Only boiling point as a characteristic parameter was needed to choose a pure compound from each hydrocarbon group. Molecular weight, critical temperature, critical pressure, critical volume, liquid molar volume, density, refractive index, heat of vaporization, and ideal gas heat capacity of petroleum fractions and pure compounds were simply correlated to the absolute boiling point and specific gravity at 60/60 F. When tested against data on pure compounds and petroleum fractions, these correlations were comparable with or superior to those obtained from previously recommended methods.
Dissert. Abstr.

N80-22507 Illinois Univ. at Urbana-Champaign.
A STEAM PROCESS FOR THE GASIFICATION OF COAL Ph.D. Thesis
Ronald Thomas Gibbs 1979 194 p
Avail: Univ. Microfilms Order No. 8009042

A process was studied for the gasification of coal which uses superheated steam in excess of stoichiometric amounts as the heat source for the endothermic gasification reactions. Energy to generate and superheat the steam was derived by burning a part of the cleaned product gas stream thus avoiding air pollution problems. The excess steam combined with the absence of oxygen in the reactor resulted in sulfur from the coal being converted to hydrogen sulfide with final removal as raw sulfur. Results show the feasibility of the process at temperatures above 1300 K. Further, results showed reasonable agreement with predictions made by the kinetic model. Dissert. Abstr.

N80-22508# Union Carbide Corp., Tonawanda, N.Y.
DIRECT IGNITION OF PULVERIZED COAL WITH ARC HEATED AIR
Philip R. Blackburn 1980 39 p refs Backup document for AIAA synoptic, 'Ignition of Pulverized Coal with Arc Heated Air', scheduled for publication in Journal of Energy, May - Jun. 1980
Avail: NTIS HC A03/MF A01

Current power plant practice, with suspension fired boilers, involves consumption of large quantities of premium fuel to accomplish ignition of pulverized coal. A new approach to coal ignition is described. A vortex stabilized electric arc heater was attached to a full scale commercial pulverized coal burner. A continuous arc heated air jet was used as an ignition source. The equipment was operated in a power plant. Ignition was accomplished with igniter input power levels which are lower than conventional practice by a factor of six. Cost of an igniter system for a 150 million BTU/hr coal burner is estimated. It is shown that the arc igniter is economically viable and is competitive with conventional practice.
Author

N80-22516# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
BIOMASS ENERGY CONVERSION WORKSHOP FOR INDUSTRIAL EXECUTIVES
1979 77 p Workshop held at Claremont, Calif., 9-10 Apr. 1979 Prepared in cooperation with Calif. Energy Comm., Sacramento
(Contract EG-77-C-01-4042)
(SERI/TP-62-299; CONF-790465) Avail: NTIS HC A05/MF A01

The potential to turn industrial waste or residue into an energy source was discussed at a workshop which provided industrial managers with current information on using residues and wastes as industrial energy sources. Successful industrial experiences were described by managers from the food processing and forest product industries, and direct combustion and low-Btu gasification equipment was examined. Some major conclusions of the conference were: numerous current industrial applications of wastes and residues as fuels are economic and reliable; off-the-shelf technologies exist for converting biomass wastes and residues to energy; a variety of financial (tax credits) and institutional (PUC rate structures) incentives can help make these waste-to-energy projects more attractive to industry. Many of these incentives are still being developed and their precise impact must be evaluated on a case-by-case basis.
DOE

N80-22518# UOP, Inc., Des Plaines, Ill. Corporate Research Center.
UPGRADING OF COAL LIQUIDS: UPGRADING DISTILLATES FROM COAL LIQUEFACTION Annual Report, 31 Jan. 1978 - 31 Jan. 1979
A. J. deRosset, Gim Tan, and Lee Hilfman May 1979 16 p refs
(Contract EF-77-C-01-2566)
(FE-2566-26) Avail: NTIS HC A02/MF A01

The coal-derived naphthas from the H-Coal and Exxon Donor Solvent (EDS) processes were hydrotreated and reformed in research pilot plants to 100 Research Octane Number (RON) gasoline. The 400 F(+) distillates from the H-Coal and EDS processes converted by hydrotreating, hydrocracking and fluid catalytic cracking (FCC). In general, hydrotreatment is required prior to either hydrocracking or FCC to reduce excessive amounts of nitrogen and to enhance processability. Hydrotreating alone will give high yields of environmentally acceptable No. 2 fuel oil. Hydrogen consumption was high, however, a portion of the hydrogen can be recovered by reforming the hydrocracked naphtha to 100 RON gasoline. Additional hydrogen can potentially be recouped by steam reforming light gases. The hydrotreated distillates responsed to fluid catalytic cracking as well as petroleum derived stocks of comparable hydrogen content. FCC gasoline product octane numbers ranged from 92 to 99 RON.
DOE

N80-22519# UOP, Inc., Des Plaines, Ill. Corporate Research Center.
UPGRADING OF COAL LIQUIDS: HYDROTREATING AND REFORMING EXXON DONOR SOLVENT (EDS) PROCESS DERIVED NAPHTHAS Interim Report
G. Tan and A. J. DeRosset Feb. 1979 48 p refs
(Contract EF-77-C-01-2566)
(FE-2566-25) Avail: NTIS HC A03/MF A01

Exxon donor solvent (EDS) process naphtha which was processed in research pilot plants into 100 octane motor fuel by conventional refinery processes, using commercial UOP catalysts is described. The naphtha comprises principally cyclic hydrocarbons. In addition, it contains over 10 percent heterocyclic structures, such as phenols, pyridines, and thiophenes. Hydrotreatment was effective in reducing the sulfur and nitrogen to levels acceptable for reforming. Reforming the hydrotreated naphtha gave 90 volume percent of 100 octane gasoline. DOE

N80-22521# Engineering Societies Commission on Energy, Inc., Washington, D. C.
GUIDELINES FOR ECONOMIC EVALUATION OF COAL CONVERSION PROCESSES Final Report
Apr. 1979 83 p refs
(Contract EF-77-C-01-2468)
(FE-2468-44) Avail: NTIS HC A05/MF A01

Guidelines developed for use in preparing and reporting engineering designs, cost estimates, and financial analyses of large scale fossil energy facilities are presented, primarily for the preliminary economic analysis of coal conversion projects producing either gas or coal liquids. In a preliminary estimate, the process, equipment, and site factors are sufficiently defined to justify a preliminary engineering design. However, the general structure and subject matter of these guidelines are applicable to either more simplified or more detailed analyses of energy facilities. Particular emphasis is placed on the treatment of capital cost estimates of new processes at various stages of technical development. Also, the financial methods and parameters to be used in determining the required selling price of products are defined in order to establish a base case for sensitivity analysis of technical, locational, or financial variables. DOE

N80-22524# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.

SURVEY OF BIOMASS GASIFICATION. VOLUME 2: PRINCIPLES OF GASIFICATION

T. B. Reed, comp. Jul. 1979 241 p refs
(Contract EG-77-C-01-4042)
(SERI/TR-33-239-Vol-2) Avail: NTIS HC A11/MF A01

Biomass gasification and associated technologies are surveyed. The technical background necessary for understanding the science, engineering, and commercialization of biomass is presented. DOE

N80-22525# Technische Hochschule, Aachen (West Germany) Inst. fuer Eisenhuettenkunde.

PRESSURE-CHANGE UNDERGROUND GASIFICATION: THEORETICAL AND EXPERIMENTAL INVESTIGATIONS OF GASIFICATION Final Report

Christian Paul Beckervordersandforth, Jochen Belzer, Manfred Kuehn, Mehrdat Mohtadi, Wolfgang Sitte, Guenther Subklew, and Walter Terschueren Bonn Bundesmin. fuer Forsch. u. Technol. Jun. 1979 93 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-79-05) Avail: NTIS HC A05/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Germany DM 19,10

The extraction of SNG, reduction gas, and other gaseous fuels by means of in situ coal gasification with hydrogen, air, and oxygen mixtures was studied both theoretically and experimentally. Special emphasis was placed on the pressure-change process. Simulation experiments were carried out above ground at pressures up to 60 bar and temperatures up to 1000 C. A feasibility study was performed taking into account technical and economic factors. Author (ESA)

N80-22614# Sandia Labs., Albuquerque, N. Mex.

HIGH-TEMPERATURE ELECTRONICS: AN OVERVIEW

Richard C. Heckman 1979 8 p refs
(Contract EY-76-C-04-0789)
(SAND-79-2319A) Avail: NTIS HC A02/MF A01

The state of the art in high temperature electronics is briefly described and the major areas where developments are needed are identified. The geothermal program, high temperature oil and gas well logging, jet engine monitors, and circuits for operation in the sodium coolant loop of a breeder reactor have simulated research. DOE

N80-22776*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

LITERATURE SURVEY OF PROPERTIES OF SYNFUELS DERIVED FROM COAL Interim Report

Thaine W. Reynolds, Richard W. Niedzwiecki, and John S. Clark Feb. 1980 162 p refs
(Contract EF-77-A-01-2593)
(NASA-TM-79243; DOE/NASA/2593-79/8; E-150) Avail: NTIS HC A08/MF A01 CSCL 21D

A literature survey of the properties of synfuels for ground-based gas turbine applications is presented. Four major concepts for converting coal into liquid fuels are described: solvent extraction, catalytic liquefaction, pyrolysis, and indirect liquefaction. Data on full range syncrudes, various distillate cuts, and upgraded products are presented for fuels derived from various processes, including H-coal, synthoil, solvent-refined coal, donor solvent, zinc chloride hydrocracking, co-steam, and flash pyrolysis. Some typical ranges of data for coal-derived low Btu gases are also presented. R.E.S.

N80-22852# United Technologies Corp., South Windsor, Conn.

A 300 Btu GAS COMBUSTOR DEVELOPMENT PROGRAM, PHASE 1 Final Report

B. N. Baillif, F. H. Boenig, J. R. Grant (Pratt and Whitney Aircraft, West Palm Beach), and T. E. Holladay (Pratt and Whitney Aircraft, West Palm Beach) Aug. 1979 100 p refs Prepared jointly with Pratt and Whitney Aircraft, West Palm Beach
(EPRI-AF-1144) Avail: NTIS HC A05/MF A01

Industrial turbines fired on medium heating value (MHV) gas (nominally 300 Btu/scf) synthesized from coal offer an attractive alternative means of producing electrical power in the future. Three MHV gas turbine combustor capable of meeting EPA NO/sub x/ requirements without water injection were designed, fabricated, and tested. Design of the combustion was based on a lean-premix concept. By premixing fuel and air in lean proportions prior to combustion flame temperatures and thus NO/sub x/formation were controlled. Tests were conducted in a single-can combustion rig at simulated engine conditions ranging from 40 to 125% of engine baseload (74 MW). Rig data were analyzed to obtain performance parameters of combustion efficiency, burner pressure loss, and exit temperature pattern factor. Results show that all three combustors meet the NO/sub x/ goal, with connected concentrations of 12 ppmv or less over the range of test conditions. DOE

N80-22853# Oak Ridge National Lab., Tenn.

FOSSIL ENERGY PROGRAM Progress Report, Sep. 1979

Nov. 1979 86 p refs
(Contract W-7405-eng-26)
(ORNL-TM-7095) Avail: NTIS HC A05/MF A01

Research and development programs that are in support of the increased utilization of coal and other fossil fuel alternatives to oil and gas as sources of clean energy are summarized. Topics covered include coal conversion development, materials engineering, a coal equipment test program, an atmospheric fluidized bed combustor for cogeneration, engineering studies and technical support, process and program analysis, environmental assessment studies, magnetic beneficiation of dry pulverized coal, technical support to the TVA fluidized bed combustion program, coal cogeneration/district heating plant assessment, chemical research and development, and technical support to major liquefaction projects. DOE

N80-22854# Oak Ridge National Lab., Tenn.

FOSSIL ENERGY PRGORAM Progress Report, Aug. 1979

Oct. 1979 98 p refs
(Contract W-7405-eng-26)
(ORNL/TM-7057; Rept-61) Avail: NTIS HC A05/MF A01

A compendium is presented for monthly progress reports for the ORNL research and development programs that are in support of the increased utilization of coal and other fossil fuel alternatives to oil and gas as sources of clean energy. The projects reported this month include those for coal conversion development, materials engineering, a coal equipment test program,an atmospheric fluid bed combustor for cogeneration, engineering studies and technical support, process and program analysis, environmental assessment studies, magnetic beneficiation of dry pulverized coal, technical support to the TVA fluid bed combustion program, coal cogeneration/district heating plant assessment, chemical research and development, and technical support to major liquefaction projects. DOE

N80-22855# Oak Ridge National Lab., Tenn.
FOSSIL ENERGY PROGRAM Progress Report, Jul. 1979
Sep. 1979 72 p refs
(Contract W-7405-eng-26)
(ORNL/TM-7031; Rept-60) Avail: NTIS HC A04/MF A01

A compendium is presented of monthly progress reports for the ORNL research and development programs that are in support of the increased utilization of coal and other fossil fuel alternatives to oil and gas as sources of clean energy. The projects reported include those for coal conversion development, materials engineering, a coal equipment test program, an atmospheric fluid bed combustor for cogeneration, engineering studies and technical support process and program analysis, environmental assessment studies, magnetic beneficiation of dry pulverized coal, technical support to the TVA fluid bed combustion program, coal cogeneration/district heating plant assessment, chemical research and development, and technical support to major liquefaction projects. DOE

N80-23399# California Univ., Berkeley. Lawrence Berkeley Lab. National Geothermal Information Resource.
AQUEOUS SOLUTIONS DATABASE TO HIGH TEMPERATURES AND PRESSURES: NaCl SOLUTIONS
S. L. Phillips, Roland J. Otto, Huseyin Ozbek, and Mehdi Tavana Aug. 1979 30 p refs Presented at the Workshop on Tech. for Meas. of Thermodyn. Properties, Albany, Oreg. 21-23 Aug. 1979
(Contract W-7405-eng-48)
(LBL-9621; CONF-790896-1) Avail: NTIS HC A03/MF A01

Available experimental data on sodium chloride solutions which are used in geothermal energy exploration and development for electrical power production and direct use were surveyed. The data are classified as thermodynamic, transport and physical; they are useful in the design and development of a geothermal area from brine production through utilization, to brine disposal. An ideal data system for geothermal energy is described. DOE

N80-23472*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE IMPACT OF FUELS ON AIRCRAFT TECHNOLOGY THROUGH THE YEAR 2000
Jack Grobman and Gregory M. Reck 1980 26 p refs Presented at the Intern. Meeting and Tech. Display: Global Technol. 2000, Baltimore, 5-11 May 1980; sponsored by AIAA
(NASA-TM-81492; E-429) Avail: NTIS HC A03/MF A01 CSCL 21D

The impact that the supply, quality, and processing costs of future fuels may have on aircraft technology is assessed. The potential range of properties for future jet fuels is discussed along with the establishment of a data base of fuel property effects on propulsion system components. Also, the evolution and evaluation of advanced component technology that would permit the use of broader property fuels and the identification of technical and economic trade-offs within the overall fuel production-air transportation system associated with variations in fuel properties are examined. M.G.

N80-23474# Suntech, Inc., Marcus Hook, Pa.
RESEARCH ON DIAMANTANE AND OTHER HIGH DENSITY HYDROCARBON FUELS
Final Report, 1 Jun. 1978 - 30 Jun. 1979
A. Schneider and H. K. Myers Wright-Patterson AFB, Ohio AFAPL Oct. 1979 93 p refs
(Contract F33615-78-C-2037; AF Proj. 3048)
(AD-A080749; AFAPL-TR-79-2080) Avail: NTIS HC A05/MF A01 CSCL 21/4

This report describes the preparation of (a) diamantane, (b) exo-tetrahydro-tricyclopentadiene, (c) the hydrogenated product of isomerized endo, endo-di(norbornadiene), and (d) some precursors of polyalkyldiamantanes. GRA

N80-23476# Institute for Industrial Research and Standards, Dublin (Ireland). Information Technology Group.
RETROSPECTIVE SEARCH ON THE BIOCHEMICAL PRODUCTION OF ALCOHOL FUELS
Jul. 1979 233 p Prepared in cooperation with National Board for Science and Technology, Dublin
(NP-24137) Avail: NTIS (US Sales Only) HC A11/MF A01; DOE Depository Libraries

The production of alcohol from a wide variety of carbohydrate and cellulose sources from 1957 to 1979 is discussed. Some general information relating to the bioconversion process and alcohol fuels is also included. DOE

N80-23481# Battelle Columbus Labs., Ohio.
CARBOHYDRATE CROPS AS A RENEWABLE RESOURCE FOR FUELS PRODUCTION. VOLUME 1: AGRICULTURAL RESEARCH
E. S. Lipinsky, D. R. Jackson, S. Kresovich, M. F. Arthur, and W. T. Lawhon 15 May 1979 94 p refs
(Contract W-7405-eng-92)
(BMI-2031-Vol-1) Avail: NTIS HC A05/MF A01

Narrow row spacing of sweet sorghum and sugarcane as a means of reducing costs and increasing availability in selected geographical areas was emphasized. The influence of row spacing, cultivar selection, and planting date on yield and composition of sweet sorghum were evaluated in a typical corn belt state (Ohio). Similar data were obtained for Texas, Louisiana, Mississippi, and Florida for sweet sorghum and sugarcane. DOE

N80-23482# Lehigh Univ., Bethlehem, Pa. Center for Surface and Coatings Research.
METHANOL AND METHYL FUEL CATALYSTS Quarterly Report, Mar. - May 1979
Kamil Klier and Richard G. Herman Jun. 1979 14 p
(Contract ET-78-S-01-3177)
(FE-3177-3) Avail: NTIS HC A02/MF A01

Additional preparations of CuO/ZnO catalysts were made and the materials were examined by X-ray powder diffractions. A series of cerium(IV) containing catalysts was prepared, and it was shown that the CuO/ZnO/CeO2 = 25/65/10 wt percent catalyst precursor contained the copper in the form of (Cu,Zn)2(OH)2CO3, analogous to the binary Cu/Zn = 30/70 sample. Calcination of this material, as well as of a binary ZnO/CeO2 = 87/13 sample, yielded oxides having small crystallite sizes (< 135 A). The reduced binary Cu/Zn catalysts were examined by diffuse reflectance spectroscopy and by X-ray powder diffraction. It was observed that the amount of noncrystalline copper assayed by X-ray diffraction correlated well with that found dissolved in the zinc oxide phase by an earlier scanning transmission electron microscopy study. The relationship between the optical parameters, such as the emergence of the high intensity visible absorption and the loss of the fundamental absorption edge of the zinc oxide, and the existence of the copper-zinc oxide solid solution were established. DOE

N80-23484# Bituminous Coal Research, Inc., Monroeville, Pa.
TEST AND EVALUATE THE TRI-GAS LOW-Btu COAL GASIFICATION PROCESS Quarterly Report, Apr. - Jun. 1979
Jul. 1979 38 p
(Contract ET-78-C-01-2798)
(FE-2798-66; BCR-L-1001) Avail: NTIS HC A03/MF A01

A total of three tests were conducted in the TRI-GAS PEDU. In the last two tests, the system was operated with the char and gas flows integrated in the process design mode. Smooth transfer of both char and gas between reactors was accomplished. Several minor equipment problems were encountered, but these will be alleviated through modifications. Work on the bench-scale equipment continued. DOE

N80-23486# Gilbert Associates, Inc., Reading, Pa.
RESEARCH AND EVALUATION OF BIOMASS RESOURCES/CONVERSION/UTILIZATION SYSTEMS (MARKET/EXPERIMENTAL ANALYSIS FOR DEVELOPMENT OF A DATA BASE FOR A FUELS FROM BIOMASS MODEL) Quarterly Progress Report, 1 Aug. - 31 Oct. 1979
Y. K. Ahn, Y. C. Chen, H. C. Chen, E. T. Nelson, R. P. Stringer, and Richard C. Bailie 1979 35 p refs Prepared in cooperation with West Virginia Univ., Morgantown, and Environmental Energy Engineering, Inc., Morgantown, W. Va.
(Contract ET-78-C-02-5022)
(COO-5022-9) Avail: NTIS HC A03/MF A01

Biomass characterization procedures were developed to characterize approximately 100 biomass species. Thermal gravimetric analyses were supplemented with a pyrogram and a pyrochromatogram to further characterize each biomass. Tests were run on the PDU in the fluidized bed mode to determine the effects of particle size on reaction time. Thirteen tests were run during this quarter to verify the results from previous testing. The process development unit was modified to accommodate future sustained runs. A mathematical model developed by modifying the Texaco entrained bed pilot plant gasifier model to simulate biomass gasification in an entrained bed. Results were evaluated. A biomass economic program was developed to provide average product fuel costs using 15 thermochemical processes. DOE

N80-23487# Gilbert Associates, Inc., Reading, Pa.
RESEARCH AND EVALUATION OF BIOMASS RESOURCES/CONVERSION/UTILIZATION SYSTEMS (MARKET/EXPERIMENTAL ANALYSIS FOR DEVELOPMENT OF A DATA BASE FOR A FUELS FROM BIOMASS MODEL)
R. P. Stringer and R. C. Bailie 1979 17 p Prepared in cooperation with West Virginia Univ., Morgantown, and Environmental Energy Engineering, Inc., Morgantown, W. Va.
(Contract ET-78-C-02-5022)
(COO-5022-8) Avail: NTIS HC A02/MF A01

A market analysis of the need for biomass derived fuels presented and the regional availability of biomass resources on seasonal bases are discussed. Biomass conversion profiles were developed for 100 biomass materials including wood species, bagasse, sugar cane, wheat and rice straw, corn stover, and others. Conversion profiles were developed from thermal gravimetric analyses runs under various conditions of temperature and pressure and in the presence of catalysts. Gasification, pyrolysis, and direct combustion were the modes of conversion. An attempt was made to develop biomass-to-fuel process models and to verify them using process development unit runs. Finally, a linear programming model was developed for selecting the most profitable combination of feedstocks and the conversion processes required to satisfy fuels need under given market conditions. The data banks of market conditions for biomass resources and biomass derived fuels, biomass conversion profiles, and commercial scale process economics were used as input to the model. DOE

N80-23711* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
COAL-SHALE INTERFACE DETECTOR Patent
Harry Reid, Jr., inventor (to NASA) Issued 1 Apr. 1980 8 p
Filed 3 Nov. 1977
(NASA-Case-MFS-23720-1; US-Patent-4,195,512;
US-Patent-Appl-SN-848419; US-Patent-Class-73-12;
US-Patent-Class-73-82) Avail: US Patent and Trademark Office CSCL 08I

A coal-shale interface detector for use with coal cutting equipment is described. The detector consists of a reciprocating hammer with an accelerometer to measure the impact of the hammer as it penetrates the ceiling or floor surface of a mine. Additionally, a pair of reflectometers simultaneously view the same surface, and the outputs from the accelerometer and reflectometers are detected and jointly registered to determine when an interface between coal and shale is being cut through.
Official Gazette of the U.S. Patent and Trademark Office

N80-23755# Geokinetics, Inc., Concord, Calif.
GEOKINETICS IN SITU SHALE OIL RECOVERY PROJECT Annual Report, Mar. 1979
Mar. 1979 61 p
(Contracts ET-78-F-03-1787; DE-FC20-78LC-0787)
(LETC-10787-25; AR-2) Avail: NTIS HC A04/MF A01

Eighteen in situ retorts were constructed, ranging in size from 330 tons to 46,000 tons. Eleven of these retorts were burned, and a total of 5400 barrels of shale oil were recovered. Oil shale thicknesses of 30 feet, and cross-sectional areas of 3800 square feet were successfully blasted. The results are encouraging, and the project will continue to scale up its size of the operation in 1979. DOE

N80-23756# University of Southern California, Marina del Rey. Medical Imaging Sciences Group.
REMOTE SENSING FOR GEOTHERMAL ENVIRONMENTAL ASSESSMENTS Final Report
W. Frei, T. Shibata, and G. C. Huth 30 Jun. 1979 35 p refs
Sponsored in part by California Univ., Lawrence Livermore Lab.
(Contract W-7405-eng-48)
(UCRL-15108) Avail: NTIS HC A03/MF A01

The role of remote sensing is examined in the context of the DOE Environmental Assessment Studies. Particular attention is paid to the exploitation by computer analysis, of low altitude aerial photographs, which were made available for this project. One technique, change detection, developed during this project, was found to be particularly useful because it permits the detection of environmental changes at a very early stage where it might escape detection on the ground. This technique, which was perfected for use on a routine basis, can thus provide a very effective environmental early warning capability. Several examples are shown in known Geothermal Resource Areas (KGRA's) in the Imperial Valley and the Geysers, California, which lead to the conclusion that remote sensing become an essential tool for the Environmental Assessment Studies. DOE

N80-23757# National Bureau of Standards, Boulder, Colo. Electromagnetic Fields Div.
DEVELOPMENT AND TESTING OF A MICROWAVE SYSTEM TO MEASURE COAL LAYER THICKNESS UP TO 25 cm
K. C. Roe and D. A. Ellerbruch Jan. 1979 27 p refs
(Contract ET-77-I-01-8881)
(FE-8881-1; SR-723-8-79) Avail: NTIS HC A03/MF A01

The design, construction and testing of a microwave coal thickness indicator built to demonstrate the hypothesis that an electromagnetic coal interface detector (EMCID) corrected for surface admittance variation can measure coal thickness up to 25 cm within + or - 10 percent accuracy is described. The design is based upon the FM-CW radar technique where reflections from layered strata are detected in time relationship to propagation path lengths. Relative depths to layered strata are displayed in numerical digits. Determining the thickness of the coal layer left on mine-haulageway roofs is important for both mine safety and maximum coal recovery. A specified thickness is required in many mines to maintain roof strength and to prevent exposure of the overlying slate or shale to air, which deteriorates slate and shale. DOE

N80-23795# Los Alamos Scientific Lab., N. Mex.
THERMAL FRACTURE EFFECTS IN GEOTHERMAL ENERGY EXTRACTION
Ruth B. Demuth and Francis H. Harlow Nov. 1979 148 p refs
(Contract W-7405-eng-36)
(LA-7963) Avail: NTIS HC A07/MF A01

Heat and water exchange between the primary crack and a lateral thermal fracture are analyzed by means of numerical modeling on a high-speed computer. Three dimensional heat flow in the rock is coupled to a two dimensional approximation for the time-varying convective patterns that result from both forced flow and buoyancy. The physical and mathematical bases for the study are described together with the numerical technique for solution. Three versions of the computer code are listed and some results of representative calculations are included. DOE

N80-23808# Dow Chemical Co., Midland, Mich. Process Development Dept.

04 FUELS AND OTHER SOURCES OF ENERGY

ENERGY FROM IN SITU PROCESSING OF ANTRIM OIL SHADE Quarterly Technical Progress Report, Apr. - Jun. 1979
Lawrence J. Washington 20 Jul. 1979 43 p ref
(Contract EX-76-C-01-2346)
(FE-2346-49) Avail: NTIS HC A03/MF A01

Four wells were drilled and cored in the 100 series for use in evaluating the fracturing in Wells No. 101-106 and for possible use in subsequent extraction trails. Extensive logging, liquid permeability, air permeability and well communication tests were carried out for fracture assessment at both the hydraulic/explosive fracture site and the explosive underream site. Although these evaluations are still incomplete and no decision can yet be made as to which would be preferred for an extraction trail, both site have much greater permeability and better interwell communications than was present in the first extraction trails on the existing site. DOE

N80-23828# Oak Ridge National Lab., Tenn.
FOSSIL ENERGY PROGRAM Progress Report, Oct. 1979
L. E. McNeese Dec. 1979 79 p refs
(Contract W-7405-eng-26)
(ORNL/TM-7144) Avail: NTIS HC A05/MF A01

The utilization of coal and other fossil fuel alternatives to oil and gas as sources of clean energy is addressed. Coal conversion development, materials engineering, a coal equipment test program, an atmospheric fluid bed combustor for cogeneration, engineering studies and technical support, process and program analysis, environmental assessment studies, magnetic beneficiation of dry pulverized coal, technical support to a fluid bed combustion program, coal cogeneration/district heating plant assessment, chemical research and development, and technical support to major liquefaction projects are specifically discussed. DOE

N80-23840# Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
PRODUCTION OF SUGARCANE AND TROPICAL GRASSES AS A RENEWABLE ENERGY SOURCE Quarterly Report, 1 Dec. 1978 - 28 Feb. 1979
Alex G. Alexander, W. Allison, and M. Garcia 1979 45 p refs
(Contract ET-78-S-05-5912; AES-UPR Proj. C-481)
(ORO-5912-T1; QR-3) Avail: NTIS HC A03/MF A01

Research on candidate screening, water and nitrogen regimes, and ratoon-crop performance for row-spacing, harvest frequency, and varietal variables is discussed. Greenhouse tests revealed several grasses having growth and drouth-tolerance characteristics superior to Sordan 70A, the project's outstanding short-rotation candidate up to this time. Johnson grass (Sorghum halepense), regarded as a weed by farmers, gave very favorable growth performances under simulated arid and semi-arid conditions. At six months into year 2, first ratoon data for sugarcane and napier grass indicate yield increases of 33% and 4%, respectively, over plant crop yields. The NCo 310 is emerging as the outstanding sugarcane variety tested to date. There are no consistent responses to narrow row spacing. Frequent recutting (at 2 month intervals) is gradually destroying sugarcane but is not appreciably affecting napier grass. DOE

N80-23925# Prakla-Seismos G.m.b.H., Hannover (West Germany)
FURTHER DEVELOPMENT OF SEISMIC METHODS: THREE-DIMENSIONAL VELOCITY DETERMINATIONS Final Report
Erich Meixner Bonn Bundesmin. fuer Forsch. und Technol. Sep. 1979 128 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. und Technol.
(BMFT-FB-T-79-19) Avail: NTIS HC A07/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Germany DM 26.45

A survey of current methods to determine the velocity of seismic waves in geological formations is presented. An iterative computer method is described to calculate seismic interval velocities. A field test example is used to illustrate the method. Author (ESA)

N80-24462# Canada Inst. for Scientific and Technical Information, Ottawa (Ontario).
NONISOTHERMAL EXPERIMENTS ON THE HYDRODESULPHURIZATION OF COAL
H. Baumann, J. Klein, and H. Juentgen 1980 22 p refs Transl. into ENGLISH from Erdoel Kohle, Petrochem. (West Germany), v. 30, no. 4, 1977 p 159-164
(NRC/CNR-TT-1963; ISSN-0077-5606) Avail: NTIS HC A02/MF A01

The hydrodesulfurization of bituminous coal by nonisothermal pyrolysis in an atmosphere of hydrogen was investigated. The rate of formation of hydrogen sulfide when samples were heated at a constant rate was plotted as a function of temperature. The curves divide into three regions: one to about 500 C, and the HS formed results from organically bound sulfur; the second is between 500 and 600 C, and the HS is due to the decomposition of pyrites into FeS; the third region extends from 600 to 1000 C, and the HS is due to organically bound sulfur, and the reduction of FeS. It is concluded that for low rank coals, moderate temperatures are sufficient for removal of most of the organic sulfur. F.O.S.

N80-24464*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
COAL DESULFURIZATION BY LOW TEMPERATURE CHLORINOLYSIS, PHASE 2 Final Report
J. J. Kalvinskas, Karel Grohmann, Naresh Rohatgi, John Ernest, and Don Feller 15 Jan. 1980 146 p
(Contracts NAS7-100; ET-N-I-019060)
(NASA-CR-163152; JPL-Pub-80-15) Avail: NTIS HC A07/MF A01 CSCL 21D

An engineering scale reactor system was constructed and operated for the evaluation of five high sulfur bituminous coals obtained from Kentucky, Ohio, and Illinois. Forty-four test runs were conducted under conditions of 100 by 200 mesh coal, solvents - methlychloroform and water, 60 to 130 C, 0 to 60 psig, 45 to 90 minutes, and gaseous chlorine flow rate of up to 24 SCFH. Sulfur removals demonstrated for the five coals were: maximum total sulfur removal of 46 to 89% (4 of 5 coals with methylchloroform) and 0 to 24% with water. In addition, an integrated continuous flow mini-pilot plant was designed and constructed for a nominal coal rate of 2 kilograms/hour which will be operated as part of the follow-on program. Equipment flow sheets and design drawings are included for both the batch and continuous flow mini-pilot plants. J.M.S.

N80-24465*# Technology Development Corp., Huntsville, Ala.
COAL CONVERSION PRODUCTS INDUSTRIAL APPLICATIONS
Joseph H. Dunkin and Dennis Warren 28 Feb. 1980 213 p
(Contract NAS8-33759)
(NASA-CR-161469; TDC-80-005) Avail: NTIS HC A10/MF A01 CSCL 21D

Coal-based synthetic fuels complexes under development consideration by NASA/MSFC will produce large quantities of synthetic fuels, primarily medium BTU gas, which could be sold commercially to industries located in South Central Tennessee and Northern Alabama. The complexes would be modular in construction, and subsequent modules may produce liquid fuels or fuels for electric power production. Current and projected industries in the two states which have a propensity for utilizing coal-based synthetic fuels were identified, and a data base was compiled to support MFSC activities. A.R.H.

N80-24467# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT, VOLUME 1 Final Report, 31 Aug. 1977 - 1 Mar. 1979
Mar. 1979 311 p refs
(Contract EX-76-C-01-2416)
(FE-2416-43-Vol-1) Avail: NTIS HC A14/MF A01

An engineering and economic assessment of the conceptual design for an integrated commercial facility to convert coal-to-methanol-to-gasoline was investigated. The process steps involved an oxygen blown, high pressure coal gasification technique, followed by a chemical shift reaction, acid gas removal, sulfur recovery, methanol synthesis, methanol conversion, gas fractionation, and HF alkylation. DOE

N80-24468# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT. VOLUME 2: COMMERCIAL PLANT ECONOMIC ANALYSIS Final Report, 31 Aug. 1977 - 1 Mar. 1979
Mar. 1979 322 p refs
(Contract EX-76-C-01-2416)
(FE-2416-43-Vol-2) Avail: NTIS HC A14/MF A01

The economic aspects of the coal-to-methanol-to-gasoline project are presented. Capital and product costs are specifically addressed. DOE

N80-24469# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT. VOLUME 4A: DRAWINGS, SPECIFICATIONS, AND ALTERNATE DESIGNS Final Report, 31 Aug. 1977 - 1 Mar. 1979
Mar. 1979 504 p
(Contract EX-76-C-01-2416)
(FE-2416-43-Vol-4A) Avail: NTIS HC A22/MF A01

Block flow diagrams, utility flow diagrams, and the one line electrical diagrams pertaining to the base case coal-to-gasoline commercial plant are presented. Mass balance figures for the main process units are tabulated. Components and totals are shown for major process streams. The duty specifications and sketches for the major equipment items and buildings comprising the facility are presented. The conceptual and mechanical design features of the slag gasifier are also presented. R.C.T.

N80-24470# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT. VOLUME 4B: DRAWINGS, SPECIFICATIONS, AND ALTERNATE DESIGNS Final Report, 31 Aug. 1977 - 1 Mar. 1979
Mar. 1979 459 p
(Contract EX-76-C-01-2416)
(FE-2416-43-Vol-4B) Avail: NTIS HC A24/MF A01

The conceptual designs for a coal gasifier are discussed. The following alternating coal gasifier concepts are described: slag bath; gas velocity in gasifier; carbon gasifier per pass; carbon gasifier overall; gasifier diameter; and number of gasifiers. R.C.T.

N80-24471# Oak Ridge National Lab., Tenn. Chemical Technology Div.
EVALUATION OF AN IN SITU COAL GASIFICATION FACILITY FOR PRODUCING M-GASOLINE VIA METHANOL
W. C. Ulrich, M. S. Edwards, and R. Salmon Dec. 1979 250 p refs
(Contract W-7405-eng-26)
(ORNL-5439) Avail: NTIS HC A11/MF A01

A conceptual process design and cost estimate was formulated for a facility producing approximately 15,000 barrels of M-gasoline per day via methanol from synthesis gas generated by gasification of coal in situ. The design was based on experimental data and mathematical predictions on the linked vertical well in situ coal gasification process. In place coal consumption is 20,000 tons/day, based on a subbituminous Wyoming coal. The capital investment was estimated to $535 million in first-quarter 1978 dollars. M-gasoline product price was calculated as a function of the debt/equity ratio, annual earning rates on debt and equity, inplace coal cost, and plant factor (onstream efficiency). Using a debt/equity ratio of 70/30, and interest rate on debt of 9%, an after tax earning rate on equity of 15%, an inplace coal cost of $5/ton, an LPG (propane) by-product credit of $410 to the 6th power Btu, and a plant factor of 90%, the product price of M-gasoline is approximately $0.90/gal at the plant gate. Calculated overall efficiency for the facility was 22%, based on inplace coal. DOE

N80-24472# Argonne National Lab., Ill.
METHANE FROM LANDFILLS
R. E. Zimmerman and M. L. Wilkey 1979 13 p refs Presented at the 2nd Ann. Conf. of Appl. Res. and Practice on Municipal and Ind. Waste, Madison, Wis., 18 Sep. 1979
(Contract W-31-109-eng-38)
(CONF-790999-1) Avail: NTIS HC A02/MF A01

The recovery, processing, and utilization technology operational in the landfill methane recovery field are described. The status of the US Department of Energy's Landfill Gas Utilization research and development program are also described. DOE

N80-24474# Illinois Univ., Urbana. Dept. of Civil Engineering.
BIOLOGICAL CONVERSION OF BIOMASS TO METHANE CORN STOVER STUDIES Progress Report, 1 Dec. 1977 - 1 Aug. 1978
John T. Pfeffer and Gerald E. Quindry Jun. 1979 171 p refs
(Contract EY-76-S-02-2917)
(COO-2917-13; UILU-ENG-79-2004) Avail: NTIS HC A08/MF A01

A series of experiments was conducted to determine the performance characteristics of the methane fermentation process using corn stover processed through four parallel fermenters each having a capacity of 775 liters. A continuous feed system was employed to determine the conversion efficiency. The dewatering characteristics of the effluents and the quality of the liquid and solid residues were determined. The biodegradability of corn stover is low. Data obtained at a fermentation temperature of 59 + -1 C show that only 36 percent of the volatile solids are biodegradable. Pretreatment with caustic (NaOH) concentration of 0.30 molar and a temperature of 115 C for one hour increased the biodegradable fraction to 71 percent of the volatile solids. The reactor slurries were easily dewatered by both vacuum filtration and centrifugation. Corn stover does not appear to be attractive economically at the present energy prices. DOE

N80-24476# Pennsylvania State Univ., University Park. Coal Research Station.
CHARACTERISTICS OF AMERICAN COALS IN RELATION TO THEIR CONVERSION INTO CLEAN ENERGY FUELS Quarterly Technical Progress Report, Jul. - Sep. 1978
W. Spackman, A. Davis, P. L. Walker, H. L. Lovell, F. J. Vastola, P. H. Given, N. H. Suhr, and R. G. Jenkins May 1979 83 p refs
(Contract EX-76-C-01-2030)
(FE-2030-13) Avail: NTIS HC A05/MF A01

Certain important aspects of the chemical and physical composition of American lignite coals were characterized. Differential scanning calorimetry and thermogravimetric analysis were used to study the interaction between oxygen and seventeen coal chars (40 x 100 mesh) at 100 C. The same techniques were used to investigate briefly the interaction between air and a highly caking coal at selected isothermal temperatures in the range 100 to 275 C. DOE

N80-24478# Midwest Research Inst., Golden, Colo. Solar Energy Research Inst.
FUEL FROM FARMS: A GUIDE TO SMALL-SCALE ETHANOL PRODUCTION
Feb. 1980 165 p refs
(Contract EG-77-C-01-4042)
(SERI/SP-451-519) Avail: NTIS HC A08/MF A01

A guide on fermentation processes with emphasis on small-scale production of ethanol using farm crops as a source of raw material is published. The status of on-farm ethanol production as well as an overview of some of the technical and economic factors is presented. Decision and planning worksheets and a sample business plan for use in decision making are included. Specifics in production including information on the raw materials, systems components, and operational requirements are also provided. Diagrams of fermentors and distilling apparatus are included. DOE

N80-24479# Department of Energy, Washington, D. C.
COAL CONVERSION COMPARISONS, TASK 002 Final Report

K. A. Rogers and R. F. Hill Jul. 1979 99 p refs
(Contract EF-77-C-01-2468)
(FE-2468-51) Avail: NTIS HC A05/MF A01

Technologies for producing synthetic fuels from coal are examined. The conclusion is made that many processes are ready for commercial demonstration but synthetic fuel will cost more than conventional petroleum fuels. An economic comparison method was developed to reflect the value differences of the different fuel products. The value method assigns relative values to all producing from a multiproduct synfuel process. This method incorporates the preferences of the marketplace to arrive at the necessary selling prices for each product. Two methods of financing, using typical utility and private venture returns on investment, are included for all products. The fourteen conversion processes studied are divided into six groups: solid clean fuel, direct liquefaction, indirect liquefaction, synthetic natural gas, industrial gas, and electric power from a combined cycle-integrated gasifier system. Three of the processes are shown in an alternate mode of operations giving a total of seventeen sets of energy costs. The prediction is made that no major technological advances are expected which will significantly decrease synfuel costs. DOE

N80-24480# Department of Energy, Washington, D. C. Coal Conversion Div.
COAL LIQUEFACTION Quarterly Report, Oct. - Dec. 1978
Sep. 1979 61 p refs
(Contract EX-76-C-01-2297)
(DOE/ET-0068/4) Avail: NTIS HC A04/MF A01

The conversion of coal to liquid fuels is discussed with emphasis on improved process configurations for both catalytic processes. The advantage of coal liquefication is assessed with respect to its high yield of a wide range of liquid products, especially boiler fuels, distillate fuel oil, and gasoline. The development of several conversion processes are briefly described. DOE

N80-24481# Department of Energy, Washington, D. C. Fossil Fuel Processing Div.
COAL CONVERSION Technical Report, 1978
Sep. 1979 188 p refs
(Contract EX-76-C-01-2297)
(DOE/ET-0061/2) Avail: NTIS HC A09/MF A01

Development of processes for converting coal into products that substitute for those derived from oil and natural gas is considered with emphasis on rapid commercialization. These substitute fuels include crude oil, fuel oil and distillates, chemical feedstocks, pipeline quality and fuel gas, and other products such as char that may be useful in energy production. J.M.S.

N80-24482# Chevron Research Co., Richmond, Calif.
REFINING AND UPGRADING OF SYNFUELS FROM COAL AND OIL SHALES BY ADVANCED CATALYTIC PROCESSES Quarterly Report, Jul. - Sep. 1979
R. F. Sullivan and D. J. ORear Oct. 1979 44 p
(Contract EX-76-C-01-2315)
(FE-2315-43) Avail: NTIS HC A03/MF A01

The denitrification fouling rate of ICR 106 catalyst was measured in an accelerated fouling rate test. At comparable conditions, the H-coal whole process product is denitrified to a greater extent than the solvent-refined coal 2 whole process product. Deposits were formed in the preheater of the whole oil hydrotreater, which appear to be from either asphaltenes of soluble iron compounds in the feed. An alumina guard bed ahead of the catalyst sucessfully removed these contaminants. A large batch of low aromatic, denitrified H-coal whole process product was prepared for downstream hydrocracking. In this preparation hydrogen was consumed by the oil at roughly 2100 SCF/bbl. The whole product from this hydrotreater was then cracked in an extinction recycle hydrocracker to make a 350 F product. In this hydrocracking step, hydrogen was consumed by the oil 800 SCF/bbl. DOE

N80-24484# Argonne National Lab., Ill. Materials Science Div.
MATERIALS TECHNOLOGY FOR COAL-CONVERSION PROCESSES Quarterly Report, Apr. - Jun. 1979
Nov. 1979 70 p refs
(Contract W-31-109-eng-38)
(ANL-79-93: QR-18) Avail: NTIS HC A04/MF A01

A 500-h test run, exposing 11 water-cooled refractions to basic slag (B/A = 1.5), was completed. High chromia content and high density again appeared to be significant factors contributing to the corrosion resistance of refractories used for slag containment. A literature review on high temperature ultrasonic coupling was completed and suggest that studies on long term (month to years) pressure-coupling stability are needed. Flow-induced acoustic energy studies (relevant to acoustic leak detection) suggest that a 20% coal-water slurry flowing through an orifice under pressure produces acoustic-energy excitation mainly at frequencies < 65 kHz and that a better correlation between acoustic runs levels and flow rate is obtained as the differential pressure is increased. Corrosion studies of type 310 stainless steel at 1000 C with various P/sub O2/ and P/sub/S2/ suggested that titanium addition increases the corrosion rate relative to that of commercially available steels. DOE

N80-24485# Argonne National Lab., Ill.
METHANE RECOVERY FROM URBAN REFUSE
M. L. Wilkey and R. Eric Zimmerman 1979 8 p Presented at the 2nd World Energy Eng. Conf., Atlanta, 28 Oct. 1979
(Contract W-31-109-eng-38)
(CONF-7910105-2) Avail: NTIS HC A02/MF A01

The goals of the methane recovery program are discussed. Major emphasis is placed on the develop, evaluation and implementation of the technologies necessary for recovery, processing, and utilization of combustible gases generated in landfills. To achieve these goals, a research program that examined the feasibility of landfill gas recovery and use, as well as future optimization techniques and methods, has been undertaken. DOE

N80-24486# Argonne National Lab., Ill.
REFUSE CONVERSION TO METHANE (REFCOM): A PROOF-OF-CONCEPT ANAEROBIC DIGESTION FACILITY
D. K. Walter and Caroline Brooks 1979 7 p refs Presented at the Joint Power Generation Conf., Charlotte, N.C., 7 Oct. 1979 Prepared in cooperation with DOE, Washington, D.C. and Mittelhauser Corp., Downers Grove, Ill.
(Contract W-31-109-eng-38)
(CONF-791006-2) Avail: NTIS HC A02/MF A01

A process for the anaerobic digestion of solid waste and sewage sludge into methane is described. Known as RefCOM (Refuse Conversion to Methane), the DOE experimental facility in Florida can process 100 tons of raw refuse per day with an output as high as 700,000 cubic feet of gas (CH4 and CO2) per day. Based on an average home gas consumption of one million cubic feet per year, a 1,000 tons-per-day plant has the potential to meet the gas needs of over 7,000 homes. The objectives of the RefCOM experiment are to: establish information on the quality and quantity of gas produced; ascertain optimum operating parameters for both mesophilic and thermophilic modes; and evaluate the reliability of the techniques. DOE

N80-24487# Los Alamos Scientific Lab., N. Mex.
CATALYTIC COAL CONVERSION SUPPORT: USE OF LASER FLASH-PYROLYSIS FOR STRUCTURAL ANALYSIS Progress Report, 1 May - 31 Aug. 1979
N. E. Vanderborgh, W. J. Verzino, Jr., and B. A. Nichols Nov. 1979 47 p refs
(Contract W-7405-eng-36)
(LA-8133-PR) Avail: NTIS HC A03/MF A01

The project plan for determining the structural changes occurring in coal, using laser pyrolysis are delineated. The pertinent, computer generated references are appended. The determination of trial heating regimes and the selection and collection of appropriate catalysts are reported. DOE

N80-24488# Montana State Univ., Bozeman.
CATALYTIC HYDROGENATION FOR COAL-DERIVED LIQUIDS Interim Report, Jun. - Aug., 1979

L. Berg and F. P. McCandless Sep. 1979 43 p
(Contract EY-76-C-01-2034)
(FE-2034-16) Avail: NTIS HC A03/MF A01

The catalysts specifically designed to hydrodenitrogenate solvent refined coal continue. Using catalyst bases of specific surface area, pore volume and pore diameter and impregnating them with tungsten, nickel, cobalt and/or molybdenum yielded denitrogenation of SRC from 1.17% nitrogen to as low as 0.01% nitrogen after 45 minutes use and 0.1% nitrogen after 90 minutes, and desulfurization of SRC from 0.73% to as low as 0.2% sulfur after three hours. The catalysts appear to be a cross between hydrotreating and hydrocracking catalysts and will require a burn-off and resulfiding after four to six hours of operation. Five additional catalysts were discovered which appear to offer the possibility of an economically attractive process for converting solvent-refined coal into a feedstock suitable for a conventional petroleum refinery. DOE

N80-24490# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
LBL CONTINUOUS BIOMASS LIQUEFACTION PROCESS ENGINEERING UNIT (PEU)
Carlos Figueroa, Jim Wrathall, and Sabri Ergun Nov. 1979 6 p ref Presented at the Thermochem. Conversion Contractors' Meeting, Rolla, Mo., 7 Nov. 1979
(Contract W-7405-eng-48)
(LBL-10092; CONF-791166-2) Avail: NTIS HC A02/MF A01

Project goals and preliminary tests of a biomass liquefaction process engineering unit are briefly described. Findings from slurry pumping capability tests indicate that hydrolyzed slurries of 20 percent can be pumped without any difficulties. A schematic for the process engineering unit is given. M.G.

N80-24498# TRW, Inc., McLean, Va. Energy Systems Planning Div.
COAL DERIVED FUEL GASES FOR MOLTEN CARBONATE FUEL CELLS
Nov. 1979 91 p
(Contract EY-77-C-21-8085)
(METC-8085-T2) Avail: NTIS HC A05/MF A01

The range of raw gas compositions available from the major classes of coal gasifiers, the degree of gas clean-up achievable with state-of-the-art and future gas clean-up systems, and the energy penalties associated with gas clean-up are described. The results indicate that gasifer product raw-gas compositions are influenced by the gasifer type, operating conditions and coal type. Fixed-bed gasifers, that do not subject the coal pyrolysis products to temperatures above approximately 1600 F, contain significant quantities of tars, oils, organic sulfur compounds and organic nitrogen compounds in the product raw gas. Fluid-bed, entrained-bed, and molten salt gasifers that operate at higher temperature, produce less of these materials. Increasing operating temperature also favors the formation of H2 and CO as compared to CO2, H2O and CH4. Since the presence of H2 and CO is preferred over CH4 for a molten carbonate fuel cell feed, high operating temperature seem to be indicated for gasifiers operating with molten carbonate fuel cells. DOE

N80-24499# Johns-Manville Sales Corp., Denver, Colo.
FILTRATION PROCESS AND EQUIPMENT STUDIES FOR COAL LIQUEFACTION PROCESSES Final Report
I. Bastidas, R. C. Himes, F. B. Hutto, and P. Martin May 1979 217 p refs
(Contract EX-76-C-01-2007)
(FE-2007-T1) Avail: NTIS HC A10/MF A01

A rotary pressure precoat filter test leaf was designed and constructed which makes it possible to simulate the operation of a full scale rotary pressure precoat filter. Variables affecting the operation of the rotary pressure precoat filter were investigated in detail. Precoat filtration principles were also reviewed. The effect of filtration variables as determined by studies with the rotary pressure precoat filter test leaf is discussed. DOE

N80-24501# Eyring Research Inst., Provo, Utah.
EXPERIMENTAL AND PROCESS DESIGN STUDY OF A HIGH RATE ENTRAINED COAL GASIFICATION PROCESS Final Report, Jan. 1974 - Nov. 1978
M. J. McIntosh and Ralph L. Caotes 1978 415 p refs
(Contract EX-76-C-01-1548)
(FE-1548-T2) Avail: NTIS HC A18/MF A01

Work began in January 1974. The original experimental equipment was designed, fabricated and installed during the first eight months of the project. A total of 296 test runs were made for a total of 800 operating hours. Cold gas efficiencies of 73 percent at specific gasification rates of 115 pounds coal/hour cu ft atmospheres were achieved. Extensive equipment modifications were made to overcome problems encountered. An extended series of runs on a range of feed coals and char were conducted. Using the results a semi-emperical mathematical model was developed. This model incorporated material and energy balances, assumption of frozen water gas shift equilibrium and Arrhenius correlations of carbon gasification and methane formation. The Arrhenius constants were found to depend directly on the carbon percentages and the percent volatile matter for the four coals tested. Mathematical models of the entrained gasifier integrated in various ways with a combined cycle system were developed and used to study the effect of mode of integration, coal type, gasifier heat loss and gasifier steam feed rate on combined cycle performance. DOE

N80-24504# NEUS, Inc., Santa Monica, Calif.
BIOSOURCES DIGEST. A JOURNAL ON BIOMASS UTILIZATION, VOLUME 1, NUMBER 3
Harry Sobel Jul. 1979 65 p refs
(Grant NSF PFR-77-12500)
(PB80-139306; NSF/RA-790296) Avail: NTIS HC A04/MF A01 CSCL 10A

A rubber analysis procedure is described which publicizes laboratory instructions and details for pilot plant operations along with a discussion on gasohol production. Four eggshaped digesters being constructed by the City of Los Angeles are also discribed. Multi-use oil and hydrocarbon-producing crops in adaptive systems for food, material and energy production are briefly examined. Patents pertinent to biomass utilizattion, sources of new available information, are listed. GRA

N80-24630# Biomass Energy Inst., Inc., Winnipeg (Manitoba).
PROCEEDINGS FOREST AND FIELD FUELS SYMPOSIUM
1977 336 p refs Symp. held at Winnipeg, Canada, 12 Oct. 1977
(CONF-7710156) Avail: NTIS (US Sales Only) HC A15/MF A01; DOE Depository Libraries

Forest and field fuels are examined areas where RD and D funding would be effective in expanding their marketability and use as substitutes for oil are identified. The present uses and immediate constraints on the wider uses of these renewable resources, compaction of field residues, and gasification and liquefaction of biomass are discussed. DOE

N80-24728*# Energy and Environmental Analysis, Inc., Arlington, Va.
FORECAST OF LONG TERM COAL SUPPLY AND MINING CONDITIONS: MODEL DOCUMENTATION AND RESULTS Final Report
7 Mar. 1980 240 p refs Sponsored by NASA and DOE Prepared for JPL
(Contract JPL-955552)
(NASA-CR-163141; JPL-9950-310) Avail: NTIS HC A11/MF A01 CSCL 08I

A coal industry model was developed to support the Jet Propulsion Laboratory in its investigation of advanced underground coal extraction systems. The model documentation includes the programming for the coal mining cost models and an accompanying users' manual, and a guide to reading model output. The methodology used in assembling the transportation, demand, and coal reserve components of the model are also described. Results presented for 1986 and 2000, include projections of coal production patterns and marginal prices, differentiated by coal sulfur content. A.R.H.

N80-24735# Department of Energy, Washington, D. C.
UNCONVENTIONAL GAS RECOVERY - ENHANCED GAS RECOVERY
Oct. 1979 71 p refs
(DOE/EDP-0049) Avail: NTIS HC A04/MF A01

The development of gas recovery methods that will make it economically possible to produce gas resources that are currently uneconomic is examined including resource targets for future development. Processes developed and tested to assist conventional gas extraction processes in the recovery of unconventional gas resources include advanced hydraulic fracturing, chemical explosive fracturing, and directionally deviated wells. The technology program, commercialization plan for unconventional gas recovery, environmental concerns and requirements, and environmental strategy are among the topics discussed. DOE

N80-24799# Naval Weapons Center, China Lake, Calif.
GEOTHERMAL ENERGY RESOURCES OF NAVY/MARINE CORPS INSTALLATIONS ON THE ATLANTIC AND GULF COASTAL PLAIN Interim Report, Jun. - Sep. 1978
Douglas W. Edsall (Naval Academy) Mar. 1980 43 p refs
(AD-A082400; NWC-TP-6062) Avail: NTIS HC A03/MF A01 CSCL 10/1

The search for alternative energy sources is of great importance to the U.S. Navy. Preliminary examination of data from the literature, bottom hole temperatures from existing deep wells, and heat flow measurements in wells drilled at selected sites as part of a current research program sponsored by the Department of Energy have demonstrated that low temperature waters (-212 F or 100 C) may be available at moderate depths in the major sedimentary basins along the Atlantic and east Gulf Coastal Plain. Although the possible geothermal energy resources present here are not sufficient for electrical power generation, they appear adequate for space heating and cooling. The Navy should take a leading role in planning and executing exploratory drilling and resource evaluation programs, especially at the following installations, all of which are major energy users: Norfolk, Portsmouth, and Virginia Beach, Virginia; Charleston, South Carolina; and Pensacola, Milton, and Panama City, Florida. GRA

N80-24808# Badger Plants, Inc., Cambridge, Mass.
CONCEPTUAL DESIGN OF A COAL-TO-METHANOL-TO-GASOLINE COMMERCIAL PLANT. VOLUME 5: ALTERNATE DESIGN STUDIES Interim Final Report, 31 Aug. 1977 - 1 Mar. 1979
Mar. 1979 209 p
(Contract EX-76-C-01-2416)
(FE-2416-43-Vol-5; IFR-2) Avail: NTIS HC A10/MF A01

Three design cases were investigated for converting methanol to gasoline using the Mobil process. These are defined as Case A, which produces gasoline and byproduct Liquid Propane Gas (LPG); Case B, which produces gasoline, high Btu gas, and byproduct LPG; and Case C, which produces gasoline only. The LPG includes propane LPG and high purity isobutane. Alternate Cases A and C are described. Additional process studies, including economy of scale evaluations, studies of Lurgi methanol synthesis recommendations, integration of Methanol-to-Gasoline facilities with a refinery, and recovery of aromatics from stabilized synthetic gasoline, are discussed. DOE

N80-24849# Science Applications, Inc., La Jolla, Calif.
CALIFORNIA THERMAL OIL UTILIZATION. VOLUME 1: EXECUTIVE SUMMARY Final Report
R. Colman and E. W. Standley Dec. 1979 385 p refs
(Contract ET-78-C-03-1864)
(SAN-1864-1) Avail: NTIS HC A17/MF A01

The potential for significant increases in California thermally produced crude oil (CTO) production and utilization by 1985 was studied. The DOE goal of 900,000 barrels/day of total CTO production by 1985 was evaluated. The constraints to increased CTO production were discussed. Incentives for increasing production were recommended. Physical and chemical properties, conventional refining processes, and alternate technologies for CTO were also discussed. DOE

N80-24906* National Aeronautics and Space Administration. Pasadena Office, Calif.
GEOLOGICAL ASSESSMENT PROBE Patent
Earl R. Collins, inventor (to NASA) (JPL) Issued 8 Apr. 1980 8 p Filed 25 Sep. 1978 Supersedes N80-12642 (18 - 3, p 0365) Sponsored by NASA
(NASA-Case-NPO-14558-1; US-Patent-4,196,619; US-Patent-Appl-SN-945436; US-Patent-Class-73-155) Avail: US Patent and Trademark Office CSCL 08G

A probe is described which can be installed in a side hole that extends from a bore hole in the Earth, to assess the permeability of the strata surrounding the borehole. The probe is elongated and has a plurality of seals spaced therealong and sealed to the walls of the side hole to form a plurality of chambers sealed from one another. A tracer fluid injector on the probe can inject a tracer fluid into one of the chambers, while a tracer fluid detector located in another chamber can detect the tracer fluid, to thereby sense the permeability of the strata surrounding the side hole. The probe can include a train of modules, with each module having an inflatable packer which is inflated by the difference between the borehole pressure and the strata pressure. Official Gazette of the U.S. Patent and Trademark Office

N80-24909 Stanford Univ., Calif.
ATTENUATION OF SEISMIC WAVES IN ROCKS AND APPLICATIONS IN ENERGY EXPLORATION Ph.D. Thesis
Einar Kjartansson 1980 160 p
Avail: Univ. Microfilms Order No. 8011658

The absorption and dissipation of seismic wave energy into heat is examined. A mathematical description for the general elastic response and wave propagation in materials where the specific loss or Q factor is exactly independent of frequency is developed. One particular mechanism for the dissipation of energy, thermal relaxation, is examined. This mechanism, which affects compressional waves more than shear waves, is highly sensitive to the state and the nature of the pore fluids. Wave propagation in media where attenuation and velocity are spatially heterogeneous is also discussed. Finite difference solutions to the wave equation are developed to include the effects of absorption, as well as arbitrary spatial heterogeneities. Finally, methods are developed to extract information about spatial variations of attenuation and velocities from seismic reflection data. The application of the inversions to amplitude and traveltime data from unstacked common-midpoint reflection data yield detailed pictures of the subsurface. Dissert. Abstr.

N80-24964# California Univ., Livermore. Lawrence Livermore Lab.
NUMERICAL WIND FIELD MODEL VALIDATION FOR A COMPLEX TERRAIN AREA IN THE VICINITY OF LAWRENCE LIVERMORE LABORATORY
W. M. Porch, H. Walker, C. R. Veith, and M. H. Dickerson 20 Sep. 1979 35 p refs
(Contract W-7405-eng-48)
(UCRL-52837) Avail: NTIS HC A03/MF A01

The computer program, MATHEW, a mass consistent wind field model including topography, was tested using statistically selected data stations in the region of Lawrence Livermore Laboratory (LLL). Predicted versus measured winds were compared for data taken across a windy pass in the hills 3 km east of LLL. The topographic scale and the number of selected stations were varied to assess their relative impact on the agreement the winds predicted by the model and those measured at Patterson Pass. The test results for a one hour data set show that the model underestimates the measured winds by 25% and the wind energy by a factor of 2.4, with little dependence on topographic scale and some dependence on which data stations were included in the model; however, high winds were predicted in high wind areas. DOE

N80-24966# Battelle Pacific Northwest Labs., Richland, Wash.
WIND RESOURCE ASSESSMENT STATUS
L. L. Wendell 1979 13 p refs Presented at the EPRI Workshop on Econ. and Operational Requirements and Status of Large-Scale Wind Systems, Monterey, Calif., 28-30 Mar. 1979
(Contract EY-76-C-06-1830)
(PNL-SA-6918-Rev-1) Avail: NTIS HC A02/MF A01

Prototype techniques for the analysis of wind energy potential and distribution over a large area were developed. These techniques involve the utilization of a large data set, the application of meteorological and topographic factors in the analysis, and the use of indirect methods of wind power estimation in areas where no wind measurements exist. The techniques were tested in five Pacific Northwest states. DOE

N80-24968# Northwestern Univ., Evanston, Ill. Dept. of Civil Engineering.
STATISTICAL MODELS FOR WIND CHARACTERISTICS AT POTENTIAL WIND ENERGY CONVERSION SITES Final Report, 15 Sep. 1977 - 14 Oct. 1978
R. B. Corotis Jan. 1979 86 p refs
(Contract EY-76-S-06-2342)
(DOE/ET/20283-1; RLO-2342-79/1) Avail: NTIS HC A05/MF A01

Simple models and guidelines are developed for wind energy site surveys. Probabilistic procedures are employed to assess survey duration, climatological adjustment, and run duration statistics. A climatological adjustment procedure is derived for the enhancement of candidate site data from a reference site with long term data, and the computation of confidence intervals is shown for existing data and for projected survey durations. The value of the enhancement procedure is diminished because of the sensitivity of the procedures to long term cross correlations. A simplified run duration model is developed for initial persistence assessment. The model is simply calibrated for each run level from the seasonal mean wind speed at a site. DOE

N80-25196# National Bureau of Standards, Washington, D.C.
DIMENSIONS/NBS, VOLUME 63, NO. 12 Monthly Report
Dec. 1979 37 p refs
(PB80-130701; NBS/DIM-63/12) Avail: NTIS HC A03/MF A01 CSCL 14B

Short summaries of major technical developments, highlights of work in progress, major speeches and statements by Bureau management, and a listing of NBS publications are presented. Topics covered include: protecting citizens' rights; once is enough; guidelines for the use of modernized metric system; refractory concrete strength measured under simulated usage; chemical degradation of refractory liners in coal gasifier systems; data centers established to aid coal conversion industry; conferences; publications; index; and news briefs. GRA

N80-25398# Montana State Univ., Bozeman. Dept. of Chemical Engineering.
CATALYTIC HYDROGENATION OF COAL-DERIVED LIQUIDS Interim Report, Sep. - Nov. 1979
Lloyd Berg and F. P. McCandless Dec. 1979 25 p
(Contract EX-76-C-01-2034)
(FE-2034-17) Avail: NTIS HC A02/MF A01

Three catalysts containing molybdenum, cobalt, nickel and/or tungsten on bases of specific surface area, pore volume and pore diameter, were fabricated and partially evaluated. Two of them produced product equaling or exceeding the nitrogen specification. Regeneration via an air burnoff of the deposited carbon was accomplished on all three of the catalysts and a subsequent run with each indicated that activity had been restored. DOE

N80-25455# C-E Lummus, Bloomfield, N.J.
SYNTHANE PILOT PLANT, SOUTH PARK TOWNSHIP, PENNSYLVANIA Final Report
1979 548 p refs
(Contract EY-76-C-02-0003)
(COO-0003-41-T1) Avail: NTIS HC A23/MF A01

The Synthane pilot plant was operated during the period 1975-1978 to test the feasibility of the Synthane process to produce pipeline quality gas from coal. The operations of the Synthane pilot plant were suspended in September, 1978. The unit was mothballed and is presently being maintained in a standby mode. Various aspects of this project are summarized. The operation, technical evaluation, and engineering for the period 1976-1978 are also included. DOE

N80-25456# New Zealand Energy Research and Development Committee, Auckland.
POTENTIAL OF ENERGY FARMING FOR TRANSPORT FUELS IN NEW ZEALAND
G. S. Harris, M. L. Leamy, T. Fraser, J. B. Dent, W. A. N. Brown, W. B. Earl, T. W. Fookes, and J. Gilbert 1979 135 p refs
(NZERDC-46) Avail: NTIS HC A07/MF A01

Farming for production of fuel in New Zealand is discussed. The technical and economic aspects of energy farming and guidelines for development of this energy source are presented. Costs and energy ratios are given and areas of concern are highlighted. The results of studies on sugar beets, fodder beets, maize, lucerne, and radiata pine are discussed. The production of methanol, methane, and ethanol by fermentation and gasification are described. Environmental issues are also discussed. DOE

N80-25457# New Zealand Energy Research and Development Committee, Auckland.
POTENTIAL OF ENERGY FARMING FOR TRANSPORT FUELS IN NEW ZEALAND, APPENDICES
G. S. Harris, M. L. Leamy, T. Fraser, J. B. Dent, W. A. N. Brown, W. B. Earl, T. W. Fookes, and J. Gilbert 1979 135 p refs
(NZERDC-46-App) Avail: NTIS HC A07/MF A01

Farming for production of fuel in New Zealand is discussed. Subjects studied in this report are: the suitability and distribution of land for the production of biomass, forestry, agricultural crops, maize grain production in the Waikato; processing routes for transport fuels; advisory panel research in the Waikato; scenarios for transport fuels to 2000; toxicity and other potential danger considerations associated with distribution and opportunity costs. DOE

N80-25460# Oklahoma State Univ., Stillwater. Dept. of Chemistry.
CONSEQUENCES OF THE MASS SPECTROMETRIC AND INFRARED ANALYSIS OF OILS AND ASPHALTENES FOR THE CHEMISTRY OF COAL LIQUEFACTION. CHARACTERIZATION OF COAL-DERIVED LIQUIDS AND OTHER FOSSIL FUEL RELATED MATERIALS EMPLOYING MASS SPECTROMETRY
P. A. Benson, S. E. Scheppele, G. J. Greenwood, T. Aczel, Q. G. Grindstaff, and B. F. Beier Sep. 1979 120 p refs Prepared in cooperation with Exxon Research and Engineering Co., Baytown, Tex.
(Contract EX-76-S-01-2537)
(FE-2537-10) Avail: NTIS HC A06/MF A01

A COED liquid was separated into oils, asphaltenes, and residue. Anion and cation exchange chromatography fractionated the oils and asphaltenes into acids, bases, and neutrals; silica gel chromatography separated neutral fractions into saturate and aromatic concentrates. Infrared spectra of the aromatic concentrates identified functional groups. Carbon number distributions for the aromatic concentrates were obtained using high and low resolution FI/MS and high resolution 70-eV EI/MS and ultra high resolution low-voltage EI/MS. The asphaltenes contain higher molecular weight Z series, higher molecular weight homologs and different compound types than do the oils. Results show that simple solvent extraction produces compositionally nonunique fractions. Thus, detailed molecular analysis is a prerequisite for the correct assessment of: (1) reaction conditions and catalyst on the mechanism and kinetics of coal liquefaction; and (2) alteration in process conditions on the quality of the coal liquid. DOE

N80-25461# West Virginia Univ., Morgantown. Dept. of Chemical Engineering.
OPTIMIZATION STUDIES OF VARIOUS COAL-CONVERSIONS SYSTEMS: COAL DISSOLUTION PHENOMENA Interim Report, Apr. - Dec. 1978
C. Y. Wen and K. W. Han 1978 199 p refs
(Contract EX-76-C-01-2274)
(FE-2274-7) Avail: NTIS HC A09/MF A01

The bituminous coal dissolution was investigated in order to develop information which would be useful in the design and scale up considerations for a commercial liquefaction plant. The experiment data were derived from pilot plants using various coal liquefaction processes. The data were analyzed in order to better understand the phenomena which occur in the preheater and reactor sections during the liquefaction of coal. Two different stages were found to exist in the coal dissolution reactions. In the initial stage of coal dissolution, a first order reaction scheme was proposed, whereby coal undergoes a fast thermal reaction producing preasphaltene as the predominant product. In the second stage of coal dissolution, a slower first order rate expression was proposed in which the preasphaltene was converted to benzene solubles with subsequent rehydrogenation of the coal derived solvent. DOE

N80-25462# Dynatech R/D Co., Cambridge, Mass.
LIQUID FUELS PRODUCTION FROM BIOMASS, NO. 7 Progress Report, 1 Jan. - 31 Mar. 1979
J. E. Sanderson, D. V. Garcia-Martinez, G. S. George, J. J. Dillon, and D. L. Wise 1979 86 p refs
(Contract EG-77-C-02-4388)
(COO-4388-7) Avail: NTIS HC A05/MF A01

The process of converting biomass into liquid hydrocarbon fuels is discussed with reference to another process which ferments marine algae to acedic acid. The conditions under which substrates other than marine algae may be converted in good yield to organic acids are also reported. Results indicate that the electrolysis of organic acids produced by fermentation to liquid hydrocarbon fuels operates with a favorable energy balance of 6/1 based on the applied potential and over 10/1 based on the working potential. DOE

N80-25463# Adelphi Univ., Garden City, N. Y.
FEASIBILITY STUDY OF USING A COAL/WATER OIL EMULSION AS A CLEAN LIQUID FUEL Final Report
Feb. 1980 43 p
(Contract EX-76-S-01-2437)
(FE-2437-T1-Add) Avail: NTIS HC A03/MF A01

The combustion, rheology, and settling of various concentrations of No. 6 oil emulsions and slurries were compared with various average particle sizes of coal. The No. 6 oil and a slurry of 40 percent coal, 60 percent oil with an average coal particle size anti x = 56.6 microns were burned. Pendulum and viscosity data is presented on four different concentrations of coal, oil and water with four different particle size distributions. Infrared radiation tests were performed on No. 6 oil and a coal/No. 6 oil slurry, and for a comparison on No. 4 oil and a coal/No. 4 oil emulsion. DOE

N80-25465# Battelle Pacific Northwest Labs., Richland, Wash.
THERMOCHEMICAL CONVERSION OF BIOMASS: AN OVERVIEW OF R AND D ACTIVITIES SPONSORED BY THE BIOMASS ENERGY SYSTEMS BRANCH OF DOE
G. F. Schiefelbein, L. J. Sealock, Jr., and S. Ergun Oct. 1979 18 p Prepared in cooperation with California Univ., Lawrence Berkeley Lab.
(Contract EY-76-C-06-1830)
(PNL-SA-8266) Avail: NTIS HC A02/MF A01

The mission is to develop competitive processes for the conversion of renewable biomass resources into clean fuels and chemical feedstocks which can supplement those produced from conventional sources were developed. A description of thermochemical conversion program areas and an overview of specific thermochemical conversion projects are presented. DOE

N80-25466# Garrett Energy Research and Engineering, Inc., Claremont, Calif.
CONVERSION OF BIOMASS MATERIALS INTO GASEOUS PRODUCTS. OPERATION OF THE POU Final Report
Donald E. Garrett and Ritchie D. Mikesell Sep. 1979 431 p refs
(Contract EY-76-C-03-1241)
(SAN-1241-3) Avail: NTIS HC A19/MF A01

Initial work on a two foot diameter, single hearth reactor provided comprehensive design data through an examination of the pertinent variable over a fairly wide range of operations. Kinetic and dynamic models were obtained for each of the reaction stages that would occur within a multiple hearth reactor. This data led to the design and construction of a process development unit (PDU) which consisted of four, four foot diameter hearths capable of processing six wet tons (50% moisture), or three dry tons of biomass per day through the steps of preheating, drying, pyrolysis, combustion, and gasification. Operation of the PDU included 10 to 20 runs on each of these steps, and work was completed with a five day, 24 hour per day, continuous operation. Process design, capital and operating costs, and an economic analysis based on this data indicated that no cost, moisture manure could produce about a 300 Btu gas with a breakeven price of $4 per million Btu's in a 100 dry ton per day unit and $2.40 per million Btu's in a 300 tons per day unit. DOE

N80-25468# Brookhaven National Lab., Upton, N. Y. Process Sciences Div.
FLASH HYDROPYROLYSIS OF COAL Quarterly Report, 1 Jan. - 31 Mar. 1979
Meyer Steinberg and Peter Fallon Jun. 1979 104 p refs
(Contract EY-76-C-02-0016)
(BNL-51052; QR-8) Avail: NTIS HC A06/MF A01

Process chemistry and design information were obtained on the flash hydropyrolysis process. The design, construction, and operation of a 1 lb/hr downflow entrained tubular reactor system were included. The effect of process variables such as temperature, pressure, feed rates, residence time, coal type and feed gas composition were studied. R.C.T.

N80-25471# Lummus Co., Bloomfield, N. J.
DEVELOPMENTAL RESEARCH PROGRAM FOR CLEAN INDUSTRIAL AND TRANSPORTATION FUELS FROM COAL: MILESTONE REPORT ON COMPARISON OF CATALYSTS, MARCH 1979
H. D. Schindler and R. H. Long Jul. 1979 36 p refs
(Contract EX-76-C-01-2514)
(FE-2514-M4) Avail: NTIS HC A03/MF A01

Employing a reference cobalt-molybdate 1/16 in extrudate catalyst, a short series of operations were conducted to obtain activity and performance data for comparison with the nickel-molybdenum catalyst previously utilized. Two sets of conditions were investigated as follows: temperatures - 830 and 850 F, pressures - 2100 and 2700 psig, coal space rates - 1.6 and 2.5 lbs coal/hr/lb catalyst, volumetric liquid recycle/fresh feed ratios - 1.5 and 0.8, and coal content of paste - 30 and 35 weight percent. Catalyst ages for the two sets of conditions were 170.4 and 275 lbs coal per lb of catalyst, respectively. The yields and product quality comparisons of the two catalysts at equivalent catalyst ages indicated very little difference in performance. DOE

N80-25472# Institute of Gas Technology, Chicago, Ill.
PREPARATION OF A COAL CONVERSION SYSTEMS TECHNICAL DATA BOOK Quarterly Report, 1 Nov. 1978 - 31 Jan. 1979
Nov. 1979 175 p refs
(Contract EX-76-C-01-2286)
(FE-2286-44) Avail: NTIS HC A08/MF A01

The results of calculations of ammonia and hydrogen sulfide partial pressures in NH3-H2S-H2O subsystem are composed. Results from application of a calorific value formula to chars are also presented. Enthalpies of distillate fractions of various syncrudes are reported along with the comparison of the experimental data with correlations developed for estimating the enthalpies of petroleum fractions. Combustion characteristics of SRC-I liquid are also described. Fixed bed gasification of coal is reviewed. For coal pyrolysis results of investigations of relations between tar-plus-light oil yield in Fischer Assay and various coal rank parameters are described. Carbon deposition boundaries are shown for temperatures between 600 F and 2400 F and pressures ranging between 15 psia and 1000 psia. Two types of carbon were considered graphite and non ideal. DOE

N80-25473# Gulf Research and Development Co., Pittsburgh, Pa.

RESEARCH AND DEVELOPMENT OF AN ADVANCED PROCESS FOR CONVERSION OF COAL TO SYNTHETIC GASOLINE AND OTHER DISTILLATE MOTOR FUELS Quarterly Report, Jun. - Aug. 1979
D. C. Succop and F. E. Wynne Dec. 1979 22 p refs
(Contract EX-76-C-01-1800)
(FE-1800-42) Avail: NTIS HC A02/MF A01

Coal slurry heating for hydroliquefaction process is described. Results are reported for Taitel/Dukler predicted flow regimes. DOE

N80-25474# Exxon Research and Engineering Co., Florham Park, N.J.
EDS COAL LIQUEFACTION PROCESS DEVELOPMENT, PHASE 4 Interim Report
Sep 1979 92 p ref Sponsored in part by Carter Oil Co., Elec. Power Res. Inst., Japan Coal Liquefaction Develop. Co., Phillips Petrol. Co., and Atlantic Richfield Co.
(Contract EF-77-A-01-2893)
(FE-2893-33) Avail: NTIS HC A05/MF A01

A maximum liquids case which utilizes steam reforming of methane, ethane, and propane for hydrogen generation is described. The FLEXICOKING of vacuum bottoms is utilized to generate low Btu gas fuel for the plant. Main plant fuel utilized as onsite fuel and fuel to the offsite boilers is low Btu gas (LBG). A vaporized C3 LPG backup fuel system is provided in the steam reforming furnaces. Besides LBG, Illinois no. 6 coal can be used in the offsite boilers to generate steam. The short term onsite fuel system variability is accommodated by varying the coal firing rate in the offsite boilers. Longer term variability in onsite fuel demand is accommodated by varying the operations in FLEXICOKING. The plant utilizes LBG for pilots to protect against flameout in all onsite process furnaces, except steam reforming. Pilots are not needed in steam reformers because of the multiplicity of burners. Use of LBG for pilot gas avoids the consumption of high value LPG. DOE

N80-25475# Exxon Research and Engineering Co., Florham Park, N.J.
EDS COAL LIQUEFACTION PROCESS DEVELOPMENT, PHASE 4. EDS COMMERCIAL PLANT STUDY DESIGN UPDATE, OFFSITE DESIGN BASIS: ILLINOIS COAL MARKET FLEXIBILITY SENSITIVITY CASE Interim Report
Jul. 1979 66 p Sponsored in part by Carter Oil Co., Elec. Power Res. Inst., Japan Coal Liquefaction Develop. Co., Phillips Petrol. Co., and Atlantic Richfield Co.
(Contract EF-77-A-01-2893)
(FE-2893-37) Avail: NTIS HC A04/MF A01

The offsite design basis for the EDS commercial plant study design update Illinois coal market flexibility sensitivity case is presented. The use of partial oxidation to produce H2 and sell the C2 gas which was processed by steam reforming was evaluated. DOE

N80-25476# Bituminous Coal Research, Inc., Monroeville, Pa.
TEST AND EVALUATE THE TRI-GAS LOW BTU COAL GASIFICATION PROCESS Quarterly Report, Oct. - Dec. 1979
Jan. 1980 20 p refs
(Contracts ET-78-C-01-2798)
(FE-2798-74) Avail: NTIS HC A02/MF A01

Three tests were conducted in the TRI-GAS PEDU, each in the process design mode. Smooth transfer of both char and gas between reactors was accomplished. Several minor equipment problems were encountered which were alleviated through modifications. DOE

N80-25478# National Technical Information Service, Springfield, Va.
SYNTHETIC FUELS: METHANE, VOLUME 1. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1970 - 1977
Diane M. Cavagnaro Feb. 1980 212 p
(PB80-805245) Avail: NTIS HC $30.00/MF $30.00 CSCL 21D

Reports from worldwide research are cited covering the production of methane. The citations pertain to the manufacturing processes and equipment process performance, economics, and combustion technology. The production of methane from wastes, especially agricultural wastes, are covered extensively. This updated bibliography contains 205 abstracts, none of which are new entries to the previous edition. GRA

N80-25479# National Technical Information Service, Springfield, Va.
SYNTHETIC FUELS: METHANE, VOLUME 2. CITATIONS FROM THE ENGINEERING INDEX DATA BASE Progress Report, 1978 - Jan. 1980
Diane M. Cavagnaro Feb. 1980 142 p Supersedes NTIS/PS-79/0030; NTIS/PS-78/0054
(PB80-805252; NTIS/PS-79/0030; NTIS/PS-78/0054) Avail: NTIS HC $30.00/MF $30.00 CSCL 21D

The production of methane is discussed in this bibliography of worldwide journal articles. The reports pertain to the manufacturing processes, equipment used, performance, economics, and combustion technology. Many of the studies cover the production of methane from wastes, especially agricultural wastes. This updated bibliography contains 135 abstracts, 76 of which are new entries to the previous edition. GRA

N80-25707# Case Western Reserve Univ., Cleveland, Ohio. Dept. of Metallurgy.
HYDROGEN SULPHIDE STRESS CORROSION CRACKING IN MATERIALS FOR GEOTHERMAL POWER Final Report
A. R. Troiano, R. F. Hehemann, and J. A. Peterson Aug. 1979 91 p refs Prepared in cooperation with Armco Steel Corp., Middletown, Ohio
(Contract EY-76-S-02-2602)
(COO-2602-7) Avail: NTIS HC A05/MF A01

Two point bent beam, NACE tensile, C-Ring and DCB stress intensity type specimens were employed to examine a series of steels SSC resistance in the standard NACE solution and in several modifications pertinent to geothermal environments. Where direct comparisons were possible, the different types of tests qualitatively ranked the alloys in the same order. These steels all exhibit a 15 to 20 percent higher yield strength break-point at service temperatures near 300 to 450 F and/or at pH values approaching 7. Several versions of well head equipment type steels with adequate hardenability have demonstrated satisfactory SSC threshold stress values at adequate yield strengths. The austenitic stainless steels displayed the usual sensitivity to chlorides and cold work. Overaging of several of the age hardenable variety improved the resistance to SSC with only a moderate reduction in strength. Two ferritic stainless steels have shown a higher threshold stress than their commonly employed counterpart. Examination of C-ring specimens cut from commercially treated casing and tubing clearly indicated the advantages of a tempered martensitic and the very real potential for temper embrittlement. DOE

N80-25764*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
ECONOMIC BASELINES FOR CURRENT UNDERGROUND COAL MINING TECHNOLOGY Final Report
William B. Mabe 15 Dec. 1979 65 p refs
(Contracts NAS7-100; ET-75-1-01-9036)
(NASA-CR-163259; JPL-Pub-79-122) Avail: NTIS HC A04/MF A01 CSCL 08I

The cost of mining coal using a room pillar mining method with continuous miner and a longwall mining system was calculated. Costs were calculated for the years 1975 and 2000 time periods and are to be used as economic standards against which advanced mining concepts and systems will be compared. Some assumptions were changed and some internal model stored data was altered from the original calculations procedure chosen, to obtain a result that more closely represented what was considered to be a standard mine. Coal seam thicknesses were varied from one and one-half feet to eight feet to obtain the cost of mining coal over a wide range. Geologic conditions were selected that had a minimum impact on the mining productivity. E.D.K.

N80-25766# Sandia Labs., Albuquerque, N. Mex.
DRILLING HORIZONTAL HOLES IN COAL BED FROM THE SURFACE WITH WATER JETS
Marvin Timmerman and Clark R. Barker 1980 14 p refs Presented at 5th Symp. of the Rocky Mountain Fuel Soc., Salt Lake City, 21 Feb. 1980
(Contract EY-76-C-04-0789)
(SAND-80-0057C; CONF-800229-1) Avail: NTIS HC A02/MF A01

A drilling system, using high pressure water jets is considered. The system could have important applications both in methane drainage and recovery and in well linking. DOE

N80-25768# New Mexico Inst. of Mining and Technology, Socorro. Petroleum Recovery Research Center.
DISPLACEMENT OF OIL BY CARBON DIOXIDE Annual Report, Oct. 1978 - Sep. 1979
F. M. Orr, Jr. and J. J. Taber Feb. 1980 72 p refs
(Contract DE-AC21-78MC-03260)
(DOE/MC-03260/4) Avail: NTIS HC A04/MF A01

A sophisticated apparatus for measurements of phase behavior and fluid properties of mixtures of CO2 and crude oils was designed and built. The experimental setup permits a variety of multiple contact phase behavior experiments which explore mixture compositions which realistically model displacement processes at temperatures and pressures of interest. Gas chromatography techniques used to characterize crude oils was extended to allow analyses of mixtures containing CO2 and hydrocarbons ranging from methane to molecules as heavy as tetracontane (C40). A qualitative analysis is given for the complex phase behavior observed for mixtures of CO2 and crude oils at temperatures below 50 C and the effects of phase behavior on expected displacement efficiency are calculated. The results indicate that relatively small changes in pressure can be expected to have a strong influence on the efficiency of CO2 displacements of crude oils. DOE

N80-25770*# New Mexico Univ., Albuquerque. Technology Applications Center.
REMOTE SENSING APPLIED TO PETROLEUM AND MINERAL EXPLORATION. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Progress Report, 1973 - Dec. 1979
Robert W. Gonzales Feb. 1980 34 p Sponsored by NASA and NTIS
(NASA-CR-163311; PB80-804800) Avail: NTIS HC $30.00/MF $30.00 CSCL 08I

The use of LANDSAT Satellites and other remote sensing methods used in petroleum and mineral exploration is discussed in 118 abstracts. Topics covered include mineral deposits, oil exploration, petroleum operations, geomorphology, resources management, thematic mapping, photogeology, photomapping and photointerpretation and imaging and digital techniques. GRA

N80-25797# TRW Defense and Space Systems Group, Redondo Beach, Calif. Applied Technology Div.
POTENTIAL APPLICATIONS OF BIOMASS TECHNOLOGY AT NATIONAL TECHNOLOGY LABORATORIES AND MISSISSIPPI ARMY AMMUNITION PLANT Final Report, 30 Jun. 1978 - 29 Feb. 1980
E. P. Motley, B. G. Cruz, L. McClanathan, and J. A. Anastasi Feb. 1980 211 p
(Contract DAAK10-78-C-0268)
(AD-A082756; TRW-33682) Avail: NTIS HC A10/MF A01 CSCL 21/4

This study was initiated to evaluate the feasibility of utilizing a common biomass (energy wood) system to produce energy for use at NASA's National Space Technology Laboratories (NSTL) and the proposed Mississippi Army Ammunition Plant (MSAAP) to be established at NSTL. The study investigated: the form and quantity of energy required at NSTL and MSAAP; the amount and characteristics of the available energy wood supply; the conversion technology; the legal and environmental issues associated with the operation of an energy wood plant; and the economics of an energy wood plant. GRA

N80-25859# Sandia Labs., Albuquerque, N. Mex.
MAGMA ENERGY: A FEASIBLE ALTERNATIVE?
J. L. Colp 1979 21 p refs Presented at Conf. on Long-Term Energy Resources, Montreal, Canada, 3 Dec. 1979
(Contract EY-76-C-04-0789)
(SAND-80-0309C; CONF-791216-2) Avail: NTIS HC A02/MF A01

A program to investigate the scientific feasibility of extracting energy directly from deeply buried circulating magma sources is described. The following program tasks are discussed: sources location and definition, source tapping, magma characterization, magma/material compatibility, and energy extraction. DOE

N80-25863# Completion Technology Co., Houston, Tex.
PERFORMANCE EVALUATION OF MAGMA POWER COMPANY'S REINJECTION WELL NO. 46-7 AT THE EAST MESA KGRA, CALIFORNIA
R. M. Jorda Feb. 1980 35 p refs Sponsored in part by Sandia Labs., Albuquerque, N. Mex.
(Contract EY-76-C-04-0789)
(SAND-79-7127) Avail: NTIS HC A03/MF A01

Water has cooled to 100 F to simulate total heat extraction and then tested using membrane filter flow procedures. The cooled water contains particles which are in the high colloid size range, and formation impairment by these particles is unlikely. There is evidence that acid soluble corrosion products and calcium compounds constitute about two thirds of the particulates, and that the acid insoluble residue contains precipitated silica, insoluble corrosion products, and possibly formation fines carried in the produced water. Under stabilized conditions, the suspended solids content of the water is less than 2 parts per million. HOwever, during the frequent production well start ups, a higher concentration of suspended solids is carried in the produced water and into the injection well, conceivably augmenting fill in the injector. But most likely, fill occurs when the injection well surges during shut-downs, because of inadequate sand control in the well completion. At the time of the test, the injection well was found to be severely impaired. DOE

N80-25865# Battelle Pacific Northwest Labs., Richland, Wash.
LONG-TERM SUPPLY CURVES FOR GEOTHERMAL ENERGY: THE IMPACTS OF TECHNOLOGY
L. L. Fassbender and C. H. Bloomster Jan. 1980 94 p refs
(Contract EY-76-C-06-1830)
(PNL-3072) Avail: NTIS HC A05/MF A01

Near term and long term supply curves are presented for electric applications of geothermal energy. The GEOCOST model was used to determine the present and future energy production costs for identified high temperature and intermediate temperature hydrothermal resources. The long term supply curves illustrate the potential shifts in the near-term supply curve which would result from certain technology improvements currently being pursued. Curves were drawn to show the impacts of individual technology improvements and also to show the cumulative impacts of combinations of technological advances expected to be achieved by 1982 and 1985. Successful completion of all the programs evaluated would result in a cumulative cost reduction of $90 billion (not discounted) in electrical generating costs from the identified hydrothermal resources. DOE

N80-25868# Aerojet Energy Conservation Co., Sacramento, Calif.
MULTI-USE GEOTHERMAL ENERGY SYSTEM WITH AUGMENTATION FOR ENHANCED UTILIZATION. A NON-ELECTRIC APPLICATION OF GEOTHERMAL ENERGY IN SUSANVILLE, CALIFORNIA Quarterly Technical Report, 1 Apr. - 30 Jun. 1978
G. R. Cunnington and G. K. Olson 1978 56 p refs
(Contract ET-78-C-03-1740)
(SAN-1740-2) Avail: NTIS HC A04/MF A01

The economic and technical feasibility of using the low to moderate temperature geothermal resource in the Susanville anomaly in a district heating/cooling system for public or private users and in a Park of Commerce developed in conjunction with the resources development is analyzed. Design approaches were studied which permit economical utilization of the resource regardless of the outcome of the drilling. The system selected depends on the result of the drilling program. A data base is presented on systems for the temperature range from 150 to 239 F. Based on a predicted fuel inflation rate of 7% and a municipal bond interest rate of 10%, the development of the Susanville Geo-Heating District is economically feasible over the entire range of anticipated reservoir conditions. Under conditions of high well costs ($130 to $175 thousands dollars per well) and low resources temperature (150 to 165 F), economic and operational advantages can be shown for the use of heat pumps to augment the resource temperature. DOE

N80-25878# Battelle Pacific Northwest Labs., Richland, Wash.
SITING SMALL WIND TURBINES
W. T. Pennell and H. L. Wegley Mar. 1979 16 p refs Presented at the Workshop on Wind Energy Appl. in Agr., Ames, Iowa, 15-16 May 1979
(Contract EY-76-C-06-1830)
(PNL-SA-7603) Avail: NTIS HC A02/MF A01

A procedure is presented for choosing the best available site for a wind turbine. A method for estimating the pertinent wind characteristics once the site is chosen is also described. In some cases, extensive onsite measurements may be required before an accurate analysis of turbine performance can be made. DOE

N80-25906# NEUS, Inc., Santa Monica, Calif.
BIOSOURCES DIGEST, A JOURNAL ON BIOMASS UTILIZATION, VOLUME 1, NO. 1
Harry Sobel, ed. Jan. 1979 90 p refs
(Grant NSF PFR-77-12500)
(PB80-140973; NSF/RA/790088) Avail: NTIS HC A05/MF A01 CSCL 10A

Biomass utilization, enzyme technology as it relates to it, renewable resources, industrial chemicals, fuels and energy from biomass biological nitrogen fixation, and biophotolysis are considered with energy derived from biomass. Benefits derived from stored solar energy collected from forests are discussed along with a theory and methodology for quantifying them. Alternatives to the presently-utilized processes for large-scale regeneration of ATP and ADP as required by biosynthetic processes are given. Production and collection of biomass and conversion of biomass are discussed. GRA

N80-25908# NEUS, Inc., Santa Monica, Calif.
BIOSOURCES DIGEST: A JOURNAL ON BIOMASS UTILIZATION, VOLUME 1, NO. 4
Harry Sobel, ed. Oct. 1979 61 p refs
(Grant NSF PFR-77-12500)
(PB80-140981; NSF/RA-790297) Avail: NTIS HC A04/MF A01 CSCL 10A

Information on various aspects of biomass utilization is presented. Recent biomass related grants are abstracted and listed giving the title, sponsor, organization, grant number and project investigator. Articles are presented on thermochemical conversion of biomass to gasoline, predicting solar energy fluxes in polluted urban areas, principles, equipment and operation of two lab-scale biodigesters, energy farming in New Zealand, and a general procedure for converting latex-bearing crops to glucose, lignin and rubber. Also included are miscellaneous documents received and a report on forestation as a renewable energy source and one on the photoproduction of hydrogen. GRA

N80-25929# Department of Energy, Washington, D. C. Assistant Secretary for Resource Applications.
ENVIRONMENTAL ASSESSMENT: GEOTHERMAL ENERGY GEOPRESSURE SUBPROGRAM. DOE SWEET LAKE NO. 1, CAMERON PARISH, LOUISIANA
Feb. 1980 245 p refs
(DOE/EA-0065) Avail: NTIS HC A11/MF A01

Geothermal geopressure resource feasibilities in the Louisiana-Texas Gulf Coast region were examined. An environmental assessment was prepared to evaluate environmental effects of test site construction of geothermal fluid wells for intermittent production testing. Physical and chemical composition of the fluids, their temperature, the nature of flow, fluid disposal techniques, and the reliability and performance of equipment were studied. Biological surveys were prepared of ecosystem cultural alterations due to the construction of the geothermal geopressure test facilities. R.G.D.

N80-26138# Wisconsin Univ., Madison. Dept. of Nuclear Engineering.
SUMMARY OF THE FUSION-FISSION HYBRID FUEL CYCLE ANALYSIS (TRITIUMLESS HYBRIDS)
G. A. Moses, comp. Dec. 1979 34 p refs
(Contract EY-76-S-02-2272)
(UWFDM-337) Avail: NTIS HC A03/MF A01

Fusion-fission hybrid reactors were used for the fusion to impact the energy productions. The elimination of the tritium breeding function in the fusion blanket and its effect on the early introduction of hybrid reactors are discussed. DOE

N80-26426*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED PFB OPERATIONS: 400-HOUR TURBINE TEST RESULTS
R. J. Rollbuhler, S. M. Benford, and G. R. Zellars 1980 23 p refs Presented at 6th Intern. Conf. on Fluidized Bed Combust., Atlanta, 9-11 Apr. 1980; sponsored by DOE, Elec. Power Res. Inst., EPA and TVA
(NASA-TM-81511; E-260) Avail: NTIS HC A02/MF A01 CSCL 11F

A pressurized fluidized bed (PFB) coal-burning reactor was used to provide hot effluent gases for operation of a small gas turbine. Preliminary tests determined the optimum operating conditions that would result in minimum bed particle carryover in the combustion gases. Solids were removed from the gases before they could be transported into the test turbine by use of a modified two stage cyclone separator. Design changes and refined operation procedures resulted in a significant decrease in particle carryover, from 2800 to 93 ppm (1.5 to 0.05 grains/std cu ft), with minimal drop in gas temperature and pressure. The achievement of stable burn conditions and low solids loadings made possible a 400 hr test of small superalloy rotor, 15 cm (6 in.) in diameter, operating in the effluent. Blades removed and examined metallographically after 200 hr exhibited accelerated oxidation over most of the blade surface, with subsurface alumina penetration to 20 micron m. After 400 hours, average erosion loss was about 25 micron m (1 mil). Sulfide particles, indicating hot corrosion, were present in depletion zones, and their presence corresponded in general to the areas of adherent solids deposit. Sulfidation appears to be a materials problem equal in importance to erosion. A.R.H.

N80-26460*# National Aeronautics and Space Administration. Pasadena Office, Calif.
AUTOCATALYTIC COAL LIQUEFACTION PROCESS Patent Application
Shaik A. Qader, inventor (to NASA) (JPL) Filed 28 Jan. 1980 31 p Sponsored by NASA
(NASA-Case-NPO-14876-1; US-Patent-Appl-SN-116310) Avail: NTIS HC A03/MF A01 CSCL 21D

An improved process is disclosed for liquefying coal in which coal minerals at high content are utilized as a hydrocracking catalyst. A slurry of 10 to 60% by weight of coal in recycled liquefied coal product which contains 15% to 30% by weight of coal minerals, is pressurized with excess hydrogen to a pressure of 2,000 to 4,000 psi and heated to a temperature of 450 to 550 C. The coal minerals autocatalytically convert coal solids to a low viscosity liquid product and to gas product in high yields while reducing oxygen, nitrogen and sulfur content of the coal product as compared to other coal liquefaction processes under development. NASA

N80-26461# Pittsburgh Energy Technology Center, Pa.
THE 2ND INTERNATIONAL SYMPOSIUM ON COAL-OIL MIXTURE COMBUSTION, VOLUME 2
1979 689 p refs Symp. held at Danvers, Mass., 27 - 29 Nov. 1979 Sponsored by DOE 2 Vol.
(CONF-791160-Vol-2) Avail: NTIS HC A99/MF A01

Technologies associated with coal oil mixtures (COM) are assessed. Production of COM, including techniques as well as equipment used, properties of the mixture, and additives needed for stabilization are discussed. Combustion efficiencies and byproducts are also studied

N80-26462# Pennsylvania State Univ., University Park. Mineral Processing Section.

GRINDING OF COAL IN OIL

P. T. Luckie and P. S. Bagga *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 20 p refs

Avail: NTIS HC A99/MF A01

Grinding kinetic parameters were determined in various fluids for three typical coals. It was found that the breakage action parameters for all of the coals did not change with environment as previously thought. Measurements of power draw of the test batch mill were also made. The implications of these findings to industrial results are discussed. Fuel oil as a grinding fluid appears to create a more sensitive tumbling action condition, and hence, lifter configuration and operational critical speed may be more critical. In addition, heating the fuel oil may achieve results similar to grinding the coal in water. E.D.K.

N80-26463# Transamerica Delaval, Inc., Crystal River, Fla. Imo Pump Div.

HANDLING COAL OIL MIXTURES WITH POSITIVE DISPLACEMENT PUMPS

Timothy W. Mabes, Sr. *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 5 p

Avail: NTIS HC A99/MF A01

The use of two and three screw positive displacement pumps for use with coal oil mixtures is discussed. Particular attention is given to both the location of wear that occurs within these pumps as well as its effect on volumetric performance. consideration is also given to the economics involved for coal oil mixture pump packages versus conventional fuel oil pump packages. E.D.K.

N80-26464# Toronto Univ. (Ontario). Dept. of Chemical Engineering and Applied Chemistry.

GRINDING OF COAL-IN-OIL SLURRIES

O. Trass and G. Papachristodoulou *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 28 p refs Prepared in cooperation with General Comminution Inc., Don Mills, Ontario

Avail: NTIS HC A99/MF A01

Grinding of coal in fuel oil for COM preparation is simpler and may give better slurry properties than dry grinding followed by dispersion in oil. A 42 weight percent slurry of 600 to 840 micrometer monosize of hard Pittsburgh coal in No. 2, No. 4, and No. 6 fuel oils was ground with the Szego mill. Particle size distributions at different residence times are reported down to a 10 micrometer mean size, along with energy consumption data. Low mill hold ups and high rotational speeds enhanced the rate of grinding. E.D.K.

N80-26465# New England Power Service Co., Westborough, Mass.

DEVELOPMENT OF STANDARDS FOR COAL-OIL MIXTURES

Sushil K. Batra and Roy C. Kurtzrock (Pittsburgh Energy Technol. Center) *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 6 p

Avail: NTIS HC A99/MF A01

As the coal oil mixture technology nears it commercialization, there is a need for uniform performance criteria, testing procedures, and quality control for trouble free and reliable utilization of this technology. Also, various terminologies associated with this technology need to be defined more precisely to have more meaningful application. With this in view, a Standards and Practice Committee was formed to establish criteria for process equipment, instrumentation, characterization of the coal oil mixtures, and combustion characteristics with respect to industrial and utility application of coal oil mixtures, as well as to develop guidelines and procedures considering feasibility from the standpoints of both cost and engineering. The goals and objectives of this committee with special reference to the various efforts underway in the area of development of standards and procedures are presented. E.D.K.

N80-26466# Dravo Corp., Pittsburgh, Pa.

PROGRESS IN DEVELOPING ULTRAFINE COAL-OIL MIXTURES

F. R. Sell and J. W. Cochran (Florida Power Corp., Crystal River) *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 23 p refs

Avail: NTIS HC A99/MF A01

A comparison between ultrafine COM and 200 mesh COM shows that ultrafine COM has many potential advantages, such as low settling rate, minimization of equipment erosion and abrasion, reduction of boiler ash related problems, and beneficiation potential. Despite high grinding costs, the total cost of ultrafine COM fuel compares favorably with 200 mesh/additive COMs. Work on the fluid mill grinding approach for preparing ultrafine (100% minus 325 mesh) COM was continued. A technical development program to address energy consumption, mill wear, and scale-up of COM fuels for U.S. and foreign user evaluations was created. Plans are discussed concerning the building of a COM preparation plant for producing large quantities of demonstration fuel. E.D.K.

N80-26467# Massachusetts Univ., Amherst.

COAL-OIL MIXTURES 4: SEDIMENTATION AND SUBSIDENCE STUDIES OF THE STABILITY AND STRUCTURE OF COAL-OIL MIXTURES

R. L. Rowell, B. J. Marlow, T. S. Tsai, Sushil K. Batra, and J. R. Pitman (New England Power Co., Salem, Mass.) *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 21 p refs Sponsored by Elec. Power Res. Inst. Prepared in cooperation with New England Power Service Co., Westborough, Mass.

Avail: NTIS HC A99/MF A01

The limits of the sedimentation column method are explored and the techniques of sedimentation and subsidence are applied to long term studies of the stability and structure of coal oil mixtures. Significant environmental effects are considered, especially the effect of carbon dioxide as a blanketing gas. It is shown that sedimentation and subsidence measurements are a sensitive probe of the stability and structure of coal oil fluids. The importance of the concept of a critical solids concentration is shown and model studies of stabilized and unstabilized COM at high concentration are given. Preliminary test results of slurry samples from various locations in the system are presented and compared to samples produced at the laboratory. The standard tests include determination of solid concentration, particle size distribution, sedimentation column drain time and sedimentation column bottom compaction. E.D.K.

N80-26468# Tufts Univ., Medford, Mass. Dept. of Chemical Engineering.

CHARACTERIZATION AND STRUCTURAL STUDIES OF THE VARIOUS TYPES OF COM

G. D. Botsaris, Y. M. Glazman, M. Adams-Viola, P. S. Goldsmith, and R. J. Haber *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 37 p refs

(Contract DE-AS01-78ET-10746)

Avail: NTIS HC A99/MF A01

The surface properties of coal, specifically its philicity or oleophilic/hydrophilic nature, are important parameters governing both the aggregative and sedimentative stability, the structure, and the rheology of COM. Moreover, it is contended that the surface properties of the coal are not only important in COM which contain additives but also in those which do not. The rheology and stability properties of various COM formulations prepared with different coals were investigated. Three parameters, a sedimentation number, an aggregation number, and a gelation number were developed to concisely reflect the results of the rheological and stability tests. An attempt was made to develop a model to explain the effect of additives on the structure, stability, and rheological properties of COM prepared from coals having different surface properties. E.D.K.

N80-26469# New England Power Service Co., Westborough, Mass.

FEASIBILITY STUDY OF USING A COAL/OIL/WATER EMULSION AND COAL/OIL MIXTURES AS CLEAN LIQUID FUELS 2

S. Y. Tsai, S. K. Batra, John P. Dooher (Adelphi Center for Energy Studies), Richard W. Genberg (Adelphi Center for Energy Studies), Sung Moon (Adelphi Center for Energy Studies), Donald Wright (Adelphi Center for Energy Studies), Steven E. Jakatt (Adelphi Center for Energy Studies), Barbara J. Gilmartin (Adelphi Center for Energy Studies), Donald Albert (Adelphi Center for Energy Studies), and Carl Danauski (Adelphi Center for Energy Studies) *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 13 p

(Contract DE-AC22-79PC-10328)
Avail: NTIS HC A99/MF A01

The rheological and combustion properties of coal-water-oil mixtures were investigated and the use of alkaline additives to remove the sulfur oxide gases were studied. Results on stability and pumpability indicate that mixtures of 50% by weight of coal and stoichiometric concentrations of alkaline absorbents are pumpable. Correlation between viscometer data and pumping data follows a power law behavior for these mixtures. Thermal efficiencies are about the same as for pure oil. Combustion efficiencies are approximately 97%. It is possible to remove in a small scale combustion from 50 to 80% of the sulfur dioxide gases. E.D.K.

N80-26470# Germantown Labs., Inc., Philadelphia, Pa.

THE PRODUCTION OF STABLE COAL-OIL MIXTURES USING HIGH INTENSITY MECHANICAL MIXING DEVICES

C. S. Stokes and N. H. Cherry *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 28 p ref

(Contract DE-AC77-ET-10634)
Avail: NTIS HC A99/MF A01

The use of four different commercially available high intensity mechanical mixing devices to produce stable coal-oil-water mixtures were investigated. The four types of mixing devices used included a Gaulin Corporation Model 15 Homogenizer, a Sonic Corporation Triplex 1000A, a Branson Sonic Power Model 190 Ultrasonic Processing System, and a Total (French) System. The stability of a coal-oil-water mixture up to 45% coal loading was evaluated by a K-scan unit. A detailed description of the parameters and operating conditions for producing the stable mixtures using the four different units is presented. The Gaulin unit proved to be the most versatile unit producing stable 45% coal loaded materials using single pass operation. The unit also produced relatively stable 30% coal loaded mixtures using a recycle mode. The Sonic unit and the Branson equipment produced similar stable emulsions, and either apparatus could be used for 45% coal loaded mixtures. The Total system produced only stable emulsions using 45% coal loaded mixtures under recycle operation. M.G.

N80-26471# Adelphi Univ., Garden City, N. Y.

RHEOLOGICAL PROPERTIES OF SOLVENT REFINED COAL-OIL MIXTURES

John P. Dooher, E. P. Foster (Air Products/Wheelabrator-Frye Joint Venture), A. S. Gudta (Air Products/Wheelabrator-Frye Joint Venture), and C. M. Kelly *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 p 1-14 Prepared in cooperation with Villanova Univ., Pa.

(Contract DE-AC05-78ORO-3054)
Avail: NTIS HC A99/MF A01

The rheological properties and stability of various mixtures of solvent refined coal (SRC) solid in No. 6 oil and one mixture with No. 5 oil are investigated. The apparent viscosity was measured as a continuous function of shear rate by a rotoviscometer. Suspension settling stability was assessed by using a pendulum-period technique. The mixtures were found to differ somewhat from coal-oil mixtures of equivalent composition. SRC solid-oil mixtures are non-Newtonian, with an apparent viscosity significantly higher than coal-oil mixtures of equivalent composition. Except for very finely divided SRC particles at low shear rate, all mixtures tested are considered pumpable. There is apparently no significant reaction between SRC solid and the oil, as indicated by a lack of change of viscosity with time. Mixtures of SRC solid and oil alone settled somewhat. Mixtures stabilized by emulsification with water or addition of surfactant are felt to be sufficiently stable for commercial use. Of the mixtures tested, an emulsion of 47 wt% SRC solid, 47 wt% No. 6 oil, and 6 wt% water is considered the best. M.G.

N80-26472# Pittsburgh Energy Technology Center, Pa.

THE ROLE OF COAL AND OIL CHARACTERISTICS IN THE STABILITY OF COAL-OIL MIXTURES

J. M. Ekmann and D. Bienstock *In its* the 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 30 p refs

Avail: NTIS HC A99/MF A01

The effect of coal type and oil type on the settling behavior of coal-oil mixtures (COM) is examined. Some discussion on the role of dispersion method and addition of water is included. The effect of oil chemistry and viscosity on settling was examined for five No. 6 oils - a correlation was found. Viscosity of the No. 6 oil strongly influenced COM viscosity, while no significant difference was found for several coals. Simple models for the shear stress-shear rate relationship were fit to available data - significant deviation from the models were found for high coal loadings. A simple model for settling is discussed. M.G.

N80-26473# Kentucky Univ., Lexington. Institute for Mining and Minerals Research.

EVALUATION OF 'STABLE' EMULSIONS OF COAL

T. T. Coburn *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 25 p refs

Avail: NTIS HC A99/MF A01

A method of testing the long term stability of coal/oil/water emulsion samples is described. The emulsions investigated were commercial coal/oil/water mixtures, 55/35/10 by weight, prepared by an ultrasonic emulsifying method. Apparent viscosity determination proved to be a convenient method of sample evaluation. A rotational type viscometer was used, and a method based on an expression which had previously been used to determine the concentration of solids in latex dispersion was applied: Log(apparent viscosity) = a Log(Spindle speed) + b. For emulsion samples from which solids settled slightly over a period of time, the weight percent solids as a function of depth could be related to the a term in the expression. At low spindle speeds it was more convenient to relate apparent viscosity and concentration of solids directly. A gravimetric method which required isolation of the dry coal solids was used to check the viscometry results. M.G.

N80-26474# Dow Chemical Co., Midland, Mich.

STABILIZATION OF COAL/FUEL OIL SLURRIES

W. C. Meyer *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 15 p refs

Avail: NTIS HC A99/MF A01

Water as an effective means of stabilizing coal-oil mixtures (COM) against settling by acting as a flocculating third phase is examined. Wetting agents are found to enhance the flocculating efficiency of water by increasing the cross sectional area of contact between coal particles, as evidenced by increased static yield values--a measure of particle-particle interaction. At excessive levels of wetting agent, the more favorable wetting of the hydrophobic surface of coal by water is counterbalanced by greatly reduced interfacial tensions between water and oil. Some loss of flocculating efficiency occurs. The effect of particle size distribution, solids content, type of fuel oil, and type of coal (having a highly oxidized surface), along with the substitution of formamide in place of water as the flocculating third phase, are briefly examined to further define the stabilizing influence of water in COM. Possible adverse consequences of continuous agitation or recirculation on COM stability dervied via this means are pointed out. M.G.

N80-26475# Kawasaki Heavy Industries, Ltd., Akashi (Japan).
RESULTS OF EXPERIMENT PRODUCTION OF FINE COM BY WET TYPE MILL
Noboru Sato *In* Pittsburgh Energy Technol. Center The 2nd Inter. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 28 p ref
Avail: NTIS HC A99/MF A01

The experimental production of fine coal-oil mixtures (COM) with a wet type mill using four kinds of bituminous coal together with Middle East heavy crude oil is discussed. The following results were obtained: (1) the holdup of COM in the mill has an important influence on grindabilty; (2) all types of coal submitted to the tests presented good grindabilty; (3) the coal density of 50% and 55% presented satisfactory grindability; (4) the temperature of COM during the pulverizing prcess should be as high as possible; (5) an increase in the production rate coarsens the particle size distribution of COM almost linearly; (6) when total moisture content of the crushed coal is of the order to 10% or less, it was confirmed that the residual moisture content of COM can be dewatefed to approximately 2%, by heating the heavy oil supplied to the mill. M.G.

N80-26476# Hitachi, Ltd., Tokyo (Japan). Shipbuilding and Engineering Div.
FINE COM PREPARATION TEST
Masazumi Yanase *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 32 p
Avail: NTIS HC A99/MF A01

Tests designed to determine the coal-oil mixture (COM) preparation conditions required to attain a satisfactory COM stability with a line mixer are discussed. The results indicate that, in premixing, the time between injection of the additive and agitation in the line mixer should be as short as possible. However a macroscopically homogenous mixing by agitation, as well as the method of injection of additive are necessary and important factors. Preparation using a line mixer gives better results compared with other preparation methods. In the preparation of COM with a line mixer, both specific agitation energy and turbine blade edge speed exceeding definite values are required. The optimum COM preparation conditions are different according to the additive, but these differences are not very pronounced. M.G.

N80-26477# Dai-ichi Kogyo Seiyaku Co. Ltd., Tokyo (Japan).
THE USE OF ADDITIVES TO STABILIZE COAL-OIL MIXTURE
Akihiro Naka *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 44 p

Avail: NTIS HC A99/MF A01

The performance of additives intended to stabilize oil-coal mixtures (COM) is discussed. Approximately 1,300 types of additives were mixed more than 10 different COM and the obtained mixture was poured into a cylinder in order to measure precipitation of the coal particles after stell storage at a temperature of 70 C. As a result of these tests, several types of additives with excellent stabilizing effects were idscovered. The effectiveness of these stabilizers in the COM was tested under various conditions, i.e., vibration, heat, freezing, and agitation. Based on these tests, the additive presenting the best results was selected (ACOM). The addition of approximately 0.1 wt% of ACOM to a mixture, without addition of water, resulted in more than 10 types of COM stable for periods of one to two months and showing, in addition, excellent economic characteristics. M.G.

N80-26478# Neos Co. Ltd., Tokyo (Japan).
COM STABILITY FORECASTING METHOD
Yoshikazu Ogura *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 32 p
Avail: NTIS HC A99/MF A01

From a discussion of a stable system model composed of coal-oil mixtures (COM) with addition of an additive, a method for evaluating long term stability of the system, by measuring the quantity of additive distributed in the COM immedietely after production is devised. The distribution forms considered are (1) additive dispersed and dissolved in the oil medium; (2) additive absorbed in the coal; and (3) additive present on the surface of coal. In case of using additive NEOS N-1, if the quantity of additive present on the surface of the coal exceeds 1,000 micro-g/coal-g experimental results demonstrate that the COM in question is able to remain as a stable system, even when still-stored for more than one month. M.G.

N80-26479# Kao Soap Co. Ltd., Tokyo (Japan).
STUDIES ON THE STABILIZATION OF COM
Masaaki Yamamura, Tatsuji Yamashita (Lion Fat and Oil Co. Ltd., Tokyo), and Taizo Igarashi (Nippon Oil and Fat Co. Ltd., Tokyo) *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 57 p refs

Avail: NTIS HC A99/MF A01

Stabilizers for coal-oil-mixtures (COM) and related technologies were developed. Emphasis was placed on developing stabilizers to minimize the sedimentation of coal particles contained in the COM. The factor influencing COM stability were determined and measures to cope with the variations occurring in the these factors were surveyed R.C.T.

N80-26480# Electric Power Development Co. Ltd. (Japan).
FINE AND COARSE COAL OIL MIXTURE COMBUSTION TESTS OF AIR ATOMIZED BURNER IN JAPAN
Y. Nakabayashi and Donald J. L. Lin, P. E. (Forney International, Inc.) *In* Pittsburgh Energy Technol., Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 24 p refs

Avail: NTIS HC A99/MF A01

A tristage air atomized burner was tested at the facilities of the three leading boiler makers in Japan. Coal oil mixtures (COM) of 50/50 weights with both fine and coarse coal particles were tested under conventional excess air and modified off-stoichiometeric combustion modes. Nitrogen-oxygen reduction techniques via flue gas recirculation and two stage off-stoichiometric combustion were confirmed. Coal-oil-mixture combustion characteristics were compared to those of heavy oil. R.C.T.

N80-26481# Atlantic Research Corp., Alexandria, Va.
DEVELOPMENT AND EVALUATION OF HIGHLY-LOADED COAL SLURRIES
R. S. Scheffee and E. T. McHale *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 14 p refs

(Contract DE-AC01-77-ET-13041)
Avail: NTIS HC A99/MF A01

Highly loaded coal slurry fuels were developed and evaluated. Slurry fuels comprised of either bitumionous, subbituminuos, or lignite coal and either aqueous media or emulsions of No. 6 oil in water as the carrier were examined at solids loadings up to 70% by weight. The water slurries of bituminous coals were emphasised. These slurries were developed for use in place of No. 6 oil in oil fired burners, and represent a companion concept to coal-oil-mixtures. R.C.T

N80-26482# Brookhaven National Lab., Upton, N. Y. Dept. of Energy and Environment.
ATOMIZATION OF COAL SLURRY JETS

T. Butcher, A. Pucci, and C. R. Krishna *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 13 p refs

(Contract EY-76-C-02-0016)
Avail: NTIS HC A99/MF A01

Jet length and drop size were examined for water and No. 2 oil slurries up to 30% concentration. Preliminary data from an air-atomized nozzle are presented for illustration. R.C.T.

N80-26483# Wayne State Univ., Detroit, Mich. Dept. of Mechanical Engineering.
ATOMIZATION OF COAL-OIL MIXTURES
S. Carmi and M. R. Ghassemzadeh *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 17 p refs

(Grant DE-FG01-77-ET-10658)
Avail: NTIS HC A99/MF A01

Atomization characteristics of coal-oil mixtures were studied by an experimental set up consisting of an airblast atomizer fed from a flow control rig, which discharges through a spray channel into a storage tank. Vapors generated were removed via an exhaust system. The fully developed spray was photographed at different axial locations using 35 mm camera fitted with a microflash designed for high speed photography. Slides and prints were analyzed for particle size distribution. R.C.T.

N80-26484# Mitsubishi Heavy-Industries Ltd., Tokyo (Japan).
BASIC STUDIES ON COM COMBUSTION
U. Takahaski, H. Hino, U. Fujima, and A. Komori *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-oil Mixture Combust., Vol. 2 1979 29 p

Avail: NTIS HC A99/MF A01

Special appropriate conditions necessary for the satifactory atomization of the coal-oil-mixture (COM) were examined. The conditions preventing the atomizer, which has very narrow passages for transporting the COM, from clogging in order to achieve stable operation was studied. The feasibility of the technological development aiming at coping with that problem was investigated. R.C.T.

N80-26485# Hitachi, Ltd., Tokyo (Japan).
REPORT ON FINE COM COMBUSTION TEST
Hitoshi Migaki *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-oil Mixture Combust., Vol. 2 1979 15 p
Avail: NTIS HC A99/MF A01

The utilization fine coal-oil mixtures transported as a fluid and as a fuel for boilers was investigated. Major emphasis was placed on the combustion, the nitrogen-oxygen countermeasures (i.e., two stage combustion), and the recirculation of gas mixing combustion. R.C.T.

N80-26486# Methacoal Corp., Dallas, Tex.
THE CFOS (CARBONACEOUS FUEL-IN-OIL SUSPENSOIDS) FUELS
Leonard J. Keller *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combustion, Vol. 2 1979 16 p refs
Avail: NTIS HC A99/MF A01

The methods producing carbonaceous fuel-in-oil suspensoid fuels are discussed. It is shown that most of the CFOS fuels, if made from pulverized coal, although not as completely stable as those made from CHC fuels, are relatively stable compared to other coal-oil-mixtures fuels. R.C.T.

N80-26524# Germantown Labs., Inc., Philadelphia, Pa.
INVESTIGATION OF FUELS CONTAINING COAL-OIL-WATER EMULSIONS Quarterly Report, 1 Oct. - 1 Dec. 1978
Norman H. Cherry and Charles S. Stokes Jan. 1979 16 p
(Contract EF-77-C-01-2689)
(FE-2689-5; QR-5) Avail: NTIS HC A02/MF A01

A total of five emulsifiers were assessed for the production of stable coal-oil-water emulsions and the determination of the practibility of their use in a boiler system was being investigated. Ancillary equipment was set up and experiments completed on two units. Mounting fixtures designed and fabricated for the third and fourth units. The third unit was evaluated using 45% coal, 50% number 6 Gulf oil and 5% water. The stability of the emulsions was evaluated on the K-scan unit. DOE

N80-26525# Rockwell International Corp., Canoga Park, Calif. Environmental and Energy Systems Div.
DEVELOPMENT OF A SINGLE-STAGE, ENTRAINED-FLOW, SHORT-RESIDENCE-TIME HYDROGASIFIER Final Report
Jul. 1979 503 p refs
(Contract EF-77-C-01-2518)
(FE-2518-24) Avail: NTIS HC A22/MF A01

A single-storage, entrained flow, short residence time reactor for flash hydrogasification of coal was developed. The unique feature was the application of rocket engine injection/mixing techniques to the rapid mixing and reaction of hot hydrogen (approximately 2000 F) and pulverized coal in very high throughput reactors. Experiments were conducted in three different hydrogasifier reactor systems. The first was a bench scale apparatus with coal feed rates of 2 to 4 lbm/hr. Results are reported for a subbituminous coal where overall carbon conversion varied between 21 and 55% and were comparable with conversions of lignite. Engineering scale tests were conducted in the other two reactor systems at a nominal coal feed rate of 1/4 ton/hour. Results with subbituminous coal compared well with those from the bench scale reactors. DOE

N80-26528# Catalytic, Inc., Wilsonville, Ala.
SOLVENT REFINED COAL (SRC) PROCESS OPERATION OF SOLVENT REFINED COAL PILOT PLANT, WILSONVILLE, ALABAMA Annual Report, Jan. - Dec. 1978
H. E. Lewis, W. H. Weber, G. B. Usnick, W. R. Hollenack, H. O. Blair, and R. G. Boykin Oct. 1979 227 p refs Prepared in cooperation with Southern Serv., Inc., Birmingham, Ala.
(Contract EX-76-C-01-2270)
(FE-2270-46) Avail: NTIS HC A11/MF A01

Operating conditions and test results obtained at six ton per day solvent refined coal (SRC) pilot plant are summarized. Two coals were processed and the effects of process variables on SRC yield and solvent quality were investigated. These variables included space rate, coal mineral concentration in the dissolver, hydrogen partial pressure, and temperature. A system for continuously withdrawing a portion of the dissolver contents was operated to investigate the effects of minimizing the concentration of solids in the dissolver. Tests confirming the high rate of coal conversion at short residence time were completed. Several methods of deashing the low pressure reaction product were tested: pressure leaf filtration; centrifugation with antisolvent addition; and 10 mm hydroclones with antisolvent addition. Both horizontal and vertical pressure leaf filtration units were tested. Filter aids such as perlite, fly ash, and several grades of diatomite were used. Operating without precoat was also studied. DOE

N80-26529# Catalytic, Inc., Philadelphia, Pa.
PRELIMINARY ENGINEERING EVALUATION OF PROMISING COAL LIQUEFACTION CONCEPTS Final Report, Dec. 1979
D. Agarwal, J. J. Cicalese, J. H. Harkins, M. T. McShance, D. J. Oriolo, and J. R. Polek Dec. 1979 201 p refs
(EPRI Proj. 832-2)
(EPRI-AF-884) Avail: NTIS HC A10/MF A01

Cost liquefaction concepts were evaluated. Ten thousand tons of coal per day were processed in the liquefaction section. Emphasis was placed on producing clean burning solid and liquid fuels suitable for electric power generation. Flash hydrogenation, supercritical gas extraction, conventional solvent refined coal (with filtration of ash), two stage solvent refined coal, conventional solvent refined coal (with critical solvent deashing), and short contact time solvent refined coal (with critical solvent deashing and hydrotreating) were investigated. For the liquefaction sections, detailed material balances, process flow diagrams, equipment sections, detailed material balances, process flow diagrams, equipment specifications, utility requirements and estimated costs were developed. For areas ancillary to the liquefaction sections, terminal material balances, overall utility requirements, and estimated costs were calculated. The conventional SRC design produced the highest thermal efficiency and product heating value, primarily due to the higher recovery of SRC when using fibration as compared to critical solvent deashing for ash removal. DOE

N80-26530# Fluor Engineers and Constructors, Inc., Irvine, Calif.
ENGINEERING EVALUATION OF CONCEPTUAL COAL CONVERSION PLANT USING THE H-COAL LIQUEFACTION PROCESS Final Report, Dec. 1979
P. A. Buckingham, R. Ravikumar, and A. A. Leavitt Dec. 1979 199 p refs
(EPRI Proj. 411-4)
(EPRI-AF-1297) Avail: NTIS HC A09/MF A01

The objective was to develop the capital costs and the product costs for and H-Coal liquefaction facility were developed. A key part of this effort was the development of a processing configuration in order to provide self sufficient facilities with respect to hydrogen, fuel, electric power, and all other utility services. The overall facility consists of a coal liquefaction plant along with the required support, utility and offsite facilities to comprise a self-sufficient operation. The major processing sections included coal preparation, coal liquefaction and product separation, light ends processing, hydrogen plant, oxygen plant, emission control systems, effluent control systems, product storage and shipping, utility systems and offsites. Capital costs upon a mid 1979 basis are $1.146 billion and $1.315 billion. The primary products naphtha, turbine oil, and distillate fuel oil are desulfurized to very low levels. The oxygen content of all three products is very high, while the nitrogen content of the turbine oil and the distillate fuel oil exceeds usual levels for conventional petroleum stocks. DOE

N80-26533# Midwest Research Inst., Kansas City, Mo.
CONTINUATION OF SYSTEMS STUDY OF FUELS FROM GRASSES AND GRAINS, PHASE 2 AND PHASE 3 Final Report
A. D. McElroy, Cynthia Tinberg, Michael Davis, Michael Snyder, and A. D. Allen 31 Jul. 1979 195 p refs
(Contract EG-77-C-01-4042)
(DSE-4042-T2) Avail: NTIS HC A09/MF A01

Biomass-derived fuels from grasses and grains are studied. A region-by-region analysis of biomass production, considering both the present (near term) and the furture (mid term) is presented. The near term analyses involved least cost estimate of production, transportation, and energy convserion. The mid term analyses involved modified crop production systems, improved crop management, and crop mixes. Conversion plants ranged in size from 500 oven dry tons per day to 3000 oven dry tons per day, or an energy input of 75 x 10 to the 9th power Btu to 45 x 10 to the 9th power Btu 7500 Btu per pound. The conversion processes consisted of anaerobic digestion, fermentation, direct combustion, and thermochemical conversion. Ammonia and methanol production was accomplished by using thermochemical conversion. DOE

N80-26534# SRI International Corp., Menlo Park, Calif.
HOMOGENEOUS CATALYTIC HYDROCRACKING PROCESSES FOR CONVERSION OF COAL TO LIQUID FUELS: BASIC AND EXPLORATORY RESEARCH Quarterly Report, 16 Sep. - 15 Dec. 1979
1979 15 p refs
(Contract EF-76-C-01-2202)
(FE-2202-51) Avail: NTIS HC A02/MF A01

The major chemical features of the catalytic activity in our CO-blue water system was determined and a preliminary investigation of its potential for coal upgrading was conducted. The nature of blue water catalysis and test its effectiveness with CO and H2 was studied. Catalyst candidates of selected transition metal salts were similarly tested. We have determined that blue water catalysis is not due to coal-derived components, and we have ruled out any major involvement of formate. It is shown that the activity of blue water is due to transition metals content. Also blue water catalysts is less effective in the pressure of H2 than CO. DOE

N80-26535# SRI International Corp., Menlo Park, Calif.
PREPARATION OF A COST DATA BANK FOR DOE/BIOMASS ENERGY SYSTEMS BRANCH Quarterly Progress Report, 1 Jul. - 30 Sep. 1979
Anthony Y. Kam, Ronald L. Dickenson, Jerry L. Jones, David C. Bomberger, Anil K. Chatterjee, Wing S. Fong, Paul C. Meagher, and Donald J. Wilhelm 1979 82 p refs
(Contract EY-76-C-03-0115-141; Contract DE-AT03-76ET-20605)
(DOE/ET-20605/4; QPR-4) Avail: NTIS HC A05/MF A01

Technical and economic analyses of Biomass Energy Systems (BES) technology options are reviewed. A total of 22 biomass conversion technology options (14 thermochemical and 8 biochemical) were selected for inclusion in the data bank. These options cover the production of electric power, steam, gases, liquids, and solid fuels from biomass. A consistent methodology for construction of the data bank was developed. For each option, the process/product data were gathered and analyzed. A base case was established to generate estimates for plant investments required, operating cost, and product cost. Statistical methods to produce error band estimates are used. Preliminary results for catalytic liquefaction (PETC and LBL processes), gasoline from biomass (China Lake process), and MBG from wood, ethanol fermentation are reported. A sensitivity analysis for cogeneration is also reported. DOE

N80-26537# California Univ., Livermore. Lawrence Livermore Lab.
LLL DATA ACQUISITION SYSTEM FOR LIQUEFIED GASEOUS FUELS PROGRAM
John Baker 17 Mar. 1980 15 p
(Contract W-7405-eng-48)
(UCID-18576) Avail: NTIS HC A02/MF A01

The liquefied natural gas dispersion tests were examined. The system employed 51 battery powered complementary metal oxide semiconductor (CMOS) data acquistion units to measure gas concentration, wind direction and speed, temperature, humidity, and heat flux. Data acquired by the CMOS data acquisition units were telemetered via UHF radio links to a trailer based microcomputer command, control, and data recording system (CCDRS). In the CCDRS wind data were displated graphically. DOE

N80-26540# Oak Ridge National Lab., Tenn.
BIOLOGICALLY IMPORTANT COMPOUNDS IN SYNFUELS PROCESSES
B. R. Clark 1980 26 p refs Presented at the 179th Meeting of the Am. Chem. Soc., Symp. on Environ. Control in Synfuels Processes, Houston, Tex., 25 Mar. 1980
(Contract W-7405-eng-26)
(CONF-800303-13) Avail: NTIS HC A03/MF A01

Biologically active constituents were isolated in preparative scale amounts from complex mixtures utilizing combinations of liquid-liquid extraction and various liquid chromatographic column-eluant combinations. Fractions were characterized using a combination of spectroscopic techniques and gas chromatography/mass spectrometry. DOE

N80-26543# Occidental Research Corp., Irvine, Calif.
FLASH PYROLYSIS COAL LIQUEFACTION PROCESS DEVELOPMENT Final Report, Jul. 1976 - Jun. 1978
Stanley C. Che, Kandaswamy Duraiswamy, Everett W. Knell, and Chang-Kuei Lee Apr. 1979 184 p refs
(Contract EX-76-C-01-2244)
(FE-2244-26) Avail: NTIS HC A09/MF A01

A specially designed, proprietary, caking coal reactor was demonstrated to process caking coals without oxidative pretreatment. Tar yields of about 35 wt % mixed amine fuel (MAF) were achieved in a 3 ton per day process development unit (PDU) from Western Kentucky No. 9 seam bituminous coal, and tar yields of about 22 wt % MAF were achieved from Wyoming Monarch seam subbituminous coal at a reactor residence time of about 1.5 seconds and a temperature of about 1200 F. The hydrorefining processability of the pyrolysis tar was demonstrated using a continuous hydrotreater. Two major technical problems were encountered and solved: (1) the initial PDU tar yield results were low compared to projections from the bench scale reactor; and (2) poor char rate control severely limited the PDU reactor operability. DOE

N80-26545# Gulf Research and Development Co., Pittsburgh, Pa.

RESEARCH AND DEVELOPMENT OF AN ADVANCED PROCESS FOR CONVERSION OF COAL TO SYNTHETIC GASOLINE AND OTHER DISTILLATE MOTOR FUELS Annual Report, Jun. 1978 - May 1979

D. C. Succop and F. E. Wynne Jul. 1979 120 p
(Contract EX-76-C-01-1800)
(FE-1800-39-Vol-1) Avail: NTIS HC A06/MF A01

Urgently needed design criteria for hydroliquefaction slurry heating were developed. It is shown that data needed on heat transfer coefficients, tube wall temperatures, slurry viscosities, slurry residence times and solvent characteristics. It is also shown that reactions occur within the slurry heaters but the extent of these reactions and the effect of heater design on the reactions is not clearly defined in terms of heat requirements, physical property changes and the effect of heater design on subsequent reaction in the downstream reactors and their design. Also, heater operating limits related to fouling are needed and fouling tests conducted with coal/petroleum resid slurries indicated that these limiting factors could be examined by similar tests. DOE

N80-26546# Gulf Research and Development Co., Pittsburgh, Pa.

RESEARCH AND DEVELOPMENT OF AN ADVANCED PROCESS FOR CONVERSION OF COAL TO SYNTHETIC GASOLINE AND OTHER DISTILLATE MOTOR FUELS

D. C. Succop and F. E. Wynne Jul. 1979 298 p Annual Report, Jun. 1978 - May 1979
(Contract EX-76-C-01-1800)
(FE-1800-39-Vol-2) Avail: NTIS HC A13/MF A01

Data are presented characterizing the operating conditions as well as the product yield for the process of converting coal to synthetic gasoline and other distillate motor fuels. Yields of distillate and residue were obtained by gas chromatography of the heater total liquid product. Hydrocarbon type analysis for the total liquid product was obtained by liquid chromatography and is reported under recovered heavy distillate. A common elemental analysis of the total liquid product is shown as product liquid fractions. Products were vacuum distilled and boiling ranges of the cuts were corrected to obtain optimum yields. R.C.T.

N80-26549# Chemical Engineering Research Group, Pretoria (South Africa).

HYDRODENITROGENATION OF COAL LIQUIDS AND PETROLEUM WITH HETEROGENOUS CATALYSTS IN MULTIPHASE REACTORS. REVIEW AND RECOMMENDATIONS FOR FURTHER WORK

C. M. Stander Nov. 1979 35 p refs
(PB80-151442; CSIR-CENG-298; ISBN-0-7988-1721-6) Avail: NTIS HC A03/MF A01 CSCL 21D

Absorption and catalytic hydrodenitrogenation in three stage reactors are considered for the removal of nitriles and heterocyclics from coal liquids. The intraparticle rate controlling processes were studied by determining effective diffusivities using model liquids and the interparticle rate controlling processes were evaluated by studying the hydrodynamics of coal liquids in trickle-bed reactors. GRA

N80-26608# Sandia Labs., Albuquerque, N. Mex.

SEMICONDUCTORS FOR HIGH TEMPERATURE ACTIVE DEVICES: SILCON, GaAs, AND GaP

Joe Allen Coquat 1980 10 p refs Presented at the Electro/80 Professional Program Meeting, Boston, 13 May 1980
(Contract EY-76-C-04-0789)
(SAND-80-0379C; CONF-800504) Avail: NTIS HC A02/MF A01

Developments in the area of high temperature active semiconductor devices for use at 275 C in instrumentation needed to characterize geothermal resources are described. Surveys of silcon bipolar, MOS, and JFET devices operated at high temperature and development work on high temperature silicon CMOS logic and DI analog circuits are reviewed. The initial results of development work on GaAs and GaP diodes are discussed. These efforts have identified several promising devices for high temperature applications, however, further development is required to resolve such problems as excessive leakage currents, metalization degradation, device stability, and long term aging. DOE

N80-26663*# National Aeronautics and Space Administration, Washington, D. C.

STUDIES ON QUESTIONS OF DESIGN AND CONSTRUCTION OF CHAIN SCRAPER CONVEYORS

Hubert Guder Mar. 1980 35 p refs Transl. into ENGLISH of Glueckauf-Forschungshefte, (West Germany) v. 30, no. 3, Jun. 1969 p 103-116 Transl. by Scientific Translation Service, Santa Barbara, Calif.
(Contract NASw-3198)
(NASA-TM-75810) Avail: NTIS HC A03/MF A01 CSCL 13I

The basic behavior of mining crushed goods in chain scraper conveyors was examined using a special test stand. The characteristics resistance lines of the upper end-piece were determined for conveyor idle as a function of the determinative crushed good characteristics (granular structure, moisture content, type of goods) on the size of the conveyor load, on the conveyor construction and on the stopped time of the conveyor. Crushed goods with a narrow granular profile and sphere-like grains caused about 35% greater resistance than fine coal and raw coal with broad granular profile. For goods containing water more than 10% by weight, the solids friction retreated in favor of flow friction. The coefficient of resistance decreased considerably in the range of lower speeds and then increased with increasing conveyor speed. The conveyance of sandstone ore required about 280% greater specific drive than the conveyance of raw coal. Resistance coefficients for coal and raw coal showed no dependence on the design of the conveyor. Start-up of loaded conveyors after longer stop times was simulated and the specific break-loose force was determined. A.R.H

N80-26669# General Electric Co., Schenectady, N. Y. Gas Turbine Div.

HIGH-TEMPERATURE TURBINE TECHNOLOGY PROGRAM LOW-Btu GAS, LOW-TEMPERATURE CHEMICAL CLEANUP PILOT PLANT: DESIGN, CONSTRUCTION, STARTUP, AND OPERATION

M. W. Horner, A. Caruvana, G. A. Cincotta, J. C. Corman, K. L. House, S. G. Kimura, R. G. Lavigne, C. C. Lawson, C. K. Neulander, H. K. Ruhl et al Feb. 1980 89 p refs
(Contract EX-76-C-01-1806)
(FE-1806-78) Avail: NTIS HC A05/MF A01

The completion of the low Btu gas, low temperature cleanup system pilot plant represents a major step toward a complete integrated coal gasification pilot plant which simulates the full-scale commercial Coal Gasification Combined Cycle Plant. Several important programmatic and technical milestones in the program were attained during the design, construction, and startup of the pilot scale chemical cleanup system. The ability to operate the system in a 30 hr fired test after only three short attempts at fired operation, attests to the excellence of the plant design, preparation, and operation personnel. The performance of the Benfield system met or exceeded expectations based on sulfur and carbon dioxide removal. The reheat and saturation equipment performed well and controllably. No evidence of foaming or mist carry over to the process gas stream was observed, and the particulate and alkali loading of the clean process gas was well within design limitations. DOE

N80-26729*# London Univ. (England).

HCMM IMAGERY FOR THE DISCRIMINATION OF ROCK TYPES, THE DETECTION OF GEOTHERMAL ENERGY SOURCES AND THE ASSESSMENT OF SOIL MOISTURE

CONTENT IN WESTERN QUEENSLAND AND ADJACENT PARTS OF NEW SOUTH WALES AND SOUTH AUSTRALIA Progress Report

Monica M. Cole, Principal Investigator 28 Feb. 1980 5 p
Sponsored by NASA HCMM
(E80-10142; NASA-CR-163160) Avail: NTIS HC A02/MF A01 CSCL 08M

The author has identified the following significant results. Day-visible and day-IR imagery of northwest Queensland show that large scale geological features like the Mitakoodi anticlinorium, which involves rocks of contrasting lithological type, can be delineated. North of Cloncurry, the contrasting lithological units of the Knapdale quartzite and bedded argillaceous limestones within the Proterozoic Corella sequence are clearly delineated in the area of the Dugald River Lode. Major structural features in the Mount Isa area are revealed on the day-visible cover which provides similar but less detailed information than the LANDSAT imagery. The day-IR cover provides less additional information for areas of outcropping bedrock than had been expected. Initial studies of the day-IR and night-IR cover for parts of South Australia suggest that they contain additional information on geology compared with day-visible cover.

N80-26747# Geological Survey, Anchorage, Alaska.
THE UNITED STATES GEOLOGICAL SURVEY IN ALASKA, 1979 PROGRAMS
Katherine M. Reed, ed. 1979 100 p
(Circ-804-A) Avail: NTIS HC A05/MF A01

A survey of programs designed to identify the land, water, energy, and mineral resources of Alaska is presented. Emphasis is placed on demonstrating how the needs of both conservation and development can be met. Classification of federally owned mineral lands and water-power sites, the exploration and development of energy and natural resources on Federal and Indian lands, and the exploration and appraisal of the petroleum potential of the National Petroleum Reserve in Alaska are among the topics discussed. Regional geology, economic geology, stratigraphy, paleontology, hydrology, marine geology, and engineering and environmental geology are included. J.M.S.

N80-26764# Pennzoil Co., Vienna, W. Va.
OIL RECOVERY BY CARBON DIOXIDE INJECTION Annual Report, Jul. 1978 - Jun. 1979
Paul E. King Nov. 1979 57 p
(Contracts EF-76-C-05-5301; DE-AC21-76MC-05301)
(ORO-5301-47) Avail: NTIS HC A04/MF A01

After one year of response, the increase in production due to waterflooding ended by December, 1978. The total production credited to the waterflood process was 10,403 barrels or 529 barrels per acre. Less than one month after limited carbon dioxide injection began, a high carbon dioxide content was found in the produced gas at Shaffer No. 1, apparently as a result of channeling through the Big Lime thief zone. In April, the carbon dioxide injection rate was reduced to a total of 90 tons per day in an attempt to increase the effective injection from 26.7% to the designed 50%. The net carbon dioxide injection was 10,595.50 tons on July 1, 1979, 42.3% of the total to be injected. DOE

N80-26798# Army Construction Engineering Research Lab., Champaign, Ill.
DENSIFIED BIOMASS AS AN ALTERNATIVE ARMY HEATING AND POWER PLANT FUEL HEATING Final Report
S. A. Hathaway, J. S. Lin, D. Mahon, T. Magrino, and K. Duster Mar. 1980 88 p refs
(AD-A083317; CERL-TR-E-158) Avail: NTIS HC A05/MF A01 CSCL 10/1

This investigation evaluated the technical and economic potential of using of densified biomass (principally wood pellets) as a coal substitute in Army heating and power plants. The report reviews Department of Defense DOD experience with and tests of wood pellets production of wood pellets (excluding silvicultural aspects) handling, storing, and feeding; combustion; major environmental considerations; and economics of use. GRA

N80-26832# Rockwell International Corp., Canoga Park, Calif Energy Systems Group.
ADVANCED DEVELOPMENT OF A SHORT RESIDENCE-TIME HYDROGASIFIER Quarterly Technical Progress Report, 1 Apr. - 30 Jun. 1979
Aug. 1979 181 p refs
(Contract ET-78-C-01-3125)
(FE-3125-8; QTPR-3) Avail: NTIS HC A09/MF A01

The design, construction, and operation of a hydrogasifier reactor for commercial application is discussed. The tests were performed at three quarter tons per hour and then at 4 tons per hour. Injection element scaling was investigated by studying single element and clustered multiple element injections at a sufficient magnification factor. Subbituminous coal was used in the test proceedings. Nitrogen usage and cooling tower requirements were lower than expected. The lower nitrogen usage reduced the heat load on the product gas cooler as less water was formed in the reactor. B.D

N80-26858# Minnesota Univ., Minneapolis. Dept. of Mechanical Engineering.
ENERGY FOR WIND POWERED OSCILLATORS Semiannual Technical Progress Report, 1 Aug. 1979 - 31 Jan. 1980
Patrick J. Starr 1980 10 p refs
(Contract DE-FG02-79R5-10129)
(DOE/R5/10129-1) Avail: NTIS HC A02/MF A01

Information is presented concerning a literature review on flow induced vibrations; an estimation of available power; design procedure for both votex shedding and galloping; and conversion schemes. DOE

N80-27382# Science Applications, Inc., Woodland Hills, Calif. Combustion Dynamics and Propulsion Technology Div.
FUNDAMENTAL CHARACTERIZATION OF ALTERNATIVE FUEL EFFECTS IN CONTINUOUS COMBUSTION SYSTEMS
R. B. Edelman, A. Turan, P. T. Harsha, E. Wong, and W. S. Blazowski (Exxon Research and Engineering Co., Linden, N.J.) *In* AGARD Combustor Modelling Feb. 1980 14 p refs

Avail: NTIS HC A17/MF A01

The problem of net soot generation which is aggravated by the reduced hydrogen content characteristic of syncrudes that have been identified as probable alternate fuel sources for use in gas turbines is addressed. The kinetics of the process are modeled using the quasi-global concept while experimental data are developed primarily from a laboratory jet stirred combustor. Results are presented showing that soot emissions can be characterized in terms of major species and that soot oxidation must be included in the prediction of net soot generation. In addition, the techniques being employed for coupling the chemical and aerodynamic processes are outlined. E.D.K.

N80-27493 California Univ., Berkeley.
THE COMBUSTION OF CARBON, COAL AND COAL RELATED FUELS IN AN OPPOSED FLOW DIFFUSION FLAME BURNER Ph.D. Thesis
Wing Kai Chin 1979 44 p
Avail: Univ. Microfilms Order No. 8014636

The burning characteristics of various carbonaceous fuels as well as polymethylmethacylate (PMMA) were compared and showed PMMA to have the highest regression rate. The comparison results also indicated that a high rate of volatiles yield enhances the regression rate. The relative importance of oxygen and carbon dioxide on the surface oxidation mechanism was investigated by determining the regression rates in mixtures of oxygen and carbon dioxide and comparing with that obtained in mixtures of oxygen and nitrogen. Because of the opposing effects of carbon dioxide as an oxidizing agent and heat sink, its importance in the surface combustion mechanism could not be unambiguously determined. The gaseous products from the combustion of coal at various oxygen mole fractions and oxidizer velocities were measured and showed that the ratios of carbon monoxide to carbon dioxide decreases with increasing oxygen mole fraction. Temperature profiles in the solid and gas phases and surface temperature were determined. Dissert. Abstr.

N80-27494# Pittsburgh Energy Technology Center, Pa.
THE 2ND INTERNATIONAL SYMPOSIUM ON COAL-OIL MIXTURE COMBUSTION, VOLUME 1
1979 595 p refs Symp. held at Danvers, Mass., 27-29 Nov. 1979 Sponsored by DOE 2 Vol.
(CONF-791160-Vol-1) Avail: NTIS HC A25/MF A01

The status of various coal-oil mixture (COM) programs is assessed, including production, conversion from conventional systems, and demonstration pilot plants. Additional topics include efficiency of both the COM and boilers, combustion byproducts and their environmental effects as well as effects on boilers, and storage tanks.

N80-27495# Electric Power Development Co. Ltd. (Japan).
OVERVIEW OF R&D STATUS ON COM TECHNOLOGY IN JAPAN
Yasuyuki Nakabayashi *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 p 1-13
Avail: NTIS HC A25/MF A01

General trends referring to commercialization of coal-oil mixtures (COM) in Japan are presented. Progress in research and development on COM, public interest, and government support is summarized. E.D.K.

N80-27496# Canadian Combustion Research Lab.-CANMET, Chatham (New Brunswick).
CURRENT STATUS OF THE CANADIAN COAL-OIL MIXTURE PROGRAM
H. Whaley *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 13 p refs

Avail: NTIS HC A25/MF A01

A description is given of the status of four projects together with an outline of other related COM work currently being undertaken or planned in Canada. The projects include: (1) a small COM utility boiler demonstration plant, (2) determination of the rheological properties of coal-oil slurries, (3) research and development study of the preparation combustion and emission characteristics of beneficiated coal-oil mixtures, and (4) development of coal-oil slurry fuels for blast furnace injection. E.D.K.

N80-27497# Tsinghua Univ., Beijing (China). Dept. of Thermal Engineering.
PRELIMINARY CONSIDERATIONS OF THE USE OF COM IN THE EXPERIMENTAL POWER PLANT OF TSINGHUA UNIVERSITY AS AN ENERGY FUEL
Lin Hao *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 17 p refs

Avail: NTIS HC A25/MF A01

The peculiarity of the Chinese energy fuels and fuel systems are described. For converting an oil fired boiler to COM, problems that may be encountered and alternative projects to be taken into consideration are discussed. Test results of viscosities and burning profiles are introduced, as well as the scheme of a COM production system and a principal sketch of an experimental power plant's burner. E.D.K.

N80-27498# New Brunswick Electric Power Commission, Fredericton.
COAL-OIL MIXTURE COMBUSTION APPLIED TO CANADIAN UTILITY BOILERS
P. J. Whalen, F. W. Davies, L. K. Lee, M. Natarajan (Montreal Engineering Co., Ltd.), and R. L. Wang (Montreal Engineering Co., Ltd.) *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 17 p refs

Avail: NTIS HC A25/MF A01

Operating experience on coal in COM relating to combustion stability, boiler efficiency, boiler slagging/fouling, and equipment erosion are reported. On line oil agglomeration coal beneficiation process is discussed. Based on a nation wide survey conducted on all oil fired canadian utility boilers, cost/benefit analyses of COM conversion for several unit sizes were carried out. Potential oil savings were predicted and a correlation between boiler sizes and break even points for benefit against cost was discussed. A candidate boiler of 100 MW capacity was selected for testing COM process and combustion. E.D.K.

N80-27499# New England Power Service Co., Westborough, Mass.
STARTUP AND INITIAL FEASIBILITY TESTING ON THE SALEM HARBOR COM DEMONSTRATION
Richard M. Dunn *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 16 p refs
Avail: NTIS HC A25/MF A01

An 80 MW coal fired boiler which had been converted to burn No. 6 oil was equipped with new burners and accessories to burn coal-oil mixture. A description of the 30% coal and 70% oil mixture preparation facility is given. Results of initial coal-oil mixture (COM) blending, combustion, and stack emission tests are presented along with a discussion of initial startup problems encountered. Recommendations are made for additional COM research and product development to improve reliability. R.C.T.

N80-27500# CoaLiquid, Inc., Louisville, Ky.
OPERATION OF A CENTRAL PREPARATION PLANT FOR COAL-OIL-WATER MIXTURES
G. T. Hawkins *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 16 p

Avail: NTIS HC A25/MF A01

A commercial scale, preparation plant for coal oil water mixtures was constructed. The facility is capable of producing 2,500 GPH at start up, and is expandable to up to 5000 GPH, with little additional expense. Various aspects of its operation are discussed. R.C.T.

N80-27501# Tennessee Valley Authority, Chattanooga.
INVESTIGATIONS OF COAL-OIL MIXTURES AS A UTILITY BOILER LIGHT-OFF FUEL
Stephen R. Smith, Randy M. Cole, Ronald B. Cox (Tenn. Univ., Chattanooga), T. C. Derbridge (Acurex Corp., Mountain View, Calif.), R. J. Schreiber (Acurex Corp., Mountain View, Calif.), and A. K. Yasuda (Acurex Corp., Mountain View, Calif.) *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 144 p refs

Avail: NTIS HC A25/MF A01

The fluid properties of unstabilized and stabilized coal-oil-water mixtures were investigated and the economics of converting light off system of a large (2600-MW) coal fired utility boiler to coal-oil-mixture firing were examined. An experimental agitator was used to determine the following: viscosity; stability; and mixing characteristics of Nos. 2, 4, and 6 fuel oil with pulverized coal. Agitation is required to obtain useful suspensions. A stabilized coal-oil-water emulsion was tested for long-term storage stability. Over a 6-month period, there was no indication of settling. An economic analysis was performed that compares COM costs to the present system using No. 2 oil and the sensitivity of COM economics to significant variables. R.C.T.

N80-27502# Tennessee Valley Authority, Chattanooga.
COAL/OIL/WATER MIXTURE STABILITY, APPENDIX A
R. H. Carty and T. T. Coburn *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 33 p refs

Avail: NTIS HC A25/MF A01

The stability of a coal-oil-water mixture prepared by an ultrasonic agitation method for stabilization of the mixture was examined. A one quart sample of this mixture was obtained to determine the test procedure for analyzing other samples for stability. Test procedures as well as the results are given. R.C.T.

N80-27503# British Petroleum Co. Ltd., Sunbury-on-Thames (England).

STABLE COAL/FUEL OIL DISPERSIONS
C. J. Veal, D. R. Wall, and A. J. Groszek *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 23 p refs

Avail: NTIS HC A25/MF A01

A novel method was developed for preparing very stable coal/fuel oil dispersions without the use of additives. The dispersions were handled like and substituted for fuel oils. Such dispersions have been shown to be stable at 100 C for periods of at least 13 weeks and also at higher temperatures (150 C) for at least a week. A total of 52 000 litres of such a dispersion were prepared, handled, stored and fired in a system designed primarily for heavy fuel oil. R.C.T.

N80-27504# Pittsburgh Energy Technology Center, Pa.
COMBUSTION OF COAL-OIL MIXTURES IN A 700 HP WATERTUBE BOILER
Y. S. Pan, G. T. Bellas, M. P. Mathur, and D. Bienstock *In its* The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 27 p refs
Avail: NTIS HC A25/MF A01

Coal-oil mixtures containing up to 50 percent coal by weight were successfully burned in a 700 high pressure watertube boiler, designed for oil firing, with no derating occuring. Carbon conversion efficiencies were above 98 percent and boiler efficiencies were the same as when firing No. 6 fuel oil. Combustion tests were conducted with No. 6 fuel oil mixed with Pittsburgh Seam coal pulverized to a coal particle size of 90 percent minus 200 mesh. Test results related to boiler performance, pollutant emissions, and ash deposition are presented. The equipment, instrumentation, and data acquisition system of the combustion test facility are described. The modest changes required to adapt the facility designed for oil firing to utilize coal-oil mixtures are discussed. Additional combustion tests needed to assess bottom ash accumulation and the corrosion, erosion, and fouling behavior inherent in the long duration operability of coal-oil mixtures in an oil fired boiler are underway. R.E.S.

N80-27505# Mitre Corp., Bedford, Mass.
A TEST PLAN FOR THE NEPSCO COAL-OIL MIXTURE COMBUSTION PROJECT
Oliver K. Foo, Edward M. Jamgochian, and Alberto J. Sabadell *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 32 p refs

Avail: NTIS HC A25/MF A01

Test objectives include the collection of technical and economic data to evaluate system performance, operability/maintainability, availability/reliability, and costs. A continuous 12 month test period was established. Superimposed on this period are four structured test periods during which the boiler load will be maintained at preselected levels while performance tests on the preparation plant and boiler are conducted. The end use of the data collected will provide a technical and economic data base to satisfy regulatory requirements and contribute to the commercialization of COM technology. E.D.K.

N80-27506# Ishikawajima-Harima Heavy Industries Co. Ltd., Tokyo (Japan).
DESIGN CONSIDERATION OF FINE COM STORAGE
Morio Kubota, Yashuhiko Kamijo (Tsukishima Kikai Co., Ltd.), and Koichi Tamura (Satake Chemical Equipment Mfg., Ltd.) *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 38 p

Avail: NTIS HC A25/MF A01

Conclusions affecting design and method of using storage tanks for COM are presented. Test items referred to include (1) an agitation test to prevent COM from setting in the tank; (2) fluidization test of COM settled in the tank; (3) still storage test of COM without agitation; (4) heat transfer in the tank; and (5) corrosion testing to determine suitable tank materials. E.D.K.

N80-27507# Hitachi, Ltd., Tokyo (Japan).
REPORT ON PUMPING CHARACTERISTIC TESTS AND PIPING PRESSURE LOSS MEASUREMENT TESTS FOR FINE COM
Isao Koyama *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 28 p

Avail: NTIS HC A25/MF A01

Data were established for transport of coal-oil mixtures (COM) and developing a design for an actual plant. The tests were carried out with two types of pumps to determine their characteristics and illuminate the pressure loss characteristics for piping transportation of COM. Four types of COM, characterized by the coal brand, coal concentration, and brand of additive mixed in the COM to prevent precipitation of coal particles, were used. The results show that pump handling of the COM is possible. R.C.T.

N80-27508# Mitsui Engineering and Shipbuilding Co. Ltd., Tokyo (Japan).
PILOT PLANT TEST ON COARSE COM SYSTEM. TESTS ON TRANSPORTATION, DE-OILING AND COMBUSTION OF COARSE COM
Kenichi Nagata, Akira Shiozawa, and Isao Koyama (Babcock-Hitachi K. K., Tokyo) *In* Pittsburgh Energy Technol. Center The 2d Intern. Symp. on Coal-Oil Mixture Combust., Vol. 1 1979 41 p refs
Avail: NTIS HC A25/MF A01

The major characteristics of the coarse coal-oil-mixtures (COM) system are described. Themes for the development and status of the COM system are addressed. Design specifications and implimentation procedures for the pilot plant and other test equipment are given. R.C.T.

N80-27509*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
USE OF PETROLEUM-BASED CORRELATIONS AND ESTIMATION METHODS FOR SYNTHETIC FUELS
A. C. Antoine Jun. 1980 23 p refs
(NASA-TM-81533; E-485) Avail: NTIS HC A02/MF A01 CSCL 21D

Correlations of hydrogen content with aromatics content, heat of combustion, and smoke point are derived for some synthetic fuels prepared from oil and coal syncrudes. Comparing the results of the aromatics content with correlations derived for petroleum fuels shows that the shale-derived fuels fit the petroleum-based correlations, but the coal-derived fuels do not. The correlations derived for heat of combustion and smoke point are comparable to some found for petroleum-based correlations. Calculated values of hydrogen content and of heat of combustion are obtained for the synthetic fuels by use of ASTM estimation methods. Comparisons of the measured and calculated values show biases in the equations that exceed the critical statistics values. Comparison of the measured hydrogen content by the standard ASTM combustion method with that by a nuclear magnetic resonance (NMR) method shows a decided bias. The comparison of the calculated and measured NMR hydrogen contents shows a difference similar to that found with petroleum fuels. Author

N80-27510*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ADVANCED FUEL SYSTEM TECHNOLOGY FOR UTILIZING BROADENED PROPERTY AIRCRAFT FUELS
G. M. Reck Jun. 1980 23 p refs Proposed for presentation at 12th Congr. of the Intern. Council of the Aeron. Sci., Munich, 13-17 Oct. 1980
(NASA-TM-81538; E-492) Avail: NTIS HC A02/MF A01 CSCL 21D

Possible changes in fuel properties are identified based on current trends and projections. The effect of those changes with respect to the aircraft fuel system are examined and some technological approaches to utilizing those fuels are described. R.C.T.

N80-27513# Virginia Polytechnic Inst. and State Univ., Blacksburg.
THE 1H AND 13C FOURIER TRANSFORM NMR CHARACTERIZATION OF JET FUELS DERIVED FROM ALTERNATED

ENERGY SOURCES Final Progress Report, 23 Mar. 1978 - 30 Aug. 1979
H. C. Dorn 30 Aug. 1979 80 p refs
(Contract N00173-78-C-0424)
(AD-A084169) Avail: NTIS HC A05/MF A01 CSCL 07/4

Initially, four jet samples were examined in this phase of the study using gel permeation liquid chromatography. We have previously discussed these results in the six month Progress Report. Although the gel permeation approach has the advantage of nearly quantitative recovery from the chromatography column (typically greater than 95%) and high preparative loading, it suffers from two drawbacks in studies of the present jet fuels. In general, the molecular weight and/or size of the compounds present in typical jet fuels do not cover a broad range. This is an obvious result of the relatively narrow distillation range(s) used to generate the jet fuels. That is, the gel permeation approach is more ideally suited in separations involving mixtures with a broad range in size and/or molecular weight (e.g., 100-1000 MW), whereas, the jet fuels have a more narrow range (e.g., 100-250MW). GRA

N80-27514# Puerto Rico Univ., Rio Piedras. Agricultural Experiment Station.
PRODUCTION OF SUGARCANE AND TROPICAL GRASSES AS A RENEWABLE ENERGY SOURCE Annual Report, 1978 - 1979
1979 134 p refs
(Contract ET-78-S-05-5912)
(ORO-5912-T2; AR-2) Avail: NTIS HC A07/MF A01

The agronomic and economic feasibility of mechanized, year round production of solar dried biomass, through the intensive management of sugarcane and napier grass as tropical forages were investigated. Alternate tropical grasses as potential sources for intensive biomass production were also examined. The selection and breeding of new sugarcane progeny having superior biomass productivity as their principal attribute were considered. R.C.T.

N80-27515# Institute of Gas Technology, Chicago, Ill.
RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS, RISER CRACKING OF COAL Quarterly Report, 1 Jul. - 30 Sep. 1979
D. A. Duncan, J. L. Beeson, and R. D. Oberle Dec. 1979 23 p refs
(Contract EX-76-C-01-2307; Proj. 61001)
(FE-2307-58) Avail: NTIS HC A02/MF A01

The technology of short residence time hydropyrolysis of lignites and coals for optimized yields of high octane gasoline blending stock constituents was developed. The design, construction, and operation of a bench scale unit (5 to 10 lb/hr) and a process development unit (50 to 100 lb/hr) were surveyed. The technical and economic aspects of large scale operation were evaluated. R.C.T.

N80-27516# Institute of Gas Technology, Chicago, Ill.
RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS, RISER CRACKING OF COAL Quarterly Report, 1 Apr. - 30 Jun. 1979
D. A. Duncan and J. L. Beeson Nov. 1979 28 p refs
(Contract EX-76-C-01-2307)
(FE-2307-55) Avail: NTIS HC A03/MF A01

The effect of heating rate on the conversion of feed carbon was studied and the distribution of products among gases, hydrocarbon liquids, and spent char was evaluated. A comparison was then made of product distribution obtained by hot hydrogen processing and by concurrent heating of the lignite and hydrogen to pyrolysis temperatures. The distribution of feed carbon among carbon oxides, methane, ethane, and hydrocarbon liquids were similar, and the yield of hydrocarbon liquids was practically identical. Equipment problems encountered thus far were minor and were easily corrected. An equipment flow sheet for a process plant was developed and various processing options were evaluated. DOE

N80-27517# Institute of Gas Technology, Chicago, Ill.
RESEARCH AND DEVELOPMENT OF RAPID HYDROGENATION FOR COAL CONVERSION TO SYNTHETIC MOTOR FUELS, RISER CRACKING OF COAL Annual Report, 1 Apr. 1978 - 31 Mar. 1979
D. A. Duncan, J. L. Beeson, and R. D. Oberle Sep. 1979 128 p refs
(Contract EX-76-C-01-2307; Proj. 61001)
(FE-2307-50) Avail: NTIS HC A07/MF A01

The effects of operating pressure and heating rate on rector performance were studied. Several techniques for processing caking coals were explored and trails of bentonite clay and iron oxide as catalysts were made. Certain aspects of the process development unit in the operation of the preheater as well as in the operation of the combustor sections were clarified. The major observations and results are reported. DOE

N80-27524# McKee (Arthur G.) and Co., Cleveland, Ohio.
COAL: AN ALTERNATE FUEL FOR THERMAL ENHANCED OIL RECOVERY STEAM GENERATION Final Report
Aug. 1979 98 p
(Contract EX-76-C-01-2418)
(SAN-2418-1) Avail: NTIS HC A05/MF A01

The technical and economic aspects of using coal to replace lower tier crude oil as fuel for thermal enhanced oil recovery steam generation is examined. Three coal technologies were evaluated: coal-oil mixtures; coal gasification; and fluidized bed combustion. Coal-oil mixtures and coal gasification were evaluated for retrofit application. Fluidized bed combustion was evaluated from the standpoint of providing replacement or future steam generating capacity. DOE

N80-27525# National Technical Information Service, Springfield, Va.
COAL GASIFICATION TECHNOLOGY. CITATIONS FROM THE NTIS DATA BASE Progress Report, 1979 - Apr. 1980
Diane M. Cavagnaro Apr. 1980 224 p Supersedes NTIS/PS-79/0516 and NTIS/PS-77/0305
(PB80-808090; NTIS/PS-79/0516; NTIS/PS-77/0305)
Copyright. Avail: NTIS HC $30.00/MF $30.00 CSCL 07A

Research reports on coal gasification are cited. They cover the techniques and processes of the conversion of coal to chemicals or fuels. Coal desulfurization, cleaning, or preparation, which do not involve conversion to gaseous fuels or chemical, are not covered. Also excluded are in-situ gasification studies. This updated bibliography contains 217 abstracts, 172 of which are new entries to the previous edition. GRA

N80-27526# National Technical Information Service, Springfield, Va.
COAL LIQUEFACTION TECHNOLOGY. CITATIONS FROM THE NTIS DATA BASE Progress Report, May 1978 - Apr. 1980
Diane M. Cavagnaro Apr. 1980 227 p Supersedes NTIS/PS-79/0375 and NTIS/PS-77/0305
(PB80-808108; NTIS/PS-79/0375; NTIS/PS-77/0305)
Copyright. Avail: NTIS HC $30.00/MF $30.00 CSCL 07A

A bibliography containing 217 citations on the techniques and processes of the conversion of coal to liquid chemicals or fuels is given. Most aspects of the processes including design, performance evaluation, cost analysis, and plant equipment are covered. GRA

N80-27527# National Technical Information Service, Springfield, Va.
COAL GASIFICATION TECHNOLOGY. CITATIONS FROM THE NTIS DATA CENTER Progress Report, May - Dec. 1978
Diane M. Cavagnaro Apr. 1980 152 p
(PB80-808082) Avail: NTIS HC $30.00/MF $30.00 CSCL 07A

This bibliography cites research reports on coal gasification technology. The citations discuss the techniques and processes of the conversion of coal to chemicals or fuels coal desulfurization, cleaning, or fuels on chemicals, are not covered. Also excluded are in-situ gasification studies. This updated bibliography contains

145 abstracts, none of which are new entries to the previous edition. GRA

N80-27535# Enviro Control, Inc., Rockville, Md.
CRITERIA FOR A RECOMMENDED STANDARD: OCCUPATIONAL EXPOSURES IN COAL GASIFICATION PLANTS
Sep. 1978 206 p refs Sponsored in part by EPA
(Contract PHS-210-76-0171)
(PB80-164874; DHEW/PUB/NIOSH-78-191) Avail: NTIS HC A10/MF A01 CSCL 06J

The criteria and standards applicable to exposure of employees to toxicants and hazardous operating conditions in commercial coal gasification plants are reported. Several aspects of preventative maintenance are discussed with specific emphasis on employee workplace monitoring and medical surveillance. R.C.T.

N80-27536# Enviro Control, Inc., Rockville, Md.
RECOMMENDED HEALTH AND SAFETY GUIDELINES FOR COAL GASIFICATION PILOT PLANTS Interagency Energy-Environment Research and Development Program Report
Jan. 1978 240 p refs
(Contract PHS-210-76-0171)
(PB80-164890; DHEW/PUB/NIOSH-78-120;
EPA-600/7-78-007) Avail: NTIS HC A11/MF A01 CSCL 06J

Potential hazards to workers in coal gasification pilot plants are identified and hazard control strategies are presented. Worker protection measures such as safe work practices, personal protective equipment and clothing, industrial and personal hygiene, workplace and medical monitoring, labeling and posting, hazard information and awareness, and recordkeeping are emphasized. Although this document is specific for pilot scale coal gasification plants, many of the potential hazards and research and development needs identified are transferable to those of bench or demonstration scale coal gasification or coal liquefaction facilities. GRA

N80-27703# California Univ., Berkeley. Lawrence Berkeley Lab. Energy and Environment Div.
HYDROLYZED WOOD SLURRY FLOW MODELING
J. Wrathall and Sabri Ergun Nov. 1979 9 p Presented at the Thermochem. Conversion Contractor's Meeting, Rolla, Mo., 7 Nov. 1979
(Contract W-7405-eng-48)
(LBL-10090) Avail: NTIS HC A02/MF A01

The catalytic conversion of hydrolyzed wood slurry to fuel oil is considered. A process to convert Douglas Fir chips into a pumpable fuel at costs comparable to current spot prices for Middle Eastern crude oil was designed. Operating difficulties that have developed at the pilot plant, include the production and handling of a pumpable, nonclogging hydrolyzed slurry as feedstock for a liquefaction process. A flow system was set up to investigate the properties of the hydrolyzed slurry in hopes of acquiring proficiency in control of slurry flow and development of conditions and correlations that will be of general usefulness to the chemical engineering community. Operating directives will be issued based on the research which will be of value in solving some of the problems encountered. DOE

N80-27795# NEUS, Inc., Santa Monica, Calif.
BIOSOURCES DIGEST, A JOURNAL ON BIOMASS UTILIZATION, VOLUME 1, NO. 2
Harry Sobel, ed. Apr. 1979 73 p refs
(Grant NSF PFR-77-12500)
(PB80-157662; NSF/RA-790175) Avail: NTIS HC A04/MF A01 CSCL 10A

The management and uses of marine resources are considered including current and potential developments in ocean farming which utilize the giant kelp (Macrocystis pyrifera). This rapidly growing species may be converted anaerobically into substitute natural gas and additionally produce enormous quantities of minerals, fertilizers, and livestock and human feed. It also enhances local fish crops. Preliminary cost estimates show this process of gas production to be competitive with alternate gas supply sources. Some of the technical and economic factors of ocean farming are discussed as well as methods for obtaining chemicals from a northern kelp. Books and papers received, grants awarded by NSF, DOE, and USDA, pertinent patents, NTIS publications, research announcements, and future meetings are listed. GRA

N80-27824# Idaho Univ., Moscow. Water Resources Research Inst.
UNDEVELOPED HYDROPOWER AS A POTENTIAL ENERGY SOURCE IN IDAHO
C. C. Warnick and L. F. Heitz Nov. 1979 28 p refs
(PB80-157399; W80-03918; OWRT-A-057-IDA(2)) Avail: NTIS HC A03/MF A01 CSCL 10B

The potential energy available in both regulated and unregulated streams in Idaho and the Pacific Northwest through the use of small scale hydro development was surveyed. For the survey a technique was developed to find low duration information along reaches of streams that do not have flow records due to inadequate gaging. Also a method for estimating flow duration curves for regulated streams was developed and applied. To determine head for power computations the difference in elevation at the inflow and outflow points of a reach was used. A preliminary social, political, and environmental feasibility evaluation was also made for each reach with theoretical energy potential. Summaries of the survey results are included. GRA

05

ENERGY CONVERSION

Includes photovoltaic, thermoelectric, geothermal, ocean thermal, and wind energy conversion. Also includes nuclear reactors and magnetohydrodynamic generators.

A80-32743 **Longitudinal baffling in Faraday generators.** R. E. Elkins, III, T. A. Trovillion (Florida, University, Gainesville, Fla.), and E. R. Lindgren (Florida, University, Gainesville, Fla.; Kungl. Tekniska Hogskolan, Stockholm, Sweden). *Physics of Fluids,* vol. 23, Apr. 1980, p. 838, 839. Contract No. N00014-76-C-410.

The effect of inserting insulating baffles parallel to the flow along the insulating walls in Faraday generators on the generator efficiency is examined for a range of moderate Hartmann numbers using a PRADI integration scheme for finite Faraday generators. The results of the computer experiments indicate no efficiency gain due to the insulating baffles. This conclusion is in agreement with the analysis of Shercliff (1977) but differs from the results obtained by Yakhot and Levin (1978). V.L.

A80-32758 **Microprocessor-controlled digital shunt regulator.** P. R. K. Chetty, W. M. Polivka, and R. D. Middlebrook (California Institute of Technology, Pasadena, Calif.). *IEEE Transactions on Aerospace and Electronic Systems,* vol. AES-16, Mar. 1980, p. 191-201.

The hardware and software details of a microprocessor-controlled digital shunt regulator (DSR) for solar power systems are presented. The DSR is briefly described, solar cell array section simulators are outlined, the operation and design of the dissipative analog shunt regulator are given, and the description and design of shunt current comparators are presented. In addition, the need for a special timing function and its design is discussed. Attention is given to the description of the microprocessor-controller, hardware implementation, software programs, and interfacing. The operation of the complete DSR system is summarized. Experimental results of the model system are presented. Some possible extensions are suggested. In conclusion, for solar power systems a digital shunt regulator is superior to other types of shunt regulators, and the use of a microprocessor for the control of the digital shunt regulator results in improved system performance. System flexibility is the chief advantage of a microprocessor-based system. S.D.

A80-32892 # **Diagnostic techniques for combustion MHD systems.** S. A. Self (Stanford University, Stanford, Calif.). *American Institute of Aeronautics and Astronautics, International Meeting and Technical Display on Global Technology 2000, Baltimore, Md., May 6-8, 1980, Paper 80-0926.* 21 p. 51 refs. NSF Grant No. ENG-77-23932; Contract No. DE-AC01-80ET-15611.

Methods for the measurement of important parameters in combustion MHD systems are reviewed, with emphasis on the determination of the properties of the plasma-flow interior to the flow train. The techniques discussed are limited to those that have actually been used in MHD systems and are illustrated mainly by the work of the High Temperature Gasdynamics Laboratory at Stanford, and of the High Temperature Institute in Moscow. The principal parameters whose measurement is discussed include the average flow velocity and turbulence intensity, the temperature, the seed concentration, the electrical conductivity, the electron concentration and mobility, the positive ion concentration and, for pulverized fuel, the ash droplet size and concentration. The merits of the various techniques are assessed with reference to their accuracy, spatial and temporal resolution, and the relative ease with which they can be implemented. (Author)

A80-32893 # **An assessment of magnetic fusion research.** J. R. Roth (Tennessee, University, Knoxville, Tenn.). *American Institute of Aeronautics and Astronautics, International Meeting and Technical Display on Global Technology 2000, Baltimore, Md., May 6-8, 1980, Paper 80-0928.* 13 p. 16 refs.

An evaluation of magnetic fusion research is presented which considers the tokamak approach as the most promising method for the industrialized countries. In the U.S., this work will achieve a milestone in 1983 when the Tokamak Fusion Test Reactor (TFTR) will first demonstrate a scientific breakeven fusion reaction. However, the fusion reaction in tokamaks or other magnetic containment configurations poses an environmental threat because of its tritium inventory, and presents difficult materials problems associated with high fluxes; this may produce a proliferation of hybrid reactors which use neutrons for the production of fissionable material. It is proposed that an international agreement be reached which would rule out the use of DT fusion reaction for any but research reactors. A.T.

A80-32957 # **Production of a small nuclear battery (Opit za s'zdavane na malogabaritna iadrena bateriia).** N. P. Kosev, M. G. Marinov, and B. A. Popov (B'lgarska Akademiia na Naukite, Institut za Iadreni Izsledvaniia i Iadrena Energetika, Sofia, Bulgaria). *Iadrena Energiia,* no. 11, 1980, p. 63-69. 9 refs. In Bulgarian.

The paper describes an experiment for producing a small nuclear battery based on promethium-147. The choice of this type of a double transformation battery was substantiated, and the characteristics of luminophores and photoelements were investigated. Finally, characteristics of the battery are discussed with a view of improving its efficiency. A.T.

A80-33042 **Tokamak reactors and structural materials.** R. W. Conn (Wisconsin, University, Madison, Wis.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 9-16. 33 refs. Research supported by the U.S. Department of Energy and Wisconsin Electric Utilities Research Foundation.

The present status of tokamaks is reviewed, emphasizing a trend towards more compact units, higher power density and neutron wall loading in the range 2-4 MW/sq m. Criteria for selecting first wall materials are discussed, including radiation damage and lifetime, compatibility with coolants and tritium, and mechanical and thermal properties. Also examined is the interrelationship between first wall and blanket materials and reactor design. The primary choice for the structure is a steel or a nickel-based alloy, with vanadium and titanium alloys as the logical backup. L.M.

A80-33043 **Mirror fusion reactor design.** W. S. Neef, Jr. and G. A. Carlson (California, University, Livermore, Calif.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 17-28. 18 refs.

The major differences between mirror and toroidal fusion systems are described. Mirror optimization leading to 'tandem' and 'field reversed' systems results in enhanced plasma efficiency and reactor power balance. Blanket designs are reviewed which depend on a mirror's simple axisymmetric geometry. Coolants are discussed and pressurized helium favored for mirror reactors. Materials problems of both the first wall and neutral beam sources are reviewed along with neutron thermal loads on cryopanel pumps and direct converters. Superconducting magnets may have to be made of Niobium-Tin due to high field strength requirements. Recent data supporting Nb-Sn's use is included. Quadrupole fields require unusual magnet designs. (Author)

05 ENERGY CONVERSION

A80-33044 **Materials implications of fusion-fission reactor designs.** K. R. Schultz (General Atomic Co., San Diego, Calif.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 29-36. 23 refs. Contract No. EY-76-C-03-0167-PA-38.

In this paper the fusion-fission reactor concept is briefly reviewed. The potential operating modes for fusion-fission systems are reviewed with emphasis on their materials environments, and the materials implications of the assumed mainline fuel producing hybrid are discussed from the reactor designer's point of view. The impact of materials performance on hybrid reactor design is assessed and it is suggested that although materials performance is of vital concern and further materials evaluation work is needed, the materials requirements of the hybrid are an overlap of fusion and fission requirements and appear to be less demanding than those of fission and fusion systems alone. (Author)

A80-33046 **A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems.** M. A. Abdou and Z. El-Derini (Georgia Institute of Technology, Atlanta, Ga.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 57-64. 10 refs.

The impact of the neutron wall load and the lifetime and operating temperature of the structural material on tokamak reactor economics was investigated and a comparative study of stainless steel and vanadium alloys was performed. Economically attractive tokamak reactors produce a neutron wall load of 3-4 MW/sq m for 3000 MW thermal power. The cost of energy is optimized by an operating temperature of the structural material in the wall/blanket in the range 475-500 C for stainless steel and 620-660 C for vanadium alloys. The gain in electric power due to higher operating temperatures is not sufficient to offset the penalty in the capital cost associated with the vanadium alloys as compared to stainless steel. Therefore, the vanadium alloy must exhibit a significant lifetime advantage over stainless steel to be economically competitive. (Author)

A80-33050 **First wall protection schemes for inertial confinement fusion reactors.** G. L. Kulcinski (Wisconsin, University, Madison, Wis.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 87-97. 39 refs. Contract No. ET-77-S-02-4296.

The successful containment of thermonuclear yields ranging from 100-4000 MJ has presented a challenge to the fusion reactor designer. It is shown that the thermal pulses associated with such pellet design can exceed the melting temperature in first walls unless the chamber size is made unreasonably large or the energy spectra of the pellet debris is modified. The various approaches to absorbing the photons and slowing down the charged particles and neutrons are reviewed. Fluidized walls and low pressure gases show promise for protection of the cavity surfaces, but there are critical experiments that need to be performed on both of these concepts before a decision on their use in reactors can be made. (Author)

A80-33051 **Materials problems with inertial confinement fusion targets.** E. H. Farnum, R. J. Fries, and J. E. Barefield, II (California, University, Los Alamos, N. Mex.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 99-102. Research supported by the U.S. Department of Energy.

The fabrication of advanced laser fusion targets requires careful attention to materials properties that are unimportant in target design. Specific problems encountered in the fabrication of high-Z pusher shells of a typical three-shell high-yield target are discussed. Electroplated gold and chemical-vapor-deposited tungsten were not usable, although both produced as-deposited coatings that met design criteria. It was observed that hydrogen permeability of chemical-vapor-deposited tungsten decreases drastically for coatings thicker than 25 microns. (Author)

A80-33052 **Fabrication of glass sphere laser fusion targets.** C. D. Hendricks, A. Rosencwaig, R. L. Woerner, J. C. Koo, J. L. Dressler, J. W. Sherohman, S. L. Weinland, and M. Jeffries (California, University, Livermore, Calif.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 107-111. 13 refs. Contract No. W-7405-eng-48.

Processes were developed for mass producing the high quality glass microspheres required for current laser fusion targets. The methods and the materials used in the liquid-droplet and dried-gel systems are described. Glass microspheres ranging from 70-600 microns OD, with walls from 0.5 to 18 microns thick, and which satisfy the exacting surface and symmetry specifications of targets for high density experiments are now produced routinely. (Author)

A80-33053 **Low pressure gas filling of laser fusion microspheres.** J. Koo, J. Dressler, and C. Hendricks (California, University, Livermore, Calif.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 113-115. 5 refs. Contract No. W-7405-eng-48.

In laser fusion microsphere production, large, thin gel-microspheres are formed before the chemicals are fused into glass. In this transient stage, the gel-microspheres are highly permeable to argon and many other inert gases. When the gel transforms to glass, the argon gas is trapped within to form argon filled, fusion target quality, glass microspheres. On the average, the partial pressure of the argon fills attained in this process is around 20,000 Pa at room temperature. (Author)

A80-33054 **Mass spectrometer determination of argon contents in laser fusion target pellets.** C. M. Ward (California, University, Livermore, Calif.) and L. E. Bergquist (Martin Marietta Aerospace, Denver, Colo.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 117-120. 6 refs. Contract No. W-7405-eng 48.

A80-33055 **Cryogenic laser fusion target material design considerations.** J. R. Miller, R. J. Fries, and W. J. Press (California, University, Los Alamos, N. Mex.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 121-125. 16 refs. Research supported by the U.S. Department of Energy.

Laser fusion target designs exhibit improved performance when the fusion fuel, a deuterium-tritium (DT) mixture, is frozen into a uniform, solid shell. The formation of such a shell requires rapid isothermal cooling of the target to cryogenic temperatures. The cooling rate must be sufficiently fast to prevent significant, gravitationally driven downward flow of the DT as it passes from the gaseous through the liquid state. Because it is not possible to measure the uniformity of a solid DT layer in opaque, multishell targets, we have modeled such targets to calculate the cooling rate and, hence, the expected thickness uniformity of the DT shell. The presented results provide target designers with practical guidelines for the selection of materials and configurations, which will assist in the fabrication of high-quality cryogenic targets. (Author)

A80-33056 **A review of lifetime analyses for tokamaks.** S. D. Harkness (Argonne National Laboratory, Argonne, Ill.) and B. Cramer (McDonnell Douglas Astronautics Co., St. Louis, Mo.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 135-145. 28 refs. Research supported by the U.S. Department of Energy.

System studies have shown that economic fusion power can best be achieved from the use of long lived components. The stresses generated in a first wall module are a complex function of its geometry, the chosen structural material and the tokamak burn cycle characteristics. A means of applying ASME Code Case 1592 to preliminary design has been established. Methods of incorporating some of the material property changes expected from irradiation are discussed. Cyclic stresses imposed by tokamak operation are expected to cause fatigue related properties to govern the life of the structure. Stress assisted bubble growth is also discussed. This may be the critical mechanism in establishing the creep rupture life of a fusion first wall component. (Author)

A80-33057 **Structural performance of plasma chamber materials for a power generating tokamak.** M. J. Delaney, B. A. Cramer, and C. A. Trachsel (McDonnell Douglas Astronautics Co., St. Louis, Mo.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 165-169. 5 refs. Contract No. EY-76-C-03-167-PA-38.

This paper compares Inconel 625, titanium 6242S, and 316 stainless steel as candidate plasma chamber first wall structural materials. Factors which have a significant effect on plasma chamber design are identified. Results are based on studies conducted for the Power Generating Fusion Reactor (PGFR) having a peak plasma power of 650 MW. The analyses use unirradiated material properties. Properties important in the design are discussed. The effect of material properties and load conditions on life of the plasma chamber is also addressed. (Author)

A80-33058 **Evaluation of materials for EPR power generation.** R. F. Mattas, H. C. Stevens, and B. Misra (Argonne National Laboratory, Argonne, Ill.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 171-175. 12 refs. Research supported by the U.S. Department of Energy.

The blanket materials employed for heat generation in the Argonne Experimental Power Reactor (EPR) are evaluated. The EPR blanket consists of annealed Type 316 stainless steel sections cooled by pressurized water and Inconel 718 sections cooled by steam. The predicted lifetimes of the two blanket sections is 2 years or normal operation for the Inconel 718 and 3.5 years for Type 316 stainless steel sections. The lifetime of Type 316 stainless steel is limited by swelling considerations, while the lifetime of Inconel 718 is limited by ductility changes. (Author)

A80-33059 **The application of martensitic stainless steels in long lifetime fusion first wall/blankets.** S. N. Rosenwasser, P. Miller, J. A. Dalessandro, J. M. Rawls, W. E. Toffolo, and W. Chen (General Atomic Co., San Diego, Calif.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 177-182. 18 refs. Contract No. EY-76-C-03-0167-PA-38.

An assessment is made of the feasibility and design impact of using a ferromagnetic martensitic steel such as HT-9 in first wall/blanket structures. A preliminary analysis indicates that HT-9 may offer significantly greater wall lifetimes than 20% cold worked type 316 stainless steel for temperatures below about 520 C. Exploratory measurements and calculations suggest that the presence of ferromagnetic material does not significantly affect the operational characteristics of tokamak power reactors. (Author)

A80-33060 **Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks.** A. Tobin (Grumman Aerospace Corp., Bethpage, N.Y.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 197-201.

SEM was used to investigate thermal fatigue failures in W, W-ThO2 and Mo subjected to thermal cycling that simulated tokamak operations. Significant evidence for surface melting, recrystallization, intergranular cracking and striation formation was observed. These results suggest that thermal fatigue is a serious problem in candidate refractory metallic protective plates. (Author)

A80-33062 **Composite materials for tokamak wall armor, limiters, and beam dump applications.** R. E. Riley, T. C. Wallace, and J. M. Dickinson (California, University, Los Alamos, N. Mex.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 221-224. 5 refs. Research sponsored by the U.S. Department of Energy.

A new generation of composite materials, graphite fiber reinforced metal carbides and borides, is being developed. These materials have high strengths and excellent chemical and mechanical stability. Their properties can be tailored over wide ranges to meet service requirements. By using components such as boron, silicon or titanium, these composites offer promise as low Z number materials for limiters, wall armor, beam stops, etc., in tokamaks. (Author)

A80-33063 **Material studies related to TFTR limiters and wall armor.** M. Ulrickson (Princeton University, Princeton, N.J.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 231-235. 5 refs. Contract No. EY-76-C-02-3073.

Candidate materials for use as limiters and wall armor in the Tokamak Fusion Test Reactor (TFTR) device have been evaluated under heat flux conditions similar to those expected in TFTR. The materials were first screened for thermal shock resistance using an electron beam gun to irradiate small test samples of each material. The best materials from the thermal shock tests were then subjected to thermal fatigue tests of up to 5000 cycles. Most of the materials subjected to the fatigue tests were also prepared in a size comparable to TFTR limiter and wall armor designs and exposed to neutral beam bombardment to establish the validity of the small tests. The results indicate that moulded graphites and carbon based composites should be given serious consideration for limiter and wall armor applications. (Author)

05 ENERGY CONVERSION

A80-33077 **Void growth characteristics in laser fusion reactor first walls.** N. M. Ghoniem (California, University, Los Angeles, Calif.) and G. L. Kulcinski (Wisconsin, University, Madison, Wis.). *(ANS, DOE, EPRI, AIME, and ASM, Topical Meeting on Fusion Reactor Materials, 1st, Miami Beach, Fla., Jan. 29-31, 1979.) Journal of Nuclear Materials,* vol. 85-86, Dec. 1979, pt. A, p. 547-552. 10 refs. Research supported by the U.S. Department of Energy.

The damaging effects of microexplosion products on void behavior in unprotected stainless steel laser fusion first walls are analyzed using the Dynamic Rate Theory. The preliminary results from this work indicate that in the zones where the temperature excursions are the highest, gas bubbles will be the predominant defect and the dislocation loops and voids will be annealed out. As one moves farther into the first wall, the growth or shrinkage of voids depends on the ambient temperature and the magnitude of the displacement rate. (Author)

A80-33290 # **Performance evaluation of wind turbines.** R. E. Akins (Virginia Polytechnic Institute and State University, Blacksburg, Va.). *(American Society of Civil Engineers, Convention and Exposition, Boston, Mass., Apr. 2-6, 1979.) ASCE, Transportation Engineering Journal,* vol. 106, Jan. 1980, p. 19-29. 7 refs. Contract No. AT(29-1)-789.

Due to the random nature of the environment in which wind turbines are expected to operate, full-scale testing is necessary to verify performance predictions. A relatively straightforward technique, termed the method of bins, is developed for determining the average output characteristics of a particular wind turbine. The technique is applicable to a wind turbine of any size or type. The output power as a function of wind speed can be combined with either a knowledge or an estimate of the wind characteristics at a particular location to predict the annual power produced by the turbine. This approach of estimating the annual power production of a wind turbine in some assumed environment is a useful tool for evaluating both different machines and the effects of locating a particular machine at different sites. S.D.

A80-33553 **Improved heat pump model for TRNSYS.** P. J. Hughes and J. H. Morehouse (Science Applications, Inc., McLean, Va.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 817-821. 6 refs. Contract No. DE-8C04-78CS-34261.

A new TRNSYS-compatible heat pump model has been developed which overcomes several shortcomings of previous models of residential heat pumps. In the cooling mode, the effect of indoor entering wet bulb temperature on total capacity and on sensible/latent load ratio is considered. In the heating mode, performance degradation due to defrost is handled in a consistent manner. The model also has the capability of estimating performance degradation due to start-up thermal transients. In addition, the model is formulated to interface with the rest of the simulation via temperature level control so that control dynamics can be studied and thermal comfort restraints imposed, using the resulting system mode. (Author)

A80-33770 **Operational characteristics of an ac commutator generator for wind power conversion.** V. I. John (Queen's University, Kingston, Ontario, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2262-2266.

A three phase commutator motor of the Schrage type is used in the generating mode to produce constant voltage, constant frequency power output. A digitally operated automatic control system is used to assure generator operation for a wide range of speeds. Operational characteristics including power output, efficiency, developed torque and power factor are determined by actual tests. An equivalent circuit for the machine is developed and the performance of the machine is calculated for both motoring and generating modes to assess the feasibility of AC Commutator Generator (ACCG) for Variable Speed Constant Frequency (VSCF) wind power systems. (Author)

A80-33773 **Performance modeling of the vertical axis wind turbine.** L. F. Jesch and D. Walton (Birmingham, University, Birmingham, England). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2277-2281. 6 refs.

The aerodynamic performance of the vertical axis wind turbine (VAWT) using troposkein shaped blades is analyzed. The effects of blade numbers, blade geometry, chord length, rotor solidity and parasitic drag on performance are investigated singly and in combinations. A new feature of the computer model is that it considers the effect of variable Reynolds number on performance. This makes it possible to get much closer agreement between theory and wind tunnel tests. A comparison with published test data shows the importance of including variable Reynolds number in the analysis. (Author)

A80-33774 **Application of probability methods to evaluate the reliability of a combined wind-electric and conventional generation system.** R. Ramakumar (Oklahoma State University, Stillwater, Okla.) and R. G. Deshmukh. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2282-2286. 7 refs. Research supported by the Oklahoma State University.

The models, approaches and the major parameters influencing the application of probability methods to evaluate the reliability of a combined wind-electric and conventional generation system feeding a common load are discussed. Capacity outage probability tables and Markov models are presented for a wind-electric conversion system. These models, in conjunction with suitable load models, are employed in the reliability evaluation of wind-assisted utility systems. Methods to include transmission lines are discussed and their implications are outlined. The results, discussion and the methodology should be of assistance in planning the incorporation of wind-electric conversion systems in the generation mixes of the future. (Author)

A80-33775 **Electro-wind energy system with oversynchronous cascade and simple adaptive maximal power control.** J. D. van Wyk (Rand Afrikaans University, Johannesburg, Republic of South Africa). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2291-2295. 16 refs. Research supported by the South African Council for Scientific and Industrial Research.

The conversion of mechanical energy from a wind turbine into electrical energy by using an induction generator with feed back of its rotor power to the supply system via a supply commutated invertor is investigated. It is shown that in comparison to VSCF systems using a synchronous generator and invertor, the power electronic equipment in the present system has only half the rated power. Advantages concerning running up of wind turbines on weak systems, as well as controllability and simplicity is pointed out, while disadvantages concerning power factor and harmonics are investigated. An overriding adaptive maximal power controller to extract maximum power from the wind at each wind speed is described. Some preliminary experimental results on a scaled down 5kW, 380V oversynchronous cascade is presented. Regarding compatibility with supply networks and dynamic response many questions are still open to be investigated under varying wind speed conditions. (Author)

A80-33776 **A design procedure for wind powered heating systems.** J. F. Manwell and J. G. McGowan (Massachusetts, University, Amherst, Mass.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2296-2300. 5 refs. Research supported by the U.S. Department of Energy.

This paper presents a generalized design procedure for the month-by-month prediction of performance of wind powered residential heating systems. In its initial form, the technique is restricted to the simulation of residential heating systems using conventional horizontal axis wind turbines that dissipate their output into water based thermal storage systems (via electrical resistance heaters or fluid dissipation devices). This procedure, using a graphical formulation (WF-chart) is designed to give the monthly heating energy fraction supplied by a wind heating system with a minimum of site, wind turbine, and system input parameters. Such information is useful for simple performance studies or as input for economic assessment of wind heating systems. (Author)

A80-34123 **Heat pumps in the PESAG supply district (Wärmepumpen im PESAG-Versorgungsgebiet).** A. Osterhus (Paderborner Elektrizitätswerk und Strassenbahn AG, Paderborn, West Germany). *Energiewirtschaftliche Tagesfragen,* vol. 30, Apr. 1980, p. 262-266. In German.

The paper examines the feasibility of using large scale heat pumps in the PESAG (Paderborner Elektrizitätswerk und Strassenbahn AG) power supply district. It is shown that due to favorable geological factors in the district which allow the tapping of ground water, the market share for heat pumps will increase steadily. Topics discussed include: calculation of electricity consumption, operating experiences with heat pumps in one- and two-family houses, heat pumps in multifamily houses, and industrially used systems. M.E.P.

A80-34311 **Calculation of a low-frequency electromagnetic field due to MHD machines inside a common shielding shell.** S. M. Apollonskii. *(Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 83-86.) *Magnetohydrodynamics,* vol. 15, no. 3, Jan. 1980, p. 296-299. 5 refs. Translation.

The paper develops a method for calculating the electromagnetic fields of two or more MHD machines encapsulated in a common housing, with consideration of the mutual field interaction. Some results are presented on the field interaction of two MHD pumps in a common housing, taking into account ferromagnetic and screening effects. B.J.

A80-34312 **Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump.** L. M. Dronnik, S. Iu. Reutskii, and A. I. El'kin. *(Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 87-93.) *Magnetohydrodynamics,* vol. 15, no. 3, Jan. 1980, p. 300-305. 10 refs. Translation.

The paper proposes a mathematical model of a plane MHD induction pump that makes it possible to investigate simultaneously longitudinal and transverse edge effects on flow parameters in the channel. An analytical solution is obtained for steady laminar flow in a channel with insulation barriers at the inlet and outlet. It is found that the longitudinal edge effect affects velocity in the central part of the channel, but has no influence on reverse flow at the walls. B.J.

A80-34313 **MHD generator of the conduction type with reciprocal motion of the composite working element.** S. E. Kuznetsov and V. I. Andreev. *(Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 97-104.) *Magnetohydrodynamics,* vol. 15, no. 3, Jan. 1980, p. 308-314. 5 refs. Translation.

A conduction-type MHD generator with a hybrid working material, liquid metal and a solid conductor (a metallic plate), has been designed in an effort to reduce the total internal resistance of the system. The operating characteristics of an MHD generator with back-and-forth motion of a working material consisting of mercury and a copper plate are analyzed. B.J.

A80-34315 **Determination of the geometry of the transition region of a series MHD generator.** G. P. Bazarov, E. N. Kufa, and S. A. Medin. *(Magnitnaia Gidrodinamika,* July-Sept. 1979, p. 140-142.) *Magnetohydrodynamics,* vol. 15, no. 3, Jan. 1980, p. 347-349. Translation.

The paper considers the characteristics of the series channels of a MHD generator for a wide range of loads with zero field strength at connections between channels. Particular attention is given to the effects of the geometry of transition regions between channels on the power output characteristics of the generator. B.J.

A80-34559 **Design of an isobutane binary cycle geothermal generation system.** K. Aikawa (Mitsubishi Heavy Industries, Ltd., Tokyo, Japan). *Energy Developments in Japan,* vol. 2, Jan. 1980, p. 193-209.

A 1000-kW binary cycle geothermal power plant with isobutane as the working medium, which uses geothermal steam and hot water, was successfully run for the first time at Otake, Kyushu, in 1978. The paper discusses the development of this plant, the features of the Otake pilot plant, the outline of the plant, and the main components. The technological feasibility of a future large operating plant is established. Factors such as economy, reliability, and social and environmental acceptability, etc. should be considered before constructing the binary cycle power generation system. S.D.

A80-34614 # **The characteristics of a nonhomogeneous helical MHD dynamo (Neodnorodnaia model' vintovogo dinamo).** A. Gailitis and Ia. Freiberg. *Magnitnaia Gidrodinamika*, Jan.-Mar. 1980, p. 15-19. 5 refs. In Russian.

An inhomogeneous model of a helical dynamo is presented. The self-excitation of a magnetic field with a rigid helical movement of a circular cylinder is investigated in a kinematic approximation taking the finite extension in the radial direction and different electric conductivities of moving and stationary media into account. The dispersion relation of the model for the three cylindrical regions whose characteristics and movements are considered constant is presented; the relation of self-excitation characteristics and the relative thickness and electrical conductivity of the pipe walls and the helical movement pitch is computed by a dispersion equation. A.T.

A80-34619 # **The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator (Ob umen'shenii vrednogo vliianiia tokov Kholla na kharakteristiki MGD-generatora).** A. A. Beloglazov, V. A. Bashkatov, and E. E. Shpil'rain. *Magnitnaia Gidrodinamika*, Jan.-Mar. 1980, p. 99-104. In Russian.

The paper proposes methods of decreasing parasitic effects of Hall currents by designing the channel cross-section and the magnetic field. The results show the practicality of additional development of these methods. A.T.

A80-34620 # **A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes (Chislennoe issledovanie nekotorykh trekhmernykh effektov v sektsionirovannom kanale MGD-generatora s posledovatel'nym vkliucheniem elektrodov).** A. V. Gubarev and V. L. Ovchinnikov. *Magnitnaia Gidrodinamika*, Jan.-Mar. 1980, p. 105-110. 18 refs. In Russian.

A80-34647 # **Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1.** K. Toi, N. Hiraki, K. Nakamura, Y. Kawai, S. Itoh (Kyushu University, Fukuoka, Japan), and O. Mitarai. *Kyushu University, Research Institute for Applied Mechanics, Reports*, vol. 27, Feb. 1980, p. 111-123. 21 refs.

The efficient heating of bulk ions of tokamak plasma is observed by application of the pulsed toroidal electric field much higher than the Dreicer field with the positive and negative polarities for the ohmic heating field. No deleterious effect on the confinement properties of tokamak plasma appears by the heating. The decay time of ion temperature raised by the heating pulse agrees well with the prediction by the neoclassical transport theory. The magnitude of the current induced by the pulsed electric field with the positive polarity is limited by the violent current disruption. In the case of the negative polarity, this is limited by lack of the MHD equilibrium due to vanishing the total plasma current. The ratio of drift velocity to electron thermal velocity attains around 0.5, which suggests that the efficient ion heating may be due to the current-driven turbulence. (Author)

A80-34648 # **Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1.** K. Nakamura, N. Hiraki, K. Toi, and S. Itoh (Kyushu University, Fukuoka, Japan). *Kyushu University, Research Institute for Applied Mechanics, Reports*, vol. 27, Feb. 1980, p. 125-146. 26 refs.

The measurement of the ion temperature of the TRIAM-1 tokamak plasma is carried out by using a seven-channel neutral energy analyzer. The temporal and spatial variations of the ion temperature have been obtained with the spatial resolution of plus or minus 4.3 mm and the temporal resolution of 100 microseconds. The energy range of the analyzed neutral particles is from 0.2 to 8 keV. The energy spectrum in the TRIAM-1 plasma without the strong gas puffing usually consists of two-component Maxwellian; the one represents the thermal part which is a superposition of the contribution from a hot region (ion temperature of 100-300 eV) and that from an edge region (ion temperature of 50 eV), and the other represents the superthermal part (ion temperature of 1 keV). The neutral particle energy spectra at several vertical positions are obtained by scanning the analyzer in the vertical direction. From those spectra, the radial profile of the ion temperature is derived by means of the nonlinear optimization method. (Author)

A80-34649 # **Electron density measurements in the TRIAM-1 tokamak.** O. Mitarai, H. Nakashima, K. Nakamura, N. Hiraki, K. Toi, Y. Kawai, and S. Itoh (Kyushu University, Fukuoka, Japan). *Kyushu University, Research Institute for Applied Mechanics, Reports*, vol. 27, Feb. 1980, p. 147-158. 7 refs.

A80-34749 **Three-dimensional reconstruction of the X-ray emission in laser imploded targets.** G. N. Minerbo, J. G. Sanderson, D. B. van Hulsteyn, and P. Lee (California, University, Los Alamos, N. Mex.). *Applied Optics*, vol. 19, May 15, 1980, p. 1723-1728. 12 refs. Research sponsored by the U.S. Department of Energy.

To investigate the uniformity of compression of spherical targets irradiated with high-energy CO2 lasers, an array of pinhole cameras has been set up to obtain 2-D views from four different directions. To reconstruct the 3-D source a computer code based on a maximum entropy algorithm was derived. With synthetic input data the code gives acceptable reconstructions provided the source is smooth and has a simple shape. A set of serial slices through the reconstructed X-ray emission distribution in a glass microsphere imploded with the LASL two-beam CO2 laser is presented. (Author)

A80-34865 **Current constriction near the anode in a combustion products plasma.** R. V. Ganefel'd (Akademiia Nauk Ukrainskoi SSR, Institut Elektrodinamiki, Kiev, Ukrainian SSR). *(Teplofizika Vysokikh Temperatur*, vol. 17, July-Aug. 1979, p. 703-710.) *High Temperature*, vol. 17, no. 4, Jan. 1980, p. 592-599. 10 refs. Translation.

In the present paper, the current constriction at the anode in a combustion-product plasma in the presence of applied and induced electric fields is analyzed on the basis of a boundary-layer heat balance equation. The parameters obtained for the transition of a diffuse discharge to a constricted mode are found to correlate well with the experiment. V.P.

A80-34873 **Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator.** N. M. Prusova (Academy of Sciences, Sibirian Energy Institute, Irkutsk, USSR). *(Teplofizika Vysokikh Temperatur*, vol. 17, July-Aug. 1979, p. 849-857.) *High Temperature*, vol. 17, no. 4, Jan. 1980, p. 712-718. 20 refs. Translation.

A80-34874 **Measurement of energy emitted by the working medium of an MHD generator.** I. A. Vasil'eva, Iu. Z. Rastegaeva, and A. S. Urinson (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, July-Aug. 1979, p. 860-862.) *High Temperature,* vol. 17, no. 4, Jan. 1980, p. 722-724. 9 refs. Translation.

An experimental determination is made of the energy emitted by the working medium of an MHD generator over a wide spectral range; in particular, data is obtained concerning the energy of radiation incident on the walls of the exit cone of the Ustanovka U-25 steam generator. Attention is given to the pyroelectric radiation detector used to detect the emitted energy, statistical errors in measuring the emission, and the absorption of radiation by water vapor and carbon dioxide in the layer of air between the window and the detector. It is found that the contribution of emission from the wall to the registered radiation does not exceed 10%, and that the total systematic error of measurement due to intensification and absorption between the plasma and receiver is on the order of 10%. J.P.B.

A80-34875 **Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel.** A. M. Vasiutkin (Scientific-Industrial Union Energiia, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, July-Aug. 1979, p. 874-876.) *High Temperature,* vol. 17, no. 4, Jan. 1980, p. 736-738. 6 refs. Translation.

A80-34970 **Submillimeter interferometry of high-density plasmas.** D. Véron (EURATOM and Commissariat à l'Energie Atomique sur la Fusion, Département de Physique du Plasma et de la Fusion Contrôlée, Fontenay-aux-Roses, Hauts-de-Seine, France). In: Infrared and millimeter waves. Volume 2. New York, Academic Press, Inc., 1979, p. 67-135. 37 refs.

Principles of density measurements with electromagnetic radiation are discussed. Phase modulation and modulation techniques are covered. Special requirements for large plasma machine interferometers, Gaussian beam propagation, and components are considered. Specific systems are described and sources of errors analyzed. Future development of laser sources and components is outlined. V.T.

A80-34973 **Electron cyclotron heating of tokamaks.** W. M. Manheimer (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: Infrared and millimeter waves. Volume 2. New York, Academic Press, Inc., 1979, p. 299-352. 65 refs.

A brief discussion of tokamaks is presented. Emphasis is placed on propagation and deposition of millimeter wave energy. A simple treatment of plasma heating with millimeter waves is discussed along with a full wave treatment. Recent experimental works are reviewed, and potentially important theoretical issues are outlined. V.T.

A80-34978 * **Numerical studies of new stellarator concepts.** F. Bauer, O. Betancourt, and P. Garabedian (New York University, New York, N.Y.). *Journal of Computational Physics,* vol. 35, May 1980, p. 341-355. 6 refs. Grant No. NsG-1579; Contract No. EY-76-C-02-3077.

A three-dimensional computer code has been developed to study the magnetohydrodynamic equilibrium and stability of a diffuse or sharp boundary plasma in toroidal geometry. It is shown how equilibria with net toroidal current identically zero can be determined and how growth rates of instabilities can be calculated. Applications are made to an l = 2, 3 stellarator configuration that offers the possibility of achieving a critical value as high as 10% for the plasma parameter. (Author)

A80-34989 # **Electrical nonuniformities in diagonally connected generators.** S. Kuo, B. Cheo, and E. Levi (New York, Polytechnic Institute, Farmingdale, N.Y.). *Journal of Energy,* vol. 4, Mar.-Apr. 1980, p. 88-94. Contract No. ET-78-C-01-3084.

Experimental data show that stationary nonuniformities may occur at much longer wavelengths than the unstable ones predicted by the linear theory. A nonlinear analysis shows that the mechanism of mode coupling may be responsible for this occurrence. It is found that the instability regime extends over a much wider parameter range than previously determined. Analyses also show that over sections of the channel, the Hall field may diminish or even reverse. (Author)

A80-34990 # **High electrical conductivity and high Hall coefficient in MHD generator.** H. Yamasaki, S. Shioda (Tokyo Institute of Technology, Yokohama, Japan), S. Saito, and Y. Shimazu. *Journal of Energy,* vol. 4, Mar.-Apr. 1980, p. 95, 96. 5 refs.

The results of power generation experiments in a nonequilibrium MHD generator are reported. With a magnetic field of 1.43 T and a seed fraction of 0.00011, the highest effective conductivity was 200 mho/m, which is close to the ideal value, and the highest effective Hall coefficient was 8.5, or 80% of the ideal value. No saturation of the effective conductivity and the effective Hall coefficient has been observed at electron densities above 10 to the 14th per cu cm. The results confirm the recovery of the effective conductivity and the effective Hall coefficient in a nonequilibrium MHD generator in the regime of fully ionized seed and suggest a significant increase in the isentropic efficiency of the generator. V.L.

A80-35161 **Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980.** Conference sponsored by the American Society of Mechanical Engineers. Edited by O. M. Griffin (U.S. Navy, Naval Research Laboratory, Washington, D.C.) and J. G. Giannotti (Giannotti and Associates, Annapolis, Md.). New York, American Society of Mechanical Engineers (Ocean Engineering Symposia Series. OED Volume 9), 1979. 91 p. $14.

The papers deal with engineering problems associated with the OTEC main platform, the mooring system, and the pipe required to raise cold water from large ocean depths. Among the topics covered are methods for predicting the static and dynamic response of the cold water pipe and the main plant platform to the forces of waves and currents; at-sea determination of a large diameter steel cold water pipe to the ocean environment; and approaches to the prediction of wave drift forces acting on OTEC platforms. V.P.

A80-35162 # **NOAA's cold-water pipe at-sea test program.** J. A. Pompa, M. C. Komelasky, J. M. Schneider, and J. R. Buck (ORI, Inc., Silver Spring, Md.). In: Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980. New York, American Society of Mechanical Engineers, 1979, p. 1-6.

The paper deals with a project concerning the design, deployment, and instrumentation of a one-third scale model of an OTEC cold water pipe (CWP). The organizational structure involved in the CWP at-sea test program is described, along with the role of the test integration management in coordinating the various activities of the test engineering group and maintaining liason between NOAA's Office of Ocean Engineering and the participants in the project. A plan established for validating the CWP analytic model is outlined. V.P.

A80-35163 # **The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses.** P. Y. Chang and R. A. Barr (Hydronautics, Inc., Laurel, Md.). In: Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980. New York, American Society of Mechanical Engineers, 1979, p. 7-20. 13 refs.

A frequency-domain method for analyzing the at-sea dynamic and static behavior of the OTEC cold water pipe (CWP) and platform/CWP designs is described. In this method, the CWP is treated as a linear elastic beam, making allowance for the coupling between the CWP and the platform. The documentation, validation, and capabilities of the method are discussed. Some relative methods merits of frequency-domain and time-domain methods are noted. V.P.

A80-35164 # **An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current.** J. R. Paulling (California, University, Berkeley, Calif.). In: Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980. New York, American Society of Mechanical Engineers, 1979, p. 21-28. Research supported by Giannotti and Associates.

A80-35165 # **Structural analysis of a cold water pipe for a 40MWe spar OTEC platform.** W. K. Jawish, III (Giannotti and Associates, Inc., Annapolis, Md.) and W. P. Deuchler (Gibbs and Cox, Inc., Arlington, Va.). In: Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980. New York, American Society of Mechanical Engineers, 1979, p. 29-46. 11 refs.

A80-35166 # **At-sea test of a large diameter steel, cold water pipe.** R. W. Blevins, H. L. Donnelly, J. T. Stadter, R. O. Weiss (Johns Hopkins University, Laurel, Md.), and L. Perez y Perez (Deep Oil Technology, Inc., Irvine, Calif.). In: Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980. New York, American Society of Mechanical Engineers, 1979, p. 47-65. Research supported by the U.S. Department of Energy.

During December 1978 and January 1979, a series of tests were conducted off Santa Catalina Island, California, on a large-diameter steel pipe. The pipe was 5 ft (1.52 m) in diameter and made up in 20-ft (6.10 m) sections to obtain a total length up to 500 ft (152.4 m). Deep Oil Technology's X-1 semi-submersible platform was used to support the pipe through a gimbal joint and the platform was moored with spring buoys in 1000 ft (304.8 m) of water. The objectives were to evaluate the at-sea performance of various configurations and to use the test results to verify or improve existing time and frequency domain analyses of cold-water pipes for Ocean Thermal Energy Conversion (OTEC) plants. The configurations tested were platform alone; platform with 120-ft (36.58 m) pipe, with 300-ft (91.44 m) pipe, with 500-ft (152.4 m) pipe and with 384-ft (117.0 m) pipe including a U-joint at 162 ft (49.38 m). The results of the analyses indicate that the frequency locations of the spectral peaks are generally well predicted, but comparison of the peak values is in poorer agreement. (Author)

A80-35167 # **Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms.** J. C. Oliver, III (Giannotti and Associates Inc., Annapolis, Md.). In: Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980. New York, American Society of Mechanical Engineers, 1979, p. 67-87. 26 refs.

The present comparative evaluation of approaches to the prediction of wave drift forces acting on floating bodies was motivated by the disparities in the predictions of two contractors for the OTEC platform designs. A number of theories and methods for the calculation of mean and slowly varying drift forces have been evaluated, on the basis of specially devised criteria, to select the methods (and organizations) which provide the highest probability for accurate prediction of stationkeeping subsystem loading. V.P.

A80-35379 # **On the low frequency drift wave and the pseudoclassical diffusion.** C.-F. Zhang (Peking University, Peking, Communist China). *Acta Physica Sinica,* vol. 29, Feb. 1980, p. 214-224. 5 refs. In Chinese, with abstract in English.

The relationship between the low frequency drift wave and the empirical law of anomalous transport in Tokamak pseudo-classical diffusion is discussed. It is shown that it is the collisionless drift wave, rather than the dissipative wave, which corresponds to the pseudoclassical diffusion. If the linear unstable collisionless drift wave is saturated mainly by the quasilinear relaxation process, it can lead to a diffusion of the pseudo-classical type. The range of the parameters in which the above mentioned mechanism may be effective is discussed. (Author)

A80-35403 **MHD direct channel from heat to electricity.** N. Lihach. *EPRI Journal,* vol. 5, Apr. 1980, p. 21-25.

The potential benefits and difficulties of the development and operation of a combined MHD/steam electric generating plant are assessed. The concept of MHD power generation by the passage of extremely hot, pressurized coal combustion gases ionized by a seeding material through the field of a superconducting magnet, coupled with conventional steam generation using the MHD exhaust gases as a heat source, is outlined, and areas of MHD technology requiring extensive development are indicated. Recent research on these areas is reviewed, and achievements in MHD channel durability, superconducting magnets, power inverters and the planned start-up of a 40-50 MW component development and integration facility are noted. Development strategies to ensure the competitiveness of MHD with other advanced power systems are discussed, and means of ensuring reliability are indicated. The economic potential of MHD is considered, and it is noted that MHD may also be coupled with future fusion and high-temperature nuclear reactors. A.L.W.

A80-35434 **Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas.** T. Maekawa, Y. Terumichi, and S. Tanaka (Kyoto University, Kyoto, Japan). *Physical Society of Japan, Journal,* vol. 48, Mar. 1980, p. 965-972. 25 refs. Research supported by the Japan Society for the Promotion of Science.

Incident lower hybrid waves propagate toward the center of the plasma in a spiral form in the poloidal and the toroidal sections and finally are absorbed by the ion and/or the electron Landau damping within the limited spatial region in accordance with the refractive index parallel to the magnetic field, N//, which is varied considerably along the trajectory, because of the toroidicity and the rotational transform. The scaling law of the wave trajectories on plasma parameters is proposed, which shows that the control of N// or the applied frequency is necessary during the lower hybrid heating. These wave trajectories and damping based on the unmagnetized ion model are compared with those based on the magnetized ion model. (Author)

A80-35438 **Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak.** S. Shinohara, K. Sakuma, S. Tsuji, and H. Toyama (Tokyo, University, Tokyo, Japan). *Physical Society of Japan, Journal,* vol. 48, Mar. 1980, p. 1051, 1052.

A80-35439 **Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak.** S. Yamamoto, Y. Shimomura, K. Ohasa, H. Kimura, S. Sengoku, K. Odajima, T. Matsuda, H. Matsumoto, H. Ohtsuka, and H. Maeda (Japan Atomic Energy Research Institute, Tokai, Ibaraki, Japan). *Physical Society of Japan, Journal,* vol. 48, Mar. 1980, p. 1053, 1054. 8 refs.

The role of runaway electrons in the formation of arcing on the electrically isolated target in the scrape-off layer of tokamaks is discussed. Runaway electrons offer the sufficient sheath potential to produce an arc spot and supply the circulating current to sustain an arc in the current rising phase and in the disruptive phase of tokamak discharge. (Author)

A80-35499 * # **An exploratory survey of noise levels associated with a 100 kW wind turbine.** J. R. Balombin (NASA, Lewis Research Center, Cleveland, Ohio). *Acoustical Society of America, Meeting, 99th, Atlanta, Ga., Apr. 21-25, 1980, Paper.* 18 p.

During performance tests of a 125-foot diameter, 100 kW wind turbine at the NASA Plum Brook Station near Sandusky, Ohio, the opportunity arose to make exploratory noise measurements and results of those surveys are presented. The data include measurements as functions of distance from the turbine, and directivity angle, and cover a frequency range from 1 Hz to several kHz.

Potential community impact is discussed in terms of A-weighted noise levels relative to background levels, and the infrasonic spectral content. Finally, the change in the sound power spectrum associated with a change in the rotor speed is described. The acoustic impact of this size wind turbine is judged to be minimal. (Author)

A80-35574 * # **Advanced Gas Turbine Powertrain System Development Project.** H. E. Helms (General Motors Corp., Detroit Diesel Allison Div., Detroit, Mich.). *U.S. Department of Energy and NASA, International Automotive Propulsion Systems Symposium, 5th, Dearborn, Mich., Apr. 14-18, 1980, Paper.* 27 p. Contract No. DEN3-168.

A progress report on the Advanced Gas Turbine Powertrain System Development Project being performed under contract from NASA Lewis is presented. The goals and objectives of the project are described noting that funds from the DOE, Office of Transportation Programs are used to sponsor the project. Among the demonstration objectives are attaining a fuel economy of 42.5 miles per gallon in a 1985 Pontiac Phoenix, multifuel capability, and emission levels within the federal standards. Design objectives examined include competitive reliability and life as well as competitive initial and life cycle costs. Finally, it is stressed that high risk and key elements in this advanced powertrain project are the development of ceramic turbine engine components and the aerodynamic development of small size turbine components. M.E.P.

A80-35685 **Effect of current constriction at electrodes on MHD generator characteristics.** V. A. Bitiurin and G. A. Liubimov (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, Sept.-Oct. 1979, p. 1069-1081.) *High Temperature,* vol. 17, no. 5, Mar. 1980, p. 879-888. 19 refs. Translation.

Relations are obtained which close the hydraulic system of equations for calculating flows in MHD generator channels which allow for the arc character of the discharge at the electrodes. These relations are the components of Ohm's law averaged in a special way with allowance for the essentially three-dimensional character of the distributions of the electrodynamic parameters in the presence of arcs on the electrodes. Possible computational procedures are discussed, or alternatively, a set of experimental data, which make it possible to determine all the required quantities in the relations obtained. (Author)

A80-35717 # **Atmospheric considerations for design of WECS.** R. W. Thresher (Oregon State University, Corvallis, Ore.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 13-27; Discussion, p. 29.

Interrelationships between atmospheric criteria and wind turbine design are investigated. Attention is given to the characteristics of the site and to quasi-steady structural design requirements. As an example, the problem of determining the tower design for a specific wind turbine is considered; the tower is a uniform circular steel tower and the turbine is a 200 kW system. B.J.

A80-35718 # **Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program.** M. A. Bowes and R. Perley (Kaman Aerospace Corp., Bloomfield, Conn.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 31-44; Discussion, p. 45. Research sponsored by the U.S. Department of Energy.

A80-35724 # **Data analysis at the Rocky Flats Wind Systems Test and Development Center.** A. C. Hansen (Rockwell International Corp., Rocky Flats, Colo.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 103-110; Discussion, p. 111, 112.

At the Rocky Flats Wind Systems Test and Development Center, data analysis techniques are in use that make possible the interpretation of every instant in the operation of wind energy conversion systems in random winds. This paper discusses three of the methods in use and gives examples of their application using samples of data from Enertech 1500 and Jacobs 3-kW systems. The method-of-bins is shown to be the proper method for obtaining a system power curve and a useful method for examining a variety of system parameters. Joint probability distribution methods are useful for visually displaying system behavior and for the identification of hysteresis. Frequency domain analyses are essential to understanding the transient response of wind systems to a turbulent wind input. B.J.

A80-35725 # **Some meteorological activities in the National Swedish Wind Energy Program.** T. Faxen (Uppsala, Universitet, Uppsala, Sweden). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 113-130. 10 refs.

Two major projects of the National Swedish Wind Energy Program are described: (1) the meteorological field station at the 60-kW windmill at Kalkugnen, and (2) the Gotland-Skane project, intended to determine sites for two 1-2 MW prototype windmills. A preliminary study indicates that the meteorological project at Kalkugnen is likely to give data of great use for wind energy technology. Continuous recording is a necessary condition for the performance evaluation of the windmill and its dependence on wind speed, wind direction, and stability. The second study gives a good example of what can be accomplished with ordinary pibal trackings; the result is an extensive data set of high quality that can be used not only for its original purpose but also for future studies and tests. B.J.

A80-35726 # **Turbulence and WTG performance.** R. H. Kirchhoff (Massachusetts, University, Amherst, Mass.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 131-137; Discussion, p. 139.

The UMass 25-kW wind turbine (Cromack et al. 1977) has been instrumented to determine its steady state and dynamic operating characteristics. The results presented in this paper focus on the dynamic response of the turbine. R. M. Young Gill-type anemometers are used to measure the turbulent wind characteristics. Generator output and other response characteristics of interest are recorded on FM tape. These data are digitized and eventually processed using the Biomedical Statistical Package. The results reported herein are an analysis of two time series. (Author)

A80-35727 # **Wind turbine dynamic blade loads due to wind gusts and wind direction changes.** W. Stoddard (U.S. Windpower Associates, Burlington, Mass.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 141-150.

A80-35730 * # **The use of wind data with an operational wind turbine in a research and development environment.** H. E. Neustadter (NASA, Lewis Research Center, Cleveland, Ohio). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 179-188; Discussion, p. 189. 9 refs.

It is noted that in 1976, 17 candidate sites were identified for detailed evaluation as potential sites for installation of large, horizontal axis Wind Turbines (WT). Attention is given to the Mod-OA, a 200 kW WT located in Clayton, New Mexico. The discussion covers the meteorological data collected, some of the analyses based on these wind data as well as additional areas currently being investigated in relation to these data. M.E.P.

A80-35738 # **Manufacturers' view of wind resource assessments.** W. Wiesner (Boeing Engineering and Construction, Seattle, Wash.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 285-291.

A typical analysis of wind resource data by a manufacturer of large wind turbines is presented. Apart from general region surveys, the analysis includes an exploratory survey of potential sites which results in wind speed frequency distributions based on one year of data, and detailed site surveys over two years or more which provide accurate wind gradient (shear) data, variability of wind direction and magnitude information, and wind direction frequency distribution. This information is necessary for determining the layout of wind turbines in a cluster, and for determining how well the turbines can provide electricity to the utility grid. The use of wind data is illustrated by examples. V.L.

A80-35739 # **Agricultural applications of wind resource assessments.** G. L. Johnson (Kansas State University of Agriculture and Applied Science, Manhattan, Kan.) and J. Wagner (Development Planning and Research Associates, Inc., Manhattan, Kan.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 293-301, 303. 6 refs.

A80-35748 # **WECS site screening by physical modeling.** R. N. Meroney (Colorado State University, Fort Collins, Colo.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 393-404. 11 refs. Contracts No. EG-77-S-06-1043; No. EY-76-S-06-2438.

Results of the physical modeling of the interactions of wind and topography to be used in wind-power generator site selection are presented. The modeling involved the measurement of air velocity and turbulence over a scale model of selected terrain features placed in a simulated atmospheric flow. Measurements of wind speed, turbulence intensity, static pressure, skin friction and spectra made for a number of generic two-dimensional model hill shapes are discussed, and methods for the prediction of mean wind velocities over actual ridge crests and turbulence effects on the basis of model distributions are indicated. Comparisons of wind velocities calculated from laboratory simulations with field measurements obtained at Rakaia Gorge, New Zealand and Kahuku Point, Oahu are presented which demonstrate the validity and usefulness of physical modeling in wind prediction and wind power system siting. A.L.W.

A80-35750 # **Status of the Large Wind Turbine Siting Handbook.** T. R. Hiester and W. T. Pennell (Battelle Pacific Northwest Laboratories, Richland, Wash.). In: Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings. Boston, Mass., American Meteorological Society, 1979, p. 417-428. Contract No. EY-76-C-06-1830.

A80-36048 **RF feedback stabilization of a thin line cusp magnetoplasma sheath.** R. Jones (Natal, University, Durban, Republic of South Africa). *Plasma Physics,* vol. 22, Apr. 1980, p. 355-359. 9 refs. Research supported by the South African Atomic Energy Board.

The stabilization of naturally occurring plasma microinstabilities in magnetoplasma line cusps by RF feedback is investigated as a means of recovering plasma leaks in a cusp-confined plasma. Langmuir and capacitance probes were used to detect and launch RF signals in and around the subject line cusp used for surface magnetic confinement in the ion source of a double plasma device. The ambient plasma noise is observed to vary with the phase of feedback amplification, leading to a widening of the plasma cusp channel upon positive feedback. When negative feedback is applied, a thinner cusp channel is obtained, corresponding to a width only slightly greater than the theoretical hybrid leak width. It is also noted that plasma flow speed into the cusp remains constant as the cusp width is modified, while the effects of sheath narrowing on central plasma density have not been determined. A.L.W.

A80-36397 **Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections.** J. A. Holmes and Y.-K. M. Peng (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *Journal of Computational Physics,* vol. 36, June 1980, p. 35-54. 24 refs. Contract No. W-7405-eng-26.

A model and associated procedures are presented which provide a method for studying the time evolution of MHD equilibria subject to various particle and energy source terms. It is demonstrated that the numerical results obtained with these procedures satisfy satisfactory convergence criteria as well as consistency between the one-dimensional and two-dimensional parts of the problem. Further, through the use of a fixed boundary equilibrium routine, it is possible to prescribe the evolution of the plasma boundary to permit the treatment of cases in which the plasma cross section changes significantly and in which precise plasma positioning and shaping are required, without the necessity of using external fields and coils. Finally, the method is applied to the neutral beam heating of a prototypical reactor plasma to ignition. M.E.P.

A80-36430 # **The helical hydromagnetic dynamo (O vintovom gidromagnitnom dinamo).** Iu. B. Ponamarenko. *PMTF - Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki,* Mar.-Apr. 1980, p. 22-28. 9 refs. In Russian.

The analysis deals with the steady-state electrodynamics in a conducting fluid in which external forces maintain a velocity field. In earlier studies of self-sustaining dynamos, it has been shown that, in a helical geometry, a magnetic field is excited by discontinuous axisymmetric motion of an electrically conducting fluid. In the present paper, the question whether the solutions hold in the case where the axisymmetric motion is continuous is examined. The problem is formulated as the excitation of a magnetic field by the helical motion of a conducting fluid in which the angular and axial velocities are constant within a cylinder of unit radius, are inversely proportional to the square of the radius beyond the cylinder, and are discontinuous on the cylinder. In the case of continuous motion, the number of eigenvalues with a positive increment is shown to increase indefinitely with increasing angular velocity. V.P.

A80-36590 **Influence of base resistivity on the temperature characteristics of silicon photoconverters.** V. G. Doroshenko, M. B. Zaks, G. I. Klimova, E. S. Russkikh, and Z. A. Stepanova. *(Geliotekhnika,* vol. 15, no. 5, 1979, p. 23-29.) *Applied Solar Energy,* vol. 15, no. 5, 1979, p. 16-22. 13 refs. Translation.

The paper demonstrates that the efficiency and no-load voltage of silicon photoconverters (PC) have an increased sensitivity to temperature effects. There is a reduction in the temperature coefficient of short-circuit current as the resistivity of the photoconverter base increases in the 100-400 K range. The investigated PC's were fabricated from p-type silicon; the n/+/-p and n/+/-p-p/+/ structures were produced by diffusion of phosphorus and boron from doping solutions to depths of 0.7 and 1 micron. It is concluded that for sufficiently large instantaneous rates of change in PC temperature during thermal cycling, destruction of the contact system of the device is not limited to the doped layer of the PC, but develops in the base region of the specimen. A.T.

A80-36714 **Derivation of CGL theory with finite Larmor radius corrections.** R. K. Chhajlani and S. C. Bhand (Vikram University, Ujjain, India). *Journal of Plasma Physics,* vol. 23, Apr. 1980, p. 205-208. 16 refs.

A method has been developed for the derivation of Chew-Goldberger-Low (CGL) theory for a collisionless plasma in the presence of a strong magnetic field. The pressure tensor in the pressure tensor equation is expanded in the inverse power of Larmor frequency. In the zeroth order, CGL equations are obtained and, in the higher order, finite Larmor radius corrections to CGL equations are derived. (Author)

A80-36726 On the validity of a hydrodynamic description of laser-driven fusion. D. N. Lowy (New South Wales, University, Kensington, Australia) and H. J. Kreuzer (New South Wales, University, Kensington, Australia; Alberta, University, Edmonton, Canada). *Journal of Plasma Physics,* vol. 23, Apr. 1980, p. 357-381. 32 refs.

The validity of hydrodynamic approximations for non-equilibrium plasmas is examined, with emphasis on applications to laser-driven fusion pellets. Typical density-temperature trajectories of such pellets, as predicted by hydrodynamic calculations in the published literature, are shown to lie sometimes outside the region of validity of hydrodynamic theory, which is an unsatisfactory situation. In view of this, certan criteria which can be easily used to test the self-consistent validity of any hydrodynamic result are discussed. Finally, it is noted that in the low-density, low-temperature plasma region, hydrodynamics initially breaks down because of a breakdown in conventional microscopic linear response theory. A modified microscopic theory is proposed with continues to be valid in the region. This may correspondingly extend the validity of hydrodynamics to plasmas of somewhat lower temperatures and densities. (Author)

A80-36831 Maximum refrigerating capacity of thermoelectric cooling devices. R. V. Koval'skii (Vsesoiuznyi Nauchno-Issledovatel'skii Institut Istochnikov Toka, Moscow, USSR). *(Geliotekhnika,* no. 4, 1979, p. 19-24.) *Applied Solar Energy,* vol. 15, no. 4, 1979, p. 16-20. 6 refs. Translation.

The paper investigates conditions under which a thermoelectric refrigerator with constant working-fluid temperature and a specified cold-generation capacity has minimum size, weight, and amount of thermoelectric material. The effect of switching losses on device optimization is considered, and an analytical relationship for determining optimal branch height of thermoelectric elements is proposed. B.J.

A80-36936 * Photoemission measurements of interface barrier energies for tunnel oxides on silicon. P. V. Dressendorfer and R. C. Barker (Yale University, New Haven, Conn.). *Applied Physics Letters,* vol. 36, June 1, 1980, p. 933-935. 18 refs. Navy-NASA-supported research.

Internal photoemission measurements of the Si/SiO2 and Al/SiO2 barrier heights on oxides of tunneling thickness (43-56 A) are compared with measurements on thick oxides (310 A and greater) and the barrier heights are found to be the same. The results suggest that substantially thinner oxides, grown by the same method, can be characterized by the same barrier heights. Limits to the experimental technique posed by photovoltaic and displacement currents, and transport of hot carriers in the tunnel oxide are discussed. (Author)

A80-37004 Surface area loss of platinum supported on carbon in phosphoric acid electrolyte. G. A. Gruver, R. F. Pascoe, and H. R. Kunz (United Technologies Corp., Power Systems Div., South Windsor, Conn.). *(Electrochemical Society, Meeting, Pittsburgh, Pa., Oct. 15-20, 1978.) Electrochemical Society, Journal,* vol. 127, June 1980, p. 1219-1224. 25 refs.

An experimental study was conducted to determine the surface area loss of platinum supported on carbon in a 191 C phosphoric acid fuel cell environment and to define the mechanism for this process. The surface area was found to decline rapidly initially, but remains above 20 sq m/g for 20,000 hr, the longest time period investigated. A study of the effect of operating potential, transmission electron microscope studies of electrodes, and Pt deposited on a carbon film, and the results of other previous studies indicate that crystallite migration and coalescence are the major mode by which Pt surface area is lost in this situation. (Author)

A80-37006 Metal filmed-semiconductor photoelectrochemical cells. S. Menezes, A. Heller, and B. Miller (Bell Telephone Laboratories, Inc., Murray Hill, N.J.). *Electrochemical Society, Journal,* vol. 127, June 1980, p. 1268-1273. 12 refs.

Voltammetric and light-to-electrical energy conversion characteristics of metallized semiconductor Schottky junctions with redox solution contacts are reported. Electrodeposited noble metal films on n-GaAs establish contacts to reversible aqueous redox couple solutions that can sustain solar photocurrent levels with low loss, requiring only a thin metal layer adequate to photovoltaic barrier formation. Possible advantages in lateral conductivity, relative to solid-state Schottky devices, and in surface stability and redox electrolyte independence, relative to semiconductor-liquid junction solar cells, are weighed against both the absorptive losses in the metal layer and the practicalities of obtaining sufficient integrity in the film to serve the semiconductor corrosion protection function. Gold, platinum, and rhodium plated n-GaAs with carbon counter-electrodes and ferro-ferricyanide solutions give 2-6% conversion efficiency under solar irradiance. (Author)

A80-37007 Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell. P. G. P. Ang and A. F. Sammells (Institute of Gas Technology, Chicago, Ill.). *Electrochemical Society, Journal,* vol. 127, June 1980, p. 1287-1294. 22 refs.

A80-37008 Glassy electrolyte galvanic cells. T. Minami, T. Katsuda, and M. Tanaka (Osaka Prefecture, University, Sakai, Japan). *Electrochemical Society, Journal,* vol. 127, June 1980, p. 1308-1310. 10 refs. Research supported by the Asahi Glass Foundation for the Contribution of Industrial Technology.

The AgI-Ag2O-MoO3 and AgI-Ag2O-P2O5 glass systems used in galvanic cells are examined for their electrolytic properties. The measured initial open-circuit voltages of 687.0, 687.0, and 685.4 mV for three different compositions are very close to the theoretical value, 687.3 mV, for the standard emf. These values are stable and decrease by 1-2 mV in 30 days. Current densities of 1 mA/sq cm are obtained without significant polarization. The discharge parameters are found to be comparable to those of the cells with crystalline electrolytes. V.L.

A80-37181 Review of the ISX-B experimental program. M. J. Saltmarsh (Oak Ridge National Laboratory, Oak Ridge, Tenn.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology,* vol. 17, Jan.-Feb. 1980, p. 260-267. 23 refs. Contract No. W-7405-eng-26.

The ISX-B tokamak is a modestly sized device that is designed to explore questions closely related to the design of future tokamak devices, such as the Engineering Test Facility (ETF). The major program emphasis is on high-beta plasma operation using neutral beams to heat plasmas with noncircular cross sections. In addition, substantial efforts are under way or planned in the areas of plasma-wall interactions, coated limiter studies, electron-cyclotron heating, ripple injection, impurity flow reversal, pellet injection, and the application of a bundle divertor. The current status and future plans for these programs are reviewed. (Author)

A80-37182 Design and operational characteristics of the cryopump high-vacuum system for the 25000-l target chamber of the Helios Laser Facility. N. G. Wilson (California, University, Los Alamos, N. Mex.) and K. N. Watts (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology,* vol. 17, Jan.-Feb. 1980, p. 270-273. Research sponsored by the U.S. Department of Energy.

A80-37185 **Transient getter scheme for the tokamak fusion test reactor.** J. L. Cecchi, S. A. Cohen (Princeton University, Princeton, N.J.), and J. J. Sredniawski (Grumman Aerospace Corp., Bethpage, N.Y.). *(American Vacuum Society, National Symposium, 26th, New York, N.Y., Oct. 1-5, 1979.) Journal of Vacuum Science and Technology,* vol. 17, Jan.-Feb. 1980, p. 294-297. 15 refs. Contract No. EY-76-C-02-3073.

A method has been developed of utilizing SAES Zr/Al getter modules, which obviates the need for frequent interruptions of machine operation by using the pulsed operation of TFTR. These interruptions are required for regeneration of the absorbed tritium after as few as 50 machine pulses. With the Zr/Al getter at 500-600 C it is possible to achieve a quasisteady state in tritium loading where the quantity of tritium desorbed between pulses is equal to the quantity which is absorbed during a pulse. Since frequent thermal cycling is not required, this scheme also reduces the possibility of Zr/Al getter material fatigue. A.T.

A80-37812 # **Pulsed power for fusion.** T. H. Martin (Sandia Laboratories, Albuquerque, N. Mex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 2-8. 9 refs. Contract No. DE-AC04-76DP-00789.

The modular ICF pulsed power concept which can provide systems to 1000 TW and 30 MJ with improvements in technology and reliability is presented. The pulsed types of accelerators are 30 to 50% efficient, and they can provide an approach to economically feasible 200 MW power reactor for ion outputs in the 1 to 3 MJ range. Repetitive pulsing of the pulsed power system for more than 10 to the 9th short lifetimes must be solved along with ion beam concentration, bunching, and drifting. A.T.

A80-37815 # **Accelerator module of 'Angara-5'.** S. V. Basenkov, O. A. Gusev, Iu. A. Istomin, Iu. V. Koba, G. M. Latmanizova, A. M. Pasechnikov, B. P. Pevchev, O. P. Pecherskii, A. S. Perlin, and L. I. Rudakov (Akademiia Nauk SSSR, Institut Atomnoi Energii, Moscow, USSR). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 25-30. 9 refs.

Design of the inertial confinement fusion multi-module 'Angara-5' accelerator is considered. The computed output parameters of an individual module are presented, and the predicted output was compared with the pulse-shaping line mock-up measurements. According to these measurements the end-on section contributes 21% of the total pulse-shaping line capacitance. The end-on capacitance was accounted for in computations via transmission line sections with appropriate impedance values. The reasonable choice of the pulse-shaping equivalent circuit was confirmed by experimental data and was in agreement with calculations based on system design features. A.T.

A80-37818 # **The near and long term pulse power requirement for laser driven inertial confinement fusion.** W. L. Gagnon (California, University, Livermore, Calif.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 49-54. 14 refs. Contract No. W-7405-eng-48.

The paper examines pulse power requirements for laser driven inertial confinement fusion. At the Lawrence Livermore Laboratory emphasis has been placed on the development of large Nd:glass laser systems in order to solve the basic physics problems associated with light driven fusion targets. A parallel program is aimed at the development of lasers which exhibit higher efficiencies and shorter wavelengths and thus are more suitable as drivers for fusion power plants. The paper discusses the pulse power technology developed to meet the needs of the laser fusion program at Livermore. A.T.

A80-37820 # **Repetitively pulsed electron beam diode lifetime and stability.** M. T. Buttram (Sandia Laboratories, Albuquerque, N. Mex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 61-64. Contract No. DE-AC04-76DP-00789.

Repetitively pulsed vacuum beam diodes will be required for most projected inertially confined fusion systems. Yet data on the operation of diodes under repetitive pulsing is sparse. This paper discusses the operation of a 250 kV, 1.5 kA/sq cm diode at repetition rates to 30 Hz for sustained runs. Short term stability is typically 3 percent (standard deviation). In a longer term there is a drift toward higher impedance at the start of the pulse. Details on this drift and a comparison of this process for a blunt versus sharp edged cathode are presented. (Author)

A80-37824 # **Fundamental limitations and design considerations for compensated pulsed alternators.** W. F. Weldon, W. L. Bird, M. D. Driga, K. M. Tolk, H. G. Rylander, and H. H. Woodson (Texas, University, Austin, Tex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 76-82. 5 refs. Research supported by the Texas Atomic Energy Research Foundation; Contracts No. EG-77-S-05-5594; No. N60921-78-C-A249.

Fundamental limitations imposed on the design of a compensated pulsed alternator by the mechanical, thermal, magnetic, and electrical properties of the materials used are discussed. Based on these limitations, power and energy available from such a machine are calculated as functions of machine dimensions. New design approaches are suggested, which extend the operating limits of a compulsator concept. V.T.

A80-37825 # **Use of transformers in producing high power output from homopolar generators.** W. H. Lupton, R. D. Ford, D. Conte, H. B. Lindstrom, and I. M. Vitkovitsky (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 83-86. 6 refs. Research supported by the U.S. Defense Nuclear Agency.

Analysis is presented for systems using high current pulse transformers to exploit the high energy storage capability of homopolar generators or other limited current sources. The stepped-up secondary current can be established either by current interruption when the primary is also used for energy storage or by commutation of current into the primary from a separate storage inductor. For high-power pulse generators the primary insulation and power supply are protected by subsequent crowbarring of the primary. An example is given of a design for matching the NRL homopolar generator with 1.46 mH inductor to 1-microH megavolt level inductive pulse generator. (Author)

A80-37854 # **A large-area cold-cathode grid-controlled electron gun for Antares.** W. R. Scarlett, K. R. Andrews, and H. Jansen (California, University, Los Alamos, N. Mex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 261-264. Research sponsored by the U.S. Department of Energy.

The CO2 laser amplifiers used in the Antares inertial confinement fusion project require large-area radial beams of high-energy electrons to ionize the laser medium before the main discharge pulse is applied. A grid-controlled, cold-cathode electron gun with a cylindrical anode having a window area of 9.3 sq m has been designed. A full diameter, 1/4 length prototype of the Antares gun has been built and tested. The design details of the Antares electron gun are presented as well as test results from the prototype. Techniques used for the prevention and control of emission and breakdown from the grid are also discussed. (Author)

A80-37855 # **The Antares laser power amplifier.** R. D. Stine, G. F. Ross, and C. Silvernail (California, University, Los Alamos, N. Mex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers.

Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 265-268. 5 refs. Research sponsored by the U.S. Department of Energy.

The overall design of the Antares laser power amplifier is discussed. The power amplifier is the last stage of amplification in the 100-kJ Antares laser. In the power amplifier a single, cylindrical, grid-controlled cold-cathode, electron gun is surrounded by 12 large-aperture CO2 electron-beam sustained laser discharge sectors. Each power amplifier will deliver 18 kJ and the six modules used in Antares will produce the required 100 kJ for delivery to the target. A large-scale interaction between optical, mechanical, and electrical disciplines is required to meet the design objectives. Significant component advances required by the power amplifier design are discussed. (Author)

A80-37867 # **Safety grounding switches in large experiments - General considerations and the TEXT application.** P. Wildi (Texas, University, Austin, Tex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 355-358. Research supported by the U.S. Department of Energy.

The electrical installations of large fusion experiments present many potential dangers such as residual charges on capacitor banks and cables, power rectifiers, and other related power supplies. The paper reviews practices commonly employed to reduce such dangers and discusses the adequacy and safety of various grounding devices. The safety grounding scheme for the TEXT tokamak is described. Specially designed switches, their contact and operating mechanisms, and the integration of the switches in the overall control and safety system are discussed. B.J.

A80-37871 # **Magnet optimization for pulsed energy conversion.** W. K. Tucker, E. C. Cnare, W. P. Brooks (Sandia Laboratories, Albuquerque, N. Mex.), R. E. Wilcox, and W. D. Markiewicz (Intermagnetic General Corp., Guilderland, N.Y.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 381-384. 6 refs. Contract No. AT(29-1)-789.

PULSAR, a flux compression generator, is being developed to meet power requirements for future fusion reactors. This paper presents results of a study performed to design a suitable superconducting magnet for PULSAR. The systems analysis, parameter study, magnet design, and cost estimates are reviewed. It is shown that designs of three different sizes have been developed, allowing flexibility in the armature-generator configuration. The basic differences in the designs are of geometry and field. B.J.

A80-38012 **Sow wind turbines and reap the wind.** O. J. M. Smith (California, University, Berkeley, Calif.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 4. New York, Pergamon Press, Inc., 1980, p. 1796-1833. 7 refs.

A 6-meter-diameter wind turbine has been designed and constructed, which is easy to fabricate and maintain, has low weight, high strength, and low cost. The turbine, which is a modification of the traditional multibladed farmer windmill pump, is intended for rural areas and can be used to feed power directly into the existing A.C. distribution and transmission system. The turbine can deliver 10 KW in a 45 km/hr wind and 17 KW in a 60 km/hr wind. In a region with a 30 km/hr average wind speed, the turbine can deliver 105 KWH per day at a cost of only one cent per KWH. The turbine uses a low-cost mass-produced 2-speed squirrel-cage induction generator (or motor), and a wheel with a front and rear bearing, instead of a cantilevered shaft; it can be manufactured for $5000 each. V.L.

A80-38283 **Review - Materials aspects of wave energy converters.** J. A. Hudson, D. C. Phillips, and N. J. M. Wilkins (Atomic Energy Research Establishment, Harwell, Oxon, England). *Journal of Materials Science*, vol. 15, June 1980, p. 1337-1363. 38 refs.

A review of the device concepts for renewable energy sources in the UK is presented. The device concepts and the materials aspects of the full-scale Wave Energy Converter (WEC) development are described, with the emphasis on generic problems. The present estimates indicate high costs, so that future efforts will be directed at reducing them, particularly those of the main structure and the mooring system. The optimum use of materials will be essential; in certain areas gaps in existing materials have been identified and experimental programs initiated. A.T.

A80-38289 **Muon catalysis for energy production by nuclear fusion.** Iu. V. Petrov (Leningrad Nuclear Physics Institute, Gatchina, USSR). *Nature*, vol. 285, June 12, 1980, p. 466-468. 16 refs.

Jackson (1957) has arrived at a negative conclusion in his study of the possibility of using muon-catalyzed deuterium-tritium fusion (dt-fusion) for energy production. However, results obtained by Sakharov and Zeldovich (1960) indicate that muons may be suitable as catalysts of dt-fusion. A reevaluation of this situation, in the present paper, showed that the use of muon-catalyzed dt-fusion in combination with the fissile nuclides blanket can well provide a positive energy gain. V.P.

A80-38482 **Optical performance of the Gemini carbon dioxide laser fusion system.** V. K. Viswanathan, J. J. Hayden, and I. Liberman (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 165-171. 7 refs. Research sponsored by the U.S. Department of Energy.

The performance of the Gemini two beam carbon dioxide laser fusion system was recently upgraded by installation of optical components with improved quality in the final amplifier. A theoretical analysis was conducted in conjunction with measurements of the new performance. The analysis and experimental procedures, and results obtained are reported and compared. Good agreement was found which was within the uncertainties of the analysis and the inaccuracies of the experiments. The focal spot Strehl ratio was between 0.24 and 0.3 for both beams. (Author)

A80-38483 **Beam simultaneity in multi-terawatt CO2 laser fusion systems.** R. L. Carlson, D. E. Casperson, J. Hanlon, J. S. Ladish, R. Quicksilver, and C. Smith (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 172-177. Research sponsored by the U.S. Department of Energy.

A system to determine the relative time of arrival of intense, subnanosecond, CO2 laser pulses on a fusion target is described. It is now installed on the Helios CO2 laser system, a 10 kJ, 20 TW, eight-beam CO2 facility. This beam simultaneity system is inexpensive, easy to use, and has a resolution of less than + or - 5 ps. (Author)

A80-38484 **Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system.** R. F. Haglund, Jr., D. E. Casperson, S. J. Czuchlewski, C. J. Elliott, J. C. Goldstein, J. S. Ladish, and A. V. Nowak (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 178-185. 7 refs. Research sponsored by the U.S. Department of Energy.

A multi-component gaseous saturable absorber has been developed and modified to prevent the onset of parasitic oscillations coupling laser-fusion targets and the power amplifiers in the Helios CO2 laser system. This absorber mix greatly increases the extractable short-pulse energy of the laser system. A computer model that predicts the behavior of multi-component saturable absorbers has been tested against the measured performance of two different absorber gas mixes used in the Helios system. The successes and shortcomings of the model are discussed, and large and small-signal transmission data for the saturable absorber mixes and their constituent gases (used as input to the model) are presented.

(Author)

A80-38485 **Helios target positioning system.** R. D. Day, C. E. Cummings, J. A. Hanlon, H. E. Tucker, and R. W. Teasdale (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 191-196.

The Los Alamos Scientific Laboratory Helios laser fusion system focuses eight powerful CO2 laser beams onto a tiny (typical 300-micron-diam) DT-filled target. The focusing is accomplished inside a vacuum chamber that is 3.5 m in diameter by 3.5 m high. The target positioning system places the target to within 5.0 microns of a predetermined point in space. This is accomplished by using two orthogonal autocollimating telescopes to determine the center of a precisely located surrogate sphere. The target is then placed at the common focal point of the two telescopes. The Helios target positioning system has been meeting or exceeding its design requirements for about one year with minimal maintenance. It has proven to be a very effective system. (Author)

A80-38486 **Design of Helios beam diagnostics.** J. D. Seagrave, I. J. Bigio, S. V. Jackson, and A. M. Laird (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 197-206. Research sponsored by the U.S. Department of Energy.

Verification of satisfactory operation of the HELIOS eight-beam laser system requires measurement of many parameters of each beam on each shot. Fifty-joule samples of each of the eight 1250-J, subnanosecond 34-cm-diameter beams of the HELIOS system are diverted to a gallery of eight folded telescopes and beamsplit to provide diagnostic measurements. Total pulse energy, and prepulse and postlase energy of each beam are measured; pulse shape details and a wavelength spectrum of a selected beam from each shot are measured; and provision is made for retropulse measurement and optical quality monitoring. All data are recorded digitally in a local screen room, with control and communication through a fiberoptic link to the main HELIOS computer. (Author)

A80-38489 **Antares Power Amplifier optical system.** C. J. Silvernail (California, University, Los Alamos, N. Mex.) and K. C. Jones (California, University; EG & G, Inc., Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings.
Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 225-231. Research sponsored by the U.S. Department of Energy.

The optical systems of the six Antares Laser Power Amplifiers is described. These assemblies are preceded by the front-end optics and followed by the target system. Each power amplifier receives an annular input beam and divides it into 12 beams which are then directed to double pass them through 12 gain regions surrounding a central electron gun. Provisions are being made for spatially filtering each beam and for the possibility of adding saturable absorbers. Two keys to the successful completion of the power amplifier are: (1) the avoidance of unwanted lasing modes and hot spots in the wavefronts, and (2) the maintenance of alignment throughout the entire laser system, including the internal alignment of the Power Amplifier. The goal has been to minimize alignment problems by careful and simplistic design of the mountings, stressing modular assemblies and accessibility. Average energy densities of 2.0 J/sq cm for salt windows and 3.0 J/sq cm on copper mirrors have been accomplished, while extracting the largest possible energy from the volume of gas which is electrically pumped.

(Author)

A80-38490 **LOTS analysis of optical diffraction in Antares.** P. N. Wolfe, A. C. Saxman (California, University, Los Alamos, N. Mex.), and G. Lawrence (California, University, Los Alamos, N. Mex.; Arizona, University, Tucson, Ariz.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 232-237. Research sponsored by the U.S. Department of Energy.

Diffraction and aberration effects are calculated for the power-amplifier and target-system portions of the 100-kJ Antares laser fusion facility, using LOTS, a fast-Fourier-transform propagation code incorporating a model for saturating gain in CO2. Energy losses due to diffraction are found to be small compared to other losses. Diffraction 'hot spots' usually typical of propagation at low Fresnel numbers are effectively suppressed in the Antares power amplifier by gain saturation. Taking account of diffraction and aberrations over the whole optical train, the code predicts a target focal spot that has 82% of its energy in a 150-micron-diameter circle, a result essentially identical to what would be expected of the final focus mirror alone.

(Author)

A80-38491 **Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems.** G. Lawrence (Arizona, University, Tucson, Ariz.) and P. N. Wolfe (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings.
Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 238-242. 7 refs. Research sponsored by the U.S. Department of Energy and University of Arizona.

A80-38492 **Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems.** V. K. Viswanathan and P. D. Bolen (California, University, Los Alamos, N. Mex.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 243-250. 7 refs. Research sponsored by the U.S. Department of Energy.

A80-38493 **Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system.** V. K. Viswanathan, J. V. Parker (California, University, Los Alamos, N. Mex.), T. A. Nussmier, C. J. Swigert (California, University, Los Alamos, N. Mex.; Hughes Research Laboratories, Malibu, Calif.), W. King, A. S. Lau, and K. Price (California, University, Los Alamos, N. Mex.; Hughes Aircraft Co., Culver City, Calif.). In: Los Alamos Conference on Optics, University of California, Los Alamos, N. Mex., May 23-25, 1979, Proceedings. Bellingham, Wash., Society of Photo-Optical Instrumentation Engineers, 1979, p. 251-257. 8 refs. Research sponsored by the U.S. Department of Energy.

The Gemini two beam CO2 laser fusion system incorporates a complex optical system with nearly 100 surfaces per beam, associated with the generation, transport and focusing of CO2 laser beams for irradiating laser fusion targets. Even though the system is nominally diffraction limited, in practice the departure from the ideal situation drops the Strehl ratio to 0.24. This departure is caused mostly by the imperfections in the large (34 cm optical clear aperture diameter) state-of-the-art components like the sodium chloride windows and micromachined mirrors. While the smaller optical components also contribute to this degradation, the various possible misalignments and nonlinear effects are considered to contribute very little to it. Analysis indicates that removing the static or quasi-static errors can dramatically improve the Strehl ratio. A deformable mirror which can comfortably achieve the design goal Strehl ratio of not less than 0.7 is described, along with the various system trade-offs in the design of the mirror and the control system. (Author)

A80-38758 # **Modeling of safe-life tests of thermoelectric batteries (Modelirovanie resursnykh ispytanii termobatarei).** V. M. Babaev, E. M. Namazov, and A. S. Okhotin. In: Materials and processes for use in space technology. Moscow, Izdatel'stvo Nauka, 1980, p. 200-202. In Russian.

Long-term testing of thermoelectric generators, designed for use in SNAP-type systems to provide power for space manufacturing experiments, is described. Generator power requirements are reviewed, and problems associated with the development of thermoelectric generators designed for several years of operation are considered. Finally, methods for modeling accelerated life tests of such generators are analyzed. B.J.

A80-38902 * # **Advanced component technologies for energy-efficient turbofan engines.** N. T. Saunders (NASA, Lewis Research Center, Cleveland, Ohio). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1086.* 11 p. 6 refs.

The paper reviews NASA's Energy Efficient Engine Project which was initiated to provide the advanced technology base for a new generation of fuel-conservative engines for introduction into airline service by the late 1980s. Efforts in this project are directed at advancing engine component and systems technologies to a point of demonstrating technology-readiness by 1984. Early results indicate high promise in achieving most of the goals established in the project. V.P.

A80-38964 # **Turbopropulsion combustion - Trends and challenges.** K. N. Hopkins (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1199.* 11 p. 6 refs.

Combustor and related engine cycle parameters are surveyed using data from 23 military engines produced between 1956 and 1979. Expected combustor related challenges resulting from normal engine advancements required for future fighter applications are addressed. Future problems are discussed with emphasis on compact combustors and improved liner cooling in a high pressure, high temperature engine environment with stringent durability requirements. (Author)

A80-39014 # **A perspective on closed-cycle gas turbines applied to naval-ship propulsion.** T. L. O. Horton, S. C. Kuo, H. T. Shu, C. W. Deane, and E. R. Fisher (United Technologies Research Center, East Hartford, Conn.). *AIAA, SAE, and ASME, Joint Propulsion Conference, 16th, Hartford, Conn., June 30-July 2, 1980, AIAA Paper 80-1304.* 7 p. 7 refs. Contract No. N00014-77-C-0735.

This paper presents the results of a systems study to evaluate the potential performance, suitability, impact and development requirements of closed-cycle gas turbines (CCGT) when applied to naval ship propulsion. The performance and design characteristics of CCGT systems are estimated based on a fossil-fired heater using marine diesel fuels. The impact of the CCGT system on payload is presented for a selected most-attractive ship type. The potential development requirements (in terms of technology, time and cost) for the entire advanced propulsion system are then projected. (Author)

A80-39539 **Breakeven for thermonuclear fusion in the hot-ion mode.** S. E. Segre (EURATOM and Comitato Nazionale per l'Energia Nucleare sulla Fusione, Frascati, Italy). *Nuovo Cimento B, Serie 11,* vol. 57 B, May 11, 1980, p. 50-58. 6 refs.

The condition for fusion breakeven is derived for the hot-ion mode in which the ion temperature considerably exceeds the electron temperature. It is found that the conditions for breakeven in this mode are greatly eased compared to the case of equal ion and electron temperatures. The critical value of the electron temperature is strongly reduced indicating the possibility of reaching breakeven with relatively weak additional heating. (Author)

A80-39642 * # **Comments on TEC trends.** J. F. Morris (NASA, Lewis Research Center, Cleveland, Ohio). *Institute of Electrical and Electronics Engineers, International Conference on Plasma Science, Montreal, Canada, June 4-6, 1979, Paper.* 26 p. 54 refs.

The paper comments on published and projected thermionic-energy-conversion (TEC) performance trends. This commentary includes graphs and an appendix relating TEC performance parameters, plots of predicted and actual TEC trends, a figure relating projected cost of electricity to overall efficiency for TEC topping, and a discussion of the implications of these relationships. V.T.

A80-39746 **Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators.** J. K. Koester (Stanford University, Stanford, Calif.) and R. A. Perkins (Lockheed Metallurgy and Composites Laboratory, Palo Alto, Calif.). *Journal of Materials for Energy Systems,* vol. 1, Sept. 1979, p. 41-54. 8 refs. Research sponsored by the Electric Power Research Institute.

The behavior of slag coated electrodes under applied transverse discharges at MHD generator duct conditions was investigated for various metal electrodes and two different coals. The critical current density for diffuse mode operation was an order of magnitude larger for iron (1018 steel) than for stainless steel or nickel electrodes. The erosion rate was large for iron anodes, but negligible for iron cathodes. Slag layers were found to have ionic as well as electronic conductivity with iron and potassium as the mobile species. This test was used to screen several electrode materials, including both active and noble metals. The polarization effects were orders of magnitude more severe for the noble materials. (Author)

A80-39763 # **Heavy-ion-driven fusion.** *Energy and Technology Review,* Mar. 1980, p. 16-23. 12 refs.

The possibility of driving inertial confinement fusion (ICF) implosions with beams of heavy ions is investigated with special reference to the adaptation of conventional high-energy accelerator technology to the purpose of inertial fusion power production. High-energy accelerators are reliable, have long lifetimes, high repetition rates (1 Hz and higher), and can be quite efficient (about 25%); this makes heavy-ion accelerators appear well suited as drivers for ICF power plants. Major design considerations are examined together with operating parameters, and criteria of driver choice. However, further experimental work is necessary to substantiate the theoretical promise of the heavy-ion approach to ICF. V.L.

A80-39899 **A new design of Stirling engine for automotive application.** C. Caputo and V. Naso (Roma, Università, Rome, Italy). *International Journal of Vehicle Design,* vol. 1, May 1980, p. 239-256. 17 refs. Research supported by the Consiglio Nazionale delle Ricerche.

The advantages and disadvantages of the Stirling engine vis a vis conventional engines for automotive power are discussed. The paper describes a new Stirling engine design constructed by the authors, the essential feature of which is two interlocking pistons moving at right-angles. Details of the mechanical arrangement and functioning are given. Tests are in progress to determine the efficacy of seals and balancing. (Author)

A80-40335 * # **Modified aerospace R&QA method for wind turbines.** W. E. Klein (NASA, Lewis Research Center, Cleveland, Ohio). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings.

New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 254-258.

This paper describes the Safety, Reliability and Quality Assurance (SR&QA) approach developed for the first large wind turbine generator project, MOD-OA. The SR&QA approach to be used had to assure that the machine would not be hazardous, would operate unattended on a utility grid, would demonstrate reliable operation, and would help establish the quality assurance and maintainability requirements for wind turbine projects. The final approach consisted of a modified Failure Modes and Effects Analysis (FMEA) during the design phase, minimal hardware inspections during parts fabrication, and three documents to control activities during machine construction and operation. (Author)

A80-40337 **Safety analysis of an advanced energy system facility.** J. R. Lance, G. A. Mutone (Westinghouse Electric Corp., Pittsburgh, Pa.), and E. F. Bjoro (U.S. Department of Energy, Washington, D.C.). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings. New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 268-274.

This paper describes a safety analysis methodology and documentation system applied to the U.S. Department of Energy's 'first of a kind' Magnetohydrodynamic (MHD) Component Development and Integration Test Facility (CDIF). A modified Failure Mode and Effects Analysis (FMEA) is used. The CDIF FMEA approach begins with failure modes at the functional component level and analyzes the effects of propagated failure modes in interfacing systems. The results of this safety analysis have resulted in design and equipment changes, operation and maintenance requirements, and requirements for personnel exclusion areas. The safety analysis approach used is rigorous and comprehensive, but is economical in terms of effort and is particularly well suited to complex projects involving multiple contractors and organizations. The approach described herein has also been applied successfully to a later, more complex magnetohydrodynamic test facility design which is still in the concept development phase. (Author)

A80-40338 * # **Photovoltaic power system reliability considerations.** V. R. Lalli (NASA, Lewis Research Center, Cleveland, Ohio). In: Annual Reliability and Maintainability Symposium, San Francisco, Calif., January 22-24, 1980, Proceedings.

New York, Institute of Electrical and Electronics Engineers, Inc., 1980, p. 283-286.

This paper describes an example of how modern engineering and safety techniques can be used to assure the reliable and safe operation of photovoltaic power systems. This particular application was for a solar cell power system demonstration project in Tangaye, Upper Volta, Africa. The techniques involve a definition of the power system natural and operating environment, use of design criteria and analysis techniques, an awareness of potential problems via the inherent reliability and FMEA methods, and use of a fail-safe and planned spare parts engineering philosophy. (Author)

A80-40716 **Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3.** G. Flamant (CNRS, Laboratoire des Ultra-Réfractaires, Odeillo, Pyrénées-Orientales; Toulouse III, Université, Toulouse, France), D. Hernandez, C. Bonet (CNRS, Laboratoire des Ultra-Réfractaires, Odeillo, Pyrénées-Orientales, France), and J.-P. Traverse (Toulouse III, Université, Toulouse, France). *Solar Energy*, vol. 24, no. 4, 1980, p. 385-395. 14 refs.

The feasibility of thermochemical conversion of concentrated solar energy is investigated. Consideration is given to heterogeneous systems in the range 500-1500 C. A reaction volume is on a laboratory scale about 30 cu cm. An experimental set-up selected is a fluid bed and a rotary kiln. An endothermal reaction, namely, decarbonation of CaCO3, is selected as a possible application for solar power plants. V.T.

A80-40719 **Characteristics of axicon concentrators for use in photovoltaic energy conversion.** U. H. Kurzweg (Florida, University, Gainesville, Fla.). *Solar Energy*, vol. 24, no. 4, 1980, p. 411, 412.

The concentration and cost characteristics of axicon concentrators when used in photovoltaic energy conversion are discussed. Attention is given to the semi-vertex angle of an outer cone required for minimum energy conversion cost. It is shown that it is possible to use truncated axicon concentrators to economic advantage in the photovoltaic conversion of solar energy. V.T.

A80-41032 **Fluctuations in output from wind turbine clusters.** N. H. Lipman (Reading, University, Reading; Science Research Council, Rutherford Laboratory, Chilton, Oxon, England), E. A. Bossanyi, P. D. Dunn, P. J. Musgrove, G. E. Whittle (Reading, University, Reading, England), and C. Maclean (Science Research Council, Rutherford Laboratory, Chilton, Oxon, England). *Wind Engineering*, vol. 4, no. 1, 1980, p. 1-7. 7 refs.

The effects of short-period wind speed fluctuations on the power output of wind turbine clusters are investigated. Wind speed is described as the sum of a constant mean speed and a normally distributed fluctuation (period less than an hour) of standard deviation related to the turbulence intensity at frequencies below the response time of the wind turbine, and mean power is expressed as an integral function of the power output function at a given velocity and the probability distribution of wind speed fluctuations. Modifications to the power-velocity relations of single and clustered wind turbines are calculated in terms of annual output and load factor for a single turbine and a 20-turbine cluster and in terms of the power fluctuations to be expected for a single turbine, many widely spaced (uncorrelated) turbines, many correlated turbines and an infinite cluster of turbines. It is shown that the variability of output is smaller where the power-velocity characteristic is flatter and decreases as the number of turbines increases, although correlations in wind field increase the variability. A.L.W.

A80-41033 **Sailwing Darrieus rotors.** P. S. Revell and K. W. Everitt (Warwick, University, Coventry, England). *Wind Engineering*, vol. 4, no. 1, 1980, p. 11-31. 10 refs.

Recently published data for a number of simply constructed sailwings has been used in a numerical analysis of the performance of flexible bladed Darrieus rotors. To facilitate comparisons, the analysis has been repeated using data for a solid aerofoil. An improved understanding of the operation of sailwing rotors has been gained and some criteria for their design are reached. It is concluded that such rotors can reliably self-start and achieve a higher power coefficient than so far reported, although still rather lower than can be obtained with solid blades, but that their full potential will not be realized in very small scale applications. (Author)

A80-41034 **Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor.** D. V. Nguyen (Thiès, Ecole Polytechnique, Thiès, Senegal). *Wind Engineering*, vol. 4, no. 1, 1980, p. 43-47.

Experimental measurements of the performance of models of the simplified Filippini Vertical Axis Wind Rotor (FVAWR), in which straight splitter plates are used instead of curved ones, employing five different bucket to swept diameter ratios are reported. Variations of rotor torque coefficient and power coefficient with tip speed ratio were determined by a Prony brake system with the rotor placed in an open-jet wind tunnel. The peak power coefficient was obtained generally at a tip speed ratio of 0.7, with a bucket diameter/swept diameter ratio of 0.3 producing the highest power coefficient at this ratio which is noted to be about 26 percent higher than that obtained for a Savonius rotor. A.L.W.

A80-41074 **Space-time solutions of the linearized coupled-mode equations.** K. Rypdal (Tromso, Universitetet, Tromso, Norway). *Physica Scripta*, vol. 22, no. 2, 1980, p. 141-146. 9 refs.

The linearized coupled-mode equations for parametric instability are solved exactly for various cases. The exact evolution of a localized wave-pulse in an unbounded interaction region is used to illustrate the relationship between damping rates, group velocities and instability. It is shown that boundaries create 'kinks' in the pulse-profile traveling back and forth at the group velocities, and that the overall effect of finiteness is to reduce the instability growth. Finally, it is demonstrated that a mismatch in frequency or wave number will produce frequency and wave number shifts, but does not otherwise change the growth of the instability. M.E.P.

A80-41330 # **Non-linear oscillations in wave power machines.** P. C. Parks (Royal Military College of Science, Shrivenham, Wilts., England) and A. Tondl (Statni Vyzkumny Ustav Konstrukce Stroju, Bechovice, Czechoslovakia). In: International Conference on Nonlinear Oscillations, 8th, Prague, Czechoslovakia, September 11-15, 1978, Proceedings. Volume 1. Prague, Academia, 1979, p. 69-86. 8 refs.

The paper examines nonlinear oscillations in wave power machines. It presents a view of wave energy research in the UK, with a brief description of the more promising wave power machines. It is theoretically possible to build a device which absorbs 100% of the energy in an incoming wave train, and two possible devices for which this is possible are reviewed using linear theory. Many of the devices proposed, however, involve nonlinear processes for energy extraction, and two nonlinear problems are investigated: (1) conversion of reciprocating to rotary motion using a crank mechanism, and (2) direct pumping by a plate which in turn is subjected to forces in the sea. A.T.

A80-41570 # **Studies of MHD generator performance with oxygen enriched coal combustion.** J. Wormhoudt, V. Yousefian, C. E. Kolb, and M. Martinez-Sanchez (Aerodyne Research, Inc., Bedford, Mass.). *American Institute of Aeronautics and Astronautics, Fluid and Plasma Dynamics Conference, 13th, Snowmass, Colo., July 14-16, 1980, Paper 80-1343.* 12 p. Contract No. EX-76-C-01-2478.

This paper presents calculations made using the Aerodyne PACKAGE (Plasma Analysis, Chemical Kinetics, and Generator Efficiency) computer code which bear on two questions which arise in connection with choices between oxygen enrichment and air preheating to attain the high combustion temperatures needed for open-cycle, coal-fired MHD power generation. The first question is which method produces the highest enthalpy extraction per unit channel length. The second is, in test facilities intended to study tradeoffs between oxygen enrichment and preheated air, can good generator performance be obtained from the same physical channel for different combustor compositions. The answer to the first question is found to depend on what combustor conditions are taken to be comparable. As for the second question, it is found that operation with channel input from off-design combustor conditions can cause serious problems, which can be partially alleviated by changing the channel load factors. (Author)

A80-41732 # **Study of the operation of a pneumatic wave-energy converter (Issledovanie raboty pnevmaticheskogo volnovogo preobrazovatelia).** I. A. Babintsev, V. V. Shcherbakov, A. I. Suzdal'tsev, and L. P. Fedosenko (Akademiia Nauk Ukrainskoi SSR, Institut Gidromekhaniki, Kiev, Ukrainian SSR). *Gidromekhanika,* no. 42, 1980, p. 23-26. In Russian.

The analysis deals with the design and principle of a pneumatic wave-energy converter which has no moving parts. The nature of the pressure variation in the converter is studied for cylindrical and conical static heads as a function of the converter diameter and the immersion depth. V.P.

A80-41745 **Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling.** J. H. Schultz (MIT, Cambridge, Mass.; Westinghouse Electric Corp., Pittsburgh, Pa.), L. Bromberg, and D. R. Cohn (MIT, Cambridge, Mass.). *Nuclear Fusion,* vol. 20, June 1980, p. 703-709. 18 refs. Contract No. EG-77-S-02-4183-A002.

A80-41748 **Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/.** R. J. Goldston and H. H. Towner (Princeton University, Princeton, N.J.). *Nuclear Fusion,* vol. 20, June 1980, p. 781-783. 6 refs. Contract No. DE-AC02-76CH-03073.

Previous work on the effects of poloidal variation of the magnetic-field ripple in tokamaks is generalized to the case of high-beta, noncircular plasma configurations. The calculations are based on the ripple-trapping coefficient, G(alpha), of Connor and Hastie (1973). The generalized G(alpha) is calculated for arbitrary ripple intensity by a method developed by Goldston and Towner (1980), which is valid as long as the ripple intensity does not vary significantly over a ripple period along a magnetic field line. V.L.

A80-41851 **Electrochemistry, power sources and energy science.** A. K. Vijh (Hydro-Québec, Institut de Recherche, Varennes, Canada). *Journal of Power Sources,* vol. 5, June 1980, p. 145-172. 43 refs.

The status of modern electrochemistry is reviewed, and its impact on energy science is considered. Some of the important electrochemical interfaces (i.e., metal-electrolyte, semiconductor-electrolyte, demetallized surface-electrolyte, and metal-plasma) in energy device situations are described. In addition, a brief review of the current status of electrochemical power sources - fuel cells, batteries, and photoelectrochemical cells - is presented. B.J.

A80-41949 **Performance study of an OTEC system.** E. N. Ganic (Illinois, University, Chicago, Ill.) and L. Moeller (Sargent and Lundy Engineers, Chicago, Ill.). *Applied Energy,* vol. 6, July 1980, p. 289-299. 15 refs.

The paper describes studies of the performance of an Ocean Thermal Energy Conversion (OTEC) system. The objective function A/W sub net, where A is the total heat exchanger area and W sub net is the network output of the system, was used for the parametric and optimization studies; by using the objective function, the heat exchangers were directly related to the remaining OTEC components, making it possible to evaluate the combined effects on the OTEC power plant. The effects of the ocean fluid velocity through the exchanger, long-mean temperature differences of the heat exchangers, the heat transfer enhancement, and the cold seawater pipe diameter on system performance were investigated. It was concluded that for a 1 MWe OTEC power plant, the net output of the plant becomes zero when the temperature difference between the hot and cold streams approaches 12.80 C. A.T.

A80-42056 # **Reliability prediction techniques for second generation marine and industrial gas turbines.** R. B. Spector (General Electric Co., Marine and Industrial Projects Dept., Evendale, Ohio). *American Society of Mechanical Engineers, Israel Joint Gas Turbine Conference and Exhibition, Haifa, Israel, July 9-11, 1979, Paper 79-GT/Isr-3.* 9 p. 6 refs. Members, $1.50; nonmembers, $3.00.

The paper discusses reliability prediction techniques for second generation marine and industrial gas turbines. A technique to provide an 'early look' at the reliability of equipment and a means of projecting its reliability growth used for the LM2500 gas turbine is examined; this technique, employing a 'family concept' to reliability growth supplements the Failure Mode, Effect and Criticality Analysis (FMECA), providing a tool for earlier assessments of the reliability potential. This new prediction technique can also be applied to the selection of the most reliable power plant and to identifying the condition when a gas turbine is sufficiently mature for release. The paper compares the features of these two methods as they were applied to the LM2500 turbine. A.T.

A80-42157 # **Differential split power transmissions for a single shaft passenger car gas turbine engine.** D. L. Carriere (Ford Motor Co., Dearborn, Mich.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-19.* 6 p. Members, $1.50; nonmembers, $3.00.

A80-42162 # **Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant.** G. L. Vieth and

D. F. Plummer (Boeing Co., Seattle, Wash.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-27.* 12 p. Members, $1.50; nonmembers, $3.00.

Subsystem and system analyses were performed to select the preferred working gas, performance characteristics and size of a closed cycle gas turbine for an intermediate-duty solar electric power plant. Capital costs for all major subsystems were evaluated, but the principal selection criterion was the projected cost of electricity produced by the plant. Detailed analyses of the power conversion loop were conducted for both air and helium systems. Since the plant was intended for use on an intermediate-duty cycle, thermal storage was required. The coupling of the storage and power conversion loops in combination with the daily operating cycle influenced plant performance and energy costs in addition to the selection of the power conversion cycle. (Author)

A80-42233 # **Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines.** O. E. Balje. *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-117.* 10 p. 20 refs. Members, $1.50; nonmembers, $3.00.

A study of the design criteria for the performance of small single and two-spool vehicular gas turbines using metallic rotors shows that the acceleration capability, i.e., component inertia and the net power output, determine to a large degree the obtainable cycle efficiency. Fluid viscosity effects and manufacturing limitations cause the cycle efficiency to decrease with decreasing net powers. When fast acceleration capability is desired, aerodynamically compromised component designs may have to be selected which causes an efficiency penalty. It is found that the blade height of the compressor turbine in two-spool designs is a significant parameter for this penalty. One interesting result of the calculations is that single spool designs using metallic radial inflow turbine rotors can be quite competitive with two-spool designs using ceramic rotors in regard to efficiency. They suffer, however, from a comparatively high rotor inertia, i.e., reduced acceleration capability. Areas of uncertainties remain for the loss relations so that the calculated performance values must be viewed as trend data. The prime performance parameter used in this study is the flow path efficiency. The thermal cycle efficiency is presented only for constant values of heat exchanger effectiveness and mechanical efficiency. (Author)

A80-42242 # **Diagnostic development for advanced power systems.** J. C. F. Wang, W. L. Flower, and D. R. Hardesty (Sandia Laboratories, Livermore, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-128.* 12 p. 48 refs. Members, $1.50; nonmembers, $3.00. Research supported by the U.S. Department of Energy.

The high temperatures, pressures, and particulate densities present in coal-fired advanced power systems place severe limitations on conventional probe techniques for thermometry, velocimetry, and gas and particulate analysis. Although laser-based techniques for measuring gas temperature, velocity, and composition have been demonstrated in relatively clean flame gases, little is known regarding their applicability to measurements in the product streams from coal-fired combustors. Hence, a program has been established at Sandia to develop and assess advanced physical sampling and laser-based optical diagnostic techniques. This paper describes some of the techniques under development, including a small-angle near-forward scattering optical arrangement for particle sizing and a system for making Raman-scattering measurements of gas temperature using a pulsed laser and a gated detection system. Also described is the atmospheric combustor exhaust simulator (ACES) facility being constructed as the test bed for the diagnostic techniques. (Author)

A80-42248 # **Closed-cycle gas turbine working fluids.** J. C. Lee, J. Campbell, Jr., and D. E. Wright (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-135.* 11 p. 21 refs. Members, $1.50; nonmembers, $3.00. Contract No. EF-77-C-01-2612.

Characteristic requirements of a closed-cycle gas turbine (CCGT) working fluid were identified and the effects of their thermodynamic and transport properties on the CCGT cycle performance, required heat exchanger surface area and metal operating temperature, cycle operating pressure levels, and the turbomachinery design were investigated. Material compatibility, thermal and chemical stability, safety, cost, and availability of the working fluid were also considered in the study. This paper also discusses CCGT working fluids utilizing mixtures of two or more pure gases. Some mixtures of gases exhibit pronounced synergetic effects on their characteristic properties including viscosity, thermal conductivity and Prandtl number, resulting in desirable heat transfer properties and high molecular weights. Typical examples of such synergetic gas mixture are helium-xenon and helium-carbon dioxide. (Author)

A80-42265 # **Organic Rankine-cycle turbine power plant utilizing low temperature heat sources.** V. Maizza (Bari, Università, Bari, Italy). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-153.* 10 p. 14 refs. Members; $1.50; nonmembers, $3.00. Research supported by the Consiglio Nazionale delle Ricerche.

Utilizing and converting of existing low temperature and waste heat sources by the use of a high efficiency bottoming cycle is attractive and should be possible for many locations. This paper presents a theoretical study on possible combination of an organic Rankine-cycle turbine power plate with the heat pump supplied by waste energy sources. Energy requirements and system performances are analyzed using realistic design operating condition for a middle town. Some conversion systems employing working fluids other than water are being studied for the purpose of proposed application. Thermodynamic efficiencies, with respect to available resource, have been calculated by varying some system operating parameters at various reference temperature. With reference to proposed application equations and graphs are presented which interrelate the turbine operational parameters for some possible working fluids with computation results. (Author)

A80-42294 **Voltage losses in fuel cell cathodes.** R. P. Iczkowski and M. B. Cutlip (Connecticut, University, Storrs, Conn.). *Electrochemical Society, Journal,* vol. 127, July 1980, p. 1433-1440. 7 refs.

A model of the air diffusion electrode used in fuel cells was developed which accounts for the diffusion of oxygen in the gas-filled pores as well as diffusion into the liquid-filled pores, electrochemical reaction, and electrical conduction. The model was applied to a PTFE-bonded, platinum-on-carbon cathode in acid electrolyte to evaluate the relative contribution of these effects. Gas diffusion contributed 38% and ohmic loss in the electrolyte contributed 48% to the voltage loss other than activation. Knudsen diffusion was found to be as important as molecular diffusion. Diffusion of dissolved oxygen and ohmic conduction produced small voltage losses. Diffusion contributes to the utilization loss, especially at high oxygen utilizations, but ohmic effects do not. (Author)

A80-42295 **The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance.** S. T. Szymanski, G. A. Gruver, M. Katz, and H. R. Kunz (United Technologies Corp., Power Systems Div., South Windsor, Conn.). *(Electrochemical Society, Meeting, Pittsburgh, Pa., Oct. 15-20, 1978.) Electrochemical Society, Journal,* vol. 127, July 1980, p. 1440-1444.

Laboratory experiments and tests conducted on phosphoric acid fuel cells have indicated that ammonia, when present as an impurity in either the fuel or oxidant streams, will react with the electrolyte to form (NH4)H2PO4. Ammoniation of the acid to greater than 0.2 mole percent resulted in a loss in performance due primarily to a lowering in the rate of O2 reduction on the cathode catalyst.

Complete recovery of the performance loss was achieved after the removal of the contaminant source. The degree of electrolyte conversion and, hence, steady-state performance loss were found to be dependent on the rate of ammonia addition to the cell relative to the rate of ammonium ion oxidation at the cathode. This oxidation process was found to be potential dependent, with an increase in cathode potential resulting in the ability of the cell to tolerate higher NH3 concentrations in the reactant gas streams. (Author)

A80-42298 **Ammonia high temperature solid electrolyte fuel cell.** R. D. Farr and C. G. Vayenas (MIT, Cambridge, Mass.). *Electrochemical Society, Journal,* vol. 127, July 1980, p. 1478-1483. 13 refs. NSF Grant No. ENG-77-27500.

NH3 was used as the fuel in a high temperature stabilized zirconia fuel cell with Pt electrodes in order to examine the product distribution of the cell and explore the possibility of NO and electric energy cogeneration. It was found that nitric oxide is the primary electrooxidation product but that the yield of NO can be severely decreased due to the catalytic side reaction between NH3 and NO on the Pt anode. The influence of this side reaction, however, can be minimized under optimal operating conditions, and yields of NO exceeding 60% can be achieved. In addition, two dimensionless numbers have been identified which govern product selectivity and power output. J.P.B.

A80-43138 # **High-power MHD system combustor development testing.** D. W. Swallom, O. K. Sonju (Maxwell Laboratories, Inc., Woburn, Mass.), R. V. Burry (Rockwell International Corp., Rocketdyne Div., Canoga Park, Calif.), and R. F. Cooper (USAF, Aero Propulsion Laboratory, Wright-Patterson AFB, Ohio). *Journal of Energy,* vol. 4, May-June 1980, p. 100-105. 8 refs. Contract No. F33615-76-C-2104.

This paper describes some of the technical accomplishments of the most recently completed phase of a multiphase program to design, construct, and test a lightweight, high-power prototype portable MHD generator system. The main objective of this phase was to demonstrate the feasibility of hot-gas flow train components of high-performance, lightweight design. Significant advances in terms of such parameters as combustor heat release density, combustion efficiency, channel power density, and energy extraction rates were made. The combustion system has a high-performance, 160-element injector, and the channel was constructed using lightweight electrode frames and a high-strength, lightweight glass-fiber-wound composite outer wall structure. The test results are compared to the theoretical predictions and are evaluated in terms of their impact on the overall goals of the High-Power MHD Systems program. The evaluation indicated that the initial program goals are achievable performance levels. (Author)

A80-43139 # **Crosswind kite power.** M. L. Loyd (California, University, Livermore, Calif.). *Journal of Energy,* vol. 4, May-June 1980, p. 106-111. 20 refs.

This paper describes a concept for large-scale wind power production by means of aerodynamically efficient kites. Based on aircraft construction, these kites fly transverse to the wind at high speed. The lift produced at this speed is sufficient to both support the kite and generate power. The equations of motion are developed, and examples are presented. One version, based on the C-5A aircraft, results in 6.7 MW produced by a 10-m/s wind. Extrapolation to newer technology, which is more comparable to modern wind turbines, indicates the production of 45 MW from a single machine. The detailed calculations are validated by comparison of their results with simple analytical models. The methodology used here lays the foundation for the systematic study of power-producing kites. (Author)

A80-43141 # **Preliminary wind tunnel tests on the pedal wind turbine.** T. Vinayagalingam (University of the West Indies, St. Augustine, Trinidad and Tobago). *Journal of Energy,* vol. 4, May-June 1980, p. 142-144.

High solidity-low speed wind turbines are relatively simple to construct and can be used advantageously in many developing countries for such direct applications as water pumping. Established designs in this class, such as the Savonius and the American multiblade rotors, have the disadvantage that their moving surfaces require a rigid construction, thereby rendering large units uneconomical. In this respect, the pedal wind turbine recently reported by the author and which incorporates sail type rotors offers a number of advantages. This note reports preliminary results from a series of wind tunnel tests which were carried out to assess the aerodynamic torque and power characteristics of the turbine. (Author)

A80-43190 # **CO2 concentrations in a molten carbonate electrochemical cell.** J. Winnick (Georgia Institute of Technology, Atlanta, Ga.). *American Society of Mechanical Engineers, Intersociety Environmental Systems Conference, San Diego, Calif., July 14-17, 1980, Paper 80-ENAs-14.* 15 p. 5 refs. Members, $1.50; nonmembers, $3.00.

The molten carbonate fuel cell is now being investigated as a possible alternative to the aqueous alkaline fuel cell which has been successfully converted into a CO2 concentrator for use in a manned spacecraft. This high-temperature (above 500 C) device has the following potential advantages over the aqueous concentrator: any humidity from 0 to 100% can be tolerated, noble electrodes are not required, and higher current densities appear possible. During the tests of a laboratory-size cell, in both driven and hydrogen modes, high current efficiencies have been achieved, but removal efficiencies have been low. Increasing current improves the removal, but current efficiency drops, which is thought to be due to poor mass transfer characteristics inherent in the small cell. Water vapor in the cathode feed has no effect on electrical or electrochemical performance, and no CO is found in the cathode (cabin) gas stream, nor carbon in the anode. V.L.

A80-43226 # **Hall effects on MHD Couette flow in a rotating system.** R. N. Jana and N. Datta (Indian Institute of Technology, Kharagpur, India). *Czechoslovak Journal of Physics,* vol. B 30, no. 6, 1980, p. 659-667. 7 refs.

The combined effect of rotation and Hall current on the MHD Couette flow have been studied. The heat transfer characteristic have also been discussed on taking the viscous and Joule dissipation into account. The primary and the secondary velocity components increase with increase in Hall parameter but the primary velocity decreases with increase in rotation parameter. It is seen that the rate of heat transfer at the stationary plate is independent of both the Hall parameter and the rotation parameter. The rate of heat transfer at the moving plate increases with increase in Hall parameter, while it decreases with increase in rotation parameter. The values of the critical Eckert number at which the direction of the heat flow changes increases with increase in Hall parameter. (Author)

A80-43325 # **The MHD /magnetohydrodynamic/ two-axis Rate Sensor.** V. H. Aske (Honeywell, Inc., Minneapolis, Minn.). *American Institute of Aeronautics and Astronautics, Aircraft Systems Meeting, Anaheim, Calif., Aug. 4-6, 1980, Paper 80-1890.* 7 p.

The MHD Rate Sensor was designed to provide two axes of rate information in a small package. The instrument measures 0.7 inches in diameter by 1.8 inches long. It consists of a torus of liquid metal, located within a radial magnetic field, which provides a voltage proportional to rate about its input axis. The torus is spun at a constant rate and the inclusion of a two-phase reference generator permits demodulation of the rate signal about two defined axes. This paper discusses the theory of operation, design of the Rate Sensor for producibility, and achieved performance. (Author)

A80-43340 * # **The performance of solar thermal electric power systems employing small heat engines.** R. L. Pons (Ford-Aerospace and Communications Corp., Newport Beach, Calif.). *American Society of Mechanical Engineers, Energy Technology Conference and Exhibition, New Orleans, La., Feb. 3-7, 1980, Paper*

80-Pet-25. 8 p. 9 refs. Members, $1.50; nonmembers, $3.00. Contract No. JPL-955115.

The paper presents a comparative analysis of small (10 to 100 KWe) heat engines for use with a solar thermal electric system employing the point-focusing, distributed receiver (PF-DR) concept. Stirling, Brayton, and Rankine cycle engines are evaluated for a nominal overall system power level of 1 MWe, although the concept is applicable to power levels up to at least 10 MWe. Multiple concentrators are electrically connected to achieve the desired plant output. Best performance is achieved with the Stirling engine, resulting in a system Levelized Busbar Energy Cost of just under 50 mills/kWH and a Capital Cost of $900/kW, based on the use of mass-produced components. Brayton and Rankine engines show somewhat less performance but are viable alternatives with particular benefits for special applications. All three engines show excellent performance for the small community application. (Author)

A80-43342 # **System thermodynamics of energy conversion plants for geopressured resources.** J. P. Lamb and G. F. Polansky (Texas, University, Austin, Tex.). *American Society of Mechanical Engineers, Energy Technology Conference and Exhibition, New Orleans, La., Feb. 3-7, 1980, Paper 80-Pet-31*. 7 p. 13 refs. Members, $1.50; nonmembers, $3.00. Research supported by Central Power and Light, Gulf States Utilities, and Houston Lighting and Power.

Performance of conversion plants for geopressured fluids has been estimated using realistic wellhead conditions and idealized thermodynamics. Maximum output of a combined hydraulic-thermal recovery system is predicted. The performance of flash and organic Rankine cycle schemes for thermal recovery are compared and the importance of hydraulic recovery is illustrated. Rankine cycle performance using both propane and isobutane is discussed. Present results illustrate the extreme significance of recovering the gaseous component because of its effect on both energy production and related economic viability. (Author)

A80-43343 # **A Stirling cycle engine for use with solar thermal-electric systems.** R. L. Pons (Ford Aerospace and Communications Corp., Newport Beach, Calif.) and W. Percival (United Stirling /Sweden/, Alexandria, Va.). *American Society of Mechanical Engineers, Energy Technology Conference and Exhibition, New Orleans, La., Feb. 3-7, 1980, Paper 80-Pet-32*. 10 p. 13 refs. Members, $1.50; nonmembers, $3.00.

Paper presents the background of development of the Stirling cycle engine at United Stirling of Sweden with emphasis on its applicability to solar thermal power plants. The development status of critical components is reviewed together with the modifications required to convert the engine from a fuel-burning unit to one capable of solar operation, as well as operation on other alternate energy sources. Detailed performance data are given for an engine designed to run on condensing sodium as the heat source; the influence of engine cost and efficiency on solar system cost is also shown. (Author)

A80-43345 # **Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications.** R. DiPippo (Southeastern Massachusetts University, North Dartmouth, Mass.), J. Kestin (Brown University, Providence, R.I.), E. M. Avelar (Rhode Island, University, Kingston, R.I.), and H. E. Khalifa (United Technologies Research Center, East Hartford, Conn.). *American Society of Mechanical Engineers, Energy Technology Conference and Exhibition, New Orleans, La., Feb. 3-7, 1980, Paper 80-Pet-83*. 11 p. 26 refs. Members, $1.50; nonmembers, $3.00. Contract No. EY-76-S-02-4051-A002.

In this paper, we extend the analysis of hybrid fossil-geothermal power plants to compound systems which combine the features of the two previously analyzed hybrid plants, the geothermal preheat and the fossil superheat systems. Compound systems of the one- and two-stage type are considered. A complete summary of formulae to assess the performance of the plants is included for completeness. From the viewpoint of thermodynamics, compound hybrid plants are superior to individual all-geothermal and all-fossil plants, and have certain advantages over basic geothermal-preheat and fossil-superheat hybrid plants. The flexibility of compound hybrid systems is illustrated by showing how such plants might be used at several geothermal sites in the western United States. (Author)

A80-43397 **An arc discharge model on electrodes of an MHD generator.** V. A. Bitiurin (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR) and G. A. Liubimov (Moskovskii Gosudarstvennyi Universitet, Moscow, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, Nov.-Dec. 1979, p. 1299-1308.) *High Temperature,* vol. 17, no. 6, May 1980, p. 1077-1085. 8 refs. Translation.

In the present paper, the current-voltage characteristics of the electrodes of an MHD generator are analyzed quantitatively for the arc discharge mode. Closure of the equations of the current-voltage characteristics is achieved on the basis of experimental data and a solution to the two-dimensional electrodynamic problem of the current and potential distribution at the arc. V.P.

A80-43398 **Theory of electrode arcs in a flow of combustion products containing an additive.** A. V. Nedospasov and L. P. Poberezhskii (Akademiia Nauk SSSR, Institut Vysokikh Temperatur, Moscow, USSR). *(Teplofizika Vysokikh Temperatur,* vol. 17, Nov.-Dec. 1979, p. 1309-1318.) *High Temperature,* vol. 17, no. 6, May 1980, p. 1086-1095. 13 refs. Translation.

A mathematical model is constructed under a number of assumptions for an arc near an electrode in a flow of combustion products containing an additive. The model consists of a system of equations containing an integral equation for conservation of energy; the system was solved numerically. As a result of the solution, the arc dimensions, temperature distribution in the arc, and voltage drop are obtained as functions of the current and parameters of the flow. It is shown that the conditions of heat transfer influence the configuration of the arc and the form of the voltage-current characteristic. Approximate models are proposed for describing the zone of overheating - a thermal dipole model in a flow for the case of an arc over a cooled surface, and a heat source for the case of an arc in a flow past an electrode. (Author)

A80-43478 **Confidence interval procedures for wind turbine candidate sites.** R. B. Corotis (Northwestern University, Evanston, Ill.). *Solar Energy,* vol. 24, no. 5, 1980, p. 427-433. 11 refs. Contract No. DE-AS06-76ET-20283.

Three different aspects of confidence intervals for seasonal mean wind speeds are investigated. Various techniques of establishing confidence intervals at a candidate site are discussed first and the consistency of results demonstrated for 20 sites. Next, a procedure is derived for the enhancement of candidate site confidence intervals through the use of a nearby reference site with long-term data. Proper incorporation of the spatial correlation between sites and the uncertainty in the correlation are essential to effective use of the reference site data. Finally, a technique is presented that permits the use of long-term regional data plus single-season data at a candidate site to establish confidence intervals for different seasons of the year. (Author)

A80-43481 **Chromatic dispersion concentrator applied to photovoltaic systems.** G. Sassi (Milano, Università, Milan, Italy). *Solar Energy,* vol. 24, no. 5, 1980, p. 451-460.

The aim of this paper is to show how it is possible to realize a chromatic dispersion concentrator which collects the different monochromatic components of the solar spectrum separately in subsequently concentric rings in the focal zone. This comes about without an increase in the energetic losses compared to any other type of concentrator. If different photovoltaic elements with energy gaps equal to the photon energy falling on the focal zone are put in the latter, energy losses due to incomplete utilization of the solar spectrum and to incomplete utilization of the energy of a single photon can be drastically reduced. How the losses due to the voltage factor and the fill-factor of the photovoltaic elements of the system can be reduced compared to the normal silicon cells is also demonstrated. The other contributions to losses in the conversion process have only been mentioned, foreseeing their possible variation. (Author)

A80-43496 **Absorption of radiation in a magnetoplasma and application to the laser-fusion process.** G. W. Ford (Michigan, University, Ann Arbor, Mich.) and R. F. O'Connell (Louisiana State University, Baton Rouge, La.). *Physical Review A - General Physics, 3rd Series,* vol. 22, July 1980, p. 295-300. 26 refs. Research supported by the Louisiana State University; Contract No. DE-AS05-79ER-10459.

The general problem of absorption of laser light in a magnetoactive plasma is discussed. General results for the power absorbed is derived in terms of three basic frequencies: laser, cyclotron, and collision frequencies. These results are applied to a laser-fusion process. V.T.

A80-43502 **An alternate approach to the application of MHD power generation technology in a utility environment.** T. K. Fung, J. W. Griswold, and J. W. Moyer (Southern California Edison Co., Rosemead, Calif.). *(Institute of Electrical and Electronics Engineers, Summer Meeting, Vancouver, Canada, July 15-20, 1979, Paper F 79 651-1.) IEEE Transactions on Power Apparatus and Systems,* vol. PAS-99, May-June 1980, p. 1306-1312; Discussion, p. 1312. 18 refs.

The magnetohydrodynamic (MHD) power generation technology offers an attractive generation potential to the electric utilities. This paper presents an alternate approach to accelerate the commercial deployment of this new technology. By retrofitting an existing generating station, the MHD system concept can be demonstrated in a utility environment as early as 1986. It is shown that this approach may be technically feasible. This accelerated approach could supplement the current national MHD program which places emphasis on large-scale, base-load applications. (Author)

A80-43503 **Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volumes 1 & 2.** Edited by J. N. Zemel. Lausanne, Elsevier Sequoia, S.A. *(Thin Solid Films,* vol. 63-64, 1979), 1979. Vol. 1, 400 p.; vol. 2, 499 p. Price of two volumes, $120.

The conference focused on surface modification by ion bombardment, metal and alloy coatings, solar energy, coatings for radiation environments, defects and internal stresses in coatings, erosion and wear, high temperature coatings, and vapor deposition technology. Papers were presented on improvement of properties by ion implantation, creep property improvement of titanium alloys by platinum ion plating, 304 stainless steel-carbon alloys synthesized by sputter deposition, formation of transparent heat mirrors by ion plating, carbon coatings for fusion applications, hydrogen retention and release in first-wall coatings for tokamaks, deposition of tungsten-alumina composite films by oxide evaporation, friction and wear of ion-implanted films, and hot corrosion evaluation of high-temperature metal coatings for combustion turbines. A.T.

A80-43517 **Coatings for fusion reactor environments.** D. M. Mattox (Sandia Laboratories, Albuquerque, N. Mex.). In: Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volume 1. Lausanne, Elsevier Sequoia, S.A., 1979, p. 213-226. 62 refs. Contract No. DE-AC04-76DP-00789.

The internal surfaces of a toroidal magnetically confined fusion reactor control the impurity injection and gas recycling into the fusion plasma. Coating of internal surfaces may provide a desirable and possibly necessary design flexibility for achieving the temperatures, ion densities and containment times necessary for net energy production from fusion reactions. In this paper the reactor environments experienced by various components are reviewed along with possible materials responses. Characteristics of coating-substrate systems that are important to fusion applications are delineated and the present status of coating development for fusion applications is reviewed. Coating development for fusion applications is just beginning and poses a unique and important challenge for materials development. (Author)

A80-43575 **Electrical properties of polycrystalline GaAs films.** J. J. J. Yang, P. D. Dapkus, R. D. Dupuis, and R. D. Yingling (Rockwell International Corp., Electronic Devices Div., Anaheim, Calif.). *Journal of Applied Physics,* vol. 51, July 1980, p. 3794-3800. 26 refs. Contract No. EY-76-C-03-1202.

The electrical properties of Se- and Zn-doped polycrystalline GaAs deposited by metalorganic chemical vapor deposition on substrates of polycrystalline alumina and glass are investigated. Attention is given to Hall-effect and resistivity measurements made over a wide range of temperature (77-420 K). The electrical activation energies are found by measuring the variation of resistivity and carrier mobility of the polycrystalline GaAs films with sample temperature. It is found that the resistivity and mobility are temperature activated over a wide temperature range, with the same activation energy applying to both properties. Finally, the results are interpreted in terms of a modified grain boundary trapping model. M.E.P.

A80-43590 **Thermodynamic energy conversion efficiencies.** P. T. Landsberg and G. Tonge (Southampton, University, Southampton, England). *Journal of Applied Physics,* vol. 51, July 1980, p. R1-R20. 71 refs.

The paper presents recent work on thermodynamic energy conversion efficiencies. The processes include the conversion into light in a laser or light-emitting diode, and the direct or indirect conversion of solar radiation into work. The thermodynamic limiting efficiencies of these processes are derived by applying simple balance equations to a generalized energy convertor. The new work includes the distinction between temperatures based on fluxes and temperatures based on standard thermodynamics and their application. The use of standard entropy formulas is justified without relying on thermodynamic equilibrium and the results are then applied to nonequilibrium situations in energy conversion. A.T.

A80-43740 **The Nigorikawa Geothermal Pilot Plant.** Y. Nakamoto (Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan). *Energy Developments in Japan,* vol. 2, Apr. 1980, p. 301-317. 10 refs.

The Nigorikawa 1000-kW pilot plant utilizing geothermal hot water is described. A binary cycle power generating system is outlined, along with criteria for selection of a working fluid and equipment for experimental studies. Tests include a maximum continuous load test and static and dynamic tests, involving start/spot characteristics, load variations and follow-up characteristics, auxiliary load operation, and variable pressure/temperature operation. V.T.

A80-43757 **Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2.** Edited by D. E. Sawyer. *Solar Cells,* vol. 1, May 1980. 112 p.

Solar cells are discussed with reference to their properties, photovoltaic mechanisms, methods of investigation, and experimental techniques. Papers are presented on infrared electroluminescence as a diagnostic tool for polycrystalline GaAs solar cells, diffusion length measurements in Cu2S, evaluation of silicon-on-ceramic using light-beam-induced currents, experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices, and electrical transport properties in inhomogeneous media. Other papers include a study of spatial inhomogeneities in photosensitive materials using direct current and microwave techniques, noise spectral density as a device reliability estimator, and measurement of the resistivity of thin CdS films on brass substrates. V.L.

A80-43758 **Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films.** B. L. Sopori and A. Baghdadi (Motorola, Inc., Solar Energy Research and Development Dept., Phoenix, Ariz.). *(Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells,* vol. 1, May 1980, p. 237-250.

Several nondestructive techniques for characterizing polycrystalline silicon films for photovoltaic applications are described. These include the surface photovoltage, current phase shift, multiple wavelength focused laser scanner and electron-beam-induced current methods. The results of some investigations of the influence of defects and grain boundaries on photovoltaic mechanisms are discussed. It is shown that polycrystalline silicon films can be characterized by an 'average' minority carrier diffusion length. (Author)

A80-43760 **Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices.** J. A. Bragagnolo and E. A. Fagen (Delaware, University, Newark, Del.). *(Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979.) Solar Cells,* vol. 1, May 1980, p. 275-283. 15 refs. Research supported by the U.S. Department of Energy, Standard Environmental Systems, and ERDA.

The optical measurement and analysis of polycrystalline thin film solar cell materials and devices is complicated by diffuse scattering at all interfaces due to roughness and diffuse volume scattering due to grain boundaries and orientation effects. An experimental approach using directional spectral reflectance and absorptance measurements with 4 pi collection geometry is described which provides an expedient route to the determination of device photon losses, intrinsic optical properties of polycrystalline materials and the effects of layer morphology on the photon economy of solar cells. This technique is applied to the photon loss analysis of thin film CdS/Cu2S cells and the assessment of Zn3P2 as a photovoltaic material. It is concluded that cell morphology is a key contributor to the high photon efficiency of polycrystalline CdS/Cu2S cells. Also, the discrepancy between bulk and thin film absorption edge data for Zn3P2 is reduced and the intrinsic absorption edge of evaporated films is revealed to be exponential. Other applications of this technique are discussed. (Author)

A80-43832 **Recent progress on ducks.** S. H. Salter (Edinburgh, University, Edinburgh, England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews,* vol. 127, pt. A, no. 5, June 1980, p. 308-319. 17 refs. Research supported by the Department of Energy.

The results of small-scale laboratory tests at Edinburgh are reported. It is reported that some test results show that the requirement for rigidity of the duck backbone is much lower than was predicted, and that in waves with lengths of twenty diameters and more, there are considerable benefits to be derived from controlled backbone movements. A design is described which employs high-pressure oil hydraulics, synchronous generation, ac transmission and parallel connections. Further, the design exploits the techniques of modern electronics and it is planned to achieve reliability by total hermetic sealing of the power conversion mechanism which will exclude all organisms, both marine and human. M.E.P.

A80-43835 **Advantage of incorporating geothermal energy into power-station cycles.** A. A. L. White (Central Electricity Generating Board, Marchwood Engineering Laboratories, Marchwood, Hants., England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews,* vol. 127, pt. A, no. 5, June 1980, p. 330-335. 9 refs.

The generation of electricity from low-temperature geothermal sources has been hampered by the low conversion efficiencies of Rankine cycle operating below 150 C. It is shown how the electrical output derived from a geothermal borehole may be substantially improved on that expected from these cycles by incorporating the geothermal heat into a conventional steam-cycle power station to provide feedwater heating. This technique can yield thermal conversion efficiencies of 11% which, for a well-head temperature of 100 C, is 50% greater than the output expected from a Rankine cycle. Coupled with the smaller capital costs involved, feedwater heating is thus a more attractive technique of converting heat into electricity. Although power stations above suitable geothermal resources would ideally have the geothermal heat incorporated from the design stage, experiments at Marchwood Power Station have shown that small existing sets can be modified to accept geothermal feedwater heating. (Author)

N80-22619# Los Alamos Scientific Lab., N. Mex.
COMMUTATOR dc MACHINES USED AS MECHANICAL CAPACITORS IN A SERIES RESONANT OHMIC-HEATING CIRCUIT SIMULATION
Philip Thullen and D. M. Weldon 1979 6 p refs Presented at the 8th IEEE Symp. on Eng. Probl. of Fusion Res., San Francisco, 13-16 Nov. 1979
(Contract W-7405-eng-36)
(LA-UR-79-3122; CONF-791102-40) Avail: NTIS HC A02/MF A01

From 8th symposium on engineering problems of fusion research; San Francisco, CA, USA (13 Nov. 1979). Rotating electrical machines, and in particular commutator dc machines can serve as a high-power energy-source for testing large, pulsed magnets. A pulsed power supply based on traction motors is described which will be used to test the LASL prototype 20-MJ superconducting Tokamak induction coil. DOE

N80-22772 Delaware Univ., Newark.
DYNAMICS AND CONTROL OF LARGE HORIZONTAL-AXIS AXISYMMETRIC WIND TURBINES Ph.D. Thesis
Murray Steven Hirschbein 1979 471 p
Avail: Univ. Microfilms Order No. 8006484

The dynamic response of an entire rotor-tower wind turbine system was examined to provide insight into the nature and solution of dynamic problems that may be encountered during the operation of large horizontal-axis, axisymmetric wind turbines. The numerical results are presented for a 3 bladed, 300 ft. diameter wind turbine driving either constant or variable speed electrical power generating equipment. Three areas of wind turbine research were studied: steady state loading, stability and gust response. Blade pitch control was used effectively to reduce the steady fatigue loading from gravity, side winds, wind shear, and to attenuate gust loading. An integral part of this analysis was the development of an algorithmic approach to kinematics of wind turbine dynamics which allowed numerically exact equations of motion to be derived by a digital computer. Dissert. Abstr.

N80-22778*# AiResearch Mfg. Co., Phoenix, Ariz.
CONCEPT DEFINITION STUDY OF SMALL BRAYTON CYCLE ENGINES FOR DISPERSED SOLAR ELECTRIC POWER SYSTEMS Final Report, Sep. 1978 - Jun. 1979
Lyle D. Six, Thomas L. Ashe, Frank X. Dobler, and Ron T. Elkins Jan. 1980 135 p refs
(Contracts DEN3-69; EX-76-A-29-1060)
(NASA-CR-159592; DOE/NASA/0069-79/1; AiResearch-31-3328) Avail: NTIS HC A07/MF A01 CSCL 10B

Three first-generation Brayton cycle engine types were studied for solar application: a near-term open cycle (configuration A), a near-term closed cycle (configuration B), and a longer-term open cycle (configuration C). A parametric performance analysis was carried out to select engine designs for the three configurations. The interface requirements for the Brayton cycle engine/generator and solar receivers were determined. A technology assessment was then carried out to define production costs, durability, and growth potential for the selected engine types. R.E.S.

N80-22787*# Mechanical Technology, Inc., Latham, N. Y. Stirling Engine Systems Div.
DESIGN STUDY OF A 15 kW FREE-PISTON STIRLING ENGINE-LINEAR ALTERNATOR FOR DISPERSED SOLAR ELECTRIC POWER SYSTEMS Final Report, Sep. 1978 - Aug. 1979

George R. Dochat, H. S. Chen, S. Bhate, and T. Marusak Aug. 1979 189 p refs
(Contracts DEN3-56; EX-76-A-29-1060)
(NASA-CR-159587; DOE/NASA/0056-79/1; MTI-79TR47) Avail: NTIS HC A08/MF A01 CSCL 10B

A conceptual design of a free piston solar Stirling engine-linear alternator which can be designed and developed to meet the requirements of a near-term solar test bed engine with minimum risks was developed. The conceptual design was calculated to have an overall system efficiency of 38% and provide 15kW electric output. The free piston engine design incorporates features such as gas bearings, close clearance seals, and gas springs. This design is hermetically sealed to provide long life, reliability, and maintenance free operation. An implementation assessment study performed indicates that the free piston solar Stirling engine-linear alternator can be manufactured at a reasonable price cost (direct labor plus material) of $2,500 per engine in production quantities of 25,000 units per year. Opportunity for significant reduction of cost was also identified. R.E.S.

N80-22840# Los Alamos Scientific Lab., N. Mex.
TECHNOLOGY ASSESSMENT OF WIND ENERGY CONVERSION SYSTEMS
R. W. Meier and T. J. Merson Sep. 1979 48 p refs
(Contract W-7405-eng-36)
(LA-8044-TASE) Avail: NTIS HC A03/MF A01

Environmental data for wind energy conversion systems (WECSs) were generated. Two candidates were chosen to characterize the WECS that might be deployed if this technology makes a significant contribution to the national energy requirements. One EECS is a large machine of 1.5-MW-rated capacity that can be used by utilities. The other WECS is a small machine that is characteristic of units that might be used to meet residential or small business energy requirements. Energy storage systems are discussed for each machine to address the intermittent nature of wind power. Cost estimates were made for both large and small systems as required for input to the strategic environmental assessment simulation computer program. Material requirements, based on current generation WECSs, are discussed and a general discussion of environmental impacts associated with WECS deployment is presented. DOE

N80-22859# Dornier-Werke G.m.b.H., Friedrichshafen (West Germany).
DEVELOPMENT OF A 5.5 m DIAMETER VERTICAL AXIS WIND TURBINE, PHASE 2 Final Report
Guenter Binder, Albert Fritzsche, Arne Vollan, Anton Dekitsch, Roland Joos, Dieter Welte, Carl-C. Etzler, and Juergen Schmelzle Bonn Bundesmin. fuer Forsch. u. Technol. Jul. 1979 138 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-79-04) Avail: NTIS HC A07/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Germany DM 28,55

The design work for the turbine, including the aerodynamic and structural dynamic investigations was performed, and the wind turbine built and tested in a wind tunnel. The rotor diameter of 5.5 m is not only a suitable size for the tests, but indicates that the results will contribute to the experimental data required for the design of large converters. The layout of the rotor, the construction methods and choice of materials favor series production, applying advanced mass production technology, without excluding the manufacture in developing countries. The wind tunnel test performed with the two, three, and four blade version of the Darrieus-rotor and with Savonius-rotors of different heights confirmed the aerodynamic calculations. Possibilities to improve the efficiency of the Savonius-rotor and to simplify some details concerning design and manufacture were evaluated. Author (ESA)

N80-23102*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN EXPLORATORY SURVEY OF NOISE LEVELS ASSOCIATED WITH A 100kW WIND TURBINE
J. R. Balombin 1980 20 p refs Presented at the 99th Meeting of the Acoustical Soc. of Am., Atlanta, 21-25 Apr. 1980
(NASA-TM-81486; E-424) Avail: NTIS HC A02/MF A01 CSCL 20A

Noise measurements of a 125-foot diameter, 100 kW wind turbine are presented. The data include measurements as functions of distance from the turbine and directivity angle and cover a frequency range from 1 Hz to several kHz. Potential community impact is discussed in terms of A-weighted noise levels relative to background levels, and the intrasonic spectral content. Finally, the change in the sound power spectrum associated with a change in the rotor speed in described. The acoustic impact of this size wind turbine is judged to be minimal. M.G.

N80-23315*# Williams Research Corp., Walled Lake, Mich.
CONCEPTUAL DESIGN STUDY OF AN IMPROVED GAS TURBINE POWERTRAIN Final Report
W. I. Chapman Mar. 1980 294 p refs
(Contracts DEN3-12; EC-77-A-31-1040)
(NASA-CR-159852; DOE/NASA/0013-80/1; WRC-78-182) Avail: NTIS HC A13/MF A01 CSCL 21E

The conceptual design for an improved gas turbine (IGT) powertrain and vehicle was investigated. Cycle parameters, rotor systems, and component technology were reviewed and a dual rotor gas turbine concept was selected and optimized for best vehicle fuel economy. The engine had a two stage centrifugal compressor with a design pressure ratio of 5.28, two axial turbine stages with advanced high temperature alloy integral wheels, variable power turbine nozzle for turbine temperature and output torque control, catalytic combustor, and annular ceramic recuperator. The engine was rated at 54.81 kW, using water injection on hot days to maintain vehicle acceleration. The estimated vehicle fuel economy was 11.9 km/l in the combined driving cycle, 43 percent over the 1976 compact automobile. The estimated IGT production vehicle selling price was 10 percent over the comparable piston engine vehicle, but the improved fuel economy and reduced maintenance and repair resulted in a 9 percent reduction in life cycle cost. R.C.T.

N80-23400# Oak Ridge National Lab., Tenn.
MASS TRANSPORT IN MOLTEN-SALT ELECTROCHEMICAL SYSTEMS
J. U. Nwalor and A. R. Manner 24 Mar. 1979 25 p refs
(Contract W-7405-eng-26)
(ORNL/MIT-290) Avail: NTIS HC A02/MF A01

Early time behavior of the open cell potential of a Li2CO3/K2CO3 electrolysis system was investigated to identify the various regimes involved. The regimes that were identified include the IR drop, anodic and cathodic double layer decays, and the themoelectric effects. The presence of a gaseous diffusion process was also inferred. DOE

N80-23768*# Westinghouse Research and Development Center, Pittsburgh, Pa.
CELL MODULE AND FUEL CONDITIONER DEVELOPMENT
D. Q. Hoover, Jr. Jan. 1980 58 p
(Contracts DEN3-161; DE-AI03-79ET-1272)
(NASA-CR-159828; DOE/NASA/0161-79/3; QR-1; Rept-80-9E6-MARED-R1) Avail: NTIS HC A04/MF A01

Components for the first 5 cell stack (no cooling plates) of the MK-2 design were fabricated. Preliminary specfications and designs for the components of a 23 cell MK-1 stack with four DIGAS cooling plates were developed. The MK-2 was selected as a bench mark design and a preliminary design of the facilities required for high rate manufacture of fuel cell modules was developed. Two stands for testing 5 cell stacks were built and design work for modifying existing stands and building new stands for 23 and 80 cell stacks was initiated. Design and procurement of components and materials for the catalyst test stand were completed and construction initiated. Work on the specifications of pipeline gas, tap water and recovered water and definition of equipment required for treatment was initiated. An innovative geometry for the reformer was conceived and modifications of the computer program to be used in its design were stated. R.E.S.

N80-23769*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CELL MODULE AND FUEL CONDITIONER Quarterly Report, Jan. - Mar. 1980
D. Q. Hoover, Jr. Apr. 1980 87 p
(Contracts DEN3-161; DE-AI03-79ET-11272)
(NASA-CR-159875; DOE/NASA/0161-2; QR-2) Avail: NTIS HC A05/MF A01 CSCL 10A

Stack tests indicate that the discrepancies between calculated and measured temperature profiles are due to reactant cross-over and a lower than expected thermal conductivity of cells. Preliminary results indicate that acceptable contact resistance between cooling plane halves can be achieved without the use of paper. The preliminary design of the enclosure, definition of required labor and equipment for manufacturing repeating components, and the assembly procedures for the benchwork design were developed. Fabrication of components for a second 5-cell stack of the MK-2 design and a second 23-cell stack of the MK-1 design was started. The definition of water and fuel for the reforming subsystem was developed along with a preliminary definition of the control system for the subsystem. The construction and shakedown of the differential catalytic reactor was completed and testing of the first catalyst initiated. R.E.S.

N80-23775*# General Electric Co., Philadelphia, Pa. Space Div.
MOD-1 WIND TURBINE GENERATOR ANALYSIS AND DESIGN REPORT, VOLUME 1 Final Report
Mar. 1979 320 p
(Contracts NAS3-20058; EX-77-A-29-1010)
(NASA-CR-159495; DOE/NASA/0058-79/2-Vol-1) Avail: NTIS HC A14/MF A01 CSCL 10A

The activities leading to the completion of detail design of the MOD-1 wind turbine generator are described. Emphasis is placed on the description of the design as it finally evolved. However, the steps through which the design progressed are also traced in order to understand the major design decisions. R.E.S.

N80-23778*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE OPTIMIZATION AIR SEPARATION PLANTS FOR COMBINED CYCLE MHD-POWER PLANT APPLICATIONS
Albert J. Juhasz, Helmut Springmann, and Ralph Greenberg 1980 11 p refs Presented at the 7th Intern. Conf. on MHD Elec. Power Generation, Cambridge, Mass., 16-20 Jun. 1980
(Contracts DEN3-165; EF-77-A-01-2674)
(NASA-TM-81510; DOE/NASA/2674-80/10) Avail: NTIS HC A02/MF A01 CSCL 10B

Some of the design approaches being employed during a current supported study directed at developing an improved air separation process for the production of oxygen enriched air for magnetohydrodynamics (MHD) combustion are outlined. The ultimate objective is to arrive at conceptual designs of air separation plants, optimized for minimum specific power consumption and capital investment costs, for integration with MHD combined cycle power plants. R.E.S.

N80-23781# National Mechanical Engineering Research Inst., Pretoria (South Africa). Aeromechanics Div.
THE AERODYNAMICS OF AXIAL FLOW WIND POWER TURBINES
W. J. VanderElst Jun. 1979 37 p refs
(CSIR-ME-1619; ISBN-0-7988-1463-2) Avail: NTIS HC A03/MF A01

A general analysis of the aerodynamics of wind power turbines of the axial flow type is presented. The design parameters appear in nondimensional form and are presented graphically. The theory is applicable to any type of wind power generator, including slow running windmills normally used for powering water pumps as well as fast running machines which are suitable for the generation of electric power. Author

N80-23783# SRI International Corp., Menlo Park, Calif.
NAVAL FACILITY ENERGY CONVERSION PLANTS AS RESOURCE RECOVERY SYSTEM COMPONENTS Interim Report, period ending Oct. 1979
Arlie G. Capps Port Hueneme, Calif. Civil Engineering Lab. Jan. 1980 68 p
(Contract N00123-78-C-0868)
(AD-A081232; CEL-CR-80-002) Avail: NTIS HC A04/MF A01 CSCL 21/4

This interim report addresses concepts for recovering energy from solid waste by using Naval facilities steam plants as principle building blocks of candidate solid waste/resource recovery systems at Navy installations. The major conclusions of this portion of the project are: although it is technically feasible to adapt Navy energy conversion systems to fire Waste Derived Fuels (WDF) in one or more of its forms, the optimal form selected should be a site-specific total system; near- to intermediate-term programs should probably continue to give first consideration to waterwall incinerators and to the cofiring of solid WDF in coal-capable plants; package incinerators and conversions of oil burning plants to fire a fluff form of solid waste fuel may be the options with the greatest potential for the intermediate term because waterwalls would be uneconomical in many small plants and because the majority of medium-sized oil-burning plants will not be converted to burn coal; and pyrolytic processes to produce gaseous and liquid fuels have not been sufficiently developed as yet to be specified for commerical operation. GRA

N80-23790# Argonne National Lab., Ill. Office of Program Management Support.
WORLD ENERGY DATA SYSTEM (WENDS). VOLUME 6: INTERNATIONAL AGREEMENT PROFILES
Jun. 1979 202 p
(Contract W-31-109-eng-38)
(ANL-PMS-79-2-Vol-6) Avail: NTIS HC A10/MF A01

The World Energy Data System contains organized data on those countries and international organizations that may have critical impact on world energy. The international agreement profiled in WENDS are all energy related and are organized by energy technology. These are: coal; conservation; fusion; geothermal; nuclear fission; oil, gas, and shale; solar, wind, and ocean thermal; and other (cooperation in electrical power equipment acquisition, energy, energy research, etc.). The agreement profiles are accessible by energy technology and alphabetically by country. DOE

N80-23818*# Thermo Electron Corp., Waltham, Mass.
DOE/JPL ADVANCED THERMIONIC TECHNOLOGY PROGRAM Progress Report, Apr. - Jun. 1979
1979 73 p refs
(Contracts JPL-95509; EY-76-C-02-3056)
(NASA-CR-163134; COO-3056-41; PR-39) Avail: NTIS HC A04/MF A01 CSCL 10A

Progress made in different tasks of the advanced thermionic technology program is described. The tasks include surface and plasma investigations (surface characterization, spectroscopic plasma experiments, and converter theory); low temperature converter development (tungsten emitter, tungsten oxide collector and tungsten emitter, nickel collector); component hardware development (hot shell development); flame-fired silicon carbide converters; high temperature and advanced converter studies; postoperational diagnostics; and correlation of design interfaces. DOE

N80-23821# Oak Ridge National Lab., Tenn. Engineering Technology Div.
SUMMARY OF THE RESEARCH AND DEVELOPMENT EFFORT ON OPEN-CYCLE COAL-FIRED GAS TURBINES
M. E. Lackey Oct. 1979 126 p refs
(Contract W-7405-eng-26)
(ORNL/TM-6253) HC A07/MF A01

Extensive experience gained with gas turbines operating not only with coal as fuel but also with dusty inlet air and with dirty fuels (such as heavy oils and blast furnace gas) as well as petroleum catalytic cracking units was reviewed. All this experience indicates that the particulate content of the hot gases fed to the turbine must be kept to less than approximately 1 ppM to keep turbine bucket erosion to an acceptable level for turbine inlet temperatures of 1500 F or more. It is shown that cyclone separators can be used to reduce the particulate content to as low as 100 ppM under the best conditions. The only effective was found to reduce the particulate content of blast furnace gas and gas from coal gasification units to the 1 ppM required for a high temperature gas turbines is to cool the gas and pass it through a two-stage water scrubber or equivalent before burning it. DOE

N80-23831# Rockwell International Corp., Golden, Colo. Energy Systems Group.
MILLVILLE WIND TURBINE GENERATOR: FAILURE ANALYSIS AND CORRECTIVE DESIGN MODIFICATION
C. A. Waldon, M. J. Carr, and V. K. Grotzky Jul. 1979 25 p refs
(Contract EY-76-C-04-3533)
(RFP-2992/3533/79-3) Avail: NTIS HC A02/MF A01

Fatigue cracks in the blade skins of the Millville Wind Turbine Generator were fractographically analyzed. It is beleived they were caused by large flapwise deflections during a wind storm on December 4, 1978. The deflections caused the skin to buckle, which initiated rapidly growing fatigue cracks. Propagation continued to the leading edge, moving radially inward and outward along the leading edge radius. A modified blade design which incorporates several corrective techniques was then developed. DOE

N80-23839# Oak Ridge National Lab., Tenn. Chemistry Div.
MOLTEN CARBONATE FUEL CELL PROGRAM. COMPOSITION GRADIENTS INDUCED BY CURRENT FLOW IN Li2CO3-K2CO3 MIXTURES Progress Report, 1 Jul. - 31 Dec. 1978
J. Braunstein, H. R. Bronstein, S. Cantor, D. E. Heatherly, J. I. Padova, T. M. Thomas, and C. E. Vallet Dec. 1979 15 p refs
(Contract W-7405-eng-26)
(ORNL/TM-7061) Avail: NTIS HC A02/MF A01

Gradients in the Li/K ratio of a LiKCO3 electrolyte caused by current flow in a molten carbonate fuel cell is the cation mobilities are unequal were examined. Composition gradients were predicted from estimated values of mobility, activity, and diffusivity utilizing a one dimensional model. Predictions from a similar model for a system of known properties were confirmed experimentally by electrolysis-relaxation experiments. The model calculations for carbonates are consistent with electrolysis-relaxation measurements on fuel cell tiles, but clearly indicate the need for additional specific physical property data, especially the tranference number. DOE

N80-23844# Argonne National Lab., Ill.
OPEN-CYCLE COAL-FIRED LIQUID-METAL MHD
E. S. Pierson, M. Petrick, F. Schreiner, and D. Cohen 1979 12 p refs Presented at the 18th Symp. on Eng. Aspects of Magnetohydrodyn., Butte, Mont., 18-20 Jun. 1979
(Contract W-31-109-eng-38)
(CONF-790640-7) Avail: NTIS HC A02/MF A01

An open-cycle, coal fired, liquid magnetohydrodynamics (MHD) concept is described and compared with the open-cycle plasma MHD cycle, and it is shown that, in the former, temperatures are much lower and the air preheater and radiant boiler are eliminated. The constraints on the electrodynamic working fluid and the choice of copper are discussed. Recent experiments with liquid copper and coal combustion gas are described, and the indicated implications for environmental impact, i.e., SO/sub x/ and NO/sub x/ control, are discussed. Initial efficiency calculations yield values comparable to those for open-cycle plasma MHD at combustor temperatures as much as 1000 K lower and MHD generator temperatures more than 1000 K lower than is the case for open-cycle plasma MHD. Significantly, the liquid metal MHD system uses components that, except for the generator, are close to or within present-day technology, and it appears that readily available containment materials are compatible with the fluids. DOE

N80-23845# West Virginia Univ., Morgantown. Dept. of Aerospace Engineering.
VERTICAL AXIS WIND TURBINE DEVELOPMENT: EXECUTIVE SUMMARY Final Report, 1 Mar. 1976 - 30 Jun. 1977
R. E. Walters, J. B. Fanucci, P. W. Hill, and P. G. Migliore Jul. 1979 26 p
(Contract EY-76-C-05-5135)
(ORO-5135-77-5-Summ) Avail: NTIS HC A03/MF A01

Information is presented concerning (1) the numerical solution of the aerodynamics of cross-flow wind turbines; (2) boundary layer considerations for a vertical axis wind turbine (VAWT); (3) VAWT outdoor test model; (4) low solidity blade tests; (5) high solidity blade design; (6) cost analysis of the VAWT test model; (7) structural parametric analysis of VAWT blades; and (8) cost study of current wind energy conversion systems. DOE

N80-23846# West Virginia Univ., Morgantown. Dept. of Aerospace Engineering.
VERTICAL AXIS WIND TURBINE DEVELOPMENT Final Report, 1 Mar. 1976 - 30 Jun. 1977
R. E. Walters, J. B. Fanucci, P. W. Hill, and P. G. Migliore Jul. 1979 243 p refs
(Contract EY-76-C-05-5135)
(ORO-5135-77-5) Avail: NTIS HC A11/MF A01

Theoretical and experimental research accomplished in evaluating an innovative concept for vertical axis wind turbines (VAWT) is described. The concept is that of using straight blades composed of circulation controlled airfoil sections. The theoretical analysis was developed to determine the unsteady lift and moment characteristics of multiple-blade cross-flow wind turbines. To determine the drag data needed as input to the theoretical analysis, an outdoor test model VAWT was constructed; design details, instrumentation, calibration results, and initial test results are reported. Initial testing was with fixed pitch blades having cross-sections of conventional symmetrical airfoils. Costs of building the test model are included, as well as cost estimates for blades constructed with composite materials. These costs are compared with those of other types of wind turbines. DOE

N80-23850# Foster-Miller Associates, Inc., Waltham, Mass.
RESEARCH AND DEVELOPMENT OF AN AIR-CYCLE HEAT-PUMP WATER HEATER Final Report
John T. Dieckmann, Alve J. Erickson, Andrew C. Harvey, and William M. Toscano 1 Oct. 1979 343 p refs
(Contract W-7405-eng-26)
(ORNL/SUB-7226/1) Avail: NTIS HC A15/MF A01

A prototype reverse Brayton air cycle heat pump water heater was designed and built for residential applications. The system consists of a compressor/expander, an air-water heat exchanger, an electric motor, a water circulation pump, a thermostat, and fluid management controls. A potential residential market for the new high-efficiency water heater of approximately 480,000 units/y was identified. The retail and installation cost of this water heater is estimated to be between $500 and $600 which is approximately $300 more than a conventional electric water heater. As part of the design effort, a thermodynamic parametric analysis was performed on the water heater system. It was determined that to obtain a coefficient of performance of 1.7, the isentropic efficiency of both the compressor and the expander must be at least 85 percent. The selected mechanical configuration is described. DOE

N80-23860# Battelle Columbus Labs., Ohio.
ANALYSIS AND DESIGN OF A 100-KILOWATT SOLAR PHOTOVOLTAIC FLAT-PANEL POWER SYSTEM FOR A MACHINING AND METALWORKING FACILITY IN COLUMBUS, OHIO. PHASE 1: PHOTOVOLTAIC FLAT PANEL APPLICATION EXPERIMENT Final Report, 1 Oct. 1978 - 28 Feb. 1979
G. T. Noel, G. Alexander, L. H. Stember, G. H. Stickford, J. H. Broehl, and D. C. Carmichael Albuquerque, N. Mex. DOE Mar. 1979 163 p
(Contracts ET-78-C-04-5395; DE-AC04-78ET-23055)
(DOE/ET/23055-1) Avail: NTIS HC A08/MF A01

A 100kW peak flat panel photovoltaic power system to supply power to a machine shop load in Columbus, Ohio was designed. The system will provide three-phase, 240 volt ac power to a machining and metal-working facility which has 100 pieces of machinery and employs 50 machinists and other craftsmen. The system will operate in parallel with the utility which will supply the backup power. Due to the close match of the array power output to the workday shop load, only a small amount of the power generated is excess to the concurrent shop demand. When there is any excess, it will be fed to alternate loads at the site, rather than into the utility grid. A system performance analysis indicates that the system will supply approximately 115, 000 kWh/ year of electrical energy after all losses. The system uses high energy-density flat panel photovoltaic modules in a roof-mounted installation, and employs a microprocessor controlled power conditioning unit. DOE

N80-23862# Massachusetts Inst. of Tech., Cambridge. Aeroelastic and Structures Research Lab.

DYNAMICS OF A FLEXIBLE ROTOR-TOWER SYSTEM

Lennart S. Hultgren and John Dugundji Stockholm Aeronautical Research Inst. of Sweden Aug. 1979 99 p refs
(Contract SWEDBESD-5061.012)
(ASRL-TR-194-1; FFA-AU-1499) Avail: NTIS HC A05/MF A01

The dynamics of a horizontal axis wind turbine were analyzed. Both the blades and the tower are taken to be flexible. The analysis is linear and modal. For a three bladed rotor, numerical results were obtained for free vibrations and forced oscillations due to static unbalance. Analytical solutions were constructed for forced vibrations due to gravity and wind shear. Author (ESA)

N80-23947# Battelle Pacific Northwest Labs., Richland, Wash.

WIND CHARACTERISTICS FOR AGRICULTURAL WIND ENERGY APPLICATIONS

David S. Renne Jan. 1979 5 p refs Presented at the 14th Conf. on Agr. and Forest Meteorology, Minneapolis, 24 Apr. 1979
(Contract EY-76-C-06-1830)
(PNL-SA-7270; CONF-7904120-1) Avail: NTIS HC A02/MF A01

The development of economically viable wind energy conversion systems (WECS) is discussed. The use of the WECS in farm and rural applications is examined. Potential applications for WECS include irrigation pumping, residential heat, control of livestock environment, crop drying, and water heating and pumping. A map outlining the wind energy resource in the United States is presented at the various wind characteristics important to WECS are delineated. A.W.H.

N80-24214# Los Alamos Scientific Lab., N. Mex.

FUEL CELL SYSTEMS FOR VEHICULAR APPLICATIONS

D. K. Lynn, J. B. McCormick, R. E. Bobbett (Arizona Univ., Tuscon), W. J. Kerwin, and C. Derouin 1980 30 p refs Presented at SAE Automotive Eng. Congr. and Exposition, Detroit, 25 Feb. 1980
(Contract W-7405-eng-36)
(LA-UR-79-2826; CONF-800202-2) Avail: NTIS HC A02/MF A01

The phosphoric acid fuel cell was used as the base line in these evaluations. Two cell sizes (15 and 60 kW) and two fuel options (methanol and propane) were included. Four vehicle types, the city bus, highway bus, delivery van, and general-purpose consumer car were selected for evaluation. Typical drive cycles and economics for these vehicles are compiled, and the fuel cell vehicle and current internal combustion and diesel engine vehicles are compared. The initial results of detailed computer simulations to illustrate a number of the important system-design considerations in configuring a fuel cell/battery electric vehicle are presented and a fuel-cell-powered golf cart currently being used as an engineering test bed is described. DOE

N80-24620*# Chrysler Corp., Detroit, Mich.

BASELINE AUTOMOTIVE GAS TURBINE ENGINE DEVELOPMENT PROGRAM Final Report

C. E. Wagner, ed. and R. C. Pampreen, ed. Apr. 1979 182 p refs Sponsored by NASA
(Contracts EY-76-C-02-2749; EC-77-A-31-1040)
(NASA-CR-159670; DOE/NASA/2749-79/1-Vol-1;
COO-2749-42) Avail: NTIS HC A09/MF A01 CSCL 21A

Tests results on a baseline engine are presented to document the automotive gas turbine state-of-the-art at the start of the program. The performance characteristics of the engine and of a vehicle powered by this engine are defined. Component improvement concepts in the baseline engine were evaluated on engine dynamometer tests in the complete vehicle on a chassis dynamometer and on road tests. The concepts included advanced combustors, ceramic regenerators, an integrated control system, low cost turbine material, a continuously variable transmission, power-turbine-driven accessories, power augmentation, and linerless insulation in the engine housing. R.E.S.

N80-24621*# Chrysler Corp., Detroit, Mich.

CONCEPTUAL DESIGN STUDY OF AN IMPROVED AUTOMOTIVE GAS TURBINE POWERTRAIN Final Report

C. E. Wagner, ed. and R. C. Pampreen, ed. Jun. 1979 196 p refs
(Contracts DE-AC02-76CS-52749)
(NASA-CR-159672; DOE/NASA/2749-79/3-Vol-3;
COO-2749-40) Avail: NTIS HC A09/MF A01 CSCL 21A

Automotive gas turbine concepts with significant technological advantages over the spark ignition (SI) engine were assessed. Possible design concepts were rated with respect to fuel economy and near-term application. A program plan which outlines the development of the improved gas turbine (IGT) concept that best met the goals and objectives of the study identifies the research and development work needed to meet the goal of entering a production engineering phase by 1983. The fuel economy goal is to show at least a 20% improvement over a conventional 1976 SI engine/vehicle system. On the basis of achieving the fuel economy goal, of overall suitability to mechanical design, and of automotive mass production cost, the powertrain selected was a single-shaft engine with a radial turbine and a continuously variable transmission (CVT). Design turbine inlet temperature was 1150 C. Reflecting near-term technology, the turbine rotor would be made of an advanced superalloy, and the transmission would be a hydromechanical CVT. With successful progress in long-lead R&D in ceramic technology and the belt-drive CVT, the turbine inlet temperature would be 1350 C to achieve near-maximum fuel economy. A.R.H.

N80-24757*# Honeywell, Inc., Minneapolis, Minn.

SPECTROPHOTOVOLTAIC ORBITAL POWER GENERATION Final Report, Aug. 1979 - Feb. 1980

Joan R. Onffroy Feb. 1980 195 p refs
(Contract NAS8-33511)
(NASA-CR-161451; HONEYWELL-80SRC8) Avail: NTIS HC A09/MF A01 CSCL 10A

The feasibilty of a spectrophotovoltaic orbital power generation system that optically concentrates solar energy is demonstrated. A dichroic beam-splitting mirror is used to divide the solar spectrum into two wavebands. Absorption of these wavebands by GaAs and Si solar cell arrays with matched energy bandgaps increases the cell efficiency while decreasing the amount of heat that must be rejected. The projected cost per peak watt if this system is $2.50/W sub p. R.E.S.

N80-24758*# Boeing Engineering and Construction, Seattle, Wash.

MOD-2 WIND TURBINE SYSTEM CONCEPT AND PRELIMINARY DESIGN REPORT. VOLUME 1: EXECUTIVE SUMMARY

Jul. 1979 31 p
(Contracts DEN3-2; DE-AI01-793T-20305)
(NASA-CR-159609; DOE/NASA/0002-80/2) Avail: NTIS HC A03/MF A01 CSCL 10A

The configuration development of the MOD-2 wind turbine system is presented. The MOD-2 is design optimized for commercial production rates which, in multi-unit installations, will be integrated into a utility power grid and achieve a cost of electricity at less than 4 cents per kilowatt hour. R.E.S.

N80-24772*# Fairchild Stratos Corp., Manhattan Beach, Calif.

NON-HEAT PIPE/P-40 STIRLING ENGINE

R. A. Haglund *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 95-97

Avail: NTIS HC A11/MF A01 CSCL 10B

The non-heat-pipe receiver/P-40 Stirling engine system design is described. A 25 kW direct-driven induction-type alternator will be mounted directly to the P-40 engine to produce to a 60 Hz, 115/230 volt output. R.E.S.

N80-24773*# Ford Aerospace and Communications Corp., Newport Beach, Calif.
THE SCSTPE ORGANIC RANKINE ENGINE
Frank P. Boda *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 99-105 refs

Avail: NTIS HC A11/MF A01 CSCL 10B

The organic Rankine cycle engine under consideration for a solar thermal system being developed is described. Design parameters, method of control, performance and cost data are provided for engine power levels up to 80 kWe; efficiency is shown as a function of turbine inlet temperature in the range of 149 C to 427 C. R.E.S.

N80-24775*# United Sterling, Inc. Alexandria, Va.
THE UNITED STIRLING P40 ENGINE FOR SOLAR DISH CONCENTRATOR APPLICATION
Lars Ortegren and Lars E. Sjostedt (United Stirling A.B., Malmo, Sweden) *In* JPL Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 113-117

Avail: NTIS HC A11/MF A01 CSCL 10A

The United Stirling P40 engine is a key component in a solar concentration based energy conversion system, to be demonstrated and tested during 1980-81. The inherent characteristics of modern Stirling engines is reviewed focusing on the baseline P40 double-acting engine. The extent of modifications required for the solar application is reviewed and performance data are predicted. Finally, the potential of an advanced solar Stirling engine is briefly considered. R.E.S.

N80-24781*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
COST ESTIMATING BRAYTON AND STIRLING ENGINES
Herbert R. Fortgang *In its* Proc. of the First Semiann. Distributed Receiver Program Rev. 15 May 1980 p 153-158

Avail: NTIS HC A11/MF A01 CSCL 05C

Brayton and Stirling engines were analyzed for cost and selling price for production quantities ranging from 1000 to 400,000 units per year. Parts and components were subjected to indepth scrutiny to determine optimum manufacturing processes coupled with make or buy decisions on materials and small parts. Tooling and capital equipment costs were estimated for each detail and/or assembly. For low annual production volumes, the Brayton engine appears to have a lower cost and selling price than the Stirling Engine. As annual production quantities increase, the Stirling becomes a lower cost engine than the Brayton. Both engines could benefit cost wise if changes were made in materials, design and manufacturing process as annual production quantities increase. Author

N80-24809# Galaxy, Inc., Washington, D.C.
ORGANIC RANKINE CYCLE ENGINE TECHNOLOGY IN JAPAN, A PRELIMINARY SURVEY
Oct. 1979 132 p refs
(Contract DE-AC03-79SF-10538)
(DOE/SF/10538-1) Avail: NTIS HC A07/MF A01

The state-of-the-art of the development of organic Rankine cycle engines in Japan is reviewed. With the first oil crisis as a momentum, general volition to research and development and commercialization efforts of the Rankine cycle has rapidly developed. However, practical applications by industries will be the matter of future. Recovery systems of waste heat should be designed based on availability of waste heat sources. The Rankine cycle, as one of the electric power generators, has a wider range of application and thus, especially in Japan, the development of Rankine cycle technology is going forward. Although the presently attained thermal utilization rate is only 20%, future improvement of the rate will be considerably dependent on the contribution of the developments on specific various units, for example, the heat exchanger. R.E.S.

N80-24811# Dayton Univ. Research Inst., Ohio.
ELECTROFLUID DYNAMIC WIND GENERATOR Final Annual Progress Report, 15 Sep. 1977 - 30 Sep. 1978
John E. Minardi, Maurice O. Lawson, and Frank L. Wattendorf May 1979 76 p refs
(Contract EY-76-S-02-4130)
(COO-4130-2; APR-3) Avail: NTIS HC A05/MF A01

The objective of the program is to conduct research leading to the development of EFD wind driven generators. In such generators, the wind blows through suitably oriented arrays of electrodes, transports charged particles against an electrical potential gradient, and thereby generates electrical power directly without moving parts. Significant progress has been made in accomplishing major research objectives. During the year, the effort was directed toward the achievement of three milestones; namely: development of a laboratory method for the production of an adequate supply of suitably low mobility charged droplets for the testing of generator performance; experimental verification of generator performance theory; and development of methods for practical production of charged droplets. DOE

N80-24812*# Rasor Associates, Inc., Sunnyvale, Calif.
ADVANCED THERMIONIC ENERGY CONVERSION Joint Highlights and Status Report, Apr. - Jun. 1979
1979 81 p refs
(Contracts JPL-955033; EY-76-C-02-2263)
(NASA-CR-163061; COO-2263-15; NSR-2-15) Avail: NTIS CSCL 10A

Developments towards space and terrestrial applications of thermionic energy conversion are presented. Significant accomplishments for the three month period include: (1) devised a blade-type distributed lead design with many advantages compared to the stud-type distributed lead; (2) completed design of Marchuk tube test apparatus; (3) concluded, based on current understanding, that residual hydrogen should not contribute to a negative space charge barrier at the collector; (4) modified THX design program to include series-coupled designs as well as inductively-coupled designs; (5) initiated work on the heat transfer technology, THX test module, output power transfer system, heat transfer system, and conceptual plant design tasks; and (6) reached 2200 hours of operation in JPL-5 cylindrical converter envelope test. DOE

N80-24834# Massachusetts Inst. of Tech., Cambridge. Dept. of Ocean Engineering.
OCEAN THERMAL ENERGY CONVERSION: A STATE-OF-THE-ART STUDY
A. Douglas Carmichael Jul. 1979 84 p Sponsored by EPRI
(EPRI-ER-1113-SR) Avail: NTIS HC A05/MF A01

A baseline ocean thermal energy conversion unit composed of eight 50 MW power modules was studied and defined. It was concluded that OTEC system is technically feasible and could operate year round in some regions of the Gulf of Mexico, off Hawaii, and off Puerto Rico. The closed Rankine cycle using ammonia as the working fluids is probably the best power plant system to utilize the small temperature differences of about 40 F between the warm surface water and the cold water taken from a depth of about 3280 ft. The most important components in the power plant are the large heat exchanges and the major technical problems are anticipated with these components. The platform will probably have a ship or barge configuration with the long cold water pipe supported from the midships region. The estimated costs of the baseline system were established from recent design studies. The total capital investment (excluding the cables to shore) was estimated to be about $3000 per kW. DOE

N80-24861# South Dakota School of Mines and Technology, Rapid City.
ENERGY FROM HUMID AIR Final Report
T. K. Oliver, W. N. Groves, C. L. Gruber, and A. Cheung Feb.

1979 99 p refs
(Contract EX-76-C-01-2553)
(DSE-2553-79/1) Avail: NTIS HC A05/MF A01

A cost effective process to convert the energy in humid air into mechanical work to drive an electrical generator was investigated using computer modeling. Results for a natural draft tower show that it is not a cost effective way to get energy from humid air. Parametric studies are presented for expansion-compression cycles. With suitable conditions, including large amounts of cooling during compression, this cycle has an attractive network output. To avoid using all the output power to overcome machine losses, it appears necessary to use a one-machine mechanization. The most promising uses vortex flow to achieve the necessary expansion and subsequent compression with cooling. Power output and costs were estimated for a vortex plant located in Puerto Rico. DOE

N80-24864# Grumman Aerospace Corp., Bethpage, N.Y.
FURTHER INVESTIGATIONS OF DIFFUSER AUGMENTED WIND TURBINES. PART 1: EXECUTIVE SUMMARY Final Report
K. M. Foreman and B. L. Gilbert Jul. 1979 11 p
(Contract EY-76-C-02-2616)
(COO-2616-2-Pt-1-Rev-1) Avail: NTIS HC A02/MF A01

A multiphased experimental program is described which involves wind tunnel test facilities and models of several compact diffuser configurations. Screens to simulate a wind turbine and a three-bladed, fixed-pitch turbine were used with the diffuser models. A candidate baseline design is described, and some of the key technical and economic issues which can lead to future full scale implementation are discussed. DOE

N80-24875# New Mexico Energy Inst., Albuquerque.
VARIABLE SPEED CONSTANT FREQUENCY VOLTAGE GENERATOR (ALTERNATOR) Final Report
W. W. Grannemann Jul. 1979 46 p refs Sponsored by New Mexico Energy and Minerals Dept.
(PB80-141286; NMEI-44) Avail: NTIS HC A03/MF A01 CSCL 10B

The objective achieved was constucting the first prorotype alternator with digital control of its output frequency for a variable shaft speed, such as a wind machine would have. The first machine is a two-pole alternator with power removed from the rotor through slip rings. The rotating field in the stationary coils of the stator is controlled by the microcircuits. Later alternators may well have the control circuits and rotating field in the rotor which would be a significant improvement since power would not need to be removed through slip rings. Except for the power amplifers which drive the stator windings, the control and the comparison circuitry is constructed with available low cost, low power integrated circuits (IC's). Test results from the first prototype demonstrate that the alternator can successfully convert available wind power directly to usable a-c 60 hertz power to supplement line power. The power generated by the alternator can have constant frequency as determined by the local power system and the control circuitry. Variations in the mechanical speed of rotation of the alternator rotor, which are caused by changes in wind velocity, will change the power output of the alternator while the voltage and the frequency remain constant. GRA

N80-25104*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SOME CALCULATED EFFECTS OF NON-UNIFORM INFLOW ON THE RADIATED NOISE OF A LARGE WIND TURBINE
George C. Greene and Harvey H. Hubbard May 1980 14 p refs
(NASA-TM-81813) Avail: NTIS HC A02/MF A01 CSCL 20A

Far field computations were performed for a large wind turbine to evaluate the effects of non-uniform aerodynamic loading over the rotor disk. A modified version of the Farassat/Nystrom propeller noise prediction program was applied to account for the variations in loading due to inflow interruption by the upstream support tower. The computations indicate that for the uniform inflow case, relatively low noise levels are generated and the first rotational harmonic dominated the spectrum. For cases representing wake flow deficiences due to the tower structure subtantially increased noise levels for all harmonics are indicated, the greatest increases being associated with the higher order harmonics. Author

N80-25161# California Univ., Livermore. Lawrence Livermore Lab.
TESTS OF HIGH-POWERED DIRECT CONVERSION ON BEAMS AND PLASMA
W. L. Barr, R. W. Moir, G. W. Hamilton, and A. F. Lietzke (Calif. Univ. Lawrence Berkeley Lab.) 6 Nov. 1979 6 p refs Presented at the 8th Symp. on Eng. Probl. of Fusion Res., San Francisco, 13 Nov. 1979
(Contract W-7405-eng-48)
(UCRL-82852; CONF-791102-31) Avail: NTIS HC A02/MF A01

Two types of direct converters at up to 100 keV were tested. A beam direct converter was tested on a reduced area TFRT source at the Lawrence Berkeley Laboratory (LBL). After surface conditioning and outgassing, the efficiency was over 60% at the beginning of a pulse. During a pulse, the efficiency decreased as the gas density built up. A single-stage plasma direct converter with immersed grids is being tested on a steady-state ion beam with 6 kW of beam power. The power density at the grids can be varied by adjusting the beam focus. Recovery efficiencies over 70% are measured and we are now studying various loss mechanisms. DOE

N80-25650# California Univ., Livermore. Lawrence Livermore Lab.
LASER PROGRAM, VOLUME 3 Annual Report, 1978
Michael J. Monsler, ed. and Brian D. Jarman, ed. Mar. 1979 266 p refs 3 Vol.
(Contract W-7405-eng-48)
(UCRL-50021-78-Vol-3) Avail: NTIS HC A12/MF A01

Progress in advanced quantum electronics, primarily the quest for advanced rep-rateable short wave length lasers with high efficiency, is documented. Application studies in electrical energy production and fissile fuel production are also described. Selected highlights of the advanced isotope separation program are also presented. DOE

N80-25666# Westinghouse Electric Corp., Pittsburgh, Pa. Advanced Energy Systems Div.
COMPACT CLOSED CYCLE BRAYTON SYSTEM FEASIBILITY STUDY, VOLUME 1 Final Report, 20 May 1976 - 20 Jun. 1979
R. E. Thompson, R. L. Ammon, R. Calvo, L. R. Eisenstatt, and F. R. Spurrier Aug. 1979 204 p refs
(Contract N00014-76-C-0706)
(AD-A081379; WAES-TNR-237-Vol-1) Avail: NTIS HC A10/MF A01 CSCL 20/13

This report presents the final results from a three year study which evaluated the feasibility of a closed Brayton cycle power conversion system for compact light weight naval propulsion plants. The overall objective of the program was to conduct the analytical study and experimental research required to evaluate and to demonstrate feasibility of a closed Brayton cycle power conversion system for a low volume, light weight marine propulsion plant. Another objective was to insure relevance of power conversion system study results to all candidate applications, including recognition of the various energy sources which the Navy could desire to use in the future. The Compact Closed Cycle Brayton System (CCCBS) program has included derivation of the most stringent representative requirements for the CCCBS power conversion system, consideration of the interfaces with the ship and with other powerplant components which were outside the scope of the system under study, investigation and evaluation of the components which are most critical to feasibility, iterative definition of a reference 52.2 M Pa (17,000 HP) CCCBS design concept: extensive creep-rupture tests of candidate turbine materials in helium and in air at 927 C (1700 F), and overall evaluations and assessments. The results have shown the feasibility and attractive characteristics of a CCCBS and have indicated that no high risk developments or technology breakt-

hroughs are needed for the CCCBS power conversion system. The results of this program provide a valuable baseline of data for use by the Navy in defining the advanced powerplants which will enhance the capabilities of many types of naval vessels.
GRA

N80-25785*# Georgia Inst. of Tech., Atlanta. Engineering Extension Lab.
PHOTOVOLTAIC SYSTEM COSTS USING LOCAL LABOR AND MATERIALS IN DEVELOPING COUNTRIES
Edward Jacobson, George Fletcher, and Gerald Hein 20 May 1980 60 p
(Grant NsG-3297)
(NASA-CR-163218) Avail: NTIS HC A04/MF A01 CSCL 10A

The use of photovoltaic (PV) technology in countries that do not presently have high technology industrial capacity was investigated. The relative cost of integrating indigenous labor (and manufacturing where available) into the balance of the system industry of seven countries (Egypt, Haiti, the Ivory Coast, Kenya, Mexico, Nepal, and the Phillipines) was determined. The results were then generalized to other countries, at most levels of development. The results of the study imply several conclusions: (1) the cost of installing and maintaining comparable photovoltaic systems in developing countries is less than in the United States; (2) skills and some materials are available in the seven subject countries that may be applied to constructing and maintaining PV systems; (3) there is an interest in foreign countries in photovoltaics; and (4) conversations with foreign nationals suggest that photovoltaics must be introduced in foreign markets as an appropriate technology with high technology components rather than as a high technology system. R.E.S.

N80-25799# Value Engineering Co., Alexandria, Va.
OTEC SUPPORT SERVICES Quarterly Technical Progress Report, 15 Nov. 1978 - 14 Feb. 1979
28 Feb. 1979 17 p
(Contract ET-78-C-02-4931)
(COO-4931-T11; QTPR-3) Avail: NTIS HC A02/MF A01

System integration, engineering, and management support services provided for the Ocean Thermal Energy Conversion (OTEC) Program are described. The tasks include (1) survey, analysis, evaluation, and recommendation concerning program performance; (2) program technical monitoring;(3) development and implementation of methodology to identify and evaluate program alternatives; (4) technical assessments; (5) OTEC system integration; and (6) environment and siting considerations. DOE

N80-25800# Science Applications, Inc., McLean, Va.
SOLAR PHOTOVOLTAIC FLAT PANEL APPLICATIONS EXPERIMENT AT THE OKLAHOMA CENTER FOR SCIENCE AND ARTS Final Report, 30 Sep. 1978 - 31 May 1979
31 May 1979 186 p refs
(Contracts ET-78-C-04-5403; DE-AC04-78ET-23063)
(DOE/ET-23063/1) Avail: NTIS HC A09/MF A01

A photovoltaic power system was designed for the Oklahoma Center for Science and Arts in Oklahoma City. The system, with a basic rating of 250 kW, is enhanced to a summer peak output of 350 kW through the use of augmentation glass mirror reflectors which are arranged to maximize summer output and to match the summer output to the summer load. The baseline system consists of 3780 photovoltaic collector modules, utilizing polycrystalline silicon cells, and companion mirror reflectors arranged in modular fashion on the roof of the Center. Total system output is more than 450 MWh, of which over 420 MWh is used on-site to displace about 65 percent of the current on site load, or about 43 percent of the projected (1981) load. Another 30 MWh is returned to the utility under a buyback agreement. The total amount of energy displaced per year is approximately 850 barrels of oil, or Btu equivalent. DOE

N80-25807# Development Planning and Research Associates, Inc., Manhattan, Kans.
WIND ENERGY APPLICATIONS IN AGRICULTURE: EXECUTIVE SUMMARY Final Report
Milton L. David, Robert J. Buzenberg, Earl F. Glynn, Gary L. Johnson, J. Kenneth Shultis, and John P. Wagner Aug. 1979 209 p refs Sponsored in part by Dept. of Agriculture
(Contract EX-76-A-29-1026)
(DOE/SEA-1109-20401-79/2) Avail: NTIS HC A10/MF A01

An assessment is presented of the potential use of wind turbine generator systems (WTGS) in US agriculture. In particular, the number of WTGS's economically feasible for use in US agriculture and the conditions which yielded economic feasibility of WTGS's for certain agricultural applications are presented. In addition, for each case, i.e., set of assumed conditions, under which WTGS's were found to be economically feasible are identified: (1) the agricultural WTGS applications in terms of location, type and size (complete farm and dedicated-use applications); (2) the number of WTGS's by wind machine and generator size category; (3) aggregate energy conversion potential; and (4) other technical and economic WTGS performance data for particular applications. The methodology, data and assumptions used for the analysis are described. DOE

N80-25824# Department of Energy, Washington, D. C. Office of Solar, Geothermal, Electric and Storage Systems.
OCEAN ENERGY SYSTEMS. FISCAL YEAR 1979 Program Summary Report
1979 284 p refs
(DOE/ET-0118) Avail: NTIS HC A13/MF A01

A review of ocean thermal energy conversion technology, test facilities, and research programs is given; and project summaries for DOE contracts are included. The project summaries list the contractor, contract title and number, funding, and work location and provide a brief description of the project. Also, project summaries for technologies for alternate ocean energy systems employing ocean currents, ocean waves, and salinity gradients are included. The technical status and program plans for each of the alternate technologies are discussed. DOE

N80-25836# Westinghouse Electric Corp., East Pittsburgh, Pa
DESIGN STUDY AND ECONOMIC ASSESSMENT OF MULTI-UNIT OFFSHORE WIND ENERGY CONVERSION SYSTEMS APPLICATIONS. VOLUME 4: METEOROLOGICAL AND OCEANOGRAPHIC SURVEYS Final Report
14 Jun. 1979 344 p refs
(Contracts EX-76-C-01-2330; E(49-18)-2330)
(WASH-2330-78/4-Vol-4) Avail: NTIS HC A15/MF A01

The results are presented of a survey of the meteorology and oceanography of the United States offshore as they pertain to the design, cost, emplacement, operation and maintenance of offshore wind energy conversion systems (OWECS). This report is intended to define the environment in which OWECS are to be considered. DOE

N80-25837# Westinghouse Electric Corp., East Pittsburgh, Pa. Advanced Systems Technology Div.
DESIGN STUDY AND ECONOMIC ASSESSMENT OF MULTI-UNIT OFFSHORE WIND ENERGY CONVERSION SYSTEMS APPLICATION. VOLUME 3: SYSTEM ANALYSIS Final Report
14 Jun. 1979 192 p refs
(Contract EX-76-C-01-2330)
(WASH-2330-78/4-Vol-3) Avail: NTIS HC A09/MF A01

Optimum offshore wind energy conversion systems are described. The cost and performance of these systems were developed for a variety of conditions and the tradeoff between cost and energy production was made of the wide range of scenarios considered. The impact of the many design parameters on the major subsystems are briefly reviewed and the interactions which exist between subsystems are discussed. In particular, a section is devoted to dynamic interactions which might exist between the wind turbine generator plant and the platform. DOE

N80-25838# Westinghouse Electric Corp., East Pittsburgh, Pa.
DESIGN STUDY AND ECONOMIC ASSESSMENT OF MULTI-UNIT OFFSHORE WIND ENERGY CONVERSION SYSTEMS APPLICATION. VOLUME 2: APPARATUS DESIGNS AND COSTS Final Report
14 Jun. 1979 310 p refs
(Contracts EX-76-C-01-2330; E(49-18)-2330)

(WASH-2330-78/4-Vol-2) Avail: NTIS HC A14/MF A01

Parametric designs and companion cost functions are presented for each major component of an offshore wind energy conversion system (OWECS). These are: (1) the support platforms; (2) the wind turbine generated (WTG) plants; and (3) the electrical energy collection and transmission system including (4) substations. A backup hydrogen energy delivery system for extremely remote or deep water sites was also evaluated. Costs are presented for fabricating, transporting, installing, operating, and maintaining each of these components. DOE

N80-25846# Montana Energy and MHB Research and Development Inst., Inc., Butte.

HIGH-TEMPERATURE FUEL CELL RESEARCH AND DEVELOPMENT Annual Technical Status Report, 1 Oct. 1978 - 30 Sep. 1979

30 Sep. 1979 25 p

(Contracts EC-77-C-03-1485; DE-AC03-77ET-11320)

(SAN-1485-T1) Avail: NTIS HC A02/MF A01

Materials which are chemically and physically stable in molten carbonate fuel cell electrolyte at 600 to 700 C were identified. Fibers of the identified materials were then prepared and characterized to determine the stability of the fibers in the molten carbonate electrolyte. DOE

N80-25847# Institute of Gas Technology, Chicago, Ill.

FUEL CELL RESEARCH ON SECOND-GENERATION MOLTEN-CARBONATE SYSTEMS Technical Report, 1 Oct. 1978 - 30 Jun. 1979

Oct. 1979 305 p refs

(Contract EM-78-C-03-1735)

(SAN-11276-1) Avail: NTIS HC A14/MF A01

Activities toward the development of a cell package containing cost effective cell components, having a cell performance satisfying utility requirements (125 W/ft 2 at 0.85 V using low Btu fuel gases), and having the capability of repeated thermal cycling with a pressure differential between the anode and the cathode are described. Structural analysis studies to identify the magnitude and the distribution of stress levels in the cell package show that differences in thermal expansion and mechanical properties of the cell components, bonding of the electrolyte tile to other cell components, and the cell design (location of supports and gas distribution channels) are extremely important. Efforts to minimize the phase transformations of the three crystalline forms of LiAlO2 during cell operation via anion or cation doping of the LiAlO2 for the purpose of stabilizing the LiAlO2 surface area at some acceptable level are showing only limited success. Both baseline and development cell components were tested in laboratory and in bench scale cells. DOE

N80-25848# Montana Energy and MHB Research and Development Inst., Inc., Butte.

HIGH TEMPERATURE FUEL CELL RESEARCH AND DEVELOPMENT Final Technical Status Report, Jun. 1977 - Sep. 1978

J. J. Rasmussen and R. Guidotti 15 Oct. 1978 253 p refs

(Contract EC-77-C-03-1485)

(SAN-1485-2) Avail: NTIS HC A12/MF A01

Ceramic materials with properties which made them potential candidates for use in molten-carbonate fuel cell tiles or electrodes were investigated. Thirteen compositions were tested statically at 1000 K in a Li2CO3-K2CO3 bath under a dry CO2 atmosphere. Four of the materials tested showed severe degradation reactions in the molten carbonate. A low temperature process for forming small diameter, high aspect ratio ceramic fibers for fuel cell use was developed. Results of a computer study on the thermodynamic analysis of fuel cell materials are discussed. The magnetohydrodynamic materials with potential use for fuel cell applications were surveyed. Laboratory facilities were established to conduct research on interfacial diffusion processes which could be detrimental to successful long term operation of the solid-electrolyte fuel cell. A variety of physical and chemical techniques were examined for the preparation of high density substituted LaCrO3 which was one component of a diffusion couple with Y2O3-stabilized ZrO2. Hydrolysis of a mixed metal nitrate solution with urea produced the most reactive powder. A final theoretical density of almost 98% was attained in cold pressed sintered discs of this material. DOE

N80-25870# General Electric Co., Philadelphia, Pa. Valley Forge Space Center.

REQUIREMENT DEFINITION AND PRELIMINARY DESIGN OF A PHOTOVOLTAIC CENTRAL POWER STATION EXPERIMENTAL TEST FACILITY Final Report

G. OBrien, R. Pohl, and N. Turner Dec. 1979 481 p refs

(Contract EY-76-C-04-0789)

(SAND-79-7022-Vol-1) Avail: NTIS HC A21/MF A01

The requirements and preliminary design for a photovoltaic central power station experimental test facility are described. Requirements, a preliminary design, costs and schedule were established for the facility construction. Utility participation was reviewed with selected utilities, and both a site selection methodology and a summary set of combined continental US insolation and meteorological data was prepared. The major results, the detailed technical discussion, cost and plans, for the experimental test facility as well as sets of preliminary specifications, drawings, and site selection data are given. DOE

N80-25888# Rockwell International Corp., Golden, Colo. Rocky Flats Plant.

NEW DEVELOPMENTS IN WIND SYSTEMS TECHNOLOGY

R. L. Moment 1979 22 p refs Presented at 2d Intern. Conf. on Alternative Energy Sources, Miami, Beach, Fla. 10 Dec. 1979

(Contract EY-76-C-04-3533)

(RFP-3000; CONF-791204-20) Avail: NTIS HC A02/MF A01

Development programs for U.S. wind turbines of under 100 kW output are reviewed. The system configurations and approaches to component design are discussed. DOE

N80-25889# Rockwell International Corp., Canoga Park, Calif. Energy Systems Group.

TECHNICAL AND MANAGEMENT SUPPORT FOR THE DEVELOPMENT OF SMALL WIND SYSTEMS Annual Report, 1 Oct. 1977 - 30 Sep. 1978

Feb. 1979 147 p refs

(Contract EY-76-C-04-3533)

(RFP-2974/3533-79-2) Avail: NTIS HC A07/MF A01

The FY 1978 annual report of the Rocky Flats Wind Systems Program describes the objectives, approach, and achievements of the program and each of its tasks areas during the period 1 October 1977 - 30 September 1978. During this period, additional testing of ten small wind energy conversion systems (SWECS) was conducted and the Test Center was expanded to accommodate up to 30 SWECS. Work on nine design and analysis projects for advanced prototypes in three size ranges progressed through a series of design reviews, with prototype delivery scheduled to begin in mid-1979. Supporting activities included a Systems Engineering project which analyzed the cost of SWECS components and fabrication, a task effort in technical support to standards development, and the dissemination of information. DOE

N80-25891# EIC, Inc., Newton, Mass.

NEW ELECTROLYTES FOR DIRECT METHANE FUEL CELLS Final Report, 10 Jan. 1977 - 9 Jan. 1979

S. B. Brummer, J. Foos, J. McHardy, J. McVeigh, D. Toland, and M. Turner May 1979 74 p refs

(Contracts EY-76-C-03-1363; DE-AC03-79ET-11321)

(DOE/ET-11321/T1) Avail: NTIS HC A04/MF A01

A fuel cell electrolyte for the direct oxidation of CH4 and/or impure H2 fuels was developed. Emphasis is placed on di and tribasic methanesulfonic acids CX2(SO3H)2 and CX(SO3H3) here X is H, F, or C1. Synthetic routes to CH2(SO3H)2, CH(SO3H)3, CCl2(SO3H)2, and CCl(SO3H)3 were identified and optimized. The diphenyl ester of CF2(SO3H)2 was prepared for the first time and various approaches to CF(SO3H)3 was investigated. In parallel with the synthetic program, apparatus was designed and fabricated for the testing of the electrolytes under fuel cell conditions. Electrodes with low Pt loading were developed for use in electrolyte evaluation. Optimum performance with H3PO4 was achieved using 1 mg Pt/cu cm and 1 mg TFE 30 cu cm deposited on TFE tape, supported on a Au plated Ta screen, and sintered. Preliminary half cell tests using CH2(SO3H)2 and $CH(SO_3H)_3$ indicated that these acids are insufficiently stable for use as fuel cell electrolytes. DOE

N80-25893# California Univ., Livermore. Lawrence Livermore Lab.

EVALUATION OF AIR CATHODES FOR POTENTIAL USE IN DEVELOPMENT OF ALUMINUM-AIR CELLS

J. W. Pyper, B. E. Kelly, and J. F. Cooper Dec. 1979 38 p refs
(Contract W-7405-eng-48)
(UCID-18561) Avail: NTIS HC A03/MF A01

Four air cathodes representing the products of three manufacturers were tested under conditions of continuous and intermittent polarization in order to determine their suitability for testing large scale aluminum-air single cells. The W electrode performed for 312 h with a decrease of potential of 0.11 V at 1.3 kA/sq m. The X standard electrode failed to sustain continuous polarization for longer than 12 h. Both W and Z electrodes met or nearly met polarization requirements. The tests demonstrated that the W electrode is sufficiently durable and low in polarization to be used for testing 0.1 sq m aluminum-air cells. DOE

N80-25895# Argonne National Lab., Ill. Chemical Engineering Div.

ADVANCED FUEL CELL DEVELOPMENT Progress Report, Jan. - Mar. 1979

R. D. Pierce, P. A. Finn, K. Kinoshita, G. H. Kucera, R. B. Poeppel, J. W. Sim, and R. N. Singh Sep. 1979 47 p refs
(Contract W-31-109-eng-38)
(ANL-79-51) Avail: NTIS HC A03/MF A01

Advanced fuel cell research activities are discussed. The effort directed toward understanding and improving the components of molten-carbonate-electrolyte fuel cells operated at temperatures near 925 K. The primary focus of this work was the development of electrolyte structures that have good electrolyte retention and mechanical properties as well as long term stability, and on developing methods of synthesis amendable to mass production. Current electrolyte structures are comprised of $LiAlO_2$ particles and an eutectic of Li_2CO_3 and K_2CO_3. DOE

N80-25897# Sandia Labs., Albuquerque, N. Mex.

AERODYNAMIC INTERFERENCE BETWEEN TWO DARRIEUS WIND TURBINES

P. R. Schatzle, P. C. Klimas, and H. R. Spahr 1980 6 p refs Presented at the Wind Energy Conf., Boulder, Colo., 9 Apr. 1980
(Contract EY-76-C-04-0789)
(SAND-79-1984C; CONF-800406-2) Avail: NTIS HC A02/MF A01

The effect of aerodynamic interference on the performance of two curved bladed Darrieus-type vertical axis wind turbines was calculated using a vortex/lifting line aerodynamic model. The turbines have a power-to-power separation distance of 1.5 turbine diameters, with the line of turbine centers varying with respect to the ambient wind direction. The effects of freestream turbulence were neglected. For the cases examined, the calculations showed that the downwind turbine power decrement (1) was significant only when the line of turbine centers was coincident with the ambient wind direction, (2) increased with increasing tip-speed-ratio, and (3) is due more to induced flow angularities downstream than to speed deficits near the downstream turbine. DOE

N80-25899# Aluminum Co. of America, Alcoa Center, Pa.

DESIGN AND FABRICATION OF A LOW-COST DARRIEUS VERTICAL AXIS WIND TURBINE SYSTEM, PHASE 1

Mar. 1980 295 p refs
(Contract EM-78-C-04-4272)
(ALO-4272) Avail: NTIS HC A13/MF A01

The design phase of a low cost Darrieus-type vertical axis wind turbine for commercialization in the United States is presented. The system definition, cost estimates, system performance analysis, structural design analysis, and environmental considerations are described. R.E.S.

N80-25910# General Accounting Office, Washington, D. C. Energy and Minerals Div.

MAGNETOHYDRODYNAMICS: A PROMISING TECHNOLOGY FOR EFFICIENTLY GENERATING ELECTRICITY FROM COAL REPORT TO THE CONGRESS

11 Feb. 1980 61 p. refs
(PB80-143175; EMD-80-14) Avail: NTIS HC A04/MF A01 CSCL 10B

The status potential, and alternative Federal strategies for development of electricity from coal are discussed. It is recommended that the Secretary of Energy: (1) evaluate the status of testing at current facilities and its effect on maintaining the pilot plant design schedule; (2) analyze the advantages and disadvantages of alternative types of pilot plants; and (3) establish a mechanism for actively involving potential users in the program. GRA

N80-25912# Research Triangle Inst., Research Triangle Park, N. C.

NOVEL CONCENTRATOR PHOTOVOLTAIC CONVERTER SYSTEM DEVELOPMENT Final Report, 24 Jan. - 30 Aug. 1979

S. M. Bedair, J. R. Hauser, M. F. Lamorte, S. Phatak, and M. L. Timmons Mar. 1980 62 p refs Prepared jointly with North Carolina Univ., Raleigh and North Carolina State Univ., Raleigh
(Contract EY-76-C-04-0789)
(SAND-80-7004) Avail: NTIS HC A04/MF A01

Several material systems were investigated for their potential use in a cascade solar cell. The studies included basic materials properties as well as p-n junction studies for the top cell, tunnel junction, and bottom cell. While junctions appropriate to each individual part of the cascade cell were demonstrated, problems still remain in fabricating a high efficiency cascade solar cell because of material and growth problems with the semiconductor layers which have optimum bandgaps. DOE

N80-26167# Argonne National Lab., Ill.

POWER TAKE-OFF ANALYSIS FOR DIAGONALLY CONNECTED MHD CHANNELS

Yen-Cheng Pan and Ezzat D. Doss 1980 13 p refs Presented at 18th AIAA Aerospace Sci. Meeting, Pasadena, Calif., 14-16 Jan. 1980
(Contract W-31-109-eng-38)
(CONF-800104-6) Avail: NTIS HC A02/MF A01

The electrical loading of the power take-off region of diagonally connected MHD channels is investigated by a two dimensional model. The loading schemes typical of those proposed for the U-25 and U-25 Bypass channels are examined. The model is applicable for the following four cases: (1) connection with diodes only, (2) connection with diodes and equal resistors, (3) connection with diodes and variable resistances to obtain a given current distribution, and (4) connection with diodes and variable resistors under changing load. The analysis is applicable for the power take-off regions of single or multiple-output systems. The general behaviors of the current and the potential distributions in all four cases are discussed. The analytical results are in good agreement with the experimental data. It is found possible to design the electrical circuit of the channel in the take-off region so as to achieve a fairly even load current output under changing total load current. DOE

N80-26172# Arnold Engineering Development Center, Arnold Air Force Station, Tenn.

MHD HIGH PERFORMANCE DEMONSTRATION EXPERIMENT Quarterly Progress Report, 1 Apr. - 30 Jun. 1979

Jul. 1979 33 p refs
(Contract ET-78-I-01-2895)
(DOE/ET-2895/5) Avail: NTIS HC A03/MF A01

The attainment of MHD performance was demonstrated on a sufficiently large scale to verify that the projected efficiency of the commercial MHD concept is attainable. To perform the experiment, an existing facility at the Arnold Engineering Development Center (USAF) was refurbished and the new systems required for performaning the experiment were designed and built. In particular, the largest systems which have required the greatest expenditure of resources are the generator channel and the 6 Tesla (T) cryogenically cooled magnet. The pressure testing of the generator channel was completed and the channel was installed in the magnet to facilitate final alignment of the burner. The diffuser assembly operations were completed. The magnet was retested in the warm mode. No problems were encountered in the latest tests and the magnet was subsequently cooled to 165 K and pulsed to a peak field strength of 2.9T. DOE

N80-26216# Brookhaven National Lab., Upton, N. Y. Electrochemical Technology Group.
DEVELOPMENT OF FUEL CELL TECHNOLOGY FOR VEHICULAR APPLICATIONS Annual Report, 1 Oct. 1977 - 30 Sep. 1978
J. McBreen, E. J. Taylor, K. V. Kordesch, G. Kissel, F. Kulesa, and S. Srinivasan May 1979 108 p refs
(Contract EY-76-C-02-0016)
(BNL-51047) Avail: NTIS HC A06/MF A01

A survey of the present state-of-the-art of fuel cells and batteries suitable for hybrid fuel cell/battery power plants is presented. Also given are a systems study on phosphoric acid fuel cells for transportation applications and the results of an experimental study of phosphoric acid and alkaline fuel cells under conditions and intermittent operation. A review of fuel options and fuel processing for fuel cells is included. DOE

N80-26628# Argonne National Lab., Ill. Chemistry Div.
REVERSE ABSORPTION MODE OF THE HYCSOS CHEMICAL HEAT PUMP WITH LOW GRADE (APPROXIMATELY 30 DEG C) THERMAL ENERGY INPUTS
D. M. Gruen, M. Mendelsohn, I. Sheft, and G. Lamich 1980 23 p refs Presented at the Workshop on Thermochem. Energy Storage, Stockholm, 7-9 Jan. 1980; sponsored by the Swedish Royal Academy of Engineering Sciences
(Contract W-7405-eng-38)
(CONF-800133-1) Avail: NTIS HC A02/MF A01

An efficient and cost competitive chemical heat pump and energy conversion system driven by solar, and by fossil fuels (gas or oil), are discussed. The HYCOS concept uses two different metal hydrides with different free energies of formation enabling hydrogen to flow from one to another of the hydrides under the influence of appropriate thermal gradients. In the chemical heat pump mode, hydrogen flows between two pairs of four vessels which take the place of the generator condenser and evaporator absorber elements of conventional absorption refrigerators. The functions of generator absorber and condenser evaporator are interchanged at the end of each two minute cycle. The chemical heat pump materials are based on the AB5 alloys which combine a remarkable ability to absorp hydrogen rapidly and reversibly at moderate pressures near ambient temperature with a large hydrogen storage capacity. DOE

N80-26671# General Electric Co., Schenectady, N. Y. Gas Turbine Div.
DEVELOPMENT OF HIGH-TEMPERATURE TURBINE SYSTEM TECHNOLOGY TO A TECHNOLOGY READINESS STATUS PHASE 2 Quarterly Report, Oct. - Dec. 1979
1979 129 p ref
(Contract EX-76-C-01-1806)
(FE-1806-76) Avail: NTIS HC A07/MF A01

The development of a high temperature gas turbine for use in a combined cycle power plant, with coal-derived fuel, at a firing temperature of 2600 F and with growth capability to 3000 F is discussed. Component design and technology testing and system design and trade-off analyses are described including hot gas path development tests, turbine simulator tests, low temperature-low Btu gas cleanup system, and aerodynamic evaluations. DOE

N80-26769*# Jet Propulsion Lab., California Inst. of Tech., Pasadena. Solar Thermal Power Systems Project.
COST AND PRICE ESTIMATE OF BRAYTON AND STIRLING ENGINES IN SELECTED PRODUCTION VOLUMES
H. R. Fortgang and H. F. Mayers 31 May 1980 16 p
(Contracts NAS7-100; DE-AI01-79ET-20397; JPL Proj. 5105-29)
(NASA-CR-163265; DOE/JPL-1060/35; JPL-Pub-80-42) Avail: NTIS HC A02/MF A01 CSCL 10B

The methods used to determine the production costs and required selling price of Brayton and Stirling engines modified for use in solar power conversion units are presented. Each engine part, component and assembly was examined and evaluated to determine the costs of its material and the method of manufacture based on specific annual production volumes. Cost estimates are presented for both the Stirling and Brayton engines in annual production volumes of 1,000, 25,000, 100,000 and 400,000. At annual production volumes above 50,000 units, the costs of both engines are similar, although the Stirling engine costs are somewhat lower. It is concluded that modifications to both the Brayton and Stirling engine designs could reduce the estimated costs. R.E.S.

N80-26774*# Toledo Univ., Ohio.
NONLINEAR AEROELASTIC EQUATIONS OF MOTION OF TWISTED, NONUNIFORM, FLEXIBLE HORIZONTAL-AXIS WIND TURBINE BLADES Final Report
Krishna Rao V. Kaza Jul. 1980 70 p refs
(Grant NsG-3139; Contract EX-76-I-01-1028)
(NASA-CR-159502; DOE/NASA/3139-1) Avail: NTIS HC A04/MF A01 CSCL 10A

The second-degree nonlinear equations of motion for a flexible, twisted, nonuniform, horizontal axis wind turbine blade were developed using Hamilton's principle. A mathematical ordering scheme which was consistent with the assumption of a slender beam was used to discard some higher-order elastic and inertial terms in the second-degree nonlinear equations. The blade aerodynamic loading which was employed accounted for both wind shear and tower shadow and was obtained from strip theory based on a quasi-steady approximation of two-dimensional, incompressible, unsteady, airfoil theory. The resulting equations had periodic coefficients and were suitable for determining the aeroelastic stability and response of large horizontal-axis wind turbine blades. R.E.S.

N80-26775*# Boeing Engineering and Construction, Seattle, Wash.
MOD-2 WIND TURBINE SYSTEM CONCEPT AND PRELIMINARY DESIGN REPORT. VOLUME 2: DETAILED REPORT
Jul. 1979 269 p
(Contracts DEN3-2; DE-A101-793T-20305)
(NASA-CR-159609; DOE/NASA-0002-80/2) Avail: NTIS HC A12/MF A01 CSCL 10A

The configuration development of the MOD-2 wind turbine system (WTS) is documented. The MOD-2 WTS project is a continuation of DOE programs to develop and achieve early commercialization of wind energy. The MOD-2 is design optimized for commercial production rates which, in multiunit installations, will be integrated into a utility power grid and achieve a cost of electricity at less than four cents per kilowatt hour. J.M.S.

N80-26779*# General Electric Co., Philadelphia, Pa. Space Sciences Lab.
PARAMETRIC STUDY OF PROSPECTIVE EARLY COMERCIAL MHD POWER PLANTS (PSPEC). GENERAL ELECTRIC COMPANY, TASK 1: PARAMETRIC ANALYSIS Final Report
C. H. Marston, F. N. Alyea, D. J. Bender, L. K. Davis, T. C. Dellinger, J. G. Hnat, E. H. Komito, C. A. Peterson, D. A. Rogers, A. J. Roman et al Feb. 1980 358 p refs Prepared in cooperation with Foster Wheeler Corp., Livingston, N.J., Hooker Chemical Co., Niagara Falls, N.Y. and Bechtel National, Inc., San Francisco
(Contract DEN3-52; EF-77-A01-2674)
(NASA-CR-159634; DOE/NASA/0052-79/1) Avail: NTIS HC A16/MF A01 CSCL 10B

The performance and cost of moderate technology coal-fired open cycle MHD/steam power plant designs which can be expected to require a shorter development time and have a lower development cost than previously considered mature OCMHD/steam plants were determined. Three base cases were considered: an indirectly-fired high temperature air heater (HTAH) subsystem delivering air at 2700 F, fired by a state of the art atmospheric pressure gasifier, and the HTAH subsystem was deleted and oxygen enrichment was used to obtain requisite MHD combustion temperature. Coal pile to bus bar efficiencies in ease case 1 ranged from 41.4% to 42.9%, and cost of electricity (COE) was highest of the three base cases. For base case 2 the efficiency range was 42.0% to 45.6%, and COE was lowest. For base case 3 the efficiency range was 42.9% to 44.4%, and COE was intermediate. The best parametric cases in bases cases 2 and 3 are recommended for conceptual design. Eventual choice between these approaches is dependent on further evaluation of the tradeoffs among HTAH development risk, O2 plant integration, and further refinements of comparative costs. J.M.S.

N80-26794# American Univ., Washington, D. C.
DEFINITION OF CHEMICAL AND ELECTROCHEMICAL PROPERTIES OF A FUEL CELL ELECTROLYTE Interim Technical Report, 24 Jul. 1978 - 24 Dec. 1979
Jalil Ahmad and R. T. Foley Jan. 1980 70 p refs
(Contract DAAK79-77-C-0080; DA Proj. 1K1-61102-AH-51)
(AD-A083608) Avail: NTIS HC A04/MF A01 CSCL 07/4

The present research is oriented toward the task of developing an improved electrolyte for the direct hydrocarbon-air fuel cell. The electrochemical behavior of methanesulfonic acid, ethanesulfonic acid, and sulfoacetic acid as fuel cell electrolytes was studied in a half cell at various temperatures. The rate of electro-oxidation of hydrogen at 115 degrees was very high in methanesulfonic acid and sulfoacetic acids. The rate of the electro-oxidation of propane in methanesulfonic acid at 80 C and 115 C was low. Further, there is evidence for adsorption of these acids on the platinum electrode. Sulfoacetic acid with H2 has supported about two times higher current density than trifluoromethanesulfonic acid monohydrate, but, attempts to purify the compound were unsuccessful. It was concluded that anhydrous sulfonic acids are not good electrolytes; water solutions are required. Sulfonic acids containing unprotected C-H bonds are adsorbed on platinum and probably decompose during electrolysis. A completely substituted sulfonic acid would be the preferred electrolyte. GRA

N80-26800# General Electric Co., Philadelphia, Pa. Valley Forge Space Center.
REQUIREMENT DEFINITION AND PRELIMINARY DESIGN OF A PHOTOVOLTAIC CENTRAL POWER STATION EXPERIMENTAL TEST FACILITY. VOLUME 2: SOLMET SITE INSOLATION AND WEATHER DATA
G OBrien Dec. 1979 481 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7022-Vol-2) Avail: NTIS HC A21/MF A01

The results of a study of the requirements and preliminary design for a photovoltaic central power station experimental test facility presented. The facility's initial capacity of 2 MW with growth to 10 MW is intended to assess photovoltaic array fields operating as generation sources in utility systems. Requirements, a preliminary design, costs and schedule were established for the facility construction. Utility participation were reviewed with selected utilities, and both a site selection methodology and a summary set of combined continental US insolation and meteorological data was prepared. A set insolation and weather data for 26 SOLMET sites are included. DOE

N80-26853# Aerojet Energy Conservation Co., Sacramento, Calif.
MULTI-MEGAWATT ORGANIC RANKINE ENGINE POWER PLANT (MORE). PHASE 1A: SYSTEM DESIGN OF MORE POWER PLANT FOR INDUSTRIAL ENERGY CONSERVATION EMPHASIZING THE CEMENT INDUSTRY Final Report, 15 Sep. 1978 - 30 Sep. 1979
E K. Bair, B. Breindel, F. N. Collamore, J. N. Hodgson, and G K Olson 31 Jan. 1980 94 p refs
(Contract DE-AC03-78ET-12434)
(DOE/ET-12434/T1) Avail: NTIS HC A05/MF A01

The Multi-Megawatt Organic Rankine Engine (MORE) program is directed towards the development of a large, organic Rankine power plant for energy conservation from moderate temperature industrial heat streams. Organic Rankine power plants are ideally suited for use with heat sources in the temperature range below 1100 F. Cement manufacture was selected as the prototype industry for the MORE system because of the range of parameters which can be tested in a cement application. This includes process exit temperatures of 650 F to 1110 F for suspension preheater and long dry kilns, severe, dust loading, multi-metawatt power generation potential, and boiler exhaust gas acid dew point variations. The work performed during the Phase 1A System Design contract period is described. The System Design task defines the complete MORE system and its installation to the level necessary to obtain detailed performance maps, equipment specifications, planning of supporting experiments, and credible construction and hardware cost estimates. The MORE power plant design is based upon installation in the Black Mountain Quarry Cement Plant near Victorville, California. DOE

N80-26857# Sandia Labs., Albuquerque, N. Mex. Advanced Energy Projects Div.
AERODYNAMIC PERFORMANCE OF THE 17-M-DIAMETER DARRIEUS WIND TURBINE IN THE THREE-BLADED CONFIGURATION: AN ADDENDUM
Mark H. Worstell Feb. 1980 59 p refs
(Contract EY-76-C-04-0789)
(SAND-79-1753) Avail: NTIS HC A04/MF A01

The US Department of Energy (DOE)/Sandia 17-m wind turbine has been tested in the three bladed configuration at five rotational speeds. These data are presented along with some fundamental comparisons to the earlier two bladed results. Also included is the theoretical output of the three bladed 17-m turbine at two selected rotational speeds. DOE

N80-26859*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
INTERNATIONAL PHOTOVOLTAIC PROGRAM. VOLUME 2: APPENDICES
Dennis Costello, Robert Koontz, David Posner, Patricia Heiferling, Paul Carpenter, Sylvia Forman, and Lewis Perelman Dec. 1979 218 p refs Prepared jointly with Midwest Research Inst., Golden, Colo., Massachusetts Inst. of Technol. Cambridge and Illinois Inst. of Technol., Chicago 2 Vol.
(Contract EG-77-C-01-4042)
(NASA-CR-163339) Avail: NTIS HC A10/MF A01

The results of analyses conducted in preparation of an international photovoltaic marketing plan are summarized. Included are compilations of relevant statutes and existing Federal programs; strategies designed to expand the use of photovoltaics abroad; information on the domestic photovoltaic plan and its impact on the proposed international plan; perspectives on foreign competition; industry views on the international photovoltaic market and ideas about the how US government actions could affect this market;international financing issues; and information on issues affecting foreign policy and developing countries. DOE

N80-26864# Franklin Research Center, Philadelphia, Pa.
SYSTEM PLANNING ANALYSIS APPLIED TO OTEC: INITIAL CASES BY FLORIDA POWER CORPORATION, TASK 2
Mar. 1980 111 p ref Prepared for Florida Power Corp., St Petersburg
(Contract DE-AC02-79ET-29187)
(DOE/ET/29187-2; FC-5237-2) Avail: NTIS HC A06/MF A01

The FPC system planning methodology was used on:(1) Base Case, 10 year generation expansion plan with coal plants providing base load expansion, and (2) same, but 400 MW of OTEC substituting for coal burning units with equal resultant system reliability. The OTEC inputs were based on reasonable economic projections of direct capital cost and O and M costs for first generation large commercial plants. The Base Case conditions for FPC system planning methodology involved base load coal fueled additions during the 1980's and early 1990's. The first trial runs of the PROMOD system plannung model substituted OTEC for 400 MW purchases of coal generated power during 1988-1989 and then 400 MW coal capacity thereafter. Result showed higher system reliability than Base Case runs. Production costing computer model runs were used as input to Corporate Model to examine corporate financial impact. Results show present value of total revenue requirements unfavorable to OTEC as compared to coal units. DOE

N80-26878# AEG-Telefunken, Wedel (West Germany). Fachbereich Raumfahrt, Neue Technologien.
DESIGN AND FABRICATION OF TERRESTRIAL PHOTOVOLTAIC SOLAR GENERATORS FOR FIELD TESTING IN REGIONS OF INTENSIVE INSOLATION Final Report
Hans-Dieter Wegmann Bonn Bundesmin. fuer Forsch. u. Technol. Oct. 1979 36 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. u. Technol.
(BMFT-FB-T-79-34) Avail: NTIS HC A03/MF A01; Fachinformationszentrum, Karlsruhe, West Germany DM 7,15

The design and production of photovoltaic solar energy converters is described for three different applications: a transmitter station, a navigation buoy, and a laboratory building. The collectors consisted of interconnected 5 cm x 5 cm silicon solar cells encapsulated in glass or glass fiber reinforced acrylic resin. The largest device delivered 2000 W of electrical power. Author (ESA)

N80-27192# STD Research Corp., Arcadia, Calif.
OPEN-CYCLE MHD SYSTEMS ANALYSIS Final Report
R. A. Harvey, C. D. Maxwell, J. L. Miller, and S. T. Demetriades Nov. 1979 156 p refs Sponsored by Electric Power Research Inst.
(EPRI-AF-1230) Avail: NTIS HC A08/MF A01

The power plant performance and economic characteristics of six open cycle magnetohydrodynamics (MHD) power plant options are investigated: four with directly fired air preheaters, one with separately fired air preheaters, and one using oxygen enrichment. Using the directly fired options, the effects of high sulfur Eastern coal and low sulfur Western coal, sulfur emissions control by seed regeneration and by wet limestone scrubbers, and slag removal performance in the MHD combustor unit are compared. Critical components requiring further development are identified. DOE

N80-27801*# General Electric Co., Wilmington, Mass. Aircraft Equipment Div.
SOLID POLYMER ELECTROLYTE FUEL CELL TECHNOLOGY PROGRAM Final Report
31 May 1980 53 p refs
(Contract NAS9-15286)
(NASA-CR-160734; TPR-77) Avail: NTIS HC A04/MF A01 CSCL 10A

Work is reported on phase 5 of the Solid Polymer Electrolyte (SPE) Fuel Cell Technology Development program. The SPE fuel cell life and performance was established at temperatures, pressures, and current densities significantly higher than those previously demonstrated in sub-scale hardware. Operation of single-cell Buildup No. 1 to establish life capabilities of the full-scale hardware was continued. A multi-cell full-scale unit (Buildup No. 2) was designed, fabricated, and test evaluated laying the groundwork for the construction of a reactor stack. A reactor stack was then designed, fabricated, and successfully test-evaluated to demonstrate the readiness of SPE fuel cell technology for future space applications. R.E.S.

N80-27817# Battelle Pacific Northwest Labs., Richland, Wash.
WIND CHARACTERISTICS FOR DESIGN OF WIND TURBINES: RESEARCH IN THE USA
J. R. Connell 1 Dec. 1979 22 p Presented at the IEA Meeting, Stockholm, 12-13 Sep. 1979
(Contract EY-76-C-06-1830)
(PNL-SA-7967; CONF-7909128-1) Avail: NTIS HC A02/MF A01

The Pacific Northwest Laboratory (PNL) of the United States Department of Energy has the primary responsibility for providing information on wind characteristics for design and for evaluation of performance of wind energy conversion systems (WECS). The objectives of the whole program are, broadly, to develop technical wind information which is relevant to the design of WECS, to determine suitable methods of measuring and analyzing the wind for evaluating WECS performance, and to communicate the information usefully to WECS designers. DOE

N80-27825# Applied Physics Lab., Johns Hopkins Univ., Laurel, Md.
ENERGY PROGRAMS AT THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY Quarterly Report, Oct. - Dec. 1979
Feb. 1980 49 p refs
(Contracts EX-76-A-36-1008; DE-AI01-79ET-27025)
(PB80-163686; JHU/APL/EQR/79-4) Avail: NTIS HC A03/MF A01 CSCL 10A

Work on various tasks to develop energy resources, utilization concepts, and storage methods is summarized. Reports are presented in the following areas: geothermal prospecting; hydroelectric power generation in southeastern states; neotectonic investigations in Connecticut; ocean thermal energy conversion core unit testing and recovery of landfill methane; and unconventional gas sources--Eastern devonian shales. R.E.S.

N80-28195# Nagoya Univ. (Japan). Inst. of Plasma Physics.
COMPARATIVE STUDY OF ENERGY ACCOUNTING FOR HEAVY ION FUSION WITH VARIOUS DRIVER ACCELERATORS
S. Kawasaki (Kanazawa Univ.) and A. Miyahara Apr. 1980 18 p refs
(IPPJ-454) Avail: NTIS HC A02/MF A01

Typical designs of driver heavy ion accelerator systems are compared with regard to their 'energy payback time' versus 'cost of construction'. The detailed analyses show that the energy investment for the construction of the Heavy Ion Fusion power station is somewhat smaller than the energy produced by the station in its lifetime, in spite of the large scale of its hardware. The situation could be more favorable than, or at least comparable with, the case of magnetically confined fusion. L.F.M.

06

ENERGY TRANSPORT, TRANSMISSION, AND DISTRIBUTION

Includes transport of fuels by pipelines, tubes, etc., microwave power transmission, and superconducting power transmission.

A80-32717 **Superconductivity - Will its potential be realized.** E. J. Lerner. *High Technology*, Apr. 1980, p. 64-71.

The article surveys possible applications of superconductivity and the question of how rapidly or whether this potential will be realized. Attention is given to applications such as magnetic levitation trains, Josephson junction computers, new means of cancer detection, and water purification. Also discussed are the use of superconducting magnets to produce the high fields needed for nuclear fusion plants and for magnetohydrodynamic generators. Further, experiments under way on superconducting power lines for virtually lossless transmission of electric power are examined. It is concluded that the main obstacle to implementation of such applications is the reluctance of American business and government to invest in further research. M.E.P.

A80-32942 **Increasing power input to a single solar power satellite rectenna by using a pair of satellites.** R. V. Gelsthorpe (ERA Technology, Ltd., Leatherhead, Surrey, England) and P. Q. Collins (Imperial College of Science and Technology, London, England). *Electronics Letters*, vol. 16, Apr. 24, 1980, p. 311-313.

An outline of the solar power satellite concept is given, and some remarks are made regarding the desirability of increasing the power handling capability of the receiving site. Three arrangements, each based on the use of a pair of satellites, are described by means of which the power handled by a single site may be doubled. (Author)

A80-33161 # **Excitation of a superconducting strip resonator by a system of Josephson point contacts (Vozbuzhdenie sverkhprovodiashchego poloskovogo rezonatora sistemoi tochechnykh Dzhozefsonovskikh kontaktov).** S. I. Zub (Akademiia Nauk Ukrainskoi SSR, Fiziko-Tekhnicheskii Institut Nizkikh Temperatur, Kharkov, Ukrainian SSR). *Zhurnal Tekhnicheskoi Fiziki*, vol. 50, Apr. 1980, p. 854-857. In Russian.

The amplitudes of oscillations generated by a system of spot contacts in a strip resonator, the shape of the current-voltage curve, and the emitted power are studied as a function of the resonator and contact system parameters. It is shown that the effective excitation of a superconducting strip resonator by a system of Josephson point contacts is possible within a range of well defined relations between the parameters of the resonator and the contact system. The conditions for optimum excitation are formulated. V.L.

A80-33424 **Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids.** T. A. Chubb, D. E. Simmons, and J. J. Nemecek (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 126-129.

A80-33756 **Interfacing dispersed solar and wind systems with electric distribution systems.** F. S. Ma, M.-L. Chen, and D. H. Curtice (Systems Control, Inc., Palo Alto, Calif.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 3. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 2138-2142. 5 refs.

This paper reports on the results of a research effort in progress. The objective is to develop a methodology for evaluating the impacts on the planning and operation of the electric distribution systems as a result of increased penetration of dispersed solar and wind (DSW) electric generators. The paper presents a discussion of the major consideration in the planning and operation of the distribution system when DSW devices are introduced. All of these considerations need to be factored into the cost of service determination for rate designs. The paper also describes the methodology being developed for the analysis. (Author)

A80-36963 # **New directions for future satellite power system /SPS/ concepts.** G. M. Hanley (Rockwell International Corp., Pittsburgh, Pa.). In: Shuttle to the next space age; Proceedings of the Southeast Seminar for Reporters and Teachers, Huntsville, Ala., July 18, 19, 1979. New York, American Institute of Aeronautics and Astronautics, Inc., 1979, p. 49-54. (AIAA 79-3069)

Evolution of SPS concepts since initiation of DOE/NASA system studies is described, and directions these concepts may take are discussed. Early SPS studies considered a large matrix of concepts, including several variations of solar thermal and solar photovoltaic concepts as well as nuclear concepts. These studies narrowed down to two solar photovoltaic satellite concepts that are currently the DOE/NASA reference concepts. Recent technology improvements in solid-state transistors and solar cells appear to have a potentially significant impact on future SPS satellite concepts. These impacts are discussed. (Author)

A80-37828 # **High power pulse modeling of coaxial transmission lines.** J. P. O'Loughlin (USAF, Weapons Laboratory, Kirtland AFB, N. Mex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 96-99.

When coaxial cable is used for high voltage pulse transmission, a voltage transient appears on the outer sheath conductor. Although the magnitude of the transient is in the order of only a few per cent, this amounts to several kilovolts in many cases and must be carefully considered in terms of its effect on instrumentation, control and safety. To a first approximation, theoretically a coaxial cable should not develop any voltage on the outer sheath. A more refined analysis and model shows that the complete cancellation depends upon the self inductance of the sheath being exactly equal to the mutual inductance between the sheath and the center conductor. This condition is never exactly satisfied due to current distribution effects, even when the distribution is uniform and radially symmetric. The situation becomes worse when proximity effects are accounted for. The predicted sheath voltage agrees with experimental data within reasonable limits. (Author)

A80-39628 **Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear.** N. G. Boriskina, A. M. Bryksin, and E. M. Kenina. *(Metallovedenie i Termicheskaia Obrabotka Metallov*, Dec. 1979, p. 34-36.) *Metal Science and Heat Treatment*, vol. 21, no. 11-12, May 1980, p. 934-936. 7 refs. Translation.

The effect of temperature, mineralization, pH, and flow rate of the corrosive medium on the gas-abrasive wear of commercial titanium alloys AT3 and AT4 is investigated in order to determine their suitability for drill pipes. It is shown that the gas-abrasive wear of these alloys depends largely on the temperature and pH of the corrosive medium, while mineralization and the corrosive medium flow rate do not affect the alloys. Wear is negligible in alkaline and neutral solutions at room temperature; however, intensive wear of both alloys is observed after treatment in acid solutions (pH less than 4) at 250 C. Alloy AT3 has higher corrosion and gas-abrasive resistance than AT6. Both alloys are recommended for deep well drill pipes. V.L.

A80-40713 **Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system.** T. A. Chubb (U.S. Navy, Naval Research Laboratory, Washington, D.C.). *Solar Energy*, vol. 24, no. 4, 1980, p. 341-345. 21 refs.

The CO2-CH4 reforming-methanation chemical cycle provides an attractive means of transporting solar energy to a central station in accord with the Solchem concept. The CO2-CH4 working fluid permits use of low temperature pipelines, in contrast to H2O-CH4, and has low toxicity, in contrast to SO3. Thermochemical receivers are expected to operate at or above the carbon removal temperature. Catalyst specificity is required in the methanator to provide high methanation temperature without carbon deposition. Methanator operation at 500 C may be achievable. (Author)

A80-40752 **Status of coal gasification processes.** K. S. Vorres (Institute of Gas Technology, Chicago, Ill.). *International Journal of Energy Research*, vol. 4, Apr.-June 1980, p. 109-112.

The current status of a number of processes which have been or are being developed to produce high-Btu, medium-Btu, and low-Btu gas from coal is reviewed. It is noted that the commercialization of high- and medium-Btu coal gasification technology on a significant scale will require very large capital expenditures for a single plant. Besides the financial barrier, a number of perhaps more difficult regulatory barriers will have to be overcome. B.J.

A80-41898 * # **Satellite Power Systems /SPS/ - Overview of system studies and critical technology.** S. V. Manson (NASA, Washington, D.C.). *American Astronautical Society, Goddard Memorial Symposium, 18th, Washington, D.C., Mar. 27, 28, 1980, Paper 80-084.* 20 p. 11 refs.

Systems studies and critical technology issues for the development and evaluation of Satellite Power Systems (SPS) for the photovoltaic generation of electrical energy and its transmission to earth are reviewed. Initial concept studies completed in 1976 and system definition studies initiated in the same year have indicated the technical feasibility of SPS and identified challenging issues to be addressed as part of the SPS Concept Development and Evaluation Program. Systems considered in the study include photovoltaic and solar thermal power conversion configurations employing klystron or solid state microwave generators or lasers for power transmission, and power transmission options, system constructability and in-orbit and ground operations. Technology investigations are being performed in the areas of microwave power transmission, structure/controls interactions and the behavior of key materials in the space/SPS environment. Favorable results have been obtained in the areas of microwave phase distribution and phase control, dc-RF conversion, antenna radiating element, and no insurmountable problems have been discovered in any of the investigations to date. A.L.W.

A80-43830 **System-reliability studies for wave-energy generation.** J. M. Dawson, S. Din (Rendel Palmer and Tritton, London, England), M. G. Mytton, N. L. Shore, and H. B. Stansfield (Kennedy and Doukin, Woking, Surrey, England). *IEE Proceedings, Part A - Physical Science, Measurement and Instrumentation, Management and Education, Reviews*, vol. 127, pt. A, no. 5, June 1980, p. 296-300.

A study is reported that is being undertaken in the United Kingdom to determine means of developing the potential of the large wave-energy resource around the coast, in particular, that to the west facing the Atlantic. It is shown that derivation of the mean annual energy to be expected involved knowledge, not only of the wave climates, conversion efficiency characteristics of the proposed devices and of the power transmission system, but also of factors reflecting the availability overall. Attention is given to a simplified approach to the quantifying of reliability for each stage of the process. An appropriate method of analysis is established and a summary of the results obtained is given. M.E.P.

N80-22378*# LinCom Corp., Pasadena, Calif.
SPS PHASE CONTROL SYSTEM PERFORMANCE VIA ANALYTICAL SIMULATION
W. C. Lindsey, A. V. Kantak, C. M. Chie, and R. W. D. Booth Mar. 1979 222 p refs
(Contract NAS9-15725)
(NASA-CR-160582; TR-7903-0977) Avail: NTIS HC A10/MF A01 CSCL 22A

A solar power satellite transmission system which incorporates automatic beam forming, steering, and phase control is discussed. The phase control concept centers around the notation of an active retrodirective phased array as a means of pointing the beam to the appropriate spot on Earth. The transmitting antenna (spacetenna) directs the high power beam so that it focuses on the ground-based receiving antenna (rectenna). A combination of analysis and computerized simulation was conducted to determine the far field performance of the reference distribution system, and the beam forming and microwave power generating systems. A.R.H.

N80-22608# Brookhaven National Lab., Upton, N. Y.
LOAD EXCITATION AT THE SUPERCONDUCTING CABLE TEST FACILITY
E. B. Forsyth, A. J. McNerney, and M. Meth Sep. 1979 11 p Presented at the 7th Symp. on Superconducting Power Transmission, Moscow, Sep. 1979; sponsored by US/USSR Tech. Exchange Comm.
(Contract EY-76-C-02-0016)
(BNL-26641) Avail: NTIS HC A02/MF A01

The superconducting cable test facility was constructed to evaluate and demonstrate flexible superconducting power transmission cables under realistic conditions. Power supplies were installed to excite two superconducting cables either separately or simultaneously. The cables formed a straight run of 100 m with a pair of terminations rated for full current and voltage located at the east and west ends of the cable enclosure. The design and operation of the test facilities are discussed. DOE

N80-22609# Brookhaven National Lab., Upton, N. Y.
CALORIMETRIC MEASUREMENT OF ac LOSSES IN SUPERCONDUCTING CABLES OF SHORT LENGTHS
J. E. Jensen 1979 13 p ref Presented at the 7th Symp. on Superconducting Power Transmission, Moscow, Sep. 1979; sponsored by US/USSR Tech. Exchange Comm.
(Contract EY-76-C-02-0016)
(BNL-26712) Avail: NTIS HC A02/MF A01

The measurement of ac losses in superconducting cables by calorimetric means is necessary as a verification of electronic measurements on short high-current models and because the present method of electronic measurement is not applicable to longer cables with simultaneously applied high current and voltage. Consequently, after the first tests of Cable no. 101 showed higher losses than anticipated using the electronic wattmeter measurements, it was decided to attempt to verify these measurements calorimetrically. The results of test completed to date are reported. DOE

N80-22770# TRW, Inc., McLean, Va. Energy Systems Group.
OIL SHALE DATA BOOK
Jun. 1979 410 p
(Contract DE-AC01-78RA-32012)
(PB80-125636) Avail: NTIS HC A18/MF A01 CSCL 08I

A ready reference for evaluation of appropriate shale oil recovery technologies and associated processes is presented. Technologies addressed are: mining and crushing; ore haulage; beneficiation of lean ore; surface and in situ retorting; upgrading of shale oil and gas clean-up; shale disposal and waste water treatment; pipeline transportation. GRA

N80-22793*# General Electric Co., Santa Barbara, Calif. Center for Advanced Studies.
THERMAL ENERGY STORAGE AND TRANSPORT
Walter Hausz *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 57-77

(EPRI Proj. 1199-3)
Avail: NTIS HC A99/MF A01 CSCL 10B

The extraction of thermal energy from large LWR and coal fired plants for long distance transport to industrial and residential/commercial users is analyzed. Transport of thermal energy as high temperature water is shown to be considerably cheaper than transport as steam, hot oil, or molten salt over a wide temperature range. The delivered heat is competitive with user-generated heat from oil, coal, or electrode boilers at distances well over 50 km when the pipeline operates at high capacity factor. Results indicate that thermal energy storage makes meeting of even very low capacity factor heat demands economic and feasible and gives the utility flexibility to meet coincident electricity and heat demands effectively. J.M.S.

N80-22861*# New Mexico Univ., Albuquerque. Technology Application Center.
SOLAR POWER SATELLITES. CITATIONS FROM THE INTERNATIONAL AEROSPACE ABSTRACTS DATA BASE Progress Report, 1973 - Nov. 1979
Gerald F. Zollars Dec. 1979 88 p Sponsored by NASA and NTIS
(NASA-CR-162931; PB80-802697) Avail: NTIS HC A05/MF A01 CSCL 10B

This bibliography of 320 citations to the international literature concerns the development of solar power satellites. The design and construction of the satellite solar arrays and the technology of satellite solar energy conversion and transmission to Earth are the major topics covered. Feasibility analyses of the solar power satellite concept are also included. GRA

N80-22863# Mitre Corp., McLean, Va. METREK Div.
NEW ENGLAND ENERGY DEVELOPMENT SYSTEMS CENTER (NEEDS). AN EXPERIMENT IN UNIVERSITY-INDUSTRY COOPERATIVE RESEARCH. VOLUME 2: CASE HISTORIES Final Report
Zwi Kohorn Jul. 1979 140 p refs 2 Vol.
(Grant NSF CG-00007)
(PB80-112980; MTR-79W00188-Vol-2; NSF/RA-7902[illegible]1)
Avail: NTIS HC A07/MF A01 CSCL 10A

Case histories of 25 projects involving the New England Energy Development Systems Center as a broker sponsor, and/or research and development (R and D) performer are reported. Projects are grouped into the energy areas of electricity generation, electrical distribution, and reported energy planning. Each case is a self-contained narrative, uniformly structured and sequenced under the following standard headings: project description, problem identification, recruitment, R and D funding, project management, R and D program, information dissemination, evaluation, and references. GRA

N80-23825# Sandia Labs., Livermore, Calif. Solar Components Div.
THERMOCHEMICAL ENERGY STORAGE AND TRANSPORT PROGRAM Progress Report, Oct. 1977 - Dec. 1978
T. T. Bramlette Sep. 1979 109 p refs
(Contract EY-76-C-04-0789)
(SAND-79-8208) Avail: NTIS HC A06/MF A01

To exploit the potential advantages and quantify the disadvantages of thermochemical reactions for energy storage and transport applications, the program was structured initially to explore a wide range of chemical reactions and applications. In general, the development procedure consists of: (1) identification and evaluation of preferred current and future users of reversible chemical reactions for energy storage and transport; (2) identification of specification requirements and evaluation of available technology and technology needs for selected storage and transport systems; (3) formulation and evaluation of energy storage and transport concepts which meet the requirements established above; (4) definition and development of the required technology; (5) comparison of thermochemical storage and transport concept with competing technologies, and assessment of their conservation potential; and (6) development of the most promising concepts and systems to the point of demonstration on a scale commensurate with commercial applications. Progress made during the reporting period is summarized. DOE

N80-24507# National Bureau of Standards, Washington, D.C. Electrosystems Div.
MEASUREMENTS ON INSULATING MATERIALS AT CRYOGENIC TEMPERATURES Final Report
William E. Anderson and Richard S. Davis Jan. 1980 165 p refs Prepared for Brookhaven National Lab., Upton, N.Y.
(Contract EA-77-A-01-6010)
(PB80-134596; NBSIR-79-1950) Avail: NTIS HC A08/MF A01 CSCL 09A

Results of a four-year effort to study the high voltage dielectric behavior of various materials at cryogenic temperatures are described. Dissipation factors at 60 Hz were measured for polymer tapes and epoxy samples at 4.2 K, atmospheric pressure. Multi-layer polymer samples in coaxial geometries at temperatures from 7 K to 10 K and helium pressures up to 1.5 megapascals were also studied. The measurements were performed at stresses up to 40 MV/m. Since partial discharges were major source of losses at the higher stresses and their presence was possibly detrimental to the integrity of the insulation, instrumentation was developed and implemented to study these discharges under conditions found in proposed ac superconducting power-transmission lines. GRA

N80-25195# National Bureau of Standards, Washington, D.C.
DIMENSIONS/NBS, VOLUME 63, NO. 11 Monthly Report
Nov. 1979 41 p refs
(PB80-141542; NBS/DIM-63/11) Avail: NTIS HC A03/MF A02 CSCL 14B

Short summaries of major technical developments, highlights of work in progress, major speeches and statements by Bureau management, and a listing of NBS publications are presented. Topics covered include: fire safety tips for wood burning appliances; computer interface standards; new photometric calibrator performs direct measurement; girth weld standards for Alaskan natural gas pipeline; and 'ultra-black' coating for high absorptance of solar energy. GRA

N80-25360*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
THE SOLAR POWER SATELLITE CONCEPTS: THE PAST DECADE AND THE NEXT DECADE
Christopher C. Kraft, Jr. Jul. 1979 22 p Presented at the 15th AIAA Ann. Meeting and Tech. Display, Washington, D.C., 6-8 Feb. 1979 Original contains color illustrations
(NASA-TM-81000; JSC-14898) Avail: NTIS HC A02/MF A01 CSCL 22B

Results of studies on the solar power satellite concept are summarized. The basic advantages are near continuous access to sunlight and freedom from atmospheric effects and cloud cover. The systems definition studies consider photovoltaic and thermal energy conversion systems and find both to be technically feasible, with the photovoltaic approach preferred. A microwave test program is under way which will provide quantitative data on critical parameters, including beam forming and steering accuracy. Ballistic and winged launch vehicles are defined for the transportation of construction materials, with the shuttle expected to provide low cost transportation to and from space. A reference system is outlined for evaluating the concept in terms of environmental and other considerations. Preliminary estimates of natural resource requirements and energy payback intervals are encouraging. E.D.K.

N80-25363# Argonne National Lab., Ill.
PROCEEDINGS OF THE WORKSHOP ON STRATOSPHERIC AND MESOSPHERIC IMPACTS OF SATELLITE POWER SYSTEMS (SPS)
Dec. 1979 120 p refs Workshop held at Rosemont, Ill., 6-8 Sep. 1978
(Contract W-31-109-eng-38)
(CONF-7809197) Avail: NTIS HC A06/MF A01

Composition perturbations due to rocket exhaust emissions and reentry effects are considered. Climatic effects due to increased noctilucent cloud formation and composition perturbations are also discussed, as well as the effects of localized energy injection, including rocket exhaust thermal energy and microwave absorption. DOE

N80-25364# Battelle Columbus Labs., Ohio.
PRELIMINARY MATERIALS ASSESSMENT FOR THE SATELLITE POWER SYSTEM (SPS)
R. R. Teeter and W. M. Jamieson Jan. 1980 131 p refs
(Contract W-7405-eng-92)
(DOE/ER-0038) Avail: NTIS HC A07/MF A01

Presently, there are two SPS reference design concepts (one using silicon solar cells, the other using gallium arsenide solar cells). A materials assessment of both systems was performed based on the materials lists set forth in the DOE/NASA SPS Reference System Report: Concept Development and Evaluation Program. This listing identified 22 materials used in the SPS. Tracing the production processes for these 22 materials, a total demand for over 20 different bulk materials and nearly 30 raw materials was revealed. Assessment of these SPS material requirements produced a number of potential material supply problems. The more serious problems are those associated with the solar cell materials, and the graphite fiber required for the satellite structure and space construction facilities. In general, the gallium arsenide SPS option exhibits more serious problems than the silicon option, possibly because gallium arsenide technology is not as well developed as that for silicon. DOE

N80-25808# Department of Energy, Washington, D. C.
SYSTEMS ENGINEERING FOR POWER: ORGANIZATIONAL FORMS FOR LARGE SCALE SYSTEMS, VOLUME 1
L. H. Fink, ed. and T. A. Trygar, ed. Oct. 1979 376 p refs
Conf. held at Davos, Switzerland, 30 Sep. - 5 Oct. 1979
(CONF-790904-P2) Avail: NTIS HC A17/MF A01

Several articles addressing electrical energy system engineering problems are presented. The development of decentralized organizational forms for large scale interconnected power systems is discussed. A number of strategies are investigated for obtaining the desired control structures including the approximation of centralized control laws; the development of controllers using multiple, approximate models of the overall system; the use of decomposition methods; and a direct formulation of decentralized optimal stochastic control problems. A particular emphasis is given to the numerical modeling methods for large scale systems. Descriptor system approaches are explored along with other deterministic and probabilistic modeling methods. Perturbation methods in the construction of model decompositions are analyzed and evaluated. M.G.

N80-26004# Argonne National Lab., Ill.
PROCEEDINGS OF THE WORKSHOP ON METEOROLOGICAL EFFECTS OF SATELLITE POWER SYSTEM RECTENNA OPERATION AND RELATED MICROWAVE TRANSMISSION PROBLEMS
Dec. 1979 58 p refs Workshop held at Rosemont, Ill., 23 Aug. 1978 Sponsored by DOE
(CONF-7808114) Avail: NTIS HC A04/MF A01

From Workshop on Meteorological Effects of Satellite Power Systems Rectenna Operation and Related Microwave Transmission Problems; Rosemont, IL, USA (23 Aug. 1978). Discussion at the workshop concentrated on the effects of the Satellite Power System (SPS) on the atmosphere and the effects of the atmosphere on the SPS microwave beam propagation. The three main concerns were the effects on the atmosphere of the estimated 750 MW excess heat released at the SPS rectenna site, the microwave interactions with the atmosphere, possibly causing loss of beam control and scattering of beam energy, and the possible effects of the beam on atmospheric electrification processes. Construction of a rectenna will modify the thermal and radiative properties of the ground, and operations will introduce a heat source at the surface. It was generally agreed that the direct effects of any single causes due to an SPS in the lower atmosphere will be small but detectable in some instances, and that their combined effects need better definition. Variations in the refractive index of the atmosphere and the presence of hydrometeors in the atmosphere cause refraction, scattering, and adsorption of electromagnetic waves. Refractive-index anomalies in the atmosphere may impact on power beam control. The effect of the rectenna waste heat may be studied on two scales: the mesoscale (regional and city sizes, 10 to 100 km) and the cloud scale (10 km and less). At 2.45 GHz the refractive index of air at fixed pressure depends mostly on water vapor and temperature. In the presence of convective or turbulent air motions a spectrum of atmospheric refractivity develops. These variations can lead to beam wandering and spreading. Direct interactions with the atmospheric electricity fields are not thought to be crucial at the 2.45 GHz frequency. However, the mere physical presence of the rectenna might have some modifying influence on the occurrence and electrical behavior of thunderstorms over and around the rectenna. DOE

N80-26487# Argonne National Lab., Ill.
COAL/OIL MIXTURE PIPELINE: A VIABLE ALTERNATIVE COAL TRANSPORTATION SYSTEM?
J Harkness, B. L. and L. J. Petrovic (Resource Engineering, Inc.) *In* Pittsburgh Energy Technol. Center The 2nd Intern. Symp. on Coal-Oil Mixture Combust., Vol. 2 1979 22 p refs

Avail: NTIS HC A99/MF A01

A coal transportation system which utilizes coal/oil mixture technology is compared to the coal/water system and to another alternative, coal/ methanol system. Major emphasis is placed on the system design considerations and trade-offs, the resource requirements (including capital), and the cost of delivered energy. The system environmental impacts, the status of the technologies, oil quality and supply, and the potential system flexibilities are discussed qualitatively. R.C.T.

N80-26785*# Raytheon Co., Waltham, Mass. Microwave and Power Tube Div.
MICROWAVE BEAMED POWER TECHNOLOGY IMPROVEMENT Final Report
W. C. Brown 15 May 1980 48 p
(Contracts NAS7-100)
(NASA-CR-163043; JPL-9950-373; PT-5613) Avail: NTIS HC A03/MF A01

The magnetron directional amplifier was tested for (1) phase shift and power output as a function of gain, anode current, and anode voltage, (2) background noise and harmonics in the output, (3) long life potential of the magnetron cathode, and (4) high operational efficiency. Examples of results were an adequate range of current and voltage over which 20 dB of amplification could be obtained, spectral noise density 155 dB below the carrier, 81.7% overall efficiency, and potential cathode life of 50 years in a design for solar power satellite use. A fabrication method was used to fabricate a 64 slot, 30 in square slotted waveguide array module from 0.020 in thick aluminum sheet. The test results on the array are discussed. J.M.S.

N80-27404# Department of Energy, Washington, D. C. Office of Energy Research.
SATELLITE POWER SYSTEMS (SPS): CONCEPT DEVELOPMENT AND EVALUATION PROGRAM, PRELIMINARY ASSESSMENT
Sep. 1979 21 p refs
(DOE/ER-0041) Avail: NTIS HC A02/MF A01

Preliminary results of a DOE-NASA 3-year study of satellite solar energy conversion and microwave transmission to Earth are presented. The assessment includes technical and economic feasibility; the effects of the microwave power transmission beam on biological, ecological, and electromagnetic systems; the impact of SPS construction, deployment and operations on the biosphere and on society; and the merits of SPS compared to other future energy alternatives. DOE

N80-27809*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 1: EXECUTIVE SUMMARY, PHASE 3 Final Report, Dec. 1979 - May 1980
Jun. 1980 69 p refs 5 Vol.
(Contract NAS9-15636)

(NASA-CR-160742; D180-25969-1-Vol-1) Avail: NTIS HC A04/MF A01 CSCL 10A

Results of a three phase study of the Solar Power Satellite System are summarized. Various options and alternate systems were considered and the following conslusions were reached: antenna mounted solid state transmitters are potentially as cost effective as the klystron approach, althrough limited to 2500 megawatts net output; the free electron laser and optical diode laser appear most promising for laser power transmission; ground antenna siting need not be restricted to below 35 degrees of latitude; and nonrecurring cost reductions attainable by using a smaller Heavy Lift Launch Vehicle are highly attractive. L.F.M.

N80-27810*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 2, PART 3: FINAL BRIEFING, 16 MAY 1980, PHASE 3
Jun. 1980 410 p 5 Vol.
(Contract NAS9-15636)
(NASA-CR-160743; D180-25969-2-Vol-2) Avail: NTIS HC A18/MF A01 CSCL 10A

Alternatives to the microwave transmission system previously defined Solar Power Satellite Systems were investigated. These were the laser power transmission, transportation systems, and an analysis or solid state power transmission. The advantages of each system are presented. F.O.S.

N80-27811*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 3: LASER SPS ANALYSIS, PHASE 3 Final Report, Dec. 1979 - May 1980
Jun. 1980 99 p refs 5 Vol.
(Contract NAS9-15636)
(NASA-CR-160744; D180-25969-3-Vol-3) Avail: NTIS HC A05/MF A01 CSCL 10A

The potential use of lasers for transmitting power to Earth from Solar Power Satellites was examined. Free electron lasers appear most promising and would have some benefits over microwave power transmission. Further research in laser technology is needed. L.F.M.

N80-27812*# Boeing Aerospace Co., Seattle, Wash.
SOLAR POWER SATELLITE SYSTEM DEFINITION STUDY. VOLUME 4: SOLID STATE SPS ANALYSIS, PHASE 3 Final Report, Dec. 1979 - May 1980
Jun. 1980 79 p 5 Vol.
(Contract NAS9-15636)
(NASA-CR-160745; D180-25969-4-Vol-4) Avail: NTIS HC A05/MF A01 CSCL 10A

A 2500 megawatt solid ground output Solar Power Satellite (SPS) of conventional configuration was designed and analyzed. Because the power per receiving antenna is halved, as compared with the klystron reference, twice the number of receiving antennas are needed to deliver the same total power. The solid state approach appears feasible with a slightly greater specific mass and slightly higher cost than the klystron SPS design. L.F.M.

07

ENERGY STORAGE

Includes flywheels, heat storage, underground air storage, compressed air, storage batteries, and electric hybrid vehicles.

A80-33419 **Energy storage and electron transfer by carbanion photolysis.** M. A. Fox, Mr. Kabir-ud-Din, and N. J. Singletary (Texas, University, Austin, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 102-106. 17 refs. Research supported by the U.S. Department of Energy.

Photo-induced carbanion reactions are studied as a possible means of efficiently storing solar energy in the form of covalent bonds. Five representative photoprocesses observed in the laboratory involving highly basic carbanions, namely a ring-opening, an isomerization, anion radical formation, reductive alkylation and electron transfer accompanied by anodic current generation, are presented which indicate that carbanions can undergo photo-induced chemical reaction. The anion reactions are shown to proceed by pathways consistent with orbital topological predictions. It is also pointed out that although current generation in the carbanionic photogalvanic cell is much less efficient than in solid-state or liquid photovoltaic cells, the optimization of cell parameters may lead to improved photoconversion. A.L.W.

A80-33420 **Photochemical storage of solar energy.** C. Kutal, R. R. Hautala, and R. B. King (Georgia, University, Athens, Ga.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 108-111. 11 refs. Research supported by the U.S. Department of Energy and NSF.

A solar energy storage system based upon the interconversion of norbornadiene and quadricyclene possesses several attractive features, including high specific energy storage capacity, long-term kinetic stability of the energy-rich photoproduct at ambient temperatures, and relatively inexpensive reactants. An energy storage system based on these principles could result in the use of solar energy for low grade (about 100 C) heat applications such as space conditioning and hot water production in buildings. (Author)

A80-33510 **Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks.** C. Sherman, B. D. Wood, and J. Mason (Arizona State University, Tempe, Ariz.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 591-595.

The efficiency of solar systems using liquid sensible heat thermal storage systems is enhanced by temperature stratification in the storage tank. This paper presents the results of an empirical study to evaluate the effects of vertical wall conductance on the temperature relaxation time of a quiescent liquid thermal storage tank which is initially uniformally stratified. Five sets of data are analyzed for a fiberglass tank with a height to diameter ratio of 2 with no liner and with copper, aluminum, steel, and stainless steel liners. Plots of temperature distribution versus time for each case are included. It is shown that vertical conduction down the tank walls can reduce thermal stratification to a significant extent. (Author)

A80-33511 **Dynamic model of a mixed /sensible plus latent/ low-temperature thermal storage system.** J.-P. Maye and M. Gauchotte (Poitiers, Université, Poitiers, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 596-598.

A80-33512 **Thermal storage in rock beds.** L. Boisdet and J.-L. Peube (CNRS, Laboratoire d'Energétique Solaire, Font-Romeu, Pyrénées-Orientales, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 599-602. 12 refs.

The feasibility of thermal stratification in rock bed thermal storage is examined. A one-dimensional numerical model is developed for a stratified thermal storage system and it is shown that a good thermal stratification is impossible within a small thermal storage with solid materials. An experiment is performed to test the mathematical model. The agreement between the model and the experiment is better than 10 percent. It is suggested that a three-dimensional model would be needed to study the complex phenomena associated with free convection in the storage system. V.L.

A80-33513 **Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory.** P. D. Metz (Brookhaven National Laboratory, Upton, N.Y.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 604-608. Research sponsored by the U.S. Department of Energy.

The results of the first half year of operation of the solar ground coupling research facility at Brookhaven National Laboratory are presented. The data are analyzed from the eight original experiments which are first generation ground coupled heat transfer and storage devices for a solar source heat pump system. A computer model of the heat transfer between these devices and the earth is discussed. (Author)

A80-33514 **Energy storage in ground-water aquifers.** W. J. Schaetzle, C. E. Brett (Alabama, University, Huntsville, Ala.), and D. M. Grubbs. In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1.
Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 614-618. 12 refs. U.S. Department of Energy Contract No. 31-109-38-4550.

One of the major economic costs in solar energy systems is the thermal energy storage system. The present paper deals with a thermal storage concept provided by nature. The system consists of two wells drilled into an underground water aquifer. Warm water is deposited into one well as the same amount of water is drawn from the other well. When the energy is withdrawn, the water flow is reversed. V.P.

A80-33515 **Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials.** A. J. T. M. Wijsman, R. Oosterhaven, and C. den Ouden (Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek, Technisch Physische Dienst TNO, Delft, Netherlands). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 619-623.

A80-33516 **The 'soil therm' system for interseasonal earth storage of solar heat for individual housing.** G. Vachaud and J.-Y. Ausseur (Grenoble, Institut de Mécanique, Grenoble, France). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 625-628. 7 refs. Research supported by the Centre National de la Recherche Scientifique.

A80-33517 **The effect of system size on the practicality of aquifer storage.** L. Ebeling, D. L. Reddell, S. Tostengard, W. B. Harris, and R. R. Davison (Texas A & M University, College Station, Tex.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 629-633. 6 refs.

The results of computer simulations and well cost estimates indicate that aquifer storage has considerable potential for relatively small systems such as those having an annual energy consumption for heating or cooling of a few billion Btu's. Aquifer thicknesses above fifty feet are very attractive, but in some applications even a zone as thin as 15 feet might be used. Preliminary results of the Texas A & M cold water storage experiment are given. (Author)

A80-33518 **A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks.** G. T. Williams, C. R. Attwater, and F. C. Hooper (Toronto, University, Toronto, Canada). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 634-638. Contracts No. EY-76-C-02-2939-A001; No. EY-76-C-02-2939-M002.

A80-33519 **Latent heat energy storage using direct contact heat transfer.** D. D. Edie, S. S. Melsheimer, J. C. Mullins, and J. F. Marra (Clemson University, Clemson, S.C.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 640-644. 12 refs. Contract No. EY-76-5-05-5190.

The use of direct contact heat transfer in latent heat energy storage systems has been proposed as a means of combating phase segregation problems and enhancing heat and mass transfer performance. Studies have shown that several salt hydrates perform satisfactorily, and that acceptable heat transfer fluids are available. Studies of system geometry and heat transfer performance, as well as of crystal growth velocity, have also been completed. Data are now being collected on a 200 liter prototype unit which will provide long term performance information under realistic operating conditions. (Author)

A80-33520 **The sizing and economics of phase change energy storage units in air-based solar heating systems.** J. J. Jurinak and S. I. Abdel-Khalik (Wisconsin, University, Madison, Wis.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 645-649. 8 refs. Contract No. E(11-1)-2588.

A80-33521 **Experimental study of coolness storage using sodium sulfate decahydrate.** W. J. Rice (Delaware, University, Wilmington, Del.; Villanova University, Villanova, Pa.) and J. J. Sliwkowski (Delaware, University, Wilmington, Del.). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 650-654. Research supported by the Delmarva Power and Light Co. and Baltimore Gas and Electric Co.

An amount of 3434 pounds of sodium-sulfate based thermal storage material has been depolyed in the Solar One House of the University of Delaware in a test of its efficacy as a coolness storage material for air conditioning using off-peak electricity. The test showed the material could store over 200,000 Btu's of coolness and that there was no sigificant change in its storage capability after 26 cycles carried out over a period of about four months. (Author)

A80-33522 **Development of a storage system based on encapsulated p.c.-materials.** E. van Galen and C. den Ouden (Centrale Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek Technish Physische Dienst TNO, Delft, Netherlands). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 655-658.

A short-term thermal storage system is presented which is based on a phase change material encapsulated in a polymer construction. The storage material belongs to the family of fused salt eutectics and contains two special additives: a polymer matrix and a nucleating agent to prevent severe supercooling. Results of the performance test of this storage system are given. In comparison with a water storage system, the same useful output can be reached with the present system for a two times smaller volume. This is due to a higher collector efficiency, lower heat losses of the tank and a higher energy density. V.L.

A80-33523 **Investigation of latent heat of fusion storage for solar heating systems.** B. Ziegenbein (Brown, Boveri et Cie. AG, Heidelberg, West Germany). In: Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volume 1. Elmsford, N.Y., Pergamon Press, Inc., 1979, p. 660-664.

The paper presents a summary of experimental and simulated results for the solar space heating system of the BBC-Solar House in Heidelberg, West Germany. The main objectives of this project are the development of latent heat of fusion storage subsystems and the investigation of the long term performance in comparison with an equivalent water storage unit. This has been accomplished by running the solar heating system of the BBC-Solar House alternatively with different thermal storage subsystems for three subsequent heating seasons. The analytical model used for computer simulations of various types of heating systems was shown to be reliable and accurate within 5%. (Author)

A80-33870 **Comparison of measured and predicted rock bed storage performance.** R. W. Persons, J. A. Duffie, and J. W. Mitchell (Wisconsin, University, Madison, Wis.). *Solar Energy,* vol. 24, no. 2, 1980, p. 199-201. 5 refs. Research supported by the U.S. Department of Energy.

A80-34081 # **An analysis of off-guideway energy storage/propulsion systems for dual mode transit systems.** I. J. Sacks (California, University, Livermore, Calif.). In: Advanced transit and urban revitalization - An international dialogue; Proceedings of the International Conference, Indianapolis, Ind., April 25-28, 1978. Volume 2. Washington, D.C., Advanced Transit Association, 1978. 24 p. 25 refs. Contract No. W-7405-eng-48.

Some evaluation criteria and a method for combining these criteria for the selection of an energy storage/propulsion system for off-guideway operation of a dual mode transit system are presented. In addition, technical options for these energy storage/propulsion systems are discussed. These options are drawn from mechanical, chemical, and electrical energy storage systems. The selection criteria discussed are used to select 'attractive' near term system option. (Author)

A80-34777 * **Manufacturing methods of a composite cell case for a Ni-Cd battery.** J. L. Bauer, R. S. Bogner (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, Calif.), E. P. Lowe, and E. Orlowski (Programmed Composites Co., Fullerton, Calif.). In: New horizons - Materials and processes for the eighties; Proceedings of the Eleventh National Conference, Boston, Mass., November 13-15, 1979. Azusa, Calif., Society for the Advancement of Material and Process Engineering, 1979, p. 364-387. 5 refs. Contract No. NAS7-100.

Graphite epoxy material for a nickel cadmium battery cell case has been evaluated and determined to perform in the simulated environment of the battery. The basic manufacturing method requires refinement to demonstrate production feasibility. The various facets of production scale-up, i.e., process and tooling development together with material and process control, have been integrated into a comprehensive manufacturing process that assures production reproducibility and product uniformity. Test results substantiate that a battery cell case produced from graphite epoxy pre-impregnated material utilizing internal pressure bag fabrication method is feasible. (Author)

A80-35382 **A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems.** A. H. A. El-Sawy (Mitre Corp., McLean, Va.) and J. Byrd, Jr. (West Virginia University, Morgantown, W. Va.). *Energy Systems and Policy,* vol. 3, no. 4, 1980, p. 337-351. 5 refs.

A mixed integer programming model is developed and optimized to generate the optimal daily schedule for a combined thermal and hydroelectric-pumped storage power generating system. Various model modifications, generalizations and problems of implementation are discussed. Also included are the results of postoptimality analysis showing the sensitivity of the optimal schedule cost and configuration. Further computational experience with the mixed integer power-scheduling model, using various heuristic priority ordering and cutoff rules to cut down the computer solution time and the number of iterations involved, led to the following conclusions: (1) the average cost priority rule led to the lowest solution time, (2) the cutoff rule is effective in cutting both the solution time and the number of iterations of search while yielding a solution that is as close to the optimal as one desires. Recommendations for further research are included. (Author)

A80-35402 Putting baseload to work on the night shift. *EPRI Journal*, vol. 5, Apr. 1980, p. 6-13.

The use of energy storage systems to make use of baseload electric generating capacity during times of peak demand and thus conserve the more expensive fossil fuels generally employed for peak power generation is discussed. Means for storing baseload electricity generated from coal or nuclear plants are examined, with attention given to pumped water storage both above and below ground, compressed air storage and advanced-technology batteries. Systems of end-use storage, where electricity generated by the utility at night and available at lower rates is stored at the place of utilization to provide daytime space heating, hot water and even air conditioning and vehicle power, are considered, and the storage of solar energy is presented as an illustration of ways in which utility and customer energy storage can complement one another. It is concluded that the range of applications, potential benefits and technological potential of energy storage at the utility and consumer levels will ensure an important future role for this technology. A.L.W.

A80-37003 On the design of silver-hydrogen electrochemical cells. P. O. Offenhartz and G. L. Holleck (EIC Corp., Newton, Mass.). *Electrochemical Society, Journal*, vol. 127, June 1980, p. 1213-1219. 8 refs. Contract No. F33615-76-C-2093.

With a projected energy density of 70-110 W-hr/kg and an estimated lifetime in excess of 1000 cycles, silver-hydrogen cells represent a promising electrochemical energy storage device for specialized applications. A cell design using a rolled stack configuration is especially attractive. A comprehensive computer simulation has been used to optimize the energy density of such a cell. The parameters considered include: cell geometry, electrode and lead dimensions, water generation and consumption, electrolyte movement, heat generation and dissipation, and active material utilization. The results show that balancing of electrolyte transport processes is essential for stable long term operation. Energy density is a strong function of rate, with incomplete silver electrode utilization the main factor. At higher rates no more than three or four layers can be used if the maximum temperature increase on discharge is to be kept below 5-10 C to avoid electrolyte loss via evaporation/condensation processes. Conversely, use of only one or two layers leads to an unacceptably high penalty in the energy density. (Author)

A80-37005 Electrical data of sodium/sulfur cells operating with dissolved catholyte. G. Weddigen (Brown, Boveri et Cie. AG, Heidelberg, West Germany). *(Electrochemical Society, Meeting, Pittsburgh, Pa., Oct. 15-20, 1978.) Electrochemical Society, Journal*, vol. 127, June 1980, p. 1225-1227. Bundesministerium für Forschung und Technologie Contract No. NT-4471.

Usual sodium/sulfur cells have an operating temperature of 300 C or higher. Thus the precipitation of solid polysulfides can be avoided during discharge until a stoichiometry of Na2S3 has been obtained in the sulfur compartment. Using organic solvents it becomes possible to discharge sodium/sulfur cells even up to the catholyte composition of Na2S. Besides this the operating temperature can be lowered to 150 C. It is shown how rechargeability and internal resistance depend on temperature, solvent, and additives. (Author)

A80-37009 Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte. R. Knödler, G. Böhme (Battelle-Institut, Frankfurt am Main, West Germany), and W. Borger (Varta Batterie AG, Kelkheim, West Germany). *Electrochemical Society, Journal*, vol. 127, June 1980, p. 1311-1313. 7 refs. Research supported by the Varta Batterie AG; Bundesministerium für Forschung und Technologie Contract No. ET-5138-A.

Results are presented of an investigation into the self-discharge behavior of LiAl/FeS with molten salt electrolyte. The experimental setup was such that it was possible to determine the smallest possible self-discharge rate of this battery system. The experimental results suggest the following conclusions: (1) the self-discharge rate of LiAl/FeS cells is less than 1% per day; (2) the electronic conductivity of the molten electrolyte is drastically increased by the addition of Li2O2; in a complete cell, Li2O is oxidized to Li2O2, thereby causing self-discharge due to electronic conductivity; and (3) the presence of air or oxygen in the cell atmosphere causes an increase in the self-discharge rate, whereas nitrogen has no effect. The consequence of the presence of air or oxygen is the formation of Li2O2 in the electrolyte. Therefore, increased conductivity of the melt may be one of the reasons for enhanced self-discharge. S.D.

A80-37455 Conceptual design of integrated energy storage and attitude control system. N. H. Nguyen and F. Mariau (Matra, S.A., Vélizy-Villacoublay, Yvelines, France). In: Automatic control in space; Proceedings of the Eighth Symposium, Oxford, England, July 2-6, 1979. Oxford, Pergamon Press, Ltd., 1980, p. 237-245. European Space Agency Contract No. 3261.

The concept of energy storage wheels (ESW) is reviewed with reference to their applications in future space missions. The key design features of ESW include the use of frictionless magnetically suspended bearings and emergency ball bearings, the use of dc motors for high efficiency, and the use of a drag free rotor made of composite materials. Major interface problems associated with the introduction of ESW into the power storage and attitude control systems are discussed, including uncertainties of wheel alignment and ESW inertia, as well as gain dispersions of ESW control electronics. The discussion also includes the proposed space missions, attitude control system designs for these missions, and the architecture of a power storage system using ESW. V.L.

A80-37591 Rechargeable batteries: Advances since 1977. Edited by R. W. Graham. Park Ridge, N. J., Noyes Data Corp. (Energy Technology Review, No. 55; Chemical Technology Review, No. 160), 1980. 464 p. $54.

The book is a data-based publication, providing information retrieved and made available from the U.S. patent literature. It thus serves a double purpose in that it supplies detailed technical information and can be used as a guide to the patent literature in the field of rechargeable batteries. The topics covered include lead-acid batteries, lithium batteries, sodium-sulfur batteries, alkaline zinc and iron electrode batteries, zinc-halogen batteries, nickel-cadmium and nickel-hydrogen batteries, and other battery systems. Also included are company index, inventor index, and U.S. patent number index. S.D.

A80-37811 International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Conference sponsored by IEEE, U.S. Air Force, U.S. Army, U.S. Navy, and U.S. Department of Energy. Edited by A. H. Guenther (USAF, Weapons Laboratory, Kirtland AFB, N. Mex.) and M. Kristiansen (Texas Tech University, Lubbock, Tex.). Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979. 521 p. $60.

The Conference concentrated on electron and ion diodes, magnetic components, power conditioning, breakdown mechanisms, switching, accelerators, and inductive and capacitive energy storage systems. Papers were given on hydrogen thyratrons for high power switching, electromagnetic guns and reaction engines, contacts for pulsed high current, exploding aluminum foil fuses, a Marx module for Antares, an electron-beam triggered spark gap, flashlamps, magnetic insulation in short coaxial vacuum structures and a low inductance 2 MV tube. A.T.

A80-37857 # **TRIDENT - A megavolt pulse generator using inductive energy storage.** D. Conte, R. D. Ford, W. H. Lupton, and I. M. Vitkovitsky (U.S. Navy, Naval Research Laboratory, Washington, D.C.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers.

Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 276-283. 7 refs. Research sponsored by the U.S. Defense Nuclear Agency.

A megavolt level pulse generator, TRIDENT, has been constructed utilizing an inductive store as the primary pulse forming device. The 2.5 micro H coaxial storage inductor can be energized with up to 500 kA obtained from a 500 kJ, 60 kV capacitor bank. Current interruption is accomplished using a three stage opening switch comprised of an explosively actuated switch in parallel with foil and wire fuses. The generator has been operated at the 410 kA charge level (70% energy) to produce 700 kV pulses with risetimes of 150 nsec. Energy has been deposited into a 7.5 ohms resistive load at a rate of 5 x 10 to the 10th W. Operation with optimized fuse dimensions and at full charge is anticipated to approach megavolt outputs at powers of 10 to the 11th W. Future experiments include utilizing a homopolar generator as the current source. (Author)

A80-37873 # **The mechanical design of a compensated pulsed alternator prototype.** M. Brennan, W. L. Bird, J. H. Gully, M. L. Spann, K. M. Tolk, W. F. Weldon, H. G. Rylander, and H. H. Woodson (Texas, University, Austin, Tex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers. Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 392-397. Research supported by the U.S. Department of Energy and Texas Atomic Energy Research Foundation.

A prototype of a compensated pulsed alternator (compulsator) with 150-kA peak output current is described. The rotor is made of 2913 laminations shrink fitted on a vertical shaft. Since the rotor has an L/D of 3.2 and a maximum speed of 5400 rpm, these insulated laminations are clamped on the ends with large Belleville washers to increase the effective stiffness. The stator is mounted on a torque frame which allows it to rotate during discharge to reduce the forces transmitted to ground. The mechanical considerations and design of this machine are presented. (Author)

A80-37875 # **A compressed magnetic field generator systems model.** J. E. Gover (Sandia Laboratories, Albuquerque, N. Mex.). In: International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers.

Piscataway, N.J., Institute of Electrical and Electronics Engineers, Inc., 1979, p. 402-405. 6 refs.

A model relating the volume of a compressed magnetic field generator pulsed power system to its electrical energy output is developed. This systems model includes energy density and/or power density models of the electronic components and a CMF generator model which has been confirmed experimentally for system output energies up to 5000 joules. For a given output energy there exists an optimum selection of the pulsed power components to give an overall minimum system volume. Under optimum conditions the volume of the CMF generator is equal to one-half of the overall system volume and the overall system volume increases with the one-half power of the systems output energy. In an all electronic system there is a linear relationship between system volume and output energy. (Author)

A80-37966 **Seasonal regeneration through underground strata.** T. Yokoyama, H. Umemiya, T. Teraoka, H. Watanabe (Yamagata, University, Yonezawa, Japan), K. Katsuragi (Nippon Chikasui-Kaihatsu Co., Ltd., Japan), and K. Kasahara (Mayekawa Manufacturing Co., Ltd., Tokyo, Japan). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2.

New York, Pergamon Press, Inc., 1980, p. 623-653. 14 refs.

A seasonal regeneration system based on artificial ground water recharge is examined; summer heat and winter 'cold' are stored in underground strata and utilized when necessary. A recovery coefficient of nearly 40% indicates that seasonal regeneration through underground strata is feasible and suitable for many applications. B.J.

A80-37967 **Some aspects of energy storage systems using Glauber salt mixtures.** D. Y. S. Lou and A. J. Harrison (Delaware, University, Newark, Del.). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2. New York, Pergamon Press, Inc., 1980, p. 666-679. 5 refs. Contract No. E(11-1)-4042.

An investigation on the phase-transformation process of the Glauber salt mixture has been performed. Results on the visual observations of the crystallization process, measurement of the crystallization rate and its dependence upon the degree of undercooling are reported in this paper. Based on experimental investigation, it is concluded that the crystallization process is limited by the rate of thermal diffusions from the growing interface. (Author)

A80-37968 **A direct contact thermal energy storage system.** A. S. Elasfouri (Cairo, University, Giza, Egypt). In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2.

New York, Pergamon Press, Inc., 1980, p. 680-696. 6 refs.

A direct contact thermal energy storage system is suggested. In this system, the heat storing material would be divided into small droplets. During the energy extraction process, the droplets while being in their liquid state, would be allowed to fall freely in the heat carrying fluid, and meanwhile to solidify. Hereafter, the solidification of these droplets during the energy extraction process is studied under certain assumptions. Considering low Archimedes number combinations, solutions are given corresponding to different ranges of Reynolds number. The factors affecting the performance of the system during the energy extraction process are presented, and the possibilities of obtaining compact heat exchanger are investigated and discussed. (Author)

A80-37988 **Hybrid chemical concepts for storage of solar thermal energy.** A. C. Vialaron (CNRS, Toulouse, France). *(Coopération Méditerranéenne pour l'Energie Solaire, Revue Internationale d'Héliotechnique,* 2nd Semester, 1978, p. 38-41.) In: Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volume 2.

New York, Pergamon Press, Inc., 1980, p. 1109-1118. 5 refs. Translation.

Solar energy storage procedures that merely involve storage of heat are compared with hybrid storage procedures that involve a chemical reaction as well as thermal storage. A sulfur dioxide and magnesium oxide system that utilizes the dissociation of water (hydrogen production) is described, and two scenarios for application of this system are considered. The system capabilities and requirements are examined. M.L.

A80-39086 **Can this car electrify America.** C. G. Burck. *Fortune,* vol. 102, July 14, 1980, p. 77, 78, 80.

A brief description of the Gulf and Western electric car propulsion system is presented. Attention is given to the firm's goals in developing the system, which include creating a new market for zinc. In addition, a comparison is made with General Motor's nickel-zinc battery system, on the basis of operating cost and performance. M.E.P.

A80-40068 # **The efficiency of ballast in composite flywheels (Effektivnost' ballasta v makhovikakh iz compozitov).** V. L. Kulakov and G. G. Portnov (Akademiia Nauk Latviiskoi SSR, Institut Mekhaniki Polimerov, Riga, Latvian SSR). *Mekhanika Kompozitnykh Materialov,* Mar.-Apr. 1980, p. 291-299. 8 refs. In Russian.

The feasibility of using ballast to increase the energy efficiency of composite flywheels was assessed; attention was given to flywheels made of glass/plastic, carbon/plastic, boron/plastic, and synthetic/plastic materials. It is shown that the use of ballast ensures a significant increase of the specific bulk energy capacity of the flywheel only in the case of a synthetic/plastic flywheel (about 50%); flywheels made from the other three composites tested experience only a slight increase of energy capacity (7-14%). B.J.

A80-40601 **The lithium-sulfur dioxide primary battery - Its characteristics, performance and applications.** D. Linden and B. McDonald (Duracell International, Inc., Lithium Systems Div., Elmsford, N.Y.). *Journal of Power Sources,* vol. 5, Mar. 1980, p. 35-55. 10 refs.

The lithium-sulfur dioxide battery is a new primary battery system with many advantages over conventional batteries. It has an energy density up to 330 W h/kg (150 W h/lb), two to four times greater than zinc batteries, and can perform to temperatures as low as -54 C (-65 F). The battery can withstand high temperature storage at 71 C (160 F) for long periods of time and its shelf life is projected to be 5-10 years at 21 C (70 F). The chemistry, construction and detailed performance characteristics of the battery are presented. The Li/SO_2 system provides an all-purpose, all-climate primary battery that is capable of filling a wide variety of military, industrial and consumer applications. A number of these applications are discussed. With increasing production and cost reduction, the Li/SO_2 battery will be cost-competitive and will receive wide acceptability and use. (Author)

A80-40602 **Primary Li/$SOCl_2$ cells. X - Optimization of D cells with respect to energy density, storability and safety.** A. N. Dey (P. R. Mallory Laboratory for Physical Science, Burlington, Mass.). *Journal of Power Sources,* vol. 5, Mar. 1980, p. 57-72. 20 refs. Grant No. DAAB07-74-C-0109.

Hermetically-constructed Li/$SOCl_2$ D cells were used for the studies reported in this publication. Optimization with respect to energy density resulted in a capacity recovery of 18-19 A h at 3.5 volt at 25 C, at 0.01 A corresponding to 20 W h/cu in. (1.24 W h/cu cm) and 300 W h/lb (661 W h/kg). The optimization with respect to storability resulted in cells having no voltage-delays after three months of storage at 72 C and test at -30 C at 3.0 A. The optimization with respect to safety resulted in cells which are resistant to abuses such as shorting and force-discharge. Approaches have also been developed to stabilize the partially-discharged cells and thus prevent spontaneous explosions on storage. (Author)

A80-40603 **Abusive testing of large Li/$SOCl_2$ cells.** N. Marincic and F. Goebel (GTE Sylvania, Inc., Waltham, Mass.). *Journal of Power Sources,* vol. 5, Mar. 1980, p. 73-82. 10 refs. USAF-supported research.

Results are reported of various abuse tests conducted with lithium-thionyl chloride primary batteries of 2,000 A h and 10,000 A h capacity. The mechanical abuse tests, such as shock and vibration, showed that the large prismatic cells can now be built to satisfy typical military requirements. The thermal abuse tests showed that the cells can withstand a considerable overheating or a thermal shock treatment, as long as provisions were made for the thermal expansion of the electrolyte. The electrochemical abuse tests showed that the cells could be overdischarged (driven in reverse beyond discharge) to an equivalent of up to 50% of the discharge capacity with no adverse effects. The short circuit test, as a combination of the electrochemical and thermal abuse, was performed with no rupture, explosions or any other adverse effects on the surroundings. (Author)

A80-40604 **Lithium batteries with voltage compatibility with conventional systems.** M. Broussely, Y. Jumel, and J. P. Gabano (Société des Accumulateurs Fixes et de Traction, Poitiers, France). *Journal of Power Sources,* vol. 5, Mar. 1980, p. 83-87. 6 refs.

The possibility of using lead or lead-bismuth mixed oxides as positive materials in organic electrolyte lithium cells with a working voltage similar to those of conventional systems (1.5 V) has been considered. Performances and main characteristics of this new class of lithium batteries are described. (Author)

A80-40605 **Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery.** Y. Uetani, K. Yokoyama, and O. Okamoto (Hitachi Maxell, Ltd., Ibaraki, Osaka, Japan). *Journal of Power Sources,* vol. 5, Mar. 1980, p. 89-98. 10 refs.

A80-40606 **Evaluation of cathode materials for the lithium/carbonmonofluoride battery.** A. Morita, T. Iijima, T. Fujii, and H. Ogawa (Matsushita Electric Industrial Co., Ltd., Central Research Laboratories, Moriguchi, Japan). *Journal of Power Sources,* vol. 5, Mar. 1980, p. 111-125. 9 refs.

The lithium-carbonmonofluoride $(CF)n$ system, one of the most promising systems for high energy density primary batteries, is described in this paper. In this system, discharge performance mainly depends on the cathode material, $(CF)n$, prepared by fluorinating various carbon materials at moderate temperatures. Two kinds of active carbons, graphite and coke, were chosen and tested in cells to determine the best carbon material for the carbonmonofluoride cathode. The $(CF)n$ cathode made of coke has been shown to have excellent discharge performance, good storage behavior, and an energy density of 140 W h/kg in small button cell sizes. (Author)

A80-40715 **Solar energy with chemical storage for cogeneration of electric power and heat.** H. W. Prengle, Jr., J. C. Hunt, C. E. Mauk, and E. C.-H. Sun (Houston, University, Houston, Tex.). *Solar Energy,* vol. 24, no. 4, 1980, p. 373-384. 12 refs. Research supported by the University of Houston; Contract No. EG-77-C-01-3974.

U.S.A. energy use by the year 2000 is estimated to be 116-130 quads, compared to 82 quads for 1978. Solar energy, utilized both at the individual residence-building level plus power plant level, along with all other conventional and new energy sources, will be needed to meet future energy demand. In order to make maximum utilization of energy sources to meet national energy-conservation and energy-economic policy, a power plant of the future must cogenerate electrical energy and heat medium, whether it burns fossil fuel or uses solar energy. A solar energy Central Receiver-AHS Chemical Storage cogeneration power plant can be configured to give complete flexibility for day-night and seasonal load combinations, with work efficiencies up to 46 per cent. Such a plant, as a stand-alone or network station, is a real possibility in the not too distant future. Electrical energy and heat medium produced therefrom will be competitive with fossil fuel powered generating plants. A 100 MWe Central Receiver-AHS Cycle cogeneration power plant is discussed in detail; cycle analysis, preliminary cost estimates, and unit energy costs are discussed. (Author)

A80-41473 # **Application of heat pipes to thermal energy storage systems.** A. Abhat (Stuttgart, Universität, Stuttgart, West Germany). *American Institute of Aeronautics and Astronautics, Thermophysics Conference, 15th, Snowmass, Colo., July 14-16, 1980, Paper 80-1509.* 9 p. 7 refs. Bundesministerium für Forschung und Technologie Contract No. ET-4060-A.

The application of heat pipes as heat transport elements in a latent heat thermal energy store for solar residential heating systems is proposed. The paper describes the development of a 20 mm diameter, 3070 mm long, axially-grooved, copper-water heat pipe selected for this purpose. The heat pipe was operated with slight gravity assistance and tested in various operational modes that simulated charging, discharging and by-pass of the heat store. Entrainment effects resulted in adverse performance, forcing modifications in the capillary structure. Results from experiments performed during three tests series, characterized by the type of capillary structure used, are discussed. (Author)

A80-41649 **Whirl and critical speeds of flywheel-container systems aboard vehicles.** G. Genta and M. Gola (Torino, Politecnico, Turin, Italy). *Meccanica,* vol. 14, Mar. 1979, p. 55-61. 9 refs.

Container-flywheel systems for road vehicles can be mounted in a variety of ways on the vehicle's body, thus allowing large or small displacements. In the case of steady precession kinematic conditions are here obtained for both large and small displacements. Dynamic analysis in the small displacement case is then tested against a complete non-linear simulation model, previously used for studies on flywheel bus dynamics. Whirling and critical speeds are obtained and discussed. (Author)

A80-41852 **Performance analysis of zinc-bromine batteries in vehicle and utility applications.** F. G. Will and H. S. Spacil (General Electric Co., Schenectady, N.Y.). *Journal of Power Sources,* vol. 5, June 1980, p. 173-188. 11 refs.

Rechargeable zinc-bromine batteries exhibit a number of inherent advantages that let them appear as possible candidates for applications in electric vehicles and utility load levelling. Based upon known single cell data, the performance characteristics of zinc-bromine batteries in vehicles and utility applications are predicted. The attainable specific energy and energy efficiency are computed as a function of specific power. The effects of specific cell resistance, self-discharge rate, and charge and discharge time on specific energy and efficiency are examined. (Author)

A80-42270 # **Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants.** R. D. Lessard, A. J. Giramonti (United Technologies Research Center, East Hartford, Conn.), and D. Merrick (Coal Processing Consultants, Ltd., Harrow, Middx., England). *American Society of Mechanical Engineers, Gas Turbine Conference and Products Show, New Orleans, La., Mar. 10-13, 1980, Paper 80-GT-160.* 8 p. 9 refs. Members, $1.50; nonmembers, $3.00.

This paper presents highlights of an ongoing study program to assess the technical and economic feasibility of advanced concepts for generating peak-load electric power from a compressed air energy storage (CAES) power plant incorporating a coal-fired fluid bed combustor (FBC). It reviews the analyses performed to select an FBC/CAES power plant system configuration for the subsequent conceptual design phase of the study. Included in this review are: the design and operating considerations involved with integrating either an atmospheric or a pressurized fluid bed combustor with a CAES system to yield practical system configurations; the integration of system configurations; the parametric performance of these system configurations; and the preliminary screening which considered performance, cost, and technical risk and led to the identification of an open-bed PFBC/CAES system as having the greatest near-term commercialization potential. (Author)

A80-42297 **Properties of alternate electrolytes for secondary zinc batteries.** R. F. Thornton (General Electric Co., Schenectady, N.Y.) and E. J. Carlson (General Electric Co., Lamp Business Div., Cleveland, Ohio). *Electrochemical Society, Journal,* vol. 127, July 1980, p. 1448-1452. 14 refs.

Several mixed aqueous electrolytes have been characterized for zinc oxide solubility, ionic conductivity, density, and nickel hydroxide utilization. These electrolytes were made by reducing the usual potassium hydroxide concentration and by adding the salts such as potassium fluoride or potassium phosphate to partially compensate for the lower ionic conductivity. These mixed electrolytes may be useful in prolonging the cycle life of the zinc electrode in secondary batteries. (Author)

A80-42299 **A preliminary investigation for an Al/AlCl3-NaCl/FeS2 secondary cell.** N. Koura (Tokyo Science University, Noda, Chiba, Japan). *Electrochemical Society, Journal,* vol. 127, July 1980, p. 1529-1531. 17 refs.

The development of an Al/AlCl3-NaCl/FeS2 cell as a potential candidate for advanced secondary cells is investigated, considering that aluminum has a negative potential and a high theoretical capacity, and the system has a low melting point and is stable as molten salt not in the presence of air or moisture. Discharge curves at various temperatures showed a high plateau at about 0.9 V and a low plateau at about 0.6 V; it was also shown that the more the current density increased, the greater was the high plateau capacity. In addition, FeS was detected from the FeS2 electrode discharged up to 0.65 V, and Al2S3 was detected up to 0.20 V by X-ray analysis. J.P.B.

A80-43480 **A convolution model of rock bed thermal storage units.** E. F. Sowell and R. L. Curry (California State University, Fullerton, Calif.). *Solar Energy,* vol. 24, no. 5, 1980, p. 441-449. 15 refs. Research supported by the U.S. Department of Energy.

A method is presented whereby a packed-bed thermal storage unit is dynamically modeled for bi-directional flow and arbitrary input flow stream temperature variations. The method is based on the principle of calculating the output temperature as the sum of earlier input temperatures, each multiplied by a predetermined 'response factor', i.e., discrete convolution. A computer implementation of the scheme, in the form of a subroutine for a widely used solar simulation program (TRNSYS) is described and numerical results compared with other models. Also, a method for efficient computation of the required response factors is described; this solution is for a triangular input pulse, previously unreported, although the solution method is also applicable for other input functions. This solution requires a single integration of a known function which is easily carried out numerically to the required precision. (Author)

N80-22641# Dayton Univ., Ohio. School of Engineering.
ANALYSIS OF SOLIDIFICATION IN A CYLINDRICAL ANNULUS WITH INTERNAL FINS Final Report, Oct. 1977 Oct. 1978
Howard E. Bandow and John N. Crip Wright-Patterson AFB, Ohio AFAPL Jul. 1979 83 p refs
(Contract F33615-77-C-2004; AF Proj. 3145)
(AD-A080131; UDR-TR-78-69; UDSE-TR-78-07; AFAPL-TR-79-2088) Avail: NTIS HC A05/MF A01 CSCL 10/3

Solutions are presented for the one dimensional and two dimensional inward solidification of a material contained in a cylindrical annulus. The outer boundary is insulated and the inner boundary is subject to a constant efflux via a heat pipe. Results are presented for the axisymmetric case and for the cases of three and six longitudinal fins of rectangular cross section. The fins extend radially from inner to outer radius and were symmetrically spaced in the circumferential direction. The phase change material was LiF-MgF2-KF and was assumed to be initially at the fusion temperature. GRA

N80-22702*# Kumm (Emerson L.), Tempe, Ariz.
DESIGN STUDY OF FLAT BELT CVT FOR ELECTRIC VEHICLES
Emerson L. Kumm Mar. 1980 159 p refs
(Contract DEN3-114; Contract EC-77-A-31-1044)
(NASA-CR-159822; P-1006) Avail: NTIS HC A08/MF A01 CSCL 13I

A continuously variable transmission (CVT) was studied, using a novel flat belt pulley arrangement which couples the high speed output shaft of an energy storage flywheel to the drive train of an electric vehicle. A specific CVT arrangement was

recommended and its components were selected and sized, based on the design requirements of a 1700 KG vehicle. A design layout was prepared and engineering calculations made of component efficiencies and operating life. The transmission efficiency was calculated to be significantly over 90% with the expected vehicle operation. A design consistent with automotive practice for low future production costs was considered, together with maintainability. The technology advancements required to develop the flat belt CVT were identified and an estimate was made of how the size of the flat belt CVT scales to larger and smaller design output torques. The suitability of the flat belt CVT for alternate application to an electric vehicle powered by an electric motor without flywheel and to a hybrid electric vehicle powered by an electric motor with an internal combustion engine was studied. E.D.K.

N80-22777*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

ADVANCED SCREENING OF ELECTRODE COUPLES

J. Giner and K. Cahill Feb. 1980 56 p refs
(Contract NAS3-20794; EC-77-A-31-1002)
(NASA-CR-159738; DOE/NASA/0794-80/1) Avail: NTIS HC A04/MF A01 CSCL 10B

The chromium (Cr(3+)/Cr(2+)) redox couple (electrolyte and electrode) was investigated to determine its suitability as negative electrode for the iron (Fe(3+)/Fe(2+))-chromium (Cr(3+)/Cr(2+)) redox flow battery. Literature search and laboratory investigation established that the solubility and stability of aqueous acidic solutions of chromium(3) chloride and chromium(2) chloride are sufficient for redox battery application. Four categories of electrode materials were tested; namely, metals and metalloid materials (elements and compounds), alloys, plated materials, and Teflon-bonded materials. In all, the relative performance of 26 candidate electrode materials was evaluated on the basis of slow scan rate linear sweep voltammetry in stirred solution. No single material tested gave both acceptable anodic an acceptable cathodic performance. However, the identification of lead as a good cathodic electrocatalyst and gold as a good anodic electrocatalyst led to the invention of the lead/gold combination electrocatalyst. This type of catalyst can be fabricated in several ways and appears to offer the advantages of each metal without the disadvantages associated with their use as single materials. This lead/gold electrocatalyst was tested by NASA-Lewis Research Center in complete, flowing, redox batteries comprising a stack of several cells. A large improvement in the battery's coulombic and energy efficiency was observed. F.O.S.

N80-22788*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THERMAL ENERGY STORAGE: FOURTH ANNUAL REVIEW MEETING

Mar. 1980 650 p refs Meeting held at Tysons Corner, Va., 3-4 Dec. 1979; sponsored by DOE
(NASA-CP-2125; E-428; CONF-791232) Avail: NTIS HC A99/MF A01 CSCL 10C

The development of low cost thermal energy storage technologies is discussed in terms of near term oil savings, solar energy applications, and dispersed energy systems for energy conservation policies. Program definition and assessment and research and technology development are considered along with industrial storage, solar thermal power storage, building heating and cooling, and seasonal thermal storage. A bibliography on seasonal thermal energy storage emphasizing aquifer thermal energy is included.

N80-22789*# Pacific Northwest Lab., Richland, Wash.

SEASONAL THERMAL ENERGY STORAGE PROGRAM

James E. Minor *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 25-31

Avail: NTIS HC A99/MF A01 CSCL 10B

The Seasonal Thermal Energy Storage (STES) Program designed to demonstrate the storage and retrieval of energy on a seasonal basis using heat or cold available from waste or other sources during a surplus period is described. Factors considered include reduction of peak period demand and electric utility load problems and establishment of favorable economics for district heating and cooling systems for commercialization of the technology. The initial thrust of the STES Program toward utilization of ground water systems (aquifers) for thermal energy storage is emphasized. J.M.S.

N80-22790*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PROGRAM DEFINITION AND ASSESSMENT OVERVIEW

Larry H. Gordon *In its* Thermal Energy Storage Mar. 1980 p 38-41 refs
Avail: NTIS HC A99/MF A01 CSCL 10B

The implementation of a program level assessment of thermal energy storage technology thrusts for the near and far term to assure overall coherent energy storage program is considered. The identification and definition of potential thermal energy storage applications, definition of technology requirements, and appropriate market sectors are discussed along with the necessary coordination, planning, and preparation associated with program reviews, workshops, multi-year plans and annual operating plans for the major laboratory tasks. J.M.S.

N80-22792*# Midwest Research Inst., Kansas City, Mo.

THERMAL ENERGY STORAGE SYSTEMS USING FLUIDIZED BED HEAT EXCHANGERS

V. Ramanathan, T. E. Weast, and K. P. Ananth *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 47-55

(Contract DEN3-96)
Avail: NTIS HC A99/MF A01 CSCL 10B

The viability of using fluidized bed heat exchangers (FBHX) for thermal energy storage (TES) in applications with potential for waste heat recovery was investigated. Of the candidate applications screened, cement plant rotary kilns and steel plant electric arc furnaces were identified, via the chosen selection criteria, as having the best potential for successful use of FBHX/TES system. A computer model of the FBHX/TES systems was developed and the technical feasibility of the two selected applications was verified. Economic and tradeoff evaluations in progress for final optimization of the systems and selection of the most promising system for further concept validation are described. J.M.S.

N80-22794*# General Electric Co., Schenectady, N. Y.

CONCEPTUAL DESIGN OF THERMAL ENERGY STORAGE SYSTEMS FOR NEAR-TERM ELECTRIC UTILITY APPLICATIONS

Eldon W. Hall *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 79-84

(Contract DEN3-12; EPRI Proj. 1082-1)
Avail: NTIS HC A99/MF A01 CSCL 10B

Promising thermal energy storage systems for midterm applications in conventional electric utilities for peaking power generation are evaluated. Conceptual designs of selected thermal energy storage systems integrated with conventional utilities are considered including characteristics of alternate systems for peaking power generation, viz gas turbines and coal fired cycling plants. Competitive benefit analysis of thermal energy storage systems with alternate systems for peaking power generation and recommendations for development and field test of thermal energy storage with a conventional utility are included. Results indicate that thermal energy storage is only marginally competitive with coal fired cycling power plants and gas turbines for peaking power generation. J.M.S.

N80-22795*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

INDUSTRIAL STORAGE APPLICATIONS OVERVIEW

Rudolph A. Duscha *In its* Thermal Energy Storage Mar. 1980 p 85-94 refs
Avail: NTIS HC A99/MF A01 CSCL 10B

The implementation of a technology demonstration for the food processing industry, development and technology demonstrations for selected near-term, in-plant applications and advanced industrial applications of thermal energy storage are overviewed. R.E.S.

N80-22796*# Westinghouse Electric Corp., Pittsburgh, Pa. Advanced Energy Systems Div.
APPLICATIONS OF THERMAL ENERGY STORAGE TO WASTE HEAT RECOVERY IN THE FOOD PROCESSING INDUSTRY
F. Wojnar (Heinz (H. J.) Co.) and Wayne L. Lunberg *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 95-104

(Contract EC-77-C-01-5002)
Avail: NTIS HC A99/MF A01 CSCL 10B

A study to assess the potential for waste heat recovery in the food industry and to evaluate prospective waste heat recovery system concepts employing thermal energy storage was conducted. The study found that the recovery of waste heat in canning facilities can be performed in significant quantities using systems involving thermal energy storage that are both practical and economical. A demonstration project is proposed to determine actual waste heat recovery costs and benefits and to encourage system implementation by the food industry. R.E.S.

N80-22797*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COLLECTION AND DISSEMINATION OF TES SYSTEM INFORMATION FOR THE PAPER AND PULP INDUSTRY
M. W. Dietrich and Howard Edde (Edde (Howard), Inc., Bellevue, Wash.) *In its* Thermal Energy Storage Mar. 1980 p 105-111
(Contract DEN3-190)
Avail: NTIS HC A99/MF A01 CSCL 10B

A survey of U.S. and international paper and pulp mills using thermal energy storage (TES) systems as a part of their production processes was conducted to obtain sufficient operating data to conduct a benefits analysis encompassing: (1) an energy conservation assessment, (2) an economic benefits analysis, and (3) an environmental impact assessment. An information dissemination plan was then proposed to effectively present the benefits of TES to the U.S. paper and pulp industry. R.E.S.

N80-22798*# Sandia Labs., Livermore, Calif.
SOLAR THERMAL POWER STORAGE APPLICATIONS LEAD LABORATORY OVERVIEW
Lee G. Radosevich *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 113-124

Avail: NTIS HC A99/MF A01 CSCL 10B

The implementation of the applications elements of the thermal energy storage for Solar Thermal Applications program is described. The program includes the accelerated development of thermal storage technologies matched to solar thermal power system requirements and scheduled milestones. The program concentrates on storage development in the FY80 to 85 time period with emphasis on the more near-term solar thermal power system application. R.E.S.

N80-22799*# Sandia Labs., Albuquerque, N. Mex.
THERMAL STORAGE EXPERIENCE AT THE MSSTF AND PLANS FOR THE FUTURE
Thomas D. Harrison and Robert A. Randall *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 125-130 ref
(Contract DE-AC04-76DP-00789)
Avail: NTIS HC A99/MF A01 CSCL 10C

The background of thermal storage development at the Midtemperature Solar Systems Test Facility is reviewed. The problems which were encountered are discussed and a course of action for resolving the problems is outlined. Scaling effects of going from laboratory models to full-size applications were determined and applied to thermal storage needs in near-term solar projects. R.E.S.

N80-22800*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
THERMAL ENERGY STORAGE EFFORT AT JPL
Donald L. Young *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 131-140

Avail: NTIS HC A99/MF A01 CSCL 10C

The technical, operational, and economic readiness of parabolic dish systems for electric and thermal applications was investigated. A parabolic dish system was then developed to the point at which subsequent commercialization activities can lead to successful market penetration. The immediate possible applications of the dish system to thermal energy storage are discussed. R.E.S.

N80-22801*# Martin Marietta Corp., Baltimore, Md.
INTERNALLY INSULATED THERMAL STORAGE SYSTEM DEVELOPMENT PROGRAM
Owen L. Scott *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 141-155

Avail: NTIS HC A99/MF A01 CSCL 10C

A cost effective thermal storage system for a solar central receiver power system using molten salt stored in internally insulated carbon steel tanks is described. Factors discussed include: testing of internal insulation materials in molten salt; preliminary design of storage tanks, including insulation and liner installation; optimization of the storage configuration; and definition of a subsystem research experiment to demonstrate the system. A thermal analytical model and analysis of a thermocline tank was performed. Data from a present thermocline test tank was compared to gain confidence in the analytical approach. A computer analysis of the various storage system parameters (insulation thickness, number of tanks, tank geometry, etc.,) showed that (1) the most cost-effective configuration was a small number of large cylindrical tanks, and (2) the optimum is set by the mechanical constraints of the system, such as soil bearing strength and tank hoop stress, not by the economics. M.G.

N80-22803*# Texas Univ. at Austin. Energy Foundation of Texas.
HIGH TEMPERATURE UNDERGROUND THERMAL ENERGY STORAGE SYSTEM FOR SOLAR ENERGY
R. Eugene Collins *In* NASA. Lewis Res. Center Thermal Energy Storage Aug. 1980 p 163-171

Avail: NTIS HC A99/MF A01 CSCL 10C

The activities feasibility of high temperature underground thermal storage of energy was investigated. Results indicate that salt cavern storage of hot oil is both technically and economically feasible as a method of storing huge quantities of heat at relatively low cost. One particular system identified utilizes a gravel filled cavern leached within a salt dome. Thermal losses are shown to be less than one percent of cyclically transferred heat. A system like this having a 40 MW sub t transfer rate capability and over eight hours of storage capacity is shown to cost about $13.50 per KWh sub t. M.G.

N80-22805*# Institute of Gas Technology, Chicago, Ill.
HIGH-TEMPERATURE MOLTEN SALT THERMAL ENERGY STORAGE SYSTEMS FOR SOLAR APPLICATIONS
Randy J. Petri and T. D. Claar *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 183-190 refs

Avail: NTIS HC A99/MF A01 CSCL 10C

Alkali and alkaline earth carbonate latent-heat storage salts, metallic containment materials, and thermal conductivity enhancement materials were investigated to satisfy the high temperature (704 to 871 C) thermal energy storage requirements of advanced solar-thermal power generation concepts are described. Properties of the following six salts selected for compatibility studies are given: three pure carbonates, K2CO3, Li2CO3 and Na2CO3; two eutectic mixtures, BaCO3/Na2CO3 and K2CO3/NaCO3, and one off-eutectic mixture of Na2CO3/K2CO3. M.G.

N80-22806*# Oak Ridge National Lab., Tenn.
BUILDING HEATING AND COOLING APPLICATIONS

THERMAL ENERGY STORAGE PROGRAM OVERVIEW
D M Eissenberg *In* NASA Lewis Res Center Thermal Energy Storage Mar 1980 p 191-201

Avail NTIS HC A99/MF A01 CSCL 10B
Thermal energy storage technology and development of building heating and cooling applications in the residential and commercial sectors is outlined. Three elements are identified to undergo an applications assessment, technology development, and demonstration. Emphasis is given to utility load management thermal energy system application where the stress is on the 'customer side of the meter'. Thermal storage subsystems for space conditioning and conservation means of increased thermal mass within the building envelope and by means of low-grade waste heat recovery are covered. M.G.

N80-22807*# Oak Ridge National Lab., Tenn.
SUBCONTRACTED ACTIVITIES RELATED TO TES FOR BUILDING HEATING AND COOLING
Jim Martin *In* NASA Lewis Res Center Thermal Energy Storage Mar 1980 p 203-211

Avail NTIS HC A99/MF A01 CSCL 10B
The subcontract program elements related to thermal energy storage for building heating and cooling systems are outlined. The following factors are included: subcontracts in the utility load management application area; life and stability testing of packaged low cost energy storage materials; and development of thermal energy storage systems for residential space cooling. Resistance storage heater component development, demonstration of storage heater systems for residential applications, and simulation and evaluation of latent heat thermal energy storage (heat pump systems) are also discussed. Application of thermal energy storage for solar application and twin cities district heating are covered including an application analysis and technology assessment of thermal energy storage. R.C.T.

N80-22808*# Purdue Univ., Lafayette, Ind.
THERMAL ENERGY STORAGE TESTING FACILITY
R J Schoenhals, H F Kuehlert, and C P Lin *In* NASA. Lewis Res Center Thermal Energy Storage Mar 1980 p 223-231
Avail NTIS HC A99/MF A01 CSCL 10C
The thermal performance of resistance storage heaters in respect to current standards is determined. The design and construction of a storage heater test facility with capability for measuring the performance of electric resistance heated storage units is described. The performance of commercial units are compared based on existing standards. Additional performance standards are proposed. R.C.T.

N80-22809*# Rocket Research Corp., Redmond, Wash.
APPLICATION OF THERMAL ENERGY STORAGE TO PROCESS HEAT RECOVERY IN THE ALUMINUM INDUSTRY
John McCabe *In* NASA Lewis Res Center Thermal Energy Storage Mar 1980 p 233-237

Avail NTIS HC A99/MF A01 CSCL 10B
The economic viability and the institutional compatibility of a district heating system in the city of Bellingham, Washington are assessed and the technical and economic advantages of using thermal energy storage methods are determined. R.C.T.

N80-22810*# General Electric Co., Schenectady, N.Y. Corporate Research and Development
HEAT STORAGE CAPABILITY OF A ROLLING CYLINDER USING GLAUBER'S SALT
C S Herrick and K P Zarnoch *In* NASA Lewis Res Center Thermal Energy Storage Mar 1980 p 239-259 refs

(Contract EM-78-C-05-5759)
Avail NTIS HC A99/MF A01 CSCL 10C
The rolling cylinder phase change heat storage concept was developed to the point where a prototype design is completed and a cost analysis is prepared. A series of experimental and analytical tasks are defined to establish the thermal, mechanical, and materials behavior of rolling cylinder devices. These tasks include: analyses of internal and external heat transfer; performance and lifetime testing of the phase change materials; corrosion evaluation; development of a mathematical model; and design of a prototype and associated test equipment. R.C.T.

N80-22811*# Oak Ridge National Lab., Tenn.
THERMAL ENERGY STORAGE TEST FACILITY
Mark P. Ternes *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 261-264

(Contract W-7405-eng-26)
Avail: NTIS HC A99/MF A01 CSCL 10C
The thermal behavior of prototype thermal energy storage units (TES) in both heating and cooling modes is determined. Improved and advanced storage systems are developed and performance standards are proposed. The design and construction of a thermal cycling facility for determining the thermal behavior of full scale TES units is described. The facility has the capability for testing with both liquid and air heat transport, at variable heat input/extraction rates, over a temperature range of 0 to 280 F. R.C.T.

N80-22814*# Delaware Univ., Wilmington. Inst. of Energy Conversion.
LIFE AND STABILITY TESTING OF PACKAGED LOW-COST ENERGY STORAGE MATERIALS
Galen R. Frysinger *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 277-281

Avail: NTIS HC A99/MF A01 CSCL 10C
Thermal cycling and performance tests, performed to verify the package integrity, life, and stability of the chub packaged materials system for storage coolness with application to residential air conditioning, are described. The moisture vapor retention characteristics of the laminate film for long term chub performance was determined. The stability, mechanical integrity, and thermal performance of chubs following mechanical shock, vibration, and temperature extremes is reported. A.W.H.

N80-22815*# General Electric Co., Santa Barbara, Calif.
EVALUATION OF THERMAL ENERGY STORAGE FOR THE PROPOSED TWIN CITIES DISTRICT HEATING SYSTEM
Charles F. Meyer *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 283-295 refs

Avail: NTIS HC A99/MF A01 CSCL 10C
The technical and economic feasibility of incorporating thermal energy storage components into the proposed Twin Cities District heating project was evaluated. The technical status of the project is reviewed and conceptual designs of district heating systems with and without thermal energy storage were compared in terms of estimated capital requirements, fuel consumption, delivered energy cost, and environmental aspects. The thermal energy storage system is based on cogeneration and the storage of heat in aquifers. A.W.H.

N80-22817*# Argonne National Lab., Ill.
EXPERIMENTAL EVALUATION OF THERMAL ENERGY STORAGE
J G Asbury and H N Hersh *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 307-314 refs

Avail: NTIS HC A99/MF A01 CSCL 10C
The technical performance of commercially available thermal energy storage (TES) residential heating units under severe weather conditions is discussed. The benefits and costs of TES to the user and utility companies were assessed. The TES issues, research and development needs, and barriers to commercialization were identified. The field tests which determined the performance characteristics for the TES are described and the TES systems, which included both ceramic and hydronic systems, are compared. A.W.H.

N80-22819*# Honeywell, Inc., Minneapolis, Minn.
ACTIVE HEAT EXCHANGE SYSTEM DEVELOPMENT FOR

LATENT HEAT THERMAL ENERGY STORAGE
Richard T. LeFrois *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 337-352

(Contract DEN3-38)
Avail: NTIS HC A99/MF A01 CSCL 10C

Alternative mechanizations of active heat exchange concepts were analyzed for use with heat of fusion Phase Change Materials (PCM's) in the temperature range of 250 C to 350 C for solar and conventional power plant applications. Over 24 heat exchange concepts were reviewed, and eight were selected for detailed assessment. Two candidates were chosen for small-scale experimentation: a coated tube and shell that exchanger, and a direct contact reflux boiler. A dilute eutectic mixture of sodium nitrate and sodium hydroxide was selected as the PCM from over fifty inorganic salt mixtures investigated. Preliminary experiments with various tube coatings indicated that a nickel or chrome plating of Teflon or Ryton coating had promise of being successful. An electroless nickel plating was selected for further testing. A series of tests with nickel-plated heat transfer tubes showed that the solidifying sodium nitrate adhered to the tubes and the experiment failed to meet the required discharge heat transfer rate of 10 kW(t). Testing of the reflux boiler is under way. A.R.H.

N80-22820*# Naval Research Lab., Washington, D. C.
ENERGY STORAGE-BOILER TANK Progress Report, 1979
Talbot A. Chubb, J. J. Nemecek, and D. E. Simmons *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 353-359
(Contract EC-77-A-31-1024; NRL Proj. M003)
Avail: NTIS HC A99/MF A01 CSCL 10B

Activities performed in an effort to demonstrate heat of fusion energy storage in containerized salts are reported. The properties and cycle life characteristics of a eutectic salt having a boiling point of about 385 C (NaCl, KCl, Mg Cl2) were determined. M-terphenyl was chosen as the heat transfer fluid. Compatibility studies were conducted and mild steel containers were selected. The design and fabrication of a 2MWh storage boiler tank are discussed. A.R.H.

N80-22822*# Grumman Aerospace Corp., Bethpage, N.Y.
ACTIVE HEAT EXCHANGE SYSTEM DEVELOPMENT FOR LATENT HEAT THERMAL ENERGY STORAGE
Joseph Alario and Robert Haslett *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 375-383

(Contract DEN3-39)
Avail: NTIS HC A99/MF A01 CSCL 10C

Various active heat exchange concepts were identified from among three generic categories: scrapers, agitators/vibrators and slurries. The more practical ones were given a more detailed technical evaluation and an economic comparison with a passive tube-shell design for a reference application. Two concepts selected for hardware development are a direct contact heat exchanger in which molten salt droplets are injected into a cooler counterflowing stream of liquid metal carrier fluid, and a rotating drum scraper in which molten salt is sprayed onto the circumference of a rotating drum, which contains the fluid heat sink in an internal annulus near the surface. A fixed scraper blade removes the solidified salt from the surface which has been nickel plated to decrease adhesion forces. Suitable phase change material (PCM) storage media with melting points in the temperature range of interest (250 C to 400 C) were investigated. The specific salt recommended for laboratory tests was a chloride eutectic (20.5KCl-24/5 NaCl-55.0MgCl 2% by wt.), with a nominal melting point of 385 C. A.R.H.

N80-22825*# Pacific Northwest Lab., Richland, Wash.
AQUIFER THERMAL ENERGY STORAGE PROGRAM
Kenneth Fox *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 401-411

(Contract EY-76-C-06-1830)
Avail: NTIS HC A99/MF A01 CSCL 10C

The purpose of the Aquifer Thermal Energy Storage Demonstration Program is to stimulate the interest of industry by demonstrating the feasibility of using a geological formation for seasonal thermal energy storage, thereby, reducing crude oil consumption, minimizing thermal pollution, and significantly reducing utility capital investments required to account for peak power requirements. This purpose will be served if several diverse projects can be operated which will demonstrate the technical, economic, environmental, and institutional feasibility of aquifer thermal energy storage systems. Author

N80-22827*# Texas A&M Research Foundation, College Station.
COLD WATER AQUIFER STORAGE
Donald L. Reddell, Richard R. Davison, and William B. Harris *In* NASA. Lewis Res. Center Thermal Energy Storage Mar. 1980 p 591-599
Avail: NTIS HC A99/MF A01 CSCL 10C

A working prototype system is described in which water is pumped from an aquifer at 70 F in the winter time, chilled to a temperature of less than 50 F, injected into a ground-water aquifer, stored for a period of several months, pumped back to the surface in the summer time. A total of 8.1 million gallons of chilled water at an average temperature of 48 F were injected. This was followed by a storage period of 100 days. The recovery cycle was completed a year later with a total of 8.1 million gallons recovered. Approximately 20 percent of the chill energy was recovered. A.R.H.

N80-22838# Los Alamos Scientific Lab., N. Mex.
SUPERCONDUCTING MAGNETIC ENERGY STORAGE FOR ELECTRIC UTILITIES AND FUSION SYSTEMS
J. D. Rogers 1978 45 p refs Presented at the Instr. Soc. of Am. Meeting, Philadelphia, 16 Oct. 1978
(Contract W-7405-eng-36)
(LA-UR-78-1213; CONF-781025-1) Avail: NTIS HC A03/MF A01

Energy storage inductors, under development for load leveling and transmission line stabilization in electric utility systems and for driving magnetic confinement and plasma heating coils in fusion energy system are described. Superconducting magnetic energy storage (SMES) systems, which will store and deliver electrical energy for load leveling, peak shaving, and the stabilization of electric utility network are discussed. In the fusion area, inductive energy transfer and storage is being developed. Both 1-ms fast discharge theta pinch systems and 1 to 2-s slow energy transfer Tokamak systems have been demonstrated. The major components and the method of operation of a SMES unit are decribed, and potential applications of different size SMES systems in electric power grids are assessed. Results are given of a reference design for a 10-Gwh unit for load leveling, of a 30-MJ coil proposed for system stabilization, and of tests with a small-scale, 100-kj magnetic energy storage system. Fusion energy storage and transfer are results included. The common technology base for the various storage systems is examined. A.R.H.

N80-22841# Argonne National Lab., Ill. Systems Engineering and Technology Group.
UNDERGROUND PUMPED HYDROELECTRIC STORAGE (UPHS)
C. A. Blomquist, A. A. Frigo, and S. W. Tam Apr. 1979 42 p refs
(Contract W-31-109-eng-38)
(ANL/EES-TM-60) Avail: NTIS HC A03/MF A01

The operating characteristics of single- and double-stage, reversible, Franccis-type pump turbines are discussed. System studies are discussed in terms of machinery costs, plant sizes, and pump-turbine efficiencies, and results and conclusions are presented. In general, the utilization of advanced turbomachinery seems to be justified for underground pumped hydroelectric storage plants. DOE

N80-22842# Oak Ridge National Lab., Tenn. Energy and Environmental Systems Div.
LOW TEMPERATURE THERMAL-ENERGY STORAGE
C. S. Seagaser and J. E. Christian Mar. 1979 86 p refs
(Contract W-31-109-eng-38)

(ANL/CES/TE-79-3) Avail: NTIS HC A05/MF A01

Techniques and estimated costs of low temperature thermal energy storage (TES) devices applicable to integrated community energy systems (ICES) installations serving communities ranging in size from approximately 3000 to about 100,000 population are evaluated. The storage of thermal energy in the form of either hotness or coldness by virtue of a change in temperature of the material, or as latent heat of fusion in which the material changes from the liquid phase to the solid phase at essentially a constant temperature is described. Both types of material are considered for TES in ICES applications. DOE

N80-22845# EIC, Inc., Newton, Mass.
METHANOL-BASED HEAT PUMPS FOR STORAGE OF SOLAR THERMAL ENERGY, PHASE 1 Final Report, 25 Apr. 1977 - 30 Jun. 1978
P. O. D. Offenhartz, M. J. Turner, F. C. Brown, R. B. Warren, J. P. Pemsler, and S. B. Brummer Jan. 1979 109 p refs Prepared for Sandia Labs., Livermore, Calif.
(Contract EY-76-C-04-0789)
(SAND-79-8188) Avail: NTIS HC A06/MF A01

Reaction of CH3OH vapor with a solid state inorganic salt substrate to produce a solid methanolated salt can be used as the basis of a combined solar heat pump/thermal energy storage system. Experiments carried out indicate that the reaction of CaCl2 with CH3OH vapor to produce CaCl2.2CH3OH is well suited to heating and cooling applications. The heat of reaction is about 20 kcal per mole of CH3OH, and kinetics and thermodynamics of the reaction appear adequate down to a CH3OH pool temperature around -10 C. Analytical and experimental work on the design of the heat exchanger for the reacting salt bed indicate that high rates of heat transfer can be accomplihshed in a reasonably compact system; the indicated energy density for the solid-phase reactant is in excess of 13,000 Btu/cu ft, assuming that the void fraction for anhydrous CaCl2 is 85% or less. DOE

N80-23216*# Honeywell, Inc., St. Paul, Minn. Technology Strategy Center.
ASSESSMENT AND PRELIMINARY DESIGN OF AN ENERGY BUFFER FOR REGENERATIVE BRAKING IN ELECTRIC VEHICLES Final Report
R. Buchholz and Anoop K. Mathur Dec. 1979 138 p
(Contracts DEN3-48; EC-77-C-31-1044)
(NASA-CR-159756; DOE/NASA/0048-79/1; TSCI0082-FR) Avail: NTIS HC A07/MF A01 CSCL 13F

Energy buffer systems, capable of storing the vehicle energy during braking and reusing this stored energy during acceleration, were examined. Some of these buffer systems when incorporated in an electric vehicle would result in an improvement in the performance and range under stop and go driving conditions. Buffer systems considered included flywheels, hydropneumatic, pneumatic, spring, and regenerative braking. Buffer ranking and rating criteria were established. Buffer systems were rated based on predicted range improvements, consumer acceptance, driveability, safety, reliability and durability, and initial and life cycle costs. A hydropneumatic buffer system was selected. Author

N80-23661# Mechanical Technology, Inc., Latham, N. Y.
MAGNETIC BEARING SUPPORT STUDY FOR A 10 kW-hr ENERGY STORAGE FLYWHEEL
M. W. Eusepi and D. F. Wilcock Nov. 1979 180 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7025; MTI-75TR59) Avail: NTIS HC A09/MF A01

The design of a magnetic suspension system which fully supports a 10 kW-hr energy storage flywheel is presented. Discussions leading to the selection of the design to other storage levels ranging from a 1 kW-hr vehicular size to a large 100 kW-hr stationary system are included. DOE

N80-23788# Lincoln Lab., Mass. Inst. of Tech., Lexington.
APPLICATION AND DESIGN STUDIES OF COMPRESSED-AIR ENERGY STORAGE FOR SOLAR APPLICATIONS Final Report
G. T. Flynn and J. L. Nash-Webber 28 Sep. 1979 118 p refs
(Contract EX-76-A-01-2295-029)
(CAES-7) Avail: NTIS HC A06/MF A01

Adiabatic compressed air energy storage (CAES), in which both the heat of compression and the compressed air stored separately, was studied. The applicability of this technology to solar power systems was examined. The basic thermodynamics of ideal single and two stage adiabatic CAES is reviewed. Generic single stage and two stage types are discussed, and the efficiency and mass flow rate as a function of storage pressure and stage pressure ratios were investigated. The performance and cost of available turbomachinery for the single and two stage adiabatic systems are examined. DOE

N80-23789# Argonne National Lab., Ill.
OPTIMAL DESIGN OF COMPRESSED AIR ENERGY STORAGE SYSTEMS
F. W. Ahrens, A. Sharma, and K. M. Ragsdell 1979 13 p refs Presented at the 6th Annual Conf. on Energy, Rolla, Mo., Oct. 1979 Prepared in cooperation with Illinois Univ., Chicago and Purdue Univ., Lafayette, Ind.
(Contract W-31-109-eng-38)
(CONF-791069-3) Avail: NTIS HC A02/MF A01

Compressed air energy storage (CAES) power systems considered by various electric utilities for load leveling applications are discussed. Models of CAES systems which employ natural underground aquifier formations, and present an optimal design methodology which demonstrates their economic viability are developed. The approach is based upon a decomposition of the CAES plant and utility grid system into three partially-decoupled subsystems. Numerical results are given for a plant employing the Media, Illinois Galesville aquifier formation. DOE

N80-23793# Battelle Pacific Northwest Labs., Richland, Wash.
THERMAL ENERGY STORAGE IN AQUIFIERS: PRELIMINARY INFORMATION
R. D. Allen Dec. 1979 86 p refs
(Contract EY-76-C-06-1830)
(PNL-3062) Avail: NTIS HC A05/MF A01

Topics discussed include conceptual design; numerical modelling; field experiments; relevant technical information, feasibility studies; preliminary aquifer selection considerations; and preliminary design and operating considerations. DOE

N80-23796# United Technologies Research Center, East Hartford, Conn.
PARAMETRIC PERFORMANCE EVALUATION AND TECHNICAL ASSESSMENT OF ADIABATIC COMPRESSED AIR ENERGY STORAGE SYSTEMS Final Report
R. D. Lessard and W. A. Blecher Oct. 1979 157 p refs
Sponsored by Elec. Power Res. Inst.
(EPRI Proj. 1199-1)
(EPRI-EM-1188) Avail: NTIS HC A08/MF A01

An adiabatic compressed air energy storage (ACAES) system, an advanced compressed air energy storage system concept which features thermal energy storage (TES) is discussed. The intermediate pressure hybrid ACAES system (an ACAES system wherein the heat of compression is transferred to the TES at a pressure level substantially below the cavern air storage pressure and which utilizes combustion of some fossil fuel prior to expansion to raise the turbine inlet temperature) was examined for near term commercialization. The level of performance and the level of turbomachinery technology required of an intermediate-pressure hybrid ACAES system are evaluated. DOE

N80-23801# Los Alamos Scientific Lab., N. Mex.
ENERGY STORAGE TECHNOLOGY-ENVIRONMENTAL IMPLICATIONS OF LARGE SCALE UTILIZATION
M. C. Krupka, J. E. Moore, W. E. Keller, G. A. Baca (Los Alamos Tech. Assoc., Inc., N. Mex.), R. I. Brasier (Los Alamos Tech. Assoc., Inc., N. Mex.), and W. S. Bennett (Los Alamos Tech. Assoc., Inc., N. Mex.) 1979 20 p refs Presented at the 2d Intern. Alternative Energy Sources Conf., Miami Beach, Fla.,

10-13 Dec. 1979
(Contract W-7405-eng-36)
(LA-UR-79-3098; CONF-791204-4) Avail: NTIS HC A02/MF A01

Environmental impacts for several energy storage technologies have been identified. State-of-the-art control technology options were similarly identified. Recommendations for research and development on new control technology were made where present controls were either deemed inadequate or non-existent. Specifically, the energy storage technologies under study included: advanced lead-acid battery, compressed air, underground pumped hydroelectric, flywheel, superconducting magnet and various thermal systems (sensible, latent heat and reversible chemical reaction). In addition, a preliminary study was conducted on fuel cell technology. Although not strictly classified as an energy storage system, fuel cells in conjunction with product recycling units can serve an energy storage function. A very large number of potential environmental impacts can be identified for all of these technologies. However, not all are of primary importance. Detailed discussions of a number of environmental impacts from the latest LASL study as they relate to primarily operational situations are emphasized. In addition, a brief discussion on new application for energy storage technologies and the additional costs of controls to be used for mitigation of specific impacts are also presented. DOE

N80-23823# Battelle Pacific Northwest Labs., Richland, Wash.
NUMERICAL ANALYSIS OF TEMPERATURE AND FLOW EFFECTS IN A DRY, TWO-DIMENSIONAL, POROUS-MEDIA RESERVOIR USED FOR COMPRESSED AIR ENERGY STORAGE
L. E. Wiles Oct. 1979 87 p refs
(Contract EY-76-C-06-1830)
(PNL-3047) Avail: NTIS HC A05/MF A01

The hydrodynamics and thermodynamic responses of a compressed air energy storage dry porous media reservoir subjected to simulated air mass cycling were investigated to develop design guidelines for the efficient and stable operation of the air storage reservoir. The analysis and results obtained by two dimensional modeling of dry reservoirs are presented. While the fluid/thermal response of the underground system is dependent on many parameters, the two-dimensional model was applied only to those parameters that entered the analysis by virtue of inclusion of the vertical dimension. In particular, the parameters or responses that were quantified or characterized include well bore heat transfer, heat losses to the vertical boundaries of the porous zone, gravitationally induced flows, producing length of the wellbore, and the effects of nonuniform permeability. The analysis of the wellbore heat tranfer included consideration of insulation, preheating (bubble development with heated air), and air mass flow rate. DOE

N80-23824# Mechanical Technology, Inc., Latham, N. Y.
APPLICATION OF MAGNETIC SUSPENSIONS AND FLUID FILM BEARINGS TO ENERGY STORAGE FLYWHEELS
M. Eusepi, L. Martin, and A. Ray Mar. 1979 168 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7007) Avail: NTIS HC A08/MF A01

The design of a suspension system for the support of a 10 kWh energy storage flywheel, with scaling equations and curves suitable for extending the 10 kWh design to other flywheel sizes up to 100 kWh is presented. The design of a test vehicle suitable for evaluating the final suspension design is included. The first phase of this effort was a concept study in which fluid film bearings for both radial and axial load support and magnet suspensions were examined in several combinations to determine suitability. The concept study is described and includes discussions on flywheel sizing, journal and thrust bearing sizing, magnetic suspension sizing and geometric arrangements. DOE

N80-23832# Oak Ridge Y-12 Plant, Tenn. Fabrication Systems Dept.
OAK RIDGE FLYWHEEL EVALUATION LABORATORY Annual Report, 1 Apr. - 30 Sep. 1979
R. S. Steele, Jr., J. M. Casstevens, and B. J. Sutton Dec. 1979 29 p refs
(Contracts W-7405-eng-48; W-7405-eng-26)
(Y-2210) Avail: NTIS HC A03/MF A01

The Oak Ridge Flywheel Evaluation Laboratory (ORFEL) was assembled, and the initial stages of proof testing were completed. The significant accomplishments for the past year included the establishment of adequate full-time personnel; facility modification to reflect the emphasis on flywheel evaluation over simple testing, and the facility proof test involving two aluminum disk flywheels and one composite flywheel. DOE

N80-23851# *BDM Corp., Albuquerque, N. Mex.*
INVESTIGATION OF THE TECHNICAL AND ECONOMIC FEASIBILITY OF USING PUMPED WELL-WATER ENERGY STORAGE SYSTEMS Final Report
Dec. 1979 92 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7096; BDM/TAC-79-518-TR-R1) Avail: NTIS HC A05/MF A01

Work completed on the three technical tasks of the project is summarized. The first task included a conceptual/preliminary system design, a selection of potential geographic locations in New Mexico for this system, and a study of relating institutional issues. The second task included a design of the baseline energy storage system with the identification of major components (off the shelf) and their associated performance estimates and a proposed site location within New Mexico. The third task area included an estimate of the capital cost for the storage system (e.g., cost of major components and processes, O and M costs) and an estimate of the potential annual fossil fuel savings. DOE

N80-23861# Yardney Electric Corp., Pawcatuck, Conn.
RESEARCH, DEVELOPMENT AND DEMONSTRATION OF NICKEL-ZINC BATTERIES FOR ELECTRIC VEHICLE PROPULSION Annual Report, 1978
Oct. 1979 64 p
(Contract W-31-109-eng-38)
(ANL/OEPM-78-12) Avail: NTIS HC A04/MF A01

The work carried on nickel zinc batteries over the past year was directed in three major areas: (1) elucidating the failure modes of the nickel-zinc battery system; (2) improving performance of the system; and (3) effecting a cost reduction program. Progress on the three areas is reported. DOE

N80-24215# Energy Research Corp., Danbury, Conn.
RESEARCH, DEVELOPMENT, AND DEMONSTRATION OF NICKEL-ZINC BATTERIES FOR ELECTRIC VEHICLE PROPULSION Annual Report
Oct. 1979 139 p
(Contract W-31-109-eng-38)
(ANL/OEPM-78-10) Avail: NTIS HC A07/MF A01

Progress in the nickel electrode development program directed at the optimization of the electrical performance, specifically, in terms of increased cycle life is reported. Pilot plant facilities to produce nickel hydroxide, manufacturing processes to produce nickel hydroxide and the effect of additives upon shape change, cycle performance and on the mechanistic processes involved in the shape change are covered along with a low cost separator which exhibits stability in the electrolyte, has uniform pores which are of a sufficiently small size to impede the growth of zinc dendrites, and exhibits low electrical resistance and good flexibility. The feasibility of sealed cell operation is also examined. Results of accelerated testing are presented. DOE

N80-24216# Department of Energy, Washington, D. C. Office of Transportation Programs.
ELECTRIC AND HYBRID VEHICLE PROGRAM Quarterly Report, Jul. - Sep. 1979
Nov. 1979 27 p
(Contract EC-77-A-31-1044)
(DOE/CS-0026) Avail: NTIS HC A03/MF A01

Progress in U.S. programs on the design, development, production, performance testing, and commercializing of electric and hybrid electric powered vehicles is briefly summarized. DOE

N80-24628# Argonne National Lab., Ill.
ASSESSMENT OF HIGH-HEAD TURBOMACHINERY FOR UNDERGROUND PUMPED HYDROELECTRIC STORAGE PLANTS
S. W. Tam, A. A. Frigo, and C. A. Blomquist 1979 18 p refs Presented at the 2nd Miami Intern. Conf. on Alternative Energy Sources, Coral Gables, Fla., 10-13 Dec. 1979
(Contract W-31-109-eng-38)
(CONF-791204-11) Avail: NTIS HC A02/MF A01

The costs for underground pumped hydroelectric storage (UPHS) plants equipped with advanced single and two stage reversible pumped turbines for operating heads from 500 to 1500 m are considered. The effects of machinery costs, operating heads, plant configurations and sizes are included. The results indicate that the use of advanced machinery seems to push the minimum UPHS plant cost to heads greater than 1500 m. The employment of advanced reversible pump turbines seems to be economically attractive. It is shown that pump-turbine efficiencies and the so-called charge/discharge ratio are very important design parameters for UPHS applications and the interactive effects of these parameters have been analyzed. Under certain conditions a pump-turbine option with a higher charge/discharge ratio at the expense of somewhat lower operating efficiency can be desirable. DOE

N80-24637# Southwest Research Inst., San Antonio, Tex. Army Fuels and Lubricants Research Lab.
ASSESSMENT OF CRUDE OIL AND REFINED PETROLEUM PRODUCT QUALITY DURING LONG-TERM STORAGE Final Interim Report, Jun. 1978 - Dec. 1979
L. L. Stavinoha, J. N. Bowden, S. R. Westbrook, and H. N. Giles (DOE, Washington, D.C.) Dec. 1979 70 p refs
(Contracts DAAK70-78-C-0001; DAAK70-80-C-0001; EL-78-A-01-2815)
(AD-A082365; AFLRL-121) Avail: NTIS HC A04/MF A01 CSCL 15/3

It is national policy to develop a strategic petroleum reserve of up to one billion barrels of crude oil and refined petroleum products to lessen U.S. vulnerability to the effects of a severe petroleum supply interruption. A four task program was undertaken to assist in ensuring that products being considered for long term storage would remain of a quality immediately usable and to identify likely quality assurance procedures. This report summarizes the results of this work. The first task reviewed and assessed the state-of-the-art in crude and petroleum product storage. The second task investigated the effect of storage on the quality of finished products. The third task developed a DOE/SPRO computer based search capability for crude oil characterization data. The fourth and final program task consisted of an overall assessment of long term fuel storage, including recommendations for product specifications intended for storage, and test methodology for monitoring selecting product quality. GRA

N80-24756*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN ELECTRIC VEHICLE PROPULSION SYSTEM'S IMPACT ON BATTERY PERFORMANCE: AN OVERVIEW
John M. Bozek, John J. Smithrick, Robert C. Cataldo, and John G. Ewashinka 1980 10 p refs Presented at the 3d Intern. Elec. Vehicle Exposition and Conf., St. Louis, 20-22 May 1980
(Contract EC-77-A-31-1044)
(NASA-TM-81515; DOE/NASA/1044-7; E-459) Avail: NTIS HC A02/MF A01 CSCL 10B

The performance of two types of batteries, lead-acid and nickel-zinc, was measured as a function of the charging and discharging demands anticipated from electric vehicle propulsion systems. The benefits of rapid high current charging were mixed: although it allowed quick charges, the energy efficiency was reduced. For low power (overnight) charging the current wave shapes delivered by the charger to the battery tended to have no effect on the battery cycle life. The use of chopper speed controllers with series traction motors resulted in a significant reduction in the energy available from a battery whenever the motor operates at part load. The demand placed on a battery by an electric vehicle propulsion system containing electrical regenerative braking confirmed significant improvment in short term performance of the battery. R.E.S.

N80-24803# Sandia Labs., Albuquerque, N. Mex.
BATTERIES FOR SPECIFIC SOLAR APPLICATIONS: PROJECT DESCRIPTION
1979 47 p Presented at the Photovoltaic/Battery Storage Meeting, Albuquerque, N. Mex., 26-27 Jul. 1979
(Contract EY-76-C-04-0789)
(SAND-79-1782C; CONF-790768-1) Avail: NTIS HC A03/MF A01

The Sandia Laboratories electrochemical power sources program is outlined. The project is divided into five tasks: (1) battery requirements analysis; (2) laboratory evaluation; (3) photovoltaic advanced systems tests; (4) photovoltaic application experiments; and (5) battery research and development. The status of each task is reviewed. DOE

N80-24810# Battelle Pacific Northwest Labs., Richland, Wash.
COMPRESSED AIR ENERGY STORAGE TECHNOLOGY PROGRAM IN THE UNITED STATES
W. V. Loscutoff 1979 8 p Presented at the Intern. Assembly on Energy Storage, Dubrovnik, Yugoslavia, 26 May - 1 Jun. 1979
(Contract EY-76-C-06-1830)
(PNL-SA-7669; CONF-790515-6) Avail: NTIS HC A02/MF A01

The development of compressed air energy storage (CAES) technology is a recognized objective of the United States Department of Energy. The specific objectives are to develop the technology to a level that will permit early commercialization of the concept and to develop advanced CAES systems that will not require any petroleum fuels for operation. The CAES technology research and development program is summarized and a brief set of recommendations on the developments required for the commercialization of the concept is provided. DOE

N80-24866# General Electric Co., Schenectady, N. Y. Chemical Systems and Technology Lab.
THERMAL ENERGY STORAGE SUBSYSTEMS FOR SOLAR HEATING AND COOLING APPLICATIONS: ROLLING CYLINDER THERMAL STORAGE Interim Report
R. F. Thornton and C. S. Herrick Jun. 1979 119 p refs
(Contract EM-78-C-05-5759)
(ORO-5759-T1) Avail: NTIS HC A06/MF A01

The rolling cylinder provides a means for utilizing the latent heat of fusion of salt hydrates for thermal energy storage. Calorimetric tests of laboratory scale rolling cylinders using Glauber's salt have confirmed the technical feasibility of the concept. Several concepts for large scale, one million Btu units were evaluated for heat rate capability, blower and rolling power requirements, and relative cost and manufacturability. Large scale units seem technically and economically viable. The recommended size of the prototype is a two foot diameter, nine foot long cylinder of about 250,000 Btu theoretical capacity. DOE

N80-25769# Department of Energy, Washington, D. C.
STRATEGIC PETROLEUM RESERVE Annual Report
16 Feb. 1980 86 p
(DOE/RA-0047) Avail: NTIS HC A05/MF A01

Progress on implementing the Strategic Petroleum Reserve (SPR) program is reported. The volume of crude oil in storage through 1979 is 91.7 million barrels, the average cost of which was $14.00 per barrel. Phase 1 facilities development is described. The total reserve storage capacity is 226 million barrels and will be increased to 248 million barrels by the time Phase 1 is complete. Phase 2 construction goods are described. Changes in the world crude market has forced changes in realistic goals for 1979. Development of improved geotechnical capability for the SPR by interagency, laboratory and contractor support is discussed. The cost control and program management was improved and management disciplines were emphasized in 1979. The Distribution Plan for the SPR utilizing methods of allocation or competitive sale are described. DOE seeks to minimize the effects of SPR purchases on world oil prices and on the availability of supplies for domestic consumption. DOE

N80-25779*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMAL ENERGY STORAGE
Jun. 1980 77 p refs
(Contract EC-77-A-31-1034)
(NASA-TM-81514; E-457; DOE/NASA/1034-8) Avail: NTIS HC A05/MF A01 CSCL 10C

The planning and implementation of activities associated with lead center management role and the technical accomplishments pertaining to high temperature thermal energy storage subsystems are described. Major elements reported are: (1) program definition and assessment; (2) research and technology development; (3) industrial storage applications; (4) solar thermal power storage applications; and (5) building heating and cooling applications. R.E.S.

N80-25780*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PULSE CHARGING OF LEAD-ACID TRACTION CELLS
John J. Smithrick May 1980 22 p refs
(Contract EC-77-A-31-1044)
(NASA-TM-81513; DOE/NASA/1044-6; E-454) Avail: NTIS HC A02/MF A01 CSCL 10C

Pulse charging, as a method of rapidly and efficiently charging 300 amp-hour lead-acid traction cells for an electric vehicle application was investigated. A wide range of charge pulse current square waveforms were investigated and the results were compared to constant current charging at the time averaged pulse current values. Representative pulse current waveforms were: (1) positive waveform-peak charge pulse current of 300 amperes (amps), discharge pulse-current of zero amps, and a duty cycle of about 50%; (2) Romanov waveform-peak charge pulse current of 300 amps, peak discharge pulse current of 15 amps, and a duty of 50%; and (3) McCulloch waveform peak charge pulse current of 193 amps, peak discharge pulse current of about 575 amps, and a duty cycle of 94%. Experimental results indicate that on the basis of amp-hour efficiency, pulse charging offered no significant advantage as a method of rapidly charging 300 amp-hour lead-acid traction cells when compared to constant current charging at the time average pulse current value. There were, however, some disadvantages of pulse charging in particular a decrease in charge amp-hour and energy efficiencies and an increase in cell electrolyte temperature. The constant current charge method resulted in the best energy efficiency with no significant sacrifice of charge time or amp-hour output. Whether or not pulse charging offers an advantage over constant current charging with regard to the cell charge/discharge cycle life is unknown at this time. R.E.S.

N80-25801# Electric Storage Battery Co., Yardley, Pa.
RESEARCH, DEVELOPMENT AND DEMONSTRATION OF LEAD-ACID BATTERIES FOR ELECTRIC VEHICLE PROPULSION Annual Report, 1978
Oct. 1979 106 p refs
(Contract W-31-109-eng-38)
(ANL/OEPM-78-8) Avail: NTIS HC A06/MF A01

The development of two levels of electric vehicle batteries, improved state-of-the-art (ISOA) and advanced is discussed. Two approaches, for the ISOA battery are being considered; one utilizing the flat pasted type plate in common use for present electric vehicle and automotive type batteries and the second utilizing the tubular type positive plate concept presently used in heavy duty industrial applications. Two battery design concepts appear to have the potential of meeting the advancing battery goals. One is tubular positive plate battery and the other is the bipolar type battery. R.E.S.

N80-25802# Gould, Inc., Rolling Meadows, Ill.
RESEARCH, DEVELOPMENT AND DEMONSTRATION OF NICKEL-ZINC BATTERIES FOR ELECTRIC VEHICLE PROPULSION Annual Report, 1978
Oct. 1979 143 p
(Contract W-31-109-eng-38)
(ANL/OEPM-78-11) Avail: NTIS HC A07/MF A01

The progress towards the demonstration of technical and economic feasibility of the nickel-zinc battery for electric vehicle propulsion is described. Six major tasks are discussed: separator development; zinc electrode development; product design and analysis; cell/module/battery testing; process development; and pilot plant. R.E.S.

N80-25803# Rockwell International Corp., Canoga Park, Calif. Energy Systems Group.
CONCEPTUAL DESIGN OF ADVANCED CENTRAL RECEIVER POWER SYSTEMS SODIUM-COOLED RECEIVER CONCEPT. VOLUME 4: COMMERCIAL AND PILOT PLANT COST DATA Final Report
Mar. 1979 200 p refs
(Contract EG-77-C-03-1483)
(SAN-1483-1/5; ESG-79-2-Vol-4) Avail: NTIS HC A09/MF A01

Cost summaries are presented for the 100 MWe and and 281 MWe commercial plants, and a summary for the cost summary data include Nth plant data for the 100 MWe and 281 MWe commercial plants, and a summary for the alternative concept air-rock storage system. The plant costing technique is described in the section discussing the 100 MWe baseline concept. DOE

N80-25806# Los Alamos Scientific Lab., N. Mex.
SUPERCONDUCTING MAGNETIC ENERGY STORAGE (SMES) PROGRAM Progress Report, 1 Jan. - 31 Dec. 1979
J. D. Rogers, comp. Jan. 1980 30 p refs
(Contract W-7405-eng-36)
(LA-8199-PR) Avail: NTIS HC A03/MF A01

Work on the development of two superconducting magnetic energy storage units is described. One is a 30-MJ unit for use by the Bonneville Power Administration to stabilize power oscillations on their Pacific ac Intertie, and the second is a 1 to 1 GWh unit for use as a diurnal load-leveling device. A contract was placed for the fabrication design of the 30 MJ coil design. Orders were placed for the stabilizing system converter and protective energy dump system, converter transformer, automation of the 4.5 K refrigerator and its installation into a trailer and a trailer mounted heat-rejection system. A third compressor was added to the refrigeration system, and the refrigerator was tested and accepted. The superconductor for the 30 MJ coil was received, tested, and found to be satisfactory. The reference design for the 1 to 10 GWh diurnal load-leveling unit was completed. The summary and recommendations of the study are included. DOE

N80-25861# Rockwell International Corp., Canoga Park, Calif. Energy Systems Group.
HYBRID THERMAL STORAGE WITH WATER Final Report, 1 Sep. 1977 - 10 Nov. 1978
30 Sep. 1979 328 p refs
(Contract EG-77-C-02-4480)
(ESG-DOE-13259) Avail: NTIS HC A15/MF A01

After completion of a state-of-the-art survey, four distinct hybrid system concepts were developed. Two computer codes were developed to model the behavior of hybrid storage devices. A systems model code was also developed to compute the performance of solar heating systems. The systems model yielded results in excellent agreement with TRNSYS code, but required only 5% of the computer time to complete a 1 year simulation. Designs for a unique water tank in a bed of gravel system, using an annular tank, were developed. Three sizes of this design were estimated to be applicable to the majority of residential applications in the United States. It was estimated that the use of these designs could result in a reduction in total cost of a solar heating system of up to 21%. It must be noted that the large uncertainties in the experimental data on which the anlysis used in this study was based, and the uncertainties involved in the heat transfer modeling of hybrid systems, are significantly larger than the performance benefits indicated. DOE

N80-25869# Georgia Univ., Athens. Dept. of Chemistry.
DEVELOPMENT OF A PRACTICAL PHOTOCHEMICAL ENERGY STORAGE SYSTEM. THE NORBORNADIENE-

QUADRICYCLENE ENERGY STORAGE SYSTEM Final Report

Richard R. Hautala, Charles R. Kutal, and R. Bruce King 15 Aug. 1979 41 p refs
(Contracts EY-76-S-09-0893; DE-AS09-76EV-00893)
(SRO-0893-17) Avail: NTIS HC A03/MF A01

The photosensitized conversion of norbornadiene to quadricyclene has been examined as a promising method for storing energy from sunlight. A device based on this reaction requires two steps: (1) energy storage through the sensitized photolysis of norbornadiene to quadricyclene in an endothermic reaction; and (2) energy release through the catalyzed reconversion of quadricyclene to norbornadiene in an exothermic reaction. Both sensitizers and catalysts have been sucessfully incorporated onto heterogeneous supports, and in several instances these immobilized components perform as well as or better than their homogeneous counterparts. An overview of the scientific progress achieved in each of the areas noted is reported. In addition, the energy capacity of the norbornadiene-quadricyclene system (relative to some typical applications) is assessed and the potential costs associated with this type of photochemical energy storage are analyzed. DOE

N80-25879# Sandia Labs., Albuquerque, N. Mex.
PRELIMINARY DEVELOPMENT OF THE BAND TYPE VARIABLE INERTIA FLYWHEEL (BVIF) Final Report
D. G. Ullman Nov. 1979 163 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7089) Avail: NTIS HC A08/MF A01

An energy storage flywheel with variable moment of inertia, combining the functions of energy storage and power control is introduced and discussed. The specific configuration addressed is the band type variable flywheel (BVIF). This hollow shell flywheel is packed with long thin bands of flexible material mounted like the main spring in a watch. The performance equations of this configuration are derived and studied. A proof-of-concept model is described and conclusions are drawn on the BVIF'S operational potential. DOE

N80-25900# Midwest Research Inst., Golden, Colo.
ANALYSIS OF COMMUNITY SOLAR SYSTEMS FOR COMBINED SPACE AND DOMESTIC HOT WATER HEATING USING ANNUAL CYCLE THERMAL ENERGY STORAGE
F. C. Hooper, J. D. McClenahan, J. D. Cook, F. Baylin, R. Monte, and S. Sillman Jan. 1980 9 p refs Presented at the 2nd Ann. Systems Simulation and Econ. Anal. Conf., San Diego, Calif., 23-25 Jan. 1980 Prepared in cooperation with Toronto Univ., Ontario
(Contract EG-77-C-01-4042)
(SERI/TP-355-570; CONF-800101-20) Avail: NTIS HC A02/MF A01

A simplified design procedure was examined for estimating the storage capacity and collector area for annual-cycle-storage, community solar heating systems in which 100% of the annual space heating energy demand is provided from the solar source for the typical meteorological year. Hourly computer simulations of the performance of these systems were carried out for 10 cities in the United States for 3 different building types and 4 community sizes. These permitted the use of design values for evaluation of a more simplified system sizing method. Results of this study show a strong correlation between annual collector efficiency and two major, location-specific, annual weather parameters: the mean air temperature during daylight hours and the total global insolation on the collector surface. Storage capacity correlates well with the net winter load, which is a measure of the seasonal variation in the total load, a correlation which appears to be independent of collector type. DOE

N80-26201*# Minicars, Inc., Goleta, Calif.
NEAR HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM, PHASE 1. APPENDICES A AND B. MISSION ANALYSIS AND PERFORMANCE SPECIFICATION STUDIES REPORT, VOLUME 1
Oct. 1979 468 p Revised Sponsored in part by DOE
(Contract NAS7-100)
(NASA-CR-163330; JPL-9950-37) Avail: NTIS HC A20/MF A01 CSCL 13F

The three most promising vehicle use patterns (missions) for the near term electric hybrid vehicle were found to be all-purpose city driving, commuting, and family and civic business. The mission selection process was based principally on an analysis of the travel patterns found in the Nationwide Transportation Survey and on the Los Angeles and Washington, D.C. origin-destination studies data. Travel patterns in turn were converted to fuel requirements for 1985 conventional and hybrid cars. By this means, the potential fuel savings for each mission were estimated, and preliminary design requirements for hybrid vehicles were derived. A.R.H.

N80-26202*# Minicars, Inc., Goleta, Calif.
NEAR HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM, PHASE 1. APPENDICES C AND D, VOLUME 2 Final Report
Oct. 1979 352 p Sponsored in part by DOE
(Contract NAS7-100)
(NASA-CR-163331; JPL-9950-337; FR-4500-09-79-11) Avail: NTIS HC A16/MF A01 CSCL 13F

Results of tradeoff studies are presented in summary form. Various aspects of the overall vehicle design discussed include selection of the base vehicle, the battery pack configuration, structural modifications, occupant protection, vehicle dynamics, and aerodynamics. The drivetrain design and integration, power conditioning unit, battery subsystem, control system, environmental system are described. Specifications, weight breakdown, and energy consumption measures, and advanced technology components are included. A.R.H.

N80-26203*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1. APPENDIX B: DESIGN TRADE-OFF STUDIES Final Report
8 Oct. 1979 204 p refs Prepared for JPL
(Contract JPL-955190)
(NASA-CR-163227; SRD-79-134/3-App-B-Vol-1; JPL-9950-334-App-B-Vol-1) Avail: NTIS HC A10/MF A01 CSCL 13F

The relative attractiveness of various hybrid/electric power train configurations and electrical and mechanical drive-line components was studied. The initial screening was concerned primarily with total vehicle weight and economic factors and identified the hybrid power train combinations which warranted detailed evaluation over various driving cycles. This was done using a second-by-second vehicle simulation program which permitted the calculations of fuel economy, electricity usage, and emissions as a function of distance traveled in urban and highway driving. Power train arrangement possibilities were examined in terms of their effect on vehicle handling, safety, serviceability, and passenger comfort. A dc electric drive system utilizing a separately excited motor with field control and battery switching was selected for the near term hybrid vehicle. Hybrid vehicle simulations showed that for the first 30 mi (the electric range of the vehicle) in urban driving, the fuel economy was 80 mpg using a gasoline engine and 100 mpg using a diesel engine. In urban driving the hybrid would save about 75% of the fuel used by the conventional vehicle and in combined urban/highway driving the fuel saving is about 50%. J.M.S.

N80-26204*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1. APPENDIX B: DESIGN TRADE-OFF STUDIES REPORT. VOLUME 2: SUPPLEMENT TO DESIGN TRADE-OFF STUDIES Final Report
8 Oct. 1979 319 p refs Prepared for JPL
(Contract JPL-955190)
(NASA-CR-163228; SRD-79-134/4-App-B-Vol-2; JPL-9950-334-App-B-Vol-2) Avail: NTIS HC A14/MF A01 CSCL 13F

Results of studies leading to the preliminary design of a hybrid passenger vehicle which is projected to have the maximum potential for reducing petroleum consumption in the near term are presented. Heat engine/electric hybrid vehicle tradeoffs, assessment of battery power source, and weight and cost analysis of key components are among the topics covered. Performance of auxiliary equipment, such as power steering, power brakes, air conditioning, lighting and electrical accessories, heating and ventilation is discussed along with the selection of preferred passenger compartment heating procedure for the hybrid vehicle. Waste heat from the engine, thermal energy storage, and an auxiliary burner are among the approaches considered. J.M.S.

N80-26205*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1. APPENDIX B: DESIGN TRADE-OFF STUDIES REPORT. VOLUME 3: COMPUTER PROGRAM LISTINGS Final Report
8 Oct. 1979 115 p Prepared for JPL
(Contract JPL-955190)
(NASA-CR-163229; SRD-79-134/5-App-B-Vol-3;
JPL-9950-334-App-B-Vol-3) Avail: NTIS HC A06/MF A01 CSCL 13F

A description and listing is presented of two computer programs: Hybrid Vehicle Design Program (HYVELD) and Hybrid Vehicle Simulation Program (HYVEC). Both of the programs are modifications and extensions of similar programs developed as part of the Electric and Hybrid Vehicle System Research and Development Project. J.M.S.

N80-26206*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1 Final Report
8 Oct. 1979 146 p refs Prepared for JPL
(Contract JPL-955190)
(NASA-CR-163230; SRD-79-134/1; JPL-9950-334) Avail: NTIS HC A07/MF A01 CSCL 13F

The preliminary design of a hybrid vehicle which fully meets or exceeds the requirements set forth in the Near Term Hybrid Vehicle Program is documented. Topics addressed include the general layout and styling, the power train specifications with discussion of each major component, vehicle weight and weight breakdown, vehicle performance, measures of energy consumption, and initial cost and ownership cost. Alternative design options considered and their relationship to the design adopted, computer simulation used, and maintenance and reliability considerations are also discussed. J.M.S.

N80-26207*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1. APPENDIX A: MISSION ANALYSIS AND PERFORMANCE SPECIFICATION STUDIES REPORT Final Report
8 Oct. 1979 138 p refs Prepared for JPL Original contains color illustrations
(Contract JPL-955190)
(NASA-CR-163231; SRD-79-134/2-App-A;
JPL-9950-334-App-A) Avail: NTIS HC A07/MF A01 CSCL 13F

Results of a study leading to the preliminary design of a five passenger hybrid vehicle utilizing two energy sources (electricity and gasoline/diesel fuel) to minimize petroleum usage on a fleet basis are presented. The study methodology is described. Vehicle characterizations, the mission description, characterization, and impact on potential sales, and the rationale for the selection of the reference internal combustion engine vehicle are presented. Conclusions and recommendations of the mission analysis and performance specification report are included. J.M.S.

N80-26208*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1. APPENDIX C: PRELIMINARY DESIGN DATA PACKAGE Final Report
8 Oct. 1979 208 p Prepared for JPL
(Contract JPL-955190)
(NASA-CR-163232; SRD-79-134/6-App-C;
JPL-9950-334-App-C) Avail: NTIS HC A10/MF A01 CSCL 13F

The design methodology, the design decision rationale, the vehicle preliminary design summary, and the advanced technology developments are presented. The detailed vehicle design, the vehicle ride and handling and front structural crashworthiness analysis, the microcomputer control of the propulsion system, the design study of the battery switching circuit, the field chopper, and the battery charger, and the recent program refinements and computer results are presented. J.M.S.

N80-26209*# General Electric Co., Schenectady, N. Y.
NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1. APPENDIX D: SENSITIVITY ANALYSIS RESPORT Final Report
8 Oct. 1979 55 p refs Prepared for JPL
(Contract JPL-955190)
(NASA-CR-163233; SRD-79-134/7-App-D;
JPL-9950-334-App-D) Avail: NTIS HC A04/MF A01 CSCL 13F

Parametric analyses, using a hybrid vehicle synthesis and economics program (HYVELD) are described investigating the sensitivity of hybrid vehicle cost, fuel usage, utility, and marketability to changes in travel statistics, energy costs, vehicle lifetime and maintenance, owner use patterns, internal combustion engine (ICE) reference vehicle fuel economy, and drive-line component costs and type. The lowest initial cost of the hybrid vehicle would be $1200 to $1500 higher than that of the conventional vehicle. For nominal energy costs ($1.00/gal for gasoline and 4.2 cents/kWh for electricity), the ownership cost of the hybrid vehicle is projected to be 0.5 to 1.0 cents/mi less than the conventional ICE vehicle. To attain this ownership cost differential, the lifetime of the hybrid vehicle must be extended to 12 years and its maintenance cost reduced by 25 percent compared with the conventional vehicle. The ownership cost advantage of the hybrid vehicle increases rapidly as the price of fuel increases from $1 to $2/gal. M.G.

N80-26210*# Minicars, Inc., Goleta, Calif.
NEAR TERM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM, PHASE 1 Final Report
Jan. 1980 144 p refs Sponsored in part by DOE Prepared for JPL
(Contracts NAS7-100; JPL-955188)
(NASA-CR-163235; JPL-9950-337; FR-4500-01-80) Avail: NTIS HC A07/MF A01 CSCL 13F

Missions for hybrid vehicles that promise to yield high petroleum impact were identified and a preliminary design, was developed that satisfies the mission requirements and performance specifications. Technologies that are critical to successful vehicle design, development and fabrication were determined. Trade-off studies to maximize fuel savings were used to develop initial design specifications of the near term hybrid vehicle. Various designs were 'driven' through detailed computer simulations which calculate the petroleum consumption in standard driving cycles, the petroleum and electricity consumptions over the specified missions, and the vehicle's life cycle costs over a 10 year vehicle lifetime. Particular attention was given to the selection of the electric motor, heat engine, drivetrain, battery pack and control system. The preliminary design reflects a modified current compact car powered by a currently available turbocharged diesel engine and a 24 kW (peak) compound dc electric motor. A.R.H.

N80-26211# Fiat Research Center, Turin, Italy.
ELECTROCHEMICAL ENERGY STORAGE ON BOARD OF ROAD ELECTRIC VEHICLES
P. Montalenti, G. Brusaglino, M. Marchetto (Fabrica Italiana Magneti, Marelli), and M. Maja (Inst. di Elettrochimica del Politecnico di Torino) 1979 11 p refs Presented at Intern. Assembly on Energy Storage, Dubrovnik, Yugoslavia, 27 May - 1 Jun. 1979
Avail: NTIS HC A02/MF A01

The use of batteries to power electric vehicles is evaluated in terms of accelerations and maximum speed. A kaline, lead/acid, and high energy density batteries are analyzed for lifetime cycles, weight range, and power density. It is concluded that the lead/acid and Ni/Cd batteries are suitable for immediate application, but improvement in lifetime and reliability for economy is recommended. Future configurations of the Ni/Fe and Ni/Zn batteries will open the market to urban, suburban and commercial transportation. F.O.S.

N80-26212*# AiResearch Mfg. Co., Torrance, Calif.
ADVANCED PROPULSION SYSTEM FOR HYBRID VEHICLES Final Report
L. V. Norrup and A. T. Lintz Jan. 1980 213 p refs
(Contracts DEN3-91; EC-77-A-31-1044)
(NASA-CR-159771; DOE/NASA/0091-80/1; AiResearch-79-16430) Avail: NTIS HC A10/MF A01 CSCL 13F

A number of hybrid propulsion systems were evaluated for application in several different vehicle sizes. A conceptual design was prepared for the most promising configuration. Various system configurations were parametrically evaluated and compared, design tradeoffs performed, and a conceptual design produced. Fifteen vehicle/propulsion systems concepts were parametrically evaluated to select two systems and one vehicle for detailed design tradeoff studies. A single hybrid propulsion system concept and vehicle (five passenger family sedan)were selected for optimization based on the results of the tradeoff studies. The final propulsion system consists of a 65 kW spark-ignition heat engine, a mechanical continuously variable traction transmission, a 20 kW permanent magnet axial-gap traction motor, a variable frequency inverter, a 386 kg lead-acid improved state-of-the-art battery, and a transaxle. The system was configured with a parallel power path between the heat engine and battery. It has two automatic operational modes: electric mode and heat engine mode. Power is always shared between the heat engine and battery during acceleration periods. In both modes, regenerative braking energy is absorbed by the battery. Author

N80-26213# California Univ., Livermore. Lawrence Livermore Lab.
ENERGY-STORAGE SYSTEMS FOR AUTOMOBILE PROPULSION, 1979 STUDY. VOLUME 3: BATTERY/FLYWHEEL ELECTRIC VEHICLES USING ADVANCED BATTERIES
M. Schwartz 15 Dec. 1979 58 p refs
(Contract W-7405-eng-48)
(UCRL-52841-Vol-3) Avail: NTIS HC A04/MF A01

The effect of applying flywheels to electric vehicles using advanced batteries is determined. The specific energy of the batteries is maximized at the expense of peak power capability to optimize performance when used with flywheels. The characteristics of battery flywheel vehicles are determined and compared to all-battery vehicles subjected to the same range and peak power specifications. Three combinations of vehicle power and range are considered for an SAE J2279aD cycle: 0.026 kW/kg and 120 km; 0.033 kW/kg and 210 km; and 0.049 kW/kg and 400 km. The combination of 0.016 kW/kg and 80 km is used with an SAE J227aC cycle. The batteries considered are lead/acid, Ni/Fe, Ni/Zn, ZnCl2, LiAl/FeS2, Na/S(cer), and Na/S(glass). Projected improvements in batteries and flywheels are considered over the next 20 y, based on probable and optimistic performance. The results show that flywheels do not necessarily yield a saving in vehicle mass (or range increase for constant vehicle mass). DOE

N80-26539# Brookhaven National Lab., Upton, N. Y.
HEAT TRANSFER ENHANCEMENT IN METAL HYDRIDE SYSTEMS
M. J. Rosso, Jr. and G. Strickland Dec. 1979 8 p refs
Presented at the 2nd Intern. Conf. on Alternative Energy Sources, Miami Beach, Fla., 10 Dec. 1979
(Contract EY-76-C-02-0016)
(BNL-27347; CONF-791204-27) Avail: NTIS HC A02/MF A01

The Brookhaven National Laboratory, Department of Energy and Environment has been engaged in finding solutions to the engineering problems associated with the storage of hydrogen as metal hydrides - principally iron-titanium hydride. The thermal conductivity in beds of fine particles, whatever their composition, is inherently poor. Attempts to enhance the heat transfer by the addition of small fractions of high conductivity materials in various configurations are described. The results indicate that the form of the enhancement material rather than its composition is the more critical factor. DOE

N80-26796# Rocketdyne, Canoga Park, Calif.
HIGH ENERGY STORAGE FLYWHEEL TEST PROGRAM Final Report
D. R. Hodson 28 Jan. 1980 148 p refs
(Contract DAAG53-75-C-0278)
(AD-A083302; RI/RD78-207-1) Avail: NTIS HC A07/MF A01 CSCL 10/3

The RS-31 Flywheel System is an energy storage device which is accelerated by an AVCO LYCOMING T55-L-7C 2930 SHP drive engine to 14,506 RPM. The two contra-rotating double disk rotors of the flywheel module have an inertia of 320,176 sq. in.-lbs storing 30 KW-HRS of energy at design speed. This was a Research Development test activity designed to explore and verify design predictions of system performance. GRA

N80-26803# AiResearch Mfg. Co., Torrance, Calif.
HIGH-ENERGY-DENSITY COMPOSITE FLYWHEEL
David L. Satchwell and Dennis A. Towgood Feb. 1980 113 p refs
(Contracts EY-76-C-04-0789; AT(29-1)-789)
(SAND-79-7019) Avail: NTIS HC A06/MF A01

A flywheel was designed and fabricated to demonstrate a high energy density of 80 w-h/kg in the rotor. The rotor design consists of a multiring, subcircular rim made of S-glass/epoxy composite and Kevlar/epoxy composite materials and mounted on a spoked hub made of graphite/epoxy composite materials. DOE

N80-26804# Battelle Pacific Northwest Labs., Richland, Wash.
POTENTIAL PETROPHYSICAL AND CHEMICAL PROPERTY ALTERATIONS IN A COMPRESSED AIR ENERGY STORAGE POROUS ROCK RESERVOIR
J. A. Stottlemyre, R. L. Erikson, and R. P. Smith Oct. 1979 88 p refs
(Contract EY-76-C-06-1830)
(PNL-2974) Avail: NTIS HC A05/MF A01

Successful commercialization of compressed air energy storage (CAES) systems depends on long term stability of the underground reservoirs subjected to somewhat unique operating conditions. A discussion on relative importance to CAES of several potential porous media damage mechanisms is presented. In this context, damage is defined as a reduction in intrinsic permeability (measure of air transport capability), a decrease in effective porosity (measure of storage capability), or an increase on elastic and/or inelastic deformation of the porous material. The potential damage mechanisms presented include: (1) disaggregation, (2) particulate plugging, (3) boundary layer viscosity anomalies, (4) inelastic microstructural consolidation, (5) clay swelling and dispersion (6) hydrothermal mineral alteration, (7) oxidation reactions, and (8) well casing corrosion. DOE

N80-26805# Brobeck (William M.) and Associates, Berkeley, Calif.
CONCEPTUAL DESIGN OF A FLYWHEEL ENERGY STORAGE SYSTEM Final Report
Nov. 1979 103 p refs
(Contract EY-76-C-04-0789)
(SAND-79-7088; REPT-4500-92-9-R1) Avail: NTIS HC A06/MF A01

A conceptual design of a flywheel energy storage system suitable for on-site interfacing with residential photovoltaic (PV) energy sources was developed. The basic design concept and the general approach to the conceptual design of the energy storage system are described. Cost of the system was determined for production models to be produced in annual quantities up to one hundred thousand for both 10-kWh and 50-kWh capacities, and also for a 10 kWh one-of-a-kind demonstration model. DOE

N80-26840# Argonne National Lab., Ill. Solar Applications Group.
DESIGN AND INSTALLATION MANUAL FOR THERMAL

ENERGY STORAGE
Roger L. Cole, Kenneth J. Nield, Raymond R. Rohde, and Ronald M. Wolosewicz Jan. 1980 381 p refs
(Contract W-31-109-eng-38)
(ANL-79-15-Ed-2) Avail: NTIS HC A17/MF A01

The design and installation of thermal energy storage in active solar systems is discussed. Both air based and liquid based systems are covered with topics on designing rock beds, tank types, pump and fan selection, installation, costs, and operation and maintenance. Topics relevant to latent heat storage include properties of phase change materials, sizing the storage unit, insulating the storage unit, available systems, and cost. Topics relevant to heating domestic water include safety, single-, and dual-tank systems, domestic water heating with air and liquid based space heating systems, and stand alone domestics hot water systems. Also examined are common problems with storage systems and their solutions, heat transfer fluid properties, economic insulation thickness, heat exchanger sizing, and sample specifications for heat exchangers, wooden rock bins, steel tanks, concrete tanks, and fiberglass reinforced plastic tanks. DOE

N80-26856# Sandia Labs., Livermore, Calif. Materials Science Div.
SIGMA PHASE FORMATION IN ALLOYS FOR SO2/SO3 THERMAL ENERGY STORAGE SYSTEMS
D. A. Hughes Feb. 1980 39 p refs
(Contract EY-76-C-04-0789)
(SAND-80-8205) Avail: NTIS HC A03/MF A01

A screening test was completed which identifies the tendency for sigma phase formation in alloys for SO2/SO3 thermal energy storage systems. The candidate alloys include austenitic and ferritic stainless steels, Fe-Ni Base, and Ni base alloys. Test specimens were aged for 4,000 hours at ambient temperature, 700, 800, 900, and 1000 C. Aged specimens were tested for Charpy V-notch toughness. Decreases in toughness upon aging correlated well with the observed changes in microstructure. DOE

N80-26862# Department of Energy, Washington, D. C. Div. of Energy Storage Systems.
THERMAL AND MECHANICAL ENERGY-STORAGE PROGRAM, PROJECT SUMMARY DATA FY 1980
1980 196 p Sponsored by DOE
(DOE/CS-0150) Avail: NTIS HC A09/MF A01

The Department of Energy's Division of Energy Storage Systems (STOR) is supporting a broad range of projects to conserve energy and to make possible shifting away from oil and natural gas by developing new and/or improved energy storage systems applicable to central power generation dispersed power generation, solar and waste heat utilization, and vehicle propulsion. These programs include: Thermal Energy Storage; Chemical/Hydrogen Energy Storage; Mechanical and Magnetic Energy Storage; and Underground Energy Storage. Technical and Economic Analysis is supported concurrently to evaluate competitive energy storage options. This summary report addresses the above categories except for Technical and Economic Analysis. Thermal and Chemical/Hydrogen Energy Storage technologies offer the greatest potential for near term impact of all the storage technologies under development. During FY 80, STOR will commit nearly $32 million to the Thermal and Mechanical Energy Storage Program. The breakdown of budget authorized funding for FY 1979 and FY 1980 is shown. This publication consists principally of summary sheets for each active project in the Thermal, Chemical/Hydrogen, and Mechanical Energy Storage Program for FY 1979. DOE

N80-26865# Oregon State Univ., Corvallis. School of Oceanography.
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS, VOLUME 8, NO. 1
Rod Mesecar Mar. 1980 8 p
(AD-A083941) Avail: NTIS HC A02/MF A01 CSCL 10/3

Dramatic progress has been made in the development of high performance batteries in recent years. Much of this development effort has concentrated on lithium-based batteries. The reason for the interest in lithium is that it has the highest potential of the metals in the electromotive series. Consequently, the theoretical energy density of lithium-based electrochemical couples is higher than other couples. As a result of research and development efforts carried out in industry and in government laboratories, the potential benefits of lithium-based batteries are now being realized in practical hardware. Lithium-sulfur and lithium-halogen couples are being developed for secondary (rechargeable) battery applications and lithium-thionyl chloride, lithium-sulfur dioxide, and lithium-vanadium pentoxide are the better known couples being developed for primary (nonrechargeable) battery applications. Comparisons of two representative examples of lithium battery electrochemistry, namely lithium sulfur dioxide (LiSO2) and lithium thionyl chloride (LiSOCl2) are made with other primary battery power sources. GRA

N80-26880# Open Univ., Milton (England). Energy Research Group.
A CHEMICAL HEAT-PUMP/ENERGY STORAGE DEVICE AND ITS APPLICATIONS
Sep. 1978 78 p refs Prepared jointly with Rutherford High Energy Lab., Chilton, England
(Grant SRC-G/RA/5360.4)
(ERG-030) Avail: NTIS HC A05/MF A01; Secr. Energy Res. Group, Milton Keynes, England

A prototype heat-pump was constructed and operated, using sulfuric acid and water as the chemical pair. It achieved a power output of 3.5 kW (this with malfunctioning heat exchangers). The heat-pump chemicals can be reconcentrated either using heat (greater than 120 C) or electricity; in the latter case the chemicals store heat-pumping capacity (with a COP of about 1.5). Thus the chemical heat-pump may find application in conjunction with either waste-heat or off-peak electricity (from nuclear, wind or wave devices at any time other than peak demand time). On the basis of present cost-assumptions, the chemical heat-pump may be immediately cost-effective: using waste heat to provide industrial process heat, using waste heat to provide space-heating and cooling, and as an off-peak heat-pump (reconcentration by electricity). Industrial heat demand in the dairy, bottle washing and brewing industries was analyzed. Author (ESA)

N80-27222*# South Coast Technology, Inc., Santa Barbara, Calif.
THE NEAR-TERM HYBRID VEHICLE PROGRAM, PHASE 1 Final Report
10 Sep. 1979 153 p refs Sponsored by NASA Prepared for JPL
(Contract JPL-955189)
(NASA-CR-163034; JPL-9950-355) Avail: NTIS HC A08/MF A01 CSCL 13F

Performance specifications were determined for a hybrid vehicle designed to achieve the greatest reduction in fuel consumption. Based on the results of systems level studies, a baseline vehicle was constructed with the following basic paramaters: a heat engine power peak of 53 kW (VW gasoline engine); a traction motor power peak of 30 kW (Siemens 1GV1, separately excited); a heat engine fraction of 0.64; a vehicle curb weight of 2080 kg; a lead acid battery (35 kg weight); and a battery weight fraction of 0.17. The heat engine and the traction motor are coupled together with their combined output driving a 3 speed automatic transmission with lockup torque converter. The heat engine is equipped withe a clutch which allows it to be decoupled from the system. A.R.H.

N80-27223*# South Coast Technology, Inc., Santa Barbara, Calif.
MISSION ANALYSIS AND PERFORMANCE SPECIFICATION STUDIES REPORT, APPENDIX A
25 Jan. 1979 177 p refs Sponsored by NASA Prepared for JPL Prepared in cooperation with Gen. Res. Corp., Santa Barbara, Calif.
(Contract JPL-955189)
(NASA-CR-163035; JPL-9950-355) Avail: NTIS HC A09/MF A01 CSCL 13F

The Near Term Hybrid Passenger Vehicle Development Program tasks included defining missions, developing distributions of daily travel and composite driving cycles for these missions, providing information necessary to estimate the potential replacement of the existing fleet by hybrids, and estimating acceleration/gradeability performance requirements for safe operation. The data was then utilized to develop mission specifications, define reference vehicles, develop hybrid vehicle performance specifications, and make fuel consumption estimates for the vehicles. The major assumptions which underlie the approach taken to the mission analysis and development of performance specifications are the following: the daily operating range of a hybrid vehicle should not be limited by the stored energy capacity and the performance of such a vehicle should not be strongly dependent on the battery state of charge. E.D.K.

N80-27224*# South Coast Technology, Inc., Santa Barbara, Calif.
DESIGN TRADEOFF STUDIES AND SENSITIVITY ANALYSIS, APPENDIX B
25 May 1979 251 p refs Sponsored by NASA Prepared for JPL
(Contract JPL-955189)
(NASA-CR-163036; JPL-9950-355-App-B) Avail: NTIS HC A12/MF A01 CSCL 13F

Further work was performed on the Near Term Hybrid Passenger Vehicle Development Program. Fuel economy on the order of 2 to 3 times that of a conventional vehicle, with a comparable life cycle cost, is possible. The two most significant factors in keeping the life cycle cost down are the retail price increment and the ratio of battery replacement cost to battery life. Both factors can be reduced by reducing the power rating of the electric drive portion of the system relative to the system power requirements. The type of battery most suitable for the hybrid, from the point of view of minimizing life cycle cost, is nickel-iron. The hybrid is much less sensitive than a conventional vehicle is, in terms of the reduction in total fuel consumption and resultant decreases in operating expense, to reductions in vehicle weight, tire rolling resistance, etc., and to propulsion system and drivetrain improvements designed to improve the brake specific fuel consumption of the engine under low road load conditions. It is concluded that modifications to package the propulsion system and battery pack can be easily accommodated within the confines of a modified carryover body such as the Ford Ltd. E.D.K.

N80-27225*# South Coast Technology, Inc., Santa Barbara, Calif.
DESIGN TRADEOFF STUDIES AND SENSITIVITY ANALYSIS, APPENDICES B1 - B4
25 May 1979 190 p Sponsored by NASA Prepared for JPL
(Contract JPL-955189)
(NASA-CR-163037; JPL-9950-355-App-B1-B4) Avail: NTIS HC A09/MF A01 CSCL 13F

Documentation is presented for a program which separately computes fuel and energy consumption for the two modes of operation of a hybrid electric vehicle. The distribution of daily travel is specified as input data as well as the weights which the component driving cycles are given in each of the composite cycles. The possibility of weight reduction through the substitution of various materials is considered as well as the market potential for hybrid vehicles. Data relating to battery compartment weight distribution and vehicle handling analysis is tabulated. A.R.H.

N80-27226*# South Coast Technology, Inc., Santa Barbara, Calif.
PRELIMINARY DESIGN DATA PACKAGE, APPENDIX C
25 Jul. 1979 239 p refs Sponsored by NASA Prepared for JPL
(Contract JPL-955189)
(NASA-CR-163038; JPL-9950-355-App-C) Avail: NTIS HC A11/MF A01 CSCL 13F

The data and documentation required to define the preliminary design of a near term hybrid vehicle and to quantify its operational characteristics are presented together with the assumptions and rationale behind the design decisions. Aspects discussed include development requirements for the propulsion system, the chassis system, the body, and the vehicle systems. Particular emphasis is given to the controls, the heat engine, and the batteries. A.R.H.

N80-27227*# South Coast Technology, Inc., Santa Barbara, Calif.
PRELIMINARY DESIGN DATA PACKAGE, APPENDICES C1 AND C2
25 Jul. 1980 202 p refs Sponsored by NASA Prepared for JPL
(Contract JPL-955189)
(NASA-CR-163039; JPL-9950-355-App-C1; JPL-9950-355-APP-C3) Avail: NTIS HC A10/MF A01 CSCL 13F

The HYBRID2 program which computes the fuel and energy consumption of a hybrid vehicle with a bi-modal control strategy over specified component driving cycles is described. Fuel and energy consumption are computed separately for the two modes of operation. The program also computes yearly average fuel and energy consumption using a composite driving cycle which varies as a function of daily travel. The modelling techniques are described, and subroutines and their functions are given. The composition of modern automobiles is discussed along with the energy required to manufacture an American automobile. The energy required to scrap and recycle automobiles is also discussed. F.O.S.

N80-27230# Army Mobility Equipment Research and Development Center, Fort Belvoir, Va. Electrical Power Lab.
EVA METRO SEDAN ELECTRIC-PROPULSION SYSTEM: TEST AND EVALUATION
E. Eberhart Reimers Sep. 1979 290 p refs
(Contract EC-77-A-31-1042)
(DOE/CS-1042/1) Avail: NTIS HC A13/MF A01

The procedure and results of the performance evaluation of the EVA Metro Sedan (car no.1) variable speed dc chopper motor drive and its three speed automatic transmission are presented. The propulsion systems for a battery powered vehicle manufactured by Electric Vehicle Associates, Valley View, Ohio, was removed from the vehicle, mounted on the programmable electric dynamometer test facility and evaluated with the aid of a HP 3052A Data Acquistion System. Performance data for the automatic transmission, the solid state dc motor speed controller, and the dc motor in the continuous and pulsating dc power mode, as derived on the dynamometer test facility, as well as the entire propulsion system are given. This concept and the system's components were evaluated in terms of commercial applicability, maintainability, and energy utility to establish a design base for the further development of this system or similar propulsion drives. DOE

N80-27231*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
HYBRID VEHICLE POTENTIAL ASSESSMENT. VOLUME 7: HYBRID VEHICLE REVIEW
K. O. Leschly 30 Sep. 1979 44 p refs Sponosred by NASA 10 Vol.
(Contract EM-78-I-01-4209)
(NASA-CR-163298; CONS-4209-T1-Vol-7) Avail: NTIS HC A03/MF A01 CSCL 13F

Review of hybrid vehicles built during the past ten years or planned to be built in the near future is presented. An attempt is made to classify and analyze these vehicles to get an overall picture of their key characteristics. The review includes onroad hybrid passenger cars, trucks, vans, and buses. DOE

N80-27232# California Univ., Livermore. Lawrence Livermore Lab.
ENERGY STORAGE SYSTEMS FOR AUTOMOBILE PROPULSION, 1979 STUDY. VOLUME 2: DETAILED REPORT
H. C. Forsberg, C. J. Anderson, E. Behrin, W. Cliff (Battelle Pacific Northwest Lab.), R. Crisp (Arkansas Univ.), C. L. Hudson (Interplan Corp.), L. G. OConnell, J. S. Payne, R. Renner, and M. D. Schrot 15 Dec. 1979 288 p refs
(Contract W-7405-eng-48)
(UCRL-52841-Vol-2) Avail: NTIS HC A13/MF A01

The findings of a national multilaboratory study of energy-storage propulsion systems for automobiles are presented, including a technical and cost update for the energy-storage devices and resultant vehicles. In addition, an evaluation methodology is described for national energy and market impact, a manufacturing and service infrastructure study is introduced, and an examination is made of certain specialty markets. The energy-storage device characteristics are projected and the resulting vehicles are evaluated. The systems analyzed included several that were not considered in the 1978 work, and three that had not been previously evaluated: the short-range but high-performance all-electric vehicle; the hydrogen-fuel-cell-powered electric; and the advanced-battery eV, power boosted with an advanced-design, fiber-composite flywheel. DOE

N80-27233# California Univ., Livermore. Lawrence Livermore Lab.
DYNAMIC TESTING OF THE ROADWAY POWERED ELECTRIC VEHICLE (RPEV) SYSTEM
D. D. Davis, C. W. Dease, Ronald I. Wallace, and Carl E. Walter 27 Feb. 1980 17 p refs Presented at the 3d Intern. Elec. Vehicle Exposition and Conf., St. Louis, 20-22 May 1980
(Contract W-7405-eng-48)
(UCRL-83662; CONF-800523-2) Avail: NTIS HC A02/MF A01

Practicality of the roadway powered electric vehicle (RPEV) system under dynamic operating conditions is being examined. In the RPEV system, energy is electromagnetically coupled without mechanical contact from a powered roadway to electric vehicles. Energy from the roadway can be used for high speed, long range travel, and for replenishing energy stored onboard the vehicles. The stored energy is available for shorter range travel on nonpowered surface streets. The dynamic test system includes a 50 m lane of powered roadway, an ac power source, and an electrically propelled test vehicle equipped with a roadway power pickup, onboard batteries, and instrumentation. The dynamic power coupling system allows up to 16 W of coupled power. Its design is based on results obtained from static prototype tests. Dynamic tests will examine power coupling capacity, system characteristics, vehicle performance, roadway compatibility, and safety. DOE

N80-27523# Argonne National Lab., Ill. Systems Engineering and Technology Group.
HYCSOS: HYDRIDE CONVERSION AND STORAGE SYSTEM SENSITIVITY ANALYSIS
Jeffrey S. Horowitz Sep. 1979 19 p refs
(Contract W-31-109-eng-38)
(ANL/EES-TM-63) Avail: NTIS HC A02/MF A01

The hydride conversion of solar energy system (HYCSOS) chemical heat pump was developed. A computer program was also developed to design a HYCSOS system. Although it is recognized that the program used is not entirely correct, it is felt that studies of this kind are valuable for determining the important parameters of the system design. Results of test studies are discussed. DOE

N80-27814# Defence Research Establishment, Ottawa. (Ontario).
EVALUATION OF THE VERTICAL AXIS WIND TURBINE AT DREO
Howard R. Braun, David J. Bristow, and Sylvia J. Wake Jan. 1980 100 p refs
(AD-A083961; DREO-R-822) Avail: NTIS HC A05/MF A01 CSCL 10/2

A Vertical Axis Wind Turbine-Battery Storage System was installed at the Defence Research Establishment Ottawa (DREO) in December 1975 and was operated for three years. The system was instrumented to control and monitor its operation and performance. This report deals with an evaluation study of a Vertical Axis Wind Turbine-Battery Storage System for a low-power unattended power source. The System's wind turbine, energy-generating and battery-storage system, mechanical drive system, installation, control-circuitry and data-acquisition system are described. Also, a performance-history outlining the problem areas encountered and a data-summary of two years of performance-data acquired during this study are presented. The objective of this study was to assess the System's ability to provide sixty watts of continuous power. The frequency of mechanical falures, especially in the turbine electrical drive system, made this particular system unsuitable as an unattended power source. It was also concluded that the average annual wind speed in the test location was of insufficient magnitude to provide the specified power output. GRA

N80-27818# Technical Univ. of Denmark, Lyngby. Thermal Insulation Lab.
INVESTIGATION OF HEAT STORAGES WITH SALT HYDRATE AS STORAGE MEDIUM BASED ON THE EXTRA WATER PRINCIPLE
S. Furbo 1980 83 p refs
(EUR-6646-Pt-2) Avail: NTIS (US Sales Only) HC A05/MF A01; DOE Depository Libraries

Experimental and computational studies of a full scale heat storage with salt hydrate as storage medium and based on the extra water principle are reported. Two different types of full scale heat storage, both making use of an incongruently melting salt hydrate as storage medium and based on the extra water principle, were examined by means of long term experiments. No decrease in the performance of the storages during the long term experiments was observed, and experiences for both storage types are obtained. By means of computer calculations, heat of fusion storage with oil as the heat transfer fluid in direct contact with the storage medium were compared with hot water storage as part of solar heating systems with the Danish Reference Year as a basis. With results of these calculations, examples of economical comparisons between heat of fusion storage and hot water storages are carried out. DOE

N80-28245*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TERM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM Final Report
P. Montalenti and R. Piccolo 21 Sep. 1979 143 p refs
(Contract JPL-955197)
(NASA-CR-163219; JPL-9950-330) Avail: NTIS HC A07/MF A01 CSCL 13F

In order to meet project requirements and be competitive in the 1985 market, the proposed six-passenger vehicle incorporates a high power type Ni-Zn battery, which by making electric-only traction possible, permits the achievement of an optimized control strategy based on electric-only traction to a set battery depth of discharge, followed by hybrid operation with thermal primary energy. This results in a highly efficient hybrid propulsion subsystem. Technical solutions are available to contain energy waste by reducing vehicle weight, rolling resistance, and drag coefficient. Repoacing new 1985 full size vehicles of the conventional type with hybrids of the proposed type would result in a U.S. average gasoline saving per vehicle of 1,261 liters/year and an average energy saving per vehicle of 27,133 MJ/year. A.R.H.

N80-28246*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TERM HYBRID PASSENGER VEHICLES DEVELOPMENT PROGRAM. APPENDIX A: MISSION ANALYSIS AND PERFORMANCE SPECIFICATION STUDIES, VOLUME 1 Final Report
M. Traversi and L. A. C. Barbarek (Illinois Inst. of Technology) 20 Apr. 1979 157 p
(Contract JPL-955187)
(NASA-CR-163220; JPL-9950-330) Avail: NTIS HC A08/MF A01 CSCL 13F

Applicable data was categorized and processed according to vehicle usage and trip parameters with consideration of payload (cargo, people, size) and driving cycles. A mission that maximizes the fuel potential savings for the total 1985 vehicle fleet was selected. Mission requirements that have a bearing on conventional and hybrid vehicle performance and characteristics were identified and formulated and a reference ICE vehicle was selected that meets or exceeds all requirements while maintaining within applicable constraints. Specifications for vehicle performance were established based on mission requirements, mission related vehicle characteristics, and fuel consumption. A.R.H.

N80-28247*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TERM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM, APPENDIX A. MISSION ANALYSIS AND PERFORMANCE SPECIFICATION STUDIES. VOLUME 2: APPENDICES Final Report
M. Traversi and L. A. C. Barbarek (Illinois Inst. of Technology) 18 May 1979 83 p
(Contract JPL-955187)
(NASA-CR-163221; JPL-9950-330) Avail: NTIS
HC A05/MF A01 CSCL 13F

A handy reference for JPL minimum requirements and guidelines is presented as well as information on the use of the fundamental information source represented by the Nationwide Personal Transportation Survey. Data on U.S. demographic statistics and highway speeds are included along with methodology for normal parameters evaluation, synthesis of daily distance distributions, and projection of car ownership districutions. The synthesis of tentative mission quantification results, of intermediate mission quantification results, and of mission quantification parameters are considered and 1985 in place fleet fuel economy data are included. A.R.H.

N80-28248*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TERM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM. APPENDIX B: TRADE-OFF STUDIES, VOLUME 1 Final Report
M. Traversi and R. Piccolo 11 Jun. 1980 131 p
(Contract JPL-955187)
(NASA-CR-163222; JPL-9950-330) Avail: NTIS
HC A07/MF A01 CSCL 13F

Tradeoff study activities and the analysis process used are described with emphasis on (1) review of the alternatives; (2) vehicle architecture; and (3) evaluation of the propulsion system alternatives; interim results are presented for the basic hybrid vehicle characterization; vehicle scheme development; propulsion system power and transmission ratios; vehicle weight; energy consumption and emissions; performance; production costs; reliability, availability and maintainability; life cycle costs, and operational quality. The final vehicle conceptual design is examined. A.R.H.

N80-28249*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TEAM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM. APPENDIX C: PRELIMINARY DESIGN DATA PACKAGE, VOLUME 1 Final Report
R. Piccolo 31 Jul. 1979 259 p
(Contract JPL-955187)
(NASA-CR-163223; JPL-9950-330) Avail: NTIS
HC A12/MF A01 CSCL 13F

The methodology used for vehicle layout and component definition is described as well as techniques for system optimization and energy evaluation. The preliminary design is examined with particular attention given to body and structure; propulsion system; crash analysis and handling; internal combustion engine; DC motor separately excited; Ni-Zn battery; transmission; control system; vehicle auxiliarries; weight breakdown, and life cycle costs. Formulas are given for the quantification of energy consumption and results are compared with the reference vehicle. A.R.H.

N80-28250*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TERM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM. APPENDIX B: TRADE-OFF STUDIES. VOLUME 2: APPENDICES Final Report
M. Traversi and R. Piccolo 15 Jun. 1979 51 p
(Contract JPL-955187)
(NASA-CR-163224; JPL-9950-330) Avail: NTIS
HC A04/MF A01 CSCL 13F

The SPEC '78 computer program which consists of mathmmatical simulations of any vehicle component and external environment is described as are configuration alternatives for the propulsion system. Preliminary assessments of the fundamental characteristics of the lead-acid and sodium-sulfur batteries are included and procedures are given for estimating the cost of a new vehicle in mass production. A.R.H.

N80-28251*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TEAM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM. APPENDIX C: PRELIMINARY DESIGN DATA PACKAGE. VOLUME 2: APPENDICES Final Report
R. Piccolo 11 Sep. 1979 124 p
(Contract JPL-955187)
(NASA-CR-163225; JPL-9950-330) Avail: NTIS
HC A06/MF A01 CSCL 13F

The design, development, efficiency, manufacturability, production costs, life cycle cost, and safety of sodium-sulfur, nickel-zinc, and lead-acid batteries for electric hybrid vehicles are discussed. Models are given for simulating the vehicle handling quality, and for finding the valuve of: (1) the various magnetic quantities in the different sections in which the magnetic circuit of the DC electric machine is divided; (2) flux distribution in the air gap and the magnetization curve under load conditions; and (3) the mechanical power curves versus motor speed at different values of armature current. A.R.H.

N80-28252*# Fiat Research Center, Orbassano (Italy).
PHASE 1 OF THE NEAR TERM HYBRID PASSENGER VEHICLE DEVELOPMENT PROGRAM. APPENDIX D: SENSITIVITY ANALYSIS Final Report
M. Traversi 3 Jul. 1979 50 p
(Contract JPL-955187)
(NASA-CR-163226; JPL-9950-330) Avail: NTIS
HC A03/MF A01 CSCL 13F

Data are presented on the sensitivity of: (1) mission analysis results to the boundary values given for number of passenger cars and average annual vehicle miles traveled per car; (2) vehicle characteristics and performance to specifications; and (3) tradeoff study results to the expected parameters. A.R.H.

08
GENERAL

N80-22846# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY INFORMATION DATA BASE CORPORATE AUTHOR ENTRIES, SUPPLEMENT 3 Progress Report, Jun. 1978 - Sep. 1979
Sep. 1979 51 p
(DOE/TIC-4585-R1-Suppl-3) Avail: NTIS HC A04/MF A01

This supplement contains additions to TID-4585-R1 and is intended for use with that publication. Supplements are cumulative from June 1978 until another revision is issued. DOE

N80-22862# Mitre Corp., McLean, Va. METREK Div.
NEW ENGLAND ENERGY DEVELOPMENT SYSTEMS CENTER (NEEDS). AN EXPERIMENT IN UNIVERSITY-INDUSTRY COOPERATIVE RESEARCH. VOLUME 1: SUMMARY OF RESULTS Final Report
Zwi Kohorn Jul. 1979 39 p refs 2 Vol.
(Grant NSF CG-00007)
(PB80-112972; MTR-79W00188-Vol-1; NSF/RA-790260) Avail: NTIS HC A03/MF A01 CSCL 10A

The organizational structure, operating mechanism, accomplishments, and lessons of the New England Energy Development Systems (NEEDS) Center are reported. The NEEDS was established as an entity to test the effectiveness of Federal cost sharing in stimulating nonfederal investment in university research, and in facilitating the use of research and development results by industry. Twenty-five individual projects are described and categorized as to performance, source of cost sharing, and total project cost. Accomplishments are discussed with respect to (1) linking private sector organizations with universities, (2) simulating cost-sharing from the private-sector, and (3) facilitating use of results. GRA

N80-23586# AEG-Telefunken, Berlin (West Germany). Forschungsinst.
DEVELOPMENT OF CURRENT CONVERTERS FOR SWITCHING AND REGULATING TASKS IN ENERGY TECHNOLOGY Final Report
Hans-Peter Beck, Peter Heinmeyer, Detlef Knuth, Werner Lukanz, and Monika Steinwegs Bonn Bundesmin. fuer Forsch. und Technol. Aug. 1979 350 p refs In GERMAN; ENGLISH summary Sponsored by Bundesmin. fuer Forsch. und Technol.
(BMFT-FB-T-79-12) Avail: NTIS HC A15/MF A01; Fachinformationszentrum Energie, Phys., Math., Eggenstein-Leopoldshafen, West Germany DM 73.10

The design and production of semiconductor switching devices are described. The devices serve as semiconductor power switches in current converting and current regulating applications. Two prototypes were developed, a power switch for 10 MW with a water cooling system and a power switch for 3 MW with an evaporative cooling system. Author (ESA)

N80-24301# Brookhaven National Lab., Upton, N. Y.
LOW-COST GENERAL ENERGY/ANALYTIC INFORMATION SYSTEM
Ann W. Reisman and Jack Allentuck 1979 7 p Presented at the Intern. Conf. on Energy Use Management, Los Angeles, 22 Oct. 1979
(Contract EY-76-C-02-0016)
(BNL-26398; CONF-791009-6) Avail: NTIS HC A02/MF A01

Energy planning is frequently complicated by the fact that many countries should not be viewed as single entities, but rather as assemblies of regions. Sub-national regional differences arise from variations in terrain and climate, and demographic and historical patterns as well as combinations of these and other factors. Planners must consider sub-national regional needs and opportunities in formulating national energy plans. The structure and data requirements for a low cost energy/analytic information system having a regional capability is outlined. The kinds of planning decisions that require energy-information-system support are examined. The information content of an energy information system is summarized and its basic analytic capabilities are described. DOE

N80-24848# United Engineers and Constructors, Inc., Philadelphia, Pa.
ENERGY ECONOMIC DATA BASE (EEDB) PROGRAM: PHASE 1: INITIAL UPDATE Final Report
Dec. 1979 210 p refs
(Contract EN-78-C-02-4954)
(COO-4954-1-Vol-3) Avail: NTIS HC A10/MF A01

Volume 1 describes the EEDB and presents some pertinent update material. The initial appendices make up Volume 2 in which descriptions of the Standard Hypothetical Middletown Sites for nuclear power plants and coal-fired power plants are presented. Additional data in appendices in Volume 2 include information on fuel-cycle work; inflation-free fixed charge rates; capital cost update procedure; and nuclear steam supply system. This Volume 3, contains additional appendices entitled: Practical Target Economics for the Liquid Metal Fast Breeder Reactor Nuclear Power Generating Station; Air-Quality Impact Analysis for determination of the Acceptability of Qualified High and Low-sulfur Coal-fired Facility Designs for the Hypothetical Middletown Site; Synthetic Power Plant Fuels by the Solvent Refined Coal Process; Inflation Free Fuel Cycle Costs for Throwaway and Recycle Cases; Inflated (6%) Fuel Cycle cost for Throwaway and Recycle cases; Inflated (7%) Fuel cost for Throwaway and Recycle Cases; Inflated (8%) Fuel Cycle Costs for Throwaway and Recycle Cases; Fuel Costing Methodology; and Bred-Fuel Scenarios. DOE

N80-25203# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY INFORMATION DATA BASE, SERIES TITLES: SUPPLEMENT 7, FEBRUARY 1978 - DECEMBER 1979
Dec. 1979 137 p
(DOE/TIC-4579-R10-Suppl-7) Avail: NTIS HC A07/MF A01

Changes and additions to the authority list for serial titles used by the DOE Technical Information Center are listed. Supplements are cumulative from February 1978 until another revision is issued. DOE

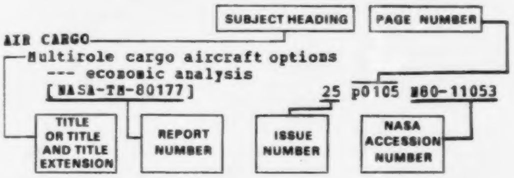
N80-25204# Department of Energy, Oak Ridge, Tenn. Technical Information Center.
ENERGY INFORMATION DATA BASE, CORPORATE AUTHOR ENTRIES: SUPPLEMENT 4, JUNE 1978 - DECEMBER 1979
Dec. 1979 57 p
(DOE/TIC-4585-R1-Suppl-4) Avail: NTIS HC A04/MF A01

Additions to the authority list for corporate author names are given. Supplements are cumulative from June 1978 until another revision is issued. DOE

SUBJECT INDEX

ENERGY/*A Continuing Bibliography (Issue 27)* OCTOBER 1980

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title or title and title extension provides the user with a brief description of the subject matter. The report number helps to indicate the type of document cited (e.g., NASA report, translation, NASA contractor report). The issue page and accession numbers are located beneath and to the right of the title e.g., 25 p0105 N80-11053. Under any subject heading the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABERRATION
The electronic aberrogram recorder --- for solar concentrators
p0391 A80-33858

ABRASION RESISTANCE
Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear
p0539 A80-39628

ABSORBERS (EQUIPMENT)
Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537

ABSORBERS (MATERIALS)
Solar operated crossflow desiccant cooling system
p0365 A80-33525
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617
Flat-plate solar collectors - Influence of design material and configuration on performance
p0404 A80-37944

ABSORPTANCE
Photoacoustic determination of absorptance and emittance of solar selective coatings
p0388 A80-33744
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces
p0388 A80-33746

ABSORPTION
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858

ABSORPTION SPECTRA
Charge collection and spectral response of amorphous-silicon solar cells
p0401 A80-36937
Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons
[UCRL-83317] p0337 N80-23629

AC GENERATORS
Operational characteristics of an ac commutator generator for wind power conversion
p0508 A80-33770
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

ACOUSTIC VELOCITY
Further development of seismic methods: Three-dimensional velocity determinations
[BMFT-FB-T-79-19] p0484 N80-23925

ACOUSTO-OPTICS
Photoacoustic determination of absorptance and emittance of solar selective coatings
p0388 A80-33744

ACTIVATED SLUDGE
Energy recovery in the sludge treatment process at Toronto's main treatment plant
p0333 A80-42927

ADAPTIVE CONTROL
Adaptive control for a multiple tank, multiple temperature solar energy storage system
p0369 A80-33557
Electro-wind energy system with oversynchronous cascade and simple adaptive maximal power control
p0508 A80-33775

ADAPTIVE OPTICS
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493

ADDITIVES
Realization of p-n junction solar cells by an ion implantation doping procedure
p0409 A80-37991
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469
The use of additives to stabilize coal-oil mixture
p0496 N80-26477

ADENOSINE DIPHOSPHATE
A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985

ADENOSINE TRIPHOSPHATE
A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985

ADHESIVE BONDING
Low cost high temperature adhesive bonded solar collectors
p0361 A80-33464
Study and analysis of a low cost cement bonded flat plate solar collector
[ALO-4122-T1] p0428 N80-23816

ADIABATIC CONDITIONS
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188] p0555 N80-23796

ADSORBENTS
Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515

AERIAL PHOTOGRAPHY
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019

AERODYNAMIC CHARACTERISTICS
Performance modeling of the vertical axis wind turbine
p0508 A80-33773
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane
[AIAA PAPER 80-1846] p0333 A80-43304
The aerodynamics of axial flow wind power turbines
[CSIR-ME-1619] p0528 N80-23781

Aerodynamic performance of the 17-m-diameter Darrieus wind turbine in the three-bladed configuration: An addendum
[SAND-79-1753] p0537 N80-26857

AERODYNAMIC CONFIGURATIONS
Crosswind kite power --- for large-scale wind power production
p0523 A80-43139

AERODYNAMIC INTERFERENCE
Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C] p0535 N80-25897

AERODYNAMIC LOADS
Wind turbine dynamic blade loads due to wind gusts and wind direction changes
p0513 A80-35727
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine
[NASA-TM-81813] p0532 N80-25104
An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients
[PB80-158769] p0458 N80-27829

AEROELASTICITY
Nonlinear aeroelastic equations of motion of twisted, nonuniform, flexible horizontal-axis wind turbine blades
[NASA-CR-159502] p0536 N80-26774

AERONAUTICAL ENGINEERING
The impact of fuels on aircraft technology through the year 2000
[NASA-TM-81492] p0482 N80-23472

AEROSOLS
Chemical characteristics of oil refinery plumes in Los Angeles
p0325 A80-36476
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor
p0330 A80-41558
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559
Mechanisms and rates of formation of sulfur aerosols in power plant plumes
p0354 N80-26907
Synoptic-scale distribution of man-made aerosols --- fossil fuel combustion products
p0354 N80-26942

AEROSPACE SYSTEMS
Large space structures - Fantasies and facts
[AIAA 80-0674] p0393 A80-34999

AEROSPACE TECHNOLOGY TRANSFER
Lessons of the NASA Tech House
[NASA-SP-442] p0456 N80-27219

AFRICA
Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems
p0381 A80-33674

AGING (MATERIALS)
Thermal aging characteristics of electrodeposited black chrome solar coatings
p0388 A80-33740
Solar energy systems: Test methods for collector insulations
[PB80-132038] p0430 N80-23867

AGREEMENTS
World Energy Data System (WENDS). Volume 6: International agreement profiles
[ANL-PMS-79-2-VOL-6] p0528 N80-23790

AGRICULTURE
Development and evaluation of a multiple use solar energy system for agriculture
p0357 A80-33403
The application of existing solar energy collecting equipment in agriculture, horticulture and fishculture
p0358 A80-33404
A modular system for bio-gas production using farm waste
p0466 A80-33415
Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665
The energy-food interface - An economic analysis of Brazil's alcohol plan
p0466 A80-33753
Agricultural applications of wind resource assessments
p0514 A80-35739
Solar energy at the P.E.I. Ark
p0420 A80-42471
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807
Environmental development plan: Solar agricultural and industrial process heat
[DOE/EDP-0033] p0446 N80-25862
Biosources digest, a journal on biomass utilization, volume 1, no. 1
[PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass utilization, volume 1, no. 4
[PB80-140981] p0493 N80-25909
Addition of inexpensive solar air-heaters to a pre-engineered metal building
[ALO-4086-1] p0452 N80-26818
Solar collector system using air collectors for a pre-drying facility in a grass drying plant
[SKT-TEIL-1] p0456 N80-26877

AILERONS
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines
[NASA-CR-159856] p0355 N80-27803

AIR
Energy from humid air
[DSE-2553-79/1] p0531 N80-24861

AIR CONDITIONING
Design and operation of a liquid-desiccant type solar air conditioning system
p0366 A80-33527
Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems
p0366 A80-33535
Prospects for solar cooling applications in Nigeria
p0382 A80-33676
Impact of solar heating and cooling of buildings on electric utilities
p0412 A80-38022
Passive cooling systems in hot arid regions
p0478 A80-42448
Solar powered refrigeration
p0420 A80-42469
Cold water aquifer storage --- air conditioning
p0554 N80-22827
Solar space heating and air conditioning, volume 3. Citations from the NTIS data base
[PB80-801707] p0424 N80-22864
Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base
[PB80-801723] p0425 N80-22865
Solar space heating and air conditioning, volume 4. Citations from the NTIS data base
[PB80-801715] p0425 N80-22866
Passive solar space heating and cooling. Citations from the engineering index data base
[PB80-801749] p0425 N80-22867
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-20] p0343 N80-24822
Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-25868
Solar Federal Buildings Program plan --- solar applications in buildings
[DOE/CS-0147A] p0453 N80-26842

AIR CONDITIONING EQUIPMENT
Experimental study of coolness storage using sodium sulfate decahydrate --- for air conditioning systems
p0546 A80-33521
Open-cycle solar air conditioner
p0365 A80-33524
Solar operated crossflow desiccant cooling system
p0365 A80-33525
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector
p0366 A80-33530
Experimental investigation on control modes for an absorption chiller of low capacity --- in air conditioning systems
p0366 A80-33532

Solar powered environment control - Criteria and realization p0366 A80-33534
A direct solar-heated R22-DMF absorption refrigerator p0367 A80-33539
Simulation of the FSEC solar cooling system p0369 A80-33563
Choice of cycle parameters for solar Freon air conditioning equipment of ejector type p0391 A80-33862
Flat plate boosters for elevating temperatures p0404 A80-37947
Comparison between two absorption cooling systems of the 'open' type under different climate conditions p0407 A80-37976
Development of a solar desiccant dehumidifier p0408 A80-37979
Liquid desiccant solar heat pump for developing nations p0408 A80-37980
Solar energy for heating and cooling p0418 A80-42445
Cooling of buildings --- solar systems p0418 A80-42446
A completely instrumented solar building - The Shenandoah Solar Recreational Center p0418 A80-42447
Comparative performance of two types of evacuated tubular solar collectors in a residential heating and cooling system [COO-2577-19] p0446 N80-25864
Site and building energy-conservation study: Survey of building 251, diagnostic chemistry [UCRL-15190] p0348 N80-25880
State-of-the-art assessment of hybrid heat pumps [EPRI-EM-1261] p0352 N80-26627

AIR COOLING
Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems p0366 A80-33535
Dual desiccant-bed dehumidifier with solar-heated regeneration p0384 A80-33705

AIR DUCTS
Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors p0361 A80-33469

AIR FLOW
The effects of air leaks on solar air heating systems p0359 A80-33448
Mass flow considerations for solar air heating systems p0369 A80-33558

AIR NAVIGATION
Autonomous solar-powered beacon for air navigation use p0385 A80-33715

AIR POLLUTION
Oil shales and carbon dioxide --- air pollution during retorting p0467 A80-34539
The trace element chemistry of coal during combustion and the emissions from coal-fired plants p0324 A80-34600
Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments p0324 A80-35649
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters p0325 A80-35878
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace p0325 A80-35879
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur p0325 A80-35880
Particulate sulfur and trace metal emissions from oil fired power plants p0325 A80-35890
Chemical characteristics of oil refinery plumes in Los Angeles p0325 A80-36476
Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings p0326 A80-36976
Impacts of fossil fuel use on environment and climate p0326 A80-37331
Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water p0326 A80-37332
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor p0330 A80-41558
Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants p0330 A80-41664
Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience p0330 A80-41842
Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology p0331 A80-41849
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors [CONF-791049-8] p0335 N80-22878
Environmental consequences of atmospheric krypton-85 [COO-4364-2] p0345 N80-24886
Environmental control technology for atmospheric carbon dioxide [BNL-27164] p0345 N80-24888
Control techniques for carbon monoxide emissions [PB80-140510] p0345 N80-24890
Quality assurance in support of energy related monitoring activities [PB80-135270] p0346 N80-24898
Diesel exhaust emissions. Citations from the American Petroleum Institute data base [PB80-805419] p0347 N80-25679
National Emissions Data System (NEDS), fuel use report [PB80-146905] p0350 N80-25919
A study of emissions from passenger cars in six cities, volume A [PB80-149800] p0350 N80-25930
Methods for analyzing inorganic compounds in particles emitted from stationary sources [PB80-141781] p0350 N80-25936
Flue gas desulfurization by the modified citrate process: Report of investigations [PB80-134836] p0351 N80-25940
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems [PB80-138464] p0351 N80-25947
Mechanisms and rates of formation of sulfur aerosols in power plant plumes p0354 N80-26907

AIR PURIFICATION
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366

AIR QUALITY
Planning air quality control systems for power generation p0325 A80-35897
Air quality measurements in the coal fired power plant environment of Colstrip, Montana p0326 A80-36477
National impacts on visual air quality from a future energy scenario [LA-UR-79-3214] p0335 N80-22882

AIR TRAFFIC CONTROL
Fuel - A system problem of major proportions --- fuel conservation in airline operations p0327 A80-37691

AIR TRANSPORTATION
Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, and Supplement p0460 A80-37330
Energy and civil aviation p0475 A80-41871

AIRCRAFT DESIGN
New Technology Transport for fuel critical economy p0328 A80-40313
The energy problem - Its effect on aircraft design. IV - The unforecastable future p0329 A80-40944
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane [AIAA PAPER 80-1846] p0333 A80-43304
Energy conservation potential of general aviation activity [AD-A081182] p0355 N80-27355
AIRCRAFT ENGINES
Hydrogen fueled high bypass turbofans in subsonic aircraft p0462 A80-37348
Advanced component technologies for energy-efficient turbofan engines [AIAA PAPER 80-1086] p0519 A80-38902
Turbopropulsion combustion - Trends and challenges [AIAA PAPER 80-1199] p0519 A80-38964
Lightweight diesel aircraft engines for general aviation [AIAA PAPER 80-1238] p0328 A80-38983
Gas turbine combustor design challenges for the 1980's [AIAA PAPER 80-1285] p0475 A80-41213
Fuel conservation through active control of rotor clearances [AIAA PAPER 80-1087] p0330 A80-41506
Fuel property effects on life characteristics of aircraft turbine engine combustors [ASME PAPER 80-GT-55] p0476 A80-42186
Design study for a fuel efficient turbofan engine [ASME PAPER 80-GT-141] p0331 A80-42254
Results from tests on a high work transonic turbine for an energy efficient engine [ASME PAPER 80-GT-146] p0332 A80-42258
Design study: A 186 kW lightweight diesel aircraft engine [NASA-CR-3261] p0334 N80-22326
Advanced component technologies for energy-efficient turbofan engines [NASA-TM-81507] p0341 N80-24316
Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan [NASA-CR-159806] p0346 N80-25332
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A [NASA-CR-135119] p0355 N80-27361
AIRCRAFT FUEL SYSTEMS
Analysis and design of insulation systems for LH2-fueled aircraft p0462 A80-37347
Advanced fuel system technology for utilizing broadened property aircraft fuels [NASA-TM-81538] p0502 N80-27510
AIRCRAFT FUELS
The impact of fuels on aircraft technology through the year 2000 [AIAA PAPER 80-0896] p0470 A80-35898
Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, and Supplement p0460 A80-37330
Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments p0460 A80-37336
Characteristics of liquid hydrogen-fueled aircraft p0461 A80-37340
Safety of liquid hydrogen in air transportation p0461 A80-37341
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen p0461 A80-37342
Liquid hydrogen engines p0461 A80-37343
Design concept for LH2 airport facilities p0461 A80-37344
A proposed liquid hydrogen development program for aircraft p0461 A80-37345
Hydrogen liquefaction, storage and transfer on an airport site p0462 A80-37349
Gaseous fuels for airship propulsion p0472 A80-39304
Fuel economy in the airlines p0329 A80-40945
Fuel property effects on life characteristics of aircraft turbine engine combustors [ASME PAPER 80-GT-55] p0476 A80-42186
Fuel character effects on J79 and F101 engine combustor emissions [ASME PAPER 80-GT-70] p0476 A80-42200
Research on diamantane and other high density hydrocarbon fuels [AD-A080749] p0482 N80-23474
Advanced fuel system technology for utilizing broadened property aircraft fuels [NASA-TM-81538] p0502 N80-27510
AIRCRAFT MAINTENANCE
New Technology Transport for fuel critical economy p0328 A80-40313
AIRCRAFT PERFORMANCE
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane [AIAA PAPER 80-1846] p0333 A80-43304
Fuel efficiency of small aircraft [AIAA PAPER 80-1847] p0333 A80-43305
AIRCRAFT RELIABILITY
Common Cause Failures - A dilemma in perspective p0328 A80-40344
AIRCRAFT SAFETY
Safety of liquid hydrogen in air transportation p0461 A80-37341
AIRLINE OPERATIONS
Fuel - A system problem of major proportions --- fuel conservation in airline operations p0327 A80-37691
Fuel economy in the airlines p0329 A80-40945
AIRPORT PLANNING
Design concept for LH2 airport facilities p0461 A80-37344
AIRPORTS
Hydrogen liquefaction, storage and transfer on an airport site p0462 A80-37349
AIRSHIPS
The sunship - The case for a solar powered airship p0413 A80-39288
Gaseous fuels for airship propulsion p0472 A80-39304
ALABAMA
Coal conversion products industrial applications [NASA-CR-161469] p0484 N80-24465
Solar energy system performance evaluation: Seasonal report for IBM system 1A, Huntsville, Alabama [NASA-CR-161464] p0442 N80-25790
ALASKA
The United States Geological Survey in Alaska, 1979 programs [CIRC-804-A] p0500 N80-26747
ALCOHOLS
The energy-food interface - An economic analysis of Brazil's alcohol plan p0466 A80-33753
Grain motor fuel alcohol technical and economic assessment study [HCP/J6639-01] p0334 N80-22523
Retrospective search on the biochemical production of alcohol fuels [NP-24137] p0482 N80-23476
ALGAE
High intensity mass algae culture requirements and limitations --- for maximum growth and energy conversion in sunlight p0358 A80-33408
Microalgal biomass systems for fuels, chemicals, and fertilizers p0465 A80-33409
Light-dependent hydrogen production by C. reinhardi --- anaerobically adapted green algae p0459 A80-33410
Photobiological hydrogen production [SERI/TP-33-410] p0463 N80-24477
ALIGNMENT
A computational alignment method for paraboloidal collectors p0378 A80-33641

Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility
p0378 A80-33642

ALIPHATIC COMPOUNDS
Liquid fuel production from biomass
p0465 A80-33412

ALKALIES
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

ALKALINE BATTERIES
Properties of alternate electrolytes for secondary zinc batteries
p0550 A80-42297
Pulse charging of lead-acid traction cells
[NASA-TM-81513] p0558 N80-25780

ALTERNATING CURRENT
Calorimetric measurement of ac losses in superconducting cables of short lengths
[BNL-26712] p0540 N80-22609

ALUMINUM ALLOYS
Survey of potential processes for the manufacturing of aluminum --- reducing industrial energy requirements
[ANL/OEPM-79-4] p0351 N80-26441

ALUMINUM CHLORIDES
A preliminary investigation for an Al/AlCl3-NaCl/FeS2 secondary cell
p0550 A80-42299

ALUMINUM COATINGS
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy
p0388 A80-33748

ALUMINUM COMPOUNDS
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797

ALUMINUM GALLIUM ARSENIDES
'Band readjustment' effect with applications to solar cells
p0397 A80-35367
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588

ALUMINUM OXIDES
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy
p0388 A80-33748

AMBIENT TEMPERATURE
The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems
p0381 A80-33663

AMMONIA
Solar energy collection using the reversible ammonia dissociation reaction
p0358 A80-33427
Ammonia dissociation for solar thermochemical absorbers
p0358 A80-33428
Design and cost analysis for an ammonia-based solar thermochemical cavity absorber
p0403 A80-37300
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector
p0407 A80-37977
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance
p0522 A80-42295
Ammonia high temperature solid electrolyte fuel cell
p0523 A80-42298

AMORPHOUS MATERIALS
Glassy electrolyte galvanic cells
p0515 A80-37008
Amorphous Si solar cells
[DOE/ET/23034-T1] p0439 N80-24839

AMORPHOUS SEMICONDUCTORS
Design considerations for a-Si solar cells
p0394 A80-35342
Charge collection and spectral response of amorphous-silicon solar cells
p0401 A80-36937
Review of amorphous and polycrystalline thin film silicon solar cell performance parameters
p0414 A80-40712
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers
p0421 A80-43513

AMPLIFIER DESIGN
The Antares laser power amplifier
p0517 A80-37855

ANAEROBES
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486

ANIONS
Energy storage and electron transfer by carbanion photolysis
p0545 A80-33419

ANNEALING
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343
Ion-implanted laser annealed silicon solar cells
p0414 A80-40252
Development of pulsed processes for the manufacture of solar cells
[NASA-CR-153188] p0427 N80-23771

ANNUAL VARIATIONS
Mean monthly performance of solar water heaters with natural circulation
p0371 A80-33579
Seasonal regeneration through underground strata --- solar terrestrial interactions
p0548 A80-37966
Seasonal Thermal Energy Storage Program
p0551 N80-22789

ANODES
Current constriction near the anode in a combustion products plasma --- in MHD generators
p0510 A80-34865
Properties of photoelectrochemical cells with a chemically sprayed photoanode
p0398 A80-35474

ANODIC COATINGS
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy
p0388 A80-33748

ANTENNA ARRAYS
Microwave beamed power technology improvement --- magnetrons and slotted waveguide arrays
[NASA-CR-163043] p0542 N80-26785

ANTIREFLECTION COATINGS
Thermal aging characteristics of electrodeposited black chrome solar coatings
p0388 A80-33740
Selective electrodeposited chromium black coatings - Optical properties, selectivity model
p0388 A80-33743
A computer analysis of heteroface solar cells with ultrathin window layer
p0422 A80-43589
Low-cost solar antireflection coatings --- for flat plate collectors
[ALO-5300-T2] p0453 N80-26844

APPLICATIONS OF MATHEMATICS
Passive solar calculation methods
[DSE/5221-T1] p0429 N80-23836

AQUEOUS SOLUTIONS
The physics of a saturated Na2O.2B2O3.10H2O non-convecting solar pond
p0372 A80-33587
Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions
p0467 A80-34019
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399

AQUICULTURE
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126
Solar energy at the P.E.I. Ark
p0420 A80-42471

Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming [PB80-157662] p0504 N80-27795

AQUIFERS
Energy storage in ground-water aquifers p0545 A80-33514
The effect of system size on the practicality of aquifer storage --- feasibility of small systems for building heat storage p0545 A80-33517
Evaluation of thermal energy storage for the proposed Twin Cities District Heating system --- using cogeneration heat production and aquifiers for heat storage p0553 N80-22815
Active heat exchange system development for latent heat thermal energy storage p0554 N80-22822
Aquifer thermal energy storage program p0554 N80-22825
Cold water aquifer storage --- air conditioning p0554 N80-22827
Optimal design of compressed air energy storage systems [CONF-791069-3] p0555 N80-23789
Investigation of the technical and economic feasibility of using pumped well-water energy storage systems [SAND-79-7096] p0556 N80-23851

ARC DISCHARGES
Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators p0519 A80-39746
An arc discharge model on electrodes of an MHD generator p0524 A80-43397

ARC GENERATORS
Effect of current constriction at electrodes on MHD generator characteristics p0513 A80-35685

ARC HEATING
Theory of electrode arcs in a flow of combustion products containing an additive p0524 A80-43398
Direct ignition of pulverized coal with arc heated air p0480 N80-22508

ARCHITECTURE
Fundamentals of solar architecture p0418 A80-42449
Prospects for energy responsive urban planning and design p0332 A80-42450
Architects and engineers guide to energy conservation in existing buildings [DOE/CS-0132] p0351 N80-26550
Site and building energy-conservation study: Survey of building 435, MFE research [UCRL-15198] p0352 N80-26568
Examination of energy consumption and the possibilities of energy savings in office buildings p0353 N80-26791
Site and building energy-conservation study: Survey of building 3, experimental physics [UCRL-15195] p0353 N80-26808
Passive solar design handbook. Volume 2 of two volumes: Passive solar design [DOE/CS-0127/2] p0455 N80-26870
Lessons of the NASA Tech House [NASA-SP-442] p0456 N80-27219

ARGON
Mass spectrometer determination of argon contents in laser fusion target pellets p0506 A80-33054

ARID LANDS
Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones p0358 A80-33425

ARIZONA
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona [NASA-CR-161450] p0441 N80-25787
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9 [NASA-CR-163267] p0352 N80-26772
Solar energy system performance evaluation: Seasonal report for Elcam Tempe Arizona State University, Tempe, Arizona [NASA-CR-161466] p0450 N80-26778
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2 [LBL-10098] p0353 N80-26817

ARMOR
Material studies related to TFTR limiters and wall armor p0507 A80-33063

ARTIFICIAL SATELLITES
Study of multi-kW solar arrays for Earth orbit application [NASA-CR-161452] p0431 N80-24345

ASHES
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash p0330 A80-41559
Design of a monitoring program for ash pond effluents [PB80-128457] p0345 N80-24896

ASSAYING
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency p0473 A80-39422

ASTEC SOLAR TURBOELECTRIC GENERATOR
Test results on solar turbogenerators p0391 A80-33860

ASTRIONICS
Study of multi-kW solar arrays for Earth orbit application [NASA-CR-161452] p0431 N80-24345

ATMOSPHERIC ATTENUATION
Attenuation of solar energy by high, thin clouds p0414 A80-40709

ATMOSPHERIC BOUNDARY LAYER
A model for the probability structure of atmospheric turbulence --- for wind engineering applications p0468 A80-35720
Boundary layer wind shear --- at wind turbine sites p0469 A80-35743

ATMOSPHERIC CHEMISTRY
Chemical characteristics of oil refinery plumes in Los Angeles p0325 A80-36476

ATMOSPHERIC COMPOSITION
Proceedings of the workshop on Stratospheric and Mesospheric Impacts of Satellite Power Systems (SPS) [CONF-7809197] p0541 N80-25363

ATMOSPHERIC EFFECTS
Atmospheric considerations for design of WECS --- Wind Energy Conversion System p0513 A80-35717

ATMOSPHERIC ENERGY SOURCES
Wind energy resource development in California p0469 A80-35733
Wind energy resource assessment of New Zealand p0469 A80-35736

ATMOSPHERIC MODELS
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory [UCRL-52837] p0488 N80-24964
Statistical models for wind characteristics at potential wind energy conversion sites [DOE/ET/20283-1] p0489 N80-24968

ATMOSPHERIC TURBULENCE
A model for the probability structure of atmospheric turbulence --- for wind engineering applications p0468 A80-35720
Wind fluctuations described as discrete events p0468 A80-35721
Wind statistics at the Boulder Atmospheric Observatory tower --- for wind turbine generator design p0468 A80-35722
On the vertical extrapolation of mean wind power density p0471 A80-36424

ATOMIZERS
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan
p0496 N80-26480

ATOMIZING
Atomization of coal slurry jets
p0496 N80-26482
Atomization of coal-oil mixtures
p0497 N80-26483

AUSTENITIC STAINLESS STEELS
Sigma phase formation in alloys for SO2/SO3 thermal energy storage systems
[SAND-80-8205] p0562 N80-26856

AUSTRALIA
Energy self-sufficiency in monsoonal Australia
p0323 A80-33433
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
[E80-10142] p0499 N80-26729

AUTOCATALYSIS
Autocatalytic coal liquefaction process
[NASA-CASE-NPO-14876-1] p0493 N80-26460

AUTOMATIC CONTROL
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems
[PB80-138464] p0351 N80-25947

AUTOMATIC TEST EQUIPMENT
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660

AUTOMOBILE ENGINES
Advanced Gas Turbine Powertrain System Development Project
p0513 A80-35574
A new design of Stirling engine for automotive application
p0519 A80-39899
Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19] p0521 A80-42157
Baseline automotive gas turbine engine development program
[NASA-CR-159670] p0530 N80-24620
Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies
[NASA-CR-163228] p0559 N80-26204
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206
Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207
Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208
Energy-storage systems for automobile propulsion, 1979 study. Volume 3: Battery/flywheel electric vehicles using advanced batteries
[UCRL-52841-VOL-3] p0561 N80-26213
The near-term hybrid vehicle program, phase 1
[NASA-CR-163034] p0562 N80-27222
Preliminary design data package, appendix C --- hybrid electric vehicles
[NASA-CR-163038] p0563 N80-27226

AUTOMOBILE FUELS
Automotive fuels from coal
p0470 A80-35800

AUTOMOBILES
Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings
p0326 A80-36976
Electric and hybrid vehicle program
[DOE/CS-0026] p0556 N80-24216
Liquid hydrogen-fueled vehicle project
[LA-UR-79-2883] p0463 N80-25467
A study of emissions from passenger cars in six cities, volume A
[PB80-149800] p0350 N80-25930
Near hybrid passenger vehicle development program, phase 1. Appendices A and B. Mission analysis and performance specification studies report, volume 1
[NASA-CR-163330] p0559 N80-26201
Near hybrid passenger vehicle development program, phase 1. Appendices C and D, Volume 2
[NASA-CR-163331] p0559 N80-26202
Near term hybrid passenger vehicle development program, phase 1
[NASA-CR-163235] p0560 N80-26210
Comparison of costs for automobile energy conservation vs synthetic fuel production
[CONF-800419-1] p0353 N80-26810
Design tradeoff studies and sensitivity analysis, appendix B
[NASA-CR-163036] p0563 N80-27224
Design tradeoff studies and sensitivity analysis, appendices B1 - B4 --- hybrid electric vehicles
[NASA-CR-163037] p0563 N80-27225
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239
Phase 1 of the near term hybrid passenger vehicle development program
[NASA-CR-163219] p0564 N80-28245
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1
[NASA-CR-163220] p0564 N80-28246
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices
[NASA-CR-163221] p0565 N80-28247
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1
[NASA-CR-163223] p0565 N80-28249
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices
[NASA-CR-163225] p0565 N80-28251
Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis
[NASA-CR-163226] p0565 N80-28252

AUXILIARY POWER SOURCES
Design of the solar water heater system for TVA's Memphis Initiative
p0371 A80-33581
Off-peak electric auxiliary heat for solar air-heating systems
[COO-4516-1] p0429 N80-23827
Solar energy system performance evaluation-seasonal report for Elcam San Diego, San Diego, California
[NASA-CR-161481] p0457 N80-27806

AVAILABILITY
Application of reliability, maintainability, and availability engineering to solar heating and cooling systems
p0414 A80-40334

AXIAL FLOW
A high performance cocurrent-flow heat pipe for heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472
The aerodynamics of axial flow wind power turbines
[CSIR-ME-1619] p0528 N80-23781

AXIAL FLOW PUMPS
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Handling coal oil mixtures with positive displacement pumps
p0494 N80-26463
AXISYMMETRIC BODIES
Class of axisymmetric mirrors with uniform flux concentration properties along their axes
p0414 A80-40473

B

BACTERIA
Development and characterization of ethanol tolerance in clostridium thermocellum --- biomass energy production
p0466 A80-33416
Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477
Biological solar cells
[SERI/TP-332-476] p0439 N80-24831
BAFFLES
Longitudinal baffling in Faraday generators
p0505 A80-32743
Effects of baffles on thermal stratification in themocline storage tanks
p0365 A80-33509
BALLAST (MASS)
The efficiency of ballast in composite flywheels
p0549 A80-40068
BALLOON FLIGHT
Results of the 1979 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-163013] p0432 N80-24752
BAND STRUCTURE OF SOLIDS
'Band readjustment' effect with applications to solar cells
p0397 A80-35367
Review of solid state physics --- emphasizing background for understanding solar cells
p0419 A80-42454
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583
BARRIER LAYERS
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583
BATTERY CHARGERS
Pulse charging of lead-acid traction cells
[NASA-TM-81513] p0558 N80-25780
BEAM SPLITTERS
Design of Helios beam diagnostics
p0518 A80-38486
BEARINGS
Magnetic bearing support study for a 10 kW-hr energy storage flywheel
[SAND-79-7025] p0555 N80-23661
BEDROCK
Thermal storage in rock beds
p0545 A80-33512
BEDS (GEOLOGY)
Drilling horizontal holes in coal bed from the surface with water jets
[SAND-80-0057C] p0492 N80-25766
BEDS (PROCESS ENGINEERING)
Comparison of measured and predicted rock bed storage performance
p0546 A80-33870
A convolution model of rock bed thermal storage units
p0550 A80-43480
Test and evaluate the TRI-GAS low-Btu coal gasification process
[FE-2798-66] p0482 N80-23484
Bulk hydrogen storage using metal hydrides
[BNL-27093] p0463 N80-24483
Synthane pilot plant, South Park Township, Pennsylvania
[COO-0003-41-T1] p0489 N80-25455
Optimization studies of various coal-conversions systems: Coal dissolution phenomena
[FE-2274-7] p0489 N80-25461
EDS coal liquefaction process development, phase 4. EDS commercial plant study design update, offsite design basis: Illinois coal market flexibility sensitivity case
[FE-2893-37] p0491 N80-25475
Development of a single-stage, entrained-flow, short-residence-time hydrogasifier
[FE-2518-24] p0497 N80-26525
Hydrodenitrogenation of coal liquids and petroleum with heterogenous catalysts in multiphase reactors. Review and recommendations for further work
[PB80-151442] p0499 N80-26549
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494
Startup and initial feasibility testing on the Salem Harbor COM demonstration
p0501 N80-27499
Operation of a central preparation plant for coal-oil-water mixtures
p0501 N80-27500
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501
Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM
p0502 N80-27508
Coal gasification technology. Citations from the NTIS data center
[PB80-808082] p0503 N80-27527
BENZENE
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology
p0467 A80-34531
BETA FACTOR
Numerical studies of new stellarator concepts
p0511 A80-34978
Review of the ISX-B experimental program
p0515 A80-37181
BIBLIOGRAPHIES
Solar power satellites. Citations from the International Aerospace Abstracts data base
[NASA-CR-162931] p0541 N80-22861
Solar space heating and air conditioning, volume 3. Citations from the NTIS data base
[PB80-801707] p0424 N80-22864
Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base
[PB80-801723] p0425 N80-22865
Solar space heating and air conditioning, volume 4. Citations from the NTIS data base
[PB80-801715] p0425 N80-22866
Passive solar space heating and cooling. Citations from the engineering index data base
[PB80-801749] p0425 N80-22867
Passive solar space heating and cooling. Citations from the NTIS data base
[PB80-801731] p0425 N80-22868
Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base
[PB80-803794] p0425 N80-22869
Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base
[PB80-803778] p0425 N80-22870
Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base
[PB80-803786] p0425 N80-22871
Cadium sulfide solar cells, volume 2. Citations from the NTIS data base
[PB80-802226] p0425 N80-22872
Cadmium sulfide solar cells. Citations from the Engineering Index data base
[PB80-802234] p0426 N80-22873
Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base
[PB80-805245] p0491 N80-25478
Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base
[PB80-805252] p0491 N80-25479

Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base
[PB80-805401] p0346 N80-25678
Diesel exhaust emissions. Citations from the American Petroleum Institute data base
[PB80-805419] p0347 N80-25679
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163311] p0492 N80-25770
Research to identify components of energy-related wastes: A state-of-the-art report --- environment effects, bibliographies
[PB80-137961] p0351 N80-25943
Coal gasification technology. Citations from the NTIS data base
[PB80-808090] p0503 N80-27525
Coal liquefaction technology. Citations from the NTIS data base
[PB80-808108] p0503 N80-27526
Coal gasification technology. Citations from the NTIS data center
[PB80-808082] p0503 N80-27527
Solar process heat. Citations from the NTIS data base
[PB80-807936] p0457 N80-27823

BINARY CODES
Comparison between results of the HELIOS and MIRVAL computer codes applied to central receiver solar-energy collection
[SAND-79-8266] p0448 N80-26075

BINARY MIXTURES
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery
p0549 A80-40605

BIOCHEMICAL FUEL CELLS
Coal derived fuel gases for molten carbonate fuel cells
[METC-8085-T2] p0487 N80-24498

BIOCHEMISTRY
Retrospective search on the biochemical production of alcohol fuels
[NP-24137] p0482 N80-23476

BIODEGRADABILITY
Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474

BIODEGRADATION
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486

BIOLOGY
Biologically important compounds in synfuels processes
[CONF-800303-13] p0498 N80-26540

BIOMASS
Microalgal biomass systems for fuels, chemicals, and fertilizers
p0465 A80-33409
Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665
Biosources Digest. A journal on biomass utilization, volume 1, number 3
[PB80-139306] p0487 N80-24504
Proceedings forest and field fuels symposium
[CONF-7710156] p0487 N80-24630
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

BIOMASS ENERGY PRODUCTION
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
p0459 A80-33406
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407
Conversion processes for liquid fuels from biomass
p0465 A80-33411
Liquid fuel production from biomass
p0465 A80-33412
Economics of energy recovery from biomass using fluidized-bed combustion
p0465 A80-33413
Pellets of immobilized yeast cells as biocatalysts for transforming biomass
p0466 A80-33414
A modular system for bio-gas production using farm waste
p0466 A80-33415
Development and characterization of ethanol tolerance in clostridium thermocellum --- biomass energy production
p0466 A80-33416
Xylose recovery from hemicellulose by selective acid hydrolysis --- biomass energy production
p0466 A80-33417
Solar flash pyrolysis of biomass
p0359 A80-33431
The potential of crop residues as a fuel for power generation
p0466 A80-33750
Bioconversion --- biomass energy production - research and development
p0471 A80-37504
Utilization of cellulosic feedstock in the production of fuel grade ethanol
p0472 A80-37679
Ethanol, a clean burning bio-solar fuel - Its production and utilization
p0472 A80-37986
Use of renewable fuels in the rural development of India
p0327 A80-37989
End use energy in Brazil and the solar technologies
p0472 A80-38016
Bioconversion of solar energy
p0420 A80-42465
Pyrolytic gasification of renewable biomass resources
p0478 A80-42466
Compaction and densification of fuels from biomass
p0478 A80-42467
Biomass energy conversion workshop for industrial executives
[SERI/TP-62-299] p0480 N80-22516
Survey of biomass gasification. Volume 2: Principles of gasification
[SERI/TR-33-239-VOL-2] p0481 N80-22524
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9] p0483 N80-23486
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-8] p0483 N80-23487
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T1] p0484 N80-23840
Environmental development plan for biomass energy systems
[DOE/EDP-0032] p0340 N80-23876
Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474
Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass
[BMI-2031-VOL-2] p0341 N80-24475
LBL continuous biomass liquefaction Process Engineering Unit (PEU)
[LBL-10092] p0487 N80-24490
Environmental and institutional considerations in the development and implementation of biomass energy technologies
[SERI/TR-62-264] p0341 N80-24493

Biosources Digest. A journal on biomass utilization, volume 1, number 3
[PB80-139306] p0487 N80-24504
Proceedings forest and field fuels symposium
[CONF-7710156] p0487 N80-24630
Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266] p0490 N80-25465
Conversion of biomass materials into gaseous products. Operation of the POU
[SAN-1241-3] p0490 N80-25466
Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant
[AD-A082756] p0492 N80-25797
Biosources digest, a journal on biomass utilization, volume 1, no. 1
[PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass utilization, volume 1, no. 4
[PB80-140981] p0493 N80-25909
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2] p0498 N80-26533
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T2] p0503 N80-27514
Hydrolyzed wood slurry flow modeling --- hydrocarbon fuel production
[LBL-10090] p0504 N80-27703
Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming
[PB80-157662] p0504 N80-27795

BIOTECHNOLOGY
Bioconversion --- biomass energy production - research and development
p0471 A80-37504

BISMUTH COMPOUNDS
Lithium batteries with voltage compatibility with conventional systems
p0549 A80-40604

BISMUTH TELLURIDES
Solar thermoelectric generation using bismuth telluride alloys
p0421 A80-43479

BLANKETS (FUSION REACTORS)
Materials implications of fusion-fission reactor designs
p0506 A80-33044
Evaluation of materials for EPR power generation
p0507 A80-33058
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059

BLUE GREEN ALGAE
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
p0459 A80-33406

BOILERS
A prototype of solar linear concentrators plant installed to supply industrial heat
p0372 A80-33592
Thermal fatigue analysis of the Department of Energy Barstow Pilot Plant
p0374 A80-33609
Three-dimensional numerical evaluation of heat loss through natural convection in a solar boiler
p0413 A80-38274
Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner
[FE-2489-45] p0334 N80-22520
Energy storage-boiler tank
p0554 N80-22820
Design of a system using CPC collectors to collect solar energy and to produce industrial process steam
[ANL-79-102] p0443 N80-25814
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505

BOILING
Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants
p0411 A80-38007

BOOLEAN FUNCTIONS
A Boolean approach to common cause analysis
p0328 A80-40349

BOUNDARY LAYER PLASMAS
Current constriction near the anode in a combustion products plasma --- in MHD generators
p0510 A80-34865
Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel
p0511 A80-34875
Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections
p0514 A80-36397

BOUNDARY LAYERS
Control of gradient zone boundaries --- in solar ponds
p0371 A80-33584

BOUNDARY VALUE PROBLEMS
Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump
p0509 A80-34312

BRAKING
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216

BRAYTON CYCLE
A solar thermal-electric experimental plant
p0374 A80-33606
Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine
p0377 A80-33635
Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592] p0526 N80-22778
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1] p0529 N80-23850
The development of an air Brayton and a steam Rankine solar receiver
p0434 N80-24770
Cost estimating Brayton and Stirling engines
p0531 N80-24781
Compact closed cycle Brayton system feasibility study, volume 1 --- marine propulsion
[AD-A081379] p0532 N80-25666
Cost and price estimate of Brayton and Stirling engines in selected production volumes
[NASA-CR-163265] p0536 N80-26769
Development of an Air Brayton solar receiver
[NASA-CR-163027] p0450 N80-26777

BRAZIL
End use energy in Brazil and the solar technologies
p0472 A80-38016

BREMSSTRAHLUNG
Absorption of radiation in a magnetoplasma and application to the laser-fusion process
p0525 A80-43496

BRINES
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399

BROMIDES
- Solar powered environment control - Criteria and realization p0366 A80-33534

BUILDINGS
- Determination of the shadows area induced on horizontal and vertical surfaces anyway oriented p0384 A80-33700
- Passive solar wall collectors p0404 A80-37949
- Energy performance standards for new buildings: Economic analysis [DOE/CS-0129] p0344 N80-24871
- Solar energy system performance evaluation. Albuquerque Western no. 1, Albuquerque, New Mexico [SOLAR/1011-79/14] p0443 N80-25816
- Evaluation of residential building energy performance standards [LBL-9816] p0348 N80-25849
- Site and building energy-conservation study: Survey of building 251, diagnostic chemistry [UCRL-15190] p0348 N80-25880
- Proposed energy performance standards for new buildings: Standard building operating conditions [DOE/CS-0118] p0349 N80-25901
- Proposed energy-performance standards for new buildings: Passive and active solar-heating analysis [DOE/CS-0117] p0349 N80-25902
- Architects and engineers guide to energy conservation in existing buildings [DOE/CS-0132] p0351 N80-26550
- State options in lighting: Efficiency standards for existing public buildings [DOE/CS-5255/2] p0352 N80-26600
- Examination of energy consumption and the possibilities of energy savings in office buildings p0353 N80-26791
- Site and building energy-conservation study: Survey of building 3, experimental physics [UCRL-15195] p0353 N80-26808
- Lessons of the NASA Tech House [NASA-SP-442] p0456 N80-27219
- Analysis of code related responses from the solar demonstration program [PB80-153968] p0457 N80-27827

BURNERS
- Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner [FE-2489-45] p0334 N80-22520

BUTANES
- Design of an isobutane binary cycle geothermal generation system p0509 A80-34559
- Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies [FE-2416-43-VOL-5] p0488 N80-24808

BY-PRODUCTS
- Catalytic hydrogenation for coal-derived liquids [FE-2034-16] p0486 N80-24488

C

CADMIUM SELENIDES
- Thin-film and ceramic solar converters based on cadmium sulfide and selenide p0401 A80-36824

CADMIUM SULFIDES
- A 20 kW photovoltaic flat panel power system in El Paso, Texas p0385 A80-33716
- A fabrication process for Cu2S-CdS thin film solar cells p0385 A80-33719
- Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells p0385 A80-33720
- The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency p0394 A80-35339
- The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements --- thin film solar cell p0398 A80-35486
- Etching of CdS films p0398 A80-35488
- Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements p0398 A80-35491
- Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters p0400 A80-36591
- Thin-film and ceramic solar converters based on cadmium sulfide and selenide p0401 A80-36824
- Screen printed thin film CdS/CdTe solar cell p0401 A80-36898
- Single-crystal solar cell heterojunctions involving N-cadmium sulfide p0413 A80-39061
- The design and fabrication of high efficiency thin film CdS/Cu2S solar cells p0422 A80-43516
- Cadium sulfide solar cells, volume 2. Citations from the NTIS data base [PB80-802226] p0425 N80-22872
- Cadmium sulfide solar cells. Citations from the Engineering Index data base [PB80-802234] p0426 N80-22873
- Solor Cell Heterojunctions Involving N-cadmium sulfide and certain P-type semiconductor single crystals p0426 N80-23766
- Cadmium sulfide/copper sulfide heterojunction cell research [DOE/ET/20429-1] p0440 N80-24847

CADMIUM TELLURIDES
- Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces p0390 A80-33786
- Screen printed thin film CdS/CdTe solar cell p0401 A80-36898
- Optimization of graded doping CdTe solar cells p0409 A80-37998
- Properties of sputtered ITO/CdTe solar cells p0426 N80-23767

CALCIUM CARBONATES
- Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3 p0520 A80-40716

CALCIUM CHLORIDES
- Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions p0467 A80-34019

CALCIUM OXIDES
- Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems p0326 A80-37618

CALIBRATING
- Results of the 1979 NASA/JPL balloon flight solar cell calibration program [NASA-CR-163013] p0432 N80-24752
- Dimensions/NBS, volume 63, no. 11 --- standards in measuring instruments [PB80-141542] p0541 N80-25195

CALIFORNIA
- Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California [UCRL-15108] p0483 N80-23756
- California thermal oil utilization. Volume 1: Executive summary [SAN-1864-1] p0488 N80-24849
- Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California [SAN-1740-2] p0492 N80-25868
- Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9 [NASA-CR-163267] p0352 N80-26772
- Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2 [LBL-10098] p0353 N80-26817
- Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming [PB80-157662] p0504 N80-27795

CANADA
Canada's federal solar energy program p0323 A80-33436
The Saskatchewan Conservation House - A year of performance data p0369 A80-33566
Canada: Estimates of future energy/GNP relationships [ORAU/IEA(M)-79-24] p0339 N80-23849
Current status of the Canadian coal-oil mixture program p0501 N80-27496
Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming [PB80-157662] p0504 N80-27795
CAPACITANCE
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells p0394 A80-35345
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance modes p0405 A80-37952
CAPACITORS
Commutator dc machines used as mechanical capacitors in a series resonant ohmic-heating circuit simulation [LA-UR-79-3122] p0526 N80-22619
CARBOHYDRATES
Retrospective search on the biochemical production of alcohol fuels [NP-24137] p0482 N80-23476
Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass [BMI-2031-VOL-2] p0341 N80-24475
CARBON
Energy storage and electron transfer by carbanion photolysis p0545 A80-33419
A new solar thermal receiver utilizing small particles p0379 A80-33652
Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004
Solar collector studies for solar heating and cooling applications [ALO-5355-T1] p0445 N80-25850
The combustion of carbon, coal and coal related fuels in an opposed flow diffusion flame burner p0500 N80-27493
CARBON COMPOUNDS
Evaluation of cathode materials for the lithium/carbonmonofluoride battery p0549 A80-40606
CARBON DIOXIDE
Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids p0539 A80-33424
Oil shales and carbon dioxide --- air pollution during retorting p0467 A80-34539
Use of solar energy to reduce carbon dioxide p0403 A80-37302
Impacts of fossil fuel use on environment and climate p0326 A80-37331
Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system p0539 A80-40713
Displacement of oil by carbon dioxide [DOE/MC-03260/4] p0492 N80-25768
Oil recovery by carbon dioxide injection --- Rock Creek Big Injun field, West Virginia [ORO-5301-47] p0500 N80-26754
Environmental control technology for atmospheric carbon dioxide [BNL-51116] p0354 N80-26956
CARBON DIOXIDE CONCENTRATION
CO2 concentrations in a molten carbonate electrochemical cell [ASME PAPER 80-ENAS-14] p0523 A80-43190
CARBON DIOXIDE LASERS
Three-dimensional reconstruction of the X-ray emission in laser imploded targets p0510 A80-34749
A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854
Optical performance of the Gemini carbon dioxide laser fusion system p0517 A80-38482
Beam simultaneity in multi-terawatt CO2 laser fusion systems p0517 A80-38483
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system p0517 A80-38484
LOTS analysis of optical diffraction in Antares --- Laser Optical Train Simulator code for fusion research p0518 A80-38490
Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems p0518 A80-38491
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems p0518 A80-38492
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system p0518 A80-38493
Solar power satellite system definition study. Volume 3: Laser SPS analysis, phase 3 [NASA-CR-160744] p0543 N80-27811
CARBON DIOXIDE REMOVAL
Environmental control technology for atmospheric carbon dioxide [BNL-27164] p0345 N80-24888
CARBON MONOXIDE
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results [ASME PAPER 80-GT-60] p0331 A80-42190
Control techniques for carbon monoxide emissions [PB80-140510] p0345 N80-24890
CARBON MONOXIDE LASERS
Solar power satellite system definition study. Volume 3: Laser SPS analysis, phase 3 [NASA-CR-160744] p0543 N80-27811
CARBONATES
CO2 concentrations in a molten carbonate electrochemical cell [ASME PAPER 80-ENAS-14] p0523 A80-43190
High-temperature fuel cell research and development [SAN-1485-T1] p0534 N80-25846
Fuel cell research on second-generation molten-carbonate systems [SAN-11276-1] p0534 N80-25847
High temperature fuel cell research and development [SAN-1485-2] p0534 N80-25848
CARRIER INJECTION
A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection p0396 A80-35358
CASCADE FLOW
Electro-wind energy system with oversynchronous cascade and simple adaptive maximal power control p0508 A80-33775
CASCADES
Cascade solar-cell design for high-temperature operation p0397 A80-35365
CASE HISTORIES
The application of shallow solar ponds for industrial process heat - Case histories p0372 A80-33588
CASES (CONTAINERS)
Manufacturing methods of a composite cell case for a Ni-Cd battery p0546 A80-34777
CASSEGRAIN OPTICS
Optical analysis of Cassegrainian concentrator systems p0377 A80-33631
Spectrophotovoltaic orbital power generation [NASA-CR-161451] p0530 N80-24757
CATALYSIS
Muon catalysis for energy production by nuclear fusion p0517 A80-38289
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis [LA-8133-PR] p0486 N80-24487

CATALYSTS
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy p0459 A80-33407
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944 p0471 A80-37678
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366
Coal liquefaction catalysts p0472 A80-39419
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents p0472 A80-39420
Fundamental aspects of catalyzed coal char gasification p0473 A80-40753
Coal derived liquids hydrotreatment-catalysts deactivation study p0479 N80-22421
Methanol and methyl fuel catalysts --- CuO/ZnO catalysts [FE-3177-3] p0482 N80-23482
The effect of catalyst length and downstream reactor distance on catalytic combustor performance [NASA-TM-81475] p0337 N80-23779
Catalytic hydrogenation for coal-derived liquids [FE-2034-16] p0486 N80-24488
Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979 [FE-2514-M4] p0490 N80-25471
Hydrodenitrogenation of coal liquids and petroleum with heterogenous catalysts in multiphase reactors. Review and recommendations for further work [PB80-151442] p0499 N80-26549
CATALYTIC ACTIVITY
Chemical nature of coal hydrogenation oils. I - The effect of catalysts p0467 A80-34532
Catalytic coal gasification for SNG manufacture --- Substitute Natural Gas p0474 A80-40755
Coal derived liquids hydrotreatment-catalysts deactivation study p0479 N80-22421
Catalytic hydrogenation of coal-derived liquids [FE-2034-17] p0489 N80-25398
Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research [FE-2202-51] p0498 N80-26534
CATHODES
Evaluation of cathode materials for the lithium/carbonmonofluoride battery p0549 A80-40606
Evaluation of air cathodes for potential use in development of aluminum-air cells [UCID-18561] p0535 N80-25893
CATHOLYTES
Electrical data of sodium/sulfur cells operating with dissolved catholyte p0547 A80-37005
CATIONS
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures [ORNL/TM-7061] p0529 N80-23839
CELL CATHODES
Voltage losses in fuel cell cathodes p0522 A80-42294
CELLULOSE
Development and characterization of ethanol tolerance in clostridium thermocellum --- biomass energy production p0466 A80-33416
Xylose recovery from hemicellulose by selective acid hydrolysis --- biomass energy production p0466 A80-33417
Utilization of cellulosic feedstock in the production of fuel grade ethanol p0472 A80-37679
CEMENTS
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry [DOE/ET-12434/T1] p0537 N80-26853
CERAMIC COATINGS
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors p0399 A80-35500
CERAMICS
Advanced solar receiver development p0379 A80-33649
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters p0400 A80-36591
High-temperature fuel cell research and development [SAN-1485-T1] p0534 N80-25846
High temperature fuel cell research and development [SAN-1485-2] p0534 N80-25848
CERIUM OXIDES
Methanol and methyl fuel catalysts --- CuO/ZnO catalysts [FE-3177-3] p0482 N80-23482
CHAINS
Studies on questions of design and construction of chain scraper conveyors --- mining operations [NASA-TM-75810] p0499 N80-26663
CHANNEL FLOW
Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography p0360 A80-33453
Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump p0509 A80-34312
The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator p0510 A80-34619
A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes p0510 A80-34620
Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel p0511 A80-34875
Hall effects on MHD Couette flow in a rotating system p0523 A80-43226
CHEMICAL ANALYSIS
Composition profiling of solar coating materials [COO-2953-4] p0437 N80-24818
CHEMICAL BONDS
A quinone-assisted photoformation of energy-rich chemical bonds p0408 A80-37985
CHEMICAL CLEANING
How clean gas is made from coal p0471 A80-36314
CHEMICAL COMPOSITION
What is black chrome p0387 A80-33738
Prediction of thermophysical properties of petroleum fractions p0479 N80-22428
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures [ORNL/TM-7061] p0529 N80-23839
CHEMICAL COMPOUNDS
Biologically important compounds in synfuels processes [CONF-800303-13] p0498 N80-26540
CHEMICAL ENERGY
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent --- for solar heating and cooling energy storage p0358 A80-33423
Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system p0358 A80-33426
Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling p0359 A80-33429

Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry
p0359 A80-33430
Upper limit for the conversion of solar energy
p0397 A80-35372
Hybrid chemical concepts for storage of solar thermal energy
p0548 A80-37988
Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system
p0539 A80-40713
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3
p0520 A80-40716
Electrochemistry, power sources and energy science
p0521 A80-41851

CHEMICAL ENGINEERING
Engineering kinetics of short residence time coal liquefaction processes
p0471 A80-37676
Utilization of cellulosic feedstock in the production of fuel grade ethanol
p0472 A80-37679

CHEMICAL FRACTIONATION
Chemical nature of coal hydrogenation oils. I - The effect of catalysts
p0467 A80-34532
Chemical nature of coal hydrogenation oils. II - The effect of temperature
p0467 A80-34533

CHEMICAL FUELS
Utilization of cellulosic feedstock in the production of fuel grade ethanol
p0472 A80-37679
Overall efficiencies for conversion of solar energy to a chemical fuel
[SAND-79-8636] p0431 N80-24495

CHEMICAL PROPERTIES
Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources
[COO-4776-2] p0355 N80-26958

CHEMICAL REACTIONS
Fundamental aspects of catalysed coal char gasification
p0473 A80-40753
Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions
p0478 A80-42800
Research on diamantane and other high density hydrocarbon fuels
[AD-A080749] p0482 N80-23474
Methane from landfills
[CONF-790999-1] p0485 N80-24472
Coal Liquefaction
[DOE/ET-0068/4] p0486 N80-24480
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage
[ORO-5759-T1] p0557 N80-24866
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460
Optimization studies of various coal-conversions systems: Coal dissolution phenomena
[FE-2274-7] p0489 N80-25461
Development of a single-stage, entrained-flow, short-residence-time hydrogasifier
[FE-2518-24] p0497 N80-26525

CHEMICAL REACTORS
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944
p0471 A80-37678
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152] p0484 N80-24464
Solar-heated fluidized bed gasification system
[NASA-CASE-NPO-15071-1] p0432 N80-24747

Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628
Advanced development of a short residence-time hydrogasifier
[FE-3125-8] p0500 N80-26832
Coal gasification technology. Citations from the NTIS data base
[PB80-808090] p0503 N80-27525

CHINA
Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel
p0501 N80-27497

CHIPS (ELECTRONICS)
Short course in microprocessors for solar energy applications Microprocessors, microcomputers and single chip computers
p0419 A80-42460
Short course in microprocessors for solar energy applications - The microcomputer family
p0420 A80-42464

CHLORINE
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152] p0484 N80-24464

CHLOROPHYLLS
Association of chlorophyll with surfactants on a particle surface --- for solar energy conversion
p0358 A80-33421

CHROMIUM
What is black chrome
p0387 A80-33738
Thermal degradation of a black chrome solar selective absorber coating - Short term
p0387 A80-33739
Selective electrodeposited chromium black coatings - Optical properties, selectivity model
p0388 A80-33743
Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594
Characterization of commercial black chrome coatings
p0402 A80-37190
Development of materials for a luminescent solar collector
[COO-4996-1] p0443 N80-25812

CHROMIUM ALLOYS
Optical and topographical properties of selective black chrome
p0422 A80-43514

CHROMIUM OXIDES
Thermal aging characteristics of electrodeposited black chrome solar coatings
p0388 A80-33740
The effect of a black chrome selective surface on the thermal performance of a solar collector
p0414 A80-40538

CIRCUIT DIAGRAMS
A circuit for measurement of the fill factor of solar cells
p0399 A80-36121

CIRCUITS
Power take-off analysis for diagonally connected MHD channels
[CONF-800104-6] p0535 N80-26167

CIRCULAR CYLINDERS
Cylindrical glass tubes for flat plate collector covers
p0361 A80-33460
Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951

CIRCULAR TUBES
Three dimensional ray tracing through concentric tubular elements using vector methods --- for solar collectors study
p0360 A80-33459
Low cost spiral shaped solar collector
p0406 A80-37960

CIRCUMSOLAR RADIATION
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761
Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840

CITRATES
  Flue gas desulfurization by the modified citrate process: Report of investigations
  [PB80-134836] p0351 N80-25940
CIVIL AVIATION
  Energy and civil aviation
  p0475 A80-41871
  Energy conservation potential of general aviation activity
  [AD-A081182] p0355 N80-27355
CLADDING
  Solar-cladding - Insulation plus insolation --- applying insulation material to outside building walls
  p0384 A80-33708
CLEAN ENERGY
  Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures
  p0416 A80-42435
  Regional planning strategies for hybrid energy optimization
  p0332 A80-42451
  Wind power
  p0478 A80-42470
  The utilization of wind-energy resources --- Soviet Union, U.S., West Europe developments review
  p0478 A80-42700
  Fossil energy program
  [ORNL-TM-7095] p0481 N80-22853
  Fossil energy program
  [ORNL/TM-7144] p0484 N80-23828
  Characteristics of American coals in relation to their conversion into clean energy fuels
  [FE-2030-13] p0485 N80-24476
CLEAN FUELS
  How clean gas is made from coal
  p0471 A80-36314
  Catalytic hydrogenation of coal-derived liquids
  [FE-2034-17] p0489 N80-25398
  Feasibility study of using a coal/water oil emulsion as a clean liquid fuel
  [FE-2437-T1-ADD] p0490 N80-25463
  Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979
  [FE-2514-M4] p0490 N80-25471
CLEANING
  Criteria for assessment of environmental pollutants from coal cleaning processes
  [PB80-102791] p0336 N80-22895
  Cleaning agents and techniques for concentrating solar collectors
  [SAND-80-7005C] p0445 N80-25860
CLEARANCES
  Fuel conservation through active control of rotor clearances
  [AIAA PAPER 80-1087] p0330 A80-41506
CLIMATE
  Climate program plan, volume 1 --- effects of energy technologies on climate and environment
  [DOE/EV-0062/1] p0351 N80-26003
CLIMATOLOGY
  Impacts of fossil fuel use on environment and climate
  p0326 A80-37331
  Mean monthly performance of passive solar water heaters
  [LBL-9295] p0437 N80-24820
  Prospects for using improved climate information to better manage energy systems
  [UCRL-83813] p0343 N80-24859
CLIMBING FLIGHT
  Fuel efficiency of small aircraft
  [AIAA PAPER 80-1847] p0333 A80-43305
CLOSED CYCLES
  Closed cycle osmotic power plants for electric power production
  p0470 A80-36051
  A perspective on closed-cycle gas turbines applied to naval-ship propulsion
  [AIAA PAPER 80-1304] p0519 A80-39014
  The prospects for solar-powered closed-cycle gas turbines
  [ASME PAPER 80-GT-26] p0416 A80-42161
  Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
  [ASME PAPER 80-GT-27] p0521 A80-42162
  2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant
  [ASME PAPER 80-GT-132] p0477 A80-42245
  Closed-cycle gas turbine working fluids
  [ASME PAPER 80-GT-135] p0522 A80-42248
  Evaluation method for closed cycle gas turbines in cogeneration applications
  [ASME PAPER 80-GT-176] p0332 A80-42282
  Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources
  [GA-A-15322] p0335 N80-22837
  Compact closed cycle Brayton system feasibility study, volume 1 --- marine propulsion
  [AD-A081379] p0532 N80-25666
CLOUD COVER
  Markov chains to solar energy storage calculations
  p0390 A80-33766
  Attenuation of solar energy by high, thin clouds
  p0414 A80-40709
CLOUDS (METEOROLOGY)
  Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds
  p0325 A80-36419
COAL
  Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas
  [FE-2566-25] p0480 N80-22519
  Literature survey of properties of synfuels derived from coal
  [NASA-TM-79243] p0481 N80-22776
  Criteria for assessment of environmental pollutants from coal cleaning processes
  [PB80-102791] p0336 N80-22895
  Coal-shale interface detector
  [NASA-CASE-MFS-23720-1] p0483 N80-23711
  Development and testing of a microwave system to measure coal layer thickness up to 25 cm
  [FE-8881-1] p0483 N80-23757
  Environmental standards for coal conversion processes. Volume 1: Most stringent, federal, and selected state regulations
  [PB80-126980] p0341 N80-23904
  Coal desulfurization by low temperature chlorinolysis, phase 2
  [NASA-CR-163152] p0484 N80-24464
  Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
  [FE-2315-43] p0486 N80-24482
  Forecast of long term coal supply and mining conditions: Model documentation and results
  [NASA-CR-163141] p0487 N80-24728
  Georgetown University Generic Integrated Community Energy System GU ICES demonstration project. Modified work management plan
  [COO-4488-2] p0343 N80-24838
  Environmental control technology for the flash hydropyrolysis of coal
  [BNL-50983] p0345 N80-24884
  Preparation of a coal conversion systems technical data book
  [FE-2286-44] p0490 N80-25472
  Evaluation of physical/chemical coal cleaning and flue gas desulfurization
  [PB80-147622] p0346 N80-25481
  Economic baselines for current underground coal mining technology
  [NASA-CR-163259] p0491 N80-25764
  Drilling horizontal holes in coal bed from the surface with water jets
  [SAND-80-0057C] p0492 N80-25766
  Investigation of fuels containing coal-oil-water emulsions
  [FE-2689-5] p0497 N80-26524
  Coal gasification technology. Citations from the NTIS data base
  [PB80-808090] p0503 N80-27525
COAL GASIFICATION
  How clean gas is made from coal
  p0471 A80-36314
  Solar coal gasification
  p0403 A80-37305

Hydrogen from fossil fuels p0460 A80-37333

Description of processes for producing hydrogen by coal gasification p0460 A80-37334

Fuel gases from coal gasification for the gas/steam turbine process p0472 A80-38300

Hoe Creek No. 3 - First long-term underground coal gasification experiment with oxygen-steam injection p0473 A80-39765

In-situ gasification and liquefaction show promise p0473 A80-40525

Status of coal gasification processes p0540 A80-40752

Fundamental aspects of catalysed coal char gasification p0473 A80-40753

Coal gasification development and commercialization of the Texaco coal gasification process p0474 A80-40754

Catalytic coal gasification for SNG manufacture --- Substitute Natural Gas p0474 A80-40755

The U-GAS process --- synthetic fuel production by coal gasification p0474 A80-40756

Synthetic fuels from coal: Overview and assessment --- Book p0329 A80-40825

Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor p0330 A80-41558

Design and test of a 73-MW water cooled gas turbine [ASME PAPER 80-GT-112] p0477 A80-42230

Survey of integrated gasification combined cycle power plant performance estimates [ASME PAPER 80-GT-113] p0477 A80-42231

Diagnostics and instrumentation requirements for advanced power systems --- coal-fired gas turbine systems [ASME PAPER 80-GT-129] p0477 A80-42243

2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant [ASME PAPER 80-GT-132] p0477 A80-42245

Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants [ASME PAPER 80-GT-160] p0550 A80-42270

Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption [ASME PAPER 80-GT-161] p0477 A80-42271

High temperature combustor designed for operation with coal derived low Btu gaseous fuels [ASME PAPER 80-GT-187] p0478 A80-42289

Development of a high temperature turbine for operation on coal-derived fuel [ASME PAPER 80-GT-188] p0478 A80-42290

Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions p0478 A80-42800

A steam process for the gasification of coal p0480 N80-22507

Guidelines for economic evaluation of coal conversion processes [FE-2468-44] p0480 N80-22521

Pressure-change underground gasification: Theoretical and experimental investigations of gasification [BMFT-FB-T-79-05] p0481 N80-22525

Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents [PB80-126469] p0334 N80-22527

Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes [PB80-126477] p0334 N80-22528

Test and evaluate the TRI-GAS low-Btu coal gasification process [FE-2798-66] p0482 N80-23484

Summary of the research and development effort on open-cycle coal-fired gas turbines [ORNL/TM-6253] p0528 N80-23821

Coal conversion products industrial applications [NASA-CR-161469] p0484 N80-24465

Conceptual design of a coal-to-methanol-to-gasoline commercial plant, volume 1 [FE-2416-43-VOL-1] p0484 N80-24467

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis [FE-2416-43-VOL-2] p0485 N80-24468

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4A: Drawings, specifications, and alternate designs [FE-2416-43-VOL-4A] p0485 N80-24469

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4B: Drawings, specifications, and alternate designs [FE-2416-43-VOL-4B] p0485 N80-24470

Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol [ORNL-5439] p0485 N80-24471

Coal conversion comparisons, task 002 [FE-2468-51] p0485 N80-24479

Materials technology for coal-conversion processes --- corrosion resistance slag containers [ANL-79-93] p0486 N80-24484

Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis [LA-8133-PR] p0486 N80-24487

Coal derived fuel gases for molten carbonate fuel cells [METC-8085-T2] p0487 N80-24498

Experimental and process design study of a high rate entrained coal gasification process [FE-1548-T2] p0487 N80-24501

Solar-heated fluidized bed gasification system [NASA-CASE-NPO-15071-1] p0432 N80-24747

Synthane pilot plant, South Park Township, Pennsylvania [COO-0003-41-T1] p0489 N80-25455

Evaluation of the Texaco synthesis gas generation process for the production of hydrogen from SRC-2 residue [ORNL/SUB-7240/6] p0463 N80-25464

Test and evaluate the TRI-GAS low Btu coal gasification process [FE-2798-74] p0491 N80-25476

Development of a single-stage, entrained-flow, short-residence-time hydrogasifier [FE-2518-24] p0497 N80-26525

Preliminary engineering evaluation of promising coal liquefaction concepts [EPRI-AP-884] p0497 N80-26529

High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation [FE-1806-78] p0499 N80-26669

Advanced development of a short residence-time hydrogasifier [FE-3125-8] p0500 N80-26832

Coal gasification technology. Citations from the NTIS data base [PB80-808090] p0503 N80-27525

Coal gasification technology. Citations from the NTIS data center [PB80-808082] p0503 N80-27527

Criteria for a recommended standard: Occupational exposures in coal gasification plants [PB80-164874] p0504 N80-27535

Recommended health and safety guidelines for coal gasification pilot plants [PB80-164890] p0504 N80-27536

COAL LIQUEFACTION

Chemical nature of coal hydrogenation oils. I - The effect of catalysts p0467 A80-34532

Chemical nature of coal hydrogenation oils. II - The effect of temperature p0467 A80-34533

Automotive fuels from coal p0470 A80-35800

Engineering kinetics of short residence time coal liquefaction processes p0471 A80-37676

Coal liquefaction catalysts p0472 A80-39419

Coal liquefaction catalysis by zinc chloride melts
in combination with organic solvents
p0472 A80-39420
In-situ gasification and liquefaction show promise
p0473 A80-40525
The zinc chloride process for the hydrocracking of
coal
p0474 A80-40757
Economic and market potential for SRC-II products
--- Solvent Refined Coal
p0474 A80-40758
Synthetic fuels from coal: Overview and assessment
--- Book
p0329 A80-40825
Comparative testing of petroleum surrogate fuels
with coal-derived liquids in a combustion
turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Combustion effects of coal liquid and other
synthetic fuels in gas turbine combustors. I -
Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
Diagnostics and instrumentation requirements for
advanced power systems --- coal-fired gas
turbine systems
[ASME PAPER 80-GT-129] p0477 A80-42243
Coal derived liquids hydrotreatment-catalysts
deactivation study
p0479 N80-22421
Upgrading of coal liquids: Upgrading distillates
from coal liquefaction
[FE-2566-26] p0480 N80-22518
Guidelines for economic evaluation of coal
conversion processes
[FE-2468-44] p0480 N80-22521
Fossil energy program
[ORNL/TM-7144] p0484 N80-23828
Coal conversion comparisons, task 002
[FE-2468-51] p0485 N80-24479
Coal Liquefaction
[DOE/ET-0068/4] p0486 N80-24480
Materials technology for coal-conversion processes
--- corrosion resistance slag containers
[ANL-79-93] p0486 N80-24484
Catalytic hydrogenation for coal-derived liquids
[FE-2034-16] p0486 N80-24488
Filtration process and equipment studies for coal
liquefaction processes
[FE-2007-T1] p0487 N80-24499
Catalytic hydrogenation of coal-derived liquids
[FE-2034-17] p0489 N80-25398
Consequences of the mass spectrometric and
infrared analysis of oils and asphaltenes for
the chemistry of coal liquefaction.
Characterization of coal-derived liquids and
other fossil fuel related materials employing
mass spectrometry
[FE-2537-10] p0489 N80-25460
Optimization studies of various coal-conversions
systems: Coal dissolution phenomena
[FE-2274-7] p0489 N80-25461
Research and development of an advanced process
for conversion of coal to synthetic gasoline and
other distillate motor fuels
[FE-1800-42] p0490 N80-25473
EDS coal liquefaction process development, phase 4
[FE-2893-33] p0491 N80-25474
EDS coal liquefaction process development, phase
4. EDS commercial plant study design update,
offsite design basis: Illinois coal market
flexibility sensitivity case
[FE-2893-37] p0491 N80-25475
Autocatalytic coal liquefaction process
[NASA-CASE-NPO-14876-1] p0493 N80-26460
Preliminary engineering evaluation of promising
coal liquefaction concepts
[EPRI-AF-884] p0497 N80-26529
Engineering evaluation of conceptual coal
conversion plant using the H-coal liquefaction
process
[EPRI-AF-1297] p0498 N80-26530
Homogeneous catalytic hydrocracking processes for
conversion of coal to liquid fuels: Basic and
exploratory research
[FE-2202-51] p0498 N80-26534
Flash pyrolysis coal liquefaction process
development
[FE-2244-26] p0498 N80-26543
Research and development of an advanced process
for conversion of coal to synthetic gasoline and
other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545
Research and development of an advanced process
for conversion of coal to synthetic gasoline and
other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546
Use of petroleum-based correlations and estimation
methods for synthetic fuels
[NASA-TM-81533] p0502 N80-27509
Coal liquefaction technology. Citations from the
NTIS data base
[PB80-808108] p0503 N80-27526

COAL UTILIZATION

A process concept for the production of
benzene-ethylene-SNG from coal using flash
hydropyrolysis technology
p0467 A80-34531
The trace element chemistry of coal during
combustion and the emissions from coal-fired
plants
p0324 A80-34600
Trace element inputs from a coal burning power
plant to adjacent terrestrial and aquatic
environments
p0324 A80-35649
Investigation of first- and second-stage variables
on control of NOx emissions using staged
combustion in a pulverized coal wall-fired furnace
p0325 A80-35879
Cloud-active nuclei from coal-fired electric power
plants and their interactions with clouds
p0325 A80-36419
Air quality measurements in the coal fired power
plant environment of Colstrip, Montana
p0326 A80-36477
Solar coal gasification
p0403 A80-37305
Hydration enhanced sulfation of limestone and
dolomite in the fluidized-bed combustion of coal
p0471 A80-37617
Technical aspects of lime/limestone scrubbers for
coal-fired power plants. I - Process chemistry
and scrubber systems
p0326 A80-37618
Environmental concerns for coal synfuel
commercialization
p0329 A80-40759
Respirable aerosols from fluidized bed coal
combustion. II - Physical characteristics of fly
ash
p0330 A80-41559
Studies of MHD generator performance with oxygen
enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570
Thermochemistry of seed and slag vaporization and
condensation in coal-fired MHD
[AIAA PAPER 80-1344] p0330 A80-41571
Fuel-flexible combined cycles for utility power
and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225
Status of the DOE/NASA critical gas turbine R & T
Project
[ASME PAPER 80-GT-104] p0477 A80-42226
Diagnostic development for advanced power systems
--- of gas turbines with coal-fire combustors
[ASME PAPER 80-GT-128] p0522 A80-42242
High-temperature, coal-fired combustor with
ceramic heat exchangers for CCGT systems ---
Closed-Cycle Gas Turbine
[ASME PAPER 80-GT-155] p0477 A80-42267
Low Btu coal gas combustion in high temperature
turbines
[ASME PAPER 80-GT-170] p0477 A80-42278
Direct ignition of pulverized coal with arc heated
air
p0480 N80-22508
Fossil energy program
[ORNL-TM-7095] p0481 N80-22853
Fossil energy prgoram
[ORNL/TM-7057] p0481 N80-22854
Fossil energy program
[ORNL/TM-7031] p0482 N80-22855
Fossil energy program
[ORNL/TM-7144] p0484 N80-23828

The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873

Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963] p0484 N80-24462

Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476

Coal conversion comparisons, task 002
[FE-2468-51] p0485 N80-24479

Coal conversion
[DOE/ET-0061/2] p0486 N80-24481

Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies
[FE-2416-43-VOL-5] p0488 N80-24808

Environmental control technology for atmospheric carbon dioxide
[BNL-27164] p0345 N80-24888

Feasibility study of using a coal/water oil emulsion as a clean liquid fuel
[FE-2437-T1-ADD] p0490 N80-25463

Flash hydropyrolysis of coal
[BNL-51052] p0490 N80-25468

Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979
[FE-2514-M4] p0490 N80-25471

Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress
[PB80-143175] p0535 N80-25910

Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923

Improved PFB operations: 400-hour turbine test results --- coal combustion products and hot corrosion in gas turbines
[NASA-TM-81511] p0493 N80-26426

The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461

Grinding of coal in oil
p0494 N80-26462

Handling coal oil mixtures with positive displacement pumps
p0494 N80-26463

Grinding of coal-in-oil slurries
p0494 N80-26464

Development of standards for coal-oil mixtures
p0494 N80-26465

Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466

Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467

Characterization and structural studies of the various types of COM
p0494 N80-26468

Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

The production of stable coal-oil mixtures using high intensity mechanical mixing devices
p0495 N80-26470

Rheological properties of solvent refined coal-oil mixtures
p0495 N80-26471

The role of coal and oil characteristics in the stability of coal-oil mixtures
p0495 N80-26472

Evaluation of "stable" emulsions of coal
p0495 N80-26473

Stabilization of coal/fuel oil slurries
p0495 N80-26474

Results of experiment production of fine COM by wet type mill
p0496 N80-26475

Fine COM preparation test
p0496 N80-26476

The use of additives to stabilize coal-oil mixture
p0496 N80-26477

COM stability forecasting method
p0496 N80-26478

Studies on the stabilization of COM
p0496 N80-26479

Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan
p0496 N80-26480

Development and evaluation of highly-loaded coal slurries
p0496 N80-26481

Atomization of coal slurry jets
p0496 N80-26482

Atomization of coal-oil mixtures
p0497 N80-26483

Basic studies on COM combustion
p0497 N80-26484

Report on fine COM combustion test
p0497 N80-26485

The CFOS (Carbonaceous Fuel-in-Oil Suspensoids) fuels
p0497 N80-26486

Coal/oil mixture pipeline: A viable alternative coal transportation system?
p0542 N80-26487

Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546

Hydrodenitrogenation of coal liquids and petroleum with heterogenous catalysts in multiphase reactors. Review and recommendations for further work
[PB80-151442] p0499 N80-26549

Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

Open-cycle MHD systems analysis
[EPRI-AF-1230] p0538 N80-27192

The combustion of carbon, coal and coal related fuels in an opposed flow diffusion flame burner
p0500 N80-27493

The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494

Overview of R&D status on COM technology in Japan
p0501 N80-27495

Current status of the Canadian coal-oil mixture program
p0501 N80-27496

Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel
p0501 N80-27497

Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498

Startup and initial feasibility testing on the Salem Harbor COM demonstration
p0501 N80-27499

Operation of a central preparation plant for coal-oil-water mixtures
p0501 N80-27500

Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501

Coal/oil/water mixture stability, appendix A
p0501 N80-27502

Stable coal/fuel oil dispersions
p0501 N80-27503

Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504

A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505

Design consideration of fine COM storage
p0502 N80-27506

Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM
p0502 N80-27507

Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM p0502 N80-27508
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-58] p0503 N80-27515
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-55] p0503 N80-27516
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-50] p0503 N80-27517
Coal: An alternate fuel for thermal enhanced oil recovery steam generation [SAN-2418-1] p0503 N80-27524

COASTAL WATER
System-reliability studies for wave-energy generation p0540 A80-43830

COATINGS
Preparation of thin films for solar energy utilization p0402 A80-37191
Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base [PB80-803794] p0425 N80-22869
Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base [PB80-803778] p0425 N80-22870
Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base [PB80-803786] p0425 N80-22871
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films [COO-4297-2] p0454 N80-26845

COAXIAL CABLES
High power pulse modeling of coaxial transmission lines p0539 A80-37828

COBALT OXIDES
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors p0399 A80-35500

COEFFICIENT OF FRICTION
Studies on questions of design and construction of chain scraper conveyors --- mining operations [NASA-TM-75810] p0499 N80-26663

COGENERATION
Fusion - An energy source for synthetic fuels [AIAA PAPER 80-0844] p0465 A80-32857
Integrating energy approaches in a large office building p0324 A80-33690
Solar energy with chemical storage for cogeneration of electric power and heat p0549 A80-40715
Fuel-flexible combined cycles for utility power and cogeneration [ASME PAPER 80-GT-101] p0331 A80-42225
Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed [ASME PAPER 80-GT-163] p0332 A80-42273
Evaluation method for closed cycle gas turbines in cogeneration applications [ASME PAPER 80-GT-176] p0332 A80-42282
Evaluation of thermal energy storage for the proposed Twin Cities District Heating system --- using cogeneration heat production and aquifiers for heat storage p0553 N80-22815
Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources [GA-A-15322] p0335 N80-22837
Fossil energy program [ORNL-TM-7095] p0481 N80-22853
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report [NASA-CR-159765] p0342 N80-24797
Cogeneration technology alternatives study. Volume 1: Summary report [NASA-CR-159759] p0347 N80-25792
Cogeneration technology alternatives study. Volume 2: Industrial process characteristics [NASA-CR-159760] p0347 N80-25793
Cogeneration technology alternatives study. Volume 4: Heat Sources, balance of plant and auxiliary systems [NASA-CR-159762] p0347 N80-25794
Cogeneration technology alternatives study. Volume 6: Computer data [NASA-CR-159764] p0347 N80-25795
Oversight: Industrial energy conservation, volume 10 [GPO-53-020] p0352 N80-26786

COLD CATHODES
A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854

COLD WATER
Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980 p0511 A80-35161
NOAA's cold-water pipe at-sea test program --- for OTEC p0511 A80-35162
The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses --- Cold Water Pipe p0511 A80-35163
An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current p0512 A80-35164
Structural analysis of a cold water pipe for a 40MWe spar OTEC platform p0512 A80-35165
At-sea test of a large diameter steel, cold water pipe --- for OTEC p0512 A80-35166
Cold water aquifer storage --- air conditioning p0554 N80-22827
Design parameters for solar powered absorption cooling systems with chilled water storage p0441 N80-25778

COLLISIONLESS PLASMAS
On the low frequency drift wave and the pseudoclassical diffusion --- of plasmas in tokamak p0512 A80-35379
Derivation of CGL theory with finite Larmor radius corrections --- for magnetized collisionless plasmas p0514 A80-36714

COLORADO
Performance evaluation of a solar air-heating and nocturnal cooling system in CSU Solar House 2 [COO-2868-5] p0440 N80-24858
CSU Solar House 3: Solar heating and cooling system performance [COO-30122-3] p0442 N80-25806
Solar project description for Perl-Mack Enterprises' single family residences, Denver, Colorado [SOLAR/1015-79/50] p0444 N80-25821

COLUMNS (PROCESS ENGINEERING)
The optimization air separation plants for combined cycle MHD-power plant applications [NASA-TM-81510] p0528 N80-23778

COMBUSTION
The combustion of carbon, coal and coal related fuels in an opposed flow diffusion flame burner p0500 N80-27493

COMBUSTION CHAMBERS
Turbopropulsion combustion - Trends and challenges [AIAA PAPER 80-1199] p0519 A80-38964
Gas turbine combustor design challenges for the 1980's [AIAA PAPER 80-1285] p0475 A80-41213
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor p0330 A80-41558
Studies of MHD generator performance with oxygen enriched coal combustion [AIAA PAPER 80-1343] p0521 A80-41570

Fuel property effects on life characteristics of aircraft turbine engine combustors
[ASME PAPER 80-GT-55] p0476 A80-42186
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests
[ASME PAPER 80-GT-68] p0476 A80-42198
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69] p0476 A80-42199
Fuel character effects on J79 and F101 engine combustor emissions
[ASME PAPER 80-GT-70] p0476 A80-42200
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems --- Closed-Cycle Gas Turbine
[ASME PAPER 80-GT-155] p0477 A80-42267
Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed
[ASME PAPER 80-GT-163] p0332 A80-42273
Low Btu coal gas combustion in high temperature turbines
[ASME PAPER 80-GT-170] p0477 A80-42278
High temperature combustor designed for operation with coal derived low Btu gaseous fuels
[ASME PAPER 80-GT-187] p0478 A80-42289
High-power MHD system combustor development testing
p0523 A80-43138
Development of a NO/x/-free combustion system
p0333 A80-43741
A 300 Btu gas combustor development program, phase 1
[EPRI-AF-1144] p0481 N80-22852
The effect of catalyst length and downstream reactor distance on catalytic combustor performance
[NASA-TM-81475] p0337 N80-23779

COMBUSTION CONTROL
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace
p0325 A80-35879

COMBUSTION EFFICIENCY
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469
Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan
p0496 N80-26480
Basic studies on COM combustion
p0497 N80-26484
Report on fine COM combustion test
p0497 N80-26485
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498
Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504

COMBUSTION PRODUCTS
Vehicle gas producers --- using solid fuels
p0467 A80-34534
Current constriction near the anode in a combustion products plasma --- in MHD generators
p0510 A80-34865
Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator
p0510 A80-34873
Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments
p0324 A80-35649
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters
p0325 A80-35878
Air quality measurements in the coal fired power plant environment of Colstrip, Montana
p0326 A80-36477
Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD
[AIAA PAPER 80-1344] p0330 A80-41571
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results
[ASME PAPER 80-GT-60] p0331 A80-42190
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
Fuel character effects on J79 and F101 engine combustor emissions
[ASME PAPER 80-GT-70] p0476 A80-42200
Diagnostics and instrumentation requirements for advanced power systems --- coal-fired gas turbine systems
[ASME PAPER 80-GT-129] p0477 A80-42243
Theory of electrode arcs in a flow of combustion products containing an additive
p0524 A80-43398
Development of a NO/x/-free combustion system
p0333 A80-43741
Improved PFB operations: 400-hour turbine test results --- coal combustion products and hot corrosion in gas turbines
[NASA-TM-81511] p0493 N80-26426
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466
Environmental control technology for atmospheric carbon dioxide
[BNL-51116] p0354 N80-26956
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A
[NASA-CR-135119] p0355 N80-27361
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382

COMBUSTION STABILITY
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498

COMMERCE
Energy extension service pilot program evaluation report: The first year. Volume 2: Pilot state reports
[DOE/CS-2671-3] p0335 N80-22850
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841

COMMERCIAL ENERGY
Status of the United States' Solar Heating and Cooling Program
p0323 A80-33446
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484
Honeywell General Offices concentrating collector system - Installation and operation
p0370 A80-33567
Integrating energy approaches in a large office building
p0324 A80-33690
Environmental concerns for coal synfuel commercialization
p0329 A80-40759
Solar air systems
p0418 A80-42444
Cooling of buildings --- solar systems
p0418 A80-42446
Solar thermal plant impact analysis and requirements definition
p0435 N80-24788
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213
EDS coal liquefaction process development, phase 4
[FE-2893-33] p0491 N80-25474
Data handbook for the national solar energy demonstration book
[DSE-5216-T4] p0446 N80-25873

Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 1: Executive summary
[SAN-1483-1/1] p0446 N80-25875
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 2, book 1: Commercial plant conceptual design
[SAN-1483-1/2] p0447 N80-25876
MHD high performance demonstration experiment
[DOE/ET-2895/5] p0535 N80-26172
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Development of standards for coal-oil mixtures
p0494 N80-26465
MOD-2 wind turbine system concept and preliminary design report. Volume 2: Detailed report
[NASA-CR-159609] p0536 N80-26775
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2] p0455 N80-26866
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494
Overview of R&D status on COM technology in Japan
p0501 N80-27495

COMMUTATORS
Operational characteristics of an ac commutator generator for wind power conversion
p0508 A80-33770
Determination of the geometry of the transition region of a series MHD generator
p0509 A80-34315
Commutator dc machines used as mechanical capacitors in a series resonant ohmic-heating circuit simulation
[LA-UR-79-3122] p0526 N80-22619

COMPACTING
Compaction and densification of fuels from biomass
p0478 A80-42467

COMPENSATORS
Collector deflections due to wind gusts and control scheme design
p0378 A80-33643

COMPOSITE MATERIALS
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062
Ion implanted materials as selective absorbers for photothermal solar energy conversion
p0388 A80-33747

COMPOSITE STRUCTURES
Concentration characteristics of composite parabolic concentrators
p0416 A80-41950

COMPRESSED AIR
Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732
Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
Application and design studies of compressed-air energy storage for solar applications
[CAES-7] p0555 N80-23788
Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23789
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188] p0555 N80-23796
Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage
[PNL-3047] p0556 N80-23823
Compressed air energy storage technology program in the United States
[PNL-SA-7669] p0557 N80-24810
Industrial compressed air applications for solar energy conversion/storage devices
[SAND-79-7077] p0451 N80-26802
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974] p0561 N80-26804

COMPRESSED GAS
A new solar thermal receiver utilizing small particles
p0379 A80-33652

COMPRESSOR ROTORS
Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines
[ASME PAPER 80-GT-117] p0522 A80-42233

COMPUTATIONAL FLUID DYNAMICS
Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections
p0514 A80-36397

COMPUTER NETWORKS
Environmental data for sites in the National Solar Data Network
[SOLAR/0010-79/05] p0339 N80-23833
Low-cost general energy/analytic information system
[BNL-26398] p0567 N80-24801

COMPUTER PROGRAMS
A data analysis program for collector testing --- solar energy for Fort Hood, Texas
p0362 A80-33482
A survey of existing solar system simulation methods
p0369 A80-33560
DELSOL - A code for central receiver performance and optimization calculations
p0376 A80-33626
An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant
p0377 A80-33628
Helios and reconcentrators --- computer code for heliostat performance predictions
p0378 A80-33637
Short course in microprocessors for solar energy applications - The microcomputer family
p0420 A80-42464
Thermal fracture effects in geothermal energy extraction --- computer programs
[LA-7963] p0483 N80-23795
Forecast of long term coal supply and mining conditions: Model documentation and results
[NASA-CR-163141] p0487 N80-24728
Comparison between results of the HELIOS and MIRVAL computer codes applied to central receiver solar-energy collection
[SAND-79-8266] p0448 N80-26075
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Design tradeoff studies and sensitivity analysis, appendices B1 - B4 --- hybrid electric vehicles
[NASA-CR-163037] p0563 N80-27225
Preliminary design data package, appendices C1 and C2
[NASA-CR-163039] p0563 N80-27227
ASHMET: A computer code for estimating insolation incident on tilted surfaces
[NASA-TM-78286] p0457 N80-27807

COMPUTER SYSTEMS DESIGN
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660
The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center
p0381 A80-33666
Short course in microprocessors for solar energy applications Microprocessors, microcomputers and single chip computers
p0419 A80-42460
Short course in microprocessors for solar energy applications - Systems --- heating system and collector control
p0419 A80-42463
Short course in microprocessors for solar energy applications - The microcomputer family
p0420 A80-42464

COMPUTER TECHNIQUES
Mini-computer-based energy monitor system
p0380 A80-33661

The design and utilization of a microprocessor-controlled absolute spectral response system --- for solar cells
p0398 A80-35492

Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

COMPUTERIZED DESIGN

Development of a 3X CPC with evacuated receiver --- Compound Parabolic Concentrator
p0364 A80-33494

DELSOL - A code for central receiver performance and optimization calculations
p0376 A80-33626

Cost and performance evaluation of passive solar systems
p0389 A80-33755

On the design of silver-hydrogen electrochemical cells
p0547 A80-37003

COMPUTERIZED SIMULATION

Open-cycle solar air conditioner
p0365 A80-33524

Evaluation of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
p0366 A80-33533

A comparative study of solar assisted heat pump systems for Canadian locations
p0367 A80-33546

Computer simulation of ground coupled storage in a series solar assisted heat pump system
p0368 A80-33547

Mass flow considerations for solar air heating systems
p0369 A80-33558

A survey of existing solar system simulation methods
p0369 A80-33560

Solar heating simulation - Accuracy and precision of a model using daily data
p0369 A80-33561

Simulation of the FSEC solar cooling system
p0369 A80-33563

User perspectives of selected solar energy system design tools
p0369 A80-33564

Study of the nonlinear dynamics of a flat-plate collector
p0369 A80-33565

Experimental system performance and comparison with computer predictions for six solar domestic hot water systems
p0370 A80-33577

Salt concentration gradient solar ponds - Modeling and optimization
p0371 A80-33585

A simplified solar cooling design method for closed-loop liquid systems
p0376 A80-33620

The simulation of partially and fully tracking flat plate collectors in northern latitudes
p0390 A80-33763

Simulation of correlated wind speeds for sites and arrays
p0466 A80-33769

Performance modeling of the vertical axis wind turbine
p0508 A80-33773

Cascade solar-cell design for high-temperature operation
p0397 A80-35365

Optimum inclination of linear reflectors
p0406 A80-37961

LOTS analysis of optical diffraction in Antares --- Laser Optical Train Simulator code for fusion research
p0518 A80-38490

Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems
p0518 A80-38491

A convolution model of rock bed thermal storage units
p0550 A80-43480

A computer analysis of heteroface solar cells with ultrathin window layer
p0422 A80-43589

Heat-pump applications to single-family dwellings - An analysis by computer model
p0333 A80-43833

SPS phase control system performance via analytical simulation
[NASA-CR-160582] p0540 N80-22378

SOLPOND: A simulation program for salinity gradient solar ponds
[SERI/TP-351-559] p0430 N80-23856

Developing and upgrading of solar system thermal energy storage simulation models
[BCS-40252] p0430 N80-23858

Energy from humid air
[DSE-2553-79/1] p0531 N80-24861

Simulation and design of solar thermal processes
[COO-2588-T1] p0444 N80-25823

Validation of solar system simulation coder by the International Energy Agency
[LA-UR-80-387] p0453 N80-26835

Analysis methods for photovoltaic applications
[SERI/SP-35-230] p0455 N80-26868

CONCENTRATORS

Prediction of long-term performance of closed-loop concentrating solar collector systems
p0362 A80-33479

Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480

Evaluation of linear concentrating collectors
p0362 A80-33481

Economic analysis of a point focusing concentrating collector system
p0363 A80-33484

Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers
p0363 A80-33489

Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors --- Compound Parabolic Concentrator
p0364 A80-33493

Development of a 3X CPC with evacuated receiver --- Compound Parabolic Concentrator
p0364 A80-33494

Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors
p0364 A80-33496

Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497

A unique new Fresnel lens solar concentrator
p0364 A80-33499

The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503

A stationary prism concentrator for solar cells
p0365 A80-33504

Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505

A non-tracking inflated cylindrical solar concentrator
p0365 A80-33506

Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604

Theoretical consideration on solar concentrations by central receiver systems
p0377 A80-33629

Optical analysis of paraboloidal concentrators with secondary reflectors
p0377 A80-33630

Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631

Unfolding concentrator slope errors from reflected-beam measurements
p0377 A80-33636

Helios and reconcentrators --- computer code for heliostat performance predictions
p0378 A80-33637

Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638

Process steam generation by a facetted, non-imaging solar concentrator p0378 A80-33639
A simple technique for measuring slope or surface error of a concentrator p0378 A80-33644
Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators p0379 A80-33646
Analytical evaluation of a solar thermophotovoltaic /TPV/ converter p0386 A80-33725
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators p0386 A80-33726
Quasi-static concentrated array with double side illuminated solar cells p0386 A80-33727
Development of 1pKW photovoltaic module with concentration p0386 A80-33728
A novel mildly concentrating photovoltaic/thermal total energy system p0386 A80-33729
The DOE photovoltaic concentrator project p0386 A80-33730
Design and analysis of a solar cell concentrating system using a flux redistributor p0386 A80-33731
Application of circumsolar measurements to concentrating collectors p0389 A80-33761
Calculation of the angular error of a solar cylindrical concentrator made from sheet material p0391 A80-33856
A new technology to fabricate high-efficiency silicon concentrator solar cells p0397 A80-35366
Evaluating the performance of reflecting concentrating systems p0400 A80-36592
Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators p0401 A80-36822
Heating characteristics of concentrator/receiver system employing a selective absorbing surface p0401 A80-36826
An array of directable mirrors as a photovoltaic solar concentrator p0402 A80-37297
Maximally concentrating collectors for solar energy applications p0403 A80-37301
Optical and thermal performances of a half-circular, cylindrical concentrator p0405 A80-37951
High-efficiency solar concentrator p0405 A80-37953
An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector p0405 A80-37956
Optimum inclination of linear reflectors p0406 A80-37961
Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator p0414 A80-39785
Concentration characteristics of composite parabolic concentrators p0416 A80-41950
Concentrating collectors p0417 A80-42442
Solar power --- solar concentrators for solar power plants p0420 A80-42468
Quasi-optimum pseudo-Lambertian reflecting concentrators - An analysis p0421 A80-43367
Chromatic dispersion concentrator applied to photovoltaic systems p0524 A80-43481
Cusp mirror - Heat pipe evacuated tubular solar thermal collector p0421 A80-43482
On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications p0421 A80-43485
Development of a solar thermal receiver for high temperature applications [SERI/TP-333-485] p0428 N80-23800
Low-cost mirror concentrator based on double-walled metallized, Tabular films [ALO-4227-12] p0428 N80-23811
Proceedings of the First Semiannual Distributed Receiver Program Review [NASA-CR-163135] p0433 N80-24760
Line-focus concentrating collector program p0433 N80-24762
Test Bed Concentrator (TBC) p0433 N80-24763
Test bed concentrator mirrors p0433 N80-24764
Initial test bed concentrator characterization p0433 N80-24765
The OMNIUM-G HTC-25 tracking concentrator p0434 N80-24766
The Shenandoah concentrator p0434 N80-24767
The 1st generation low cost point focus solar concentrator p0434 N80-24768
A cellular glass substrate solar concentrator p0434 N80-24769
OMNIUM-G concentrator test results p0434 N80-24777
TBC costing --- test bed concentrator p0434 N80-24780
The Crossbyton project p0436 N80-24790
Photovoltaic concentrators [SAND-80-0143C] p0439 N80-24832
Development of a second-generation concentrating tracking solar collector [ASR-4460] p0445 N80-25851
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results [SAND-78-7072-VOL-1/2] p0453 N80-26830
Photovoltaic applications: Past and future --- systems utilizing concentrators and arrays [CONF-800106-4] p0455 N80-26867

CONCRETES
Glass fiber reinforced concrete for terrestrial photovoltaic arrays p0393 A80-34782

CONDENSATION
Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD [AIAA PAPER 80-1344] p0330 A80-41571

CONDUCTING FLUIDS
The helical hydromagnetic dynamo p0514 A80-36430

CONDUCTIVE HEAT TRANSFER
Latent heat energy storage using direct contact heat transfer p0546 A80-33519
Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator p0414 A80-39785
Hall effects on MHD Couette flow in a rotating system p0523 A80-43226

CONFERENCES
Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 and 3 p0357 A80-33401
Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980 p0511 A80-35161
Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 1 p0398 A80-35480
Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings p0468 A80-35716

Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings
p0326 A80-36976

Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, and Supplement
p0460 A80-37330

International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers
p0547 A80-37811

Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volumes 1-4
p0403 A80-37937

Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662

Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures
p0416 A80-42435

Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volumes 1 & 2
p0525 A80-43503

Biomass energy conversion workshop for industrial executives
[SERI/TP-62-299]
p0480 N80-22516

Thermal Energy Storage: Fourth Annual Review Meeting
[NASA-CP-2125]
p0551 N80-22788

Proceedings: Symposium on Flue Gas Desulfurization, volume 1
[PB80-133168]
p0336 N80-22888

Proceedings; Symposium on Flue Gas Desulfurization, volume 2
[PB80-133176]
p0336 N80-22889

Proceedings forest and field fuels symposium
[CONF-7710156]
p0487 N80-24630

Proceedings of the First Semiannual Distributed Receiver Program Review
[NASA-CR-163135]
p0433 N80-24760

Proceedings of the workshop on Stratospheric and Mesospheric Impacts of Satellite Power Systems (SPS)
[CONF-7809197]
p0541 N80-25363

Proceedings of the Workshop on Meteorological Effects of Satellite Power System Rectenna Operation and Related Microwave Transmission Problems
[CONF-7808114]
p0542 N80-26004

The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2]
p0493 N80-26461

Photovoltaic Residential Applications Program Implementation Workshop Proceedings
[NASA-CR-163274]
p0449 N80-26768

The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1]
p0501 N80-27494

CONFIDENCE LIMITS

Confidence interval procedures for wind turbine candidate sites
p0524 A80-43478

CONFORMAL MAPPING

The utility and verification of mathematical windfield models for wind energy regional screening and site selection
p0470 A80-35747

CONGRESSIONAL REPORTS

Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress
[PB80-143175]
p0535 N80-25910

Oversight: Industrial energy conservation, volume 10
[GPO-53-020]
p0352 N80-26786

US energy assistance to developing countries: Clarification and coordination needed
[PB80-162720]
p0356 N80-28244

CONNECTICUT

Solar heating system installed at Stamford, Connecticut
[NASA-CR-161436]
p0456 N80-27800

CONSERVATION

Water availability for energy in 1985 and 1990
[ORNL/TM-6777]
p0334 N80-22764

CONSTRUCTION INDUSTRY

Analysis of code related responses from the solar demonstration program
[PB80-153968]
p0457 N80-27827

CONSTRUCTION MATERIALS

Tokamak reactors and structural materials
p0505 A80-33042

A review of lifetime analyses for tokamaks
p0507 A80-33056

Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057

Small-scale solar simulator for indoor testing of collector modules and materials
p0362 A80-33477

Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617

An application of phase change materials in passive solar systems
p0384 A80-33703

Manufacturing methods of a composite cell case for a Ni-Cd battery
p0546 A80-34777

Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778

Solar materials R & D overview emphasizing solar thermal power systems
p0393 A80-34779

Review - Materials aspects of wave energy converters
p0517 A80-38283

Fundamentals of solar architecture
p0418 A80-42449

Solar collectors --- search for materials suitable for glazing, housing, coating, and etching
[ALO-5359-T1]
p0437 N80-24821

CONSUMERS

The influence of the federal council on the formulation of the 'Regulation on general conditions for the supply of electricity for tariff customers' and the 'Second regulation on altering of the federal electricity tariff structure' Attempt at a critical assessment
p0324 A80-34125

Consumer experience with electric vehicles
p0326 A80-37351

CONTINENTAL SHELVES

Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/EA-0044]
p0342 N80-24736

CONTINGENCY

Transportation energy contingencies - A status report on public response and government roles
p0326 A80-37353

CONTROL

Test results on the Frenchman's Reef solar data acquisition and control system
[NASA-CR-161449]
p0441 N80-25783

CONTROLLED FUSION

An assessment of magnetic fusion research
[AIAA PAPER 80-0928]
p0505 A80-32893

Pulsed power for fusion
p0516 A80-37812

The near and long term pulse power requirement for laser driven inertial confinement fusion
p0516 A80-37818

Safety grounding switches in large experiments - General considerations and the TEXT application --- TEXas Tokamak
p0517 A80-37867

NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation
p0472 A80-38221

Breakeven for thermonuclear fusion in the hot-ion mode
p0519 A80-39539

Plasma physics for nuclear fusion --- Book
p0474 A80-40826

Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745

Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/ --- poloidal magnetic field variation effects in tokamak
p0521 A80-41748

Laser program, volume 3 --- laser fusion
[UCRL-50021-78-VOL-3] p0532 N80-25650

CONTROLLERS

Battery charge/solar controller for a residential size photovoltaic power system
[COO-4094-62] p0439 N80-24837

CONVECTIVE FLOW

A review of the historical developments of the use of passive solar systems
p0408 A80-37981

Thermal fracture effects in geothermal energy extraction --- computer programs
[LA-7963] p0483 N80-23795

CONVECTIVE HEAT TRANSFER

Forced convection in solar collectors
p0360 A80-33455

Membrane stratified solar ponds
p0371 A80-33582

Measurement of wind speed distributions across a solar collector
p0415 A80-40717

Free convection in solar collectors
p0417 A80-42440

Methods for reducing heat losses from flat plate solar coolectors, phase 3
[COO-2597-5] p0424 N80-22851

CONVEYORS

Studies on questions of design and construction of chain scraper conveyors --- mining operations
[NASA-TM-75810] p0499 N80-26663

CONVOLUTION INTEGRALS

A convolution model of rock bed thermal storage units
p0550 A80-43480

COOLING

Heat losses of a static low-concentration solar collector
p0399 A80-35838

COOLING SYSTEMS

Design and operation of a liquid-desiccant type solar air conditioning system
p0366 A80-33527

Solar absorption cycle cooling installations in Sydney, Australia
p0366 A80-33536

Improved heat pump model for TRNSYS --- transient simulation program for residential areas
p0508 A80-33553

Survey of simplified design methodologies for solar heating and cooling systems
p0376 A80-33619

A simplified solar cooling design method for closed-loop liquid systems
p0376 A80-33620

Cooling system parameter analysis --- for solar collectors
p0376 A80-33622

Heat pumps for heating, cooling, and energy recovery 1976-1990 --- German book
p0327 A80-38210

Cooling of buildings --- solar systems
p0418 A80-42446

Passive cooling systems in hot arid regions
p0478 A80-42448

Subcontracted activities related to TES for building heating and cooling
p0553 N80-22807

Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-25868

COPPER

Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385

COPPER OXIDES

Methanol and methyl fuel catalysts --- CuO/ZnO catalysts
[FE-3177-3] p0482 N80-23482

COPPER SULFIDES

A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716

A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719

The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339

The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements --- thin film solar cell
p0398 A80-35486

Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements
p0398 A80-35491

The design and fabrication of high efficiency thin film CdS/Cu2S solar cells
p0422 A80-43516

Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847

CORN

Grain motor fuel alcohol technical and economic assessment study
[HCP/J6639-01] p0334 N80-22523

Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474

CORRELATION

Use of petroleum-based correlations and estimation methods for synthetic fuels
[NASA-TM-81533] p0502 N80-27509

CORROSION

Preparation of highly efficient solar cells and corrosion studies on solar cell materials
[PB80-141294] p0441 N80-24874

CORROSION PREVENTION

Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-2] p0454 N80-26845

CORROSION RESISTANCE

Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617

Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators
p0519 A80-39746

Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226

Materials technology for coal-conversion processes --- corrosion resistance slag containers
[ANL-79-93] p0486 N80-24484

CORROSION TESTS

Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear
p0539 A80-39628

Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests
[ASME PAPER 80-GT-68] p0476 A80-42198

CORRUGATED PLATES

Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors
p0405 A80-37957

COST ANALYSIS

Heat pump impact upon solar collection design and cost
p0368 A80-33548

Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612

The cost/performance of large central receiver power systems as a function of heliostat design parameters
p0376 A80-33627

Cost and performance evaluation of passive solar systems
p0389 A80-33755

Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756

A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility
p0389 A80-33758

Energy prices --- economic and cost analysis in France
p0326 A80-36550
Design and cost analysis for an ammonia-based solar thermochemical cavity absorber
p0403 A80-37300
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants --- cost analysis
[CONF-791204-11]
p0557 N80-24628
Costing the OMNIUM-G system 7500
p0434 N80-24779
TBC costing --- test bed concentrator
p0434 N80-24780
Economic baselines for current underground coal mining technology
[NASA-CR-163259]
p0491 N80-25764
Classification and evaluation of electric motors and pumps
[DOE/CS-0147]
p0352 N80-26670
CF6-6D engine performance deterioration
[NASA-CR-159786]
p0355 N80-27364
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548]
p0356 N80-27805
Comparative study of energy accounting for heavy ion fusion with various driver accelerators
[IPPJ-454]
p0538 N80-28195

COST EFFECTIVENESS

A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems
p0506 A80-33046
Small-scale solar simulator for indoor testing of collector modules and materials
p0362 A80-33477
Low cost, low technology 3.4x concentrating collector for industrial/agricultural applications
p0363 A80-33491
Economical optimum TES size via marginal analysis --- Thermal Energy Storage
p0365 A80-33508
Solar heating systems in Scandinavian climate - Reality or daydreams
p0369 A80-33559
The cost and value of washing heliostats
p0375 A80-33616
MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722
Comparison of costs for solar derived electrical sources with diesel generators in remote locations
p0389 A80-33751
Description of processes for producing hydrogen by advanced electrolysis
p0460 A80-37335
A central receiver solar power system for remote locations
p0410 A80-38006
New Technology Transport for fuel critical economy
p0328 A80-40313
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105]
p0331 A80-42227
Solar thermal small power systems study. Phase 2: Study results
[DOE/ET/20516-2]
p0440 N80-24855
State options in lighting: Efficiency standards for existing public buildings
[DOE/CS-5255/2]
p0352 N80-26600

COST ESTIMATES

Construction and initial operation of the Miamisburg salt-gradient solar pond
p0371 A80-33583
Characteristics of axicon concentrators for use in photovoltaic energy conversion
p0520 A80-40719
The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period
p0421 A80-43484
Cost estimating Brayton and Stirling engines
p0531 N80-24781
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4]
p0498 N80-26535
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2]
p0563 N80-27232

COST REDUCTION

Development of a 3X CPC with evacuated receiver --- Compound Parabolic Concentrator
p0364 A80-33494
Reducing solar costs with the Solar-Assisted-Templifier --- heat pumps in series or parallel systems
p0367 A80-33541
Optimization of the combined structural components of large-power solar central receiver systems
p0376 A80-33624
Redesign of windmill towers - A cost reduction study
p0467 A80-33772
Thin-film solar cells - A unified analysis of their potential
p0393 A80-35335
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen
p0461 A80-37342

COUETTE FLOW

Hall effects on MHD Couette flow in a rotating system
p0523 A80-43226

COUPLED MODES

Space-time solutions of the linearized coupled-mode equations
p0520 A80-41074

COUPLING

Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662]
p0564 N80-27233

CRACKING (FRACTURING)

Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7]
p0491 N80-25707

CRACKS

Thermal fracture effects in geothermal energy extraction --- computer programs
[LA-7963]
p0483 N80-23795

CREEP RUPTURE STRENGTH

A review of lifetime analyses for tokamaks
p0507 A80-33056

CRITICAL VELOCITY

Whirl and critical speeds of flywheel-container systems aboard vehicles
p0550 A80-41649

CROPS

Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2]
p0498 N80-26533

CROSS FLOW

Solar operated crossflow desiccant cooling system
p0365 A80-33525

CRUDE OIL

Chemical characteristics of oil refinery plumes in Los Angeles
p0325 A80-36476
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64]
p0476 A80-42194
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69]
p0476 A80-42199
Prediction of thermophysical properties of petroleum fractions
p0479 N80-22428
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-43]
p0486 N80-24482
Assessment of crude oil and refined petroleum product quality during long-term storage
[AD-A082365]
p0557 N80-24637
California thermal oil utilization. Volume 1: Executive summary
[SAN-1864-1]
p0488 N80-24849
National Energy Plan 2, May 1979. Appendix A: World oil prices
[DOE/TIC-10203-APP-A]
p0344 N80-24870
Displacement of oil by carbon dioxide
[DOE/MC-03260/4]
p0492 N80-25768
Strategic petroleum reserve
[DOE/RA-0047]
p0557 N80-25769

Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163311] p0492 N80-25770
Hydrodenitrogenation of coal liquids and petroleum with heterogenous catalysts in multiphase reactors. Review and recommendations for further work
[PB80-151442] p0499 N80-26549
The world oil market in the years ahead: A research paper
[ER-79-10327U] p0352 N80-26749
Startup and initial feasibility testing on the Salem Harbor COM demonstration
p0501 N80-27499
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501
Coal: An alternate fuel for thermal enhanced oil recovery steam generation
[SAN-2418-1] p0503 N80-27524

CRUISING FLIGHT
Fuel efficiency of small aircraft
[AIAA PAPER 80-1847] p0333 A80-43305

CRYOGENIC FLUID STORAGE
Analysis and design of insulation systems for LH2-fueled aircraft
p0462 A80-37347
Hydrogen liquefaction, storage and transfer on an airport site
p0462 A80-37349
Liquid hydrogen-fueled vehicle project
[LA-UR-79-2883] p0463 N80-25467

CRYOGENIC STORAGE
Experimental study of coolness storage using sodium sulfate decahydrate --- for air conditioning systems
p0546 A80-33521

CRYOGENICS
Cryogenic laser fusion target material design considerations
p0506 A80-33055
Measurements on insulating materials at cryogenic temperatures
[PB80-134596] p0541 N80-24507

CRYOPUMPING
Design and operational characteristics of the cryopump high-vacuum system for the 25000-1 target chamber of the Helios Laser Facility
p0515 A80-37182

CRYSTAL DEFECTS
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369
Electron-beam-induced current characterization of polycrystalline silicon solar cells
p0398 A80-35482
Grain boundary defects in thin semicrystalline material --- effects on performance of silicon solar cells
p0422 A80-43761

CRYSTAL GROWTH
Method of mitigating titanium impurities effects in p-type silicon material for solar cells
[NASA-CASE-NPO-14635-1] p0431 N80-24741
Amorphous Si solar cells
[DOE/ET/23034-T1] p0439 N80-24839
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-163208] p0441 N80-25782

CRYSTALLIZATION
Some aspects of energy storage systems using Glauber salt mixtures
p0548 A80-37967

CULTURE TECHNIQUES
High intensity mass algae culture requirements and limitations --- for maximum growth and energy conversion in sunlight
p0358 A80-33408

CURRENT CONVERTERS (AC TO DC)
Development of current converters for switching and regulating tasks in energy technology
[BMFT-FB-T-79-12] p0567 N80-23585

CURRENT DENSITY
Effect of current constriction at electrodes on MHD generator characteristics
p0513 A80-35685

CURRENT DISTRIBUTION
A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes
p0510 A80-34620
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438
High power pulse modeling of coaxial transmission lines
p0539 A80-37828
Power take-off analysis for diagonally connected MHD channels
[CONF-800104-6] p0535 N80-26167

CYCLOTRON RESONANCE
Electron cyclotron heating of tokamaks
p0511 A80-34973

CYLINDRICAL BODIES
Calculation of the angular error of a solar cylindrical concentrator made from sheet material
p0391 A80-33856

CYLINDRICAL TANKS
A non-tracking inflated cylindrical solar concentrator
p0365 A80-33506
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks
p0546 A80-33518

CZOCHRALSKI METHOD
Cost of Czochralski wafers as a function of diameter
[NASA-CR-163277] p0449 N80-26771

D

DATA ACQUISITION
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660
Manufacturers' view of wind resource assessments
p0514 A80-35738
Test results on the Frenchman's Reef solar data acquisition and control system
[NASA-CR-161449] p0441 N80-25783
LLL Data acquisition system for liquefied gaseous fuels program
[UCID-18576] p0498 N80-26537
Guide for energy compatibility
[NP-24016] p0353 N80-26833

DATA BASES
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents
p0324 A80-34018
Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions
p0467 A80-34019
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399
Energy Economic Data Base (EEDB) program: Phase 1: Initial update
[COO-4954-1-VOL-3] p0567 N80-24848
Energy information data base, series titles: Supplement 7, February 1978 - December 1979
[DOE/TIC-4579-R10-SUPPL-7] p0567 N80-25203
Energy information data base, corporate author entries: Supplement 4, June 1978 - December 1979
[DOE/TIC-4585-R1-SUPPL-4] p0567 N80-25204
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505

DATA COLLECTION PLATFORMS
Solar-powered environmental data collection system
[DP-1529] p0440 N80-24867

DATA LINKS
Short course in microprocessors for solar energy applications - Systems --- heating system and collector control
p0419 A80-42463

LLL Data acquisition system for liquefied gaseous fuels program
[UCID-18576] p0498 N80-26537

DATA PROCESSING
Manufacturers' view of wind resource assessments p0514 A80-35738
Guide for energy compatibility
[NP-24016] p0353 N80-26833

DATA RECORDERS
Short course in microprocessors for solar energy applications - Systems --- heating system and collector control p0419 A80-42463

DATA RECORDING
Solar radiation data forecast and interpolation analysis. Folder 1, part 1: Executive summary. Part 2: Technical analysis (tasks 1 and 2). Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982

DATA REDUCTION
A data analysis program for collector testing --- solar energy for Fort Hood, Texas p0362 A80-33482
Data analysis at the Rocky Flats Wind Systems Test and Development Center p0513 A80-35724

DATA SYSTEMS
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments p0380 A80-33660
Environmental data for sites in the National Solar Data Network
[SOLAR/0010-79/05] p0339 N80-23833

DECARBONATION
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3 p0520 A80-40716

DECISION MAKING
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239

DECLINATION
Basics of solar energy p0416 A80-42436

DEFECTS
Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects p0397 A80-35370

DEFENSE PROGRAM
Military markets for solar thermal electric power systems p0435 N80-24787

DEGRADATION
Solar photovoltaic project: Materials, and testing activities
[COO-4094-60] p0430 N80-23855

DEHUMIDIFICATION
Open-cycle solar air conditioner p0365 A80-33524
Dual desiccant-bed dehumidifier with solar-heated regeneration p0384 A80-33705
Development of a solar desiccant dehumidifier p0408 A80-37979
Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling
[AIAA PAPER 80-1546] p0415 A80-41502

DEMAND (ECONOMICS)
The energy supply of today and tomorrow p0324 A80-34124
Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's p0330 A80-41826
Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764

DENITROGENATION
Catalytic hydrogenation for coal-derived liquids
[FE-2034-16] p0486 N80-24488
Hydrodenitrogenation of coal liquids and petroleum with heterogeneous catalysts in multiphase reactors. Review and recommendations for further work
[PB80-151442] p0499 N80-26549

DENMARK
Solar energy R & D projects in Denmark p0323 A80-33437

DENSE PLASMAS
Submillimeter interferometry of high-density plasmas p0511 A80-34970

DENSIFICATION
Compaction and densification of fuels from biomass p0478 A80-42467

DENSITY MEASUREMENT
Electron density measurements in the TRIAM-1 tokamak p0510 A80-34649

DEOXIDIZING
Use of solar energy to reduce carbon dioxide p0403 A80-37302

DESALINIZATION
A 500 gallons per day hybrid desalination plant using wind/solar energy p0382 A80-33682

DESICCANTS
Design and operation of a liquid-desiccant type solar air conditioning system p0366 A80-33527
Dual desiccant-bed dehumidifier with solar-heated regeneration p0384 A80-33705
Liquid desiccant solar heat pump for developing nations p0408 A80-37980
Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling
[AIAA PAPER 80-1546] p0415 A80-41502

DESIGN ANALYSIS
New air-heating collector design and performance p0359 A80-33449
Design and performance of a roof integrated solar air heater p0360 A80-33451
A novel mildly concentrating photovoltaic/thermal total energy system p0386 A80-33729
Redesign of windmill towers - A cost reduction study p0467 A80-33772
Solar cell array design handbook - The principles and technology of photovoltaic energy conversion p0393 A80-34847
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency p0394 A80-35339
Design considerations for a-Si solar cells p0394 A80-35342
High-efficiency silicon minMIS solar cells - Design and experimental results p0395 A80-35352
Cascade solar-cell design for high-temperature operation p0397 A80-35365
Wind direction variations in strong winds --- for wind turbine design considerations p0468 A80-35728
Design and operational characteristics of the cryopump high-vacuum system for the 25000-l target chamber of the Helios Laser Facility p0515 A80-37182
The sunship - The case for a solar powered airship p0413 A80-39288
Advanced non-concentrating solar collectors p0417 A80-42441
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216
Magnetic bearing support study for a 10 kW-hr energy storage flywheel
[SAND-79-7025] p0555 N80-23661
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4B: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4B] p0485 N80-24470
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Line-focus solar central power systems, phase1
[SAN-0115-140-1] p0447 N80-25903
Near term hybrid passenger vehicle development program, phase 1
[NASA-CR-163235] p0560 N80-26210

Development of an Air Brayton solar receiver [NASA-CR-163027] p0450 N80-26777
Survey and evaluation of current design of evacuated collectors [ALO-5350-1] p0452 N80-26823

DESORPTION
Application of magnesium rich rare-earth alloys to hydrogen storage p0459 A80-35192

DESULFURIZING
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur p0325 A80-35880
Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience p0330 A80-41842
Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB80-133168] p0336 N80-22888
Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB80-133176] p0336 N80-22889
Coal desulfurization by low temperature chlorinolysis, phase 2 [NASA-CR-163152] p0484 N80-24464
Evaluation of physical/chemical coal cleaning and flue gas desulfurization [PB80-147622] p0346 N80-25481
Flue gas desulfurization by the modified citrate process: Report of investigations [PB80-134836] p0351 N80-25940
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems [PB80-138464] p0351 N80-25947

DEUTERIDES
Hydrogen storage materials research and development work at Brookhaven National Laboratory [BNL-26813] p0463 N80-23478

DEUTERIUM
Muon catalysis for energy production by nuclear fusion p0517 A80-38289

DEUTERIUM PLASMA
Fabrication of glass sphere laser fusion targets p0506 A80-33052
Cryogenic laser fusion target material design considerations p0506 A80-33055

DEVELOPING NATIONS
International development assistance for renewable technologies - Current programs and institutional requirements p0323 A80-33672
Characteristics of rural energy demand and major barriers and tasks and implementation of potentially viable solar technologies p0381 A80-33673
Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems p0381 A80-33674
A renewable energy system for developing countries p0323 A80-33675
Energy systems based on local renewable energy resources for a rural community in a developing country p0323 A80-33677
Use of renewable fuels in the rural development of India p0327 A80-37989
Solar energy - UNIDO programme of action for developing countries p0412 A80-38015
Photovoltaic system costs using local labor and materials in developing countries [NASA-CR-163218] p0533 N80-25785
US energy assistance to developing countries: Clarification and coordination needed [PB80-162720] p0356 N80-28244

DIELECTRIC PROPERTIES
Measurements on insulating materials at cryogenic temperatures [PB80-134596] p0541 N80-24507

DIELECTRICS
Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors p0391 A80-33859

DIELS-ALDER REACTIONS
Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry p0359 A80-33430

DIESEL ENGINES
Comparison of costs for solar derived electrical sources with diesel generators in remote locations p0389 A80-33751
Surface transportation systems using hydrogen energy p0461 A80-37339
Lightweight diesel aircraft engines for general aviation [AIAA PAPER 80-1238] p0328 A80-38983
Design study: A 186 kW lightweight diesel aircraft engine [NASA-CR-3261] p0334 N80-22326
Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base [PB80-805401] p0346 N80-25678
Diesel exhaust emissions. Citations from the American Petroleum Institute data base [PB80-805419] p0347 N80-25679

DIESEL FUELS
Autoignition and vaporization of no. 3 diesel oil spray under lean conditions [ASME PAPER 80-GT-10] p0475 A80-42151

DIFFERENTIAL THERMAL ANALYSIS
Specific heats of Colorado oil shales - A differential scanning calorimetry study p0475 A80-41892

DIFFUSE RADIATION
Transmission of diffuse radiation through CPC and flat plate collector glazings --- Compound Parabolic Collector p0421 A80-43486

DIFFUSERS
Further investigations of diffuser augmented wind turbines. Part 1: Executive summary [COO-2616-2-PT-1-REV-1] p0532 N80-24864

DIFFUSION FLAMES
The combustion of carbon, coal and coal related fuels in an opposed flow diffusion flame burner p0500 N80-27493

DIGITAL SYSTEMS
Microprocessor-controlled digital shunt regulator --- for solar power systems p0505 A80-32758

DIGITAL TECHNIQUES
Variable speed constant frequency voltage generator (alternator) [PB80-141286] p0532 N80-24875
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base [NASA-CR-163311] p0492 N80-25770

DIODES
Thermic diode performance characteristics and design manual p0376 A80-33623
Repetitively pulsed electron beam diode lifetime and stability --- for inertial confinement fusion p0516 A80-37820
Semiconductors for high temperature active devices: Silcon, GaA lc]s, and GaP [SAND-80-0379C] p0499 N80-26608

DIRECT CURRENT
Commutator dc machines used as mechanical capacitors in a series resonant ohmic-heating circuit simulation [LA-UR-79-3122] p0526 N80-22619

DISPERSING
Chromatic dispersion concentrator applied to photovoltaic systems p0524 A80-43481

DISPERSIONS
Stable coal/fuel oil dispersions p0501 N80-27503

DISPLACEMENT
Displacement of oil by carbon dioxide [DOE/MC-03260/4] p0492 N80-25768

DISSOCIATION
Ammonia dissociation for solar thermochemical absorbers
p0358 A80-33428
Design and cost analysis for an ammonia-based solar thermochemical cavity absorber
p0403 A80-37300

DISTILLATION
Application of solar energy to food industry - A distillery
p0372 A80-33591
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959
Upgrading of coal liquids: Upgrading distillates from coal liquefaction
[FE-2566-26] p0480 N80-22518

DOLOMITE (MINERAL)
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal
p0471 A80-37617

DOMESTIC ENERGY
Australian programme for solar heating and cooling
p0359 A80-33432
Energy self-sufficiency in monsoonal Australia
p0323 A80-33433
Solar City - Mount Cotton
p0359 A80-33434
French programs of research and experimentation aiming at the development of solar energy in buildings
p0359 A80-33439
Status of the United States' Solar Heating and Cooling Program
p0323 A80-33446
The effects of air leaks on solar air heating systems
p0359 A80-33448
Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505
The 'soil therm' system for interseasonal earth storage of solar heat for individual housing
p0545 A80-33516
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector
p0366 A80-33530
Economics of solar-assisted heat pump heating systems for residential use
p0367 A80-33543
A comparative study of solar assisted heat pump systems for Canadian locations
p0367 A80-33546
Analysis of solar water heating systems
p0370 A80-33574
Design and evaluation of solar installation workshops and the HUD solar DHW installation guidelines --- Domestic Hot Water
p0370 A80-33575
Experimental system performance and comparison with computer predictions for six solar domestic hot water systems
p0370 A80-33577
The thermal performance of solar water heaters in the UK
p0370 A80-33578
Solar plus waste heat recovery hybrid water heating system
p0371 A80-33580
Monitoring solar heated houses in the European community - Procedures, results and future activities
p0381 A80-33671
The economics of solar hot water heating in multifamily units
p0389 A80-33752
A design procedure for wind powered heating systems
p0509 A80-33776
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents
p0324 A80-34018
Putting baseload to work on the night shift
p0547 A80-35402
An assessment of solar hot water heating in the Washington, D.C. area - Implications for local utilities
p0399 A80-36052
Engineering kinetics of short residence time coal liquefaction processes
p0471 A80-37676
Performance comparison of different types of solar water heaters under Egyptian conditions
p0407 A80-37973
Use of renewable fuels in the rural development of India
p0327 A80-37989
A simple water pump, powered by solar energy
p0411 A80-38011
Comfortable heating and cooling by solar reflectors and wind
p0411 A80-38013
End use energy in Brazil and the solar technologies
p0472 A80-38016
The American experience with solar energy in centralized electricity generation - Technology and economics
p0412 A80-38024
Accelerated commercialization of solar energy - A new priority for international action
p0413 A80-38026
Energy and environmental politics in the 80's
p0327 A80-38303
Paving the way for energy-saving innovations
p0328 A80-39554
Wood for energy production --- Book
p0474 A80-40830
Solar air systems
p0418 A80-42444
Fundamentals of solar architecture
p0418 A80-42449
Systematic techniques of design for solar houses in high latitudes
p0418 A80-42452
The potential of renewable energies in planning the development of rural areas
p0419 A80-42453
Solar powered refrigeration
p0420 A80-42469
A utility company's view of energy from waste
p0332 A80-42925
An alternate approach to the application of MHD power generation technology in a utility environment
[IEEE PAPER F 79 651-1] p0525 A80-43502
Fossil-fuel heat pumps for domestic, commercial and industrial space heating
p0479 A80-43834
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1] p0529 N80-23850
Solar-assisted heat pump-swimming pool synergistics for domestic heating
[UCRL-83458] p0447 N80-25905
Solar heating and cooling demonstration program: A descriptive summary of HUD Cycle 4 and 4A Solar Residential projects
[HUD-PDR-455] p0456 N80-26873

DRAINAGE PATTERNS
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
[E80-10142] p0499 N80-26729

DRILLING
Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain
[AD-A082400] p0488 N80-24799
Drilling horizontal holes in coal bed from the surface with water jets
[SAND-80-0057C] p0492 N80-25766

DROPS (LIQUIDS)
A direct contact thermal energy storage system
p0548 A80-37968

DRYING APPARATUS
Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio
p0358 A80-33405
Operation of an industrial solar drying system
p0372 A80-33590

Solar energy for kilning malt
p0372 A80-33593
Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665
Solar collector system using air collectors for a pre-drying facility in a grass drying plant
[SKT-TEIL-1] p0456 N80-26877

DYNAMIC CHARACTERISTICS
Study of the nonlinear dynamics of a flat-plate collector
p0369 A80-33565

DYNAMIC MODELS
Dynamic model of a mixed /sensible plus latent/ low-temperature thermal storage system
p0545 A80-33511
Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems
p0381 A80-33664
Dynamic modelling and verification of a flat-plate solar collector
p0391 A80-33864

DYNAMIC RESPONSE
The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses --- Cold Water Pipe
p0511 A80-35163
An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current
p0512 A80-35164
Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms
p0512 A80-35167
Turbulence and WTG performance --- Wind Turbine Generator
p0513 A80-35726

DYNAMIC STRUCTURAL ANALYSIS
The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses --- Cold Water Pipe
p0511 A80-35163
An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current
p0512 A80-35164
Structural analysis of a cold water pipe for a 40MWe spar OTEC platform
p0512 A80-35165
Wind turbine dynamic blade loads due to wind gusts and wind direction changes
p0513 A80-35727
Whirl and critical speeds of flywheel-container systems aboard vehicles
p0550 A80-41649
Dynamics of a flexible rotor-tower system
[ASRL-TR-194-1] p0530 N80-23862

DYNAMO THEORY
The characteristics of a nonhomogeneous helical MHD dynamo --- for magnetic field study
p0510 A80-34614
The helical hydromagnetic dynamo
p0514 A80-36430

E

EARTH OBSERVATIONS (FROM SPACE)
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019

EARTH RESOURCES
Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662
Projected annual resource requirements at the national and regional level for the Department of Commerce energy forecast 1985 and 2000
[PB80-126956] p0345 N80-24876
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB80-163686] p0538 N80-27825

EARTH SATELLITES
Street lighting by sunlight
p0411 A80-38009

EARTH SURFACE
Solar energy at ground surface
p0403 A80-37940

EARTHQUAKE RESISTANT STRUCTURES
Optimization of the combined structural components of large-power solar central receiver systems
p0376 A80-33624

ECOLOGY
Demonstration salt gradient solar pond
[ALO-3977-T1] p0453 N80-26837

ECONOMIC ANALYSIS
Economics of energy recovery from biomass using fluidized-bed combustion
p0465 A80-33413
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484
Economics of solar-assisted heat pump heating systems for residential use
p0367 A80-33543
Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544
A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis
p0367 A80-33545
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554
Economic analysis of the STEPS in Japan --- Solar Thermal Electric Power Systems
p0375 A80-33615
A renewable energy system for developing countries
p0323 A80-33675
Economic aspects of passive solar remodeling in existing buildings
p0383 A80-33692
Analytical and economic evaluation of heat pipe augmented passive solar heating systems
p0384 A80-33704
The economics of solar hot water heating in multifamily units
p0389 A80-33752
The energy-food interface - An economic analysis of Brazil's alcohol plan
p0466 A80-33753
The effect of an auxiliary load management strategy on solar system performance
p0389 A80-33757
Energy prices --- economic and cost analysis in France
p0326 A80-36550
Technical-economic validation for selection of solar resources as energy sources
p0400 A80-36596
Economic considerations of solar energy
p0412 A80-38019
The comparative economics of passive and active systems --- for solar residential space heating
p0412 A80-38020
An economic analysis of solar energy alternatives
p0412 A80-38021
Evaluation of solar thermal power plants using economic and performance simulations
p0412 A80-38023
The American experience with solar energy in centralized electricity generation - Technology and economics
p0412 A80-38024
Economic and market potential for SRC-II products --- Solvent Refined Coal
p0474 A80-40758
Equitable performance comparison and economic evaluation of active and passive solar energy systems
p0329 A80-40965
The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26] p0416 A80-42161
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105] p0331 A80-42227
Guidelines for economic evaluation of coal conversion processes
[FE-2468-44] p0480 N80-22521

Grain motor fuel alcohol technical and economic assessment study
[HCP/J6639-01] p0334 N80-22523
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis
[FE-2416-43-VOL-2] p0485 N80-24468
Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol
[ORNL-5439] p0485 N80-24471
The dish-Rankine SCSTPE program (Engineering Experiment no. 1) --- systems engineering and economic analysis for a small community solar thermal electric system
p0435 N80-24782
Energy Economic Data Base (EEDB) program: Phase 1: Initial update
[COO-4954-1-VOL-3] p0567 N80-24848
Italy: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-20] p0347 N80-25804
Design study and economic assessment of multi-unit offshore wind energy conversion systems applications. Volume 4: Meteorological and oceanographic surveys
[WASH-2330-78/4-VOL-4] p0533 N80-25836
Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 2: Apparatus designs and costs
[WASH-2330-78/4-VOL-2] p0533 N80-25838
Handling coal oil mixtures with positive displacement pumps
p0494 N80-26463
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535

ECONOMIC DEVELOPMENT
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
Japan: Estimates of future energy/GNP relationships in energy use
[ORAU/IEA-79-21(M)] p0344 N80-24869

ECONOMIC FACTORS
Economic implications of a low cost heliostat design
p0375 A80-33613
Investigation of further economics development of regional electricity supply concerns
p0324 A80-34122
Topical questions of energy economics
p0328 A80-38304
An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing
p0473 A80-39630
Solar energy economics - Orbiting reflectors for world energy
p0415 A80-41324
Current from the sun - A look at the economics of solar cells
p0416 A80-42101
Forecast of long term coal supply and mining conditions: Model documentation and results
[NASA-CR-163141] p0487 N80-24728

ECONOMIC IMPACT
Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies
p0389 A80-33754
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847
Energy performance standards for new buildings: Economic analysis
[DOE/CS-0129] p0344 N80-24871

ECONOMICS
The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period
p0421 A80-43484
Proposition on energy analysis and economic efficiency
[SERI/RR-51-332] p0338 N80-23805
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847
United Kingdom: Estimates of future energy/GDP relationship
[ORAU/IEA(M)-79-25] p0339 N80-23848
Canada: Estimates of future energy/GNP relationships
[ORAU/IEA(M)-79-24] p0339 N80-23849
National Energy Plan 2, May 1979. Appendix A: World oil prices
[DOE/TIC-10203-APP-A] p0344 N80-24870
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072] p0492 N80-25865

EDUCATION
Solar energy project: An overview
[DOE/CS-0124] p0447 N80-25883

EFFICIENCY
Overall efficiencies for conversion of solar energy to a chemical fuel
[SAND-79-8636] p0431 N80-24495

EFFLUENTS
Proceedings: Symposium on Flue Gas Desulfurization, volume 1
[PB80-133168] p0336 N80-22888
Proceedings: Symposium on Flue Gas Desulfurization, volume 2
[PB80-133176] p0336 N80-22889
Research to identify components of energy-related wastes: A state-of-the-art report --- environment effects, bibliographies
[PB80-137961] p0351 N80-25943

ELECTRIC ARCS
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439
Theory of electrode arcs in a flow of combustion products containing an additive
p0524 A80-43398

ELECTRIC AUTOMOBILES
Can this car electrify America --- electric car propulsion system development
p0548 A80-39086
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214
Near-term hybrid vehicle program, phase 1. Appendix D: Sensitivity analysis resport
[NASA-CR-163233] p0560 N80-26209
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548] p0356 N80-27805
Small passenger car transmission test-Chevrolet 200 transmission
[NASA-CR-159835] p0356 N80-28255

ELECTRIC BATTERIES
Production of a small nuclear battery
p0505 A80-32957
Glassy electrolyte galvanic cells
p0515 A80-37008
Advanced screening of electrode couples
[NASA-CR-159738] p0551 N80-22777
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211
Exposure: A newsletter for ocean technologists, volume 8, no. 1
[AD-A083941] p0562 N80-26865
Mission analysis and performance specification studies report, appendix A
[NASA-CR-163035] p0562 N80-27223

ELECTRIC CONDUCTORS
Evaluating the mass of current conductors and required voltage level for large orbiting solar batteries
p0401 A80-36832

ELECTRIC CONTACTS
Determination of the geometry of the transition region of a series MHD generator
p0509 A80-34315
High resolution, low cost solar cell contact development
[NASA-CR-163289] p0450 N80-26782

ELECTRIC CONTROL
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824

ELECTRIC CURRENT
Electrical nonuniformities in diagonally connected generators --- in magnetohydrodynamics
p0511 A80-34989

Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346
ELECTRIC DISCHARGES
Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte
p0547 A80-37009
ELECTRIC ENERGY STORAGE
On the design of silver-hydrogen electrochemical cells
p0547 A80-37003
Use of transformers in producing high-power output from homopolar generators
p0516 A80-37825
TRIDENT - A megavolt pulse generator using inductive energy storage
p0548 A80-37857
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216
Mission analysis and performance specification studies report, appendix A
[NASA-CR-163035] p0562 N80-27223
ELECTRIC GENERATORS
Longitudinal baffling in Faraday generators
p0505 A80-32743
Performance and cost optimisation of small solar power stations
p0373 A80-33598
Research and development on solar energy for electric and mechanical power generation
p0373 A80-33601
The potential of crop residues as a fuel for power generation
p0466 A80-33750
Comparison of costs for solar derived electrical sources with diesel generators in remote locations
p0389 A80-33751
Application of probability methods to evaluate the reliability of a combined wind-electric and conventional generation system
p0508 A80-33774
Upper limit for the conversion of solar energy
p0397 A80-35372
A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems
p0546 A80-35382
Manufacturers' view of wind resource assessments
p0514 A80-35738
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105] p0331 A80-42227
Conversion system overview assessment. Volume 2: Solar-wind hybrid systems
[SERI/TR-35-078-VOL-2] p0338 N80-23799
Electrofluid dynamic wind generator
[COO-4130-2] p0531 N80-24811
Solar thermal small power systems study. Inventory of US industrial small electric power generating systems
[ATR-79(7780)-1] p0437 N80-24817
Climate program plan, volume 1 --- effects of energy technologies on climate and environment
[DOE/EV-0062/1] p0351 N80-26003
High energy storage flywheel test program
[AD-A083302] p0561 N80-26796
Solar, geothermal, electric and storage systems program summary document, FY 1980
[DOE/ET-0102] p0354 N80-26861
ELECTRIC HYBRID VEHICLES
Assessment of the potential of hybrid vehicles: Summary
[NASA-CR-163059] p0336 N80-23215
Electric and hybrid vehicle program
[DOE/CS-0026] p0556 N80-24216
Electric and hybrid vehicles in the urban future --- market research
[CONF-791009-23] p0341 N80-24217
Near hybrid passenger vehicle development program, phase 1. Appendices A and B. Mission analysis and performance specification studies report, volume 1
[NASA-CR-163330] p0559 N80-26201
Near hybrid passenger vehicle development program, phase 1. Appendices C and D, Volume 2
[NASA-CR-163331] p0559 N80-26202
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies --- various hybrid/electric power train configurations and electrical and mechanical drive-line components
[NASA-CR-163227] p0559 N80-26203
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies
[NASA-CR-163228] p0559 N80-26204
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206
Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207
Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208
Near-term hybrid vehicle program, phase 1. Appendix D: Sensitivity analysis resport
[NASA-CR-163233] p0560 N80-26209
Near term hybrid passenger vehicle development program, phase 1
[NASA-CR-163235] p0560 N80-26210
Advanced propulsion system for hybrid vehicles
[NASA-CR-159771] p0561 N80-26212
Development of fuel cell technology for vehicular applications
[BNL-51047] p0536 N80-26216
The near-term hybrid vehicle program, phase 1
[NASA-CR-163034] p0562 N80-27222
Mission analysis and performance specification studies report, appendix A
[NASA-CR-163035] p0562 N80-27223
Design tradeoff studies and sensitivity analysis, appendix B
[NASA-CR-163036] p0563 N80-27224
Design tradeoff studies and sensitivity analysis, appendices B1 - B4 --- hybrid electric vehicles
[NASA-CR-163037] p0563 N80-27225
Preliminary design data package, appendix C --- hybrid electric vehicles
[NASA-CR-163038] p0563 N80-27226
Preliminary design data package, appendices C1 and C2
[NASA-CR-163039] p0563 N80-27227
Hybrid vehicle potential assessment. Volume 7: Hybrid vehicle review
[NASA-CR-163298] p0563 N80-27231
Phase 1 of the near term hybrid passenger vehicle development program
[NASA-CR-163219] p0564 N80-28245
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1
[NASA-CR-163220] p0564 N80-28246
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices
[NASA-CR-163221] p0565 N80-28247
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1
[NASA-CR-163223] p0565 N80-28249
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices
[NASA-CR-163225] p0565 N80-28251
Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis
[NASA-CR-163226] p0565 N80-28252

ELECTRIC MOTOR VEHICLES
Siemens/Duewag H-Bahn - Technology and comparative assessment --- of rapid transit systems
p0324 A80-34056
Consumer experience with electric vehicles
p0326 A80-37351
Design study of flat belt CVT for electric vehicles
[NASA-CR-159822] p0550 N80-22702
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-12] p0556 N80-23861
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214
Research, development, and demonstration of nickel-zinc batteries for electric vehicle propulsion --- electrode development program
[ANL/OEPM-78-10] p0556 N80-24215
Electric and hybrid vehicle program
[DOE/CS-0026] p0556 N80-24216
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515] p0557 N80-24756
Pulse charging of lead-acid traction cells
[NASA-TM-81513] p0558 N80-25780
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-8] p0558 N80-25801
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-11] p0558 N80-25802
Evaluation of air cathodes for potential use in development of aluminum-air cells
[UCID-18561] p0535 N80-25893
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies --- various hybrid/electric power train configurations and electrical and mechanical drive-line components
[NASA-CR-163227] p0559 N80-26203
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies
[NASA-CR-163228] p0559 N80-26204
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206
Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207
Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208
Near-term hybrid vehicle program, phase 1. Appendix D: Sensitivity analysis resport
[NASA-CR-163233] p0560 N80-26209
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211
Energy-storage systems for automobile propulsion, 1979 study. Volume 3: Battery/flywheel electric vehicles using advanced batteries
[UCRL-52841-VOL-3] p0561 N80-26213
ETV metro sedan electric-propulsion system: Test and evaluation
[DOE/CS-1042/1] p0563 N80-27230
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0364 N80-27233
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548] p0356 N80-27805

ELECTRIC MOTORS
Assessment of the potential of hybrid vehicles: Summary
[NASA-CR-163059] p0336 N80-23215
Classification and evaluation of electric motors and pumps
[DOE/CS-0147] p0352 N80-26670

ELECTRIC POTENTIAL
Calculation of a low-frequency electromagnetic field due to MHD machines inside a common shielding shell
p0509 A80-34311
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368
Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities
p0416 A80-42135

ELECTRIC POWER
Economic analysis of the STEPS in Japan --- Solar Thermal Electric Power Systems
p0375 A80-33615
Advanced solar receiver development
p0379 A80-33649
Energy systems based on local renewable energy resources for a rural community in a developing country
p0323 A80-33677
Heat pumps in the PESAG supply district --- for electric power
p0509 A80-34123
The influence of the federal council on the formulation of the 'Regulation on general conditions for the supply of electricity for tariff customers' and the 'Second regulation on altering of the federal electricity tariff structure' Attempt at a critical assessment
p0324 A80-34125
Physics and economics of photovoltaic solar energy conversion
p0408 A80-37990
On direct conversion of sunlight to electricity
p0409 A80-37994
Wave energy --- offshore energy conversion technology assessment
p0479 A80-43831
Implications for the UK of solar-power satellites /s.p.s/ as an energy source
p0422 A80-43836

ELECTRIC POWER PLANTS
Solar central receiver hybrid - A cost effective future power alternative
[AIAA PAPER 80-0841] p0357 A80-32856
Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057
Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids
p0539 A80-33424
The Point-Focusing Thermal and Electric Applications Project - A progress report --- small solar power systems applications
p0372 A80-33595
Small solar plants for electricity supply
p0373 A80-33596
The International Energy Agency Small Solar Power Plants Project
p0373 A80-33597
30/50 kWE solar thermal power plant of the distributed type
p0373 A80-33599
The Ansaldo 35 kW solar power system
p0373 A80-33600
Small solar thermal power plants
p0373 A80-33602
Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605
A solar thermal-electric experimental plant
p0374 A80-33606
A self supporting solar power system for an isolated community
p0374 A80-33607
The solar ten megawatt pilot plant
p0374 A80-33608
Sodium cooled solar central receiver power station
p0375 A80-33610
A solar-fossil hybrid power system using a combined cycle
p0375 A80-33611

Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612
Utility problems of central tower solar plant in Italy
p0375 A80-33614
An optimization procedure for solar thermal electric power plant design
p0376 A80-33625
The cost/performance of large central receiver power systems as a function of heliostat design parameters
p0376 A80-33627
Optical analysis of paraboloidal concentrators with secondary reflectors
p0377 A80-33630
A study on mirror fields for tower type solar power plants
p0377 A80-33633
Thermodynamic trade-offs for gas cooled high temperature solar tower receivers
p0379 A80-33648
Testing of the 10-MWe pilot plant solar central receiver
p0380 A80-33656
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678
A 100 kW peak photovoltaic power system for the Natural Bridges National Monument
p0384 A80-33713
Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies
p0389 A80-33754
A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility
p0389 A80-33758
Investigation of further economics development of regional electricity supply concerns
p0324 A80-34122
Design of an isobutane binary cycle geothermal generation system
p0509 A80-34559
The trace element chemistry of coal during combustion and the emissions from coal-fired plants
p0324 A80-34600
MHD direct channel from heat to electricity
p0512 A80-35403
Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments
p0324 A80-35649
Modified power law equations for vertical wind profiles --- in investigation of windpower plant siting
p0468 A80-35719
Some meteorological activities in the National Swedish Wind Energy Program
p0513 A80-35725
Pacific Northwest regional assessment --- of wind energy utilization
p0469 A80-35732
Particulate sulfur and trace metal emissions from oil fired power plants
p0325 A80-35890
Planning air quality control systems for power generation
p0325 A80-35897
Closed cycle osmotic power plants for electric power production
p0470 A80-36051
Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds
p0325 A80-36419
Air quality measurements in the coal fired power plant environment of Colstrip, Montana
p0326 A80-36477
Calculation principles for heliostat fields of solar power plants
p0401 A80-36825
Solar coal gasification
p0403 A80-37305
Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems
p0326 A80-37618
On the evaluation of the feasibility of solar collectors for electrical power generation applications
p0406 A80-37963
Steam and gas turbines for small outputs using solar energy
p0410 A80-38003
A helioelectric farm --- multimodular solar thermal electric plant design is presented
p0410 A80-38005
A central receiver solar power system for remote locations
p0410 A80-38006
An economic analysis of solar energy alternatives
p0412 A80-38021
Evaluation of solar thermal power plants using economic and performance simulations
p0412 A80-38023
The American experience with solar energy in centralized electricity generation - Technology and economics
p0412 A80-38024
Solar energy with chemical storage for cogeneration of electric power and heat
p0549 A80-40715
Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience
p0330 A80-41842
Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology
p0331 A80-41849
Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162
Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation
[ASME PAPER 80-GT-34] p0416 A80-42167
Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225
Survey of integrated gasification combined cycle power plant performance estimates
[ASME PAPER 80-GT-113] p0477 A80-42231
2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant
[ASME PAPER 80-GT-132] p0477 A80-42245
Closed-cycle gas turbine working fluids
[ASME PAPER 80-GT-135] p0522 A80-42248
Organic Rankine-cycle turbine power plant utilizing low temperature heat sources
[ASME PAPER 80-GT-153] p0522 A80-42265
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems --- Closed-Cycle Gas Turbine
[ASME PAPER 80-GT-155] p0477 A80-42267
Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption
[ASME PAPER 80-GT-161] p0477 A80-42271
Evaluation method for closed cycle gas turbines in cogeneration applications
[ASME PAPER 80-GT-176] p0332 A80-42282
Development of a high temperature turbine for operation on coal-derived fuel
[ASME PAPER 80-GT-188] p0478 A80-42290
Solar power --- solar concentrators for solar power plants
p0420 A80-42468
Role of the public utility in developing energy from waste
p0333 A80-42926
The performance of solar thermal electric power systems employing small heat engines
[ASME PAPER 80-PET-25] p0523 A80-43340
Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power
[ASME PAPER 80-PET-27] p0333 A80-43341

A Stirling cycle engine for use with solar thermal-electric systems
[ASME PAPER 80-PET-32] p0524 A80-43343

Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications
[ASME PAPER 80-PET-83] p0524 A80-43345

An alternate approach to the application of MHD power generation technology in a utility environment
[IEEE PAPER F 79 651-1] p0525 A80-43502

The Nigorikawa Geothermal Pilot Plant
p0525 A80-43740

Economic and operational implications of a complex of wind-driven generators on a power system
p0333 A80-43829

Advantage of incorporating geothermal energy into power-station cycles
p0526 A80-43835

Direct ignition of pulverized coal with arc heated air
p0480 N80-22508

Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592] p0526 N80-22778

Dispersed storage and generation case studies
[NASA-CR-162996] p0334 N80-22782

Conceptual design of thermal energy storage systems for near-term electric utility applications
p0551 N80-22794

Solar thermal power storage applications lead laboratory overview
p0552 N80-22798

Superconducting magnetic energy storage for electric utilities and fusion systems
[LA-UR-78-1213] p0554 N80-22838

The optimization air separation plants for combined cycle MHD-power plant applications
[NASA-TM-81510] p0528 N80-23778

Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780

Naval facility energy conversion plants as resource recovery system components
[AD-A081232] p0528 N80-23783

Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

Electricity from refuse --- technology assessment
[NZERDC-44] p0338 N80-23803

Solar thermal repowering utility value analysis
[SERI/TR-8016-1] p0428 N80-23814

The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873

Siting solar thermal power experiments
p0435 N80-24783

The JPL isolated application experiment series
p0435 N80-24784

Military markets for solar thermal electric power systems
p0435 N80-24787

Advanced thermionic energy conversion
[NASA-CR-163061] p0531 N80-24812

Sensible heat storage for a solar thermal power plant
[LBL-9321] p0437 N80-24816

Ocean thermal energy conversion: A state-of-the-art study
[EPRI-ER-1113-SR] p0531 N80-24834

Compact closed cycle Brayton system feasibility study, volume 1 --- marine propulsion
[AD-A081379] p0532 N80-25666

Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 4: Commercial and pilot plant cost data
[SAN-1483-1/5] p0558 N80-25803

Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2] p0542 N80-25808

Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p04[illegible] N80-25826

Beneficial use of rejected heat from electric power plants
[COO-4531-9] p0348 N80-25841

Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 1: Executive summary
[SAN-1483-1/1] p0446 N80-25875

Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 2, book 1: Commercial plant conceptual design
[SAN-1483-1/2] p0447 N80-25876

Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894

Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AF-884] p0497 N80-26529

Development of high-temperature turbine system technology to a technology readiness status phase 2
[FE-1806-76] p0536 N80-26671

Thermal Power Systems (TPS); Point-Focusing Thermal and Electric Applications (PFTEA). Volume 2: Detailed report, fiscal year 1979
[NASA-CR-163023] p0449 N80-26770

Study of curved glass photovoltaic module and module electrical isolation design requirements
[NASA-CR-163033] p0450 N80-26781

Central station applications planning activities and supporting studies --- application of photovoltaic technology to power generation plants
[NASA-CR-163042] p0352 N80-26784

Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data
[SAND-79-7022-VOL-2] p0537 N80-26800

More on dual purpose solar-electric power plants
[SLAC-PUB-2477] p0452 N80-26822

Mechanisms and rates of formation of sulfur aerosols in power plant plumes
p0354 N80-26907

ELECTRIC POWER SUPPLIES

Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824

Safety grounding switches in large experiments - General considerations and the TEXT application --- TEXas Tokamak
p0517 A80-37867

Magnet optimization for pulsed energy conversion --- for fusion reactors
p0517 A80-37871

The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

A compressed magnetic field generator systems model
p0548 A80-37875

Impact of solar heating and cooling of buildings on electric utilities
p0412 A80-38022

A preliminary investigation for an $Al/AlCl_3-NaCl/FeS_2$ secondary cell
p0550 A80-42299

ELECTRIC POWER TRANSMISSION

Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756

System-reliability studies for wave-energy generation
p0540 A80-43830

Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2] p0542 N80-25808

Microwave beamed power technology improvement --- magnetrons and slotted waveguide arrays
[NASA-CR-163043] p0542 N80-26785

ELECTRIC PROPULSION

Can this car electrify America --- electric car propulsion system development
p0548 A80-39086

ELECTRIC PULSES
  International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers p0547 A80-37811
  Pulsed power for fusion p0516 A80-37812
  Fundamental limitations and design considerations for compensated pulsed alternators p0516 A80-37824
  Use of transformers in producing high-power output from homopolar generators p0516 A80-37825
  The mechanical design of a compensated pulsed alternator prototype p0548 A80-37873
  A compressed magnetic field generator systems model p0548 A80-37875
ELECTRIC SWITCHES
  Safety grounding switches in large experiments - General considerations and the TEXT application --- TEXas Tokamak p0517 A80-37867
ELECTRICAL ENGINEERING
  High-temperature electronics: An overview [SAND-79-2319A] p0481 N80-22614
ELECTRICAL FAULTS
  Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel p0511 A80-34875
  Scanning light spot analysis of faulty solar cells p0420 A80-43118
ELECTRICAL GROUNDING
  Safety grounding switches in large experiments - General considerations and the TEXT application --- TEXas Tokamak p0517 A80-37867
ELECTRICAL INSULATION
  Measurements on insulating materials at cryogenic temperatures [PB80-134596] p0541 N80-24507
ELECTRICAL MEASUREMENT
  High electrical conductivity and high Hall coefficient in MHD generator p0511 A80-34990
  A circuit for measurement of the fill factor of solar cells p0399 A80-36121
  Measurement techniques in thin film polycrystalline materials and devices /solar cells/ p0422 A80-43764
  Calorimetric measurement of ac losses in superconducting cables of short lengths [BNL-26712] p0540 N80-22609
ELECTRICAL PROPERTIES
  An analytical model of a backwall MIS Schottky barrier solar cell p0399 A80-36245
  I-V and C-V characteristics of Au/TiO2 Schottky diodes p0413 A80-39055
  Electrical properties of polycrystalline GaAs films p0525 A80-43575
ELECTRICAL RESISTIVITY
  High electrical conductivity and high Hall coefficient in MHD generator p0511 A80-34990
  A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection p0396 A80-35358
  Influence of base resistivity on the temperature characteristics of silicon photoconverters p0514 A80-36590
ELECTRICITY
  Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025 p0389 A80-33759
  Line focus solar thermal central receiver research study [DOE/ET/20426-1] p0440 N80-24853
  Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress [PB80-143175] p0535 N80-25910
ELECTRIFICATION
  Traction studies of northeast corridor rail passenger service: Executive summary [NASA-CR-162997] p0336 N80-23214
ELECTRO-OPTICS
  The electronic aberrogram recorder --- for solar concentrators p0391 A80-33858
  Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators p0401 A80-36822
  Optoelectronic and photovoltaic properties of metal-SiO2-silicon tunneling structures p0426 N80-23179
ELECTROCHEMICAL CELLS
  On the design of silver-hydrogen electrochemical cells p0547 A80-37003
  Metal filmed-semiconductor photoelectrochemical cells p0515 A80-37006
  Rechargeable batteries: Advances since 1977 --- Book p0547 A80-37591
  Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators p0519 A80-39746
  Electrochemistry, power sources and energy science p0521 A80-41851
  Basic electrochemistry --- in solar energy conversion p0419 A80-42458
  CO2 concentrations in a molten carbonate electrochemical cell [ASME PAPER 80-ENAS-14] p0523 A80-43190
  Redox storage systems for solar applications [NASA-TM-81464] p0427 N80-23777
  Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report [UCRL-52841-VOL-2] p0563 N80-27232
ELECTROCHEMICAL OXIDATION
  Studies of thermochemical water-splitting cycles [NASA-CR-163029] p0449 N80-26409
ELECTROCHEMISTRY
  Electrochemistry, power sources and energy science p0521 A80-41851
  Basic electrochemistry --- in solar energy conversion p0419 A80-42458
  Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell p0462 A80-42459
  Survey of organic electrolytic processes [ANL/OEPM-79-5] p0341 N80-24393
  Batteries for specific solar applications: Project description [SAND-79-1782C] p0557 N80-24803
  Definition of chemical and electrochemical properties of a fuel cell electrolyte [AD-A083608] p0537 N80-26794
ELECTRODEPOSITION
  Thermal aging characteristics of electrodeposited black chrome solar coatings p0388 A80-33740
  Selective electrodeposited chromium black coatings - Optical properties, selectivity model p0388 A80-33743
  Electrolytic coatings of 'black chromium' type for solar collectors p0400 A80-36594
  Corrosion protection of solar-collector heat exchangers with electrochemically deposited films [COO-4297-2] p0454 N80-26845
ELECTRODES
  Advanced screening of electrode couples [NASA-CR-159738] p0551 N80-22777
  Research, development, and demonstration of nickel-zinc batteries for electric vehicle propulsion --- electrode development program [ANL/OEPM-78-10] p0556 N80-24215
  The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems [PB80-138464] p0351 N80-25947
ELECTROLYSIS
  Hydrogen from fossil fuels p0460 A80-37333

Description of processes for producing hydrogen by advanced electrolysis p0460 A80-37335

Electrolytic hydrogen production and its potential utilization for ship propulsion p0462 A80-37987

Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell p0462 A80-42459

Mass transport in molten-salt electrochemical systems [ORNL/MIT-290] p0527 N80-23400

Survey of potential processes for the manufacturing of aluminum --- reducing industrial energy requirements [ANL/OEPM-79-4] p0351 N80-26441

ELECTROLYTES

Performance of the noval solar cell substitute for the future p0409 A80-37995

Mass transport in molten-salt electrochemical systems [ORNL/MIT-290] p0527 N80-23400

New electrolytes for direct methane fuel cells [DOE/ET-11321/T1] p0534 N80-25891

Advanced fuel cell development [ANL-79-51] p0535 N80-25895

Definition of chemical and electrochemical properties of a fuel cell electrolyte [AD-A083608] p0537 N80-26794

ELECTROLYTIC CELLS

Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004

Electrical data of sodium/sulfur cells operating with dissolved catholyte p0547 A80-37005

Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell p0515 A80-37007

Glassy electrolyte galvanic cells p0515 A80-37008

Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte p0547 A80-37009

The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance p0522 A80-42295

Properties of alternate electrolytes for secondary zinc batteries p0550 A80-42297

Ammonia high temperature solid electrolyte fuel cell p0523 A80-42298

Basic electrochemistry --- in solar energy conversion p0419 A80-42458

Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell p0462 A80-42459

ELECTROMAGNETIC ABSORPTION

Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors p0391 A80-33859

Absorption of radiation in a magnetoplasma and application to the laser-fusion process p0525 A80-43496

ELECTROMAGNETIC FIELDS

Calculation of a low-frequency electromagnetic field due to MHD machines inside a common shielding shell p0509 A80-34311

Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges [SAND-79-7051-VOL-1] p0449 N80-26611

ELECTROMAGNETIC NOISE MEASUREMENT

Noise spectral density as a device reliability estimator --- for solar cells p0422 A80-43763

ELECTROMAGNETIC PUMPS

Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump p0509 A80-34312

ELECTROMAGNETIC SHIELDING

Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges [SAND-79-7051-VOL-1] p0449 N80-26611

ELECTROMECHANICAL DEVICES

Coal-shale interface detector [NASA-CASE-MFS-23720-1] p0483 N80-23711

ELECTRON ACCELERATORS

Accelerator module of 'Angara-5' --- for relativistic electron beams in inertial confinement fusion reactor design p0516 A80-37815

ELECTRON BEAMS

Electron-beam-induced current characterization of polycrystalline silicon solar cells p0398 A80-35482

Repetitively pulsed electron beam diode lifetime and stability --- for inertial confinement fusion p0516 A80-37820

ELECTRON DENSITY (CONCENTRATION)

Electron density measurements in the TRIAM-1 tokamak p0510 A80-34649

ELECTRON DIFFUSION

Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements p0398 A80-35491

ELECTRON ENERGY

Breakeven for thermonuclear fusion in the hot-ion mode p0519 A80-39539

ELECTRON GUNS

A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854

ELECTRON IRRADIATION

Radiation damage in high voltage silicon solar cells [NASA-TM-81478] p0426 N80-23180

ELECTRON MICROSCOPY

Electron-beam-induced current characterization of polycrystalline silicon solar cells p0398 A80-35482

ELECTRON PLASMA

Electron cyclotron heating of tokamaks p0511 A80-34973

ELECTRON PUMPING

A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854

ELECTRON RECOMBINATION

Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells p0395 A80-35346

A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight p0396 A80-35355

ELECTRON RUNAWAY (PLASMA PHYSICS)

Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak p0512 A80-35439

ELECTRON TRANSFER

Energy storage and electron transfer by carbanion photolysis p0545 A80-33419

ELECTRON TUNNELING

Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells p0401 A80-36933

Photoemission measurements of interface barrier energies for tunnel oxides on silicon p0515 A80-36936

ELECTRONIC CONTROL

A pin programmable controller for research systems --- of solar heating and cooling p0380 A80-33662

ELECTRONIC EQUIPMENT

High-temperature electronics: An overview [SAND-79-2319A] p0481 N80-22614

Test results on the Frenchman's Reef solar data acquisition and control system [NASA-CR-161449] p0441 N80-25783

Power take-off analysis for diagonally connected MHD channels [CONF-800104-6] p0535 N80-26167

ELECTRONIC EQUIPMENT TESTS
Photovoltaic module performance and degradation at various MIT/LL test sites p0385 A80-33717
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells p0399 A80-35493
Load excitation at the superconducting cable test facility [BNL-26641] p0540 N80-22608
High energy storage flywheel test program [AD-A083302] p0561 N80-26796
Airport solar photovoltaic concentrator project, phase 1 [DOE/CS-05317/1] p0453 N80-26839
ELECTRONIC MODULES
Photovoltaic module performance and degradation at various MIT/LL test sites p0385 A80-33717
Accelerator module of 'Angara-5' --- for relativistic electron beams in inertial confinement fusion reactor design p0516 A80-37815
ELECTRONIC RECORDING SYSTEMS
The electronic aberrogram recorder --- for solar concentrators p0391 A80-33858
ELECTROPLATING
A field ion microscope study of microstructural features of solar collector coatings p0422 A80-43528
ELEVATION ANGLE
Solar elevation angle probability distribution p0415 A80-40721
EMITTANCE
Photoacoustic determination of absorptance and emittance of solar selective coatings p0388 A80-33744
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces p0388 A80-33746
EMITTERS
Tailored emitter, low-resistivity, ion-implanted silicon solar cells p0396 A80-35361
EMULSIONS
Feasibility study of using a coal/water oil emulsion as a clean liquid fuel [FE-2437-T1-ADD] p0490 N80-25463
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2 p0495 N80-26469
Rheological properties of solvent refined coal-oil mixtures p0495 N80-26471
Evaluation of "stable" emulsions of coal p0495 N80-26473
Results of experiment production of fine COM by wet type mill p0496 N80-26475
Fine COM preparation test p0496 N80-26476
The use of additives to stabilize coal-oil mixture p0496 N80-26477
COM stability forecasting method p0496 N80-26478
Investigation of fuels containing coal-oil-water emulsions [FE-2689-5] p0497 N80-26524
ENCAPSULATING
Development of a storage system based on encapsulated p.c.-materials --- Phase Change material in solar heating p0546 A80-33522
Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems p0387 A80-33732
ENDOTHERMIC REACTIONS
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent --- for solar heating and cooling energy storage p0358 A80-33423
Solar energy collection using the reversible ammonia dissociation reaction p0358 A80-33427
A steam process for the gasification of coal p0480 N80-22507
ENERGY ABSORPTION FILMS
Thermal degradation of a black chrome solar selective absorber coating - Short term p0387 A80-33739
Thermal aging characteristics of electrodeposited black chrome solar coatings p0388 A80-33740
Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control p0388 A80-33741
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system p0388 A80-33742
Photoacoustic determination of absorptance and emittance of solar selective coatings p0388 A80-33744
Radiative selectivity and the oxidation of stainless steels p0388 A80-33745
Low-cost, high-performance solar selective paint coatings p0393 A80-34781
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors p0399 A80-35500
Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique p0402 A80-37299
Development of a low-temperature, low-cost, black liquid solar collector, phase 2 --- weathering tests [ALO-30171-1] p0453 N80-26841
ENERGY BANDS
Required minimum value of barrier height in minority-carrier M.I.S. solar cells p0414 A80-40474
ENERGY BUDGETS
La Recherche Aerospatiale, Bimonthly Bulletin Number 1979-6 [ESA-TT-632] p0448 N80-26255
ENERGY CONSERVATION
Experimental performance study of a series solar heat pump p0368 A80-33552
Integrating energy approaches in a large office building p0324 A80-33690
Design and performance of low heat loss window systems p0324 A80-33706
Solar-cladding - Insulation plus insolation --- applying insulation material to outside building walls p0384 A80-33708
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents p0324 A80-34018
Fuel - A system problem of major proportions --- fuel conservation in airline operations p0327 A80-37691
California State energy efficient State Office Building p0327 A80-37984
Solar energy - Will it conserve our non-renewable resources p0413 A80-38025
Heat pumps for heating, cooling, and energy recovery 1976-1990 --- German book p0327 A80-38210
Topical questions of energy economics p0328 A80-38304
Lightweight diesel aircraft engines for general aviation [AIAA PAPER 80-1238] p0328 A80-38983
Paving the way for energy-saving innovations p0328 A80-39554
The energy problem - Its effect on aircraft design. IV - The unforecastable future p0329 A80-40944
Determination of the extinction coefficient of glass fiber insulation [AIAA PAPER 80-1528] p0330 A80-41488

The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255
Prospects for energy responsive urban planning and design
p0332 A80-42450
A utility company's view of energy from waste
p0332 A80-42925
Building heating and cooling applications thermal energy storage program overview
p0552 N80-22806
Energy conservation via heat transfer enhancement
[COO-4649-5] p0335 N80-22847
Basic research needs in energy conservation
[LBL-9939] p0338 N80-23794
Series solar heat pump and energy conservation
[BNL-27012] p0340 N80-23857
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
Advanced component technologies for energy-efficient turbofan engines
[NASA-TM-81507] p0341 N80-24316
Federal government needs a comprehensive program to curb its energy use
[EMD-80-11] p0343 N80-24814
Evaluation of energy conserving modifications for water heaters
[PB80-133853] p0344 N80-24873
Evaluation of residential building energy performance standards
[LBL-9816] p0348 N80-25849
Site and building energy-conservation study: Survey of building 251, diagnostic chemistry
[UCRL-15190] p0348 N80-25880
International analysis of residential energy use and conservation
[LBL-9383] p0349 N80-25881
Proposed energy performance standards for new buildings: Standard building operating conditions
[DOE/CS-0118] p0349 N80-25901
Proposed energy-performance standards for new buildings: Passive and active solar-heating analysis
[DOE/CS-0117] p0349 N80-25902
Survey of potential processes for the manufacturing of aluminum --- reducing industrial energy requirements
[ANL/OEPM-79-4] p0351 N80-26441
Architects and engineers guide to energy conservation in existing buildings
[DOE/CS-0132] p0351 N80-26550
Site and building energy-conservation study: Survey of building 435, MFE research
[UCRL-15198] p0352 N80-26568
State options in lighting: Efficiency standards for existing public buildings
[DOE/CS-5255/2] p0352 N80-26600
Oversight: Industrial energy conservation, volume 10
[GPO-53-020] p0352 N80-26786
Examination of energy consumption and the possibilities of energy savings in office buildings
p0353 N80-26791
Site and building energy-conservation study: Survey of building 3, experimental physics
[UCRL-15195] p0353 N80-26808
Comparison of costs for automobile energy conservation vs synthetic fuel production
[CONF-800419-1] p0353 N80-26810
Guide for energy compatibility
[NP-24016] p0353 N80-26833
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1] p0537 N80-26853
Illinois state plan: Energy conservation in institutions (institutional buildings grant program)
[PB80-148182] p0354 N80-26882
Energy-efficient procurement in state and local governments
[DOE/CS-5255/1] p0355 N80-27207
Energy conservation potential of general aviation activity
[AD-A081182] p0355 N80-27355
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364

Solar energy system performance evaluation-seasonal report for Elcam San Diego, San Diego, California
[NASA-CR-161481] p0457 N80-27806

ENERGY CONSUMPTION
Putting baseload to work on the night shift
p0547 A80-35402
California State energy efficient State Office Building
p0327 A80-37984
End use energy in Brazil and the solar technologies
p0472 A80-38016
Topical questions of energy economics
p0328 A80-38304
Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's
p0330 A80-41826
Prospects for energy responsive urban planning and design
p0332 A80-42450
Role of the public utility in developing energy from waste
p0333 A80-42926
Heat-pump applications to single-family dwellings - An analysis by computer model
p0333 A80-43833
Fossil-fuel heat pumps for domestic, commercial and industrial space heating
p0479 A80-43834
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1] p0339 N80-23830
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841
United Kingdom: Estimates of future energy/GDP relationship
[ORAU/IEA(M)-79-25] p0339 N80-23848
Canada: Estimates of future energy/GNP relationships
[ORAU/IEA(M)-79-24] p0339 N80-23849
Process applications for geothermal energy resources
[COO-4896-T1] p0340 N80-23854
Low-cost general energy/analytic information system
[BNL-26398] p0567 N80-24801
The Project Independence Evaluation System (PIES). Volume 1: Description of the system, executive summary
[HCP/I-1321-01/1] p0342 N80-24802
Federal government needs a comprehensive program to curb its energy use
[EMD-80-11] p0343 N80-24814
California thermal oil utilization. Volume 1: Executive summary
[SAN-1064-1] p0488 N80-24849
Prospects for using improved climate information to better manage energy systems
[UCRL-83813] p0343 N80-24859
Japan: Estimates of future energy/GNP relationships in energy use
[ORAU/IEA-79-21(M)] p0344 N80-24869
Energy performance standards for new buildings: Economic analysis
[DOE/CS-0129] p0344 N80-24871
Evaluation of residential building energy performance standards
[LBL-9816] p0348 N80-25849
Site and building energy-conservation study: Survey of building 251, diagnostic chemistry
[UCRL-15190] p0348 N80-25880
International analysis of residential energy use and conservation
[LBL-9383] p0349 N80-25881
Proposed energy performance standards for new buildings: Standard building operating conditions
[DOE/CS-0118] p0349 N80-25901
Proposed energy-performance standards for new buildings: Passive and active solar-heating analysis
[DOE/CS-0117] p0349 N80-25902
Site and building energy-conservation study: Survey of building 435, MFE research
[UCRL-15198] p0352 N80-26568
Examination of energy consumption and the possibilities of energy savings in office buildings
p0353 N80-26791

Comparison of costs for automobile energy conservation vs synthetic fuel production [CONF-800419-1] p0353 N80-26810

Design tradeoff studies and sensitivity analysis, appendices B1 - B4 --- hybrid electric vehicles [NASA-CR-163037] p0563 N80-27225

Coal/oil/water mixture stability, appendix A p0501 N80-27502

ENERGY CONVERSION

Comments on TEC trends --- Thermionic Energy Conversion p0519 A80-39642

Environmental concerns for coal synfuel commercialization p0329 A80-40759

Biomass energy conversion workshop for industrial executives [SERI/TP-62-299] p0480 N80-22516

Literature survey of properties of synfuels derived from coal [NASA-TM-79243] p0481 N80-22776

Dispersed storage and generation case studies [NASA-CR-162996] p0334 N80-22782

Technology assessment of wind energy conversion systems [LA-8044-TASE] p0527 N80-22840

Technical applications of solar energy [BMFT-FB-T-79-06] p0424 N80-22860

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 3: Environmental [FE-2416-43-VOL-3] p0337 N80-23485

Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-9] p0483 N80-23486

Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-8] p0483 N80-23487

Cell module and fuel conditioner development [NASA-CR-159828] p0527 N80-23768

Cell module and fuel conditioner [NASA-CR-159875] p0528 N80-23769

The aerodynamics of axial flow wind power turbines [CSIR-ME-1619] p0528 N80-23781

Naval facility energy conversion plants as resource recovery system components [AD-A081232] p0528 N80-23783

Millville Wind Turbine Generator: Failure analysis and corrective design modification [RFP-2992/3533/79-3] p0529 N80-23831

Vertical axis wind turbine development: Executive summary [ORO-5135-77-5-SUMM] p0529 N80-23845

Vertical axis wind turbine development [ORO-5135-77-5] p0529 N80-23846

Environmental standards for coal conversion processes. Volume 1: Most stringent, federal, and selected state regulations [PB80-126980] p0341 N80-23904

Conceptual design of a coal-to-methanol-to-gasoline commercial plant, volume 1 [FE-2416-43-VOL-1] p0484 N80-24467

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis [FE-2416-43-VOL-2] p0485 N80-24468

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4A: Drawings, specifications, and alternate designs [FE-2416-43-VOL-4A] p0485 N80-24469

Characteristics of American coals in relation to their conversion into clean energy fuels [FE-2030-13] p0485 N80-24476

Coal conversion [DOE/ET-0061/2] p0486 N80-24481

Overall efficiencies for conversion of solar energy to a chemical fuel [SAND-79-8636] p0431 N80-24495

Mod-2 wind turbine system concept and preliminary design report. Volume 1: Executive summary [NASA-CR-159609] p0530 N80-24758

The United Stirling P40 engine for solar dish concentrator application p0531 N80-24775

Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report [NASA-CR-159765] p0342 N80-24797

Advanced thermionic energy conversion [NASA-CR-163061] p0531 N80-24812

Energy from humid air [DSE-2553-79/1] p0531 N80-24861

Further investigations of diffuser augmented wind turbines. Part 1: Executive summary [COO-2616-2-PT-1-REV-1] p0532 N80-24864

Quality assurance in support of energy related monitoring activities [PB80-135270] p0346 N80-24898

Statistical models for wind characteristics at potential wind energy conversion sites [DOE/ET/20283-1] p0489 N80-24968

Preparation of a coal conversion systems technical data book [FE-2286-44] p0490 N80-25472

Compact closed cycle Brayton system feasibility study, volume 1 --- marine propulsion [AD-A081379] p0532 N80-25666

Cogeneration technology alternatives study. Volume 1: Summary report [NASA-CR-159759] p0347 N80-25792

Cogeneration technology alternatives study. Volume 2: Industrial process characteristics [NASA-CR-159760] p0347 N80-25793

Cogeneration technology alternatives study. Volume 4: Heat Sources, balance of plant and auxiliary systems [NASA-CR-159762] p0347 N80-25794

Cogeneration technology alternatives study. Volume 6: Computer data [NASA-CR-159764] p0347 N80-25795

Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant [AD-A082756] p0492 N80-25797

Design study and economic assessment of multi-unit offshore wind energy conversion systems applications. Volume 4: Meteorological and oceanographic surveys [WASH-2330-78/4-VOL-4] p0533 N80-25836

Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 3: System analysis [WASH-2330-78/4-VOL-3] p0533 N80-25837

New developments in wind systems technology [RFP-3000] p0534 N80-25888

Technical and management support for the development of small wind systems [RFP-2974/3533-79-2] p0534 N80-25889

Risk of renewable energy sources: A critique of the Inhaber report [ERG-79-3] p0349 N80-25892

Aerodynamic interference between two Darrieus wind turbines [SAND-79-1984C] p0535 N80-25897

Design and fabrication of a low-cost Darrieus vertical axis wind turbine system, phase 1 [ALO-4272] p0535 N80-25899

Biosources digest, a journal on biomass utilization, volume 1, no. 1 [PB80-140973] p0493 N80-25908

Biosources digest: A journal on biomass utilization, volume 1, no. 4 [PB80-140981] p0493 N80-25909

Environmental assessments of alternative energy strategies in the United States [CONF-791172-1] p0350 N80-25927

Environmental assessment of small wind systems [SERI/PR-354-420] p0350 N80-25928

Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3 [DSE-4042-T2] p0498 N80-26533

Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs [CONF-800133-1] p0536 N80-26628

Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis [NASA-CR-159634] p0536 N80-26779

More on dual purpose solar-electric power plants [SLAC-PUB-2477] p0452 N80-26822

HYCSOS: Hydride conversion and storage system sensitivity analysis [ANL/EES-TM-63] p0564 N80-27523

Wind characteristics for design of wind turbines: Research in the USA [PNL-SA-7967] p0538 N80-27817

Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB80-163686] p0538 N80-27825

ENERGY CONVERSION EFFICIENCY

Microprocessor-controlled digital shunt regulator --- for solar power systems p0505 A80-32758

A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency p0357 A80-32933

Performance evaluation of wind turbines p0508 A80-33290

High intensity mass algae culture requirements and limitations --- for maximum growth and energy conversion in sunlight p0358 A80-33408

Conversion processes for liquid fuels from biomass p0465 A80-33411

Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids p0539 A80-33424

Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry p0359 A80-33430

Industrial solar energy activity in Monaco p0359 A80-33440

Derivation of efficiency and loss factors for solar air heaters p0359 A80-33447

The effects of air leaks on solar air heating systems p0359 A80-33448

New air-heating collector design and performance p0359 A80-33449

An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems p0360 A80-33452

Forced convection in solar collectors p0360 A80-33455

Heat transfer through collector glass covers p0360 A80-33458

The effect of pressure on the performance of cylindrical solar collectors p0361 A80-33461

Testing the performance of solar collectors under standard conditions p0361 A80-33466

Equations for representing the UL-dependence in collector test procedures --- heat loss coefficient p0361 A80-33467

Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors p0361 A80-33469

A data analysis program for collector testing --- solar energy for Fort Hood, Texas p0362 A80-33482

Suntec/Hexcel parabolic trough --- solar collector design and efficiency for industrial process energy p0363 A80-33485

Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season p0363 A80-33488

Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers p0363 A80-33489

Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance p0363 A80-33490

Low cost vee-trough evacuated tube collector module p0363 A80-33492

Experimental and theoretical evaluation of a novel concentrating solar energy collection system p0364 A80-33495

A unique new Fresnel lens solar concentrator p0364 A80-33499

Applications of CPC's in solar energy - An overview --- Compound Parabolic Concentrators p0364 A80-33501

Incidence angle modifier and average optical efficiency of parabolic trough collectors p0364 A80-33502

Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory p0545 A80-33513

A design method for parallel solar-heat pump systems p0367 A80-33542

Development of an effective solar fraction --- for solar heating subsystems p0368 A80-33555

Solar heating systems in Scandinavian climate - Reality or daydreams p0369 A80-33559

Analysis of solar water heating systems p0370 A80-33574

The Ansaldo 35 kW solar power system p0373 A80-33600

Economic analysis of the STEPS in Japan --- Solar Thermal Electric Power Systems p0375 A80-33615

Performance analysis for collector-side reflector systems p0376 A80-33621

Cooling system parameter analysis --- for solar collectors p0376 A80-33622

An optimization procedure for solar thermal electric power plant design p0376 A80-33625

Optical analysis of paraboloidal concentrators with secondary reflectors p0377 A80-33630

How to measure the optical quality of focusing solar collectors without laser ray tracing p0378 A80-33645

Thermodynamic trade-offs for gas cooled high temperature solar tower receivers p0379 A80-33648

Measurements of performance and efficiency of solar energy systems p0381 A80-33667

The characterization of the performance of passive solar heating systems p0382 A80-33686

An application of phase change materials in passive solar systems p0384 A80-33703

A 100 kW peak photovoltaic power system for the Natural Bridges National Monument p0384 A80-33713

Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells p0385 A80-33720

Design and performance of silicon solar cells under concentrated sunlight p0385 A80-33721

MIS solar cells on crystalline, polycrystal, and thin film silicon p0385 A80-33722

Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems p0387 A80-33732

Connection losses in photovoltaic arrays p0387 A80-33734

Evaluation of combined photovoltaic/thermal collectors p0387 A80-33736

Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies p0389 A80-33754

Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces p0390 A80-33786

Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors p0390 A80-33805

Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators p0391 A80-33855

Optimization of flat-plate collector-flat mirror systems
p0392 A80-33871
Fluid circulation control in conventional and heat pipe planar solar collectors
p0392 A80-33872
Photovoltaic materials --- for solar energy conversion
p0392 A80-34637
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778
Solar materials R & D overview emphasizing solar thermal power systems
p0393 A80-34779
Thin-film solar cells - A unified analysis of their potential
p0393 A80-35335
Characteristics of MOS solar cells built on /n-type/ In P substrates
p0394 A80-35336
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339
Design considerations for a-Si solar cells
p0394 A80-35342
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343
MIS and SIS solar cells
p0395 A80-35348
Detailed modeling of inversion-layer solar cells
p0395 A80-35351
High-efficiency silicon minMIS solar cells - Design and experimental results
p0395 A80-35352
Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353
Updating the limit efficiency of silicon solar cells
p0395 A80-35354
A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight
p0396 A80-35355
Unified model of fundamental limitations on the performance of silicon solar cells
p0396 A80-35356
A study of the factors which control the efficiency of ion-implanted silicon solar cells
p0396 A80-35360
Material and device considerations for cascade solar cells
p0397 A80-35364
Cascade solar-cell design for high-temperature operation
p0397 A80-35365
A new technology to fabricate high-efficiency silicon concentrator solar cells
p0397 A80-35366
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368
Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects
p0397 A80-35370
Upper limit for the conversion of solar energy
p0397 A80-35372
Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385
Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program
p0513 A80-35718
Data analysis at the Rocky Flats Wind Systems Test and Development Center
p0513 A80-35724
Some meteorological activities in the National Swedish Wind Energy Program
p0513 A80-35725
Turbulence and WTG performance --- Wind Turbine Generator
p0513 A80-35726
Heat losses of a static low-concentration solar collector
p0399 A80-35838
An analytical model of a backwall MIS Schottky barrier solar cell
p0399 A80-36245
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588
Influence of base resistivity on the temperature characteristics of silicon photoconverters
p0514 A80-36590
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591
Evaluating the performance of reflecting concentrating systems
p0400 A80-36592
Energy balance of solar thermoelectric generator
p0401 A80-36821
Heating characteristics of concentrator/receiver system employing a selective absorbing surface
p0401 A80-36826
Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters
p0401 A80-36829
Metal filmed-semiconductor photoelectrochemical cells
p0515 A80-37006
Description of processes for producing hydrogen by advanced electrolysis
p0460 A80-37335
Pulsed power for fusion
p0516 A80-37812
Magnet optimization for pulsed energy conversion --- for fusion reactors
p0517 A80-37871
The flat plate solar collector - Its steady-state and transient state behaviour
p0403 A80-37943
Flat-plate solar collectors - Influence of design material and configuration on performance
p0404 A80-37944
My new types of flat plate solar collectors
p0404 A80-37945
Measurements on a flat thermal solar energy collector with a cellular structure after Francia
p0404 A80-37946
Passive solar wall collectors
p0404 A80-37949
A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector
p0404 A80-37950
High-efficiency solar concentrator
p0405 A80-37953
Thermo-fluid analysis of a cylindrical solar heat absorber
p0405 A80-37955
An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector
p0405 A80-37956
Hot water production by means of a solar thermosyphon loop
p0407 A80-37971
New possibilities of solar energy conversion by means of refractory thermoelements
p0409 A80-37993
Performance of the noval solar cell substitute for the future
p0409 A80-37995
Optimization of graded doping CdTe solar cells
p0409 A80-37998
Solar power units with screw expanders
p0410 A80-38000
New developments for future solar power plants
p0410 A80-38001

Turbine selection for small capacity solar-power generation p0410 A80-38004

Detailed balance limit of the efficiency of tandem solar cells p0413 A80-38282

Optical performance of the Gemini carbon dioxide laser fusion system p0517 A80-38482

Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents p0472 A80-39420

Ion-implanted laser annealed silicon solar cells p0414 A80-40252

Equitable performance comparison and economic evaluation of active and passive solar energy systems p0329 A80-40965

Plastic solar collectors for 'low energy' applications p0415 A80-41948

Thermal insulation of a low capital cost solar-energy collector p0416 A80-41951

Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities p0416 A80-42135

Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0416 A80-42140

The design of a solar receiver for a 25-kWe gas turbine engine [ASME PAPER 80-GT-131] p0416 A80-42244

Results from tests on a high work transonic turbine for an energy efficient engine [ASME PAPER 80-GT-146] p0332 A80-42258

Advanced non-concentrating solar collectors p0417 A80-42441

Concentrating collectors p0417 A80-42442

Spectrally selective surfaces in photothermal solar energy conversion p0417 A80-42443

Polycrystalline solar cells p0419 A80-42456

Scanning light spot analysis of faulty solar cells p0420 A80-43118

A low-high-junction solar-cell model developed for use in tandem cell analysis p0420 A80-43122

The performance of solar thermal electric power systems employing small heat engines [ASME PAPER 80-PET-25] p0523 A80-43340

Information theory and solar energy collection p0421 A80-43368

On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications p0421 A80-43485

Transmission of diffuse radiation through CPC and flat plate collector glazings --- Compound Parabolic Collector p0421 A80-43486

An alternate approach to the application of MHD power generation technology in a utility environment [IEEE PAPER F 79 651-1] p0525 A80-43502

The design and fabrication of high efficiency thin film CdS/Cu2S solar cells p0422 A80-43516

A computer analysis of heteroface solar cells with ultrathin window layer p0422 A80-43589

Thermodynamic energy conversion efficiencies p0525 A80-43590

Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices p0526 A80-43760

Grain boundary defects in thin semicrystalline material --- effects on performance of silicon solar cells p0422 A80-43761

Energy analysis of wave and tidal power p0333 A80-43828

Economic and operational implications of a complex of wind-driven generators on a power system p0333 A80-43829

System-reliability studies for wave-energy generation p0540 A80-43830

Wave energy --- offshore energy conversion technology assessment p0479 A80-43831

Advantage of incorporating geothermal energy into power-station cycles p0526 A80-43835

Handbook of solar energy data for south-facing surfaces in the United States. Volume 2: Average hourly and total daily insolation data for 235 localities. Alaska - Montana [NASA-CR-162999] p0423 N80-22784

Handbook of solar energy data for south-facing surfaces in the United States. Volume 3: Average hourly and total daily insolation data for 235 localities. North Carolina - Wyoming [NASA-CR-163000] p0423 N80-22785

Proposition on energy analysis and economic efficiency [SERI/RR-51-332] p0338 N80-23805

Passive solar calculation methods [DSE/5221-T1] p0429 N80-23836

Tests of high-powered direct conversion on beams and plasma [UCRL-82852] p0532 N80-25161

CSU Solar House 3: Solar heating and cooling system performance [COO-30122-3] p0442 N80-25806

High temperature hydrogen cycles for solar heat sources [LA-UR-80-184] p0443 N80-25817

Solar technology application to enhanced oil recovery [SERI/TR-352-392] p0445 N80-25839

Novel solar cell concentrator photovoltaic converter system [SAND-79-7048] p0445 N80-25843

Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress [PB80-143175] p0535 N80-25910

An open cycle turbine solar thermal power system p0448 N80-26257

Solar energy system performance evaluation: Seasonal report for Elcam Tempe Arizona State University, Tempe, Arizona [NASA-CR-161466] p0450 N80-26778

Development of high efficiency stacked multiple bandgap solar cells [AD-A083092] p0450 N80-26797

System planning analysis applied to OTEC: initial cases by Florida Power Corporation, task 2 [DOE/ET/29187-2] p0537 N80-26864

Open-cycle MHD systems analysis [EPRI-AP-1230] p0538 N80-27192

ENERGY DISSIPATION

Derivation of efficiency and loss factors for solar air heaters p0359 A80-33447

The 'soil therm' system for interseasonal earth storage of solar heat for individual housing p0545 A80-33516

Connection losses in photovoltaic arrays p0387 A80-33734

Application of circumsolar measurements to concentrating collectors p0389 A80-33761

Heat losses of a static low-concentration solar collector p0399 A80-35838

Generalized shading analysis for paraboloidal collector fields [ASME PAPER 80-PET-33] p0420 A80-43344

Extrinsic losses in solar cells for linear focus systems 4 [SAND-79-1781] p0439 N80-24842

ENERGY GAPS (SOLID STATE)

Development of high efficiency stacked multiple bandgap solar cells [AD-A083092] p0450 N80-26797

ENERGY POLICY

Solar energy R & D projects in Denmark p0323 A80-33437

National solar heating and cooling programme - New Zealand p0323 A80-33442

Status of the United States' Solar Heating and Cooling Program
p0323 A80-33446

Investigation of further economics development of regional electricity supply concerns
p0324 A80-34122

The influence of the federal council on the formulation of the 'Regulation on general conditions for the supply of electricity for tariff customers' and the 'Second regulation on altering of the federal electricity tariff structure' Attempt at a critical assessment
p0324 A80-34125

Wind energy from a utility planning perspective
p0325 A80-35740

Oil from shale - The potential, the problems, and a plan for development
p0325 A80-36053

Energy prices --- economic and cost analysis in France
p0326 A80-36550

Use of renewable fuels in the rural development of India
p0327 A80-37989

Energy and environmental politics in the 80's
p0327 A80-38303

A global and long-range picture of energy developments
p0329 A80-40935

The energy problem - Its effect on aircraft design. IV - The unforecastable future
p0329 A80-40944

Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's
p0330 A80-41826

Regional planning strategies for hybrid energy optimization
p0332 A80-42451

The potential of renewable energies in planning the development of rural areas
p0419 A80-42453

The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period
p0421 A80-43484

Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner
[FE-2489-45] p0334 N80-22520

Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764

Dynamics and control of large horizontal-axis axisymmetric wind turbines
p0526 N80-22772

Solar heating and cooling demonstration project at the Florida solar energy center
[NASA-CR-161413] p0423 N80-22774

Solar process water heat for the IRIS images custom color photo lab
[NASA-CR-161414] p0423 N80-22781

Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787

Thermal Energy Storage: Fourth Annual Review Meeting
[NASA-CP-2125] p0551 N80-22788

Active heat exchange system development for latent heat thermal energy storage
p0553 N80-22819

Energy storage-boiler tank
p0554 N80-22820

The SERI solar energy storage program
p0423 N80-22821

Active heat exchange system development for latent heat thermal energy storage
p0554 N80-22822

Aquifer thermal energy storage program
p0554 N80-22825

Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources
[GA-A-15322] p0335 N80-22837

Solar-heated gas-turbine process using sulfur oxides for power production and energy storage
[LBL-9472] p0424 N80-22839

Energy conservation via heat transfer enhancement
[COO-4649-5] p0335 N80-22847

End-use matching of solar energy systems
[SERI/TP-34-325] p0335 N80-22848

Communication strategy to commercialize passive solar energy
[SERI/TP-69-412] p0335 N80-22849

Energy extension service pilot program evaluation report: The first year. Volume 2: Pilot state reports
[DOE/CS-2671-3] p0335 N80-22850

Fossil energy program
[ORNL-TM-7095] p0481 N80-22853

Passive solar space heating and cooling. Citations from the NTIS data base
[PB80-801731] p0425 N80-22868

Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base
[PB80-803794] p0425 N80-22869

Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base
[PB80-803778] p0425 N80-22870

Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base
[PB80-803786] p0425 N80-22871

Environmental development plan: Magnetohydrodynamics
[DOE/EDP-0045] p0335 N80-22876

National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882

Retrospective search on the biochemical production of alcohol fuels
[NP-24137] p0482 N80-23476

Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662

Solar hot water system installed at Quality Inn, Key West, Florida
[NASA-CR-161434] p0427 N80-23774

Mod-1 wind turbine generator analysis and design report, volume 1
[NASA-CR-159495] p0528 N80-23775

Solar heating system installed at Blakedale Professional Center, Greenwood, South Carolina
[NASA-CR-161435] p0427 N80-23776

Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-23777

The optimization air separation plants for combined cycle MHD-power plant applications
[NASA-TM-81510] p0528 N80-23778

Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780

Design, construction and testing of a 60 kW solar array and power conversion system
[AD-A080877] p0337 N80-23782

Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

NOAA's role in the solar energy program
[DOE/ET-0110] p0427 N80-23792

Basic research needs in energy conservation
[LBL-9939] p0338 N80-23794

Solar energy program evaluation: An introduction
[SERI/TR-51-294] p0427 N80-23798

Conversion system overview assessment. Volume 2: Solar-wind hybrid systems
[SERI/TR-35-078-VOL-2] p0338 N80-23799

Heliostat design cost/performance tradeoffs
[SAND-79-8248] p0428 N80-23806

Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices
[LA-UR-79-3390] p0338 N80-23807

Solar production of industrial process steam ranging in temperature from 300 deg F to 550 deg F, phase 1. Volume 3: Appendices (cont)
[DOE/CS-32199-3] p0428 N80-23812

Solar production of industrial process steam ranging in temperature from 300 degrees F to 550 degrees F, phase 1. Volume 2: Appendices
[DOE/CS-32199-2] p0428 N80-23813

Data handbook for the National Solar Energy demonstration program
[DSE/5216-T3] p0428 N80-23815
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817
Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000
[LA-UR-79-2812] p0338 N80-23820
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-82367] p0429 N80-23822
Status of insolation resource assessment in the Northeast
[NESEC-6] p0429 N80-23826
Off-peak electric auxiliary heat for solar air-heating systems
[COO-4516-1] p0429 N80-23827
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1] p0339 N80-23830
Environmental data for sites in the National Solar Data Network
[SOLAR/0010-79/05] p0339 N80-23833
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847
Performance improvement of a solar heating system utilizing off-peak electric auxilliary
[DOE/R5/10140-1] p0429 N80-23852
Low cost structures for photovoltaic arrays
[SAND-80-0142C] p0430 N80-23853
Process applications for geothermal energy resources
[COO-4896-T1] p0340 N80-23854
Solar photovoltaic project: Materials, and testing activities
[COO-4094-60] p0430 N80-23855
SOLPOND: A simulation program for salinity gradient solar ponds
[SERI/TP-351-559] p0430 N80-23856
Series solar heat pump and energy conservation
[BNL-27012] p0340 N80-23857
Developing and upgrading of solar system thermal energy storage simulation models
[BCS-40252] p0430 N80-23858
Solar reflector materials
[PNL-SA-7698] p0430 N80-23859
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy utilization of households and small consumers
[ESA-TT-582] p0463 N80-23865
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
Environmental development plans for energy technology programs
[DOE/EDP-0062] p0341 N80-23881
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214
Electric and hybrid vehicles in the urban future --- market research
[CONF-791009-23] p0341 N80-24217
Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474
Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass
[BMI-2031-VOL-2] p0341 N80-24475
Bulk hydrogen storage using metal hydrides
[BNL-27093] p0463 N80-24483
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486
Solar heating and hot water system installed at Saint Louis, Missouri
[NASA-CR-161420] p0431 N80-24744
Comparison of indoor-outdoor thermal performance for the Sunpak evacuated tube liquid collector
[NASA-CR-161421] p0432 N80-24745
Solar heating and cooling system design and development
[NASA-CR-161422] p0432 N80-24746
Solar-heated fluidized bed gasification system
[NASA-CASE-NPO-15071-1] p0432 N80-24747
Solar thermal power systems point-focusing thermal and electric applications projects. Volume 1: Executive summary
[NASA-CR-163147] p0432 N80-24750
Solar thermal power systems point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-159715] p0432 N80-24751
Federal policies to promote the widespread utilization of photovoltaic systems. Supplement: Review and critique
[NASA-CR-163148] p0342 N80-24754
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797
Institutional total energy case studies
[ANL/CNSV-TM-15] p0342 N80-24804
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3
[COO-2858-24-SUMM] p0437 N80-24807
Federal government needs a comprehensive program to curb its energy use
[EMD-80-11] p0343 N80-24814
Sensible heat storage for a solar thermal power plant
[LBL-9321] p0437 N80-24816
Photovoltaic concentrators
[SAND-80-0143C] p0439 N80-24832
Solar central receiver systems programs
[SAND-79-8777] p0439 N80-24833
Ocean thermal energy conversion: A state-of-the-art study
[EPRI-ER-1113-SR] p0531 N80-24834
Battery charge/solar controller for a residential size photovoltaic power system
[COO-4094-62] p0439 N80-24837
Amorphous Si solar cells
[DOE/ET/23034-T1] p0439 N80-24839
France: Estimates of future energy/GDP relationships
[ORAU/IEA-79-23(M)] p0343 N80-24852
Performance evaluation of a solar air-heating and nocturnal cooling system in CSU Solar House 2
[COO-2868-5] p0440 N80-24858
Prospects for using improved climate information to better manage energy systems
[UCRL-83813] p0343 N80-24859
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-25] p0344 N80-24860
Standard assumptions and methods for solar heating and cooling systems analysis
[SERI/TP-351-548] p0440 N80-24862
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-24] p0344 N80-24863
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage
[ORO-5759-T1] p0557 N80-24866
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
National Energy Plan 2, May 1979. Appendix A: World oil prices
[DOE/TIC-10203-APP-A] p0344 N80-24870
Energy performance standards for new buildings: Economic analysis
[DOE/CS-0129] p0344 N80-24871
Wind resource assessment status
[PNL-SA-6918-REV-1] p0488 N80-24966
Economic baselines for current underground coal mining technology
[NASA-CR-163259] p0491 N80-25764
Thermal energy storage
[NASA-TM-81514] p0558 N80-25779
Solar heating and cooling demonstration project at Radian Corporation, Austin, Texas
[NASA-CR-161442] p0441 N80-25784
Solar heating system installed at Telex Communications, Inc., Blue Earth, Minnesota
[NASA-CR-161437] p0441 N80-25786
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona
[NASA-CR-161450] p0441 N80-25787

Solar heating and hot water system installed at
Municipal Building complex, Abbeville, South
Carolina
[NASA-CR-161443] p0442 N80-25788
Solar energy system performance evaluation:
Seasonal report for IBM system 1A, Huntsville,
Alabama
[NASA-CR-161464] p0442 N80-25790
Solar energy system performance evaluaton:
Seasonal report for Solaron-Akron, Akron, Ohio
[NASA-CR-161465] p0442 N80-25791
Cogeneration technology alternatives study.
Volume 1: Summary report
[NASA-CR-159759] p0347 N80-25792
Cogeneration technology alternatives study.
Volume 2: Industrial process characteristics
[NASA-CR-159760] p0347 N80-25793
Cogeneration technology alternatives study.
Volume 4: Heat Sources, balance of plant and
auxiliary systems
[NASA-CR-159762] p0347 N80-25794
Cogeneration technology alternatives study.
Volume 6: Computer data
[NASA-CR-159764] p0347 N80-25795
Passive solar calculation methods
[DSE-5221-T1] p0442 N80-25798
OTEC support services
[COO-4931-T11] p0533 N80-25799
Solar photovoltaic flat panel applications
experiment at the Oklahoma Center for Science
and Arts
[DOE/ET-23063/1] p0533 N80-25800
CSU Solar House 3: Solar heating and cooling
system performance
[COO-30122-3] p0442 N80-25806
Solar project description for Perl-Mack
Enterprises' single family residences, Denver,
Colorado
[SOLAR/1015-79/50] p0444 N80-25821
West Chester Work Center: Solar space heating
demonstration project
[DOE/CS-4048/2] p0444 N80-25822
Solar total energy project Shenandoah
[ALO-3985-1-REV-1] p0444 N80-25825
Beneficial use of rejected heat from electric
power plants
[COO-4531-9] p0348 N80-25841
Novel solar cell concentrator photovoltaic
converter system
[SAND-79-7048] p0445 N80-25843
Evaluation of residential building energy
performance standards
[LBL-9816] p0348 N80-25849
Solar collector studies for solar heating and
cooling applications
[ALO-5355-T1] p0445 N80-25850
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852
Long-term supply curves for geothermal energy:
The impacts of technology
[PNL-3072] p0492 N80-25865
Two-tank seasonal storage concept for solar space
heating of buildings
[CONF-791226-2] p0446 N80-25867
Evaluation of reliability of operational
solar-energy systems
[CONF-791105-2] p0446 N80-25872
Optimization of solar assisted heat pump systems
via a simple analytic approach
[BNL-27316] p0349 N80-25896
Proposed energy performance standards for new
buildings: Standard building operating conditions
[DOE/CS-0118] p0349 N80-25901
Proposed energy-performance standards for new
buildings: Passive and active solar-heating
analysis
[DOE/CS-0117] p0349 N80-25902
SAGE, Solar Assisted Gas Energy
[PB80-153836] p0447 N80-25907
Novel concentrator photovoltaic converter system
development
[SAND-80-7004] p0535 N80-25912
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923
Division of Environmental Control Technology
program, 1978
[DOE/EV-0042] p0350 N80-25926
Near hybrid passenger vehicle development program,
phase 1. Appendices A and B. Mission analysis
and performance specification studies report,
volume 1
[NASA-CR-163330] p0559 N80-26201
Near hybrid passenger vehicle development program,
phase 1. Appendices C and D, Volume 2
[NASA-CR-163331] p0559 N80-26202
Near term hybrid passenger vehicle development
program, phase 1
[NASA-CR-163235] p0560 N80-26210
State options in lighting: Efficiency standards
for existing public buildings
[DOE/CS-5255/2] p0352 N80-26600
The world oil market in the years ahead: A
research paper
[ER-79-10327U] p0352 N80-26749
Oil recovery by carbon dioxide injection --- Rock
Creek Big Injun field, West Virginia
[ORO-5301-47] p0500 N80-26754
Solar energy facility at North Hampton Recreation
Center, Dallas, Texas
[NASA-CR-161444] p0449 N80-26766
Photovoltaic Residential Applications Program
Implementation Workshop Proceedings
[NASA-CR-163274] p0449 N80-26768
Geothermal direct heat use: Market
potential/penetration analysis for Federal
Region 9
[NASA-CR-163267] p0352 N80-26772
Solar energy system performance evaluation:
Seasonal report for Elcam Tempe Arizona State
University, Tempe, Arizona
[NASA-CR-161466] p0450 N80-26778
Oversight: Industrial energy conservation, volume
10
[GPO-53-020] p0352 N80-26786
Comparison of costs for automobile energy
conservation vs synthetic fuel production
[CONF-800419-1] p0353 N80-26810
Solar project description for Zien Mechanical
Contractors-I single family residence,
Milwaukee, Wisconsin
[SOLAR/1057-79/50-PT-1] p0451 N80-26811
Solar project description for Alpha Construction
Company's single family residence, Canton, Ohio
[SOLAR/1034-79/50] p0451 N80-26812
Solar project description for
Stewart-Teele-Mitchell single family residence,
Malta, N.Y.
[SOLAR/1018-79/50] p0451 N80-26813
Solar project description for Washington Natural
Gas Company's single family residence, Kirkland,
Washington
[SOLAR/1001-79/50] p0451 N80-26814
Solar project description for Zien Mechanical 2
single family residence, Milwaukee, Wisonsin
[SOLAR/1057-79/50-PT-2] p0451 N80-26815
Projects from Federal Region 9: Department of
energy appropriate energy technology program,
part 2
[LBL-10098] p0353 N80-26817
SERI solar energy storage program
[SERI/TP-333-497] p0452 N80-26820
More on dual purpose solar-electric power plants
[SLAC-PUB-2477] p0452 N80-26822
Solar, geothermal, electric and storage systems
program summary document, FY 1980
[DOE/ET-0102] p0354 N80-26861
Analysis methods for solar heating and cooling
applications: Passive and active systems, the
second edition
[SERI/SP-35-232R] p0455 N80-26871
Solar heating and cooling demonstration program:
A descriptive summary of HUD Cycle 4 and 4A
Solar Residential projects
[HUD-PDR-455] p0456 N80-26873
Illinois state plan: Energy conservation in
institutions (institutional buildings grant
program)
[PB80-148182] p0354 N80-26882
Energy-efficient procurement in state and local
governments
[DOE/CS-5255/1] p0355 N80-27207
The near-term hybrid vehicle program, phase 1
[NASA-CR-163034] p0562 N80-27222
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364

Satellite Power Systems (SPS): Concept development and evaluation program, preliminary assessment [DOE/ER-0041] p0542 N80-27404
Current status of the Canadian coal-oil mixture program p0501 N80-27496
Use of petroleum-based correlations and estimation methods for synthetic fuels [NASA-TM-81533] p0502 N80-27509
Hydrolyzed wood slurry flow modeling --- hydrocarbon fuel production [LBL-10090] p0504 N80-27703
Solar heating system installed at Stamford, Connecticut [NASA-CR-161436] p0456 N80-27800
Solar energy system performance evaluation: Seasonal report for Contemporary-Manchester, Manchester, New Hampshire [NASA-CR-161471] p0457 N80-27802
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines [NASA-CR-159856] p0355 N80-27803
Impact of propulsion system R and D on electric vehicle performance and cost [NASA-TM-81548] p0356 N80-27805
Solar energy system performance evaluation-seasonal report for Elcam San Diego, San Diego, California [NASA-CR-161481] p0457 N80-27806
ASHMET: A computer code for estimating insolation incident on tilted surfaces [NASA-TM-78286] p0457 N80-27807
Solar power satellite system definition study. Volume 1: Executive summary, phase 3 [NASA-CR-160742] p0542 N80-27809
Solar power satellite system definition study. Volume 3: Laser SPS analysis, phase 3 [NASA-CR-160744] p0543 N80-27811
Solar power satellite system definition study. vPMVNF 4: sPMJE sUBUFT sps aOBMZTJT, QIBTF 3 [NASA-CR-160745] p0543 N80-27812
Solar power satellite system definition study. Volume 5: Space transportation analysis, phase 3 [NASA-CR-160746] p0457 N80-27813
Evaluation of the vertical axis wind turbine at DREO [AD-A083961] p0564 N80-27814
Investigation of heat storages with salt hydrate as storage medium based on the extra water principle [EUR-6646-PT-2] p0564 N80-27818
Community impediments to implementation of solar energy [DOE/EV-0059] p0457 N80-27821
Solar process heat. Citations from the NTIS data base [PB80-807936] p0457 N80-27823
Energy programs at the Johns Hopkins University Applied Physics Laboratory [PB80-163686] p0538 N80-27825
Comparative study of energy accounting for heavy ion fusion with various driver accelerators [IPPJ-454] p0538 N80-28195
US energy assistance to developing countries: Clarification and coordination needed [PB80-162720] p0356 N80-28244
Phase 1 of the near term hybrid passenger vehicle development program [NASA-CR-163219] p0564 N80-28245
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1 [NASA-CR-163220] p0564 N80-28246
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices [NASA-CR-163221] p0565 N80-28247
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1 [NASA-CR-163222] p0565 N80-28248
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1 [NASA-CR-163223] p0565 N80-28249
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices [NASA-CR-163224] p0565 N80-28250
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices [NASA-CR-163225] p0565 N80-28251
Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis [NASA-CR-163226] p0565 N80-28252
Small passenger car transmission test-Chevrolet 200 transmission [NASA-CR-159835] p0356 N80-28255

ENERGY REQUIREMENTS

Energy self-sufficiency in monsoonal Australia p0323 A80-33433
User perspectives of selected solar energy system design tools p0369 A80-33564
Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems p0381 A80-33674
Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025 p0363 A80-33759
The energy supply of today and tomorrow p0324 A80-34124
Energy prices --- economic and cost analysis in France p0326 A80-36550
Combination of wind and solar energies at the Northern Coast of Egypt p0411 A80-38014
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry p0327 A80-38018
Solar energy - Will it conserve our non-renewable resources p0413 A80-38025
Accelerated commercialization of solar energy - A new priority for international action p0413 A80-38026
Energy and environmental politics in the 80's p0327 A80-38303
Liquid fuel supplies p0329 A80-40751
Coal gasification development and commercialization of the Texaco coal gasification process p0474 A80-40754
Catalytic coal gasification for SNG manufacture --- Substitute Natural Gas p0474 A80-40755
The U-GAS process --- synthetic fuel production by coal gasification p0474 A80-40756
A global and long-range picture of energy developments p0329 A80-40935
Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's p0330 A80-41826
Energy and civil aviation p0475 A80-41871
Energy analysis of wave and tidal power p0333 A80-43828
Low-cost general energy/analytic information system [BNL-26398] p0567 N80-24801
France: Estimates of future energy/GDP relationships [ORAU/IEA-79-23(M)] p0343 N80-24852
Projected annual resource requirements at the national and regional level for the Department of Commerce energy forecast 1985 and 2000 [PB80-126956] p0345 N80-24876
Italy: Estimates of future energy/GDP relationships [ORAU/IEA(M)-79-20] p0347 N80-25804

ENERGY SOURCES

Energy systems based on local renewable energy resources for a rural community in a developing country p0323 A80-33677

The energy-food interface - An economic analysis
of Brazil's alcohol plan
p0466 A80-33753
Establishment of a computer data base on
geothermal properties of aqueous NaCl, KCl and
CaCl2 solutions
p0467 A80-34019
The energy supply of today and tomorrow
p0324 A80-34124
Hydro-power - The use of water as an alternative
source of energy --- Book
p0468 A80-35172
Conference and Workshop on Wind Energy
Characteristics and Wind Energy Siting,
Portland, Ore., June 19-21, 1979, Proceedings
p0468 A80-35716
Wind energy from a utility planning perspective
p0325 A80-35740
Closed cycle osmotic power plants for electric
power production
p0470 A80-36051
Technical-economic validation for selection of
solar resources as energy sources
p0400 A80-36596
Impacts of fossil fuel use on environment and
climate
p0326 A80-37331
Accelerated commercialization of solar energy - A
new priority for international action
p0413 A80-38026
Solid waste conversion to energy: Current European
and U.S. practice --- Book
p0474 A80-40832
A global and long-range picture of energy
developments
p0329 A80-40935
The significance of hydrogen as a future
environmentally sound secondary energy source in
energy and propulsion technology
p0462 A80-40970
Basic elements in waste treatment operations
p0474 A80-41169
Electrochemistry, power sources and energy science
p0521 A80-41851
Energy and civil aviation
p0475 A80-41871
Characteristics of solar radiation --- intensity,
spectral and temporal characteristics of energy
received at earth surface
p0417 A80-42437
Wind power
p0478 A80-42470
The region of Peel Resource Recovery Plant -
Resource recovery and energy from waste in
partnership
p0479 A80-42929
Energy analysis of wave and tidal power
p0333 A80-43828
Implications for the UK of solar-power satellites
/s.p.s/ as an energy source
p0422 A80-43836
Fossil energy program
[ORNL/TM-7031] p0482 N80-22855
Energy from hot dry rock
[LA-UR-79-3256] p0338 N80-23802
Heat-pump-centered integrated community energy
systems
[ANL/CNSV-TM-18] p0343 N80-24813
Solar thermal small power systems study.
Inventory of US industrial small electric power
generating systems
[ATR-79(7780)-1] p0437 N80-24817
Heat-pump-centered integrated community energy
systems
[ANL/CNSV-TM-20] p0343 N80-24822
Georgetown University Generic Integrated Community
Energy System GU ICES demonstration project.
Modified work management plan
[COO-4488-2] p0343 N80-24838
Energy Economic Data Base (EEDB) program: Phase
1: Initial update
[COO-4954-1-VOL-3] p0567 N80-24848
World Energy Data System (WENDS). Volume 1:
Country data, AF-CO
[ANL/PMS-79-2-VOL-1] p0347 N80-25827
World Energy Data System (WENDS). Volume 2:
Country data, CZ-KS
[ANL/PMS-79-2-VOL-2] p0348 N80-25828
World Energy Data System (WENDS). Volume 2:
Country data, LY-PO
[ANL/PMS-79-2-VOL-3] p0348 N80-25829
World energy data system (Wends). Volume 4:
Country data, SG-YO
[ANL/PMS-79-2-VOL-4] p0348 N80-25830
World Energy Data System (WENDS). Volume 5:
Internatinal organization data
[ANL/PMS-79-2-VOL-5] p0348 N80-25831
Energy and Resource Recovery from Solid Waste:
Report from a workshop considering problems
identified by the Intergovernmental Science,
Engineering, and Technology Advisory Panel
[PB80-150790] p0354 N80-26881
Production of sugarcane and tropical grasses as a
renewable energy source
[ORO-5912-T2] p0503 N80-27514

ENERGY STORAGE
Energy storage and electron transfer by carbanion
photolysis
p0545 A80-33419
Photochemical storage of solar energy
p0545 A80-33420
Development of the sulfuric acid-water chemical
heat pump/chemical energy storage system for
solar heating and cooling
p0359 A80-33429
The sizing and economics of phase change energy
storage units in air-based solar heating systems
p0546 A80-33520
Adaptive control for a multiple tank, multiple
temperature solar energy storage system
p0369 A80-33557
Analysis of solar energy conversion processes -
Systems economic impact of thermochemical
storage efficiencies
p0389 A80-33754
The effect of an auxiliary load management
strategy on solar system performance
p0389 A80-33757
Markov chains to solar energy storage calculations
p0390 A80-33766
The use of solar energy storage for heating and
cooling applications
p0391 A80-33861
An analysis of off-guideway energy
storage/propulsion systems for dual mode transit
systems
p0546 A80-34081
Application of magnesium rich rare-earth alloys to
hydrogen storage
p0459 A80-35192
A mixed integer scheduling model for combined
thermal and hydroelectric-pumped storage
generator systems
p0546 A80-35382
Putting baseload to work on the night shift
p0547 A80-35402
Evaluating certain ways of storing solar energy
p0400 A80-36598
Hydrogen as an alternative fuel - An intermediate
report on research and development funding by
the Federal Ministry for Research and Technology
p0460 A80-37338
Conceptual design of integrated energy storage and
attitude control system --- for European
satellites
p0547 A80-37455
Some aspects of energy storage systems using
Glauber salt mixtures
p0548 A80-37967
Combination of wind and solar energies at the
Northern Coast of Egypt
p0411 A80-38014
Solar energy with chemical storage for
cogeneration of electric power and heat
p0549 A80-40715
Preliminary evaluation of coal-fired fluid bed
combustion-augmented compressed air energy
storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
Moessbauer surface studies on TiFe hydrogen
storage material
p0463 A80-43772
Analysis of solidification in a cylindrical
annulus with internal fins
[AD-A080131] p0550 N80-22641
Design study of flat belt CVT for electric vehicles
[NASA-CR-159822] p0550 N80-22702

Advanced screening of electrode couples
[NASA-CR-159738] p0551 N80-22777
Dispersed storage and generation case studies
[NASA-CR-162996] p0334 N80-22782
Life and stability testing of packaged low-cost energy storage materials
p0553 N80-22814
Cold water aquifer storage --- air conditioning
p0554 N80-22827
Superconducting magnetic energy storage for electric utilities and fusion systems
[LA-UR-78-1213] p0554 N80-22838
Solar-heated gas-turbine process using sulfur oxides for power production and energy storage
[LBL-9472] p0424 N80-22839
Lithium-metal sulfide and sodium-sulfur batteries for solar energy storage
[CONF-781228-3] p0424 N80-22843
Hydrogen storage materials research and development work at Brookhaven National Laboratory
[BNL-26813] p0463 N80-23478
Magnetic bearing support study for a 10 kW-hr energy storage flywheel
[SAND-79-7025] p0555 N80-23661
Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-2377
Application and design studies of compressed-air energy storage for solar applications
[CAES-7] p0555 N80-2378
Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23785
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188] p0555 N80-23796
Fixed site hydrogen storage. 1: Applications impact
[SAND-79-8647] p0463 N80-23797
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801
Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage
[PNL-3047] p0556 N80-23823
Application of magnetic suspensions and fluid film bearings to energy storage flywheels
[SAND-79-7007] p0556 N80-23824
Thermochemical energy storage and transport program
[SAND-79-8208] p0541 N80-23825
Off-peak electric auxiliary heat for solar air-heating systems
[COO-4516-1] p0429 N80-23827
Oak Ridge Flywheel Evaluation Laboratory
[Y-2210] p0556 N80-23832
Investigation of the technical and economic feasibility of using pumped well-water energy storage systems
[SAND-79-7096] p0556 N80-23851
Bulk hydrogen storage using metal hydrides
[BNL-27093] p0463 N80-24483
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants --- cost analysis
[CONF-791204-11] p0557 N80-24628
Batteries for specific solar applications: Project description
[SAND-79-1782C] p0557 N80-24803
Compressed air energy storage technology program in the United States
[PNL-SA-7669] p0557 N80-24810
Solar central receiver systems programs
[SAND-79-8777] p0439 N80-24833
Design parameters for solar powered absorption cooling systems with chilled water storage
p0441 N80-25778
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-8] p0558 N80-25801
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-11] p0558 N80-25802
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 4: Commercial and pilot plant cost data
[SAN-1483-1/5] p0558 N80-25803
Superconducting Magnetic Energy Storage (SMES) program
[LA-8199-PR] p0558 N80-25805
Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system
[SRO-0893-17] p0558 N80-25869
Preliminary development of the Band Type Variable Inertia Flywheel (BVIF)
[SAND-79-7089] p0559 N80-25879
Advanced fuel cell development
[ANL-79-51] p0535 N80-25895
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211
Energy-storage systems for automobile propulsion, 1979 study. Volume 3: Battery/flywheel electric vehicles using advanced batteries
[UCRL-52841-VOL-3] p0561 N80-26213
High energy storage flywheel test program
[AD-A083302] p0561 N80-26796
Industrial compressed air applications for solar energy conversion/storage devices
[SAND-79-7077] p0451 N80-26802
High-energy-density composite flywheel
[SAND-79-7019] p0561 N80-26803
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974] p0561 N80-26804
Conceptual design of a flywheel energy storage system
[SAND-79-7088] p0561 N80-26805
Design of annual storage solar space heating systems
[DOE/CS-32939/10] p0455 N80-26855
Sigma phase formation in alloys for SO2/SO3 thermal energy storage systems
[SAND-80-8205] p0562 N80-26856
Solar, geothermal, electric and storage systems program summary document, FY 1980
[DOE/ET-0102] p0354 N80-26861
Thermal and mechanical energy-storage program, project summary data FY 1980
[DOE/CS-0150] p0562 N80-26862
A chemical heat-pump/energy storage device and its applications --- waste energy utilization
[ERG-030] p0562 N80-26880
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0564 N80-27233
HYCSOS: Hydride conversion and storage system sensitivity analysis
[ANL/EES-TM-63] p0564 N80-27523
Solid polymer electrolyte fuel cell technology program
[NASA-CR-160734] p0538 N80-27801
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961] p0564 N80-27814
Hydrogen technology: Foreign, change 1
[AD-A083665] p0464 N80-27816

ENERGY TECHNOLOGY

Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 and 3
p0357 A80-33401
Nitrogen fertilizer production by solar energy
p0357 A80-33402
Energy self-sufficiency in monsoonal Australia
p0323 A80-33433
The Belgian solar heating R & D program
p0359 A80-33435
Canada's federal solar energy program
p0323 A80-33436
Solar energy R & D projects in Denmark
p0323 A80-33437
National solar heating and cooling programme in the Netherlands
p0323 A80-33441
Solar Heating '85 - Sweden's national solar heating program
p0323 A80-33443
Solar energy research in Sweden
p0323 A80-33444
New air-heating collector design and performance
p0359 A80-33449

The unitary solar collector - A new approach to low-cost, flat-plate systems p0361 A80-33463
Low cost high temperature adhesive bonded solar collectors p0361 A80-33464
Laboratory tests for flat plate solar collectors p0361 A80-33471
Weatherability test of plastic glazing materials for collectors p0362 A80-33474
Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors --- Compound Parabolic Concentrator p0364 A80-33493
Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors p0364 A80-33496
Incidence angle modifier and average optical efficiency of parabolic trough collectors p0364 A80-33502
The effect of system size on the practicality of aquifer storage --- feasibility of small systems for building heat storage p0545 A80-33517
Latent heat energy storage using direct contact heat transfer p0546 A80-33519
Solar cooling through cycles using microporous solid adsorbents p0365 A80-33526
The Saskatchewan Conservation House - A year of performance data p0369 A80-33566
Report on five years of operating experience with four pioneer school heating experiments --- using solar energy conversion p0370 A80-33569
Solar energy system with heat pump augmentation for industrial process heat - An update p0372 A80-33589
The Point-Focusing Thermal and Electric Applications Project - A progress report --- small solar power systems applications p0372 A80-33595
The International Energy Agency Small Solar Power Plants Project p0373 A80-33597
Performance and cost optimisation of small solar power stations p0373 A80-33598
Research and development on solar energy for electric and mechanical power generation p0373 A80-33601
Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs p0374 A80-33603
Optical analysis of Cassegrainian concentrator systems p0377 A80-33631
Process steam generation by a facetted, non-imaging solar concentrator p0378 A80-33639
Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility p0380 A80-33655
International development assistance for renewable technologies - Current programs and institutional requirements p0323 A80-33672
Characteristics of rural energy demand and major barriers and tasks and implementation of potentially viable solar technologies p0381 A80-33673
A renewable energy system for developing countries p0323 A80-33675
Hybrid active-passive designs - Synergy or conflict --- solar heating systems p0383 A80-33689
Design and performance of low heat loss window systems p0324 A80-33706
European progress in photovoltaic development p0384 A80-33712
Autonomous solar-powered beacon for air navigation use p0385 A80-33715
The performance of silicon solar cells under concentrated sunlight p0386 A80-33724
Photovoltaic array reliability project p0387 A80-33735
Studies of directly absorbing fluids for mid-temperature solar thermal applications p0388 A80-33749
Comparison of costs for solar derived electrical sources with diesel generators in remote locations p0389 A80-33751
Redesign of windmill towers - A cost reduction study p0467 A80-33772
Solar energy utilization --- Book p0393 A80-34841
Windpower principles - Their application on the small scale --- Book p0468 A80-34859
Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980 p0511 A80-35161
Hydro-power - The use of water as an alternative source of energy --- Book p0468 A80-35172
Thin-film solar cells - A unified analysis of their potential p0393 A80-35335
MHD direct channel from heat to electricity p0512 A80-35403
The use of wind data with an operational wind turbine in a research and development environment p0513 A80-35730
Wind energy resource development in California p0469 A80-35733
Wind energy resource assessment of New Zealand p0469 A80-35736
Manufacturers' view of wind resource assessments p0514 A80-35738
Agricultural applications of wind resource assessments p0514 A80-35739
Application of power laws for wind energy assessment p0470 A80-35744
Trees as an indicator of wind power potential p0470 A80-35745
Status of the Large Wind Turbine Siting Handbook p0514 A80-35750
The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/ p0471 A80-36983
Medium and high temperature solar processes --- Book p0402 A80-37012
Preparation of thin films for solar energy utilization p0402 A80-37191
Transportation energy contingencies - A status report on public response and government roles p0326 A80-37353
Bioconversion --- biomass energy production - research and development p0471 A80-37504
Rechargeable batteries: Advances since 1977 --- Book p0547 A80-37591
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944 p0471 A80-37678
Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volumes 1-4 p0403 A80-37937
A thermodynamic analysis of a solar-powered jet refrigeration system p0407 A80-37978
A helioelectric farm --- multimodular solar thermal electric plant design is presented p0410 A80-38005
The first solar energy system in West-Germany for industrial utilization p0411 A80-38010
Solar energy - UNIDO programme of action for developing countries p0412 A80-38015

Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft [AIAA PAPER 80-1090] p0328 A80-38905

Coal liquefaction catalysts p0472 A80-39419

Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale p0472 A80-39421

Paving the way for energy-saving innovations p0328 A80-39554

Hoe Creek No. 3 - First long-term underground coal gasification experiment with oxygen-steam injection p0473 A80-39765

RMA engineering applications to Fossil Energy projects --- Reliability and Maintainability p0473 A80-40336

In-situ gasification and liquefaction show promise p0473 A80-40525

Wood for energy production --- Book p0474 A80-40830

Solid waste conversion to energy: Current European and U.S. practice --- Book p0474 A80-40832

A global and long-range picture of energy developments p0329 A80-40935

Solar energy economics - Orbiting reflectors for world energy p0415 A80-41324

Electrochemistry, power sources and energy science p0521 A80-41851

Utility system planning effects on the economic merit of advanced combined cycle power systems [ASME PAPER 80-GT-105] p0331 A80-42227

Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures p0416 A80-42435

Advanced non-concentrating solar collectors p0417 A80-42441

Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement p0419 A80-42461

Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors p0419 A80-42462

The utilization of wind-energy resources --- Soviet Union, U.S., West Europe developments review p0478 A80-42700

A utility company's view of energy from waste p0332 A80-42925

Potential for conversion of refuse to energy in Ontario p0479 A80-42930

Recent progress on ducks --- ocean wave energy receivers p0526 A80-43832

Upgrading of coal liquids: Upgrading distillates from coal liquefaction [FE-2566-26] p0480 N80-22518

Survey of biomass gasification. Volume 2: Principles of gasification [SERI/TR-33-239-VOL-2] p0481 N80-22524

Basic Research Engineering: Fluid Dynamics and Thermal Processes [FE-2468-53] p0334 N80-22649

Thermal Energy Storage: Fourth Annual Review Meeting [NASA-CP-2125] p0551 N80-22788

Program definition and assessment overview --- for thermal energy storage project management p0551 N80-22790

Solar applications analysis for energy storage p0423 N80-22791

Thermal energy storage and transport p0540 N80-22793

Technology assessment of wind energy conversion systems [LA-8044-TASE] p0527 N80-22840

Energy information data base corporate author entries, supplement 3 [DOE/TIC-4585-R1-SUPPL-3] p0567 N80-22846

Energy conservation via heat transfer enhancement [COO-4649-5] p0335 N80-22847

End-use matching of solar energy systems [SERI/TP-34-325] p0335 N80-22848

Energy extension service pilot program evaluation report: The first year. Volume 2: Pilot state reports [DOE/CS-2671-3] p0335 N80-22850

A 300 Btu gas combustor development program, phase 1 [EPRI-AF-1144] p0481 N80-22852

Technical applications of solar energy [BMFT-FB-T-79-06] p0424 N80-22860

New England Energy Development Systems center (NEEDS). An experiment in university-industry cooperative research. Volume 1: Summary of results [PB80-112972] p0567 N80-22862

New England energy development systems center (NEEDS). An experiment in university-industry cooperative research. Volume 2: Case histories [PB80-112980] p0541 N80-22863

Environmental development plan: Magnetohydrodynamics [DOE/EDP-0045] p0335 N80-22876

Environmental assessment of the utilization of alcohol fuels in highway vehicle applications [CONF-791009-19] p0336 N80-23477

Development of current converters for switching and regulating tasks in energy technology [BMFT-FB-T-79-12] p0567 N80-23585

The effect of catalyst length and downstream reactor distance on catalytic combustor performance [NASA-TM-81475] p0337 N80-23779

Application and design studies of compressed-air energy storage for solar applications [CAES-7] p0555 N80-23788

World Energy Data System (WENDS). Volume 6: International agreement profiles [ANL-PMS-79-2-VOL-6] p0528 N80-23790

Solor Applications of Thermal Energy Storage [TID-29430] p0427 N80-23791

Electricity from refuse --- technology assessment [NZERDC-44] p0338 N80-23803

Energy from in situ processing of Antrim oil shade [FE-2346-49] p0483 N80-23808

Solar production of industrial process steam ranging in temperature from 300 deg F to 550 deg F, phase 1. Volume 3: Appendices (cont) [DOE/CS-32199-3] p0428 N80-23812

Data handbook for the National Solar Energy demonstration program [DSE/5216-T3] p0428 N80-23815

DOE/JPL advanced thermionic technology program [NASA-CR-163134] p0528 N80-23818

Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000 [LA-UR-79-2812] p0338 N80-23820

Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage [PNL-3047] p0556 N80-23823

Regional application of fossil energy technologies: An analytical approach [DOE/ET-2442-1] p0339 N80-23830

Millville Wind Turbine Generator: Failure analysis and corrective design modification [RFP-2992/3533/79-3] p0529 N80-23831

Production of sugarcane and tropical grasses as a renewable energy source [ORO-5912-T1] p0484 N80-23840

Vertical axis wind turbine development: Executive summary [ORO-5135-77-5-SUMM] p0529 N80-23845

Vertical axis wind turbine development [ORO-5135-77-5] p0529 N80-23846

Investigation of the technical and economic feasibility of using pumped well-water energy storage systems [SAND-79-7096] p0556 N80-23851

Solar reflector materials [PNL-SA-7698] p0430 N80-23859

Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion [ANL/OEPM-78-12] p0556 N80-23861

Solar energy systems: Standards for rubber hose [PB80-129828] p0430 N80-23868

Environmental development plan for biomass energy systems
[DOE/EDP-0032] p0340 N80-23876
Environmental development plan: Geothermal energy systems
[DOE/EDP-0036] p0340 N80-23877
Environmental development plans for energy technology programs
[DOE/EDP-0062] p0341 N80-23881
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205
Electric and hybrid vehicle program
[DOE/CS-0026] p0556 N80-24216
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963] p0484 N80-24462
Methane from landfills
[CONF-790999-1] p0485 N80-24472
Coal Liquefaction
[DOE/ET-0068/4] p0486 N80-24480
Materials technology for coal-conversion processes --- corrosion resistance slag containers
[ANL-79-93] p0486 N80-24484
LBL continuous biomass liquefaction Process Engineering Unit (PEU)
[LBL-10092] p0487 N80-24490
Potential prediction needs in support of energy systems
p0342 N80-24693
Unconventional gas recovery - enhanced gas recovery
[DOE/EDP-0049] p0488 N80-24735
The applicability of DOE solar cell and array technology to space power
[NASA-CR-163143] p0432 N80-24753
Federal policies to promote the widespread utilization of photovoltaic systems. Supplement: Review and critique
[NASA-CR-163148] p0342 N80-24754
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515] p0557 N80-24756
Proceedings of the First Semiannual Distributed Receiver Program Review
[NASA-CR-163135] p0433 N80-24760
Heat and electricity from the Sun using parabolic dish collector systems
p0433 N80-24761
Line-focus concentrating collector program
p0433 N80-24762
Test bed concentrator mirrors
p0433 N80-24764
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797
The Project Independence Evaluation System (PIES). Volume 1: Description of the system, executive summary
[HCP/I-1321-01/1] p0342 N80-24802
Batteries for specific solar applications: Project description
[SAND-79-1782C] p0557 N80-24803
Institutional total energy case studies
[ANL/CNSV-TM-15] p0342 N80-24804
Organic Rankine cycle engine technology in Japan, a preliminary survey
[DOE/SF/10538-1] p0531 N80-24809
Compressed air energy storage technology program in the United States
[PNL-SA-7669] p0557 N80-24810
Biological solar cells
[SERI/TP-332-476] p0439 N80-24831
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-25] p0344 N80-24860
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-24] p0344 N80-24863
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
Dimensions/NBS, volume 63, no. 12 --- dissemination of current energy and environmental research
[PB80-130701] p0489 N80-25198
Energy information data base, series titles: Supplement 7, February 1978 - December 1979
[DOE/TIC-4579-R10-SUPPL-7] p0567 N80-25203
Energy information data base, corporate author entries: Supplement 4, June 1978 - December 1979
[DOE/TIC-4585-R1-SUPPL-4] p0567 N80-25204
Market penetration of new energy systems estimated by econometric and stochastic methodology
[CONF-790852-2] p0346 N80-25207
The solar power satellite concepts: The past decade and the next decade
[NASA-TM-81000] p0541 N80-25360
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266] p0490 N80-25465
Conversion of biomass materials into gaseous products. Operation of the PDU
[SAN-1241-3] p0490 N80-25466
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477
Thermal energy storage
[NASA-TM-81514] p0558 N80-25779
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218] p0533 N80-25785
OTEC support services
[COO-4931-T11] p0533 N80-25799
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-8] p0558 N80-25801
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-11] p0558 N80-25802
Superconducting Magnetic Energy Storage (SMES) program
[LA-8199-PR] p0558 N80-25805
Ocean energy systems. Fiscal year 1979
[DOE/ET-0118] p0533 N80-25824
World Energy Data System (WENDS). Volume 1: Country data, AF-CO
[ANL/PMS-79-2-VOL-1] p0347 N80-25827
World Energy Data System (WENDS). Volume 2: Country data, CZ-KS
[ANL/PMS-79-2-VOL-2] p0348 N80-25828
World Energy Data System (WENDS). Volume 2: Country data, LY-PO
[ANL/PMS-79-2-VOL-3] p0348 N80-25829
World energy data system (Wends). Volume 4: Country data, SG-YO
[ANL/PMS-79-2-VOL-4] p0348 N80-25830
World Energy Data System (WENDS). Volume 5: Internatinal organization data
[ANL/PMS-79-2-VOL-5] p0348 N80-25831
Solar technology application to enhanced oil recovery
[SERI/TR-352-392] p0445 N80-25839
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852
Magma energy: A feasible alternative?
[SAND-80-0309C] p0492 N80-25859
Hybrid thermal storage with water
[ESG-DOE-13259] p0558 N80-25861
Environmental development plan: Solar agricultural and industrial process heat
[DOE/EDP-0033] p0446 N80-25862
Comparative performance of two types of evacuated tubular solar collectors in a residential heating and cooling system
[COO-2577-19] p0446 N80-25864
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072] p0492 N80-25865
Data handbook for the national solar energy demonstration book
[DSE-5216-T4] p0446 N80-25873
Photovoltaic energy systems: Program summary
[DOE/CS-0146] p0349 N80-25884
New developments in wind systems technology
[RFP-3000] p0534 N80-25888
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892
Line-focus solar central power systems, phase1
[SAN-0115-140-1] p0447 N80-25903
Solar energy program. Chapter from the Energy and Environment Division report
[LBL-9630] p0350 N80-25904

SAGE, Solar Assisted Gas Energy
[PB80-144363] p0447 N80-25906
Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress
[PB80-143175] p0535 N80-25910
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Division of Environmental Control Technology program, 1978
[DOE/EV-0042] p0350 N80-25926
Environmental assessments of alternative energy strategies in the United States
[CONF-791172-1] p0350 N80-25927
Research to identify components of energy-related wastes: A state-of-the-art report --- environment effects, bibliographies
[PB80-137961] p0351 N80-25943
Solar radiation data forecast and interpolation analysis. Folder 1, part 1: Executive summary. Part 2: Technical analysis (tasks 1 and 2). Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982
Climate program plan, volume 1 --- effects of energy technologies on climate and environment
[DOE/EV-0062/1] p0351 N80-26003
MHD high performance demonstration experiment
[DOE/ET-2895/5] p0535 N80-26172
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Grinding of coal in oil
p0494 N80-26462
Grinding of coal-in-oil slurries
p0494 N80-26464
Development of standards for coal-oil mixtures
p0494 N80-26465
Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467
Studies on the stabilization of COM
p0496 N80-26479
Development and evaluation of highly-loaded coal slurries
p0496 N80-26481
Atomization of coal slurry jets
p0496 N80-26482
Atomization of coal-oil mixtures
p0497 N80-26483
Basic studies on COM combustion
p0497 N80-26484
Report on fine COM combustion test
p0497 N80-26485
The CFOS (Carbonaceous Fuel-in-Oil Suspensoids) fuels
p0497 N80-26486
Coal/oil mixture pipeline: A viable alternative coal transportation system?
p0542 N80-26487
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2] p0498 N80-26533
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535
Heat transfer enhancement in metal hydride systems
[BNL-27347] p0561 N80-26539
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628
Classification and evaluation of electric motors and pumps
[DOE/CS-0147] p0352 N80-26670
Photovoltaic Residential Applications Program Implementation Workshop Proceedings
[NASA-CR-163274] p0449 N80-26768
Central station applications planning activities and supporting studies --- application of photovoltaic technology to power generation plants
[NASA-CR-163042] p0352 N80-26784
Lectures on heat technology in the Netherlands --- held on 23-24 Aug. 1977
p0353 N80-26787
Case study of an air to air heat pump
p0353 N80-26790
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974] p0561 N80-26804
Conceptual design of a flywheel energy storage system
[SAND-79-7088] p0561 N80-26805
Solar-assisted low energy dwellings
[DOE/CS-0145] p0451 N80-26816
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2
[LBL-10098] p0353 N80-26817
SERI solar energy storage program
[SERI/TP-333-497] p0452 N80-26820
Survey and evaluation of current design of evacuated collectors
[ALO-5350-1] p0452 N80-26823
Assessment of solar energy within a community: Summary of three community-level studies
[DOE/EV-0054] p0452 N80-26826
Thin film polycrystalline silicon solar cells
[DOE/SF/23047-3] p0452 N80-26828
Additional solar/load ratio correlations for direct gain buildings
[LA-UR-80-854] p0454 N80-26847
End-use matching for solar industrial process heat
[SERI/TR-34-091] p0454 N80-26849
Exposure: A newsletter for ocean technologists, volume 8, no. 1
[AD-A083981] p0562 N80-26865
Solar collector system using air collectors for a pre-drying facility in a grass drying plant
[SKT-TEIL-1] p0456 N80-26877
Design and fabrication of terrestrial photovoltaic solar generators for field testing in regions of intensive insolation
[BMFT-FB-T-79-34] p0538 N80-26878
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors --- in solar energy applications
[ASSA-PA-10] p0456 N80-26879
Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources
[COO-4776-2] p0355 N80-26958
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494
Overview of R&D status on COM technology in Japan
p0501 N80-27495
Current status of the Canadian coal-oil mixture program
p0501 N80-27496
Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel
p0501 N80-27497
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498
Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505
Design consideration of fine COM storage
p0502 N80-27506
Coal gasification technology. Citations from the NTIS data center
[PB80-808082] p0503 N80-27527
Hydrogen technology: Foreign, change 1
[AD-A083665] p0464 N80-27816
Community impediments to implementation of solar energy
[DOE/EV-0059] p0457 N80-27821
Undeveloped hydropower as a potential energy source in Idaho
[PB80-157399] p0504 N80-27824
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB80-163686] p0538 N80-27825

Analysis of code related responses from the solar demonstration program
[PB80-153968] p0457 N80-27827

ENERGY TRANSFER

Derivation of efficiency and loss factors for solar air heaters
p0359 A80-33447

Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system
p0539 A80-40713

Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources
[COO-4776-2] p0355 N80-26958

Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0564 N80-27233

ENGINE DESIGN

Rotary expander for a solar thermo-mechanical conversion system
p0382 A80-33681

Atmospheric considerations for design of WECS --- Wind Energy Conversion System
p0513 A80-35717

Hydrogen fueled high bypass turbofans in subsonic aircraft
p0462 A80-37348

Advanced component technologies for energy-efficient turbofan engines
[AIAA PAPER 80-1086] p0519 A80-38902

Turbopropulsion combustion - Trends and challenges
[AIAA PAPER 80-1199] p0519 A80-38964

A new design of Stirling engine for automotive application
p0519 A80-39899

Gas turbine combustor design challenges for the 1980's
[AIAA PAPER 80-1285] p0475 A80-41213

Fuel conservation through active control of rotor clearances
[AIAA PAPER 80-1087] p0330 A80-41506

Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19] p0521 A80-42157

Continuously variable ratio transmissions for single-shaft gas turbines
[ASME PAPER 80-GT-21] p0331 A80-42158

Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225

Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226

Design and test of a 73-MW water cooled gas turbine
[ASME PAPER 80-GT-112] p0477 A80-42230

Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines
[ASME PAPER 80-GT-117] p0522 A80-42233

Design study for a fuel efficient turbofan engine
[ASME PAPER 80-GT-141] p0331 A80-42254

The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255

A Stirling cycle engine for use with solar thermal-electric systems
[ASME PAPER 80-PET-32] p0524 A80-43343

Design study: A 186 kW lightweight diesel aircraft engine
[NASA-CR-3261] p0334 N80-22326

Design study of flat belt CVT for electric vehicles
[NASA-CR-159822] p0550 N80-22702

Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787

Conceptual design study of an improved gas turbine powertrain
[NASA-CR-159852] p0527 N80-23315

Baseline automotive gas turbine engine development program
[NASA-CR-159670] p0530 N80-24620

Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621

Non-heat pipe/P-40 Stirling engine
p0530 N80-24772

Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies --- various hybrid/electric power train configurations and electrical and mechanical drive-line components
[NASA-CR-163227] p0559 N80-26203

Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies
[NASA-CR-163228] p0559 N80-26204

Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205

Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206

Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207

Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208

ENGINE PARTS

Advanced component technologies for energy-efficient turbofan engines
[AIAA PAPER 80-1086] p0519 A80-38902

The Perbury transmission --- toroidal traction drive for gas turbine engines
[ASME PAPER 80-GT-22] p0331 A80-42159

Cost estimating Brayton and Stirling engines
p0531 N80-24781

Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan
[NASA-CR-159806] p0346 N80-25332

ENGINE TESTS

Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258

Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan
[NASA-CR-159806] p0346 N80-25332

EVA metro sedan electric-propulsion system: Test and evaluation
[DOE/CS-1042/1] p0563 N80-27230

ENRICHMENT

Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570

ENTRAINMENT

Experimental and process design study of a high rate entrained coal gasification process
[FE-1548-T2] p0487 N80-24501

ENVIRONMENT EFFECTS

How clean gas is made from coal
p0471 A80-36314

Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings
p0326 A80-36976

Impacts of fossil fuel use on environment and climate
p0326 A80-37331

Environmental concerns for coal synfuel commercialization
p0329 A80-40759

Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents
[PB80-126469] p0334 N80-22527

Environmental development plan: Magnetohydrodynamics
[DOE/EDP-0045] p0335 N80-22876

National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882

Use of reconnaissance level information for environmental assessment
[NUREG-CR-0990] p0336 N80-22883

Environmental assessment of the utilization of alcohol fuels in highway vehicle applications
[CONF-791009-19] p0336 N80-23477

Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California
[UCRL-15108] p0483 N80-23756

Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

Potential air quality impact of geothermal power
production in the Imperial Valley
[UCRL-52797]
p0340 N80-23878
Environmental development plans for energy
technology programs
[DOE/EDP-0062]
p0341 N80-23881
Environmental and institutional considerations in
the development and implementation of biomass
energy technologies
[SERI/TR-62-264]
p0341 N80-24493
Analysis of environmental impacts of water level
fluctuation in reservoirs at hydroelectric sites
[CONF-791056-2]
p0345 N80-24885
Risk of renewable energy sources: A critique of
the Inhaber report
[ERG-79-3]
p0349 N80-25892
Consequences of increased coal utilization
[CONF-791108-16]
p0350 N80-25923
Environmental assessments of alternative energy
strategies in the United States
[CONF-791172-1]
p0350 N80-25927
Environmental assessment of small wind systems
[SERI/PR-354-420]
p0350 N80-25928
Environmental assessment: Geothermal energy
geopressure subprogram. DOE Sweet Lake no. 1,
Cameron Parish, Louisiana
[DOE/EA-0065]
p0493 N80-25929
Research to identify components of energy-related
wastes: A state-of-the-art report ---
environment effects, bibliographies
[PB80-137961]
p0351 N80-25943
Climate program plan, volume 1 --- effects of
energy technologies on climate and environment
[DOE/EV-0062/1]
p0351 N80-26003
Coal-oil mixtures 4: Sedimentation and subsidence
studies of the stability and structure of
coal-oil mixtures
p0494 N80-26467
Preliminary environmental assessment for the
Satellite Power System (SPS), revision 1.
Volume 2: Detailed assessment
[DOE/ER-00362-VOL-2]
p0453 N80-26836
Heterogeneous chemistry of importance in decisions
concerning the environmental impact of energy
production and the siting of new energy sources
[COO-4776-2]
p0355 N80-26958
Land use and environmental impacts of
decentralized solar energy use
[DOE/EV-0067]
p0458 N80-27843

ENVIRONMENT POLLUTION

Production of synthetic hydrocarbon fuel,
environmental aspects and comparison to hydrogen
production from water
p0326 A80-37332
Criteria for assessment of environmental
pollutants from coal cleaning processes
[PB80-102791]
p0336 N80-22895
Consequences of increased coal utilization
[CONF-791108-16]
p0350 N80-25923

ENVIRONMENT PROTECTION

Energy and environmental politics in the 80's
p0327 A80-38303
Coatings for fusion reactor environments
p0525 A80-43517
Environmental development plan:
Magnetohydrodynamics
[DOE/EDP-0045]
p0335 N80-22876
Use of reconnaissance level information for
environmental assessment
[NUREG-CR-0990]
p0336 N80-22883
Criteria for assessment of environmental
pollutants from coal cleaning processes
[PB80-102791]
p0336 N80-22895
Conceptual design of a
coal-to-methanol-to-gasoline commercial plant.
Volume 3: Environmental
[FE-2416-43-VOL-3]
p0337 N80-23485
Environmental development plan for biomass energy
systems
[DOE/EDP-0032]
p0340 N80-23876
Environmental development plan: Geothermal energy
systems
[DOE/EDP-0036]
p0340 N80-23877
Environmental standards for coal conversion
processes. Volume 1: Most stringent, federal,
and selected state regulations
[PB80-126980]
p0341 N80-23904
Potential prediction needs in support of energy
systems
p0342 N80-24693
Dimensions/NBS, volume 63, no. 12 ---
dissemination of current energy and
environmental research
[PB80-130701]
p0489 N80-25196
Environmental control technology for biomass flash
pyrolysis
[CONF-800129-2]
p0346 N80-25477
Division of Environmental Control Technology
program, 1978
[DOE/EV-0042]
p0350 N80-25926

ENVIRONMENT SIMULATION

Manufacturing methods of a composite cell case for
a Ni-Cd battery
p0546 A80-34777
WECS site screening by physical modeling
p0514 A80-35748
Modeling of safe-life tests of thermoelectric
batteries --- for space manufacturing experiments
p0519 A80-38758

ENVIRONMENTAL CONTROL

Environmental control technology for the flash
hydropyrolysis of coal
[BNL-50983]
p0345 N80-24884

ENVIRONMENTAL ENGINEERING

Environmental development plan: Solar
agricultural and industrial process heat
[DOE/EDP-0033]
p0446 N80-25862
Division of Environmental Control Technology
program, 1978
[DOE/EV-0042]
p0350 N80-25926

ENVIRONMENTAL MONITORING

Air quality measurements in the coal fired power
plant environment of Colstrip, Montana
p0326 A80-36477
Photometric analysis of aerial photographs to
detect and map sulfur dioxide effects of
soybeans near two large, coal-fired power plants
p0330 A80-41664
Remote sensing for geothermal environmental
assessments --- Imperial Valley and The Geysers,
California
[UCRL-15108]
p0483 N80-23756
Solar-powered environmental data collection system
[DP-1529]
p0440 N80-24867

ENVIRONMENTAL QUALITY

Solar energy program. Chapter from the Energy and
Environment Division report
[LBL-9630]
p0350 N80-25904

ENVIRONMENTAL TESTS

Environmental testing of solar reflector structures
p0363 A80-33487
At-sea test of a large diameter steel, cold water
pipe --- for OTEC
p0512 A80-35166
Solar energy systems: Test methods for collector
insulations
[PB80-132038]
p0430 N80-23867
Development of a low-temperature, low-cost, black
liquid solar collector, phase 2 --- weathering
tests
[ALO-30171-1]
p0453 N80-26841

ENVIRONMENTS

Energy storage technology-environmental
implications of large scale utilization
[LA-UR-79-3098]
p0555 N80-23801

ENZYME ACTIVITY

Light-dependent hydrogen production by C. reinhardi
--- anaerobically adapted green algae
p0459 A80-33410

EPITAXY

Evidence for grain boundary passivation by
oxidation in polycrystalline GaAs solar cells
p0402 A80-37195

EQUATIONS OF MOTION

Nonlinear aeroelastic equations of motion of
twisted, nonuniform, flexible horizontal-axis
wind turbine blades
[NASA-CR-159502]
p0536 N80-26774

EROSION

Summary of the research and development effort on
open-cycle coal-fired gas turbines
[ORNL/TM-6253]
p0528 N80-23821

EROSIVE BURNING

Coal-oil mixture combustion applied to Canadian
utility boilers
p0501 N80-27498

ERROR ANALYSIS
Solar heating simulation - Accuracy and precision of a model using daily data p0369 A80-33561
Calculation of the angular error of a solar cylindrical concentrator made from sheet material p0391 A80-33856

ETCHING
Etching of CdS films p0398 A80-35488
Solar collectors --- search for materials suitable for glazing, housing, coating, and etching [ALO-5359-T1] p0437 N80-24821
Low-cost solar antireflection coatings --- for flat plate collectors [ALO-5300-T2] p0453 N80-26844

ETHANE
Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons [UCRL-83317] p0337 N80-23629

ETHYL ALCOHOL
Pellets of immobilized yeast cells as biocatalysts for transforming biomass p0466 A80-33414
Development and characterization of ethanol tolerance in clostridium thermocellum --- biomass energy production p0466 A80-33416
Utilization of cellulosic feedstock in the production of fuel grade ethanol p0472 A80-37679
Ethanol, a clean burning bio-solar fuel - Its production and utilization p0472 A80-37986
Fuel from farms: A guide to small-scale ethanol production [SERI/SP-451-519] p0485 N80-24478

ETHYLENE
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology p0467 A80-34531

EUROPE
Monitoring solar heated houses in the European community - Procedures, results and future activities p0381 A80-33671
European progress in photovoltaic development p0384 A80-33712
Survey of foreign research in the field of heat pumps for the heating of dwellings p0353 N80-26789

EUROPEAN SPACE PROGRAMS
Conceptual design of integrated energy storage and attitude control system --- for European satellites p0547 A80-37455

EVACUATING (VACUUM)
Comparison of indoor-outdoor thermal performance for the Sunpak evacuated tube liquid collector [NASA-CR-161421] p0432 N80-24745
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3 [COO-2858-24-SUMM] p0437 N80-24807
Heat conduction in partial vacuum [ALO-5367-1] p0441 N80-25618
Survey and evaluation of current design of evacuated collectors [ALO-5350-1] p0452 N80-26823

EVAPORATIVE COOLING
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector p0366 A80-33530

EXCITATION
Load excitation at the superconducting cable test facility [BNL-26641] p0540 N80-22608

EXHAUST EMISSION
The trace element chemistry of coal during combustion and the emissions from coal-fired plants p0324 A80-34600
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters p0325 A80-35878
Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds p0325 A80-36419
Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings p0326 A80-36976
The effect of catalyst length and downstream reactor distance on catalytic combustor performance [NASA-TM-81475] p0337 N80-23779
National Emissions Data System (NEDS), fuel use report [PB80-146905] p0350 N80-25919

EXHAUST GASES
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur p0325 A80-35880
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366
Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience p0330 A80-41842
Development of a NO/x/-free combustion system p0333 A80-43741
Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB80-133168] p0336 N80-22888
Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB80-133176] p0336 N80-22889
The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant p0340 N80-23873
Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base [PB80-805401] p0346 N80-25678
Diesel exhaust emissions. Citations from the American Petroleum Institute data base [PB80-805419] p0347 N80-25679
A study of emissions from passenger cars in six cities, volume A [PB80-149800] p0350 N80-25930
Methods for analyzing inorganic compounds in particles emitted from stationary sources [PB80-141781] p0350 N80-25936
Flue gas desulfurization by the modified citrate process: Report of investigations [PB80-134836] p0351 N80-25940
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems [PB80-138464] p0351 N80-25947

EXPERIMENTAL DESIGN
Experimental and process design study of a high rate entrained coal gasification process [FE-1548-T2] p0487 N80-24501

EXTERNAL COMBUSTION ENGINES
A new design of Stirling engine for automotive application p0519 A80-39899

EXTRAPOLATION
On the vertical extrapolation of mean wind power density p0471 A80-36424

F

FABRICATION
Fabrication of glass sphere laser fusion targets p0506 A80-33052
The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells p0394 A80-35340
The design and fabrication of high efficiency thin film CdS/Cu2S solar cells p0422 A80-43516
Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules [NASA-CR-163028] p0449 N80-26776

FAILURE ANALYSIS
- Safety analysis of an advanced energy system facility p0520 A80-40337
- Common Cause Failures - A dilemma in perspective p0328 A80-40344
- A Boolean approach to common cause analysis p0328 A80-40349
- Test and evaluate the TRI-GAS low Btu coal gasification process [FE-2798-74] p0491 N80-25476

FAILURE MODES
- Common Cause Failures - A dilemma in perspective p0328 A80-40344
- Reliability prediction techniques for second generation marine and industrial gas turbines [ASME PAPER 79-GT/ISR-3] p0521 A80-42056
- Noise spectral density as a device reliability estimator --- for solar cells p0422 A80-43763

FANS
- Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan [NASA-CR-159806] p0346 N80-25332

FAR FIELDS
- SPS phase control system performance via analytical simulation [NASA-CR-160582] p0540 N80-22378
- Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine [NASA-TM-81813] p0532 N80-25104

FARM CROPS
- Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio p0358 A80-33405
- The potential of crop residues as a fuel for power generation p0466 A80-33750
- Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research [BMI-2031-VOL-1] p0482 N80-23481
- Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass [BMI-2031-VOL-2] p0341 N80-24475

FARMLANDS
- Agricultural applications of wind resource assessments p0514 A80-35739
- Potential of energy farming for transport fuels in New Zealand [NZERDC-46] p0489 N80-25456
- Potential of energy farming for transport fuels in New Zealand, appendices [NZERDC-46-APP] p0489 N80-25457

FAST FOURIER TRANSFORMATIONS
- LOTS analysis of optical diffraction in Antares --- Laser Optical Train Simulator code for fusion research p0518 A80-38490

FATIGUE LIFE
- A review of lifetime analyses for tokamaks p0507 A80-33056

FAULT TREES
- A Boolean approach to common cause analysis p0328 A80-40349

FEASIBILITY ANALYSIS
- Heat pumps in the PESAG supply district --- for electric power p0509 A80-34123
- On the evaluation of the feasibility of solar collectors for electrical power generation applications p0406 A80-37963
- An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing p0473 A80-39630
- Solar energy with chemical storage for cogeneration of electric power and heat p0549 A80-40715
- Solar energy economics - Orbiting reflectors for world energy p0415 A80-41324
- An alternate approach to the application of MHD power generation technology in a utility environment [IEEE PAPER F 79 651-1] p0525 A80-43502
- Feasibility evaluation for solar industrial process heat applications [SERI/TP-333-538] p0438 N80-24824
- Feasibility study of using a coal/water oil emulsion as a clean liquid fuel [FE-2437-T1-ADD] p0490 N80-25463
- Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2 p0495 N80-26469
- Startup and initial feasibility testing on the Salem Harbor COM demonstration p0501 N80-27499

FEEDBACK CONTROL
- Microprocessor-controlled digital shunt regulator --- for solar power systems p0505 A80-32758
- A simplified solar cooling design method for closed-loop liquid systems p0376 A80-33620
- RF feedback stabilization of a thin line cusp magnetoplasma sheath p0514 A80-36048
- Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors p0419 A80-42462

FERMENTATION
- Grain motor fuel alcohol technical and economic assessment study [HCP/J6639-01] p0334 N80-22523
- Retrospective search on the biochemical production of alcohol fuels [NP-24137] p0482 N80-23476
- Biological conversion of biomass to methane corn stover studies [COO-2917-13] p0485 N80-24474
- Fuel from farms: A guide to small-scale ethanol production [SERI/SP-451-519] p0485 N80-24478

FERRITIC STAINLESS STEELS
- Sigma phase formation in alloys for SO2/SO3 thermal energy storage systems [SAND-80-8205] p0562 N80-26856

FERROMAGNETIC MATERIALS
- The application of martensitic stainless steels in long lifetime fusion first wall/blankets p0507 A80-33059

FERTILIZERS
- Nitrogen fertilizer production by solar energy p0357 A80-33402

FIBER COMPOSITES
- Glass fiber reinforced concrete for terrestrial photovoltaic arrays p0393 A80-34782

FIBER OPTICS
- Development and application of high-power lightpipes --- glass fiber optical waveguides for solar radiation transmission p0401 A80-36833

FILTRATION
- Filtration process and equipment studies for coal liquefaction processes [FE-2007-T1] p0487 N80-24499

FINITE DIFFERENCE THEORY
- A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector p0404 A80-37950

FINITE ELEMENT METHOD
- Proposed method for determining the thickness of glass in solar collector panels [NASA-CR-163151] p0432 N80-24755
- La Recherche Aerospatiale, Bimonthly Bulletin Number 1979-6 [ESA-TT-632] p0448 N80-26255

FISHERIES
- The application of existing solar energy collecting equipment in agriculture, horticulture and fishculture p0350 A80-33404

FISHES
- Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming [PB80-157662] p0504 N80-27795

FISSILE FUELS
- Summary of the fusion-fission hybrid fuel cycle analysis (tritiumless hybrids) [UWFDM-337] p0493 N80-26138

FISSION PRODUCTS
- Summary of the fusion-fission hybrid fuel cycle analysis (tritiumless hybrids) [UWFDM-337] p0493 N80-26138

FLAT PLATES
- An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems p0360 A80-33452
- Theoretical and experimental investigation of the flow in a flat plate collector p0360 A80-33454
- Forced convection in solar collectors p0360 A80-33455
- Cylindrical glass tubes for flat plate collector covers p0361 A80-33460
- The unitary solar collector - A new approach to low-cost, flat-plate systems p0361 A80-33463
- Tests of all-day collector performance p0361 A80-33468
- Laboratory tests for flat plate solar collectors p0361 A80-33471
- Proposed method for testing of radiative cooling flat-plate collectors p0362 A80-33472
- Study of the nonlinear dynamics of a flat-plate collector p0369 A80-33565
- Performance analysis for collector-side reflector systems p0376 A80-33621
- The simulation of partially and fully tracking flat plate collectors in northern latitudes p0390 A80-33763
- Dynamic modelling and verification of a flat-plate solar collector p0391 A80-33864
- Optimization of flat-plate collector-flat mirror systems p0392 A80-33871
- Fluid circulation control in conventional and heat pipe planar solar collectors p0392 A80-33872
- The flat plate solar collector - Its steady-state and transient state behaviour p0403 A80-37943
- Flat-plate solar collectors - Influence of design material and configuration on performance p0404 A80-37944
- My new types of flat plate solar collectors p0404 A80-37945
- Measurements on a flat thermal solar energy collector with a cellular structure after Francia p0404 A80-37946
- Flat plate boosters for elevating temperatures p0404 A80-37947
- A black liquid flat plate collector for economical applications p0404 A80-37948
- An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector p0405 A80-37956
- Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors p0405 A80-37957
- Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors p0415 A80-40718
- Temperature distributions in the flat-plate collector under actual unsteady insolation p0415 A80-40937
- The technology of flat plate collectors p0417 A80-42439
- Transmission of diffuse radiation through CPC and flat plate collector glazings --- Compound Parabolic Collector p0421 A80-43486
- Methods for reducing heat losses from flat plate solar coolectors, phase 3 [COO-2597-5] p0424 N80-22851
- Study and analysis of a low cost cement bonded flat plate solar collector [ALO-4122-T1] p0428 N80-23816
- Solar collector fluid parameter study [PB80-125891] p0430 N80-23869

FLORIDA
- Solar heating and cooling demonstration project at the Florida solar energy center [NASA-CR-161413] p0423 N80-22774
- Solar hot water system installed at Quality Inn, Key West, Florida [NASA-CR-161434] p0427 N80-23774

FLOW DISTRIBUTION
- Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography p0360 A80-33453
- Hydrolyzed wood slurry flow modeling --- hydrocarbon fuel production [LBL-10090] p0504 N80-27703

FLOW MEASUREMENT
- Thermosyphon circulation in solar collectors p0392 A80-33869

FLOW VELOCITY
- Diagnostic techniques for combustion MHD systems [AIAA PAPER 80-0926] p0505 A80-32892
- A method for balancing flow rates in rows of parallel collectors p0362 A80-33476
- Thermosyphon circulation in solar collectors p0392 A80-33869

FLUES
- Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366
- Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience p0330 A80-41842
- Evaluation of physical/chemical coal cleaning and flue gas desulfurization [PB80-147622] p0346 N80-25481

FLUID DYNAMICS
- Basic Research Engineering: Fluid Dynamics and Thermal Processes [FE-2468-53] p0334 N80-22649

FLUID FILMS
- Application of magnetic suspensions and fluid film bearings to energy storage flywheels [SAND-79-7007] p0556 N80-23824

FLUID FLOW
- Fluid circulation control in conventional and heat pipe planar solar collectors p0392 A80-33872

FLUID INJECTION
- Stabilizing in situ oil shale retorts with injected grout p0473 A80-39762
- Oil recovery by carbon dioxide injection --- Rock Creek Big Injun field, West Virginia [ORO-5301-47] p0500 N80-26754

FLUIDIZED BED PROCESSORS
- Economics of energy recovery from biomass using fluidized-bed combustion p0465 A80-33413
- How clean gas is made from coal p0471 A80-36314
- Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal p0471 A80-37617
- Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor p0330 A80-41558
- Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash p0330 A80-41559
- 2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant [ASME PAPER 80-GT-132] p0477 A80-42245

- Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants [ASME PAPER 80-GT-160] p0550 A80-42270
- Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed [ASME PAPER 80-GT-163] p0332 A80-42273
- Evaluation method for closed cycle gas turbines in cogeneration applications [ASME PAPER 80-GT-176] p0332 A80-42282
- Thermal energy storage systems using fluidized bed heat exchangers p0551 N80-22792
- Solar-heated fluidized bed gasification system [NASA-CASE-NPO-15071-1] p0432 N80-24747
- Improved PFB operations: 400-hour turbine test results --- coal combustion products and hot corrosion in gas turbines [NASA-TM-81511] p0493 N80-26426
- Coal: An alternate fuel for thermal enhanced oil recovery steam generation [SAN-2418-1] p0503 N80-27524

FLUIDS
- Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation p0405 A80-37958

FLUORESCENCE
- Solar energy conversion by fluorescent materials for utilization in space communication systems p0409 A80-37992

FLUORIDES
- Evaluation of cathode materials for the lithium/carbonmonofluoride battery p0549 A80-40606

FLUOROCARBONS
- Voltage losses in fuel cell cathodes p0522 A80-42294

FLUX DENSITY
- Primary Li/SOCl2 cells. X - Optimization of D cells with respect to energy density, storability and safety p0549 A80-40602

FLYWHEELS
- Conceptual design of integrated energy storage and attitude control system --- for European satellites p0547 A80-37455
- The efficiency of ballast in composite flywheels p0549 A80-40068
- Whirl and critical speeds of flywheel-container systems aboard vehicles p0550 A80-41649
- Design study of flat belt CVT for electric vehicles [NASA-CR-159822] p0550 N80-22702
- Magnetic bearing support study for a 10 kW-hr energy storage flywheel [SAND-79-7025] p0555 N80-23661
- Application of magnetic suspensions and fluid film bearings to energy storage flywheels [SAND-79-7007] p0556 N80-23824
- Oak Ridge Flywheel Evaluation Laboratory [Y-2210] p0556 N80-23832
- Preliminary development of the Band Type Variable Inertia Flywheel (BVIF) [SAND-79-7089] p0559 N80-25879
- Energy-storage systems for automobile propulsion, 1979 study. Volume 3: Battery/flywheel electric vehicles using advanced batteries [UCRL-52841-VOL-3] p0561 N80-26213
- High energy storage flywheel test program [AD-A083302] p0561 N80-26796
- High-energy-density composite flywheel [SAND-79-7019] p0561 N80-26803
- Conceptual design of a flywheel energy storage system [SAND-79-7088] p0561 N80-26805

FOAMS
- Development of improved insulation materials --- for use with solar collectors [ALO-4295-T2] p0448 N80-26403

FOCUSING
- How to measure the optical quality of focusing solar collectors without laser ray tracing p0378 A80-33645
- Extrinsic losses in solar cells for linear focus systems 4 [SAND-79-1781] p0439 N80-24842

FOOD
- The energy-food interface - An economic analysis of Brazil's alcohol plan p0466 A80-33753

FORCED CONVECTION
- Forced convection in solar collectors p0360 A80-33455

FORECASTING
- Forecast of long term coal supply and mining conditions: Model documentation and results [NASA-CR-163141] p0487 N80-24728

FOREIGN POLICY
- World Energy Data System (WENDS). Volume 5: Internatinal organization data [ANL/PMS-79-2-VOL-5] p0348 N80-25831

FORESTS
- Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers p0475 A80-41662

FOSSIL FUELS
- Solid fossil-fuel recovery by electrical induction heating in situ - A proposal p0465 A80-33127
- A solar-fossil hybrid power system using a combined cycle p0375 A80-33611
- Impacts of fossil fuel use on environment and climate p0326 A80-37331
- Hydrogen from fossil fuels p0460 A80-37333
- RMA engineering applications to Fossil Energy projects --- Reliability and Maintainability p0473 A80-40336
- Liquid fuel supplies p0329 A80-40751
- Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation [ASME PAPER 80-GT-34] p0416 A80-42167
- Regional planning strategies for hybrid energy optimization p0332 A80-42451
- Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications [ASME PAPER 80-PET-83] p0524 A80-43345
- Fossil-fuel heat pumps for domestic, commercial and industrial space heating p0479 A80-43834
- Fossil energy program [ORNL-TM-7095] p0481 N80-22853
- Fossil energy prgoram [ORNL/TM-7057] p0481 N80-22854
- Fossil energy program [ORNL/TM-7031] p0482 N80-22855
- Regional application of fossil energy technologies: An analytical approach [DOE/ET-2442-1] p0339 N80-23830
- The Crossbyton project p0436 N80-24790
- Design of a monitoring program for ash pond effluents [PB80-128457] p0345 N80-24896
- Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry [FE-2537-10] p0489 N80-25460
- Methods for analyzing inorganic compounds in particles emitted from stationary sources [PB80-141781] p0350 N80-25936
- Environmental control technology for atmospheric carbon dioxide [BNL-51116] p0354 N80-26956

FOURIER TRANSFORMATION
- The 1H and 13C Fourier transform NMR characterization of jet fuels derived from alternated energy sources [AD-A084169] p0502 N80-27513

FRACTURES (MATERIALS)
- Thermal fracture effects in geothermal energy extraction --- computer programs [LA-7963] p0483 N80-23795

FRANCE
- France: Estimates of future energy/GDP relationships [ORAU/IEA-79-23(M)] p0343 N80-24852
- Guide for energy compatibility [NP-24016] p0353 N80-26833

FREE CONVECTION
- Mean monthly performance of solar water heaters with natural circulation p0371 A80-33579
- Performance analysis of a natural convection collector system --- of solar house p0383 A80-33695
- Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors p0405 A80-37957
- Three-dimensional numerical evaluation of heat loss through natural convection in a solar boiler p0413 A80-38274
- Free convection in solar collectors p0417 A80-42440
- Thermal fracture effects in geothermal energy extraction --- computer programs [LA-7963] p0483 N80-23795

FREE ELECTRON LASERS
- Solar power satellite system definition study. Volume 3: Laser SPS analysis, phase 3 [NASA-CR-160744] p0543 N80-27811

FREON
- Choice of cycle parameters for solar Freon air conditioning equipment of ejector type p0391 A80-33862

FRESNEL LENSES
- A unique new Fresnel lens solar concentrator p0364 A80-33499
- Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications p0364 A80-33500

FRESNEL REFLECTORS
- Economic analysis of a point focusing concentrating collector system p0363 A80-33484
- Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors --- Compound Parabolic Concentrator p0364 A80-33493

FRUITS
- Operation of an industrial solar drying system p0372 A80-33590

FUEL CAPSULES
- Fabrication of glass sphere laser fusion targets p0506 A80-33052

FUEL CELLS
- Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004
- Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell p0515 A80-37007
- Voltage losses in fuel cell cathodes p0522 A80-42294
- The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance p0522 A80-42295
- Ammonia high temperature solid electrolyte fuel cell p0523 A80-42298
- CO_2 concentrations in a molten carbonate electrochemical cell [ASME PAPER 80-ENAS-14] p0523 A80-43190
- Mass transport in molten-salt electrochemical systems [ORNL/MIT-290] p0527 N80-23400
- Cell module and fuel conditioner development [NASA-CR-159828] p0527 N80-23768
- Cell module and fuel conditioner [NASA-CR-159875] p0528 N80-23769
- Molten carbonate fuel cell program. Composition gradients induced by current flow in Li_2CO_3-K_2CO_3 mixtures [ORNL/TM-7061] p0529 N80-23839
- Fuel cell systems for vehicular applications [LA-UR-79-2826] p0530 N80-24214
- Research, development, and demonstration of nickel-zinc batteries for electric vehicle propulsion --- electrode development program [ANL/OEPM-78-10] p0556 N80-24215
- High-temperature fuel cell research and development [SAN-1485-T1] p0534 N80-25846
- Fuel cell research on second-generation molten-carbonate systems [SAN-11276-1] p0534 N80-25847
- High temperature fuel cell research and development [SAN-1485-2] p0534 N80-25848
- New electrolytes for direct methane fuel cells [DOE/ET-11321/T1] p0534 N80-25891
- Evaluation of air cathodes for potential use in development of aluminum-air cells [UCID-18561] p0535 N80-25893
- Advanced fuel cell development [ANL-79-51] p0535 N80-25895
- Development of fuel cell technology for vehicular applications [BNL-51047] p0536 N80-26216
- Definition of chemical and electrochemical properties of a fuel cell electrolyte [AD-A083608] p0537 N80-26794
- Solid polymer electrolyte fuel cell technology program [NASA-CR-160734] p0538 N80-27801

FUEL COMBUSTION
- The trace element chemistry of coal during combustion and the emissions from coal-fired plants p0324 A80-34600
- Autoignition and vaporization of no. 3 diesel oil spray under lean conditions [ASME PAPER 80-GT-10] p0475 A80-42151
- Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner [ASME PAPER 80-GT-64] p0476 A80-42194
- Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results [ASME PAPER 80-GT-67] p0476 A80-42197
- Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests [ASME PAPER 80-GT-68] p0476 A80-42198
- Low NO/x/ heavy fuel combustor program [ASME PAPER 80-GT-69] p0476 A80-42199
- 2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant [ASME PAPER 80-GT-132] p0477 A80-42245
- Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants [ASME PAPER 80-GT-160] p0550 A80-42270
- Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed [ASME PAPER 80-GT-163] p0332 A80-42273
- Low Btu coal gas combustion in high temperature turbines [ASME PAPER 80-GT-170] p0477 A80-42278
- Development of a NO/x/-free combustion system p0333 A80-43741
- Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner [FE-2489-45] p0334 N80-22520
- Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3 [DSE-4042-T2] p0498 N80-26533
- Densified biomass as an alternative Army heating and power plant fuel heating [AD-A083317] p0500 N80-26798
- Synoptic-scale distribution of man-made aerosols --- fossil fuel combustion products p0354 N80-26942
- Overview of R&D status on COM technology in Japan p0501 N80-27495
- Current status of the Canadian coal-oil mixture program p0501 N80-27496
- Combustion of coal-oil mixtures in a 700 HP watertube boiler p0502 N80-27504
- Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM p0502 N80-27508

FUEL CONSUMPTION
Advanced Gas Turbine Powertrain System Development Project p0513 A80-35574
Fuel - A system problem of major proportions --- fuel conservation in airline operations p0327 A80-37691
The American experience with solar energy in centralized electricity generation - Technology and economics p0412 A80-38024
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft [AIAA PAPER 80-1090] p0328 A80-38905
New Technology Transport for fuel critical economy p0328 A80-40313
Status of coal gasification processes p0540 A80-40752
Fuel economy in the airlines p0329 A80-40945
Fuel conservation through active control of rotor clearances [AIAA PAPER 80-1087] p0330 A80-41506
Continuously variable ratio transmissions for single-shaft gas turbines [ASME PAPER 80-GT-21] p0331 A80-42158
Fuel-flexible combined cycles for utility power and cogeneration [ASME PAPER 80-GT-101] p0331 A80-42225
Design study for a fuel efficient turbofan engine [ASME PAPER 80-GT-141] p0331 A80-42254
The Energy Efficient Engine /E3/ - Advancing the state of the art [ASME PAPER 80-GT-142] p0332 A80-42255
Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption [ASME PAPER 80-GT-161] p0477 A80-42271
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane [AIAA PAPER 80-1846] p0333 A80-43304
Fuel efficiency of small aircraft [AIAA PAPER 80-1847] p0333 A80-43305
Assessment of the potential of hybrid vehicles: Summary [NASA-CR-163059] p0336 N80-23215
Advanced component technologies for energy-efficient turbofan engines [NASA-TM-81507] p0341 N80-24316
Utilization concerns of potential transportation fuels [PB80-138498] p0342 N80-24503
National Emissions Data System (NEDS), fuel use report [PB80-146905] p0350 N80-25919
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies [NASA-CR-163228] p0559 N80-26204
Near term hybrid passenger vehicle development program, phase 1 [NASA-CR-163235] p0560 N80-26210
Mission analysis and performance specification studies report, appendix A [NASA-CR-163035] p0562 N80-27223
Design tradeoff studies and sensitivity analysis, appendix B [NASA-CR-163036] p0563 N80-27224
Design tradeoff studies and sensitivity analysis, appendices B1 - B4 --- hybrid electric vehicles [NASA-CR-163037] p0563 N80-27225
Preliminary design data package, appendices C1 and C2 [NASA-CR-163039] p0563 N80-27227
Energy conservation potential of general aviation activity [AD-A081182] p0355 N80-27355
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A [NASA-CR-135119] p0355 N80-27361
CF6-6D engine performance deterioration [NASA-CR-159786] p0355 N80-27364
Phase 1 of the near term hybrid passenger vehicle development program [NASA-CR-163219] p0564 N80-28245

FUEL FLOW
Design concept for LH2 airport facilities p0461 A80-37344

FUEL OILS
Chemical nature of coal hydrogenation oils. I - The effect of catalysts p0467 A80-34532
Chemical nature of coal hydrogenation oils. II - The effect of temperature p0467 A80-34533
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2 [CONF-791160-VOL-2] p0493 N80-26461
Grinding of coal in oil p0494 N80-26462
Handling coal oil mixtures with positive displacement pumps p0494 N80-26463
Grinding of coal-in-oil slurries p0494 N80-26464
Development of standards for coal-oil mixtures p0494 N80-26465
Progress in developing ultrafine coal-oil mixtures p0494 N80-26466
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures p0494 N80-26467
Characterization and structural studies of the various types of COM p0494 N80-26468
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2 p0495 N80-26469
The production of stable coal-oil mixtures using high intensity mechanical mixing devices p0495 N80-26470
Rheological properties of solvent refined coal-oil mixtures p0495 N80-26471
The role of coal and oil characteristics in the stability of coal-oil mixtures p0495 N80-26472
Evaluation of "stable" emulsions of coal p0495 N80-26473
Stabilization of coal/fuel oil slurries p0495 N80-26474
Results of experiment production of fine COM by wet type mill p0496 N80-26475
Fine COM preparation test p0496 N80-26476
The use of additives to stabilize coal-oil mixture p0496 N80-26477
COM stability forecasting method p0496 N80-26478
Studies on the stabilization of COM p0496 N80-26479
Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan p0496 N80-26480
Development and evaluation of highly-loaded coal slurries p0496 N80-26481
Atomization of coal slurry jets p0496 N80-26482
Atomization of coal-oil mixtures p0497 N80-26483
Basic studies on COM combustion p0497 N80-26484
Report on fine COM combustion test p0497 N80-26485
The CFOS (Carbonaceous Fuel-in-Oil Suspensoids) fuels p0497 N80-26486
Coal/oil mixture pipeline: A viable alternative coal transportation system? p0542 N80-26487
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1 [CONF-791160-VOL-1] p0501 N80-27494
Overview of R&D status on COM technology in Japan p0501 N80-27495
Current status of the Canadian coal-oil mixture program p0501 N80-27496

Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel p0501 N80-27497

Coal-oil mixture combustion applied to Canadian utility boilers p0501 N80-27498

Stable coal/fuel oil dispersions p0501 N80-27503

Combustion of coal-oil mixtures in a 700 HP watertube boiler p0502 N80-27504

A test plan for the NEPSCO coal-oil mixture combustion project p0502 N80-27505

Design consideration of fine COM storage p0502 N80-27506

Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM p0502 N80-27507

Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM p0502 N80-27508

FUEL PRODUCTION

Fusion - An energy source for synthetic fuels [AIAA PAPER 80-0844] p0465 A80-32857

Microalgal biomass systems for fuels, chemicals, and fertilizers p0465 A80-33409

Conversion processes for liquid fuels from biomass p0465 A80-33411

Liquid fuel production from biomass p0465 A80-33412

Pellets of immobilized yeast cells as biocatalysts for transforming biomass p0466 A80-33414

The potential of crop residues as a fuel for power generation p0466 A80-33750

Vehicle gas producers --- using solid fuels p0467 A80-34534

Bioconversion --- biomass energy production - research and development p0471 A80-37504

Utilization of cellulosic feedstock in the production of fuel grade ethanol p0472 A80-37679

Ethanol, a clean burning bio-solar fuel - Its production and utilization p0472 A80-37986

An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing p0473 A80-39630

Status of coal gasification processes p0540 A80-40752

Coal gasification development and commercialization of the Texaco coal gasification process p0474 A80-40754

Catalytic coal gasification for SNG manufacture --- Substitute Natural Gas p0474 A80-40755

The U-GAS process --- synthetic fuel production by coal gasification p0474 A80-40756

Synthetic fuels from coal: Overview and assessment --- Book p0329 A80-40825

Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas [FE-2566-25] p0480 N80-22519

Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research [BMI-2031-VOL-1] p0482 N80-23481

Proceedings forest and field fuels symposium [CONF-7710156] p0487 N80-24630

Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies [FE-2416-43-VOL-5] p0488 N80-24808

Potential of energy farming for transport fuels in New Zealand [NZERDC-46] p0489 N80-25456

Potential of energy farming for transport fuels in New Zealand, appendices [NZERDC-46-APP] p0489 N80-25457

EDS coal liquefaction process development, phase 4 [FE-2893-33] p0491 N80-25474

The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2 [CONF-791160-VOL-2] p0493 N80-26461

The production of stable coal-oil mixtures using high intensity mechanical mixing devices p0495 N80-26470

Stabilization of coal/fuel oil slurries p0495 N80-26474

Results of experiment production of fine COM by wet type mill p0496 N80-26475

Fine COM preparation test p0496 N80-26476

Preliminary engineering evaluation of promising coal liquefaction concepts [EPRI-AF-884] p0497 N80-26529

High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation [FE-1806-78] p0499 N80-26669

Coal liquefaction technology. Citations from the NTIS data base [PB80-808108] p0503 N80-27526

FUEL SPRAYS

Autoignition and vaporization of no. 3 diesel oil spray under lean conditions [ASME PAPER 80-GT-10] p0475 A80-42151

FUEL SYSTEMS

LLL Data acquisition system for liquefied gaseous fuels program [UCID-18576] p0498 N80-26537

The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1 [CONF-791160-VOL-1] p0501 N80-27494

Overview of R&D status on COM technology in Japan p0501 N80-27495

Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel p0501 N80-27497

FUEL TANKS

Design consideration of fine COM storage p0502 N80-27506

FUEL TESTS

Autoignition and vaporization of no. 3 diesel oil spray under lean conditions [ASME PAPER 80-GT-10] p0475 A80-42151

Fuel property effects on life characteristics of aircraft turbine engine combustors [ASME PAPER 80-GT-55] p0476 A80-42186

Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner [ASME PAPER 80-GT-64] p0476 A80-42194

Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results [ASME PAPER 80-GT-67] p0476 A80-42197

Fuel character effects on J79 and F101 engine combustor emissions [ASME PAPER 80-GT-70] p0476 A80-42200

FUELS

Grain motor fuel alcohol technical and economic assessment study [HCP/J6639-01] p0334 N80-22523

Characteristics of American coals in relation to their conversion into clean energy fuels [FE-2030-13] p0485 N80-24476

Environmental control technology for biomass flash pyrolysis [CONF-800129-2] p0346 N80-25477

FULL SCALE TESTS

Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests [ASME PAPER 80-GT-68] p0476 A80-42198

FUSION REACTORS

An assessment of magnetic fusion research [AIAA PAPER 80-0928] p0505 A80-32893

Mirror fusion reactor design p0505 A80-33043

First wall protection schemes for inertial confinement fusion reactors
p0506 A80-33050
A review of lifetime analyses for tokamaks
p0507 A80-33056
Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059
Material studies related to TFTR limiters and wall armor
p0507 A80-33063
Void growth characteristics in laser fusion reactor first walls
p0508 A80-33077
Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185
Magnet optimization for pulsed energy conversion --- for fusion reactors
p0517 A80-37871
Coatings for fusion reactor environments
p0525 A80-43517

FUSION-FISSION HYBRID REACTORS
Materials implications of fusion-fission reactor designs
p0506 A80-33044
Summary of the fusion-fission hybrid fuel cycle analysis (tritiumless hybrids)
[UWFDM-337] p0493 N80-26138

G

GALLIUM ARSENIDES
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337
Deposition and characterization of gallium arsenide films for solar cells applications
p0394 A80-35338
'Band readjustment' effect with applications to solar cells
p0397 A80-35367
Observation of an active photoinductive component in high intensity solar cells
p0399 A80-36242
An analytical model of a backwall MIS Schottky barrier solar cell
p0399 A80-36245
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588
Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells
p0402 A80-37195
Electrical properties of polycrystalline GaAs films
p0525 A80-43575
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819

GALLIUM COMPOUNDS
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797

GAS ANALYSIS
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results
[ASME PAPER 80-GT-60] p0331 A80-42190

GAS COOLING
Thermodynamic trade-offs for gas cooled high temperature solar tower receivers
p0379 A80-33648
Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471

GAS DISSOCIATION
Use of solar energy to reduce carbon dioxide
p0403 A80-37302

GAS EVOLUTION
Advanced development of a short residence-time hydrogasifier
[FE-3125-8] p0500 N80-26832

GAS FLOW
A high performance cocurrent-flow heat pipe for heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472
Test and evaluate the TRI-GAS low-Btu coal gasification process
[FE-2798-66] p0482 N80-23484

GAS GENERATORS
Evaluation of the Texaco synthesis gas generation process for the production of hydrogen from SRC-2 residue
[ORNL/SUB-7240/6] p0463 N80-25464

GAS HEATING
Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation
p0379 A80-33650
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959

GAS INJECTION
Hoe Creek No. 3 - First long-term underground coal gasification experiment with oxygen-steam injection
p0473 A80-39765

GAS LASERS
Antares Power Amplifier optical system
p0518 A80-38489

GAS MIXTURES
Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner
[FE-2489-45] p0334 N80-22520

GAS RECOVERY
Solid fossil-fuel recovery by electrical induction heating in situ - A proposal
p0465 A80-33127
Methane from landfills
[CONF-790999-1] p0485 N80-24472
Methane recovery from urban refuse
[CONF-7910105-2] p0486 N80-24485
Unconventional gas recovery - enhanced gas recovery
[DOE/EDP-0049] p0488 N80-24735

GAS TRANSPORT
A high performance cocurrent-flow heat pipe for heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472

GAS TURBINE ENGINES
Advanced Gas Turbine Powertrain System Development Project
p0513 A80-35574
Solar power units with screw expanders
p0410 A80-38000
Turbopropulsion combustion - Trends and challenges
[AIAA PAPER 80-1199] p0519 A80-38964
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304] p0519 A80-39014
Gas turbine combustor design challenges for the 1980's
[AIAA PAPER 80-1285] p0475 A80-41213
Reliability prediction techniques for second generation marine and industrial gas turbines
[ASME PAPER 79-GT/ISR-3] p0521 A80-42056
Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19] p0521 A80-42157
Continuously variable ratio transmissions for single-shaft gas turbines
[ASME PAPER 80-GT-21] p0331 A80-42158
The Perbury transmission --- toroidal traction drive for gas turbine engines
[ASME PAPER 80-GT-22] p0331 A80-42159
Fuel property effects on life characteristics of aircraft turbine engine combustors
[ASME PAPER 80-GT-55] p0476 A80-42186
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results
[ASME PAPER 80-GT-60] p0331 A80-42190
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-59] p0476 A80-42199

Fuel character effects on J79 and F101 engine combustor emissions
[ASME PAPER 80-GT-70] p0476 A80-42200
Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225
Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226
Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines
[ASME PAPER 80-GT-117] p0522 A80-42233
Diagnostic development for advanced power systems --- of gas turbines with coal-fire combustors
[ASME PAPER 80-GT-128] p0522 A80-42242
Diagnostics and instrumentation requirements for advanced power systems --- coal-fired gas turbine systems
[ASME PAPER 80-GT-129] p0477 A80-42243
The design of a solar receiver for a 25-kWe gas turbine engine
[ASME PAPER 80-GT-131] p0416 A80-42244
2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant
[ASME PAPER 80-GT-132] p0477 A80-42245
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems --- Closed-Cycle Gas Turbine
[ASME PAPER 80-GT-155] p0477 A80-42267
Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption
[ASME PAPER 80-GT-161] p0477 A80-42271
Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed
[ASME PAPER 80-GT-163] p0332 A80-42273
Baseline automotive gas turbine engine development program
[NASA-CR-159670] p0530 N80-24620
Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621
High energy storage flywheel test program
[AD-A083302] p0561 N80-26796
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364

GAS TURBINES
A solar-fossil hybrid power system using a combined cycle
p0375 A80-33611
Steam and gas turbines for small outputs using solar energy
p0410 A80-38003
The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26] p0416 A80-42161
Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162
Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation
[ASME PAPER 80-GT-34] p0416 A80-42167
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests
[ASME PAPER 80-GT-68] p0476 A80-42198
Design and test of a 73-MW water cooled gas turbine
[ASME PAPER 80-GT-112] p0477 A80-42230
Survey of integrated gasification combined cycle power plant performance estimates
[ASME PAPER 80-GT-113] p0477 A80-42231
Closed-cycle gas turbine working fluids
[ASME PAPER 80-GT-135] p0522 A80-42248
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258
Organic Rankine-cycle turbine power plant utilizing low temperature heat sources
[ASME PAPER 80-GT-153] p0522 A80-42265
Low Btu coal gas combustion in high temperature turbines
[ASME PAPER 80-GT-170] p0477 A80-42278
Evaluation method for closed cycle gas turbines in cogeneration applications
[ASME PAPER 80-GT-176] p0332 A80-42282
Development of a high temperature turbine for operation on coal-derived fuel
[ASME PAPER 80-GT-188] p0478 A80-42290
Literature survey of properties of synfuels derived from coal
[NASA-TM-79243] p0481 N80-22776
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592] p0526 N80-22778
Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources
[GA-A-15322] p0335 N80-22837
Solar-heated gas-turbine process using sulfur oxides for power production and energy storage
[LBL-9472] p0424 N80-22839
A 300 Btu gas combustor development program, phase 1
[EPRI-AP-1144] p0481 N80-22852
Conceptual design study of an improved gas turbine powertrain
[NASA-CR-159852] p0527 N80-23315
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662
The effect of catalyst length and downstream reactor distance on catalytic combustor performance
[NASA-TM-81475] p0337 N80-23779
Summary of the research and development effort on open-cycle coal-fired gas turbines
[ORNL/TM-6253] p0528 N80-23821
Compact closed cycle Brayton system feasibility study, volume 1 --- marine propulsion
[AD-A081379] p0532 N80-25666
An open cycle turbine solar thermal power system
p0448 N80-26257
Improved PFB operations: 400-hour turbine test results --- coal combustion products and hot corrosion in gas turbines
[NASA-TM-81511] p0493 N80-26426
Development of high-temperature turbine system technology to a technology readiness status phase 2
[FE-1806-76] p0536 N80-26671
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382

GAS-METAL INTERACTIONS
Hydrogen in metals - Notable properties and examples for their utilization. I
p0460 A80-36653
Moessbauer surface studies on TiFe hydrogen storage material
p0463 A80-43772

GASEOUS DIFFUSION
Voltage losses in fuel cell cathodes
p0522 A80-42294

GASEOUS FUELS
Gaseous fuels for airship propulsion
p0472 A80-39304
Status of coal gasification processes
p0540 A80-40752
Coal gasification development and commercialization of the Texaco coal gasification process
p0474 A80-40754
Catalytic coal gasification for SNG manufacture --- Substitute Natural Gas
p0474 A80-40755
The U-GAS process --- synthetic fuel production by coal gasification
p0474 A80-40756
Survey of integrated gasification combined cycle power plant performance estimates
[ASME PAPER 80-GT-113] p0477 A80-42231
Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption
[ASME PAPER 80-GT-161] p0477 A80-42271
Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed
[ASME PAPER 80-GT-163] p0332 A80-42273
Low Btu coal gas combustion in high temperature turbines
[ASME PAPER 80-GT-170] p0477 A80-42278

High temperature combustor designed for operation with coal derived low Btu gaseous fuels
[ASME PAPER 80-GT-187] p0478 A80-42289
Development of a high temperature turbine for operation on coal-derived fuel
[ASME PAPER 80-GT-188] p0478 A80-42290
Pyrolytic gasification of renewable biomass resources
p0478 A80-42466
Fossil-fuel heat pumps for domestic, commercial and industrial space heating
p0479 A80-43834
Survey of biomass gasification. Volume 2: Principles of gasification
[SERI/TR-33-239-VOL-2] p0481 N80-22524
Coal derived fuel gases for molten carbonate fuel cells
[METC-8085-T2] p0487 N80-24498

GASES
Conversion of biomass materials into gaseous products. Operation of the POU
[SAN-1241-3] p0490 N80-25466

GASIFICATION
Solar flash pyrolysis of biomass
p0359 A80-33431
Vehicle gas producers --- using solid fuels
p0467 A80-34534
Waste incineration and pyrolysis
p0475 A80-41174
Pyrolytic gasification of renewable biomass resources
p0478 A80-42466
Survey of biomass gasification. Volume 2: Principles of gasification
[SERI/TR-33-239-VOL-2] p0481 N80-22524

GASOHOL (FUEL)
Retrospective search on the biochemical production of alcohol fuels
[NP-24137] p0482 N80-23476
Environmental assessment of the utilization of alcohol fuels in highway vehicle applications
[CONF-791009-19] p0336 N80-23477

GASOLINE
The zinc chloride process for the hydrocracking of coal
p0474 A80-40757
Economic and market potential for SRC-II products --- Solvent Refined Coal
p0474 A80-40758
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 3: Environmental
[FE-2416-43-VOL-3] p0337 N80-23485
Conceptual design of a coal-to-methanol-to-gasoline commercial plant, volume 1
[FE-2416-43-VOL-1] p0484 N80-24467
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis
[FE-2416-43-VOL-2] p0485 N80-24468
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4A: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4A] p0485 N80-24469
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4B: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4B] p0485 N80-24470
Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol
[ORNL-5439] p0485 N80-24471
Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies
[FE-2416-43-VOL-5] p0488 N80-24808
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-42] p0490 N80-25473
Biosources digest, a journal on biomass utilization, volume 1, no. 1
[PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass utilization, volume 1, no. 4
[PB80-140981] p0493 N80-25909
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546

GENERAL AVIATION AIRCRAFT
Lightweight diesel aircraft engines for general aviation
[AIAA PAPER 80-1238] p0328 A80-38983
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane
[AIAA PAPER 80-1846] p0333 A80-43304
Fuel efficiency of small aircraft
[AIAA PAPER 80-1847] p0333 A80-43305
Energy conservation potential of general aviation activity
[AD-A081182] p0355 N80-27355

GEOLOGICAL SURVEYS
Contribution of remote sensing to the geological problems of the country
p0472 A80-38801
Geological assessment probe
[NASA-CASE-NPO-14558-1] p0488 N80-24906
Environmental assessment: Geothermal energy geopressure subprogram. DOE Sweet Lake no. 1, Cameron Parish, Louisiana
[DOE/EA-0065] p0493 N80-25929
The United States Geological Survey in Alaska, 1979 programs
[CIRC-804-A] p0500 N80-26747

GEOMETRICAL OPTICS
The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503

GEOMORPHOLOGY
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163311] p0492 N80-25770

GEORGIA
Solar total energy project Shenandoah
[ALO-3985-1-REV-1] p0444 N80-25825

GEOTHERMAL ENERGY CONVERSION
Design of an isobutane binary cycle geothermal generation system
p0509 A80-34559
Geothermal energy - Extracting heat from hot dry rock masses
p0471 A80-36625
System thermodynamics of energy conversion plants for geopressured resources
[ASME PAPER 80-PET-31] p0524 A80-43342
The Nigorikawa Geothermal Pilot Plant
p0525 A80-43740
Advantage of incorporating geothermal energy into power-station cycles
p0526 A80-43835
Energy from hot dry rock
[LA-UR-79-3256] p0338 N80-23802
Process applications for geothermal energy resources
[COO-4896-T1] p0340 N80-23854
Environmental development plan: Geothermal energy systems
[DOE/EDP-0036] p0340 N80-23877
Potential air quality impact of geothermal power production in the Imperial Valley
[UCRL-52797] p0340 N80-23878
Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain
[AD-A082400] p0488 N80-24799
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7] p0491 N80-25707
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072] p0492 N80-25865
Engineering evaluation of conceptual coal conversion plant using the H-coal liquefaction process
[EPRI-AP-1297] p0498 N80-26530

GEOTHERMAL ENERGY UTILIZATION
Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling
[AIAA PAPER 80-1546] p0415 A80-41502

Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications
[ASME PAPER 80-PET-83] p0524 A80-43345
The Nigorikawa Geothermal Pilot Plant
p0525 A80-43740
Magma energy: A feasible alternative?
[SAND-80-0309C] p0492 N80-25859
Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-25868
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9
[NASA-CR-163267] p0352 N80-26772

GEOTHERMAL RESOURCES
Earth coils and geo-thermal wells used as solar energy storage devices
p0368 A80-33549
Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions
p0467 A80-34019
Geothermal energy - Extracting heat from hot dry rock masses
p0471 A80-36625
Contribution of remote sensing to the geological problems of the country
p0472 A80-38801
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019
Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power
[ASME PAPER 80-PET-27] p0333 A80-43341
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399
Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California
[UCRL-15108] p0483 N80-23756
Thermal fracture effects in geothermal energy extraction --- computer programs
[LA-7963] p0483 N80-23795
Conceptual design of a coal-to-methanol-to-gasoline commercial plant, volume 1
[FE-2416-43-VOL-1] p0484 N80-24467
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis
[FE-2416-43-VOL-2] p0485 N80-24468
Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain
[AD-A082400] p0488 N80-24799
Performance evaluation of Magma Power company's reinjection well no. 46-7 at the East Mesa KGRA, California
[SAND-79-7127] p0492 N80-25863
Environmental assessment: Geothermal energy geopressure subprogram. DOE Sweet Lake no. 1, Cameron Parish, Louisiana
[DOE/EA-0065] p0493 N80-25929
Semiconductors for high temperature active devices: Silcon, GaA lc]s, and GaP
[SAND-80-0379C] p0499 N80-26608
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
[E80-10142] p0499 N80-26729

GEOTHERMAL TECHNOLOGY
Solar, geothermal, electric and storage systems program summary document, FY 1980
[DOE/ET-0102] p0354 N80-26861

GERMANY
Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's
p0330 A80-41826
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841

GETTERS
Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185

GLASS
The characterization of crushed glass as a transpired air heating solar collector material
p0360 A80-33450
Heat transfer through collector glass covers
p0360 A80-33458
Cylindrical glass tubes for flat plate collector covers
p0361 A80-33460
Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications
p0364 A80-33500
Properties of low cost, high volume glasses --- for solar energy applications
p0414 A80-39937
Proposed method for determining the thickness of glass in solar collector panels
[NASA-CR-163151] p0432 N80-24755
A cellular glass substrate solar concentrator
p0434 N80-24769
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858
Study of curved glass photovoltaic module and module electrical isolation design requirements
[NASA-CR-163033] p0450 N80-26781
Low-cost solar antireflection coatings --- for flat plate collectors
[ALO-5300-T2] p0453 N80-26844

GLASS FIBERS
Glass fiber reinforced concrete for terrestrial photovoltaic arrays
p0393 A80-34782
Development and application of high-power lightpipes --- glass fiber optical waveguides for solar radiation transmission
p0401 A80-36833
Determination of the extinction coefficient of glass fiber insulation
[AIAA PAPER 80-1528] p0330 A80-41488

GLAZES
Weatherability test of plastic glazing materials for collectors
p0362 A80-33474
Solar collectors --- search for materials suitable for glazing, housing, coating, and etching
[ALO-5359-T1] p0437 N80-24821

GLOBAL AIR POLLUTION
Synoptic-scale distribution of man-made aerosols --- fossil fuel combustion products
p0354 N80-26942

GOLD
I-V and C-V characteristics of Au/TiO2 Schottky diodes
p0413 A80-39055

GOVERNMENT PROCUREMENT
Energy-efficient procurement in state and local governments
[DOE/CS-5255/1] p0355 N80-27207

GOVERNMENT/INDUSTRY RELATIONS
Transportation energy contingencies - A status report on public response and government roles
p0326 A80-37353
Paving the way for energy-saving innovations
p0328 A80-39554
Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/RA-0044] p0342 N80-24736

GRAIN BOUNDARIES
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345
Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346
Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques
p0398 A80-35467
Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells
p0402 A80-37195

Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films p0526 A80-43758
Grain boundary defects in thin semicrystalline material --- effects on performance of silicon solar cells p0422 A80-43761
Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon p0422 A80-43762

GRAPHITE-EPOXY COMPOSITE MATERIALS
Manufacturing methods of a composite cell case for a Ni-Cd battery p0546 A80-34777

GRASSES
Production of sugarcane and tropical grasses as a renewable energy source [ORO-5912-T1] p0484 N80-23840
Production of sugarcane and tropical grasses as a renewable energy source [ORO-5912-T2] p0503 N80-27514

GREENHOUSE EFFECT
The development and demonstration of a solar pond for heating greenhouses p0371 A80-33586
Solar energy at the P.E.I. Ark p0420 A80-42471

GRINDING (COMMINUTION)
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2 [CONF-791160-VOL-2] p0493 N80-26461
Grinding of coal in oil p0494 N80-26462
Grinding of coal-in-oil slurries p0494 N80-26464
Progress in developing ultrafine coal-oil mixtures p0494 N80-26466

GROUND EFFECT
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory p0545 A80-33513

GROUND WATER
Energy storage in ground-water aquifers p0545 A80-33514
Seasonal regeneration through underground strata --- solar terrestrial interactions p0548 A80-37966
Contribution of remote sensing to the geological problems of the country p0472 A80-38801
Cold water aquifer storage --- air conditioning p0554 N80-22827

GROUND WIND
Boundary layer wind shear --- at wind turbine sites p0469 A80-35743
Trees as an indicator of wind power potential p0470 A80-35745

GROUT
Stabilizing in situ oil shale retorts with injected grout p0473 A80-39762

GUST LOADS
Wind turbine dynamic blade loads due to wind gusts and wind direction changes p0513 A80-35727

GUSTS
Collector deflections due to wind gusts and control scheme design p0378 A80-33643
Wind fluctuations described as discrete events p0468 A80-35721

H

HALL EFFECT
The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator p0510 A80-34619
High electrical conductivity and high Hall coefficient in MHD generator p0511 A80-34990
Hall effects on MHD Couette flow in a rotating system p0523 A80-43226

HANDBOOKS
Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs p0374 A80-33603
Solar cell array design handbook - The principles and technology of photovoltaic energy conversion p0393 A80-34847
Status of the Large Wind Turbine Siting Handbook p0514 A80-35750

HARDWARE
Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation [BNL-51120] p0455 N80-26863

HARTMANN NUMBER
Longitudinal baffling in Faraday generators p0505 A80-32743

HAWAII
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9 [NASA-CR-163267] p0352 N80-26772
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2 [LBL-10098] p0353 N80-26817

HEAT CAPACITY MAPPING MISSION
Contribution of remote sensing to the geological problems of the country p0472 A80-38801
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia [E80-10142] p0499 N80-26729

HEAT EXCHANGERS
An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection [AIAA PAPER 80-0869] p0357 A80-32867
Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO_2/SO_3 distributed solar energy collection system p0358 A80-33426
Solar heating simulation - Accuracy and precision of a model using daily data p0369 A80-33561
Advanced solar receiver development p0379 A80-33649
Catalyzed thermal conversion of SO_3 to SO_2+O_2 for solar thermal power p0379 A80-33651
A new solar thermal receiver utilizing small particles p0379 A80-33652
A direct contact thermal energy storage system p0548 A80-37968
Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system p0406 A80-37970
Heat pipe receiver for a 20 MWe solar tower [AIAA PAPER 80-1507] p0415 A80-41471
Closed-cycle gas turbine working fluids [ASME PAPER 80-GT-135] p0522 A80-42248
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems --- Closed-Cycle Gas Turbine [ASME PAPER 80-GT-155] p0477 A80-42267
Thermal energy storage systems using fluidized bed heat exchangers p0551 N80-22792
Active heat exchange system development for latent heat thermal energy storage p0553 N80-22819
Energy storage-boiler tank p0554 N80-22820
Active heat exchange system development for latent heat thermal energy storage p0554 N80-22822
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films [COO-4297-2] p0454 N80-26845

HEAT FLUX
Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants p0411 A80-38807

Determination of the unsteady heat fluxes in the
focal plane of a radiant energy concentrator
p0414 A80-39785

HEAT GENERATION
Evaluation of materials for EPR power generation
p0507 A80-33058
The Ansaldo 35 kW solar power system
p0373 A80-33600

HEAT MEASUREMENT
A procedure for determining solar heat gain
factors for south-facing vertical surfaces on
average days
p0384 A80-33699
Specific heats of Colorado oil shales - A
differential scanning calorimetry study
p0475 A80-41892
Calorimetric measurement of ac losses in
superconducting cables of short lengths
[BNL-26712] p0540 N80-22609

HEAT OF FUSION
Investigation of latent heat of fusion storage for
solar heating systems
p0546 A80-33523
Energy storage-boiler tank
p0554 N80-22820

HEAT PIPES
Analytical and economic evaluation of heat pipe
augmented passive solar heating systems
p0384 A80-33704
Fluid circulation control in conventional and heat
pipe planar solar collectors
p0392 A80-33872
Silicon carbide-tungsten heat pipes for
high-temperature service
p0327 A80-37680
High temperature heat pipes for waste heat recovery
[AIAA PAPER 80-1505] p0329 A80-41469
Design of a heat pipe absorber for a concentrating
solar water heater
[AIAA PAPER 80-1506] p0415 A80-41470
Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471
A high performance cocurrent-flow heat pipe for
heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472
Application of heat pipes to thermal energy
storage systems --- for solar residential heating
[AIAA PAPER 80-1509] p0549 A80-41473
Cusp mirror - Heat pipe evacuated tubular solar
thermal collector
p0421 A80-43482
Analysis of solidification in a cylindrical
annulus with internal fins
[AD-A080131] p0550 N80-22641
Development of a low-cost non-tracking heat pipe
concentrating collector
[PB80-160443] p0457 N80-27828

HEAT PUMPS
Chemical heat pumps using a slurry of metal salt
ammoniates in an inert solvent --- for solar
heating and cooling energy storage
p0358 A80-33423
Development of the sulfuric acid-water chemical
heat pump/chemical energy storage system for
solar heating and cooling
p0359 A80-33429
Experimental comparison between solar assisted
compression and absorption heat pump
p0367 A80-33537
Reducing solar costs with the
Solar-Assisted-Templifier --- heat pumps in
series or parallel systems
p0367 A80-33541
A design method for parallel solar-heat pump systems
p0367 A80-33542
Economics of solar-assisted heat pump heating
systems for residential use
p0367 A80-33543
Comparison of combined solar heat pump systems to
conventional alternatives
p0367 A80-33544
A solar operated water-Li Br absorption
refrigeration machine used also as heat pump -
Technical and economic analysis
p0367 A80-33545
A comparative study of solar assisted heat pump
systems for Canadian locations
p0367 A80-33546
Computer simulation of ground coupled storage in a
series solar assisted heat pump system
p0368 A80-33547
Heat pump impact upon solar collection design and
cost
p0368 A80-33548
A solar assisted heat pump experiment
p0368 A80-33550
Some performance characteristics of the UNIBELB
air source solar boosted heat pump system
p0368 A80-33551
Experimental performance study of a series solar
heat pump
p0368 A80-33552
Improved heat pump model for TRNSYS --- transient
simulation program for residential areas
p0508 A80-33553
Comparison on the performance of a solar assisted
heat pump and an air source heat pump in a
northern climate
p0368 A80-33554
Solar energy system with heat pump augmentation
for industrial process heat - An update
p0372 A80-33589
Optimization of photovoltaic/thermal collector
heat pump systems
p0387 A80-33737
Development of a combined solar heating/heat pump
system for conditions typical of the Crimea
p0391 A80-33863
Heat pumps in the PESAG supply district --- for
electric power
p0509 A80-34123
Liquid desiccant solar heat pump for developing
nations
p0408 A80-37980
Heat pumps for heating, cooling, and energy
recovery 1976-1990 --- German book
p0327 A80-38210
Heat-pump applications to single-family dwellings
- An analysis by computer model
p0333 A80-43833
Fossil-fuel heat pumps for domestic, commercial
and industrial space heating
p0479 A80-43834
Methanol-based heat pumps for storage of solar
thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845
Fluid circulating pump operated by same incident
solar energy which heats energy collection fluid
p0426 N80-23500
Research and development of an air-cycle heat-pump
water heater
[ORNL/SUB-7226/1] p0529 N80-23850
Performance improvement of a solar heating system
utilizing off-peak electric auxilliary
[DOE/R5/10140-1] p0429 N80-23852
Series solar heat pump and energy conservation
[BNL-27012] p0340 N80-23857
Heat-pump-centered integrated community energy
systems
[ANL/CNSV-TM-18] p0343 N80-24813
Heat-pump-centered integrated community energy
systems
[ANL/CNSV-TM-20] p0343 N80-24822
Heat-pump-centered integrated community energy
systems
[ANL/CNSV-TM-25] p0344 N80-24860
Heat-pump-centered integrated community energy
systems
[ANL/CNSV-TM-24] p0344 N80-24863
Optimization of solar assisted heat pump systems
via a simple analytic approach
[BNL-27316] p0349 N80-25896
Solar-assisted heat pump-swimming pool
synergistics for domestic heating
[UCRL-83458] p0447 N80-25905
State-of-the-art assessment of hybrid heat pumps
[EPRI-EM-1261] p0352 N80-26627
Reverse absorption mode of the HYCSOS chemical
heat pump with low grade (approximately 30 deg
C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628
Lectures on heat technology in the Netherlands ---
held on 23-24 Aug. 1977
p0353 N80-26787
Survey of foreign research in the field of heat
pumps for the heating of dwellings
p0353 N80-26789

Case study of an air to air heat pump
p0353 N80-26790
A chemical heat-pump/energy storage device and its applications --- waste energy utilization
[EHG-030] p0562 N80-26880

HEAT RADIATORS

Analysis of matrix air heaters --- of radiative heat transfer in solar collectors
p0360 A80-33456
Heat-pump applications to single-family dwellings - An analysis by computer model
p0333 A80-43833

HEAT SOURCES

Description of processes for producing hydrogen by coal gasification
p0460 A80-37334
High temperature hydrogen cycles for solar heat sources
[LA-UR-80-184] p0443 N80-25817
Studies of thermochemical water-splitting cycles
[NASA-CR-163029] p0449 N80-26409

HEAT STORAGE

Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio
p0358 A80-33405
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent --- for solar heating and cooling energy storage
p0358 A80-33423
Ammonia dissociation for solar thermochemical absorbers
p0358 A80-33428
Solar Heating '85 - Sweden's national solar heating program
p0323 A80-33443
The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507
Economical optimum TES size via marginal analysis --- Thermal Energy Storage
p0365 A80-33508
Effects of baffles on thermal stratification in themocline storage tanks
p0365 A80-33509
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks
p0545 A80-33510
Dynamic model of a mixed /sensible plus latent/ low-temperature thermal storage system
p0545 A80-33511
Thermal storage in rock beds
p0545 A80-33512
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
p0545 A80-33513
Energy storage in ground-water aquifers
p0545 A80-33514
Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515
The 'soil therm' system for interseasonal earth storage of solar heat for individual housing
p0545 A80-33516
The effect of system size on the practicality of aquifer storage --- feasibility of small systems for building heat storage
p0545 A80-33517
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks
p0546 A80-33518
Latent heat energy storage using direct contact heat transfer
p0546 A80-33519
Experimental study of coolness storage using sodium sulfate decahydrate --- for air conditioning systems
p0546 A80-33521
Development of a storage system based on encapsulated p.c.-materials --- Phase Change material in solar heating
p0546 A80-33522
Investigation of latent heat of fusion storage for solar heating systems
p0546 A80-33523
Computer simulation of ground coupled storage in a series solar assisted heat pump system
p0368 A80-33547
Earth coils and geo-thermal wells used as solar energy storage devices
p0368 A80-33549
The layout of solar hot water systems, using statistical meteo- and heat demand data
p0369 A80-33562
Small solar plants for electricity supply
p0373 A80-33596
The solar ten megawatt pilot plant
p0374 A80-33608
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617
A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683
An application of phase change materials in passive solar systems
p0384 A80-33703
Cost and performance evaluation of passive solar systems
p0389 A80-33755
A design procedure for wind powered heating systems
p0509 A80-33776
Comparison of measured and predicted rock bed storage performance
p0546 A80-33870
A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /THU solar system I/
p0392 A80-34561
A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems
p0546 A80-35382
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes
p0405 A80-37952
Phase change collector wall versus water collector wall
p0406 A80-37962
Performance of a storage unit coupled to a flat plate solar collector
p0406 A80-37964
Seasonal regeneration through underground strata --- solar terrestrial interactions
p0548 A80-37966
A direct contact thermal energy storage system
p0548 A80-37968
Solar heating systems with air collectors and rock bed storage
p0406 A80-37969
Latent heat diode wall --- study of passive solar heating of houses
p0407 A80-37975
A review of the historical developments of the use of passive solar systems
p0408 A80-37981
Hybrid chemical concepts for storage of solar thermal energy
p0548 A80-37988
Application of heat pipes to thermal energy storage systems --- for solar residential heating
[AIAA PAPER 80-1509] p0549 A80-41473
A convolution model of rock bed thermal storage units
p0550 A80-43480
Solar process water heat for the IRIS images custom color photo lab
[NASA-CR-161414] p0423 N80-22781
Thermal Energy Storage: Fourth Annual Review Meeting
[NASA-CP-2125] p0551 N80-22788
Seasonal Thermal Energy Storage Program
p0551 N80-22789
Program definition and assessment overview --- for thermal energy storage project management
p0551 N80-22790
Solar applications analysis for energy storage
p0423 N80-22791
Thermal energy storage systems using fluidized bed heat exchangers
p0551 N80-22792

- Thermal energy storage and transport p0540 N80-22793
- Conceptual design of thermal energy storage systems for near-term electric utility applications p0551 N80-22794
- Industrial storage applications overview p0551 N80-22795
- Applications of thermal energy storage to waste heat recovery in the food processing industry p0552 N80-22796
- Collection and dissemination of TES system information for the paper and pulp industry p0552 N80-22797
- Solar thermal power storage applications lead laboratory overview p0552 N80-22798
- Thermal storage experience at the MSSTF and plans for the future p0552 N80-22799
- Thermal energy storage effort at JPL p0552 N80-22800
- Internally insulated thermal storage system development program p0552 N80-22801
- High temperature underground thermal energy storage system for solar energy p0552 N80-22803
- High-temperature molten salt thermal energy storage systems for solar applications p0552 N80-22805
- Building heating and cooling applications thermal energy storage program overview p0552 N80-22806
- Subcontracted activities related to TES for building heating and cooling p0553 N80-22807
- Thermal energy storage testing facility p0553 N80-22808
- Application of thermal energy storage to process heat recovery in the aluminum industry p0553 N80-22809
- Heat storage capability of a rolling cylinder using Glauber's salt p0553 N80-22810
- Thermal energy storage test facility p0553 N80-22811
- Life and stability testing of packaged low-cost energy storage materials p0553 N80-22814
- Evaluation of thermal energy storage for the proposed Twin Cities District Heating system --- using cogeneration heat production and aquifiers for heat storage p0553 N80-22815
- Experimental evaluation of thermal energy storage p0553 N80-22817
- Active heat exchange system development for latent heat thermal energy storage p0553 N80-22819
- Energy storage-boiler tank p0554 N80-22820
- The SERI solar energy storage program p0423 N80-22821
- Active heat exchange system development for latent heat thermal energy storage p0554 N80-22822
- Aquifer thermal energy storage program p0554 N80-22825
- Low temperature thermal-energy storage [ANL/CES/TE-79-3] p0554 N80-22842
- Methanol-based heat pumps for storage of solar thermal energy, phase 1 [SAND-79-8188] p0555 N80-22845
- Solar energy system performance evaluation: Seasonal report for fern, Tunkhannock, Pennsylvania [NASA-CR-161392] p0424 N80-22856
- Solor Applications of Thermal Energy Storage [TID-29430] p0427 N80-23791
- Thermal energy storage in aquifiers: Preliminary information [PNL-3062] p0555 N80-23793
- Developing and upgrading of solar system thermal energy storage simulation models [BCS-40252] p0430 N80-23858
- Sensible heat storage for a solar thermal power plant [LBL-9321] p0437 N80-24816
- Mean monthly performance of passive solar water heaters [LBL-9295] p0437 N80-24820
- Heat-pump-centered integrated community energy systems [ANL/CNSV-TM-25] p0344 N80-24860
- Heat-pump-centered integrated community energy systems [ANL/CNSV-TM-24] p0344 N80-24863
- Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage [ORO-5759-T1] p0557 N80-24866
- Thermal energy storage [NASA-TM-81514] p0558 N80-25779
- Hybrid thermal storage with water [ESG-DOE-13259] p0558 N80-25861
- Two-tank seasonal storage concept for solar space heating of buildings [CONF-791226-2] p0446 N80-25867
- Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage [SERI/TP-355-570] p0559 N80-25900
- SERI solar energy storage program [SERI/TP-333-497] p0452 N80-26820
- Design and installation manual for thermal energy storage [ANL-79-15-ED-2] p0561 N80-26840
- Thermal and mechanical energy-storage program, project summary data FY 1980 [DOE/CS-0150] p0562 N80-26862
- Investigation of heat storages with salt hydrate as storage medium based on the extra water principle [EUR-6646-PT-2] p0564 N80-27818

HEAT TRANSFER

- Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system p0358 A80-33426
- Heat transfer through collector glass covers p0360 A80-33458
- An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency p0362 A80-33473
- Studies of directly absorbing fluids for mid-temperature solar thermal applications p0388 A80-33749
- Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators p0391 A80-33855
- Geothermal energy - Extracting heat from hot dry rock masses p0471 A80-36625
- Measurements on a flat thermal solar energy collector with a cellular structure after Francia p0404 A80-37946
- A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector p0404 A80-37950
- A direct contact thermal energy storage system p0548 A80-37968
- Analysis of solidification in a cylindrical annulus with internal fins [AD-A080131] p0550 N80-22641
- Energy conservation via heat transfer enhancement [COO-4649-5] p0335 N80-22847
- Solar collector fluid parameter study [PB80-125891] p0430 N80-23869
- Energy from humid air [DSE-2553-79/1] p0531 N80-24861
- Heat transfer enhancement in metal hydride systems [BNL-27347] p0561 N80-26539
- Evaluation of heat transfer enhancement in air-heating collectors [ALO-5352-T1] p0454 N80-26848

HEAT TRANSFER COEFFICIENTS

- Heating characteristics of concentrator/receiver system employing a selective absorbing surface p0401 A80-36826
- Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors p0405 A80-37957

A high performance cocurrent-flow heat pipe for heat recovery applications [AIAA PAPER 80-1508] p0329 A80-41472

Determination of the extinction coefficient of glass fiber insulation [AIAA PAPER 80-1528] p0330 A80-41488

Active heat exchange system development for latent heat thermal energy storage p0553 N80-22819

HEAT TRANSMISSION

Theoretical and experimental investigation of the flow in a flat plate collector p0360 A80-33454

Thermal performance of compounds used to improve heat transfer in solar collectors p0360 A80-33457

Methods for reducing heat losses from flat plate solar coolectors, phase 3 [COO-2597-5] p0424 N80-22851

Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain [AD-A082400] p0488 N80-24799

HEAT TREATMENT

Thermal aging characteristics of electrodeposited black chrome solar coatings p0388 A80-33740

HEATING

Evaluation of heat transfer enhancement in air-heating collectors [ALO-5352-T1] p0454 N80-26846

HEATING EQUIPMENT

Solar heat generation for industrial process heating applications p0372 A80-33594

Survey of simplified design methodologies for solar heating and cooling systems p0376 A80-33619

Thermic diode performance characteristics and design manual p0376 A80-33623

The characterization of the performance of passive solar heating systems p0382 A80-33686

Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H. p0384 A80-33711

A design procedure for wind powered heating systems p0509 A80-33776

Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters p0325 A80-35878

Effectiveness of packed-bed solar air heaters p0407 A80-37972

Solar water heaters p0407 A80-37974

Heat pumps for heating, cooling, and energy recovery 1976-1990 --- German book p0327 A80-38210

Evaluation method for closed cycle gas turbines in cogeneration applications [ASME PAPER 80-GT-176] p0332 A80-42282

Solar air systems p0418 A80-42444

Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films) [ALO-4147-T1] p0429 N80-23817

Off-peak electric auxiliary heat for solar air-heating systems [COO-4516-1] p0429 N80-23827

Research and development of an air-cycle heat-pump water heater [ORNL/SUB-7226/1] p0529 N80-23850

Evaluation of energy conserving modifications for water heaters [PB80-133853] p0344 N80-24873

Solair heater program: Solair applications study [COO-2705-3] p0443 N80-25813

Comparative performance of two types of evacuated tubular solar collectors in a residential heating and cooling system [COO-2577-19] p0446 N80-25864

Site and building energy-conservation study: Survey of building 251, diagnostic chemistry [UCRL-15190] p0348 N80-25880

Lectures on heat technology in the Netherlands --- held on 23-24 Aug. 1977 p0353 N80-26787

Densified biomass as an alternative Army heating and power plant fuel heating [AD-A083317] p0500 N80-26798

Addition of inexpensive solar air-heaters to a pre-engineered metal building [ALO-4086-1] p0452 N80-26818

Water heating by solar energy with plastic collectors [BMFT-FB-T-79-29] p0456 N80-26876

Solar energy system performance evaluation-seasonal report for Elcam San Diego, San Diego, California [NASA-CR-161481] p0457 N80-27806

HEAVY IONS

Heavy-ion-driven fusion p0519 A80-39763

Comparative study of energy accounting for heavy ion fusion with various driver accelerators [IPPJ-454] p0538 N80-28195

HEAVY LIFT LAUNCH VEHICLES

Solar power satellite system definition study. Volume 5: Space transportation analysis, phase 3 [NASA-CR-160746] p0457 N80-27813

HELICAL FLOW

The characteristics of a nonhomogeneous helical MHD dynamo --- for magnetic field study p0510 A80-34614

HELIOSTATS

Solar central receiver hybrid - A cost effective future power alternative [AIAA PAPER 80-0841] p0357 A80-32856

Economic implications of a low cost heliostat design p0375 A80-33613

The cost and value of washing heliostats p0375 A80-33616

DELSOL - A code for central receiver performance and optimization calculations p0376 A80-33626

The cost/performance of large central receiver power systems as a function of heliostat design parameters p0376 A80-33627

An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant p0377 A80-33628

A numerical approach to the flux density integral for reflected sunlight p0377 A80-33632

Unfolding concentrator slope errors from reflected-beam measurements p0377 A80-33636

Helios and reconcentrators --- computer code for heliostat performance predictions p0378 A80-33637

Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility p0378 A80-33642

Collector deflections due to wind gusts and control scheme design p0378 A80-33643

Effects of outdoor exposure on the solar reflectance properties of silvered glass mirrors p0379 A80-33647

Users group for central receiver testing --- of heliostats p0380 A80-33654

Geometric and kinematic characteristics of solar-tower heliostats p0391 A80-33857

Calculation principles for heliostat fields of solar power plants p0401 A80-36825

An array of directable mirrors as a photovoltaic solar concentrator p0402 A80-37297

Heliostat design cost/performance tradeoffs [SAND-79-8248] p0428 N80-23806

Solarization of heliostat glasses [SAND-79-8754] p0445 N80-25858

Solar central receiver prototype heliostat. Volume 3: Cost estimates [SAN-1604-3] p0451 N80-26801

HETEROGENEITY
Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources [COO-4776-2] p0355 N80-26958

HETEROJUNCTION DEVICES
General formulation of the current-voltage characteristic of a p-n heterojunction solar cell p0390 A80-33782
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency p0394 A80-35339
Optimization of oxide-semiconductor/base-semiconductor solar cells p0394 A80-35341
Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide p0395 A80-35350
'Band readjustment' effect with applications to solar cells p0397 A80-35367
Barrier height enhancement in heterojunction Schottky-barrier solar cells p0397 A80-35368
The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements --- thin film solar cell p0398 A80-35486
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells p0399 A80-36588
Thin-film and ceramic solar converters based on cadmium sulfide and selenide p0401 A80-36824
Screen printed thin film CdS/CdTe solar cell p0401 A80-36898
On direct conversion of sunlight to electricity p0409 A80-37994
Single-crystal solar cell heterojunctions involving N-cadmium sulfide p0413 A80-39061
A computer analysis of heteroface solar cells with ultrathin window layer p0422 A80-43589
Solor Cell Heterojunctions Involving N-cadmium sulfide and certain P-type semiconductor single crystals p0426 N80-23766
Heterojunction solar cells [SERI/TP-32-134] p0457 N80-27822

HIGH CURRENT
Use of transformers in producing high-power output from homopolar generators p0516 A80-37825

HIGH POWER LASERS
Three-dimensional reconstruction of the X-ray emission in laser imploded targets p0510 A80-34749
Beam simultaneity in multi-terawatt CO2 laser fusion systems p0517 A80-38483
Helios target positioning system p0518 A80-38485

HIGH PRESSURE
Pressure-change underground gasification: Theoretical and experimental investigations of gasification [BMFT-FB-T-79-05] p0481 N80-22525
Aqueous solutions database to high temperatures and pressures: NaCl solutions [LBL-9621] p0482 N80-23399

HIGH SPEED
Crosswind kite power --- for large-scale wind power production p0523 A80-43139

HIGH TEMPERATURE
Low cost high temperature adhesive bonded solar collectors p0361 A80-33464
Analysis of experimental test results on a high temperature receiver model --- for solar thermal electric power plant p0363 A80-33486
Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors --- Compound Parabolic Concentrator p0364 A80-33493
Thermodynamic trade-offs for gas cooled high temperature solar tower receivers p0379 A80-33648
High temperature heat pipes for waste heat recovery [AIAA PAPER 80-1505] p0329 A80-41469
High temperature combustor designed for operation with coal derived low Btu gaseous fuels [ASME PAPER 80-GT-187] p0478 A80-42289
Development of a high temperature turbine for operation on coal-derived fuel [ASME PAPER 80-GT-188] p0478 A80-42290
Medium and high temperature solar processes --- Book p0421 A80-43473
Aqueous solutions database to high temperatures and pressures: NaCl solutions [LBL-9621] p0482 N80-23399
New applications of high-temperature solar energy for the production of transportable fuels and chemicals and for energy storage [ATR-78(7691-04)-1] p0438 N80-24829
High temperature fuel cell research and development [SAN-1485-2] p0534 N80-25848
Semiconductors for high temperature active devices: Silcon, GaA lc]s, and GaP [SAND-80-0379C] p0499 N80-26608

HIGH TEMPERATURE AIR
Operation of an industrial solar drying system p0372 A80-33590
Effectiveness of packed-bed solar air heaters p0407 A80-37972

HIGH TEMPERATURE ENVIRONMENTS
Cascade solar-cell design for high-temperature operation p0397 A80-35365
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors p0399 A80-35500
Flat plate boosters for elevating temperatures p0404 A80-37947
Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors p0415 A80-40718

HIGH TEMPERATURE GASES
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems --- Closed-Cycle Gas Turbine [ASME PAPER 80-GT-155] p0477 A80-42267
Industrial AFB-fired gas turbine systems with topping combustors --- Atmospheric Fluidized Bed [ASME PAPER 80-GT-163] p0332 A80-42273
Summary of the research and development effort on open-cycle coal-fired gas turbines [ORNL/TM-6253] p0528 N80-23821

HIGH TEMPERATURE NUCLEAR REACTORS
Hydrogen production from water by use of nuclear energy p0462 A80-37346

HIGH TEMPERATURE RESEARCH
High-temperature electronics: An overview [SAND-79-2319A] p0481 N80-22614
High-temperature fuel cell research and development [SAN-1485-T1] p0534 N80-25846

HIGH TEMPERATURE TESTS
Abusive testing of large Li/SOCl2 cells p0549 A80-40603
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2 [FE-1806-48] p0337 N80-23662

HIGH VACUUM
Design and operational characteristics of the cryopump high-vacuum system for the 25000-1 target chamber of the Helios Laser Facility p0515 A80-37182

HIGH VOLTAGES
High-voltage multijunction solar-energy photoelectric converter p0401 A80-36830
TRIDENT - A megavolt pulse generator using inductive energy storage p0548 A80-37857
Radiation damage in high voltage silicon solar cells [NASA-TM-81478] p0426 N80-23180

HISTORIES
A review of the historical developments of the use of passive solar systems p0408 A80-37981

HOMOPOLAR GENERATORS
Use of transformers in producing high-power output from homopolar generators p0516 A80-37825

HONEYCOMB STRUCTURES
Measurements on a flat thermal solar energy collector with a cellular structure after Francia p0404 A80-37946
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366

HOSES
Solar energy systems: Standards for rubber hose [PB80-129828] p0430 N80-23868

HOT CORROSION
Improved PFB operations: 400-hour turbine test results --- coal combustion products and hot corrosion in gas turbines [NASA-TM-81511] p0493 N80-26426

HOUSINGS
Solar collectors --- search for materials suitable for glazing, housing, coating, and etching [ALO-5359-T1] p0437 N80-24821

HUMIDITY
Energy from humid air [DSE-2553-79/1] p0531 N80-24861

HYBRID PROPULSION
Advanced propulsion system for hybrid vehicles [NASA-CR-159771] p0561 N80-26212

HYBRID STRUCTURES
State-of-the-art assessment of hybrid heat pumps [EPRI-EM-1261] p0352 N80-26627

HYDRATES
Investigation of heat storages with salt hydrate as storage medium based on the extra water principle [EUR-6646-PT-2] p0564 N80-27818

HYDRATION
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal p0471 A80-37617

HYDRAULIC EQUIPMENT
A solar-powered irrigation system for Bakel, Senegal p0382 A80-33678
A free cylinder Stirling engine solar powered water pump p0382 A80-33679
Operational experience of a 3.0 kW solar powered water pump p0382 A80-33680

HYDRAULIC JETS
Drilling horizontal holes in coal bed from the surface with water jets [SAND-80-0057C] p0492 N80-25766

HYDRIDES
Hydrogen storage materials research and development work at Brookhaven National Laboratory [BNL-26813] p0463 N80-23478
HYCSOS: Hydride conversion and storage system sensitivity analysis [ANL/EES-TM-63] p0564 N80-27523

HYDROCARBON COMBUSTION
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results [ASME PAPER 80-GT-60] p0331 A80-42190

HYDROCARBON FUEL PRODUCTION
Liquid fuel production from biomass p0465 A80-33412
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology p0467 A80-34531
How clean gas is made from coal p0471 A80-36314
Use of solar energy to reduce carbon dioxide p0403 A80-37302
Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water p0326 A80-37332
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944 p0471 A80-37678
The zinc chloride process for the hydrocracking of coal p0474 A80-40757
Economic and market potential for SRC-II products --- Solvent Refined Coal p0474 A80-40758
Pyrolytic gasification of renewable biomass resources p0478 A80-42466
Energy from in situ processing of Antrim oil shade [FE-2346-49] p0483 N80-23808
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1 [CONF-791160-VOL-1] p0501 N80-27494
Overview of R&D status on COM technology in Japan p0501 N80-27495
Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel p0501 N80-27497
Hydrolyzed wood slurry flow modeling --- hydrocarbon fuel production [LBL-10090] p0504 N80-27703

HYDROCARBON FUELS
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests [ASME PAPER 80-GT-68] p0476 A80-42198
Coal derived liquids hydrotreatment-catalysts deactivation study p0479 N80-22421
Pressure-change underground gasification: Theoretical and experimental investigations of gasification [BMFT-FB-T-79-05] p0481 N80-22525
Research on diamantane and other high density hydrocarbon fuels [AD-A080749] p0482 N80-23474
Fuel from farms: A guide to small-scale ethanol production [SERI/SP-451-519] p0485 N80-24478
Coal derived fuel gases for molten carbonate fuel cells [METC-8085-T2] p0487 N80-24498
Liquid fuels production from biomass, no. 7 [COO-4388-7] p0490 N80-25462
The CFOS (Carbonaceous Fuel-in-Oil Suspensoids) fuels p0497 N80-26486
Investigation of fuels containing coal-oil-water emulsions [FE-2689-5] p0497 N80-26524
Fundamental characterization of alternative fuel effects in continuous combustion systems p0500 N80-27382

HYDROCARBONS
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A [NASA-CR-135119] p0355 N80-27361

HYDROCRACKING
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology p0467 A80-34531
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents p0472 A80-39420
The zinc chloride process for the hydrocracking of coal p0474 A80-40757
Economic and market potential for SRC-II products --- Solvent Refined Coal p0474 A80-40758
Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions p0478 A80-42800
Upgrading of coal liquids: Upgrading distillates from coal liquefaction [FE-2566-26] p0480 N80-22518
Catalytic hydrogenation for coal-derived liquids [FE-2034-16] p0486 N80-24488
Autocatalytic coal liquefaction process [NASA-CASE-NPO-14876-1] p0493 N80-26460
Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research [FE-2202-51] p0498 N80-26534

HYDRODYNAMIC EQUATIONS
On the validity of a hydrodynamic description of laser-driven fusion p0515 A80-36726
HYDROELECTRIC POWER STATIONS
A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems p0546 A80-35382
Underground Pumped Hydroelectric Storage (UPHS) [ANL/EES-TM-60] p0554 N80-22841
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants --- cost analysis [CONF-791204-11] p0557 N80-24628
Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites [CONF-791056-2] p0345 N80-24885
Undeveloped hydropower as a potential energy source in Idaho [PB80-157399] p0504 N80-27824
HYDROGEN
Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions p0478 A80-42800
Nonisothermal experiments on the hydrodesulphurization of coal [NRC/CNR-TT-1963] p0484 N80-24462
Evaluation of the Texaco synthesis gas generation process for the production of hydrogen from SRC-2 residue [ORNL/SUB-7240/6] p0463 N80-25464
High temperature hydrogen cycles for solar heat sources [LA-UR-80-184] p0443 N80-25817
Advanced development of a short residence-time hydrogasifier [FE-3125-8] p0500 N80-26832
HYDROGEN CHLORIDES
Deposition and characterization of gallium arsenide films for solar cells applications p0394 A80-35338
HYDROGEN ENGINES
Liquid hydrogen engines [illegible]461 A80-37343
HYDROGEN FUELS
Application of magnesium rich rare-earth alloys to hydrogen storage p0459 A80-35192
Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, and Supplement p0460 A80-37330
Hydrogen from fossil fuels p0460 A80-37333
Safe handling of hydrogen in large quantities p0460 A80-37337
Hydrogen as an alternative fuel - An intermediate report on research and development funding by the Federal Ministry for Research and Technology p0460 A80-37338
Surface transportation systems using hydrogen energy p0461 A80-37339
Characteristics of liquid hydrogen-fueled aircraft p0461 A80-37340
Safety of liquid hydrogen in air transportation p0461 A80-37341
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen p0461 A80-37342
Liquid hydrogen engines p0461 A80-37343
Design concept for LH2 airport facilities p0461 A80-37344
A proposed liquid hydrogen development program for aircraft p0461 A80-37345
Analysis and design of insulation systems for LH2-fueled aircraft p0462 A80-37347
Hydrogen fueled high bypass turbofans in subsonic aircraft p0462 A80-37348
Electrolytic hydrogen production and its potential utilization for ship propulsion p0462 A80-37987
The significance of hydrogen as a future environmentally sound secondary energy source in energy and propulsion technology p0462 A80-40970
Moessbauer surface studies on TiFe hydrogen storage material p0463 A80-43772
Fixed site hydrogen storage. 1: Applications impact [SAND-79-8647] p0463 N80-23797
HYDROGEN OXYGEN FUEL CELLS
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance p0522 A80-42295
HYDROGEN PRODUCTION
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae p0459 A80-33406
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy p0459 A80-33407
Light-dependent hydrogen production by C. reinhardi --- anaerobically adapted green algae p0459 A80-33410
Hydrogen production using fusion energy and thermochemical cycles p0459 A80-35189
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents p0459 A80-35190
Comment on 'The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation' p0459 A80-35193
Hydrogen in metals - Notable properties and examples for their utilization. I p0460 A80-36653
Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water p0326 A80-37332
Hydrogen from fossil fuels p0460 A80-37333
Description of processes for producing hydrogen by coal gasification p0460 A80-37334
Description of processes for producing hydrogen by advanced electrolysis p0460 A80-37335
Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments p0460 A80-37336
Hydrogen as an alternative fuel - An intermediate report on research and development funding by the Federal Ministry for Research and Technology p0460 A80-37338
Hydrogen production from water by use of nuclear energy p0462 A80-37346
Electrolytic hydrogen production and its potential utilization for ship propulsion p0462 A80-37987
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production p0462 A80-38117
Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell p0462 A80-42459
Photobiological hydrogen production [SERI/TP-33-410] p0463 N80-24477
Bulk hydrogen storage using metal hydrides [BNL-27093] p0463 N80-24483
Utilization of solar thermal sources for thermochemical hydrogen production [LA-UR-80-837] p0464 N80-26538
More on dual purpose solar-electric power plants [SLAC-PUB-2477] p0452 N80-26822
HYDROGEN SULFIDE
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur p0325 A80-35880
Hydrogen sulphide stress corrosion cracking in materials for geothermal power [COO-2602-7] p0491 N80-25707

HYDROGEN-BASED ENERGY
- Hydrogen in metals - Notable properties and examples for their utilization. I p0460 A80-36653
- Surface transportation systems using hydrogen energy p0461 A80-37339
- Electrolytic hydrogen production and its potential utilization for ship propulsion p0462 A80-37987
- The significance of hydrogen as a future environmentally sound secondary energy source in energy and propulsion technology p0462 A80-40970
- Hydrogen storage materials research and development work at Brookhaven National Laboratory [BNL-26813] p0463 N80-23478
- Fixed site hydrogen storage. 1: Applications impact [SAND-79-8647] p0463 N80-23797
- Hydrogen technology: Foreign, change 1 [AD-A083665] p0464 N80-27816

HYDROGENATION
- Chemical nature of coal hydrogenation oils. I - The effect of catalysts p0467 A80-34532
- Chemical nature of coal hydrogenation oils. II - The effect of temperature p0467 A80-34533
- Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques p0398 A80-35467
- Coal liquefaction catalysts p0472 A80-39419
- Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas [FE-2566-25] p0480 N80-22519
- Catalytic hydrogenation for coal-derived liquids [FE-2034-16] p0486 N80-24488
- Catalytic hydrogenation of coal-derived liquids [FE-2034-17] p0489 N80-25398
- Flash hydropyrolysis of coal [BNL-51052] p0490 N80-25468
- Preliminary engineering evaluation of promising coal liquefaction concepts [EPRI-AF-884] p0497 N80-26529
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-58] p0503 N80-27515
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-55] p0503 N80-27516
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-50] p0503 N80-27517
- Coal gasification technology. Citations from the NTIS data base [PB80-808090] p0503 N80-27525

HYDROLYSIS
- Xylose recovery from hemicellulose by selective acid hydrolysis --- biomass energy production p0466 A80-33417
- The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents p0459 A80-35190
- Comment on 'The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation' p0459 A80-35193
- Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water p0326 A80-37332
- Description of processes for producing hydrogen by advanced electrolysis p0460 A80-37335
- Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments p0460 A80-37336

HYGROSCOPICITY
- Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials p0545 A80-33515

I

ICE
- Snow and ice accumulation around solar collector installations [PB80-127053] p0441 N80-24878

IGNITERS
- Direct ignition of pulverized coal with arc heated air p0480 N80-22508

IGNITION LIMITS
- Autoignition and vaporization of no. 3 diesel oil spray under lean conditions [ASME PAPER 80-GT-10] p0475 A80-42151

ILLINOIS
- Illinois state plan: Energy conservation in institutions (institutional buildings grant program) [PB80-148182] p0354 N80-26882

ILLUMINATING
- A review of the historical developments of the use of passive solar systems p0408 A80-37981
- Natural lighting in buildings - A passive solar system p0408 A80-37982
- Street lighting by sunlight p0411 A80-38009

IMAGE PROCESSING
- Remote sensing applications to wind power facility siting p0470 A80-35746
- Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California [UCRL-15108] p0483 N80-23756

IMAGE TRANSDUCERS
- Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors p0390 A80-33805

IMAGING TECHNIQUES
- Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base [NASA-CR-163311] p0492 N80-25770

IMPERIAL VALLEY (CA)
- Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California [UCRL-15108] p0483 N80-23756

IMPURITIES
- Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon p0394 A80-35343
- Effect of titanium, copper and iron on silicon solar cells p0397 A80-35385
- Analysis of the effects of impurities in silicon [NASA-CR-163133] p0427 N80-23772
- Method of mitigating titanium impurities effects in p-type silicon material for solar cells [NASA-CASE-NPO-14635-1] p0431 N80-24741

INCIDENCE
- Incidence angle modifier and average optical efficiency of parabolic trough collectors p0364 A80-33502

INCIDENT RADIATION
- The simulation of partially and fully tracking flat plate collectors in northern latitudes p0390 A80-33763
- Solar energy at ground surface p0403 A80-37940
- Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation p0405 A80-37958

INCINERATORS
- Waste incineration and pyrolysis p0475 A80-41174

INCONEL (TRADEMARK)
- Evaluation of materials for EPR power generation p0507 A80-33058

INDEXES (DOCUMENTATION)
- Energy information data base corporate author entries, supplement 3 [DOE/TIC-4585-R1-SUPPL-3] p0567 N80-22846

INDIUM COMPOUNDS

Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide p0395 A80-35350

Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0416 A80-42140

Properties of sputtered ITO/CdTe solar cells p0426 N80-23767

INDIUM PHOSPHIDES

Characteristics of MOS solar cells built on /n-type/ In P substrates p0394 A80-35336

Development of high efficiency stacked multiple bandgap solar cells [AD-A083092] p0450 N80-26797

INDUCTANCE

Observation of an active photoinductive component in high intensity solar cells p0399 A80-36242

INDUCTION HEATING

Solid fossil-fuel recovery by electrical induction heating in situ - A proposal p0465 A80-33127

INDUCTORS

TRIDENT - A megavolt pulse generator using inductive energy storage p0548 A80-37857

INDUSTRIAL ENERGY

Solar industrial process heat p0357 A80-33184

Industrial solar energy activity in Monaco p0359 A80-33440

Economic analysis of a point focusing concentrating collector system p0363 A80-33484

Suntec/Hexcel parabolic trough --- solar collector design and efficiency for industrial process energy p0363 A80-33485

Low cost, low technology 3.4x concentrating collector for industrial/agricultural applications p0363 A80-33491

The application of shallow solar ponds for industrial process heat - Case histories p0372 A80-33588

Solar energy system with heat pump augmentation for industrial process heat - An update p0372 A80-33589

Operation of an industrial solar drying system p0372 A80-33590

Application of solar energy to food industry - A distillery p0372 A80-33591

A prototype of solar linear concentrators plant installed to supply industrial heat p0372 A80-33592

Solar energy for kilning malt p0372 A80-33593

Solar heat generation for industrial process heating applications p0372 A80-33594

Mini-computer-based energy monitor system p0380 A80-33661

European progress in photovoltaic development p0384 A80-33712

The first solar energy system in West-Germany for industrial utilization p0411 A80-38010

Wood for energy production --- Book p0474 A80-40830

A global and long-range picture of energy developments p0329 A80-40935

Reliability prediction techniques for second generation marine and industrial gas turbines [ASME PAPER 79-GT/ISR-3] p0521 A80-42056

Burning refuse-derived fuel - 'The Woodstock experience' p0479 A80-42928

Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner [FE-2489-45] p0334 N80-22520

Solar process water heat for the IRIS images custom color photo lab [NASA-CR-161414] p0423 N80-22781

Industrial storage applications overview p0551 N80-22795

Applications of thermal energy storage to waste heat recovery in the food processing industry p0552 N80-22796

Collection and dissemination of TES system information for the paper and pulp industry p0552 N80-22797

Application of thermal energy storage to process heat recovery in the aluminum industry p0553 N80-22809

End-use matching of solar energy systems [SERI/TP-34-325] p0335 N80-22848

Solar production of industrial process steam ranging in temperature from 300 deg F to 550 deg F, phase 1. Volume 3: Appendices (cont) [DOE/CS-32199-3] p0428 N80-23812

Solar production of industrial process steam ranging in temperature from 300 degrees F to 550 degrees F, phase 1. Volume 2: Appendices [DOE/CS-32199-2] p0428 N80-23813

Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000 [LA-UR-79-2812] p0338 N80-23820

Application of shallow solar ponds for industrial process heat: Case histories [UCRL-82367] p0429 N80-23822

Process applications for geothermal energy resources [COO-4896-T1] p0340 N80-23854

Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment [DOE/ET/23055-1] p0529 N80-23860

Coal conversion products industrial applications [NASA-CR-161469] p0484 N80-24465

Industrial application experiment series p0435 N80-24785

Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report [NASA-CR-159765] p0342 N80-24797

Feasibility evaluation for solar industrial process heat applications [SERI/TP-333-538] p0438 N80-24824

Solar production of industrial process steam ranging in temperature from 300 F to 550 F (phase 1), volume 1 [DOE/CS/32199-1] p0438 N80-24826

Solar thermal repowering: Utility/industry market potential in the Southwest --- to drive a turbogenerator [ATR-7919] p0439 N80-24836

Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979 [FE-2514-M4] p0490 N80-25471

Cogeneration technology alternatives study. Volume 1: Summary report [NASA-CR-159759] p0347 N80-25792

Cogeneration technology alternatives study. Volume 2: Industrial process characteristics [NASA-CR-159760] p0347 N80-25793

Cogeneration technology alternatives study. Volume 4: Heat Sources, balance of plant and auxiliary systems [NASA-CR-159762] p0347 N80-25794

Cogeneration technology alternatives study. Volume 6: Computer data [NASA-CR-159764] p0347 N80-25795

Design of a system using CPC collectors to collect solar energy and to produce industrial process steam [ANL-79-102] p0443 N80-25814

Environmental development plan: Solar agricultural and industrial process heat [DOE/EDP-0033] p0446 N80-25862

Development of standards for coal-oil mixtures p0494 N80-26465

Oversight: Industrial energy conservation, volume 10 [GPO-53-020] p0352 N80-26786

End-use matching for solar industrial process heat [SERI/TR-34-091] p0454 N80-26849

Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry [DOE/ET-12434/T1] p0537 N80-26853

Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report [SAND-79-7020-VOL-2] p0455 N80-26866
Solar process heat. Citations from the NTIS data base [PB80-807936] p0457 N80-27823

INDUSTRIAL PLANTS
A prototype of solar linear concentrators plant installed to supply industrial heat p0372 A80-33592
A 500 gallons per day hybrid desalination plant using wind/solar energy p0382 A80-33682
Burning refuse-derived fuel - 'The Woodstock experience' p0479 A80-42928
Guidelines for economic evaluation of coal conversion processes [FE-2468-44] p0480 N80-22521
Environmental control technology for the flash hydropyrolysis of coal [BNL-50983] p0345 N80-24884
Solar total energy project Shenandoah [ALO-3985-1-REV-1] p0444 N80-25825
Engineering evaluation of conceptual coal conversion plant using the H-coal liquefaction process [EPRI-AF-1297] p0498 N80-26530
Criteria for a recommended standard: Occupational exposures in coal gasification plants [PB80-164874] p0504 N80-27535

INDUSTRIAL SAFETY
Recommended health and safety guidelines for coal gasification pilot plants [PB80-164890] p0504 N80-27536

INDUSTRIAL WASTES
Biomass energy conversion workshop for industrial executives [SERI/TP-62-299] p0480 N80-22516
Research to identify components of energy-related wastes: A state-of-the-art report --- environment effects, bibliographies [PB80-137961] p0351 N80-25943

INERTIA
Preliminary development of the Band Type Variable Inertia Flywheel (BTVIF) [SAND-79-7089] p0559 N80-25879

INERTIAL FUSION (REACTOR)
First wall protection schemes for inertial confinement fusion reactors p0506 A80-33050
Materials problems with inertial confinement fusion targets p0506 A80-33051
Accelerator module of 'Angara-5' --- for relativistic electron beams in inertial confinement fusion reactor design p0516 A80-37815
The near and long term pulse power requirement for laser driven inertial confinement fusion p0516 A80-37818
Repetitively pulsed electron beam diode lifetime and stability --- for inertial confinement fusion p0516 A80-37820
A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854
The Antares laser power amplifier p0517 A80-37855
NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation p0472 A80-38221
Heavy-ion-driven fusion p0519 A80-39763

INFLATABLE STRUCTURES
A non-tracking inflated cylindrical solar concentrator p0365 A80-33506

INFORMATION DISSEMINATION
Communication strategy to commercialize passive solar energy [SERI/TP-69-412] p0335 N80-22849
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions [SERI/SP-69-071] p0431 N80-24205
Dimensions/NBS, volume 63, no. 11 --- standards in measuring instruments [PB80-141542] p0541 N80-25195
Dimensions/NBS, volume 63, no. 12 --- dissemination of current energy and environmental research [PB80-130701] p0489 N80-25196

INFORMATION RETRIEVAL
Use of reconnaissance level information for environmental assessment [NUREG-CR-0990] p0336 N80-22883
Energy information data base, series titles: Supplement 7, February 1978 - December 1979 [DOE/TIC-4579-R10-SUPPL-7] p0567 N80-25203
Energy information data base, corporate author entries: Supplement 4, June 1978 - December 1979 [DOE/TIC-4585-R1-SUPPL-4] p0567 N80-25204

INFORMATION SYSTEMS
World Energy Data System (WENDS). Volume 6: International agreement profiles [ANL-PMS-79-2-VOL-6] p0528 N80-23790
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions [SERI/SP-69-071] p0431 N80-24205
Low-cost general energy/analytic information system [BNL-26398] p0567 N80-24801

INFORMATION THEORY
Information theory and solar energy collection p0421 A80-43368

INFRARED IMAGERY
Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography p0360 A80-33453

INFRARED INSPECTION
Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects p0397 A80-35370

INFRARED INTERFEROMETERS
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems p0518 A80-38492

INFRARED SPECTRA
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers p0421 A80-43513
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry [FE-2537-10] p0489 N80-25460

INFRARED SPECTROMETERS
Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons [UCRL-83317] p0337 N80-23629

INLET FLOW
Diagnostics and instrumentation requirements for advanced power systems --- coal-fired gas turbine systems [ASME PAPER 80-GT-129] p0477 A80-42243

INORGANIC COATINGS
Stability of plasma-sprayed coatings tested at White Sands Solar Facility p0380 A80-33658
Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors p0391 A80-33859

INORGANIC COMPOUNDS
Methods for analyzing inorganic compounds in particles emitted from stationary sources [PB80-141781] p0350 N80-25936

INORGANIC SULFIDES
A preliminary investigation for an $Al/AlCl_3-NaCl/FeS_2$ secondary cell p0550 A80-42299

INSOLATION
The geometrical vector flux and some new nonimaging concentrators p0364 A80-33503
Solar design by the 'Cosine Hour' method --- collector with surface orientation to optimize insolation p0375 A80-33618

Helios and reconcentrators --- computer code for heliostat performance predictions p0378 A80-33637

Testing of the 10-MWe pilot plant solar central receiver p0380 A80-33656

Monthly average daily insolation on overhang shaded windows p0383 A80-33698

A procedure for determining solar heat gain factors for south-facing vertical surfaces on average days p0384 A80-33699

Solar-cladding - Insulation plus insolation --- applying insulation material to outside building walls p0384 A80-33708

Design and performance of silicon solar cells under concentrated sunlight p0385 A80-33721

A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight p0396 A80-35355

Development and investigation of solar thermoelectric generator using a tubular module p0400 A80-36597

Optimum inclination of linear reflectors p0406 A80-37961

Temperature distributions in the flat-plate collector under actual unsteady insolation p0415 A80-40937

Characteristics of solar radiation --- intensity, spectral and temporal characteristics of energy received at earth surface p0417 A80-42437

Methods for the estimation of solar energy on vertical and inclined surfaces p0417 A80-42438

The estimation of global and sky radiation in Austria p0421 A80-43477

Handbook of solar energy data for south-facing surfaces in the United States. Volume 2: Average hourly and total daily insolation data for 235 localities. Alaska - Montana [NASA-CR-162999] p0423 N80-22784

Status of insolation resource assessment in the Northeast [NESEC-6] p0429 N80-23826

Siting solar thermal power experiments p0435 N80-24783

Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data [SAND-79-7022-VOL-2] p0537 N80-26800

ASHMET: A computer code for estimating insolation incident on tilted surfaces [NASA-TM-78286] p0457 N80-27807

INSULATION

Solar energy systems: Test methods for collector insulations [PB80-132038] p0430 N80-23867

Development of polyimide materials for use in solar energy systems [DOE/CS-35305/T1] p0445 N80-25855

INTAKE SYSTEMS

Summary of the research and development effort on open-cycle coal-fired gas turbines [ORNL/TM-6253] p0528 N80-23821

INTEGRATED ENERGY SYSTEMS

Energy self-sufficiency in monsoonal Australia p0323 A80-33433

Development of a combined solar heating/heat pump system for conditions typical of the Crimea p0391 A80-33863

A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems p0546 A80-35382

Dispersed storage and generation case studies [NASA-CR-162996] p0334 N80-22782

Cell module and fuel conditioner development [NASA-CR-159828] p0527 N80-23768

Cell module and fuel conditioner [NASA-CR-159875] p0528 N80-23769

Solar hot water system installed at Quality Inn, Key West, Florida [NASA-CR-161434] p0427 N80-23774

Off-peak electric auxiliary heat for solar air-heating systems [COO-4516-1] p0429 N80-23827

Performance improvement of a solar heating system utilizing off-peak electric auxilliary [DOE/R5/10140-1] p0429 N80-23852

Series solar heat pump and energy conservation [BNL-27012] p0340 N80-23857

Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment [DOE/ET/23055-1] p0529 N80-23860

Solar heating and hot water system installed at Saint Louis, Missouri [NASA-CR-161420] p0431 N80-24744

Institutional total energy case studies [ANL/CNSV-TM-15] p0342 N80-24804

Heat-pump-centered integrated community energy systems [ANL/CNSV-TM-25] p0344 N80-24860

Heat-pump-centered integrated community energy systems [ANL/CNSV-TM-24] p0344 N80-24863

Solar photovoltaic flat panel applications experiment at the Oklahoma Center for Science and Arts [DOE/ET-23063/1] p0533 N80-25800

Solar project description for Perl-Mack Enterprises' single family residences, Denver, Colorado [SOLAR/1015-79/50] p0444 N80-25821

West Chester Work Center: Solar space heating demonstration project [DOE/CS-4048/2] p0444 N80-25822

Reliability, energy and cost effects of wind integration with conventional electrical generating systems [CONF-791204-32] p0349 N80-25894

Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage [SERI/TP-355-570] p0559 N80-25900

Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin [SOLAR/1057-79/50-PT-1] p0451 N80-26811

Solar project description for Alpha Construction Company's single family residence, Canton, Ohio [SOLAR/1034-79/50] p0451 N80-26812

Solar project description for Stewart-Teele-Mitchell single family residence, Malta, N.Y. [SOLAR/1018-79/50] p0451 N80-26813

Solar project description for Washington Natural Gas Company's single family residence, Kirkland, Washington [SOLAR/1001-79/50] p0451 N80-26814

Solar project description for Zien Mechanical 2 single family residence, Milwaukee, Wisonsin [SOLAR/1057-79/50-PT-2] p0451 N80-26815

Solar heating system installed at Stamford, Connecticut [NASA-CR-161436] p0456 N80-27800

Solar energy system performance evaluation: Seasonal report for Contemporary-Manchester, Manchester, New Hampshire [NASA-CR-161471] p0457 N80-27802

INTERFEROMETERS

Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors p0405 A80-37957

INTERFEROMETRY

Submillimeter interferometry of high-density plasmas p0511 A80-34970

INTERMETALLICS

Hydrogen storage materials research and development work at Brookhaven National Laboratory [BNL-26313] p0463 N80-23478

INTERNAL COMBUSTION ENGINES

Assessment of the potential of hybrid vehicles: Summary [NASA-CR-163059] p0336 N80-23215

Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies --- various hybrid/electric power train configurations and electrical and mechanical drive-line components
[NASA-CR-163227] p0559 N80-26203
Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207
Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208

INTERNATIONAL COOPERATION
International development assistance for renewable technologies - Current programs and institutional requirements
p0323 A80-33672
French solar energy program and its application for international cooperation
p0327 A80-38017

INTERNATIONAL RELATIONS
World Energy Data System (WENDS). Volume 6: International agreement profiles
[ANL-PMS-79-2-VOL-6] p0528 N80-23790
World Energy Data System (WENDS). Volume 1: Country data, AF-CO
[ANL/PMS-79-2-VOL-1] p0347 N80-25827
World Energy Data System (WENDS). Volume 2: Country data, CZ-KS
[ANL/PMS-79-2-VOL-2] p0348 N80-25828
World Energy Data System (WENDS). Volume 2: Country data, LY-PO
[ANL/PMS-79-2-VOL-3] p0348 N80-25829
World energy data system (Wends). Volume 4: Country data, SG-YO
[ANL/PMS-79-2-VOL-4] p0348 N80-25830

INVENTIONS
Paving the way for energy-saving innovations
p0328 A80-39554

INVESTMENTS
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents
p0324 A80-34018

IODINE
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents
p0459 A80-35190

ION ACCELERATORS
Pulsed power for fusion
p0516 A80-37812
Heavy-ion-driven fusion
p0519 A80-39763

ION BEAMS
Heavy-ion-driven fusion
p0519 A80-39763

ION IMPLANTATION
Ion implanted materials as selective absorbers for photothermal solar energy conversion
p0388 A80-33747
A study of the factors which control the efficiency of ion-implanted silicon solar cells
p0396 A80-35360
Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361
Realization of p-n junction solar cells by an ion implantation doping procedure
p0409 A80-37991
Ion-implanted laser annealed silicon solar cells
p0414 A80-40252
Development of pulsed processes for the manufacture of solar cells
[NASA-CR-153188] p0427 N80-23771

ION TEMPERATURE
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648
Breakeven for thermonuclear fusion in the hot-ion mode
p0519 A80-39539

IONIC MOBILITY
Mass transport in molten-salt electrochemical systems
[ORNL/MIT-290] p0527 N80-23400

Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061] p0529 N80-23839

IONIZATION CHAMBERS
Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057

IRON
Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858

IRON ALLOYS
Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators
p0519 A80-39746

IRON COMPOUNDS
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery
p0549 A80-40605
Moessbauer surface studies on TiFe hydrogen storage material
p0463 A80-43772

IRRADIANCE
The measurement of solar irradiance on a tilted surface
p0390 A80-33764

IRRIGATION
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678
A free cylinder Stirling engine solar powered water pump
p0382 A80-33679
Coolidge solar powered irrigation pumping project
p0436 N80-24792
The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona
p0436 N80-24793

ITALY
Utility problems of central tower solar plant in Italy
p0375 A80-33614
Contribution of remote sensing to the geological problems of the country
p0472 A80-38801
Italy: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-20] p0347 N80-25804

J

J-79 ENGINE
Fuel character effects on J79 and F101 engine combustor emissions
[ASME PAPER 80-GT-70] p0476 A80-42200

JAPAN
Organic Rankine cycle engine technology in Japan, a preliminary survey
[DOE/SP/10538-1] p0531 N80-24809
Japan: Estimates of future energy/GNP relationships in energy use
[ORAU/IEA-79-21(M)] p0344 N80-24869
Overview of R&D status on COM technology in Japan
p0501 N80-27495

JET ENGINE FUELS
The impact of fuels on aircraft technology through the year 2000
[AIAA PAPER 80-0896] p0470 A80-35896
The impact of fuels on aircraft technology through the year 2000
[NASA-TM-81492] p0482 N80-23472
The 1H and 13C Fourier transform NMR characterization of jet fuels derived from alternated energy sources
[AD-A084169] p0502 N80-27513

JOINTS (JUNCTIONS)
Study and analysis of a low cost cement bonded flat plate solar collector
[ALO-4122-T1] p0428 N80-23816
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866

JOSEPHSON JUNCTIONS
Excitation of a superconducting strip resonator by a system of Josephson point contacts
p0539 A80-33161

JOURNAL BEARINGS
Application of magnetic suspensions and fluid film bearings to energy storage flywheels [SAND-79-7007] p0556 N80-23824
JUNCTION DIODES
Observation of an active photoinductive component in high intensity solar cells p0399 A80-36242

K

KINEMATIC EQUATIONS
Geometric and kinematic characteristics of solar-tower heliostats p0391 A80-33857
KINEMATICS
Dynamics and control of large horizontal-axis axisymmetric wind turbines p0526 N80-22772
KRYPTON 85
Environmental consequences of atmospheric krypton-85 [COO-4364-2] p0345 N80-24886

L

LAND USE
Methane from landfills [CONF-790999-1] p0485 N80-24472
Methane recovery from urban refuse [CONF-7910105-2] p0486 N80-24485
The United States Geological Survey in Alaska, 1979 programs [CIRC-804-A] p0500 N80-26747
Land use and environmental impacts of decentralized solar energy use [DOE/EV-0067] p0458 N80-27843
LANDAU DAMPING
Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas p0512 A80-35434
LARGE SPACE STRUCTURES
Large space structures - Fantasies and facts [AIAA 80-0674] p0393 A80-34999
Solar energy economics - Orbiting reflectors for world energy p0415 A80-41324
Spectrophotovoltaic orbital power generation [NASA-CR-161451] p0530 N80-24757
Study of multi-kW solar arrays for Earth orbit applications: Midterm performance review [NASA-CR-161467] p0437 N80-24798
LARMOR RADIUS
Derivation of CGL theory with finite Larmor radius corrections --- for magnetized collisionless plasmas p0514 A80-36714
LASER APPLICATIONS
A simple technique for measuring slope or surface error of a concentrator p0378 A80-33644
Pulsed laser techniques for solar cell processing p0396 A80-35362
Laser processing in the preparation of silicon solar cells p0396 A80-35363
Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects p0397 A80-35370
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis [LA-8133-PR] p0486 N80-24487
LASER FUSION
Materials problems with inertial confinement fusion targets p0506 A80-33051
Fabrication of glass sphere laser fusion targets p0506 A80-33052
Low pressure gas filling of laser fusion microspheres p0506 A80-33053
Mass spectrometer determination of argon contents in laser fusion target pellets p0506 A80-33054
Cryogenic laser fusion target material design considerations p0506 A80-33055
Void growth characteristics in laser fusion reactor first walls p0508 A80-33077
Three-dimensional reconstruction of the X-ray emission in laser imploded targets p0510 A80-34749
On the validity of a hydrodynamic description of laser-driven fusion p0515 A80-36726
Design and operational characteristics of the cryopump high-vacuum system for the 25000-l target chamber of the Helios Laser Facility p0515 A80-37182
The near and long term pulse power requirement for laser driven inertial confinement fusion p0516 A80-37818
A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854
The Antares laser power amplifier p0517 A80-37855
NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation p0472 A80-38221
Optical performance of the Gemini carbon dioxide laser fusion system p0517 A80-38482
Beam simultaneity in multi-terawatt CO2 laser fusion systems p0517 A80-38483
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system p0517 A80-38484
Helios target positioning system p0518 A80-38485
Design of Helios beam diagnostics p0518 A80-38486
Antares Power Amplifier optical system p0518 A80-38489
LOTS analysis of optical diffraction in Antares --- Laser Optical Train Simulator code for fusion research p0518 A80-38490
Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems p0518 A80-38491
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems p0518 A80-38492
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system p0518 A80-38493
Absorption of radiation in a magnetoplasma and application to the laser-fusion process p0525 A80-43496
Laser program, volume 3 --- laser fusion [UCRL-50021-78-VOL-3] p0532 N80-25650
LASER HEATING
Laser processing in the preparation of silicon solar cells p0396 A80-35363
Ion-implanted laser annealed silicon solar cells p0414 A80-40252
Absorption of radiation in a magnetoplasma and application to the laser-fusion process p0525 A80-43496
LASER MATERIALS
Solar energy conversion by fluorescent materials for utilization in space communication systems p0409 A80-37992
LASER PLASMA INTERACTIONS
Absorption of radiation in a magnetoplasma and application to the laser-fusion process p0525 A80-43496
LASER TARGETS
Materials problems with inertial confinement fusion targets p0506 A80-33051
Fabrication of glass sphere laser fusion targets p0506 A80-33052
Low pressure gas filling of laser fusion microspheres p0506 A80-33053
Mass spectrometer determination of argon contents in laser fusion target pellets p0506 A80-33054

Cryogenic laser fusion target material design considerations p0506 A80-33055

Three-dimensional reconstruction of the X-ray emission in laser imploded targets p0510 A80-34749

Beam simultaneity in multi-terawatt CO2 laser fusion systems p0517 A80-38483

Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system p0517 A80-38484

Helios target positioning system p0518 A80-38485

Design of Helios beam diagnostics p0518 A80-38486

LASERS

Direct solar pumped laser [LA-7982-MS] p0426 N80-23651

LEAD ACID BATTERIES

An electric vehicle propulsion system's impact on battery performance: An overview [NASA-TM-81515] p0557 N80-24756

Research, development and demonstration of lead-acid batteries for electric vehicle propulsion [ANL/OEPM-78-8] p0558 N80-25801

LEAD COMPOUNDS

Lithium batteries with voltage compatibility with conventional systems p0549 A80-40604

LEAD SULFIDES

Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces p0388 A80-33746

LEAKAGE

The effects of air leaks on solar air heating systems p0359 A80-33448

LENS DESIGN

A unique new Fresnel lens solar concentrator p0364 A80-33499

LIFE CYCLE COSTS

Characteristics of liquid hydrogen-fueled aircraft p0461 A80-37340

New Technology Transport for fuel critical economy p0328 A80-40313

Solar array subsystems study [NASA-CR-159857] p0431 N80-24742

Design tradeoff studies and sensitivity analysis, appendix B [NASA-CR-163036] p0563 N80-27224

LIGHT (VISIBLE RADIATION)

Thermodynamic energy conversion efficiencies p0525 A80-43590

LIGHT AIRCRAFT

Lightweight diesel aircraft engines for general aviation [AIAA PAPER 80-1238] p0328 A80-38983

LIGHT AMPLIFIERS

A large-area cold-cathode grid-controlled electron gun for Antares --- CO2 laser amplifier pumping for inertial fusion project p0516 A80-37854

The Antares laser power amplifier p0517 A80-37855

Antares Power Amplifier optical system p0518 A80-38489

Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems p0518 A80-38491

LIGHT SCATTERING

Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators p0379 A80-33646

LIGHT TRANSMISSION

Development and application of high-power lightpipes --- glass fiber optical waveguides for solar radiation transmission p0401 A80-36833

Transmission of diffuse radiation through CPC and flat plate collector glazings --- Compound Parabolic Collector p0421 A80-43486

LIGHT TRANSPORT AIRCRAFT

Design study: A 186 kW lightweight diesel aircraft engine [NASA-CR-3261] p0334 N80-22326

LIGHTING EQUIPMENT

State options in lighting: Efficiency standards for existing public buildings [DOE/CS-5255/2] p0352 N80-26600

LIGHTNING

Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges [SAND-79-7051-VOL-1] p0449 N80-26611

LIMESTONE

Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal p0471 A80-37617

Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems p0326 A80-37618

Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience p0330 A80-41842

Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology p0331 A80-41849

LINEAR RECEIVERS

Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors p0364 A80-33496

LINEAR SYSTEMS

Evaluation of linear concentrating collectors p0362 A80-33481

LINEARIZATION

An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current p0512 A80-35164

Space-time solutions of the linearized coupled-mode equations p0520 A80-41074

LIQUEFACTION

LBL continuous biomass liquefaction Process Engineering Unit (PEU) [LBL-10092] p0487 N80-24490

LIQUEFIED GASES

The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/ p0471 A80-36983

LIQUEFIED NATURAL GAS

Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons [UCRL-83317] p0337 N80-23629

LLL Data acquisition system for liquefied gaseous fuels program [UCID-18576] p0498 N80-26537

LIQUID COOLING

A method for balancing flow rates in rows of parallel collectors p0362 A80-33476

Experimental study of coolness storage using sodium sulfate decahydrate --- for air conditioning systems p0546 A80-33521

Design and operation of a liquid-desiccant type solar air conditioning system p0366 A80-33527

A simplified solar cooling design method for closed-loop liquid systems p0376 A80-33620

Cold water aquifer storage --- air conditioning p0554 N80-22827

LIQUID FLOW

Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems p0381 A80-33664

Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump p0509 A80-34312

A black liquid flat plate collector for economical applications p0404 A80-37948

LIQUID HYDROGEN
Safe handling of hydrogen in large quantities p0460 A80-37337
Characteristics of liquid hydrogen-fueled aircraft p0461 A80-37340
Safety of liquid hydrogen in air transportation p0461 A80-37341
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen p0461 A80-37342
Liquid hydrogen engines p0461 A80-37343
Design concept for LH2 airport facilities p0461 A80-37344
A proposed liquid hydrogen development program for aircraft p0461 A80-37345
Analysis and design of insulation systems for LH2-fueled aircraft p0462 A80-37347
Hydrogen liquefaction, storage and transfer on an airport site p0462 A80-37349
Liquid hydrogen-fueled vehicle project [LA-UR-79-2883] p0463 N80-25467

LIQUID INJECTION
Control of gradient zone boundaries --- in solar ponds p0371 A80-33584

LIQUID METALS
MHD generator of the conduction type with reciprocal motion of the composite working element p0509 A80-34313
Open-cycle coal-fired liquid-metal MHD [CONF-790640-7] p0529 N80-23844

LIQUID SODIUM
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 1: Executive summary [SAN-1483-1/1] p0446 N80-25875
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 2, book 1: Commercial plant conceptual design [SAN-1483-1/2] p0447 N80-25876

LITHIUM
Lithium batteries with voltage compatibility with conventional systems p0549 A80-40604
Mass transport in molten-salt electrochemical systems [ORNL/MIT-290] p0527 N80-23400

LITHIUM CHLORIDES
Exposure: A newsletter for ocean technologists, volume 6, no. 1 [AD-A083941] p0562 N80-26865

LITHIUM COMPOUNDS
Solar powered environment control - Criteria and realization p0366 A80-33534

LITHIUM SULFUR BATTERIES
The lithium-sulfur dioxide primary battery - Its characteristics, performance and applications p0549 A80-40601
Primary Li/SOCl2 cells. I - Optimization of D cells with respect to energy density, storability and safety p0549 A80-40602
Abusive testing of large Li/SOCl2 cells p0549 A80-40603
Lithium-metal sulfide and sodium-sulfur batteries for solar energy storage [CONF-781228-3] p0428 N80-22843
Exposure: A newsletter for ocean technologists, volume 6, no. 1 [AD-A083941] p0562 N80-26865

LITHOLOGY
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia [E80-10142] p0499 N80-26729

LOAD DISTRIBUTION (FORCES)
Load excitation at the superconducting cable test facility [BNL-26641] p0540 N80-22608

LOCOMOTIVES
Traction studies of northeast corridor rail passenger service: Executive summary [NASA-CR-162997] p0336 N80-23214

LOGIC CIRCUITS
A pin programmable controller for research systems --- of solar heating and cooling p0380 A80-33662

LONG TERM EFFECTS
Results of long term natural weathering effects on solar collectors under stagnation conditions p0362 A80-33475
Processes degrading the electrophysical characteristics of photoconverters in long-term operation p0399 A80-36587

LOUISIANA
Environmental assessment: Geothermal energy geopressure subprogram. DOE Sweet Lake no. 1, Cameron Parish, Louisiana [DOE/EA-0065] p0493 N80-25929

LOW COST
The unitary solar collector - A new approach to low-cost, flat-plate systems p0361 A80-33463
Low cost high temperature adhesive bonded solar collectors p0361 A80-33464
Design of an inexpensive solar simulator p0362 A80-33478
Low cost vee-trough evacuated tube collector module p0363 A80-33492
Economic implications of a low cost heliostat design p0375 A80-33613
Mini-computer-based energy monitor system p0380 A80-33661
Silicon material task - Low cost solar array project /JPL/DOE/ p0393 A80-34780
Low cost spiral shaped solar collector p0406 A80-37960
Properties of low cost, high volume glasses --- for solar energy applications p0414 A80-39937
Ion-implanted laser annealed silicon solar cells p0414 A80-40252

LOW PRESSURE
Low pressure gas filling of laser fusion microspheres p0506 A80-33053

LOW SPEED
Preliminary wind tunnel tests on the pedal wind turbine p0523 A80-43141

LOW TEMPERATURE
Low temperature thermal-energy storage [ANL/CES/TE-79-3] p0554 N80-22842

LOW TEMPERATURE ENVIRONMENTS
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs [CONF-800133-1] p0536 N80-26628

LOW TEMPERATURE TESTS
Measurements on insulating materials at cryogenic temperatures [PB80-134596] p0541 N80-24507

LUMINESCENCE
Development of materials for a luminescent solar collector [COO-4996-1] p0443 N80-25812

LUMINOUS INTENSITY
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators p0386 A80-33726

M

MAGMA
Magma energy: A feasible alternative? [SAND-80-0309C] p0492 N80-25859

MAGNESIUM ALLOYS
Application of magnesium rich rare-earth alloys to hydrogen storage p0459 A80-35192

MAGNETIC EFFECTS

Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/ --- poloidal magnetic field variation effects in tokamak p0521 A80-41748

MAGNETIC FIELD CONFIGURATIONS

An assessment of magnetic fusion research [AIAA PAPER 80-0928] p0505 A80-32893

A compressed magnetic field generator systems model p0548 A80-37875

Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/ --- poloidal magnetic field variation effects in tokamak p0521 A80-41748

MAGNETIC FIELDS

The characteristics of a nonhomogeneous helical MHD dynamo --- for magnetic field study p0510 A80-34614

Derivation of CGL theory with finite Larmor radius corrections --- for magnetized collisionless plasmas p0514 A80-36714

MAGNETIC MIRRORS

Mirror fusion reactor design p0505 A80-33043

MAGNETIC STORAGE

Superconducting magnetic energy storage for electric utilities and fusion systems [LA-UR-78-1213] p0554 N80-22838

MAGNETIC SUSPENSION

Magnetic bearing support study for a 10 kW-hr energy storage flywheel [SAND-79-7025] p0555 N80-23661

Application of magnetic suspensions and fluid film bearings to energy storage flywheels [SAND-79-7007] p0556 N80-23824

MAGNETIC TRANSDUCERS

The MHD /magnetohydrodynamic/ two-axis Rate Sensor [AIAA PAPER 80-1890] p0523 A80-43325

MAGNETOHYDRODYNAMIC FLOW

Diagnostic techniques for combustion MHD systems [AIAA PAPER 80-0926] p0505 A80-32892

Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump p0509 A80-34312

A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes p0510 A80-34620

Hall effects on MHD Couette flow in a rotating system p0523 A80-43226

Theory of electrode arcs in a flow of combustion products containing an additive p0524 A80-43398

MAGNETOHYDRODYNAMIC GENERATORS

Longitudinal baffling in Faraday generators p0505 A80-32743

Diagnostic techniques for combustion MHD systems [AIAA PAPER 80-0926] p0505 A80-32892

Calculation of a low-frequency electromagnetic field due to MHD machines inside a common shielding shell p0509 A80-34311

Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump p0509 A80-34312

MHD generator of the conduction type with reciprocal motion of the composite working element p0509 A80-34313

Determination of the geometry of the transition region of a series MHD generator p0509 A80-34315

The characteristics of a nonhomogeneous helical MHD dynamo --- for magnetic field study p0510 A80-34614

The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator p0510 A80-34619

A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes p0510 A80-34620

Current constriction near the anode in a combustion products plasma --- in MHD generators p0510 A80-34865

Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator p0510 A80-34873

Measurement of energy emitted by the working medium of an MHD generator p0510 A80-34874

Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel p0511 A80-34875

Electrical nonuniformities in diagonally connected generators --- in magnetohydrodynamics p0511 A80-34989

High electrical conductivity and high Hall coefficient in MHD generator p0511 A80-34990

MHD direct channel from heat to electricity p0512 A80-35403

Effect of current constriction at electrodes on MHD generator characteristics p0513 A80-35685

The helical hydromagnetic dynamo p0514 A80-36430

Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators p0519 A80-39746

Safety analysis of an advanced energy system facility p0520 A80-40337

Studies of MHD generator performance with oxygen enriched coal combustion [AIAA PAPER 80-1343] p0521 A80-41570

Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD [AIAA PAPER 80-1344] p0330 A80-41571

High-power MHD system combustor development testing p0523 A80-43138

Hall effects on MHD Couette flow in a rotating system p0523 A80-43226

The MHD /magnetohydrodynamic/ two-axis Rate Sensor [AIAA PAPER 80-1890] p0523 A80-43325

An arc discharge model on electrodes of an MHD generator p0524 A80-43397

Theory of electrode arcs in a flow of combustion products containing an additive p0524 A80-43398

An alternate approach to the application of MHD power generation technology in a utility environment [IEEE PAPER F 79 651-1] p0525 A80-43502

The optimization air separation plants for combined cycle MHD-power plant applications [NASA-TM-81510] p0528 N80-23778

Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC) [NASA-TM-81497] p0337 N80-23780

Open-cycle coal-fired liquid-metal MHD [CONF-790640-7] p0529 N80-23844

Power take-off analysis for diagonally connected MHD channels [CONF-800104-6] p0535 N80-26167

MHD high performance demonstration experiment [DOE/ET-2895/5] p0535 N80-26172

Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis [NASA-CR-159634] p0536 N80-26779

Open-cycle MHD systems analysis [EPRI-AP-1230] p0538 N80-27192

MAGNETOHYDRODYNAMIC STABILITY

Numerical studies of new stellarator concepts p0511 A80-34978

On the low frequency drift wave and the pseudoclassical diffusion --- of plasmas in tokamak p0512 A80-35379

RF feedback stabilization of a thin line cusp magnetoplasma sheath p0514 A80-36048

Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections p0514 A80-36397

Plasma physics for nuclear fusion --- Book
p0474 A80-40826
Space-time solutions of the linearized coupled-mode equations
p0520 A80-41074

MAGNETOHYDRODYNAMIC TURBULENCE
Diagnostic techniques for combustion MHD systems
[AIAA PAPER 80-0926] p0505 A80-32892

MAGNETOHYDRODYNAMICS
Environmental development plan: Magnetohydrodynamics
[DOE/EDP-0045] p0335 N80-22876
Open-cycle coal-fired liquid-metal MHD
[CONF-790640-7] p0529 N80-23844
Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress
[PB80-143175] p0535 N80-25910

MAGNETRONS
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system
p0388 A80-33742
Microwave beamed power technology improvement --- magnetrons and slotted waveguide arrays
[NASA-CR-163043] p0542 N80-26785

MAINTAINABILITY
Application of reliability, maintainability, and availability engineering to solar heating and cooling systems
p0414 A80-40334
Modified aerospace R&QA method for wind turbines
p0519 A80-40335
RMA engineering applications to Fossil Energy projects --- Reliability and Maintainability
p0473 A80-40336

MAJORITY CARRIERS
A comparison of majority- and minority-carrier silicon MIS solar cells
p0395 A80-35349

MAN ENVIRONMENT INTERACTIONS
Synoptic-scale distribution of man-made aerosols --- fossil fuel combustion products
p0354 N80-26942

MANAGEMENT PLANNING
Environmental development plan for biomass energy systems
[DOE/EDP-0032] p0340 N80-23876
Environmental development plan: Geothermal energy systems
[DOE/EDP-0036] p0340 N80-23877
Georgetown University Generic Integrated Community Energy System GU ICES demonstration project. Modified work management plan
[COO-4488-2] p0343 N80-24838
Thermal energy storage
[NASA-TM-81514] p0558 N80-25779

MANIFOLDS
Comparison of indoor-outdoor thermal performance for the Sunpak evacuated tube liquid collector
[NASA-CR-161421] p0432 N80-24745
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866

MANUFACTURING
Manufacturing methods of a composite cell case for a Ni-Cd battery
p0546 A80-34777
Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000
[LA-UR-79-2812] p0338 N80-23820

MARINE PROPULSION
Reliability prediction techniques for second generation marine and industrial gas turbines
[ASME PAPER 79-GT/ISR-3] p0521 A80-42056
Compact closed cycle Brayton system feasibility study, volume 1 --- marine propulsion
[AD-A081379] p0532 N80-25666

MARINE RESOURCES
Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming
[PB80-157662] p0504 N80-27795

MARKET RESEARCH
Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612
Consumer experience with electric vehicles
p0326 A80-37351
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products
[ASME PAPER 80-ENAS-9] p0479 A80-43186
Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780
Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786
Electric and hybrid vehicles in the urban future --- market research
[CONF-791009-23] p0341 N80-24217
Coal conversion products industrial applications
[NASA-CR-161469] p0484 N80-24465
The JPL isolated application experiment series
p0435 N80-24784
SPS market analysis --- small solar thermal power systems
p0435 N80-24786
Military markets for solar thermal electric power systems
p0435 N80-24787
Solar thermal repowering: Utility/industry market potential in the Southwest --- to drive a turbogenerator
[MTR-7919] p0439 N80-24836
Solar thermal small power systems study. Phase 2: Study results
[DOE/ET/20516-2] p0440 N80-24855
Market penetration of new energy systems estimated by econometric and stochastic methodology
[CONF-790852-2] p0346 N80-25207
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218] p0533 N80-25785
SAGE, Solar Assisted Gas Energy
[PB80-144363] p0447 N80-25906
Near hybrid passenger vehicle development program, phase 1. Appendices A and B. Mission analysis and performance specification studies report, volume 1
[NASA-CR-163330] p0559 N80-26201
The world oil market in the years ahead: A research paper
[ER-79-10327U] p0352 N80-26749
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9
[NASA-CR-163267] p0352 N80-26772
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859
Community impediments to implementation of solar energy
[DOE/EV-0059] p0457 N80-27821

MARKETING
Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025
p0389 A80-33759
Communication strategy to commercialize passive solar energy
[SERI/TP-69-412] p0335 N80-22849

MARKOV CHAINS
Markov chains to solar energy storage calculations
p0390 A80-33766

MARTENSITIC STAINLESS STEELS
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059

MASS FLOW RATE
Mass flow considerations for solar air heating systems
p0369 A80-33558

MASS SPECTRA
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460

MASS SPECTROMETERS
Mass spectrometer determination of argon contents in laser fusion target pellets
p0506 A80-33054

MASS TRANSFER
Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system
p0358 A80-33426

MATERIAL ABSORPTION
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628

MATERIALS HANDLING
Safe handling of hydrogen in large quantities
p0460 A80-37337

MATERIALS RECOVERY
Xylose recovery from hemicellulose by selective acid hydrolysis --- biomass energy production
p0466 A80-33417
An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing
p0473 A80-39630
Solid waste conversion to energy: Current European and U.S. practice --- Book
p0474 A80-40832
Packaging materials - Industrial possibilities for resource recovery
p0475 A80-41171
Recovery and reuse - Mechanical processing
p0475 A80-41172
Energy recovery in the sludge treatment process at Toronto's main treatment plant
p0333 A80-42927
The region of Peel Resource Recovery Plant - Resource recovery and energy from waste in partnership
p0479 A80-42929
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products
[ASME PAPER 80-ENAS-9] p0479 A80-43186

MATERIALS SCIENCE
The use of solar furnaces in materials research
p0411 A80-38008

MATERIALS TESTS
Small-scale solar simulator for indoor testing of collector modules and materials
p0362 A80-33477
Plastic solar collectors for 'low energy' applications
p0415 A80-41948

MATHEMATICAL MODELS
Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
p0364 A80-33495
Real time identification of parameters in building models --- optimal control of solar houses
p0368 A80-33556
A numerical approach to the flux density integral for reflected sunlight
p0377 A80-33632
An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current
p0512 A80-35164
Unified model of fundamental limitations on the performance of silicon solar cells
p0396 A80-35356
A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection
p0396 A80-35358
Modified power law equations for vertical wind profiles --- in investigation of windpower plant siting
p0468 A80-35719
A model for the probability structure of atmospheric turbulence --- for wind engineering applications
p0468 A80-35720
The utility and verification of mathematical windfield models for wind energy regional screening and site selection
p0470 A80-35747
High power pulse modeling of coaxial transmission lines
p0539 A80-37828
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes
p0405 A80-37952
Temperature distributions in the flat-plate collector under actual unsteady insolation
p0415 A80-40937
A convolution model of rock bed thermal storage units
p0550 A80-43480
Proposition on energy analysis and economic efficiency
[SERI/RR-51-332] p0338 N80-23805
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847
Developing and upgrading of solar system thermal energy storage simulation models
[BCS-40252] p0430 N80-23858
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837] p0488 N80-24964
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793
Colloctor test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors --- in solar energy applications
[ASSA-PA-10] p0456 N80-26879
A model for the angular distribution of sky radiance
[DOE-CS-32939-9] p0456 N80-26983
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382
Hydrolyzed wood slurry flow modeling --- hydrocarbon fuel production
[LBL-10090] p0504 N80-27703

MATHEMATICAL PROGRAMMING
A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems
p0546 A80-35382

MEASURING INSTRUMENTS
The MHD /magnetohydrodynamic/ two-axis Rate Sensor
[AIAA PAPER 80-1890] p0523 A80-43325
Geological assessment probe
[NASA-CASE-NPO-14558-1] p0488 N80-24906
Dimensions/NBS, volume 63, no. 11 --- standards in measuring instruments
[PB80-141542] p0541 N80-25195
Guide for energy compatibility
[[illegible]-24016] p0353 N80-26833

MECHANICAL DEVICES
Review - Materials aspects of wave energy converters
p0517 A80-38283

MECHANICAL DRIVES
The Perbury transmission --- toroidal traction drive for gas turbine engines
[ASME PAPER 80-GT-22] p0331 A80-42159
Design study of flat belt CVT for electric vehicles
[NASA-CR-159822] p0550 N80-22702
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies --- various hybrid/electric power train configurations and electrical and mechanical drive-line components
[NASA-CR-163227] p0559 N80-26203
Studies on questions of design and construction of chain scraper conveyors --- mining operations
[NASA-TM-75810] p0499 N80-26663

MECHANICAL ENGINEERING
Windpower principles - Their application on the small scale --- Book
p0468 A80-34859

MECHANICAL PROPERTIES
Properties of low cost, high volume glasses --- for solar energy applications
p0414 A80-39937

MEMBRANES
Membrane stratified solar ponds
p0371 A80-33582

METAL AIR BATTERIES
  Evaluation of air cathodes for potential use in development of aluminum-air cells
    [UCID-18561] p0535 N80-25893
METAL COATINGS
  What is black chrome
    p0387 A80-33738
  Electrolytic coatings of 'black chromium' type for solar collectors
    p0400 A80-36594
  Characterization of commercial black chrome coatings
    p0402 A80-37190
  Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volumes 1 & 2
    p0525 A80-43503
  Optical and topographical properties of selective black chrome
    p0422 A80-43514
  Metal foils for direct application of absorber coatings on solar collectors
    [LBL-9324-REV] p0428 N80-23810
  Composition profiling of solar coating materials
    [COO-2953-4] p0437 N80-24818
METAL FILMS
  Obtaining film materials with solar furnaces
    p0400 A80-3659
  Metal filmed-semiconductor photoelectrochemical cells
    p0515 A80-3700
  Low-cost mirror concentrator based on double-walled metallized, Tabular films
    [ALO-4227-12] p0428 N80-23811
METAL FOILS
  Metal foils for direct application of absorber coatings on solar collectors
    [LBL-9324-REV] p0428 N80-23810
METAL HYDRIDES
  Application of magnesium rich rare-earth alloys to hydrogen storage
    p0459 A80-35192
  Hydrogen in metals - Notable properties and examples for their utilization. I
    p0460 A80-36653
  Bulk hydrogen storage using metal hydrides
    [BNL-27093] p0463 N80-24483
  Heat transfer enhancement in metal hydride systems
    [BNL-27347] p0561 N80-26539
METAL OXIDE SEMICONDUCTORS
  Characteristics of MOS solar cells built on /n-type/ In P substrates
    p0394 A80-35336
  MOS solar cells
    p0409 A80-37996
  I-V and C-V characteristics of Au/TiO2 Schottky diodes
    p0413 A80-39055
  Studies of thermochemical water-splitting cycles
    [NASA-CR-163029] p0449 N80-26409
METAL OXIDES
  Lithium batteries with voltage compatibility with conventional systems
    p0549 A80-40604
METAL SURFACES
  Stability of plasma-sprayed coatings tested at White Sands Solar Facility
    p0380 A80-33658
  Radiative selectivity and the oxidation of stainless steels
    p0388 A80-33745
METAL VAPORS
  Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
    p0391 A80-33859
METAL-GAS SYSTEMS
  Hydrogen in metals - Notable properties and examples for their utilization. I
    p0460 A80-36653
METALLIC PLASMAS
  MHD generator of the conduction type with reciprocal motion of the composite working element
    p0509 A80-34313
  Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
    p0512 A80-35439
METEOROLOGICAL PARAMETERS
  The layout of solar hot water systems, using statistical meteo- and heat demand data
    p0369 A80-33562
  Retrofit sun room thermal performance based on the typical meteorological year weather data
    p0384 A80-33710
  Dynamic modelling and verification of a flat-plate solar collector
    p0391 A80-33864
  Some meteorological activities in the National Swedish Wind Energy Program
    p0513 A80-35725
  The use of wind data with an operational wind turbine in a research and development environment
    p0513 A80-35730
  Alaskan wind power study - A large area wind characteristics survey
    p0469 A80-35734
  Wind energy potential in the northern part of Germany
    p0469 A80-35735
  Solar energy at ground surface
    p0403 A80-37940
  Comparison between two absorption cooling systems of the 'open' type under different climate conditions
    p0407 A80-37976
  Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data
    [SAND-79-7022-VOL-2] p0537 N80-26800
METEOROLOGY
  NOAA's role in the solar energy program
    [DOE/ET-0110] p0427 N80-23792
METHANE
  Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids
    p0539 A80-33424
  Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system
    p0539 A80-40713
  Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions
    p0478 A80-42800
  Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons
    [UCRL-83317] p0337 N80-23629
  Methane from landfills
    [CONF-790999-1] p0485 N80-24472
  Biological conversion of biomass to methane corn stover studies
    [COO-2917-13] p0485 N80-24474
  Methane recovery from urban refuse
    [CONF-7910105-2] p0486 N80-24485
  Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
    [CONF-791006-2] p0486 N80-24486
  Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies
    [FE-2416-43-VOL-5] p0488 N80-24808
  Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base
    [PB80-805245] p0491 N80-25478
  Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base
    [PB80-805252] p0491 N80-25479
  New electrolytes for direct methane fuel cells
    [DOE/ET-11321/T1] p0534 N80-25891
METHYL ALCOHOLS
  Methanol-based heat pumps for storage of solar thermal energy, phase 1
    [SAND-79-8188] p0555 N80-22845
  Methanol and methyl fuel catalysts --- CuO/ZnO catalysts
    [FE-3177-3] p0482 N80-23482
  Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 3: Environmental
    [FE-2416-43-VOL-3] p0337 N80-23485
  Conceptual design of a coal-to-methanol-to-gasoline commercial plant, volume 1
    [FE-2416-43-VOL-1] p0484 N80-24467

Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis
[FE-2416-43-VOL-2] p0485 N80-24468
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4A: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4A] p0485 N80-24469
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4B: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4B] p0485 N80-24470
Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol
[ORNL-5439] p0485 N80-24471

MICROCOMPUTERS
Short course in microprocessors for solar energy applications Microprocessors, microcomputers and single chip computers
p0419 A80-42460
Short course in microprocessors for solar energy applications - The microcomputer family
p0420 A80-42464

MICROORGANISMS
Microalgal biomass systems for fuels, chemicals, and fertilizers
p0465 A80-33409

MICROPOROSITY
Solar cooling through cycles using microporous solid adsorbents
p0365 A80-33526

MICROPROCESSORS
Microprocessor-controlled digital shunt regulator --- for solar power systems
p0505 A80-32758
The design and utilization of a microprocessor-controlled absolute spectral response system --- for solar cells
p0398 A80-35492
Short course in microprocessors for solar energy applications Microprocessors, microcomputers and single chip computers
p0419 A80-42460
Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement
p0419 A80-42461
Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors
p0419 A80-42462
Short course in microprocessors for solar energy applications - Systems --- heating system and collector control
p0419 A80-42463
Short course in microprocessors for solar energy applications - The microcomputer family
p0420 A80-42464

MICROSTRUCTURE
What is black chrome
p0387 A80-33738
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells
p0399 A80-35493
A field ion microscope study of microstructural features of solar collector coatings
p0422 A80-43528

MICROWAVE ANTENNAS
Increasing power input to a single solar power satellite rectenna by using a pair of satellites
p0539 A80-32942

MICROWAVE INTERFEROMETERS
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649
Submillimeter interferometry of high-density plasmas
p0511 A80-34970

MICROWAVE SENSORS
Development and testing of a microwave system to measure coal layer thickness up to 25 cm
[FE-8881-1] p0483 N80-23757

MICROWAVE TRANSMISSION
Increasing power input to a single so[illegible]power satellite rectenna by using a pair [illegible]llites
p0 [illegible]80-32942
Microwave beamed power technology improvement --- magnetrons and slotted waveguide arrays
[NASA-CR-163043] p0542 N80-26785
Solar power satellite system definition study. vPMVNF 4: sPMJE sUBUPT sps aOBMZTJT, QIBTP 3
[NASA-CR-160745] p0543 N80-27812

MICROWAVES
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422

MILITARY TECHNOLOGY
Abusive testing of large Li/SOCl2 cells
p0549 A80-40603
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

MILLIMETER WAVES
Electron cyclotron heating of tokamaks
p0511 A80-34973

MINERAL DEPOSITS
The United States Geological Survey in Alaska, 1979 programs
[CIRC-804-A] p0500 N80-26747

MINERAL EXPLORATION
Treatment of molybdenite ore with laboratory scale solar furnaces
p0380 A80-33659
Contribution of remote sensing to the geological problems of the country
p0472 A80-38801
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163311] p0492 N80-25770

MINES (EXCAVATIONS)
Economic baselines for current underground coal mining technology
[NASA-CR-163259] p0491 N80-25764

MINICOMPUTERS
Mini-computer-based energy monitor system
p0380 A80-33661

MINING
Coal-shale interface detector
[NASA-CASE-MFS-23720-1] p0483 N80-23711
Development and testing of a microwave system to measure coal layer thickness up to 25 cm
[FE-8881-1] p0483 N80-23757
Forecast of long term coal supply and mining conditions: Model documentation and results
[NASA-CR-163141] p0487 N80-24728
Economic baselines for current underground coal mining technology
[NASA-CR-163259] p0491 N80-25764
Studies on questions of design and construction of chain scraper conveyors --- mining operations
[NASA-TM-75810] p0499 N80-26663

MINNESOTA
Solar heating system installed at Telex Communications, Inc., Blue Earth, Minnesota
[NASA-CR-161437] p0441 N80-25786

MINORITY CARRIERS
A comparison of majority- and minority-carrier silicon MIS solar cells
p0395 A80-35349
High-efficiency silicon minMIS solar cells - Design and experimental results
p0395 A80-35352
Updating the limit efficiency of silicon solar cells
p0395 A80-35354
Required minimum value of barrier height in minority-carrier M.I.S. solar cells
p0414 A80-40474

MIRRORS
Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors
p0364 A80-33496
Specular reflectance properties of solar mirrors as a function of incident angle
p0378 A80-33640
Effects of outdoor exposure on the solar reflectance properties of silvered glass mirrors
p0379 A80-33647
Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors
p0381 A80-33668

Optimization of flat-plate collector-flat mirror systems
p0392 A80-33871

Evaluating the performance of reflecting concentrating systems
p0400 A80-36592

Class of axisymmetric mirrors with uniform flux concentration properties along their axes
p0414 A80-40473

Cusp mirror - Heat pipe evacuated tubular solar thermal collector
p0421 A80-43482

Spectrophotovoltaic orbital power generation
[NASA-CR-161451] p0530 N80-24757

Initial test bed concentrator characterization
p0433 N80-24765

MIS (SEMICONDUCTORS)

MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722

MIS and SIS solar cells
p0395 A80-35348

A comparison of majority- and minority-carrier silicon MIS solar cells
p0395 A80-35349

Detailed modeling of inversion-layer solar cells
p0395 A80-35351

High-efficiency silicon minMIS solar cells - Design and experimental results
p0395 A80-35352

An analytical model of a backwall MIS Schottky barrier solar cell
p0399 A80-36245

Importance of the interface in noncrystalline /poly and amorphous/ conductor-insulator-semiconductor /CIS/ solar cells
p0402 A80-37192

Required minimum value of barrier height in minority-carrier M.I.S. solar cells
p0414 A80-40474

Metal-insulator-semiconductor /MIS/ and semiconductor-insulator-semiconductor /SIS/ solar cells. I - Basic principles. II - Performance characteristics
p0419 A80-42457

An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583

Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon
p0422 A80-43762

Optoelectronic and photovoltaic properties of metal-SiO2-silicon tunneling structures
p0426 N80-23179

MISSOURI

Solar heating and hot water system installed at Saint Louis, Missouri
[NASA-CR-161420] p0431 N80-24744

MIXERS

The production of stable coal-oil mixtures using high intensity mechanical mixing devices
p0495 N80-26470

MIXTURES

The role of coal and oil characteristics in the stability of coal-oil mixtures
p0495 N80-26472

MODULES

Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules
[NASA-CR-163028] p0449 N80-26776

MOLTEN SALT ELECTROLYTES

Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
p0515 A80-37007

Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte
p0547 A80-37009

Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061] p0529 N80-23839

High temperature fuel cell research and development
[SAN-1485-2] p0534 N80-25848

MOLTEN SALTS

High-temperature molten salt thermal energy storage systems for solar applications
p0552 N80-22805

Active heat exchange system development for latent heat thermal energy storage
p0553 N80-22819

Mass transport in molten-salt electrochemical systems
[ORNL/MIT-290] p0527 N80-23400

High-temperature fuel cell research and development
[SAN-1485-T1] p0534 N80-25846

Fuel cell research on second-generation molten-carbonate systems
[SAN-11276-1] p0534 N80-25847

MOLYBDENUM COMPOUNDS

Treatment of molybdenite ore with laboratory scale solar furnaces
p0380 A80-33659

n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852

MONITORS

Mini-computer-based energy monitor system
p0380 A80-33661

MONOCHROMATIC RADIATION

Chromatic dispersion concentrator applied to photovoltaic systems
p0524 A80-43481

MOSSBAUER EFFECT

Moessbauer surface studies on TiFe hydrogen storage material
p0463 A80-43772

MOTOR VEHICLES

The bus systems, passenger transit system of the future
p0324 A80-34067

Vehicle gas producers --- using solid fuels
p0467 A80-34534

The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/
p0471 A80-36983

Whirl and critical speeds of flywheel-container systems aboard vehicles
p0550 A80-41649

Environmental assessment of the utilization of alcohol fuels in highway vehicle applications
[CONF-791009-19] p0336 N80-23477

MUONS

Muon catalysis for energy production by nuclear fusion
p0517 A80-38289

N

N-P-N JUNCTIONS

A low-high-junction solar-cell model developed for use in tandem cell analysis
p0420 A80-43122

N-TYPE SEMICONDUCTORS

n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852

NAPHTHALENE

Upgrading of coal liquids: hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas
[FE-2566-25] p0480 N80-22519

NAPHTHENES

Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived napthas
[FE-2566-25] p0480 N80-22519

NASA PROGRAMS

Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226

The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255

Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-23777

The JPL isolated application experiment series
p0435 N80-24784

NATIONS
World Energy Data System (WENDS). Volume 6: International agreement profiles [ANL-PMS-79-2-VOL-6] p0528 N80-23790
World Energy Data System (WENDS). Volume 1: Country data, AF-CO [ANL/PMS-79-2-VOL-1] p0347 N80-25827
World Energy Data System (WENDS). Volume 2: Country data, CZ-KS [ANL/PMS-79-2-VOL-2] p0348 N80-25828
World Energy Data System (WENDS). Volume 2: Country data, LY-PO [ANL/PMS-79-2-VOL-3] p0348 N80-25829
World energy data system (Wends). Volume 4: Country data, SG-YO [ANL/PMS-79-2-VOL-4] p0348 N80-25830
World Energy Data System (WENDS). Volume 5: Internatinal organization data [ANL/PMS-79-2-VOL-5] p0348 N80-25831

NATURAL GAS
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology p0467 A80-34531
Hydrogen from fossil fuels p0460 A80-37333
Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear p0539 A80-39628
Unconventional gas recovery - enhanced gas recovery [DOE/EDP-0049] p0488 N80-24735
SAGE, Solar Assisted Gas Energy [PB80-153836] p0447 N80-25907

NEODYMIUM LASERS
The near and long term pulse power requirement for laser driven inertial confinement fusion p0516 A80-37818

NETHERLANDS
National solar heating and cooling programme in the Netherlands p0323 A80-33441
Case study of an air to air heat pump p0353 N80-26790
The potential for heat production with solar water heaters in the Netherlands climate p0450 N80-26792

NEUTRAL BEAMS
Review of the ISX-B experimental program p0515 A80-37181
Tests of high-powered direct conversion on beams and plasma [UCRL-82852] p0532 N80-25161

NEUTRAL PARTICLES
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1 p0510 A80-34648

NEVADA
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9 [NASA-CR-163267] p0352 N80-26772

NEW HAMPSHIRE
Solar energy system performance evaluation: Seasonal report for Contemporary-Manchester, Manchester, New Hampshire [NASA-CR-161471] p0457 N80-27802

NEW MEXICO
Solar energy system performance evaluation. Albuquerque Western no. 1, Albuquerque, New Mexico [SOLAR/1011-79/14] p0443 N80-25816
Solar project description. Albuquerque Western-2 multi-dwelling building Albuquerque, New Mexico [SOLAR/1090-79/50] p0444 N80-25819

NEW YORK
Solar project description for Stewart-Teele-Mitchell single family residence, Malta, N.Y. [SOLAR/1018-79/50] p0451 N80-26813

NEW ZEALAND
National solar heating and cooling programme - New Zealand p0323 A80-33442
Wind energy resource assessment of New Zealand p0469 A80-35736
Potential of energy farming for transport fuels in New Zealand [NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices [NZERDC-46-APP] p0489 N80-25457

NICKEL
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy p0388 A80-33748

NICKEL CADMIUM BATTERIES
Manufacturing methods of a composite cell case for a Ni-Cd battery p0546 A80-34777

NICKEL COATINGS
A field ion microscope study of microstructural features of solar collector coatings p0422 A80-43528

NICKEL ZINC BATTERIES
Properties of alternate electrolytes for secondary zinc batteries p0550 A80-42297
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion [ANL/OEPM-78-12] p0556 N80-23861
Research, development, and demonstration of nickel-zinc batteries for electric vehicle propulsion --- electrode development program [ANL/OEPM-78-10] p0556 N80-24215
An electric vehicle propulsion system's impact on battery performance: An overview [NASA-TM-81515] p0557 N80-24756
Pulse charging of lead-acid traction cells [NASA-TM-81513] p0558 N80-25780
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion [ANL/OEPM-78-11] p0558 N80-25802

NITRIC OXIDE
Ammonia high temperature solid electrolyte fuel cell p0523 A80-42298

NITROGEN
Nitrogen fertilizer production by solar energy p0357 A80-33402
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae p0459 A80-33406

NITROGEN OXIDES
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters p0325 A80-35878
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace p0325 A80-35879
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results [ASME PAPER 80-GT-60] p0331 A80-42190
Low NO/x/ heavy fuel combustor program [ASME PAPER 80-GT-69] p0476 A80-42199
Development of a NO/x/-free combustion system p0333 A80-43741

NOISE INTENSITY
An exploratory survey of noise levels associated with a 100 kW wind turbine p0512 A80-35499
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine [NASA-TM-81813] p0532 N80-25104

NOISE MEASUREMENT
An exploratory survey of noise levels associated with a 100kW wind turbine [NASA-TM-81486] p0527 N80-23102

NOISE PREDICTION (AIRCRAFT)
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine [NASA-TM-81813] p0532 N80-25104

NOISE REDUCTION
Characteristics of liquid hydrogen-fueled aircraft p0461 A80-37340

NOISE SPECTRA
An exploratory survey of noise levels associated with a 100 kW wind turbine p0512 A80-35499

- Noise spectral density as a device reliability estimator --- for solar cells p0422 A80-43763

NONAQUEOUS ELECTROLYTES
- n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple p0390 A80-33852
- Glassy electrolyte galvanic cells p0515 A80-37008
- Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery p0549 A80-40605
- Ammonia high temperature solid electrolyte fuel cell p0523 A80-42298

NONDESTRUCTIVE TESTS
- Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films p0526 A80-43758
- Noise spectral density as a device reliability estimator --- for solar cells p0422 A80-43763

NONEQUILIBRIUM PLASMAS
- Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator p0510 A80-34873
- On the validity of a hydrodynamic description of laser-driven fusion p0515 A80-36726

NONLINEAR SYSTEMS
- Study of the nonlinear dynamics of a flat-plate collector p0369 A80-33565

NONLINEARITY
- Non-linear oscillations in wave power machines p0521 A80-41330

NONUNIFORM PLASMAS
- The characteristics of a nonhomogeneous helical MHD dynamo --- for magnetic field study p0510 A80-34614

NORMAL DENSITY FUNCTIONS
- Fluctuations in output from wind turbine clusters p0520 A80-41032

NORTHERN HEMISPHERE
- The simulation of partially and fully tracking flat plate collectors in northern latitudes p0390 A80-33763

NUCLEAR ELECTRIC POWER GENERATION
- Production of a small nuclear battery p0505 A80-32957

NUCLEAR ENERGY
- Hydrogen production from water by use of nuclear energy p0462 A80-37346
- Muon catalysis for energy production by nuclear fusion p0517 A80-38289

NUCLEAR FUELS
- Muon catalysis for energy production by nuclear fusion p0517 A80-38289
- Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling p0521 A80-41745
- High-level waste immobilization program: An overview --- vitrification, drying and calcination [PNL-3094] p0336 N80-23131
- Environmental consequences of atmospheric krypton-85 [COO-4364-2] p0345 N80-24886

NUCLEAR FUSION
- Fusion - An energy source for synthetic fuels [AIAA PAPER 80-0844] p0465 A80-32857
- Hydrogen production using fusion energy and thermochemical cycles p0459 A80-35189
- Muon catalysis for energy production by nuclear fusion p0517 A80-38289
- Superconducting magnetic energy storage for electric utilities and fusion systems [LA-UR-78-1213] p0554 N80-22838
- Tests of high-powered direct conversion on beams and plasma [UCRL-82852] p0532 N80-25161
- Comparative study of energy accounting for heavy ion fusion with various driver accelerators [IPPJ-454] p0538 N80-28195

NUCLEAR HEAT
- Hydrogen production using fusion energy and thermochemical cycles p0459 A80-35189

NUCLEAR MAGNETIC RESONANCE
- The 1H and 13C Fourier transform NMR characterization of jet fuels derived from alternated energy sources [AD-A084169] p0502 N80-27513

NUCLEAR POWER PLANTS
- Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors [CONF-791049-8] p0335 N80-22878
- Use of reconnaissance level information for environmental assessment [NUREG-CR-0990] p0336 N80-22883
- Solar-powered environmental data collection system [DP-1529] p0440 N80-24867

NUCLEAR REACTORS
- Common Cause Failures - A dilemma in perspective p0328 A80-40344

NUCLEATION
- Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources [COO-4776-2] p0355 N80-26958

NUMERICAL ANALYSIS
- A numerical approach to the flux density integral for reflected sunlight p0377 A80-33632
- A computational alignment method for paraboloidal collectors p0378 A80-33641
- Numerical studies of new stellarator concepts p0511 A80-34978
- Sailwing Darrieus rotors p0520 A80-41033
- Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage [PNL-3047] p0556 N80-23823

NUMERICAL CONTROL
- Adaptive control for a multiple tank, multiple temperature solar energy storage system p0369 A80-33557
- Control systems for interfacing solar agricultural dryers with other energy sources p0381 A80-33665
- The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center p0381 A80-33666
- Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement p0419 A80-42461
- Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors p0419 A80-42462
- Short course in microprocessors for solar energy applications - The microcomputer family p0420 A80-42464
- Variable speed constant frequency voltage generator (alternator) [PB80-141286] p0532 N80-24875

NUMERICAL WEATHER FORECASTING
- The potential impact of automated wind guidance on wind energy conversion operations p0469 A80-35731

O

OCEAN THERMAL ENERGY CONVERSION
- Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980 p0511 A80-35161
- NOAA's cold-water pipe at-sea test program --- for OTEC p0511 A80-35162

The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses --- Cold Water Pipe p0511 A80-35163

An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current p0512 A80-35164

Structural analysis of a cold water pipe for a 40MWe spar OTEC platform p0512 A80-35165

At-sea test of a large diameter steel, cold water pipe --- for OTEC p0512 A80-35166

Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms p0512 A80-35167

Performance study of an OTEC system p0521 A80-41949

Ocean thermal energy conversion: A state-of-the-art study [EPRI-ER-1113-SR] p0531 N80-24834

OTEC support services [COO-4931-T11] p0533 N80-25799

Ocean energy systems. Fiscal year 1979 [DOE/ET-0118] p0533 N80-25824

System planning analysis applied to OTEC: initial cases by Florida Power Corporation, task 2 [DOE/ET/29187-2] p0537 N80-26864

OFFSHORE ENERGY SOURCES

Wave energy --- offshore energy conversion technology assessment p0479 A80-43831

Recent progress on ducks --- ocean wave energy receivers p0526 A80-43832

Analysis of exploration, development and production activity on Federal outer Continental Shelf leases [DOE/RA-0044] p0342 N80-24736

Design study and economic assessment of multi-unit offshore wind energy conversion systems applications. Volume 4: Meteorological and oceanographic surveys [WASH-2330-78/4-VOL-4] p0533 N80-25836

Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 2: Apparatus designs and costs [WASH-2330-78/4-VOL-2] p0533 N80-25838

OFFSHORE PLATFORMS

Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980 p0511 A80-35161

NOAA's cold-water pipe at-sea test program --- for OTEC p0511 A80-35162

The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses --- Cold Water Pipe p0511 A80-35163

Structural analysis of a cold water pipe for a 40MWe spar OTEC platform p0512 A80-35165

At-sea test of a large diameter steel, cold water pipe --- for OTEC p0512 A80-35166

Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms p0512 A80-35167

Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 3: System analysis [WASH-2330-78/4-VOL-3] p0533 N80-25837

OHIO

Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment [DOE/ET/23055-1] p0529 N80-23860

Solar energy system performance evaluaton: Seasonal report for Solaron-Akron, Akron, Ohio [NASA-CR-161465] p0442 N80-25791

Solar project description for Alpha Construction Company's single family residence, Canton, Ohio [SOLAR/1034-79/50] p0451 N80-26812

OIL EXPLORATION

Further development of seismic methods: Three-dimensional velocity determinations [BMFT-FB-T-79-19] p0484 N80-23925

Attenuation of seismic waves in rocks and applications in energy exploration p0488 N80-24909

Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base [NASA-CR-163311] p0492 N80-25770

OIL RECOVERY

Solid fossil-fuel recovery by electrical induction heating in situ - A proposal p0465 A80-33127

Stabilizing in situ oil shale retorts with injected grout p0473 A80-39762

Oil shale data book [PB80-125636] p0540 N80-22770

Geokinetics in situ shale oil recovery project [LETC-10787-25] p0483 N80-23755

Displacement of oil by carbon dioxide [DOE/MC-03260/4] p0492 N80-25768

Solar technology application to enhanced oil recovery [SERI/TR-352-392] p0445 N80-25839

Oil recovery by carbon dioxide injection --- Rock Creek Big Injun field, West Virginia [ORO-5301-47] p0500 N80-26754

OILS

Feasibility study of using a coal/water oil emulsion as a clean liquid fuel [FE-2437-T1-ADD] p0490 N80-25463

OKLAHOMA

Solar photovoltaic flat panel applications experiment at the Oklahoma Center for Science and Arts [DOE/ET-23063/1] p0533 N80-25800

ONTARIO

Evaluation of the vertical axis wind turbine at DREO [AD-A083961] p0564 N80-27814

OPERATING TEMPERATURE

Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry p0359 A80-33430

Dynamic modelling and verification of a flat-plate solar collector p0391 A80-33864

Electrical data of sodium/sulfur cells operating with dissolved catholyte p0547 A80-37005

Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors p0415 A80-40718

High temperature heat pipes for waste heat recovery [AIAA PAPER 80-1505] p0329 A80-41469

Development of a high temperature turbine for operation on coal-derived fuel [ASME PAPER 80-GT-18] p0478 A80-42290

Medium and high temperature solar processes --- Book p0421 A80-43473

OPERATIONS RESEARCH

Synthane pilot plant, South Park Township, Pennsylvania [COO-0003-41-T1] p0489 N80-25455

Operation of a central preparation plant for coal-oil-water mixtures p0501 N80-27500

Solar power satellite system definition study. Volume 1: Executive summary, phase 3 [NASA-CR-160742] p0542 N80-27809

OPERATORS (PERSONNEL)

An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry p0327 A80-38018

OPTICAL CORRECTION PROCEDURE

Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system p0518 A80-38493

OPTICAL MEASUREMENT

A simple technique for measuring slope or surface error of a concentrator p0378 A80-33644

How to measure the optical quality of focusing solar collectors without laser ray tracing p0378 A80-33645

Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators p0401 A80-36822

OPTICAL MEASURING INSTRUMENTS

Diagnostic development for advanced power systems --- of gas turbines with coal-fire combustors [ASME PAPER 80-GT-128] p0522 A80-42242

OPTICAL PATHS

Three dimensional ray tracing through concentric tubular elements using vector methods --- for solar collectors study p0360 A80-33459

OPTICAL PROPERTIES

The characterization of crushed glass as a transpired air heating solar collector material p0360 A80-33450

Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors p0364 A80-33496

Optical and thermal properties of truncated compound circular arc concentrators p0365 A80-33505

An experimental approach for studying direct solar gain optics of model interiors p0382 A80-33687

What is black chrome p0387 A80-33738

Selective electrodeposited chromium black coatings - Optical properties, selectivity model p0388 A80-33743

Radiative selectivity and the oxidation of stainless steels p0388 A80-33745

Low-cost, high-performance solar selective paint coatings p0393 A80-34781

Optical and thermal performances of a half-circular, cylindrical concentrator p0405 A80-37951

Properties of low cost, high volume glasses --- for solar energy applications p0414 A80-39937

Optical and topographical properties of selective black chrome p0422 A80-43514

Solar reflectance, transmittance and absorptance of common materials [SERI/TP-334-457] p0437 N80-24805

Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications [DOE/ET-20413/1] p0448 N80-26143

OPTICAL REFLECTION

Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control p0388 A80-33741

Calculation of the angular error of a solar cylindrical concentrator made from sheet material p0391 A80-33856

Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities p0416 A80-42135

OPTICAL SCANNERS

Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects p0397 A80-35370

Scanning light spot analysis of faulty solar cells p0420 A80-43118

OPTICAL WAVEGUIDES

Development and application of high-power lightpipes --- glass fiber optical waveguides for solar radiation transmission p0401 A80-36833

OPTIMAL CONTROL

Evaluation of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator p0366 A80-33533

Real time identification of parameters in building models --- optimal control of solar houses p0368 A80-33556

Solar design by the 'Cosine Hour' method --- collector with surface orientation to optimize insolation p0375 A80-33618

Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems p0381 A80-33664

The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center p0381 A80-33666

OPTIMIZATION

Effect of off-south orientation on optimum conditions for maximum solar energy absorbed by flat plate collector augmented by plane reflector p0361 A80-33462

An optimization procedure for solar thermal electric power plant design p0376 A80-33625

An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant p0377 A80-33628

Optimization of photovoltaic/thermal collector heat pump systems p0387 A80-33737

Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south p0392 A80-33867

Optimum inclination of linear reflectors p0406 A80-37961

Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor p0520 A80-41034

ORBITAL ASSEMBLY

The solar power satellite concepts: The past decade and the next decade [NASA-TM-81000] p0541 N80-25360

ORGANIC COMPOUNDS

Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents p0472 A80-39420

Survey of organic electrolytic processes [ANL/OEPM-79-5] p0341 N80-24393

ORGANIC WASTES (FUEL CONVERSION)

Conversion processes for liquid fuels from biomass p0465 A80-33411

A modular system for bio-gas production using farm waste p0466 A80-33415

Xylose recovery from hemicellulose by selective acid hydrolysis --- biomass energy production p0466 A80-33417

The potential of crop residues as a fuel for power generation p0466 A80-33750

An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing p0473 A80-39630

Pyrolytic gasification of renewable biomass resources p0478 A80-42466

Compaction and densification of fuels from biomass p0478 A80-42467

Burning refuse-derived fuel - 'The Woodstock experience' p0479 A80-42928

Potential for conversion of refuse to energy in Ontario p0479 A80-42930

Biomass energy conversion workshop for industrial executives [SERI/TP-62-299] p0480 N80-22516

Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility [CONF-791006-2] p0486 N80-24486

Environmental and institutional considerations in the development and implementation of biomass energy technologies [SERI/TR-62-264] p0341 N80-24493

ORGANIZATIONS

World Energy Data System (WENDS). Volume 6: International agreement profiles [ANL-PMS-79-2-VOL-6] p0528 N80-23790

OSCILLATORS
Energy for wind powered oscillators
[DOE/R5/10129-1] p0500 N80-26858
OSMOSIS
Closed cycle osmotic power plants for electric power production
p0470 A80-36051
OXIDATION
Radiative selectivity and the oxidation of stainless steels
p0388 A80-33745
Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells
p0402 A80-37195
Ammonia high temperature solid electrolyte fuel cell
p0523 A80-42298
The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873
OXIDATION-REDUCTION REACTIONS
Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-23777
OXIDE FILMS
Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361
Obtaining film materials with solar furnaces
p0400 A80-36593
Photoemission measurements of interface barrier energies for tunnel oxides on silicon
p0515 A80-36936
OXYGEN
Hoe Creek No. 3 - First long-term underground coal gasification experiment with oxygen-steam injection
p0473 A80-39765
Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570
Voltage losses in fuel cell cathodes
p0522 A80-42294

P

P-I-N JUNCTIONS
A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight
p0396 A80-35355
P-N JUNCTIONS
General formulation of the current-voltage characteristic of a p-n heterojunction solar cell
p0390 A80-33782
Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346
A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection
p0396 A80-35358
Pulsed laser techniques for solar cell processing
p0396 A80-35362
Laser processing in the preparation of silicon solar cells
p0396 A80-35363
Observation of an active photoinductive component in high intensity solar cells
p0399 A80-36242
High-voltage multijunction solar-energy photoelectric converter
p0401 A80-36830
Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells
p0401 A80-36933
Realization of p-n junction solar cells by an ion implantation doping procedure
p0409 A80-37991
Optimization of graded doping CdTe solar cells
p0409 A80-37998
Review of solid state physics --- emphasizing background for understanding solar cells
p0419 A80-42454
P-TYPE SEMICONDUCTORS
Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon
p0422 A80-43762
PACIFIC NORTHWEST (US)
Wind resource assessment status
[PNL-SA-5918-REV-1] p0488 N80-24966
PACIFIC OCEAN
Pacific Northwest regional assessment --- of wind energy utilization
p0469 A80-35732
PACKAGING
Packaging materials - Industrial possibilities for resource recovery
p0475 A80-41171
PAINTS
Low-cost, high-performance solar selective paint coatings
p0393 A80-34781
PANELS
Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778
PARABOLIC BODIES
Transmission of diffuse radiation through CPC and flat plate collector glazings --- Compound Parabolic Collector
p0421 A80-43486
PARABOLIC REFLECTORS
Suntec/Hexcel parabolic trough --- solar collector design and efficiency for industrial process energy
p0363 A80-33485
Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers
p0363 A80-33489
Development of a 3X CPC with evacuated receiver --- Compound Parabolic Concentrator
p0364 A80-33494
Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498
Applications of CPC's in solar energy - An overview --- Compound Parabolic Concentrators
p0364 A80-33501
Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505
Optical analysis of paraboloidal concentrators with secondary reflectors
p0377 A80-33630
Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638
An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector
p0405 A80-37956
Generalized shading analysis for paraboloidal collector fields
[ASME PAPER 80-PET-33] p0420 A80-43344
Chromatic dispersion concentrator applied to photovoltaic systems
p0524 A80-43481
Thermal energy storage effort at JPL
p0552 N80-22800
Costing the OMNIUM-G system 7500
p0434 N80-24779
TBC costing --- test bed concentrator
p0434 N80-24780
Industrial application experiment series
p0435 N80-24785
Design and test of non-evacuated solar collectors with compound parabolic concentrators
[EPI-79-42] p0443 N80-25811
PARABOLOID MIRRORS
A study on mirror fields for tower type solar power plants
p0377 A80-33633
A computational alignment method for paraboloidal collectors
p0378 A80-33641
Concentration characteristics of composite parabolic concentrators
p0416 A80-41950
Proceedings of the First Semiannual Distributed Receiver Program Review
[NASA-CR-163135] p0433 N80-24760

Heat and electricity from the Sun using parabolic dish collector systems
p0433 N80-24761
Line-focus concentrating collector program
p0433 N80-24762
The OMNIUM-G HTC-25 tracking concentrator
p0434 N80-24766
The Shenandoah concentrator
p0434 N80-24767
The 1st generation low cost point focus solar concentrator
p0434 N80-24768
Preliminary operational results from the Willard solar power system
p0436 N80-24794
Solar total energy-large scale experiment, Shenandoah, Georgia
p0436 N80-24795
Solar total energy project at Shenandoah, Georgia system design
p0436 N80-24796

PARALLEL PLATES
Heat transfer through collector glass covers
p0360 A80-33458

PARAMETER IDENTIFICATION
Real time identification of parameters in building models --- optimal control of solar houses
p0368 A80-33556

PARTICLE PRODUCTION
A new solar thermal receiver utilizing small particles
p0379 A80-33652

PARTICLE SIZE DISTRIBUTION
Summary of the research and development effort on open-cycle coal-fired gas turbines
[ORNL/TM-6253] p0528 N80-23821
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Grinding of coal-in-oil slurries
p0494 N80-26464
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467

PARTICULATE SAMPLING
Particulate sulfur and trace metal emissions from oil fired power plants
p0325 A80-35890
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor
p0330 A80-41558
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559

PASSENGERS
The bus systems, passenger transit system of the future
p0324 A80-34067

PATTERN REGISTRATION
Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662

PEDALS
Preliminary wind tunnel tests on the pedal wind turbine
p0523 A80-43141

PELLETS
Mass spectrometer determination of argon contents in laser fusion target pellets
p0506 A80-33054
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

PENNSYLVANIA
West Chester Work Center: Solar space heating demonstration project
[DOE/CS-4048/2] p0444 N80-25822

PERFORMANCE PREDICTION
Design and performance of a roof integrated solar air heater
p0360 A80-33451
A method for balancing flow rates in rows of parallel collectors
p0362 A80-33476
Prediction of long-term performance of closed-loop concentrating solar collector systems
p0362 A80-33479
Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance
p0363 A80-33490
Low cost vee-trough evacuated tube collector module
p0363 A80-33492
Investigation of latent heat of fusion storage for solar heating systems
p0546 A80-33523
Solar absorption cycle cooling installations in Sydney, Australia
p0366 A80-33536
A design method for parallel solar-heat pump systems
p0367 A80-33542
Solar heating simulation - Accuracy and precision of a model using daily data
p0369 A80-33561
Simulation of the FSEC solar cooling system
p0369 A80-33563
Analysis of solar water heating systems
p0370 A80-33574
Performance vs prediction for four classes of solar hot water systems
p0370 A80-33576
Experimental system performance and comparison with computer predictions for six solar domestic hot water systems
p0370 A80-33577
Mean monthly performance of solar water heaters with natural circulation
p0371 A80-33579
Salt concentration gradient solar ponds - Modeling and optimization
p0371 A80-33585
Performance analysis for collector-side reflector systems
p0376 A80-33621
Cooling system parameter analysis --- for solar collectors
p0376 A80-33622
DELSOL - A code for central receiver performance and optimization calculations
p0376 A80-33626
The cost/performance of large central receiver power systems as a function of heliostat design parameters
p0376 A80-33627
An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant
p0377 A80-33628
Helios and reconcentrators --- computer code for heliostat performance predictions
p0378 A80-33637
Photovoltaic concentrator design comparison
p0385 A80-33723
Cost and performance evaluation of passive solar systems
p0389 A80-33755
Markov chains to solar energy storage calculations
p0390 A80-33766
Operational characteristics of an ac commutator generator for wind power conversion
p0508 A80-33770
Performance modeling of the vertical axis wind turbine
p0508 A80-33773
A design procedure for wind powered heating systems
p0509 A80-33776
Dynamic modelling and verification of a flat-plate solar collector
p0391 A80-33864
Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south
p0392 A80-33867
Thermosyphon circulation in solar collectors
p0392 A80-33869
Comparison of measured and predicted rock bed storage performance
p0546 A80-33870
Wind direction variations in strong winds --- for wind turbine design considerations
p0468 A80-35728
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
p0517 A80-38484

A perspective on closed-cycle gas turbines applied to naval-ship propulsion [AIAA PAPER 80-1304] p0519 A80-39014
Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors p0415 A80-40718
Equitable performance comparison and economic evaluation of active and passive solar energy systems p0329 A80-40965
Sailwing Darrieus rotors p0520 A80-41033
Performance analysis of zinc-bromine batteries in vehicle and utility applications p0550 A80-41852
Survey of integrated gasification combined cycle power plant performance estimates [ASME PAPER 80-GT-113] p0477 A80-42231
Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines [ASME PAPER 80-GT-117] p0522 A80-42233
Preliminary wind tunnel tests on the pedal wind turbine p0523 A80-43141
System thermodynamics of energy conversion plants for geopressured resources [ASME PAPER 80-PET-31] p0524 A80-43342
Mission analysis and performance specification studies report, appendix A [NASA-CR-163035] p0562 N80-27223
CF6-6D engine performance deterioration [NASA-CR-159786] p0355 N80-27364

PERFORMANCE TESTS
Diagnostic techniques for combustion MHD systems [AIAA PAPER 80-0926] p0505 A80-32892
Performance evaluation of wind turbines p0508 A80-33290
New air-heating collector design and performance p0359 A80-33449
Testing the performance of solar collectors under standard conditions p0361 A80-33466
Equations for representing the UL-dependence in collector test procedures --- heat loss coefficient p0361 A80-33467
Tests of all-day collector performance p0361 A80-33468
CSIRO collector test facilities p0361 A80-33470
Laboratory tests for flat plate solar collectors p0361 A80-33471
Weatherability test of plastic glazing materials for collectors p0362 A80-33474
Small-scale solar simulator for indoor testing of collector modules and materials p0362 A80-33477
Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector p0362 A80-33480
A data analysis program for collector testing --- solar energy for Fort Hood, Texas p0362 A80-33482
Environmental testing of solar reflector structures p0363 A80-33487
Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season p0363 A80-33488
Experimental and theoretical evaluation of a novel concentrating solar energy collection system p0364 A80-33495
A stationary prism concentrator for solar cells p0365 A80-33504
Experimental comparison between solar assisted compression and absorption heat pump p0367 A80-33537
The Saskatchewan Conservation House - A year of performance data p0369 A80-33566
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report p0370 A80-33571
The operation results of the Yazaki Experimental Solar House One and the Ishibashi Solar House p0370 A80-33572
Experimental system performance and comparison with computer predictions for six solar domestic hot water systems p0370 A80-33577
Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility p0380 A80-33655
The characterization of the performance of passive solar heating systems p0382 A80-33686
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska p0383 A80-33693
Performance of passive test units during the 1978-79 heating season --- solar house p0383 A80-33694
Photovoltaic module performance and degradation at various MIT/LL test sites p0385 A80-33717
Design and performance of silicon solar cells under concentrated sunlight p0385 A80-33721
The performance of silicon solar cells under concentrated sunlight p0386 A80-33724
A novel mildly concentrating photovoltaic/thermal total energy system p0386 A80-33729
Evaluation of combined photovoltaic/thermal collectors p0387 A80-33736
Test results on solar turbogenerators p0391 A80-33860
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells p0399 A80-35493
High-efficiency solar concentrator p0405 A80-37953
An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector p0405 A80-37956
Performance comparison of different types of solar water heaters under Egyptian conditions p0407 A80-37973
Optical performance of the Gemini carbon dioxide laser fusion system p0517 A80-38482
Studies of MHD generator performance with oxygen enriched coal combustion [AIAA PAPER 80-1343] p0521 A80-41570
Performance study of an OTEC system p0521 A80-41949
Design and test of a 73-MW water cooled gas turbine [ASME PAPER 80-GT-112] p0477 A80-42230
High temperature combustor designed for operation with coal derived low Btu gaseous fuels [ASME PAPER 80-GT-187] p0478 A80-42289
Burning refuse-derived fuel - 'The Woodstock experience' p0479 A80-42928
High-power MHD system combustor development testing p0523 A80-43138
Experimental evaluation of thermal energy storage p0553 N80-22817
Solar energy system performance evaluation: Seasonal report for fern, Tunkhannock, Pennsylvania [NASA-CR-161392] p0424 N80-22856
Assessment of the potential of hybrid vehicles: Summary [NASA-CR-163059] p0336 N80-23215
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems [EPRI-EM-1188] p0555 N80-23796
Performance evaluation of Magma Power company's reinjection well no. 46-7 at the East Mesa KGRA, California [SAND-79-7127] p0492 N80-25863
Handling coal oil mixtures with positive displacement pumps p0494 N80-26463
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system [UCRL-83662] p0564 N80-27233

Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A [NASA-CR-135119] p0355 N80-27361
A test plan for the NEPSCO coal-oil mixture combustion project p0502 N80-27505
Small passenger car transmission test-Chevrolet 200 transmission [NASA-CR-159835] p0356 N80-28255

PERIPHERAL EQUIPMENT (COMPUTERS)
Short course in microprocessors for solar energy applications - Systems --- heating system and collector control p0419 A80-42463

PERMEABILITY
Geological assessment probe [NASA-CASE-NPO-14558-1] p0488 N80-24906

PERMITTIVITY
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency p0473 A80-39422

PETROLEUM PRODUCTS
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters p0325 A80-35878
Assessment of crude oil and refined petroleum product quality during long-term storage [AD-A082365] p0557 N80-24637

PHASE CONTROL
SPS phase control system performance via analytical simulation [NASA-CR-160582] p0540 N80-22378

PHASE MODULATION
Submillimeter interferometry of high-density plasmas p0511 A80-34970

PHASE TRANSFORMATIONS
The sizing and economics of phase change energy storage units in air-based solar heating systems p0546 A80-33520
Development of a storage system based on encapsulated p.c.-materials --- Phase Change material in solar heating p0546 A80-33522
An application of phase change materials in passive solar systems p0384 A80-33703
Some aspects of energy storage systems using Glauber salt mixtures p0548 A80-37967
Performance of the noval solar cell substitute for the future p0409 A80-37995
Displacement of oil by carbon dioxide [DOE/MC-03260/4] p0492 N80-25768

PHOSPHORIC ACID
Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance p0522 A80-42295

PHOTOABSORPTION
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces p0388 A80-33746
Ion implanted materials as selective absorbers for photothermal solar energy conversion p0388 A80-33747
Charge collection and spectral response of amorphous-silicon solar cells p0401 A80-36937
Absorption enhancement in solar collectors by multiple reflections p0403 A80-37306
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system p0517 A80-38484

PHOTOCHEMICAL REACTIONS
Photochemical storage of solar energy p0545 A80-33420
Evaluating certain ways of storing solar energy p0400 A80-36598
Basic electrochemistry --- in solar energy conversion p0419 A80-42458
Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell p0462 A80-42459
Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system [SRO-0893-17] p0558 N80-25869
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy [COO-2889-5] p0447 N80-25886

PHOTOCONDUCTIVITY
Photoconductivity as a probe of polycrystalline films p0398 A80-35490

PHOTODECOMPOSITION
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy utilization of households and small consumers [ESA-TT-582] p0463 N80-23865

PHOTOELECTRIC EFFECT
Observation of an active photoinductive component in high intensity solar cells p0399 A80-36242

PHOTOELECTRIC EMISSION
Photoemission measurements of interface barrier energies for tunnel oxides on silicon p0515 A80-36936

PHOTOELECTRIC MATERIALS
Silicon material task - Low cost solar array project /JPL/DOE/ p0393 A80-34780
Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 1 p0398 A80-35480
Photoconductivity as a probe of polycrystalline films p0398 A80-35490
I-V and C-V characteristics of Au/TiO2 Schottky diodes p0413 A80-39055
Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2 p0525 A80-43757

PHOTOELECTRICITY
The photovoltaic effect, its present understanding and remaining mysteries p0385 A80-33718

PHOTOELECTROCHEMICAL DEVICES
A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency p0357 A80-32933
Properties of photoelectrochemical cells with a chemically sprayed photoanode p0398 A80-35474
Metal filmed-semiconductor photoelectrochemical cells p0515 A80-37006
Performance of the noval solar cell substitute for the future p0409 A80-37995
Basic electrochemistry --- in solar energy conversion p0419 A80-42458
Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell p0462 A80-42459
Biological solar cells [SERI/TP-332-476] p0439 N80-24831

PHOTOGEOLOGY
Contribution of remote sensing to the geological problems of the country p0472 A80-38801
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base [NASA-CR-163311] p0492 N80-25770
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia [E80-10142] p0499 N80-26729

PHOTOINTERPRETATION
Remote sensing applications to wind power facility siting p0470 A80-35746

Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662

Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants
p0330 A80-41664

Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163311] p0492 N80-25770

PHOTOLYSIS

Energy storage and electron transfer by carbanion photolysis
p0545 A80-33419

Comment on 'The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation'
p0459 A80-35193

Photolytic decomposition of water into oxygen and hydrogen as an alternative energy utilization of households and small consumers
[ESA-TT-582] p0463 N80-23865

Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487

Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

PHOTOMAPPING

Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662

PHOTOMETRY

Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

PHOTOSYNTHESIS

High intensity mass algae culture requirements and limitations --- for maximum growth and energy conversion in sunlight
p0358 A80-33408

Light-dependent hydrogen production by C. reinhardi --- anaerobically adapted green algae
p0459 A80-33410

Association of chlorophyll with surfactants on a particle surface --- for solar energy conversion
p0358 A80-33421

Evaluating certain ways of storing solar energy
p0400 A80-36598

A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985

Bioconversion of solar energy
p0420 A80-42465

Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477

Biological solar cells
[SERI/TP-332-476] p0439 N80-24831

PHOTOTHERMAL CONVERSION

Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498

The Point-Focusing Thermal and Electric Applications Project - A progress report --- small solar power systems applications
p0372 A80-33595

Small solar thermal power plants
p0373 A80-33602

Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs
p0374 A80-33603

Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604

Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605

A self supporting solar power system for an isolated community
p0374 A80-33607

Sodium cooled solar central receiver power station
p0375 A80-33610

Optical analysis of paraboloidal concentrators with secondary reflectors
p0377 A80-33630

A new solar thermal receiver utilizing small particles
p0379 A80-33652

Analytical evaluation of a solar thermophotovoltaic /TPV/ converter
p0386 A80-33725

A novel mildly concentrating photovoltaic/thermal total energy system
p0386 A80-33729

Ion implanted materials as selective absorbers for photothermal solar energy conversion
p0388 A80-33747

Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies
p0389 A80-33754

Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778

Solar materials R & D overview emphasizing solar thermal power systems
p0393 A80-34779

Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353

Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597

Evaluating certain ways of storing solar energy
p0400 A80-36598

Medium and high temperature solar processes --- Book
p0402 A80-37012

Solar thermal power plant - Thermodynamic analysis
p0410 A80-37999

Steam and gas turbines for small outputs using solar energy
p0410 A80-38003

A helioelectric farm --- multimodular solar thermal electric plant design is presented
p0410 A80-38005

A central receiver solar power system for remote locations
p0410 A80-38006

End use energy in Brazil and the solar technologies
p0472 A80-38016

Evaluation of solar thermal power plants using economic and performance simulations
p0412 A80-38023

The effect of a black chrome selective surface on the thermal performance of a solar collector
p0414 A80-40538

Solar energy with chemical storage for cogeneration of electric power and heat
p0549 A80-40715

Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471

Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162

The design of a solar receiver for a 25-kWe gas turbine engine
[ASME PAPER 80-GT-131] p0416 A80-42244

Spectrally selective surfaces in photothermal solar energy conversion
p0417 A80-42443

Solar thermal repowering utility value analysis
[SERI/TR-8016-1] p0428 N80-23814

Design and installation manual for thermal energy storage
[ANL-79-15-ED-2] p0561 N80-26840

Development of a low-cost non-tracking heat pipe concentrating collector
[PB80-160443] p0457 N80-27828

PHOTOTROPISM

Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477

PHOTOVOLTAIC CELLS

Energy storage and electron transfer by carbanion photolysis
p0545 A80-33419

Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498

Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications p0364 A80-33500
A stationary prism concentrator for solar cells p0365 A80-33504
The Ramon Areces concentration photovoltaic array p0384 A80-33714
Photovoltaic module performance and degradation at various MIT/LL test sites p0385 A80-33717
Photovoltaic concentrator design comparison p0385 A80-33723
Analytical evaluation of a solar thermophotovoltaic /TPV/ converter p0386 A80-33725
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators p0386 A80-33726
Development of 1pKW photovoltaic module with concentration p0386 A80-33728
The DOE photovoltaic concentrator project p0386 A80-33730
Photovoltaic array reliability project p0387 A80-33735
Evaluation of combined photovoltaic/thermal collectors p0387 A80-33736
Optimization of photovoltaic/thermal collector heat pump systems p0387 A80-33737
Photovoltaic materials --- for solar energy conversion p0392 A80-34637
Glass fiber reinforced concrete for terrestrial photovoltaic arrays p0393 A80-34782
Solar cell array design handbook - The principles and technology of photovoltaic energy conversion p0393 A80-34847
Thin-film solar cells - A unified analysis of their potential p0393 A80-35335
Design considerations for a-Si solar cells p0394 A80-35342
New directions for future satellite power system /SPS/ concepts [AIAA 79-3069] p0539 A80-36963
An array of directable mirrors as a photovoltaic solar concentrator p0402 A80-37297
Single-crystal solar cell heterojunctions involving N-cadmium sulfide p0413 A80-39061
Characteristics of axicon concentrators for use in photovoltaic energy conversion p0520 A80-40719
Current from the sun - A look at the economics of solar cells p0416 A80-42101
Silicon solar cells. I - Basics. II - Practical aspects p0419 A80-42455
Metal-insulator-semiconductor /MIS/ and semiconductor-insulator-semiconductor /SIS/ solar cells. I - Basic principles. II - Performance characteristics p0419 A80-42457
Scanning light spot analysis of faulty solar cells p0420 A80-43118
Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2 p0525 A80-43757
Handbook of solar energy data for south-facing surfaces in the United States. Volume 2: Average hourly and total daily insolation data for 235 localities. Alaska - Montana [NASA-CR-162999] p0423 N80-22784
Handbook of solar energy data for south-facing surfaces in the United States. Volume 3: Average hourly and total daily insolation data for 235 localities. North Carolina - Wyoming [NASA-CR-163000] p0423 N80-22785
Cadium sulfide solar cells, volume 2. Citations from the NTIS data base [PB80-802226] p0425 N80-22872
Cadmium sulfide solar cells. Citations from the Engineering Index data base [PB80-802234] p0426 N80-22873
Design of low-cost structures for photovoltaic arrays. Volume 2: Technical studies and appendices [SAND-79-7002-VOL-2] p0429 N80-23837
Low cost structures for photovoltaic arrays [SAND-80-0142C] p0430 N80-23853
Solar photovoltaic project: Materials, and testing activities [COO-4094-60] p0430 N80-23855
Federal policies to promote the widespread utilization of photovoltaic systems. Supplement: Review and critique [NASA-CR-163148] p0342 N80-24754
Heterostructure single crystal silicon photovoltaic solar cells [DOE/ET/20408-1] p0438 N80-24823
Photovoltaic concentrators [SAND-80-0143C] p0439 N80-24832
Battery charge/solar controller for a residential size photovoltaic power system [COO-4094-62] p0439 N80-24837
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility [SAND-79-7022-VOL-1] p0534 N80-25870
Photovoltaic energy systems: Program summary [DOE/CS-0146] p0349 N80-25884
Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges [SAND-79-7051-VOL-1] p0449 N80-26611
Study of curved glass photovoltaic module and module electrical isolation design requirements [NASA-CR-163033] p0450 N80-26781
Central station applications planning activities and supporting studies --- application of photovoltaic technology to power generation plants [NASA-CR-163042] p0352 N80-26784
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data [SAND-79-7022-VOL-2] p0537 N80-26800
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results [SAND-78-7072-VOL-1/2] p0453 N80-26830
Airport solar photovoltaic concentrator project, phase 1 [DOE/CS-05317/1] p0453 N80-26839
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report [SAND-79-7020-VOL-2] p0455 N80-26866
Photovoltaic applications: Past and future --- systems utilizing concentrators and arrays [CONF-800106-4] p0455 N80-26867
Analysis methods for photovoltaic applications [SERI/SP-35-230] p0455 N80-26868
Phase 2 experiment test plan: Solar photovoltaic/thermal residential experiment [COO-4094-65] p0455 N80-26869

PHOTOVOLTAIC CONVERSION
The Belgian solar heating R & D program p0359 A80-33435
European progress in photovoltaic development p0384 A80-33712
A 100 kW peak photovoltaic power system for the Natural Bridges National Monument p0384 A80-33713
A 20 kW photovoltaic flat panel power system in El Paso, Texas p0385 A80-33716
A novel mildly concentrating photovoltaic/thermal total energy system p0386 A80-33729
Design and analysis of a solar cell concentrating system using a flux redistributor p0386 A80-33731
Status of the photovoltaic systems definition project p0387 A80-33733
Connection losses in photovoltaic arrays p0387 A80-33734

Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces
p0390 A80-33786
Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353
Upper limit for the conversion of solar energy
p0397 A80-35372
Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 1
p0398 A80-35480
Influence of base resistivity on the temperature characteristics of silicon photoconverters
p0514 A80-36590
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591
Evaluating certain ways of storing solar energy
p0400 A80-36598
Physics and economics of photovoltaic solar energy conversion
p0408 A80-37990
Photovoltaic power system reliability considerations
p0520 A80-40338
Characteristics of axicon concentrators for use in photovoltaic energy conversion
p0520 A80-40719
Chromatic dispersion concentrator applied to photovoltaic systems
p0524 A80-43481
On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications
p0421 A80-4348
Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films
p0526 A80-43758
Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices
p0526 A80-43760
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1] p0529 N80-23860
Spectrophotovoltaic orbital power generation
[NASA-CR-161451] p0530 N80-24757
Batteries for specific solar applications: Project description
[SAND-79-1782C] p0557 N80-24803
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218] p0533 N80-25785
Solar photovoltaic flat panel applications experiment at the Oklahoma Center for Science and Arts
[DOE/ET-23063/1] p0533 N80-25800
Novel solar cell concentrator photovoltaic converter system
[SAND-79-7048] p0445 N80-25843
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Photovoltaic Residential Applications Program Implementation Workshop Proceedings
[NASA-CR-163274] p0449 N80-26768
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859
Design and fabrication of terrestrial photovoltaic solar generators for field testing in regions of intensive insolation
[BMFT-FB-T-79-34] p0538 N80-26878

PHOTOVOLTAIC EFFECT
The photovoltaic effect, its present understanding and remaining mysteries
p0385 A80-33718
Optoelectronic and photovoltaic properties of metal-SiO2-silicon tunneling structures
p0426 N80-23179

PHYSICAL OPTICS
Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems
p0518 A80-38491

PILOT PLANTS
30/50 kWE solar thermal power plant of the distributed type
p0373 A80-33599
The solar ten megawatt pilot plant
p0374 A80-33608
Thermal fatigue analysis of the Department of Energy Barstow Pilot Plant
p0374 A80-33609
Testing of the 10-MWe pilot plant solar central receiver
p0380 A80-33656
How clean gas is made from coal
p0471 A80-36314
The Nigorikawa Geothermal Pilot Plant
p0525 A80-43740
Solar thermal plant impact analysis and requirements definition
p0435 N80-24788
A study of mass production and installation of small solar thermal electric power systems
p0436 N80-24789
The Crossbyton project
p0436 N80-24790
IEA/SPS 500 kW distributed collector system
p0436 N80-24791
EDS coal liquefaction process development, phase 4
[FE-2893-33] p0491 N80-25474
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669
Solar central receiver prototype heliostat. Volume 3: Cost estimates
[SAN-1604-3] p0451 N80-26801
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505
Recommended health and safety guidelines for coal gasification pilot plants
[PB80-164890] p0504 N80-27536

PIPE FLOW
Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM
p0502 N80-27507

PIPELINES
Coal/oil mixture pipeline: A viable alternative coal transportation system?
p0542 N80-26487

PIPES (TUBES)
Cylindrical glass tubes for flat plate collector covers
p0361 A80-33460
NOAA's cold-water pipe at-sea test program --- for OTEC
p0511 A80-35162
The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses --- Cold Water Pipe
p0511 A80-35163
An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current
p0512 A80-35164
Structural analysis of a cold water pipe for a 40MWe spar OTEC platform
p0512 A80-35165
At-sea test of a large diameter steel, cold water pipe --- for OTEC
p0512 A80-35166

PISTON ENGINES
A free cylinder Stirling engine solar powered water pump
p0382 A80-33679
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787

PLANAR STRUCTURES
Fluid circulation control in conventional and heat pipe planar solar collectors
p0392 A80-33872

PLANTS (BOTANY)
Bioconversion of solar energy
p0420 A80-42465
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

PLASMA CHEMISTRY
Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570

PLASMA CONDUCTIVITY
High electrical conductivity and high Hall coefficient in MHD generator
p0511 A80-34990
The helical hydromagnetic dynamo
p0514 A80-36430

PLASMA CONTROL
An assessment of magnetic fusion research
[AIAA PAPER 80-0928] p0505 A80-32893
Mirror fusion reactor design
p0505 A80-33043
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062
Material studies related to TFTR limiters and wall armor
p0507 A80-33063
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439
RF feedback stabilization of a thin line cusp magnetoplasma sheath
p0514 A80-36048
Review of the ISX-B experimental program
p0515 A80-37181
Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185
Plasma physics for nuclear fusion --- Book
p0474 A80-40826
Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/ --- poloidal magnetic field variation effects in tokamak
p0521 A80-41748
Coatings for fusion reactor environments
p0525 A80-43517

PLASMA CURRENTS
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Current constriction near the anode in a combustion products plasma --- in MHD generators
p0510 A80-34865
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438

PLASMA DENSITY
On the validity of a hydrodynamic description of laser-driven fusion
p0515 A80-36726

PLASMA DIAGNOSTICS
Mass spectrometer determination of argon contents in laser fusion target pellets
p0506 A80-33054
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649
Submillimeter interferometry of high-density plasmas
p0511 A80-34970
Design of Helios beam diagnostics
p0518 A80-38486

PLASMA DIFFUSION
On the low frequency drift wave and the pseudoclassical diffusion --- of plasmas in tokamak
p0512 A80-35379

PLASMA DYNAMICS
Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator
p0510 A80-34873
The helical hydromagnetic dynamo
p0514 A80-36430

PLASMA ELECTRODES
Determination of the geometry of the transition region of a series MHD generator
p0509 A80-34315
The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator
p0510 A80-34619
Current constriction near the anode in a combustion products plasma --- in MHD generators
p0510 A80-34865
Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel
p0511 A80-34875
Effect of current constriction at electrodes on MHD generator characteristics
p0513 A80-35685
Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators
p0519 A80-39746
An arc discharge model on electrodes of an MHD generator
p0524 A80-43397
Theory of electrode arcs in a flow of combustion products containing an additive
p0524 A80-43398

PLASMA EQUILIBRIUM
Numerical studies of new stellarator concepts
p0511 A80-34978
Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections
p0514 A80-36397
Plasma physics for nuclear fusion --- Book
p0474 A80-40826

PLASMA HEATING
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648
Electron cyclotron heating of tokamaks
p0511 A80-34973
Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434
Review of the ISX-B experimental program
p0515 A80-37181
Breakeven for thermonuclear fusion in the hot-ion mode
p0519 A80-39539
Plasma physics for nuclear fusion --- Book
p0474 A80-40826

PLASMA OSCILLATIONS
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438

PLASMA PHYSICS
Electrical nonuniformities in diagonally connected generators --- in magnetohydrodynamics
p0511 A80-34989
Breakeven for thermonuclear fusion in the hot-ion mode
p0519 A80-39539
Plasma physics for nuclear fusion --- Book
p0474 A80-40826

PLASMA POWER SOURCES
DOE/JPL advanced thermionic technology program
[NASA-CR-163134] p0528 N80-23818

PLASMA RADIATION

Measurement of energy emitted by the working medium of an MHD generator p0510 A80-34874

PLASMA SHEATHS

RF feedback stabilization of a thin line cusp magnetoplasma sheath p0514 A80-36048

PLASMA SPRAYING

Stability of plasma-sprayed coatings tested at White Sands Solar Facility p0380 A80-33658

PLASMA TEMPERATURE

Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator p0510 A80-34873

On the validity of a hydrodynamic description of laser-driven fusion p0515 A80-36726

Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling p0521 A80-41745

PLASMA WAVES

On the low frequency drift wave and the pseudoclassical diffusion --- of plasmas in tokamak p0512 A80-35379

Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas p0512 A80-35434

Space-time solutions of the linearized coupled-mode equations p0520 A80-41074

PLASMA-ELECTROMAGNETIC INTERACTION

A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes p0510 A80-34620

PLASMAS (PHYSICS)

Tests of high-powered direct conversion on beams and plasma [UCRL-82852] p0532 N80-25161

PLASTICS

Weatherability test of plastic glazing materials for collectors p0362 A80-33474

Plastic solar collectors for 'low energy' applications p0415 A80-41948

Development of a low-temperature, low-cost, black liquid solar collector, phase 2 --- weathering tests [ALO-30171-1] p0453 N80-26841

PLATINUM

Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004

PLUMES

Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds p0325 A80-36419

Chemical characteristics of oil refinery plumes in Los Angeles p0325 A80-36476

The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant p0340 N80-23873

PNEUMATIC EQUIPMENT

Study of the operation of a pneumatic wave-energy converter p0521 A80-41732

POINTING CONTROL SYSTEMS

Solar design by the 'Cosine Hour' method --- collector with surface orientation to optimize insolation p0375 A80-33618

Collector deflections due to wind gusts and control scheme design p0378 A80-33643

The 1st generation low cost point focus solar concentrator p0434 N80-24768

POLAR REGIONS

Systematic techniques of design for solar houses in high latitudes p0418 A80-42452

POLARIZATION CHARACTERISTICS

Voltage losses in fuel cell cathodes p0522 A80-42294

POLICIES

Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass [BMI-2031-VOL-2] p0341 N80-24475

Analysis of exploration, development and production activity on Federal outer Continental Shelf leases [DOE/RA-0044] p0342 N80-24736

POLITICS

Energy and environmental politics in the 80's p0327 A80-38303

POLLUTION

Potential air quality impact of geothermal power production in the Imperial Valley [UCRL-52797] p0340 N80-23878

POLLUTION CONTROL

Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters p0325 A80-35878

Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace p0325 A80-35879

Planning air quality control systems for power generation p0325 A80-35897

Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems p0326 A80-37618

Practical application of flue gas de-NO/x/ system using honey-comb type catalyst p0328 A80-38366

Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology p0331 A80-41849

Development of a NO/x/-free combustion system p0333 A80-43741

Proceedings: Symposium on Flue Gas Desulfurization, volume 1 [PB80-133168] p0336 N80-22888

Proceedings: Symposium on Flue Gas Desulfurization, volume 2 [PB80-133176] p0336 N80-22889

Criteria for assessment of environmental pollutants from coal cleaning processes [PB80-102791] p0336 N80-22895

Environmental standards for coal conversion processes. Volume 1: Most stringent, federal, and selected state regulations [PB80-126980] p0341 N80-23904

Environmental control technology for the flash hydropyrolysis of coal [BNL-50983] p0345 N80-24884

Environmental control technology for atmospheric carbon dioxide [BNL-27164] p0345 N80-24888

Control techniques for carbon monoxide emissions [PB80-140510] p0345 N80-24890

Evaluation of physical/chemical coal cleaning and flue gas desulfurization [PB80-147622] p0346 N80-25481

Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base [PB80-805401] p0346 N80-25678

National Emissions Data System (NEDS), fuel use report [PB80-146905] p0350 N80-25919

Flue gas desulfurization by the modified citrate process: Report of investigations [PB80-134836] p0351 N80-25940

The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems [PB80-138464] p0351 N80-25947

Environmental control technology for atmospheric carbon dioxide [BNL-51116] p0354 N80-26956

POLLUTION MONITORING

Air quality measurements in the coal fired power plant environment of Colstrip, Montana p0326 A80-36477

Scientific Workshop on the Automobile: Energy Conservation and Atmospheric Pollution, Paris, France, December 6, 7, 1979, Complete Proceedings p0326 A80-36976
Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants p0330 A80-41664
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors [CONF-791049-8] p0335 N80-22878
Design of a monitoring program for ash pond effluents [PB80-128457] p0345 N80-24896
Quality assurance in support of energy related monitoring activities [PB80-135270] p0346 N80-24898
Methods for analyzing inorganic compounds in particles emitted from stationary sources [PB80-141781] p0350 N80-25936

POLYCRYSTALS
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon p0394 A80-35343
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells p0394 A80-35345
Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells p0395 A80-35346
Photoconductivity as a probe of polycrystalline films p0398 A80-35490
Review of amorphous and polycrystalline thin film silicon solar cell performance parameters p0414 A80-40712
Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0416 A80-42140
Polycrystalline solar cells p0419 A80-42456
Electrical properties of polycrystalline GaAs films p0525 A80-43575
Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films p0526 A80-43758
Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices p0526 A80-43760
Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon p0422 A80-43762
Measurement techniques in thin film polycrystalline materials and devices /solar cells/ p0422 A80-43764
Development of polycrystal GaAs solar cells [DSE-4042-T28] p0452 N80-26819
Thin film polycrystalline silicon solar cells [DOE/SF/23047-3] p0452 N80-26828

POLYIMIDES
Development of polyimide materials for use in solar energy systems [DOE/CS-35305/T1] p0445 N80-25855

POLYMERIC FILMS
Development of a low-temperature, low-cost, black liquid solar collector, phase 2 --- weathering tests [ALO-30171-1] p0453 N80-26841

POLYMERS
Solid polymer electrolyte fuel cell technology program [NASA-CR-160734] p0538 N80-27801

PONDS
Demonstration salt gradient solar pond [ALO-3977-T1] p0453 N80-26837

POROUS MATERIALS
Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation p0379 A80-33650
Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage [PNL-3047] p0556 N80-23823
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir [PNL-2974] p0561 N80-26804

PORTABLE EQUIPMENT
Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors p0381 A80-33668
High-power MHD system combustor development testing p0523 A80-43138
The MHD /magnetohydrodynamic/ two-axis Rate Sensor [AIAA PAPER 80-1890] p0523 A80-43325

POSITION ERRORS
Collector deflections due to wind gusts and control scheme design p0378 A80-33643
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems p0518 A80-38492

POSITIONING
Helios target positioning system p0518 A80-38485

POTASSIUM
Mass transport in molten-salt electrochemical systems [ORNL/MIT-290] p0527 N80-23400

POTASSIUM CHLORIDES
Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions p0467 A80-34019

POWER AMPLIFIERS
The Antares laser power amplifier p0517 A80-37855
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system p0517 A80-38484
Antares Power Amplifier optical system p0518 A80-38489
LOTS analysis of optical diffraction in Antares --- Laser Optical Train Simulator code for fusion research p0518 A80-38490

POWER CONDITIONING
Increasing power input to a single solar power satellite rectenna by using a pair of satellites p0539 A80-32942

POWER CONVERTERS
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility [SAND-79-7022-VOL-1] p0534 N80-25870

POWER EFFICIENCY
Tests of all-day collector performance p0361 A80-33468
Operational characteristics of an ac commutator generator for wind power conversion p0508 A80-33770
Electro-wind energy system with oversynchronous cascade and simple adaptive maximal power control p0508 A80-33775
A circuit for measurement of the fill factor of solar cells p0399 A80-36121
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket p0401 A80-36834
On the evaluation of the feasibility of solar collectors for electrical power generation applications p0406 A80-37963
The efficiency of ballast in composite flywheels p0549 A80-40068
Fluctuations in output from wind turbine clusters p0520 A80-41032
Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor p0520 A80-41034
Performance analysis of zinc-bromine batteries in vehicle and utility applications p0550 A80-41852

Design study for a fuel efficient turbofan engine [ASME PAPER 80-GT-141] p0331 A80-42254

High-power MHD system combustor development testing p0523 A80-43130

Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane [AIAA PAPER 80-1846] p0333 A80-43304

Fuel efficiency of small aircraft [AIAA PAPER 80-1847] p0333 A80-43305

POWER GAIN

An experimental approach for studying direct solar gain optics of model interiors p0382 A80-33687

Quasi-optimum pseudo-Lambertian reflecting concentrators - An analysis p0421 A80-43367

POWER LINES

Load excitation at the superconducting cable test facility [BNL-26641] p0540 N80-22608

POWER PLANTS

Solar thermal power plant - Thermodynamic analysis p0410 A80-37999

New developments for future solar power plants p0410 A80-38001

System thermodynamics of energy conversion plants for geopressured resources [ASME PAPER 80-PET-31] p0524 A80-43342

Design of a monitoring program for ash pond effluents [PB80-128457] p0345 N80-24896

POWER TRANSMISSION

The Perbury transmission --- toroidal traction drive for gas turbine engines [ASME PAPER 80-GT-22] p0331 A80-42159

PREDICTION ANALYSIS TECHNIQUES

The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems p0381 A80-33663

Structural analysis of a cold water pipe for a 40MWe spar OTEC platform p0512 A80-35165

Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms p0512 A80-35167

The Project Independence Evaluation System (PIES). Volume 1: Description of the system, executive summary [HCP/I-1321-01/1] p0342 N80-24802

Use of petroleum-based correlations and estimation methods for synthetic fuels [NASA-TM-81533] p0502 N80-27509

ASHMET: A computer code for estimating insolation incident on tilted surfaces [NASA-TM-78286] p0457 N80-27807

PRESSURE DISTRIBUTION

An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients [PB80-158769] p0458 N80-27829

PRESSURE EFFECTS

The effect of pressure on the performance of cylindrical solar collectors p0361 A80-33461

PRESSURE GRADIENTS

Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM p0502 N80-27507

PRESSURE MEASUREMENTS

Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM p0502 N80-27507

PRESSURE VESSELS

Bulk hydrogen storage using metal hydrides [BNL-27093] p0463 N80-24483

PRESSURIZED WATER REACTORS

Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors [CONF-791049-8] p0335 N80-22878

PRIMARY BATTERIES

The lithium-sulfur dioxide primary battery - Its characteristics, performance and applications p0549 A80-40601

Primary Li/SOCl2 cells. I - Optimization of D cells with respect to energy density, storability and safety p0549 A80-40602

Abusive testing of large Li/SOCl2 cells p0549 A80-40603

Evaluation of cathode materials for the lithium/carbonmonofluoride battery p0549 A80-40606

PRISMS

A stationary prism concentrator for solar cells p0365 A80-33504

PROBABILITY DISTRIBUTION FUNCTIONS

A model for the probability structure of atmospheric turbulence --- for wind engineering applications p0468 A80-35720

Wind direction variations in strong winds --- for wind turbine design considerations p0468 A80-35728

Solar elevation angle probability distribution p0415 A80-40721

PROBABILITY THEORY

Application of probability methods to evaluate the reliability of a combined wind-electric and conventional generation system p0508 A80-33774

PROCESS CONTROL (INDUSTRY)

Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents [PB80-126469] p0334 N80-22527

Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes [PB80-126477] p0334 N80-22528

Test and evaluate the TRI-GAS low-Btu coal gasification process [FE-2798-66] p0482 N80-23484

Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-9] p0483 N80-23486

Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model) [COO-5022-8] p0483 N80-23487

Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes [FE-2315-43] p0486 N80-24482

Materials technology for coal-conversion processes --- corrosion resistance slag containers [ANL-79-93] p0486 N80-24484

Filtration process and equipment studies for coal liquefaction processes [FE-2007-T1] p0487 N80-24499

Liquid fuels production from biomass, no. 7 [COO-4388-7] p0490 N80-25462

Preparation of a coal conversion systems technical data book [FE-2286-44] p0490 N80-25472

Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels [FE-1800-42] p0490 N80-25473

EDS coal liquefaction process development, phase 4. EDS commercial plant study design update, offsite design basis: Illinois coal market flexibility sensitivity case [FE-2893-37] p0491 N80-25475

Test and evaluate the TRI-GAS low Btu coal gasification process [FE-2798-74] p0491 N80-25476

Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base [PB80-805245] p0491 N80-25478

Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base [PB80-805252] p0491 N80-25479

Investigation of fuels containing coal-oil-water emulsions [FE-2689-5] p0497 N80-26524

Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama [FE-2270-46] p0497 N80-26528

Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research [FE-2202-51] p0498 N80-26534
Biologically important compounds in synfuels processes [CONF-800303-13] p0498 N80-26540
Flash pyrolysis coal liquefaction process development [FE-2244-26] p0498 N80-26543
Coal/oil/water mixture stability, appendix A p0501 N80-27502

PROCUREMENT MANAGEMENT
Energy-efficient procurement in state and local governments [DOE/CS-5255/1] p0355 N80-27207

PRODUCT DEVELOPMENT
Advanced Gas Turbine Powertrain System Development Project p0513 A80-35574
Development of current converters for switching and regulating tasks in energy technology [BMFT-FB-T-79-12] p0567 N80-23585
Cell module and fuel conditioner development [NASA-CR-159828] p0527 N80-23768
Cell module and fuel conditioner [NASA-CR-159875] p0528 N80-23769
Heliostat design cost/performance tradeoffs [SAND-79-8248] p0428 N80-23806
Study of multi-kW solar arrays for Earth orbit application [NASA-CR-161452] p0431 N80-24345
Fuel from farms: A guide to small-scale ethanol production [SERI/SP-451-519] p0485 N80-24478
Baseline automotive gas turbine engine development program [NASA-CR-159670] p0530 N80-24620
Photovoltaic concentrators [SAND-80-0143C] p0439 N80-24832
Amorphous Si solar cells [DOE/ET/23034-T1] p0439 N80-24839
Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base [PB80-805245] p0491 N80-25478
Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base [PB80-805252] p0491 N80-25479
Novel solar cell concentrator photovoltaic converter system [SAND-79-7048] p0445 N80-25843
High-temperature fuel cell research and development [SAN-1485-T1] p0534 N80-25846
Fuel cell research on second-generation molten-carbonate systems [SAN-11276-1] p0534 N80-25847
Development of a second-generation concentrating tracking solar collector [ASE-4460] p0445 N80-25851
Development of polyimide materials for use in solar energy systems [DOE/CS-35305/T1] p0445 N80-25855
Preliminary development of the Band Type Variable Inertia Flywheel (BVIF) [SAND-79-7089] p0559 N80-25879
Optimization of solar assisted heat pump systems via a simple analytic approach [BNL-27316] p0349 N80-25896
Novel concentrator photovoltaic converter system development [SAND-80-7004] p0535 N80-25912
Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules [NASA-CR-163028] p0449 N80-26776
Study of curved glass photovoltaic module and module electrical isolation design requirements [NASA-CR-163033] p0450 N80-26781
High-energy-density composite flywheel [SAND-79-7019] p0561 N80-26803
Development of polycrystal gaAs solar cells [DSE-4042-T28] p0452 N80-26819
Evaluation of heat transfer enhancement in air-heating collectors [ALO-5352-T1] p0454 N80-26848
Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation [BNL-51120] p0455 N80-26863
Exposure: A newsletter for ocean technologists, volume 8, no. 1 [AD-A083941] p0562 N80-26865
The near-term hybrid vehicle program, phase 1 [NASA-CR-163034] p0562 N80-27222
Solid polymer electrolyte fuel cell technology program [NASA-CR-160734] p0538 N80-27801
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices [NASA-CR-163221] p0565 N80-28247
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1 [NASA-CR-163222] p0565 N80-28248
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1 [NASA-CR-163223] p0565 N80-28249
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices [NASA-CR-163224] p0565 N80-28250
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices [NASA-CR-163225] p0565 N80-28251
Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis [NASA-CR-163226] p0565 N80-28252

PRODUCTION ENGINEERING
New technologies for solar energy silicon - Cost analysis of BCL process p0415 A80-40714
Development of pulsed processes for the manufacture of solar cells [NASA-CR-153188] p0427 N80-23771
Analysis of the effects of impurities in silicon [NASA-CR-163133] p0427 N80-23772
Survey of organic electrolytic processes [ANL/OEPM-79-5] p0341 N80-24393
Costing the OMNIUM-G system 7500 p0434 N80-24779
TBC costing --- test bed concentrator p0434 N80-24780
Cost estimating Brayton and Stirling engines p0531 N80-24781
Composition profiling of solar coating materials [COO-2953-4] p0437 N80-24818
Analysis and evaluation in the production process and equipment area of the low-cost solar array project [NASA-CR-163208] p0441 N80-25782
Survey of potential processes for the manufacturing of aluminum --- reducing industrial energy requirements [ANL/OEPM-79-4] p0351 N80-26441
Cost and price estimate of Brayton and Stirling engines in selected production volumes [NASA-CR-163265] p0536 N80-26769
Cost of Czochralski wafers as a function of diameter [NASA-CR-163277] p0449 N80-26771
High resolution, low cost solar cell contact development [NASA-CR-163289] p0450 N80-26782
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results [SAND-78-7072-VOL-1/2] p0453 N80-26830
Design and fabrication of terrestrial photovoltaic solar generators for field testing in regions of intensive insolation [BMFT-FB-T-79-34] p0538 N80-26878

PRODUCTION PLANNING
The world oil market in the years ahead: A research paper [ER-79-10327U] p0352 N80-26749

PROJECT MANAGEMENT
Solar energy program evaluation: An introduction [SERI/TR-51-294] p0427 N80-23798

PROJECT PLANNING
Aquifer thermal energy storage program
p0554 N80-22825
Environmental development plan for biomass energy systems
[DOE/EDP-0032] p0340 N80-23876
Environmental development plan: Geothermal energy systems
[DOE/EDP-0036] p0340 N80-23877
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205
Mission analysis and performance specification studies report, appendix A
[NASA-CR-163035] p0562 N80-27223

PROMETHIUM ISOTOPES
Production of a small nuclear battery
p0505 A80-32957

PROPAGATION MODES
Space-time solutions of the linearized coupled-mode equations
p0520 A80-41074

PROPANE
Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies
[FE-2416-43-VOL-5] p0488 N80-24808

PROPELLANT PROPERTIES
The impact of fuels on aircraft technology through the year 2000
[AIAA PAPER 80-0896] p0470 A80-35898

PROPELLER FANS
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905

PROPULSION SYSTEM CONFIGURATIONS
The impact of fuels on aircraft technology through the year 2000
[NASA-TM-81492] p0482 N80-23472
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies --- various hybrid/electric power train configurations and electrical and mechanical drive-line components
[NASA-CR-163227] p0559 N80-26203
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies
[NASA-CR-163228] p0559 N80-26204
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206
Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207
Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208
Design tradeoff studies and sensitivity analysis, appendix B
[NASA-CR-163036] p0563 N80-27224
Hybrid vehicle potential assessment. Volume 7: Hybrid vehicle review
[NASA-CR-163298] p0563 N80-27231

PROPULSION SYSTEM PERFORMANCE
An analysis of off-guideway energy storage/propulsion systems for dual mode transit systems
p0546 A80-34081
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304] p0519 A80-39014
Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan
[NASA-CR-159806] p0346 N80-25332
EVA metro sedan electric-propulsion system: Test and evaluation
[DOE/CS-1042/1] p0563 N80-27230

PROPULSIVE EFFICIENCY
Turbopropulsion combustion - Trends and challenges
[AIAA PAPER 80-1199] p0519 A80-38964
Fuel conservation through active control of rotor clearances
[AIAA PAPER 80-1087] p0330 A80-41506

PROTECTION
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801

PROTECTIVE COATINGS
Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volumes 1 & 2
p0525 A80-43503
Coatings for fusion reactor environments
p0525 A80-43517
Solar collectors --- search for materials suitable for glazing, housing, coating, and etching
[ALO-5359-T1] p0437 N80-24821

PROTON IRRADIATION
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

PUBLIC HEALTH
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892
Recommended health and safety guidelines for coal gasification pilot plants
[PB80-164890] p0504 N80-27536

PUBLIC RELATIONS
Transportation energy contingencies - A status report on public response and government roles
p0326 A80-37353

PULSE GENERATORS
International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers
p0547 A80-37811
Pulsed power for fusion
p0516 A80-37812
Accelerator module of 'Angara-5' --- for relativistic electron beams in inertial confinement fusion reactor design
p0516 A80-37815
Repetitively pulsed electron beam diode lifetime and stability --- for inertial confinement fusion
p0516 A80-37820
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
Use of transformers in producing high-power output from homopolar generators
p0516 A80-37825
High power pulse modeling of coaxial transmission lines
p0539 A80-37828
TRIDENT - A megavolt pulse generator using inductive energy storage
p0548 A80-37857
Magnet optimization for pulsed energy conversion --- for fusion reactors
p0517 A80-37871
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873
A compressed magnetic field generator systems model
p0548 A80-37875

PULSED LASERS
Pulsed laser techniques for solar cell processing
p0396 A80-35362
The near and long term pulse power requirement for laser driven inertial confinement fusion
p0516 A80-37818
Diagnostic development for advanced power systems --- of gas turbines with coal-fire combustors
[ASME PAPER 80-GT-128] p0522 A80-42242

PUMPS
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678
A free cylinder Stirling engine solar powered water pump
p0382 A80-33679
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680
A simple water pump, powered by solar energy
p0411 A80-38011

The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona
p0436 N80-24793

Classification and evaluation of electric motors and pumps
[DOE/CS-0147] p0352 N80-26670
Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM
p0502 N80-27507

PYROLYSIS
Solar flash pyrolysis of biomass
p0359 A80-33431

A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology
p0467 A80-34531

Waste incineration and pyrolysis
p0475 A80-41174

Pyrolytic gasification of renewable biomass resources
p0478 A80-42466

Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525
Environmental control technology for the flash hydropyrolysis of coal
[BNL-50983] p0345 N80-24884
Flash hydropyrolysis of coal
[BNL-51052] p0490 N80-25468
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477
Flash pyrolysis coal liquefaction process development
[FE-2244-26] p0498 N80-26543

Q

Q SWITCHED LASERS
Pulsed laser techniques for solar cell processing
p0396 A80-35362

QUALITATIVE ANALYSIS
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487
QUALITY CONTROL
Modified aerospace R&QA method for wind turbines
p0519 A80-40335

QUANTUM MECHANICS
Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources
[COO-4776-2] p0355 N80-26958
QUATERNARY ALLOYS
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797

R

RADIANT FLUX DENSITY
Class of axisymmetric mirrors with uniform flux concentration properties along their axes
p0414 A80-40473

RADIATION ABSORPTION
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422

RADIATION COUNTERS
Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement
p0419 A80-42461

RADIATION DAMAGE
Void growth characteristics in laser fusion reactor first walls
p0508 A80-33077

Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180

RADIATION DISTRIBUTION
Analytical and experimental determination of radiation and temperature distributions inside solar receivers
p0377 A80-33634

Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
p0386 A80-33726

Class of axisymmetric mirrors with uniform flux concentration properties along their axes
p0414 A80-40473

Information theory and solar energy collection
p0421 A80-43368

RADIATION EFFECTS
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761

Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination
p0390 A80-33785

Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422

Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840
RADIATION MEASUREMENT
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761

The measurement of solar irradiance on a tilted surface
p0390 A80-33764

Measurement of energy emitted by the working medium of an MHD generator
p0510 A80-34874

Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement
p0419 A80-42461

The estimation of global and sky radiation in Austria
p0421 A80-43477

Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840
RADIATIVE HEAT TRANSFER
Analysis of matrix air heaters --- of radiative heat transfer in solar collectors
p0360 A80-33456

Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors
p0361 A80-33469

Proposed method for testing of radiative cooling flat-plate collectors
p0362 A80-33472

Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator
p0414 A80-39785

Determination of the extinction coefficient of glass fiber insulation
[AIAA PAPER 80-1528] p0330 A80-41488
RADIATIVE TRANSFER
Development and application of high-power lightpipes --- glass fiber optical waveguides for solar radiation transmission
p0401 A80-36833

RADIO BEACONS
Autonomous solar-powered beacon for air navigation use
p0385 A80-33715

RADIO CONTROL
RF feedback stabilization of a thin line cusp magnetoplasma sheath
p0514 A80-36048

RADIOACTIVE WASTES
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8] p0335 N80-22878
High-level waste immobilization program: An overview --- vitrification, drying and calcination
[PNL-3094] p0336 N80-23131

RADIOISOTOPE BATTERIES
Modeling of safe-life tests of thermoelectric batteries --- for space manufacturing experiments
p0519 A80-38758
RAIL TRANSPORTATION
Siemens/Duewag H-Bahn - Technology and comparative assessment --- of rapid transit systems
p0324 A80-34056
Traction studies of northeast corridor rail passenger service: Executive summary
[NASA-CR-162997] p0336 N80-23214
RANKINE CYCLE
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680
Rotary expander for a solar thermo-mechanical conversion system
p0382 A80-33681
Organic Rankine-cycle turbine power plant utilizing low temperature heat sources
[ASME PAPER 80-GT-153] p0522 A80-42265
Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power
[ASME PAPER 80-PET-27] p0333 A80-43341
System thermodynamics of energy conversion plants for geopressured resources
[ASME PAPER 80-PET-31] p0524 A80-43342
The development of an air Brayton and a steam Rankine solar receiver
p0434 N80-24770
An organic Rankine receiver for the SCSTPE program
p0434 N80-24771
The SCSTPE organic Rankine engine
p0531 N80-24773
The dish-Rankine SCSTPE program (Engineering Experiment no. 1) --- systems engineering and economic analysis for a small community solar thermal electric system
p0435 N80-24782
Organic Rankine cycle engine technology in Japan, a preliminary survey
[DOE/SF/10538-1] p0531 N80-24809
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1] p0537 N80-26853
RAPID TRANSIT SYSTEMS
Siemens/Duewag H-Bahn - Technology and comparative assessment --- of rapid transit systems
p0324 A80-34056
The bus systems, passenger transit system of the future
p0324 A80-34067
An analysis of off-guideway energy storage/propulsion systems for dual mode transit systems
p0546 A80-34081
Impact of advanced group rapid transit technology
[PB80-153323] p0351 N80-26219
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239
RARE EARTH ALLOYS
Application of magnesium rich rare-earth alloys to hydrogen storage
p0459 A80-35192
RARE GASES
Low pressure gas filling of laser fusion microspheres
p0506 A80-33053
RAY TRACING
Three dimensional ray tracing through concentric tubular elements using vector methods --- for solar collectors study
p0360 A80-33459
Development of a 3X CPC with evacuated receiver --- Compound Parabolic Concentrator
p0364 A80-33494
The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503
Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors
p0390 A80-33805
REACTION KINETICS
Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry
p0359 A80-33430
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents
p0459 A80-35190
Electrical data of sodium/sulfur cells operating with dissolved catholyte
p0547 A80-37005
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
p0515 A80-37007
Description of processes for producing hydrogen by coal gasification
p0460 A80-37334
Engineering kinetics of short residence time coal liquefaction processes
p0471 A80-37676
Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale
p0472 A80-39421
Fundamental aspects of catalysed coal char gasification
p0473 A80-40753
The effect of catalyst length and downstream reactor distance on catalytic combustor performance
[NASA-TM-81475] p0337 N80-23779
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487
Autocatalytic coal liquefaction process
[NASA-CASE-NPO-14876-1] p0493 N80-26460
Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504
REACTION TIME
Engineering kinetics of short residence time coal liquefaction processes
p0471 A80-37676
REACTOR DESIGN
Mirror fusion reactor design
p0505 A80-33043
First wall protection schemes for inertial confinement fusion reactors
p0506 A80-33050
Void growth characteristics in laser fusion reactor first walls
p0508 A80-33077
Accelerator module of 'Angara-5' --- for relativistic electron beams in inertial confinement fusion reactor design
p0516 A80-37815
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
Plasma physics for nuclear fusion --- Book
p0474 A80-40826
Advanced development of a short residence-time hydrogasifier
[FE-3125-8] p0500 N80-26832
REACTOR MATERIALS
Tokamak reactors and structural materials
p0505 A80-33042
Materials implications of fusion-fission reactor designs
p0506 A80-33044
A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems
p0506 A80-33046
Materials problems with inertial confinement fusion targets
p0506 A80-33051
Fabrication of glass sphere laser fusion targets
p0506 A80-33052
Low pressure gas filling of laser fusion microspheres
p0506 A80-33053
Cryogenic laser fusion target material design considerations
p0506 A80-33055
A review of lifetime analyses for tokamaks
p0507 A80-33056

Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057
Evaluation of materials for EPR power generation
p0507 A80-33058
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059
Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062
Material studies related to TFTR limiters and wall armor
p0507 A80-33063
Void growth characteristics in laser fusion reactor first walls
p0508 A80-33077

REACTOR PHYSICS
Tests of high-powered direct conversion on beams and plasma
[UCRL-82852] p0532 N80-25161

REACTOR TECHNOLOGY
An assessment of magnetic fusion research
[AIAA PAPER 80-0928] p0505 A80-32893
Safety grounding switches in large experiments - General considerations and the TEXT application --- TExas Tokamak
p0517 A80-37867
Coatings for fusion reactor environments
p0525 A80-43517

REACTORS
Tokamak reactors and structural materials
p0505 A80-33042

REAL TIME OPERATION
Real time identification of parameters in building models --- optimal control of solar houses
p0368 A80-33556
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660

RECEIVERS
Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471

RECTENNAS
Increasing power input to a single solar power satellite rectenna by using a pair of satellites
p0539 A80-32942

RECYCLING
Packaging materials - Industrial possibilities for resource recovery
p0475 A80-41171
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products
[ASME PAPER 80-ENAS-9] p0479 A80-43186

REDUCTION (CHEMISTRY)
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963] p0484 N80-24462
Survey of potential processes for the manufacturing of aluminum --- reducing industrial energy requirements
[ANL/OEPM-79-4] p0351 N80-26441

REFINING
Chemical characteristics of oil refinery plumes in Los Angeles
p0325 A80-36476

REFLECTANCE
Specular reflectance properties of solar mirrors as a function of incident angle
p0378 A80-33640
Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators
p0379 A80-33646
Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control
p0388 A80-33741

REFLECTED WAVES
A numerical approach to the flux density integral for reflected sunlight
p0377 A80-33632
Absorption enhancement in solar collectors by multiple reflections
p0403 A80-37306

REFLECTOMETERS
Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors
p0381 A80-33668

REFRACTORY MATERIALS
Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062
Silicon carbide-tungsten heat pipes for high-temperature service
p0327 A80-37680
New possibilities of solar energy conversion by means of refractory thermoelements
p0409 A80-37993
The use of solar furnaces in materials research
p0411 A80-38008

REFRIGERANTS
Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems
p0366 A80-33535
Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants
p0411 A80-38007

REFRIGERATING
Prospects for solar cooling applications in Nigeria
p0382 A80-33676
A thermodynamic analysis of a solar-powered jet refrigeration system
p0407 A80-37978

REFRIGERATING MACHINERY
A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis
p0367 A80-33545
Choice of cycle parameters for solar Freon air conditioning equipment of ejector type
p0391 A80-33862

REFRIGERATORS
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529
A direct solar-heated R22-DMF absorption refrigerator
p0367 A80-33539
Theoretical and experimental investigations of an intermittent solar refrigerator
p0367 A80-33540
Maximum refrigerating capacity of thermoelectric cooling devices
p0515 A80-36831
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector
p0407 A80-37977
Solar powered refrigeration
p0420 A80-42469

REGENERATION (ENGINEERING)
Dual desiccant-bed dehumidifier with solar-heated regeneration
p0384 A80-33705
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216
An open cycle turbine solar thermal power system
p0448 N80-26257

REGENERATORS
High temperature heat pipes for waste heat recovery
[AIAA PAPER 80-1505] p0329 A80-41469

REGIONAL PLANNING
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents
p0324 A80-34018
Investigation of further economics development of regional electricity supply concerns
p0324 A80-34122
Regional planning strategies for hybrid energy optimization
p0332 A80-42451

The potential of renewable energies in planning
the development of rural areas
p0419 A80-42453
Energy availabilities for state and local
development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
REGRESSION ANALYSIS
Performance vs prediction for four classes of
solar hot water systems
p0370 A80-33576
REGULATIONS
The influence of the federal council on the
formulation of the 'Regulation on general
conditions for the supply of electricity for
tariff customers' and the 'Second regulation on
altering of the federal electricity tariff
structure' Attempt at a critical assessment
p0324 A80-34125
Environmental and institutional considerations in
the development and implementation of biomass
energy technologies
[SERI/TR-62-264] p0341 N80-24493
REGULATORS
Microprocessor-controlled digital shunt regulator
--- for solar power systems
p0505 A80-32758
REINFORCED PLASTICS
The efficiency of ballast in composite flywheels
p0549 A80-40068
REINFORCING FIBERS
Composite materials for tokamak wall armor,
limiters, and beam dump applications
p0507 A80-33062
RELATIVISTIC ELECTRON BEAMS
Accelerator module of 'Angara-5' --- for
relativistic electron beams in inertial
confinement fusion reactor design
p0516 A80-37815
NIIEFA research and design in the field of
inertial fusion using relativistic electron
beams and laser radiation
p0472 A80-38221
RELIABILITY ANALYSIS
Photovoltaic array reliability project
p0387 A80-33735
Application of probability methods to evaluate the
reliability of a combined wind-electric and
conventional generation system
p0508 A80-33774
Statistical reliability of wind power assessments
p0469 A80-35741
A Boolean approach to common cause analysis
p0328 A80-40349
Reliability prediction techniques for second
generation marine and industrial gas turbines
[ASME PAPER 79-GT/ISR-3] p0521 A80-42056
Noise spectral density as a device reliability
estimator --- for solar cells
p0422 A80-43763
System-reliability studies for wave-energy
generation
p0540 A80-43830
Evaluation of reliability of operational
solar-energy systems
[CONF-791105-2] p0446 N80-25872
RELIABILITY ENGINEERING
Pulsed power for fusion
p0516 A80-37812
Application of reliability, maintainability, and
availability engineering to solar heating and
cooling systems
p0414 A80-40334
Modified aerospace R&QA method for wind turbines
p0519 A80-40335
RMA engineering applications to Fossil Energy
projects --- Reliability and Maintainability
p0473 A80-40336
Photovoltaic power system reliability considerations
p0520 A80-40338
Reliability and maintainability evaluation of
solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866
Reliability and materials performance of solar
heating and cooling systems
[SOLAR/0906-79/70] p0452 N80-26824
REMOTE REGIONS
A central receiver solar power system for remote
locations
p0410 A80-38006
REMOTE SENSORS
Solar-powered environmental data collection system
[DP-1529] p0440 N80-24867
RESEARCH
Basic research needs in energy conservation
[LBL-9939] p0338 N80-23794
RESEARCH AND DEVELOPMENT
Tokamak reactors and structural materials
p0505 A80-33042
Nitrogen fertilizer production by solar energy
p0357 A80-33402
Development and evaluation of a multiple use solar
energy system for agriculture
p0357 A80-33403
The Belgian solar heating R & D program
p0359 A80-33435
Canada's federal solar energy program
p0323 A80-33436
Solar energy R & D projects in Denmark
p0323 A80-33437
Solar energy projects for heating of buildings in
Germany
p0359 A80-33438
French programs of research and experimentation
aiming at the development of solar energy in
buildings
p0359 A80-33439
National solar heating and cooling programme in
the Netherlands
p0323 A80-33441
Solar Heating '85 - Sweden's national solar
heating program
p0323 A80-33443
Solar energy research in Sweden
p0323 A80-33444
The United Kingdom solar heating programme
p0323 A80-33445
Latent heat energy storage using direct contact
heat transfer
p0546 A80-33519
Theoretical and experimental investigations of an
intermittent solar refrigerator
p0367 A80-33540
Research and development on solar energy for
electric and mechanical power generation
p0373 A80-33601
A pin programmable controller for research systems
--- of solar heating and cooling
p0380 A80-33662
International development assistance for renewable
technologies - Current programs and
institutional requirements
p0323 A80-33672
European progress in photovoltaic development
p0384 A80-33712
The Ramon Areces concentration photovoltaic array
p0384 A80-33714
The DOE photovoltaic concentrator project
p0386 A80-33730
Two new energy information bases - ERDI/West, an
energy research and development inventory for
the West; and ESIDD, energy saving and
investment data and documents
p0324 A80-34016
Solar materials R & D overview emphasizing solar
thermal power systems
p0393 A80-34779
The use of wind data with an operational wind
turbine in a research and development environment
p0513 A80-35730
Hydrogen as an alternative fuel - An intermediate
report on research and development funding by
the Federal Ministry for Research and Technology
p0460 A80-37338
Bioconversion --- biomass energy production -
research and development
p0471 A80-37504
Fischer-Tropsch processes investigated at the
Pittsburgh Energy Technology Center since 1944
p0471 A80-37678
My new types of flat plate solar collectors
p0404 A80-37945
Solar collector related research and development
in the United States for heating and cooling of
buildings
p0408 A80-37983
French solar energy program and its application
for international cooperation
p0327 A80-38017

Solar energy - Will it conserve our non-renewable resources
p0413 A80-38025
Accelerated commercialization of solar energy - A new priority for international action
p0413 A80-38026
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905
Can this car electrify America --- electric car propulsion system development
p0548 A80-39086
Comments on TEC trends --- Thermionic Energy Conversion
p0519 A80-39642
Modified aerospace R&QA method for wind turbines
p0519 A80-40335
RMA engineering applications to Fossil Energy projects --- Reliability and Maintainability
p0473 A80-40336
In-situ gasification and liquefaction show promise
p0473 A80-40525
The potential of renewable energies in planning the development of rural areas
p0419 A80-42453
The utilization of wind-energy resources --- Soviet Union, U.S., West Europe developments review
p0478 A80-42700
Fossil energy prgoram
[ORNL/TM-7057] p0481 N80-22854
Fossil energy program
[ORNL/TM-7031] p0482 N80-22855
New England Energy Development Systems center (NEEDS). An experiment in university-industry cooperative research. Volume 1: Summary of results
[PB80-112972] p0567 N80-22862
New England energy development systems center (NEEDS). An experiment in university-industry cooperative research. Volume 2: Case histories
[PB80-112980] p0541 N80-22863
Survey of foreign research in the field of heat pumps for the heating of dwellings
p0353 N80-26789

RESEARCH FACILITIES
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
p0545 A80-33513
Energy information data base corporate author entries, supplement 3
[DOE/TIC-4585-R1-SUPPL-3] p0567 N80-22846

RESEARCH MANAGEMENT
Program definition and assessment overview --- for thermal energy storage project management
p0551 N80-22790
Unfulfilled technology needs in space power systems
[NASA-TM-80677] p0442 N80-25789

RESEARCH PROJECTS
NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation
p0472 A80-38221
Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226

RESERVOIRS
Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764
Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites
[CONF-791056-2] p0345 N80-24885

RESIDENTIAL AREAS
Economics of solar-assisted heat pump heating systems for residential use
p0367 A80-33543
Improved heat pump model for TRNSYS --- transient simulation program for residential areas
p0508 A80-33553
A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683
The economics of solar hot water heating in multifamily units
p0389 A80-33752
Data handbook for the national solar energy demonstration book
[DSE-5216-T4] p0446 N80-25873
International analysis of residential energy use and conservation
[LBL-9383] p0349 N80-25881
Solar-assisted heat pump-swimming pool synergistics for domestic heating
[UCRL-83458] p0447 N80-25905
Phase 2 experiment test plan: Solar photovoltaic/thermal residential experiment
[COO-4094-65] p0455 N80-26869

RESISTANCE HEATING
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554
A design procedure for wind powered heating systems
p0509 A80-33776

RESONATORS
Excitation of a superconducting strip resonator by a system of Josephson point contacts
p0539 A80-33161

RESOURCES MANAGEMENT
Oil from shale - The potential, the problems, and a plan for development
p0325 A80-36053
Liquid fuel supplies
p0329 A80-40751
Biosources Digest. A journal on biomass utilization, volume 1, number 3
[PB80-139306] p0487 N80-24504
Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/RA-0044] p0342 N80-24736
Projected annual resource requirements at the national and regional level for the Department of Commerce energy forecast 1985 and 2000
[PB80-126956] p0345 N80-24876
Economic baselines for current underground coal mining technology
[NASA-CR-163259] p0491 N80-25764
Beneficial use of rejected heat from electric power plants
[COO-4531-9] p0348 N80-25841

RETORT PROCESSING
Oil shales and carbon dioxide --- air pollution during retorting
p0467 A80-34539
Stabilizing in situ oil shale retorts with injected grout
p0473 A80-39762
Geokinetics in situ shale oil recovery project
[LETC-10787-25] p0483 N80-23755

RETROFITTING
Economic aspects of passive solar remodeling in existing buildings
p0383 A80-33692

REYNOLDS NUMBER
Performance modeling of the vertical axis wind turbine
p0508 A80-33773

RHEOLOGY
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
Characterization and structural studies of the various types of COM
p0494 N80-26468
Rheological properties of solvent refined coal-oil mixtures
p0495 N80-26471

ROADS
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0564 N80-27233

ROASTING
High-level waste immobilization program: An overview --- vitrification, drying and calcination
[PNL-3094] p0336 N80-23131

ROCKET ENGINE DESIGN
Liquid hydrogen engines
p0461 A80-37343

ROCKET ENGINES
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket p0401 A80-36834
ROCKET EXHAUST
Proceedings of the workshop on Stratospheric and Mesospheric Impacts of Satellite Power Systems (SPS) [CONF-7809197] p0541 N80-25363
ROCKET PROPELLANTS
Safe handling of hydrogen in large quantities p0460 A80-37337
ROCKS
Thermal storage in rock beds p0545 A80-33512
Comparison of measured and predicted rock bed storage performance p0546 A80-33870
Geothermal energy - Extracting heat from hot dry rock masses p0471 A80-36625
Attenuation of seismic waves in rocks and applications in energy exploration p0488 N80-24909
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia [E80-10142] p0499 N80-26729
ROOFS
Integration of solar collectors in large prefabricated roof/wall sections p0361 A80-33465
Snow and ice accumulation around solar collector installations [PB80-127053] p0441 N80-24878
ROTATING CYLINDERS
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage [ORO-5759-T1] p0557 N80-24866
ROTATING GENERATORS
Hall effects on MHD Couette flow in a rotating system p0523 A80-43226
ROTATING SHAFTS
Continuously variable ratio transmissions for single-shaft gas turbines [ASME PAPER 80-GT-21] p0331 A80-42158
ROTATION
Whirl and critical speeds of flywheel-container systems aboard vehicles p0550 A80-41649
ROTOR AERODYNAMICS
Sailwing Darrieus rotors p0520 A80-41033
Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines [ASME PAPER 80-GT-117] p0522 A80-42233
Development of a 5.5 m diameter vertical axis wind turbine, phase 2 [BMFT-FB-T-79-04] p0527 N80-22859
ROTOR BLADES (TURBOMACHINERY)
Sailwing Darrieus rotors p0520 A80-41033
Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor p0520 A80-41034
Development of a 5.5 m diameter vertical axis wind turbine, phase 2 [BMFT-FB-T-79-04] p0527 N80-22859
Millville Wind Turbine Generator: Failure analysis and corrective design modification [RFP-2992/3533/79-3] p0529 N80-23831
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines [NASA-CR-159856] p0355 N80-27803
ROTOR SPEED
Data analysis at the Rocky Flats Wind Systems Test and Development Center p0513 A80-35724
ROTORS
Dynamics of a flexible rotor-tower system [ASRL-TR-194-1] p0530 N80-23862
RUBBER
Solar energy systems: Standards for rubber hose [PB80-129828] p0430 N80-23868
RUNGE-KUTTA METHOD
Thermo-fluid analysis of a cylindrical solar heat absorber p0405 A80-37955
RURAL AREAS
A self supporting solar power system for an isolated community p0374 A80-33607
Characteristics of rural energy demand and major barriers and tasks and implementation of potentially viable solar technologies p0381 A80-33673
A renewable energy system for developing countries p0323 A80-33675
Energy systems based on local renewable energy resources for a rural community in a developing country p0323 A80-33677
Use of renewable fuels in the rural development of India p0327 A80-37989
A simple water pump, powered by solar energy p0411 A80-38011
The potential of renewable energies in planning the development of rural areas p0419 A80-42453

S

SAFETY FACTORS
Safety grounding switches in large experiments - General considerations and the TEXT application --- TEXas Tokamak p0517 A80-37867
Safety analysis of an advanced energy system facility p0520 A80-40337
Photovoltaic power system reliability considerations p0520 A80-40338
Primary Li/SOCl2 cells. I - Optimization of D cells with respect to energy density, storability and safety p0549 A80-40602
Recommended health and safety guidelines for coal gasification pilot plants [PB80-164890] p0504 N80-27536
SAFETY MANAGEMENT
Safe handling of hydrogen in large quantities p0460 A80-37337
Safety of liquid hydrogen in air transportation p0461 A80-37341
Environmental development plans for energy technology programs [DOE/EDP-0062] p0341 N80-23881
Criteria for a recommended standard: Occupational exposures in coal gasification plants [PB80-164874] p0504 N80-27535
SAILWINGS
Sailwing Darrieus rotors p0520 A80-41033
SALINITY
Control of gradient zone boundaries --- in solar ponds p0371 A80-33584
Salt concentration gradient solar ponds - Modeling and optimization p0371 A80-33585
Demonstration salt gradient solar pond [ALO-3977-T1] p0453 N80-26837
SALT BEDS
Investigation of heat storages with salt hydrate as storage medium based on the extra water principle [EUR-6646-PT-2] p0564 N80-27818
SALTS
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent --- for solar heating and cooling energy storage p0358 A80-33423
Construction and initial operation of the Miamisburg salt-gradient solar pond p0371 A80-33583
The physics of a saturated Na2O.2B2O3.10H2O non-convecting solar pond p0372 A80-33587

Some aspects of energy storage systems using
Glauber salt mixtures
p0548 A80-37967

SATELLITE ATTITUDE CONTROL
Conceptual design of integrated energy storage and
attitude control system --- for European
satellites
p0547 A80-37455

SATELLITE DESIGN
New directions for future satellite power system
/SPS/ concepts
[AIAA 79-3069] p0539 A80-36963

SATELLITE NETWORKS
Increasing power input to a single solar power
satellite rectenna by using a pair of satellites
p0539 A80-32942

SATELLITE POWER TRANSMISSION (TO EARTH)
Increasing power input to a single solar power
satellite rectenna by using a pair of satellites
p0539 A80-32942
Satellite Power Systems /SPS/ - Overview of system
studies and critical technology
[AAS PAPER 80-084] p0540 A80-41898
SPS phase control system performance via
analytical simulation
[NASA-CR-160582] p0540 N80-22378
Solar power satellites. Citations from the
International Aerospace Abstracts data base
[NASA-CR-162931] p0541 N80-22861
Study of multi-kW solar arrays for Earth orbit
application
[NASA-CR-161453] p0431 N80-24344
The solar power satellite concepts: The past
decade and the next decade
[NASA-TM-81000] p0541 N80-25360
Proceedings of the workshop on Stratospheric and
Mesospheric Impacts of Satellite Power Systems
(SPS)
[CONF-7809197] p0541 N80-25363
Preliminary materials assessment for the Satellite
Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Proceedings of the Workshop on Meteorological
Effects of Satellite Power System Rectenna
Operation and Related Microwave Transmission
Problems
[CONF-7808114] p0542 N80-26004
Satellite Power Systems (SPS): Concept
development and evaluation program, preliminary
assessment
[DOE/ER-0041] p0542 N80-27404
Solar power satellite system definition study.
Volume 1: Executive summary, phase 3
[NASA-CR-160742] p0542 N80-27809
Solar power satellite system definition study.
Volume 2, part 3: Final briefing, 16 May 1980,
phase 3
[NASA-CR-160743] p0543 N80-27810
Solar power satellite system definition study.
Volume 3: Laser SPS analysis, phase 3
[NASA-CR-160744] p0543 N80-27811
Solar power satellite system definition study.
vPMVMF 4: sPMJE sUBUFT sps aOBMZTJT, QIBTF 3
[NASA-CR-160745] p0543 N80-27812
Solar power satellite system definition study.
Volume 5: Space transportation analysis, phase 3
[NASA-CR-160746] p0457 N80-27813

SATELLITE SOLAR ENERGY CONVERSION
Evaluating the mass of current conductors and
required voltage level for large orbiting solar
batteries
p0401 A80-36832
The solar power satellite concepts: The past
decade and the next decade
[NASA-TM-81000] p0541 N80-25360

SATELLITE SOLAR POWER STATIONS
Large space structures - Fantasies and facts
[AIAA 80-0674] p0393 A80-34999
New directions for future satellite power system
/SPS/ concepts
[AIAA 79-3069] p0539 A80-36963
Satellite Power Systems /SPS/ - Overview of system
studies and critical technology
[AAS PAPER 80-084] p0540 A80-41898
Study of multi-kW solar arrays for Earth orbit
application
[NASA-CR-161453] p0431 N80-24344

The solar power satellite concepts: The past
decade and the next decade
[NASA-TM-81000] p0541 N80-25360

SATELLITES
Preliminary environmental assessment for the
Satellite Power System (SPS), revision 1.
Volume 2: Detailed assessment
[DOE/ER-00362-VOL-2] p0453 N80-26836

SCALE MODELS
Physical modeling of buildings --- simulating
thermal behavior of building by scale model
p0383 A80-33688
NOAA's cold-water pipe at-sea test program --- for
OTEC
p0511 A80-35162
WECS site screening by physical modeling
p0514 A80-35748

SCHOOLS
Report on five years of operating experience with
four pioneer school heating experiments ---
using solar energy conversion
p0370 A80-33569

SCHOTTKY DIODES
Characteristics of MOS solar cells built on
/n-type/ In P substrates
p0394 A80-35336
Grain boundary effects on the electrical behavior
of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345
'Band readjustment' effect with applications to
solar cells
p0397 A80-35367
Barrier height enhancement in heterojunction
Schottky-barrier solar cells
p0397 A80-35368
An analytical model of a backwall MIS Schottky
barrier solar cell
p0399 A80-36245
Metal filmed-semiconductor photoelectrochemical
cells
p0515 A80-37006
I-V and C-V characteristics of Au/TiO2 Schottky
diodes
p0413 A80-39055
Optoelectronic and photovoltaic properties of
metal-SiO2-silicon tunneling structures
p0426 N80-23179

SCRAPERS
Studies on questions of design and construction of
chain scraper conveyors --- mining operations
[NASA-TM-75810] p0499 N80-26663

SCREEN EFFECT
Calculation of a low-frequency electromagnetic
field due to MHD machines inside a common
shielding shell
p0509 A80-34311

SCREWS
Solar power units with screw expanders
p0410 A80-38000

SCRUBBERS
Technical aspects of lime/limestone scrubbers for
coal-fired power plants. I - Process chemistry
and scrubber systems
p0326 A80-37618
Technical aspects of lime/limestone scrubbers for
coal-fired power plants. II - Instrumentation
and technology
p0331 A80-41849

SEA WATER
Review - Materials aspects of wave energy converters
p0517 A80-38283

SEAWEEDS
Biosources Digest, a journal on biomass
utilization, volume 1, no. 2 --- ocean farming
[PB80-157662] p0504 N80-27795

SEDIMENTS
Coal-oil mixtures 4: Sedimentation and subsidence
studies of the stability and structure of
coal-oil mixtures
p0494 N80-26467
Characterization and structural studies of the
various types of COM
p0494 N80-26468

SEISMIC WAVES
Further development of seismic methods:
Three-dimensional velocity determinations
[BMFT-FB-T-79-19] p0484 N80-23925

Attenuation of seismic waves in rocks and applications in energy exploration p0488 N80-24909
SEISMOLOGY
Contribution of remote sensing to the geological problems of the country p0472 A80-38801
SELENIDES
n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple p0390 A80-33852
SELENIUM
Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique p0402 A80-37299
SELF ALIGNMENT
The Ansaldo 35 kW solar power system p0373 A80-33600
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems p0518 A80-38492
SEMICONDUCTING FILMS
A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency p0357 A80-32933
A fabrication process for Cu2S-CdS thin film solar cells p0385 A80-33719
Deposition and characterization of gallium arsenide films for solar cells applications p0394 A80-35338
Laser processing in the preparation of silicon solar cells p0396 A80-35363
A new technology to fabricate high-efficiency silicon concentrator solar cells p0397 A80-35366
Properties of photoelectrochemical cells with a chemically sprayed photoanode p0398 A80-35474
Etching of CdS films p0398 A80-35488
Photoconductivity as a probe of polycrystalline films p0398 A80-35490
Processes degrading the electrophysical characteristics of photoconverters in long-term operation p0399 A80-36587
Obtaining film materials with solar furnaces p0400 A80-36593
Screen printed thin film CdS/CdTe solar cell p0401 A80-36898
Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique p0402 A80-37299
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers p0421 A80-43513
A field ion microscope study of microstructural features of solar collector coatings p0422 A80-43528
Electrical properties of polycrystalline GaAs films p0525 A80-43575
Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films p0526 A80-43758
Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices p0526 A80-43760
SEMICONDUCTOR DEVICES
Quasi-static concentrated array with double side illuminated solar cells p0386 A80-33727
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation p0394 A80-35337
Physics underlying the performance of back-surface-field solar cells p0396 A80-35359
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells p0397 A80-35369
Upper limit for the conversion of solar energy p0397 A80-35372
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells p0399 A80-35493
Physics and economics of photovoltaic solar energy conversion p0408 A80-37990
Measurement techniques in thin film polycrystalline materials and devices /solar cells/ p0422 A80-43764
Development of current converters for switching and regulating tasks in energy technology [BMFT-FB-T-79-12] p0567 N80-23585
Semiconductors for high temperature active devices: Silcon, GaA lc]s, and GaP [SAND-80-0379C] p0499 N80-26608
Heterojunction solar cells [SERI/TP-32-134] p0457 N80-27822
SEMICONDUCTOR JUNCTIONS
n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple p0390 A80-33852
Material and device considerations for cascade solar cells p0397 A80-35364
Metal filmed-semiconductor photoelectrochemical cells p0515 A80-37006
Detailed balance limit of the efficiency of tandem solar cells p0413 A80-38282
A low-high-junction solar-cell model developed for use in tandem cell analysis p0420 A80-43122
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact p0422 A80-43583
Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2 p0525 A80-43757
Development of high efficiency stacked multiple bandgap solar cells [AD-A083092] p0450 N80-26797
SEMICONDUCTORS (MATERIALS)
Photovoltaic materials --- for solar energy conversion p0392 A80-34637
Material and device considerations for cascade solar cells p0397 A80-35364
Solar thermoelectric generation using bismuth telluride alloys p0421 A80-43479
Electrical properties of polycrystalline GaAs films p0525 A80-43575
Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2 p0525 A80-43757
Cadium sulfide solar cells, volume 2. Citations from the NTIS data base [PB80-802226] p0425 N80-22872
Cadmium sulfide solar cells. Citations from the Engineering Index data base [PB80-802234] p0426 N80-22873
Preparation of highly efficient solar cells and corrosion studies on solar cell materials [PB80-141294] p0441 N80-24874
SERVICE LIFE
Evaluation of materials for EPR power generation p0507 A80-33058
The application of martensitic stainless steels in long lifetime fusion first wall/blankets p0507 A80-33059
Repetitively pulsed electron beam diode lifetime and stability --- for inertial confinement fusion p0516 A80-37820

Modeling of safe-life tests of thermoelectric batteries --- for space manufacturing experiments
p0519 A80-38758
Fuel property effects on life characteristics of aircraft turbine engine combustors
[ASME PAPER 80-GT-55] p0476 A80-42186

SEWAGE TREATMENT
Microalgal biomass systems for fuels, chemicals, and fertilizers
p0465 A80-33409

SHADES
Generalized shading analysis for paraboloidal collector fields
[ASME PAPER 80-PET-33] p0420 A80-43344

SHADOWS
Determination of the shadows area induced on horizontal and vertical surfaces anyway oriented
p0384 A80-33700

SHAFTS (MACHINE ELEMENTS)
Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19] p0521 A80-42157

SHALE OIL
Oil shales and carbon dioxide --- air pollution during retorting
p0467 A80-34539
Oil from shale - The potential, the problems, and a plan for development
p0325 A80-36053
Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale
p0472 A80-39421
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422
Stabilizing in situ oil shale retorts with injected grout
p0473 A80-39762
Specific heats of Colorado oil shales - A differential scanning calorimetry study
p0475 A80-41892
Oil shale data book
[PB80-125636] p0540 N80-22770
Geokinetics in situ shale oil recovery project
[LETC-10787-25] p0483 N80-23755
Energy from in situ processing of Antrim oil shade
[FE-2346-49] p0483 N80-23808
Use of petroleum-based correlations and estimation methods for synthetic fuels
[NASA-TM-81533] p0502 N80-27509

SHALES
Coal-shale interface detector
[NASA-CASE-MFS-23720-1] p0483 N80-23711

SHALLOW WATER
The application of shallow solar ponds for industrial process heat - Case histories
p0372 A80-33588
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-82367] p0429 N80-23822

SHEAR FLOW
Boundary layer wind shear --- at wind turbine sites
p0469 A80-35743

SHEAR STRESS
The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells
p0394 A80-35340

SHEATHS
High power pulse modeling of coaxial transmission lines
p0539 A80-37828

SHIPS
Electrolytic hydrogen production and its potential utilization for ship propulsion
p0462 A80-37987
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304] p0519 A80-39014

SHIVA LASER SYSTEM
Laser program, volume 3 --- laser fusion
[UCRL-50021-78-VOL-3] p0532 N80-25650

SHORT HAUL AIRCRAFT
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905

SILICON
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343
Charge collection and spectral response of amorphous-silicon solar cells
p0401 A80-36937
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers
p0421 A80-43513
Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films
p0526 A80-43758
Analysis of the effects of impurities in silicon
[NASA-CR-163133] p0427 N80-23772
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-163208] p0441 N80-25782
Cost of Czochralski wafers as a function of diameter
[NASA-CR-163277] p0449 N80-26771

SILICON CARBIDES
Advanced solar receiver development
p0379 A80-33649
Silicon carbide-tungsten heat pipes for high-temperature service
p0327 A80-37680
High temperature heat pipes for waste heat recovery
[AIAA PAPER 80-1505] p0329 A80-41469

SILICON COMPOUNDS
Airport solar photovoltaic concentrator project, phase 1
[DOE/CS-05317/1] p0453 N80-26839

SILICON DIOXIDE
Photoemission measurements of interface barrier energies for tunnel oxides on silicon
p0515 A80-36936

SILICON FILMS
Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications
p0364 A80-33500
Silicon material task - Low cost solar array project /JPL/DOE/
p0393 A80-34780
The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells
p0394 A80-35340
Review of amorphous and polycrystalline thin film silicon solar cell performance parameters
p0414 A80-40712

SILICON JUNCTIONS
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716
Design and performance of silicon solar cells under concentrated sunlight
p0385 A80-33721
MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722
Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination
p0390 A80-33785
Design considerations for a-Si solar cells
p0394 A80-35342
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345
Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346
Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide
p0395 A80-35350

High-efficiency silicon minMIS solar cells - Design and experimental results p0395 A80-35352

A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight p0396 A80-35355

Unified model of fundamental limitations on the performance of silicon solar cells p0396 A80-35356

Physics underlying the performance of back-surface-field solar cells p0396 A80-35359

A study of the factors which control the efficiency of ion-implanted silicon solar cells p0396 A80-35360

Tailored emitter, low-resistivity, ion-implanted silicon solar cells p0396 A80-35361

Pulsed laser techniques for solar cell processing p0396 A80-35362

A new technology to fabricate high-efficiency silicon concentrator solar cells p0397 A80-35366

Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques p0398 A80-35467

Observation of an active photoinductive component in high intensity solar cells p0399 A80-36242

Influence of base resistivity on the temperature characteristics of silicon photoconverters p0514 A80-36590

High-voltage multijunction solar-energy photoelectric converter p0401 A80-36830

Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells p0401 A80-36933

Photoemission measurements of interface barrier energies for tunnel oxides on silicon p0515 A80-36936

Review of amorphous and polycrystalline thin film silicon solar cell performance parameters p0414 A80-40712

Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0416 A80-42140

Silicon solar cells. I - Basics. II - Practical aspects p0419 A80-42455

Grain boundary defects in thin semicrystalline material --- effects on performance of silicon solar cells p0422 A80-43761

SILICON OXIDES

Improved model of In2O3/SnO2-SiO/x/-nSi solar cells p0391 A80-33854

SILICONES

Development of improved insulation materials --- for use with solar collectors [ALO-4295-T2] p0448 N80-26403

SILVER COMPOUNDS

Glassy electrolyte galvanic cells p0515 A80-37008

SILVER HYDROGEN BATTERIES

On the design of silver-hydrogen electrochemical cells p0547 A80-37003

SIMULATORS

Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation [BNL-51120] p0455 N80-26863

SINGLE CRYSTALS

Single-crystal solar cell heterojunctions involving N-cadmium sulfide p0413 A80-39061

Heterostructure single crystal silicon photovoltaic solar cells [DOE/ET/20408-1] p0438 N80-24823

SIS (SEMICONDUCTORS)

Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination p0390 A80-33785

Optimization of oxide-semiconductor/base-semiconductor solar cells p0394 A80-35341

MIS and SIS solar cells p0395 A80-35348

Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide p0395 A80-35350

Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0416 A80-42140

Metal-insulator-semiconductor /MIS/ and semiconductor-insulator-semiconductor /SIS/ solar cells. I - Basic principles. II - Performance characteristics p0419 A80-42457

SITE DATA PROCESSORS

Modified power law equations for vertical wind profiles --- in investigation of windpower plant siting p0468 A80-35719

Effect of complex terrain on wind fluctuations --- for consideration of windpower machine site p0468 A80-35723

Some meteorological activities in the National Swedish Wind Energy Program p0513 A80-35725

SITE SELECTION

Remote sensing applications to wind power facility siting p0470 A80-35746

SITES

Simulation of correlated wind speeds for sites and arrays p0466 A80-33769

Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings p0468 A80-35716

Status of the Large Wind Turbine Siting Handbook p0514 A80-35750

Confidence interval procedures for wind turbine candidate sites p0524 A80-43478

Use of reconnaissance level information for environmental assessment [NUREG-CR-0990] p0336 N80-22883

Methane from landfills [CONF-790999-1] p0485 N80-24472

Methane recovery from urban refuse [CONF-7910105-2] p0486 N80-24485

Siting solar thermal power experiments p0435 N80-24783

Statistical models for wind characteristics at potential wind energy conversion sites [DOE/ET/20283-1] p0489 N80-24968

Siting small wind turbines [PNL-SA-7603] p0493 N80-25878

Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data [SAND-79-7022-VOL-2] p0537 N80-26800

SIZE DETERMINATION

Economical optimum TES size via marginal analysis --- Thermal Energy Storage p0365 A80-33508

SIZING (SHAPING)

The sizing and economics of phase change energy storage units in air-based solar heating systems p0546 A80-33520

SKY RADIATION

The estimation of global and sky radiation in Austria p0421 A80-43477

A model for the angular distribution of sky radiance [DOE-CS-32939-9] p0456 N80-26983

SLAGS

Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators p0519 A80-39746

SLOPES

A simple technique for measuring slope or surface error of a concentrator p0378 A80-33644

Optimum inclination of linear reflectors p0406 A80-37961

SLOT ANTENNAS

Microwave beamed power technology improvement --- magnetrons and slotted waveguide arrays [NASA-CR-163043] p0542 N80-26785

SLUDGE
  Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology
    p0331 A80-4184
SLURRIES
  Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent --- for solar heating and cooling energy storage
    p0358 A80-33423
  The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
    [CONF-791160-VOL-2] p0493 N80-26461
  Grinding of coal in oil
    p0494 N80-26462
  Grinding of coal-in-oil slurries
    p0494 N80-26464
  Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
    p0494 N80-26467
  Characterization and structural studies of the various types of COM
    p0494 N80-26468
  Stabilization of coal/fuel oil slurries
    p0495 N80-26474
  Hydrolyzed wood slurry flow modeling --- hydrocarbon fuel production
    [LBL-10090] p0504 N80-27703
SLURRY PROPELLANTS
  Development and evaluation of highly-loaded coal slurries
    p0496 N80-26481
  Atomization of coal slurry jets
    p0496 N80-26482
SNAP
  Modeling of safe-life tests of thermoelectric batteries --- for space manufacturing experiments
    p0519 A80-38758
SNOW
  Snow and ice accumulation around solar collector installations
    [PB80-127053] p0441 N80-24878
SNOW COVER
  Remote sensing applications to wind power facility siting
    p0470 A80-35746
SODIUM CHLORIDES
  Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions
    p0467 A80-34019
  A preliminary investigation for an Al/AlCl3-NaCl/FeS2 secondary cell
    p0550 A80-42299
SODIUM COOLING
  Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 4: Commercial and pilot plant cost data
    [SAN-1483-1/5] p0558 N80-25803
SODIUM SULFATES
  Experimental study of coolness storage using sodium sulfate decahydrate --- for air conditioning systems
    p0546 A80-33521
SODIUM SULFUR BATTERIES
  Electrical data of sodium/sulfur cells operating with dissolved catholyte
    p0547 A80-37005
  Lithium-metal sulfide and sodium-sulfur batteries for solar energy storage
    [CONF-781228-3] p0424 N80-22843
SOIL MAPPING
  Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
    p0475 A80-41662
SOIL MOISTURE
  HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
    [E80-10142] p0499 N80-26729
SOLAR ARRAYS
  Microprocessor-controlled digital shunt regulator --- for solar power systems
    p0505 A80-32758
  Solar central receiver hybrid - A cost effective future power alternative
    [AIAA PAPER 80-0841] p0357 A80-32856
  Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications
    p0364 A80-33500
  Incidence angle modifier and average optical efficiency of parabolic trough collectors
    p0364 A80-33502
  Solar energy system with heat pump augmentation for industrial process heat - An update
    p0372 A80-33589
  The cost/performance of large central receiver power systems as a function of heliostat design parameters
    p0376 A80-33627
  An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant
    p0377 A80-33628
  Theoretical consideration on solar concentrations by central receiver systems
    p0377 A80-33629
  Optical analysis of Cassegrainian concentrator systems
    p0377 A80-33631
  The Ramon Areces concentration photovoltaic array
    p0384 A80-33714
  Photovoltaic module performance and degradation at various MIT/LL test sites
    p0385 A80-33717
  Photovoltaic concentrator design comparison
    p0385 A80-33723
  Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
    p0386 A80-33726
  Quasi-static concentrated array with double side illuminated solar cells
    p0386 A80-33727
  Development of 1pKW photovoltaic module with concentration
    p0386 A80-33728
  The DOE photovoltaic concentrator project
    p0386 A80-33730
  Connection losses in photovoltaic arrays
    p0387 A80-33734
  Photovoltaic array reliability project
    p0387 A80-33735
  Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators
    p0391 A80-33855
  Silicon material task - Low cost solar array project /JPL/DOE/
    p0393 A80-34780
  Glass fiber reinforced concrete for terrestrial photovoltaic arrays
    p0393 A80-34782
  Solar cell array design handbook - The principles and technology of photovoltaic energy conversion
    p0393 A80-34847
  Evaluating the mass of current conductors and required voltage level for large orbiting solar batteries
    p0401 A80-36832
  An array of directable mirrors as a photovoltaic solar concentrator
    p0402 A80-37297
  Detailed balance limit of the efficiency of tandem solar cells
    p0413 A80-38282
  The design of a solar receiver for a 25-kWe gas turbine engine
    [ASME PAPER 80-GT-131] p0416 A80-42244
  Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors
    p0419 A80-42462
  Generalized shading analysis for paraboloidal collector fields
    [ASME PAPER 80-PET-33] p0420 A80-43344
  Development of pulsed processes for the manufacture of solar cells
    [NASA-CR-153188] p0427 N80-23771
  Design, construction and testing of a 60 kW solar array and power conversion system
    [AD-A080877] p0337 N80-23782

Design of low-cost structures for photovoltaic arrays. Volume 2: Technical studies and appendices
[SAND-79-7002-VOL-2] p0429 N80-23837

Low cost structures for photovoltaic arrays
[SAND-80-0142C] p0430 N80-23853

Study of multi-kW solar arrays for Earth orbit application
[NASA-CR-161453] p0431 N80-24344

Study of multi-kW solar arrays for Earth orbit application
[NASA-CR-161452] p0431 N80-24345

Solar array subsystems study
[NASA-CR-159857] p0431 N80-24742

Proposed method for determining the thickness of glass in solar collector panels
[NASA-CR-163151] p0432 N80-24755

Study of multi-kW solar arrays for Earth orbit applications: Midterm performance review
[NASA-CR-161467] p0437 N80-24798

Battery charge/solar controller for a residential size photovoltaic power system
[COO-4094-62] p0439 N80-24837

Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-163208] p0441 N80-25782

Unfulfilled technology needs in space power systems
[NASA-TM-80677] p0442 N80-25789

Cost of Czochralski wafers as a function of diameter
[NASA-CR-163277] p0449 N80-26771

Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules
[NASA-CR-163028] p0449 N80-26776

Study of curved glass photovoltaic module and module electrical isolation design requirements
[NASA-CR-163033] p0450 N80-26781

Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830

Photovoltaic applications: Past and future --- systems utilizing concentrators and arrays
[CONF-800106-4] p0455 N80-26867

SOLAR AUXILIARY POWER UNITS

Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612

SOLAR CELLS

A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency
p0357 A80-32933

Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications
p0364 A80-33500

A stationary prism concentrator for solar cells
p0365 A80-33504

The Ramon Areces concentration photovoltaic array
p0384 A80-33714

A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716

A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719

Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells
p0385 A80-33720

Design and performance of silicon solar cells under concentrated sunlight
p0385 A80-33721

MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722

The performance of silicon solar cells under concentrated sunlight
p0386 A80-33724

Analytical evaluation of a solar thermophotovoltaic /TPV/ converter
p0386 A80-33725

Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727

Development of 1pKW photovoltaic module with concentration
p0386 A80-33728

Design and analysis of a solar cell concentrating system using a flux redistributor
p0386 A80-33731

Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems
p0387 A80-33732

Connection losses in photovoltaic arrays
p0387 A80-33734

Evaluation of combined photovoltaic/thermal collectors
p0387 A80-33736

Optimization of photovoltaic/thermal collector heat pump systems
p0387 A80-33737

General formulation of the current-voltage characteristic of a p-n heterojunction solar cell
p0390 A80-33782

Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination
p0390 A80-33785

Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces
p0390 A80-33786

n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852

Improved model of In2O3/SnO2-SiO/x/-nSi solar cells
p0391 A80-33854

Geometric and kinematic characteristics of solar-tower heliostats
p0391 A80-33857

Photovoltaic materials --- for solar energy conversion
p0392 A80-34637

Silicon material task - Low cost solar array project /JPL/DOE/
p0393 A80-34780

Glass fiber reinforced concrete for terrestrial photovoltaic arrays
p0393 A80-34782

Solar cell array design handbook - The principles and technology of photovoltaic energy conversion
p0393 A80-34847

Thin-film solar cells - A unified analysis of their potential
p0393 A80-35335

Characteristics of MOS solar cells built on /n-type/ In P substrates
p0394 A80-35336

The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337

Deposition and characterization of gallium arsenide films for solar cells applications
p0394 A80-35338

The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339

The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells
p0394 A80-35340

Optimization of oxide-semiconductor/base-semiconductor solar cells
p0394 A80-35341

Design considerations for a-Si solar cells
p0394 A80-35342

Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343

Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345

Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346

MIS and SIS solar cells
p0395 A80-35348

A comparison of majority- and minority-carrier silicon MIS solar cells
p0395 A80-35349

Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide
p0395 A80-35350

Detailed modeling of inversion-layer solar cells
p0395 A80-35351

High-efficiency silicon minMIS solar cells - Design and experimental results
p0395 A80-35352

Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353

Updating the limit efficiency of silicon solar cells
p0395 A80-35354

A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight
p0396 A80-35355

Unified model of fundamental limitations on the performance of silicon solar cells
p0396 A80-35356

A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection
p0396 A80-35358

Physics underlying the performance of back-surface-field solar cells
p0396 A80-35359

A study of the factors which control the efficiency of ion-implanted silicon solar cells
p0396 A80-35360

Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361

Pulsed laser techniques for solar cell processing
p0396 A80-35362

Laser processing in the preparation of silicon solar cells
p0396 A80-35363

Material and device considerations for cascade solar cells
p0397 A80-35364

Cascade solar-cell design for high-temperature operation
p0397 A80-35365

A new technology to fabricate high-efficiency silicon concentrator solar cells
p0397 A80-35366

'Band readjustment' effect with applications to solar cells
p0397 A80-35367

Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368

Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects
p0397 A80-35370

Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385

Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques
p0398 A80-35467

Properties of photoelectrochemical cells with a chemically sprayed photoanode
p0398 A80-35474

Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 1
p0398 A80-35480

Electron-beam-induced current characterization of polycrystalline silicon solar cells
p0398 A80-35482

The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements --- thin film solar cell
p0398 A80-35486

Etching of CdS films
p0398 A80-35488

Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements
p0398 A80-35491

The design and utilization of a microprocessor-controlled absolute spectral response system --- for solar cells
p0398 A80-35492

Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells
p0399 A80-35493

A circuit for measurement of the fill factor of solar cells
p0399 A80-36121

Observation of an active photoinductive component in high intensity solar cells
p0399 A80-36242

An analytical model of a backwall MIS Schottky barrier solar cell
p0399 A80-36245

Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588

Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591

Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

Thin-film and ceramic solar converters based on cadmium sulfide and selenide
p0401 A80-36824

Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters
p0401 A80-36829

High-voltage multijunction solar-energy photoelectric converter
p0401 A80-36830

Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898

Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells
p0401 A80-36933

Charge collection and spectral response of amorphous-silicon solar cells
p0401 A80-36937

New directions for future satellite power system /SPS/ concepts
[AIAA 79-3069] p0539 A80-36963

Importance of the interface in noncrystalline /poly and amorphous/ conductor-insulator-semiconductor /CIS/ solar cells
p0402 A80-37192

Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells
p0402 A80-37195

Realization of p-n junction solar cells by an ion implantation doping procedure
p0409 A80-37991

On direct conversion of sunlight to electricity
p0409 A80-37994

Performance of the noval solar cell substitute for the future
p0409 A80-37995

MOS solar cells
p0409 A80-37996

Optimization of graded doping CdTe solar cells
p0409 A80-37998

Detailed balance limit of the efficiency of tandem solar cells
p0413 A80-38282

Single-crystal solar cell heterojunctions involving N-cadmium sulfide
p0413 A80-39061

Ion-implanted laser annealed silicon solar cells
p0414 A80-40252

Required minimum value of barrier height in minority-carrier M.I.S. solar cells
p0414 A80-40474

Review of amorphous and polycrystalline thin film silicon solar cell performance parameters
p0414 A80-40712

New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

Current from the sun - A look at the economics of solar cells
p0416 A80-42101
Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities
p0416 A80-42135
Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells
p0416 A80-42140
Free convection in solar collectors
p0417 A80-42440
Review of solid state physics --- emphasizing background for understanding solar cells
p0419 A80-42454
Silicon solar cells. I - Basics. II - Practical aspects
p0419 A80-42455
Polycrystalline solar cells
p0419 A80-42456
Metal-insulator-semiconductor /MIS/ and semiconductor-insulator-semiconductor /SIS/ solar cells. I - Basic principles. II - Performance characteristics
p0419 A80-42457
Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors
p0419 A80-42462
Scanning light spot analysis of faulty solar cells
p0420 A80-43118
A low-high-junction solar-cell model developed for use in tandem cell analysis
p0420 A80-43122
The design and fabrication of high efficiency thin film CdS/Cu2S solar cells
p0422 A80-43516
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583
A computer analysis of heteroface solar cells with ultrathin window layer
p0422 A80-43589
Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2
p0525 A80-43757
Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices
p0526 A80-43760
Grain boundary defects in thin semicrystalline material --- effects on performance of silicon solar cells
p0422 A80-43761
Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon
p0422 A80-43762
Noise spectral density as a device reliability estimator --- for solar cells
p0422 A80-43763
Measurement techniques in thin film polycrystalline materials and devices /solar cells/
p0422 A80-43764
Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base
[PB80-803794] p0425 N80-22869
Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base
[PB80-803778] p0425 N80-22870
Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base
[PB80-803786] p0425 N80-22871
Cadium sulfide solar cells, volume 2. Citations from the NTIS data base
[PB80-802226] p0425 N80-22872
Cadmium sulfide solar cells. Citations from the Engineering Index data base
[PB80-802234] p0426 N80-22873
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180
Solor Cell Heterojunctions Involving N-cadmium sulfide and certain P-type semiconductor single crystals
p0426 N80-23766
Properties of sputtered ITO/CdTe solar cells
p0426 N80-23767
Analysis of the effects of impurities in silicon
[NASA-CR-163133] p0427 N80-23772
Method of mitigating titanium impurities effects in p-type silicon material for solar cells
[NASA-CASE-NPO-14635-1] p0431 N80-24741
Results of the 1979 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-163013] p0432 N80-24752
The applicability of DOE solar cell and array technology to space power
[NASA-CR-163143] p0432 N80-24753
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823
Amorphous Si solar cells
[DOE/ET/23034-T1] p0439 N80-24839
Extrinsic losses in solar cells for linear focus systems 4
[SAND-79-1781] p0439 N80-24842
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847
Preparation of highly efficient solar cells and corrosion studies on solar cell materials
[PB80-141294] p0441 N80-24874
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Novel solar cell concentrator photovoltaic converter system
[SAND-79-7048] p0445 N80-25843
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Studies of thermochemical water-splitting cycles
[NASA-CR-163029] p0449 N80-26409
Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges
[SAND-79-7051-VOL-1] p0449 N80-26611
Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules
[NASA-CR-163028] p0449 N80-26776
High resolution, low cost solar cell contact development
[NASA-CR-163289] p0450 N80-26782
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797
Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819
Thin film polycrystalline silicon solar cells
[DOE/SF/23047-3] p0452 N80-26828
Heterojunction solar cells
[SERI/TP-32-134] p0457 N80-27822

SOLAR COLLECTORS
An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection
[AIAA PAPER 80-0869] p0357 A80-32867
Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 and 3
p0357 A80-33401
Development and evaluation of a multiple use solar energy system for agriculture
p0357 A80-33403
The application of existing solar energy collecting equipment in agriculture, horticulture and fishculture
p0358 A80-33404
Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones
p0358 A80-33425
Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system
p0358 A80-33426
Solar energy collection using the reversible ammonia dissociation reaction
p0358 A80-33427

French programs of research and experimentation aiming at the development of solar energy in buildings
p0359 A80-33439

Industrial solar energy activity in Monaco
p0359 A80-33440

Derivation of efficiency and loss factors for solar air heaters
p0359 A80-33447

New air-heating collector design and performance
p0359 A80-33449

The characterization of crushed glass as a transpired air heating solar collector material
p0360 A80-33450

Design and performance of a roof integrated solar air heater
p0360 A80-33451

An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems
p0360 A80-33452

Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography
p0360 A80-33453

Theoretical and experimental investigation of the flow in a flat plate collector
p0360 A80-33454

Forced convection in solar collectors
p0360 A80-33455

Analysis of matrix air heaters --- of radiative heat transfer in solar collectors
p0360 A80-33456

Thermal performance of compounds used to improve heat transfer in solar collectors
p0360 A80-33457

Heat transfer through collector glass covers
p0360 A80-33458

Three dimensional ray tracing through concentric tubular elements using vector methods --- for solar collectors study
p0360 A80-33459

Cylindrical glass tubes for flat plate collector covers
p0361 A80-33460

The effect of pressure on the performance of cylindrical solar collectors
p0361 A80-33461

Effect of off-south orientation on optimum conditions for maximum solar energy absorbed by flat plate collector augmented by plane reflector
p0361 A80-33462

The unitary solar collector - A new approach to low-cost, flat-plate systems
p0361 A80-33463

Low cost high temperature adhesive bonded solar collectors
p0361 A80-33464

Integration of solar collectors in large prefabricated roof/wall sections
p0361 A80-33465

Testing the performance of solar collectors under standard conditions
p0361 A80-33466

Equations for representing the UL-dependence in collector test procedures --- heat loss coefficient
p0361 A80-33467

Tests of all-day collector performance
p0361 A80-33468

Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors
p0361 A80-33469

CSIRO collector test facilities
p0361 A80-33470

Laboratory tests for flat plate solar collectors
p0361 A80-33471

Proposed method for testing of radiative cooling flat-plate collectors
p0362 A80-33472

An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473

Weatherability test of plastic glazing materials for collectors
p0362 A80-33474

Results of long term natural weathering effects on solar collectors under stagnation conditions
p0362 A80-33475

A method for balancing flow rates in rows of parallel collectors
p0362 A80-33476

Small-scale solar simulator for indoor testing of collector modules and materials
p0362 A80-33477

Design of an inexpensive solar simulator
p0362 A80-33478

Prediction of long-term performance of closed-loop concentrating solar collector systems
p0362 A80-33479

Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480

Evaluation of linear concentrating collectors
p0362 A80-33481

A data analysis program for collector testing --- solar energy for Fort Hood, Texas
p0362 A80-33482

Design and development of a paraboloidal dish solar collector for intermediate temperature service
p0363 A80-33483

Suntec/Hexcel parabolic trough --- solar collector design and efficiency for industrial process energy
p0363 A80-33485

Analysis of experimental test results on a high temperature receiver model --- for solar thermal electric power plant
p0363 A80-33486

Environmental testing of solar reflector structures
p0363 A80-33487

Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season
p0363 A80-33488

Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers
p0363 A80-33489

Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance
p0363 A80-33490

Low cost, low technology 3.4x concentrating collector for industrial/agricultural applications
p0363 A80-33491

Low cost vee-trough evacuated tube collector module
p0363 A80-33492

Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors --- Compound Parabolic Concentrator
p0364 A80-33493

Development of a 3X CPC with evacuated receiver --- Compound Parabolic Concentrator
p0364 A80-33494

Experimental and theoretical evaluation of a novel concentrating solar energy collection system
p0364 A80-33495

Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors
p0364 A80-33496

Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497

Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498

A unique new Fresnel lens solar concentrator
p0364 A80-33499

Applications of CPC's in solar energy - An overview --- Compound Parabolic Concentrators
p0364 A80-33501

Incidence angle modifier and average optical efficiency of parabolic trough collectors
p0364 A80-33502

The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503

A stationary prism concentrator for solar cells
p0365 A80-33504

A non-tracking inflated cylindrical solar concentrator
p0365 A80-33506

Economical optimum TES size via marginal analysis --- Thermal Energy Storage
p0365 A80-33508

Two stage evaporative cooling using a rockbed associated with the active clearview solar collector
p0366 A80-33530

Experimental investigation on control modes for an absorption chiller of low capacity --- in air conditioning systems
p0366 A80-33532

Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537

On the use of a zeolite 13X-H20 intermittent cycle for the application to solar climatization of buildings
p0367 A80-33538

A direct solar-heated R22-DMF absorption refrigerator
p0367 A80-33539

Reducing solar costs with the Solar-Assisted-Templifier --- heat pumps in series or parallel systems
p0367 A80-33541

Heat pump impact upon solar collection design and cost
p0368 A80-33548

A solar assisted heat pump experiment
p0368 A80-33550

Mass flow considerations for solar air heating systems
p0369 A80-33558

Solar heating systems in Scandinavian climate - Reality or daydreams
p0369 A80-33559

Solar heating simulation - Accuracy and precision of a model using daily data
p0369 A80-33561

The layout of solar hot water systems, using statistical meteo- and heat demand data
p0369 A80-33562

Simulation of the FSEC solar cooling system
p0369 A80-33563

Study of the nonlinear dynamics of a flat-plate collector
p0369 A80-33565

Honeywell General Offices concentrating collector system - Installation and operation
p0370 A80-33567

Solar heating and cooling performance in CSU Solar House III
p0370 A80-33570

Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report
p0370 A80-33571

Solar heating and hot water supply system of Fuji Electric Solar House
p0370 A80-33573

The application of shallow solar ponds for industrial process heat - Case histories
p0372 A80-33588

Application of solar energy to food industry - A distillery
p0372 A80-33591

A prototype of solar linear concentrators plant installed to supply industrial heat
p0372 A80-33592

30/50 kWE solar thermal power plant of the distributed type
p0373 A80-33599

The Ansaldo 35 kW solar power system
p0373 A80-33600

Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs
p0374 A80-33603

Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604

A self supporting solar power system for an isolated community
p0374 A80-33607

The solar ten megawatt pilot plant
p0374 A80-33608

Sodium cooled solar central receiver power station
p0375 A80-33610

Economic implications of a low cost heliostat design
p0375 A80-33613

The cost and value of washing heliostats
p0375 A80-33616

Solar design by the 'Cosine Hour' method --- collector with surface orientation to optimize insolation
p0375 A80-33618

Performance analysis for collector-side reflector systems
p0376 A80-33621

Cooling system parameter analysis --- for solar collectors
p0376 A80-33622

Thermic diode performance characteristics and design manual
p0376 A80-33623

DELSOL - A code for central receiver performance and optimization calculations
p0376 A80-33626

Theoretical consideration on solar concentrations by central receiver systems
p0377 A80-33629

Optical analysis of paraboloidal concentrators with secondary reflectors
p0377 A80-33630

A numerical approach to the flux density integral for reflected sunlight
p0377 A80-33632

Analytical and experimental determination of radiation and temperature distributions inside solar receivers
p0377 A80-33634

Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine
p0377 A80-33635

Helios and reconcentrators --- computer code for heliostat performance predictions
p0378 A80-33637

Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638

Process steam generation by a facetted, non-imaging solar concentrator
p0378 A80-33639

A computational alignment method for paraboloidal collectors
p0378 A80-33641

Collector deflections due to wind gusts and control scheme design
p0378 A80-33643

How to measure the optical quality of focusing solar collectors without laser ray tracing
p0378 A80-33645

Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators
p0379 A80-33646

Effects of outdoor exposure on the solar reflectance properties of silvered glass mirrors
p0379 A80-33647

Thermodynamic trade-offs for gas cooled high temperature solar tower receivers
p0379 A80-33648

Advanced solar receiver development
p0379 A80-33649

Study and realisation of a high temperature air cooled solar receiver
p0379 A80-33653

Users group for central receiver testing --- of heliostats
p0380 A80-33654

Testing of the 10-MWe pilot plant solar central receiver
p0380 A80-33656

One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657

Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660

Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems
p0381 A80-33664

Measurements of performance and efficiency of solar energy systems
p0381 A80-33667

Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors
p0381 A80-33668

An experimental approach for studying direct solar gain optics of model interiors
p0382 A80-33687

Performance analysis of a natural convection collector system --- of solar house
p0383 A80-33695

A procedure for determining solar heat gain factors for south-facing vertical surfaces on average days
p0384 A80-33699

Determination of the shadows area induced on horizontal and vertical surfaces anyway oriented
p0384 A80-33700

An application of phase change materials in passive solar systems
p0384 A80-33703

Analytical and economic evaluation of heat pipe augmented passive solar heating systems
p0384 A80-33704

Dual desiccant-bed dehumidifier with solar-heated regeneration
p0384 A80-33705

Design and performance of silicon solar cells under concentrated sunlight
p0385 A80-33721

Photovoltaic concentrator design comparison
p0385 A80-33723

A novel mildly concentrating photovoltaic/thermal total energy system
p0386 A80-33729

Design and analysis of a solar cell concentrating system using a flux redistributor
p0386 A80-33731

Evaluation of combined photovoltaic/thermal collectors
p0387 A80-33736

Optimization of photovoltaic/thermal collector heat pump systems
p0387 A80-33737

Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control
p0388 A80-33741

Application of circumsolar measurements to concentrating collectors
p0389 A80-33761

The simulation of partially and fully tracking flat plate collectors in northern latitudes
p0390 A80-33763

Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors
p0390 A80-33805

Calculation of the angular error of a solar cylindrical concentrator made from sheet material
p0391 A80-33856

Geometric and kinematic characteristics of solar-tower heliostats
p0391 A80-33857

The electronic aberrogram recorder --- for solar concentrators
p0391 A80-33858

Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
p0391 A80-33859

Development of a combined solar heating/heat pump system for conditions typical of the Crimea
p0391 A80-33863

Dynamic modelling and verification of a flat-plate solar collector
p0391 A80-33864

Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south
p0392 A80-33867

Thermosyphon circulation in solar collectors
p0392 A80-33869

Optimization of flat-plate collector-flat mirror systems
p0392 A80-33871

Fluid circulation control in conventional and heat pipe planar solar collectors
p0392 A80-33872

A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/
p0392 A80-34561

Solar collectors for low and intermediate temperature applications
p0392 A80-34598

Low-cost, high-performance solar selective paint coatings
p0393 A80-34781

Solar energy utilization --- Book
p0393 A80-34841

Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
p0399 A80-35500

Heat losses of a static low-concentration solar collector
p0399 A80-35838

Evaluating the performance of reflecting concentrating systems
p0400 A80-36592

Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594

Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

Calculation principles for heliostat fields of solar power plants
p0401 A80-36825

Heating characteristics of concentrator/receiver system employing a selective absorbing surface
p0401 A80-36826

Maximally concentrating collectors for solar energy applications
p0403 A80-37301

Absorption enhancement in solar collectors by multiple reflections
p0403 A80-37306

The flat plate solar collector - Its steady-state and transient state behaviour
p0403 A80-37943

Flat-plate solar collectors - Influence of design material and configuration on performance
p0404 A80-37944

My new types of flat plate solar collectors
p0404 A80-37945

Measurements on a flat thermal solar energy collector with a cellular structure after Francia
p0404 A80-37946

Flat plate boosters for elevating temperatures
p0404 A80-37947

A black liquid flat plate collector for economical applications
p0404 A80-37948

Passive solar wall collectors
p0404 A80-37949

A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector
p0404 A80-37950

Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951

Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes
p0405 A80-37952

High-efficiency solar concentrator
p0405 A80-37953

An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector
p0405 A80-37956

Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors
p0405 A80-37957

Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating p0406 A80-37959

Low cost spiral shaped solar collector p0406 A80-37960

Phase change collector wall versus water collector wall p0406 A80-37962

On the evaluation of the feasibility of solar collectors for electrical power generation applications p0406 A80-37963

Performance of a storage unit coupled to a flat plate solar collector p0406 A80-37964

Solar heating systems with air collectors and rock bed storage p0406 A80-37969

Hot water production by means of a solar thermosyphon loop p0407 A80-37971

Effectiveness of packed-bed solar air heaters p0407 A80-37972

Performance comparison of different types of solar water heaters under Egyptian conditions p0407 A80-37973

Latent heat diode wall --- study of passive solar heating of houses p0407 A80-37975

Comparison between two absorption cooling systems of the 'open' type under different climate conditions p0407 A80-37976

Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector p0407 A80-37977

Development of a solar desiccant dehumidifier p0408 A80-37979

Liquid desiccant solar heat pump for developing nations p0408 A80-37980

Solar collector related research and development in the United States for heating and cooling of buildings p0408 A80-37983

California State energy efficient State Office Building p0327 A80-37984

Solar power units with screw expanders p0410 A80-38000

New developments for future solar power plants p0410 A80-38001

A central receiver solar power system for remote locations p0410 A80-38006

Combination of wind and solar energies at the Northern Coast of Egypt p0411 A80-38014

Economic considerations of solar energy p0412 A80-38019

Wangen EVS-solarhouse with a positive balance sheet p0413 A80-38305

Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator p0414 A80-39785

Class of axisymmetric mirrors with uniform flux concentration properties along their axes p0414 A80-40473

The effect of a black chrome selective surface on the thermal performance of a solar collector p0414 A80-40538

Attenuation of solar energy by high, thin clouds p0414 A80-40709

Measurement of wind speed distributions across a solar collector p0415 A80-40717

Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors p0415 A80-40718

Characteristics of axicon concentrators for use in photovoltaic energy conversion p0520 A80-40719

Solar elevation angle probability distribution p0415 A80-40721

Temperature distributions in the flat-plate collector under actual unsteady insolation p0415 A80-40937

Equitable performance comparison and economic evaluation of active and passive solar energy systems p0329 A80-40965

Plastic solar collectors for 'low energy' applications p0415 A80-41948

Concentration characteristics of composite parabolic concentrators p0416 A80-41950

Thermal insulation of a low capital cost solar-energy collector p0416 A80-41951

The technology of flat plate collectors p0417 A80-42439

Free convection in solar collectors p0417 A80-42440

Advanced non-concentrating solar collectors p0417 A80-42441

Concentrating collectors p0417 A80-42442

Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement p0419 A80-42461

Short course in microprocessors for solar energy applications - Systems --- heating system and collector control p0419 A80-42463

Solar power --- solar concentrators for solar power plants p0420 A80-42468

The performance of solar thermal electric power systems employing small heat engines [ASME PAPER 80-PET-25] p0523 A80-43340

Generalized shading analysis for paraboloidal collector fields [ASME PAPER 80-PET-33] p0420 A80-43344

Quasi-optimum pseudo-Lambertian reflecting concentrators - An analysis p0421 A80-43367

Information theory and solar energy collection p0421 A80-43368

Solar thermoelectric generation using bismuth telluride alloys p0421 A80-43479

Chromatic dispersion concentrator applied to photovoltaic systems p0524 A80-43481

Cusp mirror - Heat pipe evacuated tubular solar thermal collector p0421 A80-43482

On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications p0421 A80-43485

Transmission of diffuse radiation through CPC and flat plate collector glazings --- Compound Parabolic Collector p0421 A80-43486

A field ion microscope study of microstructural features of solar collector coatings p0422 A80-43528

Handbook of solar energy data for south-facing surfaces in the United States. Volume 3: Average hourly and total daily insolation data for 235 localities. North Carolina - Wyoming [NASA-CR-163000] p0423 N80-22785

Thermal energy storage effort at JPL p0552 N80-22800

Methods for reducing heat losses from flat plate solar coolectors, phase 3 [COO-2597-5] p0424 N80-22851

Development and preparation for series production of a modular solar space heating system, phases 1 and 2 [BMFT-FB-T-79-02] p0424 N80-22857

Technical applications of solar energy [BMFT-FB-T-79-06] p0424 N80-22860

Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base [PB80-803794] p0425 N80-22869

Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base [PB80-803778] p0425 N80-22870

Optical coatings for solar cells and solar
collectors, volume 2. Citations from the NTIS
data base
[PB80-803786] p0425 N80-22871
Development of a solar thermal receiver for high
temperature applications
[SERI/TP-333-485] p0428 N80-23800
Metal foils for direct application of absorber
coatings on solar collectors
[LBL-9324-REV] p0428 N80-23810
Low-cost mirror concentrator based on
double-walled metallized, Tubular films
[ALO-4227-12] p0428 N80-23811
Study and analysis of a low cost cement bonded
flat plate solar collector
[ALO-4122-T1] p0428 N80-23816
Solar energy systems: Test methods for collector
insulations
[PB80-132038] p0430 N80-23867
Solar collector fluid parameter study
[PB80-125891] p0430 N80-23869
Comparison of indoor-outdoor thermal performance
for the Sunpak evacuated tube liquid collector
[NASA-CR-161421] p0432 N80-24745
Proposed method for determining the thickness of
glass in solar collector panels
[NASA-CR-163151] p0432 N80-24755
Proceedings of the First Semiannual Distributed
Receiver Program Review
[NASA-CR-163135] p0433 N80-24760
Heat and electricity from the Sun using parabolic
dish collector systems
p0433 N80-24761
Line-focus concentrating collector program
p0433 N80-24762
Test Bed Concentrator (TBC)
p0433 N80-24763
Test bed concentrator mirrors
p0433 N80-24764
Initial test bed concentrator characterization
p0433 N80-24765
The OMNIUM-G ETC-25 tracking concentrator
p0434 N80-24766
The Shenandoah concentrator
p0434 N80-24767
The 1st generation low cost point focus solar
concentrator
p0434 N80-24768
A cellular glass substrate solar concentrator
p0434 N80-24769
OMNIUM-G concentrator test results
p0434 N80-24777
Costing the OMNIUM-G system 7500
p0434 N80-24779
TBC costing --- test bed concentrator
p0434 N80-24780
Siting solar thermal power experiments
p0435 N80-24783
A study of mass production and installation of
small solar thermal electric power systems
p0436 N80-24789
The Crosbyton project
p0436 N80-24790
IEA/SPS 500 kW distributed collector system
p0436 N80-24791
Coolidge solar powered irrigation pumping project
p0436 N80-24792
Preliminary operational results from the Willard
solar power system
p0436 N80-24794
Solar total energy-large scale experiment,
Shenandoah, Georgia
p0436 N80-24795
Solar total energy project at Shenandoah, Georgia
system design
p0436 N80-24796
Solar reflectance, transmittance and absorptance
of common materials
[SERI/TP-334-457] p0437 N80-24805
Residential solar heating and cooling using
evacuated tube solar collectors: CSU solar
house 3
[COO-2858-24-SUMM] p0437 N80-24807
Solar collectors --- search for materials suitable
for glazing, housing, coating, and etching
[ALO-5359-T1] p0437 N80-24821
Development of a second-generation concentrating
tracking solar collector
[ASE-4371] p0438 N80-24828
Application of circumsolar measurements to
concentrating collectors
[LBL-9412] p0439 N80-24840
Snow and ice accumulation around solar collector
installations
[PB80-127053] p0441 N80-24878
Heat conduction in partial vacuum
[ALO-5367-1] p0441 N80-25618
CSU Solar House 3: Solar heating and cooling
system performance
[COO-30122-3] p0442 N80-25806
Design and test of non-evacuated solar collectors
with compound parabolic concentrators
[RPI-79-42] p0443 N80-25811
Development of materials for a luminescent solar
collector
[COO-4996-1] p0443 N80-25812
Design of a system using CPC collectors to collect
solar energy and to produce industrial process
steam
[ANL-79-102] p0443 N80-25814
Solar project description for A-Frame Industries'
single family residence: Kaneohe, Hawaii
[SOLAR/1010-79/50] p0444 N80-25818
Solar collector studies for solar heating and
cooling applications
[ALO-5355-T1] p0445 N80-25850
Development of a second-generation concentrating
tracking solar collector
[ASE-4460] p0445 N80-25851
Cleaning agents and techniques for concentrating
solar collectors
[SAND-80-7005C] p0445 N80-25860
Comparative performance of two types of evacuated
tubular solar collectors in a residential
heating and cooling system
[COO-2577-19] p0446 N80-25864
Reliability and maintainability evaluation of
solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866
Conceptual design of advanced central receiver
power systems sodium-cooled receiver concept.
Volume 1: Executive summary
[SAN-1483-1/1] p0446 N80-25875
Conceptual design of advanced central receiver
power systems sodium-cooled receiver concept.
Volume 2, book 1: Commercial plant conceptual
design
[SAN-1483-1/2] p0447 N80-25876
Comparison between results of the HELIOS and
MIRVAL computer codes applied to central
receiver solar-energy collection
[SAND-79-8266] p0448 N80-26075
Development of improved insulation materials ---
for use with solar collectors
[ALO-4295-T2] p0448 N80-26403
Thermal Power Systems (TPS); Point-Focusing
Thermal and Electric Applications (PFTEA).
Volume 2: Detailed report, fiscal year 1979
[NASA-CR-163023] p0449 N80-26770
Development of an Air Brayton solar receiver
[NASA-CR-163027] p0450 N80-26777
Solar central receiver prototype heliostat.
Volume 3: Cost estimates
[SAN-1604-3] p0451 N80-26801
Addition of inexpensive solar air-heaters to a
pre-engineered metal building
[ALO-4086-1] p0452 N80-26818
Survey and evaluation of current design of
evacuated collectors
[ALO-5350-1] p0452 N80-26823
Development of a low-temperature, low-cost, black
liquid solar collector, phase 2 --- weathering
tests
[ALO-30171-1] p0453 N80-26841
Low-cost solar antireflection coatings --- for
flat plate collectors
[ALO-5300-T2] p0453 N80-26844
Corrosion protection of solar-collector heat
exchangers with electrochemically deposited films
[COO-4297-2] p0454 N80-26845
Evaluation of heat transfer enhancement in
air-heating collectors
[ALO-5352-T1] p0454 N80-26848
Wind effects on collectors
[DOE/CS-35364/T1] p0454 N80-26851
Water heating by solar energy with plastic
collectors
[BMFT-FB-T-79-29] p0456 N80-26876

Solar collector system using air collectors for a pre-drying facility in a grass drying plant [SKT-TEIL-1] p0456 N80-26877
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors --- in solar energy applications [ASSA-FA-10] p0456 N80-26879
Solar energy system performance evaluation-seasonal report for Elcam San Diego, San Diego, California [NASA-CR-161481] p0457 N80-27806
ASHMET: A computer code for estimating insolation incident on tilted surfaces [NASA-TM-78286] p0457 N80-27807
Development of a low-cost non-tracking heat pipe concentrating collector [PB80-160443] p0457 N80-27828
An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients [PB80-158769] p0458 N80-27829

SOLAR COOLING
Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling p0359 A80-33429
Australian programme for solar heating and cooling p0359 A80-33432
Solar City - Mount Cotton p0359 A80-33434
National solar heating and cooling programme in the Netherlands p0323 A80-33441
National solar heating and cooling programme - New Zealand p0323 A80-33442
Status of the United States' Solar Heating and Cooling Program p0323 A80-33446
Integration of solar collectors in large prefabricated roof/wall sections p0361 A80-33465
Open-cycle solar air conditioner p0365 A80-33524
Solar operated crossflow desiccant cooling system p0365 A80-33525
Solar cooling through cycles using microporous solid adsorbents p0365 A80-33526
Design and operation of a liquid-desiccant type solar air conditioning system p0366 A80-33527
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house p0366 A80-33529
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector p0366 A80-33530
Experimental investigation on control modes for an absorption chiller of low capacity --- in air conditioning systems p0366 A80-33532
Evaluation of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator p0366 A80-33533
Solar powered environment control - Criteria and realization p0366 A80-33534
Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems p0366 A80-33535
Solar absorption cycle cooling installations in Sydney, Australia p0366 A80-33536
On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings p0367 A80-33538
Theoretical and experimental investigations of an intermittent solar refrigerator p0367 A80-33540
Economics of solar-assisted heat pump heating systems for residential use p0367 A80-33543
A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis p0367 A80-33545
A survey of existing solar system simulation methods p0369 A80-33560
Simulation of the FSEC solar cooling system p0369 A80-33563
Honeywell General Offices concentrating collector system - Installation and operation p0370 A80-33567
A manufactured solar home p0370 A80-33568
Solar heating and cooling performance in CSU Solar House III p0370 A80-33570
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report p0370 A80-33571
The operation results of the Yazaki Experimental Solar House One and the Ishibashi Solar House p0370 A80-33572
Survey of simplified design methodologies for solar heating and cooling systems p0376 A80-33619
A simplified solar cooling design method for closed-loop liquid systems p0376 A80-33620
Cooling system parameter analysis --- for solar collectors p0376 A80-33622
A pin programmable controller for research systems --- of solar heating and cooling p0380 A80-33662
Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings p0381 A80-33669
Prospects for solar cooling applications in Nigeria p0382 A80-33676
Utilization of natural/passive energy systems in a University Office/Teaching Laboratory Building p0383 A80-33691
The use of solar energy storage for heating and cooling applications p0391 A80-33861
Choice of cycle parameters for solar Freon air conditioning equipment of ejector type p0391 A80-33862
Flat plate boosters for elevating temperatures p0404 A80-37947
Seasonal regeneration through underground strata --- solar terrestrial interactions p0548 A80-37966
Comparison between two absorption cooling systems of the 'open' type under different climate conditions p0407 A80-37976
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector p0407 A80-37977
A thermodynamic analysis of a solar-powered jet refrigeration system p0407 A80-37978
Development of a solar desiccant dehumidifier p0408 A80-37979
Solar collector related research and development in the United States for heating and cooling of buildings p0408 A80-37983
Comfortable heating and cooling by solar reflectors and wind p0411 A80-38013
Impact of solar heating and cooling of buildings on electric utilities p0412 A80-38022
Application of reliability, maintainability, and availability engineering to solar heating and cooling systems p0414 A80-40334
Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling [AIAA PAPER 80-1546] p0415 A80-41502
Solar energy for heating and cooling p0418 A80-42445
Cooling of buildings --- solar systems p0418 A80-42446

Solar powered refrigeration p0420 A80-42469
Solar heating and cooling demonstration project at the Florida solar energy center [NASA-CR-161413] p0423 N80-22774
Solar space heating and air conditioning, volume 3. Citations from the NTIS data base [PB80-801707] p0424 N80-22864
Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base [PB80-801723] p0425 N80-22865
Solar space heating and air conditioning, volume 4. Citations from the NTIS data base [PB80-801715] p0425 N80-22866
Passive solar space heating and cooling. Citations from the NTIS data base [PB80-801731] p0425 N80-22868
Solar heating and cooling system design and development [NASA-CR-161422] p0432 N80-24746
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3 [COO-2858-24-SUMM] p0437 N80-24807
Standard assumptions and methods for solar heating and cooling systems analysis [SERI/TP-351-548] p0440 N80-24862
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage [ORO-5759-T1] p0557 N80-24866
Design parameters for solar powered absorption cooling systems with chilled water storage p0441 N80-25778
Solar heating and cooling demonstration project at Radian Corporation, Austin, Texas [NASA-CR-161442] p0441 N80-25784
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona [NASA-CR-161450] p0441 N80-25787
Solar energy facility at North Hampton Recreation Center, Dallas, Texas [NASA-CR-161444] p0449 N80-26766
Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin [SOLAR/1057-79/50-PT-1] p0451 N80-26811
Reliability and materials performance of solar heating and cooling systems [SOLAR/0906-79/70] p0452 N80-26824
Collector array performance report for sites of the National Solar Heating and Cooling Demonstration Program [SOLAR/0021-79/07] p0454 N80-26846
Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation [BNL-51120] p0455 N80-26863
Analysis methods for solar heating and cooling applications: Passive and active systems, the second edition [SERI/SP-35-232R] p0455 N80-26871
Solar heating and cooling demonstration program: A descriptive summary of HUD Cycle 4 and 4A Solar Residential projects [HUD-PDR-455] p0456 N80-26873

SOLAR ENERGY
Solar energy collection using the reversible ammonia dissociation reaction p0358 A80-33427
Canada's federal solar energy program p0323 A80-33436
Solar energy R & D projects in Denmark p0323 A80-33437
Solar energy research in Sweden p0323 A80-33444
Latent heat energy storage using direct contact heat transfer p0546 A80-33519
Application of solar energy to food industry - A distillery p0372 A80-33591
Characteristics of rural energy demand and major barriers and tasks and implementation of potentially viable solar technologies p0381 A80-33673
Markov chains to solar energy storage calculations p0390 A80-33766
Technical-economic validation for selection of solar resources as energy sources p0400 A80-36596
Evaluating certain ways of storing solar energy p0400 A80-36598
Development and application of high-power lightpipes --- glass fiber optical waveguides for solar radiation transmission p0401 A80-36833
Attenuation of solar energy by high, thin clouds p0414 A80-40709
Basics of solar energy p0416 A80-42436
Characteristics of solar radiation --- intensity, spectral and temporal characteristics of energy received at earth surface p0417 A80-42437
Short course in microprocessors for solar energy applications - Sensors --- computer controlled light meter for insolation measurement p0419 A80-42461
Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power [ASME PAPER 80-PET-27] p0333 A80-43341
Handbook of solar energy data for south-facing surfaces in the United States. Volume 2: Average hourly and total daily insolation data for 235 localities. Alaska - Montana [NASA-CR-162999] p0423 N80-22784
Handbook of solar energy data for south-facing surfaces in the United States. Volume 3: Average hourly and total daily insolation data for 235 localities. North Carolina - Wyoming [NASA-CR-163000] p0423 N80-22785
Solar applications analysis for energy storage p0423 N80-22791
Internally insulated thermal storage system development program p0552 N80-22801
High temperature underground thermal energy storage system for solar energy p0552 N80-22803
High-temperature molten salt thermal energy storage systems for solar applications p0552 N80-22805
Lithium-metal sulfide and sodium-sulfur batteries for solar energy storage [CONF-781228-3] p0424 N80-22843
Technical applications of solar energy [BMFT-FB-T-79-06] p0424 N80-22860
Direct solar pumped laser [LA-7982-MS] p0426 N80-23651
Application and design studies of compressed-air energy storage for solar applications [CAES-7] p0555 N80-23788
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions [SERI/SP-69-071] p0431 N80-24205
Overall efficiencies for conversion of solar energy to a chemical fuel [SAND-79-8636] p0431 N80-24495
Solar-heated fluidized bed gasification system [NASA-CASE-NPO-15071-1] p0432 N80-24747
Solar thermal repowering: Utility/industry market potential in the Southwest --- to drive a turbogenerator [MTR-7919] p0439 N80-24836
High temperature hydrogen cycles for solar heat sources [LA-UR-80-184] p0443 N80-25817
Solar technology application to enhanced oil recovery [SERI/TR-352-392] p0445 N80-25839
Environmental development plan: Solar agricultural and industrial process heat [DOE/EDP-0033] p0446 N80-25862
Data handbook for the national solar energy demonstration book [DSE-5216-T4] p0446 N80-25873
Line-focus solar central power systems, phase1 [SAN-0115-140-1] p0447 N80-25903
Solar energy program. Chapter from the Energy and Environment Division report [LBL-9630] p0350 N80-25904

Solar-assisted heat pump-swimming pool
synergistics for domestic heating
[UCRL-83458] p0447 N80-25905
SAGE, Solar Assisted Gas Energy
[PB80-144363] p0447 N80-25906
Biosources digest, a journal on biomass
utilization, volume 1, no. 1
[PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass
utilization, volume 1, no. 4
[PB80-140981] p0493 N80-25909
Solar radiation data forecast and interpolation
analysis. Folder 1, part 1: Executive summary.
Part 2: Technical analysis (tasks 1 and 2).
Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982
Utilization of solar thermal sources for
thermochemical hydrogen production
[LA-UR-80-837] p0464 N80-26538
Thermal Power Systems (TPS); Point-Focusing
Thermal and Electric Applications (PFTEA).
Volume 2: Detailed report, fiscal year 1979
[NASA-CR-163023] p0449 N80-26770
MOD-2 wind turbine system concept and preliminary
design report. Volume 2: Detailed report
[NASA-CR-159609] p0536 N80-26775
Development of high efficiency stacked multiple
bandgap solar cells
[AD-A083092] p0450 N80-26797
Assessment of solar energy within a community:
Summary of three community-level studies
[DOE/EV-0054] p0452 N80-26826
Design and installation manual for thermal energy
storage
[ANL-79-15-ED-2] p0561 N80-26840
Solar Federal Buildings Program plan --- solar
applications in buildings
[DOE/CS-0147A] p0453 N80-26842
Collector array performance report for sites of
the National Solar Heating and Cooling
Demonstration Program
[SOLAR/0021-79/07] p0454 N80-26846
Additional solar/load ratio correlations for
direct gain buildings
[LA-UR-80-854] p0454 N80-26847
Design of annual storage solar space heating systems
[DOE/CS-32939/10] p0455 N80-26855
Solar, geothermal, electric and storage systems
program summary document, FY 1980
[DOE/ET-0102] p0354 N80-26861
Passive solar design handbook. Volume 2 of two
volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870
HYCSOS: Hydride conversion and storage system
sensitivity analysis
[ANL/EES-TM-63] p0564 N80-27523
Analysis of code related responses from the solar
demonstration program
[PB80-153968] p0457 N80-27827

SOLAR ENERGY ABSORBERS

Ammonia dissociation for solar thermochemical
absorbers
p0358 A80-33428
The characterization of crushed glass as a
transpired air heating solar collector material
p0360 A80-33450
Thermal performance of compounds used to improve
heat transfer in solar collectors
p0360 A80-33457
Heat transfer through collector glass covers
p0360 A80-33458
Effect of off-south orientation on optimum
conditions for maximum solar energy absorbed by
flat plate collector augmented by plane reflector
p0361 A80-33462
Theoretical and experimental study of parabolic
troughs and paraboloidal dish concentrators with
plane absorbers
p0363 A80-33489
Parabolic trough collector with thermal or
photovoltaic receiver
p0364 A80-33498
The 'soil therm' system for interseasonal earth
storage of solar heat for individual housing
p0545 A80-33516
Development of a storage system based on
encapsulated p.c.-materials --- Phase Change
material in solar heating
p0546 A80-33522
Solar cooling through cycles using microporous
solid adsorbents
p0365 A80-33526
Theoretical and experimental investigations of a
countercurrent solar regenerator
p0366 A80-33528
Experimental investigation on control modes for an
absorption chiller of low capacity --- in air
conditioning systems
p0366 A80-33532
Evaluation of performance enhancement of solar
powered absorption chiller with an improved
control strategy using the BNL-built hardware
simulator
p0366 A80-33533
Some design aspects of air cooled solar powered
LiBr-H_2O absorption cycle air conditioning systems
p0366 A80-33535
A direct solar-heated R22-DMF absorption
refrigerator
p0367 A80-33539
A solar operated water-Li Br absorption
refrigeration machine used also as heat pump -
Technical and economic analysis
p0367 A80-33545
Design and performance characteristics of compound
parabolic concentrators with evacuated and with
non-evacuated receivers
p0378 A80-33638
Theoretical study of gas heated in a porous
material subjected to a concentrated solar
radiation
p0379 A80-33650
A new solar thermal receiver utilizing small
particles
p0379 A80-33652
Study and realisation of a high temperature air
cooled solar receiver
p0379 A80-33653
One-quarter MWt air cycle receiver test at the
Advanced Component Thermal Test Facility at
Georgia Institute of Technology
p0380 A80-33657
Stability of plasma-sprayed coatings tested at
White Sands Solar Facility
p0380 A80-33658
What is black chrome
p0387 A80-33738
Thermal degradation of a black chrome solar
selective absorber coating - Short term
p0387 A80-33739
Thermal aging characteristics of electrodeposited
black chrome solar coatings
p0388 A80-33740
Improvement of optical reflectance of homogeneous
interference film for solar absorber by texture
control
p0388 A80-33741
Production and properties of selective surfaces
coated onto glass tubes by a magnetron
sputtering system
p0388 A80-33742
Selective electrodeposited chromium black coatings
- Optical properties, selectivity model
p0388 A80-33743
Photoacoustic determination of absorptance and
emittance of solar selective coatings
p0388 A80-33744
Radiative selectivity and the oxidation of
stainless steels
p0388 A80-33745
Absorptance and emittance measurements of AlPbS
and Zn dust selective surfaces
p0388 A80-33746
Ion implanted materials as selective absorbers for
photothermal solar energy conversion
p0388 A80-33747
Nickel pigmented anodic aluminium oxide for
selective absorption of solar energy
p0388 A80-33748
Studies of directly absorbing fluids for
mid-temperature solar thermal applications
p0388 A80-33749
General formulation of the current-voltage
characteristic of a p-n heterojunction solar cell
p0390 A80-33782

Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
p0391 A80-33859
Low-cost, high-performance solar selective paint coatings
p0393 A80-34781
Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
p0399 A80-35500
Heat losses of a static low-concentration solar collector
p0399 A80-35838
Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594
Heating characteristics of concentrator/receiver system employing a selective absorbing surface
p0401 A80-36826
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket
p0401 A80-36834
Characterization of commercial black chrome coatings
p0402 A80-37190
Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique
p0402 A80-37299
Design and cost analysis for an ammonia-based solar thermochemical cavity absorber
p0403 A80-37300
Absorption enhancement in solar collectors by multiple reflections
p0403 A80-37306
Flat plate boosters for elevating temperatures
p0404 A80-37947
A black liquid flat plate collector for economical applications
p0404 A80-37948
Thermo-fluid analysis of a cylindrical solar heat absorber
p0405 A80-37955
Effectiveness of packed-bed solar air heaters
p0407 A80-37972
Comparison between two absorption cooling systems of the 'open' type under different climate conditions
p0407 A80-37976
The effect of a black chrome selective surface on the thermal performance of a solar collector
p0414 A80-40538
Design of a heat pipe absorber for a concentrating solar water heater
[AIAA PAPER 80-1506] p0415 A80-41470
Information theory and solar energy collection
p0421 A80-43368
Cusp mirror - Heat pipe evacuated tubular solar thermal collector
p0421 A80-43482
On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications
p0421 A80-43485
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers
p0421 A80-43513
Optical and topographical properties of selective black chrome
p0422 A80-43514
Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base
[PB80-803794] p0425 N80-22869
Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base
[PB80-803778] p0425 N80-22870
Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base
[PB80-803786] p0425 N80-22871
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817
Composition profiling of solar coating materials
[COO-2953-4] p0437 N80-24818

SOLAR ENERGY CONVERSION
Solar industrial process heat
p0357 A80-33184
Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 and 3
p0357 A80-33401
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
p0459 A80-33406
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407
High intensity mass algae culture requirements and limitations --- for maximum growth and energy conversion in sunlight
p0358 A80-33408
Photochemical storage of solar energy
p0545 A80-33420
Association of chlorophyll with surfactants on a particle surface --- for solar energy conversion
p0358 A80-33421
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent --- for solar heating and cooling energy storage
p0358 A80-33423
Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones
p0358 A80-33425
Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry
p0359 A80-33430
Australian programme for solar heating and cooling
p0359 A80-33432
Solar energy projects for heating of buildings in Germany
p0359 A80-33438
Thermal performance of compounds used to improve heat transfer in solar collectors
p0360 A80-33457
Suntec/Hexcel parabolic trough --- solar collector design and efficiency for industrial process energy
p0363 A80-33485
Low cost vee-trough evacuated tube collector module
p0363 A80-33492
Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497
Applications of CPC's in solar energy - An overview --- Compound Parabolic Concentrators
p0364 A80-33501
Incidence angle modifier and average optical efficiency of parabolic trough collectors
p0364 A80-33502
The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507
Energy storage in ground-water aquifers
p0545 A80-33514
Theoretical and experimental investigations of a countercurrent solar regenerator
p0366 A80-33528
Reducing solar costs with the Solar-Assisted-Templifier --- heat pumps in series or parallel systems
p0367 A80-33541
A design method for parallel solar-heat pump systems
p0367 A80-33542
Computer simulation of ground coupled storage in a series solar assisted heat pump system
p0368 A80-33547
Heat pump impact upon solar collection design and cost
p0368 A80-33548
Some performance characteristics of the UNIMELB air source solar boosted heat pump system
p0368 A80-33551

User perspectives of selected solar energy system design tools
p0369 A80-33564

Report on five years of operating experience with four pioneer school heating experiments --- using solar energy conversion
p0370 A80-33569

The thermal performance of solar water heaters in the UK
p0370 A80-33578

Solar energy system with heat pump augmentation for industrial process heat - An update
p0372 A80-33589

Performance and cost optimisation of small solar power stations
p0373 A80-33598

Research and development on solar energy for electric and mechanical power generation
p0373 A80-33601

Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs
p0374 A80-33603

Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605

A solar-fossil hybrid power system using a combined cycle
p0375 A80-33611

Utility problems of central tower solar plant in Italy
p0375 A80-33614

A study on mirror fields for tower type solar power plants
p0377 A80-33633

Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power
p0379 A80-33651

Measurements of performance and efficiency of solar energy systems
p0381 A80-33667

Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems
p0381 A80-33674

Rotary expander for a solar thermo-mechanical conversion system
p0382 A80-33681

A 500 gallons per day hybrid desalination plant using wind/solar energy
p0382 A80-33682

The characterization of the performance of passive solar heating systems
p0382 A80-33686

Integrating energy approaches in a large office building
p0324 A80-33690

Monthly average daily insolation on overhang shaded windows
p0383 A80-33698

European progress in photovoltaic development
p0384 A80-33712

The Ramon Areces concentration photovoltaic array
p0384 A80-33714

Autonomous solar-powered beacon for air navigation use
p0385 A80-33715

The DOE photovoltaic concentrator project
p0386 A80-33730

Status of the photovoltaic systems definition project
p0387 A80-33733

Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies
p0389 A80-33754

A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility
p0389 A80-33758

Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025
p0389 A80-33759

Test results on solar turbogenerators
p0391 A80-33860

The use of solar energy storage for heating and cooling applications
p0391 A80-33861

Comparison of measured and predicted rock bed storage performance
p0546 A80-33870

Solar collectors for low and intermediate temperature applications
p0392 A80-34598

Solar energy utilization --- Book
p0393 A80-34841

Material and device considerations for cascade solar cells
p0397 A80-35364

Upper limit for the conversion of solar energy
p0397 A80-35372

An assessment of solar hot water heating in the Washington, D.C. area - Implications for local utilities
p0399 A80-36052

Energy balance of solar thermoelectric generator
p0401 A80-36821

Thin-film and ceramic solar converters based on cadmium sulfide and selenide
p0401 A80-36824

Calculation principles for heliostat fields of solar power plants
p0401 A80-36825

Heating characteristics of concentrator/receiver system employing a selective absorbing surface
p0401 A80-36826

Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters
p0401 A80-36829

High-voltage multijunction solar-energy photoelectric converter
p0401 A80-36830

Medium and high temperature solar processes --- Book
p0402 A80-37012

Preparation of thin films for solar energy utilization
p0402 A80-37191

Maximally concentrating collectors for solar energy applications
p0403 A80-37301

Use of solar energy to reduce carbon dioxide
p0403 A80-37302

Solar coal gasification
p0403 A80-37305

Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volumes 1-4
p0403 A80-37937

Solar energy at ground surface
p0403 A80-37940

My new types of flat plate solar collectors
p0404 A80-37945

Passive solar wall collectors
p0404 A80-37949

Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951

High-efficiency solar concentrator
p0405 A80-37953

A thermodynamic analysis of a solar-powered jet refrigeration system
p0407 A80-37978

California State energy efficient State Office Building
p0327 A80-37984

A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985

Ethanol, a clean burning bio-solar fuel - Its production and utilization
p0472 A80-37986

Hybrid chemical concepts for storage of solar thermal energy
p0548 A80-37988

Use of renewable fuels in the rural development of India
p0327 A80-37989

Physics and economics of photovoltaic solar energy conversion
p0408 A80-37990

Solar energy conversion by fluorescent materials for utilization in space communication systems
p0409 A80-37992

New possibilities of solar energy conversion by means of refractory thermoelements
p0409 A80-37993

On direct conversion of sunlight to electricity p0409 A80-37994

Power from the sun by thermodynamics French tower type projects p0410 A80-38002

Steam and gas turbines for small outputs using solar energy p0410 A80-38003

The first solar energy system in West-Germany for industrial utilization p0411 A80-38010

A simple water pump, powered by solar energy p0411 A80-38011

Combination of wind and solar energies at the Northern Coast of Egypt p0411 A80-38014

Solar energy - UNIDO programme of action for developing countries p0412 A80-38015

End use energy in Brazil and the solar technologies p0472 A80-38016

French solar energy program and its application for international cooperation p0327 A80-38017

An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry p0327 A80-38018

An economic analysis of solar energy alternatives p0412 A80-38021

Evaluation of solar thermal power plants using economic and performance simulations p0412 A80-38023

The American experience with solar energy in centralized electricity generation - Technology and economics p0412 A80-38024

Solar energy - Will it conserve our non-renewable resources p0413 A80-38025

Accelerated commercialization of solar energy - A new priority for international action p0413 A80-38026

Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system p0539 A80-40713

Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3 p0520 A80-40716

Characteristics of axicon concentrators for use in photovoltaic energy conversion p0520 A80-40719

Equitable performance comparison and economic evaluation of active and passive solar energy systems p0329 A80-40965

Solar energy economics - Orbiting reflectors for world energy p0415 A80-41324

Current from the sun - A look at the economics of solar cells p0416 A80-42101

Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation [ASME PAPER 80-GT-34] p0416 A80-42167

Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures p0416 A80-42435

The technology of flat plate collectors p0417 A80-42439

Spectrally selective surfaces in photothermal solar energy conversion p0417 A80-42443

Polycrystalline solar cells p0419 A80-42456

Basic electrochemistry --- in solar energy conversion p0419 A80-42458

Short course in microprocessors for solar energy applications Microprocessors, microcomputers and single chip computers p0419 A80-42460

Short course in microprocessors for solar energy applications - The microcomputer family p0420 A80-42464

Bioconversion of solar energy p0420 A80-42465

Solar powered refrigeration p0420 A80-42469

Solar energy at the P.E.I. Ark p0420 A80-42471

Scanning light spot analysis of faulty solar cells p0420 A80-43118

A low-high-junction solar-cell model developed for use in tandem cell analysis p0420 A80-43122

The performance of solar thermal electric power systems employing small heat engines [ASME PAPER 80-PET-25] p0523 A80-43340

Medium and high temperature solar processes --- Book p0421 A80-43473

Thermodynamic energy conversion efficiencies p0525 A80-43590

Solar process water heat for the IRIS images custom color photo lab [NASA-CR-161414] p0423 N80-22781

Solar thermal power storage applications lead laboratory overview p0552 N80-22798

Thermal storage experience at the MSSTF and plans for the future p0552 N80-22799

Methanol-based heat pumps for storage of solar thermal energy, phase 1 [SAND-79-8188] p0555 N80-22845

End-use matching of solar energy systems [SERI/TP-34-325] p0335 N80-22848

Communication strategy to commercialize passive solar energy [SERI/TP-69-412] p0335 N80-22849

Fluid circulating pump operated by same incident solar energy which heats energy collection fluid p0426 N80-23500

Direct solar pumped laser [LA-7982-MS] p0426 N80-23651

Solar hot water system installed at Quality Inn, Key West, Florida [NASA-CR-161434] p0427 N80-23774

Redox storage systems for solar applications [NASA-TM-81464] p0427 N80-23777

Design, construction and testing of a 60 kW solar array and power conversion system [AD-A080877] p0337 N80-23782

Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology [EPRI-ER-1070-VOL-2] p0338 N80-23786

Solor Applications of Thermal Energy Storage [TID-29430] p0427 N80-23791

NOAA's role in the solar energy program [DOE/ET-0110] p0427 N80-23792

Solar energy program evaluation: An introduction [SERI/TR-51-294] p0427 N80-23798

Conversion system overview assessment. Volume 2: Solar-wind hybrid systems [SERI/TR-35-078-VOL-2] p0338 N80-23799

Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices [LA-UR-79-3390] p0338 N80-23807

Solar production of industrial process steam ranging in temperature from 300 deg F to 550 deg F, phase 1. Volume 3: Appendices (cont) [DOE/CS-32199-3] p0428 N80-23812

Solar production of industrial process steam ranging in temperature from 300 degrees F to 550 degrees F, phase 1. Volume 2: Appendices [DOE/CS-32199-2] p0428 N80-23813

Solar thermal repowering utility value analysis [SERI/TR-8016-1] p0428 N80-23814

Data handbook for the National Solar Energy demonstration program [DSE/5216-T3] p0428 N80-23815

Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000 [LA-UR-79-2812] p0338 N80-23820

Status of insolation resource assessment in the Northeast [NESEC-6] p0429 N80-23826

Environmental data for sites in the National Solar Data Network [SOLAR/0010-79/05] p0339 N80-23833

Passive solar calculation methods [DSE/5221-T1] p0429 N80-23836

Series solar heat pump and energy conservation [BNL-27012] p0340 N80-23857

Developing and upgrading of solar system thermal energy storage simulation models [BCS-40252] p0430 N80-23858

Solar energy systems: Standards for rubber hose [PB80-129828] p0430 N80-23868

Solar thermal power systems point-focusing thermal and electric applications projects. Volume 1: Executive summary [NASA-CR-163147] p0432 N80-24750

Solar thermal power systems point-focusing distributed receiver technology project. Volume 2: Detailed report [NASA-CR-159715] p0432 N80-24751

Proceedings of the First Semiannual Distributed Receiver Program Review [NASA-CR-163135] p0433 N80-24760

Heat and electricity from the Sun using parabolic dish collector systems p0433 N80-24761

Line-focus concentrating collector program p0433 N80-24762

The 1st generation low cost point focus solar concentrator p0434 N80-24768

Cost estimating Brayton and Stirling engines p0531 N80-24781

Siting solar thermal power experiments p0435 N80-24783

The JPL isolated application experiment series p0435 N80-24784

Industrial application experiment series p0435 N80-24785

SPS market analysis --- small solar thermal power systems p0435 N80-24786

Military markets for solar thermal electric power systems p0435 N80-24787

Solar thermal plant impact analysis and requirements definition p0435 N80-24788

A study of mass production and installation of small solar thermal electric power systems p0436 N80-24789

The Crossbyton project p0436 N80-24790

IEA/SPS 500 kW distributed collector system p0436 N80-24791

Coolidge solar powered irrigation pumping project p0436 N80-24792

The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona p0436 N80-24793

Preliminary operational results from the Willard solar power system p0436 N80-24794

Study of multi-kW solar arrays for Earth orbit applications: Midterm performance review [NASA-CR-161467] p0437 N80-24798

Solar production of industrial process steam ranging in temperature from 300 F to 550 F (phase 1), volume 1 [DOE/CS/32199-1] p0438 N80-24826

New applications of high-temperature solar energy for the production of transportable fuels and chemicals and for energy storage [ATR-78(7691-04)-1] p0438 N80-24829

Biological solar cells [SERI/TP-332-476] p0439 N80-24831

Solar central receiver systems programs [SAND-79-8777] p0439 N80-24833

Performance evaluation of a solar air-heating and nocturnal cooling system in CSU Solar House 2 [COO-2868-5] p0440 N80-24858

Test results on the Frenchman's Reef solar data acquisition and control system [NASA-CR-161449] p0441 N80-25783

Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona [NASA-CR-161450] p0441 N80-25787

Solar heating and hot water system installed at Municipal Building complex, Abbeville, South Carolina [NASA-CR-161443] p0442 N80-25788

Solar energy system performance evaluation: Seasonal report for IBM system 1A, Huntsville, Alabama [NASA-CR-161464] p0442 N80-25790

Solar energy system performance evaluaton: Seasonal report for Solaron-Akron, Akron, Ohio [NASA-CR-161465] p0442 N80-25791

Passive solar calculation methods [DSE-5221-T1] p0442 N80-25798

Solair heater program: Solair applications study [COO-2705-3] p0443 N80-25813

Solar project description for Perl-Mack Enterprises' single family residences, Denver, Colorado [SOLAR/1015-79/50] p0444 N80-25821

Simulation and design of solar thermal processes [COO-2588-T1] p0444 N80-25823

Solar total energy project Shenandoah [ALO-3985-1-REV-1] p0444 N80-25825

Solar collector studies for solar heating and cooling applications [ALO-5355-T1] p0445 N80-25850

Solar energy conversion through biophotolysis [SAN-0034-239-T1] p0445 N80-25852

Development of polyimide materials for use in solar energy systems [DOE/CS-35305/T1] p0445 N80-25855

Evaluation of reliability of operational solar-energy systems [CONF-791105-2] p0446 N80-25872

Solar energy project: An overview [DOE/CS-0124] p0447 N80-25883

Photochemical determinants of the efficiency of photogalvanic conversion of solar energy [COO-2889-5] p0447 N80-25886

Optimization of solar assisted heat pump systems via a simple analytic approach [BNL-27316] p0349 N80-25896

SAGE, Solar Assisted Gas Energy [PB80-153836] p0447 N80-25907

Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications [DOE/ET-20413/1] p0448 N80-26143

An open cycle turbine solar thermal power system p0448 N80-26257

Photovoltaic Residential Applications Program Implementation Workshop Proceedings [NASA-CR-163274] p0449 N80-26768

Solar energy system performance evaluation: Seasonal report for Elcam Tempe Arizona State University, Tempe, Arizona [NASA-CR-161466] p0450 N80-26778

Industrial compressed air applications for solar energy conversion/storage devices [SAND-79-7077] p0451 N80-26802

Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin [SOLAR/1057-79/50-PT-1] p0451 N80-26811

Solar project description for Alpha Construction Company's single family residence, Canton, Ohio [SOLAR/1034-79/50] p0451 N80-26812

Solar project description for Stewart-Teele-Mitchell single family residence, Malta, N.Y. [SOLAR/1018-79/50] p0451 N80-26813

Solar project description for Washington Natural Gas Company's single family residence, Kirkland, Washington [SOLAR/1001-79/50] p0451 N80-26814

Solar project description for Zien Mechanical 2 single family residence, Milwaukee, Wisonsin [SOLAR/1057-79/50-PT-2] p0451 N80-26815

SERI solar energy storage program [SERI/TP-333-497] p0452 N80-26820

Validation of solar system simulation coder by the International Energy Agency [LA-UR-80-387] p0453 N80-26835

End-use matching for solar industrial process heat [SERI/TR-34-091] p0454 N80-26849

Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2] p0455 N80-26866
Photovoltaic applications: Past and future --- systems utilizing concentrators and arrays
[CONF-800106-4] p0455 N80-26867
Analysis methods for photovoltaic applications
[SERI/SP-35-230] p0455 N80-26868
Phase 2 experiment test plan: Solar photovoltaic/thermal residential experiment
[COO-4094-65] p0455 N80-26869
Water heating by solar energy with plastic collectors
[BMFT-FB-T-79-29] p0456 N80-26876
Solar heating system installed at Stamford, Connecticut
[NASA-CR-161436] p0456 N80-27800
Solar energy system performance evaluation: Seasonal report for Contemporary-Manchester, Manchester, New Hampshire
[NASA-CR-161471] p0457 N80-27802
Community impediments to implementation of solar energy
[DOE/EV-0059] p0457 N80-27821
Solar process heat. Citations from the NTIS data base
[PB80-807936] p0457 N80-27823
Land use and environmental impacts of decentralized solar energy use
[DOE/EV-0067] p0458 N80-27843

SOLAR FLUX DENSITY
A numerical approach to the flux density integral for reflected sunlight
p0377 A80-33632
Methods for the estimation of solar energy on vertical and inclined surfaces
p0417 A80-42438

SOLAR FURNACES
Solar flash pyrolysis of biomass
p0359 A80-33431
Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation
p0379 A80-33650
Treatment of molybdenite ore with laboratory scale solar furnaces
p0380 A80-33659
Obtaining film materials with solar furnaces
p0400 A80-36593
Power from the sun by thermodynamics French tower type projects
p0410 A80-38002
The use of solar furnaces in materials research
p0411 A80-38008
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3
p0520 A80-40716
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858

SOLAR GENERATORS
Solar central receiver hybrid - A cost effective future power alternative
[AIAA PAPER 80-0841] p0357 A80-32856
Nitrogen fertilizer production by solar energy
p0357 A80-33402
Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones
p0358 A80-33425
Analysis of experimental test results on a high temperature receiver model --- for solar thermal electric power plant
p0363 A80-33486
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529
The Point-Focusing Thermal and Electric Applications Project - A progress report --- small solar power systems applications
p0372 A80-33595
Small solar plants for electricity supply
p0373 A80-33596
The International Energy Agency Small Solar Power Plants Project
p0373 A80-33597
Performance and cost optimisation of small solar power stations
p0373 A80-33598
30/50 kWE solar thermal power plant of the distributed type
p0373 A80-33599
Small solar thermal power plants
p0373 A80-33602
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605
A solar thermal-electric experimental plant
p0374 A80-33606
A self supporting solar power system for an isolated community
p0374 A80-33607
Sodium cooled solar central receiver power station
p0375 A80-33610
Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617
Optimization of the combined structural components of large-power solar central receiver systems
p0376 A80-33624
An optimization procedure for solar thermal electric power plant design
p0376 A80-33625
The cost/performance of large central receiver power systems as a function of heliostat design parameters
p0376 A80-33627
An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant
p0377 A80-33628
Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility
p0380 A80-33655
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678
A free cylinder Stirling engine solar powered water pump
p0382 A80-33679
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680
A 100 kW peak photovoltaic power system for the Natural Bridges National Monument
p0384 A80-33713
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716
Comparison of costs for solar derived electrical sources with diesel generators in remote locations
p0389 A80-33751
Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756
A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility
p0389 A80-33758
Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025
p0389 A80-33759
Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators
p0391 A80-33855
Test results on solar turbogenerators
p0391 A80-33860
Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597
Energy balance of solar thermoelectric generator
p0401 A80-36821
Calculation principles for heliostat fields of solar power plants
p0401 A80-36825
On the evaluation of the feasibility of solar collectors for electrical power generation applications
p0406 A80-37963

Solar power units with screw expanders p0410 A80-38000

New developments for future solar power plants p0410 A80-38001

Turbine selection for small capacity solar-power generation p0410 A80-38004

A helioelectric farm --- multimodular solar thermal electric plant design is presented p0410 A80-38005

Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants p0411 A80-38007

Photovoltaic power system reliability considerations p0520 A80-40338

Heat pipe receiver for a 20 MWe solar tower [AIAA PAPER 80-1507] p0415 A80-41471

The prospects for solar-powered closed-cycle gas turbines [ASME PAPER 80-GT-26] p0416 A80-42161

Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant [ASME PAPER 80-GT-27] p0521 A80-42162

The design of a solar receiver for a 25-kWe gas turbine engine [ASME PAPER 80-GT-131] p0416 A80-42244

Solar power --- solar concentrators for solar power plants p0420 A80-42468

Solar thermoelectric generation using bismuth telluride alloys p0421 A80-43479

Concept definition study of small Brayton cycle engines for dispersed solar electric power systems [NASA-CR-159592] p0526 N80-22778

Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems [NASA-CR-159587] p0526 N80-22787

Solar-heated gas-turbine process using sulfur oxides for power production and energy storage [LBL-9472] p0424 N80-22839

Design, construction and testing of a 60 kW solar array and power conversion system [AD-A080877] p0337 N80-23782

Heliostat design cost/performance tradeoffs [SAND-79-8248] p0428 N80-23806

Solar thermal power systems point-focusing thermal and electric applications projects. Volume 1: Executive summary [NASA-CR-163147] p0432 N80-24750

Solar thermal power systems point-focusing distributed receiver technology project. Volume 2: Detailed report [NASA-CR-159715] p0432 N80-24751

The development of an air Brayton and a steam Rankine solar receiver p0434 N80-24770

An organic Rankine receiver for the SCSTPE program p0434 N80-24771

Non-heat pipe/P-40 Stirling engine p0530 N80-24772

The SCSTPE organic Rankine engine p0531 N80-24773

The United Stirling P40 engine for solar dish concentrator application p0531 N80-24775

The dish-Rankine SCSTPE program (Engineering Experiment no. 1) --- systems engineering and economic analysis for a small community solar thermal electric system p0435 N80-24782

Solar thermal plant impact analysis and requirements definition p0435 N80-24788

A study of mass production and installation of small solar thermal electric power systems p0436 N80-24789

IEA/SPS 500 kW distributed collector system p0436 N80-24791

Coolidge solar powered irrigation pumping project p0436 N80-24792

Sensible heat storage for a solar thermal power plant [LBL-9321] p0437 N80-24816

Solar thermal small power systems study. Inventory of US industrial small electric power generating systems [ATR-79(7780)-1] p0437 N80-24817

Solar central receiver systems programs [SAND-79-8777] p0439 N80-24833

Battery charge/solar controller for a residential size photovoltaic power system [COO-4094-62] p0439 N80-24837

Line focus solar thermal central receiver research study [DOE/ET/20426-1] p0440 N80-24853

Solar thermal small power systems study. Phase 2: Study results [DOE/ET/20516-2] p0440 N80-24855

Solar-powered environmental data collection system [DP-1529] p0440 N80-24867

Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets [ALO-4261-T8] p0346 N80-25213

Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 4: Commercial and pilot plant cost data [SAN-1483-1/5] p0558 N80-25803

Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant [SAN-2073-1] p0444 N80-25826

An open cycle turbine solar thermal power system p0448 N80-26257

More on dual purpose solar-electric power plants [SLAC-PUB-2477] p0452 N80-26822

Preliminary environmental assessment for the Satellite Power System (SPS), revision 1. Volume 2: Detailed assessment [DOE/ER-00362-VOL-2] p0453 N80-26836

Airport solar photovoltaic concentrator project, phase 1 [DOE/CS-05317/1] p0453 N80-26839

International photovoltaic program. Volume 2: Appendices [NASA-CR-163339] p0537 N80-26859

Design and fabrication of terrestrial photovoltaic solar generators for field testing in regions of intensive insolation [BMFT-FB-T-79-34] p0538 N80-26878

SOLAR HEATING

An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection [AIAA PAPER 80-0869] p0357 A80-32867

Solar industrial process heat p0357 A80-33184

Development and evaluation of a multiple use solar energy system for agriculture p0357 A80-33403

Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio p0358 A80-33405

Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling p0359 A80-33429

Solar flash pyrolysis of biomass p0359 A80-33431

Australian programme for solar heating and cooling p0359 A80-33432

Solar City - Mount Cotton p0359 A80-33434

The Belgian solar heating R & D program p0359 A80-33435

Canada's federal solar energy program p0323 A80-33436

Solar energy projects for heating of buildings in Germany p0359 A80-33438

Industrial solar energy activity in Monaco p0359 A80-33440

National solar heating and cooling programme in the Netherlands p0323 A80-33441

National solar heating and cooling programme - New Zealand p0323 A80-33442

Solar Heating '85 - Sweden's national solar heating program p0323 A80-33443

The United Kingdom solar heating programme p0323 A80-33445

Status of the United States' Solar Heating and Cooling Program
p0323 A80-33446

Derivation of efficiency and loss factors for solar air heaters
p0359 A80-33447

The effects of air leaks on solar air heating systems
p0359 A80-33448

The characterization of crushed glass as a transpired air heating solar collector material
p0360 A80-33450

Design and performance of a roof integrated solar air heater
p0360 A80-33451

An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems
p0360 A80-33452

Analysis of matrix air heaters --- of radiative heat transfer in solar collectors
p0360 A80-33456

Integration of solar collectors in large prefabricated roof/wall sections
p0361 A80-33465

Tests of all-day collector performance
p0361 A80-33468

Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors
p0361 A80-33469

Proposed method for testing of radiative cooling flat-plate collectors
p0362 A80-33472

An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473

Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505

The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507

Economical optimum TES size via marginal analysis --- Thermal Energy Storage
p0365 A80-33508

Effects of baffles on thermal stratification in themocline storage tanks
p0365 A80-33509

Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks
p0545 A80-33510

Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
p0545 A80-33513

Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515

The sizing and economics of phase change energy storage units in air-based solar heating systems
p0546 A80-33520

Development of a storage system based on encapsulated p.c.-materials --- Phase Change material in solar heating
p0546 A80-33522

Investigation of latent heat of fusion storage for solar heating systems
p0546 A80-33523

Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529

Solar powered environment control - Criteria and realization
p0366 A80-33534

Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537

A direct solar-heated R22-DMF absorption refrigerator
p0367 A80-33539

A design method for parallel solar-heat pump systems
p0367 A80-33542

Economics of solar-assisted heat pump heating systems for residential use
p0367 A80-33543

Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544

A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis
p0367 A80-33545

A comparative study of solar assisted heat pump systems for Canadian locations
p0367 A80-33546

Earth coils and geo-thermal wells used as solar energy storage devices
p0368 A80-33549

A solar assisted heat pump experiment
p0368 A80-33550

Experimental performance study of a series solar heat pump
p0368 A80-33552

Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554

Development of an effective solar fraction --- for solar heating subsystems
p0368 A80-33555

Adaptive control for a multiple tank, multiple temperature solar energy storage system
p0369 A80-33557

Mass flow considerations for solar air heating systems
p0369 A80-33558

Solar heating systems in Scandinavian climate - Reality or daydreams
p0369 A80-33559

A survey of existing solar system simulation methods
p0369 A80-33560

Solar heating simulation - Accuracy and precision of a model using daily data
p0369 A80-33561

The layout of solar hot water systems, using statistical meteo- and heat demand data
p0369 A80-33562

The Saskatchewan Conservation House - A year of performance data
p0369 A80-33566

A manufactured solar home
p0370 A80-33568

Report on five years of operating experience with four pioneer school heating experiments --- using solar energy conversion
p0370 A80-33569

Solar heating and cooling performance in CSU Solar House III
p0370 A80-33570

Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report
p0370 A80-33571

The operation results of the Yazaki Experimental Solar House One and the Ishibashi Solar House
p0370 A80-33572

Solar heating and hot water supply system of Fuji Electric Solar House
p0370 A80-33573

Analysis of solar water heating systems
p0370 A80-33574

Design and evaluation of solar installation workshops and the HUD solar DHW installation guidelines --- Domestic Hot Water
p0370 A80-33575

Performance vs prediction for four classes of solar hot water systems
p0370 A80-33576

Experimental system performance and comparison with computer predictions for six solar domestic hot water systems
p0370 A80-33577

The thermal performance of solar water heaters in the UK
p0370 A80-33578

Mean monthly performance of solar water heaters with natural circulation
p0371 A80-33579

Solar plus waste heat recovery hybrid water heating system
p0371 A80-33580

Design of the solar water heater system for TVA's Memphis Initiative
p0371 A80-33581

Construction and initial operation of the Miamisburg salt-gradient solar pond
p0371 A80-33583

Control of gradient zone boundaries --- in solar ponds
p0371 A80-33584

Salt concentration gradient solar ponds - Modeling and optimization
p0371 A80-33585

The development and demonstration of a solar pond for heating greenhouses
p0371 A80-33586

Operation of an industrial solar drying system
p0372 A80-33590

A prototype of solar linear concentrators plant installed to supply industrial heat
p0372 A80-33592

Solar energy for kilning malt
p0372 A80-33593

Solar heat generation for industrial process heating applications
p0372 A80-33594

The solar ten megawatt pilot plant
p0374 A80-33608

Thermal fatigue analysis of the Department of Energy Barstow Pilot Plant
p0374 A80-33609

Economic analysis of the STEPS in Japan --- Solar Thermal Electric Power Systems
p0375 A80-33615

Survey of simplified design methodologies for solar heating and cooling systems
p0376 A80-33619

Thermic diode performance characteristics and design manual
p0376 A80-33623

Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine
p0377 A80-33635

Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation
p0379 A80-33650

Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility
p0380 A80-33655

Mini-computer-based energy monitor system
p0380 A80-33661

A pin programmable controller for research systems --- of solar heating and cooling
p0380 A80-33662

The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems
p0381 A80-33663

Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems
p0381 A80-33664

Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665

The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center
p0381 A80-33666

Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings
p0381 A80-33669

Monitoring solar heated houses in the European community - Procedures, results and future activities
p0381 A80-33671

A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683

A simple procedure for assessing thermal comfort in passive solar heated buildings
p0382 A80-33684

Thermopond applicability to climate and structure --- design of solar heating and cooling system for buildings
p0382 A80-33685

The characterization of the performance of passive solar heating systems
p0382 A80-33686

An experimental approach for studying direct solar gain optics of model interiors
p0382 A80-33687

Physical modeling of buildings --- simulating thermal behavior of building by scale model
p0383 A80-33688

Hybrid active-passive designs - Synergy or conflict --- solar heating systems
p0383 A80-33689

Utilization of natural/passive energy systems in a University Office/Teaching Laboratory Building
p0383 A80-33691

Economic aspects of passive solar remodeling in existing buildings
p0383 A80-33692

Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693

Performance analysis of a natural convection collector system --- of solar house
p0383 A80-33695

Measured performance of a passive solar residence in Bozeman, Montana
p0383 A80-33696

A new and simple method for estimating the monthly and yearly performance of passive solar systems
p0383 A80-33697

A procedure for determining solar heat gain factors for south-facing vertical surfaces on average days
p0384 A80-33699

Analytical and economic evaluation of heat pipe augmented passive solar heating systems
p0384 A80-33704

Dual desiccant-bed dehumidifier with solar-heated regeneration
p0384 A80-33705

Solar-cladding - Insulation plus insolation --- applying insulation material to outside building walls
p0384 A80-33708

Hybrid passive for motel guest rooms
p0384 A80-33709

Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710

Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H.
p0384 A80-33711

Optimization of photovoltaic/thermal collector heat pump systems
p0387 A80-33737

The economics of solar hot water heating in multifamily units
p0389 A80-33752

Cost and performance evaluation of passive solar systems
p0389 A80-33755

The effect of an auxiliary load management strategy on solar system performance
p0389 A80-33757

The use of solar energy storage for heating and cooling applications
p0391 A80-33861

Development of a combined solar heating/heat pump system for conditions typical of the Crimea
p0391 A80-33863

A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/
p0392 A80-34561

Solar collectors for low and intermediate temperature applications
p0392 A80-34598

Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778

Solar materials R & D overview emphasizing solar thermal power systems
p0393 A80-34779

Comment on 'The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation'
p0459 A80-35193

An assessment of solar hot water heating in the Washington, D.C. area - Implications for local utilities p0399 A80-36052

Development and investigation of solar thermoelectric generator using a tubular module p0400 A80-36597

Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments p0460 A80-37336

Thermo-fluid analysis of a cylindrical solar heat absorber p0405 A80-37955

Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation p0405 A80-37958

Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating p0406 A80-37959

Phase change collector wall versus water collector wall p0406 A80-37962

Seasonal regeneration through underground strata --- solar terrestrial interactions p0548 A80-37966

Solar heating systems with air collectors and rock bed storage p0406 A80-37969

Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system p0406 A80-37970

Hot water production by means of a solar thermosyphon loop p0407 A80-37971

Effectiveness of packed-bed solar air heaters p0407 A80-37972

Performance comparison of different types of solar water heaters under Egyptian conditions p0407 A80-37973

Solar water heaters p0407 A80-37974

Latent heat diode wall --- study of passive solar heating of houses p0407 A80-37975

A review of the historical developments of the use of passive solar systems p0408 A80-37981

Solar collector related research and development in the United States for heating and cooling of buildings p0408 A80-37983

Solar thermal power plant - Thermodynamic analysis p0410 A80-37999

A central receiver solar power system for remote locations p0410 A80-38006

Comfortable heating and cooling by solar reflectors and wind p0411 A80-38013

Economic considerations of solar energy p0412 A80-38019

The comparative economics of passive and active systems --- for solar residential space heating p0412 A80-38020

Impact of solar heating and cooling of buildings on electric utilities p0412 A80-38022

Three-dimensional numerical evaluation of heat loss through natural convection in a solar boiler p0413 A80-38274

Wangen EVS-solarhouse with a positive balance sheet p0413 A80-38305

Application of reliability, maintainability, and availability engineering to solar heating and cooling systems p0414 A80-40334

Solar energy with chemical storage for cogeneration of electric power and heat p0549 A80-40715

Design of a heat pipe absorber for a concentrating solar water heater [AIAA PAPER 80-1506] p0415 A80-41470

Application of heat pipes to thermal energy storage systems --- for solar residential heating [AIAA PAPER 80-1509] p0549 A80-41473

Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation [ASME PAPER 80-GT-34] p0416 A80-42167

The technology of flat plate collectors p0417 A80-42439

Solar air systems p0418 A80-42444

Solar energy for heating and cooling p0418 A80-42445

A completely instrumented solar building - The Shenandoah Solar Recreational Center p0418 A80-42447

Solar energy at the P.E.I. Ark p0420 A80-42471

A Stirling cycle engine for use with solar thermal-electric systems [ASME PAPER 80-PET-32] p0524 A80-43343

The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period p0421 A80-43484

Solar heating and cooling demonstration project at the Florida solar energy center [NASA-CR-161413] p0423 N80-22774

Building heating and cooling applications thermal energy storage program overview p0552 N80-22806

Heat storage capability of a rolling cylinder using Glauber's salt p0553 N80-22810

The SERI solar energy storage program p0423 N80-22821

Solar energy system performance evaluation: Seasonal report for fern, Tunkhannock, Pennsylvania [NASA-CR-161392] p0424 N80-22856

Development and preparation for series production of a modular solar space heating system, phases 1 and 2 [BMFT-FB-T-79-02] p0424 N80-22857

Solar space heating and air conditioning, volume 3. Citations from the NTIS data base [PB80-801707] p0424 N80-22864

Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base [PB80-801723] p0425 N80-22865

Solar space heating and air conditioning, volume 4. Citations from the NTIS data base [PB80-801715] p0425 N80-22866

Passive solar space heating and cooling. Citations from the engineering index data base [PB80-801749] p0425 N80-22867

Passive solar space heating and cooling. Citations from the NTIS data base [PB80-801731] p0425 N80-22868

Solar heating system installed at Blakedale Professional Center, Greenwood, South Carolina [NASA-CR-161435] p0427 N80-23776

Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films) [ALO-4147-T11] p0429 N80-23817

Off-peak electric auxiliary heat for solar air-heating systems [COO-4516-1] p0429 N80-23827

Performance improvement of a solar heating system utilizing off-peak electric auxilliary [DOE/R5/10140-1] p0429 N80-23852

Solar heating and hot water system installed at Saint Louis, Missouri [NASA-CR-161420] p0431 N80-24744

Solar heating and cooling system design and development [NASA-CR-161422] p0432 N80-24746

Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3 [COO-2858-24-SUMM] p0437 N80-24807

Mean monthly performance of passive solar water heaters [LBL-9295] p0437 N80-24820

Feasibility evaluation for solar industrial process heat applications [SERI/TP-333-538] p0438 N80-24824

Performance evaluation of a solar air-heating and nocturnal cooling system in CSU Solar House 2 [COO-2868-5] p0440 N80-24858

Standard assumptions and methods for solar heating and cooling systems analysis
[SERI/TP-351-548] p0440 N80-24862
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage
[ORO-5759-T1] p0557 N80-24866
Solar heating and cooling demonstration project at Radian Corporation, Austin, Texas
[NASA-CR-161442] p0441 N80-25784
Solar heating system installed at Telex Communications, Inc., Blue Earth, Minnesota
[NASA-CR-161437] p0441 N80-25786
Solar heating and hot water system installed at Municipal Building complex, Abbeville, South Carolina
[NASA-CR-161443] p0442 N80-25788
Passive solar calculation methods
[DSE-5221-T1] p0442 N80-25798
CSU Solar House 3: Solar heating and cooling system performance
[COO-30122-3] p0442 N80-25806
Solar energy system performance evaluation. Albuquerque Western no. 1, Albuquerque, New Mexico
[SOLAR/1011-79/14] p0443 N80-25816
Solar project description. Albuquerque Western-2 multi-dwelling building Albuquerque, New Mexico
[SOLAR/1090-79/50] p0444 N80-25819
West Chester Work Center: Solar space heating demonstration project
[DOE/CS-4048/2] p0444 N80-25822
Two-tank seasonal storage concept for solar space heating of buildings
[CONF-791226-2] p0446 N80-25867
Evaluation of reliability of operational solar-energy systems
[CONF-791105-2] p0446 N80-25872
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900
Proposed energy-performance standards for new buildings: Passive and active solar-heating analysis
[DOE/CS-0117] p0349 N80-25902
Solar energy facility at North Hampton Recreation Center, Dallas, Texas
[NASA-CR-161444] p0449 N80-26766
Lectures on heat technology in the Netherlands --- held on 23-24 Aug. 1977
p0353 N80-26787
The potential for heat production with solar water heaters in the Netherlands climate
p0450 N80-26792
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793
Reliability and materials performance of solar heating and cooling systems
[SOLAR/0906-79/70] p0452 N80-26824
Collector array performance report for sites of the National Solar Heating and Cooling Demonstration Program
[SOLAR/0021-79/07] p0454 N80-26846
Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation
[BNL-51120] p0455 N80-26863
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870
Analysis methods for solar heating and cooling applications: Passive and active systems, the second edition
[SERI/SP-35-232R] p0455 N80-26871
Solar heating and cooling demonstration program: A descriptive summary of HUD Cycle 4 and 4A Solar Residential projects
[HUD-PDR-455] p0456 N80-26873
Investigation of heat storages with salt hydrate as storage medium based on the extra water principle
[EUR-6646-PT-2] p0564 N80-27818

SOLAR HOUSES

Solar City - Mount Cotton
p0359 A80-33434
French programs of research and experimentation aiming at the development of solar energy in buildings
p0359 A80-33439
Design and performance of a roof integrated solar air heater
p0360 A80-33451
Integration of solar collectors in large prefabricated roof/wall sections
p0361 A80-33465
Investigation of latent heat of fusion storage for solar heating systems
p0546 A80-33523
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529
Real time identification of parameters in building models --- optimal control of solar houses
p0368 A80-33556
Solar heating systems in Scandinavian climate - Reality or daydreams
p0369 A80-33559
The Saskatchewan Conservation House - A year of performance data
p0369 A80-33566
A manufactured solar home
p0370 A80-33568
Solar heating and cooling performance in CSU Solar House III
p0370 A80-33570
The operation results of the Yazaki Experimental Solar House One and the Ishibashi Solar House
p0370 A80-33572
Solar heating and hot water supply system of Fuji Electric Solar House
p0370 A80-33573
The development and demonstration of a solar pond for heating greenhouses
p0371 A80-33586
Measurements of performance and efficiency of solar energy systems
p0381 A80-33667
Monitoring solar heated houses in the European community - Procedures, results and future activities
p0381 A80-33671
A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683
A simple procedure for assessing thermal comfort in passive solar heated buildings
p0382 A80-33684
Utilization of natural/passive energy systems in a University Office/Teaching Laboratory Building
p0383 A80-33691
Performance of passive test units during the 1978-79 heating season --- solar house
p0383 A80-33694
Performance analysis of a natural convection collector system --- of solar house
p0383 A80-33695
Measured performance of a passive solar residence in Bozeman, Montana
p0383 A80-33696
Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710
A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /THU solar system I/
p0392 A80-34561
Solar energy utilization --- Book
p0393 A80-34841
Economic considerations of solar energy
p0412 A80-38019
The comparative economics of passive and active systems --- for solar residential space heating
p0412 A80-38020
Wangen EVS-solarhouse with a positive balance sheet
p0413 A80-38305
Solar air systems
p0418 A80-42444
A completely instrumented solar building - The Shenandoah Solar Recreational Center
p0418 A80-42447
Fundamentals of solar architecture
p0418 A80-42449

Systematic techniques of design for solar houses in high latitudes
p0418 A80-42452
Building heating and cooling applications thermal energy storage program overview
p0552 N80-22806
Development and preparation for series production of a modular solar space heating system, phases 1 and 2
[BMFT-FB-T-79-02] p0424 N80-22857
Solar project description for A-Frame Industries' single family residence: Kaneohe, Hawaii
[SOLAR/1010-79/50] p0444 N80-25818
Solar-assisted low energy dwellings
[DOE/CS-0145] p0451 N80-26816

SOLAR PHYSICS
Basics of solar energy
p0416 A80-42436

SOLAR PONDS (HEAT STORAGE)
Membrane stratified solar ponds
p0371 A80-33582
Construction and initial operation of the Miamisburg salt-gradient solar pond
p0371 A80-33583
Control of gradient zone boundaries --- in solar ponds
p0371 A80-33584
Salt concentration gradient solar ponds - Modeling and optimization
p0371 A80-33585
The development and demonstration of a solar pond for heating greenhouses
p0371 A80-33586
The physics of a saturated Na2O.2B2O3.10H2O non-convecting solar pond
p0372 A80-33587
The application of shallow solar ponds for industrial process heat - Case histories
p0372 A80-33588
Thermopond applicability to climate and structure --- design of solar heating and cooling system for buildings
p0382 A80-33685
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-82367] p0429 N80-23822
SOLPOND: A simulation program for salinity gradient solar ponds
[SERI/TP-351-559] p0430 N80-23856

SOLAR POSITION
Solar elevation angle probability distribution
p0415 A80-40721

SOLAR POWER SATELLITES
Increasing power input to a single solar power satellite rectenna by using a pair of satellites
p0539 A80-32942
New directions for future satellite power system /SPS/ concepts
[AIAA 79-3069] p0539 A80-36963
Satellite Power Systems /SPS/ - Overview of system studies and critical technology
[AAS PAPER 80-084] p0540 A80-41898
Implications for the UK of solar-power satellites /s.p.s/ as an energy source
p0422 A80-43836
SPS phase control system performance via analytical simulation
[NASA-CR-160582] p0540 N80-22378
Solar power satellites. Citations from the International Aerospace Abstracts data base
[NASA-CR-162931] p0541 N80-22861
The solar power satellite concepts: The past decade and the next decade
[NASA-TM-81000] p0541 N80-25360
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Satellite Power Systems (SPS): Concept development and evaluation program, preliminary assessment
[DOE/ER-0041] p0542 N80-27404
Solar power satellite system definition study. Volume 1: Executive summary, phase 3
[NASA-CR-160742] p0542 N80-27809
Solar power satellite system definition study. Volume 3: Laser SPS analysis, phase 3
[NASA-CR-160744] p0543 N80-27811
Solar power satellite system definition study. vPMVNF 4: sPMJE sUBUPT sps aOBMZTJT, QIBTF 3
[NASA-CR-160745] p0543 N80-27812
Solar power satellite system definition study. Volume 5: Space transportation analysis, phase 3
[NASA-CR-160746] p0457 N80-27813

SOLAR PROPULSION
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket
p0401 A80-36834
The sunship - The case for a solar powered airship
p0413 A80-39288

SOLAR RADIATION
Analytical and experimental determination of radiation and temperature distributions inside solar receivers
p0377 A80-33634
The measurement of solar irradiance on a tilted surface
p0390 A80-33764
Medium and high temperature solar processes --- Book
p0402 A80-37012
Solar energy at ground surface
p0403 A80-37940
Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation
p0405 A80-37958
Attenuation of solar energy by high, thin clouds
p0414 A80-40709
Characteristics of solar radiation --- intensity, spectral and temporal characteristics of energy received at earth surface
p0417 A80-42437
NOAA's role in the solar energy program
[DOE/ET-0110] p0427 N80-23792
Status of insolation resource assessment in the Northeast
[NESEC-6] p0429 N80-23826
Solar radiation data forecast and interpolation analysis. Folder 1, part 1: Executive summary. Part 2: Technical analysis (tasks 1 and 2). Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982

SOLAR REFLECTORS
Effect of off-south orientation on optimum conditions for maximum solar energy absorbed by flat plate collector augmented by plane reflector
p0361 A80-33462
Design and development of a paraboloidal dish solar collector for intermediate temperature service
p0363 A80-33483
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484
Environmental testing of solar reflector structures
p0363 A80-33487
Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors
p0364 A80-33496
Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497
Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505
Performance analysis for collector-side reflector systems
p0376 A80-33621
Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631
A study on mirror fields for tower type solar power plants
p0377 A80-33633
Unfolding concentrator slope errors from reflected-beam measurements
p0377 A80-33636
Specular reflectance properties of solar mirrors as a function of incident angle
p0378 A80-33640
Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility
p0378 A80-33642

A simple technique for measuring slope or surface error of a concentrator p0378 A80-33644
Effects of outdoor exposure on the solar reflectance properties of silvered glass mirrors p0379 A80-33647
Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south p0392 A80-33867
Selection of materials and development of processes for the fabrication of solar reflector panels p0393 A80-34778
An array of directable mirrors as a photovoltaic solar concentrator p0402 A80-37297
Absorption enhancement in solar collectors by multiple reflections p0403 A80-37306
Optimum inclination of linear reflectors p0406 A80-37961
Street lighting by sunlight p0411 A80-38009
Comfortable heating and cooling by solar reflectors and wind p0411 A80-38013
Properties of low cost, high volume glasses --- for solar energy applications p0414 A80-39937
Solar energy economics - Orbiting reflectors for world energy p0415 A80-41324
Quasi-optimum pseudo-Lambertian reflecting concentrators - An analysis p0421 A80-43367
On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications p0421 A80-43485
Solar reflector materials [PNL-SA-7698] p0430 N80-23859
Solar thermal power systems point-focusing thermal and electric applications projects. Volume 1: Executive summary [NASA-CR-163147] p0432 N80-24750
Solar thermal power systems point-focusing distributed receiver technology project. Volume 2: Detailed report [NASA-CR-159715] p0432 N80-24751
Solar central receiver prototype heliostat. Volume 3: Cost estimates [SAN-1604-3] p0451 N80-26801

SOLAR SENSORS
The OMNIUM-G HTC-25 tracking concentrator p0434 N80-24766

SOLAR SIMULATION
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating p0406 A80-37959

SOLAR SIMULATORS
Small-scale solar simulator for indoor testing of collector modules and materials p0362 A80-33477
Design of an inexpensive solar simulator p0362 A80-33478

SOLAR TERRESTRIAL INTERACTIONS
Seasonal regeneration through underground strata --- solar terrestrial interactions p0548 A80-37966
Attenuation of solar energy by high, thin clouds p0414 A80-40709
Potential prediction needs in support of energy systems p0342 N80-24693

SOLAR TOTAL ENERGY SYSTEMS
Energy self-sufficiency in monsoonal Australia p0323 A80-33433
Design and development of a paraboloidal dish solar collector for intermediate temperature service p0363 A80-33483
A novel mildly concentrating photovoltaic/thermal total energy system p0386 A80-33729
Performance of a storage unit coupled to a flat plate solar collector p0406 A80-37964
A helioelectric farm --- multimodular solar thermal electric plant design is presented p0410 A80-38005
Comfortable heating and cooling by solar reflectors and wind p0411 A80-38013
French solar energy program and its application for international cooperation p0327 A80-38017
The SERI solar energy storage program p0423 N80-22821
Solar total energy-large scale experiment, Shenandoah, Georgia p0436 N80-24795
Solar total energy project at Shenandoah, Georgia system design p0436 N80-24796
Solar total energy project Shenandoah [ALO-3985-1-REV-1] p0444 N80-25825

SOLETTAS
Spectrophotovoltaic orbital power generation [NASA-CR-161451] p0530 N80-24757

SOLID PROPELLANTS
Vehicle gas producers --- using solid fuels p0467 A80-34534

SOLID STATE DEVICES
Solar heating and cooling performance in CSU Solar House III p0370 A80-33570
MOS solar cells p0409 A80-37996
Solar power satellite system definition study. vPMVMP 4: sPMJE sUBUFT sps aOHMZTJT, QIBTF 3 [NASA-CR-160745] p0543 N80-27812

SOLID STATE LASERS
Solar power satellite system definition study. Volume 2, part 3: Final briefing, 16 May 1980, phase 3 [NASA-CR-160743] p0543 N80-27810

SOLID STATE PHYSICS
Review of solid state physics --- emphasizing background for understanding solar cells p0419 A80-42454

SOLID WASTES
Solid waste conversion to energy: Current European and U.S. practice --- Book p0474 A80-40832
Recovery and reuse - Mechanical processing p0475 A80-41172
Potential for conversion of refuse to energy in Ontario p0479 A80-42930
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products [ASME PAPER 80-ENAS-9] p0479 A80-43186
Naval facility energy conversion plants as resource recovery system components [AD-A081232] p0528 N80-23783
SWARU: Solid waste disposal resource system [NP-24196] p0341 N80-24146
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility [CONF-791006-2] p0486 N80-24486

SOLIDIFICATION
A direct contact thermal energy storage system p0548 A80-37968

SOLIDS
Solar cooling through cycles using microporous solid adsorbents p0365 A80-33526

SOLVENTS
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama [FE-2270-46] p0497 N80-26528

SOOT
Fundamental characterization of alternative fuel effects in continuous combustion systems p0500 N80-27382

SOUND WAVES
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine [NASA-TM-81813] p0532 N80-25104

SOUTH CAROLINA
Solar heating system installed at Blakedale Professional Center, Greenwood, South Carolina [NASA-CR-161435] p0427 N80-23776

Solar heating and hot water system installed at Municipal Building complex, Abbeville, South Carolina
[NASA-CR-161443] p0442 N80-25788

SOUTHERN CALIFORNIA

Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California
[UCRL-15108] p0483 N80-23756

SOYBEANS

Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants
p0330 A80-41664

SPACE CHARGE

Charge collection and spectral response of amorphous-silicon solar cells
p0401 A80-36937

SPACE COMMUNICATION

Solar energy conversion by fluorescent materials for utilization in space communication systems
p0409 A80-37992

SPACE ERECTABLE STRUCTURES

Large space structures - Fantasies and facts
[AIAA 80-0674] p0393 A80-34999

SPACE HEATING (BUILDINGS)

Australian programme for solar heating and cooling
p0359 A80-33432

Solar energy projects for heating of buildings in Germany
p0359 A80-33438

The United Kingdom solar heating programme
p0323 A80-33445

Derivation of efficiency and loss factors for solar air heaters
p0359 A80-33447

The effects of air leaks on solar air heating systems
p0359 A80-33448

New air-heating collector design and performance
p0359 A80-33449

Design and performance of a roof integrated solar air heater
p0360 A80-33451

Equations for representing the UL-dependence in collector test procedures --- heat loss coefficient
p0361 A80-33467

The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507

Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515

Development of a storage system based on encapsulated p.c.-materials --- Phase Change material in solar heating
p0546 A80-33522

Investigation of latent heat of fusion storage for solar heating systems
p0546 A80-33523

On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings
p0367 A80-33538

Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544

Experimental performance study of a series solar heat pump
p0368 A80-33552

Improved heat pump model for TRNSYS --- transient simulation program for residential areas
p0508 A80-33553

Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554

Real time identification of parameters in building models --- optimal control of solar houses
p0368 A80-33556

The Saskatchewan Conservation House - A year of performance data
p0369 A80-33566

Honeywell General Offices concentrating collector system - Installation and operation
p0370 A80-33567

Report on five years of operating experience with four pioneer school heating experiments --- using solar energy conversion
p0370 A80-33569

Solar heating and cooling performance in CSU Solar House III
p0370 A80-33570

Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report
p0370 A80-33571

Solar heating and hot water supply system of Fuji Electric Solar House
p0370 A80-33573

The development and demonstration of a solar pond for heating greenhouses
p0371 A80-33586

The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems
p0381 A80-33663

The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center
p0381 A80-33666

Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings
p0381 A80-33669

A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683

A simple procedure for assessing thermal comfort in passive solar heated buildings
p0382 A80-33684

Thermopond applicability to climate and structure --- design of solar heating and cooling system for buildings
p0382 A80-33685

An experimental approach for studying direct solar gain optics of model interiors
p0382 A80-33687

Physical modeling of buildings --- simulating thermal behavior of building by scale model
p0383 A80-33688

Hybrid active-passive designs - Synergy or conflict --- solar heating systems
p0383 A80-33689

Integrating energy approaches in a large office building
p0324 A80-33690

Economic aspects of passive solar remodeling in existing buildings
p0383 A80-33692

Performance analysis of a natural convection collector system --- of solar house
p0383 A80-33695

Measured performance of a passive solar residence in Bozeman, Montana
p0383 A80-33696

A new and simple method for estimating the monthly and yearly performance of passive solar systems
p0383 A80-33697

Analytical and economic evaluation of heat pipe augmented passive solar heating systems
p0384 A80-33704

Hybrid passive for motel guest rooms
p0384 A80-33709

Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710

Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H.
p0384 A80-33711

Cost and performance evaluation of passive solar systems
p0389 A80-33755

The use of solar energy storage for heating and cooling applications
p0391 A80-33861

Development of a combined solar heating/heat pump system for conditions typical of the Crimea
p0391 A80-33863

A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /THU solar system I/
p0392 A80-34561

Solar heating systems with air collectors and rock bed storage
p0406 A80-37969
Latent heat diode wall --- study of passive solar heating of houses
p0407 A80-37975
A review of the historical developments of the use of passive solar systems
p0408 A80-37981
Solar collector related research and development in the United States for heating and cooling of buildings
p0408 A80-37983
Economic considerations of solar energy
p0412 A80-38019
The comparative economics of passive and active systems --- for solar residential space heating
p0412 A80-38020
Impact of solar heating and cooling of buildings on electric utilities
p0412 A80-38022
Wangen EVS-solarhouse with a positive balance sheet
p0413 A80-38305
Application of heat pipes to thermal energy storage systems --- for solar residential heating
[AIAA PAPER 80-1509] p0549 A80-41473
Solar air systems
p0418 A80-42444
A completely instrumented solar building - The Shenandoah Solar Recreational Center
p0418 A80-42447
Passive cooling systems in hot arid regions
p0478 A80-42448
Prospects for energy responsive urban planning and design
p0332 A80-42450
The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period
p0421 A80-43484
Heat-pump applications to single-family dwellings - An analysis by computer model
p0333 A80-43833
Fossil-fuel heat pumps for domestic, commercial and industrial space heating
p0479 A80-43834
Subcontracted activities related to TES for building heating and cooling
p0553 N80-22807
Solar space heating and air conditioning, volume 3. Citations from the NTIS data base
[PB80-801707] p0424 N80-22864
Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base
[PB80-801723] p0425 N80-22865
Solar space heating and air conditioning, volume 4. Citations from the NTIS data base
[PB80-801715] p0425 N80-22866
Passive solar space heating and cooling. Citations from the NTIS data base
[PB80-801731] p0425 N80-22868
Solar heating system installed at Blakedale Professional Center, Greenwood, South Carolina
[NASA-CR-161435] p0427 N80-23776
Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices
[LA-UR-79-3396] p0338 N80-23807
Solar heating and hot water system installed at Saint Louis, Missouri
[NASA-CR-161420] p0431 N80-24744
Solar heating system installed at Telex Communications, Inc., Blue Earth, Minnesota
[NASA-CR-161437] p0441 N80-25786
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona
[NASA-CR-161450] p0441 N80-25787
Solar heating and hot water system installed at Municipal Building complex, Abbeville, South Carolina
[NASA-CR-161443] p0442 N80-25788
Solar energy system performance evaluation: Seasonal report for IBM system 1A, Huntsville, Alabama
[NASA-CR-161464] p0442 N80-25790
Solar energy system performance evaluation: Seasonal report for Solaron-Akron, Akron, Ohio
[NASA-CR-161465] p0442 N80-25791
Solar project description. Albuquerque Western-2 multi-dwelling building Albuquerque, New Mexico
[SOLAR/1090-79/50] p0444 N80-25819
West Chester Work Center: Solar space heating demonstration project
[DOE/CS-4048/2] p0444 N80-25822
Two-tank seasonal storage concept for solar space heating of buildings
[CONF-791226-2] p0446 N80-25867
Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-25868
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900
Architects and engineers guide to energy conservation in existing buildings
[DOE/CS-0132] p0351 N80-26550
Solar energy facility at North Hampton Recreation Center, Dallas, Texas
[NASA-CR-161444] p0449 N80-26766
Survey of foreign research in the field of heat pumps for the heating of dwellings
p0353 N80-26789
Case study of an air to air heat pump
p0353 N80-26790
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793
Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin
[SOLAR/1057-79/50-PT-1] p0451 N80-26811
Solar project description for Alpha Construction Company's single family residence, Canton, Ohio
[SOLAR/1034-79/50] p0451 N80-26812
Solar project description for Stewart-Teele-Mitchell single family residence, Malta, N.Y.
[SOLAR/1018-79/50] p0451 N80-26813
Solar project description for Washington Natural Gas Company's single family residence, Kirkland, Washington
[SOLAR/1001-79/50] p0451 N80-26814
Addition of inexpensive solar air-heaters to a pre-engineered metal building
[ALO-4086-1] p0452 N80-26818
Solar Federal Buildings Program plan --- solar applications in buildings
[DOE/CS-0147A] p0453 N80-26842
Design of annual storage solar space heating systems
[DOE/CS-32939/10] p0455 N80-26855
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870
Solar heating system installed at Stamford, Connecticut
[NASA-CR-161436] p0456 N80-27800
Solar energy system performance evaluation: Seasonal report for Contemporary-Manchester, Manchester, New Hampshire
[NASA-CR-161471] p0457 N80-27802

SPACE MANUFACTURING
Modeling of safe-life tests of thermoelectric batteries --- for space manufacturing experiments
p0519 A80-38758

SPACE TRANSPORTATION
Solar power satellite system definition study. Volume 5: Space transportation analysis, phase 3
[NASA-CR-160746] p0457 N80-27813

SPACE-TIME FUNCTIONS
Space-time solutions of the linearized coupled-mode equations
p0520 A80-41074

SPACECRAFT CONSTRUCTION MATERIALS
The solar power satellite concepts: The past decade and the next decade
[NASA-TM-81000] p0541 N80-25360

SPACECRAFT POWER SUPPLIES
Conceptual design of integrated energy storage and attitude control system --- for European satellites
p0547 A80-37455
Solar energy conversion by fluorescent materials for utilization in space communication systems
p0409 A80-37992

- CO2 concentrations in a molten carbonate electrochemical cell [ASME PAPER 80-ENAS-14] p0523 A80-43190
- Solar array subsystems study [NASA-CR-159857] p0431 N80-24742
- Unfulfilled technology needs in space power systems [NASA-TM-80677] p0442 N80-25789

SPACECRAFT PROPULSION
- The applicability of DOE solar cell and array technology to space power [NASA-CR-163143] p0432 N80-24753

SPACECRAFT STRUCTURES
- Large space structures - Fantasies and facts [AIAA 80-0674] p0393 A80-34999

SPATIAL FILTERING
- Antares Power Amplifier optical system p0518 A80-38489

SPECIFIC HEAT
- Specific heats of Colorado oil shales - A differential scanning calorimetry study p0475 A80-41892

SPECIFICATIONS
- Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1 [NASA-CR-163220] p0564 N80-28246
- Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices [NASA-CR-163221] p0565 N80-28247

SPECTRAL REFLECTANCE
- Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors p0381 A80-33668
- Selective electrodeposited chromium black coatings - Optical properties, selectivity model p0388 A80-33743
- Nickel pigmented anodic aluminium oxide for selective absorption of solar energy p0388 A80-33748
- Evaluating the performance of reflecting concentrating systems p0400 A80-36592
- Optical and topographical properties of selective black chrome p0422 A80-43514

SPECTRAL SENSITIVITY
- Selective electrodeposited chromium black coatings - Optical properties, selectivity model p0388 A80-33743
- Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces p0388 A80-33746
- Ion implanted materials as selective absorbers for photothermal solar energy conversion p0388 A80-33747
- Nickel pigmented anodic aluminium oxide for selective absorption of solar energy p0388 A80-33748
- Low-cost, high-performance solar selective paint coatings p0393 A80-34781
- Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors p0399 A80-35500
- Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket p0401 A80-36834
- Spectrally selective surfaces in photothermal solar energy conversion p0417 A80-42443

SPECTRAL SIGNATURES
- Remote sensing for geothermal environmental assessments --- Imperial Valley and The Geysers, California [UCRL-15108] p0483 N80-23756

SPECTRUM ANALYSIS
- The design and utilization of a microprocessor-controlled absolute spectral response system --- for solar cells p0398 A80-35492

SPECULAR REFLECTION
- Specular reflectance properties of solar mirrors as a function of incident angle p0378 A80-33640
- Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors p0381 A80-33668
- Optimization of flat-plate collector-flat mirror systems 0392 A80-33871

SPHERICAL ANTENNAS
- Test Bed Concentrator (TBC) p0433 N80-24763

SPIRALS
- Low cost spiral shaped solar collector p0406 A80-37960

SPOILERS
- Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines [NASA-CR-159856] p0355 N80-27803

SPRAYED COATINGS
- Stability of plasma-sprayed coatings tested at White Sands Solar Facility p0380 A80-33658
- Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide p0395 A80-35350

SPUTTERING
- Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system p0388 A80-33742
- Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces p0390 A80-33786
- Properties of sputtered ITO/CdTe solar cells p0426 N80-23767

STABILITY
- Characterization and structural studies of the various types of COM p0494 N80-26468

STABILITY TESTS
- Life and stability testing of packaged low-cost energy storage materials p0553 N80-22814

STABILIZATION
- Stabilizing in situ oil shale retorts with injected grout p0473 A80-39762

STAINLESS STEELS
- A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems p0506 A80-33046
- Evaluation of materials for EPR power generation p0507 A80-33058
- Radiative selectivity and the oxidation of stainless steels p0388 A80-33745
- A field ion microscope study of microstructural features of solar collector coatings p0422 A80-43528

STANDARDIZATION
- Development of standards for coal-oil mixtures p0494 N80-26465

STANDARDS
- Dimensions/NBS, volume 63, no. 11 --- standards in measuring instruments [PB80-141542] p0541 N80-25195
- Analysis of code related responses from the solar demonstration program [PB80-153968] p0457 N80-27827

STATISTICAL ANALYSIS
- The layout of solar hot water systems, using statistical meteo- and heat demand data p0369 A80-33562
- Markov chains to solar energy storage calculations p0390 A80-33766
- Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology [EPRI-ER-1070-VOL-2] p0338 N80-23786

STATISTICAL CORRELATION
- Simulation of correlated wind speeds for sites and arrays p0466 A80-33769

STATISTICAL DISTRIBUTIONS
Wind statistics at the Boulder Atmospheric Observatory tower --- for wind turbine generator design p0468 A80-35722

STATISTICAL WEATHER FORECASTING
The potential impact of automated wind guidance on wind energy conversion operations p0469 A80-35731

STATORS
Differential split power transmissions for a single shaft passenger car gas turbine engine [ASME PAPER 80-GT-19] p0521 A80-42157

STEAM
Application of solar energy to food industry - A distillery p0372 A80-33591
Process steam generation by a facetted, non-imaging solar concentrator p0378 A80-33639
Hoe Creek No. 3 - First long-term underground coal gasification experiment with oxygen-steam injection p0473 A80-39765
A steam process for the gasification of coal p0480 N80-22507
Solar production of industrial process steam ranging in temperature from 300 F to 550 F (phase 1), volume 1 [DOE/CS/32199-1] p0438 N80-24826
Design of a system using CPC collectors to collect solar energy and to produce industrial process steam [ANL-79-102] p0443 N80-25814

STEAM TURBINES
Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones p0358 A80-33425
Rotary expander for a solar thermo-mechanical conversion system p0382 A80-33681
Steam and gas turbines for small outputs using solar energy p0410 A80-38003
Fuel gases from coal gasification for the gas/steam turbine process p0472 A80-38300
IEA/SPS 500 kW distributed collector system p0436 N80-24791
Solar thermal repowering: Utility/industry market potential in the Southwest --- to drive a turbogenerator [MTR-7919] p0439 N80-24836

STELLARATORS
Numerical studies of new stellarator concepts p0511 A80-34978

STIRLING CYCLE
Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine p0377 A80-33635
A free cylinder Stirling engine solar powered water pump p0382 A80-33679
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket p0401 A80-36834
A new design of Stirling engine for automotive application p0519 A80-39899
A Stirling cycle engine for use with solar thermal-electric systems [ASME PAPER 80-PET-32] p0524 A80-43343
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems [NASA-CR-159587] p0526 N80-22787
Non-heat pipe/P-40 Stirling engine p0530 N80-24772
The United Stirling P40 engine for solar dish concentrator application p0531 N80-24775
Cost estimating Brayton and Stirling engines p0531 N80-24781
Cost and price estimate of Brayton and Stirling engines in selected production volumes [NASA-CR-163265] p0536 N80-26769

STOICHIOMETRY
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace p0325 A80-35879

STORAGE
Strategic petroleum reserve [DOE/EA-0047] p0557 N80-25769

STORAGE BATTERIES
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters p0400 A80-36591
Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte p0547 A80-37009
Rechargeable batteries: Advances since 1977 --- Book p0547 A80-37591
Lithium batteries with voltage compatibility with conventional systems p0549 A80-40604
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery p0549 A80-40605
Performance analysis of zinc-bromine batteries in vehicle and utility applications p0550 A80-41852
Properties of alternate electrolytes for secondary zinc batteries p0550 A80-42297
A preliminary investigation for an Al/AlCl3-NaCl/FeS2 secondary cell p0550 A80-42299

STORAGE STABILITY
Membrane stratified solar ponds p0371 A80-33582
The physics of a saturated Na2O.2B2O3.10H2O non-convecting solar pond p0372 A80-33587
Primary Li/SOCl2 cells. X - Optimization of D cells with respect to energy density, storability and safety p0549 A80-40602
Assessment of crude oil and refined petroleum product quality during long-term storage [AD-A082365] p0557 N80-24637
Design consideration of fine COM storage p0502 N80-27506

STORAGE TANKS
Effects of baffles on thermal stratification in themocline storage tanks p0365 A80-33509
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks p0545 A80-33510
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks p0546 A80-33518
Adaptive control for a multiple tank, multiple temperature solar energy storage system p0369 A80-33557
Internally insulated thermal storage system development program p0552 N80-22801
Energy storage-boiler tank p0554 N80-22820
IEA/SPS 500 kW distributed collector system p0436 N80-24791
Hybrid thermal storage with water [ESG-DOE-13259] p0558 N80-25861
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1 [CONF-791160-VOL-1] p0501 N80-27494
Design consideration of fine COM storage p0502 N80-27506

STRATA
Seasonal regeneration through underground strata --- solar terrestrial interactions p0548 A80-37966

STRATIFICATION
The actual benefits of thermally stratified storage in a small and a medium size solar system p0365 A80-33507

STREAMS
Undeveloped hydropower as a potential energy source in Idaho
[PB80-157399] p0504 N80-27824
STREETS
Street lighting by sunlight
p0411 A80-38009
STRESS CORROSION
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7] p0491 N80-25707
STRIP TRANSMISSION LINES
Excitation of a superconducting strip resonator by a system of Josephson point contacts
p0539 A80-33161
STRUCTURAL DESIGN
An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant
p0377 A80-33628
Monthly average daily insolation on overhang shaded windows
p0383 A80-33698
Atmospheric considerations for design of WECS --- Wind Energy Conversion System
p0513 A80-35717
Gas turbine combustor design challenges for the 1980's
[AIAA PAPER 80-1285] p0475 A80-41213
Design of low-cost structures for photovoltaic arrays. Volume 2: Technical studies and appendices
[SAND-79-7002-VOL-2] p0429 N80-23837
Low cost structures for photovoltaic arrays
[SAND-80-0142C] p0430 N80-23853
Test Bed Concentrator (TBC)
p0433 N80-24763
A cellular glass substrate solar concentrator
p0434 N80-24769
The development of an air Brayton and a steam Rankine solar receiver
p0434 N80-24770
Study of multi-kW solar arrays for Earth orbit applications: Midterm performance review
[NASA-CR-161467] p0437 N80-24798
Site and building energy-conservation study: Survey of building 435, MFE research
[UCRL-15198] p0352 N80-26568
Design of annual storage solar space heating systems
[DOE/CS-32939/10] p0455 N80-26855
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870
STRUCTURAL DESIGN CRITERIA
Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program
p0513 A80-35718
Analysis of code related responses from the solar demonstration program
[PB80-153968] p0457 N80-27827
STRUCTURAL ENGINEERING
Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms
p0512 A80-35167
Architects and engineers guide to energy conservation in existing buildings
[DOE/CS-0132] p0351 N80-26550
Lessons of the NASA Tech House
[NASA-SP-442] p0456 N80-27219
STRUCTURAL FAILURE
Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060
STRUCTURAL VIBRATION
La Recherche Aerospatiale, Bimonthly Bulletin Number 1979-6
[ESA-TT-632] p0448 N80-26255
SUBMARINE CABLES
System-reliability studies for wave-energy generation
p0540 A80-43830
SUBMERGED BODIES
Recent progress on ducks --- ocean wave energy receivers
p0526 A80-43832
SUBMILLIMETER WAVES
Submillimeter interferometry of high-density plasmas
p0511 A80-34970
SUBREFLECTORS
Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors
p0390 A80-33805
SUBSIDENCE
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467
SUBSONIC AIRCRAFT
Hydrogen fueled high bypass turbofans in subsonic aircraft
p0462 A80-37348
SUBSONIC SPEED
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905
SUBSTRATES
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers
p0421 A80-43513
Optical and topographical properties of selective black chrome
p0422 A80-43514
SUGAR CANE
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T1] p0484 N80-23840
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T2] p0503 N80-27514
SUGARS
Pellets of immobilized yeast cells as biocatalysts for transforming biomass
p0466 A80-33414
SULFATES
The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873
Studies of thermochemical water-splitting cycles
[NASA-CR-163029] p0449 N80-26409
Synoptic-scale distribution of man-made aerosols --- fossil fuel combustion products
p0354 N80-26942
SULFATION
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal
p0471 A80-37617
SULFIDES
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery
p0549 A80-40605
SULFUR
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur
p0325 A80-35880
Particulate sulfur and trace metal emissions from oil fired power plants
p0325 A80-35890
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963] p0484 N80-24462
SULFUR COMPOUNDS
Mechanisms and rates of formation of sulfur aerosols in power plant plumes
p0354 N80-26907
SULFUR DIOXIDES
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents
p0459 A80-35190
Air quality measurements in the coal fired power plant environment of Colstrip, Montana
p0326 A80-36477
The lithium-sulfur dioxide primary battery - Its characteristics, performance and applications
p0549 A80-40601
Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants
p0330 A80-41664
The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873

SULFUR OXIDES
  Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids p0539 A80-33424
  Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system p0358 A80-33426
  Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power p0379 A80-33651
  Solar-heated gas-turbine process using sulfur oxides for power production and energy storage [LBL-9472] p0424 N80-22839
SULFURIC ACID
  Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling p0359 A80-33429
SUNLIGHT
  Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators p0379 A80-33646
  The performance of silicon solar cells under concentrated sunlight p0386 A80-33724
  Natural lighting in buildings - A passive solar system p0408 A80-37982
  Street lighting by sunlight p0411 A80-38009
SUPERCONDUCTING MAGNETS
  Mirror fusion reactor design p0505 A80-33043
  Magnet optimization for pulsed energy conversion --- for fusion reactors p0517 A80-37871
  Superconducting magnetic energy storage for electric utilities and fusion systems [LA-UR-78-1213] p0554 N80-22838
  Superconducting Magnetic Energy Storage (SMES) program [LA-8199-PR] p0558 N80-25805
SUPERCONDUCTING POWER TRANSMISSION
  Excitation of a superconducting strip resonator by a system of Josephson point contacts p0539 A80-33161
  Load excitation at the superconducting cable test facility [BNL-26641] p0540 N80-22608
  Calorimetric measurement of ac losses in superconducting cables of short lengths [BNL-26712] p0540 N80-22609
  Measurements on insulating materials at cryogenic temperatures [PB80-134596] p0541 N80-24507
SUPERCONDUCTIVITY
  Superconductivity - will its potential be realized p0539 A80-32717
SUPERCONDUCTORS
  Superconductivity - Will its potential be realized p0539 A80-32717
  Excitation of a superconducting strip resonator by a system of Josephson point contacts p0539 A80-33161
  MHD generator of the conduction type with reciprocal motion of the composite working element p0509 A80-34313
SUPERSONIC FLOW
  Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator p0510 A80-34873
SUPPLYING
  Forecast of long term coal supply and mining conditions: Model documentation and results [NASA-CR-163141] p0487 N80-24728
SUPPORTS
  Design of low-cost structures for photovoltaic arrays. Volume 2: Technical studies and appendices [SAND-79-7002-VOL-2] p0429 N80-23837
  Low cost structures for photovoltaic arrays [SAND-80-0142C] p0430 N80-23853
SURFACE DEFECTS
  A simple technique for measuring slope or surface error of a concentrator p0378 A80-33644
SURFACE FINISHING
  Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volumes 1 & 2 p0525 A80-43503
  Cleaning agents and techniques for concentrating solar collectors [SAND-80-7005C] p0445 N80-25860
  Low-cost solar antireflection coatings --- for flat plate collectors [ALO-5300-T2] p0453 N80-26844
SURFACE GEOMETRY
  Unfolding concentrator slope errors from reflected-beam measurements p0377 A80-33636
  Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators p0386 A80-33726
  Concentration characteristics of composite parabolic concentrators p0416 A80-41950
SURFACE PROPERTIES
  Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system p0388 A80-33742
  Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant --- for Stirling engine and solar thermal rocket p0401 A80-36834
  The effect of a black chrome selective surface on the thermal performance of a solar collector p0414 A80-40538
  Spectrally selective surfaces in photothermal solar energy conversion p0417 A80-42443
  Characterization and structural studies of the various types of COM p0494 N80-26468
SURFACE REACTIONS
  Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004
SURFACE ROUGHNESS EFFECTS
  Modified power law equations for vertical wind profiles --- in investigation of windpower plant siting p0468 A80-35719
  Effect of complex terrain on wind fluctuations --- for consideration of windpower machine site p0468 A80-35723
  Optical and topographical properties of selective black chrome p0422 A80-43514
SURFACE TEMPERATURE
  Contribution of remote sensing to the geological problems of the country p0472 A80-38801
  Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers p0475 A80-41662
SURFACE VEHICLES
  Surface transportation systems using hydrogen energy p0461 A80-37339
  Whirl and critical speeds of flywheel-container systems aboard vehicles p0550 A80-41649
SURFACTANTS
  Association of chlorophyll with surfactants on a particle surface --- for solar energy conversion p0358 A80-33421
SWEDEN
  Solar Heating '85 - Sweden's national solar heating program p0323 A80-33443
  Solar energy research in Sweden p0323 A80-33444
SWITCHING CIRCUITS
  A circuit for measurement of the fill factor of solar cells p0399 A80-36121

Short course in microprocessors for solar energy applications - Control --- of switching for solar battery charging network in feedback-controlled step-motor tracking collectors
p0419 A80-42462

SYNOPTIC MEASUREMENT
Synoptic-scale distribution of man-made aerosols --- fossil fuel combustion products
p0354 N80-26942

SYNTHANE
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126
Catalytic coal gasification for SNG manufacture --- Substitute Natural Gas
p0474 A80-40755
Synthane pilot plant, South Park Township, Pennsylvania
[COO-0003-41-T1] p0489 N80-25455

SYNTHESIS
Research on diamantane and other high density hydrocarbon fuels
[AD-A080749] p0482 N80-23474

SYNTHETIC FUELS
Fusion - An energy source for synthetic fuels
[AIAA PAPER 80-0844] p0465 A80-32857
Liquid fuel production from biomass
p0465 A80-33412
Hydrogen production using fusion energy and thermochemical cycles
p0459 A80-35189
Automotive fuels from coal
p0470 A80-35800
Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water
p0326 A80-37332
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944
p0471 A80-37678
Ethanol, a clean burning bio-solar fuel - Its production and utilization
p0472 A80-37986
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117
Fuel gases from coal gasification for the gas/steam turbine process
p0472 A80-38300
Liquid fuel supplies
p0329 A80-40751
Status of coal gasification processes
p0540 A80-40752
Coal gasification development and commercialization of the Texaco coal gasification process
p0474 A80-40754
The U-GAS process --- synthetic fuel production by coal gasification
p0474 A80-40756
The zinc chloride process for the hydrocracking of coal
p0474 A80-40757
Economic and market potential for SRC-II products --- Solvent Refined Coal
p0474 A80-40758
Environmental concerns for coal synfuel commercialization
p0329 A80-40759
Synthetic fuels from coal: Overview and assessment --- Book
p0329 A80-40825
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
Compaction and densification of fuels from biomass
p0478 A80-42467
Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions
p0478 A80-42800
Literature survey of properties of synfuels derived from coal
[NASA-TM-79243] p0481 N80-22776
A 300 Btu gas combustor development program, phase 1
[EPRI-AP-1144] p0481 N80-22852
Research on diamantane and other high density hydrocarbon fuels
[AD-A080749] p0482 N80-23474
Methanol and methyl fuel catalysts --- CuO/ZnO catalysts
[FE-3177-3] p0482 N80-23482
Coal conversion products industrial applications
[NASA-CR-161469] p0484 N80-24465
Coal conversion
[DOE/ET-0061/2] p0486 N80-24481
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-43] p0486 N80-24482
Utilization concerns of potential transportation fuels
[PB80-138498] p0342 N80-24503
Solar-heated fluidized bed gasification system
[NASA-CASE-NPO-15071-1] p0432 N80-24747
Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base
[PB80-805245] p0491 N80-25478
Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base
[PB80-805252] p0491 N80-25479
Biologically important compounds in synfuels processes
[CONF-800303-13] p0498 N80-26540
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546
Comparison of costs for automobile energy conservation vs synthetic fuel production
[CONF-800419-1] p0353 N80-26810
More on dual purpose solar-electric power plants
[SLAC-PUB-2477] p0452 N80-26822
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382
Use of petroleum-based correlations and estimation methods for synthetic fuels
[NASA-TM-81533] p0502 N80-27509
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-58] p0503 N80-27515
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-55] p0503 N80-27516
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-50] p0503 N80-27517

SYSTEM EFFECTIVENESS
Development of an effective solar fraction --- for solar heating subsystems
p0368 A80-33555
Monitoring solar heated houses in the European community - Procedures, results and future activities
p0381 A80-33671
Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H.
p0384 A80-33711

SYSTEM FAILURES
Safety analysis of an advanced energy system facility
p0520 A80-40337
Common Cause Failures - A dilemma in perspective
p0328 A80-40344

SYSTEMS ANALYSIS
A survey of existing solar system simulation methods
p0369 A80-33560
The characterization of the performance of passive solar heating systems
p0382 A80-33686

Status of the photovoltaic systems definition project
p0387 A80-33733

A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304] p0519 A80-39014

The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26] p0416 A80-42161

Evaluation of thermal energy storage for the proposed Twin Cities District Heating system --- using cogeneration heat production and aquifiers for heat storage
p0553 N80-22815

Experimental evaluation of thermal energy storage
p0553 N80-22817

Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188] p0555 N80-23796

Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214

Standard assumptions and methods for solar heating and cooling systems analysis
[SERI/TP-351-548] p0440 N80-24862

Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2] p0542 N80-25808

Solar radiation data forecast and interpolation analysis. Folder 1, part 1: Executive summary. Part 2: Technical analysis (tasks 1 and 2). Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982

Reliability and materials performance of solar heating and cooling systems
[SOLAR/0906-79/70] p0452 N80-26824

System planning analysis applied to OTEC: initial cases by Florida Power Corporation, task 2
[DOE/ET/29187-2] p0537 N80-26864

Analysis methods for photovoltaic applications
[SERI/SP-35-230] p0455 N80-26868

Analysis methods for solar heating and cooling applications: Passive and active systems, the second edition
[SERI/SP-35-232R] p0455 N80-26871

SYSTEMS ENGINEERING

Solar City - Mount Cotton
p0359 A80-33434

Design of an inexpensive solar simulator
p0362 A80-33478

Design and operation of a liquid-desiccant type solar air conditioning system
p0366 A80-33527

Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs
p0374 A80-33603

A solar thermal-electric experimental plant
p0374 A80-33606

A simplified solar cooling design method for closed-loop liquid systems
p0376 A80-33620

An optimization procedure for solar thermal electric power plant design
p0376 A80-33625

Thermopond applicability to climate and structure --- design of solar heating and cooling system for buildings
p0382 A80-33685

Hybrid passive for motel guest rooms
p0384 A80-33709

Photovoltaic concentrator design comparison
p0385 A80-33723

Status of the photovoltaic systems definition project
p0387 A80-33733

Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south
p0392 A80-33867

The bus systems, passenger transit system of the future
p0324 A80-34067

Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980
p0511 A80-35161

Updating the limit efficiency of silicon solar cells
p0395 A80-35354

Wind statistics at the Boulder Atmospheric Observatory tower --- for wind turbine generator design
p0468 A80-35722

New directions for future satellite power system /SPS/ concepts
[AIAA 79-3069] p0539 A80-36963

TRIDENT - A megavolt pulse generator using inductive energy storage
p0548 A80-37857

Heavy-ion-driven fusion
p0519 A80-39763

Photovoltaic power system reliability considerations
p0520 A80-40338

Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471

Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732

Performance study of an OTEC system
p0521 A80-41949

Fundamentals of solar architecture
p0418 A80-42449

Systematic techniques of design for solar houses in high latitudes
p0418 A80-42452

The MHD /magnetohydrodynamic/ two-axis Rate Sensor
[AIAA PAPER 80-1890] p0523 A80-43325

SPS phase control system performance via analytical simulation
[NASA-CR-160582] p0540 N80-22378

Active heat exchange system development for latent heat thermal energy storage
p0553 N80-22819

Active heat exchange system development for latent heat thermal energy storage
p0554 N80-22822

Direct solar pumped laser
[LA-7982-MS] p0426 N80-23651

Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662

Mod-1 wind turbine generator analysis and design report, volume 1
[NASA-CR-159495] p0528 N80-23775

Investigation of the technical and economic feasibility of using pumped well-water energy storage systems
[SAND-79-7096] p0556 N80-23851

Solar heating and cooling system design and development
[NASA-CR-161422] p0432 N80-24746

An organic Rankine receiver for the SCSTPE program
p0434 N80-24771

Costing the OMNIUM-G system 7500
p0434 N80-24779

The dish-Rankine SCSTPE program (Engineering Experiment no. 1) --- systems engineering and economic analysis for a small community solar thermal electric system
p0435 N80-24782

Study of multi-kW solar arrays for Earth orbit applications: Midterm performance review
[NASA-CR-161467] p0437 N80-24798

Design parameters for solar powered absorption cooling systems with chilled water storage
p0441 N80-25778

Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 4: Commercial and pilot plant cost data
[SAN-1483-1/5] p0558 N80-25803

Superconducting Magnetic Energy Storage (SMES) program
[LA-8199-PR] p0558 N80-25805

Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2] p0542 N80-25808

Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system
[SRO-0893-17] p0558 N80-25869

Requirement definition and preliminary design of a photovoltaic central power station experimental test facility
[SAND-79-7022-VOL-1] p0534 N80-25870

Design and fabrication of a low-cost Darrieus vertical axis wind turbine system, phase 1
[ALO-4272] p0535 N80-25899

Near hybrid passenger vehicle development program, phase 1. Appendices C and D, Volume 2
[NASA-CR-163331] p0559 N80-26202
Conceptual design of a flywheel energy storage system
[SAND-79-7088] p0561 N80-26805
Preliminary design data package, appendix C --- hybrid electric vehicles
[NASA-CR-163038] p0563 N80-27226
HYCSOS: Hydride conversion and storage system sensitivity analysis
[ANL/EES-TM-63] p0564 N80-27523

T

TECHNOLOGICAL FORECASTING
The bus systems, passenger transit system of the future
p0324 A80-34067
The energy supply of today and tomorrow
p0324 A80-34124
The impact of fuels on aircraft technology through the year 2000
[AIAA PAPER 80-0896] p0470 A80-35898
Hydrogen production from water by use of nuclear energy
p0462 A80-37346
Performance of the noval solar cell substitute for the future
p0409 A80-37995
The significance of hydrogen as a future environmentally sound secondary energy source in energy and propulsion technology
p0462 A80-40970
Gas turbine combustor design challenges for the 1980's
[AIAA PAPER 80-1285] p0475 A80-41213
National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882
Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000
[LA-UR-79-2812] p0338 N80-23820
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841
United Kingdom: Estimates of future energy/GDP relationship
[ORAU/IEA(M)-79-25] p0339 N80-23848
Canada: Estimates of future energy/GNP relationships
[ORAU/IEA(M)-79-24] p0339 N80-23849
Electric and hybrid vehicles in the urban future --- market research
[CONF-791009-23] p0341 N80-24217
Cogeneration technology alternatives study. Volume 1: Summary report
[NASA-CR-159759] p0347 N80-25792
Cogeneration technology alternatives study. Volume 2: Industrial process characteristics
[NASA-CR-159760] p0347 N80-25793
Cogeneration technology alternatives study. Volume 4: Heat Sources, balance of plant and auxiliary systems
[NASA-CR-159762] p0347 N80-25794
Cogeneration technology alternatives study. Volume 6: Computer data
[NASA-CR-159764] p0347 N80-25795
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072] p0492 N80-25865
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239

TECHNOLOGY ASSESSMENT
Status of the United States' Solar Heating and Cooling Program
p0323 A80-33446
Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612
Monitoring solar heated houses in the European community - Procedures, results and future activities
p0381 A80-33671
Siemens/Duewag H-Bahn - Technology and comparative assessment --- of rapid transit systems
p0324 A80-34056
Statistical reliability of wind power assessments
p0469 A80-35741
Wind energy assessment of the San Gorgonio Pass Region
p0470 A80-35749
Technical-economic validation for selection of solar resources as energy sources
p0400 A80-36596
Evaluating certain ways of storing solar energy
p0400 A80-36598
Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments
p0460 A80-37336
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018
Synthetic fuels from coal: Overview and assessment --- Book
p0329 A80-40825
Satellite Power Systems /SPS/ - Overview of system studies and critical technology
[AAS PAPER 80-084] p0540 A80-41898
The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26] p0416 A80-42161
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105] p0331 A80-42227
The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255
Concentrating collectors
p0417 A80-42442
An alternate approach to the application of MHD power generation technology in a utility environment
[IEEE PAPER F 79 651-1] p0525 A80-43502
Recent progress on ducks --- ocean wave energy receivers
p0526 A80-43832
Basic Research Engineering: Fluid Dynamics and Thermal Processes
[FE-2468-53] p0334 N80-22649
Oil shale data book
[PB80-125636] p0540 N80-22770
The SERI solar energy storage program
p0423 N80-22821
Technology assessment of wind energy conversion systems
[LA-8044-TASE] p0527 N80-22840
High-level waste immobilization program: An overview --- vitrification, drying and calcination
[PNL-3094] p0336 N80-23131
Assessment of the potential of hybrid vehicles: Summary
[NASA-CR-163059] p0336 N80-23215
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216
Electricity from refuse --- technology assessment
[NZERDC-44] p0338 N80-23803
Environmental development plans for energy technology programs
[DOE/EDP-0062] p0341 N80-23881
Materials technology for coal-conversion processes --- corrosion resistance slag containers
[ANL-79-93] p0486 N80-24484
Solar array subsystems study
[NASA-CR-159857] p0431 N80-24742
Organic Rankine cycle engine technology in Japan, a preliminary survey
[DOE/SF/10538-1] p0531 N80-24809
Dimensions/NBS, volume 63, no. 11 --- standards in measuring instruments
[PB80-141542] p0541 N80-25195
Dimensions/NBS, volume 63, no. 12 --- dissemination of current energy and environmental research
[PB80-130701] p0489 N80-25196
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807

Ocean energy systems. Fiscal year 1979
[DOE/ET-0118] p0533 N80-25824
Impact of advanced group rapid transit technology
[PB80-153323] p0351 N80-26219
Survey of potential processes for the manufacturing of aluminum --- reducing industrial energy requirements
[ANL/OEPM-79-4] p0351 N80-26441
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535
State-of-the-art assessment of hybrid heat pumps
[EPRI-EM-1261] p0352 N80-26627
Collector array performance report for sites of the National Solar Heating and Cooling Demonstration Program
[SOLAR/0021-79/07] p0454 N80-26846
Design of annual storage solar space heating systems
[DOE/CS-32939/10] p0455 N80-26855
Lessons of the NASA Tech House
[NASA-SP-442] p0456 N80-27219
Hybrid vehicle potential assessment. Volume 7: Hybrid vehicle review
[NASA-CR-163298] p0563 N80-27231
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
Satellite Power Systems (SPS): Concept development and evaluation program, preliminary assessment
[DOE/ER-0041] p0542 N80-27404
Advanced fuel system technology for utilizing broadened property aircraft fuels
[NASA-TM-81538] p0502 N80-27510
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548] p0356 N80-27805
Hydrogen technology: Foreign, change 1
[AD-A083665] p0464 N80-27816

TECHNOLOGY TRANSFER
New Technology Transport for fuel critical economy
p0328 A80-40313
Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662
Collection and dissemination of TES system information for the paper and pulp industry
p0552 N80-22797
Communication strategy to commercialize passive solar energy
[SERI/TP-69-412] p0335 N80-22849
New England Energy Development Systems center (NEEDS). An experiment in university-industry cooperative research. Volume 1: Summary of results
[PB80-112972] p0567 N80-22862
New England energy development systems center (NEEDS). An experiment in university-industry cooperative research. Volume 2: Case histories
[PB80-112980] p0541 N80-22863
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205
Test Bed Concentrator (TBC)
p0433 N80-24763
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213

TECHNOLOGY UTILIZATION
Superconductivity - Will its potential be realized
p0539 A80-32717
Nitrogen fertilizer production by solar energy
p0357 A80-33402
The application of existing solar energy collecting equipment in agriculture, horticulture and fishculture
p0358 A80-33404
Windpower principles - Their application on the small scale --- Book
p0468 A80-34859
Preparation of thin films for solar energy utilization
p0402 A80-37191
The use of solar furnaces in materials research
p0411 A80-[illegible]9008
Wood for energy production --- Book
p0474 A80-40830
Packaging materials - Industrial possibilities for resource recovery
p0475 A80-41171
Solar power --- solar concentrators for solar power plants
p0420 A80-42468
Industrial storage applications overview
p0551 N80-22795
Applications of thermal energy storage to waste heat recovery in the food processing industry
p0552 N80-22796
Collection and dissemination of TES system information for the paper and pulp industry
p0552 N80-22797
Solar thermal power storage applications lead laboratory overview
p0552 N80-22798
Thermal storage experience at the MSSTF and plans for the future
p0552 N80-22799
Fluid circulating pump operated by same incident solar energy which heats energy collection fluid
p0426 N80-23500
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-82367] p0429 N80-23822
Process applications for geothermal energy resources
[COO-4896-T1] p0340 N80-23854
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1] p0529 N80-23860
The applicability of DOE solar cell and array technology to space power
[NASA-CR-163143] p0432 N80-24753
Federal policies to promote the widespread utilization of photovoltaic systems. Supplement: Review and critique
[NASA-CR-163148] p0342 N80-24754
The United Stirling P40 engine for solar dish concentrator application
p0531 N80-24775
Market penetration of new energy systems estimated by econometric and stochastic methodology
[CONF-790852-2] p0346 N80-25207
Solar project description for Perl-Mack Enterprises' single family residences, Denver, Colorado
[SOLAR/1015-79/50] p0444 N80-25821
West Chester Work Center: Solar space heating demonstration project
[DOE/CS-4048/2] p0444 N80-25822
Data handbook for the national solar energy demonstration book
[DSE-5216-T4] p0446 N80-25873
Case study of an air to air heat pump
p0353 N80-26790
Assessment of solar energy within a community: Summary of three community-level studies
[DOE/EV-0054] p0452 N80-26826
Solar heating and cooling demonstration program: A descriptive summary of HUD Cycle 4 and 4A Solar Residential projects
[HUD-PDR-455] p0456 N80-26873

TELLURIUM
Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique
p0402 A80-37299

TEMPERATURE CONTROL
An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection
[AIAA PAPER 80-0869] p0357 A80-32867
Experimental investigation on control modes for an absorption chiller of low capacity --- in air conditioning systems
p0366 A80-33532
Improved heat pump model for TRNSYS --- transient simulation program for residential areas
p0508 A80-33553
A pin programmable controller for research systems --- of solar heating and cooling
p0380 A80-33662

Analytical and economic evaluation of heat pipe augmented passive solar heating systems p0384 A80-33704

TEMPERATURE DISTRIBUTION
Analytical and experimental determination of radiation and temperature distributions inside solar receivers p0377 A80-33634
Temperature distributions in the flat-plate collector under actual unsteady insolation p0415 A80-40937

TEMPERATURE EFFECTS
Void growth characteristics in laser fusion reactor first walls p0508 A80-33077
A simple procedure for assessing thermal comfort in passive solar heated buildings p0382 A80-33684
Chemical nature of coal hydrogenation oils. II - The effect of temperature p0467 A80-34533
Influence of base resistivity on the temperature characteristics of silicon photoconverters p0514 A80-36590
Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale p0472 A80-39421
Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear p0539 A80-39628
Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation [ASME PAPER 80-GT-34] p0416 A80-42167

TEMPERATURE MEASUREMENT
Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography p0360 A80-33453
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1 p0510 A80-34648
Diagnostic development for advanced power systems --- of gas turbines with coal-fire combustors [ASME PAPER 80-GT-128] p0522 A80-42242

TEMPERATURE PROFILES
Effects of baffles on thermal stratification in themocline storage tanks p0365 A80-33509

TENNESSEE
Coal conversion products industrial applications [NASA-CR-161469] p0484 N80-24465

TENSOR ANALYSIS
Derivation of CGL theory with finite Larmor radius corrections --- for magnetized collisionless plasmas p0514 A80-36714

TERMINAL FACILITIES
Hydrogen liquefaction, storage and transfer on an airport site p0462 A80-37349

TERRAIN ANALYSIS
Effect of complex terrain on wind fluctuations --- for consideration of windpower machine site p0468 A80-35723

TEST FACILITIES
CSIRO collector test facilities p0361 A80-33470
Proposed method for testing of radiative cooling flat-plate collectors p0362 A80-33472
Design of an inexpensive solar simulator p0362 A80-33478
Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season p0363 A80-33488
Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility p0378 A80-33642
Users group for central receiver testing --- of heliostats p0380 A80-33654
Performance of passive test units during the 1978-79 heating season --- solar house p0383 A80-33694
Transient getter scheme for the tokamak fusion test reactor p0516 A80-37185
Safety analysis of an advanced energy system facility p0520 A80-40337
Thermal energy storage testing facility p0553 N80-22808
Thermal energy storage test facility p0553 N80-22811
Energy information data base corporate author entries, supplement 3 [DOE/TIC-4585-R1-SUPPL-3] p0567 N80-22846
Oak Ridge Flywheel Evaluation Laboratory [Y-2210] p0556 N80-23832
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility [SAND-79-7022-VOL-1] p0534 N80-25870

TETHERING
Crosswind kite power --- for large-scale wind power production p0523 A80-43139

TEXAS
Solar heating and cooling demonstration project at Radian Corporation, Austin, Texas [NASA-CR-161442] p0441 N80-25784
Environmental assessment: Geothermal energy geopressure subprogram. DOE Sweet Lake no. 1, Cameron Parish, Louisiana [DOE/EA-0065] p0493 N80-25929
Solar energy facility at North Hampton Recreation Center, Dallas, Texas [NASA-CR-161444] p0449 N80-26766

THEMATIC MAPPING
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base [NASA-CR-163311] p0492 N80-25770

THERMAL ABSORPTION
Solar absorption cycle cooling installations in Sydney, Australia p0366 A80-33536
Earth coils and geo-thermal wells used as solar energy storage devices p0368 A80-33549

THERMAL BATTERIES
Batteries for specific solar applications: Project description [SAND-79-1782C] p0557 N80-24603

THERMAL COMFORT
A simple procedure for assessing thermal comfort in passive solar heated buildings p0382 A80-33684

THERMAL CONDUCTIVITY
Thermal performance of compounds used to improve heat transfer in solar collectors p0360 A80-33457
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks p0545 A80-33510
Thermo-fluid analysis of a cylindrical solar heat absorber p0405 A80-37955
Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator p0414 A80-39785
Heat conduction in partial vacuum [ALO-5367-1] p0441 N80-25618
Heat transfer enhancement in metal hydride systems [BNL-27347] p0561 N80-26539

THERMAL CONDUCTORS
Thermal performance of compounds used to improve heat transfer in solar collectors p0360 A80-33457

THERMAL DECOMPOSITION
Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power p0379 A80-33651

THERMAL DEGRADATION
Thermal degradation of a black chrome solar selective absorber coating - Short term p0387 A80-33739

THERMAL DISSOCIATION
Solar energy collection using the reversible ammonia dissociation reaction p0358 A80-33427
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents p0459 A80-35190

THERMAL ENERGY
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks
p0545 A80-33510
Dynamic model of a mixed /sensible plus latent/ low-temperature thermal storage system
p0545 A80-33511
Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515
Solar plus waste heat recovery hybrid water heating system
p0371 A80-33580
An optimization procedure for solar thermal electric power plant design
p0376 A80-33625
Solar thermal power plant - Thermodynamic analysis
p0410 A80-37999
Evaluation of solar thermal power plants using economic and performance simulations
p0412 A80-38023
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3
p0520 A80-40716
Role of the public utility in developing energy from waste
p0333 A80-42926
Medium and high temperature solar processes --- Book
p0421 A80-43473
A convolution model of rock bed thermal storage units
p0550 A80-43480
Thermal Energy Storage: Fourth Annual Review Meeting
[NASA-CP-2125]
p0551 N80-22788
Seasonal Thermal Energy Storage Program
p0551 N80-22789
Program definition and assessment overview --- for thermal energy storage project management
p0551 N80-22790
Thermal energy storage systems using fluidized bed heat exchangers
p0551 N80-22792
Thermal energy storage and transport
p0540 N80-22793
Conceptual design of thermal energy storage systems for near-term electric utility applications
p0551 N80-22794
Subcontracted activities related to TES for building heating and cooling
p0553 N80-22807
Thermal energy storage testing facility
p0553 N80-22808
Application of thermal energy storage to process heat recovery in the aluminum industry
p0553 N80-22809
Heat storage capability of a rolling cylinder using Glauber's salt
p0553 N80-22810
Thermal energy storage test facility
p0553 N80-22811
Life and stability testing of packaged low-cost energy storage materials
p0553 N80-22814
Evaluation of thermal energy storage for the proposed Twin Cities District Heating system --- using cogeneration heat production and aquifiers for heat storage
p0553 N80-22815
Experimental evaluation of thermal energy storage
p0553 N80-22817
Low temperature thermal-energy storage
[ANL/CES/TE-79-3]
p0554 N80-22842
Thermal energy storage in aquifiers: Preliminary information
[PNL-3062]
p0555 N80-23793
Development of a solar thermal receiver for high temperature applications
[SERI/TP-333-485]
p0428 N80-23800
Thermal Power Systems (TPS); Point-Focusing Thermal and Electric Applications (PFTEA). Volume 2: Detailed report, fiscal year 1979
[NASA-CR-163023]
p0449 N80-26770
Additional solar/load ratio correlations for direct gain buildings
[LA-UR-80-854]
p0454 N80-26847
End-use matching for solar industrial process heat
[SERI/TR-34-091]
p0454 N80-26849
Sigma phase formation in alloys for SO2/SO3 thermal energy storage systems
[SAND-80-8205]
p0562 N80-26856
Phase 2 experiment test plan: Solar photovoltaic/thermal residential experiment
[COO-4094-65]
p0455 N80-26869

THERMAL EXPANSION
The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells
p0394 A80-35340

THERMAL FATIGUE
Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060
Thermal fatigue analysis of the Department of Energy Barstow Pilot Plant
p0374 A80-33609

THERMAL INSULATION
Solar-cladding - Insulation plus insolation --- applying insulation material to outside building walls
p0384 A80-33708
Analysis and design of insulation systems for LH2-fueled aircraft
p0462 A80-37347
Passive solar wall collectors
p0404 A80-37949
Determination of the extinction coefficient of glass fiber insulation
[AIAA PAPER 80-1528]
p0330 A80-41488
Thermal insulation of a low capital cost solar-energy collector
p0416 A80-41951
Cusp mirror - Heat pipe evacuated tubular solar thermal collector
p0421 A80-43482
Development of improved insulation materials --- for use with solar collectors
[ALO-4295-T2]
p0448 N80-26403

THERMAL MAPPING
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
[E80-10142]
p0499 N80-26729

THERMAL PROTECTION
First wall protection schemes for inertial confinement fusion reactors
p0506 A80-33050
Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060

THERMAL RADIATION
The effect of a black chrome selective surface on the thermal performance of a solar collector
p0414 A80-40538

THERMAL RESISTANCE
Material studies related to TFTR limiters and wall armor
p0507 A80-33063
An application of phase change materials in passive solar systems
p0384 A80-33703
Design and performance of low heat loss window systems
p0324 A80-33706

THERMAL RESOURCES
Thermal storage in rock beds
p0545 A80-33512

THERMAL SIMULATION
Physical modeling of buildings --- simulating thermal behavior of building by scale model
p0383 A80-33688

THERMAL STABILITY
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617

Stability of plasma-sprayed coatings tested at White Sands Solar Facility
p0380 A80-33658
Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745

THERMIONIC POWER GENERATION
Advanced thermionic energy conversion
[NASA-CR-163061] p0531 N80-24812

THERMIONICS
Comments on TEC trends --- Thermionic Energy Conversion
p0519 A80-39642
DOE/JPL advanced thermionic technology program
[NASA-CR-163134] p0520 N80-23818

THERMOCHEMICAL PROPERTIES
Design and cost analysis for an ammonia-based solar thermochemical cavity absorber
p0403 A80-37300
Hybrid chemical concepts for storage of solar thermal energy
p0548 A80-37988
Studies of thermochemical water-splitting cycles
[NASA-CR-163029] p0449 N80-26409

THERMOCHEMISTRY
Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids
p0539 A80-33424
Solar energy collection using the reversible ammonia dissociation reaction
p0358 A80-33427
Hydrogen production using fusion energy and thermochemical cycles
p0459 A80-35189
Use of solar energy to reduce carbon dioxide
p0403 A80-37302
Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system
p0539 A80-40713
Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD
[AIAA PAPER 80-1348] p0330 A80-41571
Thermochemical energy storage and transport program
[SAND-79-8208] p0541 N80-23825
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266] p0490 N80-25465
Utilization of solar thermal sources for thermochemical hydrogen production
[LA-UR-80-837] p0464 N80-26538
SERI solar energy storage program
[SERI/TP-333-497] p0452 N80-26820
A chemical heat-pump/energy storage device and its applications --- waste energy utilization
[ERG-030] p0562 N80-26880

THERMOCLINES
Effects of baffles on thermal stratification in themocline storage tanks
p0365 A80-33509

THERMOCOUPLES
Solar thermoelectric generation using bismuth telluride alloys
p0421 A80-43479

THERMODYNAMIC COUPLING
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
p0545 A80-33513
Computer simulation of ground coupled storage in a series solar assisted heat pump system
p0368 A80-33547

THERMODYNAMIC CYCLES
Open-cycle solar air conditioner
p0365 A80-33524
Solar cooling through cycles using microporous solid adsorbents
p0365 A80-33526
On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings
p0367 A80-33538
Theoretical and experimental investigations of an intermittent solar refrigerator
p0367 A80-33540
Design of an isobutane binary cycle geothermal generation system
p0509 A80-34559
Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters
p0401 A80-36829
Use of solar energy to reduce carbon dioxide
p0403 A80-37302
Comparison between two absorption cooling systems of the 'open' type under different climate conditions
p0407 A80-37976
Hybrid chemical concepts for storage of solar thermal energy
p0548 A80-37988
Turbine selection for small capacity solar-power generation
p0410 A80-38004
Turbopropulsion combustion - Trends and challenges
[AIAA PAPER 80-1199] p0519 A80-38964
Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system
p0539 A80-40713
Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225
Survey of integrated gasification combined cycle power plant performance estimates
[ASME PAPER 80-GT-113] p0477 A80-42231
The performance of solar thermal electric power systems employing small heat engines
[ASME PAPER 80-PET-25] p0523 A80-43340
High temperature hydrogen cycles for solar heat sources
[LA-UR-80-184] p0443 N80-25817
An open cycle turbine solar thermal power system
p0448 N80-26257

THERMODYNAMIC EFFICIENCY
Testing the performance of solar collectors under standard conditions
p0361 A80-33466
Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544
The thermal performance of solar water heaters in the UK
p0370 A80-33578
Mean monthly performance of solar water heaters with natural circulation
p0371 A80-33579
Testing of the 10-MWe pilot plant solar central receiver
p0380 A80-33656
Hydrogen production using fusion energy and thermochemical cycles
p0459 A80-35189
Automotive fuels from coal
p0470 A80-35800
Maximum refrigerating capacity of thermoelectric cooling devices
p0515 A80-36831
Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes
p0405 A80-37952
Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors
p0415 A80-40718
Solar power --- solar concentrators for solar power plants
p0420 A80-42468
Thermodynamic energy conversion efficiencies
p0525 A80-43590
Proposition on energy analysis and economic efficiency
[SERI/RR-51-332] p0338 N80-23805
Passive solar calculation methods
[DSE/5221-T1] p0429 N80-23836
SOLPOND: A simulation program for salinity gradient solar ponds
[SERI/TP-351-559] p0430 N80-23856
Comparison of indoor-outdoor thermal performance for the Sunpak evacuated tube liquid collector
[NASA-CR-161421] p0432 N80-24745

OMNIUM-G concentrator test results p0434 N80-24777
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona [NASA-CR-161450] p0441 N80-25787
Solar energy system performance evaluation: Seasonal report for IBM system 1A, Huntsville, Alabama [NASA-CR-161464] p0442 N80-25790
Solar energy system performance evaluaton: Seasonal report for Solaron-Akron, Akron, Ohio [NASA-CR-161465] p0442 N80-25791
Evaluation of residential building energy performance standards [LBL-9816] p0348 N80-25849
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2 p0495 N80-26469
Analysis methods for solar heating and cooling applications: Passive and active systems, the second edition [SERI/SP-35-232R] p0455 N80-26871
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors --- in solar energy applications [ASSA-FA-10] p0456 N80-26879

THERMODYNAMIC PROPERTIES
The characterization of crushed glass as a transpired air heating solar collector material p0360 A80-33450
Optical and thermal properties of truncated compound circular arc concentrators p0365 A80-33505
Solar thermal power plant - Thermodynamic analysis p0410 A80-37999
System thermodynamics of energy conversion plants for geopressured resources [ASME PAPER 80-PET-31] p0524 A80-43342
Medium and high temperature solar processes --- Book p0421 A80-43473
Advanced screening of electrode couples [NASA-CR-159738] p0551 N80-22777
Passive solar calculation methods [DSE-5221-T1] p0442 N80-25798

THERMODYNAMICS
A thermodynamic analysis of a solar-powered jet refrigeration system p0407 A80-37978
Power from the sun by thermodynamics French tower type projects p0410 A80-38002
Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications [ASME PAPER 80-PET-83] p0524 A80-43345
Basic Research Engineering: Fluid Dynamics and Thermal Processes [FE-2468-53] p0334 N80-22649

THERMOELECTRIC COOLING
Maximum refrigerating capacity of thermoelectric cooling devices p0515 A80-36831

THERMOELECTRIC GENERATORS
Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe p0374 A80-33604
Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators p0391 A80-33855
Development and investigation of solar thermoelectric generator using a tubular module p0400 A80-36597
Energy balance of solar thermoelectric generator p0401 A80-36821
Modeling of safe-life tests of thermoelectric batteries --- for space manufacturing experiments p0519 A80-38758
Solar thermoelectric generation using bismuth telluride alloys p0421 A80-43479
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems [NASA-CR-159587] p0526 N80-22787
Solar-heated gas-turbine process using sulfur oxides for power production and energy storage [LBL-9472] p0424 N80-22839
Organic Rankine cycle engine technology in Japan, a preliminary survey [DOE/SF/10538-1] p0531 N80-24809

THERMOELECTRIC POWER GENERATION
New possibilities of solar energy conversion by means of refractory thermoelements p0409 A80-37993
A Stirling cycle engine for use with solar thermal-electric systems [ASME PAPER 80-PET-32] p0524 A80-43343
Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources [GA-A-15322] p0335 N80-22837
Solar thermal power systems point-focusing thermal and electric applications projects. Volume 1: Executive summary [NASA-CR-163147] p0432 N80-24750
Solar thermal power systems point-focusing distributed receiver technology project. Volume 2: Detailed report [NASA-CR-159715] p0432 N80-24751
Heat and electricity from the Sun using parabolic dish collector systems p0433 N80-24761
An organic Rankine receiver for the SCSTPE program p0434 N80-24771
Non-heat pipe/P-40 Stirling engine p0530 N80-24772
The SCSTPE organic Rankine engine p0531 N80-24773
The United Stirling P40 engine for solar dish concentrator application p0531 N80-24775
The dish-Rankine SCSTPE program (Engineering Experiment no. 1) --- systems engineering and economic analysis for a small community solar thermal electric system p0435 N80-24782
The JPL isolated application experiment series p0435 N80-24784
Industrial application experiment series p0435 N80-24785
SPS market analysis --- small solar thermal power systems p0435 N80-24786
Military markets for solar thermal electric power systems p0435 N80-24787
Solar thermal plant impact analysis and requirements definition p0435 N80-24788
A study of mass production and installation of small solar thermal electric power systems p0436 N80-24789
IEA/SPS 500 kW distributed collector system p0436 N80-24791
Coolidge solar powered irrigation pumping project p0436 N80-24792
The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona p0436 N80-24793
Preliminary operational results from the Willard solar power system p0436 N80-24794
Solar total energy-large scale experiment, Shenandoah, Georgia p0436 N80-24795
Solar total energy project at Shenandoah, Georgia system design p0436 N80-24796
Solar central receiver systems programs [SAND-79-8777] p0439 N80-24833
Ocean thermal energy conversion: A state-of-the-art study [EPRI-ER-1113-SR] p0531 N80-24834
Cost and price estimate of Brayton and Stirling engines in selected production volumes [NASA-CR-163265] p0536 N80-26769

THERMONUCLEAR POWER GENERATION
Comparative study of energy accounting for heavy ion fusion with various driver accelerators [IPPJ-454] p0538 N80-28195

THERMONUCLEAR REACTIONS
- NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation p0472 A80-38221

THERMOPHILIC PLANTS
- Development and characterization of ethanol tolerance in clostridium thermocellum --- biomass energy production p0466 A80-33416

THERMOPHYSICAL PROPERTIES
- Prediction of thermophysical properties of petroleum fractions p0479 N80-22428

THERMOSIPHONS
- An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection [AIAA PAPER 80-0869] p0357 A80-32867
- Thermic diode performance characteristics and design manual p0376 A80-33623
- Thermosyphon circulation in solar collectors p0392 A80-33869
- Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system p0406 A80-37970
- Hot water production by means of a solar thermosyphon loop p0407 A80-37971

THICK FILMS
- Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films) [ALO-4147-T1] p0429 N80-23817

THICKNESS
- Development and testing of a microwave system to measure coal layer thickness up to 25 cm [FE-8881-1] p0483 N80-23757
- Proposed method for determining the thickness of glass in solar collector panels [NASA-CR-163151] p0432 N80-24755

THIN FILMS
- A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency p0357 A80-32933
- A fabrication process for Cu2S-CdS thin film solar cells p0385 A80-33719
- Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells p0385 A80-33720
- MIS solar cells on crystalline, polycrystal, and thin film silicon p0385 A80-33722
- What is black chrome p0387 A80-33738
- Thin-film solar cells - A unified analysis of their potential p0393 A80-35335
- The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation p0394 A80-35337
- The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency p0394 A80-35339
- The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells p0394 A80-35340
- A new technology to fabricate high-efficiency silicon concentrator solar cells p0397 A80-35366
- The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements --- thin film solar cell p0398 A80-35486
- Processes degrading the electrophysical characteristics of photoconverters in long-term operation p0399 A80-36587
- Thin-film and ceramic solar converters based on cadmium sulfide and selenide p0401 A80-36824
- Screen printed thin film CdS/CdTe solar cell p0401 A80-36098
- Preparation of thin films for solar energy utilization p0402 A80-37191
- Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique p0402 A80-37299
- Review of amorphous and polycrystalline thin film silicon solar cell performance parameters p0414 A80-40712
- The design and fabrication of high efficiency thin film CdS/Cu2S solar cells p0422 A80-43516
- Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices p0526 A80-43760
- Measurement techniques in thin film polycrystalline materials and devices /solar cells/ p0422 A80-43764
- Composition profiling of solar coating materials [COO-2953-4] p0437 N80-24818
- Cadmium sulfide/copper sulfide heterojunction cell research [DOE/ET/20429-1] p0440 N80-24847
- Development of polycrystal gaAs solar cells [DSE-4042-T28] p0452 N80-26819
- Thin film polycrystalline silicon solar cells [DOE/SF/23047-3] p0452 N80-26828

THREE DIMENSIONAL FLOW
- Three-dimensional numerical evaluation of heat loss through natural convection in a solar boiler p0413 A80-38274

THRUST BEARINGS
- Application of magnetic suspensions and fluid film bearings to energy storage flywheels [SAND-79-7007] p0556 N80-23824

TIDAL WAVES
- Energy analysis of wave and tidal power p0333 A80-43828

TIDE POWERED GENERATORS
- Energy analysis of wave and tidal power p0333 A80-43828
- System-reliability studies for wave-energy generation p0540 A80-43830

TIDE POWERED MACHINES
- Energy analysis of wave and tidal power p0333 A80-43828

TIDEPOWER
- The influence of Tidal Generating Force on windflow - A preliminary study p0465 A80-32930
- Hydro-power - The use of water as an alternative source of energy --- Book p0468 A80-35172

TIDES
- The influence of Tidal Generating Force on windflow - A preliminary study p0465 A80-32930

TIME DEPENDENCE
- Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak p0512 A80-35438
- Advanced development of a short residence-time hydrogasifier [FE-3125-8] p0500 N80-26832

TIME SERIES ANALYSIS
- Wind fluctuations described as discrete events p0468 A80-35721

TIN OXIDES
- Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination p0390 A80-33785
- Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces p0390 A80-33786
- Improved model of In2O3/SnO2-SiO/x/-nSi solar cells p0391 A80-33854
- Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0416 A80-42140

TITANIUM
- Effect of titanium, copper and iron on silicon solar cells p0397 A80-35385

Method of mitigating titanium impurities effects in p-type silicon material for solar cells
[NASA-CASE-NPO-14635-1] p0431 N80-24741

TITANIUM ALLOYS

Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear
p0539 A80-39628

TITANIUM COMPOUNDS

Moessbauer surface studies on TiFe hydrogen storage material
p0463 A80-43772

TITANIUM OXIDES

I-V and C-V characteristics of Au/TiO2 Schottky diodes
p0413 A80-39055

TOKAMAK DEVICES

An assessment of magnetic fusion research
[AIAA PAPER 80-0928] p0505 A80-32893

Tokamak reactors and structural materials
p0505 A80-33042

A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems
p0506 A80-33046

A review of lifetime analyses for tokamaks
p0507 A80-33056

Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057

Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060

Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062

Material studies related to TFTR limiters and wall armor
p0507 A80-33063

Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647

Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648

Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649

Electron cyclotron heating of tokamaks
p0511 A80-34973

On the low frequency drift wave and the pseudoclassical diffusion --- of plasmas in tokamak
p0512 A80-35379

Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434

Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438

Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections
p0514 A80-36397

Review of the ISX-B experimental program
p0515 A80-37181

Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185

Safety grounding switches in large experiments - General considerations and the TEXT application --- TEXas Tokamak
p0517 A80-37867

Breakeven for thermonuclear fusion in the hot-ion mode
p0519 A80-39539

Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745

Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/ --- poloidal magnetic field variation effects in tokamak
p0521 A80-41748

TOPOGRAPHY

Meteorological and topographical indicators of wind energy for regional assessments
p0469 A80-35737

WECS site screening by physical modeling
p0514 A80-35748

TOROIDAL PLASMAS

Mirror fusion reactor design
p0505 A80-33043

Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647

Electron cyclotron heating of tokamaks
p0511 A80-34973

Numerical studies of new stellarator concepts
p0511 A80-34978

On the low frequency drift wave and the pseudoclassical diffusion --- of plasmas in tokamak
p0512 A80-35379

Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434

Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745

Coatings for fusion reactor environments
p0525 A80-43517

TORQUE CONVERTERS

Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19] p0521 A80-42157

Small passenger car transmission test-Chevrolet 200 transmission
[NASA-CR-159835] p0356 N80-28255

TOWERS

Thermodynamic trade-offs for gas cooled high temperature solar tower receivers
p0379 A80-33648

Redesign of windmill towers - A cost reduction study
p0467 A80-33772

Atmospheric considerations for design of WECS --- Wind Energy Conversion System
p0513 A80-35717

Power from the sun by thermodynamics French tower type projects
p0410 A80-38002

Dynamics of a flexible rotor-tower system
[ASRL-TR-194-1] p0530 N80-23862

TRACE ELEMENTS

The trace element chemistry of coal during combustion and the emissions from coal-fired plants
p0324 A80-34600

Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments
p0324 A80-35649

Particulate sulfur and trace metal emissions from oil fired power plants
p0325 A80-35890

TRACKING (POSITION)

Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors --- Compound Parabolic Concentrator
p0364 A80-33493

The simulation of partially and fully tracking flat plate collectors in northern latitudes
p0390 A80-33763

The Crossbyton project
p0436 N80-24790

Development of a second-generation concentrating tracking solar collector
[ASR-4371] p0438 N80-24828

Development of a second-generation concentrating tracking solar collector
[ASR-4460] p0445 N80-25851

TRACKING NETWORKS

Airport solar photovoltaic concentrator project, phase 1
[DOE/CS-05317/1] p0453 N80-26839

TRACTION

The Perbury transmission --- toroidal traction drive for gas turbine engines
[ASME PAPER 80-GT-22] p0331 A80-42159

Traction studies of northeast corridor rail passenger service: Executive summary
[NASA-CR-162997] p0336 N80-23214

TRADEOFFS

Near hybrid passenger vehicle development program, phase 1. Appendices C and D, Volume 2
[NASA-CR-163331] p0559 N80-26202

Design tradeoff studies and sensitivity analysis, appendices B1 - B4 --- hybrid electric vehicles
[NASA-CR-163037] p0563 N80-27225

Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248

Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250

TRAINING EVALUATION

An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018

TRAJECTORY ANALYSIS

Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434

TRANSFORMATIONS (MATHEMATICS)

A Boolean approach to common cause analysis
p0328 A80-40349

TRANSFORMERS

Use of transformers in producing high-power output from homopolar generators
p0516 A80-37825

TRANSIENT RESPONSE

Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185

A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector
p0404 A80-37950

TRANSMISSION LINES

High power pulse modeling of coaxial transmission lines
p0539 A80-37828

Measurements on insulating materials at cryogenic temperatures
[PB80-134596] p0541 N80-24507

TRANSMISSION LOSS

Calorimetric measurement of ac losses in superconducting cables of short lengths
[BNL-26712] p0540 N80-22609

TRANSMISSIONS (MACHINE ELEMENTS)

Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19] p0521 A80-42157

Continuously variable ratio transmissions for single-shaft gas turbines
[ASME PAPER 80-GT-21] p0331 A80-42158

The Perbury transmission --- toroidal traction drive for gas turbine engines
[ASME PAPER 80-GT-22] p0331 A80-42159

Design study of flat belt CVT for electric vehicles
[NASA-CR-159822] p0550 N80-22702

Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621

Small passenger car transmission test-Chevrolet 200 transmission
[NASA-CR-159835] p0356 N80-28255

TRANSONIC FLOW

Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258

TRANSPORT AIRCRAFT

A proposed liquid hydrogen development program for aircraft
p0461 A80-37345

Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905

TRANSPORT PROPERTIES

Photoconductivity as a probe of polycrystalline films
p0398 A80-35490

TRANSPORTATION

Thermochemical energy storage and transport program
[SAND-79-8208] p0541 N80-23825

Energy policy impact evaluation
[PB80-137953] p0340 N80-23866

TRANSPORTATION ENERGY

An analysis of off-guideway energy storage/propulsion systems for dual mode transit systems
p0546 A80-34081

The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/
p0471 A80-36983

Hydrogen in air transportation; Proceedings of the International Symposium, Stuttgart, West Germany, September 11-14, 1979, and Supplement
p0460 A80-37330

Hydrogen as an alternative fuel - An intermediate report on research and development funding by the Federal Ministry for Research and Technology
p0460 A80-37338

Surface transportation systems using hydrogen energy
p0461 A80-37339

Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen
p0461 A80-37342

Design concept for LH2 airport facilities
p0461 A80-37344

A proposed liquid hydrogen development program for aircraft
p0461 A80-37345

Transportation energy contingencies - A status report on public response and government roles
p0326 A80-37353

Fuel economy in the airlines
p0329 A80-40945

Performance analysis of zinc-bromine batteries in vehicle and utility applications
p0550 A80-41852

Energy and civil aviation
p0475 A80-41871

Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines
[ASME PAPER 80-GT-117] p0522 A80-42233

Traction studies of northeast corridor rail passenger service: Executive summary
[NASA-CR-162997] p0336 N80-23214

Utilization concerns of potential transportation fuels
[PB80-138498] p0342 N80-24503

Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456

Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457

Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979
[FE-2514-M4] p0490 N80-25471

Development of fuel cell technology for vehicular applications
[BNL-51047] p0536 N80-26216

TRANSVERSE OSCILLATION

Crosswind kite power --- for large-scale wind power production
p0523 A80-43139

TREES (PLANTS)

Trees as an indicator of wind power potential
p0470 A80-35745

TRITIUM

Muon catalysis for energy production by nuclear fusion
p0517 A80-38289

Summary of the fusion-fission hybrid fuel cycle analysis (tritiumless hybrids)
[UWFDM-337] p0493 N80-26138

TROMBE WALLS

A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683

Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693

Performance of passive test units during the 1978-79 heating season --- solar house
p0383 A80-33694

Latent heat diode wall --- study of passive solar
heating of houses
p0407 A80-37975
Residential passive solar systems: Regional
sensitivity to system performance costs, and
alternative prices
[LA-UR-79-3390] p0338 N80-23807

TROPICAL REGIONS
Conceptual design and analysis of a 100 MWe
distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826

TUBE HEAT EXCHANGERS
Application of heat pipes to thermal energy
storage systems --- for solar residential heating
[AIAA PAPER 80-1509] p0549 A80-41473

TUBES
Low cost vee-trough evacuated tube collector module
p0363 A80-33492

TUNGSTEN CARBIDES
Silicon carbide-tungsten heat pipes for
high-temperature service
p0327 A80-37680

TURBINE BLADES
Performance modeling of the vertical axis wind
turbine
p0508 A80-33773
Wind turbine dynamic blade loads due to wind gusts
and wind direction changes
p0513 A80-35727
Nonlinear aeroelastic equations of motion of
twisted, nonuniform, flexible horizontal-axis
wind turbine blades
[NASA-CR-159502] p0536 N80-26774

TURBINE ENGINES
The Ansaldo 35 kW solar power system
p0373 A80-33600
Rotary expander for a solar thermo-mechanical
conversion system
p0382 A80-33681
Comparative testing of petroleum surrogate fuels
with coal-derived liquids in a combustion
turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Coolidge solar powered irrigation pumping project
p0436 N80-24792

TURBINE PUMPS
Underground Pumped Hydroelectric Storage (UPHS)
[ANL/EES-TM-60] p0554 N80-22841
Assessment of high-head turbomachinery for
underground pumped hydroelectric storage plants
--- cost analysis
[CONF-791204-11] p0557 N80-24628

TURBINES
An exploratory survey of noise levels associated
with a 100 kW wind turbine
p0512 A80-35499
The use of wind data with an operational wind
turbine in a research and development environment
p0513 A80-35730
Manufacturers' view of wind resource assessments
p0514 A80-35738
Status of the Large Wind Turbine Siting Handbook
p0514 A80-35750
Turbine selection for small capacity solar-power
generation
p0410 A80-38004
Dynamics and control of large horizontal-axis
axisymmetric wind turbines
p0526 N80-22772
An exploratory survey of noise levels associated
with a 100kW wind turbine
[NASA-TM-81486] p0527 N80-23102
Mod-1 wind turbine generator analysis and design
report, volume 1
[NASA-CR-159495] p0528 N80-23775
The aerodynamics of axial flow wind power turbines
[CSIR-ME-1619] p0528 N80-23781
Millville Wind Turbine Generator: Failure
analysis and corrective design modification
[RFP-2992/3533/79-3] p0529 N80-23831
Vertical axis wind turbine development: Executive
summary
[ORO-5135-77-5-SUMM] p0529 N80-23845
Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846
Mod-2 wind turbine system concept and preliminary
design report. Volume 1: Executive summary
[NASA-CR-159609] p0530 N80-24758
The SCSTPE organic Rankine engine
p0531 N80-24773
Further investigations of diffuser augmented wind
turbines. Part 1: Executive summary
[COO-2616-2-PT-1-REV-1] p0532 N80-24864
Some calculated effects of non-uniform inflow on
the radiated noise of a large wind turbine
[NASA-TM-81813] p0532 N80-25104
Siting small wind turbines
[PNL-SA-7603] p0493 N80-25878
Aerodynamic interference between two Darrieus wind
turbines
[SAND-79-1984C] p0535 N80-25897
Design and fabrication of a low-cost Darrieus
vertical axis wind turbine system, phase 1
[ALO-4272] p0535 N80-25899
High-temperature turbine technology program
low-Btu gas, low-temperature chemical cleanup
pilot plant: Design, construction, startup, and
operation
[FE-1806-78] p0499 N80-26669
Nonlinear aeroelastic equations of motion of
twisted, nonuniform, flexible horizontal-axis
wind turbine blades
[NASA-CR-159502] p0536 N80-26774
MOD-2 wind turbine system concept and preliminary
design report. Volume 2: Detailed report
[NASA-CR-159609] p0536 N80-26775
Aerodynamic performance of the 17-m-diameter
Darrieus wind turbine in the three-bladed
configuration: An addendum
[SAND-79-1753] p0537 N80-26857
Feasibility study of aileron and spoiler control
systems for large horizontal axis wind turbines
[NASA-CR-159856] p0355 N80-27803
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961] p0564 N80-27814
Wind characteristics for design of wind turbines:
Research in the USA
[PNL-SA-7967] p0538 N80-27817

TURBOCOMPRESSORS
Solar power units with screw expanders
p0410 A80-38000

TURBOFAN ENGINES
Preliminary studies of a turbofan engine and fuel
system for use with liquid hydrogen
p0461 A80-37342
Hydrogen fueled high bypass turbofans in subsonic
aircraft
p0462 A80-37348
Advanced component technologies for
energy-efficient turbofan engines
[AIAA PAPER 80-1086] p0519 A80-38902
Fuel conservation through active control of rotor
clearances
[AIAA PAPER 80-1087] p0330 A80-41506
Design study for a fuel efficient turbofan engine
[ASME PAPER 80-GT-141] p0331 A80-42254
The Energy Efficient Engine /E3/ - Advancing the
state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255
Results from tests on a high work transonic
turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258
Advanced component technologies for
energy-efficient turbofan engines
[NASA-TM-81507] p0341 N80-24316

TURBOGENERATORS
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678
Operational experience of a 3.0 kW solar powered
water pump
p0382 A80-33680
Rotary expander for a solar thermo-mechanical
conversion system
p0382 A80-33681
Electro-wind energy system with oversynchronous
cascade and simple adaptive maximal power control
p0508 A80-33775
An exploratory survey of noise levels associated
with a 100 kW wind turbine
p0512 A80-35499
Turbulence and WTG performance --- Wind Turbine
Generator
p0513 A80-35726
Thermodynamic analysis of solar-energy
thermal-power converters operating together with
photoelectric converters
p0401 A80-36829

Sow wind turbines and reap the wind p0517 A80-38012
Modified aerospace R&QA method for wind turbines p0519 A80-40335
Fluctuations in output from wind turbine clusters p0520 A80-41032
Design and test of a 73-MW water cooled gas turbine [ASME PAPER 80-GT-112] p0477 A80-42230
Diagnostics and instrumentation requirements for advanced power systems --- coal-fired gas turbine systems [ASME PAPER 80-GT-129] p0477 A80-42243
High temperature combustor designed for operation with coal derived low Btu gaseous fuels [ASME PAPER 80-GT-187] p0478 A80-42289
Electricity from refuse --- technology assessment [NZERDC-44] p0338 N80-23803
Solar thermal repowering: Utility/industry market potential in the Southwest --- to drive a turbogenerator [MTR-7919] p0439 N80-24836
An open cycle turbine solar thermal power system p0448 N80-26257
Development of high-temperature turbine system technology to a technology readiness status phase 2 [FE-1806-76] p0536 N80-26671

TURBULENCE EFFECTS
Turbulence and WTG performance --- Wind Turbine Generator p0513 A80-35726

TWO STAGE TURBINES
Conceptual design study of an improved gas turbine powertrain [NASA-CR-159852] p0527 N80-23315

U

ULTRASHORT PULSED LASERS
Beam simultaneity in multi-terawatt CO2 laser fusion systems p0517 A80-38483
Design of Helios beam diagnostics p0518 A80-38486

UNDERGROUND STORAGE
The 'soil therm' system for interseasonal earth storage of solar heat for individual housing p0545 A80-33516
The effect of system size on the practicality of aquifer storage --- feasibility of small systems for building heat storage p0545 A80-33517
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks p0546 A80-33518
Seasonal regeneration through underground strata --- solar terrestrial interactions p0548 A80-37966
High temperature underground thermal energy storage system for solar energy p0552 N80-22803
Aquifer thermal energy storage program p0554 N80-22825
Underground Pumped Hydroelectric Storage (UPHS) [ANL/EES-TM-60] p0554 N80-22841
Fixed site hydrogen storage. 1: Applications impact [SAND-79-8647] p0463 N80-23797
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants --- cost analysis [CONF-791204-11] p0557 N80-24628

UNDERWATER RESOURCES
Biosources Digest, a journal on biomass utilization, volume 1, no. 2 --- ocean farming [PB80-157662] p0504 N80-27795

UNIFORM FLOW
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine [NASA-TM-81813] p0532 N80-25104

UNITED KINGDOM
Implications for the UK of solar-power satellites /s.p.s/ as an energy source p0422 A80-43836
United Kingdom: Estimates of future energy/GDP relationship [ORAU/IEA(M)-79-25] p0339 N80-23848

UNITED NATIONS
Solar energy - UNIDO programme of action for developing countries p0412 A80-38015

UNITED STATES OF AMERICA
National impacts on visual air quality from a future energy scenario [LA-UR-79-3214] p0335 N80-22882
Data handbook for the National Solar Energy demonstration program [DSE/5216-T3] p0428 N80-23815
Environmental data for sites in the National Solar Data Network [SOLAR/0010-79/05] p0339 N80-23833
Prospects for using improved climate information to better manage energy systems [UCRL-83813] p0343 N80-24859
National Energy Plan 2, May 1979. Appendix A: World oil prices [DOE/TIC-10203-APP-A] p0344 N80-24870

UPGRADING
Upgrading of coal liquids: Upgrading distillates from coal liquefaction [FE-2566-26] p0480 N80-22518

URBAN DEVELOPMENT
Energy availabilities for state and local development: 1975 data volume [ORNL/TM-6951] p0344 N80-24868

URBAN PLANNING
Prospects for energy responsive urban planning and design p0332 A80-42450

URBAN RESEARCH
Integrating energy approaches in a large office building p0324 A80-33690
Chemical characteristics of oil refinery plumes in Los Angeles p0325 A80-36476
Basic elements in waste treatment operations p0474 A80-41169

URBAN TRANSPORTATION
Siemens/Duewag H-Bahn - Technology and comparative assessment --- of rapid transit systems p0324 A80-34056
The bus systems, passenger transit system of the future p0324 A80-34067
An analysis of off-guideway energy storage/propulsion systems for dual mode transit systems p0546 A80-34081
The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/ p0471 A80-36983
Consumer experience with electric vehicles p0326 A80-37351
Traction studies of northeast corridor rail passenger service: Executive summary [NASA-CR-162997] p0336 N80-23214
Electric and hybrid vehicles in the urban future --- market research [CONF-791009-23] p0341 N80-24217
Near hybrid passenger vehicle development program, phase 1. Appendices A and B. Mission analysis and performance specification studies report, volume 1 [NASA-CR-163330] p0559 N80-26201
Near hybrid passenger vehicle development program, phase 1. Appendices C and D, Volume 2 [NASA-CR-163331] p0559 N80-26202
Near term hybrid passenger vehicle development program, phase 1 [NASA-CR-163235] p0560 N80-26210
Potential change strategies in urban transportation: An overview and tentative appraisal [PB80-155278] p0355 N80-27239
Phase 1 of the near term hybrid passenger vehicle development program [NASA-CR-163219] p0564 N80-28245
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1 [NASA-CR-163220] p0564 N80-28246

Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices
[NASA-CR-163221] p0565 N80-28247

Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248

Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1
[NASA-CR-163223] p0565 N80-28249

Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250

Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices
[NASA-CR-163225] p0565 N80-28251

Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis
[NASA-CR-163226] p0565 N80-28252

USER MANUALS (COMPUTER PROGRAMS)

Forecast of long term coal supply and mining conditions: Model documentation and results
[NASA-CR-163141] p0487 N80-24728

UTILITIES

Utility problems of central tower solar plant in Italy
p0375 A80-33614

The effect of an auxiliary load management strategy on solar system performance
p0389 A80-33757

A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility
p0389 A80-33758

Putting baseload to work on the night shift
p0547 A80-35402

A method for estimating the impact of WECS on utility operating reserve requirements
p0469 A80-35729

Wind energy from a utility planning perspective
p0325 A80-35740

An assessment of solar hot water heating in the Washington, D.C. area - Implications for local utilities
p0399 A80-36052

Impact of solar heating and cooling of buildings on electric utilities
p0412 A80-38022

The American experience with solar energy in centralized electricity generation - Technology and economics
p0412 A80-38024

Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105] p0331 A80-42227

Dispersed storage and generation case studies
[NASA-CR-162996] p0334 N80-22782

Conceptual design of thermal energy storage systems for near-term electric utility applications
p0551 N80-22794

Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780

Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23789

Solar thermal repowering: Utility/industry market potential in the Southwest --- to drive a turbogenerator
[MTR-7919] p0439 N80-24836

Line focus solar thermal central receiver research study
[DOE/ET/20426-1] p0440 N80-24853

Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894

Central station applications planning activities and supporting studies --- application of photovoltaic technology to power generation plants
[NASA-CR-163042] p0352 N80-26784

V

V GROOVES

Low cost vee-trough evacuated tube collector module
p0363 A80-33492

VACUUM CHAMBERS

Design and operational characteristics of the cryopump high-vacuum system for the 25000-l target chamber of the Helios Laser Facility
p0515 A80-37182

Helios target positioning system
p0518 A80-38485

VACUUM PUMPS

Design and operational characteristics of the cryopump high-vacuum system for the 25000-l target chamber of the Helios Laser Facility
p0515 A80-37182

VACUUM TUBES

Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480

Repetitively pulsed electron beam diode lifetime and stability --- for inertial confinement fusion
p0516 A80-37820

Solair heater program: Solair applications study
[COO-2705-3] p0443 N80-25813

VANADIUM ALLOYS

A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems
p0506 A80-33046

VAPOR DEPOSITION

Materials problems with inertial confinement fusion targets
p0506 A80-33051

Deposition and characterization of gallium arsenide films for solar cells applications
p0394 A80-35338

Single-crystal solar cell heterojunctions involving N-cadmium sulfide
p0413 A80-39061

VAPORIZING

Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD
[AIAA PAPER 80-1344] p0330 A80-41571

Autoignition and vaporization of no. 3 diesel oil spray under lean conditions
[ASME PAPER 80-GT-10] p0475 A80-42151

VARIABILITY

Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites
[CONF-791056-2] p0345 N80-24885

VARIANCE (STATISTICS)

Effect of complex terrain on wind fluctuations --- for consideration of windpower machine site
p0468 A80-35723

VECTOR ANALYSIS

The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503

VECTORS (MATHEMATICS)

Three dimensional ray tracing through concentric tubular elements using vector methods --- for solar collectors study
p0360 A80-33459

VEGETATION

Remote sensing applications to wind power facility siting
p0470 A80-35746

VENTILATION

State-of-the-art assessment of hybrid heat pumps
[EPRI-EM-1261] p0352 N80-26627

VERTICAL ORIENTATION

Vertical axis wind turbine development: Executive summary
[ORO-5135-77-5-SUMM] p0529 N80-23845

Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846

Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C] p0535 N80-25897

Design and fabrication of a low-cost Darrieus vertical axis wind turbine system, phase 1
[ALO-4272] p0535 N80-25899

VISIBILITY

National impacts on visual air quality from a future energy scenario [LA-UR-79-3214] p0335 N80-22882

VITRIFICATION

High-level waste immobilization program: An overview --- vitrification, drying and calcination [PNL-3094] p0336 N80-23131

VOLCANOES

Contribution of remote sensing to the geological problems of the country p0472 A80-38801

VOLT-AMPERE CHARACTERISTICS

General formulation of the current-voltage characteristic of a p-n heterojunction solar cell p0390 A80-33782

Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination p0390 A80-33785

Characteristics of MOS solar cells built on /n-type/ In P substrates p0394 A80-35336

Deposition and characterization of gallium arsenide films for solar cells applications p0394 A80-35338

Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells p0394 A80-35345

MIS and SIS solar cells p0395 A80-35348

Spray-deposited ITO-silicon SIS heterojunction solar cells --- Indium-Tin-Oxide p0395 A80-35350

Detailed modeling of inversion-layer solar cells p0395 A80-35351

Tailored emitter, low-resistivity, ion-implanted silicon solar cells p0396 A80-35361

A circuit for measurement of the fill factor of solar cells p0399 A80-36121

Influence of base resistivity on the temperature characteristics of silicon photoconverters p0514 A80-36590

Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells p0401 A80-36933

Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell p0515 A80-37007

Glassy electrolyte galvanic cells p0515 A80-37008

Required minimum value of barrier height in minority-carrier M.I.S. solar cells p0414 A80-40474

Performance analysis of zinc-bromine batteries in vehicle and utility applications p0550 A80-41852

An arc discharge model on electrodes of an MHD generator p0524 A80-43397

An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact p0422 A80-43583

Grain boundary defects in thin semicrystalline material --- effects on performance of silicon solar cells p0422 A80-43761

Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon p0422 A80-43762

W

WAFERS

Analysis and evaluation in the production process and equipment area of the low-cost solar array project [NASA-CR-163208] p0441 N80-25782

Cost of Czochralski wafers as a function of diameter [NASA-CR-163277] p0449 N80-26771

WALL TEMPERATURE

First wall protection schemes for inertial confinement fusion reactors p0506 A80-33050

Void growth characteristics in laser fusion reactor first walls p0508 A80-33077

Phase change collector wall versus water collector wall p0406 A80-37962

WALLS

Integration of solar collectors in large prefabricated roof/wall sections p0361 A80-33465

Solar-cladding - Insulation plus insolation --- applying insulation material to outside building walls p0384 A80-33708

Passive solar wall collectors p0404 A80-37949

WANKEL ENGINES

Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A [NASA-CR-135119] p0355 N80-27361

WASHING

The cost and value of washing heliostats p0375 A80-33616

WASHINGTON

Solar project description for Washington Natural Gas Company's single family residence, Kirkland, Washington [SOLAR/1001-79/50] p0451 N80-26814

WASTE DISPOSAL

Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology p0331 A80-41849

High-level waste immobilization program: An overview --- vitrification, drying and calcination [PNL-3094] p0336 N80-23131

SWARU: Solid waste disposal resource system [NP-24196] p0341 N80-24146

Methane from landfills [CONF-790999-1] p0485 N80-24472

Methane recovery from urban refuse [CONF-7910105-2] p0486 N80-24485

WASTE ENERGY UTILIZATION

Fusion - An energy source for synthetic fuels [AIAA PAPER 80-0844] p0465 A80-32857

A modular system for bio-gas production using farm waste p0466 A80-33415

Solar plus waste heat recovery hybrid water heating system p0371 A80-33580

Paving the way for energy-saving innovations p0328 A80-39554

High temperature heat pipes for waste heat recovery [AIAA PAPER 80-1505] p0329 A80-41469

Organic Rankine-cycle turbine power plant utilizing low temperature heat sources [ASME PAPER 80-GT-153] p0522 A80-42265

A utility company's view of energy from waste p0332 A80-42925

Role of the public utility in developing energy from waste p0333 A80-42926

Energy recovery in the sludge treatment process at Toronto's main treatment plant p0333 A80-42927

Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power [ASME PAPER 80-PET-27] p0333 A80-43341

Seasonal Thermal Energy Storage Program p0551 N80-22789

Applications of thermal energy storage to waste heat recovery in the food processing industry p0552 N80-22796

Naval facility energy conversion plants as resource recovery system components [AD-A081232] p0528 N80-23783

Solar production of industrial process steam ranging in temperature from 300 degrees F to 550 degrees F, phase 1. Volume 2: Appendices [DOE/CS-32199-2] p0428 N80-23813

SWARU: Solid waste disposal resource system [NP-24196] p0341 N80-24146

Solar total energy-large scale experiment, Shenandoah, Georgia p0436 N80-24795

Beneficial use of rejected heat from electric power plants [COO-4531-9] p0348 N80-25841
A chemical heat-pump/energy storage device and its applications --- waste energy utilization [ERG-030] p0562 N80-26880

WASTE TREATMENT

Basic elements in waste treatment operations p0474 A80-41169
Waste incineration and pyrolysis p0475 A80-41174
Role of the public utility in developing energy from waste p0333 A80-42926
Energy recovery in the sludge treatment process at Toronto's main treatment plant p0333 A80-42927
Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes [PB80-126477] p0334 N80-22528

WASTE UTILIZATION

Bioconversion --- biomass energy production - research and development p0471 A80-37504
Ethanol, a clean burning bio-solar fuel - Its production and utilization p0472 A80-37986
An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing p0473 A80-39630
Solid waste conversion to energy: Current European and U.S. practice --- Book p0474 A80-40832
Basic elements in waste treatment operations p0474 A80-41169
Recovery and reuse - Mechanical processing p0475 A80-41172
Role of the public utility in developing energy from waste p0333 A80-42926
Burning refuse-derived fuel - 'The Woodstock experience' p0479 A80-42928
The region of Peel Resource Recovery Plant - Resource recovery and energy from waste in partnership p0479 A80-42929
Potential for conversion of refuse to energy in Ontario p0479 A80-42930
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products [ASME PAPER 80-ENAS-9] p0479 A80-43186
Biomass energy conversion workshop for industrial executives [SERI/TP-62-299] p0480 N80-22516
Electricity from refuse --- technology assessment [NZERDC-44] p0338 N80-23803
Biosources digest, a journal on biomass utilization, volume 1, no. 1 [PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass utilization, volume 1, no. 4 [PB80-140981] p0493 N80-25909
Energy and Resource Recovery from Solid Waste: Report from a workshop considering problems identified by the Intergovernmental Science, Engineering, and Technology Advisory Panel [PB80-150790] p0354 N80-26881

WASTE WATER

Solar plus waste heat recovery hybrid water heating system p0371 A80-33580

WATER

H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy p0459 A80-33407
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector p0407 A80-37977
A simple water pump, powered by solar energy p0411 A80-38011
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy utilization of households and small consumers [ESA-TT-582] p0463 N80-23865
Evaluation of energy conserving modifications for water heaters [PB80-133853] p0344 N80-24873
Feasibility study of using a coal/water oil emulsion as a clean liquid fuel [FE-2437-T1-ADD] p0490 N80-25463
Solar energy system performance evaluation. Albuquerque Western no. 1, Albuquerque, New Mexico [SOLAR/1011-79/14] p0443 N80-25816
Hybrid thermal storage with water [ESG-DOE-13259] p0558 N80-25861
Studies of thermochemical water-splitting cycles [NASA-CR-163029] p0449 N80-26409

WATER CIRCULATION

Mean monthly performance of solar water heaters with natural circulation p0371 A80-33579

WATER DEPTH

Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites [CONF-791056-2] p0345 N80-24885

WATER FLOW

Undeveloped hydropower as a potential energy source in Idaho [PB80-157399] p0504 N80-27824

WATER HEATING

An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection [AIAA PAPER 80-0869] p0357 A80-32867
French programs of research and experimentation aiming at the development of solar energy in buildings p0359 A80-33439
Industrial solar energy activity in Monaco p0359 A80-33440
The United Kingdom solar heating programme p0323 A80-33445
An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems p0360 A80-33452
A non-tracking inflated cylindrical solar concentrator p0365 A80-33506
Earth coils and geo-thermal wells used as solar energy storage devices p0368 A80-33549
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate p0368 A80-33554
Adaptive control for a multiple tank, multiple temperature solar energy storage system p0369 A80-33557
The layout of solar hot water systems, using statistical meteo- and heat demand data p0369 A80-33562
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report p0370 A80-33571
Solar heating and hot water supply system of Fuji Electric Solar House p0370 A80-33573
Analysis of solar water heating systems p0370 A80-33574
Design and evaluation of solar installation workshops and the HUD solar DHW installation guidelines --- Domestic Hot Water p0370 A80-33575
Performance vs prediction for four classes of solar hot water systems p0370 A80-33576
Experimental system performance and comparison with computer predictions for six solar domestic hot water systems p0370 A80-33577
The thermal performance of solar water heaters in the UK p0370 A80-33578
Mean monthly performance of solar water heaters with natural circulation p0371 A80-33579

Solar plus waste heat recovery hybrid water
heating system
p0371 A80-33580
Design of the solar water heater system for TVA's
Memphis Initiative
p0371 A80-33581
Construction and initial operation of the
Miamisburg salt-gradient solar pond
p0371 A80-33583
Salt concentration gradient solar ponds - Modeling
and optimization
p0371 A80-33585
A prototype of solar linear concentrators plant
installed to supply industrial heat
p0372 A80-33592
Small solar plants for electricity supply
p0373 A80-33596
Thermopond applicability to climate and structure
--- design of solar heating and cooling system
for buildings
p0382 A80-33685
Hybrid active-passive designs - Synergy or conflict
--- solar heating systems
p0383 A80-33689
The economics of solar hot water heating in
multifamily units
p0389 A80-33752
An assessment of solar hot water heating in the
Washington, D.C. area - Implications for local
utilities
p0399 A80-36052
Study of a multi-pass radiation fluid-heater
exposed to non-uniform radiation
p0405 A80-37958
Simulations of solar captation systems -
Methodology and applications to distillation,
gas and water heating
p0406 A80-37959
Phase change collector wall versus water collector
wall
p0406 A80-37962
Influence of heat exchanger effectiveness on the
performance of thermosyphon double loop water
heating system
p0406 A80-37970
Hot water production by means of a solar
thermosyphon loop
p0407 A80-37971
Performance comparison of different types of solar
water heaters under Egyptian conditions
p0407 A80-37973
Solar water heaters
p0407 A80-37974
The first solar energy system in West-Germany for
industrial utilization
p0411 A80-38010
Economic considerations of solar energy
p0412 A80-38019
Application of reliability, maintainability, and
availability engineering to solar heating and
cooling systems
p0414 A80-40334
Design of a heat pipe absorber for a concentrating
solar water heater
[AIAA PAPER 80-1506] p0415 A80-41470
The technology of flat plate collectors
p0417 A80-42439
Solar energy for heating and cooling
p0418 A80-42445
A completely instrumented solar building - The
Shenandoah Solar Recreational Center
p0418 A80-42447
The economics of solar heating - A note on the
appropriate discount rate and the use of the pay
back period
p0421 A80-43484
Solar process water heat for the IRIS images
custom color photo lab
[NASA-CR-161414] p0423 N80-22781
Solar hot water system installed at Quality Inn,
Key West, Florida
[NASA-CR-161434] p0427 N80-23774
Research and development of an air-cycle heat-pump
water heater
[ORNL/SUB-7226/1] p0529 N80-23850
Solar heating and hot water system installed at
Saint Louis, Missouri
[NASA-CR-161420] p0431 N80-24744
Solar heating and hot water system installed at
Municipal Building complex, Abbeville, South
Carolina
[NASA-CR-161443] p0442 N80-25788
Solar energy system performance evaluation:
Seasonal report for IBM system 1A, Huntsville,
Alabama
[NASA-CR-161464] p0442 N80-25790
Solar energy system performance evaluaton:
Seasonal report for Solaron-Akron, Akron, Ohio
[NASA-CR-161465] p0442 N80-25791
Solar project description for A-Frame Industries'
single family residence: Kaneohe, Hawaii
[SOLAR/1010-79/50] p0444 N80-25818
Comparative performance of two types of evacuated
tubular solar collectors in a residential
heating and cooling system
[COO-2577-19] p0446 N80-25864
Analysis of community solar systems for combined
space and domestic hot water heating using
annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900
SAGE, Solar Assisted Gas Energy
[PB80-153836] p0447 N80-25907
Solar energy facility at North Hampton Recreation
Center, Dallas, Texas
[NASA-CR-161444] p0449 N80-26766
Solar energy system performance evaluation:
Seasonal report for Elcam Tempe Arizona State
University, Tempe, Arizona
[NASA-CR-161466] p0450 N80-26778
The potential for heat production with solar water
heaters in the Netherlands climate
p0450 N80-26792
Solar project description for Alpha Construction
Company's single family residence, Canton, Ohio
[SOLAR/1034-79/50] p0451 N80-26812
Solar project description for
Stewart-Teele-Mitchell single family residence,
Malta, N.Y.
[SOLAR/1018-79/50] p0451 N80-26813
Solar project description for Washington Natural
Gas Company's single family residence, Kirkland,
Washington
[SOLAR/1001-79/50] p0451 N80-26814
Solar project description for Zien Mechanical 2
single family residence, Milwaukee, Wisonsin
[SOLAR/1057-79/50-PT-2] p0451 N80-26815
Solar Federal Buildings Program plan --- solar
applications in buildings
[DOE/CS-0147A] p0453 N80-26842
Water heating by solar energy with plastic
collectors
[BMFT-FB-T-79-29] p0456 N80-26876
Solar energy system performance evaluation:
Seasonal report for Contemporary-Manchester,
Manchester, New Hampshire
[NASA-CR-161471] p0457 N80-27802

WATER INJECTION
Performance evaluation of Magma Power company's
reinjection well no. 46-7 at the East Mesa KGRA,
California
[SAND-79-7127] p0492 N80-25863

WATER POLLUTION
Trace element inputs from a coal burning power
plant to adjacent terrestrial and aquatic
environments
p0324 A80-35649

WATER RESOURCES
Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764
Beneficial use of rejected heat from electric
power plants
[COO-4531-9] p0348 N80-25841
The United States Geological Survey in Alaska,
1979 programs
[CIRC-804-A] p0500 N80-26747
Undeveloped hydropower as a potential energy
source in Idaho
[PB80-157399] p0504 N80-27824

WATER TREATMENT
Performance evaluation of Magma Power company's
reinjection well no. 46-7 at the East Mesa KGRA,
California
[SAND-79-7127] p0492 N80-25863

WATER WAVES
Comparative evaluation of various methods for the
prediction of wave drift forces on OTEC platforms
p0512 A80-35167

WATERWAVE ENERGY CONVERSION
Hydro-power - The use of water as an alternative source of energy --- Book
p0468 A80-35172
Review - Materials aspects of wave energy converters
p0517 A80-38283
Non-linear oscillations in wave power machines
p0521 A80-41330
Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732
Wave energy --- offshore energy conversion technology assessment
p0479 A80-43831
Recent progress on ducks --- ocean wave energy receivers
p0526 A80-43832
WATERWAVE POWERED MACHINES
Non-linear oscillations in wave power machines
p0521 A80-41330
WAVE ATTENUATION
Attenuation of seismic waves in rocks and applications in energy exploration
p0488 N80-24909
WAVE DIFFRACTION
LOTS analysis of optical diffraction in Antares --- Laser Optical Train Simulator code for fusion research
p0518 A80-38490
WAVE FRONT DEFORMATION
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493
WAVE FRONT RECONSTRUCTION
Three-dimensional reconstruction of the X-ray emission in laser imploded targets
p0510 A80-34749
WAVEGUIDE ANTENNAS
Microwave beamed power technology improvement --- magnetrons and slotted waveguide arrays
[NASA-CR-163043]
p0542 N80-26785
WEAR TESTS
Handling coal oil mixtures with positive displacement pumps
p0494 N80-26463
WEATHER FORECASTING
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837]
p0488 N80-24964
WEATHER STATIONS
LLL Data acquisition system for liquefied gaseous fuels program
[UCID-18576]
p0498 N80-26537
WEATHERING
Weatherability test of plastic glazing materials for collectors
p0362 A80-33474
Development of a low-temperature, low-cost, black liquid solar collector, phase 2 --- weathering tests
[ALO-30171-1]
p0453 N80-26841
WELLS
The effect of system size on the practicality of aquifer storage --- feasibility of small systems for building heat storage
p0545 A80-33517
Earth coils and geo-thermal wells used as solar energy storage devices
p0368 A80-33549
Investigation of the technical and economic feasibility of using pumped well-water energy storage systems
[SAND-79-7096]
p0556 N80-23851
Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain
[AD-A082400]
p0488 N80-24799
Performance evaluation of Magma Power company's reinjection well no. 46-7 at the East Mesa KGRA, California
[SAND-79-7127]
p0492 N80-25863
WEST VIRGINIA
Oil recovery by carbon dioxide injection --- Rock Creek Big Injun field, West Virginia
[ORO-5301-47]
p0500 N80-26754
WHEAT
Grain motor fuel alcohol technical and economic assessment study
[HCP/J6639-01]
p0334 N80-22523
WIDE ANGLE LENSES
Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors
p0390 A80-33805
WIND (METEOROLOGY)
The influence of Tidal Generating Force on windflow - A preliminary study
p0465 A80-32930
Meteorological and topographical indicators of wind energy for regional assessments
p0469 A80-35737
Remote sensing applications to wind power facility siting
p0470 A80-35746
Wind characteristics for agricultural wind energy applications
[PNL-SA-7270]
p0530 N80-23947
Wind resource assessment status
[PNL-SA-6918-REV-1]
p0488 N80-24966
Siting small wind turbines
[PNL-SA-7603]
p0493 N80-25878
MOD-2 wind turbine system concept and preliminary design report. Volume 2: Detailed report
[NASA-CR-159609]
p0536 N80-26775
WIND DIRECTION
Wind turbine dynamic blade loads due to wind gusts and wind direction changes
p0513 A80-35727
Wind direction variations in strong winds --- for wind turbine design considerations
p0468 A80-35728
The potential impact of automated wind guidance on wind energy conversion operations
p0469 A80-35731
Measurement of wind speed distributions across a solar collector
p0415 A80-40717
WIND EFFECTS
Collector deflections due to wind gusts and control scheme design
p0378 A80-33643
Turbulence and WTG performance --- Wind Turbine Generator
p0513 A80-35726
WECS site screening by physical modeling
p0514 A80-35748
Wind effects on collectors
[DOE/CS-35364/T1]
p0454 N80-26851
WIND MEASUREMENT
The use of wind data with an operational wind turbine in a research and development environment
p0513 A80-35730
Wind energy assessment of the San Gorgonio Pass Region
p0470 A80-35749
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837]
p0488 N80-24964
LLL Data acquisition system for liquefied gaseous fuels program
[UCID-18576]
p0498 N80-26537
WIND PRESSURE
Statistical models for wind characteristics at potential wind energy conversion sites
[DOE/ET/20283-1]
p0489 N80-24968
WIND PROFILES
Modified power law equations for vertical wind profiles --- in investigation of windpower plant siting
p0468 A80-35719
The potential impact of automated wind guidance on wind energy conversion operations
p0469 A80-35731
Pacific Northwest regional assessment --- of wind energy utilization
p0469 A80-35732
Alaskan wind power study - A large area wind characteristics survey
p0469 A80-35734
Wind energy potential in the northern part of Germany
p0469 A80-35735

The utility and verification of mathematical windfield models for wind energy regional screening and site selection p0470 A80-35747
On the vertical extrapolation of mean wind power density p0471 A80-36424
Confidence interval procedures for wind turbine candidate sites p0524 A80-43478
Wind characteristics for agricultural wind energy applications [PNL-SA-7270] p0530 N80-23947
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory [UCRL-52837] p0488 N80-24964

WIND TUNNEL TESTS
Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor p0520 A80-41034
Preliminary wind tunnel tests on the pedal wind turbine p0523 A80-43141

WIND VARIATIONS
Wind fluctuations described as discrete events p0468 A80-35721
Effect of complex terrain on wind fluctuations --- for consideration of windpower machine site p0468 A80-35723
Wind direction variations in strong winds --- for wind turbine design considerations p0468 A80-35728
Fluctuations in output from wind turbine clusters p0520 A80-41032

WIND VELOCITY
Simulation of correlated wind speeds for sites and arrays p0466 A80-33769
Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program p0513 A80-35718
WECS site screening by physical modeling p0514 A80-35748
Fluctuations in output from wind turbine clusters p0520 A80-41032
Confidence interval procedures for wind turbine candidate sites p0524 A80-43478
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory [UCRL-52837] p0488 N80-24964
Statistical models for wind characteristics at potential wind energy conversion sites [DOE/ET/20283-1] p0489 N80-24968

WIND VELOCITY MEASUREMENT
A new approach of wind speed characterization for wind energy studies p0466 A80-33771
Wind fluctuations described as discrete events p0468 A80-35721
Data analysis at the Rocky Flats Wind Systems Test and Development Center p0513 A80-35724
Application of power laws for wind energy assessment p0470 A80-35744
Measurement of wind speed distributions across a solar collector p0415 A80-40717

WINDMILLS (WINDPOWERED MACHINES)
Simulation of correlated wind speeds for sites and arrays p0466 A80-33769
Redesign of windmill towers - A cost reduction study p0467 A80-33772
Performance modeling of the vertical axis wind turbine p0508 A80-33773
Windpower principles - Their application on the small scale --- Book p0468 A80-34859
Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings p0468 A80-35716
Atmospheric considerations for design of WECS --- Wind Energy Conversion System p0513 A80-35717
Wind statistics at the Boulder Atmospheric Observatory tower --- for wind turbine generator design p0468 A80-35722
Effect of complex terrain on wind fluctuations --- for consideration of windpower machine site p0468 A80-35723
Data analysis at the Rocky Flats Wind Systems Test and Development Center p0513 A80-35724
Some meteorological activities in the National Swedish Wind Energy Program p0513 A80-35725
Wind direction variations in strong winds --- for wind turbine design considerations p0468 A80-35728
Sow wind turbines and reap the wind p0517 A80-38012
Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor p0520 A80-41034
Wind power p0478 A80-42470
Dynamics of a flexible rotor-tower system [ASRL-TR-194-1] p0530 N80-23862
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines [NASA-CR-159856] p0355 N80-27803

WINDOWS (APERTURES)
Monthly average daily insolation on overhang shaded windows p0383 A80-33698
Design and performance of low heat loss window systems p0324 A80-33706
A computer analysis of heteroface solar cells with ultrathin window layer p0422 A80-43589

WINDPOWER UTILIZATION
The influence of Tidal Generating Force on windflow - A preliminary study p0465 A80-32930
A 500 gallons per day hybrid desalination plant using wind/solar energy p0382 A80-33682
A new approach of wind speed characterization for wind energy studies p0466 A80-33771
Windpower principles - Their application on the small scale --- Book p0468 A80-34859
Conference and Workshop on Wind Energy Characteristics and Wind Energy Siting, Portland, Ore., June 19-21, 1979, Proceedings p0468 A80-35716
Modified power law equations for vertical wind profiles --- in investigation of windpower plant siting p0468 A80-35719
A model for the probability structure of atmospheric turbulence --- for wind engineering applications p0468 A80-35720
Wind fluctuations described as discrete events p0468 A80-35721
Data analysis at the Rocky Flats Wind Systems Test and Development Center p0513 A80-35724
A method for estimating the impact of WECS on utility operating reserve requirements p0469 A80-35729
The potential impact of automated wind guidance on wind energy conversion operations p0469 A80-35731
Pacific Northwest regional assessment --- of wind energy utilization p0469 A80-35732
Wind energy resource development in California p0469 A80-35733
Alaskan wind power study - A large area wind characteristics survey p0469 A80-35734
Wind energy resource assessment of New Zealand p0469 A80-35736

Meteorological and topographical indicators of wind energy for regional assessments
p0469 A80-35737

Manufacturers' view of wind resource assessments
p0514 A80-35738

Agricultural applications of wind resource assessments
p0514 A80-35739

Statistical reliability of wind power assessments
p0469 A80-35741

Boundary layer wind shear --- at wind turbine sites
p0469 A80-35743

Application of power laws for wind energy assessment
p0470 A80-35744

Trees as an indicator of wind power potential
p0470 A80-35745

The utility and verification of mathematical windfield models for wind energy regional screening and site selection
p0470 A80-35747

WECS site screening by physical modeling
p0514 A80-35748

Wind energy assessment of the San Gorgonio Pass Region
p0470 A80-35749

Status of the Large Wind Turbine Siting Handbook
p0514 A80-35750

On the vertical extrapolation of mean wind power density
p0471 A80-36424

Technical-economic validation for selection of solar resources as energy sources
p0400 A80-36596

Comfortable heating and cooling by solar reflectors and wind
p0411 A80-38013

Combination of wind and solar energies at the Northern Coast of Egypt
p0411 A80-38014

Passive cooling systems in hot arid regions
p0478 A80-42448

Wind power
p0478 A80-42470

The utilization of wind-energy resources --- Soviet Union, U.S., West Europe developments review
p0478 A80-42700

Crosswind kite power --- for large-scale wind power production
p0523 A80-43139

Dynamics and control of large horizontal-axis axisymmetric wind turbines
p0526 N80-22772

Technology assessment of wind energy conversion systems
[LA-8044-TASE]
p0527 N80-22840

Conversion system overview assessment. Volume 2: Solar-wind hybrid systems
[SERI/TR-35-078-VOL-2]
p0338 N80-23799

Wind characteristics for agricultural wind energy applications
[PNL-SA-7270]
p0530 N80-23947

Mod-2 wind turbine system concept and preliminary design report. Volume 1: Executive summary
[NASA-CR-159609]
p0530 N80-24758

Further investigations of diffuser augmented wind turbines. Part 1: Executive summary
[COO-2616-2-PT-1-REV-1]
p0532 N80-24864

Wind resource assessment status
[PNL-SA-6918-REV-1]
p0488 N80-24966

Statistical models for wind characteristics at potential wind energy conversion sites
[DOE/ET/20283-1]
p0489 N80-24968

Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2]
p0533 N80-25807

Design study and economic assessment of multi-unit offshore wind energy conversion systems applications. Volume 4: Meteorological and oceanographic surveys
[WASH-2330-78/4-VOL-4]
p0533 N80-25836

Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 3: System analysis
[WASH-2330-78/4-VOL-3]
p0533 N80-25837

Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 2: Apparatus designs and costs
[WASH-2330-78/4-VOL-2]
p0533 N80-25838

Siting small wind turbines
[PNL-SA-7603]
p0493 N80-25878

New developments in wind systems technology
[RFP-3000]
p0534 N80-25888

Technical and management support for the development of small wind systems
[RFP-2974/3533-79-2]
p0534 N80-25889

Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32]
p0349 N80-25894

Environmental assessment of small wind systems
[SERI/PR-354-420]
p0350 N80-25928

Aerodynamic performance of the 17-m-diameter Darrieus wind turbine in the three-bladed configuration: An addendum
[SAND-79-1753]
p0537 N80-26857

Energy for wind powered oscillators
[DOE/R5/10129-1]
p0500 N80-26858

Evaluation of the vertical axis wind turbine at DREO
[AD-A083961]
p0564 N80-27814

Wind characteristics for design of wind turbines: Research in the USA
[PNL-SA-7967]
p0538 N80-27817

WINDPOWERED GENERATORS

Performance evaluation of wind turbines
p0508 A80-33290

Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756

Operational characteristics of an ac commutator generator for wind power conversion
p0508 A80-33770

Application of probability methods to evaluate the reliability of a combined wind-electric and conventional generation system
p0508 A80-33774

Electro-wind energy system with oversynchronous cascade and simple adaptive maximal power control
p0508 A80-33775

A design procedure for wind powered heating systems
p0509 A80-33776

An exploratory survey of noise levels associated with a 100 kW wind turbine
p0512 A80-35499

Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program
p0513 A80-35718

Wind statistics at the Boulder Atmospheric Observatory tower --- for wind turbine generator design
p0468 A80-35722

Turbulence and WTG performance --- Wind Turbine Generator
p0513 A80-35726

Wind turbine dynamic blade loads due to wind gusts and wind direction changes
p0513 A80-35727

The use of wind data with an operational wind turbine in a research and development environment
p0513 A80-35730

Wind energy potential in the northern part of Germany
p0469 A80-35735

Wind energy from a utility planning perspective
p0325 A80-35740

Sow wind turbines and reap the wind
p0517 A80-38012

Modified aerospace R&QA method for wind turbines
p0519 A80-40335

Fluctuations in output from wind turbine clusters
p0520 A80-41032

Sailwing Darrieus rotors
p0520 A80-41033

Crosswind kite power --- for large-scale wind power production
p0523 A80-43139

Preliminary wind tunnel tests on the pedal wind turbine
p0523 A80-43141

Confidence interval procedures for wind turbine candidate sites
p0524 A80-43478

Economic and operational implications of a complex of wind-driven generators on a power system
p0333 A80-43829
Dynamics and control of large horizontal-axis axisymmetric wind turbines
p0526 N80-22772
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859
An exploratory survey of noise levels associated with a 100kW wind turbine
[NASA-TM-81486] p0527 N80-23102
Mod-1 wind turbine generator analysis and design report, volume 1
[NASA-CR-159495] p0528 N80-23775
The aerodynamics of axial flow wind power turbines
[CSIR-ME-1619] p0528 N80-23781
Hillville Wind Turbine Generator: Failure analysis and corrective design modification
[RFP-2992/3533/79-3] p0529 N80-23831
Vertical axis wind turbine development: Executive summary
[ORO-5135-77-5-SUMM] p0529 N80-23845
Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846
Mod-2 wind turbine system concept and preliminary design report. Volume 1: Executive summary
[NASA-CR-159609] p0530 N80-24758
Electrofluid dynamic wind generator
[COO-4130-2] p0531 N80-24811
Further investigations of diffuser augmented wind turbines. Part 1: Executive summary
[COO-2616-2-PT-1-REV-1] p0532 N80-24864
Variable speed constant frequency voltage generator (alternator)
[PB80-141286] p0532 N80-24875
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine
[NASA-TM-81813] p0532 N80-25104
Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 3: System analysis
[WASH-2330-76/4-VOL-3] p0533 N80-25837
New developments in wind systems technology
[RFP-3000] p0534 N80-25888
Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C] p0535 N80-25897
Design and fabrication of a low-cost Darrieus vertical axis wind turbine system, phase 1
[ALO-4272] p0535 N80-25899
Nonlinear aeroelastic equations of motion of twisted, nonuniform, flexible horizontal-axis wind turbine blades
[NASA-CR-159502] p0536 N80-26774
MOD-2 wind turbine system concept and preliminary design report. Volume 2: Detailed report
[NASA-CR-159609] p0536 N80-26775
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961] p0564 N80-27814

WINDPOWERED PUMPS
Agricultural applications of wind resource assessments
p0514 A80-35739

WINTER
Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season
p0363 A80-33488
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693

WISCONSIN
Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin
[SOLAR/1057-79/50-PT-1] p0451 N80-26811
Solar project description for Zien Mechanical 2 single family residence, Milwaukee, Wisconsin
[SOLAR/1057-79/50-PT-2] p0451 N80-26815

WOOD
Wood for energy production --- Book
p0474 A80-40830
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

WORK CAPACITY
Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537

WORKING FLUIDS
An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473
Studies of directly absorbing fluids for mid-temperature solar thermal applications
p0388 A80-33749
MHD generator of the conduction type with reciprocal motion of the composite working element
p0509 A80-34313
A black liquid flat plate collector for economical applications
p0404 A80-37948
Thermo-fluid analysis of a cylindrical solar heat absorber
p0405 A80-37955
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector
p0407 A80-37977
Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162
Closed-cycle gas turbine working fluids
[ASME PAPER 80-GT-135] p0522 A80-42248
Solar collector fluid parameter study
[PB80-125891] p0430 N80-23869

X

X RAY IRRADIATION
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180

X RAYS
Three-dimensional reconstruction of the X-ray emission in laser imploded targets
p0510 A80-34749

XYLOSE
Xylose recovery from hemicellulose by selective acid hydrolysis --- biomass energy production
p0466 A80-33417

Y

YEAST
Pellets of immobilized yeast cells as biocatalysts for transforming biomass
p0466 A80-33414

Z

ZINC
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces
p0388 A80-33746

ZINC CHLORIDES
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents
p0472 A80-39420
The zinc chloride process for the hydrocracking of coal
p0474 A80-40757

ZINC OXIDES
Properties of alternate electrolytes for secondary zinc batteries
p0550 A80-42297
Methanol and methyl fuel catalysts --- CuO/ZnO catalysts
[FE-3177-3] p0482 N80-23482

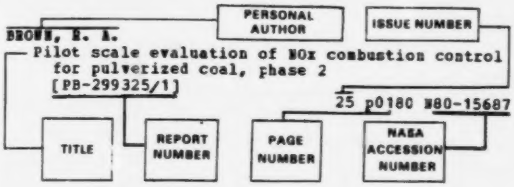
ZINC SULFIDES
The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements --- thin film solar cell
p0398 A80-35486

PERSONAL AUTHOR INDEX

ENERGY/*A Continuing Bibliography (Issue 27)*

OCTOBER 1980

Typical Personal Author Index Listing



Listings in this index are arranged alphabetically by personal author. The title of the document provides the user with a brief description of the subject matter. The report number helps to indicate the type of document listed (e.g., NASA report, translation, NASA contractor report). The issue, page and accession numbers are located beneath and to the right of the title, e.g., 25 p0180 N80-15687. Under any one author's name the accession numbers are arranged in sequence with the *IAA* accession numbers appearing first.

A

ABLECAN, R. B.
A simplified solar cooling design method for closed-loop liquid systems
p0376 A80-33620

ABBOTT, D. H.
Cascade solar-cell design for high-temperature operation
p0397 A80-35365

ABBOTT, J. M.
Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780

ABDALLA, S.
New possibilities of solar energy conversion by means of refractory thermoelements
p0409 A80-37993

ABDEL HAFIEZ, M. S.
Combination of wind and solar energies at the Northern Coast of Egypt
p0411 A80-38014

ABDEL-KHALIK, S. I.
The sizing and economics of phase change energy storage units in air-based solar heating systems
p0546 A80-33520

ABDELHAFIEZ, M. S.
Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants
p0411 A80-38007

ABDELSALAM, H. A.
Investigation of pool boiling heat transfer in the energy carrying liquids of solar energy power plants
p0411 A80-38007

ABDOU, M. A.
A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems
p0506 A80-33046

ABDURAKHMANOV, A.
Heating characteristics of concentrator/receiver system employing a selective absorbing surface
p0401 A80-36826
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant
p0401 A80-36834

ABERNATHY, G. H.
Preliminary operational results from the Willard solar power system
p0436 N80-24794

ABHAT, A.
Application of heat pipes to thermal energy storage systems
[AIAA PAPER 80-1509] p0549 A80-41473

ACCIAN, T.
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems
[PB80-138464] p0351 N80-25947

ACQUISTA, C. R.
Solar elevation angle probability distribution
p0415 A80-40721

ACZEL, T.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460

ADACHI, T.
A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985

ADAMS-VIOLA, M.
Characterization and structural studies of the various types of COM
p0494 N80-26468

ADAMS, M. W. W.
H_2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407

ADAMS, R. I.
The energy-food interface - An economic analysis of Brazil's alcohol plan
p0466 A80-33753

ADDEO, A.
Plastic solar collectors for 'low energy' applications
p0415 A80-41948

AGABAEV, C.
Energy balance of solar thermoelectric generator
p0401 A80-36821

AGABAEV, CH.
Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597

AGARWAL, D.
Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AF-884] p0497 N80-26529

AGARWAL, R. C.
Low cost spiral shaped solar collector
p0406 A80-37960

AGGEEVA, I. A.
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant
p0401 A80-36834

AGHAN, A.
Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480

AGNIHOTRI, O. P.
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces
p0388 A80-33746

AHMAD, J.
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A083608]
AHMED, M. M. p0537 N80-26794
Coal derived liquids hydrotreatment-catalysts deactivation study

AHMED, S. B. p0479 N80-22421
An experimental investigation of comparative performance of a header-type compound parabolic concentrator and a flat-plate collector

p0405 A80-37956
Performance of a storage unit coupled to a flat plate solar collector

AHN, Y. K. p0406 A80-37964
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9]
AHRENS, F. W. p0483 N80-23486
Optimal design of compressed air energy storage systems
[CONF-791069-3]
AIKAWA, K. p0555 N80-23789
Design of an isobutane binary cycle geothermal generation system

AIMAN, W. R. p0509 A80-34559
Solar coal gasification

AJAKAIYE, B. A. p0403 A80-37305
Prospects for solar cooling applications in Nigeria
AKERS, D. W. p0382 A80-33676
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8]
AKINS, R. E. p0335 N80-22878
Performance evaluation of wind turbines

p0508 A80-33290
An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients
[PB80-158769]
ALARIO, J. p0458 N80-27829
Active heat exchange system development for latent heat thermal energy storage

ALBANESE, A. S. p0554 N80-22822
Environmental control technology for atmospheric carbon dioxide
[BNL-27164]
p0345 N80-24888
Environmental control technology for atmospheric carbon dioxide
[BNL-51116]
ALBERT, D. p0354 N80-26956
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2

ALBERTS, R. D. p0495 N80-26469
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2]
ALDERSON, B. D. p0455 N80-26866
Design and test of a 73-MW water cooled gas turbine
[ASME PAPER 80-GT-112] p0477 A80-42230
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48]
ALDWINCKLE, R. H. p0337 N80-23662
Canada's federal solar energy program

ALEXANDER, A. G. p0323 A80-33436
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T1]
p0484 N80-23840

ALEXANDER, G.
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1]
p0529 N80-23860
The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona
ALIMOV, A. K. p0436 N80-24793
Test results on solar turbogenerators

ALKIRE, R. C. p0391 A80-33860
Survey of organic electrolytic processes
[ANL/OEPM-79-5]
ALLAWAY, W. p0341 N80-24393
Lessons of the NASA Tech House
[NASA-SP-442]
ALLEN, A. D. p0456 N80-27219
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2]
ALLEN, E. L. p0498 N80-26533
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22]
p0339 N80-23841
United Kingdom: Estimates of future energy/GDP relationship
[ORAU/IEA(M)-79-25]
p0339 N80-23848
Canada: Estimates of future energy/GNP relationships
[ORAU/IEA(M)-79-24]
p0339 N80-23849
France: Estimates of future energy/GDP relationships
[ORAU/IEA-79-23(M)]
p0343 N80-24852
Japan: Estimates of future energy/GNP relationships in energy use
[ORAU/IEA-79-21(M)]
p0344 N80-24869
Italy: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-20]
ALLEN, R. D. p0347 N80-25804
Thermal energy storage in aquifiers: Preliminary information
[PNL-3062]
ALLEN, R. W. p0555 N80-23793
A simplified solar cooling design method for closed-loop liquid systems

ALLENTUCK, J. p0376 A80-33620
Low-cost general energy/analytic information system
[BNL-26398]
ALLISON, H. J. p0567 N80-24801
A renewable energy system for developing countries
ALLISON, W. p0323 A80-33675
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T1]
ALLRED, R. E. p0484 N80-23840
Environmental testing of solar reflector structures
ALMANZA, R. p0363 A80-33487
Research and development on solar energy for electric and mechanical power generation
ALONSO, A. p0373 A80-33601
The Ramon Areces concentration photovoltaic array
ALTER, H. p0384 A80-33714
Solid waste conversion to energy: Current European and U.S. practice

p0474 A80-40832
Recovery and reuse - Mechanical processing
ALTSHULER, A. p0475 A80-41172
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278]
ALYEA, F. N. p0355 N80-27239
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634]
ALZIARY DE ROQUEFORT, T. p0536 N80-26779
Three-dimensional numerical evaluation of heat loss through natural convection in a solar boiler
p0413 A80-38274

AMEDURI, G.
Solar energy system with heat pump augmentation for industrial process heat - An update
p0372 A80-33589
Mini-computer-based energy monitor system
p0380 A80-33661
AMMON, R. L.
Compact closed cycle Brayton system feasibility study, volume 1
[AD-A081379] p0532 N80-25666
ANAND, D. K.
A simplified solar cooling design method for closed-loop liquid systems
p0376 A80-33620
ANANTH, K. P.
Thermal energy storage systems using fluidized bed heat exchangers
p0551 N80-22792
ANASTASI, J. A.
Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant
[AD-A082756] p0492 N80-25797
ANDERSON, C. J.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
ANDERSON, D.
The effect of catalyst length and downstream reactor distance on catalytic combustor performance
[NASA-TM-81475] p0337 N80-23779
ANDERSON, G. C.
Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505
ANDERSON, J. H.
Solar collector studies for solar heating and cooling applications
[ALO-5355-T1] p0445 N80-25850
ANDERSON, J. V.
A design method for parallel solar-heat pump systems
p0367 A80-33542
ANDERSON, K.
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892
ANDERSON, L. L.
Synthetic fuels from coal: Overview and assessment
p0329 A80-40825
ANDERSON, W. A.
MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722
Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon
p0422 A80-43762
ANDERSON, W. E.
Measurements on insulating materials at cryogenic temperatures
[PB80-134596] p0541 N80-24507
ANDERSSON, A.
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy
p0388 A80-33748
ANDREEV, V. I.
MHD generator of the conduction type with reciprocal motion of the composite working element
p0509 A80-34313
ANDREWS, J. E.
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797
ANDREWS, J. W.
Computer simulation of ground coupled storage in a series solar assisted heat pump system
p0368 A80-33547
Heat pump impact upon solar collection design and cost
p0368 A80-33548
Optimization of solar assisted heat pump systems via a simple analytic approach
[BNL-27316] p0349 N80-25896
ANDREWS, K. R.
A large-area cold-cathode grid-controlled electron gun for Antares
p0516 A80-37854
ANDREWS, L.
Development of materials for a luminescent solar collector
[COO-4996-1] p0443 N80-25812
ANG, P. G. P.
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
p0515 A80-37007
ANGELINO, G.
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680
ANGELINO, T.
The Ansaldo 35 kW solar power system
p0373 A80-33600
ANTAL, M. J., JR.
Solar flash pyrolysis of biomass
p0359 A80-33431
ANTOINE, A. C.
Use of petroleum-based correlations and estimation methods for synthetic fuels
[NASA-TM-81533] p0502 N80-27509
ANTRIM, N. R.
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662
ANTRIM, W. D., JR.
Development of a second-generation concentrating tracking solar collector
[ASE-4460] p0445 N80-25851
APARISI, R. R.
Geometric and kinematic characteristics of solar-tower heliostats
p0391 A80-33857
APOLLONSKII, S. M.
Calculation of a low-frequency electromagnetic field due to MHD machines inside a common shielding shell
p0509 A80-34311
ARAFA, A.
The flat plate solar collector - Its steady-state and transient state behaviour
p0403 A80-37943
Technical applications of solar energy
[BMFT-FB-T-79-06] p0424 N80-22860
ARAUJO, G. L.
The Ramon Areces concentration photovoltaic array
p0384 A80-33714
ARGOUD, M. J.
Test bed concentrator mirrors
p0433 N80-24764
ARIENZO, M.
Single-crystal solar cell heterojunctions involving N-cadmium sulfide
p0413 A80-39061
ARIGA, T.
New air-heating collector design and performance
p0359 A80-33449
ARIOTEDJO, A. P.
Review of amorphous and polycrystalline thin film silicon solar cell performance parameters
p0414 A80-40712
Measurement techniques in thin film polycrystalline materials and devices /solar cells/
p0422 A80-43764
ARMSTRONG, J. E.
Community impediments to implementation of solar energy
[DOE/EV-0059] p0457 N80-27821
ARMSTRONG, M. D.
Community impediments to implementation of solar energy
[DOE/EV-0059] p0457 N80-27821
ARMSTRONG, P. R.
A pin programmable controller for research systems
p0380 A80-33662
ARNDT, W.
A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719
Technical applications of solar energy
[BMFT-FB-T-79-06] p0424 N80-22860
ARTHUR, M. P.
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481

ASBURY, J. G.
Experimental evaluation of thermal energy storage
ASHCROFT, N. W. p0553 N80-22817
Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications
[DOE/ET-20413/1]
ASHE, T. L. p0448 N80-26143
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592]
ASHMOLE, P. H. p0526 N80-22778
Economic and operational implications of a complex of wind-driven generators on a power system
ASHOK, A. p0333 A80-43829
Spray-deposited ITO-silicon SIS heterojunction solar cells
ASHWORTH, J. H. p0395 A80-35350
International development assistance for renewable technologies - Current programs and institutional requirements
ASKE, V. H. p0323 A80-33672
The MHD /magnetohydrodynamic/ two-axis Rate Sensor
[AIAA PAPER 80-1890]
ATIENZA, J. A. p0523 A80-43325
Process steam generation by a facetted, non-imaging solar concentrator
ATTWATER, C. R. p0378 A80-33639
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks
AUDIBERT, M. p0546 A80-33518
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
AUH, P. C. p0374 A80-33605
Evaluation of performance enhancement of solar powered absorption chiller with an improved control strategy using the BNL-built hardware simulator
p0366 A80-33533
Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation
[BNL-51120]
AUSSEUR, J.-Y. p0455 N80-26863
The 'soil therm' system for interseasonal earth storage of solar heat for individual housing
AVELAR, E. M. p0545 A80-33516
Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications
[ASME PAPER 80-PET-83]
AXELROD, M. C. p0524 A80-43345
Potential air quality impact of geothermal power production in the Imperial Valley
[UCRL-52797]
AYER, F. A. p0340 N80-23878
Proceedings: Symposium on Flue Gas Desulfurization, volume 1
[PB80-133168]
p0336 N80-22888
Proceedings: Symposium on Flue Gas Desulfurization, volume 2
[PB80-133176]
AZIMOV, S. A. p0336 N80-22889
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588

B

BABAEV, V. M.
Modeling of safe-life tests of thermoelectric batteries
BABINTSEV, I. A. p0519 A80-38758
Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732
BABU, S. V.
Feasibility of a large scale solar power generation system suitable for the arid and semi-arid zones
BACA, G. A. p0358 A80-33425
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098]
BACH, W. p0555 N80-23801
Impacts of fossil fuel use on environment and climate
BACKUS, C. E. p0326 A80-37331
The performance of silicon solar cells under concentrated sunlight
BADGER, P. C. p0386 A80-33724
The development and demonstration of a solar pond for heating greenhouses
BADGLEY, H. B. p0371 A80-33586
Solar array subsystems study
[NASA-CR-159857]
BADO, G. p0431 N80-24742
Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498
The Ansaldo 35 kW solar power system
BAERST, C. F. p0373 A80-33600
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen
BAGGA, P. S. p0461 A80-37342
Grinding of coal in oil
BAGHDADI, A. p0494 N80-26462
Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films
BAHADORI, M. N. p0526 A80-43758
Passive cooling systems in hot arid regions
BAHR, A. p0478 A80-42448
Measurements on a flat thermal solar energy collector with a cellular structure after Francia
BAHR, D. W. p0404 A80-37946
Fuel property effects on life characteristics of aircraft turbine engine combustors
[ASME PAPER 80-GT-55]
BAHRAMI, K. p0476 A80-42186
Dispersed storage and generation case studies
[NASA-CR-162996]
BAILIE, R. C. p0334 N80-22782
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9]
p0483 N80-23486
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-8]
BAILLIF, B. M. p0483 N80-23487
A 300 Btu gas combustor development program, phase 1
[EPRI-AP-1144]
BAIR, R. K. p0481 N80-22852
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1]
BAIRD, M. J. p0537 N80-26853
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944
BAIRD, W. E. p0471 A80-37678
Control systems for interfacing solar agricultural dryers with other energy sources
BAKER, J. p0381 A80-33665
LLL Data acquisition system for liquefied gaseous fuels program
[UCID-18576]
p0498 N80-26537

BALCOMB, J. D.
Hybrid active-passive designs - Synergy or conflict
p0383 A80-33689
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

BALDWIN, T. F.
Sensible heat storage for a solar thermal power plant
[LBL-9321] p0437 N80-24816

BALJE, O. E.
Aerodynamic and geometric design criteria for the performance of low powered vehicular gas turbines
[ASME PAPER 80-GT-117] p0522 A80-42233

BALL, G. L.
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817

BALL, G. L., III
Low-cost mirror concentrator based on double-walled metallized, Tubular films
[ALO-4227-12] p0428 N80-23811

BALLANTYNE, J.
Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819

BALLHEIM, R. W.
Development of a 3X CPC with evacuated receiver
p0364 A80-33494

BALLOU, S. W.
Environmental assessments of alternative energy strategies in the United States
[CONF-791172-1] p0350 N80-25927

BALOMBIN, J. R.
An exploratory survey of noise levels associated with a 100 kW wind turbine
p0512 A80-35499
An exploratory survey of noise levels associated with a 100kW wind turbine
[NASA-TM-81486] p0527 N80-23102

BAMMERT, K.
Steam and gas turbines for small outputs using solar energy
p0410 A80-38003

BANDOW, H. E.
Analysis of solidification in a cylindrical annulus with internal fins
[AD-A080131] p0550 N80-22641

BANKSTON, C. A.
Forced convection in solar collectors
p0360 A80-33455

BARANIUK, V. B.
Improved model of In2O3/SnO2-SiO/x/-nSi solar cells
p0391 A80-33854

BARANYI, A. D.
Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power
p0379 A80-33651

BARBAREK, L. A. C.
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1
[NASA-CR-163220] p0564 N80-28246
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices
[NASA-CR-163221] p0565 N80-28247

BARBER, E. M., JR.
A method for balancing flow rates in rows of parallel collectors
p0362 A80-33476

BARBER, R.
An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473
Results of long term natural weathering effects on solar collectors under stagnation conditions
p0362 A80-33475
Solar collector fluid parameter study
[PB80-125891] p0430 N80-23869

BARBER, R. E.
Solar and geothermal Rankine cycle engines can convert petroleum industry waste heat into electrical power
[ASME PAPER 80-PET-27] p0333 A80-43341

BARBIERI, R. H.
Photovoltaic Residential Applications Program Implementation Workshop Proceedings
[NASA-CR-163274] p0449 N80-26768

BARCHET, W. R.
Pacific Northwest regional assessment
p0469 A80-35732

BAREFIELD, J. E., II
Materials problems with inertial confinement fusion targets
p0506 A80-33051

BARKER, C. R.
Drilling horizontal holes in coal bed from the surface with water jets
[SAND-80-0057C] p0492 N80-25766

BARKER, R. C.
Photoemission measurements of interface barrier energies for tunnel oxides on silicon
p0515 A80-36936

BARLEY, D.
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

BARNERT, H.
Hydrogen production from water by use of nuclear energy
p0462 A80-37346

BARNETT, A. M.
Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells
p0385 A80-33720
Thin-film solar cells - A unified analysis of their potential
p0393 A80-35335
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339

BARNSTONE, R.
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018

BARON, S.
Solar energy - Will it conserve our non-renewable resources
p0413 A80-38025

BARR, R. A.
The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses
p0511 A80-35163

BARR, W. L.
Tests of high-powered direct conversion on beams and plasma
[UCRL-82852] p0532 N80-25161

BARRA, O. A.
A prototype of solar linear concentrators plant installed to supply industrial heat
p0372 A80-33592

BARRASS, G.
Chemical nature of coal hydrogenation oils. I - The effect of catalysts
p0467 A80-34532
Chemical nature of coal hydrogenation oils. II - The effect of temperature
p0467 A80-34533

BARTHEL, H.
Solar collector system using air collectors for a pre-drying facility in a grass drying plant
[SKT-TEIL-1] p0456 N80-26877

BARUTTI, A.
Analysis of experimental test results on a high temperature receiver model
p0363 A80-33486
A prototype of solar linear concentrators plant installed to supply industrial heat
p0372 A80-33592

BASENKOV, S. V.
Accelerator module of 'Angara-5'
p0516 A80-37815

BASHKATOV, V. A.
The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator
p0510 A80-34619

BASS, A. H., JR.
Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631

BASTIDAS, I.
Filtration process and equipment studies for coal liquefaction processes
[FE-2007-T1]
p0487 N80-24499
BATRA, S. K.
Development of standards for coal-oil mixtures
p0494 N80-26465
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469
BATTISTELLI, J. P.
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605
BAUER, F.
Numerical studies of new stellarator concepts
p0511 A80-34978
BAUER, J. L.
Manufacturing methods of a composite cell case for a Ni-Cd battery
p0546 A80-34777
BAUM, B.
Solar collectors
[ALO-5359-T1]
p0437 N80-24821
BAUM, V. A.
Energy balance of solar thermoelectric generator
p0401 A80-36821
BAUMANN, H.
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963]
p0484 N80-24462
BAUSERMAN, G. W.
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64]
p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67]
p0476 A80-42197
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests
[ASME PAPER 80-GT-68]
p0476 A80-42198
BAYLIN, F.
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570]
p0559 N80-25900
BAZARIAN, E. R.
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64]
p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67]
p0476 A80-42197
BAZAROV, B. A.
Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters
p0401 A80-36829
BAZAROV, G. P.
Determination of the geometry of the transition region of a series MHD generator
p0509 A80-34315
BEACH, C. D.
Tests of all-day collector performance
p0361 A80-33468
BEALE, W. T.
A free cylinder Stirling engine solar powered water pump
p0382 A80-33679
BEARD, J. T.
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
p0364 A80-33495
BECHTEL, T. N.
A pin programmable controller for research systems
p0380 A80-33662
BECK, H. P.
Development of current converters for switching and regulating tasks in energy technology
[BMFT-FB-T-79-12]
p0567 N80-23585
BECK, T. R.
Survey of organic electrolytic processes
[ANL/OEPM-79-5]
p0341 N80-24393
BECKERVORDERSANDFORTH, C. P.
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05]
p0481 N80-22525
BECKMAN, W. A.
Prediction of long-term performance of closed-loop concentrating solar collector systems
p0362 A80-33479
A design method for parallel solar-heat pump systems
p0367 A80-33542
Transmission of diffuse radiation through CPC and flat plate collector glazings
p0421 A80-43486
BEDAIR, S. M.
Material and device considerations for cascade solar cells
p0397 A80-35364
Novel concentrator photovoltaic converter system development
[SAND-80-7004]
p0535 N80-25912
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092]
p0450 N80-26797
BEDARD, R.
A cellular glass substrate solar concentrator
p0434 N80-24769
BEERS, D.
Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin
[SOLAR/1057-79/50-PT-1]
p0451 N80-26811
Solar project description for Alpha Construction Company's single family residence, Canton, Ohio
[SOLAR/1034-79/50]
p0451 N80-26812
Solar project description for Stewart-Teele-Mitchell single family residence, Malta, N.Y.
[SOLAR/1018-79/50]
p0451 N80-26813
Solar project description for Washington Natural Gas Company's single family residence, Kirkland, Washington
[SOLAR/1001-79/50]
p0451 N80-26814
BEESON, J. L.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-58]
p0503 N80-27515
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-55]
p0503 N80-27516
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-50]
p0503 N80-27517
BEHAGHEL, J.-M.
Selective electrodeposited chromium black coatings - Optical properties, selectivity model
p0388 A80-33743
BEHRIN, E.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2]
p0563 N80-27232
BEIER, E. P.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction.
Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10]
p0489 N80-25460
BEITLER, R. S.
Fuel conservation through active control of rotor clearances
[AIAA PAPER 80-1087]
p0330 A80-41506
BEJAN, A.
End-use matching of solar energy systems
[SERI/TP-34-325]
p0335 N80-22848
BELL, D.
A cellular glass substrate solar concentrator
p0434 N80-24769

BELL, R. O.
Charge collection and spectral response of amorphous-silicon solar cells
p0401 A80-36937

BELLANGER, N.
French programs of research and experimentation aiming at the development of solar energy in buildings
p0359 A80-33439

BELLAS, G. T.
Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504

BELLINGER, D. Q.
RMA engineering applications to Fossil Energy projects
p0473 A80-40336

BELOGLAZOV, A. A.
The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator
p0510 A80-34619

BELZER, J.
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525

BEN-DAVID, S.
A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683
The comparative economics of passive and active systems
p0412 A80-38020
Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices
[LA-UR-79-3390] p0338 N80-23807

BEN-DROR, J.
Solar powered environment control - Criteria and realization
p0366 A80-33534

BENDER, D. J.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

BENDT, P.
How to measure the optical quality of focusing solar collectors without laser ray tracing
p0378 A80-33645

BENEMANN, J. R.
Microalgal biomass systems for fuels, chemicals, and fertilizers
p0465 A80-33409
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

BENEZECH, G.
Treatment of molybdenite ore with laboratory scale solar furnaces
p0380 A80-33659

BENFORD, S. M.
Improved PFB operations: 400-hour turbine test results
[NASA-TM-81511] p0493 N80-26426

BENNETH, W. S.
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801

BENNETT, R. L.
Particulate sulfur and trace metal emissions from oil fired power plants
p0325 A80-35890

BENSEMAN, R. F.
National solar heating and cooling programme - New Zealand
p0323 A80-33442

BENSON, P. A.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460

BERG, L.
Catalytic hydrogenation for coal-derived liquids
[FE-2034-16] p0486 N80-24488
Catalytic hydrogenation of coal-derived liquids
[FE-2034-17] p0489 N80-25398

BERGHMANS, J.
Solar heating systems with air collectors and rock bed storage
p0406 A80-37969
Hot water production by means of a solar thermosyphon loop
p0407 A80-37971

BERGLES, A. E.
Energy conservation via heat transfer enhancement
[COO-4649-5] p0335 N80-22847

BERGMAN, J. G.
Performance vs prediction for four classes of solar hot water systems
p0370 A80-33576

BERGMARK, D.
Solar energy at the P.E.I. Ark
p0420 A80-42471

BERGQUIST, L. E.
Mass spectrometer determination of argon contents in laser fusion target pellets
p0506 A80-33054

BERLAD, A. L.
Design and performance of low heat loss window systems
p0324 A80-33706

BERMAN, P. A.
The applicability of DOE solar cell and array technology to space power
[NASA-CR-163143] p0432 N80-24753

BERNARD, D. E.
Thermic diode performance characteristics and design manual
p0376 A80-33623

BERNARD, H. J., III
Environmental assessment of the utilization of alcohol fuels in highway vehicle applications
[CONF-791009-19] p0336 N80-23477
Electric and hybrid vehicles in the urban future
[CONF-791009-23] p0341 N80-24217

BERTHIER, S.
Selective electrodeposited chromium black coatings - Optical properties, selectivity model
p0388 A80-33743

BESANT, R. W.
The Saskatchewan Conservation House - A year of performance data
p0369 A80-33566

BESHORE, D. G.
Solar central receiver hybrid - A cost effective future power alternative
[AIAA PAPER 80-0841] p0357 A80-32856

BESSLER, G.
Development of a solar thermal receiver for high temperature applications
[SERI/TP-333-485] p0428 N80-23800

BESSLER, W. F.
Economics of solar-assisted heat pump heating systems for residential use
p0367 A80-33543

BETANCOURT, O.
Numerical studies of new stellarator concepts
p0511 A80-34978

BEVERLY, W. D.
A solar thermal-electric experimental plant
p0374 A80-33606

BEVILACQUA, O. M.
Environmental assessment of the utilization of alcohol fuels in highway vehicle applications
[CONF-791009-19] p0336 N80-23477

BEYER, R.
Wind energy potential in the northern part of Germany
p0469 A80-35735

BHAGAT, N.
The potential of crop residues as a fuel for power generation
p0466 A80-33750

BHAND, S. C.
Derivation of CGL theory with finite Larmor radius corrections
p0514 A80-36714

BHATE, S.
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787

BIASCA, F. E.
The zinc chloride process for the hydrocracking of coal
p0474 A80-40757

BIENSTOCK, D.
The role of coal and oil characteristics in the stability of coal-oil mixtures
p0495 N80-26472

Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504

BIGGS, F.
Unfolding concentrator slope errors from reflected-beam measurements
p0377 A80-33636

Helios and reconcentrators
p0378 A80-33637

Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators
p0379 A80-33646

Comparison between results of the HELIOS and MIRVAL computer codes applied to central receiver solar-energy collection
[SAND-79-8266]
p0448 N80-26075

BIGIO, I. J.
Design of Helios beam diagnostics
p0518 A80-38486

BIGNON, R. J.
A self supporting solar power system for an isolated community
p0374 A80-33607

Power from the sun by thermodynamics French tower type projects
p0410 A80-38002

BIHL, N. K.
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8]
p0335 N80-22878

BILGEN, E.
Solar powered refrigeration
p0420 A80-42469

BILGER, G.
A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719

Technical applications of solar energy
[BMFT-FB-T-79-06]
p0424 N80-22860

BILLMAN, K. W.
Solar energy economics - Orbiting reflectors for world energy
p0415 A80-41328

BINDER, G.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04]
p0527 N80-22859

BINGHAM, C.
Conversion system overview assessment. Volume 2: Solar-wind hybrid systems
[SERI/TR-35-078-VOL-2]
p0338 N80-23799

BINGHAM, G. E.
Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons
[UCRL-83317]
p0337 N80-23629

BIRD, W. L.
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824

The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

BIRINGER, K. L.
Status of the photovoltaic systems definition project
p0387 A80-33733

BIRIUKOVA, R. S.
Obtaining film materials with solar furnaces
p0400 A80-36593

BISAGNI, M.
Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers
p0363 A80-33489

BITER, W. J.
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1]
p0440 N80-24847

BITIURIN, V. A.
Effect of current constriction at electrodes on MHD generator characteristics
p0513 A80-35685

An arc discharge model on electrodes of an MHD generator
p0524 A80-43397

BITTKER, D. A.
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results
[ASME PAPER 80-GT-60]
p0331 A80-42190

BIVACCA, S. J.
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology
p0467 A80-34531

BJORO, E. F.
Safety analysis of an advanced energy system facility
p0520 A80-40337

BLACKBURN, P. E.
Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD
[AIAA PAPER 80-1344]
p0330 A80-41571

BLACKBURN, P. R.
Direct ignition of pulverized coal with arc heated air
p0480 N80-22508

BLACKMON, J. B.
Economic implications of a low cost heliostat design
p0375 A80-33613

BLAESIUS, A.
Moessbauer surface studies on TiFe hydrogen storage material
p0463 A80-43772

BLAIR, H. O.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46]
p0497 N80-26528

BLAKE, R. L.
Potential prediction needs in support of energy systems
p0342 N80-24693

BLANCHARD, T.
Solar applications analysis for energy storage
p0423 N80-22791

BLATT, M. H.
State-of-the-art assessment of hybrid heat pumps
[EPRI-EM-1261]
p0352 N80-26627

BLAY, D.
Analytical and experimental determination of radiation and temperature distributions inside solar receivers
p0377 A80-33634

Study and realisation of a high temperature air cooled solar receiver
p0379 A80-33653

BLAZOWSKI, W. S.
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382

BLECHER, W. A.
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188]
p0555 N80-23796

BLEVINS, D.
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716

BLEVINS, R. W.
At-sea test of a large diameter steel, cold water pipe
p0512 A80-35166

BLOMQUIST, C. A.
Underground Pumped Hydroelectric Storage (UPHS)
[ANL/EES-TM-60]
p0554 N80-22841

Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants
[CONF-791204-11]
p0557 N80-24628

BLOOMSTER, C. H.
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072]
p0492 N80-25865

BLOSS, W. H.
A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719

BLUHM, S. A.
Industrial application experiment series
p0435 N80-24785

BOBBETT, R. E.
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214

BODA, F. P.
The SCSTPE organic Rankine engine
p0531 N80-24773

BOECK, W. L.
Environmental consequences of atmospheric krypton-85
[COO-4364-2] p0345 N80-24886

BOEHM, R.
The effect of an auxiliary load management strategy on solar system performance
p0389 A80-33757

BOEHM, R. F.
Three dimensional ray tracing through concentric tubular elements using vector methods
p0360 A80-33459
Mass flow considerations for solar air heating systems
p0369 A80-33558

BOEHME, G.
Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte
p0547 A80-37009

BOENIG, F. H.
A 300 Btu gas combustor development program, phase 1
[EPRI-AF-1144] p0481 N80-22852

BOER, K. W.
Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 and 3
p0357 A80-33401
The photovoltaic effect, its present understanding and remaining mysteries
p0385 A80-33718

BOES, E.
Photovoltaic concentrator design comparison
p0385 A80-33723

BOES, E. C.
The DOE photovoltaic concentrator project
p0386 A80-33730
Photovoltaic concentrators
[SAND-80-0143C] p0439 N80-24832

BOGART, J.
An experimental evaluation of thermosiphon solar water heaters with closed loop freeze protection
[AIAA PAPER 80-0869] p0357 A80-32867

BOGNER, R. S.
Manufacturing methods of a composite cell case for a Ni-Cd battery
p0546 A80-34777

BOHN, M.
Development of a solar thermal receiver for high temperature applications
[SERI/TP-333-485] p0428 N80-23800

BOHON, W. M.
An optimization procedure for solar thermal electric power plant design
p0376 A80-33625

BOISDET, L.
Thermal storage in rock beds
p0545 A80-33512

BOLDRIN, B.
Experimental investigation on control modes for an absorption chiller of low capacity
p0366 A80-33532

BOLEN, P. D.
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems
p0518 A80-38492

BOLTON, C. N.
Solar central receiver hybrid - A cost effective future power alternative
[AIAA PAPER 80-0841] p0357 A80-32856

BOLZAN, M.
Comparison between two absorption cooling systems of the 'open' type under different climate conditions
p0407 A80-37976

BOMBERGER, D. C.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535

BONET, C.
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3
p0520 A80-40716

BONNER, W. R.
High-level waste immobilization program: An overview
[PNL-3094] p0336 N80-23131

BOOTH, R. W. D.
SPS phase control system performance via analytical simulation
[NASA-CR-160582] p0540 N80-22378

BORDOLOI, K.
Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes
p0405 A80-37952

BORGER, W.
Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte
p0547 A80-37009

BORGESE, D.
Utility problems of central tower solar plant in Italy
p0375 A80-33614

BORISKINA, N. G.
Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear
p0539 A80-39628

BOROFSKY, R. L.
Comparison of costs for solar derived electrical sources with diesel generators in remote locations
p0389 A80-33751

BORREGO, J. M.
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337

BORTON, D. N.
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484

BOSE, J. E.
Earth coils and geo-thermal wells used as solar energy storage devices
p0368 A80-33549

BOSSANYI, E. A.
Fluctuations in output from wind turbine clusters
p0520 A80-41032

BOSSEL, U.
Solar design by the 'Cosine Hour' method
p0375 A80-33618

BOSTWICK, L. E.
Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents
[PB80-126469] p0334 N80-22527
Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes
[PB80-126477] p0334 N80-22528

BOTSARIS, G. D.
Characterization and structural studies of the various types of COM
p0494 N80-26468

BOUAZZI, A. S.
Optimization of graded doping CdTe solar cells
p0409 A80-37998

BOURDEAU, L.
Phase change collector wall versus water collector wall
p0406 A80-37962
Latent heat diode wall
p0407 A80-37975

BOURNE, J. N.
Solar powered environment control - Criteria and realization
p0366 A80-33534

BOWDEN, J. N.
Assessment of crude oil and refined petroleum product quality during long-term storage
[AD-A082365] p0557 N80-24637

BOWEN, A.
Fundamentals of solar architecture
p0418 A80-42449
Prospects for energy responsive urban planning and design
p0332 A80-42450
Regional planning strategies for hybrid energy optimization
p0332 A80-42451

BOWEN, S. W.
Solar energy economics - Orbiting reflectors for world energy
p0415 A80-41324

BOWES, M. A.
Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program
p0513 A80-35718

BOWLES, J. V.
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090]
p0328 A80-38905

BOWMAN, M. G.
High temperature hydrogen cycles for solar heat sources
[LA-UR-80-184]
p0443 N80-25817
Utilization of solar thermal sources for thermochemical hydrogen production
[LA-UR-80-837]
p0464 N80-26538

BOWSER, R. P.
Construction and initial operation of the Miamisburg salt-gradient solar pond
p0371 A80-33583

BOY-MARCOTTE, J.-L.
Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604

BOYANER, M. R.
Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778

BOYER, W. J.
Large space structures - Fantasies and facts
[AIAA 80-0674]
p0393 A80-34999

BOYKIN, R. G.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46]
p0497 N80-26528

BOZEK, J. M.
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515]
p0557 N80-24756

BRADLEY, J. O.
The physics of a saturated Na2O.2B2O3.10H2O non-convecting solar pond
p0372 A80-33587

BRAGAGNOLO, J. A.
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339
Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices
p0526 A80-43760

BRAGG, G. M.
Wind power
p0478 A80-42470

BRAMLETTE, T. T.
Thermochemical energy storage and transport program
[SAND-79-8208]
p0541 N80-23825

BRANDEMUEHL, M. J.
Open-cycle solar air conditioner
p0365 A80-33524
Transmission of diffuse radiation through CPC and flat plate collector glazings
p0421 A80-43486

BRANDHORST, H., JR.
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478]
p0426 N80-23180

BRASIER, R. I.
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098]
p0555 N80-23801

BRAUN, H. R.
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961]
p0564 N80-27814

BRAUN, H.
Description of processes for producing hydrogen by advanced electrolysis
p0460 A80-37335

BRAUN, H. J.
Guide for energy compatibility
[NP-24016]
p0353 N80-26833

BRAUNSTEIN, J.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061]
p0529 N80-23839

BREINDEL, B.
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1]
p0537 N80-26853

BREMNER, P. S.
Cooling system parameter analysis
p0376 A80-33622

BRENNAN, M.
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

BRETT, C. E.
Energy storage in ground-water aquifers
p0545 A80-33514
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-25]
p0344 N80-24860

BREWER, G. D.
Characteristics of liquid hydrogen-fueled aircraft
p0461 A80-37340
A proposed liquid hydrogen development program for aircraft
p0461 A80-37345

BRIDGWATER, A. V.
Packaging materials - Industrial possibilities for resource recovery
p0475 A80-41171
Waste incineration and pyrolysis
p0475 A80-41174

BRISTOW, D. J.
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961]
p0564 N80-27814

BRODIE, D. E.
Optimization of oxide-semiconductor/base-semiconductor solar cells
p0394 A80-35341
Polycrystalline solar cells
p0419 A80-42456

BROEHL, J. H.
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1]
p0529 N80-23860

BROMBERG, L.
Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745

BRONISZ, L.
Small-scale solar simulator for indoor testing of collector modules and materials
p0362 A80-33477

BRONSTEIN, H. R.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061]
p0529 N80-23839

BROOKS, C.
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2]
p0486 N80-24486

BROOKS, W. P.
Magnet optimization for pulsed energy conversion
p0517 A80-37871

BROUSSELY, M.
Lithium batteries with voltage compatibility with conventional systems
p0549 A80-40604

BROUWERS, A. P.
Lightweight diesel aircraft engines for general aviation
[AIAA PAPER 80-1238]
p0328 A80-38983

Design study: A 186 kW lightweight diesel aircraft engine
[NASA-CR-3261] p0334 N80-22326
BROWN, C. T.
Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility
p0378 A80-33642
BROWN, D. H.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797
BROWN, F. C.
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845
BROWN, J.
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716
BROWN, K. C.
Solar technology application to enhanced oil recovery
[SERI/TR-352-392] p0445 N80-25839
End-use matching for solar industrial process heat
[SERI/TR-34-091] p0454 N80-26849
BROWN, R. A.
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace
p0325 A80-35879
BROWN, T.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657
BROWN, W. A. N.
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457
BROWN, W. C.
Microwave beamed power technology improvement
[NASA-CR-163043] p0542 N80-26785
BRUCE, M. R.
Nitrogen fertilizer production by solar energy
p0357 A80-33402
BRUCK, M.
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors
[ASSA-FA-10] p0456 N80-26879
BRUCKER, G. G.
Suntec/Hexcel parabolic trough
p0363 A80-33485
BRUNNER, S. B.
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1] p0534 N80-25891
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-2] p0454 N80-26845
BRUNGER, A. P.
A model for the angular distribution of sky radiance
[DOE-CS-32939-9] p0456 N80-26983
BRUSAGLINO, G.
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211
BRYANT, H. C.
Demonstration salt gradient solar pond
[ALO-3977-T1] p0453 N80-26837
BRYANT, R. S.
Construction and initial operation of the Miamisburg salt-gradient solar pond
p0371 A80-33583
BRYKSIN, A. M.
Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear
p0539 A80-39628
BUBE, R. H.
Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces
p0390 A80-33786
Photoconductivity as a probe of polycrystalline films
p0398 A80-35490
BUBENKO, J. A., SR.
Heat-pump applications to single-family dwellings - An analysis by computer model
p0333 A80-43833
BUCHHOLZ, R.
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216
BUCK, J. R.
NOAA's cold-water pipe at-sea test program
p0511 A80-35162
BUCKINGHAM, P. A.
Engineering evaluation of conceptual coal conversion plant using the H-coal liquefaction process
[EPRI-AP-1297] p0498 N80-26530
BUCKLES, W. E.
Analysis of solar water heating systems
p0370 A80-33574
BUCKLEY, S.
Thermic diode performance characteristics and design manual
p0376 A80-33623
BUCKWALTER, C. Q.
Properties of low cost, high volume glasses
p0414 A80-39937
BUEHRING, W. A.
Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894
BUHRMAN, R. A.
Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications
[DOE/ET-20413/1] p0448 N80-26143
BUJOLD, M. P.
Small passenger car transmission test-Chevrolet 200 transmission
[NASA-CR-159835] p0356 N80-28255
BURCK, C. G.
Can this car electrify America
p0548 A80-39086
BURK, D.
MIS and SIS solar cells
p0395 A80-35348
BURKE, A. E.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
p0388 A80-33749
BURRY, R. V.
High-power MHD system combustor development testing
p0523 A80-43138
BURTON, L. C.
The ZnxCd/1-x/S/Cu2S heterojunction - Review and recent measurements
p0398 A80-35486
BURTSEV, V. A.
NIIEFA research and design in the field of inertial fusion using relativistic electron beams and laser radiation
p0472 A80-38221
BUSCH, D. P.
The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona
p0436 N80-24793
BUSI, J. D.
Hydrogen technology: Foreign, change 1
[AD-A083665] p0464 N80-27816
BUTCHER, T.
Atomization of coal slurry jets
p0496 N80-26482
BUTLER, B. C.
Solar reflectance, transmittance and absorptance of common materials
[SERI/TP-334-457] p0437 N80-24805
BUTLER, B. L.
Environmental testing of solar reflector structures
p0363 A80-33487
Solar materials R & D overview emphasizing solar thermal power systems
p0393 A80-34779
BUTLER, R. G.
Wind energy from a utility planning perspective
p0325 A80-35740

BUTTERFIELD, J. F.
A study of mass production and installation of small solar thermal electric power systems
p0436 N80-24789

BUTTRAM, M. T.
Repetitively pulsed electron beam diode lifetime and stability
p0516 A80-37820

BUXEY, D.
Solar water heaters
p0407 A80-37974

BUZENBERG, R. J.
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2]
p0533 N80-25807

BYNUM, F.
Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance modes
p0405 A80-37952

BYRD, J., JR.
A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems
p0546 A80-35382

C

CADIEUX, R. N.
Battery charge/solar controller for a residential size photovoltaic power system
[COO-4094-62]
p0439 N80-24837

CAHILL, K.
Advanced screening of electrode couples
[NASA-CR-159738]
p0551 N80-22777

CALARCO, A.
Determination of the shadows area induced on horizontal and vertical surfaces anyway oriented
p0384 A80-33700

CALHOUN, J. T.
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines
[NASA-CR-159856]
p0355 N80-27803

CALL, P. J.
Solar reflectance, transmittance and absorptance of common materials
[SERI/TP-334-457]
p0437 N80-24805

CALVERT, N. G.
Windpower principles - Their application on the small scale
p0468 A80-34859

CALVO, R.
Compact closed cycle Brayton system feasibility study, volume 1
[AD-A081379]
p0532 N80-25666

CAMPANILE, G.
Plastic solar collectors for 'low energy' applications
p0415 A80-41948

CAMPBELL, J., JR.
Closed-cycle gas turbine working fluids
[ASME PAPER 80-GT-135]
p0522 A80-42248
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems
[ASME PAPER 80-GT-155]
p0477 A80-42267

CAMPORESE, R.
Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537

CANAL, G.
The urban bus and liquefied casinghead gas /Evaluation of a preliminary experiment/
p0471 A80-36983

CANETE, D.
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1]
p0339 N80-23830

CANTOR, S.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061]
p0529 N80-23839

CANTRELL, J.
Dual desiccant-bed dehumidifier with solar-heated regeneration
p0384 A80-33705

CAOTES, R. L.
Experimental and process design study of a high rate entrained coal gasification process
[FE-1548-T2]
p0487 N80-24501

CAPPS, A. G.
Naval facility energy conversion plants as resource recovery system components
[AD-A081232]
p0526 N80-23783

CAPUTO, C.
A new design of Stirling engine for automotive application
p0519 A80-39899

CARD, H. C.
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345
A comparison of majority- and minority-carrier silicon MIS solar cells
p0395 A80-35349

CARD, N. F.
Large space structures - Fantasies and facts
[AIAA 80-0674]
p0393 A80-34999

CARDEN, P. O.
Ammonia dissociation for solar thermochemical absorbers
p0358 A80-33428

CARLSON, E. J.
Properties of alternate electrolytes for secondary zinc batteries
p0550 A80-42297

CARLSON, G. A.
Mirror fusion reactor design
p0505 A80-33043

CARLSON, R. L.
Beam simultaneity in multi-terawatt CO2 laser fusion systems
p0517 A80-38483

CARNI, S.
Atomization of coal-oil mixtures
p0497 N80-26483

CARMICHAEL, A. D.
Ocean thermal energy conversion: A state-of-the-art study
[EPRI-ER-1113-SR]
p0531 N80-24834

CARMICHAEL, D. C.
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1]
p0529 N80-23860

CARNEGIE, E. J.
Operation of an industrial solar drying system
p0372 A80-33590

CARNEY, T. M.
Design of the solar water heater system for TVA's Memphis Initiative
p0371 A80-33581

CARPENTER, H. W.
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems
[ASME PAPER 80-GT-155]
p0477 A80-42267

CARPENTER, P.
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339]
p0537 N80-26859

CARPENTER, R. L.
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor
p0330 A80-41558
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559

CARR, M. J.
Millville Wind Turbine Generator: Failure analysis and corrective design modification
[RFP-2992/3533/79-3]
p0529 N80-23831

CARRATELLI, E. P.
A prototype of solar linear concentrators plant installed to supply industrial heat
p0372 A80-33592

CARRIERE, D. L.
Differential split power transmissions for a single shaft passenger car gas turbine engine
[ASME PAPER 80-GT-19]
p0521 A80-42157

CARRIGAN, B.
Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base
[PB80-803794] p0425 N80-22869
Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base
[PB80-803778] p0425 N80-22870
Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base
[PB80-803786] p0425 N80-22871
Cadium sulfide solar cells, volume 2. Citations from the NTIS data base
[PB80-802226] p0425 N80-22872
Cadmium sulfide solar cells. Citations from the Engineering Index data base
[PB80-802234] p0426 N80-22873

CARSON, B. H.
Fuel efficiency of small aircraft
[AIAA PAPER 80-1847] p0333 A80-43305

CARTER, G. M.
The potential impact of automated wind guidance on wind energy conversion operations
p0469 A80-35731

CARTER, W. A.
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters
p0325 A80-35878

CARTY, R. H.
Coal/oil/water mixture stability, appendix A
p0501 N80-27502

CARUVANA, A.
Design and test of a 73-MW water cooled gas turbine
[ASME PAPER 80-GT-112] p0477 A80-42230
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669

CASAMAJOR, A. B.
The application of shallow solar ponds for industrial process heat - Case histories
p0372 A80-33588
Application of shallow solar ponds for industrial process heat: Case histories
[UCRL-82367] p0429 N80-23822

CASE, C. W.
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2
[LBL-10098] p0353 N80-26817

CASH, M.
The effects of air leaks on solar air heating systems
p0359 A80-33448

CASPERSON, D. E.
Beam simultaneity in multi-terawatt CO2 laser fusion systems
p0517 A80-38483
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
p0517 A80-38484

CASSADY, P.
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117

CASSEL, D. E.
A survey of existing solar system simulation methods
p0369 A80-33560

CASSINIS, R.
Contribution of remote sensing to the geological problems of the country
p0472 A80-38801

CASSTEVENS, J. M.
Oak Ridge Flywheel Evaluation Laboratory
[Y-2210] p0556 N80-23832

CASTELLAZZI, P.
Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers
p0363 A80-33489

CASTLEMAN, A. W., JR.
Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources
[COO-4776-2] p0355 N80-26958

CATALDO, R. C.
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515] p0557 N80-24756

CAVAGNARO, D. M.
Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base
[PB80-805245] p0491 N80-25478
Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base
[PB80-805252] p0491 N80-25479
Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base
[PB80-805401] p0346 N80-25678
Diesel exhaust emissions. Citations from the American Petroleum Institute data base
[PB80-805419] p0347 N80-25679
Coal gasification technology. Citations from the NTIS data base
[PB80-808090] p0503 N80-27525
Coal liquefaction technology. Citations from the NTIS data base
[PB80-808108] p0503 N80-27526
Coal gasification technology. Citations from the NTIS data center
[PB80-808082] p0503 N80-27527

CAVARD, D.
Energy systems based on local renewable energy resources for a rural community in a developing country
p0323 A80-33677

CECCHI, J. L.
Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185

CEPARATTI, G.
Utility problems of central tower solar plant in Italy
p0375 A80-33614

CHA, B. K.
Two-tank seasonal storage concept for solar space heating of buildings
[CONF-791226-2] p0446 N80-25867

CHAI, V. W.
A thermodynamic analysis of a solar-powered jet refrigeration system
p0407 A80-37978

CHAMBERS, B. C.
The performance of silicon solar cells under concentrated sunlight
p0386 A80-33724

CHAMBERS, R. P.
Xylose recovery from hemicellulose by selective acid hydrolysis
p0466 A80-33417

CHAN, S.-L.
Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756

CHANDRASHEKAR, M.
A comparative study of solar assisted heat pump systems for Canadian locations
p0367 A80-33546

CHANG, P. Y.
The NOAA/DOE frequency-domain methods for analysis of OTEC plant CWP and CWP/platform static and dynamic responses
p0511 A80-35163

CHANG, T. Y.
Evaluation of the Texaco synthesis gas generation process for the production of hydrogen from SRC-2 residue
[ORNL/SUB-7240/6] p0463 N80-25464

CHAPMAN, W. L.
Conceptual design study of an improved gas turbine powertrain
[NASA-CR-159852] p0527 N80-23315

CHAPPELL, T. I.
A study of the conversion efficiency limit of p/+/-i-n/+/ silicon solar cells in concentrated sunlight
p0396 A80-35355

CHARLES, H. K., JR.
Review of amorphous and polycrystalline thin film silicon solar cell performance parameters
p0414 A80-40712
Measurement techniques in thin film polycrystalline materials and devices /solar cells/
p0422 A80-43764

CHARTERS, W. W. S.
Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems
p0366 A80-33535
Some performance characteristics of the UNIMELB air source solar boosted heat pump system
p0368 A80-33551

CHASSAGNE, G.
Ion implanted materials as selective absorbers for photothermal solar energy conversion
p0388 A80-33747

CHATTERJEE, A. K.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4]
p0498 N80-26535

CHATURVEDI, S.
Development of a solar desiccant dehumidifier
p0408 A80-37979

CHAVES, E.
Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951

CHE, S. C.
Flash pyrolysis coal liquefaction process development
[FE-2244-26]
p0498 N80-26543

CHEN, B.
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693

CHEN, H. C.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9]
p0483 N80-23486

CHEN, H. S.
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587]
p0526 N80-22787

CHEN, W.
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059

CHEN, W. D.
Some design aspects of air cooled solar powered LiBr-H2O absorption cycle air conditioning systems
p0366 A80-33535

CHEN, Y. C.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9]
p0483 N80-23486

CHENLO, F.
The Ramon Areces concentration photovoltaic array
p0384 A80-33714

CHEO, B.
Electrical nonuniformities in diagonally connected generators
p0511 A80-34989

CHER, M.
Quality assurance in support of energy related monitoring activities
[PB80-135270]
p0346 N80-24898

CHEREMISINOFF, N. P.
Wood for energy production
p0474 A80-40830

CHEREMISINOFF, P. N.
Planning air quality control systems for power generation
p0325 A80-35897

CHERKASSKII, A. KH.
Evaluating the mass of current conductors and required voltage level for large orbiting solar batteries
p0401 A80-36832

CHERRY, N. H.
The production of stable coal-oil mixtures using high intensity mechanical mixing devices
p0495 N80-26470
Investigation of fuels containing coal-oil-water emulsions
[FE-2689-5]
p0497 N80-26524

CHERRY, N. J.
Wind energy resource assessment of New Zealand
p0469 A80-35736

CHETTY, P. R. K.
Microprocessor-controlled digital shunt regulator
p0505 A80-32758

CHEUNG, A.
Energy from humid air
[DSE-2553-79/1]
p0531 N80-24861

CHHAJLANI, R. K.
Derivation of CGL\theory with finite Larmor radius corrections
p0514 A80-36714

CHICUREL, R.
Rotary expander for a solar thermo-mechanical conversion system
p0382 A80-33681

CHIE, C. M.
SPS phase control system performance via analytical simulation
[NASA-CR-160582]
p0540 N80-22378

CHILTON, V.
Preliminary operational results from the Willard solar power system
p0436 N80-24794

CHIN, W. K.
The combustion of carbon, coal and coal related fuels in an opposed flow diffusion flame burner
p0500 N80-27493

CHOMITZ, K.
Energy policy impact evaluation
[PB80-137953]
p0340 N80-23866

CHOPRA, K. L.
Optical and topographical properties of selective black chrome
p0422 A80-43514

CHOPRA, P. S.
Application of reliability, maintainability, and availability engineering to solar heating and cooling systems
p0414 A80-40334
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70]
p0446 N80-25866
Reliability and materials performance of solar heating and cooling systems
[SOLAR/0906-79/70]
p0452 N80-26824

CHRISTENSEN, D. L.
Data handbook for the National Solar Energy demonstration program
[DSE/5216-T3]
p0428 N80-23815
Data handbook for the national solar energy demonstration book
[DSE-5216-T4]
p0446 N80-25873

CHRISTIAN, J. E.
Low temperature thermal-energy storage
[ANL/CES/TE-79-3]
p0554 N80-22842

CHRISTIE, W. H.
Pulsed laser techniques for solar cell processing
p0396 A80-35362

CHRISTOPHERSON, C. R.
Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance
p0363 A80-33490

CHU, S. S.
Deposition and characterization of gallium arsenide films for solar cells applications
p0394 A80-35338

CHU, T. L.
Deposition and characterization of gallium arsenide films for solar cells applications
p0394 A80-35338

CHU, T. Y. J.
Design of a monitoring program for ash pond effluents
[PB80-128457]
p0345 N80-24896

CHUBB, T. A.
Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids
p0539 A80-33424

Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power
p0379 A80-33651

Characteristics of CO2-CH4 reforming-methanation cycle relevant to the Solchem thermochemical power system
p0539 A80-40713

Energy storage-boiler tank
p0554 N80-22820

CICALESE, J. J.

Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AP-884] p0497 N80-26529

CICHANOWICZ, E.

Autoignition and vaporization of no. 3 diesel oil spray under lean conditions
[ASME PAPER 80-GT-10] p0475 A80-42151

CINCOTTA, G. A.

Design and test of a 73-MW water cooled gas turbine
[ASME PAPER 80-GT-112] p0477 A80-42230

High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669

CLAAR, T. D.

High-temperature molten salt thermal energy storage systems for solar applications
p0552 N80-22805

CLARK, A.

Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866

CLARK, A. F.

Weatherability test of plastic glazing materials for collectors
p0362 A80-33474

CLARK, B. R.

Biologically important compounds in synfuels processes
[CONF-800303-13] p0498 N80-26540

CLARK, E. C.

Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling
p0359 A80-33429

CLARK, H. R.

Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2
[LBL-10098] p0353 N80-26817

CLARK, J. S.

Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226

Literature survey of properties of synfuels derived from coal
[NASA-TM-79243] p0481 N80-22776

CLARK, W. E.

The zinc chloride process for the hydrocracking of coal
p0474 A80-40757

CLAUSING, A. M.

The characterization of the performance of passive solar heating systems
p0382 A80-33686

CLAVERIE, M. J.

Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025
p0389 A80-33759

CLIFF, W.

Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232

CNARE, E. C.

Magnet optimization for pulsed energy conversion
p0517 A80-37871

COAR, G.

Utilization concerns of potential transportation fuels
[PB80-138498] p0342 N80-24503

COBB, J. T., JR.

Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944
p0471 A80-37678

COBURN, T. T.

Evaluation of "stable" emulsions of coal
p0495 N80-26473

Coal/oil/water mixture stability, appendix A
p0501 N80-27502

COCCHI, A.

A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis
p0367 A80-33545

COCHRAN, J. W.

Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466

COCKS, F. H.

Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique
p0402 A80-37299

COELLO, A.

The Ramon Areces concentration photovoltaic array
p0384 A80-33714

COHEN, D.

Open-cycle coal-fired liquid-metal MHD
[CONF-790640-7] p0529 N80-23844

COHEN, M. J.

Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819

COHEN, S. A.

Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185

COHN, A.

Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194

Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197

Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests
[ASME PAPER 80-GT-68] p0476 A80-42198

COHN, D. R.

Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745

COLE, M. M.

HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
[E80-10142] p0499 N80-26729

COLE, R.

Applications of CPC's in solar energy - An overview
p0364 A80-33501

Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638

COLE, R. L.

Design and installation manual for thermal energy storage
[ANL-79-15-ED-2] p0561 N80-26840

COLE, R. M.

Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501

COLEMAN, G. C.

Testing of the 10-MWe pilot plant solar central receiver
p0380 A80-33656

COLLAMORE, F. N.

Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1] p0537 N80-26853

COLLARES-PEREIRA, M.

Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors
p0364 A80-33493

Applications of CPC's in solar energy - An overview
p0364 A80-33501

Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers

COLLAROS, G. J. p0378 A80-33638
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1]
COLLIER, R. K. p0444 N80-25826
The characterization of crushed glass as a transpired air heating solar collector material
p0360 A80-33450
Solar collector related research and development in the United States for heating and cooling of buildings

COLLINS, A. R. p0408 A80-37983
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system

COLLINS, E. R. p0388 A80-33742
Fluid circulating pump operated by same incident solar energy which heats energy collection fluid
p0426 N80-23500
Geological assessment probe
[NASA-CASE-NPO-14558-1]
COLLINS, H. A. p0488 N80-24906
National solar heating and cooling programme - New Zealand

COLLINS, P. Q. p0323 A80-33442
Increasing power input to a single solar power satellite rectenna by using a pair of satellites
COLLINS, R. E. p0539 A80-32942
High temperature underground thermal energy storage system for solar energy

COLMAN, R. p0552 N80-22803
California thermal oil utilization. Volume 1: Executive summary
[SAN-1864-1]
COLP, J. L. p0488 N80-24849
Magma energy: A feasible alternative?
[SAND-80-0309C]
CONN, R. W. p0492 N80-25859
Tokamak reactors and structural materials

CONNELL, H. L. p0505 A80-33042
Proposed method for testing of radiative cooling flat-plate collectors

CONNELL, J. R. p0362 A80-33472
Wind characteristics for design of wind turbines: Research in the USA
[PNL-SA-7967]
CONNOR, D. W. p0538 N80-27817
Two-tank seasonal storage concept for solar space heating of buildings
[CONF-791226-2]
CONTA, L. D. p0446 N80-25867
Basic Research Engineering: Fluid Dynamics and Thermal Processes
[FE-2468-53]
CONTE, D. p0334 N80-22649
Use of transformers in producing high-power output from homopolar generators

p0516 A80-37825
TRIDENT - A megavolt pulse generator using inductive energy storage

CONTI, M. p0548 A80-37857
Development of 1pKW photovoltaic module with concentration

CONVERSE, A. O. p0386 A80-33728
Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H.

CONWAY, T. M. p0384 A80-33711
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report
COOK, C. p0370 A80-33571
Wind energy resource development in California
p0469 A80-35733

COOK, J.
Performance analysis of a natural convection collector system

COOK, J. D. p0383 A80-33695
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570]
p0559 N80-25900
Design of annual storage solar space heating systems
[DOE/CS-32939/10]
COOMBS, M. p0455 N80-26855
The design of a solar receiver for a 25-kWe gas turbine engine
[ASME PAPER 80-GT-131]
COOPER, J. F. p0416 A80-42244
Evaluation of air cathodes for potential use in development of aluminum-air cells
[UCID-18561]
COOPER, R. F. p0535 N80-25893
High-power MHD system combustor development testing
COPELAND, R. J. p0523 A80-43138
The SERI solar energy storage program

p0423 N80-22821
SERI solar energy storage program
[SERI/TP-333-497]
COQUAT, J. A. p0452 N80-26820
Semiconductors for high temperature active devices: Silcon, GaA lc]s, and GaP
[SAND-80-0379C]
CORDIER, A. p0499 N80-26608
A solar assisted heat pump experiment

CORLISS, J. M. p0368 A80-33550
Analytical and economic evaluation of heat pipe augmented passive solar heating systems
CORMAN, J. C. p0384 A80-33704
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78]
CORNABY, B. W. p0499 N80-26669
Criteria for assessment of environmental pollutants from coal cleaning processes
[PB80-102791]
COROTIS, R. B. p0336 N80-22895
Simulation of correlated wind speeds for sites and arrays

p0466 A80-33769
Statistical reliability of wind power assessments
p0469 A80-35741
Confidence interval procedures for wind turbine candidate sites

p0524 A80-43478
Statistical models for wind characteristics at potential wind energy conversion sites
[DOE/ET/20283-1]
COSTELLO, D. p0489 N80-24968
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339]
COSTOGUE, E. p0537 N80-26859
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators

COURREGES, F. G. p0386 A80-33726
Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces
p0390 A80-33786
Properties of sputtered ITO/CdTe solar cells
COUTURES, J. P. p0426 N80-23767
Treatment of molybdenite ore with laboratory scale solar furnaces

COX, R. B. p0380 A80-33659
Investigations of coal-oil mixtures as a utility boiler light-off fuel

CRAMER, B. p0501 N80-27501
A review of lifetime analyses for tokamaks
p0507 A80-33056

CRAMER, D. A.
Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057

CRANE, R. E.
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-24] p0344 N80-24863

CRIP, J. N.
Analysis of solidification in a cylindrical annulus with internal fins
[AD-A080131] p0550 N80-22641

CRIQUI, P.
Energy systems based on local renewable energy resources for a rural community in a developing country
p0323 A80-33677

CRISP, R.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232

CRITOPH, R. E.
Fossil-fuel heat pumps for domestic, commercial and industrial space heating
p0479 A80-43834

CROW, D. E.
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258

CRUZ, B. G.
Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant
[AD-A082756] p0492 N80-25797

CUBITT, L. J.
Redesign of windmill towers - A cost reduction study
p0467 A80-33772

CUEVAS, A.
Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727

CUMALI, Z. O.
Passive solar calculation methods
[DSE-5221-T1] p0442 N80-25798

CUMMINGS, C. E.
Helios target positioning system
p0518 A80-38485

CUNNINGHAM, S. J.
SAGE, Solar Assisted Gas Energy
[PB80-144363] p0447 N80-25906
SAGE, Solar Assisted Gas Energy
[PB80-153836] p0447 N80-25907

CUNNINGTON, G. R.
Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-25868

CUNNINGTON, G. R., JR.
Analysis and design of insulation systems for LH2-fueled aircraft
p0462 A80-37347

CURRY, R. L.
A convolution model of rock bed thermal storage units
p0550 A80-43480

CURTICE, D. H.
Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756

CURTO, P.
Solar thermal repowering: Utility/industry market potential in the Southwest
[MTR-7919] p0439 N80-24836

CUTLIP, W. B.
Voltage losses in fuel cell cathodes
p0522 A80-42294

CYPERS, L.
Solar heating systems with air collectors and rock bed storage
p0406 A80-37969
Hot water production by means of a solar thermosyphon loop
p0407 A80-37971

CZUCHLEWSKI, S. J.
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
p0517 A80-38484

D

DAGUENET, M.
Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation
p0379 A80-33650
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959

DAHAN, G.
Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604

DAIELLO, R. V.
A study of the factors which control the efficiency of ion-implanted silicon solar cells
p0396 A80-35360

DALAL, V. L.
Design considerations for a-Si solar cells
p0394 A80-35342
Amorphous Si solar cells
[DOE/ET/23034-T1] p0439 N80-24839

DALBERT-CONSEIL, A.-M.
Theoretical and experimental investigation of the flow in a flat plate collector
p0360 A80-33454

DALESSANDRO, J. A.
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059

DALETSKII, G. S.
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

DALTON, J. J.
Low cost high temperature adhesive bonded solar collectors
p0361 A80-33464

DAME, R. E.
Low cost high temperature adhesive bonded solar collectors
p0361 A80-33464

DANESHYAR, M.
Mean monthly performance of solar water heaters with natural circulation
p0371 A80-33579
Mean monthly performance of passive solar water heaters
[LBL-9295] p0437 N80-24820

DANG, V. D.
Hydrogen production using fusion energy and thermochemical cycles
p0459 A80-35189

DAPKUS, P. D.
Electrical properties of polycrystalline GaAs films
p0525 A80-43575

DAROLLES, J. M.
New possibilities of solar energy conversion by means of refractory thermoelements
p0409 A80-37993

DARRIET, B.
Application of magnesium rich rare-earth alloys to hydrogen storage
p0459 A80-35192

DARYAN, R. S.
A black liquid flat plate collector for economical applications
p0404 A80-37948

DASCHER, R. E.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826

DATTA, N.
Hall effects on MHD Couette flow in a rotating system
p0523 A80-43226

DAUDET, H. C.
Evaluation method for closed cycle gas turbines in cogeneration applications
[ASME PAPER 80-GT-176] p0332 A80-42282

DAVID, M. L.
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807

DAVIES, P. W.
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498

DAVIS, A.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13]
p0485 N80-24476

DAVIS, D. D.
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662]
p0564 N80-27233

DAVIS, F.
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105]
p0331 A80-42227

DAVIS, J. R.
Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385

DAVIS, L. K.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634]
p0536 N80-26779

DAVIS, M.
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2]
p0498 N80-26533

DAVIS, R. S.
Measurements on insulating materials at cryogenic temperatures
[PB80-134596]
p0541 N80-24507

DAVIS, S.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657

DAVISON, C.
Italy: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-20]
p0347 N80-25804

DAVISON, J. R.
Suntec/Hexcel parabolic trough
p0363 A80-33485

DAVISON, R. R.
The effect of system size on the practicality of aquifer storage
p0545 A80-33517

Cold water aquifer storage
p0554 N80-22827

DAVITIAN, H.
The potential of crop residues as a fuel for power generation
p0466 A80-33750

DAVLETOV, A.
The use of solar energy storage for heating and cooling applications
p0391 A80-33861

DAWSON, J. K.
System-reliability studies for wave-energy generation
p0540 A80-43830

DAY, J.
Solar thermal repowering utility value analysis
[SERI/TR-8016-1]
p0428 N80-23814

DAY, R. D.
Helios target positioning system
p0518 A80-38485

DE BENI, G.
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents
p0459 A80-35190

DE LUCA, M.
Determination of the shadows area induced on horizontal and vertical surfaces anyway oriented
p0384 A80-33700

DE RON, A. J.
Study of the nonlinear dynamics of a flat-plate collector
p0369 A80-33565

Dynamic modelling and verification of a flat-plate solar collector
p0391 A80-33864

DE VOS, A.
Detailed balance limit of the efficiency of tandem solar cells
p0413 A80-38282

DE VRIES, H. F. W.
Fluid circulation control in conventional and heat pipe planar solar collectors
p0392 A80-33872

DEANE, C. W.
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304]
p0519 A80-39014

DEASE, C. W.
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662]
p0564 N80-27233

DEBEYER, W. E. J.
Survey of foreign research in the field of heat pumps for the heating of dwellings
p0353 N80-26789

DEBOSSCHER, A.
Solar heating systems with air collectors and rock bed storage
p0406 A80-37969

Hot water production by means of a solar thermosyphon loop
p0407 A80-37971

DEBS, A. S.
Impact of solar heating and cooling of buildings on electric utilities
p0412 A80-38022

DEERNS, P. W.
Examination of energy consumption and the possibilities of energy savings in office buildings
p0353 N80-26791

DEFLANDRE, J.
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605

DEKITSCH, A.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04]
p0527 N80-22859

DEL ALAMO, J.
Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727

DELAHOY, A. E.
MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722

Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon
p0422 A80-43762

DELANEY, M. J.
Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057

DELEON, P.
Solar energy program evaluation: An introduction
[SERI/TR-51-294]
p0427 N80-23798

Solar technology application to enhanced oil recovery
[SERI/TR-352-392]
p0445 N80-25839

DELLIN, T. A.
DELSOL - A code for central receiver performance and optimization calculations
p0376 A80-33626

The cost/performance of large central receiver power systems as a function of heliostat design parameters
p0376 A80-33627

Heliostat design cost/performance tradeoffs
[SAND-79-8248]
p0428 N80-23806

DELLINGER, T. C.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634]
p0536 N80-26779

DELMAS, A.
Ion implanted materials as selective absorbers for photothermal solar energy conversion
p0388 A80-33747

DEMETRIADES, S. T.
Open-cycle MHD systems analysis
[EPRI-AP-1230]
p0538 N80-27192

DEMUTH, R. B.
Thermal fracture effects in geothermal energy extraction
[LA-7963]
p0483 N80-23795

DEN OUDEN, C.
Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515
Development of a storage system based on encapsulated p.c.-materials
p0546 A80-33522

DENAUSKI, C.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

DENEE, P. B.
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559

DENOUDEN, C.
The potential for heat production with solar water heaters in the Netherlands climate
p0450 N80-26792
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793

DENT, J. B.
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457

DERBRIDGE, T. C.
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501

DEROSSET, A. J.
Upgrading of coal liquids: Upgrading distillates from coal liquefaction
[FE-2566-26] p0480 N80-22518
Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas
[FE-2566-25] p0480 N80-22519

DEROUIN, C.
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214

DERR, V. E.
Attenuation of solar energy by high, thin clouds
p0414 A80-40709

DESAUTEL, J.
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605

DESHMUKH, R. G.
Application of probability methods to evaluate the reliability of a combined wind-electric and conventional generation system
p0508 A80-33774

DEUCHLER, W. P.
Structural analysis of a cold water pipe for a 40MWe spar OTEC platform
p0512 A80-35165

DEVANEY, W. E.
The design and utilization of a microprocessor-controlled absolute spectral response system
p0398 A80-35492

DEVRIES, A. J.
Solor Applications of Thermal Energy Storage
[TID-29430] p0427 N80-23791

DEY, A. N.
Primary Li/SOC12 cells. X - Optimization of D cells with respect to energy density, storability and safety
p0549 A80-40602

DICANIO, D. G.
Line focus solar thermal central receiver research study
[DOE/ET/20426-1] p0440 N80-24853

DICKENSON, R. L.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535

DICKERSON, M. H.
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837] p0488 N80-24964

DICKEY, H. C.
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823

DICKINSON, J. M.
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062

DIECKMANN, J. T.
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1] p0529 N80-23850

DIECKMANN, L.
Hybrid passive for motel guest rooms
p0384 A80-33709

DIETRICH, M. W.
Collection and dissemination of TES system information for the paper and pulp industry
p0552 N80-22797

DILLON, J.
Pellets of immobilized yeast cells as biocatalysts for transforming biomass
p0466 A80-33414

DILLON, J. J.
Liquid fuel production from biomass
p0465 A80-33412
Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462

DIN, S.
System-reliability studies for wave-energy generation
p0540 A80-43830

DIONISIO, G.
Development of 1pKW photovoltaic module with concentration
p0386 A80-33728

DIPIPPO, R.
Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications
[ASME PAPER 80-PET-83] p0524 A80-43345

DITTENHOEFER, A. C.
The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873

DITTES, W.
Testing the performance of solar collectors under standard conditions
p0361 A80-33466

DIXON, A. E.
Solar energy conversion: An introductory course; Course, 5th, University of Waterloo, Waterloo, Ontario, Canada, August 6-19, 1978, Selected Lectures
p0416 A80-42435
Review of solid state physics
p0419 A80-42454

DIXON, C. W.
Some performance characteristics of the UNIMELB air source solar boosted heat pump system
p0368 A80-33551

DOBLER, F. X.
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592] p0526 N80-22778

DOBSON, J. E.
Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764

DOCHAT, G. R.
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787

DOCTOR, R. D.
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477

DODSON, C.
A modular system for bio-gas production using farm waste
p0466 A80-33415

DOERING, E.
Report on five years of operating experience with four pioneer school heating experiments
p0370 A80-33569

DOERING, H. V.
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48]
DONATH, R. E. p0337 N80-23662
Vehicle gas producers

DONNELLY, H. L. p0467 A80-34534
At-sea test of a large diameter steel, cold water pipe

DOOHER, J. P. p0512 A80-35166
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2

Rheological properties of solvent refined coal-oil mixtures p0495 N80-26469

DORAN, J. C. p0495 N80-26471
Wind direction variations in strong winds

DORMAN, J. p0468 A80-35728
High-efficiency solar concentrator

DORN, H. C. p0405 A80-37953
The 1H and 13C Fourier transform NMR characterization of jet fuels derived from alternated energy sources
[AD-A084169]
DOROSHENKO, V. G. p0502 N80-27513
Influence of base resistivity on the temperature characteristics of silicon photoconverters

High-voltage multijunction solar-energy photoelectric converter p0514 A80-36590

DOSS, E. D. p0401 A80-36830
Power take-off analysis for diagonally connected MHD channels
[CONF-800104-6]
DOUGHERTY, J. p0535 N80-26167
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2]
DOUGLAS, E. C. p0453 N80-26830
A study of the factors which control the efficiency of ion-implanted silicon solar cells

DRABKIN, L. M. p0396 A80-35360
Test results on solar turbogenerators

DREEDMAN, M. p0391 A80-33860
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48]
DRENKER, G. p0337 N80-23662
Design and development of a paraboloidal dish solar collector for intermediate temperature service

DRESSENDORFER, P. V. p0363 A80-33483
Photoemission measurements of interface barrier energies for tunnel oxides on silicon

DRESSLER, J. p0515 A80-36936
Low pressure gas filling of laser fusion microspheres

DRESSLER, J. L. p0506 A80-33053
Fabrication of glass sphere laser fusion targets

DREUIL, A. p0506 A80-33052
A solar assisted heat pump experiment

DREW, M. S. p0368 A80-33550
Equitable performance comparison and economic evaluation of active and passive solar energy systems

DRIGA, M. D. p0329 A80-40965
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824

DRIVER, P. R.
What is black chrome

DROLEN, R. L. p0387 A80-33738
The characterization of the performance of passive solar heating systems

DRONNIK, L. M. p0382 A80-33686
Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump

DRUMMOND, R. p0509 A80-34312
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2]
DU PREEZ, I. C. p0453 N80-26830
Chemical nature of coal hydrogenation oils. II - The effect of temperature

DUBIN, R. p0467 A80-34533
Energy policy impact evaluation
[PB80-137953]
DUBOIS, R. P. p0340 N80-23866
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48]
DUBOW, J. p0337 N80-23662
Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination p0390 A80-33785
Noise spectral density as a device reliability estimator

DUBOW, J. B. p0422 A80-43763
Specific heats of Colorado oil shales - A differential scanning calorimetry study

Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells p0475 A80-41892
DUCE, S. W. p0416 A80-42140
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8]
DUERR, E. p0335 N80-22878
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae

DUFF, W. F. p0459 A80-33406
Comparative performance of two types of evacuated tubular solar collectors in a residential heating and cooling system
[COO-2577-19]
DUFF, W. S. p0446 N80-25864
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report

DUFFIE, J. A. p0370 A80-33571
Analysis of solar water heating systems

Comparison of measured and predicted rock bed storage performance p0370 A80-33574

DUFFY, T. E. p0546 A80-33870
Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101]
DUGAN, V. L. p0331 A80-42225
Line-focus concentrating collector program

DUGUNDJI, J. p0433 N80-24762
Dynamics of a flexible rotor-tower system
[ASRL-TR-194-1]
DUMONT, R. S. p0530 N80-23862
The Saskatchewan Conservation House - A year of performance data

DUNCAN, D. A. p0369 A80-33566
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-58]
p0503 N80-27515

- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-55] p0503 N80-27516
- Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal [FE-2307-50] p0503 N80-27517

DUNDER, V.
- Optimization of the combined structural components of large-power solar central receiver systems p0376 A80-33624

DUNKIN, J. H.
- Coal conversion products industrial applications [NASA-CR-161469] p0484 N80-24465

DUNN, J. J., JR.
- Solid waste conversion to energy: Current European and U.S. practice p0474 A80-40832

DUNN, P. D.
- Fluctuations in output from wind turbine clusters p0520 A80-41032

DUNN, R. H.
- Startup and initial feasibility testing on the Salem Harbor COM demonstration p0501 N80-27499

DUNNING, S. W.
- Design study for a fuel efficient turbofan engine [ASME PAPER 80-GT-141] p0331 A80-42254

DUPAS, A. P.
- Prediction of global solar electricity market, in connection with geographical distribution of decentralized and centralized electrical demand up to year 2025 p0389 A80-33759

DUPPENTHALER, A.
- The layout of solar hot water systems, using statistical meteo- and heat demand data p0369 A80-33562

DUPUIS, R. D.
- Electrical properties of polycrystalline GaAs films p0525 A80-43575

DURAISWAMY, K.
- Flash pyrolysis coal liquefaction process development [FE-2244-26] p0498 N80-26543

DURAND, J. P.
- A solar-powered irrigation system for Bakel, Senegal p0382 A80-33678

DURAND, J.-P.
- Small solar plants for electricity supply p0373 A80-33596

DUSCHA, R. A.
- Industrial storage applications overview p0551 N80-22795

DUSSEAU, J. M.
- New possibilities of solar energy conversion by means of refractory thermoelements p0409 A80-37993

DUSTER, K.
- Densified biomass as an alternative Army heating and power plant fuel heating [AD-A083317] p0500 N80-26798

DUSTIN, P.
- A solar-powered irrigation system for Bakel, Senegal p0382 A80-33678

DUTRE, W. L.
- Solar heating systems with air collectors and rock bed storage p0406 A80-37969
- Hot water production by means of a solar thermosyphon loop p0407 A80-37971

DUTRUY, B.
- Study and realisation of a high temperature air cooled solar receiver p0379 A80-33653

DUTTON, J. A.
- A model for the probability structure of atmospheric turbulence p0468 A80-35720

DVERNIAKOV, V. S.
- Obtaining film materials with solar furnaces p0400 A80-36593
- Development and application of high-power lightpipes p0401 A80-36833

E

EARL, W. B.
- Potential of energy farming for transport fuels in New Zealand [NZERDC-46] p0489 N80-25456
- Potential of energy farming for transport fuels in New Zealand, appendices [NZERDC-46-APP] p0489 N80-25457

EASON, E. D.
- The cost and value of washing heliostats p0375 A80-33616

EASTON, C. R.
- Economic implications of a low cost heliostat design p0375 A80-33613

EASTWOOD, J.
- The design of a solar receiver for a 25-kWe gas turbine engine [ASME PAPER 80-GT-131] p0416 A80-42244

EBELING, L.
- The effect of system size on the practicality of aquifer storage p0545 A80-33517

EDDE, H.
- Collection and dissemination of TES system information for the paper and pulp industry p0552 N80-22797

EDELMAN, R. B.
- Fundamental characterization of alternative fuel effects in continuous combustion systems p0500 N80-27382

EDENBURN, M.
- Photovoltaic concentrator design comparison p0385 A80-33723

EDENBURN, M. W.
- Analytical evaluation of a solar thermophotovoltaic /TPV/ converter p0386 A80-33725

EDESKUTY, F. J.
- Safety of liquid hydrogen in air transportation p0461 A80-37341

EDIE, D. D.
- Latent heat energy storage using direct contact heat transfer p0546 A80-33519

EDMONDS, J. A.
- Canada: Estimates of future energy/GNP relationships [ORAU/IEA(M)-79-24] p0339 N80-23849
- Japan: Estimates of future energy/GNP relationships in energy use [ORAU/IEA-79-21(M)] p0344 N80-24869

EDSALL, D. W.
- Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain [AD-A082400] p0488 N80-24799

EDWALL, D.
- Barrier height enhancement in heterojunction Schottky-barrier solar cells p0397 A80-35368

EDWARDS, B.
- A computational alignment method for paraboloidal collectors p0378 A80-33641
- Collector deflections due to wind gusts and control scheme design p0378 A80-33643

EDWARDS, H. S.
- Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol [ORNL-5439] p0485 N80-24471

EDWARDS, S. W.
- Analysis of exploration, development and production activity on Federal outer Continental Shelf leases [DOE/RA-0044] p0342 N80-24736

EGUREN, J.
- Quasi-static concentrated array with double side illuminated solar cells p0386 A80-33727

EISENLOHR, K. H.
- Automotive fuels from coal p0470 A80-35800

EISENSTATT, L. R.
- Compact closed cycle Brayton system feasibility study, volume 1 [AD-A081379] p0532 N80-25666

EISSENBERG, D. M.
Building heating and cooling applications thermal energy storage program overview
EKMANN, J. M. p0552 N80-22806
The role of coal and oil characteristics in the stability of coal-oil mixtures
EL-DERINI, Z. p0495 N80-26472
A comparative study of the performance and economics of advanced and conventional structural materials in fusion systems
EL-GABAWALI, N. p0506 A80-33046
Evaluation of solar thermal power plants using economic and performance simulations
EL-REFAIE, M. F. p0412 A80-38023
Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation
p0405 A80-37958
Temperature distributions in the flat-plate collector under actual unsteady insolation
EL-SAWY, A. H. A. p0415 A80-40937
A mixed integer scheduling model for combined thermal and hydroelectric-pumped storage generator systems
EL-SHIDANI, A. A. p0546 A80-35382
Physical modeling of buildings
EL-WAKIL, M. M. p0383 A80-33688
Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors
ELASFOURI, A. S. p0405 A80-37957
A direct contact thermal energy storage system
ELCHLEPP, R. p0548 A80-37968
Development and preparation for series production of a modular solar space heating system, phases 1 and 2
[BMFT-FB-T-79-02]
ELDIGHIDY, S. M. p0424 N80-22857
Effect of off-south orientation on optimum conditions for maximum solar energy absorbed by flat plate collector augmented by plane reflector
ELKIN, A. I. p0361 A80-33462
Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump
ELKIN, R. p0509 A80-34312
The effects of air leaks on solar air heating systems
ELKIN, R. F. p0359 A80-33448
ASHMET: A computer code for estimating insolation incident on tilted surfaces
[NASA-TM-78286]
ELKINS, R. E., III p0457 N80-27807
Longitudinal baffling in Faraday generators
ELKINS, R. T. p0505 A80-32743
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592]
ELKOTB, M. M. p0526 N80-22778
Study of a multi-pass radiation fluid-heater exposed to non-uniform radiation
ELLERBRUCH, D. A. p0405 A80-37958
Development and testing of a microwave system to measure coal layer thickness up to 25 cm
[FE-8881-1]
ELLIBEE, D. E. p0483 N80-23757
Preliminary operational results from the Willard solar power system
ELLIOTT, C. J. p0436 N80-24794
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
ELLIOTT, D. L. p0517 A80-38484
Pacific Northwest regional assessment
p0469 A80-35732
Meteorological and topographical indicators of wind energy for regional assessments
ELTIMSAHY, A. H. p0469 A80-35737
Performance improvement of a solar heating system utilizing off-peak electric auxilliary
[DOE/R5/10140-1]
EMERY, K. p0429 N80-23852
Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells
ERB, R. A. p0416 A80-42140
The unitary solar collector - A new approach to low-cost, flat-plate systems
ER[illegible]AINA, T. V. p0361 A80-33463
Development and application of high-power lightpipes
ERGUN, S. p0401 A80-36833
LBL continuous biomass liquefaction Process Engineering Unit (PEU)
[LBL-10092]
p0487 N80-24490
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266]
p0490 N80-25465
Hydrolyzed wood slurry flow modeling
[LBL-10090]
ERICKSON, A. J. p0504 N80-27703
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1]
ERICKSON, K. W. p0529 N80-23850
Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/EA-0044]
ERICKSON, R. C. p0342 N80-24736
State-of-the-art assessment of hybrid heat pumps
[EPRI-EM-1261]
ERIKSON, R. L. p0352 N80-26627
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974]
ERMAK, D. L. p0561 N80-26804
Potential air quality impact of geothermal power production in the Imperial Valley
[UCRL-52797]
ERNEST, J. p0340 N80-23878
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152]
ESBENSEN, T. V. p0484 N80-24464
Solar energy R & D projects in Denmark
p0323 A80-33437
Solar-assisted low energy dwellings
[DOE/CS-0145]
ESCHER, W. J. D. p0451 N80-26816
Comment on 'The impracticability of large-scale generation of hydrogen from water photolysis by utilization of solar radiation'
p0459 A80-35193
Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments
p0460 A80-37336
Surface transportation systems using hydrogen energy
ESPY, P. N. p0461 A80-37339
Performance analysis for collector-side reflector systems
ESTES, R. C. p0376 A80-33621
Economical optimum TES size via marginal analysis
ESTEVA, D. J. p0365 A80-33508
Solar energy conversion through biophotolysis
[SAN-0034-239-F1]
ETTER, D. R. p0445 N80-25852
Studies of directly absorbing fluids for mid-temperature solar thermal applications
ETZLER, C. C. p0388 A80-33749
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04]
p0527 N80-22859

UKER, C. A., JR.
Catalytic coal gasification for SNG manufacture
p0474 A80-40755

USEPI, M.
Application of magnetic suspensions and fluid film bearings to energy storage flywheels
[SAND-79-7007] p0556 N80-23824

USEPI, M. W.
Magnetic bearing support study for a 10 kW-hr energy storage flywheel
[SAND-79-7025] p0555 N80-23661

USER, P.
Examination of energy consumption and the possibilities of energy savings in office buildings
p0353 N80-26791

EVANS, D.
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761
Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840

EVANS, D. W.
Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments
p0324 A80-35649

EVERITT, K. W.
Sailwing Darrieus rotors
p0520 A80-41033

EWASHINKA, J. G.
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515] p0557 N80-24756

EWING, R. A.
Criteria for assessment of environmental pollutants from coal cleaning processes
[PB80-102791] p0336 N80-22895

EZAWA, H.
Economic analysis of the STEPS in Japan
p0375 A80-33615

F

FAGEN, E. A.
Experimental determination of the photon economy in polycrystalline thin film photovoltaic materials and devices
p0526 A80-43760

FAHRENBRUCH, A. L.
Sputtered indium-tin oxide/cadmium telluride junctions and cadmium telluride surfaces
p0390 A80-33786

FAIR, J. A.
Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions
p0467 A80-34019

FAIST, A.
Passive solar wall collectors
p0404 A80-37949

FAIZIEV, SH. A.
Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
p0391 A80-33859
Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594

FALLON, P.
Flash hydropyrolysis of coal
[BNL-51052] p0490 N80-25468

FANG, C. S.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

FANNEY, A. H.
Experimental system performance and comparison with computer predictions for six solar domestic hot water systems
p0370 A80-33577

FANUCCI, J. B.
Vertical axis wind turbine development: Executive summary
[ORO-5135-77-5-SUMM] p0529 N80-23845
Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846

FARMER, E. D.
Economic and operational implications of a complex of wind-driven generators on a power system
p0333 A80-43829

FARNUM, E. H.
Materials problems with inertial confinement fusion targets
p0506 A80-33051

FARR, R. D.
Ammonia high temperature solid electrolyte fuel cell
p0523 A80-42298

FARWELL, D.
Stability of plasma-sprayed coatings tested at White Sands Solar Facility
p0380 A80-33658

FASSBENDER, L. L.
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072] p0492 N80-25865

FAUNCE, S.
An application of phase change materials in passive solar systems
p0384 A80-33703

FAXEN, T.
Some meteorological activities in the National Swedish Wind Energy Program
p0513 A80-35725

FEARN, J.
Solar energy systems: Test methods for collector insulations
[PB80-132038] p0430 N80-23867

FEDORUS, G. A.
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591
Thin-film and ceramic solar converters based on cadmium sulfide and selenide
p0401 A80-36824

FEDOSENKO, L. P.
Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732

FEDOTOWSKY, A.
Scanning light spot analysis of faulty solar cells
p0420 A80-43118

FEHLNER, F. P.
Cusp mirror - Heat pipe evacuated tubular solar thermal collector
p0421 A80-43482

FELDER, R. M.
How clean gas is made from coal
p0471 A80-36314

FELDMAN, K. T., JR.
Design of a heat pipe absorber for a concentrating solar water heater
[AIAA PAPER 80-1506] p0415 A80-41470
Development of a low-cost non-tracking heat pipe concentrating collector
[PB80-160443] p0457 N80-27828

FELL, D. M.
Characterization of commercial black chrome coatings
p0402 A80-37190

FELLER, D.
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152] p0484 N80-24464

FENG, T.
Thin film polycrystalline silicon solar cells
[DOE/SF/23047-3] p0452 N80-26828

FENTON, D.
Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings
p0381 A80-33669

FENTON, D. L.
Preliminary operational results from the Willard solar power system
p0436 N80-24794

FERNANDEZ, R. O.
Markov chains to solar energy storage calculations
p0390 A80-33766

FERRELL, J. K.
How clean gas is made from coal
p0471 A80-36314

FEUSTEL, J.
New developments for future solar power plants
p0410 A80-38001

FEUSTEL, J. E.
Performance and cost optimisation of small solar power stations
p0373 A80-33598

FIGUEROA, C.
LBL continuous biomass liquefaction Process Engineering Unit (PEU)
[LBL-10092]
p0487 N80-24490

FILLO, J. A.
Fusion - An energy source for synthetic fuels
[AIAA PAPER 80-0844]
p0465 A80-32857

FINETTI, M.
A new technology to fabricate high-efficiency silicon concentrator solar cells
p0397 A80-35366

FINK, L. H.
Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2]
p0542 N80-25808

FINN, P. A.
Advanced fuel cell development
[ANL-79-51]
p0535 N80-25895

FIORE, P. J.
Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance
p0363 A80-33490

FISCH, N.
The flat plate solar collector - Its steady-state and transient state behaviour
p0403 A80-37943

FISCHL, R.
Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems
p0381 A80-33664

FISH, J. D.
Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies
p0389 A80-33754

Overall efficiencies for conversion of solar energy to a chemical fuel
[SAND-79-8636]
p0431 N80-24495

Solar central receiver systems programs
[SAND-79-8777]
p0439 N80-24833

FISH, M. J.
DELSOL - A code for central receiver performance and optimization calculations
p0376 A80-33626

The cost/performance of large central receiver power systems as a function of heliostat design parameters
p0376 A80-33627

Heliostat design cost/performance tradeoffs
[SAND-79-8248]
p0428 N80-23806

FISHER, E. R.
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304]
p0519 A80-39014

FISHER, S.
Solid fossil-fuel recovery by electrical induction heating in situ - A proposal
p0465 A80-33127

FLAMANT, G.
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3
p0520 A80-40716

FLEMING, E. S.
Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner
[FE-2489-45]
p0334 N80-22520

FLETCHER, G.
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218]
p0533 N80-25785

FLORIS, R.
Analysis of experimental test results on a high temperature receiver model
p0363 A80-33486

Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498

FLOWER, W. L.
Diagnostic development for advanced power systems
[ASME PAPER 80-GT-128]
p0522 A80-42242

FLYNN, G. T.
Application and design studies of compressed-air energy storage for solar applications
[CAES-7]
p0555 N80-23788

FOERSTER, H. J.
Continuously variable ratio transmissions for single-shaft gas turbines
[ASME PAPER 80-GT-21]
p0331 A80-42158

FOGARASSY, E.
Laser processing in the preparation of silicon solar cells
p0396 A80-35363

FOGAROLI, R.
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2]
p0453 N80-26830

FOH, S. E.
Studies of thermochemical water-splitting cycles
[NASA-CR-163029]
p0449 N80-26409

FOLEY, R. T.
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A083608]
p0537 N80-26794

FONASH, S. J.
General formulation of the current-voltage characteristic of a p-n heterojunction solar cell
p0390 A80-33782

Spray-deposited ITO-silicon SIS heterojunction solar cells
p0395 A80-35350

Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1]
p0438 N80-24823

Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1]
p0440 N80-24847

FONG, A.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1]
p0444 N80-25826

FONG, W. S.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4]
p0498 N80-26535

FOO, O. K.
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505

FOOKES, T. W.
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46]
p0489 N80-25456

Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP]
p0489 N80-25457

FOOS, J.
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1]
p0534 N80-25891

FORBES, R. E.
Addition of inexpensive solar air-heaters to a pre-engineered metal building
[ALO-4086-1]
p0452 N80-26818

FORD, G. W.
Absorption of radiation in a magnetoplasma and application to the laser-fusion process
p0525 A80-43496

FORD, R. D.
Use of transformers in producing high-power output from homopolar generators
p0516 A80-37825

TRIDENT - A megavolt pulse generator using inductive energy storage
p0548 A80-37857

FORD, T.
Fuel economy in the airlines
p0329 A80-40945

FOREMAN, K. M.
Further investigations of diffuser augmented wind turbines. Part 1: Executive summary
[COO-2616-2-PT-1-REV-1]
p0532 N80-24864

FOREMAN, S. E.
Solar photovoltaic project: Materials, and testing activities
[COO-4094-60]
p0430 N80-23855

FORMAN, S.
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339]
p0537 N80-26859

FORMAN, S. E.
Photovoltaic module performance and degradation at various MIT/LL test sites
p0385 A80-33717

FORSBERG, H. C.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232

FORSYTH, E. B.
Load excitation at the superconducting cable test facility
[BNL-26641] p0540 N80-22608

FORTGANG, H. R.
Costing the OMNIUM-G system 7500
p0434 N80-24779
Cost estimating Brayton and Stirling engines
p0531 N80-24781
Cost and price estimate of Brayton and Stirling engines in selected production volumes
[NASA-CR-163265] p0536 N80-26769

FOSS, A.
Solar-heated gas-turbine process using sulfur oxides for power production and energy storage
[LBL-9472] p0424 N80-22839

FOSS, A. S.
Sensible heat storage for a solar thermal power plant
[LBL-9321] p0437 N80-24816

FOSSUM, J. G.
Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346
Physics underlying the performance of back-surface-field solar cells
p0396 A80-35359

FOSTER, E. P.
Rheological properties of solvent refined coal-oil mixtures
p0495 N80-26471

FOSTER, R. F.
Use of reconnaissance level information for environmental assessment
[NUREG-CR-0990] p0336 N80-22883

FOSTER, R. W.
Surface transportation systems using hydrogen energy
p0461 A80-37339

FOWLES, H.
Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges
[SAND-79-7051-VOL-1] p0449 N80-26611

FOWLKES, C. W.
Measured performance of a passive solar residence in Bozeman, Montana
p0383 A80-33696

FOX, K.
Aquifer thermal energy storage program
p0554 N80-22825

FOX, M. A.
Energy storage and electron transfer by carbanion photolysis
p0545 A80-33419

FOX, S. W.
A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985

FRAIZE, W.
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105] p0331 A80-42227

FRANCIA, G.
Analysis of experimental test results on a high temperature receiver model
p0363 A80-33486
A study on mirror fields for tower type solar power plants
p0377 A80-33633

FRANCKEN, J. C.
Fluid circulation control in conventional and heat pipe planar solar collectors
p0392 A80-33872

FRANGOS, A. Z.
Sodium cooled solar central receiver power station
p0375 A80-33610

FRANTSEVICH, I. N.
Obtaining film materials with solar furnaces
p0400 A80-36593

FRASER, T.
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457

FREDERICH, P.
Siemens/Duewag H-Bahn - Technology and comparative assessment
p0324 A80-34056

FREEMAN, T. L.
Validation of solar system simulation coder by the International Energy Agency
[LA-UR-80-387] p0453 N80-26835

FREESE, J. M.
Effects of outdoor exposure on the solar reflectance properties of silvered glass mirrors
p0379 A80-33647
Development of a portable reflectometer for field measurements of the specular reflectance of solar mirrors
p0381 A80-33668

FREI, W.
Remote sensing for geothermal environmental assessments
[UCRL-15108] p0483 N80-23756

FREIBERG, IA.
The characteristics of a nonhomogeneous helical MHD dynamo
p0510 A80-34614

FRENZEL, D.
Hydrogen as an alternative fuel - An intermediate report on research and development funding by the Federal Ministry for Research and Technology
p0460 A80-37338

FRIEDRICH, F. J.
Solar energy projects for heating of buildings in Germany
p0359 A80-33438

FRIEFELD, J. F.
Testing of the 10-MWe pilot plant solar central receiver
p0380 A80-33656

FRIES, R. J.
Materials problems with inertial confinement fusion targets
p0506 A80-33051
Cryogenic laser fusion target material design considerations
p0506 A80-33055

FRIGO, A. A.
Underground Pumped Hydroelectric Storage (UPHS)
[ANL/EES-TM-60] p0554 N80-22841
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants
[CONF-791204-11] p0557 N80-24628

FRISCHE, R.
Heat pumps for heating, cooling, and energy recovery 1976-1990
p0327 A80-38210

FRISHMUTH, R.
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662

FRITZSCHE, A.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859

FRYSINGER, G. R.
Life and stability testing of packaged low-cost energy storage materials
p0553 N80-22814

FU, C. M.
Solar energy system performance evaluation. Albuquerque Western no. 1, Albuquerque, New Mexico
[SOLAR/1011-79/14] p0443 N80-25816

FUCHS, R.
An experimental approach for studying direct solar gain optics of model interiors
p0382 A80-33687

FUJII, T.
Evaluation of cathode materials for the lithium/carbonmonofluoride battery
p0549 A80-40606

FUJIMA, U.
Basic studies on COM combustion
p0497 N80-26484

FUNG, T. K.
An alternate approach to the application of MHD power generation technology in a utility environment
[IEEE PAPER F 79 651-1] p0525 A80-43502

FURBO, S.
Investigation of heat storages with salt hydrate as storage medium based on the extra water principle
[EUR-6646-PT-2] p0564 N80-27818

FURUSAWA, T.
Development of a NO/x/-free combustion system
p0333 A80-43741

G

GABANO, J. P.
Lithium batteries with voltage compatibility with conventional systems
p0549 A80-40604

GAENSSLEN, H.
Automotive fuels from coal
p0470 A80-35800

GAEVSKAIA, L. A.
Obtaining film materials with solar furnaces
p0400 A80-36593

GAFFIN, W. O.
Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan
[NASA-CR-159806] p0346 N80-25332

GAGE, R.
Solar collectors
[ALO-5359-T1] p0437 N80-24821

GAGLIANI, J.
Development of polyimide materials for use in solar energy systems
[DOE/CS-35305/T1] p0445 N80-25855

GAGNON, W. L.
The near and long term pulse power requirement for laser driven inertial confinement fusion
p0516 A80-37818

GAIA, M.
The Ansaldo 35 kW solar power system
p0373 A80-33600

Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680

GAILITIS, A.
The characteristics of a nonhomogeneous helical MHD dynamo
p0510 A80-34614

GAINES, G. B.
Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems
p0387 A80-33732

GALANT, I. E.
Development and application of high-power lightpipes
p0401 A80-36833

GALLAGHER, J. E., JR.
Catalytic coal gasification for SNG manufacture
p0474 A80-40755

GALLOWAY, T. R.
Solar-assisted heat pump-swimming pool synergistics for domestic heating
[UCRL-83458] p0447 N80-25905

GANDHIDASAN, P.
Theoretical and experimental investigations of a countercurrent solar regenerator
p0366 A80-33528

GANEFELD, R. V.
Current constriction near the anode in a combustion products plasma
p0510 A80-34865

GANGWAL, S. K.
Fundamental aspects of catalysed coal char gasification
p0473 A80-40753

GANI, R.
Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors
p0415 A80-40718

GANIC, E. N.
Performance study of an OTEC system
p0521 A80-41949

GARABEDIAN, P.
Numerical studies of new stellarator concepts
p0511 A80-34978

GARCIA-MARTINEZ, D. V.
Liquid fuel production from biomass
p0465 A80-33412

Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462

GARCIA, M.
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T1] p0484 N80-23840

GARCIA, R. V.
Markov chains to solar energy storage calculations
p0390 A80-33766

GARCIA, S. R.
Air quality measurements in the coal fired power plant environment of Colstrip, Montana
p0326 A80-36477

GARDNER, W. B.
The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255

GARIBAY, J.
Research and development on solar energy for electric and mechanical power generation
p0373 A80-33601

GARLICK, G. F. J.
Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells
p0401 A80-36933

GARNER, C. M.
Extrinsic losses in solar cells for linear focus systems 4
[SAND-79-1781] p0439 N80-24842

GARRETT, D. E.
Conversion of biomass materials into gaseous products. Operation of the PDU
[SAN-1241-3] p0490 N80-25466

GATZKE, A. E.
Land use and environmental impacts of decentralized solar energy use
[DOE/EV-0067] p0458 N80-27843

GAUCHOTTE, M.
Dynamic model of a mixed /sensible plus latent/ low-temperature thermal storage system
p0545 A80-33511

GAUL, H.
Incidence angle modifier and average optical efficiency of parabolic trough collectors
p0364 A80-33502

How to measure the optical quality of focusing solar collectors without laser ray tracing
p0378 A80-33645

GAY, J. B.
Passive solar wall collectors
p0404 A80-37949

GAZIEV, U. KH.
Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
p0391 A80-33859

Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594

GEBHART, J. E.
Research to identify components of energy-related wastes: A state-of-the-art report
[PB80-137961] p0351 N80-25943

GEE, R. C.
Honeywell General Offices concentrating collector system - Installation and operation
p0370 A80-33567

GEHMAN, J. C.
United Kingdom: Estimates of future energy/GDP relationship
[ORAU/IEA(M)-79-25] p0339 N80-23848

GELSTHORPE, R. V.
Increasing power input to a single solar power satellite rectenna by using a pair of satellites
p0539 A80-32942

GENDERG, R. W.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

GENIS, A. P.
Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells
p0416 A80-42140

GENTA, G.
Whirl and critical speeds of flywheel-container systems aboard vehicles
p0550 A80-41649

GEORGE, G. S.
Liquid fuel production from biomass
p0465 A80-33412
Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462

GERICH, J. W.
A non-tracking inflated cylindrical solar concentrator
p0365 A80-33506

GERLAUGH, H. E.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797

GERSHMAN, H. W.
An approach to determining the economic feasibility of refuse-derived fuel and materials recovery processing
p0473 A80-39630

GERVAIS, R. L.
The solar ten megawatt pilot plant
p0374 A80-33608

GESSINN, G.
A solar assisted heat pump experiment
p0368 A80-33550

GHANDHI, S. K.
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337

GHASSEMZADEH, M. R.
Atomization of coal-oil mixtures
p0497 N80-26483

GHONIEM, N. M.
Void growth characteristics in laser fusion reactor first walls
p0508 A80-33077

GHOSH, A. K.
Thin film polycrystalline silicon solar cells
[DOE/SF/23047-3] p0452 N80-26828

GIANNOTTI, J. G.
Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980
p0511 A80-35161

GIBBS, R. T.
A steam process for the gasification of coal
p0480 N80-22507

GIBSON, H.
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018

GIDASPOW, D.
Solar operated crossflow desiccant cooling system
p0365 A80-33525
Development of a solar desiccant dehumidifier
p0408 A80-37979

GIERUSZCZAK, T. E.
A utility company's view of energy from waste
p0332 A80-42925

GILBERT, B. L.
Further investigations of diffuser augmented wind turbines. Part 1: Executive summary
[COO-2616-2-PT-1-REV-1] p0532 N80-24864

GILBERT, J.
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457

GILBREATH, W. P.
Solar energy economics - Orbiting reflectors for world energy
p0415 A80-41324

GILES, H. N.
Assessment of crude oil and refined petroleum product quality during long-term storage
[AD-A082365] p0557 N80-24637

GILHOUSEN, D. B.
The potential impact of automated wind guidance on wind energy conversion operations
p0469 A80-35731

GILLESPIE, C. H.
Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons
[UCRL-83317] p0337 N80-23629

GILMARTIN, B. J.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

GINER, J.
Advanced screening of electrode couples
[NASA-CR-159738] p0551 N80-22777

GINLEY, D. S.
Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques
p0398 A80-35467

GINOSAR, M.
Wind energy resource development in California
p0469 A80-35733

GINTZ, J.
Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility
p0380 A80-33655

GIRAMONTI, A. J.
Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption
[ASME PAPER 80-GT-161] p0477 A80-42271

GIRDO, V.
Solar heating systems in Scandinavian climate - Reality or daydreams
p0369 A80-33559

GIUFFRIDA, M.
Development of 1pKW photovoltaic module with concentration
p0386 A80-33728

GIULIANO, M. N.
Analysis of the effects of impurities in silicon
[NASA-CR-163133] p0427 N80-23772

GIUTRONICH, J. E.
A stationary prism concentrator for solar cells
p0365 A80-33504
Solar thermoelectric generation using bismuth telluride alloys
p0421 A80-43479

GIVEN, P. H.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476

GLASGOW, L. E.
Sodium cooled solar central receiver power station
p0375 A80-33610

GLAZMAN, Y. M.
Characterization and structural studies of the various types of COM
p0494 N80-26468

GLEASON, C. C.
Fuel property effects on life characteristics of aircraft turbine engine combustors
[ASME PAPER 80-GT-55] p0476 A80-42186
Fuel character effects on J79 and F101 engine combustor emissions
[ASME PAPER 80-GT-70] p0476 A80-42200

GLEICK, P. H.
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892

GLENDENNING, I.
Wave energy
p0479 A80-43831

GLENN, B.
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205

GLENN, B. H.
Solar industrial process heat
p0357 A80-33184
Sun II; Proceedings of the Silver Jubilee Congress, Atlanta, Ga., May 28-June 1, 1979. Volumes 1, 2 and 3
p0357 A80-33401

GLIBERMAN, A. IA.
Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

GLIDDEN, D. N.
Specular reflectance properties of solar mirrors as a function of incident angle
p0378 A80-33640

GLYNN, E. F.
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807

GODETTE, M.
Solar energy systems: Test methods for collector insulations
[PB80-132038] p0430 N80-23867

GODFREY, R. B.
High-efficiency silicon minMIS solar cells - Design and experimental results
p0395 A80-35352

GOEBEL, F.
Abusive testing of large Li/SOCl2 cells
p0549 A80-40603

GOETTLING, D. R.
Testing the performance of solar collectors under standard conditions
p0361 A80-33466

GOFF, H. C.
SPS market analysis
p0435 N80-24786

GOGNA, P. K.
Optical and topographical properties of selective black chrome
p0422 A80-43514

GOH, T. N.
A new approach of wind speed characterization for wind energy studies
p0466 A80-33771

GOKHMAN, A.
On the evaluation of the feasibility of solar collectors for electrical power generation applications
p0406 A80-37963

GOLA, M.
Whirl and critical speeds of flywheel-container systems aboard vehicles
p0550 A80-41649

GOLDBERG, V. R.
Test Bed Concentrator (TBC)
p0433 N80-24763

GOLDBERT, A. J.
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923

GOLDENBLATT, M.
A method for estimating the impact of WECS on utility operating reserve requirements
p0469 A80-35729

GOLDMAN, H.
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-163208] p0441 N80-25782

GOLDSMID, H. J.
Solar thermoelectric generation using bismuth telluride alloys
p0421 A80-43479

GOLDSMITH, I. M.
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905

GOLDSMITH, P. S.
Characterization and structural studies of the various types of COM
p0494 N80-26468

GOLDSTEIN, D. B.
Evaluation of residential building energy performance standards
[LBL-9816] p0348 N80-25849

GOLDSTEIN, J. C.
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
p0517 A80-38484

GOLDSTEIN, L., JR.
Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system
p0406 A80-37970

GOLDSTON, R. J.
Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/
p0521 A80-41748

GOLUCKE, L.
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716

GOMEZ AGOST, J. M.
Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727

GOMEZ, R. F.
Development and characterization of ethanol tolerance in clostridium thermocellum
p0466 A80-33416

GONSER, U.
Moessbauer surface studies on TiFe hydrogen storage material
p0463 A80-43772

GONZALES, R. W.
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163311] p0492 N80-25770

GOODNICK, S. M.
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells
p0399 A80-35493

GORADIA, C.
A one-dimensional theory of high base resistivity tandem-junction solar cells in low injection
p0396 A80-35358

GORDAN, A. L.
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548] p0356 N80-27805

GORDON, J. J.
Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems
p0381 A80-33674

GORDON, L. H.
Program definition and assessment overview
p0551 N80-22790

GORMAN, R.
Cost and performance evaluation of passive solar systems
p0389 A80-33755
Comparison of costs for automobile energy conservation vs synthetic fuel production
[CONF-800419-1] p0353 N80-26810

GORNYI, V. I.
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019

GORSKI, A.
Applications of CPC's in solar energy - An overview
p0364 A80-33501

GOUNI, L.
Energy prices
p0326 A80-36550

GOVER, J. E.
A compressed magnetic field generator systems model
p0548 A80-37875

GRAHAM, B. J.
Survey and evaluation of current design of evacuated collectors
[ALO-5350-1] p0452 N80-26823

GRAHAM, R. W.
Rechargeable batteries: Advances since 1977
p0547 A80-37591

GRALLERT, H.
Development and preparation for series production of a modular solar space heating system, phases 1 and 2
[BMFT-FB-T-79-02] p0424 N80-22857

GRANIER, P.
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959

GRANNEMANN, W. W.
Variable speed constant frequency voltage generator (alternator)
[PB80-141286] p0532 N80-24875
GRANQVIST, C. G.
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy
p0388 A80-33748
GRANT, J. R.
A 300 Btu gas combustor development program, phase 1
[EPRI-AP-1144] p0481 N80-22852
GRASSBERGER, R. E.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826
GRASSO, F.
Heat losses of a static low-concentration solar collector
p0399 A80-35838
GRAY, D.
Chemical nature of coal hydrogenation oils. I - The effect of catalysts
p0467 A80-34532
Chemical nature of coal hydrogenation oils. II - The effect of temperature
p0467 A80-34533
GRAY, D. E.
The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255
GREEN, M. A.
High-efficiency silicon minMIS solar cells - Design and experimental results
p0395 A80-35352
GREENBAUM, P.
Hydrogen technology: Foreign, change 1
[AD-A083665] p0464 N80-27816
GREENBERG, R.
The optimization air separation plants for combined cycle MHD-power plant applications
[NASA-TM-81510] p0528 N80-23778
GREENE, C. R.
The zinc chloride process for the hydrocracking of coal
p0474 A80-40757
GREENE, D. L.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
GREENE, G. C.
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine
[NASA-TM-81813] p0532 N80-25104
GREENE, M. I.
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology
p0467 A80-34531
GREENMAN, P.
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
p0386 A80-33726
GREENWOOD, G. J.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460
GREEVEN, H.
The design of a solar receiver for a 25-kWe gas turbine engine
[ASME PAPER 80-GT-131] p0416 A80-42244
GREEVEN, H. V.
The development of an air Brayton and a steam Rankine solar receiver
p0434 N80-24770
GREGG, D. W.
Solar coal gasification
p0403 A80-37305
GREGORY, D. P.
Hydrogen from fossil fuels
p0460 A80-37333
GRENS, E. A., II
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents
p0472 A80-39420
GRETHER, D. F.
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761
Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840
GRIBBIN, J. A.
Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/EA-0044] p0342 N80-24736
GRIEGO, D. B.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826
GRIFFIN, O. M.
Ocean engineering for OTEC; Proceedings of the 1980 Energy-Sources Technology Conference and Exhibition, New Orleans, La., February 3-7, 1980
p0511 A80-35161
GRIGGS, E. I.
Wind effects on collectors
[DOE/CS-35364/T1] p0454 N80-26851
GRIGSBY, C. E.
The dish-Rankine SCSTPE program (Engineering Experiment no. 1)
p0435 N80-24782
GRIMMER, D. P.
Small-scale solar simulator for indoor testing of collector modules and materials
p0362 A80-33477
GRINDSTAFF, Q. G.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460
GRISWOLD, J. W.
An alternate approach to the application of MHD power generation technology in a utility environment
[IEEE PAPER F 79 651-1] p0525 A80-43502
GROBMAN, J.
The impact of fuels on aircraft technology through the year 2000
[AIAA PAPER 80-0896] p0470 A80-35898
The impact of fuels on aircraft technology through the year 2000
[NASA-TM-81492] p0482 N80-23472
GROHMANN, K.
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152] p0484 N80-24464
GROLL, M.
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617
GROS, J. G.
Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894
GROSSMAN, G.
Solar powered environment control - Criteria and realization
p0366 A80-33534
GROSZEK, A. J.
Stable coal/fuel oil dispersions
p0501 N80-27503
GROTZKY, V. K.
Millville Wind Turbine Generator: Failure analysis and corrective design modification
[RFP-2992/3533/79-3] p0529 N80-23831
GROVES, D. J., JR.
Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612
GROVES, W. E.
Energy from humid air
[DSE-2553-79/1] p0531 N80-24861
GRUBBS, D. M.
Energy storage in ground-water aquifers
p0545 A80-33514

GRUBER, C. L.
Energy from humid air
[DSE-2553-79/1] p0531 N80-24861

GRUEN, D. M.
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628

GRUENING, F.
Heat pumps for heating, cooling, and energy recovery 1976-1990 p0327 A80-38210

GRUVER, G. A.
Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance p0522 A80-42295

GUAY, R. J.
Maximally concentrating collectors for solar energy applications p0403 A80-37301

GUBAREV, A. V.
A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes p0510 A80-34620

GUCERI, S.
An application of phase change materials in passive solar systems p0384 A80-33703

GUDER, M.
Studies on questions of design and construction of chain scraper conveyors
[NASA-TM-75810] p0499 N80-26663

GUDIKSEN, P. H.
Potential air quality impact of geothermal power production in the Imperial Valley
[UCRL-52797] p0340 N80-23878

GUDTA, A. S.
Rheological properties of solvent refined coal-oil mixtures p0495 N80-26471

GUENTHER, A. H.
International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers p0547 A80-37811

GUERRIERA, G.
Heat losses of a static low-concentration solar collector p0399 A80-35838

GUIDOTTI, R.
High temperature fuel cell research and development
[SAN-1485-2] p0534 N80-25848

GUILLEMINOT, J. J.
On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings p0367 A80-33538

GUKHMAN, G. A.
Development and investigation of solar thermoelectric generator using a tubular module p0400 A80-36597

GULLY, J. H.
The mechanical design of a compensated pulsed alternator prototype p0548 A80-37873

GUPTA, B. K.
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces p0388 A80-33746

GUPTA, M. C.
Theoretical and experimental investigations of a countercurrent solar regenerator p0366 A80-33528
Theoretical and experimental investigations of an intermittent solar refrigerator p0367 A80-33540
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector p0407 A80-37977
Solar thermal power plant - Thermodynamic analysis p0410 A80-37999

GUPTA, S. C.
Effectiveness of packed-bed solar air heaters p0407 A80-37972

GUPTA, Y. P.
Solar thermal plant impact analysis and requirements definition p0435 N80-24788

GURULE, G.
National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882

GURURAJA, J.
Characteristics of rural energy demand and major barriers and tasks and implementation of potentially viable solar technologies p0381 A80-33673

GUSEINOVA, F. A.
The use of solar energy storage for heating and cooling applications p0391 A80-33861

GUSEV, O. A.
Accelerator module of 'Angara-5' p0516 A80-37815

H

HABER, R. J.
Characterization and structural studies of the various types of COM p0494 N80-26468

HAEFELE, W.
A global and long-range picture of energy developments p0329 A80-40935

HAGE-ALI, M.
Realization of p-n junction solar cells by an ion implantation doping procedure p0409 A80-37991

HAGEDORN, N. H.
Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-23777

HAGENMULLER, P.
Application of magnesium rich rare-earth alloys to hydrogen storage p0459 A80-35192

HAGLUND, R. A.
Non-heat pipe/P-40 Stirling engine p0530 N80-24772

HAGLUND, R. F., JR.
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system p0517 A80-38484

HAHNE, E.
Laboratory tests for flat plate solar collectors p0361 A80-33471
The flat plate solar collector - Its steady-state and transient state behaviour p0403 A80-37943

HALILI, E. E.
RMA engineering applications to Fossil Energy projects p0473 A80-40336

HALL-MARTINDALE, E.
Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H. p0384 A80-33711

HALL, D. O.
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy p0459 A80-33407
Bioconversion of solar energy p0420 A80-42465

HALL, E. W.
Conceptual design of thermal energy storage systems for near-term electric utility applications p0551 N80-22794
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797

HALL, F. F.
More on dual purpose solar-electric power plants
[SLAC-PUB-2477] p0452 N80-26022

HALL, P. D.
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847

HALL, R. B.
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339
The design and fabrication of high efficiency thin film CdS/Cu2S solar cells
p0422 A80-43516
HALLENBECK, P. C.
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852
HALLET, R. W., JR.
The solar ten megawatt pilot plant
p0374 A80-33608
HAMILTON, G. W.
Tests of high-powered direct conversion on beams and plasma
[UCRL-82852] p0532 N80-25161
HAMILTON, N. I.
Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine
p0377 A80-33635
HAHN, J.
Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges
[SAND-79-7051-VOL-1] p0449 N80-26611
HAN, K. W.
Optimization studies of various coal-conversions systems: Coal dissolution phenomena
[FE-2274-7] p0489 N80-25461
HANISAK, M. D.
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126
HANLEY, G. M.
New directions for future satellite power system /SPS/ concepts
[AIAA 79-3069] p0539 A80-36963
HANLON, J.
Beam simultaneity in multi-terawatt CO2 laser fusion systems
p0517 A80-38483
HANLON, J. A.
Helios target positioning system
p0518 A80-38485
HANOKA, J. I.
Electron-beam-induced current characterization of polycrystalline silicon solar cells
p0398 A80-35482
HANSEN, A. C.
Data analysis at the Rocky Flats Wind Systems Test and Development Center
p0513 A80-35724
HANSEN, D. G.
Thermal performance of compounds used to improve heat transfer in solar collectors
p0360 A80-33457
HANSON, J. A.
Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments
p0460 A80-37336
HAO, L.
Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel
p0501 N80-27497
HARDAKER, W. T.
Fuel - A system problem of major proportions
p0327 A80-37691
HARDESTY, D. R.
Diagnostic development for advanced power systems
[ASME PAPER 80-GT-128] p0522 A80-42242
Diagnostics and instrumentation requirements for advanced power systems
[ASME PAPER 80-GT-129] p0477 A80-42243
HARDING, G. L.
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system
p0388 A80-33742
HARKINS, J. H.
Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AP-884] p0497 N80-26529
HARKNESS, J. B. L.
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477
HARKNESS, J., B.L.
Coal/oil mixture pipeline: A viable alternative coal transportation system?
p0542 N80-26487
HARKNESS, S. D.
A review of lifetime analyses for tokamaks
p0507 A80-33056
HARLEY, E. L.
Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710
HARLOW, F. H.
Thermal fracture effects in geothermal energy extraction
[LA-7963] p0483 N80-23795
HARPER, A. D.
2.5-MWe coal-fired, atmospheric fluidized bed, recuperated closed gas turbine electrical power generating plant
[ASME PAPER 80-GT-132] p0477 A80-42245
HARPER, W.
Open-cycle solar air conditioner
p0365 A80-33524
HARRIGAN, R. W.
Midtemperature Solar Thermal Systems Design Handbook Parabolic troughs
p0374 A80-33603
HARRIS, G. S.
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457
HARRIS, J. S., JR.
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368
Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819
HARRIS, W. B.
The effect of system size on the practicality of aquifer storage
p0545 A80-33517
Cold water aquifer storage
p0554 N80-22827
HARRISON, A. J.
Some aspects of energy storage systems using Glauber salt mixtures
p0548 A80-37967
HARRISON, R.
Energy analysis of wave and tidal power
p0333 A80-43828
HARRISON, T. D.
Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season
p0363 A80-33488
Thermal storage experience at the MSSTF and plans for the future
p0552 N80-22799
HARSHA, P. T.
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382
HARTGEN, D. T.
Transportation energy contingencies - A status report on public response and government roles
p0326 A80-37353
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
HARTING, E.
A stationary prism concentrator for solar cells
p0365 A80-33504
HARTL, J. C.
A high performance cocurrent-flow heat pipe for heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472
HARTMAN, C. D.
IEA/SPS 500 kW distributed collector system
p0436 N80-24791
HARTMAN, J. S.
Properties of low cost, high volume glasses
p0414 A80-39937

HARVEY, A. C.
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1]
p0529 N80-23850

HARVEY, R. A.
Open-cycle MHD systems analysis
[EPRI-AF-1230]
p0538 N80-27192

HASHISH, H. A.
Temperature distributions in the flat-plate collector under actual unsteady insolation
p0415 A80-40937

HASLETT, R.
Active heat exchange system development for latent heat thermal energy storage
p0554 N80-22822

HASSAN, K.-E.
Heat transfer through collector glass covers
p0360 A80-33458
Physical modeling of buildings
p0383 A80-33688

HATCHIKIAN, E. C.
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407

HATHAWAY, S. A.
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317]
p0500 N80-26798

HAUGER, J. S.
Military markets for solar thermal electric power systems
p0435 N80-24787

HAUSER, J. R.
Material and device considerations for cascade solar cells
p0397 A80-35364
Novel concentrator photovoltaic converter system development
[SAND-80-7004]
p0535 N80-25912
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092]
p0450 N80-26797

HAUSZ, W.
Thermal energy storage and transport
p0540 N80-22793

HAUTALA, R. R.
Photochemical storage of solar energy
p0545 A80-33420
Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system
[SRO-0893-17]
p0558 N80-25869

HAWKINS, G. T.
Operation of a central preparation plant for coal-oil-water mixtures
p0501 N80-27500

HAY, H. R.
Thermopond applicability to climate and structure
p0382 A80-33685

HAYDEN, J. J.
Optical performance of the Gemini carbon dioxide laser fusion system
p0517 A80-38482

HAYNES, W. P.
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944
p0471 A80-37678

HAYS, D. K.
Real time identification of parameters in building models
p0368 A80-33556
The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems
p0381 A80-33663

HAYS, R. A.
Stability of plasma-sprayed coatings tested at White Sands Solar Facility
p0380 A80-33658

HAZIZA, C.
Analytical and experimental determination of radiation and temperature distributions inside solar receivers
p0377 A80-33634

HBIKA, A.
Application of magnesium rich rare-earth alloys to hydrogen storage
p0459 A80-35192

HEALD, R. C.
Boundary layer wind shear
p0469 A80-35743

HEALEY, J.
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554

HEATHERLY, D. E.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061]
p0529 N80-23839

HECKER, G.
Topical questions of energy economics
p0328 A80-38304

HECKMAN, R. C.
High-temperature electronics: An overview
[SAND-79-2319A]
p0481 N80-22614

HEDSTROM, J. C.
Hybrid active-passive designs - Synergy or conflict
p0383 A80-33689
Validation of solar system simulation coder by the International Energy Agency
[LA-UR-80-387]
p0453 N80-26835

HEESS, F.
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617

HEGAZI, A. I.
Flat plate boosters for elevating temperatures
p0404 A80-37947

HEGAZY, A. S.
Optimum inclination of linear reflectors
p0406 A80-37961
Combination of wind and solar energies at the Northern Coast of Egypt
p0411 A80-38014

HEGEDUS, L. S.
Moderate temperature solar thermochemical systems - An application of Diels-Alder chemistry
p0359 A80-33430

HEHEMANN, R. F.
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7]
p0491 N80-25707

HEIBEIN, S.
Solor Applications of Thermal Energy Storage
[TID-29430]
p0427 N80-23791

HEIDT, F. D.
Thermodynamic trade-offs for gas cooled high temperature solar tower receivers
p0379 A80-33648

HEIFERLING, P.
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339]
p0537 N80-26859

HEIN, G.
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218]
p0533 N80-25785

HEINDL, W.
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors
[ASSA-FA-10]
p0456 N80-26879

HEINE, D.
Physical and chemical properties of phase change materials for application in solar tower and solar farm plants
p0375 A80-33617

HEINMEYER, P.
Development of current converters for switching and regulating tasks in energy technology
[BMFT-FB-T-79-12]
p0567 N80-23585

HEITNER, K. L.
Cost and performance evaluation of passive solar systems
p0389 A80-33755
Comparison of costs for automobile energy conservation vs synthetic fuel production
[CONF-800419-1]
p0353 N80-26810

HEITZ, L. F.
Undeveloped hydropower as a potential energy source in Idaho
[PB80-157399]
p0504 N80-27824

HELLER, A.
  Metal filmed-semiconductor photoelectrochemical cells p0515 A80-37006
HELLICKSON, H. A.
  Development and evaluation of a multiple use solar energy system for agriculture p0357 A80-33403
HELMS, H. E.
  Advanced Gas Turbine Powertrain System Development Project p0513 A80-35574
HELWA, N. H.
  Solar energy at ground surface p0403 A80-37940
HENDERSON, B.
  Results of long term natural weathering effects on solar collectors under stagnation conditions p0362 A80-33475
HENDERSON, J.
  Salt concentration gradient solar ponds - Modeling and optimization p0371 A80-33585
  Conversion system overview assessment. Volume 2: Solar-wind hybrid systems [SERI/TR-35-078-VOL-2] p0338 N80-23799
  SOLPOND: A simulation program for salinity gradient solar ponds [SERI/TP-351-559] p0430 N80-23856
HENDRICKS, C.
  Low pressure gas filling of laser fusion microspheres p0506 A80-33053
HENDRICKS, C. D.
  Fabrication of glass sphere laser fusion targets p0506 A80-33052
HENDRIX, S. D.
  Evaluation of combined photovoltaic/thermal collectors p0387 A80-33736
HENDRON, R. H.
  Energy from hot dry rock [LA-UR-79-3256] p0338 N80-23802
HENRY, W. M.
  Methods for analyzing inorganic compounds in particles emitted from stationary sources [PB80-141781] p0350 N80-25936
HENSLEY, W. R.
  Solar total energy-large scale experiment, Shenandoah, Georgia p0436 N80-24795
HERCZFELD, P. R.
  Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems p0381 A80-33664
HERMAN, R. G.
  Methanol and methyl fuel catalysts [FE-3177-3] p0482 N80-23482
HERNANDEZ, D.
  Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3 p0520 A80-40716
HERRERO, A. A.
  Development and characterization of ethanol tolerance in clostridium thermocellum p0466 A80-33416
HERRICK, C. S.
  Heat storage capability of a rolling cylinder using Glauber's salt p0553 N80-22810
  Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage [ORO-5759-T1] p0557 N80-24866
HERSH, H. N.
  Experimental evaluation of thermal energy storage p0553 N80-22817
HERSHKOWITZ, F.
  Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents p0472 A80-39420
HERSKOVITZ, S. B.
  Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors p0390 A80-33805
HERTZMARK, D. I.
  Proposition on energy analysis and economic efficiency [SERI/RR-51-332] p0338 N80-23805
HERWIG, L. O.
  Report on five years of operating experience with four pioneer school heating experiments p0370 A80-33569
HETZEL, A.
  Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results [SAND-78-7072-VOL-1/2] p0453 N80-26830
HEWIG, G. H.
  A fabrication process for Cu2S-CdS thin film solar cells p0385 A80-33719
HEWITT, H. C., JR.
  Wind effects on collectors [DOE/CS-35364/T1] p0454 N80-26851
HEWSON, E. W.
  Trees as an indicator of wind power potential p0470 A80-35745
HIATT, R. E.
  Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency p0473 A80-39422
HICKS, B. B.
  Application of power laws for wind energy assessment p0470 A80-35744
HIESTER, T. R.
  Status of the Large Wind Turbine Siting Handbook p0514 A80-35750
HIGGIN, R. M. R.
  Potential for conversion of refuse to energy in Ontario p0479 A80-42930
HIGGINS, S. M.
  Optical analysis of Cassegrainian concentrator systems p0377 A80-33631
HILDEBRAND, S. G.
  Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites [CONF-791056-2] p0345 N80-24885
HILDEBRANDT, A. F.
  Users group for central receiver testing p0380 A80-33654
HILFMAN, L.
  Upgrading of coal liquids: Upgrading distillates from coal liquefaction [FE-2566-26] p0480 N80-22518
HILL, P. W.
  Vertical axis wind turbine development: Executive summary [ORO-5135-77-5-SUMM] p0529 N80-23845
  Vertical axis wind turbine development [ORO-5135-77-5] p0529 N80-23846
HILL, R. F.
  Basic Research Engineering: Fluid Dynamics and Thermal Processes [FE-2468-53] p0334 N80-22649
  Coal conversion comparisons, task 002 [FE-2468-51] p0485 N80-24479
HILLER, C. C.
  Development of the sulfuric acid-water chemical heat pump/chemical energy storage system for solar heating and cooling p0359 A80-33429
HINES, R. C.
  Filtration process and equipment studies for coal liquefaction processes [FE-2007-T1] p0487 N80-24499
HINO, H.
  Basic studies on COM combustion p0497 N80-26484
HIRAKI, N.
  Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1 p0510 A80-34647
  Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1 p0510 A80-34648
  Electron density measurements in the TRIAM-1 tokamak p0510 A80-34649

HIRSCHBEIN, M. S.
Dynamics and control of large horizontal-axis axisymmetric wind turbines
HNAT, J. G. p0526 N80-22772
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634]
HOANG, C. p0536 N80-26779
Modeling a V-trough collector in terms of zero, single or multiple thermal capacitance nodes
HOBBS, P. V. p0405 A80-37952
Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds
HODES, G. p0325 A80-36419
A thin-film polycrystalline photoelectrochemical cell with 8% solar conversion efficiency
HODGE, R. C. p0357 A80-32933
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2]
HODGSON, J. W. p0453 N80-26830
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1]
HODSON, D. R. p0537 N80-26853
High energy storage flywheel test program
[AD-A083302]
HOFFMAN, M. Z. p0561 N80-26796
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
[COO-2889-5]
HOFFMANN, I. p0447 N80-25886
The first solar energy system in West-Germany for industrial utilization
HOFFMANN, L. p0411 A80-38010
Bioconversion
HOJSTRUP, J. p0471 A80-37504
A model for the probability structure of atmospheric turbulence
HOLBECK, H. J. p0468 A80-35720
Siting solar thermal power experiments
HOLDREN, J. P. p0435 N80-24783
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3]
HOLL, R. J. p0349 N80-25892
A central receiver solar power system for remote locations
HOLLADAY, T. E. p0410 A80-38006
A 300 Btu gas combustor development program, phase 1
[EPRI-AP-1144]
HOLLANDER, J. M. p0481 N80-22852
Basic research needs in energy conservation
[LBL-9939]
HOLLANDER, P. p0338 N80-23794
Design and evaluation of solar installation workshops and the HUD solar DHW installation guidelines
HOLLANDS, K. G. T. p0370 A80-33575
Equations for representing the UL-dependence in collector test procedures
p0361 A80-33467
A comparative study of solar assisted heat pump systems for Canadian locations
p0367 A80-33546
Free convection in solar collectors
p0417 A80-42440
Advanced non-concentrating solar collectors
p0417 A80-42441
Methods for reducing heat losses from flat plate solar coolectors, phase 3
[COO-2597-5]
p0424 N80-22851
HOLLECK, G. L.
On the design of silver-hydrogen electrochemical cells
HOLLENACK, W. R. p0547 A80-3700
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46]
HOLLINGSWORTH, M. p0497 N80-2652
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
HOLMES, B. J. p0383 A80-3369
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane
[AIAA PAPER 80-1846]
HOLMES, J. A. p0333 A80-4330
Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections
HOLMES, W. p0514 A80-36397
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
HOLT, F. S. p0383 A80-33693
Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors
HOLTEN, R. R. p0390 A80-33805
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents
HOMAN, G. R. p0472 A80-39420
Development of improved insulation materials
[ALO-4295-T2]
HOOKER, D. W. p0448 N80-26403
End-use matching for solar industrial process heat
[SERI/TR-34-091]
HOOPER, F. C. p0454 N80-26849
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks
p0546 A80-33518
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570]
p0559 N80-25900
Design of annual storage solar space heating systems
[DOE/CS-32939/10]
p0455 N80-26855
A model for the angular distribution of sky radiance
[DOE-CS-32939-9]
HOOVER, D. Q., JR. p0456 N80-26983
Cell module and fuel conditioner development
[NASA-CR-159828]
p0527 N80-23768
Cell module and fuel conditioner
[NASA-CR-159875]
HOOVER, L. J. p0528 N80-23769
Consequences of increased coal utilization
[CONF-791108-16]
HOPKINS, K. H. p0350 N80-25923
Turbopropulsion combustion - Trends and challenges
[AIAA PAPER 80-1199]
HOPKINS, R. H. p0519 A80-38964
Effect of titanium, copper and iron on silicon solar cells
HORIGOME, T. p0397 A80-35385
Economic analysis of the STEPS in Japan
HORNER, M. W. p0375 A80-33615
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78]
HOROWITZ, J. S. p0499 N80-26669
HYCSOS: Hydride conversion and storage system sensitivity analysis
[ANL/EES-TM-63]
HORRELL, J. F. p0564 N80-27523
An economic analysis of solar energy alternatives
HORTON, J. H. p0412 A80-38021
Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments
p0324 A80-35649

HORTON, T. L. O.
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304] p0519 A80-39014
The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26] p0416 A80-42161

HORWITZ, C.
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system
p0388 A80-33742

HOUSE, K. L.
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669

HOUSTON, S. H.
Open-cycle solar air conditioner
p0365 A80-33524

HOWELL, J. R.
Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling
[AIAA PAPER 80-1546] p0415 A80-41502

HOYT, J. G.
Design concept for LH2 airport facilities
p0461 A80-37344

HOZUMI, S.
A direct solar-heated R22-DMF absorption refrigerator
p0367 A80-33539

HSIAO, R.
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716

HSIEH, C. K.
Design of a system using CPC collectors to collect solar energy and to produce industrial process steam
[ANL-79-102] p0443 N80-25814

HSU, G.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

HUB, K. A.
Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894

HUBBARD, H. H.
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine
[NASA-TM-81813] p0532 N80-25104

HUBER, C. C.
Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894

HUBIG, K.
Investigation of further economics development of regional electricity supply concerns
p0324 A80-34122

HUDAK, P. A.
New Technology Transport for fuel critical economy
p0328 A80-40313

HUDSON, C. L.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232

HUDSON, J. A.
Review - Materials aspects of wave energy converters
p0517 A80-38283

HUETTINGER, K. J.
Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions
p0478 A80-42800

HUETTNER, D. A.
An economic analysis of solar energy alternatives
p0412 A80-38021

HUGENHOLTZ, H.
Examination of energy consumption and the possibilities of energy savings in office buildings
p0353 N80-26791

HUGGINS, J. C.
Tests of all-day collector performance
p0361 A80-33468

HUGHES, D. A.
Sigma phase formation in alloys for SO2/SO3 thermal energy storage systems
[SAND-80-8205] p0562 N80-26856

HUGHES, P. J.
Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544
Improved heat pump model for TRNSYS
p0508 A80-33553
Survey of simplified design methodologies for solar heating and cooling systems
p0376 A80-33619

HULL, J. R.
Membrane stratified solar ponds
p0371 A80-33582

HULTGREN, L. S.
Dynamics of a flexible rotor-tower system
[ASRL-TR-194-1] p0530 N80-23862

HUNDEMANN, A. S.
Solar space heating and air conditioning, volume 3. Citations from the NTIS data base
[PB80-801707] p0424 N80-22864
Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base
[PB80-801723] p0425 N80-22865
Solar space heating and air conditioning, volume 4. Citations from the NTIS data base
[PB80-801715] p0425 N80-22866
Passive solar space heating and cooling. Citations from the engineering index data base
[PB80-801749] p0425 N80-22867
Passive solar space heating and cooling. Citations from the NTIS data base
[PB80-801731] p0425 N80-22868
Solar process heat. Citations from the NTIS data base
[PB80-807936] p0457 N80-27823

HUNDERI, O.
Nickel pigmented anodic aluminium oxide for selective absorption of solar energy
p0388 A80-33748

HUNT, A.
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761
Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840

HUNT, A. J.
A new solar thermal receiver utilizing small particles
p0379 A80-33652

HUNT, J. C.
Solar energy with chemical storage for cogeneration of electric power and heat
p0549 A80-40715

HUNTER, S. C.
Application of combustion technology for NO/x/ emissions reduction on petroleum process heaters
p0325 A80-35878

HURWOOD, D. L.
The American experience with solar energy in centralized electricity generation - Technology and economics
p0412 A80-38024

HUSAIN, S. A.
Comfortable heating and cooling by solar reflectors and wind
p0411 A80-38013

HUSAR, R. B.
Synoptic-scale distribution of man-made aerosols
p0354 N80-26942

HUTCHESON, R.
Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience
p0330 A80-41842

HUTCHINS, M. G.
Radiative selectivity and the oxidation of stainless steels
p0388 A80-33745

HUTH, G. C.
Remote sensing for geothermal environmental assessments
[UCRL-15108] p0483 N80-23756

HUTTO, F. B.
Filtration process and equipment studies for coal liquefaction processes
[FE-2007-T1] p0487 N80-24499
HWANG, B.-C.
Economics of solar-assisted heat pump heating systems for residential use
p0367 A80-33543
HWANG, W.
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345
HYLAND, S. L.
MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722
Grain boundary effects and conduction mechanism studies in chromium metal-insulator-silicon solar cells on polycrystalline silicon
p0422 A80-43762

I

IANNUCCI, J. J.
Analysis of solar energy conversion processes - Systems economic impact of thermochemical storage efficiencies
p0389 A80-33754
Fixed site hydrogen storage. 1: Applications impact
[SAND-79-8647] p0463 N80-23797
ICZKOWSKI, R. P.
Voltage losses in fuel cell cathodes
p0522 A80-42294
IGARASHI, T.
Studies on the stabilization of COM
p0496 N80-26479
IIJIMA, T.
Evaluation of cathode materials for the lithium/carbonmonofluoride battery
p0549 A80-40606
IKEGAMI, S.
Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898
ILES, P. A.
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583
IMAGAWA, M.
Development of a NO/x/-free combustion system
p0333 A80-43741
IMBERT, B.
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605
INAL, O. T.
A field ion microscope study of microstructural features of solar collector coatings
p0422 A80-43528
INGENE, C. A.
An economic analysis of solar energy alternatives
p0412 A80-38021
INOUE, N.
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells
p0399 A80-35493
IRELAND, P. J.
Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells
p0402 A80-37195
ISAEV, K. B.
Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator
p0414 A80-39785
ISHIBASHI, T.
The operation results of the Yazaki Experimental Solar House One and the Ishibashi Solar House
p0370 A80-33572
ISHII, A.
A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/
p0392 A80-34561
ISKANDEROV, A.
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588
ISTOMIN, IU. A.
Accelerator module of 'Angara-5'
p0516 A80-37815
ITO, N.
A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/
p0392 A80-34561
ITOH, H.
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343
ITOH, S.
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649
ITTNER, W. B., III
An array of directable mirrors as a photovoltaic solar concentrator
p0402 A80-37297

J

JACKSON, D. M.
Economic and market potential for SRC-II products
p0474 A80-40758
JACKSON, D. R.
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481
JACKSON, S. V.
Design of Helios beam diagnostics
p0518 A80-38486
JACOBSON, E.
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218] p0533 N80-25785
JAFFRIN, A.
Phase change collector wall versus water collector wall
p0406 A80-37962
Latent heat diode wall p0407 A80-37975
JAIN, F. C.
Observation of an active photoinductive component in high intensity solar cells
p0399 A80-36242
JAIN, S. C.
Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities
p0416 A80-42135
JAKATT, S. E.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469
JAMES, L. W.
Novel solar cell concentrator photovoltaic converter system
[SAND-79-7048] p0445 N80-25843
JAMGOCHIAN, E. M.
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505
JAMIESON, W. M.
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
JANA, R. N.
Hall effects on MHD Couette flow in a rotating system
p0523 A80-43226

JANI, Y.
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018

JANKE, S. H.
Three dimensional ray tracing through concentric tubular elements using vector methods
p0360 A80-33459

JANKOVIC, R.
My new types of flat plate solar collectors
p0404 A80-37945

JANSEN, E.
A large-area cold-cathode grid-controlled electron gun for Antares
p0516 A80-37854
Heat pumps for heating, cooling, and energy recovery 1976-1990
p0327 A80-38210

JANSSEN, W.
The energy supply of today and tomorrow
p0324 A80-34124

JANSSON, D. G.
Paving the way for energy-saving innovations
p0328 A80-39554

JANZEN, A. F.
Basic electrochemistry
p0419 A80-42458
Photoelectrochemistry. I - Photoelectrolysis. II - The photogalvanic cell
p0462 A80-42459
Biological solar cells
[SERI/TP-332-476] p0439 N80-24831

JARAS, T. F.
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213

JARMAN, B. D.
Laser program, volume 3
[UCRL-50021-78-VOL-3] p0532 N80-25650

JARVINEN, P. O.
Conceptual design of a solar-heated-air receiver coupled to a Brayton or Stirling engine
p0377 A80-33635
Advanced solar receiver development
p0379 A80-33649

JAUNG, R.
Design and performance of low heat loss window systems
p0324 A80-33706

JAWISH, W. K., III
Structural analysis of a cold water pipe for a 40MWe spar OTEC platform
p0512 A80-35165

JAYADEV, T. S.
Salt concentration gradient solar ponds - Modeling and optimization
p0371 A80-33585
Conversion system overview assessment. Volume 2: Solar-wind hybrid systems
[SERI/TR-35-078-VOL-2] p0338 N80-23799

JEFFERSON-LOVEDAY, D. W.
The United Kingdom solar heating programme
p0323 A80-33445

JEFFRIES, H.
Fabrication of glass sphere laser fusion targets
p0506 A80-33052

JENKINS, R. G.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476

JENSEN, J. E.
Calorimetric measurement of ac losses in superconducting cables of short lengths
[BNL-26712] p0540 N80-22609

JENSEN, S. O.
Solar collector studies for solar heating and cooling applications
[ALO-5355-T1] p0445 N80-25850

JESCH, L. F.
Adaptive control for a multiple tank, multiple temperature solar energy storage system
p0369 A80-33557
Performance modeling of the vertical axis wind turbine
p0508 A80-33773

JETER, S. M.
Evaluation of linear concentrating collectors
p0362 A80-33481

JOHANNSEN, A.
Design and operation of a liquid-desiccant type solar air conditioning system
p0366 A80-33527

JOHN, V. I.
Operational characteristics of an ac commutator generator for wind power conversion
p0508 A80-33770

JOHNSON, C. A.
Alabama Electric Cooperative flue gas desulfurization operating and maintenance experience
p0330 A80-41842

JOHNSON, C. E.
Thermochemistry of seed and slag vaporization and condensation in coal-fired MHD
[AIAA PAPER 80-1344] p0330 A80-41571

JOHNSON, G. L.
Agricultural applications of wind resource assessments
p0514 A80-35739
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807

JOHNSON, I.
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal
p0471 A80-37617

JOHNSON, J. R.
Hydrogen storage materials research and development work at Brookhaven National Laboratory
[BNL-26813] p0463 N80-23478

JOHNSON, T. L.
Sodium cooled solar central receiver power station
p0375 A80-33610

JOHNSTON, D. W.
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent
p0358 A80-33423

JONES, D. B.
Specific heats of Colorado oil shales - A differential scanning calorimetry study
p0475 A80-4189

JONES, G. J.
Status of the photovoltaic systems definition project
p0387 A80-33733

JONES, J. F.
Thermal fatigue analysis of the Department of Energy Barstow Pilot Plant
p0374 A80-[illegible]609

JONES, J. L.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-265

JONES, K. C.
Antares Power Amplifier optical system
p0518 A80-38489

JONES, R.
RF feedback stabilization of a thin line cusp magnetoplasma sheath
p0514 A80-36040

JONES, R. E., JR.
Optical and thermal properties of truncated compound circular arc concentrators
p0365 A80-33505
Monthly average daily insolation on overhang shaded windows
p0383 A80-33698

JONES, T. B.
Off-peak electric auxiliary heat for solar air-heating systems
[COO-4516-1] p0429 N80-23827

JONES, W. T.
The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center
p0381 A80-33666

JOON, K.
National solar heating and cooling programme in the Netherlands
p0323 A80-33441

JOOS, R.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859

JORDA, R. H.
Performance evaluation of Magma Power company's reinjection well no. 46-7 at the East Mesa KGRA, California
[SAND-79-7127]
p0492 N80-25863

JORGENSEN, G. L.
Solar reflectance, transmittance and absorptance of common materials
[SERI/TP-334-457]
p0437 N80-24805

JORSTAD, N. D.
Accelerated commercialization of solar energy - A new priority for international action
p0413 A80-38026

JUDZIS, A.
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422

JUDZIS, A., JR.
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422

JUENTGEN, H.
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963]
p0484 N80-24462

JUHASZ, A. J.
The optimization air separation plants for combined cycle MHD-power plant applications
[NASA-TM-81510]
p0528 N80-23778

JUMEL, Y.
Lithium batteries with voltage compatibility with conventional systems
p0549 A80-40604

JUNKHAN, G. H.
Energy conservation via heat transfer enhancement
[COO-4649-5]
p0335 N80-22847

JUR, F. A.
Line focus solar thermal central receiver research study
[DOE/ET/20426-1]
p0440 N80-24853

JURINAK, J. J.
The sizing and economics of phase change energy storage units in air-based solar heating systems
p0546 A80-33520
Open-cycle solar air conditioner
p0365 A80-33524

JUSTIN, B.
The measurement of solar irradiance on a tilted surface
p0390 A80-33764

K

KABIR-UD-DIN, MR.
Energy storage and electron transfer by carbanion photolysis
p0545 A80-33419

KACHARE, A.
Cost of Czochralski wafers as a function of diameter
[NASA-CR-163277]
p0449 N80-26771

KACHARE, A. H.
Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells
p0401 A80-36933

KAHAN, W.
Economical optimum TES size via marginal analysis
p0365 A80-33508

KAI, J.
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529

KAILA, M. M.
Solar thermoelectric generation using bismuth telluride alloys
p0421 A80-43479

KAIMAL, J. C.
Wind statistics at the Boulder Atmospheric Observatory tower
p0468 A80-35722

KAITZ, G. M.
Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/EA-0044]
p0342 N80-24736

KALASHIAN, V. A.
High-voltage multijunction solar-energy photoelectric converter
p0401 A80-36830

KALLIAMPUR, C.
Xylose recovery from hemicellulose by selective acid hydrolysis
p0466 A80-33417

KALT, A. C.
The International Energy Agency Small Solar Power Plants Project
p0373 A80-33597

KALVINSKAS, J. J.
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152]
p0484 N80-24464

KAM, A. Y.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4]
p0498 N80-26535

KAMATH, G. S.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

KAMIJO, Y.
Design consideration of fine COM storage
p0502 N80-27506

KAMIMOTO, M.
Economic analysis of the STEPS in Japan
p0375 A80-33615

KAMINSKI, H. L.
TBC costing
p0434 N80-24780

KAMMERUD, R.
Mean monthly performance of passive solar water heaters
[LBL-9295]
p0437 N80-24820

KAMMINGA, W.
Fluid circulation control in conventional and heat pipe planar solar collectors
p0392 A80-33872

KANDPAL, T. C.
Concentration characteristics of composite parabolic concentrators
p0416 A80-41950

KANNENBERG, S. L.
Status of insolation resource assessment in the Northeast
[NESEC-6]
p0429 N80-23826

KANTAK, A. V.
SPS phase control system performance via analytical simulation
[NASA-CR-160582]
p0540 N80-22378

KAPLAN, S. I.
Photovoltaic applications: Past and future
[CONF-800106-4]
p0455 N80-26867

KARAKI, S.
A pin programmable controller for research systems
p0380 A80-33662
Performance evaluation of a solar air-heating and nocturnal cooling system in CSU Solar House 2
[COO-2868-5]
p0440 N80-24858

KARIZHENSKII, V. E.
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019

KARLSSON, H. T.
Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems
p0326 A80-37618
Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology
p0331 A80-41849

KARPENKO, I. V.
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

KARPUKHIN, V. A.
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

KARWAT, H. U.
Description of processes for producing hydrogen by coal gasification
p0460 A80-37334
KASAHARA, K.
Seasonal regeneration through underground strata
p0548 A80-37966
KASHIWAMURA, K.
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529
KASICH-PILIPENKO, I. E.
Obtaining film materials with solar furnaces
p0400 A80-36593
Development and application of high-power lightpipes
p0401 A80-36833
KATSUDA, T.
Glassy electrolyte galvanic cells
p0515 A80-37008
KATSURAGI, K.
Seasonal regeneration through underground strata
p0548 A80-37966
KATZ, A.
Environmental assessments of alternative energy strategies in the United States
[CONF-791172-1] p0350 N80-25927
KATZ, M.
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance
p0522 A80-42295
KATZEFF, J. S.
Ion-implanted laser annealed silicon solar cells
p0414 A80-40252
KAWADA, Y.
New air-heating collector design and performance
p0359 A80-33449
KAWAI, Y.
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649
KAWASAKI, S.
Comparative study of energy accounting for heavy ion fusion with various driver accelerators
[IPPJ-454] p0538 N80-28195
KAY, J.
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2
[LBL-10098] p0353 N80-26817
KAZA, K. R. V.
Nonlinear aeroelastic equations of motion of twisted, nonuniform, flexible horizontal-axis wind turbine blades
[NASA-CR-159502] p0536 N80-26774
KAZMERSKI, L. L.
Evidence for grain boundary passivation by oxidation in polycrystalline GaAs solar cells
p0402 A80-37195
KEABLE, J.
A modular system for bio-gas production using farm waste
p0466 A80-33415
KEARNEY, D.
End-use matching of solar energy systems
[SERI/TP-34-325] p0335 N80-22848
KEARNEY, D. W.
Solar industrial process heat
p0357 A80-33184
KEDDY, E. S.
High temperature heat pipes for waste heat recovery
[AIAA PAPER 80-1505] p0329 A80-41469
KEENER, H. M.
Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio
p0358 A80-33405
KEISER, J.
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678
KELLER, L. J.
The CFOS (Carbonaceous Fuel-in-Oil Suspensoids) fuels
p0497 N80-26486
KELLER, W. E.
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801
KELLY, B. E.
Evaluation of air cathodes for potential use in development of aluminum-air cells
[UCID-18561] p0535 N80-25893
KELLY, C. M.
Rheological properties of solvent refined coal-oil mixtures
p0495 N80-26471
KELLY, R. M.
How clean gas is made from coal
p0471 A80-36314
KEMP, C. C.
The region of Peel Resource Recovery Plant - Resource recovery and energy from waste in partnership
p0479 A80-42929
KENAN, R. P.
Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems
p0387 A80-33732
KENINA, E. M.
Resistance of titanium alloys AT3 and AT6 to gas-abrasive wear
p0539 A80-39628
KENNEDY, A. S.
Market penetration of new energy systems estimated by econometric and stochastic methodology
[CONF-790852-2] p0346 N80-25207
KENNEDY, F. M.
Evaluation of physical/chemical coal cleaning and flue gas desulfurization
[PB80-147622] p0346 N80-25481
KERN, E. C., JR.
Optimization of photovoltaic/thermal collector heat pump systems
p0387 A80-33737
KERSHAW, J. R.
Chemical nature of coal hydrogenation oils. I - The effect of catalysts
p0467 A80-34532
Chemical nature of coal hydrogenation oils. II - The effect of temperature
p0467 A80-34533
KERWIN, W. J.
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214
KESSELRING, P.
The layout of solar hot water systems, using statistical meteo- and heat demand data
p0369 A80-33562
Measurements of performance and efficiency of solar energy systems
p0381 A80-33667
KESSLER, H. J.
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector
p0366 A80-33530
KESSLER, H. K.
Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects
p0397 A80-35370
KESTIN, J.
Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications
[ASME PAPER 80-PET-83] p0524 A80-43345
KHALEFA, D. A.
Optimum inclination of linear reflectors
p0406 A80-37961
KHALIFA, H. E.
Compound hybrid geothermal-fossil power plants - Thermodynamic analyses and site-specific applications
[ASME PAPER 80-PET-83] p0524 A80-43345
KHALIL, H. F.
Thermo-fluid analysis of a cylindrical solar heat absorber
p0405 A80-37955
KHANTSIS, B. G.
Geometric and kinematic characteristics of solar-tower heliostats
p0391 A80-33857

KHATANOV, P. U.
Test results on solar turbogenerators
p0391 A80-33860

KHOURY, G. A.
The sunship - The case for a solar powered airship
p0413 A80-39288

KILGREN, L. M.
The design and utilization of a microprocessor-controlled absolute spectral response system
p0398 A80-35492

KIM, J. K.
MIS solar cells on crystalline, polycrystal, and thin film silicon
p0385 A80-33722

KINCHI, Y.
Solar powered environment control - Criteria and realization
p0366 A80-33534

KIMURA, H.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

KIMURA, S. G.
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78]
p0499 N80-26669

KING, C. J.
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur
p0325 A80-35880

KING, D. L.
Unfolding concentrator slope errors from reflected-beam measurements
p0377 A80-33636

KING, P. R.
Oil recovery by carbon dioxide injection
[ORO-5301-47]
p0500 N80-26754

KING, R. B.
Photochemical storage of solar energy
p0545 A80-33420
Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system
[SRO-0893-17]
p0558 N80-25869

KING, R. J.
Measurement techniques in thin film polycrystalline materials and devices /solar cells/
p0422 A80-43764

KING, W.
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493

KINGCOMBE, R. C.
Design study for a fuel efficient turbofan engine
[ASME PAPER 80-GT-141]
p0331 A80-42254

KINOSHITA, K.
Advanced fuel cell development
[ANL-79-51]
p0535 N80-25895

KIRCHHOFF, R. H.
Turbulence and WTG performance
p0513 A80-35726

KIRKPATRICK, A. R.
Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361

KIRRMANN, E.
Models for hydrogen gasification of coal - Analysis and significance of methane formation reactions
p0478 A80-42800

KIRSCHNER, C.
Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices
[LA-UR-79-3390]
p0338 N80-23807

KISSEL, G.
Development of fuel cell technology for vehicular applications
[BNL-51047]
p0536 N80-26216

KIZILYALLI, H. M.
MOS solar cells
p0409 A80-37996

KJARTANSSON, E.
Attenuation of seismic waves in rocks and applications in energy exploration
p0488 N80-24909

KLEE, H.
Simulation of the FSEC solar cooling system
p0369 A80-33563

KLEIN, J.
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963]
p0484 N80-24462

KLEIN, S. A.
Prediction of long-term performance of closed-loop concentrating solar collector systems
p0362 A80-33479
Analysis of solar water heating systems
p0370 A80-33574

KLEIN, W. E.
Modified aerospace R&QA method for wind turbines
p0519 A80-40335

KLEINWAECHTER, J.
Water heating by solar energy with plastic collectors
[BMFT-FB-T-79-29]
p0456 N80-26876

KLIER, K.
Methanol and methyl fuel catalysts
[FE-3177-3]
p0482 N80-23402

KLIMAS, P. C.
Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C]
p0535 N80-25897

KLIMOVA, G. I.
Influence of base resistivity on the temperature characteristics of silicon photoconverters
p0514 A80-36590

KLOSTERMAN, E. L.
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117

KNAPP, K. T.
Particulate sulfur and trace metal emissions from oil fired power plants
p0325 A80-35890

KNECHTLI, R. C.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

KNELL, E. W.
Flash pyrolysis coal liquefaction process development
[FE-2244-26]
p0498 N80-26543

KNIGHTLY, W. F.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765]
p0342 N80-24797

KNISELEY, R. N.
An experimental approach for studying direct solar gain optics of model interiors
p0382 A80-33687

KNOEDLER, R.
Some aspects on the self-discharge of LiAl/FeS experimental cells with molten salt electrolyte
p0547 A80-37009

KNUTH, D.
Development of current converters for switching and regulating tasks in energy technology
[BMFT-FB-T-79-12]
p0567 N80-23585

KOBA, IU. V.
Accelerator module of 'Angara-5'
p0516 A80-37815

KOBLISH, T. R.
High temperature combustor designed for operation with coal derived low Btu gaseous fuels
[ASME PAPER 80-GT-187]
p0478 A80-42289

KOCH, H.
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors
[ASSA-FA-10]
p0456 N80-26879

KOCH, V. R.
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-2]
p0454 N80-26845

KOCHIAN, L. V.
Solar energy conversion through biophotolysis
[SAN-0034-239-T1]
p0445 N80-25852

KOCIS, R. A.
Consumer experience with electric vehicles
p0326 A80-37351

KOEHNE, R.
30/50 kWE solar thermal power plant of the distributed type
p0373 A80-33599

KOENIG, A.
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830

KOENIG, A. A.
Design and development of a paraboloidal dish solar collector for intermediate temperature service
p0363 A80-33483

KOENIG, J. C.
Economic and market potential for SRC-II products
p0474 A80-40758

KOESTER, J. K.
Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators
p0519 A80-39746

KOHORN, E.
New England Energy Development Systems center (NEEDS). An experiment in university-industry cooperative research. Volume 1: Summary of results
[PB80-112972] p0567 N80-22862

New England energy development systems center (NEEDS). An experiment in university-industry cooperative research. Volume 2: Case histories
[PB80-112980] p0541 N80-22863

KOIZUMI, H.
New air-heating collector design and performance
p0359 A80-33449

KOKHOVA, I. I.
Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators
p0391 A80-33855

KOLB, C. E.
Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570

KOLOMOETS, N. V.
Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597

KOLTUN, M. M.
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

KOMASHENKO, V. N.
Thin-film and ceramic solar converters based on cadmium sulfide and selenide
p0401 A80-36824

KOMELASKY, M. C.
NOAA's cold-water pipe at-sea test program
p0511 A80-35162

KOMITO, E. H.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

KOMORI, A.
Basic studies on COM combustion
p0497 N80-26484

KONYK, S., JR.
Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems
p0381 A80-33664

KOO, J.
Low pressure gas filling of laser fusion microspheres
p0506 A80-33053

KOO, J. C.
Fabrication of glass sphere laser fusion targets
p0506 A80-33052

KOONTZ, R.
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859

KORDESCH, K. V.
Development of fuel cell technology for vehicular applications
[BNL-51047] p0536 N80-26216

KORSGAARD, V.
Solar energy R & D projects in Denmark
p0323 A80-33437

KOSEV, N. P.
Production of a small nuclear battery
p0505 A80-32957

KOTHARI, L. S.
Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities
p0416 A80-42135

KOURA, N.
A preliminary investigation for an Al/AlCl3-NaCl/FeS2 secondary cell
p0550 A80-42299

KOVACIC, J. E.
Solar collector studies for solar heating and cooling applications
[ALO-5355-T1] p0445 N80-25850

KOVALEV, I. I.
Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

KOVALSKII, L. V.
Maximum refrigerating capacity of thermoelectric cooling devices
p0515 A80-36831

KOYAMA, I.
Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM
p0502 N80-27507

Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM
p0502 N80-27508

KRAFT, C. C., JR.
The solar power satellite concepts: The past decade and the next decade
[NASA-TM-81000] p0541 N80-25360

KRAFT, H.
30/50 kWE solar thermal power plant of the distributed type
p0373 A80-33599

New developments for future solar power plants
p0410 A80-38001

KRAMER, W. H.
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364

KRASILOVSKII, V. I.
Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

KRAUS, E.
Laboratory tests for flat plate solar collectors
p0361 A80-33471

KRAUTER, B. L.
An analytical model of a backwall MIS Schottky barrier solar cell
p0399 A80-36245

KREEB, H.
Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471

KREIDER, J. F.
Medium and high temperature solar processes
p0402 A80-37012

Medium and high temperature solar processes
p0421 A80-43473

KREITER, B. G.
Basic elements in waste treatment operations
p0474 A80-41169

KREITH, F.
Solar collectors for low and intermediate temperature applications
p0392 A80-34598

End-use matching of solar energy systems
[SERI/TP-34-325] p0335 N80-22848

KRESOVICH, S.
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481

KREUZER, H. J.
On the validity of a hydrodynamic description of laser-driven fusion
KRISHNA, C. R. p0515 A80-36726
Atomization of coal slurry jets
KRISHNASWAMY, S. V. p0496 N80-26482
Characterization of commercial black chrome coatings
KRISTIANSEN, M. p0402 A80-37190
International Pulsed Power Conference, 2nd, Lubbock, Tex., June 12-14, 1979, Digest of Technical Papers
KRISTOFFERSON, L. p0547 A80-37811
Solar energy research in Sweden
KRIVOKAPICH, G. p0323 A80-33444
Preliminary operational results from the Willard solar power system
KRUEGER, M. p0436 N80-24794
The bus systems, passenger transit system of the future
KRUGER, P. D. p0324 A80-34067
Honeywell General Offices concentrating collector system - Installation and operation
KRUKOVSKII, P. G. p0370 A80-33567
Determination of the unsteady heat fluxes in the focal plane of a radiant energy concentrator
KRUPKA, M. C. p0414 A80-39785
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098]
KRUSI, P. p0555 N80-23801
Design of an inexpensive solar simulator
KSENDZATSKAIA, IU. M. p0362 A80-33478
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
KUBOTA, M. p0399 A80-36587
Design consideration of fine COM storage
KUCERA, G. H. p0502 N80-27506
Advanced fuel cell development
[ANL-79-51]
KUDRIN, O. I. p0535 N80-25895
Heating characteristics of concentrator/receiver system employing a selective absorbing surface
p0401 A80-36826
Selective radiation absorption as a means of improving efficiency of a high-temperature solar power plant
KUEHLERT, H. F. p0401 A80-36834
Thermal energy storage testing facility
KUEHN, M. p0553 N80-22808
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05]
KUPA, E. N. p0481 N80-22525
Determination of the geometry of the transition region of a series MHD generator
KUGATH, D. A. p0509 A80-34315
Design and development of a paraboloidal dish solar collector for intermediate temperature service
KUHN, J. K. p0363 A80-33483
Developing and upgrading of solar system thermal energy storage simulation models
[BCS-40252]
KULAKOV, V. L. p0430 N80-23858
The efficiency of ballast in composite flywheels
KULCINSKI, G. L. p0549 A80-40068
First wall protection schemes for inertial confinement fusion reactors
p0506 A80-33050
Void growth characteristics in laser fusion reactor first walls
KULESA, F. p0508 A80-33077
Development of fuel cell technology for vehicular applications
[BNL-51047]
KUMAZAWA, S. p0536 N80-26216
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
KUMM, E. L. p0459 A80-33406
Design study of flat belt CVT for electric vehicles
[NASA-CR-159822]
KUNII, D. p0550 N80-22702
Development of a NO/x/-free combustion system
KUNZ, H. R. p0333 A80-43741
Surface area loss of platinum supported on carbon in phosphoric acid electrolyte
p0515 A80-37004
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance
KUO, S. p0522 A80-42295
Electrical nonuniformities in diagonally connected generators
KUO, S. C. p0511 A80-34989
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304]
p0519 A80-39014
The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26]
KURODA, K. p0416 A80-42161
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
KURTZROCK, R. C. p0394 A80-35343
Development of standards for coal-oil mixtures
KURZWEG, U. H. p0494 N80-26465
Class of axisymmetric mirrors with uniform flux concentration properties along their axes
p0414 A80-40473
Characteristics of axicon concentrators for use in photovoltaic energy conversion
p0520 A80-40719
On a class of axisymmetric concentrators with uniform flux concentration for photovoltaic applications
KUSH, E. A. p0421 A80-43485
Experimental performance study of a series solar heat pump
p0368 A80-33552
Series solar heat pump and energy conservation
[BNL-27012]
KUTAL, C. p0340 N80-23857
Photochemical storage of solar energy
KUTAL, C. R. p0545 A80-33420
Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system
[SRO-0893-17]
KUZNETSOV, S. E. p0558 N80-25869
MHD generator of the conduction type with reciprocal motion of the composite working element
KUZNETSOV, V. M. p0509 A80-34313
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587
The utilization of wind-energy resources
p0478 A80-42700

L

LACKEY, M. E.
Summary of the research and development effort on open-cycle coal-fired gas turbines
[ORNL/TM-6253]
p0528 N80-23821

LADELFA, C. J.
A process concept for the production of benzene-ethylene-SNG from coal using flash hydropyrolysis technology
p0467 A80-34531

LADISH, J. S.
Beam simultaneity in multi-terawatt CO2 laser fusion systems
p0517 A80-38483
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
p0517 A80-38484

LAFAIT, J.
Selective electrodeposited chromium black coatings - Optical properties, selectivity model
p0388 A80-33743

LAI, P.-W.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

LAIRD, A. M.
Design of Helios beam diagnostics
p0518 A80-38486

LALLI, V. R.
Photovoltaic power system reliability considerations
p0520 A80-40338

LAM, E. Y.
A solar-fossil hybrid power system using a combined cycle
p0375 A80-33611

LAMANT, D.
Autonomous solar-powered beacon for air navigation use
p0385 A80-33715

LAMB, J. P.
System thermodynamics of energy conversion plants for geopressured resources
[ASME PAPER 80-PET-31] p0524 A80-43342

LAMICH, G.
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628

LAMORTE, M. F.
Cascade solar-cell design for high-temperature operation
p0397 A80-35365
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797

LAMPERT, C. M.
Thermal degradation of a black chrome solar selective absorber coating - Short term
p0387 A80-33739
Metal foils for direct application of absorber coatings on solar collectors
[LBL-9324-REV] p0428 N80-23810

LAMPING, R. K.
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A
[NASA-CR-135119] p0355 N80-27361

LAMSON, K. C.
Potential air quality impact of geothermal power production in the Imperial Valley
[UCRL-52797] p0340 N80-23878

LANCE, J. R.
Safety analysis of an advanced energy system facility
p0520 A80-40337

LANDO, J. L.
Solar powered environment control - Criteria and realization
p0366 A80-33534

LANDSBERG, P. T.
Thermodynamic energy conversion efficiencies
p0525 A80-43590

LANDSTROM, D. K.
Development of a low-temperature, low-cost, black liquid solar collector, phase 2
[ALO-30171-1] p0453 N80-26841

LANG, W. R.
Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612

LANGRIDGE, D.
Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497

LANSING, F. L.
A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector
p0404 A80-37950
High-efficiency solar concentrator
p0405 A80-37953
A thermodynamic analysis of a solar-powered jet refrigeration system
p0407 A80-37978

LAPEDES, D. E.
Solar thermal small power systems study. Phase 2: Study results
[DOE/ET/20516-2] p0440 N80-24855

LARKO, D. E.
Effect of complex terrain on wind fluctuations
p0468 A80-35723

LARSON, D. C.
Optimization of flat-plate collector-flat mirror systems
p0392 A80-33871
Solar elevation angle probability distribution
p0415 A80-40721

LARSON, D. L.
Coolidge solar powered irrigation pumping project
p0436 N80-24792

LARSON, J. W.
Survey of integrated gasification combined cycle power plant performance estimates
[ASME PAPER 80-GT-113] p0477 A80-42231

LATINI, G.
Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography
p0360 A80-33453

LATMANIZOVA, G. M.
Accelerator module of 'Angara-5'
p0516 A80-37815

LAU, A. S.
A manufactured solar home
p0370 A80-33568
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493

LAUER, H. K.
Selection of materials and development of processes for the fabrication of solar reflector panels
p0393 A80-34778

LAVAN, Z.
Cylindrical glass tubes for flat plate collector covers
p0361 A80-33460
The effect of pressure on the performance of cylindrical solar collectors
p0361 A80-33461
Solar operated crossflow desiccant cooling system
p0365 A80-33525
Development of a solar desiccant dehumidifier
p0408 A80-37979

LAVIGNE, R. G.
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669

LAWAND, T. A.
The potential of renewable energies in planning the development of rural areas
p0419 A80-42453

LAWHON, W. T.
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481

LAWRENCE, G.
LOTS analysis of optical diffraction in Antares
p0518 A80-38490

Applications of the laser optical train
simulations /LOTS/ computer code to laser fusion
systems and other physical optics problems
LAWRENCE, K. p0518 A80-38491
Environmental assessment of small wind systems
[SERI/PR-354-420]
LAWSON, C. C. p0350 N80-25928
High-temperature turbine technology program
low-Btu gas, low-temperature chemical cleanup
pilot plant: Design, construction, startup, and
operation
[FE-1806-78]
LAWSON, H. O. p0499 N80-26669
Electrofluid dynamic wind generator
[COO-4130-2]
LAZZARIN, R. p0531 N80-24811
Experimental study on flow distribution in
channels of flat-plate solar collectors using
I.R. thermography
p0360 A80-33453
Experimental comparison between solar assisted
compression and absorption heat pump
p0367 A80-33537
Comparison between two absorption cooling systems
of the 'open' type under different climate
conditions

LAZZARIN, R. M. p0407 A80-37976
Experimental investigation on control modes for an
absorption chiller of low capacity
LE GALL, J. p0366 A80-33532
H2 production from water - Use of natural and
synthetic catalysts for the bioconversion of
solar energy

LE QUERE, P. p0459 A80-33407
Three-dimensional numerical evaluation of heat
loss through natural convection in a solar boiler
LE, N. T. p0413 A80-38274
A comparative study of solar assisted heat pump
systems for Canadian locations

LEAHY, M. L. p0367 A80-33546
Potential of energy farming for transport fuels in
New Zealand
[NZERDC-46]
p0489 N80-25456
Potential of energy farming for transport fuels in
New Zealand, appendices
[NZERDC-46-APP]
LEARY, P. L. p0489 N80-25457
Comparison between results of the HELIOS and
MIRVAL computer codes applied to central
receiver solar-energy collection
[SAND-79-8266]
LEAVITT, A. A. p0448 N80-26075
Engineering evaluation of conceptual coal
conversion plant using the H-coal liquefaction
process
[EPRI-AF-1297]
LEBOEUF, C. M. p0498 N80-26530
SOLPOND: A simulation program for salinity
gradient solar ponds
[SERI/TP-351-559]
p0430 N80-23856
Standard assumptions and methods for solar heating
and cooling systems analysis
[SERI/TP-351-548]
LEDBETTER, C. W. p0440 N80-24862
Earth coils and geo-thermal wells used as solar
energy storage devices

LEE, C. p0368 A80-33549
Solor Applications of Thermal Energy Storage
[TID-29430]
p0427 N80-23791
Market penetration of new energy systems estimated
by econometric and stochastic methodology
[CONF-790852-2]
LEE, C. K. p0346 N80-25207
Flash pyrolysis coal liquefaction process
development
[FE-2244-26]
LEE, C. L. p0498 N80-26543
Development of improved insulation materials
[ALO-4295-T2]
p0448 N80-26403

LEE, J.
Solar energy systems: Test methods for collector
insulations
[PB80-132038]
LEE, J. C. p0430 N80-23867
Closed-cycle gas turbine working fluids
[ASME PAPER 80-GT-135]
p0522 A80-42248
Low-cost solar antireflection coatings
[ALO-5300-T2]
LEE, L. K. p0453 N80-26844
Coal-oil mixture combustion applied to Canadian
utility boilers

LEE, P. p0501 N80-27498
Three-dimensional reconstruction of the X-ray
emission in laser imploded targets

LEE, S.-C. p0510 A80-34749
'Band readjustment' effect with applications to
solar cells

LEE, T. R. p0397 A80-35367
Energy self-sufficiency in monsoonal Australia
LEE, Y. T. p0323 A80-33433
Deposition and characterization of gallium
arsenide films for solar cells applications
LEE, Y. Y. p0394 A80-35338
Xylose recovery from hemicellulose by selective
acid hydrolysis

LEFEBVRE, J. p0466 A80-33417
Guide for energy compatibility
[NP-24016]
LEFFINGWELL, J. W. p0353 N80-26833
Low-cost mirror concentrator based on
double-walled metallized, Tubular films
[ALO-4227-12]
p0428 N80-23811
Non-Concentrating collectors for solar heating
applications (medium temperature air heaters
based on durable transparent films)
[ALO-4147-T1]
LEFROIS, R. T. p0429 N80-23817
Active heat exchange system development for latent
heat thermal energy storage

LEGRIVES, E. p0553 N80-22819
An open cycle turbine solar thermal power system
LEHMAN, S. J. p0448 N80-26257
Coal gasification/repowering - A means of
increasing plant capacity while reducing oil
consumption
[ASME PAPER 80-GT-161]
LEHOVEC, K. p0477 A80-42271
Scanning light spot analysis of faulty solar cells
LEIPOLD, M. H. p0420 A80-43118
Cost of Czochralski wafers as a function of diameter
[NASA-CR-163277]
LEMPICKI, A. p0449 N80-26771
Development of materials for a luminescent solar
collector
[COO-4996-1]
LENZ, T. G. p0443 N80-25812
Solar energy collection using the reversible
ammonia dissociation reaction

p0358 A80-33427
Moderate temperature solar thermochemical systems
- An application of Diels-Alder chemistry
LEONARD, S. L. p0359 A80-33430
Central station applications planning activities
and supporting studies
[NASA-CR-163042]
LERNER, E. J. p0352 N80-26784
Superconductivity - Will its potential be realized
LESCHLY, K. O. p0539 A80-32717
Hybrid vehicle potential assessment. Volume 7:
Hybrid vehicle review
[NASA-CR-163298]
LESLIE, J. D. p0563 N80-27231
Solar energy conversion: An introductory course;
Course, 5th, University of Waterloo, Waterloo,
Ontario, Canada, August 6-19, 1978, Selected
Lectures

p0416 A80-42435

LESSARD, R. D.
Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188] p0555 N80-23796

LETHAN, C. D.
Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497

LEVEN, H.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

LEVI, E.
Electrical nonuniformities in diagonally connected generators
p0511 A80-34989

LEVIN, R. R.
The JPL isolated application experiment series
p0435 N80-24784

LEVINE, M. D.
Evaluation of residential building energy performance standards
[LBL-9816] p0348 N80-25849

LEVY, S. L.
An optimization procedure for solar thermal electric power plant design
p0376 A80-33625

LEWIS, A. E.
Oil from shale - The potential, the problems, and a plan for development
p0325 A80-36053

LEWIS, G. C.
Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility
p0378 A80-33642

LEWIS, H. E.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528

LEWIS, T. T.
User perspectives of selected solar energy system design tools
p0369 A80-33564

LI, C. H.
Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system
p0358 A80-33426

LI, K.-Y.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

LI, S. S.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

LI, V. V.
Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
p0391 A80-33859
Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594

LIBERMAN, I.
Optical performance of the Gemini carbon dioxide laser fusion system
p0517 A80-38482

LICHTIN, N. N.
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
[COO-2889-5] p0447 N80-25886

LIEBELT, K. H.
A manufactured solar home
p0370 A80-33568

LIEN, R. H.
Flue gas desulfurization by the modified citrate process: Report of investigations
[PB80-134836] p0351 N80-25940

LIEN, S.
Light-dependent hydrogen production by C. reinhardi
p0459 A80-33410
Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477

LIETZKE, A. F.
Tests of high-powered direct conversion on beams and plasma
[UCRL-82852] p0532 N80-25161

LIHACH, N.
MHD direct channel from heat to electricity
p0512 A80-35403

LIMBAUGH, H. L.
Xylose recovery from hemicellulose by selective acid hydrolysis
p0466 A80-33417

LIN, C. P.
Thermal energy storage testing facility
p0553 N80-22808

LIN, D. J. L., P.E.
Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan
p0496 N80-26480

LIN, E. I. H.
Effects of baffles on thermal stratification in themocline storage tanks
p0365 A80-33509

LIN, J. S.
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

LIN, R. J. H.
Low-cost solar antireflection coatings
[ALO-5300-T2] p0453 N80-26844

LIND, M. A.
Properties of low cost, high volume glasses
p0414 A80-39937
Solar reflector materials
[PNL-SA-7698] p0430 N80-23859

LINDAHL, B. C.
Industrial AFB-fired gas turbine systems with topping combustors
[ASME PAPER 80-GT-163] p0332 A80-42273

LINDEN, D.
The lithium-sulfur dioxide primary battery - Its characteristics, performance and applications
p0549 A80-40601

LINDGREN, E. R.
Longitudinal baffling in Faraday generators
p0505 A80-32743

LINDHOLM, F. A.
Theory of grain-boundary and intragrain recombination currents in polysilicon p-n-junction solar cells
p0395 A80-35346

LINDSEY, W. C.
SPS phase control system performance via analytical simulation
[NASA-CR-160582] p0540 N80-22378

LINDSTROM, H. B.
Use of transformers in producing high-power output from homopolar generators
p0516 A80-37825

LINTZ, A. T.
Advanced propulsion system for hybrid vehicles
[NASA-CR-159771] p0561 N80-26212

LIPINSKY, E. S.
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481
Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass
[BMI-2031-VOL-2] p0341 N80-24475

LIPMAN, N. H.
Fluctuations in output from wind turbine clusters
p0520 A80-41032

LIPPS, F. W.
A numerical approach to the flux density integral for reflected sunlight
p0377 A80-33632

LIPSCHUTZ, R. C.
Effect of complex terrain on wind fluctuations
p0468 A80-35723

LISTER, E.
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69] p0476 A80-42199

LITZ, B. C.
Retrofit sun room thermal performance based on the typical meteorological year weather data p0384 A80-33710

LIU, C.-H. J.
Properties of photoelectrochemical cells with a chemically sprayed photoanode p0398 A80-35474

LIU, S. T.
Experimental system performance and comparison with computer predictions for six solar domestic hot water systems p0370 A80-33577

LIUBIMOV, G. A.
Effect of current constriction at electrodes on MHD generator characteristics p0513 A80-35685
An arc discharge model on electrodes of an MHD generator p0524 A80-43397

LOAR, J. M.
Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites [CONF-791056-2] p0345 N80-24885

LOCKE, P.
A 20 kW photovoltaic flat panel power system in El Paso, Texas p0385 A80-33716

LOEF, G. O. G.
Comparative performance of two types of evacuated tubular solar collectors in a residential heating and cooling system [COO-2577-19] p0446 N80-25864

LOF, G. O. G.
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report p0370 A80-33571
Cooling system parameter analysis p0376 A80-33622
Solar collectors for low and intermediate temperature applications p0392 A80-34598
Solar air systems p0418 A80-42444

LOFERSKI, J. J.
Single-crystal solar cell heterojunctions involving N-cadmium sulfide p0413 A80-39061
Current from the sun - A look at the economics of solar cells p0416 A80-42101

LOKMANHEKIM, A. H.
Evaluation of residential building energy performance standards [LBL-9816] p0348 N80-25849

LONG, R. H.
Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979 [FE-2514-M4] p0490 N80-25471

LOO, R. Y.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells p0397 A80-35369

LOPEZ, A. M.
Process steam generation by a facetted, non-imaging solar concentrator p0378 A80-33639

LOPEZ, S.
Research and development on solar energy for electric and mechanical power generation p0373 A80-33601

LORD, N.
Solar thermal repowering: Utility/industry market potential in the Southwest [MTR-7919] p0439 N80-24836

LORENZ, J.
New developments for future solar power plants p0410 A80-38001

LORENZO, E.
Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications p0364 A80-33500
The Ramon Areces concentration photovoltaic array p0384 A80-33714
Connection losses in photovoltaic arrays p0387 A80-33734

LOSCUTOFF, W. V.
Compressed air energy storage technology program in the United States [PNL-SA-7669] p0557 N80-24840

LOU, D. Y. S.
Some aspects of energy storage systems using Glauber salt mixtures p0548 A80-37967

LOVE, T. J.
Determination of the extinction coefficient of glass fiber insulation [AIAA PAPER 80-1528] p0330 A80-41488

LOVELL, H. L.
Characteristics of American coals in relation to their conversion into clean energy fuels [FE-2030-13] p0485 N80-24476

LOWE, E. P.
Manufacturing methods of a composite cell case for a Ni-Cd battery p0546 A80-34777

LOWY, D. N.
On the validity of a hydrodynamic description of laser-driven fusion p0515 A80-36726

LOYD, M. L.
Crosswind kite power p0523 A80-43139

LOZOVSKII, V. N.
High-voltage multijunction solar-energy photoelectric converter p0401 A80-36830

LUCARELLI, F. B.
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2 [LBL-10098] p0353 N80-26817

LUCIFREDI, A.
Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers p0363 A80-33489

LUCKIE, P. T.
Grinding of coal in oil p0494 N80-26462

LUDWICK, J. D.
Air quality measurements in the coal fired power plant environment of Colstrip, Montana p0326 A80-36477

LUKA, R.
Burning refuse-derived fuel - 'The Woodstock experience' p0479 A80-42928

LUKANZ, W.
Development of current converters for switching and regulating tasks in energy technology [BMFT-FB-T-79-12] p0567 N80-23585

LUMSDAINE, E.
A 500 gallons per day hybrid desalination plant using wind/solar energy p0382 A80-33682

LUNBERG, W. L.
Applications of thermal energy storage to waste heat recovery in the food processing industry p0552 N80-22796

LUNDBERG, L. B.
Silicon carbide-tungsten heat pipes for high-temperature service p0327 A80-37680

LUPTON, W. H.
Use of transformers in producing high-power output from homopolar generators p0516 A80-37825
TRIDENT - A megavolt pulse generator using inductive energy storage p0548 A80-37857

LUQUE, A.
The Ramon Areces concentration photovoltaic array p0384 A80-33714
Quasi-static concentrated array with double side illuminated solar cells p0386 A80-33727
Connection losses in photovoltaic arrays p0387 A80-33734
Quasi-optimum pseudo-Lambertian reflecting concentrators - An analysis p0421 A80-43367

LUSH, D. M.
Monitoring solar heated houses in the European community - Procedures, results and future activities
p0381 A80-33671

LUTWACK, R.
Silicon material task - Low cost solar array project /JPL/DOE/
p0393 A80-34780
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

LYDON, R. T.
A method for balancing flow rates in rows of parallel collectors
p0362 A80-33476

LYNN, D. K.
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214

LYNN, S.
Solar-heated gas-turbine process using sulfur oxides for power production and energy storage
[LBL-9472] p0424 N80-22839
Sensible heat storage for a solar thermal power plant
[LBL-9321] p0437 N80-24816

LYON, E. P.
A 100 kW peak photovoltaic power system for the Natural Bridges National Monument
p0384 A80-33713

M

MA, F. S.
Interfacing dispersed solar and wind systems with electric distribution systems
p0539 A80-33756

MABE, N. B.
Economic baselines for current underground coal mining technology
[NASA-CR-163259] p0491 N80-25764

MABES, T. W., SR.
Handling coal oil mixtures with positive displacement pumps
p0494 N80-26463

MACCHI, E.
The Ansaldo 35 kW solar power system
p0373 A80-33600
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680

MACCIO, C.
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680

MACDONALD, K. A. B.
New Technology Transport for fuel critical economy
p0328 A80-40313

MACEDO, I. C.
End use energy in Brazil and the solar technologies
p0472 A80-38016

MACGREGOR, A. W. K.
An experimental investigation into the effect of plate thermal capacity on the performance of solar water heating systems
p0360 A80-33452
Solar-cladding - Insulation plus insolation
p0384 A80-33708

MACIE, T. W.
Traction studies of northeast corridor rail passenger service: Executive summary
[NASA-CR-162997] p0336 N80-23214

MACKAY, K. T.
Solar energy at the P.E.I. Ark
p0420 A80-42471

MACLEAN, C.
Fluctuations in output from wind turbine clusters
p0520 A80-41032

MADDALONE, R.
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems
[PB80-138464] p0351 N80-25947

MADDOX, J. D.
Assessment of solar hybrid repowering for electric utilities
p0375 A80-33612

MAEDA, H.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

MAEKAWA, T.
Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434

MAGNOLI, D.
Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system
p0406 A80-37970

MAGRINO, T.
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

MAHON, D.
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

MAISH, A. B.
Experimental and theoretical evaluation of a novel concentrating solar energy collection system
p0364 A80-33495

MAIZZA, V.
Organic Rankine-cycle turbine power plant utilizing low temperature heat sources
[ASME PAPER 80-GT-153] p0522 A80-42265

MAJA, M.
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211

MALEVSKII, IU. M.
Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators
p0391 A80-33855

MALIK, A. I.
Improved model of In2O3/SnO2-SiO/x/-nSi solar cells
p0391 A80-33854

MALONE, M.
Solar thermal repowering utility value analysis
[SERI/TR-8016-1] p0428 N80-23814

MALONEY, J.
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693

MAMANE, Y.
Mechanisms and rates of formation of sulfur aerosols in power plant plumes
p0354 N80-26907

MANASSE, F. K.
A novel mildly concentrating photovoltaic/thermal total energy system
p0386 A80-33729
Comparison of costs for solar derived electrical sources with diesel generators in remote locations
p0389 A80-33751

MANASSON, V. A.
Improved model of In2O3/SnO2-SiO/x/-nSi solar cells
p0391 A80-33854

MANDERSON, G.
Pellets of immobilized yeast cells as biocatalysts for transforming biomass
p0466 A80-33414

MANELAS, A. J.
A novel mildly concentrating photovoltaic/thermal total energy system
p0386 A80-33729

MANHEIMER, W. M.
Electron cyclotron heating of tokamaks
p0511 A80-34973

MANNER, A. R.
Mass transport in molten-salt electrochemical systems
[ORNL/MIT-290] p0527 N80-23400

MANNING, G.
Utility system planning effects on the economic merit of advanced combined cycle power systems
[ASME PAPER 80-GT-105] p0331 A80-42227

MANNING, G. B.
Development of a high temperature turbine for operation on coal-derived fuel
[ASME PAPER 80-GT-188] p0478 A80-42290

MANNING, I.
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A
[NASA-CR-135119] p0355 N80-27361

MANRIQUE, J. A.
The effect of a black chrome selective surface on the thermal performance of a solar collector
p0414 A80-40538

MANSON, S. V.
Satellite Power Systems /SPS/ - Overview of system studies and critical technology
[AAS PAPER 80-084] p0540 A80-41898

MANWELL, J. F.
A design procedure for wind powered heating systems
p0509 A80-33776

MARCHENKO, A. I.
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591
Thin-film and ceramic solar converters based on cadmium sulfide and selenide
p0401 A80-36824

MARCHETTO, M.
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211

MARDESICH, N.
High resolution, low cost solar cell contact development
[NASA-CR-163289] p0450 N80-26782

MARFAING, Y.
Physics and economics of photovoltaic solar energy conversion
p0408 A80-37990

MARGIOTTA, R. A.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866

MARGOLIS, J. W.
Solar technology application to enhanced oil recovery
[SERI/TR-352-392] p0445 N80-25839

MARIAU, F.
Conceptual design of integrated energy storage and attitude control system
p0547 A80-37455

MARIE, J. P.
French programs of research and experimentation aiming at the development of solar energy in buildings
p0359 A80-33439

MARINCIC, N.
Abusive testing of large Li/SOCl2 cells
p0549 A80-40603

MARINOV, M. G.
Production of a small nuclear battery
p0505 A80-32957

MARKIEWICZ, W. D.
Magnet optimization for pulsed energy conversion
p0517 A80-37871

MARKMAN, M. A.
Calculation of the angular error of a solar cylindrical concentrator made from sheet material
p0391 A80-33856
Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597

MARKSBERRY, C. L.
Industrial AFB-fired gas turbine systems with topping combustors
[ASME PAPER 80-GT-163] p0332 A80-42273

MARLOW, B. J.
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467

MARRA, J. F.
Latent heat energy storage using direct contact heat transfer
p0546 A80-33519

MARRABLE, W. C.
Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710

MARRIOTT, A.
Solar thermal power systems point-focusing thermal and electric applications projects. Volume 1: Executive summary
[NASA-CR-163147] p0432 N80-24750

MARRIOTT, A. T.
The Point-Focusing Thermal and Electric Applications Project - A progress report
p0372 A80-33595

MARSHALL, B.
Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility
p0380 A80-33655

MARSTON, C. H.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

MARTIN, D. A.
Flue gas desulfurization by the modified citrate process: Report of investigations
[PB80-134836] p0351 N80-25940

MARTIN, J.
Subcontracted activities related to TES for building heating and cooling
p0553 N80-22807

MARTIN, L.
Application of magnetic suspensions and fluid film bearings to energy storage flywheels
[SAND-79-7007] p0556 N80-23824

MARTIN, L. R.
Use of solar energy to reduce carbon dioxide
p0403 A80-37302

MARTIN, P.
Filtration process and equipment studies for coal liquefaction processes
[FE-2007-T1] p0487 N80-24499

MARTIN, R. J.
Utilization of natural/passive energy systems in a University Office/Teaching Laboratory Building
p0383 A80-33691

MARTIN, T. H.
Pulsed power for fusion
p0516 A80-37812

MARTINDALE, W. R.
A new and simple method for estimating the monthly and yearly performance of passive solar systems
p0383 A80-33697

MARTINEZ-SANCHEZ, M.
Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570

MARTONE, J. A.
Fuel character effects on J79 and F101 engine combustor emissions
[ASME PAPER 80-GT-70] p0476 A80-42200

MARUSAK, T.
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787

MARUSKA, H. P.
Thin film polycrystalline silicon solar cells
[DOE/SF/23047-3] p0452 N80-26828

MASON, H. B.
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace
p0325 A80-35879

MASON, J.
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks
p0545 A80-33510

MASUD, A.
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716

MATHEWS, L. K.
Helios and reconcentrators
p0378 A80-33637

MATHIPRAKASAM, B.
Solar operated crossflow desiccant cooling system
p0365 A80-33525
Development of a solar desiccant dehumidifier
p0408 A80-37979

MATHUR, A. K.
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216

MATHUR, H. B.
Ethanol, a clean burning bio-solar fuel - Its production and utilization
p0472 A80-37986

MATHUR, M. P.
Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504

MATHUR, S. S.
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces
p0388 A80-33746
Concentration characteristics of composite parabolic concentrators
p0416 A80-41950

MATSSON, L. O.
Solar Heating '85 - Sweden's national solar heating program
p0323 A80-33443

MATSUBARA, S.
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343

MATSUDA, K.
A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/
p0392 A80-34561

MATSUDA, T.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

MATSUI, K.
New air-heating collector design and performance
p0359 A80-33449

MATSUMOTO, H.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439
Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898

MATTAS, R. F.
Evaluation of materials for EPR power generation
p0507 A80-33058

MATTHEI, K. W.
Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361

MATTHEWS, L.
Testing procedures and test results for the EPRI/Boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility
p0380 A80-33655

MATTOX, D. L.
Evaluation of heat transfer enhancement in air-heating collectors
[ALO-5352-T1] p0454 N80-26848

MATTOX, D. M.
Preparation of thin films for solar energy utilization
p0402 A80-37191
Coatings for fusion reactor environments
p0525 A80-43517

MAUK, C. E.
Solar energy with chemical storage for cogeneration of electric power and heat
p0549 A80-40715

MAULDIN, G. L.
High intensity mass algae culture requirements and limitations
p0358 A80-33408

MAULE, P. A.
Remote sensing applications to wind power facility siting
p0470 A80-35746

MAURIZIO, A.
Solor Cell Heterojunctions Involving N-cadmium sulfide and certain P-type semiconductor single crystals
p0426 N80-23766

MAVEC, J. A.
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866
Evaluation of reliability of operational solar-energy systems
[CONF-791105-2] p0446 N80-25872

MAXWELL, C. D.
Open-cycle MHD systems analysis
[EPRI-AP-1230] p0538 N80-27192

MAXWELL, H.
Glass fiber reinforced concrete for terrestrial photovoltaic arrays
p0393 A80-34782

MAYE, J.-P.
Dynamic model of a mixed /sensible plus latent/ low-temperature thermal storage system
p0545 A80-33511

MAYERS, H. F.
Cost and price estimate of Brayton and Stirling engines in selected production volumes
[NASA-CR-163265] p0536 N80-26769

MCBREEN, J.
Development of fuel cell technology for vehicular applications
[BNL-51047] p0536 N80-26216

MCBRIDE, C.
Light-dependent hydrogen production by C. reinhardi
p0459 A80-33410

MCCABE, J.
Application of thermal energy storage to process heat recovery in the aluminum industry
p0553 N80-22809

MCCANDLESS, F. P.
Catalytic hydrogenation for coal-derived liquids
[FE-2034-16] p0486 N80-24488
Catalytic hydrogenation of coal-derived liquids
[FE-2034-17] p0489 N80-25398

MCCARTHY, L.
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830

MCCLANATHAN, L.
Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant
[AD-A082756] p0492 N80-25797

MCCLELLAND, J. F.
An experimental approach for studying direct solar gain optics of model interiors
p0382 A80-33687

MCCLENAHAN, J. D.
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900

MCCLENDON, R. W.
Addition of inexpensive solar air-heaters to a pre-engineered metal building
[ALO-4086-1] p0452 N80-26818

MCCLURE, T. A.
Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass
[BMI-2031-VOL-2] p0341 N80-24475

MCCOLLUM, B. C.
Development of materials for a luminescent solar collector
[COO-4996-1] p0443 N80-25812

MCCORMICK, J. B.
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214

MCCORMICK, J. R.
Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385

MCCORMICK, P. G.
Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497

MCCREARY, S. T.
Land use and environmental impacts of decentralized solar energy use
[DOE/EV-0067] p0458 N80-27843

MCCULLOCH, W. H.
Midtemperature Solar Systems Test Facility /MSSTF/ system test results, winter season
p0363 A80-33488

MCCULLOUGH, M.
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830

MCDANAL, A. J.
Optical analysis of paraboloidal concentrators with secondary reflectors
p0377 A80-33630

MCDONALD, B.
The lithium-sulfur dioxide primary battery - Its characteristics, performance and applications
p0549 A80-40601

MCDONALD, C. F.
Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources
[GA-A-15322] p0335 N80-22837

MCDONALD, G.
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
p0399 A80-35500

MCDONNELL, M.
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213

MCDOWELL, J. F.
The DOE photovoltaic concentrator project
p0386 A80-33730

MCDOWELL, J. H.
A data analysis program for collector testing
p0362 A80-33482

MCELIGOT, D. M.
Forced convection in solar collectors
p0360 A80-33455

MCELROY, A. D.
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2] p0498 N80-26533

MCEWEN, L. B., JR.
Industrial compressed air applications for solar energy conversion/storage devices
[SAND-79-7077] p0451 N80-26802

MCFARLAND, R.
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

MCFARLAND, R. D.
Hybrid active-passive designs - Synergy or conflict
p0383 A80-33689

MCGARITY, A. E.
Solar heating simulation - Accuracy and precision of a model using daily data
p0369 A80-33561

MCGINNISS, V. D.
Development of a low-temperature, low-cost, black liquid solar collector, phase 2
[ALO-30171-1] p0453 N80-26841

MCGOWAN, J. G.
A design procedure for wind powered heating systems
p0509 A80-33776

MCGRATH, L. J.
Redesign of windmill towers - A cost reduction study
p0467 A80-33772

MCHALE, E. T.
Development and evaluation of highly-loaded coal slurries
p0496 N80-26481

MCHARDY, J.
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1] p0534 N80-25891

MCINTIRE, W.
Applications of CPC's in solar energy - An overview
p0364 A80-33501
Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638
Absorption enhancement in solar collectors by multiple reflections
p0403 A80-37306

MCINTIRE, W. R.
Optimization of stationary nonimaging reflectors for tubular evacuated receivers aligned north-south
p0392 A80-33867

MCINTOSH, M. J.
Experimental and process design study of a high rate entrained coal gasification process
[FE-1548-T2] p0487 N80-24501

MCKELVEY, W. D.
Low-cost, high-performance solar selective paint coatings
p0393 A80-34781

MCKENZIE, D. R.
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system
p0388 A80-33742

MCKIBBEN, C. K.
Nitrogen fertilizer production by solar energy
p0357 A80-33402

MCKOWN, M. M.
Research to identify components of energy-related wastes: A state-of-the-art report
[PB80-137961] p0351 N80-25943

MCMULLIN, P. G.
Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385

MCNEESE, L. E.
Fossil energy program
[ORNL/TM-7144] p0484 N80-23828

MCNERNEY, A. J.
Load excitation at the superconducting cable test facility
[BNL-26641] p0540 N80-22608

MCPARTLAND, R. J.
A low-high-junction solar-cell model developed for use in tandem cell analysis
p0420 A80-43122

MCQUAID, J. H.
Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons
[UCRL-83317] p0337 N80-23629

MCSHANCE, M. T.
Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AF-884] p0497 N80-26529

MCVEIGH, J.
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1] p0534 N80-25891

MEAGHER, P. C.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535

MEAKIN, J. D.
Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells
p0385 A80-33720
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339
The design and fabrication of high efficiency thin film CdS/Cu2S solar cells
p0422 A80-43516

MEDIN, S. A.
Determination of the geometry of the transition region of a series MHD generator
p0509 A80-34315

MEDVEDEVA, L. M.
Multielement silicon photoelectric converters for investigating the optical and energy characteristics of solar and radiant energy concentrators
p0401 A80-36822

MEEKER, F.
State options in lighting: Efficiency standards for existing public buildings
[DOE/CS-5255/2] p0352 N80-26600

MEHTA, K. H.
Cost and performance evaluation of passive solar systems
p0389 A80-33755

MEI, V.
Solar operated crossflow desiccant cooling system
p0365 A80-33525

MEIER, R. W.
Technology assessment of wind energy conversion systems
[LA-8044-TASE] p0527 N80-22840
MEIXNER, E.
Further development of seismic methods: Three-dimensional velocity determinations
[BMFT-FB-T-79-19] p0484 N80-23925
MELEHY, M. A.
On direct conversion of sunlight to electricity
p0409 A80-37994
MELSHEIMER, S. S.
Latent heat energy storage using direct contact heat transfer
p0546 A80-33519
MENDELSOHN, M.
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628
MENEZES, S.
Metal filmed-semiconductor photoelectrochemical cells
p0515 A80-37006
MERGES, V.
Development and preparation for series production of a modular solar space heating system, phases 1 and 2
[BMFT-FB-T-79-02] p0424 N80-22857
MERIGOUX, J. M.
Solar power units with screw expanders
p0410 A80-38000
MERONEY, R. N.
WECS site screening by physical modeling
p0514 A80-35748
MERRICK, D.
Preliminary evaluation of coal-fired fluid bed combustion-augmented compressed air energy storage power plants
[ASME PAPER 80-GT-160] p0550 A80-42270
MERRIGAN, M. A.
High temperature heat pipes for waste heat recovery
[AIAA PAPER 80-1505] p0329 A80-41469
MERSON, T. J.
Technology assessment of wind energy conversion systems
[LA-8044-TASE] p0527 N80-22840
MESECAR, R.
Exposure: A newsletter for ocean technologists, volume 8, no. 1
[AD-A083941] p0562 N80-26865
MESSIER, R.
Characterization of commercial black chrome coatings
p0402 A80-37190
METH, M.
Load excitation at the superconducting cable test facility
[BNL-26641] p0540 N80-22608
METZ, P. D.
Experimental results from the solar ground coupling research facility at Brookhaven National Laboratory
p0545 A80-33513
Computer simulation of ground coupled storage in a series solar assisted heat pump system
p0368 A80-33547
MEUNIER, F.
Solar cooling through cycles using microporous solid adsorbents
p0365 A80-33526
On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings
p0367 A80-33538
MEUNIER, R. E.
International development assistance for renewable technologies - Current programs and institutional requirements
p0323 A80-33672
MEYER, B. A.
Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors
p0405 A80-37957
MEYER, C. F.
Evaluation of thermal energy storage for the proposed Twin Cities District Heating system
p0553 N80-22815
MEYER, R. H.
Coal gasification/repowering - A means of increasing plant capacity while reducing oil consumption
[ASME PAPER 80-GT-161] p0477 A80-42271
MEYER, R. T.
Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000
[LA-UR-79-2812] p0338 N80-23820
MEYER, W. C.
Stabilization of coal/fuel oil slurries
p0495 N80-26474
MICHALAK, J. L.
Solar energy systems: Standards for rubber hose
[PB80-129828] p0430 N80-23868
MICHELS, T.
Solar energy utilization
p0393 A80-34841
MICKELSON, J. L., JR.
Economic aspects of passive solar remodeling in existing buildings
p0383 A80-33692
MIDDLEBROOK, R. D.
Microprocessor-controlled digital shunt regulator
p0505 A80-32758
MIGAKI, H.
Report on fine COM combustion test
p0497 N80-26485
MIGLIORE, P. G.
Vertical axis wind turbine development: Executive summary
[ORO-5135-77-5-SUMM] p0529 N80-23845
Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846
MIKESELL, R. D.
Conversion of biomass materials into gaseous products. Operation of the POU
[SAN-1241-3] p0490 N80-25466
MILEVSKAIA, N. G.
Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597
MILLAR, J. H.
Industrial solar energy activity in Monaco
p0359 A80-33440
MILLER, B.
Metal filmed-semiconductor photoelectrochemical cells
p0515 A80-37006
MILLER, D. L.
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368
Development of polycrystal GaAs solar cells
[DSE-4042-T28] p0452 N80-2681
MILLER, D. W.
Environmental testing of solar reflector structures
p0363 A80-33487
MILLER, F. A., III
Design of a monitoring program for ash pond effluents
[PB80-128457] p0345 N80-24896
MILLER, F. Q.
Solar array subsystems study
[NASA-CR-159857] p0431 N80-24742
MILLER, G. A.
Oil shales and carbon dioxide
p0467 A80-34539
MILLER, J. L.
Open-cycle MHD systems analysis
[EPRI-AP-1230] p0538 N80-27192
MILLER, J. R.
Cryogenic laser fusion target material design considerations
p0506 A80-33055
MILLER, P.
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059
MILLER, R. W.
Development of a second-generation concentrating tracking solar collector
[ASE-4371] p0438 N80-24828
MILLER, S. F.
Utilization of cellulosic feedstock in the production of fuel grade ethanol
p0472 A80-37679

MILLS, D. R.
A stationary prism concentrator for solar cells
p0365 A80-33504

MILLS, J. B.
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868

MINAGAWA, S.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0328 A80-38366

MINAMI, T.
Glassy electrolyte galvanic cells
p0515 A80-37008

MINARDI, J. E.
Electrofluid dynamic wind generator
[COO-4130-2] p0531 N80-24811

MINERBO, G. N.
Three-dimensional reconstruction of the X-ray emission in laser imploded targets
p0510 A80-34749

MINNUCCI, J. A.
Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361
Development of pulsed processes for the manufacture of solar cells
[NASA-CR-153188] p0427 N80-23771

MINOR, J. E.
Seasonal Thermal Energy Storage Program
p0551 N80-22789

MINTZER, I.
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892

MIRZABAEV, M. M.
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588

MISCHLER, B.
Solar cooling through cycles using microporous solid adsorbents
p0365 A80-33526
On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings
p0367 A80-33538

MISKELL, J. T.
In-situ gasification and liquefaction show promise
p0473 A80-40525

MISRA, B.
Evaluation of materials for EPR power generation
p0507 A80-33058

MISRA, R. N.
Computer simulation for optimization of solar energy storage and utilization for crop drying in Ohio
p0358 A80-33405

MITARAI, O.
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649

MITCHELL, J. W.
Open-cycle solar air conditioner
p0365 A80-33524
A design method for parallel solar-heat pump systems
p0367 A80-33542
Comparison of measured and predicted rock bed storage performance
p0546 A80-33870
Interferometric investigations of convection in slat, flat plate and vee-corrugated solar collectors
p0405 A80-37957

MITSUI, A.
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
p0459 A80-33406

MIYAGAWA, T.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0328 A80-38366

MIYAHARA, A.
Comparative study of energy accounting for heavy ion fusion with various driver accelerators
[IPPJ-454] p0538 N80-28195

MIYAKE, J.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0328 A80-38366

MIYAMOTO, K.
Plasma physics for nuclear fusion
p0474 A80-40826
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

MOBARAK, A.
Turbine selection for small capacity solar-power generation
p0410 A80-38004

MODELLI, A.
Development of 1pKW photovoltaic module with concentration
p0386 A80-33728

MOELLER, L.
Performance study of an OTEC system
p0521 A80-41949

MOHTADI, M.
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525

MOIR, R. W.
Tests of high-powered direct conversion on beams and plasma
[UCRL-82852] p0532 N80-25161

MOISAN, F.
Application of solar energy to food industry - A distillery
p0372 A80-33591

MOLANDER, A. B.
Cost and performance evaluation of passive solar systems
p0389 A80-33755

MOLES, D. R.
Nitrogen fertilizer production by solar energy
p0357 A80-33402

MOMENT, R. L.
New developments in wind systems technology
[RFP-3000] p0534 N80-25888

MONSLER, M. J.
Laser program, volume 3
[UCRL-50021-78-VOL-3] p0532 N80-25650

MONTAGNA, A. A.
Coal liquefaction catalysts
p0472 A80-39419

MONTAGUE, J. E.
Solar central receiver hybrid - A cost effective future power alternative
[AIAA PAPER 80-0841] p0357 A80-32856

MONTALENTI, P.
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211
Phase 1 of the near term hybrid passenger vehicle development program
[NASA-CR-163219] p0564 N80-28245

MONTE, R.
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900

MOON, S.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

MOORE, D.
Solar project description. Albuquerque Western-2 multi-dwelling building Albuquerque, New Mexico
[SOLAR/1090-79/50] p0444 N80-25819

MOORE, D. M.
Proposed method for determining the thickness of glass in solar collector panels
[NASA-CR-163151] p0432 N80-24755

MOORE, D. O.
Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents
[PB80-126469] p0334 N80-22527

MOORE, F.
Dual desiccant-bed dehumidifier with solar-heated regeneration
p0384 A80-33705
MOORE, J. E.
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801
MORDCHELLES-REGNIER, G.
Solar thermal-electric power plant with distributed collectors 100 to 1000 kWe
p0374 A80-33604
MOREHOUSE, J.
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018
MOREHOUSE, J. H.
Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544
Improved heat pump model for TRNSYS
p0508 A80-33553
MORGAN, J. H.
Optimization of oxide-semiconductor/base-semiconductor solar cells
p0394 A80-35341
MORIARTY, J. E.
Prospects for using improved climate information to better manage energy systems
[UCRL-83813] p0343 N80-24859
MORITA, A.
Evaluation of cathode materials for the lithium/carbonmonofluoride battery
p0549 A80-40606
MORITZ, P. S.
Cost and performance evaluation of passive solar systems
p0389 A80-33755
MORRIS, G.
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892
MORRIS, J. F.
Comments on TEC trends
p0519 A80-39642
MORRIS, P.
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407
MORRIS, S.
Performance analysis of a natural convection collector system
p0383 A80-33695
MORRIS, W. L.
Cleaning agents and techniques for concentrating solar collectors
[SAND-80-7005C] p0445 N80-25860
MORRISON, C. B.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2] p0455 N80-26866
MORRISON, G. L.
Thermosyphon circulation in solar collectors
p0392 A80-33869
MORRISON, J.
A 20 kW photovoltaic flat panel power system in El Paso, Texas
p0385 A80-33716
MORSE, F. H.
Status of the United States' Solar Heating and Cooling Program
p0323 A80-33446
MOSES, C.
Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements
p0398 A80-35491
MOSES, G. A.
Summary of the fusion-fission hybrid fuel cycle analysis (tritiumless hybrids)
[UWFDM-337] p0493 N80-26138
MOSKOWITZ, S.
Development of a high temperature turbine for operation on coal-derived fuel
[ASME PAPER 80-GT-188] p0478 A80-42290
MOTES, B. G.
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8] p0335 N80-22878
MOTLEY, E. P.
Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant
[AD-A082756] p0492 N80-25797
MOURNING, P.
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205
MOWFORTH, E.
Gaseous fuels for airship propulsion
p0472 A80-39304
MOYER, J. W.
An alternate approach to the application of MHD power generation technology in a utility environment
[IEEE PAPER F 79 651-1] p0525 A80-43502
MOYLE, M. A.
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213
MUELLER, M.
Safe handling of hydrogen in large quantities
p0460 A80-37337
MUELLER, R. O.
Two-tank seasonal storage concept for solar space heating of buildings
[CONF-791226-2] p0446 N80-25867
MUFTI, R. K.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
MULIK, P. R.
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
MULLER, J. C.
Laser processing in the preparation of silicon solar cells
p0396 A80-35363
Realization of p-n junction solar cells by an ion implantation doping procedure
p0409 A80-37991
MULLINS, J. C.
Latent heat energy storage using direct contact heat transfer
p0546 A80-33519
MULREADY, R. C.
Liquid hydrogen engines
p0461 A80-37343
MUMMA, S. A.
Thermal performance of compounds used to improve heat transfer in solar collectors
p0360 A80-33457
MUNJAL, P. K.
Solar thermal small power systems study. Phase 2: Study results
[DOE/ET/20516-2] p0440 N80-24855
MUNOZ, F.
Research and development on solar energy for electric and mechanical power generation
p0373 A80-33601
MUNSON, M. J.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
MURAVEVA, M. I.
Development and application of high-power lightpipes
p0401 A80-36833
MURPHY, B.
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554
MURPHY, G. D.
A pin programmable controller for research systems
p0380 A80-33662

MURRAY, T.
Optical and thermal performances of a half-circular, cylindrical concentrator
p0405 A80-37951

MURRAY, T. R., JR.
The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center
p0381 A80-33666

MURRY, D. A.
A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility
p0389 A80-33758

MURRY, M. A.
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

MURTHY, H. K.
Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power
p0379 A80-33651

MUSGROVE, P. J.
Fluctuations in output from wind turbine clusters
p0520 A80-41032

MUSSULMAN, R. L.
A new and simple method for estimating the monthly and yearly performance of passive solar systems
p0383 A80-33697

MUSUMECI, F.
Heat losses of a static low-concentration solar collector
p0399 A80-35838

MUTONE, G. A.
Safety analysis of an advanced energy system facility
p0520 A80-40337

MYERS, D.
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A
[NASA-CR-135119] p0355 N80-27361

MYERS, H. K.
Research on diamantane and other high density hydrocarbon fuels
[AD-A080749] p0482 N80-23474

MYLES, K. M.
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal
p0471 A80-37617

MYTTON, M. G.
System-reliability studies for wave-energy generation
p0540 A80-43830

N

NACCACH, A. F.
Low cost, low technology 3.4x concentrating collector for industrial/agricultural applications
p0363 A80-33491

NAGATA, K.
Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM
p0502 N80-27508

NAIR, K.
Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

NAKA, A.
The use of additives to stabilize coal-oil mixture
p0496 N80-26477

NAKABAYASHI, Y.
Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan
p0496 N80-26480
Overview of R&D status on COM technology in Japan
p0501 N80-27495

NAKAMOTO, Y.
The Nigorikawa Geothermal Pilot Plant
p0525 A80-43740

NAKAMURA, K.
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649

NAKANO, A.
Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898

NAKASHIMA, H.
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649

NAKAYAMA, N.
Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898

NAMAZOV, B. M.
Modeling of safe-life tests of thermoelectric batteries
p0519 A80-38750

NARAYAN, J.
Pulsed laser techniques for solar cell processing
p0396 A80-35362

NASBY, R. D.
Design and performance of silicon solar cells under concentrated sunlight
p0385 A80-33721
Physics underlying the performance of back-surface-field solar cells
p0396 A80-35359

NASH-WEBBER, J. L.
Application and design studies of compressed-air energy storage for solar applications
[CAES-7] p0555 N80-23788

NASO, V.
A new design of Stirling engine for automotive application
p0519 A80-39899

NASR, L. H.
Solar technology application to enhanced oil recovery
[SERI/TR-352-392] p0445 N80-25839

NATARAJAN, R.
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498

NATHAN, G. K.
A new approach of wind speed characterization for wind energy studies
p0466 A80-33771

NAWADA, H.
Development of a NO/x/-free combustion system
p0333 A80-43741

NDOYE, B.
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959

NEDOSPASOV, A. V.
Theory of electrode arcs in a flow of combustion products containing an additive
p0524 A80-43398

NEEF, W. S., JR.
Mirror fusion reactor design
p0505 A80-33043

NEEPER, D. A.
Analysis of matrix air heaters
p0360 A80-33456

NELSON, E. T.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9] p0483 N80-23486

NEMAT-NASSER, S.
Geothermal energy - Extracting heat from hot dry rock masses
p0471 A80-36625

NEMECEK, J. J.
Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids
p0539 A80-33424
Energy storage-boiler tank
p0554 N80-22820

NEULANDER, C. K.
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669

NEUMANN, T. W.
IEA/SPS 500 kW distributed collector system
p0436 N80-24791

NEUSTADTER, H. E.
The use of wind data with an operational wind turbine in a research and development environment
p0513 A80-35730

NEUWIRTH, F.
The estimation of global and sky radiation in Austria
p0421 A80-43477

NEWELL, T.
The effect of an auxiliary load management strategy on solar system performance
p0389 A80-33757

NEWELL, T. A.
Mass flow considerations for solar air heating systems
p0369 A80-33558

NEWMAN, V. G.
Economic and operational implications of a complex of wind-driven generators on a power system
p0333 A80-43829

NEWTON, G. C., JR.
Paving the way for energy-saving innovations
p0328 A80-39554

NEWTON, G. J.
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor
p0330 A80-41558
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559

NG, K.
Optoelectronic and photovoltaic properties of metal-SiO2-silicon tunneling structures
p0426 N80-23179

NG, K. K.
A comparison of majority- and minority-carrier silicon MIS solar cells
p0395 A80-35349

NGUYEN, D. V.
Experimental study for the optimization of the performance of the Filippini Vertical Axis Wind Rotor
p0520 A80-41034

NGUYEN, H. H.
Conceptual design of integrated energy storage and attitude control system
p0547 A80-37455

NICHOLS, R. A.
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487

NICHOLS, J.
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830

NICHOLS, L.
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69] p0476 A80-42199

NICOLAIS, L.
Plastic solar collectors for 'low energy' applications
p0415 A80-41948

NICOSIA, G.
Energy and civil aviation
p0475 A80-41871

NIEDZWIECKI, R. W.
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69] p0476 A80-42199
Literature survey of properties of synfuels derived from coal
[NASA-TM-79243] p0481 N80-22776

NIELD, K. J.
Design and installation manual for thermal energy storage
[ANL-79-15-ED-2] p0561 N80-26840

NIELSEN, C. E.
Control of gradient zone boundaries
p0371 A80-33584

NIELSEN, O. M.
Required minimum value of barrier height in minority-carrier M.I.S. solar cells
p0410 A80-40474

NILES, P. W.
Operation of an industrial solar drying system
p0372 A80-33590

NISHIO, M.
Solar heating and hot water supply system of Fuji Electric Solar House
p0370 A80-33573

NISHIYAMA, E.
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529

NISSEN, W. I.
Flue gas desulfurization by the modified citrate process: Report of investigations
[PB80-134836] p0351 N80-25940

NOCHUMSON, D.
National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882

NOEL, G. T.
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1] p0529 N80-23860

NOLL, S.
The comparative economics of passive and active systems
p0412 A80-38020
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

NOLLET, A. R.
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products
[ASME PAPER 80-ENAS-9] p0479 A80-43186

NOREEN, D. L.
Design of a heat pipe absorber for a concentrating solar water heater
[AIAA PAPER 80-1506] p0415 A80-41470
Development of a low-cost non-tracking heat pipe concentrating collector
[PB80-160443] p0457 N80-27828

NORMAN, C. E.
Detailed modeling of inversion-layer solar cells
p0395 A80-35351

NORRUP, L. V.
Advanced propulsion system for hybrid vehicles
[NASA-CR-159771] p0561 N80-26212

NORTON, B.
Thermal insulation of a low capital cost solar-energy collector
p0416 A80-41951

NOWAK, A. V.
Optimization of a multicomponent gaseous saturable absorber for the Helios CO2 laser system
p0517 A80-38484

NUCCI, L. M.
High temperature combustor designed for operation with coal derived low Btu gaseous fuels
[ASME PAPER 80-GT-187] p0478 A80-42289

NUSSDORFER, T.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657

NUSSMEIER, T. A.
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493

NWALOR, J. U.
Mass transport in molten-salt electrochemical systems
[ORNL/MIT-290] p0527 N80-23400

NYHOLM, R. A.
Potential air quality impact of geothermal power production in the Imperial Valley
[UCRL-52797] p0340 N80-23878

O

OBERLE, R. D.
Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-58] p0503 N80-27515

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-50] p0503 N80-27517

OBEROI, H. S.
Solar heating and cooling performance in CSU Solar House III
p0370 A80-33570
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3
[COO-2858-24-SUMM] p0437 N80-24807

OBRIEN, G.
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility
[SAND-79-7022-VOL-1] p0534 N80-25870
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data
[SAND-79-7022-VOL-2] p0537 N80-26800

OCHS, T. L.
The physics of a saturated Na2O.2B2O3.10H2O non-convecting solar pond
p0372 A80-33587

OCONNELL, L. G.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232

OCONNELL, R. F.
Absorption of radiation in a magnetoplasma and application to the laser-fusion process
p0525 A80-43496

ODAJIMA, K.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

ODONNELL, D.
Environmental assessment of small wind systems
[SERI/PR-354-420] p0350 N80-25928

OFFENHARTZ, P. O.
On the design of silver-hydrogen electrochemical cells
p0547 A80-37003

OFFENHARTZ, P. O. D.
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845

OGALLAGHER, J.
Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors
p0364 A80-33493
Applications of CPC's in solar energy - An overview
p0364 A80-33501
Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
p0386 A80-33726
Design and test of non-evacuated solar collectors with compound parabolic concentrators
[EFI-79-42] p0443 N80-25811

OGALLAGHER, J. J.
Absorption enhancement in solar collectors by multiple reflections
p0403 A80-37306

OGAWA, B.
Evaluation of cathode materials for the lithium/carbonmonofluoride battery
p0549 A80-40606

OGURA, Y.
COM stability forecasting method
p0496 N80-26478

OHASA, K.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

OHNO, J.
Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control
p0388 A80-33741

OHTSUBO, M.
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529

OHTSUKA, M.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

OKA, J.
Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control
p0388 A80-33741

OKADA, H.
Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control
p0388 A80-33741

OKAMOTO, O.
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery
p0549 A80-40605

OKEEFFE, T. W.
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847

OKHOTIN, A. S.
Modeling of safe-life tests of thermoelectric batteries
p0519 A80-38758

OLAFSEN, A. G.
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

OLALDE, G.
Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation
p0379 A80-33650
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959

OLIPHANT, M. V.
Measurement of wind speed distributions across a solar collector
p0415 A80-40717

OLIVER, J. C., III
Comparative evaluation of various methods for the prediction of wave drift forces on OTEC platforms
p0512 A80-35167

OLIVER, T. K.
Energy from humid air
[DSE-2553-79/1] p0531 N80-24861

OLOUGHLIN, J. P.
High power pulse modeling of coaxial transmission lines
p0539 A80-37828

OLSEN, K. B.
Air quality measurements in the coal fired power plant environment of Colstrip, Montana
p0326 A80-36477

OLSON, G. K.
Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-2586
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1] p0537 N80-2685

ONEILL, M.
Design and evaluation of solar installation workshops and the HUD solar DHW installation guidelines
p0370 A80-3357

ONEILL, M. J.
Optical analysis of the fixed spherical mirror/tracking linear receiver solar concentrator including statistically distributed reflector slope errors
p0364 A80-334

A unique new Fresnel lens solar concentrator
p0364 A80-33499

ONFFROY, J. R.
Spectrophotovoltaic orbital power generation
[NASA-CR-161451] p0530 N80-24757

ONISCHAK, M.
Development of a solar desiccant dehumidifier
p0408 A80-37979

OOSTERHAVEN, R.
Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515

ORBACH, A.
Optimal and sub-optimal control strategies and sensitivity study for solar liquid collector systems
p0381 A80-33664

OREAR, D. J.
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-43] p0486 N80-24482

ORIOLO, D. J.
Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AF-884] p0497 N80-26529

ORLANDO, A. F.
Influence of heat exchanger effectiveness on the performance of thermosyphon double loop water heating system
p0406 A80-37970

ORLOWSKI, E.
Manufacturing methods of a composite cell case for a Ni-Cd battery
p0546 A80-34777

OROFINO, T. A.
Low-cost mirror concentrator based on double-walled metallized, Tabular films
[ALO-4227-12] p0428 N80-23811
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817

OROURKE, M. J.
Snow and ice accumulation around solar collector installations
[PB80-127053] p0441 N80-24878

ORR, F. M., JR.
Displacement of oil by carbon dioxide
[DOE/MC-03260/4] p0492 N80-25768

ORSAK, C. G.
An assessment of need for developing and implementing technical and skilled worker training for the solar energy industry
p0327 A80-38018

ORTABASI, U.
Process steam generation by a facetted, non-imaging solar concentrator
p0378 A80-33639
Cusp mirror - Heat pipe evacuated tubular solar thermal collector
p0421 A80-43482

ORTEGREN, L.
The United Stirling P40 engine for solar dish concentrator application
p0531 N80-24775

ORTIZ, F.
Study and realisation of a high temperature air cooled solar receiver
p0379 A80-33653

OSAWA, H.
A water-trickle type solar collector with a massive concrete slab for heat storage and radiation /TMU solar system I/
p0392 A80-34561

OSBORN, D. B.
Generalized shading analysis for paraboloidal collector fields
[ASME PAPER 80-PET-33] p0420 A80-43344
An organic Rankine receiver for the SCSTPE program
p0434 N80-24771

OSTERHUS, A.
Heat pumps in the PESAG supply district
p0509 A80-34123

OSTERWALD, C.
Noise spectral density as a device reliability estimator
p0422 A80-43763

OSTOJA, P.
A new technology to fabricate high-efficiency silicon concentrator solar cells
p0397 A80-35366

OTSUKI, H. H.
Solar coal gasification
p0403 A80-37305

OTT, K. H.
Development and preparation for series production of a modular solar space heating system, phases 1 and 2
[BMFT-FB-T-79-02] p0424 N80-22857

OTTO, R. J.
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399

OVCHINNIKOV, V. L.
A numerical investigation of three-dimensional effects in an MHD generator segmented duct with series-connected electrodes
p0510 A80-34620

OVEZSAKHATOV, N.
Energy balance of solar thermoelectric generator
p0401 A80-36821

OZAKCAY, L. B.
Process steam generation by a facetted, non-imaging solar concentrator
p0378 A80-33639

OZBEK, H.
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399

OZBOYA, N.
On the evaluation of the feasibility of solar collectors for electrical power generation applications
p0406 A80-37963

P

PACETTI, M.
Experimental study on flow distribution in channels of flat-plate solar collectors using I.R. thermography
p0360 A80-33453

PACKARD, C. J.
Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings
p0381 A80-33669

PADOVA, J. I.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061] p0529 N80-23839

PAGE, J. K.
Methods for the estimation of solar energy on vertical and inclined surfaces
p0417 A80-42438
Systematic techniques of design for solar houses in high latitudes
p0418 A80-42452

PALLA, R. L., JR.
Evaluation of energy conserving modifications for water heaters
[PB80-133853] p0344 N80-24873

PALMITER, L.
Development of an effective solar fraction
p0368 A80-33555
Performance of passive test units during the 1978-79 heating season
p0383 A80-33694

PALUDAN, T.
Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662

PAMPREEN, R. C.
Baseline automotive gas turbine engine development program
[NASA-CR-159670] p0530 N80-24620
Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621

PAN, Y. C.
Power take-off analysis for diagonally connected MHD channels
[CONF-800104-6] p0535 N80-26167

PAN, Y. S.
Combustion of coal-oil mixtures in a 700 HP watertube boiler p0502 N80-27504

PANDE, K. P.
Characteristics of MOS solar cells built on /n-type/ In P substrates p0394 A80-35336

The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation p0394 A80-35337

PANDEY, G. C.
Use of renewable fuels in the rural development of India p0327 A80-37989

PANOFSKY, H. A.
Effect of complex terrain on wind fluctuations p0468 A80-35723

PAO, S. C.
Physics underlying the performance of back-surface-field solar cells p0396 A80-35359

PAPACHRISTODOULOU, G.
Grinding of coal-in-oil slurries p0494 N80-26464

PARK, S. N.
Preparation of highly efficient solar cells and corrosion studies on solar cell materials [PB80-141294] p0441 N80-24874

PARKER, B. F.
Derivation of efficiency and loss factors for solar air heaters p0359 A80-33447

PARKER, J. D.
Economic considerations of solar energy p0412 A80-38019

PARKER, J. V.
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system p0518 A80-38493

PARKER, W. G.
Assessment of solar hybrid repowering for electric utilities p0375 A80-33612

PARKINSON, B. W.
Real time identification of parameters in building models p0368 A80-33556

The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems p0381 A80-33663

PARKS, P. C.
Non-linear oscillations in wave power machines p0521 A80-41330

PARMELE, M. C.
Development of improved insulation materials [ALO-4295-T2] p0448 N80-26403

PARTIN, J. R.
Earth coils and geo-thermal wells used as solar energy storage devices p0368 A80-33549

PARUNGO, F. P.
Chemical characteristics of oil refinery plumes in Los Angeles p0325 A80-36476

PASCOE, R. F.
Surface area loss of platinum supported on carbon in phosphoric acid electrolyte p0515 A80-37004

PASECHNIKOV, A. N.
Accelerator module of 'Angara-5' p0516 A80-37815

PASICHNYI, V. V.
Development and application of high-power lightpipes p0401 A80-36833

PASQUETTI, R.
Solar thermal electric power in the range of medium size units - The French programme 'THEK' p0374 A80-3360

PASS, J. E.
CF6-6D engine performance deterioration [NASA-CR-159786] p0355 N80-27364

PATAPOFF, N. W.
Photovoltaic array reliability project p0387 A80-33735

PATEL, J. G.
The U-GAS process p0474 A80-40756

PATERA, R. P.
Information theory and solar energy collection p0421 A80-43368

PATON, B. E.
Short course in microprocessors for solar energy applications Microprocessors, microcomputers and single chip computers p0419 A80-42460

Short course in microprocessors for solar energy applications - Sensors p0419 A80-42461

Short course in microprocessors for solar energy applications - Control p0419 A80-42462

Short course in microprocessors for solar energy applications - Systems p0419 A80-42463

Short course in microprocessors for solar energy applications - The microcomputer family p0420 A80-42464

PATTERSON, D. E.
Synoptic-scale distribution of man-made aerosols p0354 N80-26942

PATTERSON, J. G.
Evaluation of physical/chemical coal cleaning and flue gas desulfurization [PB80-147622] p0346 N80-25481

PATZER, J. F., II
Coal liquefaction catalysts p0472 A80-39419

PATZOLD, J. D.
OMNIUM-G concentrator test results p0434 N80-24777

PAUL, I.
Heat pumps for heating, cooling, and energy recovery 1976-1990 p0327 A80-38210

PAULLING, J. R.
An equivalent linear representation of the forces exerted on the OTEC CW pipe by combined effects of waves and current p0512 A80-35164

PAYNE, J. S.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report [UCRL-52841-VOL-2] p0563 N80-27232

PAYZER, R. J.
Hydrogen fueled high bypass turbofans in subsonic aircraft p0462 A80-37348

PEARSON, G. L.
'Band readjustment' effect with applications to solar cells p0397 A80-35367

PECHERSKII, O. P.
Accelerator module of 'Angara-5' p0516 A80-37815

PECK, J. F.
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector p0366 A80-33530

PECK, M. K.
Design and performance of a roof integrated solar air heater p0360 A80-33451

CSIRO collector test facilities p0361 A80-3347

PEDERSEN, K.
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska p0383 A80-3369

PEELE, E. R.
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor p0330 A80-4155

PEMSLER, J. P.
Methanol-based heat pumps for storage of solar thermal energy, phase 1 [SAND-79-8188] p0555 N80-2284

PENG, C. S. P.
Optimization of liquid desiccant systems for solar/geothermal dehumidification and cooling [AIAA PAPER 80-1546] p0415 A80-4156

PENG, Y.-K. M.
Evolution of flux-conserving tokamak equilibria with preprogrammed cross sections
p0514 A80-36397

PENNELL, W. T.
Status of the Large Wind Turbine Siting Handbook
p0514 A80-35750
Siting small wind turbines
[PNL-SA-7603] p0493 N80-25878

PENOT, F.
Theoretical and experimental investigation of the flow in a flat plate collector
p0360 A80-33454

PERCIVAL, W.
A Stirling cycle engine for use with solar thermal-electric systems
[ASME PAPER 80-PET-32] p0524 A80-43343

PERELMAN, L.
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859

PEREZ Y PEREZ, L.
At-sea test of a large diameter steel, cold water pipe
p0512 A80-35166

PEREZ-ALBUERNE, E. A.
Photovoltaic materials
p0392 A80-34637

PERI, G.
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605

PERKARI, S.
Development of a solar desiccant dehumidifier
p0408 A80-37979

PERKINS, W. J.
Energy recovery in the sludge treatment process at Toronto's main treatment plant
p0333 A80-42927

PERKINS, R. A.
Discharge and corrosion characteristics of slagging metal electrodes for MHD power generators
p0519 A80-39746

PERLEY, R.
Analysis of wind speed characteristics for design criteria development in the Kaman/DOE 40-kW wind turbine generator program
p0513 A80-35718

PERLIN, A. S.
Accelerator module of 'Angara-5'
p0516 A80-37815

PERO, D.
Autonomous solar-powered beacon for air navigation use
p0385 A80-33715

PERRY, F. G. DE B.
The Perbury transmission
[ASME PAPER 80-GT-22] p0331 A80-42159

PERRY, H.
Liquid fuel supplies
p0329 A80-40751

PERRY, J., JR.
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

PERSHING, D. W.
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace
p0325 A80-35879

PERSONS, R. W.
Comparison of measured and predicted rock bed storage performance
p0546 A80-33870

PESCHKA, W.
Production of synthetic hydrocarbon fuel, environmental aspects and comparison to hydrogen production from water
p0326 A80-37332
The significance of hydrogen as a future environmentally sound secondary energy source in energy and propulsion technology
p0462 A80-40970

PETERSON, C. A.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

PETERSON, J. A.
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7] p0491 N80-25707

PETERSON, M. J.
Selenium and tellurium selective absorber coatings produced by an oblique vacuum deposition technique
p0402 A80-37299

PETERSON, W. H.
Development and evaluation of a multiple use solar energy system for agriculture
p0357 A80-33403

PETRI, R. J.
High-temperature molten salt thermal energy storage systems for solar applications
p0552 N80-22805

PETRICK, M.
Open-cycle coal-fired liquid-metal MHD
[CONF-790640-7] p0529 N80-23844

PETROV, IU. V.
Muon catalysis for energy production by nuclear fusion
p0517 A80-38289

PETROVA, A. A.
The use of solar energy storage for heating and cooling applications
p0391 A80-33861

PETROVIC, L. J.
Coal/oil mixture pipeline: A viable alternative coal transportation system?
p0542 N80-26487

PETTIT, R. B.
Specular reflectance properties of solar mirrors as a function of incident angle
p0378 A80-33640
Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators
p0379 A80-33646
Thermal aging characteristics of electrodeposited black chrome solar coatings
p0388 A80-33740
Solar reflectance, transmittance and absorptance of common materials
[SERI/TP-334-457] p0437 N80-24805

PEUBE, J. L.
Theoretical study of gas heated in a porous material subjected to a concentrated solar radiation
p0379 A80-33650

PEUBE, J.-L.
Theoretical and experimental investigation of the flow in a flat plate collector
p0360 A80-33454
Thermal storage in rock beds
p0545 A80-33512

PEVCHEV, B. P.
Accelerator module of 'Angara-5'
p0516 A80-37815

PEZAT, M.
Application of magnesium rich rare-earth alloys to hydrogen storage
p0459 A80-35192

PFEFFER, J. T.
Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474

PFISTERER, F.
A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719

PHATAK, S.
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797

PHATAK, S. B.
Material and device considerations for cascade solar cells
p0397 A80-35364

PHELINE, M. J.
French solar energy program and its application for international cooperation
p0327 A80-38017

PHILLIPS, D. C.
Review - Materials aspects of wave energy converters
p0517 A80-38283

PHILLIPS, G. T.
The utility and verification of mathematical windfield models for wind energy regional screening and site selection
p0470 A80-35747

PHILLIPS, J. E.
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339

PHILLIPS, S. L.
Establishment of a computer data base on geothermal properties of aqueous NaCl, KCl and CaCl2 solutions
p0467 A80-34019
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399

PHIPPS, H.
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1] p0339 N80-23830

PHLIPS, E.
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
p0459 A80-33406

PICCOLO, R.
Phase 1 of the near term hybrid passenger vehicle development program
[NASA-CR-163219] p0564 N80-28245
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1
[NASA-CR-163223] p0565 N80-28249
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices
[NASA-CR-163225] p0565 N80-28251

PIERCE, R. D.
Advanced fuel cell development
[ANL-79-51] p0535 N80-25895

PIERINI, G.
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents
p0459 A80-35190

PIERRE, B.
Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation
[ASME PAPER 80-GT-34] p0416 A80-42167

PIERSON, E. S.
Open-cycle coal-fired liquid-metal MHD
[CONF-790640-7] p0529 N80-23844

PILATTE, A.
The Belgian solar heating R & D program
p0359 A80-33435

PILLAI, P. K. C.
A black liquid flat plate collector for economical applications
p0404 A80-37948
Low cost spiral shaped solar collector
p0406 A80-37960

PILLSBURY, P. W.
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197

PIROT, L.
Small solar plants for electricity supply
p0373 A80-33596
A solar-powered irrigation system for Bakel, Senegal
p0382 A80-33678

PITKIN, E. T.
Solar plus waste heat recovery hybrid water heating system
p0371 A80-33580

PITMAN, J. R.
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467

PIWECKI, H.
Measurements on a flat thermal solar energy collector with a cellular structure after Francia
p0404 A80-37946

PIZZINI, S.
Development of 1pKW photovoltaic module with concentration
p0386 A80-33728

PLACE, W.
Mean monthly performance of passive soler water heaters
[LBL-9295] p0437 N80-24820

PLEATSIKAS, C. J.
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847

PLUMMER, D. F.
Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162

POBEREZHSKII, L. P.
Theory of electrode arcs in a flow of combustion products containing an additive
p0524 A80-43398

POCARD, P.
Solar power units with screw expanders
p0410 A80-38000

POCHE, A. J.
The Shenandoah concentrator
p0434 N80-24767
Solar total energy project at Shenandoah, Georgia system design
p0436 N80-24796

POEPPEL, R. B.
Advanced fuel cell development
[ANL-79-51] p0535 N80-25895

POESENTRUP, H.
Steam and gas turbines for small outputs using solar energy
p0410 A80-38003

POHL, R.
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility
[SAND-79-7022-VOL-1] p0534 N80-25870

POIRIER, A.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657

POIRIER, R.
I-V and C-V characteristics of Au/TiO2 Schottky diodes
p0413 A80-39055

POLANSKY, G. F.
System thermodynamics of energy conversion plants for geopressured resources
[ASME PAPER 80-PET-31] p0524 A80-43342

POLEK, J. R.
Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AF-884] p0497 N80-26529

POLIVKA, W. M.
Microprocessor-controlled digital shunt regulator
p0505 A80-32758

POMEROY, C. F.
Conversion processes for liquid fuels from biomass
p0465 A80-33411

POMPA, J. A.
NOAA's cold-water pipe at-sea test program
p0511 A80-35162

PONAMARENKO, IU. B.
The helical hydromagnetic dynamo
p0514 A80-36430

PONS, R. L.
The performance of solar thermal electric power systems employing small heat engines
[ASME PAPER 80-PET-25] p0523 A80-43340
A Stirling cycle engine for use with solar thermal-electric systems
[ASME PAPER 80-PET-32] p0524 A80-43343

The dish-Rankine SCSTPE program (Engineering Experiment no. 1)
p0435 N80-24782

POON, P. T. Y.
Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631

POPKIROV, G.
A circuit for measurement of the fill factor of solar cells
p0399 A80-36121

POPOV, B. A.
Production of a small nuclear battery
p0505 A80-32957

PORCH, W. M.
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837] p0488 N80-24964

PORTER, R. W.
Beneficial use of rejected heat from electric power plants
[COO-4531-9] p0348 N80-25841

PORTNOV, G. G.
The efficiency of ballast in composite flywheels
p0549 A80-40068

POSNER, D.
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859

POST, H.
Low cost structures for photovoltaic arrays
[SAND-80-0142C] p0430 N80-23853

POST, H. N.
Status of the photovoltaic systems definition project
p0387 A80-33733

POUDER, R.
The potential of crop residues as a fuel for power generation
p0466 A80-33750

POWELL, D. C.
Wind fluctuations described as discrete events
p0468 A80-35721

POWELL, G. L.
A procedure for determining solar heat gain factors for south-facing vertical surfaces on average days
p0384 A80-33699

POWELL, J.
Fusion - An energy source for synthetic fuels
[AIAA PAPER 80-0844] p0465 A80-32857

POWELL, W.
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9
[NASA-CR-163267] p0352 N80-26772

PRAST, G.
Small solar thermal power plants
p0373 A80-33602

PRATT, R. G.
Comparative performance of two types of evacuated tube solar collectors in a residential heating and cooling system - A progress report
p0370 A80-33571

PRENGLE, H. W., JR.
Solar energy with chemical storage for cogeneration of electric power and heat
p0549 A80-40715

PRESS, W. J.
Cryogenic laser fusion target material design considerations
p0506 A80-33055

PRICE, K.
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493

PRIESTLEY, R. R.
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797

PROBERT, S. D.
Thermal insulation of a low capital cost solar-energy collector
p0416 A80-41951

PROCTOR, D.
Design and performance of a roof integrated solar air heater
p0360 A80-33451

CSIRO collector test facilities
p0361 A80-33470

PRUSOVA, N. M.
Simulation of nonequilibrium physicochemical processes for supersonic flow of combustion products in an open-cycle MHD generator
p0510 A80-34873

PRYTHERO, T.
Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000
[LA-UR-79-2812] p0338 N80-23820

PUCCI, A.
Atomization of coal slurry jets
p0496 N80-26482

PUCHER, J.
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239

PUESCHEL, R. F.
Chemical characteristics of oil refinery plumes in Los Angeles
p0325 A80-36476

Mechanisms and rates of formation of sulfur aerosols in power plant plumes
p0354 N80-26907

PULFREY, D. L.
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583

PURPER, G.
Heat pumps for heating, cooling, and energy recovery 1976-1990
p0327 A80-38210

PUTNEY, E. C.
Grain boundary defects in thin semicrystalline material
p0422 A80-43761

PYE, D. B.
The measurement of solar irradiance on a tilted surface
p0390 A80-33764

PYPER, J. W.
Evaluation of air cathodes for potential use in development of aluminum-air cells
[UCID-18561] p0535 N80-25893

PYTLINSKI, G. T.
Proposed method for testing of radiative cooling flat-plate collectors
p0362 A80-33472

Q

QADER, S. A.
Solar-heated fluidized bed gasification system
[NASA-CASE-NPO-15071-1] p0432 N80-24747
Autocatalytic coal liquefaction process
[NASA-CASE-NPO-14876-1] p0493 N80-26460

QUICKSILVER, R.
Beam simultaneity in multi-terawatt CO2 laser fusion systems
p0517 A80-38483

QUINDRY, G. E.
Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474

QUIRK, W. J.
Prospects for using improved climate information to better manage energy systems
[UCRL-83813] p0343 N80-24859

R

RABE, J. A.
Development of improved insulation materials
[ALO-4295-T2] p0448 N80-26403

RABI, A.
End-use matching for solar industrial process heat
[SERI/TR-34-091] p0454 N80-26849

RABL, A.
Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors
p0364 A80-33493
Applications of CPC's in solar energy - An overview
p0364 A80-33501

Incidence angle modifier and average optical
efficiency of parabolic trough collectors
p0364 A80-33502
Design and performance characteristics of compound
parabolic concentrators with evacuated and with
non-evacuated receivers
p0378 A80-33638
How to measure the optical quality of focusing
solar collectors without laser ray tracing
p0378 A80-33645
Solar collectors for low and intermediate
temperature applications
p0392 A80-34598
Absorption enhancement in solar collectors by
multiple reflections
p0403 A80-37306
Design and test of non-evacuated solar collectors
with compound parabolic concentrators
[EFI-79-42] p0443 N80-25811
RADICS, C.
Cost of Czochralski wafers as a function of diameter
[NASA-CR-163277] p0449 N80-26771
RADKE, L. F.
Cloud-active nuclei from coal-fired electric power
plants and their interactions with clouds
p0325 A80-36419
RADOSEVICH, L. G.
Solar thermal power storage applications lead
laboratory overview
p0552 N80-22798
RADOVICH, J. M.
Conversion processes for liquid fuels from biomass
p0465 A80-33411
RAFAT, N.
Turbine selection for small capacity solar-power
generation
p0410 A80-38004
RAFAT, N. M.
Study of a multi-pass radiation fluid-heater
exposed to non-uniform radiation
p0405 A80-37958
RAFFELLINI, G.
A solar operated water-Li Br absorption
refrigeration machine used also as heat pump -
Technical and economic analysis
p0367 A80-33545
RAGSDELL, K. M.
Optimal design of compressed air energy storage
systems
[CONF-791069-3] p0555 N80-23789
RAI-CHOUDHURY, P.
Effect of titanium, copper and iron on silicon
solar cells
p0397 A80-35385
RAINES, G. E.
Criteria for assessment of environmental
pollutants from coal cleaning processes
[PB80-102791] p0336 N80-22895
RAITHBY, G. D.
Methods for reducing heat losses from flat plate
solar coolectors, phase 3
[COO-2597-5] p0424 N80-22851
RAJESHWAR, K.
Specific heats of Colorado oil shales - A
differential scanning calorimetry study
p0475 A80-41892
RAJKANAN, K.
MIS solar cells on crystalline, polycrystal, and
thin film silicon
p0385 A80-33722
Optimization of
oxide-semiconductor/base-semiconductor solar cells
p0394 A80-35341
Importance of the interface in noncrystalline
/poly and amorphous/
conductor-insulator-semiconductor /CIS/ solar
cells
p0402 A80-37192
Grain boundary effects and conduction mechanism
studies in chromium metal-insulator-silicon
solar cells on polycrystalline silicon
p0422 A80-43762
RALDOW, W. M.
Chemical heat pumps using a slurry of metal salt
ammoniates in an inert solvent
p0358 A80-33423
RAMACHANDRAN, A.
Characteristics of rural energy demand and major
barriers and tasks and implementation of
potentially viable solar technologies
p0381 A80-33673
RAMAKUMAR, R.
Application of probability methods to evaluate the
reliability of a combined wind-electric and
conventional generation system
p0508 A80-33774
RAMANATHAN, V.
Thermal energy storage systems using fluidized bed
heat exchangers
p0551 N80-22792
RANATUNGA, D. B. J.
Thermosyphon circulation in solar collectors
p0392 A80-33869
RANDALL, K. R.
Interferometric investigations of convection in
slat, flat plate and vee-corrugated solar
collectors
p0405 A80-37957
RANDALL, R. A.
Thermal storage experience at the MSSTF and plans
for the future
p0552 N80-22799
RANDOLPH, H. W.
Solar-powered environmental data collection system
[DP-1529] p0440 N80-24867
RANSHARK, S.-E.
Flat-plate solar collectors - Influence of design
material and configuration on performance
p0404 A80-37944
RAO, D. P.
Feasibility of a large scale solar power
generation system suitable for the arid and
semi-arid zones
p0358 A80-33425
RAO, K. K.
H2 production from water - Use of natural and
synthetic catalysts for the bioconversion of
solar energy
p0459 A80-33407
An experimental investigation of comparative
performance of a header-type compound parabolic
concentrator and a flat-plate collector
p0405 A80-37956
RAO, S.
Solar energy - UNIDO programme of action for
developing countries
p0412 A80-38015
RAO, V. S.
Feasibility of a large scale solar power
generation system suitable for the arid and
semi-arid zones
p0358 A80-33425
RASCH, D. M.
Development of improved insulation materials
[ALO-4295-T2] p0448 N80-26403
RASK, N.
The energy-food interface - An economic analysis
of Brazil's alcohol plan
p0466 A80-33753
RASMUSSEN, J. J.
High temperature fuel cell research and development
[SAN-1485-2] p0534 N80-25848
RASTEGAEVA, IU. Z.
Measurement of energy emitted by the working
medium of an MHD generator
p0510 A80-34874
RASTOGI, S. C.
Performance of the noval solar cell substitute for
the future
p0409 A80-37995
RASULOV, K.
Investigation into the influence of high
solar-excitation level on optimal parameters of
P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588
RAUSCHENBACH, H. S.
Solar cell array design handbook - The principles
and technology of photovoltaic energy conversion
p0393 A80-34847
RAVIKUMAR, R.
Engineering evaluation of conceptual coal
conversion plant using the H-coal liquefaction
process
[EPRI-AP-1297] p0498 N80-26530

RAVINA, E.
Theoretical and experimental study of parabolic troughs and paraboloidal dish concentrators with plane absorbers
p0363 A80-33489
RAWLS, J. M.
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059
RAY, A.
Application of magnetic suspensions and fluid film bearings to energy storage flywheels
[SAND-79-7007] p0556 N80-23824
READ, W. R. W.
Australian programme for solar heating and cooling
p0359 A80-33432
Solar heat generation for industrial process heating applications
p0372 A80-33594
REALI, M.
Closed cycle osmotic power plants for electric power production
p0470 A80-36051
REBELLO, W.
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1] p0339 N80-23830
RECK, G. M.
The impact of fuels on aircraft technology through the year 2000
[AIAA PAPER 80-0896] p0470 A80-35898
The impact of fuels on aircraft technology through the year 2000
[NASA-TM-81492] p0482 N80-23472
Advanced fuel system technology for utilizing broadened property aircraft fuels
[NASA-TM-81538] p0502 N80-27510
REDDELL, D. L.
The effect of system size on the practicality of aquifer storage
p0545 A80-33517
Cold water aquifer storage
p0554 N80-22827
REDFIELD, D.
Unified model of fundamental limitations on the performance of silicon solar cells
p0396 A80-35356
REED, B.
Solar thermal repowering utility value analysis
[SERI/TR-8016-1] p0428 N80-23814
REED, K.
Applications of CPC's in solar energy - An overview
p0364 A80-33501
Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638
REED, K. M.
The United States Geological Survey in Alaska, 1979 programs
[CIRC-804-A] p0500 N80-26747
REED, T. B.
Survey of biomass gasification. Volume 2: Principles of gasification
[SERI/TR-33-239-VOL-2] p0481 N80-22524
REEDY, G. T.
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers
p0421 A80-43513
REEP, D. H.
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337
REGNAULT, W. F.
Grain boundary defects in thin semicrystalline material
p0422 A80-43761
REICHERT, J. D.
The Crossbyton project
p0436 N80-24790
REID, H., JR.
Coal-shale interface detector
[NASA-CASE-MFS-23720-1] p0483 N80-23711
REILLY, L. J.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
REIMERS, E. R.
EVA metro sedan electric-propulsion system: Test and evaluation
[DOE/CS-1042/1] p0563 N80-27230
REIN, B. K.
Nitrogen fertilizer production by solar energy
p0357 A80-33402
REISMAN, A. W.
Low-cost general energy/analytic information system
[BNL-26398] p0567 N80-24801
REMICK, R. J.
Studies of thermochemical water-splitting cycles
[NASA-CR-163029] p0449 N80-26409
RENARD, R.
Treatment of molybdenite ore with laboratory scale solar furnaces
p0380 A80-33659
RENNE, D. S.
Wind characteristics for agricultural wind energy applications
[PNL-SA-7270] p0530 N80-23947
RENNER, R.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
RENNINGER, S. W.
Hydrogen fueled high bypass turbofans in subsonic aircraft
p0462 A80-37348
REUTSKII, S. IU.
Simultaneous calculation of the transverse and longitudinal fringe effects in the channel of a plane induction-type MHD pump
p0509 A80-34312
REVELL, P. S.
Sailwing Darrieus rotors
p0520 A80-41033
REYNOLDS, T. W.
Literature survey of properties of synfuels derived from coal
[NASA-TM-79243] p0481 N80-22776
RIABIKOV, S. V.
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587
RIAZI, M. R.
Prediction of thermophysical properties of petroleum fractions
p0479 N80-22428
RICE, J.
SAGE, Solar Assisted Gas Energy
[PB80-144363] p0447 N80-25906
RICE, M. J., JR.
The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells
p0394 A80-35340
RICE, M. P.
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484
RICE, P. L.
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
RICE, W. J.
Experimental study of coolness storage using sodium sulfate decahydrate
p0546 A80-33521
RICHARDS, T. R.
Modified power law equations for vertical wind profiles
p0468 A80-35719
RICHARDSON, P. W.
Solar array subsystems study
[NASA-CR-159857] p0431 N80-24742
RICKARD, W. H.
Use of reconnaissance level information for environmental assessment
[NUREG-CR-0990] p0336 N80-22883
RIGOLINI, L.
Measurements on a flat thermal solar energy collector with a cellular structure after Francia
p0404 A80-37946
RILEY, M.
Solar absorption cycle cooling installations in Sydney, Australia
p0366 A80-33536

RILEY, R. E.
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062

RIPLE, J. C.
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen
p0461 A80-37342

RISHELL, L.
Accelerated commercialization of solar energy - A new priority for international action
p0413 A80-38026

RITSCHARD, R. L.
Assessment of solar energy within a community: Summary of three community-level studies
[DOE/EV-0054] p0452 N80-26826

RIZER, S.
Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2
[LBL-10098] p0353 N80-26817

ROACH, F.
A regional comparative analysis of residential passive solar systems - Thermal storage walls and direct gain
p0382 A80-33683
The comparative economics of passive and active systems
p0412 A80-38020
Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices
[LA-UR-79-3390] p0338 N80-23807

ROACHE, P. J.
Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710

ROBBINS, C. L.
A review of the historical developments of the use of passive solar systems
p0408 A80-37981
Natural lighting in buildings - A passive solar system
p0408 A80-37982

ROBERT, J.-F.
Theoretical and experimental investigation of the flow in a flat plate collector
p0360 A80-33454

ROBERTS, P. B.
Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225

ROBERTSON, E. E.
Pyrolytic gasification of renewable biomass resources
p0478 A80-42466
Compaction and densification of fuels from biomass
p0478 A80-42467

ROBERTSON, F. B.
Design of the solar water heater system for TVA's Memphis Initiative
p0371 A80-33581

ROBERTSON, H. S.
Information theory and solar energy collection
p0421 A80-43368

ROBINSON, S. L.
Fixed site hydrogen storage. 1: Applications impact
[SAND-79-8647] p0463 N80-23797

ROBISON, H.
Liquid desiccant solar heat pump for developing nations
p0408 A80-37980

ROBISON, H. I.
Open-cycle solar air conditioner
p0365 A80-33524

ROCARIES, F.
Simulations of solar captation systems - Methodology and applications to distillation, gas and water heating
p0406 A80-37959

ROCHE, F.
New possibilities of solar energy conversion by means of refractory thermoelements
p0409 A80-37993

ROCHELLE, G. T.
Process alternatives for stack gas desulfurization with H2S regeneration to produce sulfur
p0325 A80-35880

ROCK, K. C.
The utility and verification of mathematical windfield models for wind energy regional screening and site selection
p0470 A80-35747

RODE, C.
Heat pumps for heating, cooling, and energy recovery 1976-1990
p0327 A80-38210

RODOT, M.
Solar flash pyrolysis of biomass
p0359 A80-33431
French programs of research and experimentation aiming at the development of solar energy in buildings
p0359 A80-33439

ROE, K. C.
Development and testing of a microwave system to measure coal layer thickness up to 25 cm
[FE-8881-1] p0483 N80-23757

ROGERS, D. A.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

ROGERS, J. D.
Superconducting magnetic energy storage for electric utilities and fusion systems
[LA-UR-78-1213] p0554 N80-22838
Superconducting Magnetic Energy Storage (SMES) program
[LA-8199-PR] p0558 N80-25805

ROGERS, K. A.
Coal conversion comparisons, task 002
[FE-2468-51] p0485 N80-24479

ROGERS, R. J.
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484

ROGERS, W. E.
Economic analysis of a point focusing concentrating collector system
p0363 A80-33484

ROHATGI, A.
Effect of titanium, copper and iron on silicon solar cells
p0397 A80-35385

ROHATGI, N.
Coal desulfurization by low temperature chlorinolysis, phase 2
[NASA-CR-163152] p0484 N80-24464

ROHATGI, P. K.
The use of solar furnaces in materials research
p0411 A80-38008

ROHDE, R. R.
Design and installation manual for thermal energy storage
[ANL-79-15-ED-2] p0561 N80-26840

ROLAND, J. D.
Tests of all-day collector performance
p0361 A80-33468

ROLLBUHLER, R. J.
Improved PFB operations: 400-hour turbine test results
[NASA-TM-81511] p0493 N80-26426

ROLLER, W. L.
The development and demonstration of a solar pond for heating greenhouses
p0371 A80-33586

ROMAN, A. J.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

ROMEO, G.
Plastic solar collectors for 'low energy' applications
p0415 A80-41948

ROSE, R. S.
Design and test of a 73-MW water cooled gas turbine
[ASME PAPER 80-GT-112] p0477 A80-42230

ROSENBERG, H. S.
Technical aspects of lime/limestone scrubbers for coal-fired power plants. I - Process chemistry and scrubber systems
p0326 A80-37618

Technical aspects of lime/limestone scrubbers for coal-fired power plants. II - Instrumentation and technology
p0331 A80-41849

ROSENCWAIG, A.
Fabrication of glass sphere laser fusion targets
p0506 A80-33052

ROSENFELD, A. H.
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents
p0324 A80-34018
Evaluation of residential building energy performance standards
[LBL-9816] p0348 N80-25849

ROSENFELD, C. L.
Remote sensing applications to wind power facility siting
p0470 A80-35746

ROSENFELD, J. L. J.
The thermal performance of solar water heaters in the UK
p0370 A80-33578
The measurement of solar irradiance on a tilted surface
p0390 A80-33764

ROSENWASSER, S. N.
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059

ROSS, D.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657

ROSS, G. F.
The Antares laser power amplifier
p0517 A80-37855

ROSSO, H. J., JR.
Heat transfer enhancement in metal hydride systems
[BNL-27347] p0561 N80-26539

ROST, D. F.
Solar energy system with heat pump augmentation for industrial process heat - An update
p0372 A80-33589
Mini-computer-based energy monitor system
p0380 A80-33661

ROTH, J. R.
An assessment of magnetic fusion research
[AIAA PAPER 80-0928] p0505 A80-32893

ROTHENBERG, S. J.
Respirable aerosols from fluidized bed coal combustion. II - Physical characteristics of fly ash
p0330 A80-41559

ROTHWARF, A.
Advances in the development of low-cost, high performance cadmium-sulfide based thin-film solar cells
p0385 A80-33720
Thin-film solar cells - A unified analysis of their potential
p0393 A80-35335
The design and fabrication of thin-film CdS/Cu2S cells of 9.15-percent conversion efficiency
p0394 A80-35339

ROUSSEAU, R. W.
How clean gas is made from coal
p0471 A80-36314

ROWELL, R. L.
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467

ROY, A. S.
Concentrating collectors
p0417 A80-42442

ROYERE, C.
Solar flash pyrolysis of biomass
p0359 A80-33431

ROZYEV, N.
Development and investigation of solar thermoelectric generator using a tubular module
p0400 A80-36597

RUANE, R. J.
Design of a monitoring program for ash pond effluents
[PB80-128457] p0345 N80-24896

RUBECK, H.
A solar thermal-electric experimental plant
p0374 A80-33606

RUBIN, S. A.
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205

RUDAKOV, L. I.
Accelerator module of 'Angara-5'
p0516 A80-37815

RUDMAN, L.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866

RUDOLPH, R.
Heat pumps for heating, cooling, and energy recovery 1976-1990
p0327 A80-38210

RUGGERI, R. T.
Survey of organic electrolytic processes
[ANL/OEPM-79-5] p0341 N80-24393

RUHL, H. K.
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669

RUIZ, J. M.
The Ramon Areces concentration photovoltaic array
p0384 A80-33714
Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727
Connection losses in photovoltaic arrays
p0387 A80-33734

RULE, T. T.
The performance of silicon solar cells under concentrated sunlight
p0386 A80-33724

RUPPEL, W.
Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353
Upper limit for the conversion of solar energy
p0397 A80-35372

RUSAKOV, G. V.
Obtaining film materials with solar furnaces
p0400 A80-36593

RUSSELL, F. B.
Methods for reducing heat losses from flat plate solar coolectors, phase 3
[COO-2597-5] p0424 N80-22851

RUSSELL, J. W., JR.
Energy-efficient procurement in state and local governments
[DOE/CS-5255/1] p0355 N80-27207

RUSSELL, L. H.
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems
[ASME PAPER 80-GT-155] p0477 A80-42267

RUSSELL, M. C.
Optimization of photovoltaic/thermal collector heat pump systems
p0387 A80-33737

RUSSKIKH, E. S.
Influence of base resistivity on the temperature characteristics of silicon photoconverters
p0514 A80-36590

RUSSO, H. J., JR.
Bulk hydrogen storage using metal hydrides
[BNL-27093] p0463 N80-24483

RYAN, W. A.
Prediction of long-term performance of closed-loop concentrating solar collector systems
p0362 A80-33479

RYLANDER, H. G.
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

RYPDAL, K.
Space-time solutions of the linearized coupled-mode equations
p0520 A80-41074

RYTHER, J. H.
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126

S

SAAD, M.
Turbine selection for small capacity solar-power generation
p0410 A80-38004
SAASKI, E. W.
A high performance cocurrent-flow heat pipe for heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472
SABADELL, A. J.
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505
SABNIS, A. G.
A low-high-junction solar-cell model developed for use in tandem cell analysis
p0420 A80-43122
SABOONCHI, A.
Determination of the extinction coefficient of glass fiber insulation
[AIAA PAPER 80-1528] p0330 A80-41488
SACKS, I. J.
An analysis of off-guideway energy storage/propulsion systems for dual mode transit systems
p0546 A80-34081
SADAKATA, M.
Development of a NO/x/-free combustion system
p0333 A80-43741
SAITO, S.
High electrical conductivity and high Hall coefficient in MHD generator
p0511 A80-34990
SAITOH, T.
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343
SAKAS, J. G.
Street lighting by sunlight
p0411 A80-38009
SAKR, I. A.
Flat plate boosters for elevating temperatures
p0404 A80-37947
Performance comparison of different types of solar water heaters under Egyptian conditions
p0407 A80-37973
Combination of wind and solar energies at the Northern Coast of Egypt
p0411 A80-38014
SAKUMA, K.
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438
SAKURAI, T.
Theoretical consideration on solar concentrations by central receiver systems
p0377 A80-33629
SAKUTA, K.
Economic analysis of the STEPS in Japan
p0375 A80-33615
SALA, G.
Hybrid silicone-glass Fresnel lens as concentrator for photovoltaic applications
p0364 A80-33500
The Ramon Areces concentration photovoltaic array
p0384 A80-33714
Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727
SALAMA, A. M.
Method of mitigating titanium impurities effects in p-type silicon material for solar cells
[NASA-CASE-NPO-14635-1] p0431 N80-24741
SALIB, R. A.
Planning air quality control systems for power generation
p0325 A80-35897
SALIEVA, R. B.
Technical-economic validation for selection of solar resources as energy sources
p0400 A80-36596
SALLES, D.
Laser processing in the preparation of silicon solar cells
p0396 A80-35363
SALMON, R.
Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol
[ORNL-5439] p0485 N80-24471
SALTER, S. H.
Recent progress on ducks
p0526 A80-43832
SALTMARSH, M. J.
Review of the ISX-B experimental program
p0515 A80-37181
SAMMELLS, A. F.
Influence of electrolyte composition on electrode kinetics in the molten carbonate fuel cell
p0515 A80-37007
Lithium-metal sulfide and sodium-sulfur batteries for solar energy storage
[CONF-781228-3] p0424 N80-22843
SAMUEL, A. A.
Solar thermal power plant - Thermodynamic analysis
p0410 A80-37999
SAN MARTIN, R. L.
Performance data from reduced levels of instrumentation in solar heated and/or cooled buildings
p0381 A80-33669
SAN PIETRO, A.
Light-dependent hydrogen production by C. reinhardi
p0459 A80-33410
SANCHEZ, J.
A simple technique for measuring slope or surface error of a concentrator
p0378 A80-33644
SANDERS, B. D.
The influence of the federal council on the formulation of the 'Regulation on general conditions for the supply of electricity for tariff customers' and the 'Second regulation on altering of the federal electricity tariff structure' Attempt at a critical assessment
p0324 A80-34125
SANDERSON, J. E.
Liquid fuel production from biomass
p0465 A80-33412
Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462
SANDERSON, J. G.
Three-dimensional reconstruction of the X-ray emission in laser imploded targets
p0510 A80-34749
SANDERSON, R. W.
The performance of silicon solar cells under concentrated sunlight
p0386 A80-33724
SANGRADOR, J.
Quasi-static concentrated array with double side illuminated solar cells
p0386 A80-33727
SANZ, J.
The Ramon Areces concentration photovoltaic array
p0384 A80-33714
SAPP, C. D.
Photometric analysis of aerial photographs to detect and map sulfur dioxide effects of soybeans near two large, coal-fired power plants
p0330 A80-41664
SARGENT, S. L.
Solar industrial process heat
p0357 A80-33184
SARMA, K. R.
The thermal expansion shear separation /TESS/ technique for producing thin self-supporting silicon films for low-cost solar cells
p0394 A80-35340
SASH, R.
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693
SASSI, G.
Chromatic dispersion concentrator applied to photovoltaic systems
p0524 A80-43481

SATCHWELL, D. L.
High-energy-density composite flywheel
[SAND-79-7019] p0561 N80-26803

SATO, N.
Results of experiment production of fine COM by wet type mill
p0496 N80-26475

SATTAROV, D. K.
Development and application of high-power lightpipes
p0401 A80-36833

SAUNDERS, A. A.
Fuel conservation through active control of rotor clearances
[AIAA PAPER 80-1087] p0330 A80-41506

SAUNDERS, N. T.
Advanced component technologies for energy-efficient turbofan engines
[AIAA PAPER 80-1086] p0519 A80-38902
Advanced component technologies for energy-efficient turbofan engines
[NASA-TM-81507] p0341 N80-24316

SAWATA, S.
Economic analysis of the STEPS in Japan
p0375 A80-33615

SAWYER, D. E.
Laser scanning of solar cells for the display of cell operating characteristics and detection of cell defects
p0397 A80-35370
Photovoltaic Material and Device Measurements Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 1
p0398 A80-35480
Photovoltaic Material and Device Measurement Workshop, Arlington, Va., June 11-13, 1979, Proceedings. Part 2
p0525 A80-43757

SAXMAN, A. C.
LOTS analysis of optical diffraction in Antares
p0518 A80-38490

SAYIGH, A. A. M.
Basics of solar energy
p0416 A80-42436
Characteristics of solar radiation
p0417 A80-42437
The technology of flat plate collectors
p0417 A80-42439

SAYLOR, W.
A simple technique for measuring slope or surface error of a concentrator
p0378 A80-33644

SCALABRIN, G.
Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537

SCANTLAND, D. A.
Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass
[BMI-2031-VOL-2] p0341 N80-24475

SCARLETT, W. R.
A large-area cold-cathode grid-controlled electron gun for Antares
p0516 A80-37854

SCARPI, G.
Development of 1pKW photovoltaic module with concentration
p0386 A80-33728

SCHABER, K.
Heat pipe receiver for a 20 MWe solar tower
[AIAA PAPER 80-1507] p0415 A80-41471

SCHAETZLE, W. J.
Energy storage in ground-water aquifers
p0545 A80-33514
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-25] p0344 N80-24860

SCHAFFAR, G.
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors
[ASSA-FA-10] p0456 N80-26879

SCHATZLE, P. R.
Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C] p0535 N80-25897

SCHEFFEE, R. S.
Development and evaluation of highly-loaded coal slurries
p0496 N80-26481

SCHEHL, R. R.
Fischer-Tropsch processes investigated at the Pittsburgh Energy Technology Center since 1944
p0471 A80-37678

SCHEPPELE, S. E.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460

SCHERTZ, W.
Applications of CPC's in solar energy - An overview
p0364 A80-33501
Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638

SCHIEFELBEIN, G. F.
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266] p0490 N80-25465

SCHINDLER, H. D.
Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979
[FE-2514-44] p0490 N80-25471

SCHIPPER, L.
International analysis of residential energy use and conservation
[LBL-9383] p0349 N80-25881

SCHLAG, J. H.
Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665

SCHLEGEL, H. G.
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407

SCHLINGER, W. G.
Coal gasification development and commercialization of the Texaco coal gasification process
p0474 A80-40754

SCHMELZLE, J.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859

SCHMID, B. K.
Economic and market potential for SRC-II products
p0474 A80-40758

SCHMID, R.
Design of an inexpensive solar simulator
p0362 A80-33478

SCHMIDT, C. A.
Electrolytic hydrogen production and its potential utilization for ship propulsion
p0462 A80-37987

SCHMIDT, E. W.
Heat and mass transfer analysis of a chemical converter/heat exchanger for the SO2/SO3 distributed solar energy collection system
p0358 A80-33426

SCHMITT, C. R.
Stability of plasma-sprayed coatings tested at White Sands Solar Facility
p0380 A80-33658

SCHMITT, W.
The design and development of programs to optimize the control, monitoring and functional analysis of the U of L solar research center
p0381 A80-33666

SCHNAPER, G. H.
Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-2] p0454 N80-26845

SCHNEEMEYER, L. F.
n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852

SCHNEIDER, A.
Research on diamantane and other high density hydrocarbon fuels
[AD-A080749] p0482 N80-23474
SCHNEIDER, J. H.
NOAA's cold-water pipe at-sea test program
p0511 A80-35162
SCHNEIDER, K.
H2 production from water - Use of natural and synthetic catalysts for the bioconversion of solar energy
p0459 A80-33407
SCHNELL, C.
Bioconversion
p0471 A80-37504
SCHOCK, H.-W.
A fabrication process for Cu2S-CdS thin film solar cells
p0385 A80-33719
SCHOENAU, G. J.
The Saskatchewan Conservation House - A year of performance data
p0369 A80-33566
SCHOENHALS, R. J.
Thermal energy storage testing facility
p0553 N80-22808
SCHREIBER, H.
Fuel-flexible combined cycles for utility power and cogeneration
[ASME PAPER 80-GT-101] p0331 A80-42225
SCHREIBER, R. J.
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501
SCHREINER, F.
Open-cycle coal-fired liquid-metal MHD
[CONF-790640-7] p0529 N80-23844
SCHRENK, G. L.
Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631
SCHREYER, J. M.
Stability of plasma-sprayed coatings tested at White Sands Solar Facility
p0380 A80-33658
SCHROT, H. D.
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
SCHUELER, D. G.
The DOE photovoltaic concentrator project
p0386 A80-33730
SCHUENDEMAN, J. L.
Low-cost mirror concentrator based on double-walled metallized, Tubular films
[ALO-4227-12] p0428 N80-23811
SCHULER, H. F.
Solar energy system with heat pump augmentation for industrial process heat - An update
p0372 A80-33589
Mini-computer-based energy monitor system
p0380 A80-33661
SCHULTEN, R.
Hydrogen production from water by use of nuclear energy
p0462 A80-37346
SCHULTZ, J. H.
Ignition and thermal stability characteristics of advanced-fuel tokamak plasmas with empirical scaling
p0521 A80-41745
SCHULTZ, K. R.
Materials implications of fusion-fission reactor designs
p0506 A80-33044
SCHULTZ, W.
An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473
Solar collector fluid parameter study
[PB80-125891] p0430 N80-23069
SCHULTZ, W. E.
Results of long term natural weathering effects on solar collectors under stagnation conditions
p0362 A80-33475
SCHWAB, C.
Environmental and institutional considerations in the development and implementation of biomass energy technologies
[SERI/TR-62-264] p0341 N80-24493
SCHWARTZ, H. J.
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548] p0356 N80-27805
SCHWARTZ, H.
Energy-storage systems for automobile propulsion, 1979 study. Volume 3: Battery/flywheel electric vehicles using advanced batteries
[UCRL-52841-VOL-3] p0561 N80-26213
SCHWARZOTT, W.
Thermodynamic trade-offs for gas cooled high temperature solar tower receivers
p0379 A80-33648
SCHWENDEMAN, J. L.
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817
SCOFIELD, M. P.
A manufactured solar home
p0370 A80-33568
SCOTT-MONCK, J. A.
The applicability of DOE solar cell and array technology to space power
[NASA-CR-163143] p0432 N80-24753
SCOTT, L.
Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges
[SAND-79-7051-VOL-1] p0449 N80-26611
SCOTT, O. L.
Internally insulated thermal storage system development program
p0552 N80-22801
SEAGASER, C. S.
Low temperature thermal-energy storage
[ANL/CES/TE-79-3] p0554 N80-22842
SEAGER, C. H.
Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques
p0398 A80-35467
SEAGRAVE, J. D.
Design of Helios beam diagnostics
p0518 A80-38486
SEALOCK, L. J., JR.
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266] p0490 N80-25465
SEAMAN, C. H.
Results of the 1979 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-163013] p0432 N80-24752
SEAMONS, L. O.
Helios and reconcentrators
p0378 A80-33637
SEDEFIAN, L.
On the vertical extrapolation of mean wind power density
p0471 A80-36424
SEDLACEK, C.
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693
SEELY, G. R.
Association of chlorophyll with surfactants on a particle surface
p0358 A80-33421
SEGRE, S. E.
Breakeven for thermonuclear fusion in the hot-ion mode
p0519 A80-39539
SEHRA, J. S.
Solar energy conversion by fluorescent materials for utilization in space communication systems
p0409 A80-37992
SEIBERT, M.
Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477
Biological solar cells
[SERI/TP-332-476] p0439 N80-24831
SELBY, R.
Hybrid passive for motel guest rooms
p0384 A80-33709

SELCUK, M. K.
Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480
Low cost vee-trough evacuated tube collector module
p0363 A80-33492
SELF, S. A.
Diagnostic techniques for combustion MHD systems
[AIAA PAPER 80-0926] p0505 A80-32892
SELL, F. R.
Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466
SELVAGE, R. B. G.
Equitable performance comparison and economic evaluation of active and passive solar energy systems
p0329 A80-40965
SEMINARIO, C.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657
SEMINARIO, C. E.
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660
SEMMENS, M. G.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826
SEN, A. K.
Solar energy conversion by fluorescent materials for utilization in space communication systems
p0409 A80-37992
SENGOKU, S.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439
SENGOKU, T.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0320 A80-38366
SENS, P. F.
National solar heating and cooling programme in the Netherlands
p0323 A80-33441
SEPPANEN, M. S.
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-25] p0344 N80-24860
SERAPHIN, B. O.
Spectrally selective surfaces in photothermal solar energy conversion
p0417 A80-42443
SETTY, B. S.
California State energy efficient State Office Building
p0327 A80-37988
SEWARD, W. H.
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477
SEZGEN, A. O.
Passive solar calculation methods
[DSE-5221-T1] p0442 N80-25790
SHA, W. T.
Effects of baffles on thermal stratification in thermocline storage tanks
p0365 A80-33509
SHAFER, B.
Photovoltaic concentrator design comparison
p0385 A80-33723
SHAFER, B. D.
The DOE photovoltaic concentrator project
p0386 A80-33730
SHAGINIAN, L. R.
Obtaining film materials with solar furnaces
p0400 A80-36593
SHAHROKHI, F.
Remote sensing of earth resources. Volume 8 - Annual Remote Sensing of Earth Resources Conference, 7th, Tullahoma, Tenn., March 27-29, 1979, Technical Papers
p0475 A80-41662
SHARMA, A.
Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23789
SHARMA, P. P.
Spray-deposited ITO-silicon SIS heterojunction solar cells
p0395 A80-35350
SHARMA, V. C.
Radiative selectivity and the oxidation of stainless steels
p0388 A80-33745
SHASTRY, S. K.
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337
SHCHERBAKOV, V. V.
Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732
SHCHETININA, N. A.
Choice of cycle parameters for solar Freon air conditioning equipment of ejector type
p0391 A80-33862
SHEARER, J. A.
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal
p0471 A80-37617
SHEFT, I.
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628
SHEKLEIN, A. V.
Evaluating certain ways of storing solar energy
p0400 A80-36598
SHELBY, J. E.
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858
SHELDON, D. B.
Phase 2 experiment test plan: Solar photovoltaic/thermal residential experiment
[COO-4094-65] p0455 N80-26869
SHELTON, R. M.
Implications for the UK of solar-power satellites /s.p.s/ as an energy source
p0422 A80-43836
SHEN, Y.-D.
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368
SHEPARD, N. F.
Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules
[NASA-CR-163028] p0449 N80-26776
SHEPHERD, A. D.
Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764
SHEPPARD, A. P.
Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665
SHEREMETOVA, G. L.
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591
SHERMAN, C.
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks
p0545 A80-33510
SHEROHMAN, J. W.
Fabrication of glass sphere laser fusion targets
p0506 A80-33052
SHERWIN, E. T.
An update of solid waste resource recovery technology - Improved economics through potential penetration of new markets for recycled products
[ASME PAPER 80-ENAS-9] p0479 A80-43186
SHET, U. S. P.
Solar thermal power plant - Thermodynamic analysis
p0410 A80-37999
SHEWCHUN, J.
MIS and SIS solar cells
p0395 A80-35348

Metal-insulator-semiconductor /MIS/ and semiconductor-insulator-semiconductor /SIS/ solar cells. I - Basic principles. II - Performance characteristics
p0419 A80-42457

SHEWEN, E. C.
Equations for representing the UL-dependence in collector test procedures
p0361 A80-33467

SHIBATA, T.
Remote sensing for geothermal environmental assessments
[UCRL-15108] p0483 N80-23756

SHIH, P. S.
Design parameters for solar powered absorption cooling systems with chilled water storage
p0441 N80-25778

SHIH, S.-M.
Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale
p0472 A80-39421

SHILIN, B. V.
Measurement of geothermal fluxes by aerial thermal surveys
p0475 A80-42019

SHIMAZU, Y.
High electrical conductivity and high Hall coefficient in MHD generator
p0511 A80-34990

SHIMOMURA, Y.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

SHINDOH, Y.
Improvement of optical reflectance of homogeneous interference film for solar absorber by texture control
p0388 A80-33741

SHINN, J. H.
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents
p0472 A80-39420

SHINN, N. R.
A manufactured solar home
p0370 A80-33568

SHINOHARA, S.
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438

SHIODA, S.
High electrical conductivity and high Hall coefficient in MHD generator
p0511 A80-34990

SHIOMI, T.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0328 A80-38366

SHIOZAWA, A.
Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM
p0502 N80-27508

SHIRAZIAN, M.
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117

SHIRER, H. N.
Effect of complex terrain on wind fluctuations
p0468 A80-35723

SHIRLAND, F. A.
Etching of CdS films
p0398 A80-35488
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847

SHOEMAKER, F. F.
Communication strategy to commercialize passive solar energy
[SERI/TP-69-412] p0335 N80-22849
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205

SHORE, N. L.
System-reliability studies for wave-energy generation
p0540 A80-43830

SHORT, T. H.
The development and demonstration of a solar pond for heating greenhouses
p0371 A80-33586

SHPILRAIN, E. E.
The decreased detrimental effect of the Hall effect on the characteristics of an MHD generator
p0510 A80-34619

SHU, H. T.
A perspective on closed-cycle gas turbines applied to naval-ship propulsion
[AIAA PAPER 80-1304] p0519 A80-39014
The prospects for solar-powered closed-cycle gas turbines
[ASME PAPER 80-GT-26] p0416 A80-42161

SHULTIS, J. K.
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807

SHUM, J.
Illinois state plan: Energy conservation in institutions (institutional buildings grant program)
[PB80-148182] p0354 N80-26882

SICHERMAN, A.
Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

SICKMUELLER, G.
Investigation of further economics development of regional electricity supply concerns
p0324 A80-34122

SIDOROV, V. I.
The utilization of wind-energy resources
p0478 A80-42700

SIDOROV, V. V.
The utilization of wind-energy resources
p0478 A80-42700

SIEGEL, B.
Central station applications planning activities and supporting studies
[NASA-CR-163042] p0352 N80-26784

SIENKO, M. J.
n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852

SIEVERS, A. J.
Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications
[DOE/ET-20413/1] p0448 N80-26143

SIFFERT, P.
Realization of p-n junction solar cells by an ion implantation doping procedure
p0409 A80-37991

SIFFERT, P. M.
Laser processing in the preparation of silicon solar cells
p0396 A80-35363

SILLMAN, S.
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900

SILVERNAIL, C.
The Antares laser power amplifier
p0517 A80-37855

SILVERNAIL, C. J.
Antares Power Amplifier optical system
p0518 A80-38489

SIM, J. W.
Advanced fuel cell development
[ANL-79-51] p0535 N80-25895

SIMANOVSKII, L. N.
Calculation of the angular error of a solar cylindrical concentrator made from sheet material
p0391 A80-33856

SIMMONS, C.
Hydro-power - The use of water as an alternative source of energy
p0468 A80-35172

SIMMONS, D. M.
Loss factors in the design of thermochemical power plants, CO2-CH4 vs. SO3 chemical transport fluids
p0539 A80-33424
Energy storage-boiler tank
p0554 N80-22820

SIMMONS, M.
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797
SIMONOT, M. M.
On the use of a zeolite 13X-H2O intermittent cycle for the application to solar climatization of buildings
p0367 A80-33538
SIMONSON, J. R.
The simulation of partially and fully tracking flat plate collectors in northern latitudes
p0390 A80-33763
SIMS, J. R.
RMA engineering applications to Fossil Energy projects
p0473 A80-40336
SINGER-BART, S.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
SINGER, I. D.
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258
SINGH, H. K.
Electric and hybrid vehicles in the urban future
[CONF-791009-23] p0341 N80-24217
SINGH, P. P.
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
SINGH, R.
Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination
p0390 A80-33785
Optimization of oxide-semiconductor/base-semiconductor solar cells
p0394 A80-35341
Importance of the interface in noncrystalline /poly and amorphous/ conductor-insulator-semiconductor /CIS/ solar cells
p0402 A80-37192
Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells
p0416 A80-42140
SINGH, R. N.
Concentration characteristics of composite parabolic concentrators
p0416 A80-41950
Advanced fuel cell development
[ANL-79-51] p0535 N80-25895
SINGLETARY, N. J.
Energy storage and electron transfer by carbanion photolysis
p0545 A80-33419
SISTERSON, D. L.
Application of power laws for wind energy assessment
p0470 A80-35744
SITNEY, L. R.
Solar thermal small power systems study. Phase 2: Study results
[DOE/ET/20516-2] p0440 N80-24855
SITTE, W.
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525
SIX, L. D.
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592] p0526 N80-22778
SIZEMORE, M. M.
Economic aspects of passive solar remodeling in existing buildings
p0383 A80-33692
SJOSTEDT, L. E.
The United Stirling P40 engine for solar dish concentrator application
p0531 N80-24775
SKAGGS, S. R.
Treatment of molybdenite ore with laboratory scale solar furnaces
p0380 A80-33659
SKELTON, B. C.
Evaluation of hardware and software requirements for the Advanced Components Test Facility real time data collection system - Experiences from two solar experiments
p0380 A80-33660
SKJOLDAL, H.
Biological solar energy conversion - Hydrogen production and nitrogen fixation by marine blue-green algae
p0459 A80-33406
SKOKOV, IU. V.
High-voltage multijunction solar-energy photoelectric converter
p0401 A80-36830
SLEMMONS, A. J.
Line-focus solar central power systems, phase1
[SAN-0115-140-1] p0447 N80-25903
SLETTEN, C. J.
Wide-angle lenses and image collapsing subreflectors for nontracking solar collectors
p0390 A80-33805
SLIEPCEVICH, C. M.
Conversion processes for liquid fuels from biomass
p0465 A80-33411
SLIFER, L. W., JR.
Unfulfilled technology needs in space power systems
[NASA-TM-80677] p0442 N80-25789
SLIWKOWSKI, J.
An application of phase change materials in passive solar systems
p0384 A80-33703
SLIWKOWSKI, J. J.
Experimental study of coolness storage using sodium sulfate decahydrate
p0546 A80-33521
SLOOP, J. L.
Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems
p0381 A80-33674
SMIRNOV, S. I.
Development of a combined solar heating/heat pump system for conditions typical of the Crimea
p0391 A80-33863
SMITH, A. M.
Common Cause Failures - A dilemma in perspective
p0328 A80-40344
SMITH, C.
Beam simultaneity in multi-terawatt CO2 laser fusion systems
p0517 A80-38483
SMITH, C. C.
Solar energy for kilning malt
p0372 A80-33593
SMITH, D. R.
Status of the photovoltaic systems definition project
p0387 A80-33733
SMITH, F. B.
Users group for central receiver testing
p0380 A80-33654
SMITH, G. B.
Solar absorption cycle cooling installations in Sydney, Australia
p0366 A80-33536
SMITH, G. W.
Hydration enhanced sulfation of limestone and dolomite in the fluidized-bed combustion of coal
p0471 A80-37617
SMITH, J. H.
Handbook of solar energy data for south-facing surfaces in the United States. Volume 2: Average hourly and total daily insolation data for 235 localities. Alaska - Montana
[NASA-CR-162999] p0423 N80-22784
Handbook of solar energy data for south-facing surfaces in the United States. Volume 3: Average hourly and total daily insolation data for 235 localities. North Carolina - Wyoming
[NASA-CR-163000] p0423 N80-22785
SMITH, J. J.
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364
SMITH, J. L.
Federal policies to promote the widespread utilization of photovoltaic systems. Supplement: Review and critique
[NASA-CR-163148] p0342 N80-24754

SMITH, K. G.
Energy analysis of wave and tidal power
p0333 A80-43828
SMITH, M. R.
Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents
[PB80-126469] p0334 N80-22527
Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes
[PB80-126477] p0334 N80-22528
Risk of renewable energy sources: A critique of the Inhaber report
[ERG-79-3] p0349 N80-25892
SMITH, O. J. M.
A helioelectric farm
p0410 A80-38005
Sow wind turbines and reap the wind
p0517 A80-38012
SMITH, P.
Reverse current-voltage characteristics of indium tin oxide/silicon solar cells under illumination
p0390 A80-33705
SMITH, P. A.
Efficient indium tin oxide/polycrystalline silicon semiconductor-insulator-semiconductor solar cells
p0416 A80-42140
SMITH, P. L.
Land use and environmental impacts of decentralized solar energy use
[DOE/EV-0067] p0458 N80-27843
SMITH, P. S.
A helioelectric farm
p0410 A80-38005
SMITH, R.
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1] p0339 N80-23830
SMITH, R. D.
The trace element chemistry of coal during combustion and the emissions from coal-fired plants
p0324 A80-34600
SMITH, R. P.
A method for balancing flow rates in rows of parallel collectors
p0362 A80-33476
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974] p0561 N80-26804
SMITH, S. R.
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501
SMITH, W. A.
The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona
p0436 N80-24793
SMITHRICK, J. J.
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515] p0557 N80-24756
Pulse charging of lead-acid traction cells
[NASA-TM-81513] p0558 N80-25780
SNYDER, A.
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2] p0498 N80-26533
SNYDER, M. H.
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines
[NASA-CR-159856] p0355 N80-27803
SOBEL, M.
Biosources Digest. A journal on biomass utilization, volume 1, number 3
[PB80-139306] p0487 N80-24504
Biosources digest, a journal on biomass utilization, volume 1, no. 1
[PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass utilization, volume 1, no. 4
[PB80-140981] p0493 N80-25909
Biosources Digest, a journal on biomass utilization, volume 1, no. 2
[PB80-157662] p0504 N80-27795
SODERSTROM, K. G.
Process steam generation by a facetted, non-imaging solar concentrator
p0378 A80-33639
SOFER, S. S.
Conversion processes for liquid fuels from biomass
p0465 A80-33411
SOHN, H. Y.
Nonisothermal determination of the intrinsic kinetics of oil generation from oil shale
p0472 A80-39421
SOHNS, J.
Laboratory tests for flat plate solar collectors
p0361 A80-33471
SOLMI, S.
A new technology to fabricate high-efficiency silicon concentrator solar cells
p0397 A80-35366
SOLODUKHA, O. I.
High-voltage multijunction solar-energy photoelectric converter
p0401 A80-36830
SONCINI, G.
A new technology to fabricate high-efficiency silicon concentrator solar cells
p0397 A80-35366
SONJU, O. K.
High-power MHD system combustor development testing
p0523 A80-43138
SOPORI, B. L.
Some investigations on the influence of defects/grain boundaries on photovoltaic mechanisms in polycrystalline silicon films
p0526 A80-43758
SORATHIA, U. A.
Development of polyimide materials for use in solar energy systems
[DOE/CS-35305/T1] p0445 N80-25855
SOTO, R.
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205
SOUKUP, R. J.
An analytical model of a backwall MIS Schottky barrier solar cell
p0399 A80-36245
SOULE, D. E.
Infrared spectra of the hydrogenated amorphous silicon layers on metallic substrates of solar absorbers
p0421 A80-43513
SOVRANO, M.
Experimental comparison between solar assisted compression and absorption heat pump
p0367 A80-33537
SOWELL, E. F.
A convolution model of rock bed thermal storage units
p0550 A80-43480
SOWELL, R. R.
Thermal aging characteristics of electrodeposited black chrome solar coatings
p0388 A80-33740
SPACIL, H. S.
Performance analysis of zinc-bromine batteries in vehicle and utility applications
p0550 A80-41852
SPACKMAN, W.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476
SPAHR, H. R.
Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C] p0535 N80-25897
SPALTHOFF, F. J.
Energy economic demands of the Federal Republic of Germany and the resulting consequences for the energy policy of the 1980's
p0330 A80-41826
SPANN, M. L.
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873
SPARKS, P. R.
An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients
[PB80-158769] p0458 N80-27829
SPECTOR, R. B.
Reliability prediction techniques for second generation marine and industrial gas turbines
[ASME PAPER 79-GT/ISR-3] p0521 A80-42056

SPEIDEL, K.
A simple water pump, powered by solar energy
p0411 A80-38011
SPELLS, S.
Development of improved insulation materials
[ALO-4295-T2] p0448 N80-26403
SPELTA, B.
The reaction of sulphur dioxide with water and a halogen: The case of iodine - Reaction in presence of organic solvents
p0459 A80-35190
SPENCER, D. L.
Integration of solar collectors in large prefabricated roof/wall sections
p0361 A80-33465
SPENCER, D. W.
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554
SPENGLER, C. J.
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. II - Full scale combustor and corrosion tests
[ASME PAPER 80-GT-68] p0476 A80-42198
SPERA, D. A.
Modified power law equations for vertical wind profiles
p0468 A80-35719
SPITZER, M. B.
MIS and SIS solar cells
p0395 A80-35348
SPRINGMANN, H.
The optimization air separation plants for combined cycle MHD-power plant applications
[NASA-TM-81510] p0528 N80-23778
SPURRIER, F. R.
Compact closed cycle Brayton system feasibility study, volume 1
[AD-A081379] p0532 N80-25666
SREDNIAWSKI, J. J.
Transient getter scheme for the tokamak fusion test reactor
p0516 A80-37185
SRINIVASAN, S.
Development of fuel cell technology for vehicular applications
[BNL-51047] p0536 N80-26216
SRIRAMULU, V.
Theoretical and experimental investigations of a countercurrent solar regenerator
p0366 A80-33528
Theoretical and experimental investigations of an intermittent solar refrigerator
p0367 A80-33540
Performance of a storage unit coupled to a flat plate solar collector
p0406 A80-37964
STAATS, E. B.
Federal government needs a comprehensive program to curb its energy use
[EMD-80-11] p0343 N80-24814
STACK, D. W.
A Boolean approach to common cause analysis
p0328 A80-40349
STACY, A.
n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852
STADHERR, M. A.
Survey of organic electrolytic processes
[ANL/OEPM-79-5] p0341 N80-24393
STADJUHAR, S. A.
Feasibility evaluation for solar industrial process heat applications
[SERI/TP-333-538] p0438 N80-24824
End-use matching for solar industrial process heat
[SERI/TR-34-091] p0454 N80-26849
STADTER, J. T.
At-sea test of a large diameter steel, cold water pipe
p0512 A80-35166
STAFFA, N. G.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2] p0455 N80-26866
STAIGNER, P. J.
Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780
STALLINGS, J. W.
Economics of energy recovery from biomass using fluidized-bed combustion
p0465 A80-33413
STALLKAMP, J. A.
Dispersed storage and generation case studies
[NASA-CR-162996] p0334 N80-22782
Traction studies of northeast corridor rail passenger service: Executive summary
[NASA-CR-162997] p0336 N80-23214
STANDER, C. M.
Hydrodenitrogenation of coal liquids and petroleum with heterogenous catalysts in multiphase reactors. Review and recommendations for further work
[PB80-151442] p0499 N80-26549
STANDLEY, E. W.
California thermal oil utilization. Volume 1: Executive summary
[SAN-1864-1] p0488 N80-24849
STANSFIELD, H. B.
System-reliability studies for wave-energy generation
p0540 A80-43830
STARKEY, D. J.
Initial test bed concentrator characterization
p0433 N80-24765
STARR, P. J.
Energy for wind powered oscillators
[DOE/R5/10129-1] p0500 N80-26858
STAVINOHA, L. L.
Assessment of crude oil and refined petroleum product quality during long-term storage
[AD-A082365] p0557 N80-24637
STEELE, R. S., JR.
Oak Ridge Flywheel Evaluation Laboratory
[Y-2210] p0556 N80-23832
STEFANAKOS, E.
Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819
STEIN, T. R.
Comparative testing of petroleum surrogate fuels with coal-derived liquids in a combustion turbine burner
[ASME PAPER 80-GT-64] p0476 A80-42194
Combustion effects of coal liquid and other synthetic fuels in gas turbine combustors. I - Fuels used and subscale combustion results
[ASME PAPER 80-GT-67] p0476 A80-42197
STEINBERG, M.
Fusion - An energy source for synthetic fuels
[AIAA PAPER 80-0844] p0465 A80-32857
Hydrogen production using fusion energy and thermochemical cycles
p0459 A80-35189
Environmental control technology for atmospheric carbon dioxide
[BNL-27164] p0345 N80-24888
Flash hydropyrolysis of coal
[BNL-51052] p0490 N80-25468
Environmental control technology for atmospheric carbon dioxide
[BNL-51116] p0354 N80-26956
STEINHAUER, L.
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117
STEINWEGS, M.
Development of current converters for switching and regulating tasks in energy technology
[BMFT-FB-T-79-12] p0567 N80-23585
STELLA, P. M.
The applicability of DOE solar cell and array technology to space power
[NASA-CR-163143] p0432 N80-24753
STEMBER, L. H.
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1] p0529 N80-23860

STEPANOVA, Z. A.
Influence of base resistivity on the temperature characteristics of silicon photoconverters
p0514 A80-36590
STEPKO, I. I.
Investigation into operating characteristics of solar batteries using Cu/2-x/S-CdS ceramic photoconverters
p0400 A80-36591
STEVENS, H. C.
Evaluation of materials for EPR power generation
p0507 A80-33058
STEWART, R.
Comparison on the performance of a solar assisted heat pump and an air source heat pump in a northern climate
p0368 A80-33554
STEWART, W. F.
Liquid hydrogen-fueled vehicle project
[LA-UR-79-2883] p0463 N80-25467
STICKFORD, G. H.
Analytical and economic evaluation of heat pipe augmented passive solar heating systems
p0384 A80-33704
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1] p0529 N80-23860
STIEHLER, R. D.
Solar energy systems: Standards for rubber hose
[PB80-129828] p0430 N80-23868
STILLWELL, W.
A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985
STINE, R. D.
The Antares laser power amplifier
p0517 A80-37855
STINE, W. B.
Operation of an industrial solar drying system
p0372 A80-33590
STITH, J. L.
Cloud-active nuclei from coal-fired electric power plants and their interactions with clouds
p0325 A80-36419
STODDARD, W.
Wind turbine dynamic blade loads due to wind gusts and wind direction changes
p0513 A80-35727
STOKES, C. S.
The production of stable coal-oil mixtures using high intensity mechanical mixing devices
p0495 N80-26470
Investigation of fuels containing coal-oil-water emulsions
[FE-2689-5] p0497 N80-26524
STOLL, J. A.
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847
STOPPONI, V.
A solar operated water-Li Br absorption refrigeration machine used also as heat pump - Technical and economic analysis
p0367 A80-33545
STOTTLEMYRE, J. A.
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974] p0561 N80-26804
STOTTS, B. E.
A new and simple method for estimating the monthly and yearly performance of passive solar systems
p0383 A80-33697
STOURNARAS, C. J.
Catalyzed thermal conversion of SO3 to SO2+O2 for solar thermal power
p0379 A80-33651
STRAND, J. A.
Use of reconnaissance level information for environmental assessment
[NUREG-CR-0990] p0336 N80-22883
STREED, E. R.
An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473
STRICKLAND, G.
Bulk hydrogen storage using metal hydrides
[BNL-27093] p0463 N80-24483
Heat transfer enhancement in metal hydride systems
[BNL-27347] p0561 N80-26539
STRINGER, R. P.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9] p0483 N80-23486
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-8] p0483 N80-23487
STROJAN, C.
Environmental assessment of small wind systems
[SERI/PR-354-420] p0350 N80-25928
STRONG, S. J.
A novel mildly concentrating photovoltaic/thermal total energy system
p0386 A80-33729
STRUB, R. A.
Integration of solar collectors in large prefabricated roof/wall sections
p0361 A80-33465
STRUCK, R. T.
The zinc chloride process for the hydrocracking of coal
p0474 A80-40757
STUART, M. W.
An assessment of solar hot water heating in the Washington, D.C. area - Implications for local utilities
p0399 A80-36052
STUCK, R.
Laser processing in the preparation of silicon solar cells
p0396 A80-35363
STUEBER, T. F.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826
STURGESS, G. J.
Gas turbine combustor design challenges for the 1980's
[AIAA PAPER 80-1285] p0475 A80-41213
SUAREZ, R.
The effect of a black chrome selective surface on the thermal performance of a solar collector
p0414 A80-40538
SUBKLEW, G.
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525
SUCCOP, D. C.
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-42] p0490 N80-25473
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546
SUELZLE, J. S.
Design, construction and testing of a 60 kW solar array and power conversion system
[AD-A080877] p0337 N80-23782
SUGIHARA, H.
Test results of the solar powered Rankine cycle refrigerator installed in the experimental house
p0366 A80-33529
SUGIURA, S.
Solar heating and hot water supply system of Fuji Electric Solar House
p0370 A80-33573
SUHR, N. H.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476

SULLIVAN, H. F.
A comparative study of solar assisted heat pump systems for Canadian locations
p0367 A80-33546

SULLIVAN, R.
Passive solar calculation methods
[DSE-5221-T1] p0442 N80-25798

SULLIVAN, R. F.
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-43] p0486 N80-24482

SULLIVAN, T. E.
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823

SULOCK, J. M.
The economics of solar heating - A note on the appropriate discount rate and the use of the pay back period
p0421 A80-43484

SUN, R. C.-H.
Solar energy with chemical storage for cogeneration of electric power and heat
p0549 A80-40715

SUNDELL, J.
Heat-pump applications to single-family dwellings - An analysis by computer model
p0333 A80-43833

SUNDQUIST, E. T.
Oil shales and carbon dioxide
p0467 A80-34539

SURBER, F. T.
Assessment of the potential of hybrid vehicles: Summary
[NASA-CR-163059] p0336 N80-23215

SURESH, D.
The use of solar furnaces in materials research
p0411 A80-38008

SURLES, T.
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923

SUTER, J. M.
Measurements of performance and efficiency of solar energy systems
p0381 A80-33667

SUTTON-VANE, V.
The influence of Tidal Generating Force on windflow - A preliminary study
p0465 A80-32930

SUTTON, R. J.
Oak Ridge Flywheel Evaluation Laboratory
[Y-2210] p0556 N80-23832

SUZDALTSEV, A. I.
Study of the operation of a pneumatic wave-energy converter
p0521 A80-41732

SWAFFORD, C. J.
Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility
p0378 A80-33642

SWAIN, J. W., JR.
Industrial compressed air applications for solar energy conversion/storage devices
[SAND-79-7077] p0451 N80-26802

SWALLOM, D. W.
High-power MHD system combustor development testing
p0523 A80-43138

SWANSON, S.
The effect of an auxiliary load management strategy on solar system performance
p0389 A80-33757

SWANSON, S. R.
Mass flow considerations for solar air heating systems
p0369 A80-33558

SWANSON, T.
Comparison of combined solar heat pump systems to conventional alternatives
p0367 A80-33544

SWARTMAN, R. K.
Cooling of buildings
p0418 A80-42446

SWARTZ, C. K.
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180

SWIGERT, C. J.
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493

SYMONS, J. G.
Thermal performance predictions and sensitivity analysis for high temperature flat-plate solar collectors
p0415 A80-40718

SZEDON, J. R.
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847

SZLUHA, A. T.
Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites
[CONF-791056-2] p0345 N80-24885

SZOKOLAY, S. V.
Solar City - Mount Cotton
p0359 A80-33434

SZYDLO, N.
I-V and C-V characteristics of Au/TiO2 Schottky diodes
p0413 A80-39055

SZYMANSKI, S. T.
The effect of ammonia on hydrogen-air phosphoric acid fuel cell performance
p0522 A80-42295

T

TABER, J. J.
Displacement of oil by carbon dioxide
[DOE/MC-03260/4] p0492 N80-25768

TAG, I.
A 500 gallons per day hybrid desalination plant using wind/solar energy
p0382 A80-33682

TAHA, I. S.
Effect of off-south orientation on optimum conditions for maximum solar energy absorbed by flat plate collector augmented by plane reflector
p0361 A80-33462

TAIROV, B. D.
Thermodynamic analysis of solar-energy thermal-power converters operating together with photoelectric converters
p0401 A80-36829

TAKAHASKI, U.
Basic studies on COM combustion
p0497 N80-26484

TAKESHITA, I.
A direct solar-heated R22-DMF absorption refrigerator
p0367 A80-33539

TALBERT, S. G.
Development of a low-temperature, low-cost, black liquid solar collector, phase 2
[ALO-30171-1] p0453 N80-26841

TAM, S. W.
Underground Pumped Hydroelectric Storage (UPHS)
[ANL/EES-TM-60] p0554 N80-22841
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants
[CONF-791204-11] p0557 N80-24628

TAMURA, K.
Design consideration of fine COM storage
p0502 N80-27506

TAN, G.
Upgrading of coal liquids: Upgrading distillates from coal liquefaction
[FE-2566-26] p0480 N80-22518
Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas
[FE-2566-25] p0480 N80-22519

TAN, J. F.
Cylindrical 'elastical' concentrating solar collectors
p0364 A80-33497

TANAKA, H.
Glassy electrolyte galvanic cells
p0515 A80-37008

TANAKA, S.
Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434

TANAKA, T.
Economic analysis of the STEPS in Japan
p0375 A80-33615

TANG, K.
Geothermal direct heat use: Market potential/penetration analysis for Federal Region 9
[NASA-CR-163267] p0352 N80-26772

TANI, T.
Economic analysis of the STEPS in Japan
p0375 A80-33615

TARKINGTON, T. W.
Evaluation of physical/chemical coal cleaning and flue gas desulfurization
[PB80-147622] p0346 N80-25481

TARMAN, P. B.
Hydrogen from fossil fuels
p0460 A80-37333

TARR, N. G.
An induced back surface field solar cell employing a negative barrier metal-insulator-semiconductor contact
p0422 A80-43583

TAUSSIG, R. T.
The use of an unsteady wave chemical reactor as a key element in the production of H2 for use in synthetic fuel production
p0462 A80-38117

TAVANA, M.
Aqueous solutions database to high temperatures and pressures: NaCl solutions
[LBL-9621] p0482 N80-23399

TAYLOR, B. J.
An economic analysis of solar energy alternatives
p0412 A80-38021

TAYLOR, E. J.
Development of fuel cell technology for vehicular applications
[BNL-51047] p0536 N80-26216

TAYLOR, L.
Solor Applications of Thermal Energy Storage
[TID-29430] p0427 N80-23791

TAYLOR, R.
Solar thermal repowering utility value analysis
[SERI/TR-8016-1] p0428 N80-23814

TEAGUE, E.
One-quarter MWt air cycle receiver test at the Advanced Component Thermal Test Facility at Georgia Institute of Technology
p0380 A80-33657

TEAGUE, H. L.
Identification of alignment and tracking errors in the open loop, time based heliostat system of the 400 kw Advanced Components Test Facility
p0378 A80-33642

TEASDALE, R. W.
Helios target positioning system
p0518 A80-38485

TEETER, R. R.
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364

TEMOFONTE, T. A.
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823

TEOTIA, A. P. S.
Market penetration of new energy systems estimated by econometric and stochastic methodology
[CONF-790852-2] p0346 N80-25207

TEPLIAKOV, D. I.
Geometric and kinematic characteristics of solar-tower heliostats
p0391 A80-33857

TERAOKA, T.
Seasonal regeneration through underground strata
p0548 A80-37966

TERNES, M. P.
Thermal energy storage test facility
p0553 N80-22811

TERSCHUEREN, W.
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525

TERUMICHI, Y.
Numerical study of propagation and damping of lower hybrid wave in tokamak plasmas
p0512 A80-35434

TETZLAFF, G.
Wind energy potential in the northern part of Germany
p0469 A80-35735

TEWARI, F. K.
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces
p0388 A80-33746

TEWARY, V. K.
Effect of plasma reflection on open-circuit voltage of a solar cell at ultrahigh light intensities
p0416 A80-42135

THALLER, L. H.
Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-23777

THANGARAJ, R.
Absorptance and emittance measurements of AlPbS and Zn dust selective surfaces
p0388 A80-33746

THEMELIS, N. P.
Solar photovoltaic project: Materials, and testing activities
[COO-4094-60] p0430 N80-23855

THIBAULT, J. J.
Hydrogen liquefaction, storage and transfer on an airport site
p0462 A80-37349

THOMAS, C. J.
Cost and performance evaluation of passive solar systems
p0389 A80-33755

THOMAS, J. P. S.
The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507

THOMAS, J. R.
Heat conduction in partial vacuum
[ALO-5367-1] p0441 N80-25618

THOMAS, R. E.
Detailed modeling of inversion-layer solar cells
p0395 A80-35351
Silicon solar cells. I - Basics. II - Practical aspects
p0419 A80-42455

THOMAS, S. K.
Illinois state plan: Energy conservation in institutions (institutional buildings grant program)
[PB80-148182] p0354 N80-26882

THOMAS, T. M.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061] p0529 N80-23839

THOMPSON, R. E.
Compact closed cycle Brayton system feasibility study, volume 1
[AD-A081379] p0532 N80-25666

THOMPSON, T. L.
Two stage evaporative cooling using a rockbed associated with the active clearview solar collector
p0366 A80-33530

THOMSON, W. B.
Sodium cooled solar central receiver power station
p0375 A80-33610

THORNTON, R. F.
Properties of alternate electrolytes for secondary zinc batteries
p0550 A80-42297
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage
[ORO-5759-T1] p0557 N80-24866

THORP, J.
Preliminary winter comparison results of four passive test cells in Omaha, Nebraska
p0383 A80-33693

THORSNESS, C. B.
Solar coal gasification
p0403 A80-37305

THRESHER, R. W.
Atmospheric considerations for design of WECS
p0513 A80-35717

THULLEN, P.
Commutator dc machines used as mechanical capacitors in a series resonant ohmic-heating circuit simulation
[LA-UR-79-3122] p0526 N80-22619

TIELEMAN, H. W.
An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients
[PB80-158769] p0458 N80-27829

TIKUSH, V. L.
Obtaining film materials with solar furnaces
p0400 A80-36593

TILLIETTE, Z. P.
Reciprocal efficiency improvement of high temperature fossil and low temperature solar heat sources for power generation
[ASME PAPER 80-GT-34] p0416 A80-42167

TILLMAN, D. A.
Synthetic fuels from coal: Overview and assessment
p0329 A80-40825

TIMMERMAN, M.
Drilling horizontal holes in coal bed from the surface with water jets
[SAND-80-0057C] p0492 N80-25766

TIMMONS, M. L.
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797

TINBERG, C.
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2] p0498 N80-26533

TIPPNER, K.
Fuel gases from coal gasification for the gas/steam turbine process
p0472 A80-38300

TIPTON, J. A.
Economic considerations of solar energy
p0412 A80-38019

TJOA, B.
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A
[NASA-CR-135119] p0355 N80-27361

TKACHYK, J. W.
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8] p0335 N80-22878

TOBIN, A.
Thermal fatigue failures in candidate refractory materials for use as protective plates in tokamaks
p0507 A80-33060

TOELLE, R. G.
ASHRET: A computer code for estimating insolation incident on tilted surfaces
[NASA-TM-78286] p0457 N80-27807

TOFFOLO, W. E.
The application of martensitic stainless steels in long lifetime fusion first wall/blankets
p0507 A80-33059

TOGASAKI, R.
Light-dependent hydrogen production by C. reinhardi
p0459 A80-33410

TOI, K.
Efficient ion heating of tokamak plasma by application of positive and negative current pulse in TRIAM-1
p0510 A80-34647
Ion temperature measurement by neutral energy analyzer in high-field tokamak TRIAM-1
p0510 A80-34648
Electron density measurements in the TRIAM-1 tokamak
p0510 A80-34649

TOKUYAMA, T.
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343

TOLAND, D.
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1] p0534 N80-25891

TOLK, K. M.
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

TOMEI, G.
Parabolic trough collector with thermal or photovoltaic receiver
p0364 A80-33498
The Ansaldo 35 kW solar power system
p0373 A80-33600
Operational experience of a 3.0 kW solar powered water pump
p0382 A80-33680

TONDL, A.
Non-linear oscillations in wave power machines
p0521 A80-41330

TONGE, G.
Thermodynamic energy conversion efficiencies
p0525 A80-43590

TONGSON, L. L.
Characterization of commercial black chrome coatings
p0402 A80-37190

TOOMEY, G. P.
User perspectives of selected solar energy system design tools
p0369 A80-33564

TOSCANO, W. M.
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1] p0529 N80-23850

TOSTENGARD, S.
The effect of system size on the practicality of aquifer storage
p0545 A80-33517

TOWGOOD, D. A.
High-energy-density composite flywheel
[SAND-79-7019] p0561 N80-26803

TOWNER, H. H.
Generalization of Connor and Hastie's ripple-trapping coefficient, G/alpha/
p0521 A80-41748

TOYAMA, H.
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438

TRACHSEL, C. A.
Structural performance of plasma chamber materials for a power generating tokamak
p0507 A80-33057

TRACI, R. M.
The utility and verification of mathematical windfield models for wind energy regional screening and site selection
p0470 A80-35747

TRAEGER, R. K.
Engineering kinetics of short residence time coal liquefaction processes
p0471 A80-37676

TRAISNEL, J. P.
Solar thermal electric power in the range of medium size units - The French programme 'THEK'
p0374 A80-33605

TRASS, O.
Grinding of coal-in-oil slurries
p0494 N80-26464

TRAVERSE, J.-P.
Experimental aspects of the thermochemical conversion of solar energy - Decarbonation of CaCO3
p0520 A80-40716

TRAVERSI, M.
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1
[NASA-CR-163220] p0564 N80-28246
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices
[NASA-CR-163221] p0565 N80-28247
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248

Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250
Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis
[NASA-CR-163226] p0565 N80-28252

TREHARNE, R. W.
Nitrogen fertilizer production by solar energy
p0357 A80-33402

TREILLEUX, M.
Ion implanted materials as selective absorbers for photothermal solar energy conversion
p0388 A80-33747

TREYTL, W. J.
Line focus solar thermal central receiver research study
[DOE/ET/20426-1] p0440 N80-24853

TRIGLIA, A.
Heat losses of a static low-concentration solar collector
p0399 A80-35838

TRIMBLE, S. W.
Evaluation method for closed cycle gas turbines in cogeneration applications
[ASME PAPER 80-GT-176] p0332 A80-42282

TROIANO, A. R.
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7] p0491 N80-25707

TROSHIN, A. S.
Development of a combined solar heating/heat pump system for conditions typical of the Crimea
p0391 A80-33863

TROVILLION, T. A.
Longitudinal baffling in Faraday generators
p0505 A80-32743

TRUE, S.
Solar thermal repowering: Utility/industry market potential in the Southwest
[MTR-7919] p0439 N80-24836

TRUESDALE, R. S.
Fundamental aspects of catalysed coal char gasification
p0473 A80-40753

TRUKHOV, V. S.
Investigation of light-absorbing coatings obtained by the combined condensation of metal and dielectric vapors
p0391 A80-33859
Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594

TRUSCELLO, V. C.
Heat and electricity from the Sun using parabolic dish collector systems
p0433 N80-24761

TRYGAR, T. A.
Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2] p0542 N80-25808

TSAI, S. Y.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

TSAI, T. S.
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467

TSONG, I. S. T.
Characterization of commercial black chrome coatings
p0402 A80-37190

TSUJI, S.
Time evolution of the elongation ratio and Mirnov oscillation under the different current profiles in a non-circular tokamak
p0512 A80-35438

TSVETKOV, A. I.
Analysis of heat losses and ways to improve the efficiency of solar-array thermoelectric generators
p0391 A80-33855

TUCKER, H. E.
Helios target positioning system
p0518 A80-38485

TUCKER, W. K.
Magnet optimization for pulsed energy conversion
p0517 A80-37871

TUMA, S. L.
Illinois state plan: Energy conservation in institutions (institutional buildings grant program)
[PB80-148182] p0354 N80-26882

TURAN, A.
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382

TURNER, B.
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1] p0534 N80-25891

TURNER, M. J.
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845

TURNER, W.
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility
[SAND-79-7022-VOL-1] p0534 N80-25870

TURNER, R. R.
Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites
[CONF-791056-2] p0345 N80-24885

TURSUNOV, M.
Investigation into the influence of high solar-excitation level on optimal parameters of P-Al/x/Ga/1-x/As-P-GaAs-n-GaAs heterophotocells
p0399 A80-36588

TUTU, N.
Design and performance of low heat loss window systems
p0324 A80-33706

TWISS, R. H.
Land use and environmental impacts of decentralized solar energy use
[DOE/EV-0067] p0458 N80-27843

TYAN, Y.-S.
Photovoltaic materials
p0392 A80-34637

TYE, W.
The energy problem - Its effect on aircraft design. IV - The unforecastable future
p0329 A80-40944

TYKVENKO, R. N.
Processes degrading the electrophysical characteristics of photoconverters in long-term operation
p0399 A80-36587

TYSON, G. K.
Solar-heated gas-turbine process using sulfur oxides for power production and energy storage
[LBL-9472] p0424 N80-22839

U

UDA, H.
Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898

UETANI, Y.
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery
p0549 A80-40605

ULLMAN, D. G.
Preliminary development of the Band Type Variable Inertia Flywheel (BVIF)
[SAND-79-7089] p0559 N80-25879

ULRICH, W. C.
Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol
[ORNL-5439] p0485 N80-24471

ULRICKSON, M.
Material studies related to TFTR limiters and wall armor
p0507 A80-33063

UMAROV, G. IA.
Test results on solar turbogenerators
p0391 A80-33860
Electrolytic coatings of 'black chromium' type for solar collectors
p0400 A80-36594

UMEMIYA, H.
Seasonal regeneration through underground strata
p0548 A80-37966

UNG, C.
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems
[PB80-138464] p0351 N80-25947

URINSON, A. S.
Measurement of energy emitted by the working medium of an MHD generator
p0510 A80-34874

USELTON, R. B.
A data analysis program for collector testing
p0362 A80-33482

USNICK, G. B.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528

V

VACHAUD, G.
The 'soil therm' system for interseasonal earth storage of solar heat for individual housing
p0545 A80-33516

VAIDYANATHAN, T. S.
The use of an unsteady wave chemical reactor as a key element in the production of H_2 for use in synthetic fuel production
p0462 A80-38117

VALLET, C. E.
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li_2CO_3-K_2CO_3 mixtures
[ORNL/TM-7061] p0529 N80-23839

VAN GALEN, E.
Development of a storage system based on encapsulated p.c.-materials
p0546 A80-33522

VAN HULSTEYN, D. B.
Three-dimensional reconstruction of the X-ray emission in laser imploded targets
p0510 A80-34749

VAN KOPPEN, C. W. J.
National solar heating and cooling programme in the Netherlands
p0323 A80-33441
The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507

VAN OVERSTRAETEN, R. J.
European progress in photovoltaic development
p0384 A80-33712

VAN WYK, J. D.
Electro-wind energy system with oversynchronous cascade and simple adaptive maximal power control
p0508 A80-33775

VAN ZUIDEN, G. J.
Reducing solar costs with the Solar-Assisted-Templifier
p0367 A80-33541

VANCO, M. R.
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258

VANDERBORGH, N. E.
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487

VANDERELST, W. J.
The aerodynamics of axial flow wind power turbines
[CSIR-ME-1619] p0528 N80-23781

VANDERHORST, J. F.
Case study of an air to air heat pump
p0353 N80-26790

VANDERPLAS, A.
Novel solar cell concentrator photovoltaic converter system
[SAND-79-7048] p0445 N80-25843

VANGALEN, E.
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793

VANKUIKEN, J. C.
Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894

VANVORIS, P.
Criteria for assessment of environmental pollutants from coal cleaning processes
[PB80-102791] p0336 N80-22895

VARDI, I.
Solar powered environment control - Criteria and realization
p0366 A80-33534

VARGA, P.
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors
[ASSA-FA-10] p0456 N80-26879

VARLEY, J. S.
Energy analysis of wave and tidal power
p0333 A80-43828

VASILEVA, I. A.
Measurement of energy emitted by the working medium of an MHD generator
p0510 A80-34874

VASIUTKIN, A. N.
Effect of voltage losses near the electrodes on development of boundary layers in an MHD channel
p0511 A80-34875

VASTOLA, F. J.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476

VAYENAS, C. G.
Ammonia high temperature solid electrolyte fuel cell
p0523 A80-42298

VEAL, C. J.
Stable coal/fuel oil dispersions
p0501 N80-27503

VEITH, C. R.
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837] p0488 N80-24964

VELTKAMP, W. B.
The actual benefits of thermally stratified storage in a small and a medium size solar system
p0365 A80-33507

VENKATESH, A.
Theoretical and experimental investigations of an intermittent solar refrigerator
p0367 A80-33540
Analysis of ammonia-water intermittent solar refrigerator operating with a flat plate collector
p0407 A80-37977

VERMA, L. R.
Development and evaluation of a multiple use solar energy system for agriculture
p0357 A80-33403

VERMEULEN, T.
Coal liquefaction catalysis by zinc chloride melts in combination with organic solvents
p0472 A80-39420

VERON, D.
Submillimeter interferometry of high-density plasmas
p0511 A80-34970

VERSTEEGEN, P. L.
A survey of existing solar system simulation methods
p0369 A80-33560
Survey of simplified design methodologies for solar heating and cooling systems
p0376 A80-33619

VERZINO, W. J., JR.
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487

VEZIROGLU, T. N.
Solar energy: International progress; Proceedings of the International Symposium-Workshop, Cairo, Egypt, June 16-22, 1978. Volumes 1-4
p0403 A80-37937

VIALARON, A.
Solar flash pyrolysis of biomass
p0359 A80-33431

VIALARON, A. C.
Hybrid chemical concepts for storage of solar thermal energy
p0548 A80-37988

VIETH, G. L.
Selection of a closed Brayton cycle gas turbine for an intermediate-duty solar-electric power plant
[ASME PAPER 80-GT-27] p0521 A80-42162

VIJH, A. K.
Electrochemistry, power sources and energy science
p0521 A80-41851
VILARDO, J. M.
Effect of complex terrain on wind fluctuations
p0468 A80-35723
VILLECCO, M.
Integrating energy approaches in a large office building
p0324 A80-33690
VILLET, R.
Pellets of immobilized yeast cells as biocatalysts for transforming biomass
p0466 A80-33414
VINAYAGALINGAM, T.
Preliminary wind tunnel tests on the pedal wind turbine
p0523 A80-43141
VISWANATHAN, V. K.
Optical performance of the Gemini carbon dioxide laser fusion system
p0517 A80-38482
Infrared Smartt interferometer as an alignment tool for carbon dioxide laser fusion systems
p0518 A80-38492
Use of adaptive optics element for wavefront error correction in the Gemini CO2 laser fusion system
p0518 A80-38493
VITKO, J., JR.
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858
VITKOVITSKY, I. M.
Use of transformers in producing high-power output from homopolar generators
p0516 A80-37825
TRIDENT - A megavolt pulse generator using inductive energy storage
p0548 A80-37857
VITTITOE, C. N.
Unfolding concentrator slope errors from reflected-beam measurements
p0377 A80-33636
Helios and reconcentrators
p0378 A80-33637
Practical method for including material scattering effects in determining the amount of intercepted sunlight in solar concentrators
p0379 A80-33646
Comparison between results of the HELIOS and MIRVAL computer codes applied to central receiver solar-energy collection
[SAND-79-8266] p0448 N80-26075
VOGT, D. P.
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
VOGT, F.
The application of existing solar energy collecting equipment in agriculture, horticulture and fishculture
p0358 A80-33404
VOGT, R. L.
Low Btu coal gas combustion in high temperature turbines
[ASME PAPER 80-GT-170] p0477 A80-42278
VOLKIN, H. C.
Direct solar pumped laser
[LA-7982-MS] p0426 N80-23651
VOLLAN, A.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859
VONFUCHS, G. F.
Developing and upgrading of solar system thermal energy storage simulation models
[BCS-40252] p0430 N80-23858
VORRES, K. S.
Status of coal gasification processes
p0540 A80-40752

W

WACO, D.
Wind energy resource development in California
p0469 A80-35733
WADE, J. E.
Trees as an indicator of wind power potential
p0470 A80-35745
WADSWORTH, B.
Performance of passive test units during the 1978-79 heating season
p0383 A80-33694
WAGNER, C. E.
Baseline automotive gas turbine engine development program
[NASA-CR-159670] p0530 N80-24620
Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621
WAGNER, J.
Agricultural applications of wind resource assessments
p0514 A80-35739
WAGNER, J. P.
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807
WAGNER, S.
Heterojunction solar cells
[SERI/TP-32-134] p0457 N80-27822
WAHLIG, M.
Application of circumsolar measurements to concentrating collectors
p0389 A80-33761
Application of circumsolar measurements to concentrating collectors
[LBL-9412] p0439 N80-24840
WAIBEL, R. T.
Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner
[FE-2489-45] p0334 N80-22520
WAITE, E.
Evaluation of reliability of operational solar-energy systems
[CONF-791105-2] p0446 N80-25872
WAKE, S. J.
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961] p0564 N80-27814
WALDON, C. A.
Millville Wind Turbine Generator: Failure analysis and corrective design modification
[RFP-2992/3533/79-3] p0529 N80-23831
WALKER, H.
Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory
[UCRL-52837] p0488 N80-24964
WALKER, P. L.
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476
WALKER, S. N.
Wind energy assessment of the San Gorgonio Pass Region
p0470 A80-35749
WALL, D. R.
Stable coal/fuel oil dispersions
p0501 N80-27503
WALLACE, R. L.
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0564 N80-27233
WALLACE, T. C.
Composite materials for tokamak wall armor, limiters, and beam dump applications
p0507 A80-33062
WALTER, C. E.
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0564 N80-27233
WALTER, D. K.
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486
WALTERS, R. E.
Vertical axis wind turbine development: Executive summary
[ORO-5135-77-5-SUMM] p0529 N80-23845
Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846
WALTERS, R. J.
Role of the public utility in developing energy from waste
p0333 A80-42926

WALTON, A.
Dispersed storage and generation case studies
[NASA-CR-162996] p0334 N80-22782

WALTON, D.
Performance modeling of the vertical axis wind turbine
p0508 A80-33773

WALZEL, M. D.
An investigation of optimum heliostat spacings for the sub-tower region of a solar power plant
p0377 A80-33628

WANG, D. I. C.
Development and characterization of ethanol tolerance in clostridium thermocellum
p0466 A80-33416

WANG, J. C. F.
Diagnostic development for advanced power systems
[ASME PAPER 80-GT-128] p0522 A80-42242

WANG, J. H.
Properties of photoelectrochemical cells with a chemically sprayed photoanode
p0398 A80-35474

WANG, P.
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866

WANG, R. L.
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498

WANG, W.-L.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

WANGER, R. P.
Fuel conservation through active control of rotor clearances
[AIAA PAPER 80-1087] p0330 A80-41506

WARABISAKO, T.
Impurity gettering of polycrystalline solar cells fabricated from refined metallurgical-grade silicon
p0394 A80-35343

WARD, C. M.
Mass spectrometer determination of argon contents in laser fusion target pellets
p0506 A80-33054

WARD, D. S.
Solar heating and cooling performance in CSU Solar House III
p0370 A80-33570
Cooling system parameter analysis
p0376 A80-33622
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3
[COO-2858-24-SUMM] p0437 N80-24807
CSU Solar House 3: Solar heating and cooling system performance
[COO-30122-3] p0442 N80-25806

WARD, J. C.
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3
[COO-2858-24-SUMM] p0437 N80-24807

WARNER, M. L.
Use of reconnaissance level information for environmental assessment
[NUREG-CR-0990] p0336 N80-22883

WARNER, R. E.
Design and analysis of a solar cell concentrating system using a flux redistributor
p0386 A80-33731

WARNICK, C. C.
Undeveloped hydropower as a potential energy source in Idaho
[PB80-157399] p0504 N80-27824

WARREN, D.
Coal conversion products industrial applications
[NASA-CR-161469] p0484 N80-24465

WARREN, R. B.
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845

WARRINGTON, R. O.
A new and simple method for estimating the monthly and yearly performance of passive solar systems
p0383 A80-33697

WASHINGTON, L. J.
Energy from in situ processing of Antrim oil shade
[FE-2346-49] p0483 N80-23808

WASSERMAN, D.
Electron diffusion lengths in the CdS/Cu/x/S cell from spectral response measurements
p0398 A80-35491

WATANABE, H.
Seasonal regeneration through underground strata
p0548 A80-37966

WATERS, R. E.
Role of the public utility in developing energy from waste
p0333 A80-42926

WATSON, A. L.
Projected annual resource requirements at the national and regional level for the Department of Commerce energy forecast 1985 and 2000
[PB80-126956] p0345 N80-24876

WATSON, C. D.
Line focus solar thermal central receiver research study
[DOE/ET/20426-1] p0440 N80-24853

WATSON, I. A.
Common Cause Failures - A dilemma in perspective
p0328 A80-40344

WATT, M. H.
Solar energy in Africa: Survey of needs and activities - Potential applications of small solar energy systems
p0381 A80-33674

WATTENDORF, F. L.
Electrofluid dynamic wind generator
[COO-4130-2] p0531 N80-24811

WATTS, K. M.
Design and operational characteristics of the cryopump high-vacuum system for the 25000-1 target chamber of the Helios Laser Facility
p0515 A80-37182

WEAST, T. E.
Thermal energy storage systems using fluidized bed heat exchangers
p0551 N80-22792

WEAVER, H. T.
Design and performance of silicon solar cells under concentrated sunlight
p0385 A80-33721

WEAVER, P. F.
Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477

WEBB, R. L.
Energy conservation via heat transfer enhancement
[COO-4649-5] p0335 N80-22847

WEBBER, D. K.
Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents
[PB80-126469] p0334 N80-22527
Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes
[PB80-126477] p0334 N80-22528
Environmental standards for coal conversion processes. Volume 1: Most stringent, federal, and selected state regulations
[PB80-126980] p0341 N80-23904

WEBER, D. D.
Air quality measurements in the coal fired power plant environment of Colstrip, Montana
p0326 A80-36477

WEBER, W. H.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528

WEBSTER, T. L.
User perspectives of selected solar energy system design tools
p0369 A80-33564

WECKSUNG, M.
National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882

WEDDIGEN, G.
Electrical data of sodium/sulfur cells operating with dissolved catholyte
p0547 A80-37005

WEGLEY, H. L.
Siting small wind turbines
[PNL-SA-7603] p0493 N80-25878
WEGMANN, E. D.
Design and fabrication of terrestrial photovoltaic solar generators for field testing in regions of intensive insolation
[BMFT-FB-T-79-34] p0538 N80-26878
WEHNER, G. K.
Composition profiling of solar coating materials
[COO-2953-4] p0437 N80-24818
WEINBERG, I.
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180
WEINBERG, N. L.
Survey of organic electrolytic processes
[ANL/OEPM-79-5] p0341 N80-24393
WEINER, A. S.
The preparation and properties of thin polycrystalline GaAs solar cells with grain boundary edge passivation
p0394 A80-35337
WEINLAND, S. L.
Fabrication of glass sphere laser fusion targets
p0506 A80-33052
WEINSTEIN, A.
Reducing solar costs with the Solar-Assisted-Templifier
p0367 A80-33541
WEISER, G.
Energy and environmental politics in the 80's
p0327 A80-38303
WEISS, E. O.
At-sea test of a large diameter steel, cold water pipe
p0512 A80-35166
WEISS, R. S.
Results of the 1979 NASA/JPL balloon flight solar cell calibration program
[NASA-CR-163013] p0432 N80-24752
WEIZER, V. G.
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180
WELDON, D. M.
Commutator dc machines used as mechanical capacitors in a series resonant ohmic-heating circuit simulation
[LA-UR-79-3122] p0526 N80-22619
WELDON, W. F.
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
The mechanical design of a compensated pulsed alternator prototype
p0540 A80-37873
WELFORD, W. T.
The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503
WELLMAN, D. I.
Chemical characteristics of oil refinery plumes in Los Angeles
p0325 A80-36476
WELNA, H.
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258
WELTE, D.
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859
WEN, C. Y.
Optimization studies of various coal-conversions systems: Coal dissolution phenomena
[FE-2274-7] p0489 N80-25461
WENDEKAMM, W. U.
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy utilization of households and small consumers
[ESA-TT-562] p0463 N80-23865
WENDELL, L. L.
Wind resource assessment status
[PNL-SA-6918-REV-1] p0488 N80-24966
WENDT, J. O. L.
Investigation of first- and second-stage variables on control of NOx emissions using staged combustion in a pulverized coal wall-fired furnace
p0325 A80-35879
WENNSTROM, J. E.
Design and analysis of a solar cell concentrating system using a flux redistributor
p0386 A80-33731
WENTINK, T., JR.
Alaskan wind power study - A large area wind characteristics survey
p0469 A80-35734
WENTWORTH, W. E.
Chemical heat pumps using a slurry of metal salt ammoniates in an inert solvent
p0358 A80-33423
WENTZ, W. H., JR.
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines
[NASA-CR-159856] p0355 N80-27803
WENZL, H.
Hydrogen in metals - Notable properties and examples for their utilization. I
p0460 A80-36653
WERDEN, R. G.
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-24] p0344 N80-24863
WESSLING, F. C.
Retrofit sun room thermal performance based on the typical meteorological year weather data
p0384 A80-33710
WEST, A. S.
Evaluation of the Texaco synthesis gas generation process for the production of hydrogen from SRC-2 residue
[ORNL/SUB-7240/6] p0463 N80-25464
WEST, R. E.
End-use matching for solar industrial process heat
[SERI/TR-34-091] p0454 N80-26849
WESTBROOK, S. R.
Assessment of crude oil and refined petroleum product quality during long-term storage
[AD-A082365] p0557 N80-24637
WHALEN, P. J.
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498
WHALEY, H.
Current status of the Canadian coal-oil mixture program
p0501 N80-27496
WHEELING, T.
Performance of passive test units during the 1978-79 heating season
p0383 A80-33694
WHISNANT, R. A.
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2] p0455 N80-26866
WHITE, A. A. L.
Advantage of incorporating geothermal energy into power-station cycles
p0526 A80-43835
WHITE, C. S.
Design and initial performance of the solarium-assisted dormitory at the White Mountain School, Littleton, N.H.
p0384 A80-33711
WHITE, C. W.
Pulsed laser techniques for solar cell processing
p0396 A80-35362
WHITE, D. J.
Autoignition and vaporization of no. 3 diesel oil spray under lean conditions
[ASME PAPER 80-GT-10] p0475 A80-42151
WHITE, R.
Electricity from refuse
[NZERDC-44] p0330 N80-23803
WHITTAKER, D. E.
Environmental standards for coal conversion processes. Volume 1: Most stringent, federal, and selected state regulations
[PB80-126980] p0341 N80-23904
WHITTLE, G. E.
Fluctuations in output from wind turbine clusters
p0520 A80-41032
WIEDENHEFT, C. J.
Studies of directly absorbing fluids for mid-temperature solar thermal applications
p0388 A80-33749

WIENER, J. G.
Trace element inputs from a coal burning power plant to adjacent terrestrial and aquatic environments
p0324 A80-35649
WIESNER, W.
Manufacturers' view of wind resource assessments
p0514 A80-35738
WIJSMAN, A. J. T. H.
Development of a thermal storage system based on the heat of adsorption of water in hygroscopic materials
p0545 A80-33515
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793
WILBUR, P. J.
Off-peak electric auxiliary heat for solar air-heating systems
[COO-4516-1] p0429 N80-23827
WILCOCK, D. P.
Magnetic bearing support study for a 10 kW-hr energy storage flywheel
[SAND-79-7025] p0555 N80-23661
WILCOX, R. E.
Magnet optimization for pulsed energy conversion
p0517 A80-37871
WILCOXSON, A. L.
Development of polyimide materials for use in solar energy systems
[DOE/CS-35305/T1] p0445 N80-25855
WILDI, P.
Safety grounding switches in large experiments - General considerations and the TEXT application
p0517 A80-37867
WILES, I. C.
Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors
p0361 A80-33469
WILES, L. E.
Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage
[PNL-3047] p0556 N80-23823
WILHELM, D. J.
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535
WILKEY, M. L.
Methane from landfills
[CONF-790999-1] p0485 N80-24472
Methane recovery from urban refuse
[CONF-7910105-2] p0486 N80-24485
WILKINS, J. W.
Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications
[DOE/ET-20413/1] p0448 N80-26143
WILKINS, R. J. H.
Review - Materials aspects of wave energy converters
p0517 A80-38283
WILKINSON, B. G.
Methods for reducing heat losses from flat plate solar coolectors, phase 3
[COO-2597-5] p0424 N80-22851
WILL, P. G.
Performance analysis of zinc-bromine batteries in vehicle and utility applications
p0550 A80-41852
WILLEKE, G.
Dual desiccant-bed dehumidifier with solar-heated regeneration
p0384 A80-33705
WILLIAMS, A. H.
Heat and electricity from the Sun using parabolic dish collector systems
p0433 N80-24761
WILLIAMS, B.
Absorption of microwave energy by oil shale - Effects of shale richness, packing factor, and frequency
p0473 A80-39422
WILLIAMS, G. T.
A design method to determine the optimal distribution and amount of insulation for in-ground heat storage tanks
p0546 A80-33518
WILLIAMS, J. R.
Solar energy for heating and cooling
p0418 A80-42445
A completely instrumented solar building - The Shenandoah Solar Recreational Center
p0418 A80-42447
Solar power
p0420 A80-42468
WILLIAMS, L. D.
Recycling the nutrients in residues from methane digesters of aquatic macrophytes for new biomass production
p0465 A80-33126
WILLIAMS, O. M.
Ammonia dissociation for solar thermochemical absorbers
p0358 A80-33428
Design and cost analysis for an ammonia-based solar thermochemical cavity absorber
p0403 A80-37300
WILLIAMSON, R. B.
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841
Canada: Estimates of future energy/GNP relationships
[ORAU/IEA(M)-79-24] p0339 N80-23849
WILMSEN, C. W.
Electron-beam-induced current and scanning light spot techniques for investigating the response of polycrystalline solar cells
p0399 A80-35493
WILSON, N. G.
Design and operational characteristics of the cryopump high-vacuum system for the 25000-l target chamber of the Helios Laser Facility
p0515 A80-37182
WINDOW, B.
Production and properties of selective surfaces coated onto glass tubes by a magnetron sputtering system
p0388 A80-33742
WINKELMANN, F. C.
Two new energy information bases - ERDI/West, an energy research and development inventory for the West; and ESIDD, energy saving and investment data and documents
p0324 A80-34018
WINN, C. B.
Real time identification of parameters in building models
p0368 A80-33556
The development of an Ambient Temperature Observer/Predictor /ATOP/ for use with solar heating systems
p0381 A80-33663
WINNICK, J.
CO2 concentrations in a molten carbonate electrochemical cell
[ASME PAPER 80-ENAS-14] p0523 A80-43190
WINSTON, R.
Nonevacuated high temperature linear Fresnel lens and second stage CPC type collector with large tolerance for tracking errors
p0364 A80-33493
Applications of CPC's in solar energy - An overview
p0364 A80-33501
The geometrical vector flux and some new nonimaging concentrators
p0364 A80-33503
Design and performance characteristics of compound parabolic concentrators with evacuated and with non-evacuated receivers
p0378 A80-33638
Process steam generation by a facetted, non-imaging solar concentrator
p0378 A80-33639
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
p0386 A80-33726
Solar collectors for low and intermediate temperature applications
p0392 A80-34598
Absorption enhancement in solar collectors by multiple reflections
p0403 A80-37306

Design and test of non-evacuated solar collectors with compound parabolic concentrators
[EPI-79-42] p0443 N80-25811

WISE, D. L.
Liquid fuel production from biomass
p0465 A80-33412
Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462

WITMER, F. E.
Environmental concerns for coal synfuel commercialization
p0329 A80-40759

WITTENBERG, L. J.
Construction and initial operation of the Miamisburg salt-gradient solar pond
p0371 A80-33583
Studies of directly absorbing fluids for mid-temperature solar thermal applications
p0388 A80-33749

WOERNER, R. L.
Fabrication of glass sphere laser fusion targets
p0506 A80-33052

WOHLGEMUTH, J. H.
Analysis of the effects of impurities in silicon
[NASA-CR-163133] p0427 N80-23772

WOJNAR, F.
Applications of thermal energy storage to waste heat recovery in the food processing industry
p0552 N80-22796

WOLCOTT, D. R.
Communication strategy to commercialize passive solar energy
[SERI/TP-69-412] p0335 N80-22849

WOLF, J. C.
Development of a high temperature turbine for operation on coal-derived fuel
[ASME PAPER 80-GT-188] p0478 A80-42290

WOLF, M.
Updating the limit efficiency of silicon solar cells
p0395 A80-35354
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-163208] p0441 N80-25782

WOLFE, P. N.
LOTS analysis of optical diffraction in Antares
p0518 A80-38490
Applications of the laser optical train simulations /LOTS/ computer code to laser fusion systems and other physical optics problems
p0518 A80-38491

WOLOSEWICZ, R.
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866
Evaluation of reliability of operational solar-energy systems
[CONF-791105-2] p0446 N80-25872

WOLOSEWICZ, R. M.
Application of reliability, maintainability, and availability engineering to solar heating and cooling systems
p0414 A80-40334
Design and installation manual for thermal energy storage
[ANL-79-15-ED-2] p0561 N80-26840

WOMACK, J.
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239

WONG, E.
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382

WOO, J., JR.
Solar radiation data forecast and interpolation analysis. Folder 1, part 1: Executive summary. Part 2: Technical analysis (tasks 1 and 2). Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982

WOOD, B. D.
Application of ASHRAE Standard 93-77 for testing concentrating collectors for the purpose of predicting all day performance
p0363 A80-33490
Effect of vertical wall conductance on temperature relaxation in thermally stratified liquid thermal storage tanks
p0545 A80-33510

WOOD, J. A.
Control systems for interfacing solar agricultural dryers with other energy sources
p0381 A80-33665

WOOD, R. F.
Pulsed laser techniques for solar cell processing
p0396 A80-35362

WOOD, V. E.
Effects of encapsulation on the optical and thermal response of solar cells used in concentrated-flux systems
p0387 A80-33732

WOODSON, H. H.
Fundamental limitations and design considerations for compensated pulsed alternators
p0516 A80-37824
The mechanical design of a compensated pulsed alternator prototype
p0548 A80-37873

WOREK, W.
Solar operated crossflow desiccant cooling system
p0365 A80-33525

WOREK, W. M.
Cylindrical glass tubes for flat plate collector covers
p0361 A80-33460
The effect of pressure on the performance of cylindrical solar collectors
p0361 A80-33461

WORMHOUDT, J.
Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570

WORRELL, R. B.
A Boolean approach to common cause analysis
p0328 A80-40349

WORSTELL, M. H.
Aerodynamic performance of the 17-m-diameter Darrieus wind turbine in the three-bladed configuration: An addendum
[SAND-79-1753] p0537 N80-26857

WRATHALL, J.
LBL continuous biomass liquefaction Process Engineering Unit (PEU)
[LBL-10092] p0487 N80-24490
Hydrolyzed wood slurry flow modeling
[LBL-10090] p0504 N80-27703

WRAY, W. O.
A simple procedure for assessing thermal comfort in passive solar heated buildings
p0382 A80-33684
Additional solar/load ratio correlations for direct gain buildings
[LA-UR-80-854] p0454 N80-26847
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

WRIGHT, D.
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469

WRIGHT, D. E.
Closed-cycle gas turbine working fluids
[ASME PAPER 80-GT-135] p0522 A80-42248
High-temperature, coal-fired combustor with ceramic heat exchangers for CCGT systems
[ASME PAPER 80-GT-155] p0477 A80-42267

WRIGHT, J. D.
The SERI solar energy storage program
p0423 N80-22821
SERI solar energy storage program
[SERI/TP-333-497] p0452 N80-26820

WRIGHT, J. H.
Solar energy collection using the reversible ammonia dissociation reaction
p0358 A80-33427

WRIGHT, R.
Hybrid passive for motel guest rooms
p0384 A80-33709

WRIGHT, S.
Hybrid passive for motel guest rooms
p0384 A80-33709

WRIGHTON, M. S.
n-type molybdenum-diselenide-based liquid-junction solar cells - A nonaqueous electrolyte system employing the chlorine/chloride couple
p0390 A80-33852

WU, C.-M. M.
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345

WUERFEL, P.
Upper limit of thermophotovoltaic solar-energy conversion
p0395 A80-35353
Upper limit for the conversion of solar energy
p0397 A80-35372

WULF, R. H.
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364

WULFINGHOFF, D.
Institutional total energy case studies
[ANL/CNSV-TM-15] p0342 N80-24804

WYETH, N. C.
The design and utilization of a microprocessor-controlled absolute spectral response system
p0398 A80-35492

WYMAN, C. E.
The SERI solar energy storage program
p0423 N80-22821
SERI solar energy storage program
[SERI/TP-333-497] p0452 N80-26820

WYNNE, F. E.
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-42] p0490 N80-25473
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546

Y

YAMAMOTO, M.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0328 A80-38366

YAMAMOTO, S.
Role of runaway electrons in the formation of arcing on the electrically isolated target in tokamak
p0512 A80-35439

YAMAMURA, M.
Studies on the stabilization of COM
p0496 N80-26479

YAMASAKI, H.
High electrical conductivity and high Hall coefficient in MHD generator
p0511 A80-34990

YAMASHITA, T.
Screen printed thin film CdS/CdTe solar cell
p0401 A80-36898
Studies on the stabilization of COM
p0496 N80-26479

YAMASE, M.
Fine COM preparation test
p0496 N80-26476

YANESKE, P. P.
Experimental evaluation of zero radiation heat loss testing of rear duct air-heating solar collectors
p0361 A80-33469

YANG, R. S.
Grain boundary effects on the electrical behavior of Al-poly-Si Schottky-barrier solar cells
p0394 A80-35345

YANG, H.-T.
Barrier height enhancement in heterojunction Schottky-barrier solar cells
p0397 A80-35368

YANG, J. J. J.
Electrical properties of polycrystalline GaAs films
p0525 A80-43575

YARBROUGH, N.
A field ion microscope study of microstructural features of solar collector coatings
p0422 A80-43528

YASUDA, A. K.
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501

YAWS, C. L.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

YEH, H.-C.
Respirable aerosols from fluidized bed coal combustion. I - Sampling methodology for an 18-inch experimental fluidized bed coal combustor
p0330 A80-41558

YEH, Y. J.
Design and performance of low heat loss window systems
p0324 A80-33706

YELLOTT, J. I.
A procedure for determining solar heat gain factors for south-facing vertical surfaces on average days
p0384 A80-33699

YINGLING, R. D.
Electrical properties of polycrystalline GaAs films
p0525 A80-43575

YOKOYAMA, K.
Preparation of iron sulfides and the study of their electrochemical characteristics for use in a nonaqueous-lithium battery
p0549 A80-40605

YOKOYAMA, N.
Practical application of flue gas de-NO/x/ system using honey-comb type catalyst
p0328 A80-38366

YOKOYAMA, T.
Seasonal regeneration through underground strata
p0548 A80-37966

YOSHIKAWA, A.
A computer analysis of heteroface solar cells with ultrathin window layer
p0422 A80-43589

YOUNG, D. L.
Thermal energy storage effort at JPL
p0552 N80-22800

YOUNG, R. T.
Pulsed laser techniques for solar cell processing
p0396 A80-35362

YOUNGBLOOD, W.
An evaluation of the influence of heat transfer fluid properties and flow rate on flat plate solar collector efficiency
p0362 A80-33473

YOUNGBLOOD, W. W.
Solar collector fluid parameter study
[PB80-125891] p0430 N80-23869

YOUSEFIAN, V.
Studies of MHD generator performance with oxygen enriched coal combustion
[AIAA PAPER 80-1343] p0521 A80-41570

YOUSSEF, S. W.
Performance comparison of different types of solar water heaters under Egyptian conditions
p0407 A80-37973

YU, J.
Utilization of cellulosic feedstock in the production of fuel grade ethanol
p0472 A80-37679

YUN, S. I.
Photoacoustic determination of absorptance and emittance of solar selective coatings
p0388 A80-33744

Z

ZAKHAROVA, O. P.
Calculation of the angular error of a solar cylindrical concentrator made from sheet material
p0391 A80-33856

ZAKHIDOV, R. A.
The electronic aberrogram recorder
p0391 A80-33858
Evaluating the performance of reflecting concentrating systems
p0400 A80-36592

Calculation principles for heliostat fields of solar power plants p0401 A80-36825

ZAKI, G. M.
Physical modeling of buildings p0383 A80-33688

ZAKS, M. B.
Influence of base resistivity on the temperature characteristics of silicon photoconverters p0514 A80-36590

High-voltage multijunction solar-energy photoelectric converter p0401 A80-36830

ZAMBRANO, T. G.
Wind energy assessment of the San Gorgonio Pass Region p0470 A80-35749

ZANGRANDO, F.
Demonstration salt gradient solar pond [ALO-3977-T1] p0453 N80-26837

ZANI, P.
Development of 1pKW photovoltaic module with concentration p0386 A80-33728

ZARATE, R.
Research and development on solar energy for electric and mechanical power generation p0373 A80-33601

ZARNOCH, K. P.
Heat storage capability of a rolling cylinder using Glauber's salt p0553 N80-22810

ZEKIOS, A.
Adaptive control for a multiple tank, multiple temperature solar energy storage system p0369 A80-33557

ZELINGER, S.
The OMNIUM-G HTC-25 tracking concentrator p0434 N80-24766

ZELLARS, G. R.
Improved PFB operations: 400-hour turbine test results [NASA-TM-81511] p0493 N80-26426

ZEMEL, J. N.
Metallurgical coatings 1979; Proceedings of the Sixth International Conference, San Diego, Calif., April 23-27, 1979. Volumes 1 & 2 p0525 A80-43503

ZENTNER, R.
Testing procedures and test results for the EPRI/boeing gas-cooled receiver tested in the Central Receiver Solar Thermal Test Facility p0380 A80-33655

ZHADAN, S. Z.
Choice of cycle parameters for solar Freon air conditioning equipment of ejector type p0391 A80-33862

ZHANG, C.-F.
On the low frequency drift wave and the pseudoclassical diffusion p0512 A80-35379

ZIEGENBEIN, B.
Investigation of latent heat of fusion storage for solar heating systems p0546 A80-33523

ZIEN, H. B.
The economics of solar hot water heating in multifamily units p0389 A80-33752

ZIMMER, P. B.
Low-cost, high-performance solar selective paint coatings p0393 A80-34781

Low-cost solar antireflection coatings [ALO-5300-T2] p0453 N80-26844

ZIMMERMAN, J.
The 1st generation low cost point focus solar concentrator p0434 N80-24768

ZIMMERMAN, R. E.
Methane from landfills [CONF-790999-1] p0485 N80-24472

Methane recovery from urban refuse [CONF-7910105-2] p0486 N80-24485

ZIMMERMAN, R. G. J.
Projected annual resource requirements at the national and regional level for the Department of Commerce energy forecast 1985 and 2000 [PB80-126956] p0345 N80-24876

ZOB, A. P.
Developing and upgrading of solar system thermal energy storage simulation models [BCS-40252] p0430 N80-23858

ZOLLARS, G. F.
Solar power satellites. Citations from the International Aerospace Abstracts data base [NASA-CR-162931] p0541 N80-22861

ZOOK, J. D.
Improvement of polycrystalline silicon solar cells with grain-boundary hydrogenation techniques p0398 A80-35467

ZUB, S. I.
Excitation of a superconducting strip resonator by a system of Josephson point contacts p0539 A80-33161

ZUCK, J. C.
Criteria for assessment of environmental pollutants from coal cleaning processes [PB80-102791] p0336 N80-22895

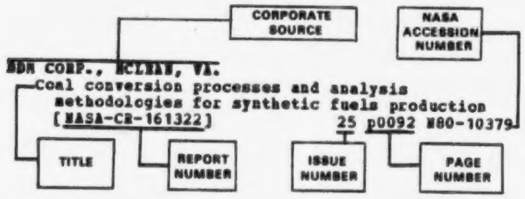
ZUCKER, A.
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results [SAND-78-7072-VOL-1/2] p0453 N80-26830

ZUMWALT, R.
A benefit-cost analysis of the impact upon an existing utility of a solar electric experimental facility p0389 A80-33758

ZWIBEL, H.
A 20 kW photovoltaic flat panel power system in El Paso, Texas p0385 A80-33716

CORPORATE SOURCE INDEX

Typical Corporate Source Index Listing



BDM CORP., MCLEAN, VA.
Coal conversion processes and analysis methodologies for synthetic fuels production
[NASA-CR-161322] 25 p0092 N80-10379

The title of the document is used to provide a brief description of the subject matter. The issue, page number and NASA or AIAA accession number are included in each entry to assist the user in locating the abstract in the abstract section of an individual supplement of *Energy*. If applicable, a report number is also included as an aid in identifying the document.

A

ACUREX CORP., MOUNTAIN VIEW, CALIF.
A cellular glass substrate solar concentrator
p0434 N80-24769
IEA/SPS 500 kW distributed collector system
p0436 N80-24791

ADELPHI UNIV., GARDEN CITY, N. Y.
Feasibility study of using a coal/water oil emulsion as a clean liquid fuel
[FE-2437-T1-ADD] p0490 N80-25463
Rheological properties of solvent refined coal-oil mixtures
p0495 N80-26471

AEG-TELEFUNKEN, BERLIN (WEST GERMANY).
Development of current converters for switching and regulating tasks in energy technology
[BMFT-FB-T-79-12] p0567 N80-23585

AEG-TELEFUNKEN, WEDEL (WEST GERMANY).
Design and fabrication of terrestrial photovoltaic solar generators for field testing in regions of intensive insolation
[BMFT-FB-T-79-34] p0538 N80-26878

AEROJET ENERGY CONSERVATION CO., SACRAMENTO, CALIF.
Multi-use geothermal energy system with augmentation for enhanced utilization. A non-electric application of geothermal energy in Susanville, California
[SAN-1740-2] p0492 N80-25868
Multi-Megawatt Organic Rankine Engine power plant (MORE). Phase 1A: System design of MORE power plant for industrial energy conservation emphasizing the cement industry
[DOE/ET-12434/T1] p0537 N80-26853

AEROSPACE CORP., EL SEGUNDO, CALIF.
Central station applications planning activities and supporting studies
[NASA-CR-163042] p0352 N80-26784

AEROSPACE CORP., LOS ANGELES, CALIF.
Solar thermal small power systems study. Inventory of US industrial small electric power generating systems
[ATR-79(7780)-1] p0437 N80-24817
New applications of high-temperature solar energy for the production of transportable fuels and chemicals and for energy storage
[ATR-78(7691-04)-1] p0438 N80-24829
Solar thermal small power systems study. Phase 2: Study results
[DOE/ET/20516-2] p0440 N80-24855

AIRESEARCH MFG. CO., PHOENIX, ARIZ.
Preliminary studies of a turbofan engine and fuel system for use with liquid hydrogen
p0461 A80-37342
Concept definition study of small Brayton cycle engines for dispersed solar electric power systems
[NASA-CR-159592] p0526 N80-22778

AIRESEARCH MFG. CO., TORRANCE, CALIF.
The development of an air Brayton and a steam Rankine solar receiver
p0434 N80-24770
Advanced propulsion system for hybrid vehicles
[NASA-CR-159771] p0561 N80-26212
High-energy-density composite flywheel
[SAND-79-7019] p0561 N80-26803

ALABAMA UNIV., HUNTSVILLE.
Data handbook for the National Solar Energy demonstration program
[DSE/5216-T3] p0428 N80-23815

ALABAMA UNIV., UNIVERSITY.
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-25] p0344 N80-24860

ALABAMA UNIV. IN HUNTSVILLE.
Data handbook for the national solar energy demonstration book
[DSE-5216-T4] p0446 N80-25873

ALUMINUM CO. OF AMERICA, ALCOA CENTER, PA.
Design and fabrication of a low-cost Darrieus vertical axis wind turbine system, phase 1
[ALO-4272] p0535 N80-25899

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, WASHINGTON, D.C.
Energy and Resource Recovery from Solid Waste: Report from a workshop considering problems identified by the Intergovernmental Science, Engineering, and Technology Advisory Panel
[PB80-150790] p0354 N80-26881

AMERICAN SCIENCE AND ENGINEERING, INC., CAMBRIDGE, MASS.
Development of a second-generation concentrating tracking solar collector
[ASE-4371] p0438 N80-24828
Development of a second-generation concentrating tracking solar collector
[ASE-4460] p0445 N80-25851

AMERICAN UNIV., WASHINGTON, D. C.
Definition of chemical and electrochemical properties of a fuel cell electrolyte
[AD-A083608] p0537 N80-26794

APPLIED PHYSICS LAB., JOHNS HOPKINS UNIV., LAUREL, MD.
Energy programs at the Johns Hopkins University Applied Physics Laboratory
[PB80-163686] p0538 N80-27825

ARGONNE NATIONAL LAB., IDAHO FALLS, IDAHO.
Environmental assessments of alternative energy strategies in the United States
[CONF-791172-1] p0350 N80-25927

ARGONNE NATIONAL LAB., ILL.
Experimental evaluation of thermal energy storage
p0553 N80-22817
Underground Pumped Hydroelectric Storage (UPHS)
[ANL/EES-TM-60] p0554 N80-22841
Environmental assessment of the utilization of alcohol fuels in highway vehicle applications
[CONF-791009-19] p0336 N80-23477
Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23789
World Energy Data System (WENDS). Volume 6: International agreement profiles
[ANL-PMS-79-2-VOL-6] p0528 N80-23790

Open-cycle coal-fired liquid-metal MHD
[CONF-790640-7] p0529 N80-23844
Electric and hybrid vehicles in the urban future
[CONF-791009-23] p0341 N80-24217
Methane from landfills
[CONF-790999-1] p0485 N80-24472
Materials technology for coal-conversion processes
[ANL-79-93] p0486 N80-24484
Methane recovery from urban refuse
[CONF-7910105-2] p0486 N80-24485
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486
Assessment of high-head turbomachinery for underground pumped hydroelectric storage plants
[CONF-791204-11] p0557 N80-24628
Institutional total energy case studies
[ANL/CNSV-TM-15] p0342 N80-24804
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-18] p0343 N80-24813
Market penetration of new energy systems estimated by econometric and stochastic methodology
[CONF-790852-2] p0346 N80-25207
Proceedings of the workshop on Stratospheric and Mesospheric Impacts of Satellite Power Systems (SPS)
[CONF-7809197] p0541 N80-25363
Environmental control technology for biomass flash pyrolysis
[CONF-800129-2] p0346 N80-25477
Design of a system using CPC collectors to collect solar energy and to produce industrial process steam
[ANL-79-102] p0443 N80-25814
World Energy Data System (WENDS). Volume 1: Country data, AF-CO
[ANL/PMS-79-2-VOL-1] p0347 N80-25827
World Energy Data System (WENDS). Volume 2: Country data, CZ-KS
[ANL/PMS-79-2-VOL-2] p0348 N80-25828
World Energy Data System (WENDS). Volume 2: Country data, LY-PO
[ANL/PMS-79-2-VOL-3] p0348 N80-25829
World energy data system (Wends). Volume 4: Country data, SG-YO
[ANL/PMS-79-2-VOL-4] p0348 N80-25830
World Energy Data System (WENDS). Volume 5: Internatinal organization data
[ANL/PMS-79-2-VOL-5] p0348 N80-25831
Reliability and maintainability evaluation of solar collector and manifold interconnections
[SOLAR/0902-79/70] p0446 N80-25866
Two-tank seasonal storage concept for solar space heating of buildings
[CONF-791226-2] p0446 N80-25867
Evaluation of reliability of operational solar-energy systems
[CONF-791105-2] p0446 N80-25872
Reliability, energy and cost effects of wind integration with conventional electrical generating systems
[CONF-791204-32] p0349 N80-25894
Advanced fuel cell development
[ANL-79-51] p0535 N80-25895
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923
Proceedings of the Workshop on Meteorological Effects of Satellite Power System Rectenna Operation and Related Microwave Transmission Problems
[CONF-7808114] p0542 N80-26004
Power take-off analysis for diagonally connected MHD channels
[CONF-800104-6] p0535 N80-26167
Coal/oil mixture pipeline: A viable alternative coal transportation system?
p0542 N80-26487
Reverse absorption mode of the HYCSOS chemical heat pump with low grade (approximately 30 deg C) thermal energy inputs
[CONF-800133-1] p0536 N80-26628
Classification and evaluation of electric motors and pumps
[DOE/CS-0147] p0352 N80-26670
Reliability and materials performance of solar heating and cooling systems
[SOLAR/0906-79/70] p0452 N80-26824
Design and installation manual for thermal energy storage
[ANL-79-15-ED-2] p0561 N80-26840
HYCSOS: Hydride conversion and storage system sensitivity analysis
[ANL/EES-TM-63] p0564 N80-27523

ARIZONA PUBLIC SERVICE CO., PHOENIX.
Airport solar photovoltaic concentrator project, phase 1
[DOE/CS-05317/1] p0453 N80-26839

ARIZONA UNIV., TUCSON.
Coolidge solar powered irrigation pumping project
p0436 N80-24792

ARMCO STEEL CORP., MIDDLETOWN, OHIO.
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7] p0491 N80-25707

ARMY CONSTRUCTION ENGINEERING RESEARCH LAB., CHAMPAIGN, ILL.
Densified biomass as an alternative Army heating and power plant fuel heating
[AD-A083317] p0500 N80-26798

ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTER, FORT BELVOIR, VA.
EVA metro sedan electric-propulsion system: Test and evaluation
[DOE/CS-1042/1] p0563 N80-27230

ARNOLD ENGINEERING DEVELOPMENT CENTER, ARNOLD AIR FORCE STATION, TENN.
MHD high performance demonstration experiment
[DOE/ET-2895/5] p0535 N80-26172

ATLANTIC RESEARCH CORP., ALEXANDRIA, VA.
Development and evaluation of highly-loaded coal slurries
p0496 N80-26481

AUSTRIAN SOLAR AND SPACE AGENCY, VIENNA.
Collector test methods: Analysis of test methods for the determination of the thermal efficiency of flat-plate collectors
[ASSA-FA-10] p0456 N80-26879

AUTOMOTIVE TESTING LABS., INC., AURORA, COLO.
A study of emissions from passenger cars in six cities, volume A
[PB80-149800] p0350 N80-25930

B

BADGER PLANTS, INC., CAMBRIDGE, MASS.
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 3: Environmental
[FE-2416-43-VOL-3] p0337 N80-23485
Conceptual design of a coal-to-methanol-to-gasoline commercial plant, volume 1
[FE-2416-43-VOL-1] p0484 N80-24467
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 2: Commercial plant economic analysis
[FE-2416-43-VOL-2] p0485 N80-24468
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4A: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4A] p0485 N80-24469
Conceptual design of a coal-to-methanol-to-gasoline commercial plant. Volume 4B: Drawings, specifications, and alternate designs
[FE-2416-43-VOL-4B] p0485 N80-24470
Conceptual design of a coal-to-methanol-to-gasoline commercial plant Volume 5: Alternate design studies
[FE-2416-43-VOL-5] p0488 N80-24808

BATTELLE COLUMBUS LABS., OHIO.
Criteria for assessment of environmental pollutants from coal cleaning processes
[PB80-102791] p0336 N80-22895
Carbohydrate crops as a renewable resource for fuels production. Volume 1: Agricultural research
[BMI-2031-VOL-1] p0482 N80-23481
Analysis and design of a 100-kilowatt solar photovoltaic flat-panel power system for a machining and metalworking facility in Columbus, Ohio. Phase 1: Photovoltaic flat panel application experiment
[DOE/ET/23055-1] p0529 N80-23860

Carbohydrate crops as a renewable resource for fuels production. Volume 2: Identification of key policy issues, alternatives, and implications relating energy from biomass
[BMI-2031-VOL-2] p0341 N80-24475
The 50-horsepower solar-powered irrigation facility located near Gila Bend, Arizona
p0436 N80-24793
Preliminary materials assessment for the Satellite Power System (SPS)
[DOE/ER-0038] p0542 N80-25364
Methods for analyzing inorganic compounds in particles emitted from stationary sources
[PB80-141781] p0350 N80-25936
Development of a low-temperature, low-cost, black liquid solar collector, phase 2
[ALO-30171-1] p0453 N80-26841

BATTELLE PACIFIC NORTHWEST LABS., RICHLAND, WASH.
Use of reconnaissance level information for environmental assessment
[NUREG-CR-0990] p0336 N80-22883
High-level waste immobilization program: An overview
[PNL-3094] p0336 N80-23131
Thermal energy storage in aquifiers: Preliminary information
[PNL-3062] p0555 N80-23793
Numerical analysis of temperature and flow effects in a dry, two-dimensional, porous-media reservoir used for compressed air energy storage
[PNL-3047] p0556 N80-23823
Solar reflector materials
[PNL-SA-7698] p0430 N80-23859
Wind characteristics for agricultural wind energy applications
[PNL-SA-7270] p0530 N80-23947
Compressed air energy storage technology program in the United States
[PNL-SA-7669] p0557 N80-24810
Wind resource assessment status
[PNL-SA-6918-REV-1] p0488 N80-24966
Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE
[PNL-SA-8266] p0490 N80-25465
Long-term supply curves for geothermal energy: The impacts of technology
[PNL-3072] p0492 N80-25865
Siting small wind turbines
[PNL-SA-7603] p0493 N80-25878
Potential petrophysical and chemical property alterations in a compressed air energy storage porous rock reservoir
[PNL-2974] p0561 N80-26804
Wind characteristics for design of wind turbines: Research in the USA
[PNL-SA-7967] p0538 N80-27817

BDM CORP., ALBUQUERQUE, N. MEX.
Investigation of the technical and economic feasibility of using pumped well-water energy storage systems
[SAND-79-7096] p0556 N80-23851

BDM CORP., MCLEAN, VA.
Military markets for solar thermal electric power systems
p0435 N80-24787

BDM SERVICES CO., ALBUQUERQUE, N. MEX.
Conceptual design and analysis of a 100 MWe distributed line focus solar central power plant
[SAN-2073-1] p0444 N80-25826

BECHTEL NATIONAL, INC., SAN FRANCISCO, CALIF.
Design of low-cost structures for photovoltaic arrays. Volume 2: Technical studies and appendices
[SAND-79-7002-VOL-2] p0429 N80-23837
Projected annual resource requirements at the national and regional level for the Department of Commerce energy forecast 1985 and 2000
[PB80-126956] p0345 N80-24876
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779
Study of curved glass photovoltaic module and module electrical isolation design requirements
[NASA-CR-163033] p0450 N80-26781

BELL TELEPHONE LABS., INC., PHILADELPHIA, PA.
West Chester Work Center: Solar space heating demonstration project
[DOE/CS-4048/2] p0444 N80-25822

BIOMASS ENERGY INST., INC., WINNIPEG (MANITOBA).
Proceedings forest and field fuels symposium
[CONF-7710156] p0487 N80-24630

BITUMINOUS COAL RESEARCH, INC., MONROEVILLE, PA.
Test and evaluate the TRI-GAS low-Btu coal gasification process
[FE-2798-66] p0482 N80-23484
Test and evaluate the TRI-GAS low Btu coal gasification process
[FE-2798-74] p0491 N80-25476

BOEING AEROSPACE CO., SEATTLE, WASH.
Solar project description for Perl-Mack Enterprises' single family residences, Denver, Colorado
[SOLAR/1015-79/50] p0444 N80-25821
Solar power satellite system definition study. Volume 1: Executive summary, phase 3
[NASA-CR-160742] p0542 N80-27809
Solar power satellite system definition study. Volume 2, part 3: Final briefing, 16 May 1980, phase 3
[NASA-CR-160743] p0543 N80-27810
Solar power satellite system definition study. Volume 3: Laser SPS analysis, phase 3
[NASA-CR-160744] p0543 N80-27811
Solar power satellite system definition study. vPMVNF 4: sPMJE sUBUPT sps aOBMZTJT, QIBTF 3
[NASA-CR-160745] p0543 N80-27812
Solar power satellite system definition study. Volume 5: Space transportation analysis, phase 3
[NASA-CR-160746] p0457 N80-27813

BOEING CO., SEATTLE, WASH.
Solar project description for A-Frame Industries' single family residence: Kaneohe, Hawaii
[SOLAR/1010-79/50] p0444 N80-25818
Solar project description. Albuquerque Western-2 multi-dwelling building Albuquerque, New Mexico
[SOLAR/1090-79/50] p0444 N80-25819
Solar project description for Zien Mechanical Contractors-I single family residence, Milwaukee, Wisconsin
[SOLAR/1057-79/50-PT-1] p0451 N80-26811
Solar project description for Alpha Construction Company's single family residence, Canton, Ohio
[SOLAR/1034-79/50] p0451 N80-26812
Solar project description for Stewart-Teele-Mitchell single family residence, Malta, N.Y.
[SOLAR/1018-79/50] p0451 N80-26813
Solar project description for Washington Natural Gas Company's single family residence, Kirkland, Washington
[SOLAR/1001-79/50] p0451 N80-26814
Solar project description for Zien Mechanical 2 single family residence, Milwaukee, Wisonsin
[SOLAR/1057-79/50-PT-2] p0451 N80-26815

BOEING COMPUTER SERVICES, INC., SEATTLE, WASH.
Developing and upgrading of solar system thermal energy storage simulation models
[BCS-40252] p0430 N80-23858

BOEING ENGINEERING AND CONSTRUCTION, SEATTLE, WASH.
Mod-2 wind turbine system concept and preliminary design report. Volume 1: Executive summary
[NASA-CR-159609] p0530 N80-24758
MOD-2 wind turbine system concept and preliminary design report. Volume 2: Detailed report
[NASA-CR-159609] p0536 N80-26775
Solar central receiver prototype heliostat. Volume 3: Cost estimates
[SAN-1604-3] p0451 N80-26801

BOSTON UNIV., MASS.
Photochemical determinants of the efficiency of photogalvanic conversion of solar energy
[COO-2889-5] p0447 N80-25886

BRITISH PETROLEUM CO. LTD., SUNBURY-ON-THAMES (ENGLAND).
Stable coal/fuel oil dispersions
p0501 N80-27503

BROBECK (WILLIAM M.) AND ASSOCIATES, BERKELEY, CALIF.
- Conceptual design of a flywheel energy storage system [SAND-79-7088] p0561 N80-26805

BROOKHAVEN NATIONAL LAB., UPTON, N. Y.
- Load excitation at the superconducting cable test facility [BNL-26641] p0540 N80-22608
- Calorimetric measurement of ac losses in superconducting cables of short lengths [BNL-26712] p0540 N80-22609
- Hydrogen storage materials research and development work at Brookhaven National Laboratory [BNL-26813] p0463 N80-23478
- Series solar heat pump and energy conservation [BNL-27012] p0340 N80-23857
- Bulk hydrogen storage using metal hydrides [BNL-27093] p0463 N80-24483
- Measurements on insulating materials at cryogenic temperatures [PB80-134596] p0541 N80-24507
- Low-cost general energy/analytic information system [BNL-26398] p0567 N80-24801
- Environmental control technology for the flash hydropyrolysis of coal [BNL-50983] p0345 N80-24884
- Environmental control technology for atmospheric carbon dioxide [BNL-27164] p0345 N80-24888
- Flash hydropyrolysis of coal [BNL-51052] p0490 N80-25468
- Optimization of solar assisted heat pump systems via a simple analytic approach [BNL-27316] p0349 N80-25896
- Consequences of increased coal utilization [CONF-791108-16] p0350 N80-25923
- Development of fuel cell technology for vehicular applications [BNL-51047] p0536 N80-26216
- Atomization of coal slurry jets p0496 N80-26482
- Heat transfer enhancement in metal hydride systems [BNL-27347] p0561 N80-26539
- Development of hardware simulators for tests of solar cooling/heating subsystems and systems. Phase 1: Residential subsystem hardware simulator and steady state simulation [BNL-51120] p0455 N80-26863
- Environmental control technology for atmospheric carbon dioxide [BNL-51116] p0354 N80-26956

BROWN UNIV., PROVIDENCE, R. I.
- Solor Cell Heterojunctions Involving N-cadmium sulfide and certain P-type semiconductor single crystals p0426 N80-23766

BUREAU OF MINES, SALT LAKE CITY, UTAH.
- Flue gas desulfurization by the modified citrate process: Report of investigations [PB80-134836] p0351 N80-25940

BURT, HILL, KOSAR, RITTELMAN, AND ASSOCIATES, BUTLER, PA.
- Solar-assisted low energy dwellings [DOE/CS-0145] p0451 N80-26816

C

C-E LUMMUS, BLOOMFIELD, N.J.
- Synthane pilot plant, South Park Township, Pennsylvania [COO-0003-41-T1] p0489 N80-25455

CALIFORNIA ENERGY COMMISSION, SACRAMENTO.
- Biomass energy conversion workshop for industrial executives [SERI/TP-62-299] p0480 N80-22516

CALIFORNIA UNIV., BERKELEY.
- Risk of renewable energy sources: A critique of the Inhaber report [ERG-79-3] p0349 N80-25892
- The combustion of carbon, coal and coal related fuels in an opposed flow diffusion flame burner p0500 N80-27493
- Land use and environmental impacts of decentralized solar energy use [DOE/EV-0067] p0458 N80-27843

CALIFORNIA UNIV., BERKELEY. LAWRENCE BERKELEY LAB.
- Aqueous solutions database to high temperatures and pressures: NaCl solutions [LBL-9621] p0482 N80-23399
- Basic research needs in energy conservation [LBL-9939] p0338 N80-23794
- Metal foils for direct application of absorber coatings on solar collectors [LBL-9324-REV] p0428 N80-23810
- LBL continuous biomass liquefaction Process Engineering Unit (PEU) [LBL-10092] p0487 N80-24490
- Sensible heat storage for a solar thermal power plant [LBL-9321] p0437 N80-24816
- Mean monthly performance of passive solar water heaters [LBL-9295] p0437 N80-24820
- Application of circumsolar measurements to concentrating collectors [LBL-9412] p0439 N80-24840
- Thermochemical conversion of biomass: An overview of R and D activities sponsored by the biomass energy systems branch of DOE [PNL-SA-8266] p0490 N80-25465
- Evaluation of residential building energy performance standards [LBL-9816] p0348 N80-25849
- International analysis of residential energy use and conservation [LBL-9383] p0349 N80-25881
- Solar energy program. Chapter from the Energy and Environment Division report [LBL-9630] p0350 N80-25904
- Consequences of increased coal utilization [CONF-791108-16] p0350 N80-25923
- Projects from Federal Region 9: Department of energy appropriate energy technology program, part 2 [LBL-10098] p0353 N80-26817
- Assessment of solar energy within a community: Summary of three community-level studies [DOE/EV-0054] p0452 N80-26826
- Hydrolyzed wood slurry flow modeling [LBL-10090] p0504 N80-27703

CALIFORNIA UNIV., LIVERMORE. LAWRENCE LIVERMORE LAB.
- Solar-heated gas-turbine process using sulfur oxides for power production and energy storage [LBL-9472] p0424 N80-22839
- Battery-powered, differential infrared absorption sensor for methane, ethane, and other hydrocarbons [UCRL-83317] p0337 N80-23629
- Application of shallow solar ponds for industrial process heat: Case histories [UCRL-82367] p0429 N80-23822
- Potential air quality impact of geothermal power production in the Imperial Valley [UCRL-52797] p0340 N80-23878
- Prospects for using improved climate information to better manage energy systems [UCRL-83813] p0343 N80-24859
- Numerical wind field model validation for a complex terrain area in the vicinity of Lawrence Livermore Laboratory [UCRL-52837] p0488 N80-24964
- Tests of high-powered direct conversion on beams and plasma [UCRL-82852] p0532 N80-25161
- Laser program, volume 3 [UCRL-50021-78-VOL-3] p0532 N80-25650
- Site and building energy-conservation study: Survey of building 251, diagnostic chemistry [UCRL-15190] p0348 N80-25880
- Evaluation of air cathodes for potential use in development of aluminum-air cells [UCID-18561] p0535 N80-25893
- Solar-assisted heat pump-swimming pool synergistics for domestic heating [UCRL-83458] p0447 N80-25905
- Climate program plan, volume 1 [DOE/EV-0062/1] p0351 N80-26003
- Energy-storage systems for automobile propulsion, 1979 study. Volume 3: Battery/flywheel electric vehicles using advanced batteries [UCRL-52841-VOL-3] p0561 N80-26213

LLL Data acquisition system for liquefied gaseous fuels program
[UCID-18576] p0498 N80-26537
Site and building energy-conservation study: Survey of building 435, MFE research
[UCRL-15198] p0352 N80-26568
Site and building energy-conservation study: Survey of building 3, experimental physics
[UCRL-15195] p0353 N80-26808
Energy storage systems for automobile propulsion, 1979 study. Volume 2: Detailed report
[UCRL-52841-VOL-2] p0563 N80-27232
Dynamic testing of the Roadway Powered Electric Vehicle (RPEV) system
[UCRL-83662] p0564 N80-27233

CALIFORNIA UNIV. AT BERKELEY.
Solar energy conversion through biophotolysis
[SAN-0034-239-T1] p0445 N80-25852

CANADA INST. FOR SCIENTIFIC AND TECHNICAL INFORMATION, OTTAWA (ONTARIO).
Nonisothermal experiments on the hydrodesulphurization of coal
[NRC/CNR-TT-1963] p0484 N80-24462

CANADIAN COMBUSTION RESEARCH LAB.-CANMET, CHATHAM (NEW BRUNSWICK).
Current status of the Canadian coal-oil mixture program
p0501 N80-27496

CANADIAN INDUSTRIES LTD., KINGSTON (ONTARIO).
SWARU: Solid waste disposal resource system
[NP-24196] p0341 N80-24146

CASE WESTERN RESERVE UNIV., CLEVELAND, OHIO.
Hydrogen sulphide stress corrosion cracking in materials for geothermal power
[COO-2602-7] p0491 N80-25707

CATALYTIC, INC., PHILADELPHIA, PA.
Preliminary engineering evaluation of promising coal liquefaction concepts
[EPRI-AP-884] p0497 N80-26529

CATALYTIC, INC., WILSONVILLE, ALA.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528

CCB/CUMALI ASSOCIATES, OAKLAND, CALIF.
Passive solar calculation methods
[DSE/5221-T1] p0429 N80-23836
Passive solar calculation methods
[DSE-5221-T1] p0442 N80-25798

CENTRAL INTELLIGENCE AGENCY, WASHINGTON, D.C.
The world oil market in the years ahead: A research paper
[ER-79-10327U] p0352 N80-26749

CENTRAL TECHNICAL INST. TNO, APELDOORN (NETHERLANDS).
Lectures on heat technology in the Netherlands
p0353 N80-26787
Survey of foreign research in the field of heat pumps for the heating of dwellings
p0353 N80-26789
Case study of an air to air heat pump
p0353 N80-26790

CHEMICAL ENGINEERING RESEARCH GROUP, PRETORIA (SOUTH AFRICA).
Hydrodenitrogenation of coal liquids and petroleum with heterogenous catalysts in multiphase reactors. Review and recommendations for further work
[PB80-151442] p0499 N80-26549

CHEVRON RESEARCH CO., RICHMOND, CALIF.
Refining and upgrading of synfuels from coal and oil shales by advanced catalytic processes
[FE-2315-43] p0486 N80-24482

CHICAGO STATE UNIV., ILL.
Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
p0386 A80-33726

CHICAGO UNIV., ILL.
Design and test of non-evacuated solar collectors with compound parabolic concentrators
[EPI-79-42] p0443 N80-25811

CHRYSLER CORP., DETROIT, MICH.
Baseline automotive gas turbine engine development program
[NASA-CR-159670] p0530 N80-24620
Conceptual design study of an improved automotive gas turbine powertrain
[NASA-CR-159672] p0530 N80-24621

COALIQUID, INC., LOUISVILLE, KY.
Operation of a central preparation plant for coal-oil-water mixtures
p0501 N80-27500

COLORADO STATE UNIV., FORT COLLINS.
Off-peak electric auxiliary heat for solar air-heating systems
[COO-4516-1] p0429 N80-23827
Residential solar heating and cooling using evacuated tube solar collectors: CSU solar house 3
[COO-2858-24-SUMM] p0437 N80-24807
Performance evaluation of a solar air-heating and nocturnal cooling system in CSU Solar House 2
[COO-2868-5] p0440 N80-24858
CSU Solar House 3: Solar heating and cooling system performance
[COO-30122-3] p0442 N80-25806
Comparative performance of two types of evacuated tubular solar collectors in a residential heating and cooling system
[COO-2577-19] p0446 N80-25864

COLORADO UNIV., BOULDER.
Heterogeneous chemistry of importance in decisions concerning the environmental impact of energy production and the siting of new energy sources
[COO-4776-2] p0355 N80-26958

COLUMBIA UNIV., NEW YORK.
Optoelectronic and photovoltaic properties of metal-SiO2-silicon tunneling structures
p0426 N80-23179

COMMITTEE ON SCIENCE AND TECHNOLOGY (U. S. HOUSE).
Oversight: Industrial energy conservation, volume 10
[GPO-53-020] p0352 N80-26786

COMPLETION TECHNOLOGY CO., HOUSTON, TEX.
Performance evaluation of Magma Power company's reinjection well no. 46-7 at the East Mesa KGRA, California
[SAND-79-7127] p0492 N80-25863

CONSULTANTS COMPUTATION BUREAU, OAKLAND, CALIF.
Site and building energy-conservation study: Survey of building 435, MFE research
[UCRL-15198] p0352 N80-26568
Site and building energy-conservation study: Survey of building 3, experimental physics
[UCRL-15195] p0353 N80-26808

CONTRACT RESEARCH CORP., CHICAGO, ILL.
Illinois state plan: Energy conservation in institutions (institutional buildings grant program)
[PB80-148182] p0354 N80-26882

CORNELL UNIV., ITHACA, N. Y.
Optical properties of metallic surfaces, small particles and composite coatings for solar energy conversion applications
[DOE/ET-20413/1] p0448 N80-26143

CURTISS-WRIGHT CORP., WOOD-RIDGE, N.J.
Performance, emissions, and physical characteristics of a rotating combustion aircraft engine, supplement A
[NASA-CR-135119] p0355 N80-27361

D

DAI-ICHI KOGYO SEIYAKU CO. LTD., TOKYO (JAPAN).
The use of additives to stabilize coal-oil mixture
p0496 N80-26477

DAVID SARNOFF RESEARCH CENTER, PRINCETON, N.J.
A study of the factors which control the efficiency of ion-implanted silicon solar cells
p0396 A80-35360

DAYTON UNIV., OHIO.
Analysis of solidification in a cylindrical annulus with internal fins
[AD-A080131] p0550 N80-22641
Electrofluid dynamic wind generator
[COO-4130-2] p0531 N80-24811

DEFENCE RESEARCH ESTABLISHMENT, OTTAWA. (ONTARIO).
Evaluation of the vertical axis wind turbine at DREO
[AD-A083961] p0564 N80-27814

DEFENSE INTELLIGENCE AGENCY, WASHINGTON, D.C.
Hydrogen technology: Foreign, change 1
[AD-A083665] p0464 N80-27816

DELAWARE UNIV., NEWARK.
Dynamics and control of large horizontal-axis axisymmetric wind turbines
p0526 N80-22772
Amorphous Si solar cells
[DOE/ET/23034-T1] p0439 N80-24839
DELAWARE UNIV., WILMINGTON.
Life and stability testing of packaged low-cost energy storage materials
p0553 N80-22814
DELTA ELECTRONIC CONTROL CORP., IRVINE, CALIF.
Design, construction and testing of a 60 kW solar array and power conversion system
[AD-A080877] p0337 N80-23782
DEPARTMENT OF ENERGY, GERMANTOWN, MD.
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69] p0476 A80-42199
DEPARTMENT OF ENERGY, OAK RIDGE, TENN.
Energy information data base corporate author entries, supplement 3
[DOE/TIC-4585-R1-SUPPL-3] p0567 N80-22846
Energy information data base, series titles: Supplement 7, February 1978 - December 1979
[DOE/TIC-4579-R10-SUPPL-7] p0567 N80-25203
Energy information data base, corporate author entries: Supplement 4, June 1978 - December 1979
[DOE/TIC-4585-R1-SUPPL-4] p0567 N80-25204
DEPARTMENT OF ENERGY, WASHINGTON, D. C.
Solar applications analysis for energy storage
p0423 N80-22791
Environmental development plan: Magnetohydrodynamics
[DOE/EDP-0045] p0335 N80-22876
NOAA's role in the solar energy program
[DOE/ET-0110] p0427 N80-23792
Environmental development plan for biomass energy systems
[DOE/EDP-0032] p0340 N80-23876
Environmental development plan: Geothermal energy systems
[DOE/EDP-0036] p0340 N80-23877
Environmental development plans for energy technology programs
[DOE/EDP-0062] p0341 N80-23881
Electric and hybrid vehicle program
[DOE/CS-0026] p0556 N80-24216
Coal conversion comparisons, task 002
[FE-2468-51] p0485 N80-24479
Coal Liquefaction
[DOE/ET-0068/4] p0486 N80-24480
Coal conversion
[DOE/ET-0061/2] p0486 N80-24481
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486
Unconventional gas recovery - enhanced gas recovery
[DOE/EDP-0049] p0488 N80-24735
Analysis of exploration, development and production activity on Federal outer Continental Shelf leases
[DOE/RA-0044] p0342 N80-24736
National Energy Plan 2, May 1979. Appendix A: World oil prices
[DOE/TIC-10203-APP-A] p0344 N80-24870
Energy performance standards for new buildings: Economic analysis
[DOE/CS-0129] p0344 N80-24871
Strategic petroleum reserve
[DOE/RA-0047] p0557 N80-25769
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona
[NASA-CR-161450] p0441 N80-25787
Systems engineering for power: Organizational forms for large scale systems, volume 1
[CONF-790904-P2] p0542 N80-25808
Ocean energy systems. Fiscal year 1979
[DOE/ET-0118] p0533 N80-25824
Environmental development plan: Solar agricultural and industrial process heat
[DOE/EDP-0033] p0446 N80-25862
Solar energy project: An overview
[DOE/CS-0124] p0447 N80-25883
Photovoltaic energy systems: Program summary
[DOE/CS-0146] p0349 N80-25884
Proposed energy performance standards for new buildings: Standard building operating conditions
[DOE/CS-0118] p0349 N80-25901
Proposed energy-performance standards for new buildings: Passive and active solar-heating analysis
[DOE/CS-0117] p0349 N80-25902
Division of Environmental Control Technology program, 1978
[DOE/EV-0042] p0350 N80-25926
Environmental assessment: Geothermal energy geopressure subprogram. DOE Sweet Lake no. 1, Cameron Parish, Louisiana
[DOE/EA-0065] p0493 N80-25929
Architects and engineers guide to energy conservation in existing buildings
[DOE/CS-0132] p0351 N80-26550
Preliminary environmental assessment for the Satellite Power System (SPS), revision 1. Volume 2: Detailed assessment
[DOE/ER-00362-VOL-2] p0453 N80-26836
Solar Federal Buildings Program plan
[DOE/CS-0147A] p0453 N80-26842
Solar, geothermal, electric and storage systems program summary document, FY 1980
[DOE/ET-0102] p0354 N80-26861
Thermal and mechanical energy-storage program, project summary data FY 1980
[DOE/CS-0150] p0562 N80-26862
Satellite Power Systems (SPS): Concept development and evaluation program, preliminary assessment
[DOE/ER-0041] p0542 N80-27404
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, WASHINGTON, D. C.
Solar heating and cooling demonstration program: A descriptive summary of HUD Cycle 4 and 4A Solar Residential projects
[HUD-PDR-455] p0456 N80-26873
DEVELOPMENT PLANNING AND RESEARCH ASSOCIATES, INC., MANHATTAN, KANS.
Wind energy applications in agriculture: Executive summary
[DOE/SEA-1109-20401-79/2] p0533 N80-25807
DORNIER-WERKE G.M.B.H., FRIEDRICHSHAFEN (WEST GERMANY).
Development of a 5.5 m diameter vertical axis wind turbine, phase 2
[BMFT-FB-T-79-04] p0527 N80-22859
DOUGLAS AIRCRAFT CO., INC., LONG BEACH, CALIF.
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905
DOW CHEMICAL CO., MIDLAND, MICH.
Energy from in situ processing of Antrim oil shade
[FE-2346-49] p0483 N80-23808
Stabilization of coal/fuel oil slurries
p0495 N80-26474
DOW CORNING CORP., MIDLAND, MICH.
Development of improved insulation materials
[ALO-4295-T2] p0448 N80-26403
DRAVO CORP., PITTSBURGH, PA.
Progress in developing ultrafine coal-oil mixtures
p0494 N80-26466
DU PONT DE NEMOURS (E. I.) AND CO., AIKEN, S.C.
Solar-powered environmental data collection system
[DP-1529] p0440 N80-24867
DYNATECH R/D CO., CAMBRIDGE, MASS.
Liquid fuels production from biomass, no. 7
[COO-4388-7] p0490 N80-25462

E

E-SYSTEMS, INC., DALLAS, TEX.
Test Bed Concentrator (TBC)
p0433 N80-24763
EATON ENGINEERING AND RESEARCH CENTER, SOUTHFIELD, MICH.
Small passenger car transmission test-Chevrolet 200 transmission
[NASA-CR-159835] p0356 N80-28255
EIC, INC., NEWTON, MASS.
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845
New electrolytes for direct methane fuel cells
[DOE/ET-11321/T1] p0534 N80-25891

Corrosion protection of solar-collector heat exchangers with electrochemically deposited films
[COO-4297-2] p0454 N80-26845

ELECTRIC POWER DEVELOPMENT CO. LTD. (JAPAN).
Fine and coarse coal oil mixture combustion tests of air atomized burner in Japan
p0496 N80-26480
Overview of R&D status on COM technology in Japan
p0501 N80-27495

ELECTRIC STORAGE BATTERY CO., YARDLEY, PA.
Research, development and demonstration of lead-acid batteries for electric vehicle propulsion
[ANL/OEPM-78-8] p0558 N80-25801

ELECTROCHEMICAL TECHNOLOGY CORP., SEATTLE, WASH.
Survey of organic electrolytic processes
[ANL/OEPM-79-5] p0341 N80-24393

ENERGY AND ENVIRONMENTAL ANALYSIS, INC., ARLINGTON, VA.
Forecast of long term coal supply and mining conditions: Model documentation and results
[NASA-CR-163141] p0487 N80-24728

ENERGY RESEARCH CORP., DANBURY, CONN.
Research, development, and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-10] p0556 N80-24215

ENGINEERING SOCIETIES COMMISSION ON ENERGY, INC., WASHINGTON, D. C.
Guidelines for economic evaluation of coal conversion processes
[FE-2468-44] p0480 N80-22521
Basic Research Engineering: Fluid Dynamics and Thermal Processes
[FE-2468-53] p0334 N80-22649

ENTWICKLUNGS- UND FORSCHUNGSLABOR, LORRACH (WEST GERMANY).
Water heating by solar energy with plastic collectors
[BMFT-FB-T-79-29] p0456 N80-26876

ENVIRO CONTROL, INC., ROCKVILLE, MD.
Criteria for a recommended standard: Occupational exposures in coal gasification plants
[PB80-164874] p0504 N80-27535
Recommended health and safety guidelines for coal gasification pilot plants
[PB80-164890] p0504 N80-27536

ENVIRONMENTAL ENERGY ENGINEERING, INC., MORGANTOWN, W. VA.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9] p0483 N80-23486
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-8] p0483 N80-23487

ENVIRONMENTAL LAW INST., WASHINGTON, D. C.
State options in lighting: Efficiency standards for existing public buildings
[DOE/CS-5255/2] p0352 N80-26600
Energy-efficient procurement in state and local governments
[DOE/CS-5255/1] p0355 N80-27207

ENVIRONMENTAL PROTECTION AGENCY, RESEARCH TRIANGLE PARK, N.C.
Control techniques for carbon monoxide emissions
[PB80-140510] p0345 N80-24890
National Emissions Data System (NEDS), fuel use report
[PB80-146905] p0350 N80-25919

EUROPEAN SPACE AGENCY, PARIS (FRANCE).
Photolytic decomposition of water into oxygen and hydrogen as an alternative energy utilization of households and small consumers
[ESA-TT-582] p0463 N80-23865
La Recherche Aerospatiale, Bimonthly Bulletin Number 1979-6
[ESA-TT-632] p0448 N80-26255

EXXON NUCLEAR IDAHO CO., INC., IDAHO FALLS.
Low-level airborne monitoring techniques utilized in a field measurement program at operating pressurized water reactors
[CONF-791049-8] p0335 N80-22878

EXXON RESEARCH AND ENGINEERING CO., BAYTOWN, TEX.
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460

EXXON RESEARCH AND ENGINEERING CO., FLORHAM PARK, N.J.
EDS coal liquefaction process development, phase 4
[FE-2893-33] p0491 N80-25474
EDS coal liquefaction process development, phase 4. EDS commercial plant study design update, offsite design basis: Illinois coal market flexibility sensitivity case
[FE-2893-37] p0491 N80-25475

EXXON RESEARCH AND ENGINEERING CO., LINDEN, N.J.
Thin film polycrystalline silicon solar cells
[DOE/SF/23047-3] p0452 N80-26828

EYRING RESEARCH INST., PROVO, UTAH.
Experimental and process design study of a high rate entrained coal gasification process
[FE-1548-T2] p0487 N80-24501

F

FAIRCHILD STRATOS CORP., MANHATTAN BEACH, CALIF.
Non-heat pipe/P-40 Stirling engine
p0530 N80-24772

FEDERAL AVIATION ADMINISTRATION, WASHINGTON, D. C.
Energy conservation potential of general aviation activity
[AD-A081182] p0355 N80-27355

FIAT RESEARCH CENTER, ORBASSANO (ITALY).
Phase 1 of the near term hybrid passenger vehicle development program
[NASA-CR-163219] p0564 N80-28245
Phase 1 of the near term hybrid passenger vehicles development program. Appendix A: Mission analysis and performance specification studies, volume 1
[NASA-CR-163220] p0564 N80-28246
Phase 1 of the near term hybrid passenger vehicle development program, appendix A. Mission analysis and performance specification studies. Volume 2: Appendices
[NASA-CR-163221] p0565 N80-28247
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies, volume 1
[NASA-CR-163222] p0565 N80-28248
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package, volume 1
[NASA-CR-163223] p0565 N80-28249
Phase 1 of the near term hybrid passenger vehicle development program. Appendix B: Trade-off studies. Volume 2: Appendices
[NASA-CR-163224] p0565 N80-28250
Phase 1 of the near team hybrid passenger vehicle development program. Appendix C: Preliminary design data package. Volume 2: Appendices
[NASA-CR-163225] p0565 N80-28251
Phase 1 of the near term hybrid passenger vehicle development program. Appendix D: Sensitivity analysis
[NASA-CR-163226] p0565 N80-28252

FIAT RESEARCH CENTER, TURIN (ITALY).
Electrochemical energy storage on board of road electric vehicles
p0560 N80-26211

FLORIDA POWER CORP., ST. PETERSBURG.
System planning analysis applied to OTEC: initial cases by Florida Power Corporation, task 2
[DOE/ET/29187-2] p0537 N80-26868

FLORIDA SOLAR ENERGY CENTER, CAPE CANAVERAL.
Solar heating and cooling demonstration project at the Florida solar energy center
[NASA-CR-161413] p0423 N80-22774

FLORIDA UNIV., GAINESVILLE.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

FLUOR ENGINEERS AND CONSTRUCTORS, INC., IRVINE, CALIF.
Engineering evaluation of conceptual coal conversion plant using the H-coal liquefaction process
[EPRI-AF-1297] p0498 N80-26530
FMC CORP., SANTA CLARA, CALIF.
Line focus solar thermal central receiver research study
[DOE/ET/20426-1] p0440 N80-24853
FORD AEROSPACE AND COMMUNICATIONS CORP., NEWPORT BEACH, CALIF.
The performance of solar thermal electric power systems employing small heat engines
[ASME PAPER 80-PET-25] p0523 A80-43340
Generalized shading analysis for paraboloidal collector fields
[ASME PAPER 80-PET-33] p0420 A80-43344
An organic Rankine receiver for the SCSTPE program
p0434 N80-24771
The SCSTPE organic Rankine engine
p0531 N80-24773
The dish-Rankine SCSTPE program (Engineering Experiment no. 1)
p0435 N80-24782
FOSTER-MILLER ASSOCIATES, INC., WALTHAM, MASS.
Research and development of an air-cycle heat-pump water heater
[ORNL/SUB-7226/1] p0529 N80-23850
FOSTER WHEELER CORP., LIVINGSTON, N.J.
Solar production of industrial process steam ranging in temperature from 300 deg F to 550 deg F, phase 1. Volume 3: Appendices (cont)
[DOE/CS-32199-3] p0428 N80-23812
Solar production of industrial process steam ranging in temperature from 300 degrees F to 550 degrees F, phase 1. Volume 2: Appendices
[DOE/CS-32199-2] p0428 N80-23813
Solar production of industrial process steam ranging in temperature from 300 F to 550 F (phase 1), volume 1
[DOE/CS/32199-1] p0438 N80-24826
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779
FRANKLIN RESEARCH CENTER, PHILADELPHIA, PA.
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-24] p0344 N80-24863
System planning analysis applied to OTEC: initial cases by Florida Power Corporation, task 2
[DOE/ET/29187-2] p0537 N80-26864

G

GALAXY, INC., WASHINGTON, D.C.
Organic Rankine cycle engine technology in Japan, a preliminary survey
[DOE/SF/10538-1] p0531 N80-24809
GARRETT ENERGY RESEARCH AND ENGINEERING, INC., CLAREMONT, CALIF.
Conversion of biomass materials into gaseous products. Operation of the POU
[SAN-1241-3] p0490 N80-25466
GENERAL ACCOUNTING OFFICE, WASHINGTON, D. C.
Federal government needs a comprehensive program to curb its energy use
[EMD-80-11] p0343 N80-24814
Magnetohydrodynamics: A promising technology for efficiently generating electricity from coal, report to the Congress
[PB80-143175] p0535 N80-25910
US energy assistance to developing countries: Clarification and coordination needed
[PB80-162720] p0356 N80-28244
GENERAL ATOMIC CO., SAN DIEGO, CALIF.
Closed-cycle gas turbine: A proven cogeneration plant adaptable to fossil, nuclear, and solar heat sources
[GA-A-15322] p0335 N80-22837
GENERAL COMMINUTION, INC., DON MILLS (ONTARIO).
Grinding of coal-in-oil slurries
p0494 N80-26464
GENERAL ELECTRIC CO., CINCINNATI, OHIO.
CF6-6D engine performance deterioration
[NASA-CR-159786] p0355 N80-27364
GENERAL ELECTRIC CO., EVENDALE, OHIO.
Fuel conservation through active control of rotor clearances
[AIAA PAPER 80-1087] p0330 A80-41506
GENERAL ELECTRIC CO., PHILADELPHIA, PA.
Mod-1 wind turbine generator analysis and design report, volume 1
[NASA-CR-159495] p0528 N80-23775
Solar heating and cooling system design and development
[NASA-CR-161422] p0432 N80-24746
The Shenandoah concentrator
p0434 N80-24767
The 1st generation low cost point focus solar concentrator
p0434 N80-24768
SPS market analysis
p0435 N80-24786
Solar total energy project at Shenandoah, Georgia system design
p0436 N80-24796
Solair heater program: Solair applications study
[COO-2705-3] p0443 N80-25813
Solar total energy project Shenandoah
[ALO-3985-1-REV-1] p0444 N80-25825
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility
[SAND-79-7022-VOL-1] p0534 N80-25870
Design, fabrication, test, and qualification and price analysis of third generation design solar cell modules
[NASA-CR-163028] p0449 N80-26776
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779
Requirement definition and preliminary design of a photovoltaic central power station experimental test facility. Volume 2: SOLMET site insolation and weather data
[SAND-79-7022-VOL-2] p0537 N80-26800
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830
GENERAL ELECTRIC CO., SANTA BARBARA, CALIF.
Thermal energy storage and transport
p0540 N80-22793
Evaluation of thermal energy storage for the proposed Twin Cities District Heating system
p0553 N80-22815
GENERAL ELECTRIC CO., SCHENECTADY, N. Y.
Conceptual design of thermal energy storage systems for near-term electric utility applications
p0551 N80-22794
Heat storage capability of a rolling cylinder using Glauber's salt
p0553 N80-22810
Development of high-temperature turbine subsystem technology to a technology readiness status, phase 2
[FE-1806-48] p0337 N80-23662
Cogeneration Technology Alternatives Study (CTAS). Volume 1: Summary report
[NASA-CR-159765] p0342 N80-24797
Thermal energy storage subsystems for solar heating and cooling applications: Rolling cylinder thermal storage
[ORO-5759-T1] p0557 N80-24866
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies
[NASA-CR-163227] p0559 N80-26203
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 2: Supplement to design trade-off studies
[NASA-CR-163228] p0559 N80-26204
Near-term hybrid vehicle program, phase 1. Appendix B: Design trade-off studies report. Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206
Near-term hybrid vehicle program, phase 1. Appendix A: Mission analysis and performance specification studies report
[NASA-CR-163231] p0560 N80-26207

Near-term hybrid vehicle program, phase 1. Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208
Near-term hybrid vehicle program, phase 1. Appendix D: Sensitivity analysis resport
[NASA-CR-163233] p0560 N80-26209
High-temperature turbine technology program low-Btu gas, low-temperature chemical cleanup pilot plant: Design, construction, startup, and operation
[FE-1806-78] p0499 N80-26669
Development of high-temperature turbine system technology to a technology readiness status phase 2
[FE-1806-76] p0536 N80-26671

GENERAL ELECTRIC CO., WILMINGTON, MASS.
Solid polymer electrolyte fuel cell technology program
[NASA-CR-160734] p0538 N80-27801

GENERAL MOTORS CORP., DETROIT, MICH.
Advanced Gas Turbine Powertrain System Development Project
p0513 A80-35574

GENERAL RESEARCH CORP., SANTA BARBARA, CALIF.
Mission analysis and performance specification studies report, appendix A
[NASA-CR-163035] p0562 N80-27223

GEOKINETICS, INC., CONCORD, CALIF.
Geokinetics in situ shale oil recovery project
[LETC-10787-25] p0483 N80-23755

GEOLOGICAL SURVEY, ANCHORAGE, ALASKA.
The United States Geological Survey in Alaska, 1979 programs
[CIRC-804-A] p0500 N80-26747

GEORGETOWN UNIV., WASHINGTON, D.C.
Georgetown University Generic Integrated Community Energy System GU ICES demonstration project. Modified work management plan
[COO-4488-2] p0343 N80-24838

GEORGIA INST. OF TECH., ATLANTA.
Photovoltaic system costs using local labor and materials in developing countries
[NASA-CR-163218] p0533 N80-25785

GEORGIA POWER CO., ATLANTA.
Solar total energy-large scale experiment, Shenandoah, Georgia
p0436 N80-24795

GEORGIA UNIV., ATHENS.
Development of a practical photochemical energy storage system. The norbornadiene-quadricyclene energy storage system
[SRO-0893-17] p0558 N80-25869

GERMANTOWN LABS., INC., PHILADELPHIA, PA.
The production of stable coal-oil mixtures using high intensity mechanical mixing devices
p0495 N80-26470
Investigation of fuels containing coal-oil-water emulsions
[FE-2689-5] p0497 N80-26524

GILBERT ASSOCIATES, INC., READING, PA.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9] p0483 N80-23486
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-8] p0483 N80-23487

GILBERT (W. E.) AND ASSOCIATES, INC., GREENWOOD, S.C.
Solar heating system installed at Blakedale Professional Center, Greenwood, South Carolina
[NASA-CR-161435] p0427 N80-23776

GILLILAND-BELL ASSOCIATES, INC., GREENWOOD, S.C.
Solar heating and hot water system installed at Municipal Building complex, Abbeville, South Carolina
[NASA-CR-161443] p0442 N80-25788

GOULD, INC., ROLLING MEADOWS, ILL.
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-11] p0558 N80-25802

GRAMMER (WILLIBALD), AMBERG (WEST GERMANY).
Solar collector system using air collectors for a pre-drying facility in a grass drying plant
[SKT-TEIL-1] p0456 N80-26877

GRUMMAN AEROSPACE CORP., BETHPAGE, N.Y.
Active heat exchange system development for latent heat thermal energy storage
p0554 N80-22822
Further investigations of diffuser augmented wind turbines. Part 1: Executive summary
[COO-2616-2-PT-1-REV-1] p0532 N80-24864

GTE LABS., INC., WALTHAM, MASS.
Development of materials for a luminescent solar collector
[COO-4996-1] p0443 N80-25812

GULF RESEARCH AND DEVELOPMENT CO., PITTSBURGH, PA.
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-42] p0490 N80-25473
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-1] p0499 N80-26545
Research and development of an advanced process for conversion of coal to synthetic gasoline and other distillate motor fuels
[FE-1800-39-VOL-2] p0499 N80-26546

GULF SOUTH RESEARCH INST., NEW ORLEANS, LA.
Research to identify components of energy-related wastes: A state-of-the-art report
[PB80-137961] p0351 N80-25943

H

HITACHI LTD., TOKYO (JAPAN).
Fine COM preparation test
p0496 N80-26476
Report on fine COM combustion test
p0497 N80-26485
Report on pumping characteristic tests and piping pressure loss measurement tests for fine COM
p0502 N80-27507

HITTMAN ASSOCIATES, INC., COLUMBIA, MD.
Solor Applications of Thermal Energy Storage
[TID-29430] p0427 N80-23791

HONEYWELL, INC., MINNEAPOLIS, MINN.
Active heat exchange system development for latent heat thermal energy storage
p0553 N80-22819
Spectrophotovoltaic orbital power generation
[NASA-CR-161451] p0530 N80-24757
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-18] p0343 N80-24813
Low-cost solar antireflection coatings
[ALO-5300-T2] p0453 N80-26844

HONEYWELL, INC., ST. PAUL, MINN.
Assessment and preliminary design of an energy buffer for regenerative braking in electric vehicles
[NASA-CR-159756] p0555 N80-23216

HOOKER CHEMICAL CORP., NIAGARA FALLS, N.Y.
Parametric study of prospective early commercial MHD power plants (PSPEC). General Electric Company, task 1: Parametric analysis
[NASA-CR-159634] p0536 N80-26779

HUGHES RESEARCH LABS., MALIBU, CALIF.
Deep-level defects, recombination mechanisms, and their correlation to the performance of low-energy proton-irradiated AlGaAs-GaAs solar cells
p0397 A80-35369

I

IBM FEDERAL SYSTEMS DIV., HUNTSVILLE, ALA.
Solar energy system performance evaluation: Seasonal report for fern, Tunkhannock, Pennsylvania
[NASA-CR-161392] p0424 N80-22856
Environmental data for sites in the National Solar Data Network
[SOLAR/0010-79/05] p0339 N80-23833
Solar energy system performance evaluation: Seasonal report for Decade 80 House, Tucson, Arizona
[NASA-CR-161450] p0441 N80-25787

Solar energy system performance evaluation: Seasonal report for IBM system 1A, Huntsville, Alabama
[NASA-CR-161464] p0442 N80-25790

Solar energy system performance evaluaton: Seasonal report for Solaron-Akron, Akron, Ohio
[NASA-CR-161465] p0442 N80-25791

Solar energy system performance evaluation: Seasonal report for Elcam Tempe Arizona State University, Tempe, Arizona
[NASA-CR-161466] p0450 N80-26778

Solar energy system performance evaluation: Seasonal report for Contemporary-Manchester, Manchester, New Hampshire
[NASA-CR-161471] p0457 N80-27802

Solar energy system performance evaluation-seasonal report for Elcam San Diego, San Diego, California
[NASA-CR-161481] p0457 N80-27806

ICF, INC., WASHINGTON, D. C.

Energy extension service pilot program evaluation report: The first year. Volume 2: Pilot state reports
[DOE/CS-2671-3] p0335 N80-22850

IDAHO UNIV., MOSCOW.

Undeveloped hydropower as a potential energy source in Idaho
[PB80-157399] p0504 N80-27824

ILLINOIS INST. OF NATURAL RESOURCES, SPRINGFIELD.

Illinois state plan: Energy conservation in institutions (institutional buildings grant program)
[PB80-148182] p0354 N80-26882

ILLINOIS INST. OF TECH., CHICAGO.

International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859

ILLINOIS UNIV. AT URBANA-CHAMPAIGN.

A steam process for the gasification of coal
p0480 N80-22507

ILLINOIS UNIV., CHICAGO.

Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23789

ILLINOIS UNIV., URBANA.

Biological conversion of biomass to methane corn stover studies
[COO-2917-13] p0485 N80-24474

INSTITUT FRANCAIS DE L'ENERGIE, PARIS.

Guide for energy compatibility
[NP-24016] p0353 N80-26833

INSTITUTE FOR ENERGY ANALYSIS, WASHINGTON, D.C.

France: Estimates of future energy/GDP relationships
[ORAU/IEA-79-23(M)] p0343 N80-24852

INSTITUTE FOR INDUSTRIAL RESEARCH AND STANDARDS, DUBLIN (IRELAND).

Retrospective search on the biochemical production of alcohol fuels
[NP-24137] p0482 N80-23476

INSTITUTE OF GAS TECHNOLOGY, CHICAGO, ILL.

Development of combustion data to utilize low-Btu gases as industrial process fuels. Project 61004 special report no. 8: Boiler burner
[FE-2489-45] p0334 N80-22520

High-temperature molten salt thermal energy storage systems for solar applications
p0552 N80-22805

Lithium-metal sulfide and sodium-sulfur batteries for solar energy storage
[CONF-781228-3] p0424 N80-22843

Preparation of a coal conversion systems technical data book
[FE-2286-44] p0490 N80-25472

Beneficial use of rejected heat from electric power plants
[COO-4531-9] p0348 N80-25841

Fuel cell research on second-generation molten-carbonate systems
[SAN-11276-1] p0534 N80-25847

Studies of thermochemical water-splitting cycles
[NASA-CR-163029] p0449 N80-26409

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-58] p0503 N80-27515

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-55] p0503 N80-27516

Research and development of rapid hydrogenation for coal conversion to synthetic motor fuels, riser cracking of coal
[FE-2307-50] p0503 N80-27517

INTERACTIVE RESOURCES, INC., POINT RICHMOND, CALIF.

Solar process water heat for the IRIS images custom color photo lab
[NASA-CR-161414] p0423 N80-22781

INTERNATIONAL BUSINESS MACHINES CORP., GAITHERSBURG, MD.

Solar energy system performance evaluation. Albuquerque Western no. 1, Albuquerque, New Mexico
[SOLAR/1011-79/14] p0443 N80-25816

INTERNATIONAL BUSINESS MACHINES CORP., HUNTSVILLE, ALA.

Collector array performance report for sites of the National Solar Heating and Cooling Demonstration Program
[SOLAR/0021-79/07] p0454 N80-26846

IOWA STATE UNIV. OF SCIENCE AND TECHNOLOGY, AMES.

Energy conservation via heat transfer enhancement
[COO-4649-5] p0335 N80-22847

ISHIKAWAJIMA-HARIMA HEAVY INDUSTRIES CO. LTD., TOKYO (JAPAN).

Design consideration of fine COE storage
p0502 N80-27506

J

JALAR ASSOCIATES, SAN FRANCISCO, CALIF.

Industrial compressed air applications for solar energy conversion/storage devices
[SAND-79-7077] p0451 N80-26802

JET PROPULSION LAB., CALIFORNIA INST. OF TECH., PASADENA.

Analysis and two years of testing of the vee-trough concentrator/evacuated tube solar collector
p0362 A80-33480

Low cost vee-trough evacuated tube collector module
p0363 A80-33492

The Point-Focusing Thermal and Electric Applications Project - A progress report
p0372 A80-33595

Thermic diode performance characteristics and design manual
p0376 A80-33623

Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631

Reduction of intensity variations on a photovoltaic array with compound parabolic concentrators
p0386 A80-33726

Manufacturing methods of a composite cell case for a Ni-Cd battery
p0546 A80-34777

Silicon material task - Low cost solar array project /JPL/DOE/
p0393 A80-34780

Glass fiber reinforced concrete for terrestrial photovoltaic arrays
p0393 A80-34782

Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells
p0401 A80-36933

Future production of hydrogen from solar energy and water - A summary and assessment of U.S. developments
p0460 A80-37336

A two-dimensional finite-difference solution for the transient thermal behavior of a tubular solar collector
p0404 A80-37950

High-efficiency solar concentrator
p0405 A80-37953

A thermodynamic analysis of a solar-powered jet refrigeration system
p0407 A80-37978

Evaluation of solar thermal power plants using economic and performance simulations
p0412 A80-38023

New technologies for solar energy silicon - Cost
analysis of BCL process
p0415 A80-40714
Dispersed storage and generation case studies
[NASA-CR-162996] p0334 N80-22782
Handbook of solar energy data for south-facing
surfaces in the United States. Volume 2:
Average hourly and total daily insolation data
for 235 localities. Alaska - Montana
[NASA-CR-162999] p0423 N80-22784
Handbook of solar energy data for south-facing
surfaces in the United States. Volume 3:
Average hourly and total daily insolation data
for 235 localities. North Carolina - Wyoming
[NASA-CR-163000] p0423 N80-22785
Thermal energy storage effort at JPL
p0552 N80-22800
Traction studies of northeast corridor rail
passenger service: Executive summary
[NASA-CR-162997] p0336 N80-23214
Assessment of the potential of hybrid vehicles:
Summary
[NASA-CR-163059] p0336 N80-23215
Fluid circulating pump operated by same incident
solar energy which heats energy collection fluid
p0426 N80-23500
Coal desulfurization by low temperature
chlorinolysis, phase 2
[NASA-CR-163152] p0484 N80-24464
Forecast of long term coal supply and mining
conditions: Model documentation and results
[NASA-CR-163141] p0487 N80-24728
Method of mitigating titanium impurities effects
in p-type silicon material for solar cells
[NASA-CASE-NPO-14635-1] p0431 N80-24741
Solar-heated fluidized bed gasification system
[NASA-CASE-NPO-15071-1] p0432 N80-24747
Solar thermal power systems point-focusing
thermal and electric applications projects.
Volume 1: Executive summary
[NASA-CR-163147] p0432 N80-24750
Solar thermal power systems point-focusing
distributed receiver technology project.
Volume 2: Detailed report
[NASA-CR-159715] p0432 N80-24751
Results of the 1979 NASA/JPL balloon flight
solar cell calibration program
[NASA-CR-163013] p0432 N80-24752
The applicability of DOE solar cell and array
technology to space power
[NASA-CR-163143] p0432 N80-24753
Federal policies to promote the widespread
utilization of photovoltaic systems.
Supplement: Review and critique
[NASA-CR-163148] p0342 N80-24754
Proposed method for determining the thickness of
glass in solar collector panels
[NASA-CR-163151] p0432 N80-24755
Proceedings of the First Semiannual Distributed
Receiver Program Review
[NASA-CR-163135] p0433 N80-24760
Heat and electricity from the Sun using
parabolic dish collector systems
p0433 N80-24761
Test bed concentrator mirrors
p0433 N80-24764
Initial test bed concentrator characterization
p0433 N80-24765
OMNIUM-G concentrator test results
p0434 N80-24777
Costing the OMNIUM-G system 7500
p0434 N80-24779
Cost estimating Brayton and Stirling engines
p0531 N80-24781
Siting solar thermal power experiments
p0435 N80-24783
The JPL isolated application experiment series
p0435 N80-24784
Industrial application experiment series
p0435 N80-24785
Geological assessment probe
[NASA-CASE-NPO-14558-1] p0488 N80-24906
Economic baselines for current underground coal
mining technology
[NASA-CR-163259] p0491 N80-25764
Near-term hybrid vehicle program, phase 1.
Appendix B: Design trade-off studies
[NASA-CR-163227] p0559 N80-26203
Near-term hybrid vehicle program, phase 1.
Appendix B: Design trade-off studies report.
Volume 2: Supplement to design trade-off
studies
[NASA-CR-163228] p0559 N80-26204
Near-term hybrid vehicle program, phase 1.
Appendix B: Design trade-off studies report.
Volume 3: Computer program listings
[NASA-CR-163229] p0560 N80-26205
Near-term hybrid vehicle program, phase 1
[NASA-CR-163230] p0560 N80-26206
Near-term hybrid vehicle program, phase 1.
Appendix A: Mission analysis and performance
specification studies report
[NASA-CR-163231] p0560 N80-26207
Near-term hybrid vehicle program, phase 1.
Appendix C: Preliminary design data package
[NASA-CR-163232] p0560 N80-26208
Near-term hybrid vehicle program, phase 1.
Appendix D: Sensitivity analysis resport
[NASA-CR-163233] p0560 N80-26209
Near term hybrid passenger vehicle development
program, phase 1
[NASA-CR-163235] p0560 N80-26210
Autocatalytic coal liquefaction process
[NASA-CASE-NPO-14876-1] p0493 N80-26460
Photovoltaic Residential Applications Program
Implementation Workshop Proceedings
[NASA-CR-163274] p0449 N80-26768
Cost and price estimate of Brayton and Stirling
engines in selected production volumes
[NASA-CR-163265] p0536 N80-26769
Thermal Power Systems (TPS); Point-Focusing
Thermal and Electric Applications (PFTEA).
Volume 2: Detailed report, fiscal year 1979
[NASA-CR-163023] p0449 N80-26770
Cost of Czochralski wafers as a function of
diameter
[NASA-CR-163277] p0449 N80-26771
Geothermal direct heat use: Market
potential/penetration analysis for Federal
Region 9
[NASA-CR-163267] p0352 N80-26772
International photovoltaic program. Volume 2:
Appendices
[NASA-CR-163339] p0537 N80-26859
The near-term hybrid vehicle program, phase 1
[NASA-CR-163034] p0562 N80-27222
Mission analysis and performance specification
studies report, appendix A
[NASA-CR-163035] p0562 N80-27223
Design tradeoff studies and sensitivity
analysis, appendix B
[NASA-CR-163036] p0563 N80-27224
Design tradeoff studies and sensitivity
analysis, appendices B1 - B4
[NASA-CR-163037] p0563 N80-27225
Preliminary design data package, appendix C
[NASA-CR-163038] p0563 N80-27226
Preliminary design data package, appendices C1
and C2
[NASA-CR-163039] p0563 N80-27227
Hybrid vehicle potential assessment. Volume 7:
Hybrid vehicle review
[NASA-CR-163298] p0563 N80-27231
JOHNS-MANVILLE SALES CORP., DENVER, COLO.
Filtration process and equipment studies for
coal liquefaction processes
[FE-2007-T1] p0487 N80-24499

K

KAISER ENGINEERS, OAKLAND, CALIF.
Site and building energy-conservation study:
Survey of building 435, MFE research
[UCRL-15198] p0352 N80-26568
Site and building energy-conservation study:
Survey of building 3, experimental physics
[UCRL-15195] p0353 N80-26808
KAO SOAP CO. LTD., TOKYO (JAPAN).
Studies on the stabilization of COM
p0496 N80-26479
KATZEN (RAPHAEL) ASSOCIATES, CINCINNATI, OHIO.
Grain motor fuel alcohol technical and economic
assessment study
[HCP/J6639-01] p0334 N80-22523

KAWASAKI HEAVY INDUSTRIES, LTD., AKASHI (JAPAN).
Results of experiment production of fine COM by wet type mill
p0496 N80-26475

KENTUCKY UNIV., LEXINGTON.
Basic Research Engineering: Fluid Dynamics and Thermal Processes
[FE-2468-53] p0334 N80-22649
Evaluation of "stable" emulsions of coal
p0495 N80-26473

KONINKLIJKE INST. VAN INGENIEURS, THE HAGUE (NETHERLANDS).
Lectures on heat technology in the Netherlands
p0353 N80-26787

KUHN (EMERSON L.), TEMPE, ARIZ.
Design study of flat belt CVT for electric vehicles
[NASA-CR-159822] p0550 N80-22702

L

LAMAR UNIV., BEAUMONT, TEX.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714

LEHIGH UNIV., BETHLEHEM, PA.
Methanol and methyl fuel catalysts
[FE-3177-3] p0482 N80-23482

LINCOLN LAB., MASS. INST. OF TECH., LEXINGTON.
Application and design studies of compressed-air energy storage for solar applications
[CAES-7] p0555 N80-23788
Solar photovoltaic project: Materials, and testing activities
[COO-4094-60] p0430 N80-23855
Phase 2 experiment test plan: Solar photovoltaic/thermal residential experiment
[COO-4094-65] p0455 N80-26869

LINCOM CORP., PASADENA, CALIF.
SPS phase control system performance via analytical simulation
[NASA-CR-160582] p0540 N80-22378

LITTLE (ARTHUR D.), INC., CAMBRIDGE, MASS.
Survey of potential processes for the manufacturing of aluminum
[ANL/OEPM-79-4] p0351 N80-26441

LITTLE (ARTHUR D.), INC., SAN FRANCISCO, CALIF.
A study of mass production and installation of small solar thermal electric power systems
p0436 N80-24789

LOCKHEED MISSILES AND SPACE CO., PALO ALTO, CALIF.
Analysis and design of insulation systems for LH2-fueled aircraft
p0462 A80-37347

LOCKHEED MISSILES AND SPACE CO., SUNNYVALE, CALIF.
Ion-implanted laser annealed silicon solar cells
p0414 A80-40252
Study of multi-kW solar arrays for Earth orbit application
[NASA-CR-161453] p0431 N80-24344
Study of multi-kW solar arrays for Earth orbit application
[NASA-CR-161452] p0431 N80-24345

LOGISTICS MANAGEMENT INST., WASHINGTON, D. C.
The Project Independence Evaluation System (PIES). Volume 1: Description of the system, executive summary
[HCP/I-1321-01/1] p0342 N80-24802

LONDON UNIV. (ENGLAND).
HCMM imagery for the discrimination of rock types, the detection of geothermal energy sources and the assessment of soil moisture content in western Queensland and adjacent parts of New South Wales and South Australia
[E80-10142] p0499 N80-26729

LOS ALAMOS SCIENTIFIC LAB., N. MEX.
Commutator dc machines used as mechanical capacitors in a series resonant ohmic-heating circuit simulation
[LA-UR-79-3122] p0526 N80-22619
Superconducting magnetic energy storage for electric utilities and fusion systems
[LA-UR-78-1213] p0554 N80-22838
Technology assessment of wind energy conversion systems
[LA-8044-TASE] p0527 N80-22840
National impacts on visual air quality from a future energy scenario
[LA-UR-79-3214] p0335 N80-22882
Direct solar pumped laser
[LA-7982-MS] p0426 N80-23651
Thermal fracture effects in geothermal energy extraction
[LA-7963] p0483 N80-23795
Energy storage technology-environmental implications of large scale utilization
[LA-UR-79-3098] p0555 N80-23801
Energy from hot dry rock
[LA-UR-79-3256] p0338 N80-23802
Residential passive solar systems: Regional sensitivity to system performance costs, and alternative prices
[LA-UR-79-3390] p0338 N80-23807
Preliminary definition and characterizations of solar industrial process heat technology and manufacturing plant for the year 2000
[LA-UR-79-2812] p0338 N80-23820
Fuel cell systems for vehicular applications
[LA-UR-79-2826] p0530 N80-24214
Catalytic coal conversion support: Use of laser flash-pyrolysis for structural analysis
[LA-8133-PR] p0486 N80-24487
Potential prediction needs in support of energy systems
p0342 N80-24693
Liquid hydrogen-fueled vehicle project
[LA-UR-79-2883] p0463 N80-25467
Superconducting Magnetic Energy Storage (SMES) program
[LA-8199-PR] p0558 N80-25805
High temperature hydrogen cycles for solar heat sources
[LA-UR-80-184] p0443 N80-25817
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923
Utilization of solar thermal sources for thermochemical hydrogen production
[LA-UR-80-837] p0464 N80-26538
Validation of solar system simulation codes by the International Energy Agency
[LA-UR-80-387] p0453 N80-26835
Additional solar/load ratio correlations for direct gain buildings
[LA-UR-80-854] p0454 N80-26847
Passive solar design handbook. Volume 2 of two volumes: Passive solar design
[DOE/CS-0127/2] p0455 N80-26870

LUMMUS CO., BLOOMFIELD, N. J.
Developmental research program for clean industrial and transportation fuels from coal: Milestone report on comparison of catalysts, March 1979
[FE-2514-M4] p0490 N80-25471

LUTZ-SOTIRE PARTNERSHIP, STAMFORD, CONN.
Solar heating system installed at Stamford, Connecticut
[NASA-CR-161436] p0456 N80-27800

M

MARTIN MARIETTA CORP., BALTIMORE, MD.
Internally insulated thermal storage system development program
p0552 N80-22801

MASSACHUSETTS INST. OF TECH., CAMBRIDGE.
Thermic diode performance characteristics and design manual
p0376 A80-33623
Process applications for geothermal energy resources
[COO-4896-T1] p0340 N80-23854
Dynamics of a flexible rotor-tower system
[ASRL-TR-194-1] p0530 N80-23862
Ocean thermal energy conversion: A state-of-the-art study
[EPRI-ER-1113-SR] p0531 N80-24834
Battery charge/solar controller for a residential size photovoltaic power system
[COO-4094-62] p0439 N80-24837
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859
Potential change strategies in urban transportation: An overview and tentative appraisal
[PB80-155278] p0355 N80-27239

MASSACHUSETTS UNIV., AMHERST.
Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467
MCDONNELL-DOUGLAS ASTRONAUTICS CO., HUNTINGTON BEACH, CALIF.
Cleaning agents and techniques for concentrating solar collectors
[SAND-80-7005C] p0445 N80-25860
MCKEE (ARTHUR G.) AND CO., CLEVELAND, OHIO.
Coal: An alternate fuel for thermal enhanced oil recovery steam generation
[SAN-2418-1] p0503 N80-27524
MECHANICAL TECHNOLOGY, INC., LATHAM, N. Y.
Design study of a 15 kW free-piston Stirling engine-linear alternator for dispersed solar electric power systems
[NASA-CR-159587] p0526 N80-22787
Magnetic bearing support study for a 10 kW-hr energy storage flywheel
[SAND-79-7025] p0555 N80-23661
Application of magnetic suspensions and fluid film bearings to energy storage flywheels
[SAND-79-7007] p0556 N80-23824
MEGA ANALYTICAL RESEARCH SERVICES, INC., SILVER SPRING, MD.
Study and analysis of a low cost cement bonded flat plate solar collector
[ALO-4122-T1] p0428 N80-23816
MESSERSCHMITT-BOELKOW-BLOHM G.M.B.H., OTTOBRUNN (WEST GERMANY).
Development and preparation for series production of a modular solar space heating system, phases 1 and 2
[BMFT-FB-T-79-02] p0424 N80-22857
METHACOAL CORP., DALLAS, TEX.
The CFOS (Carbonaceous Fuel-in-Oil Suspensoids) fuels
p0497 N80-26486
MIAMI UNIV., CORAL GABLES, FLA.
A quinone-assisted photoformation of energy-rich chemical bonds
p0408 A80-37985
MIDWEST RESEARCH INST., GOLDEN, COLO.
Biomass energy conversion workshop for industrial executives
[SERI/TP-62-299] p0480 N80-22516
Survey of biomass gasification. Volume 2: Principles of gasification
[SERI/TR-33-239-VOL-2] p0481 N80-22524
The SERI solar energy storage program
p0423 N80-22821
End-use matching of solar energy systems
[SERI/TP-34-325] p0335 N80-22848
Communication strategy to commercialize passive solar energy
[SERI/TP-69-412] p0335 N80-22849
Solar energy program evaluation: An introduction
[SERI/TR-51-294] p0427 N80-23798
Conversion system overview assessment. Volume 2: Solar-wind hybrid systems
[SERI/TR-35-078-VOL-2] p0338 N80-23799
Development of a solar thermal receiver for high temperature applications
[SERI/TP-333-485] p0428 N80-23800
Proposition on energy analysis and economic efficiency
[SERI/RR-51-332] p0338 N80-23805
Solar thermal repowering utility value analysis
[SERI/TR-8016-1] p0428 N80-23814
Technical information dissemination plan for the US Department of Energy, ETS/Solar Divisions
[SERI/SP-69-071] p0431 N80-24205
Photobiological hydrogen production
[SERI/TP-33-410] p0463 N80-24477
Fuel from farms: A guide to small-scale ethanol production
[SERI/SP-451-519] p0485 N80-24478
Environmental and institutional considerations in the development and implementation of biomass energy technologies
[SERI/TR-62-264] p0341 N80-24493
Feasibility evaluation for solar industrial process heat applications
[SERI/TP-333-538] p0438 N80-24824
Biological solar cells
[SERI/TP-332-476] p0439 N80-24831
Standard assumptions and methods for solar heating and cooling systems analysis
[SERI/TP-351-548] p0440 N80-24862
Solar technology application to enhanced oil recovery
[SERI/TR-352-392] p0445 N80-25839
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900
Environmental assessment of small wind systems
[SERI/PR-354-420] p0350 N80-25928
SERI solar energy storage program
[SERI/TP-333-497] p0452 N80-26820
End-use matching for solar industrial process heat
[SERI/TR-34-091] p0454 N80-26849
International photovoltaic program. Volume 2: Appendices
[NASA-CR-163339] p0537 N80-26859
Analysis methods for photovoltaic applications
[SERI/SP-35-230] p0455 N80-26868
Analysis methods for solar heating and cooling applications: Passive and active systems, the second edition
[SERI/SP-35-232R] p0455 N80-26871
Heterojunction solar cells
[SERI/TP-32-134] p0457 N80-27822
MIDWEST RESEARCH INST., KANSAS CITY, MO.
Thermal energy storage systems using fluidized bed heat exchangers
p0551 N80-22792
SOLPOND: A simulation program for salinity gradient solar ponds
[SERI/TP-351-559] p0430 N80-23856
Solar reflectance, transmittance and absorptance of common materials
[SERI/TP-334-457] p0437 N80-24805
Continuation of systems study of fuels from grasses and grains, phase 2 and phase 3
[DSE-4042-T2] p0498 N80-26533
MINICARS, INC., GOLETA, CALIF.
Near hybrid passenger vehicle development program, phase 1. Appendices A and B. Mission analysis and performance specification studies report, volume 1
[NASA-CR-163330] p0559 N80-26201
Near hybrid passenger vehicle development program, phase 1. Appendices C and D, Volume 2
[NASA-CR-163331] p0559 N80-26202
Near term hybrid passenger vehicle development program, phase 1
[NASA-CR-163235] p0560 N80-26210
MINNESOTA UNIV., MINNEAPOLIS.
Composition profiling of solar coating materials
[COO-2953-4] p0437 N80-24818
Energy for wind powered oscillators
[DOE/R5/10129-1] p0500 N80-26858
MISSION RESEARCH CORP., ALBUQUERQUE, N. MEX.
Transient effects from lightning. Volume 1: Transient electromagnetic fields from lightning discharges
[SAND-79-7051-VOL-1] p0449 N80-26611
MISSISSIPPI STATE UNIV., MISSISSIPPI STATE.
Addition of inexpensive solar air-heaters to a pre-engineered metal building
[ALO-4086-1] p0452 N80-26818
MITRE CORP., BEDFORD, MASS.
A test plan for the NEPSCO coal-oil mixture combustion project
p0502 N80-27505
MITRE CORP., MCLEAN, VA.
New England Energy Development Systems center (NEEDS). An experiment in university-industry cooperative research. Volume 1: Summary of results
[PB80-112972] p0567 N80-22862
New England energy development systems center (NEEDS). An experiment in university-industry cooperative research. Volume 2: Case histories
[PB80-112980] p0541 N80-22863
Solar thermal repowering: Utility/industry market potential in the Southwest
[MTR-7919] p0439 N80-24836
MITSUBISHI HEAVY-INDUSTRIES LTD., TOKYO (JAPAN).
Basic studies on COM combustion
p0497 N80-26484

MITSUI ENGINEERING AND SHIPBUILDING CO. LTD., TOKYO (JAPAN).
Pilot plant test on coarse COM system. Tests on transportation, de-oiling and combustion of coarse COM
p0502 N80-27508

MITTELHAUSER CORP., DOWNERS GROVE, ILL.
Refuse conversion to methane (RefCOM): A proof-of-concept anaerobic digestion facility
[CONF-791006-2] p0486 N80-24486

MONSANTO RESEARCH CORP., DAYTON, OHIO.
Low-cost mirror concentrator based on double-walled metallized, Tubular films
[ALO-4227-12] p0428 N80-23811
Non-Concentrating collectors for solar heating applications (medium temperature air heaters based on durable transparent films)
[ALO-4147-T1] p0429 N80-23817

MONTANA ENERGY AND MHD RESEARCH AND DEVELOPMENT INST., INC., BUTTE.
High-temperature fuel cell research and development
[SAN-1485-T1] p0534 N80-25846
High temperature fuel cell research and development
[SAN-1485-2] p0534 N80-25848

MONTANA STATE UNIV., BOZEMAN.
Catalytic hydrogenation for coal-derived liquids
[FE-2034-16] p0486 N80-24488
Catalytic hydrogenation of coal-derived liquids
[FE-2034-17] p0489 N80-25398

MOTOROLA, INC., SCOTTSDALE, ARIZ.
Airport solar photovoltaic concentrator project, phase 1
[DOE/CS-05317/1] p0453 N80-26839

N

NAGOYA UNIV. (JAPAN).
Comparative study of energy accounting for heavy ion fusion with various driver accelerators
[IPPJ-454] p0538 N80-28195

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, D. C.
Satellite Power Systems /SPS/ - Overview of system studies and critical technology
[AAS PAPER 80-084] p0540 A80-41898
Studies on questions of design and construction of chain scraper conveyors
[NASA-TM-75810] p0499 N80-26663
Lessons of the NASA Tech House
[NASA-SP-442] p0456 N80-27219

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. AMES RESEARCH CENTER, MOFFETT FIELD, CALIF.
Potential benefits for propfan technology on derivatives of future short- to medium-range transport aircraft
[AIAA PAPER 80-1090] p0328 A80-38905

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. GODDARD SPACE FLIGHT CENTER, GREENBELT, MD.
Unfulfilled technology needs in space power systems
[NASA-TM-80677] p0442 N80-25789

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LYNDON B. JOHNSON SPACE CENTER, HOUSTON, TEX.
The solar power satellite concepts: The past decade and the next decade
[NASA-TM-81000] p0541 N80-25360

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LANGLEY RESEARCH CENTER, HAMPTON, VA.
Large space structures - Fantasies and facts
[AIAA 80-0674] p0393 A80-34999
Aerodynamic design optimization of a fuel efficient high-performance, single-engine, business airplane
[AIAA PAPER 80-1846] p0333 A80-43304
Some calculated effects of non-uniform inflow on the radiated noise of a large wind turbine
[NASA-TM-81813] p0532 N80-25104

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. LEWIS RESEARCH CENTER, CLEVELAND, OHIO.
An exploratory survey of noise levels associated with a 100 kW wind turbine
p0512 A80-35499
Preliminary study of a solar selective coating system using black cobalt oxide for high temperature solar collectors
p0399 A80-35500
Modified power law equations for vertical wind profiles
p0468 A80-35719
The use of wind data with an operational wind turbine in a research and development environment
p0513 A80-35730
The impact of fuels on aircraft technology through the year 2000
[AIAA PAPER 80-0896] p0470 A80-35898
Advanced component technologies for energy-efficient turbofan engines
[AIAA PAPER 80-1086] p0519 A80-38902
Comments on TEC trends
p0519 A80-39642
Modified aerospace R&QA method for wind turbines
p0519 A80-40335
Photovoltaic power system reliability considerations
p0520 A80-40338
An analytical study of nitrogen oxides and carbon monoxide emissions in hydrocarbon combustion with added nitrogen - Preliminary results
[ASME PAPER 80-GT-60] p0331 A80-42190
Low NO/x/ heavy fuel combustor program
[ASME PAPER 80-GT-69] p0476 A80-42199
Status of the DOE/NASA critical gas turbine R & T Project
[ASME PAPER 80-GT-104] p0477 A80-42226
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258
Literature survey of properties of synfuels derived from coal
[NASA-TM-79243] p0481 N80-22776
Advanced screening of electrode couples
[NASA-CR-159738] p0551 N80-22777
Thermal Energy Storage: Fourth Annual Review Meeting
[NASA-CP-2125] p0551 N80-22788
Program definition and assessment overview
p0551 N80-22790
Industrial storage applications overview
p0551 N80-22795
Collection and dissemination of TES system information for the paper and pulp industry
p0552 N80-22797
An exploratory survey of noise levels associated with a 100kW wind turbine
[NASA-TM-81486] p0527 N80-23102
Radiation damage in high voltage silicon solar cells
[NASA-TM-81478] p0426 N80-23180
The impact of fuels on aircraft technology through the year 2000
[NASA-TM-81492] p0482 N80-23472
Cell module and fuel conditioner
[NASA-CR-159875] p0528 N80-23769
Redox storage systems for solar applications
[NASA-TM-81464] p0427 N80-23777
The optimization air separation plants for combined cycle MHD-power plant applications
[NASA-TM-81510] p0528 N80-23778
The effect of catalyst length and downstream reactor distance on catalytic combustor performance
[NASA-TM-81475] p0337 N80-23779
Summary and evaluation of the parametric study of potential early commercial MHD power plants (PSPEC)
[NASA-TM-81497] p0337 N80-23780
Advanced component technologies for energy-efficient turbofan engines
[NASA-TM-81507] p0341 N80-24316
Solar thermal power systems point-focusing distributed receiver technology project. Volume 2: Detailed report
[NASA-CR-159715] p0432 N80-24751
An electric vehicle propulsion system's impact on battery performance: An overview
[NASA-TM-81515] p0557 N80-24756
Thermal energy storage
[NASA-TM-81514] p0558 N80-25779
Pulse charging of lead-acid traction cells
[NASA-TM-81513] p0558 N80-25780
Improved PFB operations: 400-hour turbine test results
[NASA-TM-81511] p0493 N80-26426

Use of petroleum-based correlations and estimation methods for synthetic fuels
[NASA-TM-81533] p0502 N80-27509
Advanced fuel system technology for utilizing broadened property aircraft fuels
[NASA-TM-81538] p0502 N80-27510
Impact of propulsion system R and D on electric vehicle performance and cost
[NASA-TM-81548] p0356 N80-27805

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. MARSHALL SPACE FLIGHT CENTER, HUNTSVILLE, ALA.
The effects of air leaks on solar air heating systems
p0359 A80-33448
Performance analysis for collector-side reflector systems
p0376 A80-33621
Coal-shale interface detector
[NASA-CASE-MFS-23720-1] p0483 N80-23711
ASHMET: A computer code for estimating insolation incident on tilted surfaces
[NASA-TM-78286] p0457 N80-27807

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. PASADENA OFFICE, CALIF.
Method of mitigating titanium impurities effects in p-type silicon material for solar cells
[NASA-CASE-NPO-14635-1] p0431 N80-24741
Solar-heated fluidized bed gasification system
[NASA-CASE-NPO-15071-1] p0432 N80-24747
Geological assessment probe
[NASA-CASE-NPO-14558-1] p0488 N80-24906
Autocatalytic coal liquefaction process
[NASA-CASE-NPO-14876-1] p0493 N80-26460

NATIONAL BOARD FOR SCIENCE AND TECHNOLOGY, DUBLIN (IRELAND).
Retrospective search on the biochemical production of alcohol fuels
[NP-24137] p0482 N80-23476

NATIONAL BUREAU OF STANDARDS, BOULDER, COLO.
Development and testing of a microwave system to measure coal layer thickness up to 25 cm
[FE-8881-1] p0483 N80-23757

NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C.
Solar energy systems: Test methods for collector insulations
[PB80-132038] p0430 N80-23867
Solar energy systems: Standards for rubber hose
[PB80-129828] p0430 N80-23868
Solar collector fluid parameter study
[PB80-125891] p0430 N80-23869
Measurements on insulating materials at cryogenic temperatures
[PB80-134596] p0541 N80-24507
Evaluation of energy conserving modifications for water heaters
[PB80-133853] p0344 N80-24873
Dimensions/NBS, volume 63, no. 11
[PB80-141542] p0541 N80-25195
Dimensions/NBS, volume 63, no. 12
[PB80-130701] p0489 N80-25196
Analysis of code related responses from the solar demonstration program
[PB80-153968] p0457 N80-27827

NATIONAL MECHANICAL ENGINEERING RESEARCH INST., PRETORIA (SOUTH AFRICA).
The aerodynamics of axial flow wind power turbines
[CSIR-ME-1619] p0528 N80-23781

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, BOULDER, COLO.
Mechanisms and rates of formation of sulfur aerosols in power plant plumes
p0354 N80-26907

NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA.
Solar space heating and air conditioning, volume 3. Citations from the NTIS data base
[PB80-801707] p0424 N80-22864
Solar space heating and air conditioning, volume 3. Citations from the Engineering Index data base
[PB80-801723] p0425 N80-22865
Solar space heating and air conditioning, volume 4. Citations from the NTIS data base
[PB80-801715] p0425 N80-22866
Passive solar space heating and cooling. Citations from the engineering index data base
[PB80-801749] p0425 N80-22867
Passive solar space heating and cooling. Citations from the NTIS data base
[PB80-801731] p0425 N80-22868
Optical coatings for solar cells and solar collectors. Citations from the Engineering Index data base
[PB80-803794] p0425 N80-22869
Optical coatings for solar cells and solar collectors, volume 1. Citations from the NTIS data base
[PB80-803778] p0425 N80-22870
Optical coatings for solar cells and solar collectors, volume 2. Citations from the NTIS data base
[PB80-803786] p0425 N80-22871
Cadium sulfide solar cells, volume 2. Citations from the NTIS data base
[PB80-802226] p0425 N80-22872
Cadmium sulfide solar cells. Citations from the Engineering Index data base
[PB80-802234] p0426 N80-22873
Synthetic fuels: Methane, volume 1. Citations from the Engineering Index data base
[PB80-805245] p0491 N80-25478
Synthetic fuels: Methane, volume 2. Citations from the Engineering Index data base
[PB80-805252] p0491 N80-25479
Diesel exhaust emission control for motor vehicles, volume 2. Citations from the Engineering Index data base
[PB80-805401] p0346 N80-25678
Diesel exhaust emissions. Citations from the American Petroleum Institute data base
[PB80-805419] p0347 N80-25679
Coal gasification technology. Citations from the NTIS data base
[PB80-808090] p0503 N80-27525
Coal liquefaction technology. Citations from the NTIS data base
[PB80-808108] p0503 N80-27526
Coal gasification technology. Citations from the NTIS data center
[PB80-808082] p0503 N80-27527
Solar process heat. Citations from the NTIS data base
[PB80-807936] p0457 N80-27823

NATIONAL TRANSPORTATION POLICY STUDY COMMISSION, WASHINGTON, D. C.
Utilization concerns of potential transportation fuels
[PB80-138498] p0342 N80-24503

NAVAL RESEARCH LAB., WASHINGTON, D. C.
Energy storage-boiler tank
p0554 N80-22820

NAVAL WEAPONS CENTER, CHINA LAKE, CALIF.
Geothermal energy resources of Navy/Marine Corps installations on the Atlantic and Gulf Coastal plain
[AD-A082400] p0488 N80-24799

NEDERLANDSE TECHNISCHE VERENIGING VOOR VERWARMING EN LUCHTBEHANDELING.
Lectures on heat technology in the Netherlands
p0353 N80-26787

NEOS CO. LTD., TOKYO (JAPAN).
COM stability forecasting method
p0496 N80-26478

NEUS, INC., SANTA MONICA, CALIF.
Biosources Digest. A journal on biomass utilization, volume 1, number 3
[PB80-139306] p0487 N80-24504
Biosources digest, a journal on biomass utilization, volume 1, no. 1
[PB80-140973] p0493 N80-25908
Biosources digest: A journal on biomass utilization, volume 1, no. 4
[PB80-140981] p0493 N80-25909
Biosources Digest, a journal on biomass utilization, volume 1, no. 2
[PB80-157662] p0504 N80-27795

NEW BRUNSWICK ELECTRIC POWER COMMISSION, FREDERICTON.
Coal-oil mixture combustion applied to Canadian utility boilers
p0501 N80-27498

NEW ENGLAND POWER SERVICE CO., WESTBOROUGH, MASS.
Development of standards for coal-oil mixtures
p0494 N80-26465

Coal-oil mixtures 4: Sedimentation and subsidence studies of the stability and structure of coal-oil mixtures
p0494 N80-26467
Feasibility study of using a coal/oil/water emulsion and coal/oil mixtures as clean liquid fuels 2
p0495 N80-26469
Startup and initial feasibility testing on the Salem Harbor COM demonstration
p0501 N80-27499

NEW MEXICO ENERGY INST., ALBUQUERQUE.
Preparation of highly efficient solar cells and corrosion studies on solar cell materials
[PB80-141294] p0441 N80-24874
Variable speed constant frequency voltage generator (alternator)
[PB80-141286] p0532 N80-24875
Development of a low-cost non-tracking heat pipe concentrating collector
[PB80-160443] p0457 N80-27828

NEW MEXICO INST. OF MINING AND TECHNOLOGY, SOCORRO.
Displacement of oil by carbon dioxide
[DOE/MC-03260/4] p0492 N80-25768

NEW MEXICO STATE UNIV., LAS CRUCES.
Preliminary operational results from the Willard solar power system
p0436 N80-24794

NEW MEXICO UNIV., ALBUQUERQUE.
Solar power satellites. Citations from the International Aerospace Abstracts data base
[NASA-CR-162931] p0541 N80-22861
Remote sensing applied to petroleum and mineral exploration. Citations from the International Aerospace Abstracts data base
[NASA-CR-163371] p0492 N80-25770
Demonstration salt gradient solar pond
[ALO-3977-T1] p0453 N80-26837

NEW YORK UNIV., N. Y.
Numerical studies of new stellarator concepts
p0511 A80-34978

NEW ZEALAND ENERGY RESEARCH AND DEVELOPMENT COMMITTEE, AUCKLAND.
Electricity from refuse
[NZERDC-44] p0338 N80-23803
Potential of energy farming for transport fuels in New Zealand
[NZERDC-46] p0489 N80-25456
Potential of energy farming for transport fuels in New Zealand, appendices
[NZERDC-46-APP] p0489 N80-25457

NIAGRA UNIV., NEW YORK, N.Y.
Environmental consequences of atmospheric krypton-85
[COO-4364-2] p0345 N80-24886

NORTH CAROLINA STATE UNIV., RALEIGH.
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912

NORTH CAROLINA UNIV., RALEIGH.
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912

NORTHEAST SOLAR ENERGY CENTER, CAMBRIDGE, MASS.
Status of insolation resource assessment in the Northeast
[NESEC-6] p0429 N80-23826

NORTHROP SERVICES, INC., HUNTSVILLE, ALA.
Solar radiation data forecast and interpolation analysis. Folder 1, part 1: Executive summary. Part 2: Technical analysis (tasks 1 and 2). Part 3: Appendices (tasks 1 and 2)
[COO-4494-1] p0448 N80-25982
Evaluation of heat transfer enhancement in air-heating collectors
[ALO-5352-T1] p0454 N80-26848

NORTHWESTERN UNIV., EVANSTON, ILL.
Statistical models for wind characteristics at potential wind energy conversion sites
[DOE/ET/20283-1] p0489 N80-24968

O

OAK RIDGE ASSOCIATED UNIVERSITIES, TENN.
Federal Republic of Germany: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-22] p0339 N80-23841
United Kingdom: Estimates of future energy/GDP relationship
[ORAU/IEA(M)-79-25] p0339 N80-23848
Canada: Estimates of future energy/GNP relationships
[ORAU/IEA(M)-79-24] p0339 N80-23849
Japan: Estimates of future energy/GNP relationships in energy use
[ORAU/IEA-79-21(M)] p0344 N80-24869

OAK RIDGE ASSOCIATED UNIVERSITIES, INC., WASHINGTON, D.C.
Italy: Estimates of future energy/GDP relationships
[ORAU/IEA(M)-79-20] p0347 N80-25804

OAK RIDGE NATIONAL LAB., TENN.
Water availability for energy in 1985 and 1990
[ORNL/TM-6777] p0334 N80-22764
Building heating and cooling applications thermal energy storage program overview
p0552 N80-22806
Subcontracted activities related to TES for building heating and cooling
p0553 N80-22807
Thermal energy storage test facility
p0553 N80-22811
Low temperature thermal-energy storage
[ANL/CES/TE-79-3] p0554 N80-22842
Fossil energy program
[ORNL-TM-7095] p0481 N80-22853
Fossil energy prgoram
[ORNL/TM-7057] p0481 N80-22854
Fossil energy program
[ORNL/TM-7031] p0482 N80-22855
Mass transport in molten-salt electrochemical systems
[ORNL/MIT-290] p0527 N80-23400
Summary of the research and development effort on open-cycle coal-fired gas turbines
[ORNL/TM-6253] p0528 N80-23821
Fossil energy program
[ORNL/TM-7144] p0484 N80-23828
Molten carbonate fuel cell program. Composition gradients induced by current flow in Li2CO3-K2CO3 mixtures
[ORNL/TM-7061] p0529 N80-23839
Evaluation of an in situ coal gasification facility for producing M-gasoline via methanol
[ORNL-5439] p0485 N80-24471
Energy availabilities for state and local development: 1975 data volume
[ORNL/TM-6951] p0344 N80-24868
Analysis of environmental impacts of water level fluctuation in reservoirs at hydroelectric sites
[CONF-791056-2] p0345 N80-24885
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923
Biologically important compounds in synfuels processes
[CONF-800303-13] p0498 N80-26540
Photovoltaic applications: Past and future
[CONF-800106-4] p0455 N80-26867

OAK RIDGE Y-12 PLANT, TENN.
Oak Ridge Flywheel Evaluation Laboratory
[Y-2210] p0556 N80-23832

OCCIDENTAL RESEARCH CORP., IRVINE, CALIF.
Flash pyrolysis coal liquefaction process development
[FE-2244-26] p0498 N80-26543

OFFICE NATIONAL D'ETUDES ET DE RECHERCHES AEROSPATIALES, PARIS (FRANCE).
La Recherche Aerospatiale, Bimonthly Bulletin Number 1979-6
[ESA-TT-632] p0448 N80-26255
An open cycle turbine solar thermal power system
p0448 N80-26257

OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D. C.
Impact of advanced group rapid transit technology
[PB80-153323] p0351 N80-26219

OKLAHOMA STATE UNIV., STILLWATER.
Coal derived liquids hydrotreatment-catalysts deactivation study
p0479 N80-22421
Consequences of the mass spectrometric and infrared analysis of oils and asphaltenes for the chemistry of coal liquefaction. Characterization of coal-derived liquids and other fossil fuel related materials employing mass spectrometry
[FE-2537-10] p0489 N80-25460

Design parameters for solar powered absorption cooling systems with chilled water storage
p0441 N80-25778

OMNIUM-G CO., ANAHEIM, CALIF.
The OMNIUM-G HTC-25 tracking concentrator
p0434 N80-24766

OPEN UNIV., MILTON (ENGLAND).
A chemical heat-pump/energy storage device and its applications
[ERG-030] p0562 N80-26880

OREGON STATE UNIV., CORVALLIS.
Exposure: A newsletter for ocean technologists, volume 8, no. 1
[AD-A083941] p0562 N80-26865

P

PACIFIC NORTHWEST LAB., RICHLAND, WASH.
Seasonal Thermal Energy Storage Program
p0551 N80-22789
Aquifer thermal energy storage program
p0554 N80-22825
Consequences of increased coal utilization
[CONF-791108-16] p0350 N80-25923

PENNSYLVANIA STATE UNIV., UNIVERSITY PARK.
Prediction of thermophysical properties of petroleum fractions
p0479 N80-22428
The chemical transformation of sulfur dioxide to sulfate in the plume of the coal-burning Keystone power plant
p0340 N80-23873
Characteristics of American coals in relation to their conversion into clean energy fuels
[FE-2030-13] p0485 N80-24476
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823
Grinding of coal in oil
p0494 N80-26462

PENNSYLVANIA UNIV., PHILADELPHIA.
Optical analysis of Cassegrainian concentrator systems
p0377 A80-33631
Updating the limit efficiency of silicon solar cells
p0395 A80-35354
Analysis and evaluation in the production process and equipment area of the low-cost solar array project
[NASA-CR-163208] p0441 N80-25782

PENNZOIL CO., VIENNA, W. VA.
Oil recovery by carbon dioxide injection
[ORO-5301-47] p0500 N80-26754

PHOTOCHEMICAL RESEARCH ASSOCIATES, INC., LONDON (ONTARIO).
Biological solar cells
[SERI/TP-332-476] p0439 N80-24831

PIONEER ENGINEERING AND MFG. CO., INC., WARREN, MICH.
TBC costing
p0434 N80-24780

PITTSBURGH ENERGY TECHNOLOGY CENTER, PA.
The 2nd International Symposium on Coal-oil Mixture Combustion, volume 2
[CONF-791160-VOL-2] p0493 N80-26461
The role of coal and oil characteristics in the stability of coal-oil mixtures
p0495 N80-26472
The 2nd International Symposium on Coal-Oil Mixture Combustion, volume 1
[CONF-791160-VOL-1] p0501 N80-27494
Combustion of coal-oil mixtures in a 700 HP watertube boiler
p0502 N80-27504

PRAKLA-SEISMOS G.M.B.H., HANNOVER (WEST GERMANY).
Further development of seismic methods: Three-dimensional velocity determinations
[BMFT-FB-T-79-19] p0484 N80-23925

PRATT AND WHITNEY AIRCRAFT, WEST PALM BEACH, FLA.
A 300 Btu gas combustor development program, phase 1
[EPRI-AF-1144] p0481 N80-22852

PRATT AND WHITNEY AIRCRAFT GROUP, EAST HARTFORD, CONN.
The Energy Efficient Engine /E3/ - Advancing the state of the art
[ASME PAPER 80-GT-142] p0332 A80-42255
Results from tests on a high work transonic turbine for an energy efficient engine
[ASME PAPER 80-GT-146] p0332 A80-42258
Engine component improvement: Performance improvement, JT9D-7 3.8 AR fan
[NASA-CR-159806] p0346 N80-25332

PRC SYSTEMS SERVICES CO., HUNTSVILLE, ALA.
Solar array subsystems study
[NASA-CR-159857] p0431 N80-24742

PUERTO RICO UNIV., RIO PIEDRAS.
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T1] p0484 N80-23840
Production of sugarcane and tropical grasses as a renewable energy source
[ORO-5912-T2] p0503 N80-27514

PULLMAN KELLOGG, HOUSTON, TEX.
Coal conversion control technology. Volume 1: Environmental regulations; liquid effluents
[PB80-126469] p0334 N80-22527
Coal conversion control technology. Volume 2: Gaseous emissions; solid wastes
[PB80-126477] p0334 N80-22528
Environmental standards for coal conversion processes. Volume 1: Most stringent, federal, and selected state regulations
[PB80-126980] p0341 N80-23904

PURDUE UNIV., LAFAYETTE, IND.
Thermal energy storage testing facility
p0553 N80-22808
Optimal design of compressed air energy storage systems
[CONF-791069-3] p0555 N80-23789

Q

QUALITY INN OF KEY WEST, MIAMI BEACH, FLA.
Solar hot water system installed at Quality Inn, Key West, Florida
[NASA-CR-161434] p0427 N80-23774

R

RADIAN CORP., AUSTIN, TEX.
Solar heating and cooling demonstration project at Radian Corporation, Austin, Texas
[NASA-CR-161442] p0441 N80-25784

RASOR ASSOCIATES, INC., SUNNYVALE, CALIF.
Advanced thermionic energy conversion
[NASA-CR-163061] p0531 N80-24812

RAYTHEON CO., WALTHAM, MASS.
Microwave beamed power technology improvement
[NASA-CR-163043] p0542 N80-26785

RENSSELAER POLYTECHNIC INST., TROY, N. Y.
Snow and ice accumulation around solar collector installations
[PB80-127053] p0441 N80-24878

RESEARCH TRIANGLE INST., RESEARCH TRIANGLE PARK, N. C.
Proceedings: Symposium on Flue Gas Desulfurization, volume 1
[PB80-133168] p0336 N80-22888
Proceedings: Symposium on Flue Gas Desulfurization, volume 2
[PB80-133176] p0336 N80-22889
Novel concentrator photovoltaic converter system development
[SAND-80-7004] p0535 N80-25912
Development of high efficiency stacked multiple bandgap solar cells
[AD-A083092] p0450 N80-26797
Application analysis and photovoltaic system conceptual design for service/commercial/institutional and industrial sectors. Volume 2: Technical report
[SAND-79-7020-VOL-2] p0455 N80-26866

ROCKET RESEARCH CORP., REDMOND, WASH.
Application of thermal energy storage to process heat recovery in the aluminum industry
p0553 N80-22809
Heat-pump-centered integrated community energy systems
[ANL/CNSV-TM-20] p0343 N80-24822

ROCKETDYNE, CANOGA PARK, CALIF.
High energy storage flywheel test program
[AD-A083302] p0561 N80-26796

ROCKWELL INTERNATIONAL CORP., CANOGA PARK, CALIF.
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 4: Commercial and pilot plant cost data
[SAN-1483-1/5] p0558 N80-25803
Hybrid thermal storage with water
[ESG-DOE-13259] p0558 N80-25861
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 1: Executive summary
[SAN-1483-1/1] p0446 N80-25875
Conceptual design of advanced central receiver power systems sodium-cooled receiver concept. Volume 2, book 1: Commercial plant conceptual design
[SAN-1483-1/2] p0447 N80-25876
Technical and management support for the development of small wind systems
[RFP-2974/3533-79-2] p0534 N80-25889
Development of a single-stage, entrained-flow, short-residence-time hydrogasifier
[FE-2518-24] p0497 N80-26525
Advanced development of a short residence-time hydrogasifier
[FE-3125-8] p0500 N80-26832

ROCKWELL INTERNATIONAL CORP., GOLDEN, COLO.
Millville Wind Turbine Generator: Failure analysis and corrective design modification
[RFP-2992/3533/79-3] p0529 N80-23831
New developments in wind systems technology
[RFP-3000] p0534 N80-25888

ROCKWELL INTERNATIONAL CORP., HUNTSVILLE, ALA.
Study of multi-kW solar arrays for Earth orbit applications: Midterm performance review
[NASA-CR-161467] p0437 N80-24798

ROCKWELL INTERNATIONAL CORP., NEWBURY PARK, CALIF.
Quality assurance in support of energy related monitoring activities
[PB80-135270] p0346 N80-24898

ROCKWELL INTERNATIONAL CORP., THOUSAND OAKS, CALIF.
Development of polycrystal gaAs solar cells
[DSE-4042-T28] p0452 N80-26819

RUTHERFORD HIGH ENERGY LAB., CHILTON (ENGLAND).
A chemical heat-pump/energy storage device and its applications
[ERG-030] p0562 N80-26880

S

SANDERS ASSOCIATES, INC., NASHUA, N. H.
Development of an Air Brayton solar receiver
[NASA-CR-163027] p045[illegible] N80-26777

SANDIA LABS., ALBUQUERQUE, N. MEX.
High-temperature electronics: An overview
[SAND-79-2319A] p0481 N80-22614
Thermal storage experience at the MSSTF and plans for the future
p0552 N80-22799
Low cost structures for photovoltaic arrays
[SAND-80-0142C] p0430 N80-23853
Line-focus concentrating collector program
p0433 N80-24762
Batteries for specific solar applications: Project description
[SAND-79-1782C] p0557 N80-24803
Photovoltaic concentrators
[SAND-80-0143C] p0439 N80-24832
Solar central receiver systems programs
[SAND-79-8777] p0439 N80-24833
Extrinsic losses in solar cells for linear focus systems 4
[SAND-79-1781] p0439 N80-24842
Drilling horizontal holes in coal bed from the surface with water jets
[SAND-80-0057C] p0492 N80-25766
Novel solar cell concentrator photovoltaic converter system
[SAND-79-7048] p0445 N80-25843
Solarization of heliostat glasses
[SAND-79-8754] p0445 N80-25858
Magma energy: A feasible alternative?
[SAND-80-0309C] p0492 N80-25859
Preliminary development of the Band Type Variable Inertia Flywheel (BVIF)
[SAND-79-7089] p0559 N80-25879
Aerodynamic interference between two Darrieus wind turbines
[SAND-79-1984C] p0535 N80-25897
Comparison between results of the HELIOS and MIRVAL computer codes applied to central receiver solar-energy collection
[SAND-79-8266] p0448 N80-26075
Semiconductors for high temperature active devices: Silcon, GaA lc]s, and GaP
[SAND-80-0379C] p0499 N80-26608
Industrial compressed air applications for solar energy conversion/storage devices
[SAND-79-7077] p0451 N80-26802
Concentrating array production process design. Volume 1: Study summary. Volume 2: Study results
[SAND-78-7072-VOL-1/2] p0453 N80-26830
Aerodynamic performance of the 17-m-diameter Darrieus wind turbine in the three-bladed configuration: An addendum
[SAND-79-1753] p0537 N80-26857

SANDIA LABS., LIVERMORE, CALIF.
Solar thermal power storage applications lead laboratory overview
p0552 N80-22798
Methanol-based heat pumps for storage of solar thermal energy, phase 1
[SAND-79-8188] p0555 N80-22845
Fixed site hydrogen storage. 1: Applications impact
[SAND-79-8647] p0463 N80-23797
Heliostat design cost/performance tradeoffs
[SAND-79-8248] p0428 N80-23806
Thermochemical energy storage and transport program
[SAND-79-8208] p0541 N80-23825
Overall efficiencies for conversion of solar energy to a chemical fuel
[SAND-79-8636] p0431 N80-24495
Sigma phase formation in alloys for SO2/SO3 thermal energy storage systems
[SAND-80-8205] p0562 N80-26856

SCIENCE APPLICATIONS, INC., LA JOLLA, CALIF.
California thermal oil utilization. Volume 1: Executive summary
[SAN-1864-1] p0488 N80-24849
State-of-the-art assessment of hybrid heat pumps
[EPRI-EM-1261] p0352 N80-26627

SCIENCE APPLICATIONS, INC., MCLEAN, VA.
Solar thermal plant impact analysis and requirements definition
p0435 N80-24788
Assessment of the technology transfer potential of federal photovoltaic power system applications to commercial markets
[ALO-4261-T8] p0346 N80-25213
Solar photovoltaic flat panel applications experiment at the Oklahoma Center for Science and Arts
[DOE/ET-23063/1] p0533 N80-25800

SCIENCE APPLICATIONS, INC., WOODLAND HILLS, CALIF.
Fundamental characterization of alternative fuel effects in continuous combustion systems
p0500 N80-27382

SCIENTIFIC DESIGN CO., INC., NEW YORK.
Evaluation of the Texaco synthesis gas generation process for the production of hydrogen from SRC-2 residue
[ORNL/SUB-7240/6] p0463 N80-25464

SIGMA RESEARCH, INC., RICHLAND, WASH.
A high performance cocurrent-flow heat pipe for heat recovery applications
[AIAA PAPER 80-1508] p0329 A80-41472

SOLAR TURBINES INTERNATIONAL, SAN DIEGO, CALIF.
Development of polyimide materials for use in solar energy systems
[DOE/CS-35305/T1] p0445 N80-25855

SOLAREX CORP., ROCKVILLE, MD.
Analysis of the effects of impurities in silicon
[NASA-CR-163133] p0427 N80-23772

SOUTH COAST TECHNOLOGY, INC., SANTA BARBARA, CALIF.
The near-term hybrid vehicle program, phase 1
[NASA-CR-163034] p0562 N80-27222
Mission analysis and performance specification studies report, appendix A
[NASA-CR-163035] p0562 N80-27223
Design tradeoff studies and sensitivity analysis, appendix B
[NASA-CR-163036] p0563 N80-27224
Design tradeoff studies and sensitivity analysis, appendices B1 - B4
[NASA-CR-163037] p0563 N80-27225

Preliminary design data package, appendix C
[NASA-CR-163038] p0563 N80-27226
Preliminary design data package, appendices C1 and C2
[NASA-CR-163039] p0563 N80-27227
SOUTH DAKOTA SCHOOL OF MINES AND TECHNOLOGY, RAPID CITY.
Energy from humid air
[DSE-2553-79/1] p0531 N80-24861
SOUTHERN CALIFORNIA GAS CO., LOS ANGELES.
SAGE, Solar Assisted Gas Energy
[PB80-144363] p0447 N80-25906
SAGE, Solar Assisted Gas Energy
[PB80-153836] p0447 N80-25907
SOUTHERN SERVICES, INC., BIRMINGHAM, ALA.
Solvent Refined Coal (SRC) process operation of solvent refined coal pilot plant, Wilsonville, Alabama
[FE-2270-46] p0497 N80-26528
SOUTHWEST RESEARCH INST., SAN ANTONIO, TEX.
Assessment of crude oil and refined petroleum product quality during long-term storage
[AD-A082365] p0557 N80-24637
SPECTROLAB, INC., SYLMAR, CALIF.
High resolution, low cost solar cell contact development
[NASA-CR-163289] p0450 N80-26782
SPERRY UNIVAC, ST. PAUL, MINN.
Solar collector studies for solar heating and cooling applications
[ALO-5355-T1] p0445 N80-25850
SPIRE CORP., BEDFORD, MASS.
Tailored emitter, low-resistivity, ion-implanted silicon solar cells
p0396 A80-35361
Development of pulsed processes for the manufacture of solar cells
[NASA-CR-153188] p0427 N80-23771
SPRINGBORN LABS., INC., ENFIELD, CONN.
Solar collectors
[ALO-5359-T1] p0437 N80-24821
SRI INTERNATIONAL CORP., MENLO PARK, CALIF.
Naval facility energy conversion plants as resource recovery system components
[AD-A081232] p0528 N80-23783
Line-focus solar central power systems, phase1
[SAN-0115-140-1] p0447 N80-25903
Homogeneous catalytic hydrocracking processes for conversion of coal to liquid fuels: Basic and exploratory research
[FE-2202-51] p0498 N80-26534
Preparation of a cost data bank for DOE/Biomass Energy Systems Branch
[DOE/ET-20605/4] p0498 N80-26535
Community impediments to implementation of solar energy
[DOE/EV-0059] p0457 N80-27821
STANFORD LINEAR ACCELERATOR CENTER, CALIF.
More on dual purpose solar-electric power plants
[SLAC-PUB-2477] p0452 N80-26822
STANFORD UNIV., CALIF.
Properties of sputtered ITO/CdTe solar cells
p0426 N80-23767
Attenuation of seismic waves in rocks and applications in energy exploration
p0488 N80-24909
STD RESEARCH CORP., ARCADIA, CALIF.
Open-cycle MHD systems analysis
[EPRI-AF-1230] p0538 N80-27192
STUTTGART UNIV. (WEST GERMANY).
Technical applications of solar energy
[BMFT-FB-T-79-06] p0424 N80-22860
SUNTECH, INC., MARCUS HOOK, PA.
Research on diamantane and other high density hydrocarbon fuels
[AD-A080749] p0482 N80-23474
SYSTEMS CONSULTANTS, INC., WASHINGTON, D. C.
Regional application of fossil energy technologies: An analytical approach
[DOE/ET-2442-1] p0339 N80-23830

T

TAO (WILLIAM) AND ASSOCIATES, ST. LOUIS, MO.
Solar heating and hot water system installed at Saint Louis, Missouri
[NASA-CR-161420] p0431 N80-24744
TECHNICAL UNIV. OF DENMARK, LYNGBY.
Investigation of heat storages with salt hydrate as storage medium based on the extra water principle
[EUR-6646-PT-2] p0564 N80-27818
TECHNISCHE HOCHSCHULE, AACHEN (WEST GERMANY).
Pressure-change underground gasification: Theoretical and experimental investigations of gasification
[BMFT-FB-T-79-05] p0481 N80-22525
TECHNISCHE PHYSISCHE DIENST TNO-TH, DELFT (NETHERLANDS).
Examination of energy consumption and the possibilities of energy savings in office buildings
p0353 N80-26791
The potential for heat production with solar water heaters in the Netherlands climate
p0450 N80-26792
The design of a solar home heating installation, using a mathematical model
p0450 N80-26793
TECHNOLOGY DEVELOPMENT CORP., HUNTSVILLE, ALA.
Coal conversion products industrial applications
[NASA-CR-161469] p0484 N80-24465
TELEDYNE CONTINENTAL MOTORS, MUSKEGON, MICH.
Design study: A 186 kW lightweight diesel aircraft engine
[NASA-CR-3261] p0334 N80-22326
TELEX COMMUNICATIONS, INC., BLUE EARTH, MINN.
Solar heating system installed at Telex Communications, Inc., Blue Earth, Minnesota
[NASA-CR-161437] p0441 N80-25786
TENNESSEE TECHNOLOGICAL UNIV., COOKEVILLE.
Wind effects on collectors
[DOE/CS-35364/T1] p0454 N80-26851
TENNESSEE VALLEY AUTHORITY, CHATTANOOGA.
Design of a monitoring program for ash pond effluents
[PB80-128457] p0345 N80-24896
Investigations of coal-oil mixtures as a utility boiler light-off fuel
p0501 N80-27501
Coal/oil/water mixture stability, appendix A
p0501 N80-27502
TENNESSEE VALLEY AUTHORITY, MUSCLE SHOALS, ALA.
Evaluation of physical/chemical coal cleaning and flue gas desulfurization
[PB80-147622] p0346 N80-25481
TEXAS A&M UNIV., COLLEGE STATION.
Cold water aquifer storage
p0554 N80-22827
TEXAS TECHNOLOGICAL UNIV., LUBBOCK.
The Crossbyton project
p0436 N80-24790
TEXAS UNIV. AT AUSTIN.
High temperature underground thermal energy storage system for solar energy
p0552 N80-22803
THERMO ELECTRON CORP., WALTHAM, MASS.
DOE/JPL advanced thermionic technology program
[NASA-CR-163134] p0528 N80-23818
TOLEDO UNIV., OHIO.
Performance improvement of a solar heating system utilizing off-peak electric auxiliary
[DOE/R5/10140-1] p0429 N80-23852
Nonlinear aeroelastic equations of motion of twisted, nonuniform, flexible horizontal-axis wind turbine blades
[NASA-CR-159502] p0536 N80-26774
TORONTO UNIV. (ONTARIO).
Analysis of community solar systems for combined space and domestic hot water heating using annual cycle thermal energy storage
[SERI/TP-355-570] p0559 N80-25900
Grinding of coal-in-oil slurries
p0494 N80-26464
Design of annual storage solar space heating systems
[DOE/CS-32939/10] p0455 N80-26855
A model for the angular distribution of sky radiance
[DOE-CS-32939-9] p0456 N80-26983
TRANSAMERICA DELAVAL, INC., CRYSTAL RIVER, FLA.
Handling coal oil mixtures with positive displacement pumps
p0494 N80-26463

TRANSPORTATION RESEARCH BOARD, WASHINGTON, D.C.
Energy policy impact evaluation
[PB80-137953] p0340 N80-23866
TRAVIS-BRAUN AND ASSOCIATES, INC., DALLAS, TEX.
Solar energy facility at North Hampton Recreation Center, Dallas, Texas
[NASA-CR-161444] p0449 N80-26766
TRIDENT ENGINEERING ASSOCIATES, INC., ANNAPOLIS, MD.
Survey and evaluation of current design of evacuated collectors
[ALO-5350-1] p0452 N80-26823
TRW DEFENSE AND SPACE SYSTEMS GROUP, REDONDO BEACH, CALIF.
Solar cell array design handbook - The principles and technology of photovoltaic energy conversion
p0393 A80-34847
Potential applications of biomass technology at National Technology Laboratories and Mississippi Army Ammunition Plant
[AD-A082756] p0492 N80-25797
The use of pH and chloride electrodes for the automatic control of flue gas desulfurization systems
[PB80-138464] p0351 N80-25947
TRW, INC., MCLEAN, VA.
Oil shale data book
[PB80-125636] p0540 N80-22770
Coal derived fuel gases for molten carbonate fuel cells
[METC-8085-T2] p0487 N80-24498
TRW SYSTEMS GROUP, MCLEAN, VA.
Comparison of costs for automobile energy conservation vs synthetic fuel production
[CONF-800419-1] p0353 N80-26810
TSINGHUA UNIV., BEIJING (CHINA).
Preliminary considerations of the use of COM in the experimental power plant of Tsinghua University as an energy fuel
p0501 N80-27497
TUFTS UNIV., MEDFORD, MASS.
Characterization and structural studies of the various types of COM
p0494 N80-26468

U

UNION CARBIDE CORP., TONAWANDA, N.Y.
Direct ignition of pulverized coal with arc heated air
p0480 N80-22508
UNITED ENGINEERS AND CONSTRUCTORS, INC., PHILADELPHIA, PA.
Energy Economic Data Base (EEDB) program: Phase 1: Initial update
[COO-4954-1-VOL-3] p0567 N80-24848
UNITED STERLING, INC. ALEXANDRIA, VA.
The United Stirling P40 engine for solar dish concentrator application
p0531 N80-24775
UNITED TECHNOLOGIES CORP., SOUTH WINDSOR, CONN.
A 300 Btu gas combustor development program, phase 1
[EPRI-AP-1144] p0481 N80-22852
Cogeneration technology alternatives study. Volume 1: Summary report
[NASA-CR-159759] p0347 N80-25792
Cogeneration technology alternatives study. Volume 2: Industrial process characteristics
[NASA-CR-159760] p0347 N80-25793
Cogeneration technology alternatives study. Volume 4: Heat Sources, balance of plant and auxiliary systems
[NASA-CR-159762] p0347 N80-25794
Cogeneration technology alternatives study. Volume 6: Computer data
[NASA-CR-159764] p0347 N80-25795
UNITED TECHNOLOGIES RESEARCH CENTER, EAST HARTFORD, CONN.
Parametric performance evaluation and technical assessment of adiabatic compressed air energy storage systems
[EPRI-EM-1188] p0555 N80-23796
UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES.
Forward- and reverse-bias tunneling effects in n/+/p silicon solar cells
p0401 A80-36933
UNIVERSITY OF SOUTHERN CALIFORNIA, MARINA DEL REY.
Remote sensing for geothermal environmental assessments
[UCRL-15108] p0483 N80-23756
UNIVERSITY OF SOUTHWESTERN LOUISIANA, LAFAYETTE.
New technologies for solar energy silicon - Cost analysis of BCL process
p0415 A80-40714
UOP, INC., DES PLAINES, ILL.
Upgrading of coal liquids: Upgrading distillates from coal liquefaction
[FE-2566-26] p0480 N80-22518
Upgrading of coal liquids: Hydrotreating and reforming Exxon Donor Solvent (EDS) process derived naphthas
[FE-2566-25] p0480 N80-22519
URBAN SYSTEMS RESEARCH AND ENGINEERING, INC., CAMBRIDGE, MASS.
Direct Regional Energy/Economic Modeling (DREEM) design
[DOE/EIA/6345-1] p0339 N80-23847

V

VALUE ENGINEERING CO., ALEXANDRIA, VA.
OTEC support services
[COO-4931-T11] p0533 N80-25799
VARIAN ASSOCIATES, PALO ALTO, CALIF.
Novel solar cell concentrator photovoltaic converter system
[SAND-79-7048] p0445 N80-25843
VILLANOVA UNIV., PA.
Rheological properties of solvent refined coal-oil mixtures
p0495 N80-26471
VIRGINIA POLYTECHNIC INST. AND STATE UNIV., BLACKSBURG.
Heat conduction in partial vacuum
[ALO-5367-1] p0441 N80-25618
The 1H and 13C Fourier transform NMR characterization of jet fuels derived from alternated energy sources
[AD-A084169] p0502 N80-27513
An investigation of wind loads on solar collectors. Appendix 2: Net pressure coefficients
[PB80-158769] p0458 N80-27829

W

WASHINGTON UNIV., ST. LOUIS, MO.
Synoptic-scale distribution of man-made aerosols
p0354 N80-26942
WATERLOO UNIV. (ONTARIO).
Methods for reducing heat losses from flat plate solar coolectors, phase 3
[COO-2597-5] p0424 N80-22851
WAYNE STATE UNIV., DETROIT, MICH.
Atomization of coal-oil mixtures
p0497 N80-26483
WEST VIRGINIA UNIV., MORGANTOWN.
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-9] p0483 N80-23486
Research and evaluation of biomass resources/conversion/utilization systems (market/experimental analysis for development of a data base for a fuels from biomass model)
[COO-5022-8] p0483 N80-23487
Vertical axis wind turbine development: Executive summary
[ORO-5135-77-5-SUMM] p0529 N80-23845
Vertical axis wind turbine development
[ORO-5135-77-5] p0529 N80-23846
Optimization studies of various coal-conversions systems: Coal dissolution phenomena
[FE-2274-7] p0489 N80-25461
WESTAT RESEARCH, INC., ROCKVILLE, MD.
Energy extension service pilot program evaluation report: The first year. Volume 2: Pilot state reports
[DOE/CS-2671-3] p0335 N80-22850

WESTINGHOUSE ELECTRIC CORP., EAST PITTSBURGH, PA.
Design study and economic assessment of multi-unit offshore wind energy conversion systems applications. Volume 4: Meteorological and oceanographic surveys
[WASH-2330-78/4-VOL-4] p0533 N80-25836
Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 3: System analysis
[WASH-2330-78/4-VOL-3] p0533 N80-25837
Design study and economic assessment of multi-unit offshore wind energy conversion systems application. Volume 2: Apparatus designs and costs
[WASH-2330-78/4-VOL-2] p0533 N80-25838

WESTINGHOUSE ELECTRIC CORP., PITTSBURGH, PA.
Applications of thermal energy storage to waste heat recovery in the food processing industry
p0552 N80-22796
Heterostructure single crystal silicon photovoltaic solar cells
[DOE/ET/20408-1] p0438 N80-24823
Compact closed cycle Brayton system feasibility study, volume 1
[AD-A081379] p0532 N80-25666

WESTINGHOUSE RESEARCH AND DEVELOPMENT CENTER, PITTSBURGH, PA.
Cell module and fuel conditioner development
[NASA-CR-159828] p0527 N80-23768
Cadmium sulfide/copper sulfide heterojunction cell research
[DOE/ET/20429-1] p0440 N80-24847

WICHITA STATE UNIV., KANS.
Feasibility study of aileron and spoiler control systems for large horizontal axis wind turbines
[NASA-CR-159856] p0355 N80-27803

WILLIAMS RESEARCH CORP., WALLED LAKE, MICH.
Conceptual design study of an improved gas turbine powertrain
[NASA-CR-159852] p0527 N80-23315

WISCONSIN UNIV. - MADISON.
Simulation and design of solar thermal processes
[COO-2588-T1] p0444 N80-25823

WISCONSIN UNIV., MADISON.
Summary of the fusion-fission hybrid fuel cycle analysis (tritiumless hybrids)
[UWFDM-337] p0493 N80-26138

WOODARD-CLYDE CONSULTANTS, SAN FRANCISCO, CALIF.
Environmental assessment methodology: Solar power plant applications. Volume 2: Industrial implications and secondary-impact methodology
[EPRI-ER-1070-VOL-2] p0338 N80-23786

WYLE LABS., INC., HUNTSVILLE, ALA.
Comparison of indoor-outdoor thermal performance for the Sunpak evacuated tube liquid collector
[NASA-CR-161421] p0432 N80-24745
Test results on the Frenchman's Reef solar data acquisition and control system
[NASA-CR-161449] p0441 N80-25783

Y

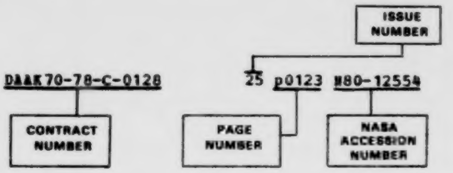
YALE UNIV., NEW HAVEN, CONN.
Photoemission measurements of interface barrier energies for tunnel oxides on silicon
p0515 A80-36936

YARDNEY ELECTRIC CORP., PAWCATUCK, CONN.
Research, development and demonstration of nickel-zinc batteries for electric vehicle propulsion
[ANL/OEPM-78-12] p0556 N80-23861

CONTRACT NUMBER INDEX

ENERGY / *A Continuing Bibliography (Issue 27)* OCTOBER 1980

Typical Contract Number Index Listing



Listings in this index are arranged alphanumerically by contract number. Under each contract number, the accession numbers denoting documents that have been produced as a result of research done under that contract are arranged in ascending order with the *IAA* accession numbers appearing first. The accession number denotes the number by which the citation is identified in either the *IAA* or *STAR* section. Preceding the accession number are the issue and page number in the particular supplement in which the citation may be found.

AC01-79PE-70151
p0353 N80-26810
AES-UPR PROJ. C-481
p0484 N80-23840
AF PROJ. 3048
p0482 N80-23474
AF PROJ. 3145
p0550 N80-22641
AT(29-1)-789
p0508 A80-33290
p0378 A80-33637
p0386 A80-33725
p0517 A80-37871
p0561 N80-26803
BMFT-ET-4045
p0385 A80-33719
BMFT-ET-4045-A
p0361 A80-33471
p0403 A80-37943
BMFT-ET-4060-A
p0549 A80-41473
BMFT-ET-5138-A
p0547 A80-37009
BMFT-NT-4471
p0547 A80-37005
CEC-509-78-2
p0381 A80-33671
CEC-524-78-1-ESF
p0367 A80-33538
CEC-524-78-2-ESF
p0365 A80-33526
CEC-642-78-7
p0381 A80-33671
DA PROJ. 1K1-61102-AH-51
p0537 N80-26794
DAAB07-74-C-0109
p0549 A80-40602
DAAG-79-C-0079
p0395 A80-35349
DAAG53-75-C-0278
p0561 N80-26796
DAAK10-78-C-0268
p0492 N80-25797
DAAK70-78-C-0001
p0557 N80-24637
DAAK70-78-C-0018
p0337 N80-23782
DAAK70-80-C-0001
p0557 N80-24637
DAAK79-77-C-0080
p0537 N80-26794
DE-AC01-77-ET-13041
p0496 N80-26481
DE-AC01-78RA-32012
p0540 N80-22770
DE-AC01-79ET-23108
p0396 A80-35356
DE-AC01-80ET-15611
p0505 A80-32892
DE-AC02-76CH-00016
p0354 N80-26956
DE-AC02-76CH-03073
p0521 A80-41748
DE-AC02-76CS-52749
p0530 N80-24621
DE-AC02-79CS-30122
p0442 N80-25806
DE-AC02-79ET-29187
p0537 N80-26864
DE-AC03-77ET-11320
p0534 N80-25846
DE-AC03-78ET-12434
p0537 N80-26853
DE-AC03-78ET-21050
p0375 A80-33611
DE-AC03-79ET-11321
p0534 N80-25891
DE-AC03-79ET-20460
p0401 A80-36937
DE-AC03-79ET-23034
p0439 N80-24839
DE-AC03-79ET-23047
p0452 N80-26828
DE-AC03-79SF-10538
p0531 N80-24809
DE-AC04-76DP-00053
p0371 A80-33583
p0388 A80-33749
DE-AC04-76DP-00789
p0363 A80-33487
p0363 A80-33488
p0374 A80-33609
p0375 A80-33616
p0376 A80-33626
p0376 A80-33627
p0377 A80-33636
p0378 A80-33640
p0379 A80-33646
p0379 A80-33647
p0381 A80-33668
p0388 A80-33740
p0389 A80-33754
p0398 A80-35467
p0471 A80-37676
p0516 A80-37812
p0516 A80-37820
p0525 A80-43517
p0552 N80-22799
p0428 N80-23806
p0431 N80-24495
DE-AC04-77ET-2D260
p0434 N80-24767
DE-AC04-77ET-20260
p0436 N80-24796
p0444 N80-25825
DE-AC04-78CS-05352
p0454 N80-26848
DE-AC04-78CS-35300
p0453 N80-26844
DE-AC04-78ET-23055
p0529 N80-23860
DE-AC04-78ET-23063
p0533 N80-25800
DE-AC04-79CS-30171
p0453 N80-26841
DE-AC04-79DP-00789
p0445 N80-25858
DE-AC05-76OR-00033
p0339 N80-23841
p0339 N80-23848
p0339 N80-23849
p0343 N80-24852
DE-AC05-78ORO-3054
p0495 N80-26471
DE-AC21-76MC-05301
p0500 N80-26754
DE-AC21-78MC-03260
p0492 N80-25768
DE-AC22-79PC-10328
p0495 N80-26469
DE-AC77-ET-10634
p0495 N80-26470
DE-AI01-79ET-20307
p0432 N80-24750
p0432 N80-24751
p0433 N80-24760
DE-AI01-79ET-20397
p0536 N80-26769
p0449 N80-26770
DE-AI01-79ET-27025
p0538 N80-27825
DE-AI01-79ET-29026
p0334 N80-22782
DE-AI01-793T-20305
p0530 N80-24758
DE-AI03-79ET-1272
p0527 N80-23768
DE-AI03-79ET-11272
p0528 N80-23769
DE-AI06-79ET-23115
p0468 A80-35722
DE-AS01-78ET-10746
p0494 N80-26468
DE-AS01-79ET-2305
p0466 A80-33417
DE-AS03-78ET-13095
p0472 A80-39421
DE-AS05-79ER-10459
p0525 A80-43496
DE-AS06-76ET-20283
p0524 A80-43478
DE-AS09-76EV-00893
p0558 N80-25869
DE-AT03-76ET-20605
p0498 N80-26535
DE-A101-793T-20305
p0536 N80-26775
DE-FC20-78LC-0787
p0483 N80-23755
DE-FG01-77-ET-10658
p0497 N80-26483
DE-FG02-79R5-10129
p0500 N80-26858
DE-FG02-79R5-10140
p0429 N80-23852
DE-FG04-77CS-34163
p0390 A80-33805
DE-SA04-77AL-04222
p0384 A80-33704
DE-8C04-78CS-34261
p0367 A80-33544
p0508 A80-33553
p0369 A80-33560
p0376 A80-33619
DEN-000006
p0432 N80-24745
DEN3-2 p0530 N80-24758
p0536 N80-26775
DEN3-12
p0551 N80-22794
p0527 N80-23315
DEN3-30
p0347 N80-25792
p0347 N80-25793
p0347 N80-25794
p0347 N80-25795
DEN3-31
p0342 N80-24797
DEN3-38
p0553 N80-22819
DEN3-39
p0554 N80-22822
DEN3-48
p0555 N80-23216
DEN3-52
p0536 N80-26779
DEN3-56
p0526 N80-22787
DEN3-69
p0526 N80-22778
DEN3-91
p0561 N80-26212
DEN3-96
p0551 N80-22792
DEN3-114
p0550 N80-22702
DEN3-124
p0356 N80-28255
DEN3-161
p0527 N80-23768
p0528 N80-23769
DEN3-165
p0528 N80-23778
DEN3-168
p0513 A80-35574
DEN3-190
p0552 N80-22797
DGRST-77-7-1203
p0413 A80-39055
DOE TASK 12
p0469 A80-35734
DOE-31-109-38-4550
p0545 A80-33514
DOT-OST-50240
p0355 N80-27239
E(04-3)-1101
p0403 A80-37302
E(11-1)-2588
p0546 A80-33520
E(11-1)-2941
p0405 A80-37957
E(11-1)-4042
p0548 A80-37967
E(49-18)-2330
p0533 N80-25836
p0533 N80-25838
E(49-18)-2369
p0474 A80-40755
E(49-18)-2376
p0441 N80-25786
E(49-26)-1024
p0362 A80-33480
E-8-77-5-02-4512
p0381 A80-33664
EA-77-A-01-6010
p0541 N80-24507
EA-77-A-6010
p0397 A80-35370
EA-78-X-01-1321
p0342 N80-24802
EC-77-A-31-1002
p0551 N80-22777
EC-77-A-31-1024
p0554 N80-22820

CONTRACT NUMBER INDEX

EC-77-A-31-1034
  p0558 N80-25779
EC-77-A-31-1040
  p0527 N80-23315
  p0337 N80-23779
  p0530 N80-24620
EC-77-A-31-1042
  p0563 N80-27230
EC-77-A-31-1044
  p0550 N80-22702
  p0556 N80-24216
  p0557 N80-24756
  p0558 N80-25780
  p0561 N80-26212
  p0356 N80-27805
  p0356 N80-28255
EC-77-A-31-1062
  p0347 N80-25792
  p0347 N80-25793
  p0347 N80-25794
  p0347 N80-25795
EC-77-C-01-5002
  p0552 N80-22796
EC-77-C-02-4235
  p0424 N80-22843
EC-77-C-02-4488
  p0343 N80-24838
EC-77-C-03-1485
  p0534 N80-25846
  p0534 N80-25848
EC-77-C-31-1044
  p0555 N80-23216
EC-77-S-02-4531
  p0348 N80-25841
EE-77-S-02-4364
  p0345 N80-24886
EEC-428-78-ESD
  p0385 A80-33719
EF-76-C-01-2202
  p0498 N80-26534
EF-76-C-05-5301
  p0500 N80-26754
EF-77-A-01-2593
  p0481 N80-22776
EF-77-A-01-2674
  p0528 N80-23778
EF-77-A-01-2893
  p0491 N80-25474
  p0491 N80-25475
EF-77-A-31-1002
  p0427 N80-23777
EF-77-A-31-2674
  p0337 N80-23780
EF-77-A01-2674
  p0536 N80-26779
EF-77-C-01-2468
  p0480 N80-22521
  p0334 N80-22649
  p0485 N80-24479
EF-77-C-01-2518
  p0497 N80-26525
EF-77-C-01-2566
  p0480 N80-22518
  p0480 N80-22519
EF-77-C-01-2611
  p0332 A80-42282
EF-77-C-01-2612
  p0522 A80-42248
  p0477 A80-42267
EF-77-C-01-2689
  p0497 N80-26524
EG-77-A-01-4074
  p0423 N80-22774
EG-77-C-01-3974
  p0549 A80-40715
EG-77-C-01-4024
  p0414 A80-40712
  p0422 A80-43764
EG-77-C-01-4042
  p0466 A80-33414
  p0364 A80-33502
  p0394 A80-35338
  p0395 A80-35346
  p0480 N80-22516
  p0481 N80-22524
  p0335 N80-22848
  p0335 N80-22849
  p0427 N80-23798
  p0338 N80-23799
  p0338 N80-23805
  p0428 N80-23814
  p0430 N80-23856
  p0431 N80-24205
  p0463 N80-24477
  p0485 N80-24478
  p0341 N80-24493
  p0437 N80-24805
  p0438 N80-24824
  p0439 N80-24831
  p0440 N80-24862
  p0445 N80-25839
  p0559 N80-25900
  p0350 N80-25928
  p0498 N80-26533
  p0452 N80-26819
  p0452 N80-26820
  p0454 N80-26849
  p0537 N80-26859
  p0455 N80-26868
  p0455 N80-26871
  p0457 N80-27822
EG-77-C-01-4049
  p0339 N80-23833
  p0443 N80-25816
  p0444 N80-25821
  p0454 N80-26846
EG-77-C-01-4050
  p0362 A80-33473
  p0430 N80-23869
EG-77-C-02-4042
  p0428 N80-23800
EG-77-C-02-4388
  p0490 N80-25462
EG-77-C-02-4480
  p0558 N80-25861
EG-77-C-02-4482
  p0430 N80-23858
EG-77-C-02-4494
  p0448 N80-25982
EG-77-C-03-1467
  p0365 A80-33508
EG-77-C-03-1483
  p0375 A80-33610
  p0558 N80-25803
  p0446 N80-25875
  p0447 N80-25876
EG-77-C-03-1555
  p0380 A80-33657
EG-77-C-03-1576
  p0385 A80-33720
EG-77-C-03-1576-2
  p0422 A80-43516
EG-77-C-03-1577
  p0398 A80-35488
  p0440 N80-24847
EG-77-C-03-1589
  p0365 A80-33525
  p0408 A80-37979
EG-77-C-03-1604
  p0451 N80-26801
EG-77-C-03-1608
  p0375 A80-33612
EG-77-C-04-3974
  p0377 A80-33628
  p0377 A80-33632
EG-77-C-04-3985
  p0434 N80-24767
  p0436 N80-24796
  p0444 N80-25825
EG-77-C-04-4147
  p0429 N80-23817
EG-77-C-29-0001
  p0452 N80-26818
EG-77-C-002-4388
  p0465 A80-33412
EG-77-C-0104-042
  p0459 A80-33410
EG-77-G-01-1633
  p0427 N80-23774
EG-77-G-01-4085
  p0431 N80-24744
EG-77-G-04-4086
  p0452 N80-26818
EG-77-S-02-4183-A002
  p0521 A80-41745
EG-77-S-02-4198
  p0466 A80-33416
EG-77-S-02-4383
  p0376 A80-33623
EG-77-S-02-4516
  p0429 N80-23827
EG-77-S-03-1456
  p0448 N80-26143
EG-77-S-04-3977
  p0453 N80-26837
EG-77-S-05-5594
  p0516 A80-37824
EG-77-S-06-1043
  p0514 A80-35748
EG-77-6-04-4139
  p0384 A80-33711
EG-77-04-4122
  p0428 N80-23816
EG-78-C-03-1719
  p0367 A80-33543
EI-78-C-01-6345
  p0339 N80-23847
EJ-78-C-01-6639
  p0334 N80-22523
EL-78-A-01-2815
  p0557 N80-24637
EM-78-C-01-4274
  p0429 N80-23826
EM-78-C-01-4275
  p0427 N80-23791
EM-78-C-01-5221
  p0429 N80-23836
  p0442 N80-25798
EM-78-C-01-5255
  p0352 N80-26600
  p0355 N80-27207
EM-78-C-03-1735
  p0534 N80-25847
EM-78-C-04-4227
  p0428 N80-23811
EM-78-C-04-4261
  p0346 N80-25213
EM-78-C-04-4272
  p0535 N80-25899
EM-78-C-04-4275
  p0445 N80-25851
EM-78-C-04-4295
  p0448 N80-26403
EM-78-C-04-4297
  p0454 N80-26845
EM-78-C-04-4375
  p0438 N80-24828
EM-78-C-04-5300
  p0453 N80-26844
EM-78-C-04-5305
  p0445 N80-25855
EM-78-C-04-5350
  p0452 N80-26823
EM-78-C-04-5352
  p0454 N80-26848
EM-78-C-04-5355
  p0445 N80-25850
EM-78-C-04-5359
  p0437 N80-24821
EM-78-C-04-5364
  p0454 N80-26851
EM-78-C-04-5367
  p0441 N80-25618
EM-78-C-05-5759
  p0553 N80-22810
  p0557 N80-24866
EM-78-F-01-5202
  p0442 N80-25788
EM-78-I-01-4209
  p0563 N80-27231
EM-78-I-01-4290
  p0336 N80-23215
EM-78-S-01-4257
  p0368 A80-33549
EM-78-S-01-5216
  p0428 N80-23815
  p0446 N80-25873
EM-78-C-02-4954
  p0567 N80-24848
EO-A01-78-3605
  p0458 N80-27829
EP-78-S-02-4776
  p0355 N80-26958
EPA-IAG-D5-B681
  p0324 A80-35649
EPA-IAG-D6-E721
  p0330 A80-41664
EPA-IAG-D7-0473
  p0326 A80-36477
EPA-R-803896
  p0354 N80-26942
EPA-R-804811-02
  p0471 A80-36314
EPA-R-806548
  p0354 N80-26942
EPA-68-02-2163
  p0336 N80-22895
EPA-68-02-2165
  p0351 N80-25947
EPA-68-02-2198
  p0334 N80-22527
  p0334 N80-22528
  p0341 N80-23904
EPA-68-02-2296
  p0350 N80-25936
EPA-68-02-2412
  p0346 N80-24898
EPA-68-02-2612
  p0336 N80-22888
  p0336 N80-22889
EPA-68-03-2487
  p0351 N80-25943
EPA-68-03-2593
  p0350 N80-25930
EPRI PROJ. 411-4
  p0498 N80-26530
EPRI PROJ. 551
  p0338 N80-23786
EPRI PROJ. 832-2
  p0497 N80-26529
EPRI PROJ. 1082-1
  p0551 N80-22794
EPRI PROJ. 1199-1
  p0555 N80-23796
EPRI PROJ. 1199-3
  p0540 N80-22793
EPRI PROJ. 1201-6
  p0352 N80-26627
ER-78-C-02-4996
  p0443 N80-25812
ER-78-S-02-4899
  p0417 A80-42443
ER-78-5-02-4657
  p0403 A80-37306
ER-78-04-4226
  p0422 A80-43528
ESA-3261
  p0547 A80-37455
ET-N-I-019060
  p0484 N80-24464
ET-75-1-01-9036
  p0491 N80-25764
ET-77-I-01-8881
  p0483 N80-23757
ET-77-S-02-4296
  p0506 A80-33050
ET-78-C-01-2777
  p0474 A80-40755
ET-78-C-01-2798
  p0482 N80-23484
  p0491 N80-25476
ET-78-C-01-2854
  p0439 N80-24836
ET-78-C-01-3084
  p0511 A80-34989
ET-78-C-01-3125
  p0500 N80-26832
ET-78-C-01-3179
  p0331 A80-42227
ET-78-C-02-4931
  p0533 N80-25799
ET-78-C-02-5022
  p0483 N80-23486
  p0483 N80-23487
ET-78-C-03-1740
  p0492 N80-25868
ET-78-C-03-1864
  p0488 N80-24849
ET-78-C-03-2073
  p0444 N80-25826
ET-78-C-03-2199
  p0428 N80-23812
  p0428 N80-23813
  p0438 N80-24826
ET-78-C-03-2207
  p0394 A80-35340
ET-78-C-03-2226
  p0437 N80-24817
  p0440 N80-24855
ET-78-C-04-4239
  p0364 A80-33494

CONTRACT NUMBER INDEX

- ET-78-C-04-5317
  - p0453 N80-26839
- ET-78-C-04-5395
  - p0529 N80-23860
- ET-78-C-04-5402
  - p0385 A80-33716
- ET-78-C-04-5403
  - p0533 N80-25800
- ET-78-C-06-1095
  - p0462 A80-38117
- ET-78-F-03-1787
  - p0483 N80-23755
- ET-78-I-01-2895
  - p0535 N80-26172
- ET-78-A-03-1876
  - p0394 A80-35345
  - p0395 A80-35349
  - p0422 A80-43762
- ET-78-S-01-3177
  - p0482 N80-23482
- ET-78-S-02-4649
  - p0335 N80-22847
- ET-78-S-02-4896
  - p0340 N80-23854
- ET-78-S-05-5912
  - p0484 N80-23840
  - p0503 N80-27514
- ET-79-03-23034
  - p0394 A80-35342
- EX-76-A-01-2295-029
  - p0555 N80-23788
- EX-76-A-29-1012
  - p0342 N80-24754
  - p0432 N80-24755
  - p0449 N80-26768
  - p0449 N80-26771
- EX-76-A-29-1020
  - p0444 N80-25818
  - p0444 N80-25819
  - p0451 N80-26811
  - p0451 N80-26812
  - p0451 N80-26813
  - p0451 N80-26814
  - p0451 N80-26815
  - p0456 N80-26873
- EX-76-A-29-1026
  - p0533 N80-25807
- EX-76-A-29-1060
  - p0526 N80-22778
  - p0526 N80-22787
- EX-76-A-36-1008
  - p0538 N80-27825
- EX-76-C-01-1548
  - p0487 N80-24501
- EX-76-C-01-1743
  - p0474 A80-40757
- EX-76-C-01-1800
  - p0490 N80-25473
  - p0499 N80-26545
  - p0499 N80-26546
- EX-76-C-01-1806
  - p0337 N80-23662
  - p0499 N80-26669
  - p0536 N80-26671
- EX-76-C-01-2007
  - p0487 N80-24499
- EX-76-C-01-2030
  - p0485 N80-24476
- EX-76-C-01-2034
  - p0489 N80-25398
- EX-76-C-01-2244
  - p0498 N80-26543
- EX-76-C-01-2270
  - p0497 N80-26528
- EX-76-C-01-2274
  - p0489 N80-25461
- EX-76-C-01-2286
  - p0490 N80-25472
- EX-76-C-01-2291
  - p0478 A80-42290
- EX-76-C-01-2297
  - p0486 N80-24480
  - p0486 N80-24481
- EX-76-C-01-2307
  - p0503 N80-27515
  - p0503 N80-27516
  - p0503 N80-27517
- EX-76-C-01-2315
  - p0486 N80-24482
- EX-76-C-01-2330
  - p0533 N80-25836
  - p0533 N80-25837
  - p0533 N80-25838
- EX-76-C-01-2346
  - p0483 N80-23808
- EX-76-C-01-2377
  - p0456 N80-27800
- EX-76-C-01-2381
  - p0423 N80-22781
- EX-76-C-01-2389
  - p0427 N80-23776
- EX-76-C-01-2396
  - p0441 N80-25784
- EX-76-C-01-2416
  - p0337 N80-23485
  - p0484 N80-24467
  - p0485 N80-24468
  - p0485 N80-24469
  - p0485 N80-24470
  - p0488 N80-24808
- EX-76-C-01-2418
  - p0503 N80-27524
- EX-76-C-01-2442
  - p0339 N80-23830
- EX-76-C-01-2478
  - p0521 A80-41570
- EX-76-C-01-2489
  - p0334 N80-22520
- EX-76-C-01-2514
  - p0490 N80-25471
- EX-76-C-01-2543
  - p0449 N80-26766
- EX-76-C-01-2553
  - p0531 N80-24861
- EX-76-I-01-1028
  - p0536 N80-26774
  - p0355 N80-27803
- EX-76-S-01-2437
  - p0490 N80-25463
- EX-76-S-01-2537
  - p0489 N80-25460
- EX-77-A-29-1010
  - p0528 N80-23775
- EY-76-C-01-2034
  - p0486 N80-24488
- EY-76-C-02-0003
  - p0489 N80-25455
- EY-76-C-02-0016
  - p0459 A80-35189
  - p0540 N80-22608
  - p0540 N80-22609
  - p0463 N80-23478
  - p0340 N80-23857
  - p0463 N80-24483
  - p0567 N80-24801
  - p0345 N80-24884
  - p0345 N80-24888
  - p0490 N80-25468
  - p0349 N80-25896
  - p0536 N80-26216
  - p0496 N80-26482
  - p0561 N80-26539
  - p0354 N80-26956
- EY-76-C-02-2263
  - p0531 N80-24812
- EY-76-C-02-2608
  - p0421 A80-43482
- EY-76-C-02-2616
  - p0532 N80-24864
- EY-76-C-02-2705
  - p0443 N80-25813
- EY-76-C-02-2749
  - p0530 N80-24620
- EY-76-C-02-2939
  - p0455 N80-26855
  - p0456 N80-26983
- EY-76-C-02-2939-A001
  - p0546 A80-33518
- EY-76-C-02-2939-M002
  - p0546 A80-33518
- EY-76-C-02-3056
  - p0528 N80-23818
- EY-76-C-02-3073
  - p0507 A80-33063
  - p0516 A80-37185
- EY-76-C-02-3077
  - p0511 A80-34978
- EY-76-C-02-4048
  - p0444 N80-25822
- EY-76-C-02-4094
  - p0357 A80-33402
  - p0430 N80-23855
  - p0439 N80-24837
  - p0455 N80-26869
- EY-76-C-03-167-PA-38
  - p0507 A80-33057
- EY-76-C-03-0015
  - p0447 N80-25903
- EY-76-C-03-0115-141
  - p0498 N80-26535
- EY-76-C-03-0167
  - p0335 N80-22837
- EY-76-C-03-0167-PA-38
  - p0506 A80-33044
  - p0507 A80-33059
- EY-76-C-03-0515
  - p0452 N80-26822
- EY-76-C-03-1101
  - p0438 N80-24829
- EY-76-C-03-1202
  - p0525 A80-43575
- EY-76-C-03-1241
  - p0490 N80-25466
- EY-76-C-03-1246
  - p0440 N80-24853
- EY-76-C-03-1282
  - p0438 N80-24823
- EY-76-C-03-1363
  - p0534 N80-25891
- EY-76-C-04-0789
  - p0481 N80-22614
  - p0555 N80-22845
  - p0555 N80-23661
  - p0463 N80-23797
  - p0428 N80-23806
  - p0556 N80-23824
  - p0541 N80-23825
  - p0429 N80-23837
  - p0556 N80-23851
  - p0430 N80-23853
  - p0431 N80-24495
  - p0557 N80-24803
  - p0439 N80-24832
  - p0439 N80-24833
  - p0439 N80-24842
  - p0492 N80-25766
  - p0445 N80-25843
  - p0445 N80-25858
  - p0492 N80-25859
  - p0445 N80-25860
  - p0492 N80-25863
  - p0534 N80-25870
  - p0559 N80-25879
  - p0535 N80-25897
  - p0535 N80-25912
  - p0448 N80-26075
  - p0499 N80-26608
  - p0449 N80-26611
  - p0537 N80-26800
  - p0451 N80-26802
  - p0561 N80-26803
  - p0561 N80-26805
  - p0453 N80-26830
  - p0562 N80-26856
  - p0537 N80-26857
  - p0455 N80-26866
- EY-76-C-04-1013
  - p0330 A80-41558
  - p0330 A80-41559
- EY-76-C-04-3533
  - p0529 N80-23831
  - p0534 N80-25888
  - p0534 N80-25889
- EY-76-C-05-0033
  - p0339 N80-23841
  - p0339 N80-23848
  - p0339 N80-23849
  - p0343 N80-24852
  - p0344 N80-24869
  - p0347 N80-25804
- EY-76-C-05-5123
  - p0372 A80-33590
- EY-76-C-05-5135
  - p0529 N80-23845
  - p0529 N80-23846
- EY-76-C-06-1830
  - p0468 A80-35716
  - p0468 A80-35728
  - p0469 A80-35732
  - p0469 A80-35737
  - p0514 A80-35750
  - p0414 A80-39937
  - p0554 N80-22825
  - p0336 N80-22883
  - p0336 N80-23131
  - p0555 N80-23793
  - p0556 N80-23823
  - p0430 N80-23859
  - p0530 N80-23947
  - p0557 N80-24810
  - p0488 N80-24966
  - p0490 N80-25465
  - p0492 N80-25865
  - p0493 N80-25878
  - p0561 N80-26804
  - p0538 N80-27817
- EY-76-C-07-1570
  - p0335 N80-22878
- EY-76-C-09-0001
  - p0440 N80-24867
- EY-76-C-09-0819
  - p0324 A80-35649
- EY-76-G-02-2597
  - p0424 N80-22851
- EY-76-S-02-2272
  - p0493 N80-26138
- EY-76-S-02-2446
  - p0378 A80-33638
  - p0443 N80-25811
- EY-76-S-02-2577
  - p0446 N80-25864
- EY-76-S-02-2588
  - p0444 N80-25823
- EY-76-S-02-2602
  - p0491 N80-25707
- EY-76-S-02-2858
  - p0437 N80-24807
- EY-76-S-02-2868
  - p0440 N80-24858
- EY-76-S-02-2889
  - p0447 N80-25886
- EY-76-S-02-2917
  - p0485 N80-24474
- EY-76-S-02-2948
  - p0465 A80-33126
- EY-76-S-02-2953
  - p0437 N80-24818
- EY-76-S-02-4051-A002
  - p0524 A80-43345
- EY-76-S-02-4130
  - p0531 N80-24811
- EY-76-S-02-4446
  - p0364 A80-33501
- EY-76-S-03-0034
  - p0445 N80-25852
- EY-76-S-04-3709
  - p0417 A80-42443
- EY-76-S-05-4908
  - p0451 N80-26816
- EY-76-S-05-4976
  - p0376 A80-33620
- EY-76-S-06-2229
  - p0469 A80-35734
- EY-76-S-06-2342
  - p0466 A80-33769
  - p0469 A80-35741
  - p0489 N80-24968
- EY-76-S-06-2438
  - p0514 A80-35748
- EY-76-S-09-0893
  - p0558 N80-25869
- EY-76-5-05-5190
  - p0546 A80-33519
- EY-77-C-01-2671
  - p0335 N80-22850
- EY-77-C-21-8085
  - p0487 N80-24498
- EY-77-S-02-2446
  - p0364 A80-33493
- EY-79-C-02-0016
  - p0455 N80-26863
- F33615-76-C-2093
  - p0547 A80-37003
- F33615-76-C-2104
  - p0523 A80-43138
- F33615-77-C-2004
  - p0550 N80-22641
- F33615-77-C-2042
  - p0476 A80-4218
- F33615-77-C-2043
  - p0476 A80-42186
- F33615-78-C-2037
  - p0482 N80-23474

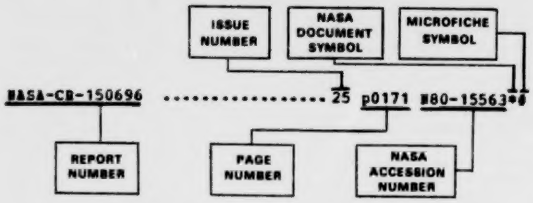
F33615-78-C-2077
p0450 N80-26797
H-2372 p0451 N80-26815
HUD-H-2372
p0444 N80-25818
p0444 N80-25819
p0444 N80-25821
JPL PROJ. 5030-345
p0336 N80-23215
JPL PROJ. 5103-93
p0432 N80-24750
JPL PROJ. 5104-61
p0432 N80-24751
JPL PROJ. 5105-29
p0536 N80-26769
JPL-KM-68903
p0395 A80-35354
JPL-95509
p0528 N80-23818
JPL-953913
p0393 A80-34847
JPL-954563
p0386 A80-33726
JPL-954698
p0450 N80-26781
JPL-954786
p0427 N80-23771
JPL-954796
p0441 N80-25782
JPL-954868
p0396 A80-35360
JPL-955033
p0531 N80-24812
JPL-955115
p0523 A80-43340
p0420 A80-43344
JPL-955120
p0450 N80-26777
JPL-955187
p0564 N80-28246
p0565 N80-28247
p0565 N80-28248
p0565 N80-28249
p0565 N80-28250
p0565 N80-28251
p0565 N80-28252
JPL-955188
p0560 N80-26210
JPL-955189
p0562 N80-27222
p0562 N80-27223
p0563 N80-27224
p0563 N80-27225
p0563 N80-27226
p0563 N80-27227
JPL-955190
p0559 N80-26203
p0559 N80-26204
p0560 N80-26205
p0560 N80-26206
p0560 N80-26207
p0560 N80-26208
p0560 N80-26209
JPL-955197
p0564 N80-28245
JPL-955238
p0435 N80-24788
JPL-955298
p0450 N80-26782
JPL-955307
p0427 N80-23772
JPL-955401
p0449 N80-26776
JPL-955434
p0352 N80-26784
JPL-955494
p0449 N80-26409
JPL-955552
p0487 N80-24728
NASW-3198
p0499 N80-26663
NAS1-14614
p0462 A80-37347
NAS3-20058
p0528 N80-23775
NAS3-20630
p0346 N80-25332
NAS3-20631
p0355 N80-27364
NAS3-20643
p0330 A80-41506
NAS3-20646
p0332 A80-42258
NAS3-20794
p0551 N80-22777
NAS3-20808
p0355 N80-27361
NAS3-20823
p0396 A80-35361
NAS3-20830
p0334 N80-22326
NAS3-21926
p0431 N80-24742
NAS7-100
p0546 A80-34777
p0404 A80-37950
p0405 A80-37953
p0407 A80-37978
p0412 A80-38023
p0334 N80-22782
p0336 N80-23214
p0336 N80-23215
p0426 N80-23500
p0484 N80-24464
p0432 N80-24747
p0432 N80-24750
p0432 N80-24751
p0432 N80-24752
p0432 N80-24753
p0342 N80-24754
p0432 N80-24755
p0433 N80-24760
p0491 N80-25764
p0559 N80-26201
p0559 N80-26202
p0560 N80-26210
p0449 N80-26409
p0449 N80-26768
p0536 N80-26769
p0449 N80-26770
p0449 N80-26771
p0352 N80-26772
p0450 N80-26782
p0542 N80-26785
NAS8-32036
p0424 N80-22856
p0441 N80-25783
p0441 N80-25787
p0442 N80-25790
p0442 N80-25791
p0450 N80-26778
p0457 N80-27802
p0457 N80-27806
NAS8-32092
p0432 N80-24746
NAS8-32981
p0431 N80-24344
p0431 N80-24345
NAS8-32988
p0437 N80-24798
NAS8-33511
p0530 N80-24757
NAS8-33759
p0484 N80-24465
NAS9-15286
p0538 N80-27801
NAS9-15636
p0542 N80-27809
p0543 N80-27810
p0543 N80-27811
p0543 N80-27812
p0457 N80-27813
NAS9-15725
p0540 N80-22378
NB79-NAAA-6099
p0441 N80-24878
NGR-10-007-008
p0408 A80-37985
NRL PROJ. N003
p0554 N80-22820
NSF AER-75-16962
p0459 A80-33410
NSF BNS-75-03415
p0459 A80-33410
NSF CG-00007
p0567 N80-22862
p0541 N80-22863
NSF DEB-77-16327
p0337 N80-23629
NSF DMR-76-84373
p0397 A80-35367
NSF DMR-79-01661
p0397 A80-35367
NSF ENG-77-22155
p0471 A80-36625
NSF ENG-77-23932
p0505 A80-32892
NSF ENG-77-27500
p0523 A80-42298
NSF ENG-78-19426
p0394 A80-35345
NSF ENV-75-19701
p0325 A80-36419
NSF OPA-78-24464
p0354 N80-26881
NSF PCM-77-5502
p0398 A80-35474
NSF PFR-76-17159
p0459 A80-33406
NSF PFR-77-11545-A01
p0459 A80-33406
NSF PFR-77-12500
p0487 N80-24504
p0493 N80-25908
p0493 N80-25909
p0504 N80-27795
NSF PTP-75-03457
p0447 N80-25906
p0447 N80-25907
NSG-1425
p0397 A80-35369
NSG-1579
p0511 A80-34978
NSG-3139
p0536 N80-26774
NSG-3277
p0355 N80-27803
NSG-3297
p0533 N80-25785
N00014-76-C-410
p0505 A80-32743
N00014-76-C-0706
p0532 N80-25666
N00014-77-C-0735
p0519 A80-39014
N00123-78-C-0868
p0528 N80-23783
N00173-78-C-0272
p0358 A80-33426
N00173-78-C-0424
p0502 N80-27513
N60921-78-C-A249
p0516 A80-37824
N68305-77-C-0043
p0358 A80-33423
PHS-210-76-0171
p0504 N80-27535
p0504 N80-27536
PROJ. 61001
p0503 N80-27515
p0503 N80-27517
SRC-B/RG/93199
p0417 A80-42438
p0418 A80-42452
SRC-G/RA/5360.4
p0562 N80-26880
SRC-GR/A/34788
p0417 A80-42438
p0418 A80-42452
SWEDBESD-5061.012
p0530 N80-23862
W-31-109-ENG-38
p0364 A80-33501
p0378 A80-33638
p0392 A80-33867
p0403 A80-37306
p0554 N80-22841
p0554 N80-22842
p0336 N80-23477
p0555 N80-23789
p0528 N80-23790
p0529 N80-23844
p0556 N80-23861
p0556 N80-24215
p0341 N80-24217
p0341 N80-24393
p0485 N80-24472
p0486 N80-24484
p0486 N80-24485
p0486 N80-24486
p0557 N80-24628
p0342 N80-24804
p0343 N80-24813
p0343 N80-24822
p0344 N80-24860
p0344 N80-24863
p0346 N80-25207
p0541 N80-25363
p0346 N80-25477
p0558 N80-25801
p0558 N80-25802
p0443 N80-25814
p0347 N80-25827
p0348 N80-25828
p0348 N80-25829
p0348 N80-25830
p0348 N80-25831
p0446 N80-25866
p0446 N80-25867
p0446 N80-25872
p0349 N80-25894
p0535 N80-25895
p0350 N80-25923
p0350 N80-25927
p0535 N80-26167
p0351 N80-26441
p0352 N80-26670
p0452 N80-26824
p0561 N80-26840
p0564 N80-27523
W-4705-ENG-48
p0379 A80-33652
W-7405-ENG 48
p0506 A80-33054
W-7405-ENG-26
p0380 A80-33658
p0396 A80-35362
p0514 A80-36397
p0515 A80-37181
p0417 A80-42442
p0334 N80-22764
p0553 N80-22811
p0481 N80-22853
p0481 N80-22854
p0482 N80-22855
p0527 N80-23400
p0528 N80-23821
p0484 N80-23828
p0556 N80-23832
p0529 N80-23839
p0529 N80-23850
p0485 N80-24471
p0344 N80-24868
p0345 N80-24885
p0463 N80-25464
p0498 N80-26540
p0455 N80-26867
W-7405-ENG-36
p0526 N80-22619
p0554 N80-22838
p0527 N80-22840
p0335 N80-22882
p0426 N80-23651
p0483 N80-23795
p0555 N80-23801
p0338 N80-23802
p0338 N80-23807
p0338 N80-23820
p0530 N80-24214
p0486 N80-24487
p0463 N80-25467
p0558 N80-25805
p0443 N80-25817
p0464 N80-26538
p0453 N80-26835
p0454 N80-26847
W-7405-ENG-38
p0536 N80-26628
W-7405-ENG-48
p0506 A80-33052
p0506 A80-33053
p0362 A80-33474
p0365 A80-33506
p0372 A80-33588
p0387 A80-33739
p0389 A80-33761
p0546 A80-34081
p0325 A80-36053
p0403 A80-37305
p0516 A80-37818
p0472 A80-39420
p0424 N80-22839
p0482 N80-23399

CONTRACT NUMBER INDEX

p0337 N80-23629
p0483 N80-23756
p0338 N80-23794
p0428 N80-23810
p0429 N80-23822
p0556 N80-23832
p0340 N80-23878
p0487 N80-24490
p0437 N80-24816
p0437 N80-24820
p0439 N80-24840
p0343 N80-24859
p0488 N80-24964
p0532 N80-25161
p0532 N80-25650
p0348 N80-25849
p0348 N80-25880
p0349 N80-25881
p0349 N80-25892
p0535 N80-25893
p0350 N80-25904
p0447 N80-25905
p0351 N80-26003
p0561 N80-26213
p0498 N80-26537
p0352 N80-26568
p0353 N80-26808
p0353 N80-26817
p0455 N80-26870
p0563 N80-27232
p0564 N80-27233
p0504 N80-27703
p0457 N80-27821
p0458 N80-27843
W-7405-ENG-92
p0482 N80-23481
p0341 N80-24475
p0542 N80-25364
XS-9-8232-1
p0390 A80-33785
505-32-03-03
p0532 N80-25104

REPORT/ACCESSION INDEX

Typical Report/Accession Number Index Listing



Listings in this index are arranged alphanumerically by report number. The issue and page number indicate the actual Supplement and page where the citation may be located. The accession number denotes the number by which the citation is identified. An asterisk (*) indicates that the item is a NASA report. A pound sign (#) indicates that the item is available on microfiche.

AAAS/PUB-79/R/17 p0354 N80-26881 #

AAS PAPER 80-084 p0540 A80-41898*#

AD-A080131 p0550 N80-22641 #
AD-A080749 p0482 N80-23474 #
AD-A080877 p0337 N80-23782 #
AD-A081182 p0355 N80-27355 #
AD-A081232 p0528 N80-23783 #
AD-A081379 p0532 N80-25666 #
AD-A082365 p0557 N80-24637 #
AD-A082400 p0488 N80-24799 #
AD-A082756 p0492 N80-25797 #
AD-A083092 p0450 N80-26797 #
AD-A083302 p0561 N80-26796 #
AD-A083317 p0500 N80-26798 #
AD-A083608 p0537 N80-26794 #
AD-A083665 p0464 N80-27816 #
AD-A083941 p0562 N80-26865 #
AD-A083961 p0564 N80-27814 #
AD-A084169 p0502 N80-27513 #

AFAPL-TR-79-2080 p0482 N80-23474 #
AFAPL-TR-79-2088 p0550 N80-22641 #
AFAPL-TR-79-2116 p0450 N80-26797 #

AFLRL-121 p0557 N80-24637 #

AIAA PAPER 80-0841 p0357 A80-32856 #
AIAA PAPER 80-0844 p0465 A80-32857 #
AIAA PAPER 80-0869 p0357 A80-32867 #
AIAA PAPER 80-0896 p0470 A80-35898*#
AIAA PAPER 80-0926 p0505 A80-32892 #
AIAA PAPER 80-0928 p0505 A80-32893 #
AIAA PAPER 80-1086 p0519 A80-38902*#
AIAA PAPER 80-1087 p0330 A80-41506*#
AIAA PAPER 80-1090 p0328 A80-38905*#
AIAA PAPER 80-1199 p0519 A80-38964 #
AIAA PAPER 80-1238 p0328 A80-38983 #
AIAA PAPER 80-1285 p0475 A80-41213 #
AIAA PAPER 80-1304 p0519 A80-39014 #
AIAA PAPER 80-1343 p0521 A80-41570 #
AIAA PAPER 80-1344 p0330 A80-41571 #
AIAA PAPER 80-1505 p0329 A80-41469 #
AIAA PAPER 80-1506 p0415 A80-41470 #
AIAA PAPER 80-1507 p0415 A80-41471 #
AIAA PAPER 80-1508 p0329 A80-41472*#
AIAA PAPER 80-1509 p0549 A80-41473 #
AIAA PAPER 80-1528 p0330 A80-41488 #
AIAA PAPER 80-1546 p0415 A80-41502 #
AIAA PAPER 80-1846 p0333 A80-43304*#
AIAA PAPER 80-1847 p0333 A80-43305 #
AIAA PAPER 80-1890 p0523 A80-43325 #
AIAA 79-3069 p0539 A80-36963 #
AIAA 80-0674 p0393 A80-34999*#

AIRESEARCH-31-3328 p0526 N80-22778*#
AIRESEARCH-79-16430 p0561 N80-26212*#

ALO-3977-T1 p0453 N80-26837 #
ALO-3985-1-REV-1 p0444 N80-25825 #
ALO-4086-1 p0452 N80-26818 #
ALO-4122-T1 p0428 N80-23816 #
ALO-4147-T1 p0429 N80-23817 #
ALO-4227-12 p0428 N80-23811 #
ALO-4261-T8 p0346 N80-25213 #
ALO-4272 p0535 N80-25899 #
ALO-4295-T2 p0448 N80-26403 #
ALO-5300-T2 p0453 N80-26844 #
ALO-5350-1 p0452 N80-26823 #
ALO-5352-T1 p0454 N80-26848 #
ALO-5355-T1 p0445 N80-25850 #
ALO-5359-T1 p0437 N80-24821 #
ALO-5367-1 p0441 N80-25618 #
ALO-30171-1 p0453 N80-26841 #

AMC-8303.135-AR-2 p0346 N80-24898 #

ANL-PMS-79-2-VOL-6 p0528 N80-23790 #

ANL-79-15-ED-2 p0561 N80-26840 #
ANL-79-51 p0535 N80-25895 #
ANL-79-93 p0486 N80-24484 #
ANL-79-102 p0443 N80-25814 #

ANL/CES/TE-79-3 p0554 N80-22842 #
ANL/CNSV-TM-15 p0342 N80-24804 #
ANL/CNSV-TM-18 p0343 N80-24813 #
ANL/CNSV-TM-20 p0343 N80-24822 #
ANL/CNSV-TM-24 p0344 N80-24863 #
ANL/CNSV-TM-25 p0344 N80-24860 #
ANL/EES-TM-60 p0554 N80-22841 #
ANL/EES-TM-63 p0564 N80-27523 #
ANL/ICES-TM-26-REV p0344 N80-24863 #
ANL/ICES-TM-30 p0344 N80-24860 #
ANL/ICES-TM-31 p0343 N80-24813 #
ANL/OEPM-78-8 p0558 N80-25801 #
ANL/OEPM-78-10 p0556 N80-24215 #
ANL/OEPM-78-11 p0558 N80-25802 #
ANL/OEPM-78-12 p0556 N80-23861 #
ANL/OEPM-79-4 p0351 N80-26441 #
ANL/OEPM-79-5 p0341 N80-24393 #
ANL/PMS-79-2-VOL-1 p0347 N80-25827 #
ANL/PMS-79-2-VOL-2 p0348 N80-25828 #
ANL/PMS-79-2-VOL-3 p0348 N80-25829 #
ANL/PMS-79-2-VOL-4 p0348 N80-25830 #
ANL/PMS-79-2-VOL-5 p0348 N80-25831 #
ANL/SDP-TM-79-8 p0452 N80-26824 #
ANL/SDP/TM-79-4 p0446 N80-25866 #

APR-3 p0531 N80-24811 #

AR-2 p0483 N80-23755 #
AR-2 p0346 N80-24898 #
AR-2 p0350 N80-25926 #
AR-2 p0503 N80-27514 #
AR-3 p0445 N80-25852 #

ASE-4371 p0438 N80-24828 #
ASE-4460 p0445 N80-25851 #

ASME PAPER 79-GT/ISR-3 p0521 A80-42056 #
ASME PAPER 80-ENAS-9 p0479 A80-43186 #
ASME PAPER 80-ENAS-14 p0523 A80-43190 #
ASME PAPER 80-GT-10 p0475 A80-42151 #
ASME PAPER 80-GT-19 p0521 A80-42157 #
ASME PAPER 80-GT-21 p0331 A80-42158 #

ASME PAPER 80-GT-22 .... p0331 A80-42159 #
ASME PAPER 80-GT-26 .... p0416 A80-42161 #
ASME PAPER 80-GT-27 .... p0521 A80-42162 #
ASME PAPER 80-GT-34 .... p0416 A80-42167 #
ASME PAPER 80-GT-55 .... p0476 A80-42186 #
ASME PAPER 80-GT-60 .... p0331 A80-42190*#
ASME PAPER 80-GT-64 .... p0476 A80-42194 #
ASME PAPER 80-GT-67 .... p0476 A80-42197 #
ASME PAPER 80-GT-68 .... p0476 A80-42198 #
ASME PAPER 80-GT-69 .... p0476 A80-42199*#
ASME PAPER 80-GT-70 .... p0476 A80-42200 #
ASME PAPER 80-GT-101 .... p0331 A80-42225 #
ASME PAPER 80-GT-104 .... p0477 A80-42226*#
ASME PAPER 80-GT-105 .... p0331 A80-42227 #
ASME PAPER 80-GT-112 .... p0477 A80-42230 #
ASME PAPER 80-GT-113 .... p0477 A80-42231 #
ASME PAPER 80-GT-117 .... p0522 A80-42233 #
ASME PAPER 80-GT-128 .... p0522 A80-42242 #
ASME PAPER 80-GT-129 .... p0477 A80-42243 #
ASME PAPER 80-GT-131 .... p0416 A80-42244 #
ASME PAPER 80-GT-132 .... p0477 A80-42245 #
ASME PAPER 80-GT-135 .... p0522 A80-42248 #
ASME PAPER 80-GT-141 .... p0331 A80-42254
ASME PAPER 80-GT-142 .... p0332 A80-42255*#
ASME PAPER 80-GT-146 .... p0332 A80-42258*#
ASME PAPER 80-GT-153 .... p0522 A80-42265 #
ASME PAPER 80-GT-155 .... p0477 A80-42267 #
ASME PAPER 80-GT-160 .... p0550 A80-42270 #
ASME PAPER 80-GT-161 .... p0477 A80-42271 #
ASME PAPER 80-GT-163 .... p0332 A80-42273 #
ASME PAPER 80-GT-170 .... p0477 A80-42278 #
ASME PAPER 80-GT-176 .... p0332 A80-42282 #
ASME PAPER 80-GT-187 .... p0478 A80-42289 #
ASME PAPER 80-GT-188 .... p0478 A80-42290 #
ASME PAPER 80-PET-25 .... p0523 A80-43340*#
ASME PAPER 80-PET-27 .... p0333 A80-43341 #
ASME PAPER 80-PET-31 .... p0524 A80-43342 #
ASME PAPER 80-PET-32 .... p0524 A80-43343 #
ASME PAPER 80-PET-33 .... p0420 A80-43344*#
ASME PAPER 80-PET-83 .... p0524 A80-43345 #

ASRL-TR-194-1 .... p0530 N80-23862 #

ASSA-FA-10 .... p0456 N80-26879 #

ATR-78(7691-04)-1 .... p0438 N80-24829 #
ATR-79(7780)-1 .... p0437 N80-24817 #
ATR-80(7820-04)-2 .... p0352 N80-26784*#

BCR-L-1001 .... p0482 N80-23484 #

BCS-40252 .... p0430 N80-23858 #

BDM/TAC-79-518-TR-R1 .... p0556 N80-23851 #

BM-RI-8403 .... p0351 N80-25940 #

BMFT-FB-T-79-02 .... p0424 N80-22857 #
BMFT-FB-T-79-04 .... p0527 N80-22859 #
BMFT-FB-T-79-05 .... p0481 N80-22525 #
BMFT-FB-T-79-06 .... p0424 N80-22860 #
BMFT-FB-T-79-12 .... p0567 N80-23585 #
BMFT-FB-T-79-19 .... p0484 N80-23925 #
BMFT-FB-T-79-29 .... p0456 N80-26876 #
BMFT-FB-T-79-30 .... p0456 N80-26877 #
BMFT-FB-T-79-34 .... p0538 N80-26878 #

BMI-2031-VOL-1 .... p0482 N80-23481 #
BMI-2031-VOL-2 .... p0341 N80-24475 #

BNL-26398 .... p0567 N80-24801 #
BNL-26641 .... p0540 N80-22608 #
BNL-26712 .... p0540 N80-22609 #
BNL-26813 .... p0463 N80-23478 #
BNL-27012 .... p0340 N80-23857 #
BNL-27093 .... p0463 N80-24483 #
BNL-27164 .... p0345 N80-24888 #
BNL-27316 .... p0349 N80-25896 #
BNL-27347 .... p0561 N80-26539 #
BNL-50983 .... p0345 N80-24884 #
BNL-51047 .... p0536 N80-26216 #
BNL-51052 .... p0490 N80-25468 #
BNL-51116 .... p0354 N80-26956 #
BNL-51120 .... p0455 N80-26863 #

CAES-7 .... p0555 N80-23788 #

CCMS-93 .... p0451 N80-26816 #

CEL-CR-80-002 .... p0528 N80-23783 #

CERL-TR-E-158 .... p0500 N80-26798 #

CIRC-804-A .... p0500 N80-26747 #

CONF-781025-1 .... p0554 N80-22838 #
CONF-781228-3 .... p0424 N80-22843 #
CONF-790383-1 .... p0335 N80-22837 #
CONF-790465 .... p0480 N80-22516 #
CONF-790515-6 .... p0557 N80-24810 #
CONF-790541-57 .... p0429 N80-23822 #
CONF-790541-58 .... p0439 N80-24840 #
CONF-790640-7 .... p0529 N80-23844 #
CONF-790768-1 .... p0557 N80-24803 #
CONF-790808-23 .... p0456 N80-26983 #
CONF-790852-2 .... p0346 N80-25207 #
CONF-790887-1 .... p0337 N80-23629 #
CONF-790896-1 .... p0482 N80-23399 #
CONF-790904-P2 .... p0542 N80-25808 #
CONF-790999-1 .... p0485 N80-24472 #
CONF-791006-2 .... p0486 N80-24486 #
CONF-791009-6 .... p0567 N80-24801 #
CONF-791009-19 .... p0336 N80-23477 #
CONF-791009-23 .... p0341 N80-24217 #
CONF-791009-27 .... p0349 N80-25881 #
CONF-791021-1-REV .... p0428 N80-23810 #
CONF-791022-10 .... p0335 N80-22849 #
CONF-791022-11 .... p0437 N80-24820 #
CONF-791024-4 .... p0338 N80-23820 #
CONF-791024-5 .... p0439 N80-24833 #
CONF-791024-9 .... p0437 N80-24805 #
CONF-791049-8 .... p0335 N80-22878 #
CONF-791056-2 .... p0345 N80-24885 #
CONF-791069-3 .... p0555 N80-23789 #
CONF-791082-1 .... p0463 N80-25467 #
CONF-791102-31 .... p0532 N80-25161 #
CONF-791102-40 .... p0526 N80-22619 #
CONF-791105-2 .... p0446 N80-25872 #
CONF-791108-16 .... p0350 N80-25923 #
CONF-791108-20 .... p0455 N80-26855 #
CONF-791127-2 .... p0463 N80-23478 #
CONF-791139-1 .... p0335 N80-22882 #
CONF-791143-3 .... p0443 N80-25817 #
CONF-791160-VOL-1 .... p0501 N80-27494 #
CONF-791160-VOL-2 .... p0493 N80-26461 #
CONF-791166-2 .... p0487 N80-24490 #
CONF-791172-1 .... p0350 N80-25927 #
CONF-791204-4 .... p0555 N80-23801 #
CONF-791204-7 .... p0439 N80-24831 #
CONF-791204-9 .... p0431 N80-24495 #
CONF-791204-10 .... p0463 N80-23797 #
CONF-791204-11 .... p0557 N80-24628 #
CONF-791204-12 .... p0338 N80-23807 #
CONF-791204-13 .... p0340 N80-23857 #
CONF-791204-14 .... p0463 N80-24483 #
CONF-791204-20 .... p0534 N80-25888 #
CONF-791204-27 .... p0561 N80-26539 #
CONF-791204-32 .... p0349 N80-25894 #
CONF-791204-33 .... p0452 N80-26822 #
CONF-791216-1 .... p0338 N80-23802 #
CONF-791216-2 .... p0492 N80-25859 #
CONF-791221-1 .... p0428 N80-23800 #
CONF-791226-2 .... p0446 N80-25867 #
CONF-791232 .... p0551 N80-22788*#
CONF-791232-1 .... p0452 N80-26820 #
CONF-791233-2 .... p0348 N80-25849 #
CONF-800101-1 .... p0447 N80-25905 #
CONF-800101-3 .... p0438 N80-24824 #
CONF-800101-4 .... p0430 N80-23856 #
CONF-800101-9 .... p0440 N80-24862 #
CONF-800101-17 .... p0349 N80-25896 #
CONF-800101-18 .... p0453 N80-26835 #
CONF-800101-20 .... p0559 N80-25900 #
CONF-800104-6 .... p0535 N80-26167 #
CONF-800106-4 .... p0455 N80-26867 #
CONF-800106-7 .... p0439 N80-24832 #
CONF-800106-9 .... p0430 N80-23853 #
CONF-800129-2 .... p0346 N80-25477 #
CONF-800133-1 .... p0536 N80-26628 #
CONF-800202-2 .... p0530 N80-24214 #
CONF-800220-2 .... p0445 N80-25860 #
CONF-800229-1 .... p0492 N80-25766 #
CONF-800303-13 .... p0498 N80-26540 #
CONF-800309-1 .... p0345 N80-24888 #
CONF-800309-2 .... p0343 N80-24859 #
CONF-800406-2 .... p0535 N80-25897 #
CONF-800419-1 .... p0353 N80-26810 #

CONF-800504 .... p0499 N80-26608 #
CONF-800523-2 .... p0564 N80-27233 #
CONF-800604-2 .... p0454 N80-26847 #
CONF-800604-3 .... p0464 N80-26538 #
CONF-7710156 .... p0487 N80-24630 #
CONF-7808114 .... p0542 N80-26004 #
CONF-7809197 .... p0541 N80-25363 #
CONF-7811142-1 .... p0457 N80-27822 #
CONF-7904120-1 .... p0530 N80-23947 #
CONF-7905134-1 .... p0430 N80-23859 #
CONF-7909128-1 .... p0538 N80-27817 #
CONF-7910105-2 .... p0486 N80-24485 #

CONS-4209-T1-VOL-7 .... p0563 N80-27231*#

COO-0003-41-T1 .... p0489 N80-25455 #
COO-2263-15 .... p0531 N80-24812*#
COO-2577-19 .... p0446 N80-25864 #
COO-2588-T1 .... p0444 N80-25823 #
COO-2597-5 .... p0424 N80-22851 #
COO-2602-7 .... p0491 N80-25707 #
COO-2616-2-PT-1-REV-1 .... p0532 N80-24864 #
COO-2705-3 .... p0443 N80-25813 #
COO-2749-42 .... p0530 N80-24620*#
COO-2858-24-SUMM .... p0437 N80-24807 #
COO-2868-5 .... p0440 N80-24858 #
COO-2889-5 .... p0447 N80-25886 #
COO-2917-13 .... p0485 N80-24474 #
COO-2953-4 .... p0437 N80-24818 #
COO-3056-41 .... p0528 N80-23818*#
COO-4048-2 .... p0444 N80-25822 #
COO-4094-60 .... p0430 N80-23855 #
COO-4094-62 .... p0439 N80-24837 #
COO-4094-65 .... p0455 N80-26869 #
COO-4130-2 .... p0531 N80-24811 #
COO-4297-2 .... p0454 N80-26845 #
COO-4364-2 .... p0345 N80-24886 #
COO-4388-7 .... p0490 N80-25462 #
COO-4488-2 .... p0343 N80-24838 #
COO-4494-1 .... p0448 N80-25982 #
COO-4516-1 .... p0429 N80-23827 #
COO-4531-9 .... p0348 N80-25841 #
COO-4649-5 .... p0335 N80-22847 #
COO-4776-2 .... p0355 N80-26958 #
COO-4896-T1 .... p0340 N80-23854 #
COO-4931-T11 .... p0533 N80-25799 #
COO-4954-1-VOL-3 .... p0567 N80-24848 #
COO-4996-1 .... p0443 N80-25812 #
COO-5022-8 .... p0483 N80-23487 #
COO-5022-9 .... p0483 N80-23486 #
COO-30122-3 .... p0442 N80-25806 #

CSIR-CENG-298 .... p0499 N80-26549 #

CSIR-ME-1619 .... p0528 N80-23781 #

CW-WR-76-028.3 .... p0355 N80-27361*#

COO-2749-40 .... p0530 N80-24621*#

DECC-61211-003 .... p0337 N80-23782 #

DFVLR-FB-78-17 .... p0463 N80-23865 #

DHEW/PUB/NIOSH-78-120 .... p0504 N80-27536 #
DHEW/PUB/NIOSH-78-191 .... p0504 N80-27535 #

DIA-DST-1860S-522-78-CHG-1 .... p0464 N80-27816 #

DOE-CS-32939-9 .... p0456 N80-26983 #

DOE/CS-0026 .... p0556 N80-24216 #
DOE/CS-0117 .... p0349 N80-25902 #
DOE/CS-0118 .... p0349 N80-25901 #
DOE/CS-0124 .... p0447 N80-25883 #
DOE/CS-0127/2 .... p0455 N80-26870 #
DOE/CS-0129 .... p0344 N80-24871 #
DOE/CS-0132 .... p0351 N80-26550 #
DOE/CS-0145 .... p0451 N80-26816 #
DOE/CS-0146 .... p0349 N80-25884 #
DOE/CS-0147 .... p0352 N80-26670 #
DOE/CS-0147A .... p0453 N80-26842 #
DOE/CS-0150 .... p0562 N80-26862 #
DOE/CS-1042/1 .... p0563 N80-27230 #
DOE/CS-2671-3 .... p0335 N80-22850 #
DOE/CS-4048/2 .... p0444 N80-25822 #
DOE/CS-5255/1 .... p0355 N80-27207 #
DOE/CS-5255/2 .... p0352 N80-26600 #
DOE/CS-05317/1 .... p0453 N80-26839 #
DOE/CS-32199-2 .... p0428 N80-23813 #
DOE/CS-32199-3 .... p0428 N80-23812 #
DOE/CS-32939/10 .... p0455 N80-26855 #
DOE/CS-35305/T1 .... p0445 N80-25855 #
DOE/CS-35364/T1 .... p0454 N80-26851 #
DOE/CS/32199-1 .... p0438 N80-24826 #
DOE/EA-0065 .... p0493 N80-25929 #
DOE/EDP-0032 .... p0340 N80-23876 #
DOE/EDP-0033 .... p0446 N80-25862 #
DOE/EDP-0036 .... p0340 N80-23877 #
DOE/EDP-0045 .... p0335 N80-22876 #
DOE/EDP-0049 .... p0488 N80-24735 #
DOE/EDP-0062 .... p0341 N80-23881 #
DOE/EIA/6345-1 .... p0339 N80-23847 #
DOE/ER-0038 .... p0542 N80-25364 #
DOE/ER-0041 .... p0542 N80-27404 #
DOE/ER-00362-VOL-2 .... p0453 N80-26836 #
DOE/ET-0061/2 .... p0486 N80-24481 #
DOE/ET-0068/4 .... p0486 N80-24480 #
DOE/ET-0102 .... p0354 N80-26861 #
DOE/ET-0110 .... p0427 N80-23792 #
DOE/ET-0118 .... p0533 N80-25824 #
DOE/ET-2442-1 .... p0339 N80-23830 #
DOE/ET-2895/5 .... p0535 N80-26172 #
DOE/ET-11321/T1 .... p0534 N80-25891 #
DOE/ET-12434/T1 .... p0537 N80-26853 #
DOE/ET-20413/1 .... p0448 N80-26143 #
DOE/ET-20605/4 .... p0498 N80-26535 #
DOE/ET-23063/1 .... p0533 N80-25800 #
DOE/ET/20283-1 .... p0489 N80-24968 #
DOE/ET/20408-1 .... p0438 N80-24823 #
DOE/ET/20426-1 .... p0440 N80-24853 #
DOE/ET/20429-1 .... p0440 N80-24847 #
DOE/ET/20516-2 .... p0440 N80-24855 #
DOE/ET/23034-T1 .... p0439 N80-24839 #
DOE/ET/23055-1 .... p0529 N80-23860 #
DOE/ET/29187-2 .... p0537 N80-26864 #
DOE/EV-0042 .... p0350 N80-25926 #
DOE/EV-0054 .... p0452 N80-26826 #
DOE/EV-0059 .... p0457 N80-27821 #
DOE/EV-0062/1 .... p0351 N80-26003 #
DOE/EV-0067 .... p0458 N80-27843 #
DOE/JPL-1012-25-VOL-2 .... p0423 N80-22784*#
DOE/JPL-1012-25-VOL-3 .... p0423 N80-22785*#
DOE/JPL-1012-41 .... p0432 N80-24755*#
DOE/JPL-1012-45 .... p0342 N80-24754*#
DOE/JPL-1012/37 .... p0449 N80-26771*#
DOE/JPL-1060-30-VOL-2 .... p0432 N80-24751*#
DOE/JPL-1060-31-VOL-1 .... p0432 N80-24750*#
DOE/JPL-1060-33 .... p0433 N80-24760*#
DOE/JPL-1060/31-VOL-2 .... p0449 N80-26770*#
DOE/JPL-1060/35 .... p0536 N80-26769*#
DOE/JPL-954698-80/2 .... p0450 N80-26781*#
DOE/JPL-954786-79/02 .... p0427 N80-23771*#
DOE/JPL-954796-79/7 .... p0441 N80-25782*#
DOE/JPL-955298-80/2 .... p0450 N80-26782*#
DOE/JPL-955307 .... p0427 N80-23772*#
DOE/JPL-955401-80/1 .... p0449 N80-26776*#
DOE/MC-03260/4 .... p0492 N80-25768 #
DOE/NASA-0002-80/2 .... p0536 N80-26775*#
DOE/NASA/0002-80/2 .... p0530 N80-24758*#
DOE/NASA/0013-80/1 .... p0527 N80-23315*#
DOE/NASA/0030-80/1 .... p0347 N80-25792*#
DOE/NASA/0030-80/2 .... p0347 N80-25793*#
DOE/NASA/0030-80/4 .... p0347 N80-25794*#
DOE/NASA/0030-80/6 .... p0347 N80-25795*#
DOE/NASA/0031-80/1 .... p0342 N80-24797*#
DOE/NASA/0048-79/1 .... p0555 N80-23216*#
DOE/NASA/0052-79/1 .... p0536 N80-26779*#
DOE/NASA/0056-79/1 .... p0526 N80-22787*#
DOE/NASA/0058-79/2-VOL-1 .... p0528 N80-23775*#
DOE/NASA/0069-79/1 .... p0526 N80-22778*#
DOE/NASA/0091-80/1 .... p0561 N80-26212*#
DOE/NASA/0124-1 .... p0356 N80-28255*#
DOE/NASA/0161-2 .... p0528 N80-23769*#
DOE/NASA/0161-79/3 .... p0527 N80-23768*#
DOE/NASA/0794-80/1 .... p0551 N80-22777*#
DOE/NASA/1002-80/5 .... p0427 N80-23777*#
DOE/NASA/1034-8 .... p0558 N80-25779*#
DOE/NASA/1040-80/14 .... p0337 N80-23779*#
DOE/NASA/1044-6 .... p0558 N80-25780*#
DOE/NASA/1044-7 .... p0557 N80-24756*#
DOE/NASA/1044-9 .... p0356 N80-27805*#
DOE/NASA/2593-79/8 .... p0481 N80-22776*#
DOE/NASA/2674-80/9 .... p0337 N80-23780*#
DOE/NASA/2674-80/10 .... p0528 N80-23778*#
DOE/NASA/2749-79/1-VOL-1 .... p0530 N80-24620*#
DOE/NASA/2749-79/3-VOL-3 .... p0530 N80-24621*#
DOE/NASA/3139-1 .... p0536 N80-26774*#

DOE/NASA/3277-1 .... p0355 N80-27803*#
DOE/RA-0044 .... p0342 N80-24736 #
DOE/RA-0047 .... p0557 N80-25769 #
DOE/R5/10129-1 .... p0500 N80-26858 #
DOE/R5/10140-1 .... p0429 N80-23852 #
DOE/SEA-1109-20401-79/2 .... p0533 N80-25807 #
DOE/SF/10538-1 .... p0531 N80-24809 #
DOE/SF/23047-3 .... p0452 N80-26828 #
DOE/TIC-4579-R10-SUPPL-7 .... p0567 N80-25203 #
DOE/TIC-4585-R1-SUPPL-3 .... p0567 N80-22846 #
DOE/TIC-4585-R1-SUPPL-4 .... p0567 N80-25204 #
DOE/TIC-10203-APP-A .... p0344 N80-24870 #

DOT/RSPA/DPB/50-79/8 .... p0355 N80-27239 #

DP-1529 .... p0440 N80-24867 #

DREO-R-822 .... p0564 N80-27814 #

DSE-2553-79/1 .... p0531 N80-24861 #
DSE-4042-T2 .... p0498 N80-26533 #
DSE-4042-T28 .... p0452 N80-26819 #
DSE-5216-T4 .... p0446 N80-25873 #
DSE-5221-T1 .... p0442 N80-25798 #

DSE/5216-T3 .... p0428 N80-23815 #
DSE/5221-T1 .... p0429 N80-23836 #

D180-25969-1-VOL-1 .... p0542 N80-27809*#
D180-25969-2-VOL-2 .... p0543 N80-27810*#
D180-25969-3-VOL-3 .... p0543 N80-27811*#
D180-25969-4-VOL-4 .... p0543 N80-27812*#
D180-25969-5-VOL-5 .... p0457 N80-27813*#

E-150 .... p0481 N80-22776*#
E-260 .... p0493 N80-26426*#
E-383 .... p0427 N80-23777*#
E-409 .... p0337 N80-23779*#
E-412 .... p0426 N80-23180*#
E-424 .... p0527 N80-23102*#
E-428 .... p0551 N80-22788*#
E-429 .... p0482 N80-23472*#
E-434 .... p0337 N80-23780*#
E-445 .... p0341 N80-24316*#
E-454 .... p0558 N80-25780*#
E-457 .... p0558 N80-25779*#
E-459 .... p0557 N80-24756*#
E-485 .... p0502 N80-27509*#
E-492 .... p0502 N80-27510*#
E-504 .... p0356 N80-27805*#

ECDP/B-5 .... p0346 N80-25481 #

EPI-79-42 .... p0443 N80-25811 #

EMD-80-11 .... p0343 N80-24814 #
EMD-80-14 .... p0535 N80-25910 #

EPA-450/3-79-006 .... p0345 N80-24890 #
EPA-450/4-79-020 .... p0350 N80-25919 #
EPA-460/3-78-011A .... p0350 N80-25930 #
EPA-600/2-79-202 .... p0351 N80-25947 #
EPA-600/7-78-007 .... p0504 N80-27536 #
EPA-600/7-79-136 .... p0346 N80-24898 #
EPA-600/7-79-140 .... p0336 N80-22895 #
EPA-600/7-79-167A .... p0336 N80-22888 #
EPA-600/7-79-167B .... p0336 N80-22889 #
EPA-600/7-79-228A-VOL-1 .... p0334 N80-22527 #
EPA-600/7-79-228B-VOL-2 .... p0334 N80-22528 #
EPA-600/7-79-231-A .... p0341 N80-23904 #
EPA-600/7-79-236 .... p0345 N80-24896 #
EPA-600/7-79-250 .... p0346 N80-25481 #
EPA-600/7-79-255 .... p0351 N80-25943 #

EPRI-AF-884 .... p0497 N80-26529 #
EPRI-AF-1144 .... p0481 N80-22852 #
EPRI-AF-1230 .... p0538 N80-27192 #
EPRI-AF-1297 .... p0498 N80-26530 #

EPRI-EM-1188 .... p0555 N80-23796 #
EPRI-EM-1261 .... p0352 N80-26627 #

EPRI-ER-1070-VOL-2 .... p0338 N80-23786 #
EPRI-ER-1113-SR .... p0531 N80-24834 #

ER-79-10327U .... p0352 N80-26749 #

ERC-L1B-79168 .... p0356 N80-28255*#

ERG-79-3 .... p0349 N80-25892 #
ERG-030 .... p0562 N80-26880 #

ESA-TT-582 .... p0463 N80-23865 #
ESA-TT-632 .... p0448 N80-26255 #

ESG-DOE-13259 .... p0558 N80-25861 #

ESG-79-2-VOL-1 .... p0446 N80-25875 #
ESG-79-2-VOL-2-BK-1 .... p0447 N80-25876 #
ESG-79-2-VOL-4 .... p0558 N80-25803 #

EUR-6646-PT-2 .... p0564 N80-27818 #

E80-10142 .... p0499 N80-26729*#

FAA/EE-79-20 .... p0355 N80-27355 #

FC-5237-2 .... p0537 N80-26864 #

FE-1548-T2 .... p0487 N80-24501 #
FE-1800-39-VOL-1 .... p0499 N80-26545 #
FE-1800-39-VOL-2 .... p0499 N80-26546 #
FE-1800-42 .... p0490 N80-25473 #
FE-1806-48 .... p0337 N80-23662 #
FE-1806-76 .... p0536 N80-26671 #
FE-1806-78 .... p0499 N80-26669 #
FE-2007-T1 .... p0487 N80-24499 #
FE-2030-13 .... p0485 N80-24476 #
FE-2034-16 .... p0486 N80-24488 #
FE-2034-17 .... p0489 N80-25398 #
FE-2202-51 .... p0498 N80-26534 #
FE-2244-26 .... p0498 N80-26543 #
FE-2270-46 .... p0497 N80-26528 #
FE-2274-7 .... p0489 N80-25461 #
FE-2286-44 .... p0490 N80-25472 #
FE-2307-50 .... p0503 N80-27517 #
FE-2307-55 .... p0503 N80-27516 #
FE-2307-58 .... p0503 N80-27515 #
FE-2315-43 .... p0486 N80-24482 #
FE-2346-49 .... p0483 N80-23808 #
FE-2416-43-VOL-1 .... p0484 N80-24467 #
FE-2416-43-VOL-2 .... p0485 N80-24468 #
FE-2416-43-VOL-3 .... p0337 N80-23485 #
FE-2416-43-VOL-4A .... p0485 N80-24469 #
FE-2416-43-VOL-4B .... p0485 N80-24470 #
FE-2416-43-VOL-5 .... p0488 N80-24808 #
FE-2437-T1-ADD .... p0490 N80-25463 #
FE-2468-44 .... p0480 N80-22521 #
FE-2468-51 .... p0485 N80-24479 #
FE-2468-53 .... p0334 N80-22649 #
FE-2489-45 .... p0334 N80-22520 #
FE-2514-M4 .... p0490 N80-25471 #
FE-2518-24 .... p0497 N80-26525 #
FE-2537-10 .... p0489 N80-25460 #
FE-2566-25 .... p0480 N80-22519 #
FE-2566-26 .... p0480 N80-22518 #
FE-2689-5 .... p0497 N80-26524 #
FE-2798-66 .... p0482 N80-23484 #
FE-2798-74 .... p0491 N80-25476 #
FE-2893-33 .... p0491 N80-25474 #
FE-2893-37 .... p0491 N80-25475 #
FE-3125-8 .... p0500 N80-26832 #
FE-3177-3 .... p0482 N80-23482 #
FE-8881-1 .... p0483 N80-23757 #

FPA-AU-1499 .... p0530 N80-23862 #

FR-79-10052 .... p0427 N80-23771*#
FR-4500-01-80 .... p0560 N80-26210*#
FR-4500-09-79-11 .... p0559 N80-26202*#

FWDC-9-41-4010 .... p0438 N80-24826 #

GA-A-15322 .... p0335 N80-22837 #

GE79ET0102 .... p0342 N80-24797*#

GPO-53-020 .... p0352 N80-26786 #

HCP/I-1321-01/1 .... p0342 N80-24802 #
HCP/J6639-01 .... p0334 N80-22523 #

HONEYWELL-80SRC8 .... p0530 N80-24757*#

HUD-PDR-455 .... p0456 N80-26873 #

ID-80-7 .... p0356 N80-28244 #

REPORT/ACCESSION NUMBER INDEX

IEEE PAPER F 79 651-1 .... p0525 A80-43502

IPR-2 .... p0337 N80-23485 #
IPR-2 .... p0488 N80-24808 #

IPPJ-454 .... p0538 N80-28195 #

ISBN-0-309-02979-1 .... p0340 N80-23866 #
ISBN-0-7988-1463-2 .... p0528 N80-23781 #
ISBN-0-7988-1721-6 .... p0499 N80-26549 #
ISBN-3-7041-0050-1 .... p0456 N80-26879 #

ISSN-0077-5606 .... p0484 N80-24462 #
ISSN-0110-1692 .... p0338 N80-23803 #
ISSN-0361-1981 .... p0340 N80-23866 #

JHU/APL/EQR/79-4 .... p0538 N80-27825 #

JPL-PUB-79-98 .... p0334 N80-22782*#
JPL-PUB-79-103-VOL-2 .... p0423 N80-22784*#
JPL-PUB-79-103-VOL-3 .... p0423 N80-22785*#
JPL-PUB-79-112-VOL-2 .... p0432 N80-24751*#
JPL-PUB-79-118-VOL-1 .... p0432 N80-24750*#
JPL-PUB-79-118-VOL-2 .... p0449 N80-26770*#
JPL-PUB-79-122 .... p0491 N80-25764*#
JPL-PUB-80-3 .... p0336 N80-23214*#
JPL-PUB-80-10 .... p0433 N80-24760*#
JPL-PUB-80-13 .... p0336 N80-23215*#
JPL-PUB-80-15 .... p0484 N80-24464*#
JPL-PUB-80-22 .... p0449 N80-26768*#
JPL-PUB-80-25 .... p0449 N80-26771*#
JPL-PUB-80-29 .... p0432 N80-24753*#
JPL-PUB-80-31 .... p0432 N80-24752*#
JPL-PUB-80-34 .... p0432 N80-24755*#
JPL-PUB-80-41 .... p0352 N80-26772*#
JPL-PUB-80-42 .... p0536 N80-26769*#

JPL-80-32 .... p0342 N80-24754*#
JPL-9950-37 .... p0559 N80-26201*#
JPL-9950-310 .... p0487 N80-24728*#
JPL-9950-324 .... p0427 N80-23771*#
JPL-9950-325 .... p0427 N80-23772*#
JPL-9950-330 .... p0564 N80-28245*#
JPL-9950-330 .... p0564 N80-28246*#
JPL-9950-330 .... p0565 N80-28247*#
JPL-9950-330 .... p0565 N80-28248*#
JPL-9950-330 .... p0565 N80-28249*#
JPL-9950-330 .... p0565 N80-28250*#
JPL-9950-330 .... p0565 N80-28251*#
JPL-9950-330 .... p0565 N80-28252*#
JPL-9950-334 .... p0560 N80-26206*#
JPL-9950-334-APP-A .... p0560 N80-26207*#
JPL-9950-334-APP-B-VOL-1 .... p0559 N80-26203*#
JPL-9950-334-APP-B-VOL-2 .... p0559 N80-26204*#
JPL-9950-334-APP-B-VOL-3 .... p0560 N80-26205*#
JPL-9950-334-APP-C .... p0560 N80-26208*#
JPL-9950-334-APP-D .... p0560 N80-26209*#
JPL-9950-337 .... p0559 N80-26202*#
JPL-9950-337 .... p0560 N80-26210*#
JPL-9950-342 .... p0441 N80-25782*#
JPL-9950-351 .... p0450 N80-26777*#
JPL-9950-353 .... p0449 N80-26776*#
JPL-9950-355 .... p0562 N80-27222*#
JPL-9950-355 .... p0562 N80-27223*#
JPL-9950-355-APP-B .... p0563 N80-27224*#
JPL-9950-355-APP-B1-B4 .... p0563 N80-27225*#
JPL-9950-355-APP-C .... p0563 N80-27226*#
JPL-9950-355-APP-C1 .... p0563 N80-27227*#
JPL-9950-355-APP-C3 .... p0563 N80-27227*#
JPL-9950-365 .... p0450 N80-26781*#
JPL-9950-368 .... p0450 N80-26782*#
JPL-9950-371 .... p0449 N80-26409*#
JPL-9950-372 .... p0352 N80-26784*#
JPL-9950-373 .... p0542 N80-26785*#

JSC-14898 .... p0541 N80-25360*#

LA-UR-78-1213 .... p0554 N80-22838 #
LA-UR-79-2812 .... p0338 N80-23820 #
LA-UR-79-2826 .... p0530 N80-24214 #
LA-UR-79-2883 .... p0463 N80-25467 #
LA-UR-79-3098 .... p0555 N80-23801 #
LA-UR-79-3122 .... p0526 N80-22619 #
LA-UR-79-3214 .... p0335 N80-22882 #
LA-UR-79-3256 .... p0338 N80-23802 #
LA-UR-79-3390 .... p0338 N80-23807 #
LA-UR-80-184 .... p0443 N80-25817 #
LA-UR-80-387 .... p0453 N80-26835 #
LA-UR-80-837 .... p0464 N80-26538 #
LA-UR-80-854 .... p0454 N80-26847 #

LA-7963 .... p0483 N80-23795 #
LA-7982-MS .... p0426 N80-23651 #
LA-8044-TASE .... p0527 N80-22840 #
LA-8133-PR .... p0486 N80-24487 #
LA-8199-PR .... p0558 N80-25805 #

LBL-9295 .... p0437 N80-24820 #
LBL-9321 .... p0437 N80-24816 #
LBL-9324-REV .... p0428 N80-23810 #
LBL-9383 .... p0349 N80-25881 #
LBL-9412 .... p0439 N80-24840 #
LBL-9472 .... p0424 N80-22839 #
LBL-9621 .... p0482 N80-23399 #
LBL-9630 .... p0350 N80-25904 #
LBL-9816 .... p0348 N80-25849 #
LBL-9939 .... p0338 N80-23794 #
LBL-10090 .... p0504 N80-27703 #
LBL-10092 .... p0487 N80-24490 #
LBL-10098 .... p0353 N80-26817 #

LC-79-607912 .... p0340 N80-23866 #
LC-80-600001 .... p0351 N80-26219 #
LC-80-607024 .... p0456 N80-27219*#

LETC-10787-25 .... p0483 N80-23755 #

LMSC-D715827 .... p0431 N80-24345*#
LMSC-D715841 .... p0431 N80-24344*#

METC-8085-T2 .... p0487 N80-24498 #

MRC-DA-867 .... p0429 N80-23817 #

MTI-75TR59 .... p0555 N80-23661 #
MTI-79TR47 .... p0526 N80-22787*#

MTR-79W00188-VOL-1 .... p0567 N80-22862 #
MTR-79W00188-VOL-2 .... p0541 N80-22863 #
MTR-7919 .... p0439 N80-24836 #

NASA-CASE-MFS-23720-1 .... p0483 N80-23711*

NASA-CASE-NPO-14558-1 .... p0488 N80-24906*
NASA-CASE-NPO-14635-1 .... p0431 N80-24741*
NASA-CASE-NPO-14876-1 .... p0493 N80-26460*#
NASA-CASE-NPO-15071-1 .... p0432 N80-24747*#

NASA-CP-2125 .... p0551 N80-22788*#

NASA-CR-3261 .... p0334 N80-22326*#
NASA-CR-135119 .... p0355 N80-27361*#
NASA-CR-153188 .... p0427 N80-23771*#
NASA-CR-159495 .... p0528 N80-23775*#
NASA-CR-159502 .... p0536 N80-26774*#
NASA-CR-159587 .... p0526 N80-22787*#
NASA-CR-159592 .... p0526 N80-22778*#
NASA-CR-159609 .... p0530 N80-24758*#
NASA-CR-159609 .... p0536 N80-26775*#
NASA-CR-159634 .... p0536 N80-26779*#
NASA-CR-159670 .... p0530 N80-24620*#
NASA-CR-159672 .... p0530 N80-24621*#
NASA-CR-159715 .... p0432 N80-24751*#
NASA-CR-159738 .... p0551 N80-22777*#
NASA-CR-159756 .... p0555 N80-23216*#
NASA-CR-159759 .... p0347 N80-25792*#
NASA-CR-159760 .... p0347 N80-25793*#
NASA-CR-159762 .... p0347 N80-25794*#
NASA-CR-159764 .... p0347 N80-25795*#
NASA-CR-159765 .... p0342 N80-24797*#
NASA-CR-159771 .... p0561 N80-26212*#
NASA-CR-159786 .... p0355 N80-27364*#
NASA-CR-159806 .... p0346 N80-25332*#
NASA-CR-159822 .... p0550 N80-22702*#
NASA-CR-159828 .... p0527 N80-23768*#
NASA-CR-159835 .... p0356 N80-28255*#
NASA-CR-159852 .... p0527 N80-23315*#
NASA-CR-159856 .... p0355 N80-27803*#
NASA-CR-159857 .... p0431 N80-24742*#
NASA-CR-159875 .... p0528 N80-23769*#
NASA-CR-160582 .... p0540 N80-22378*#
NASA-CR-160734 .... p0538 N80-27801*#
NASA-CR-160742 .... p0542 N80-27809*#
NASA-CR-160743 .... p0543 N80-27810*#
NASA-CR-160744 .... p0543 N80-27811*#
NASA-CR-160745 .... p0543 N80-27812*#
NASA-CR-160746 .... p0457 N80-27813*#

NASA-CR-161392 .... p0424 N80-22856*#
NASA-CR-161413 .... p0423 N80-22774*#
NASA-CR-161414 .... p0423 N80-22781*#
NASA-CR-161420 .... p0431 N80-24744*#
NASA-CR-161421 .... p0432 N80-24745*#
NASA-CR-161422 .... p0432 N80-24746*#
NASA-CR-161434 .... p0427 N80-23774*#
NASA-CR-161435 .... p0427 N80-23776*#
NASA-CR-161436 .... p0456 N80-27800*#
NASA-CR-161437 .... p0441 N80-25786*#
NASA-CR-161442 .... p0441 N80-25784*#
NASA-CR-161443 .... p0442 N80-25788*#
NASA-CR-161444 .... p0449 N80-26766*#
NASA-CR-161449 .... p0441 N80-25783*#
NASA-CR-161450 .... p0441 N80-25787*#
NASA-CR-161451 .... p0530 N80-24757*#
NASA-CR-161452 .... p0431 N80-24345*#
NASA-CR-161453 .... p0431 N80-24344*#
NASA-CR-161464 .... p0442 N80-25790*#
NASA-CR-161465 .... p0442 N80-25791*#
NASA-CR-161466 .... p0450 N80-26778*#
NASA-CR-161467 .... p0437 N80-24798*#
NASA-CR-161469 .... p0484 N80-24465*#
NASA-CR-161471 .... p0457 N80-27802*#
NASA-CR-161481 .... p0457 N80-27806*#
NASA-CR-162931 .... p0541 N80-22861*#
NASA-CR-162996 .... p0334 N80-22782*#
NASA-CR-162997 .... p0336 N80-23214*#
NASA-CR-162999 .... p0423 N80-22784*#
NASA-CR-163000 .... p0423 N80-22785*#
NASA-CR-163013 .... p0432 N80-24752*#
NASA-CR-163023 .... p0449 N80-26770*#
NASA-CR-163027 .... p0450 N80-26777*#
NASA-CR-163028 .... p0449 N80-26776*#
NASA-CR-163029 .... p0449 N80-26409*#
NASA-CR-163033 .... p0450 N80-26781*#
NASA-CR-163034 .... p0562 N80-27222*#
NASA-CR-163035 .... p0562 N80-27223*#
NASA-CR-163036 .... p0563 N80-27224*#
NASA-CR-163037 .... p0563 N80-27225*#
NASA-CR-163038 .... p0563 N80-27226*#
NASA-CR-163039 .... p0563 N80-27227*#
NASA-CR-163042 .... p0352 N80-26784*#
NASA-CR-163043 .... p0542 N80-26785*#
NASA-CR-163059 .... p0336 N80-23215*#
NASA-CR-163061 .... p0531 N80-24812*#
NASA-CR-163133 .... p0427 N80-23772*#
NASA-CR-163134 .... p0528 N80-23818*#
NASA-CR-163135 .... p0433 N80-24760*#
NASA-CR-163141 .... p0487 N80-24728*#
NASA-CR-163143 .... p0432 N80-24753*#
NASA-CR-163147 .... p0432 N80-24750*#
NASA-CR-163148 .... p0342 N80-24754*#
NASA-CR-163151 .... p0432 N80-24755*#
NASA-CR-163152 .... p0484 N80-24464*#
NASA-CR-163160 .... p0499 N80-26729*#
NASA-CR-163208 .... p0441 N80-25782*#
NASA-CR-163218 .... p0533 N80-25785*#
NASA-CR-163219 .... p0564 N80-28245*#
NASA-CR-163220 .... p0564 N80-28246*#
NASA-CR-163221 .... p0565 N80-28247*#
NASA-CR-163222 .... p0565 N80-28248*#
NASA-CR-163223 .... p0565 N80-28249*#
NASA-CR-163224 .... p0565 N80-28250*#
NASA-CR-163225 .... p0565 N80-28251*#
NASA-CR-163226 .... p0565 N80-28252*#
NASA-CR-163227 .... p0559 N80-26203*#
NASA-CR-163228 .... p0559 N80-26204*#
NASA-CR-163229 .... p0560 N80-26205*#
NASA-CR-163230 .... p0560 N80-26206*#
NASA-CR-163231 .... p0560 N80-26207*#
NASA-CR-163232 .... p0560 N80-26208*#
NASA-CR-163233 .... p0560 N80-26209*#
NASA-CR-163235 .... p0560 N80-26210*#
NASA-CR-163259 .... p0491 N80-25764*#
NASA-CR-163265 .... p0536 N80-26769*#
NASA-CR-163267 .... p0352 N80-26772*#
NASA-CR-163274 .... p0449 N80-26768*#
NASA-CR-163277 .... p0449 N80-26771*#
NASA-CR-163289 .... p0450 N80-26782*#
NASA-CR-163298 .... p0563 N80-27231*#
NASA-CR-163311 .... p0492 N80-25770*#
NASA-CR-163330 .... p0559 N80-26201*#
NASA-CR-163331 .... p0559 N80-26202*#
NASA-CR-163339 .... p0537 N80-26859*#

NASA-SP-442 .... p0456 N80-27219*#

NASA-TM-75810 .... p0499 N80-26663*#

NASA-TM-78286 .... p0457 N80-27807*#
NASA-TM-79243 .... p0481 N80-22776*#
NASA-TM-80677 .... p0442 N80-25789*#
NASA-TM-81000 .... p0541 N80-25360*#
NASA-TM-81464 .... p0427 N80-23777*#
NASA-TM-81475 .... p0337 N80-23779*#
NASA-TM-81478 .... p0426 N80-23180*#
NASA-TM-81486 .... p0527 N80-23102*#
NASA-TM-81492 .... p0482 N80-23472*#
NASA-TM-81497 .... p0337 N80-23780*#
NASA-TM-81507 .... p0341 N80-24316*#
NASA-TM-81510 .... p0528 N80-23778*#
NASA-TM-81511 .... p0493 N80-26426*#
NASA-TM-81513 .... p0558 N80-25780*#
NASA-TM-81514 .... p0558 N80-25779*#
NASA-TM-81515 .... p0557 N80-24756*#
NASA-TM-81533 .... p0502 N80-27509*#
NASA-TM-81538 .... p0502 N80-27510*#
NASA-TM-81548 .... p0356 N80-27805*#
NASA-TM-81813 .... p0532 N80-25104*#

NBS-GCR-79-180 .... p0441 N80-24878 #
NBS-GCR-79-184 .... p0430 N80-23869 #

NBS/DIM-63/11 .... p0541 N80-25195 #
NBS/DIM-63/12 .... p0489 N80-25196 #

NBSIR-79-1783 .... p0344 N80-24873 #
NBSIR-79-1908 .... p0430 N80-23867 #
NBSIR-79-1917 .... p0430 N80-23868 #
NBSIR-79-1950 .... p0541 N80-24507 #
NBSIR-79-1957 .... p0457 N80-27827 #

NESEC-6 .... p0429 N80-23826 #

NMEI-23 .... p0457 N80-27828 #
NMEI-44 .... p0532 N80-24875 #
NMEI-46 .... p0441 N80-24874 #

NP-24016 .... p0353 N80-26833 #
NP-24137 .... p0482 N80-23476 #
NP-24196 .... p0341 N80-24146 #

NRC/CNR-TT-1963 .... p0484 N80-24462 #

NSF/RA-790175 .... p0504 N80-27795 #
NSF/RA-790260 .... p0567 N80-22862 #
NSF/RA-790261 .... p0541 N80-22863 #
NSF/RA-790296 .... p0487 N80-24504 #
NSF/RA-790297 .... p0493 N80-25909 #
NSF/RA-790330 .... p0447 N80-25906 #
NSF/RA-790331 .... p0447 N80-25907 #
NSF/RA-790345 .... p0354 N80-26881 #
NSF/RA/790088 .... p0493 N80-25908 #

NSR-2-15 .... p0531 N80-24812*#

NTIS/PS-75/089 .... p0425 N80-22872 #
NTIS/PS-75/137 .... p0425 N80-22871 #
NTIS/PS-75/345 .... p0425 N80-22866 #
NTIS/PS-75/689 .... p0425 N80-22866 #
NTIS/PS-75/692 .... p0425 N80-22871 #
NTIS/PS-75/693 .... p0425 N80-22872 #
NTIS/PS-76/0727 .... p0425 N80-22866 #
NTIS/PS-76/0728 .... p0425 N80-22865 #
NTIS/PS-76/0855 .... p0425 N80-22871 #
NTIS/PS-76/0929 .... p0425 N80-22872 #
NTIS/PS-76/0930 .... p0426 N80-22873 #
NTIS/PS-77/0305 .... p0503 N80-27525 #
NTIS/PS-77/0305 .... p0503 N80-27526 #
NTIS/PS-77/0827 .... p0425 N80-22866 #
NTIS/PS-77/0829 .... p0425 N80-22865 #
NTIS/PS-77/1036 .... p0425 N80-22871 #
NTIS/PS-77/1051 .... p0425 N80-22872 #
NTIS/PS-77/1052 .... p0426 N80-22873 #
NTIS/PS-78/0054 .... p0491 N80-25479 #
NTIS/PS-78/1015 .... p0425 N80-22866 #
NTIS/PS-78/1017 .... p0425 N80-22865 #
NTIS/PS-78/1213 .... p0425 N80-22872 #
NTIS/PS-78/1214 .... p0426 N80-22873 #
NTIS/PS-78/1341 .... p0425 N80-22871 #
NTIS/PS-78/1342 .... p0425 N80-22869 #
NTIS/PS-79/0030 .... p0491 N80-25479 #
NTIS/PS-79/0038 .... p0346 N80-25678 #
NTIS/PS-79/0039 .... p0347 N80-25679 #
NTIS/PS-79/0375 .... p0503 N80-27526 #
NTIS/PS-79/0516 .... p0503 N80-27525 #

NTPSC/WP-79-37 .... p0342 N80-24503 #

REPORT/ACCESSION NUMBER INDEX

NUREG-CR-0990 .... p0336 N80-22883 #

NWC-TP-6062 .... p0488 N80-24799 #

NZERDC-44 .... p0338 N80-23803 #
NZERDC-46 .... p0489 N80-25456 #
NZERDC-46-APP .... p0489 N80-25457 #

ONERA-NT-1979-6 .... p0448 N80-26255 #

ORAU/IEA(M)-79-20 .... p0347 N80-25804 #
ORAU/IEA(M)-79-22 .... p0339 N80-23841 #
ORAU/IEA(M)-79-24 .... p0339 N80-23849 #
ORAU/IEA(M)-79-25 .... p0339 N80-23848 #
ORAU/IEA-79-21(M) .... p0344 N80-24869 #
ORAU/IEA-79-23(M) .... p0343 N80-24852 #

ORNL-TM-7095 .... p0481 N80-22853 #

ORNL-5439 .... p0485 N80-24471 #

ORNL/MIT-290 .... p0527 N80-23400 #
ORNL/SUB-7226/1 .... p0529 N80-23850 #
ORNL/SUB-7240/6 .... p0463 N80-25464 #
ORNL/TM-6253 .... p0528 N80-23821 #
ORNL/TM-6951 .... p0344 N80-24868 #
ORNL/TM-7031 .... p0482 N80-22855 #
ORNL/TM-7057 .... p0481 N80-22854 #
ORNL/TM-7061 .... p0529 N80-23839 #
ORNL/TM-7144 .... p0484 N80-23828 #
ORNL/TN-6777 .... p0334 N80-22764 #

ORO-5135-77-5 .... p0529 N80-23846 #
ORO-5135-77-5-SUMM .... p0529 N80-23845 #
ORO-5301-47 .... p0500 N80-26754 #
ORO-5759-T1 .... p0557 N80-24866 #
ORO-5912-T1 .... p0484 N80-23840 #
ORO-5912-T2 .... p0503 N80-27514 #

OTA-T-106 .... p0351 N80-26219 #

OWRT-A-057-IDA(2) .... p0504 N80-27824 #

P-1006 .... p0550 N80-22702*#

PB80-102791 .... p0336 N80-22895 #
PB80-112972 .... p0567 N80-22862 #
PB80-112980 .... p0541 N80-22863 #
PB80-125636 .... p0540 N80-22770 #
PB80-125891 .... p0430 N80-23869 #
PB80-126469 .... p0334 N80-22527 #
PB80-126477 .... p0334 N80-22528 #
PB80-126956 .... p0345 N80-24876 #
PB80-126980 .... p0341 N80-23904 #
PB80-127053 .... p0441 N80-24878 #
PB80-128457 .... p0345 N80-24896 #
PB80-129828 .... p0430 N80-23868 #
PB80-130701 .... p0489 N80-25196 #
PB80-132038 .... p0430 N80-23867 #
PB80-133168 .... p0336 N80-22888 #
PB80-133176 .... p0336 N80-22889 #
PB80-133853 .... p0344 N80-24873 #
PB80-134596 .... p0541 N80-24507 #
PB80-134836 .... p0351 N80-25940 #
PB80-135270 .... p0346 N80-24898 #
PB80-137953 .... p0340 N80-23866 #
PB80-137961 .... p0351 N80-25943 #
PB80-138464 .... p0351 N80-25947 #
PB80-138498 .... p0342 N80-24503 #
PB80-139306 .... p0487 N80-24504 #
PB80-140510 .... p0345 N80-24890 #
PB80-140973 .... p0493 N80-25908 #
PB80-140981 .... p0493 N80-25909 #
PB80-141286 .... p0532 N80-24875 #
PB80-141294 .... p0441 N80-24874 #
PB80-141542 .... p0541 N80-25195 #
PB80-141781 .... p0350 N80-25936 #
PB80-143175 .... p0535 N80-25910 #
PB80-144363 .... p0447 N80-25906 #
PB80-146905 .... p0350 N80-25919 #
PB80-147622 .... p0346 N80-25481 #
PB80-148182 .... p0354 N80-26882 #
PB80-149800 .... p0350 N80-25930 #
PB80-150790 .... p0354 N80-26881 #
PB80-151442 .... p0499 N80-26549 #
PB80-153323 .... p0351 N80-26219 #
PB80-153836 .... p0447 N80-25907 #
PB80-153968 .... p0457 N80-27827 #
PB80-155278 .... p0355 N80-27239 #
PB80-157399 .... p0504 N80-27824 #
PB80-157662 .... p0504 N80-27795 #
PB80-158769 .... p0458 N80-27829 #
PB80-160443 .... p0457 N80-27828 #
PB80-162720 .... p0356 N80-28244 #
PB80-163686 .... p0538 N80-27825 #
PB80-164874 .... p0504 N80-27535 #
PB80-164890 .... p0504 N80-27536 #
PB80-801707 .... p0424 N80-22864 #
PB80-801715 .... p0425 N80-22866 #
PB80-801723 .... p0425 N80-22865 #
PB80-801731 .... p0425 N80-22868 #
PB80-801749 .... p0425 N80-22867 #
PB80-802226 .... p0425 N80-22872 #
PB80-802234 .... p0426 N80-22873 #
PB80-802697 .... p0541 N80-22861*#
PB80-803778 .... p0425 N80-22870 #
PB80-803786 .... p0425 N80-22871 #
PB80-803794 .... p0425 N80-22869 #
PB80-804800 .... p0492 N80-25770*#
PB80-805245 .... p0491 N80-25478 #
PB80-805252 .... p0491 N80-25479 #
PB80-805401 .... p0346 N80-25678 #
PB80-805419 .... p0347 N80-25679 #
PB80-807936 .... p0457 N80-27823 #
PB80-808082 .... p0503 N80-27527 #
PB80-808090 .... p0503 N80-27525 #
PB80-808108 .... p0503 N80-27526 #

PNL-SA-6918-REV-1 .... p0488 N80-24966 #
PNL-SA-7270 .... p0530 N80-23947 #
PNL-SA-7603 .... p0493 N80-25878 #
PNL-SA-7669 .... p0557 N80-24810 #
PNL-SA-7698 .... p0430 N80-23859 #
PNL-SA-7967 .... p0538 N80-27817 #
PNL-SA-8266 .... p0490 N80-25465 #

PNL-2974 .... p0561 N80-26804 #
PNL-3047 .... p0556 N80-23823 #
PNL-3062 .... p0555 N80-23793 #
PNL-3072 .... p0492 N80-25865 #
PNL-3080 .... p0336 N80-22883 #
PNL-3094 .... p0336 N80-23131 #

PR-3 .... p0345 N80-24884 #
PR-39 .... p0528 N80-23818*#

PRS-41 .... p0345 N80-24896 #

PT-5613 .... p0542 N80-26785*#

PWA-5515-114 .... p0346 N80-25332*#

QPR-4 .... p0498 N80-26535 #

QR-1 .... p0527 N80-23768*#
QR-2 .... p0528 N80-23769*#
QR-2 .... p0439 N80-24839 #
QR-3 .... p0484 N80-23840 #
QR-3 .... p0452 N80-26828 #
QR-5 .... p0497 N80-26524 #
QR-8 .... p0490 N80-25468 #
QR-18 .... p0486 N80-24484 #

QTPR-3 .... p0533 N80-25799 #
QTPR-3 .... p0452 N80-26819 #
QTPR-3 .... p0500 N80-26832 #

REPT-60 .... p0482 N80-22855 #
REPT-61 .... p0481 N80-22854 #
REPT-65 .... p0353 N80-26833 #
REPT-79-65-RE .... p0353 N80-26808 #
REPT-79-72-RE .... p0352 N80-26568 #
REPT-80-9E6-MARED-R1 .... p0527 N80-23768*#
REPT-4500-92-9-R1 .... p0561 N80-26805 #

RFP-2974/3533-79-2 .... p0534 N80-25889 #
RFP-2992/3533/79-3 .... p0529 N80-23831 #
RFP-3000 .... p0534 N80-25888 #

RI/RD78-207-1 .... p0561 N80-26796 #

RLO-2342-79/1 .... p0489 N80-24968 #

RTI-41U-1678 .... p0450 N80-26797 #

R80AEG218 .... p0355 N80-27364*#

SAN-0034-239-T1 .... p0445 N80-25852 #
SAN-0115-140-1 .... p0447 N80-25903 #
SAN-1241-3 .... p0490 N80-25466 #
SAN-1483-1/1 .... p0446 N80-25875 #
SAN-1483-1/2 .... p0447 N80-25876 #
SAN-1483-1/5 .... p0558 N80-25803 #
SAN-1485-T1 .... p0534 N80-25846 #
SAN-1485-2 .... p0534 N80-25848 #
SAN-1604-3 .... p0451 N80-26801 #
SAN-1740-2 .... p0492 N80-25868 #
SAN-1864-1 .... p0488 N80-24849 #
SAN-2073-1 .... p0444 N80-25826 #
SAN-2418-1 .... p0503 N80-27524 #
SAN-11276-1 .... p0534 N80-25847 #

SAND-78-7072-VOL-1/2 .... p0453 N80-26830 #
SAND-79-1753 .... p0537 N80-26857 #
SAND-79-1781 .... p0439 N80-24842 #
SAND-79-1782C .... p0557 N80-24803 #
SAND-79-1984C .... p0535 N80-25897 #
SAND-79-2319A .... p0481 N80-22614 #
SAND-79-7002-VOL-2 .... p0429 N80-23837 #
SAND-79-7007 .... p0556 N80-23824 #
SAND-79-7019 .... p0561 N80-26803 #
SAND-79-7020-VOL-2 .... p0455 N80-26866 #
SAND-79-7022-VOL-1 .... p0534 N80-25870 #
SAND-79-7022-VOL-2 .... p0537 N80-26800 #
SAND-79-7025 .... p0555 N80-23661 #
SAND-79-7048 .... p0445 N80-25843 #
SAND-79-7051-VOL-1 .... p0449 N80-26611 #
SAND-79-7077 .... p0451 N80-26802 #
SAND-79-7088 .... p0561 N80-26805 #
SAND-79-7089 .... p0559 N80-25879 #
SAND-79-7096 .... p0556 N80-23851 #
SAND-79-7127 .... p0492 N80-25863 #
SAND-79-8188 .... p0555 N80-22845 #
SAND-79-8208 .... p0541 N80-23825 #
SAND-79-8248 .... p0428 N80-23806 #
SAND-79-8266 .... p0448 N80-26075 #
SAND-79-8636 .... p0431 N80-24495 #
SAND-79-8647 .... p0463 N80-23797 #
SAND-79-8754 .... p0445 N80-25858 #
SAND-79-8777 .... p0439 N80-24833 #
SAND-80-0057C .... p0492 N80-25766 #
SAND-80-0142C .... p0430 N80-23853 #
SAND-80-0143C .... p0439 N80-24832 #
SAND-80-0309C .... p0492 N80-25859 #
SAND-80-0379C .... p0499 N80-26608 #
SAND-80-7004 .... p0535 N80-25912 #
SAND-80-7005C .... p0445 N80-25860 #
SAND-80-8205 .... p0562 N80-26856 #

SAPR-2 .... p0428 N80-23811 #
SAPR-4 .... p0453 N80-26837 #

SAR-2 .... p0454 N80-26845 #

SERI/PR-354-420 .... p0350 N80-25928 #
SERI/RR-51-332 .... p0338 N80-23805 #
SERI/SP-35-230 .... p0455 N80-26868 #
SERI/SP-35-232R .... p0455 N80-26871 #
SERI/SP-69-071 .... p0431 N80-24205 #
SERI/SP-451-519 .... p0485 N80-24478 #
SERI/TP-32-134 .... p0457 N80-27822 #
SERI/TP-33-410 .... p0463 N80-24477 #
SERI/TP-34-325 .... p0335 N80-22848 #
SERI/TP-62-299 .... p0480 N80-22516 #
SERI/TP-69-412 .... p0335 N80-22849 #
SERI/TP-332-476 .... p0439 N80-24831 #
SERI/TP-333-485 .... p0428 N80-23800 #
SERI/TP-333-497 .... p0452 N80-26820 #
SERI/TP-333-538 .... p0438 N80-24824 #
SERI/TP-334-457 .... p0437 N80-24805 #
SERI/TP-351-548 .... p0440 N80-24862 #
SERI/TP-351-559 .... p0430 N80-23856 #
SERI/TP-355-570 .... p0559 N80-25900 #
SERI/TR-33-239-VOL-2 .... p0481 N80-22524 #
SERI/TR-34-091 .... p0454 N80-26849 #
SERI/TR-35-078-VOL-2 .... p0338 N80-23799 #
SERI/TR-51-294 .... p0427 N80-23798 #
SERI/TR-62-264 .... p0341 N80-24493 #
SERI/TR-352-392 .... p0445 N80-25839 #
SERI/TR-8016-1 .... p0428 N80-23814 #

SKT-TEIL-1 .... p0456 N80-26877 #

SLAC-PUB-2477 .... p0452 N80-26822 #

SOLAR/0010-79/05 .... p0339 N80-23833 #
SOLAR/0021-79/07 .... p0454 N80-26846 #
SOLAR/0902-79/70 .... p0446 N80-25866 #
SOLAR/0906-79/70 .... p0452 N80-26824 #
SOLAR/1001-79/50 .... p0451 N80-26814 #
SOLAR/1010-79/50 .... p0444 N80-25818 #
SOLAR/1011-79/14 .... p0443 N80-25816 #
SOLAR/1015-79/50 .... p0444 N80-25821 #
SOLAR/1018-79/50 .... p0451 N80-26813 #
SOLAR/1034-79/50 .... p0451 N80-26812 #
SOLAR/1057-79/50-PT-1 .... p0451 N80-26811 #
SOLAR/1057-79/50-PT-2 .... p0451 N80-26815 #
SOLAR/1090-79/50 .... p0444 N80-25819 #

SR-79-R-4650-09 .... p0445 N80-25855 #
SR-723-8-79 .... p0483 N80-23757 #

SRD-79-134/1 .... p0560 N80-26206*#
SRD-79-134/2-APP-A .... p0560 N80-26207*#
SRD-79-134/3-APP-B-VOL-1 .... p0559 N80-26203*#
SRD-79-134/4-APP-B-VOL-2 .... p0559 N80-26204*#
SRD-79-134/5-APP-B-VOL-3 .... p0560 N80-26205*#
SRD-79-134/6-APP-C .... p0560 N80-26208*#
SRD-79-134/7-APP-D .... p0560 N80-26209*#

SRO-0893-17 .... p0558 N80-25869 #

TDC-80-005 .... p0484 N80-24465*#

TID-29430 .... p0427 N80-23791 #

TPR-1 .... p0437 N80-24821 #
TPR-77 .... p0538 N80-27801*#

TR-7903-0977 .... p0540 N80-22378*#

TRB/TRR-726 .... p0340 N80-23866 #

TRW-33682 .... p0492 N80-25797 #

TSCI0082-FR .... p0555 N80-23216*#

UCID-18561 .... p0535 N80-25893 #
UCID-18576 .... p0498 N80-26537 #

UCRL-15108 .... p0483 N80-23756 #
UCRL-15190 .... p0348 N80-25880 #
UCRL-15195 .... p0353 N80-26808 #
UCRL-15198 .... p0352 N80-26568 #
UCRL-50021-78-VOL-3 .... p0532 N80-25650 #
UCRL-52797 .... p0340 N80-23878 #
UCRL-52837 .... p0488 N8C-24964 #
UCRL-52841-VOL-2 .... p0563 N80-27232 #
UCRL-52841-VOL-3 .... p0561 N80-26213 #
UCRL-82367 .... p0429 N80-23822 #
UCRL-82852 .... p0532 N80-25161 #
UCRL-83317 .... p0337 N80-23629 #
UCRL-83458 .... p0447 N80-25905 #
UCRL-83662 .... p0564 N80-27233 #
UCRL-83813 .... p0343 N80-24859 #

UDR-TR-78-69 .... p0550 N80-22641 #

UDSE-TR-78-07 .... p0550 N80-22641 #

UILU-ENG-79-2004 .... p0485 N80-24474 #

US-PATENT-APPL-SN-008212 .... p0431 N80-24741*
US-PATENT-APPL-SN-116310 .... p0493 N80-26460*#
US-PATENT-APPL-SN-150115 .... p0432 N80-24747*#
US-PATENT-APPL-SN-848419 .... p0483 N80-23711*
US-PATENT-APPL-SN-945436 .... p0488 N80-24906*

US-PATENT-CLASS-73-12 .... p0483 N80-23711*
US-PATENT-CLASS-73-82 .... p0483 N80-23711*
US-PATENT-CLASS-73-155 .... p0488 N80-24906*
US-PATENT-CLASS-136-89SG p0431 N80-24741*
US-PATENT-CLASS-156-DIG.64 .... p0431 N80-24741*
US-PATENT-CLASS-156-605 .... p0431 N80-24741*
US-PATENT-CLASS-156-617SP p0431 N80-24741*
US-PATENT-CLASS-252-62.3E p0431 N80-24741*

US-PATENT-4,195,512 .... p0483 N80-23711*
US-PATENT-4,196,619 .... p0488 N80-24906*
US-PATENT-4,210,622 .... p0431 N80-24741*

UTC-FCR-1333-VOL-1 .... p0347 N80-25792*#
UTC-FCR-1333-VOL-2 .... p0347 N80-25793*#

REPORT/ACCESSION NUMBER INDEX

UTC-FCR-1333-VOL-4	p0347	N80-25794*#
UTC-FCR-1333-VOL-6	p0347	N80-25795*#
UWFDM-337	p0493	N80-26138 #
VPI-E-80-1-APP-2	p0458	N80-27829 #
WAES-TNR-237-VOL-1	p0532	N80-25666 #
WASH-2330-78/4-VOL-2	p0533	N80-25838 #
WASH-2330-78/4-VOL-3	p0533	N80-25837 #
WASH-2330-78/4-VOL-4	p0533	N80-25836 #
WER-10	p0355	N80-27803*#
WRC-78-182	p0527	N80-23315*#
WYLE-TR-531-40-R	p0432	N80-24745*#
N80-03918	p0504	N80-27824 #
Y-2210	p0556	N80-23832 #

☆U.S. GOVERNMENT PRINTING OFFICE:1980 735-006 /9 1-3

1. Report No. NASA SP-7043 (27)	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Energy A Continuing Bibliography (Issue 27)		5. Report Date October 1980
		6. Performing Organization Code
7. Author(s)		8. Performing Organization Report No.
		10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D.C. 20546		11. Contract or Grant No.
		13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address		14. Sponsoring Agency Code
15. Supplementary Notes		

16. Abstract

This bibliography lists 1920 reports, articles, and other documents introduced into the NASA scientific and technical information system from July 1, 1980 through September 30, 1980.

17. Key Words (Suggested by Author(s)) Bibliographies Energy Conversion Energy Policy Solar Energy Wind Energy	18. Distribution Statement Unclassified - Unlimited

19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 552	22. Price* $15.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley
COLORADO
University of Colorado, Boulder
DISTRICT OF COLUMBIA
Library of Congress
GEORGIA
Georgia Institute of Technology, Atlanta
ILLINOIS
The John Crerar Library, Chicago
MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge
MISSOURI
Linda Hall Library, Kansas City
NEW YORK
Columbia University, New York
OKLAHOMA
University of Oklahoma, Bizzell Library
PENNSYLVANIA
Carnegie Library of Pittsburgh
WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library
COLORADO
Denver Public Library
CONNECTICUT
Hartford Public Library
MARYLAND
Enoch Pratt Free Library, Baltimore
MASSACHUSETTS
Boston Public Library
MICHIGAN
Detroit Public Library
MINNESOTA
Minneapolis Public Library
MISSOURI
Kansas City Public Library
St. Louis Public Library
NEW JERSEY
Trenton Public Library
NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library
OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library
TENNESSEE
Memphis Public Library
TEXAS
Dallas Public Library
Fort Worth Public Library
WASHINGTON
Seattle Public Library
WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from: ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.